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PATENT AND TRADEMARK OFFICE NOTICES

Registration to Practice

The following are names of persons applying for registration to practice before the United States Patent and Trademark Office. Information tending to affect the eligibility of said applicants on moral, ethical, or other grounds, should be furnished the Commissioner of Patents and Trademarks on or before July 22, 1977.

Calvetti, Frederick F. V., 3921 Watson Place, NW., Washington, D.C. 20016

Drezin, Norman A., 783 Kimberly Ct., West Gaithersburg, Md. 20760

Heald, Randall M., 1825 Barbee St., McLean, Va. 22101

Langsam, Andrew S., 3201 Landover St., Alexandria, Va. 22305

Marquette, Darrell F., 12301-B Inletridge, Maryland Heights, Mo. 63043

LUTRELLE F. PARKER,
Deputy Commissioner of Patents and Trademarks, and
Chairman, Committe on Enrollment.

Deposit of Computer Program Listings

[37 CFR Part 1]

Notice of Proposed Rulemaking

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Proposed Rule.

SUMMARY: This proposed rule would amend the rules of practice to provide special procedures for presentation of computer program listings in patent applications. This proposal would reduce the present burden of presenting such listings on paper and would also reduce expenses for both the patent applicant and the Patent and Trademark Office.

DATES: Comments must be received on or before: September 13, 1977. Hearing: September 13, 1977, beginning at 9:30 a.m.

ADDRESSES: Send comments to: Commissioner of Patents and Trademarks, Washington, D.C. 20231. The hearing will be held in Room 11C24 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia. Written comments and transcript of hearing will be available for public inspection in Room 11E10 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557-3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

SUPPLEMENTARY INFORMATION: Notice is hereby given that, pursuant to the authority contained in section 6 of the Act of July 19, 1952, as amended (66 Stat. 793; 85 Stat. 364; 88 Stat. 1949; 35 U.S.C. 6 as amended), the Patent and Trademark Office proposes to amend Title 37 of the Code of Federal Regulations by amending Sections 1.21 and 1.77 and by adding a new Section 1.96. This proposal has been reviewed pursuant to E.O. 11821 and OMB Circular A-107 and determined to have no major inflationary impact.

The purpose of the proposed rule change is to provide suitable procedures for presenting computer program listings where such listings are submitted with applications for patent to fulfill the disclosure requirements under 35 U.S.C. 112.

This proposal does not in any way imply that the Patent and Trademark Office considers computer programs per se to be patentable subject matter.

The provisions of 37 CFR Sections 1.52 and 1.84 were developed for and are suitable for the specification and drawings of most patent applications. However, when lengthy computer program listings must be included in order to provide a complete disclosure, their presentation in the conventional manner can become burdensome.

The cost of printing long computer programs or routines in patent documents is very expensive to the Office. The issue fees for the applicant, which are based on the number of pages or sheets, are correspondingly high.

Proposed new Section 1.96 sets forth alternative methods for presentation of such listings. Under paragraph (a), relatively short computer program listings (10 printout pages or less) will be printed as part of the patent. Paragraph (b) provides for submitting computer program listings which are 51 or more paper pages in length in the form of microfiche as an appendix. Computer program listings 11–50 pages in length may be submitted under the provisions of either paragraphs (a) or (b). Appendices on microfiche will not be printed in the patent but will become publicly available on the date the patent is issued. After patenting, the appendix will be prior art under 35 U.S.C. 102(e) as of the filing date of the application with which it was filed. Various incorporations by reference have been approved by the courts in *General Electric Company, v. Brenner*, 159 USPQ 335; In re Hawkins, 179 USPQ 157, and In re Argoudelis et al., 168 USPQ 99.

Copies of publicly available computer program listing appendices may be purchased either as microfiche (148 mm x 105 mm card) at $1.00 per microfiche or as printed out on paper copy at 30¢ per page.

The micrographic standards referred to in proposed Section 1.96(b)(2) may be obtained from either the National Micrographic Association, 8728 Colesville Road, Silver Spring, Maryland 20910 or the American National Standards Institute, 1430 Broadway, New York, New York, 10018.

1. Section 1.21 is proposed to be amended by adding a new paragraph (l) to read as follows:

Section 1.21. *Patent and miscellaneous fees and charges.*

* * * * *

(l) The fee for obtaining a microfiche copy, per microfiche ---- $1.00

* * * * *

2. Section 1.77 is proposed to be amended by revising paragraph (c) to read as follows:

Section 1.77 *Arrangement of application.*

* * * * *

(c) (1) Cross-reference to related applications, if any.
(2) Reference to material incorporated by reference, if any. (See Sections 1.96(b) and (c)).

* * * * *

3. A new Section 1.96 is proposed to be added which reads as follows:

Section 1.96 *Submission of computer program listings.*

Computer program listings may be submitted in the following forms:

(a) *As part of application which is to appear in the patent.* If the computer program listing is contained on 10 printout pages or less, it may be submitted either as drawings or as part of the specification.

(1) *Drawings.* The listing may be submitted in the manner and complying with the requirements for drawings as provided in Section 1.84. At least one figure numeral is required on each sheet of drawing.

(2) *Specification.*

(i) The listing may be submitted as part of the specification in accordance with the provisions of Section 1.52, at the end of the description but before the claims.

(ii) The listing may be submitted as part of the specification in the form of computer printout sheets commonly (11 by 14 inches in size) for use as "camera ready copy" when a patent is subsequently printed. Such computer printout sheets must be original copies from the computer with dark solid black letters, on white, unshaded and unlined paper, the printing on each sheet must be limited to an area 9 inches high by 11 inches wide, and the sheets should be submited in a protective cover. When printed in patents, such computer printout sheets will appear at the end of the description but before the claims and will be reduced about ½ in size with two printout sheets being printed as one patent specification page. Any corrections must be made by way of substitute sheets.

(b) *As an appendix which will not be printed.* If a computer program listing printout is more than 51 pages long, applicants must submit such listing in the form of microfiche, referred to in the specifications. The microfiche filed with a patent application is referred to as an appendix. The microfiche appendix will not be part of the printed patent. Reference in the application to the appendix should be made at the location indicated in Section 1.77(c).

(1) *Availability of appendix.* Such computer program listings on microfiche will be available to the public, and paper or microfiche copies will be available for purchase, after a patent is granted based on such an application. Any corrections must be made by way of revised microfiche.

(2) *Submission requirements.* Computer-generated information submitted as an appendix to an application for patent shall be in the form of microfiche in accordance with the standards set forth in National Micrographics Association (NMA) Standards—

MS1—Quality Standards for Computer Output Microfilm
MS2 (ANSI PH 5.18–1976)—Format and Coding Standards for Computer Output Microfilm
MS5 (ANSI PH 5.9–1975)—Microfiche of Documents
ANSI PH 2.19–1959—"Diffuse Transmission Density"—

except as modified or clarified below:

(i) Film submitted shall be first generation (camera film) negative appearing microfiche (with emulsion on the back side of the film when viewed with the images right reading).

(ii) Either Computer-Output-Microfilm (COM) output or copies of photographed paper copy may be submitted. In the former case, NMA standards MS1 and MS2 apply; in the latter case, standard MS5 applies.

(iii) Reduction ratio of microfiche submitted should be 24:1 or a similar ratio where variation from said ratio is required in order to fit the documents into the image area of the microfiche format used.

(iv) Film submitted shall have a thickness of at least .005 inches (0.13 mm) and not more than .009 inches (0.23 mm) for either cellulose acetate base or polyester base type.

(v) Both microfiche formats A1 (98 frames, 14 columns x 7 rows) and A3 (63 frames, 9 columns x 7 rows) which are described in NMA standard MS2 (A1 is also described in MS5) are acceptable for use in preparation of microfiche submitted.

(vi) At least the left-most ⅓ (50 mm x 12 mm) of the header of each microfiche submitted shall be clear or positive appearing so that the Patent and Trademark Office can apply serial number and filing date thereto in an eye-readable form. The middle portion of the header shall be used by applicant to apply an eye-readable application title together with inventor's name and any other bibliographic information the applicant sees fit to include. The final right-hand portion of the microfiche shall contain sequence information for the microfiche such as 1 of 4, 2 of 4, etc.

(vii) Additional requirements which apply specifically to microfiche of filmed paper copy or COM microfiche:

(a) Microfiche of filmed paper copy.

(1) The first frame of each microfiche submitted shall contain a standard NBS Microcopy Resolution Test Chart (No. 1010A).
(2) The second frame of each microfiche submitted must contain a fully descriptive title.
(3) The pages appearing on the microfiche frames should be consecutively numbered.
(4) Pagination of the microfiche frames shall be left to right and from top to bottom.
(5) At a reduction of 24:1 resolution of the original microfilm shall be at least 120 lines per mm (5.0 target) so that reproduction copies may be expected to comply with provisions of paragraph 7.1.4 of NMA Standard MS5.
(6) Background density of negative-appearing camera master microfiche of filmed paper documents shall be within the range 0.9 to 1.2 and line density should be no greater than 0.08. The density shall be visual diffuse density as measured using the method described in ANSI Standard PH 2.19–1959.
(7) A suitable index should be included on each microfiche.

(b) Microfiche generated by COM.

(1) Background density of negative-appearing COM-generated camera master microfiche shall be within the range of 1.7 to 2.0 and line density should be no greater than 0.2. The density shall be visual diffuse density as described in ANSI PH 2.19–1959.
(2) The first frame of each microfiche submitted shall contain a resolution test frame in conformance with NMA Standard MS1 (3.1.1).
(3) The second frame of each microfiche submitted must contain a fully descriptive title together with any other suitable index or other appropriate information.
(4) The pages appearing on the microfiche frames should be consecutively numbered.
(5) It is preferred that pagination of the microfiche frames be from left to right and top to bottom but the alternative, i.e., from top to bottom and from left to right, is also acceptable.

(c) *Optional use of either paragraph (a) or (b).* If the computer program listing is 11–50 pages long, applicants may utilize either the procedures of paragraph (a) or (b) of this section.

June 1, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved June 7, 1977.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 77–17030: Filed 6–14–77; 8:45 a.m.]
42 FR 30522, June 15, 1977

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,811,816, O'Brien and Hawker, RADIO NAVIGATION SYSTEMS, **filed** Aug. 26, 1970, United States Court of Claims (District of Columbia) Doc. 299–70, *Decca Limited v. The United States.* Claims held valid and infringed, July 9, 1976.

3,012,585, H. C. O'Brien, PIPE COATING WITH FLOWABLE INNER LAYER; **3,211,598,** same, METHODS OF COATING PIPE, **filed** Oct. 15, 1975, D.C., N.D. Ohio (Cleveland) Doc. C75–902, *H. C. Price Company and Plicoflex Inc. v. Samuel Moore & Co.* Stipulation and order settling and dismissing action. Notice waived, Feb. 16, 1977.

3,029,109, W. P. Nail, CONTROL OF INFLATABLE ARTICLES, **filed** May 27, 1976, D.C., N.D. Calif. (San Francisco) Doc. C76–1084 SC, *World Products Warehouse Company v. Keith W. Reid, Donald Johnson and Air Beds Inc.* Stipulated dismissal, Feb. 25, 1977.

3,030,371, L. A. Walter, PROCESS FOR THE PREPARATION OF D- AND L-ARYL-(2-PYRIDYL)-AMINO ALKANES, **filed** Feb. 18, 1977, D.C.N.J. (Newark) Doc. 77–0351, *Schering Corporation v. Premo Pharmaceutical Laboratories, Inc.*

3,057,449, J. E. Thomson, TYPEWRITER, **filed** Feb. 10, 1977, D.C., S.D.N.Y., Doc. 77–C–662, *Western Stamping Corp. v. Buddy L. Corp. et al.*

3,211,598. (See 3,012,585.)

3,214,936, L. J. Di Peri, DRY-AIR EVAPORATIVE COOLER, **filed** Feb. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–580–LTL, *Leonard J. Diperi et al. v. American Environmental Systems, Inc. et al.*

3,312,124, Meier and Meier, STEERING-WHEEL ASSEMBLY FOR AUTOMOTIVE VEHICLES, **filed** Feb. 24, 1977, D.C., N.D. Tex. (Dallas) Doc. CA3–77–0242–C, *Superior Industries International, Inc. v. Superior Industries, Inc.*

3,325,899, M. Staunt. DENTAL HANDPIECE AND COLLET WRENCH THEREFOR; **Reg. No. 1,020,796** (QUIET-AIR), American Hospital Supply Corporation, **filed** Feb. 17, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–572 RF, *American Hospital Supply Corp. v. Fleetwood Dental et al.*

3,381,001, Perlman and Perlman, COFFEEMAKER, **filed** May 15, 1972, D.C., S.D. Ill. (Springfield) Doc. S–C–72–90, *Hill-Shaw Company v. Bunn-O-Matic Corporation.* Order of dismissal without prejudice, entered, Mar. 3, 1977.

3,398,689, R. W. Allington, APPARATUS PROVIDING A CONSTANT-RATE TWO COMPONENT FLOW STREAM, **filed** Feb. 17, 1977, D.C. Mass. (Boston) Doc. CA77–506–T, *Waters Associates Inc. v. Instrumentation Specialties Co.*

3,161,626, Stamps and Nelkirk, AGRICULTURAL CHEMICAL APPLICATION PROCESS AND APPARATUS THEREFOR, **filed** Feb. 18, 1977, D.C. Wash. (Spokane) Doc. C–77–53, *Inject-O-Meter Manufacturing Company, Inc. v. Agri Systems Division of Calvert Controls.*

3,189,198, Brody and Chaney, FLAME PHOTOMETRIC DETECTOR WITH IMPROVED SPECIFICITY TO SULFUR AND PHOSPHORUS, **filed** Feb. 28, 1977, D.C. Md. (Baltimore) Doc. H77 291, *American Standard Inc. v. Meloy Laboratories, Inc. and Monitor Labs, Incorporated.*

3,562,462, E. L. Long, TILT SWITCH WITH FLAT SPRING CENTERING MEANS; **3,674,966,** same, TILT SWITCH WITH ELONGATED SWITCH BLADE MOUNTED ON A TRIANGULAR PIVOT FOR WIPING ACTION, **filed** Feb. 22, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c587, *Cherry Electrical Products Corporation v. Controls Company of American Dir. of the Singer Co.*

3,588,576, C. J. Kawlecki, SPARK-GAP DEVICE HAVING A THIN CONDUCTIVE LAYER FOR STABILIZING OPERATION, **filed** July 1, 1976, D.C., N.D. Ill. (Chicago) Doc. 76c2419, *Joslyn Mfg. & Supply Co. v. Reliable Electric Company.* Stipulation to dismiss the above cause without prejudice granted, Feb. 22, 1977.

3,613,353, B. A. Kock, WATCH; **3,685,282,** same, WATCH ESCAPEMENT MECHANISM, **filed** Feb. 25, 1977, D.C., N.D.N.Y. (Utica) Doc. 77–C–941(WK), *Bruce A. Kock v. Louis Marx & Company, Inc. et al.*

3,671,931, R. M. Teich, AUTOMOBILE THEFT ALARM FOR DETECTING UNAUTHORIZED ENERGIZATION OF RESISTIVE LOAD, **filed** Aug. 12, 1975, D.C.N.J. (Newark) Doc. 75–1380, *General Automotive Specialty Co., Inc. v. On-Guard Corporation of America et al.* Consent judgment for permanent injunction, Aug. 13, 1975.

3,674,966. (See 3,562,462.)

3,774,186, R. B. Enemark, SMOKE DETECTOR FAILURE ALARM; **3,868,181,** A. A. Marsocci, OPTICAL SMOKE DETECTOR WITH LIGHT SCATTERING TEST DEVICE, **filed** Jan. 24, 1977, D.C., C.D. Calif. (Los Angeles), Doc. CV77–290–AAH, *Electro Signal Lab., Inc. v. Tire Corp. et al.*

3,685,282. (See 3,613,353.)

3,789,210, Weber, Shroyer and Baker, RECESSED LIGHTED ASSIST BAR, **filed** Feb. 23, 1977, D.C., N.D. Ind. (South Bend) Doc. S77–0030, *Progressive Dynamics, Inc. v. Conroth Company.*

3,792,163, S. J. Fudro, EGG DECORATING DEVICE; **Reg. No. 970,678** (DECOREGGER), Spearhead Marketing, Inc., **filed** Mar. 17, 1975, D.C., N.D. Ill. (Chicago) Doc. 75c860, *Spearhead Marketing, Inc. v. Toys "R" Us, Inc.* Filed plaintiff's notice of dismissal pursuant to Rule 41(a)(1)(i), Aug. 1, 1975.

3,799,568, R. G. Hager, LUGGAGE TRANSPORT STRUCTURE; **Re. 29,036,** same, **filed** Feb. 11, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–509–MML, *Samsonite Corporation v. Robert G. Hager.*

3,816,702, R. E. Green, ELECTRONIC ISOTHERMAL DEVICE, **filed** Jan. 27, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV–77–0336–WMB, *Bio-Dynamics, Inc. v. Robert E. Green, doing business as Phenix Company.*

3,818,198, Walker and Maloy, AUTOMATIC DIRECT-READING PHOTOMETER APPARATUS AND METHOD, **filed** Feb. 15, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–524 RMT, *Collmorgen Technologies Corp. v. Gamma Scientific Inc. et al.*

3,825,172, C. A. Mollura, TUBULAR FLEXIBLE BAG WITH LAP WELDED ENDS, **filed** Feb. 15, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–532–R, *Carlos A. Mollura v. Curtis G. Miller et al.*

3,835,610, A. W. Hughes, Jr., TALKING ALARM CLOCK, **filed** Feb. 25, 1977, D.C., S.D.N.Y., Doc. 77–C–966, *Janex Corporation v. Bradley Time et al.*

3,856,317, Bell, Wallace and Winters, CONVERTIBLE AND REVERSIBLE SEAT STRUCTURE, **filed** Feb. 23, 1977, D.C., N.D. Ohio (Toledo) Doc. C77–93, *General Engineering & Mfg. Corp. v. Kustom Fit of Ohio, Inc.*

3,868,181. (See 3,774,186.)

3,983,656, D. L. Bain, FISHING LURE, **filed** Dec. 16, 1976, D.C., S.D. Miss. (Jackson) Doc. J76–386(C), *Dewey L. Bain v. Action Lures Company, Inc.* Order dismissing cause on motion of plaintiff without prejudice, Feb. 15, 1977.

Re. 29,036. (See 3,799,568.)

D. 238,268, C. Strada, MOTORCYCLE EXHAUST PIPE, **filed** Feb. 25, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c661, *Charles Strada v. AMF, Inc.*

Reg. No. 970,678. (See 3,792,163.)

Reg. No. 1,020,796. (See 3,325,899.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

No Reissue Filing Notices published in this Issue.

PATENT NOTICES

Certificates of Correction for the Week of July 5, 1977

P.P. 4,042
D. 242,117
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Adverse Decisions in Interferences

In the designated interferences involving the indicated claims of the following patents, final decisions have been rendered that the respective patentees were not the first inventors with respect to the claims listed.

Patent No. 3,594,425, W. H. Brader, Jr., S. B. Cavitt and R. M. Gipson, HYDROFORMYLATION PROCESS, Interference No. 98,461, decided Dec. 9, 1976, claims 1, 2, 3, 6 and 8.

Patent No. 3,735,161, G. D. Perkins and J. R. Colbert, PIEZOELECTRIC TRANSDUCER, Interference No. 98,973, decided Jan. 27, 1977, claims 2, 5–8, 13 and 14.

Patent No. 3,756,984, C. H. J. Klaren, H. Krak and F. Jeanno, EPOXY-IMIDAZOLE ADDUCTS AS CURING AGENTS FOR EPOXY RESINS, Interference No. 99,141, decided Feb. 1, 1977, claims 1 and 4–11.

Patent No. 3,762,866, J. Rayment, D. D. McCordell and C. Parr, TEXTILE FINISHING PROCESSES, Interference No. 99,215, decided Feb. 17, 1977, claims 1, 2, 4 and 5.

Patent No. 3,770,978, W. E. Kluge, MAGNETIC BUBBLE DOMAIN SWITCHING DEVICE, Interference No. 98,708, decided Dec. 29, 1976, claim 1.

Patent No. 3,781,852, E. A. White, and J. H. Bunting, CALCULATOR DISPLAY CIRCUIT, Interference No. 98,950, decided Feb. 25, 1977, claims 1–11.

Patent No. 3,790,839, L. Dietch, RECTANGULAR GRADE BLACK SURROUND SCREEN, Interference No. 98,668, decided Oct. 29, 1976, claims 1–7.

Patent No. 3,804,781, J. D. Colgan, EXTRUDED ALUMINA CATALYST SUPPORTS, Interference No. 99,013, decided Mar. 2, 1977, claims 1 and 3.

Patent No. 3,806,757, S. Saruta, IN-LINE GUN TYPE COLOR TELEVISION PICTURE TUBE APPARATUS, Interference No. 99,381, decided Feb. 16, 1977, claims 1–6.

Patent No. 3,820,903, H. Kindl and V. Met, DEVICE FOR PRODUCING A LIGHT PLANE, Interference No. 98,871, decided Jan. 19, 1977, claims 1–9.

Patent No. 3,824,571, R. B. Clover, Jr. and R. F. Waites, MAGNETIC BUBBLE GENERATION, Interference No. 99,192, decided Mar. 2, 1977, claims 1, 2, 5, 6 and 7.

Patent No. 3,842,184, A. E. Kulepkamp and W. Wangard, MUSICAL INSTRUMENT HAVING AUTOMATIC ARPEGGIO SYSTEM, Interference No. 99,242, decided Mar. 18, 1977, claims 6, 7 and 10.

Patent No. 3,861,417, G. W. Rowe, INSTRUMENT CONSOLE FOR UNDERWATER DIVING APPARATUS, Interference No. 99,117, decided Feb. 17, 1977, claims 2, 3, 17, 19, 20, 21, 22, 24 and 25.

Patent No. 3,866,127, G. A. Demos and D. S. Ruhoff, SELECTIVE AUDIO SIGNAL FREQUENCY MULTIPLIER, Interference No. 99,286, decided Mar. 2, 1977, claims 1–9, and 11–15.

Patent No. 3,867,460, E. J. Corey, REAGENTS FOR THE STEREO SELECTIVE GENERATION OF THE CHIRAL SIDECHAIN CARBINOL UNIT (C-15) IN PROSTAGLANDIN SYNTHESIS, Interference No. 99,382, decided Feb. 17, 1977, claims 1–3.

Patent No. 3,921,638, C. H. Schaar, DIAPER WITH PLEAT SECURING TAPE MEANS, Interference No. 99,332, decided Feb. 17, 1977, claims 1, 2, 3 and 11.

Errata

All reference to Patent No. 4,024,331 to Richard W. Neuzil, et al., of Illinois for Process for Separating a Ketose From an Aldose by Selective Adsorption appearing in the OFFICIAL GAZETTE of May 17, 1977, should be deleted since no patent was granted.

All reference to Patent No. 4,025,816 to Geoffrey Phillip Watts of Arizona for Bargraph Display appearing in the OFFICIAL GAZETTE of May 24, 1977, should be deleted since no patent was granted.

All reference to Patent No. 4,026,745 to Donald M. Hatch, et al. of California for High Temperature Consolidation Process appearing in the OFFICIAL GAZETTE of May 31, 1977, should be deleted since no patent was granted.

All reference to Patent No. 4,031,304 to Richard W. Neuzil, et al. of Illinois for Process for Separating a Ketose From an Aldose by Selective Adsorption appearing in the OFFICIAL GAZETTE of June 21, 1977, should be deleted since no patent was granted.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 4, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-4-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	5-17-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	2-9-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	1-19-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	5-24-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-4-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-27-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	10-28-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-7-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion - Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	11-12-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-3-76

Expiration of patents: The patents within the range of numbers indicated below expire during June 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,939,145 to 2,943,326, inclusive
Plant Patents	Numbers 1,950 to 1,956, inclusive

DEFENSIVE PUBLICATIONS

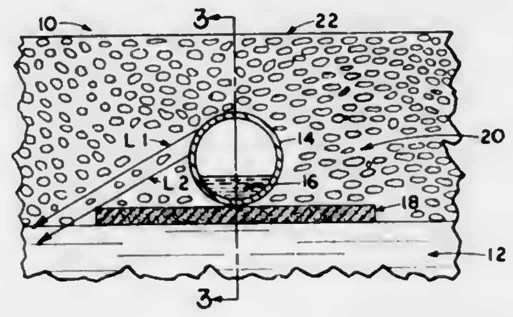
PUBLISHED JULY 5, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec. 16, 1969, 869 O.G. 687. The abstracts of Defensive Publication applications are identified by distinctly numbered series and are arranged chronologically. The heading of each abstract indicates the number of pages of specification, including claims and sheets of drawings contained in the application as originally filed. The files of these applications are available to the public for inspection and reproduction may be purchased for 30 cents a sheet.

Defensive Publication applications have not been examined as to the merits of alleged invention. The Patent and Trademark Office makes no assertion as to the novelty of the disclosed subject matter.

T960,001
CULVERT CONSTRUCTION

George R. Knight, Box 5-465, College, Alaska 99701
Continuation of Ser. No. 577,577, May 15, 1975, abandoned, which is a continuation of Ser. No. 388,291, Aug. 14, 1973, abandoned, which is a continuation-in-part of Ser. No. 186,240, Oct. 4, 1971, abandoned. This application Apr. 12, 1976, Ser. No. 676,444
Int. Cl.^{2} E01F *5/00*
U.S. Cl. 61—16
1 Sheets Drawing. 14 Pages Specification

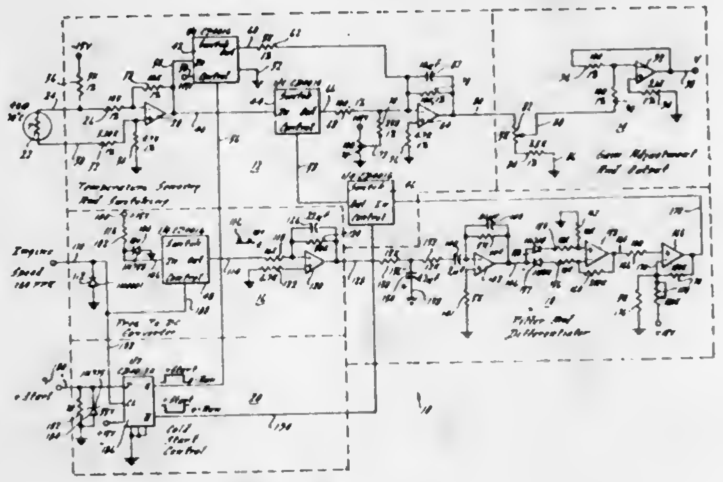


A culvert construction particularly useful in Arctic regions wherein a permafrost condition typically prevails is provided by a culvert having an insulating base layer between the culvert and the permafrost, preferably wherein the base layer is of greater width than the width of the culvert. Suitable materials for preparing the insulating base layer are synthetic resin foams such as polyurethane and polystyrene. The culvert construction is useful in Arctic regions where a permafrost condition prevails to inhibit culvert sag and culvert icing.

T960,002
FUEL ENRICHMENT CONTROL CIRCUIT FOR AN INTERNAL COMBUSTION ENGINE

Roger A. Moon, 1659 Sheffield Road, Ypsilanti, Mich. 48197
Continuation of Ser. No. 519,156, Oct. 30, 1974, abandoned. This application Mar. 4, 1976, Ser. No. 663,662
Int. Cl.^{2} F02B *3/00*
U.S. Cl. 123—32 EA
1 Sheets Drawing. 27 Pages Specification

An internal combustion engine fuel enrichment control circuit which produces an output electrical signal suitable for use in modifying an engine fuel demand electrical signal when the temperature of the engine is below its normal operating temperature. The output signal has a fixed magnitude when the engine is not being cranked or started and the angular acceleration of the engine output shaft is less than a predetermined magnitude. The output electrical signal is proportional to the temperature of the engine when the engine is being cranked or started and also when the angular acceleration of the engine output shaft is greater than the predetermined magnitude. The angular acceleration of the engine is used as an indication of the roughness of operation of the engine. The output electrical signal proportional to engine temperature effects fuel enrichment by the modification of a fuel demand signal that represents engine fuel demand when the engine is at its normal operating temperature. In a preferred embodiment the invention includes an engine temperature sensing and switching circuit, a gain control and output circuit, an engine speed sensing circuit, a filter and differentiator circuit for producing a signal proportional to acceleration of the engine's output shaft and a cold start control circuit.



Temperature Sensing And Switching
Gain Adjustment And Output
Engine Speed
Freq To DC Converter
Filter And Differentiator
Cold Start Control

T960,003
ALLEVIATION OF TISSUE DAMAGE WITH BIS(SUBSTITUTEDPHENYL)MERCAPTOLES

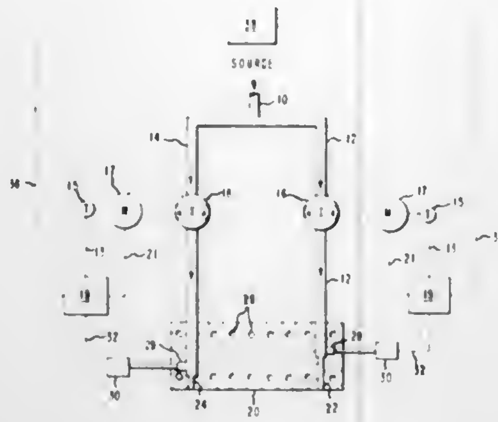
Ian R. Innes, 575 Elm St., and William J. Davidson, 1286 Paterson St., both of Winnipeg, Manitoba, Canada
Filed May 14, 1976, Ser. No. 686,357
Int. Cl.^{2} A61K *31/10*
U.S. Cl. 424—337
No Drawing. 25 Pages Specification

Tissue damage alleviative effects are obtained by administration of a bis(substitutedphenyl)mercaptole, such as probucol, to animals. Tissue protective or recuperative effects are obtained, for example, in cardiac hepatic, uterine and kidney tissue subject to myopathy or histopathological injury by oral or parenteral administration of mercaptole compounds.

T960,004
APPARATUS FOR CONCURRENT MEASUREMENT OF POLYMER MELT

Garth Emanuel Neville, 307 Brandywine Drive, Old Hickory, Tenn. 37138
Continuation of Ser. No. 469,838, May 14, 1974, abandoned. This application May 26, 1976, Ser. No. 690,313
Int. Cl.² G01N *11/04*
U.S. Cl. 73—55
1 Sheets Drawing. 12 Pages Specification

A polymer melt's rheological properties are comprehensively described by defining the constants K and n in the rheological equation: $T = KG^n$ where T = shear stress and G = shear rate. The constants are determined by a rheometer which divides a molten polymer sample into two streams pumped by positive displacement pumps having identical speed-displacement characteristics past pressure transducers and finally through dissimilar capillaries to atmosphere. The pressure in each line is regulated at a predetermined level. Pressure and tachometer readings are used to compute the constants K and n.



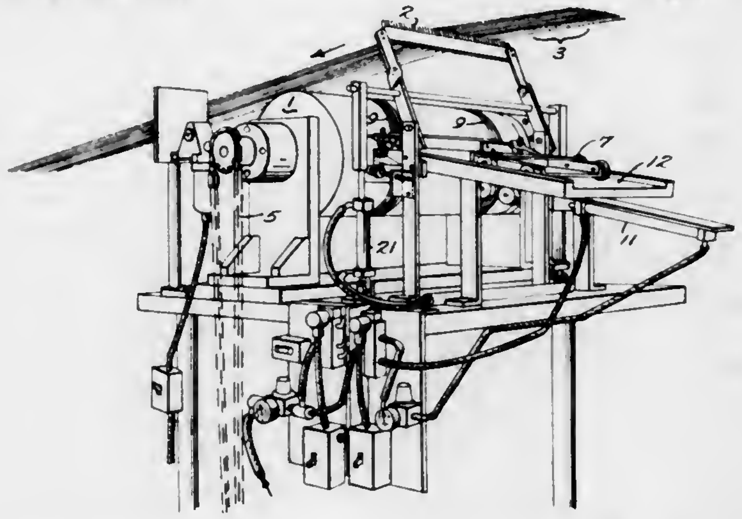
REISSUES

JULY 5, 1977

Matter enclosed in heavy brackets[ ]appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,287
APPARATUS FOR APPLYING HOT MELT SIZE MATERIAL TO TEXTILE YARNS

Walter F. Illman, Greensboro; Robert C. Malpass, High Point, and Delano M. Conklin, Burlington, all of N.C., assignors to Burlington Industries, Inc., Greensboro, N.C.
Original No. 3,862,475, dated Jan. 28, 1975, Ser. No. 326,149, Jan. 23, 1973. Application for reissue Feb. 13, 1976, Ser. No. 658,063
Int. Cl.² D06C *29/00*
U.S. Cl. 28—178 7 Claims

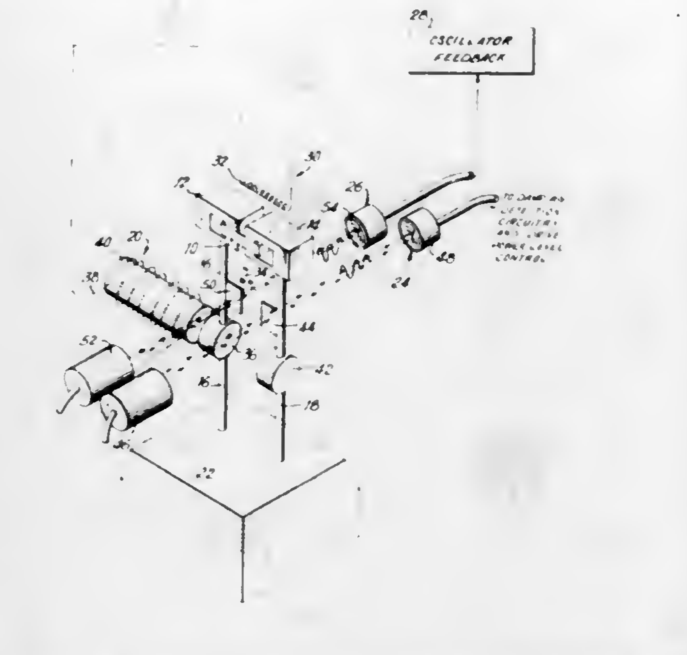


1. An apparatus for applying sizing material to a plurality of textile strands *of given diameter*, the sizing material initially being *in* solid form, comprising [:]
- a roller having a plurality of grooves therein extending circumferentially about the peripheral closed surface thereof, *each of said grooves having a depth greater than the given diameter of a textile strand cooperating therewith*,
- means for melting the sizing material and means for applying the sizing material to said roller *from the exterior of said roller* so that sizing is lodged in said grooves [thereof] *of said roller*, and
- means for rotating said roller so that sizing in said grooves is applied to textile strands each moving past said roller, and travelling[for]at least a short distance in a groove *immersed in sizing in said groove* so as to pick up at least a portion of the sizing in that groove.

Re. 29,288
MATERIAL ANALYZING APPARATUS AND METHOD

Robert G. Schilling, Jr., Flushing, N.Y., assignor to Chemical Instruments Corporation, Bayside, N.Y.
Original No. 3,751,977, dated Aug. 14, 1973, Ser. No. 245,574, Apr. 19, 1972. Application for reissue July 17, 1975, Ser. No. 596,589
Int. Cl.² G01N *3/32*
U.S. Cl. 73—101 23 Claims

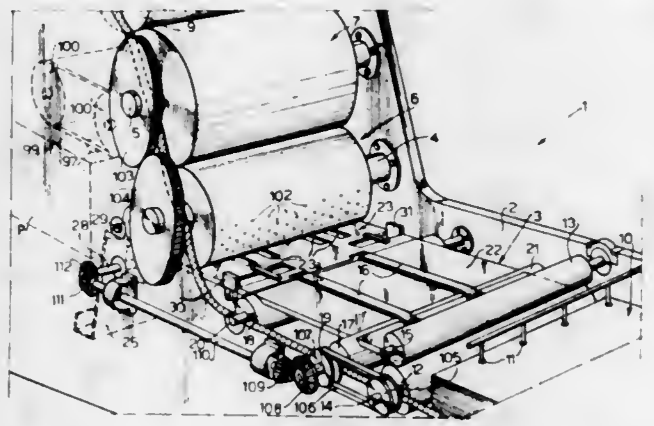
22. A method of dynamically analyzing a sample comprising the steps of:
- *cyclically moving the center of the mass of a sample along an arcuate path lying in a plane, and*
- *simultaneously moving spaced portions of said sample in opposite senses in said plane transverse to said arcuate path,*



thereby to create stresses in said sample, and sensing said stresses.

Re. 29,289
PRINTING PRESS WITH VARIABLE SPEED TRANSFER CYLINDER

Giancarlo Terzuolo, and Federico Capetti, both of Turin, Italy, assignors to Societa Nebiolo S.p.A., Turin, Italy
Original No. 3,913,478, dated Oct. 21, 1975, Ser. No. 401,298, Sept. 27, 1973. Continuation of Ser. No. 154,105, June 17, 1971, abandoned. Application for reissue Feb. 18, 1976, Ser. No. 659,062
Claims priority, application Italy, June 22, 1970, 69147/70
Int. Cl.² B41F *13/24*
U.S. Cl. 101—232 9 Claims



1. In a rotary printing press of the type having a constant speed rotary printing cylinder, a setting table, transport means for transporting sheets of material to be printed by said printing cylinder along said setting table, lateral setting means on said setting table for setting said sheets in lateral registration with respect to said printing cylinder while said sheets are on said setting table, a continuously rotating variable speed transfer cylinder tangential to said printing cylinder and to said table, longitudinal setting means carried by said transfer cylinder for setting the front edge of said sheets in longitudinal registration with respect to said printing cylinder without

stopping said sheets, and holding means carried by said transfer cylinder operable for holding the individual sheet so set in contact with said transfer cylinder, and gripping means on said printing cylinder for gripping said sheet when said holding means reaches the periphery of the printing cylinder, the improvement comprising the diameter of the transfer cylinder being smaller than the diameter of the printing cylinder.

a safety device comprised of at least one sensory lever pivotally mounted at one end on a shaft parallel to the axis of said transfer cylinder,

means on said transfer cylinder urging said sensory lever to rotate so that its free end projects from the surface of said transfer cylinder,

means resisting said rotation of said sensory lever to maintain it in a position such that its said free end does not project from said surface of said transfer cylinder except for a period when said holding means on said cylinder passes the position where a sheet is picked up for transfer from said setting table,

a switch mounted at a relatively fixed position near said transfer cylinder, said switch, when actuated, operating to disable said holding means on said transfer cylinder,

an actuating member carried by said cylinder, means on said cylinder urging said actuating member towards an actuating position,

a latching member on said cylinder, said latching member locking said actuating member away from its actuating position when said sensory lever is in such a position that its end does not project from the surface of the cylinder.

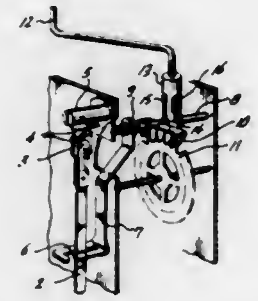
Re. 29,290
PENDULUM AND ESCAPEMENT ANCHOR RELATIONSHIP INDICATOR AND SETTER

Dale Nofziger, Bothell, Wash., assignor to Ansonia Clock Company, Inc., Lynnwood, Wash.

Original No. 3,874,324, dated Apr. 1, 1975, Ser. No. 439,877, Feb. 6, 1974. Continuation-in-part of Ser. No. 250,783, May 5, 1972, abandoned. Application for reissue July 30, 1975, Ser. No. 600,316

Int. Cl.^{2} G04B *15/14, 17/02*

U.S. Cl. 116—124 R **9 Claims**



1. Clock escapement mechanism comprising a frame, an escape wheel, shaft means mounting said escape wheel and journaled in said frame for rotation about an axis fixed relative to said frame, anchor means including an anchor and an anchor shaft carrying said anchor and journaled in said frame for rotation about an axis stationary with respect to said frame [and fixed relative to said escape wheel axis] , a pendulum connector frictionally mounted on said anchor shaft and angularly adjustable relative to said *anchor* shaft, an indicator arm projecting from and fixedly secured to said anchor shaft, and index means cooperating with said indicator arm for indicating the angular position of said pendulum connector relative to said anchor shaft.

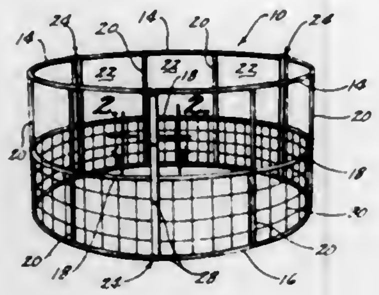
Re. 29,291
PORTABLE ANIMAL FEED BUNK AND METHOD OF FEEDING STACKED OR BALED HAY

Leonard R. Peak, Lacona, Iowa 50139

Original No. 3,851,624, dated Dec. 3, 1974, Ser. No. 404,673, Oct. 9, 1973. Application for reissue June 4, 1976, Ser. No. 692,805

Int. Cl.^{2} A01K *5/00*

U.S. Cl. 119—60 **6 Claims**



1. A portable animal feed bunk comprising,

a plurality of arcuate frame sections having interconnected [overlapping] end portions forming a cylindrical feed bunk of substantially large diameter, open at opposite ends and along its length for free formed substantially large baled hay, said frame sections having a grid formed by vertical and horizontal members in spaced apart relationship with the substantial top half of said grid having large animal feeding grid openings and the substantial bottom half of said grid having hay retaining relatively smaller grid openings, and said feed bunk being light weight for rolling between use locations and tipping onto said large bales of hay.

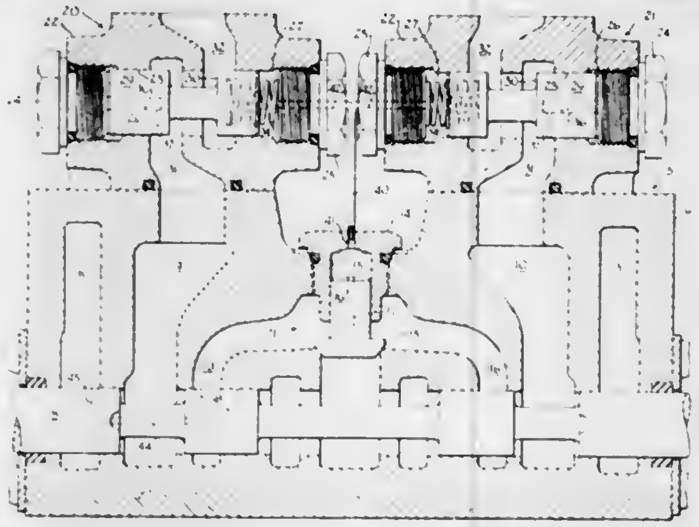
Re. 29,292
CONTROL VALVE MEANS FOR FLUID MOTORS

Francis H. Tennis, Oconomowoc, Wis., assignor to Sundstrand Corporation, Rockford, Ill.

Original No. 3,730,219, dated May 1, 1973, Ser. No. 145,137, May 20, 1971. Application for reissue Apr. 21, 1975, Ser. No. 570,119

Int. Cl.^{2} F15B *13/04*

U.S. Cl. 137—596 **11 Claims**



15. Valve instrumentalities for governing flow in a service line connectable with a fluid motor of pressure fluid to the motor and return fluid therefrom, said valve instrumentalities being of the type comprising a directional control valve having a service passage for connection with the service line to form a part thereof, fluid supply passage means, return passage means, and a valve element movable from a hold position blocking communication between the service passage and both of said passage means to a pair of operating positions, in one of which the service passage is communicated with the fluid supply passage means and in the other of which the service passage is communicated with the return passage means, through a range of metering positions at which the valve element restricts flow of fluid between the service passage and a passage means to an extent that decreases with movement of the valve element towards an operating position, said valve instrumentalities comprising:

A. a pressure reducing valve mechanism for said service passage

(1) having a single passageway through which all fluid that flows in said service line must pass,

(2) having a valve member movable in one direction to an open position and movable in the opposite direction to a restricting position throttling flow of fluid through said passageway, said valve member being arranged to be urged in said opposite direction with a force that depends upon pressure of fluid in the service passage,

(3) a chamber separate from said passageway, and

(4) means responsive to pressure of fluid in said chamber and operatively associated with the valve member for imposing a biasing force on said valve member that is in said one direction and of a magnitude that depends upon pressure of fluid in said chamber and is sufficient to maintain the valve member in its open position when fluid pressure in the service passage does not exceed pressure of fluid in said chamber; and

means at all times communicating said chamber with the fluid supply passage means, so that said valve member is held in its open position whenever pressure fluid is flowing from the pressure fluid source to the motor through the service passage.

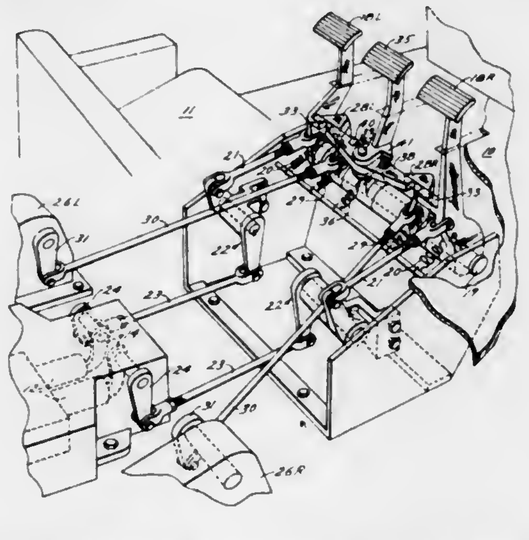
Re. 29,293
PEDAL ACTUATED STEERING CLUTCH AND BRAKE CONTROLS FOR TRACTORS

Charles C. Ehlke; Donald K. Strohschein, both of Naperville, and John W. Yancey, East Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Original No. 3,262,525, dated July 26, 1966, Ser. No. 363,241, Apr. 28, 1964. Application for reissue May 20, 1975, Ser. No. 579,284

Int. Cl.^{2} F16D *67/05*

U.S. Cl. 192—13 R **17 Claims**



1. In a tractor which has steering clutches and steering brakes, the combiation comprising: *first and second* actuating members for said clutches and brakes, *a fluid-operated clutch disengaging valve associated with each clutch*, a linkage *arrangement to operate one clutch disengaging valve and* to release one clutch upon actuation of one member and to apply the corresponding brake upon further actuation of said one member, and *a* similar linkage *arrangement* between the other clutch and brake and the other member, *each of said linkage arrangements including a first linkage from each actuating member to the corresponding clutch disengaging valve and a second separate linkage from each actuating member to the corresponding brake*, a third member and means operable upon actuation of said third member to apply both brakes only *and without operating the clutches.*

Re. 29,294
PRESS FOR MOULDING GRAMOPHONE RECORDS OR THE LIKE

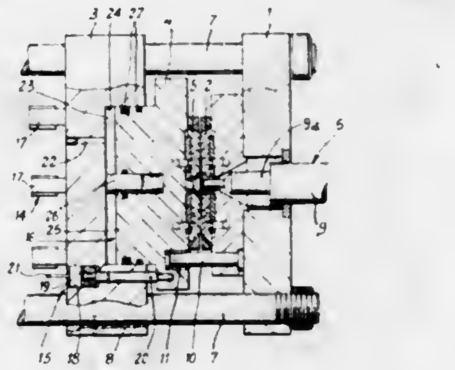
Marcel J. Pierre, Cheptainville, France, assignor to Societe Materiel pour Toutes Applications Plastiques - M.A.P., Paris, France

Original No. 3,969,057, dated July 13, 1976, Ser. No. 548,752, Feb. 10, 1975. Application for reissue Nov. 18, 1976, Ser. No. 743,033

Claims priority, application France, Feb. 21, 1974, 74.05980

Int. Cl.^{2} B29F *1/00;* **B29H** *3/08*

U.S. Cl. 425—590 **4 Claims**



1. Press for moulding gramophone disc records, comprising: a fixed press platen adapted to carry a first mould element; parallel guide columns fast with the fixed press platen; a movable press platen mounted on and movable relatively to said columns, a movable intermediate platen adapted to carry a second mould element, said first and second mould elements having cavities which together form the shape of a gramophone disc record, the movable press and intermediate platens co-operating one within the other as an arrangement of a piston in a cylinder with the intermediate platen supported wholly by the movable press platen; means including a constant-stroke closing mechanism of the toggle type for moving the movable press platen along the guide columns, between an operative position close to the fixed press platen and an inoperative position remote from the fixed press platen; a circuit for the admission of fluid under pressure between the movable press and intermediate platens to effect relative movement of the piston of said piston and cylinder arrangement out of its cylinder, and a feed system for plastics material in the fluid state capable of introducing under pressure a metered charge of this plastics material between the two mould elements when the movable press platen occupies its operative position and when the said circuit delivers fluid under pressure as aforesaid between the movable press and intermediate platens, said means for moving the movable press platen and the circuit for the admission of fluid under pressure being operable, after the

movable platen has been moved toward the fixed platen by the constant stroke mechanism, to act upon the intermediate platen, on each operation of introduction of plastics material under pressure, in two successive stages, the first of which consists in driving the intermediate platen towards the fixed platen with a resilient force calibrated to a value lower than the opposing force which is produced by the introduction of the plastics material into the mould and which tends to separate the mould elements of the fixed and intermediate platens, and the second of which is a stage of compression with a force sufficient to move the two mould elements one against the other after introduction of the charge of plastics material.

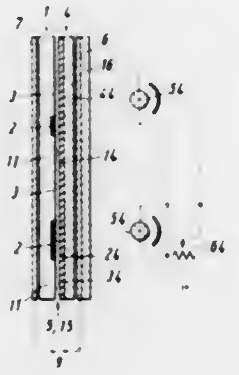
Re. 29,295
TREATMENT PROCESS

Margaret Lillian Steel, and Frank Holt, both of Runcorn, England, assignors to Imperial Chemical Industries Limited, London England

Original No. 3,950,182, dated Apr. 13, 1976, Ser. No. 524,946, Nov. 18, 1974. Application for reissue Oct. 29, 1976, Ser. No. 737,191

Int. Cl.² B02C *23/06*

U.S. Cl. 106—308C **23 Claims**



1. A mineral comminution process which comprises comminuting the mineral in the presence of a liquid medium comprising an ionic polysaccharide, *in which the polysaccharide is a cellulose.*

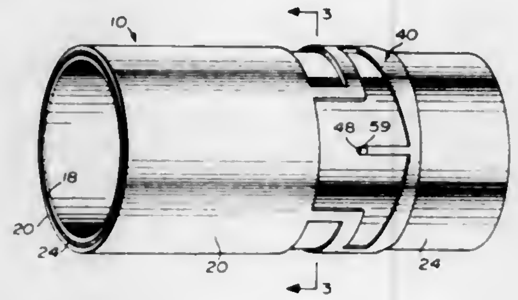
Re. 29,296
DUAL SLOT MICROSTRIP ANTENNA DEVICE

Jack K. Krutsinger, Boulder; Carl N. Bullai, Longmont, and Robert E. Munson, Boulder, all of Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Original No. 3,810,183, dated May 7, 1974, Ser. No. 99,481, Dec. 18, 1970. Application for reissue July 16, 1975, Ser. No. 596,263

Int. Cl.² H01Q *13/10, 1/28*

U.S. Cl. 343—700 MS **7 Claims**



5. A dual slot antenna assembly comprising:

a pair of laterally spaced-apart conductive elements separated with respect to one another by a sheet of dielectric material,

one of said conductive elements being of larger dimensions and underlying the other element and defining an electrical reference or ground surface;

said conductive elements defining a pair of radiation slots between opposing edges of said other element and said reference surface, said radiation slots being longitudinally spaced-apart a predetermined distance approximately equal to one-half wavelength at the anticipated operating frequency of said assembly,

each of which radiation slots emanates radiation therefrom such that the radiation patterns developed are in substantially the same direction;

said radiation slots having a length dimension equal to the entire length of said opposing edges, which length dimension is greater than the spacing between said conductive elements; and

a single electrical signal feed assembly integrally connected with said other conductive element at only one of said opposing edges for electrically exciting both of said radiation slots from a single signal feed junction.

PLANT PATENTS

GRANTED JULY 5, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,069
RUBBER PLANT (FICUS GOLD KING)

Tokuyasu Ito, and Hideo Ikuta, both of Hekinan, Japan, assignors to Cerro Gordo, Inc., Vega Alta, P.R.

Filed Aug. 12, 1976, Ser. No. 713,994

Claims priority, application Japan, Aug. 19, 1975, 50-99798

Int. Cl.² A01H *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of *Ficus elastica* Roxb. var. *decora* tricolor hort., substantially as herein shown and described, characterized over the known rubber plant having variegated foliage, *Ficus elastica* Roxb. var. *decora* tricolor hort., in that leaves are smaller in size, the leaf blade has an ovate shape with a thick coriaceous texture and exhibits a very narrow dark-green area appearing on the edge of the leaf blade and a light-yellow area appearing at the interior of the leaf blade, the boundary between the dark-green border area and the light-yellow interior area is very distinct; the peripheral edge of the leaf blade is wavy; the internode length is shorter; the rate of growth is lower and, since propagation by using cuttings is difficult, air layering is employed.

4,070
ROSE PLANT

Ralph S. Moore, 2519 E. Noble Ave., Visalia, Calif. 93277

Filed Sept. 1, 1976, Ser. No. 719,607

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—9 **1 Claim**

1. A new and distinct variety of miniature rose plant of hardy, dwarf, bushy, spreading, much branched habit, essentially as illustrated and described, characterized by buds and flowers of a medium lavender or lavender pink color resembling the 'Angel Face' Floribunda rose (U.S. Plant Pat. No. 2,792) and resembling the New Penny miniature rose (not patented) in form of bud and flower — the buds and flowers being somewhat larger in size than New Penny; and further characterized by a plant which is vigorous and compact, said plant being easy to propagate from cuttings, with medium small, disease resistant, semi-glossy, foliage, an abundance of bloom, with flowers borne singly or several to the stem in small clusters.

4,071
CLEAR YELLOW MAY SHOESMITH

Yoshio Kono, 13200 Barbata Road, La Mirada, Calif. 90638

Filed Sept. 29, 1975, Ser. No. 617,525

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—78 **1 Claim**

1. A new and distinct variety of chrysanthemum plant, substantially as herein shown and descibed, characterized by a yellow flower 12.7 mm to 19.05 mm smaller than the parent May Shoesmith; having a clearer yellow color which is more toward the yellow-green than toward the yellow-orange; exhibiting an absence of a darker yellow; the distal end of the petal shows occasional whiskers; has a two to three day earlier response time than the parent and other known sports of the parent; plant growth is 5.08 cm to 7.62 cm shorter, the leaf surface has a sheen; the flower is less formal incurving; and the individual petals appear more narrow and exhibit greater cupping through the length of the petal.

4,072
PEACH TREE

Hitoshi P. Nakayama, 7420 E. Lincoln, Fowler, Calif. 93625

Filed Aug. 2, 1976, Ser. No. 710,684

Int. Cl.² A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. The new and distinct variety of peach tree, substantially as shown and described herein, characterized by highly colored, firm, fine grained, yellow-fleshed freestone fruit which reaches maturity a week to 10 days before the peaches of the Red Top variety (unpatented).

4,073
BEGONIA PLANT

Leslie Woodriff, McKinleyville, Calif., assignor to Mikkelsens Inc., Ashtabula, Ohio

Filed June 1, 1976, Ser. No. 691,484

Int. Cl.² A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct cultivar of begonia plant known by the cultivar name Roulette and particularly characterized as to uniqueness by the combined characteristics of foliage which has an overall ruffled or wavy appearance and which is dark green mottled with yellow-green patches between the veins, and a hairy texture on the margins of the leaves; the leaf petiole often forms a coalesced multi-cylindrical effect at the base of the leaf formed by the fusion of the leaf veins from the two opposite spirals; leaf size of up to 10 cm. wide and up to 8 cm. deep when laid out flat; parted leaf margin with two based lobes that spiral; plant height of upward to 12-15 cm.; very light pink to nearly white flowers, and by its efficient propagation by leaf cuttings.

PATENTS

GRANTED JULY 5, 1977

ERRATA

For CLASS	See PATENT NO.
085–004	4,033,243
085–045	4,033,244
123–117 R	4,033,272
124–017	4,033,313
226–157	4,033,560
297–389	4,033,594
203–027	4,033,617
062–003	4,033,734
062–064	4,033,737
062–158	4,033,738
062–202	4,033,739
062–259	4,033,740
423–024	4,033,764
209–073	4,033,862
250–199	4,033,882
250–231 SE	4,033,883
250–496	4,033,884
250–496	4,033,885
250–491	4,033,904
264–045.9	4,033,929
264–032	4,034,027
260–429 R	4,034,037
260–462 R	4,034,038
260–570 R	4,034,039
260–570.9	4,034,040
260–571	4,034,041
260–576	4,034,042
260–578	4,034,043
260–586 R	4,034,044
260–590 FB	4,034,045
260–607 B	4,034,046
260–610 B	4,034,047
260–621 H	4,034,048
260–658 R	4,034,049
260–622 R	4,034,050
260–652.5 R	4,034,051
260–671 C	4,034,052
260–672 T	4,034,053
219–218	4,034,200
219–222	4,034,201
219–230	4,034,202
219–272	4,034,203
219–368	4,034,204

ERRATA – continued

219-385	4,034,205
219-464	4,034,206
219-517	4,034,207
361-002	4,034,264
361-025	4,034,265
361-042	4,034,266
361-044	4,034,267
361-111	4,034,268
361-079	4,034,269
361-256	4,034,270
361-332	4,034,271
361-025	4,034,280
340-173 LM	4,034,355
340-173 R	4,034,356
340-174 TF	4,034,357
340-174 TF	4,034,358
340-174 TF	4,034,359
340-253 A	4,034,360
340-272	4,034,361
340-347 AD	4,034,362
340-347 P	4,034,363
340-347 NT	4,034,364
340-347 DA	4,034,365
340-347 AD	4,034,366
340-347 AD	4,034,367
340-347 AD	4,034,368
340-052 F	4,034,369
357-068	4,034,399

PATENTS

GRANTED JULY 5, 1977

NOTE—A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,032,989

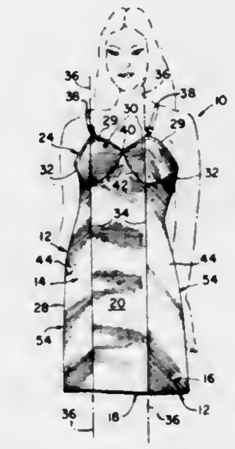
GARMENT LINER

Aubrey Jay, White Plains, and Maurice A. Jacobs, Valley Cottage, both of N.Y., assignors to J. C. Penney Company, Inc., New York, N.Y.

Filed Nov. 8, 1974, Ser. No. 522,318

Int. Cl.^{2} A41B *9/10*

U.S. Cl. 2—73 **10 Claims**



1. A form fitting undergarment which comprises a bodice section and a depending skirt section connected thereto, said bodice section including two bust covering portions, each comprising inner and outer bust panels, said skirt portion including at least a front panel and at least a pair of opposed side panels connected to opposite edge portions of said front panel, and a rear panel interconnecting said opposite side panels, said inner bust covering panels, said front panel, and said back panel being formed of a straight-cut material having generally straight cut edge portions, said outer bust panels and said opposed side panels being formed of a biased cut material having generally biased-cut edge portions biasing the corresponding side and bust panels, said bias-cut of said outer bust panels extending in substantially the same direction as the bias-cut of said opposed side panels at least along a portion defined by a generally vertical line extending generally medially of each breast of a wearer and respective front medial portions along the legs, said bust and side panels further extending respectively over side zones of the body along at least a portion of a vertical line extending generally medially of each respective shoulder blade of the wearer and longitudinally along a rear medial portion of each respective leg to form a snugly encompassing relation with the body of a wearer due to the substantially vertical interconnecting edge portions of said panels and the elastic properties exhibited by said bias-cut side and bust panels.

4,032,990

HEAT RESISTANT GLOVE HAVING ADDITIONAL PROTECTIVE PORTION IN GRIPPING AREA

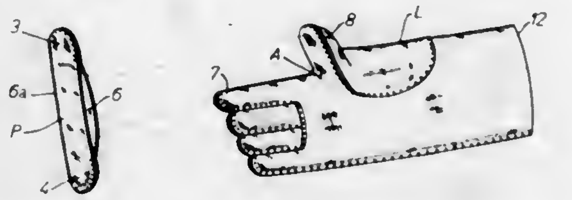
Mayar Richard Mandlman, Bayside, Wis., assignor to Apex Glove Co., Inc., Milwaukee, Wis.

Filed Dec. 3, 1976, Ser. No. 747,376

Int. Cl.^{2} A41D *19/00*

U.S. Cl. 2—161 R **7 Claims**

1. An insulated glove having a liner and also having an outer glove into which the liner is assembled, said liner and glove each having an inter-engaging index finger and thumb with a gripping area therebetween, an insulating portion for said gripping area formed of flexible, heat resistant material and having a pocket at each of its ends, said pockets slipped over the index finger and thumb of said liner and said insulating portion covers said liner gripping area, said liner inserted in said glove with said index finger and said thumb of said insulating portion inserted in said index finger and thumb of said glove and held in assembled relationship between said liner and outer glove.



4,032,991

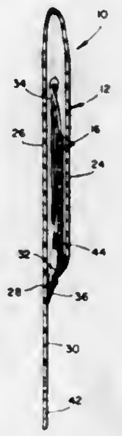
FACE AND HEAD PROTECTIVE DEVICE

Joseph L. Vandeweghe, Englewood, N.J., assignor to Engleway Corporation, Englewood, N.J.

Filed Jan. 5, 1976, Ser. No. 646,505

Int. Cl.^{2} A42B *1/18*

U.S. Cl. 2—173 **8 Claims**



1. A protective device operative to be rendered from a storage condition into an operative condition to afford protection to the wearer against the effects of fire, smoke and noxious fume inhalation; said device in the storage condition comprising; a water-proof envelope enclosing a moistened porous face mask secured thereto, said envelope including an aperture and air-tight closure means operative to air-tight seal said aperture to thereby maintain said face mask in its moistened condition when said device is in said storage condition, whereby removal of said closure means permits access to and withdrawal of said face mask from the interior of said envelope to render said device into the operative condition wherein said envelope is adaptable to be rendered into a head cap.

4,032,992

CONTROLLING DEGREE OF REACTION BY CONTROLLING HEAT INPUT IN CELLULOSE TEXTILE-REACTANT SYSTEMS

Ildo Emil Pensa, Palisades Park, and Robert Otto Rau, Franklin Lakes, both of N.J., assignors to J. P. Stevens & Co., Inc., New York, N.Y.

Continuation-in-part of Ser. No. 542,119, April 12, 1966, abandoned, which is a continuation of Ser. No. 402,626, Oct. 8, 1964, abandoned, which is a continuation-in-part of Ser. No. 292,727, June 3, 1963, abandoned. This application Oct. 17, 1969, Ser. No. 867,411

Int. Cl.^{2} D06M *13/28, 15/54, 15/58, 15/64, 15/72*

U.S. Cl. 2—243 R **20 Claims**

1. The method of producing a permanently shaped textile

article from a material comprising cellulosic fibers comprising the steps of.

- A. shaping a material into a desired configuration, said material comprising cellulosic fibers and which material has been:
  - 1. impregnated with a cellulose cross-linking reagent selected from the group consisting of:
    - a. reaction products of formaldehyde with carboxamides wherein said reaction products contain 2 or 3 N-methylol groups and methyl ethers thereof;
    - compounds having the following generic formula:

$R_1OCH_2CH_2SO_2(OSO_2)_nCH_2CH_2OR_2$

wherein R_1 and R_2 may be the same or different and are selected from the group consisting of hydrogen and an alkyl radical of up to five carbon atoms; Q is a divalent organic radical selected from the group consisting of aliphatic radicals containing at least three carbon atoms, aromatic radicals and alkylaromatic radicals; and, *n* is 0 or 1; and, said reaction conditions include the presence of an alkaline catalyst;

    - c. compounds selected from the group consisting of 1,3,5 tris (hydroxypropyl) hexahydro-s-triazine and 1,3,5 tris (methoxypropyl) hexahydro-s-triazine and,
    - d. tris-1-aziridinyl phosphine oxide; and,
  - 2. heated in an atmosphere in which the relative humidity is less than 100% and in the presence of a catalyst, to a temperature in the range of between about 200° F. to about 1000° F. for a period of time in the range of between about 5 minutes and about 4 seconds during which time period said cross-linking reagent is chemically bonded to said cellulosic material, said time-temperature relationship being such that in the lower temperature range the time period is in the higher time range and in the higher temperature range the time period in the lower time range and under such heating conditions that the maximum heat energy applied to said impregnated material is that heat energy which allows said material to have a maximum dry crease recovery angle increasable by at least 10% by subsequent heating to cure said material, to thereby produce a modified material intermediate; and
- B. without further addition of catalysts to said material, heating the shaped material to cure said chemically bonded cross-linking reagent to provide a permanently shaped textile article having at least said increased dry crease recovery angle.

16. A permanently shaped textile article produced in accordance with the method of claim 1.

4,032,993
BIORESORBABLE SURGICAL ARTICLES

Jean Coquard, Grezieu-La Varenne; Pierre Sédivy, Sceaux; Michel Ruaud, Ternay, and Jean Verrier, Boulogne-sur-Seine, all of France, assignors to Rhone-Poulenc Industries, Paris, France

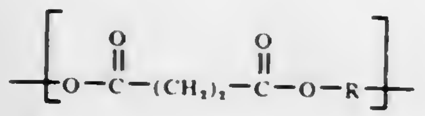
Filed June 25, 1975, Ser. No. 590,284

Claims priority, application France, June 28, 1974, 74.22587

Int. Cl.² A61F *1/24, 1/00;* **A61L** *17/00*

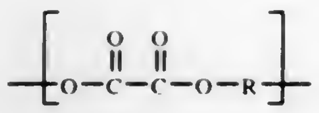
U.S. Cl. 3—1 **30 Claims**

1. A sterile implantable surgical article which is at least partially bioresorbable, and which consists at least partially of a copolyester of succinic acid and oxalic acid possessing recurring units of the general formulae:



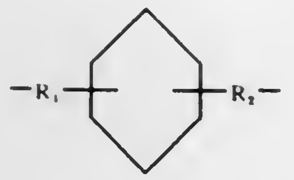
$$\left[-O-\overset{\overset{O}{\|}}{C}-(CH_2)_2-\overset{\overset{O}{\|}}{C}-O-R-\right] \qquad (I)$$

and



$$\left[-O-\overset{\overset{O}{\|}}{C}-\overset{\overset{O}{\|}}{C}-O-R-\right] \qquad (II)$$

in which each R radical in the chain, which may be identical or different, represents a linear or branched alkylene radical possessing 2 to 6 carbon atoms, at least 2 of which carbon atoms form part of the polymer chain, a cyclo-alkylene radical possessing 5 to 8 carbon atoms, or a radical of the general formula:



(III)

in which each of R_1 and R_2, which may be identical or different, represents a methylene or ethylene radical.

4,032,994
HIP JOINT PROSTHESIS

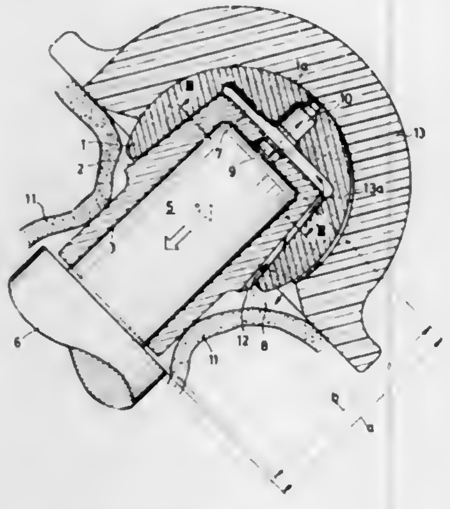
Otto Frey, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed May 24, 1976, Ser. No. 688,994

Claims priority, application Switzerland, June 3, 1975, 7113/75

Int. Cl.² A61F *1/24*

U.S. Cl. 3—1.912 **9 Claims**



8. A hip joint prosthesis comprising

a pin;

a cup-shaped member rotatably and axially movably mounted on said pin, said member having a sleeve defining a bore surrounding said pin and an end wall facing an end of said pin, said sleeve having an outer conical circumferential surface and said end wall having a passage therethrough communicating with said bore;

a spherical joint head rigidly mounted on said sleeve, said joint head having an interior cone-shaped surface in engagement with said sleeve surface and being spaced from said end wall to define a chamber therebetween, said chamber being in communication with said passage in said end wall; and

at least one groove-like recess in said conical circumferential surface of said sleeve communicating the exterior space around said sleeve and joint head with said chamber.

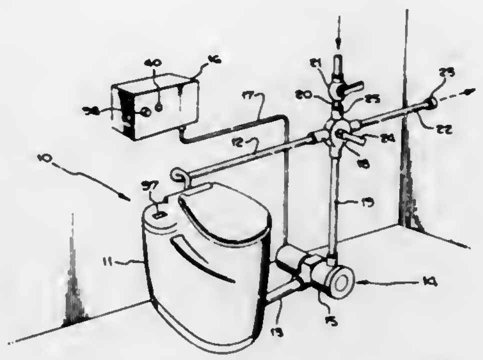
4,032,995
SYSTEM AND METHOD FOR TREATING HUMAN WASTE

James M. Kemper, Sherman Oaks, Calif., assignor to Monogram Industries, Inc., Santa Monica, Calif.

Filed Feb. 23, 1976, Ser. No. 660,645

Int. Cl.² E03D *1/00, 3/00, 5/00*

U.S. Cl. 4—10 **10 Claims**



1. In a treatment system for a toilet having a water inlet in fluid communication therewith for introducing water therein and a holding tank portion at the bottom thereof for receiving human waste deposited in said toilet and a grinder and pump activated by a motor having its inlet operatively connected and in fluid communication with said holding tank portion and its outlet leading to a point remote from said grinder and pump, said system comprising:

valving means operatively connected to both said outlet and the water inlet into said toilet for selectively introducing either water alone from a remote source through said water inlet into said toilet or waste from said grinder and pump either back into said toilet through said water inlet or to said point remote from said grinder and pump; and

sensing means associated with said motor activated grinder and pump for sensing the presence of a tablet of a predetermined size, shape and weight thereby activating said motor to drive said grinder and pump.

4,032,996
SEALING APPARATUS FOR TOILET

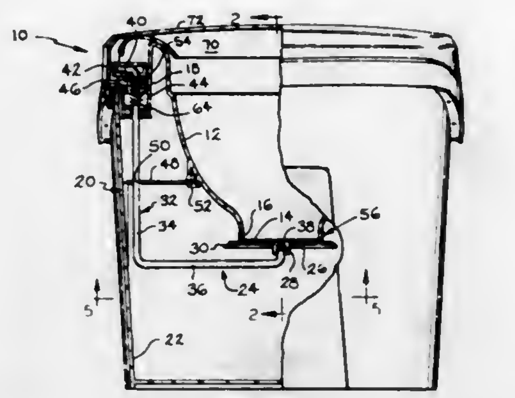
Frak T. Sargent, and John M. Antos, both of Ann Arbor, Mich., assignors to Thetford Corporation, Ann Arbor, Mich.

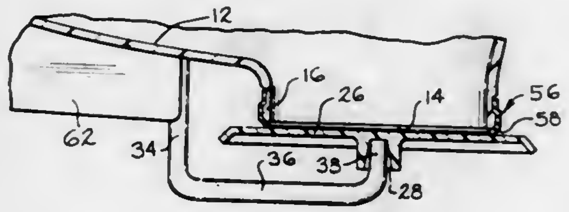
Filed Aug. 4, 1976, Ser. No. 711,434

Int. Cl.² E03D *5/01, 5/012, 5/09*

U.S. Cl. 4—17 **14 Claims**

1. Toilet apparatus comprising a bowl having at its bottom a discharge outlet, a housing supporting said bowl, and a sealing mechanism for closing and opening said bowl outlet, said sealing mechanism comprising a blade of larger area than said bowl outlet, a crank having a vertical shaft mounted in said housing for rotary movement about its vertical axis, a crank arm radiating from said shaft and supporting said blade, actuating means connected to said shaft at a location accessible from the outside of said housing for rotating said shaft between a first position wherein said blade is under said bowl outlet for closing the bottom of the bowl and a second position wherein said blade is at one side of said bowl outlet, a seal member mounted in sealing relationship to the bottom of said bowl around said outlet, and spring means urging said shaft axially upward so that the blade will be seated in sealing relationship against said seal member when the blade is in its closed position.





4,032,997
FLUSH TOILET ACCESSORY

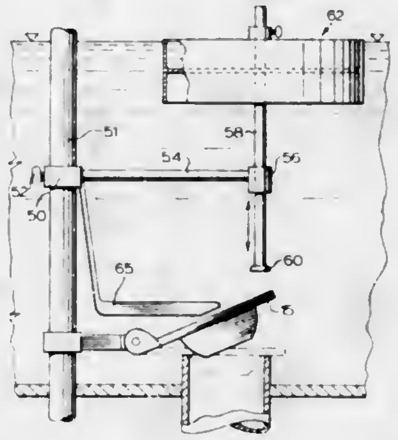
Clarence F. Phripp, R.R. No. 1, St. Clements, Ontario, Canada (N0B 2M0), and Norman R. Preston, 169 Ross Ave., Kitchener, Ontario, Canada (N2A 1V5)

Filed Sept. 23, 1975, Ser. No. 615,923

Claims priority, application United Kingdom, Sept. 30, 1974, 42437/74

Int. Cl.² E03D *1/34, 3/12*

U.S. Cl. 4—52 **7 Claims**



1. A flush regulator assembly for use in a toilet flush tank for regulating the outflow therefrom through an outlet pipe, the assembly comprising:

a mounting portion,

first means supporting the mounting portion from another part of the flush tank such that the mounting portion can move between upper and lower positions in the flush tank,

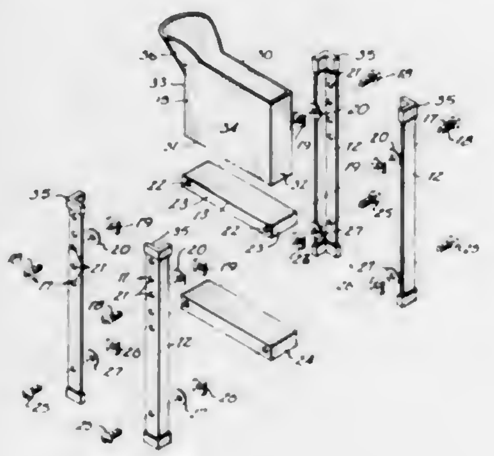
upwardly open water chamber means connected to the mounting portion,

downwardly open air chamber means connected to the mounting portion,

and second means enabling the mounting portion to exert a premature downward push on a valve member adapted to open and close said outlet pipe, said second means including an elongated member oriented substantially vertically and adapted to slide freely up and down while constrained against lateral movement within the flush tank, the elongated member having a lower end adapted to push downwardly against said valve member when the latter is in its open position, said mounting portion being attached to the elongated member and being adjustable vertically with respect thereto.

4,032,998
STAND UP TOILET

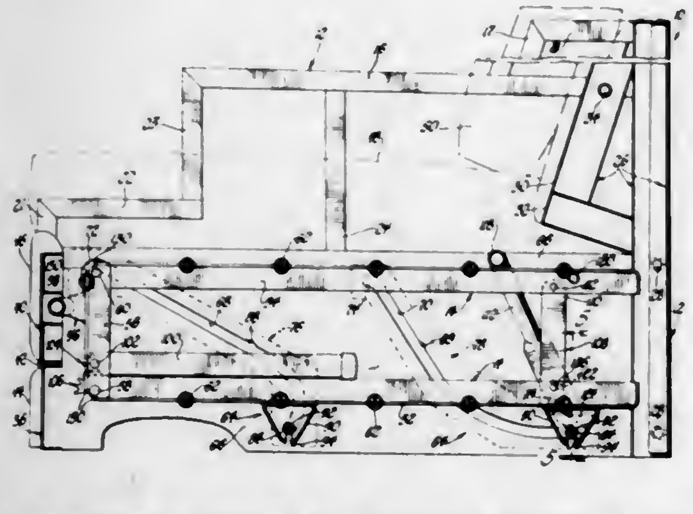
Robert W. England, Rte. 3, Box 356, Cheney, Wash. 99041
Filed Nov. 6, 1975, Ser. No. 629,385
Int. Cl.² A47K *11/02*
U.S. Cl. 4—111 5 Claims



1. A stand up toilet, comprising:
- a plurality of upright legs;
- a horizontal support releasably interconnecting the legs and located downward of upper leg ends so that portions of the legs project upwardly from the support;
- a container of rectangular cross section having an open upper end and a closed lower end adapted to be loosely received between portions of the legs extending above the support with the closed lower end loosely resting against the support; and
- wherein an upward and rearwardly projecting deflector is provided at the open upper end of the container at a rearward end of the opening.

4,032,999
SOFA BED

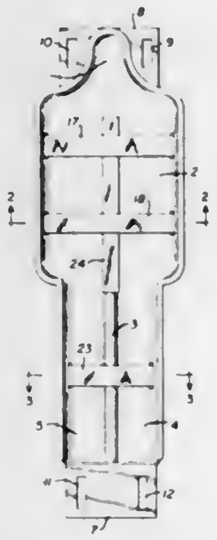
William L. Pringle, Grosse Pointe Shores, Mich., assignor to United States Steel Corporation, Pittsburgh, Pa.
Division of Ser. No. 585,684, June 10, 1975, Pat. No. 3,975,783. This application Apr. 16, 1976, Ser. No. 677,692
Int. Cl.² A47C *17/14, 17/06*
U.S. Cl. 5—14 5 Claims



1. A furniture assembly for movement between a sitting configuration and a bed configuration comprising; support frame means, bed frame means movable between a folded position and an unfolded position, said bed frame means being in said folded position when in said sitting configuration and in said unfolded position when in said bed configuration, means interconnecting said bed frame means and said support frame means for allowing movement of said bed frame means relative to said support frame means, said bed frame means including at least first and second mattress frames pivotally connected together for movement between said folded and unfolded positions, and foldable handle-leg means pivotally connected to said second frame for moving said second frame from said folded position toward said unfolded position and for moving to a support position to act as a leg to support said second frame in said unfolded position.

4,033,000
FUNCTIONAL STRETCHER SHELL DEVICE

André Bonifay, 14 Boulevard d'Athens, 13001 Marseille, France
Filed Nov. 5, 1974, Ser. No. 520,989
Int. Cl.² A61G *1/00*
U.S. Cl. 5—82 R 2 Claims



1. A stretcher, especially for patients requiring orthopaedic retention of lesions of one or more of the limbs, head, spine and torso; comprising a trough-like integral shell of moulded plastic material having a depth suitable to receive the body within its depth and having its wall shaped to define in order from one end of said shell to the other a compartment for the head, and a compartment for the torso and a compartment for the legs, said shell including a longitudinal partition wall extending substantially centrally along and within the leg compartment so as to sub-divide said compartment into individual leg-receiving zones, said shell having in its wall at said torso compartment and at said leg compartment at least one pair of patient attachment means, said head compartment, said torso compartment and said leg compartment of said shell following the outlines of the human body on the sides and back of the body, and being of dimensions standardized to the current norms of the most frequently encountered sizes, the underside of said shell comprising stiffening support means and including means for the handling and transport of the stretcher.

4,033,001
SLEEPING BAG

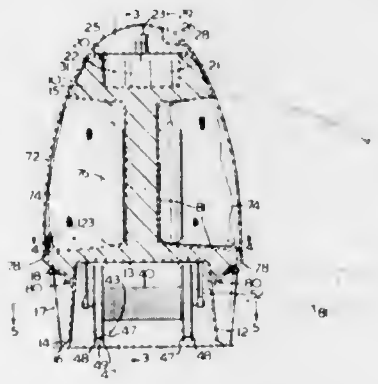
Margaret Jean Kern, Port Colborne, Canada, assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed Apr. 26, 1976, Ser. No. 680,285
Int. Cl.² A47G *9/00*
U.S. Cl. 5—343 2 Claims

1. A sleeping bag, comprising

- a hood back part having a pair of enclosed arm and hand portions extending from opposite sides thereof;
- a lower back part affixed to and extending from the hood back part;
- a hood front part having a face opening therein and a pair of enclosed arm and hand portions extending from opposite sides thereof and corresponding to the arm and hand portions of the hood back part and affixed to the hood back part to accommodate the head, upper chest area and arms of a user of the bag;
- a lower front part affixed to and extending from the hood front part and affixed to the lower back part to accommodate the remaining torso of a user of the bag; and
- a zipper extending down the center of the hood front part from the face opening thereof and down the center of the lower front part to the bottom edge thereof.

4,033,002
LIFE SAVING EQUIPMENT FOR VESSELS

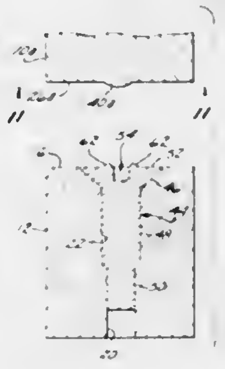
William York Higgs, Gibsons, Canada, assignor to Intercontinental Marine Limited, Vancouver, Canada
Continuation-in-part of Ser. No. 471,964, May 21, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,788
Claims priority, application United Kingdom, May 21, 1973, 24113/73
Int. Cl.² B63C *9/22*
U.S. Cl. 9—14 29 Claims



1. Life saving apparatus for vessels comprising a buoy suitable for being carried by a vessel in a manner providing automatic release and flotation of the buoy should the vessel sink, said buoy including a body having sufficient buoyancy to cause the buoy and parts carried thereby to float free from the sinking vessel, a cable of adequate strength to act as an anchor cable connected with the buoy and for connection with the vessel so as to maintain connection between the floating buoy and the vessel after the vessel has sunk, wherein the buoy includes a casing filled with rigid buoyant material imparting strength to the body of the buoy, said anchor cable being connected to a lower part of the buoy so that when the buoy is floating the weight of the cable and relative weights of the remaining parts of the buoy hold the buoy upright with the anchor cable extending from its lower end, said body having at least one recess therein opening into that surface of the body which is at the side when the buoy is floating upright, said recess having outwardly sloping side surfaces and being surrounded by said rigid buoyant material which forms a solid structure connecting the upper and lower parts of the buoy above and below said recess, said recess being normally closed by a cover which forms an enclosure with said recess, an inflatable life raft normally stowed in deflated condition in said enclosure together with a source of pressurized gas for inflating said life raft, said source of pressurized gas communicating with valve means controlling flow of gas into the life raft for its inflation, said valve means being operable by release means extending out of said enclosure, said cover of the recess being joined to the buoy body by holding means which holding means are so arranged as to permit the life raft to dislodge said cover and to expel itself from said enclosure during its inflation, whereby said valve means are operable from outside the enclosure to cause the life raft to inflate and expel itself from the buoy.

4,033,003
HEAD FORMING METHOD

Emilio R. Marroquin, Lawndale, Calif., assignor to Briles Manufacturing, El Segundo, Calif.
Filed Nov. 7, 1975, Ser. No. 629,856
Int. Cl.² B23G *9/00;* B21K *1/46*
U.S. Cl. 10—10 R 12 Claims



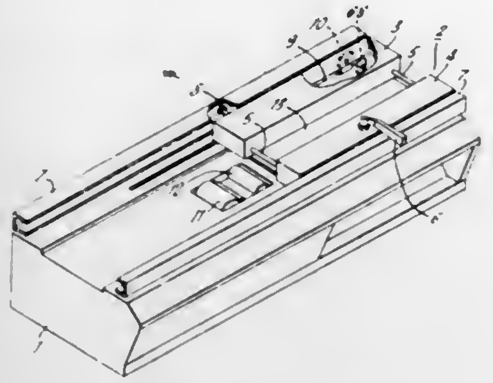
1. A method of forming an undercut slot of "bowtie" configuration in the head of a fastener which comprises the steps of:
- applying a first header punch member to said head to form a primary head surface with a "bowtie"-shaped slot recessed below said surface and a single bulge of material projecting upwardly from said surface adjacent to each side of said slot, each of said bulges of material being elongated in the longitudinal direction of the slot and continuously convexly curving from a greatest height above said primary surface proximate the slot down to an intersection with said primary surface spaced from said slot, and
- applying a second header punch member to said head to compress said bulges of material down into the head below the level of said surface laterally displacing and forming material of the head into a single, elongated lateral bulge in each side of the slot to produce an undercut slot configuration between said lateral bulges, said curvature of each of said upwardly projecting bulges causing each of said lateral bulges to convexly curve in the direction from the bottom to the top of the slot.

4,033,004
BOOKBINDING MACHINE

Yasuji Sugioka, Kyoto, Japan, assignor to Taiyo Seiki Co., Ltd., Kyoto, Japan
Filed Mar. 29, 1976, Ser. No. 671,262
Claims priority, application Japan, Apr. 7, 1975, 50-47219[U]
Int. Cl.² B32B *1/04*
U.S. Cl. 11—1 AD 9 Claims

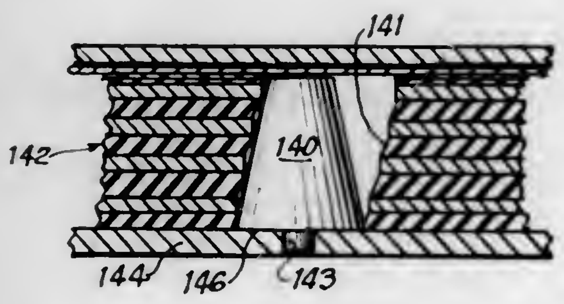
1. A bookbinding machine comprising: a clamp carriage including means for clamping a book comprising a plurality of piled sheets of paper or the like to be bound; means for reciprocating said clamp carriage along a predetermined path; adhesive applicator means disposed in said path for applying

adhesive to the back of said book as it is moved along said path; and cover sheet supporting means for adhering a cover sheet onto said back when said book has returned to its original position after reciprocal movement along said path.



4,033,005
BEARING PAD ASSEMBLY

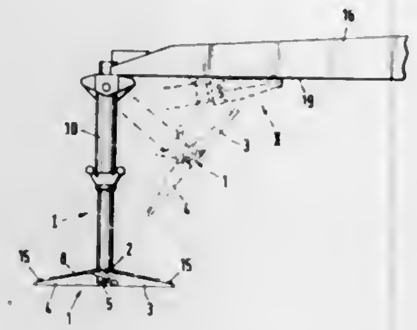
Daniel E. Czernik, Hinsdale, and John F. Brady, Wood Dale, both of Ill., assignors to Felt Products Mfg. Co., Skokie, Ill.
Filed Dec. 20, 1974, Ser. No. 534,708
Int. Cl.² E01D *19/06*
U.S. Cl. 14—16.1 **9 Claims**



7. A bearing assembly ready for installation in a bridge construction, wherein said bridge construction includes a load carrying member and a bridge support, comprising a mounting plate for mounting upon said support, an elastomeric bearing pad having side edges and end edges and being mounted on said mounting plate and defining contactor surfaces extending upwardly from said mounting plate and having a generally flat expansive upper surface and embedding shim means spaced above said mounting plate and lying generally parallel to said upper surface, high strength metallic shear controlling means fixed to and extending upwardly from said mounting plate at least to the elevation of said shim means and positioned adjacent said contactor surfaces but having surface portions spaced from and proportioned relative to said contactor surfaces so that when said bearing pad is strained in shear beyond a predetermined amount in the direction of said end edges and is deformed toward said shear controlling means, said shear controlling means will bear against said bearing pad at the elevation of said shim means, an upper layer of polytetrafluoroethylene intimately contacting and secured to said upper surface so as to overlie said upper surface and provide an upper slide surface for said bearing pad, and a slide plate assembly for mounting to said load carrying member and having a generally flat slide surface intimately contacting and of greater expanse than said upper slide surface of said elastomeric bearing pad for accommodating sliding movement of said slide plate relative to said elastomeric bearing pad, and in which there are connector means provided at the side edges of said bearing pad, said connector means securing said slide plate assembly in overlying relation to said bearing pad to resist movement of said slide plate in the direction of the side edges of said bearing pad and to help prevent the separation of the contacting slide surfaces of said slide plate assembly and said bearing pad.

4,033,006
SWINGABLE SUPPORT LEG FOR A BRIDGE

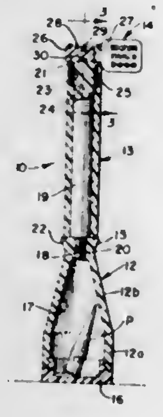
Friedhelm Soffge, Kornwestheim; Ortwin Piper, Schwieberdingen, and Gerhard Albrecht, Illingen, all of Germany, assignors to Dr. -Ing. H.c.F. Porsch Aktiengesellschaft, Germany
Filed May 12, 1975, Ser. No. 576,444
Claims priority, application Germany, May 11, 1974, 2422932
Int. Cl.² E01D *19/02*
U.S. Cl. 14—75 **22 Claims**



1. Supporting apparatus for a bridge or the like, especially for a portable bridge, said apparatus comprising:
- a bridge support leg having an intermediate support member at the free end thereof,
- a pair of foot plate members pivotally supported at the intermediate support member,
- and a control device connecting said foot plate members to one another such that pivotal movement of one of said foot plate members results in pivotal movement of the other of said foot plate members.

4,033,007
TOOTHBRUSH

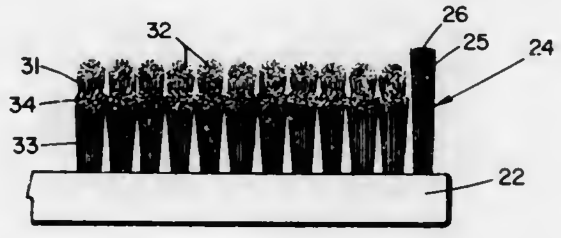
Joseph Hadary, 5405 Linden Court, Bethesda, Md. 20014
Continuation-in-part of Ser. No. 564,074, April 1, 1975. This application Apr. 7, 1976, Ser. No. 674,438
Int. Cl.² A46B *9/10*
U.S. Cl. 15—172 **6 Claims**



1. A toothbrush, comprising: an elongate handle means having opposite end portions, one of said end portions comprising a hollow, diametrically enlarged base capable of supporting the toothbrush in an upright position and of a size to receive and store a bristle head therein, said base extending over approximately one-third the length of the handle means; the other end of the handle means including en elongate shaft fixed at one end thereof to one end of the base and extending axially therefrom; a sleeve telescopically received over the shaft and axially slidable relative thereto, said sleeve and shaft being approximately the same length and extending over approximately the other two-thirds of the length of the handle means; a bristle head adjustably carried by the handle means at said other end thereof and including a bristle head shaft projecting therefrom, said bristle head shaft extending at approximately a right angle to the axis of the handle means and releasably adjustably engaged with the handle means to support the bristle head in adjusted positions on the handle means; and bristles on the bristle head extending in a direction mutually perpendicular to the axis of the handle means and the axis of the bristle head shaft.

4,033,008
TOOTHBRUSH

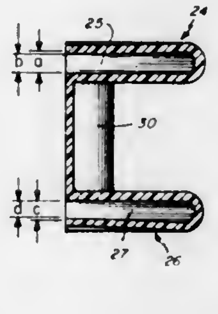
William C. Warren, North Brunswick; Anthony R. Volpe, Somerset, and Kedar N. Rustogi, Kendall Park, all of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.
Filed Apr. 5, 1976, Ser. No. 673,769
Int. Cl.² A46B *9/04*
U.S. Cl. 15—167 R **9 Claims**



1. A toothbrush comprising a handle terminating at one end in a head and at least two distinct groups of bristle tufts projecting from the head, one of said groups comprising a plurality of rows of relatively soft bristle tufts extending longitudinally of the head and the other of said groups comprising rows of relatively hard bristle tufts extending longitudinally of the head alongside and laterally outwardly and on opposite sides of said one group, the tufts of said one group being longer and of smaller diameter bristles than the tufts of said other group, and a transverse row of bristle tufts on the end of the head remote from the handle and comprising bristle tufts that are longer than any of the other bristle tufts on the head the bristle tufts of said end row being harder and of larger diameter than the bristle tufts of said one group.

4,033,009
HANDLES FOR SUPPORTING A DISH OR THE LIKE IN A MICROWAVE OVEN

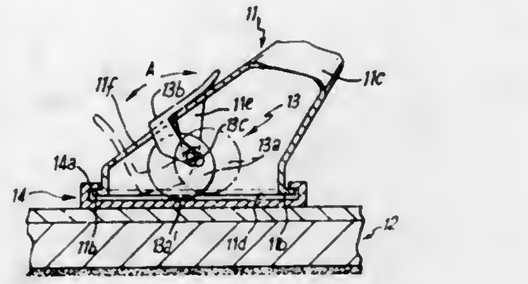
Lynne E. Hoinash, Brighton, Mass., assignor to Sage Laboratories, Inc., Natick, Mass.
Continuation of Ser. No. 544,295, Jan. 27, 1975, abandoned. This application Apr. 9, 1976, Ser. No. 675,512
Int. Cl.² A47J *45/07*
U.S. Cl. 16—114 R **8 Claims**



1. A handle for a dish or the like food container for supporting the dish in a microwave oven, said handle comprising opposite end sections and an interconnecting section, each end section having means defining a slot for receiving an edge of the dish, wherein the slots of the opposite end sections are close to but of a different width to permit selective fitting of the handle to the dish, said opposite end sections each including a bowed wall defining said slot so that said slot has a maximum and minimum width.

4,033,010
HANDLES

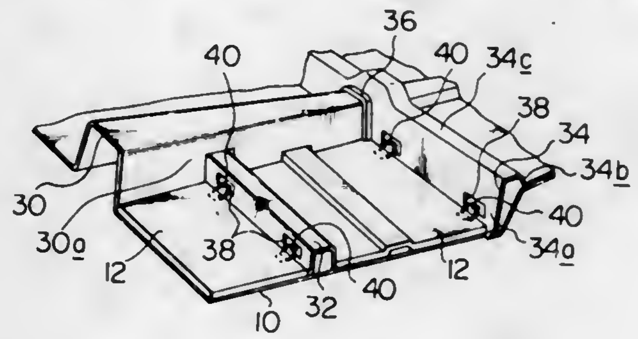
Charles McCalla, Disley, England, assignor to Flock Development and Research Company Limited, England
Filed Dec. 10, 1975, Ser. No. 639,297
Claims priority, application United Kingdom, Apr. 17, 1975, 15784/75
Int. Cl.² A46B *5/02*
U.S. Cl. 16—114 R **9 Claims**



2. A handle arrangement in combination with a lipped channel comprising a base plate having spaced opposed lateral edges for engagement with respective opposite longitudinal sides of the channel, a handle member extending from said edges and outwardly of the plane defined thereby and a locking means arranged in association with the handle member and selectively adjustable about a pivot axis parallel to the said opposed lateral edges between a first, or datum, position wherein a part thereof is relatively retracted in relation to the general plane of the edges and a second position wherein said part is displaced outwardly from such plane, the said locking means comprising an edge cam having a periphery for engagement with the lipped channel intermediate the lateral limits thereof when the locking means is in the said second position, which second position represents an over-center position of the cam.

4,033,011
VEHICLE FLOOR TRIMMING FASTENING ARRANGEMENT

Toshiaki Endo, Fujisawa, and Toshiro Hatta, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Nov. 26, 1975, Ser. No. 635,555
Claims priority, application Japan, Dec. 24, 1974, 49-501800
Int. Cl.² A44B *21/00*
U.S. Cl. 24—73 FT **5 Claims**



1. An arrangement for fastening a floor trimming to a vehicle floor panel comprising:
- an elongated rigid member formed into a channel member with a pair of said walls and a head wall, said side walls being foot portions generally opposite to said head wall,

said elongated rigid member being firmly connected at said foot portions to said vehicle floor panel, one of said side walls being formed with an inverted U-shaped opening, said one side wall having a lug portion which is surrounded by said inverted U-shaped opening; and

a hook member fastened to an edge portion of said floor trimming and hookable on said lug portion.

4,033,012

BUTTON, PARTICULARLY FOR CLOTHING PIECES

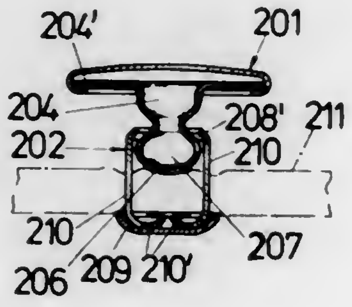
Friedhelm Kramer, Ennepetal-Milspe; Günter Wolfertz, Wuppertal-Barmen; Harald Klaus, Wuppertal-Elberfeld; Raimund Stanik, Wuppertal-Beyenburg; Horst Gustav Appelt, Wuppertal-Barmen, and Walter Ramspott, Wuppertal-Cronenberg, all of Germany, assignors to Schaeffer-Homberg GmbH, Wuppertal-Barmen, Germany

Filed Oct. 29, 1975, Ser. No. 626,987

Claims priority, application Germany, Nov. 14, 1974, 7438001[U]; Jan. 30, 1975, 2503798; Feb. 7, 1975, 2505139; July 16, 1975, 2531728

Int. Cl.^{2} A44B *1/42*

U.S. Cl. 24—90 D **8 Claims**



1. A button, particularly for clothing pieces including a carrier material in fastened condition, comprising

a foot part having a wall formed in the shape of a vertically oriented open ended hollow member defining a hollow cavity therein, said foot part having a lower peripheral edge defining a lower opening communicating with said cavity and abutting an upper side of the carrier material and clamping claws integrally extending substantially flush from said wall and said lower peripheral edge and non-rotatably clamping said peripheral edge and the carrier material and piercing through the latter,

a button plate operatively freely selectively tiltably seated on said foot part,

a tilting pin secured to said button plate, said tilting pin having a bulge-shaped lower end,

said foot part having an upper head end, the latter being formed with an insert opening communicating with said hollow cavity and freely tiltably mountably receiving said bulge-shaped lower end of said tilting pin therein,

a counter holder plate abutting an underside of the carrier material, and having curved deflection channel means for turning said clamping claws around pointing upwardly in said counter holder plate in a direction toward said hollow cavity,

said securing claws passing downwardly through said carrier material and engaging said counter holder plate in non-rotatable position relative to said carrier material, entering said deflection channel means thereby being turned upwardly, cooperatively clamping and pressing the carrier material against said peripheral edge of said foot part, whereby the carrier material partially extends archingly inside said lower hollow opening into said hollow cavity, and

said bulge-shaped lower end of said tilting pin having a vertical length substantially equal to the height of said foot part from said upper head end to said lower peripheral edge and having a curved lower end surface aligned adjacent the level of said peripheral edge of said foot part and pivotal relative to said foot part, said lower end surface abutting the carrier material, thereby dampening noise and providing a friction brake action effect for said tilting pin.

4,033,013

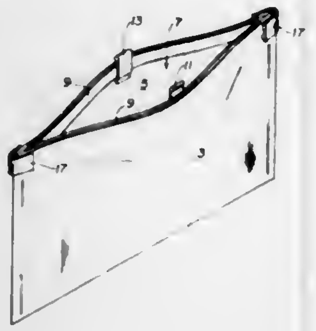
FLEXIBLE MAGNETIC PLASTIC STRIP CLOSURE

John Elwood Peterson, 90 Kent Court, Apt. 19, Daly City, Calif. 94015

Filed Nov. 18, 1975, Ser. No. 633,028

Int. Cl.^{2} E05C *19/16;* **A44B** *17/00*

U.S. Cl. 24—201 B **4 Claims**



1. A closure for a flexible case or the like having flexible side walls forming a mouth opening, a first strip of flexible magnetic tape, means securing said first strip of flexible magnetic tape to one of said flexible side walls, a second strip of similar length of such tape, means securing said second strip to said other side wall in position to be engaged by said first strip, said strips having opposite exposed polarities to effect a normal attraction of one for the other when in proximity to each other, and at least one opening tab extending at one end at least partially across the inner or exposable surface of one of said strips of flexible magnetic tape and, at its other end, extending beyond the proximate edge of said side walls, whereby application of finger pressure thereto to separate said strips and open said flexible case, will not strain said securing means. wherein, said closure is characterized by a pair of opening tabs, each of said tabs being affixed at one end to the inner or exposable surface of a different one said strips and extending upwaredly to a point above the proximate edges of said side walls, with both said openings tabs being located within a central region of the associated side walls

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4,033,014

CONTINUOUS MOLDED SLIDE FASTENER STRINGER AND METHOD AND APPARATUS FOR MANUFACTURE

Harry F. Manning, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed May 17, 1976, Ser. No. 687,075

Int. Cl.^{2} A44B *19/34*

U.S. Cl. 24—205.16 R **17 Claims**

1. A stringer for a slide fastener comprising

a carrier tape,

a train of spaced coupling elements disposed along one edge of the tape,

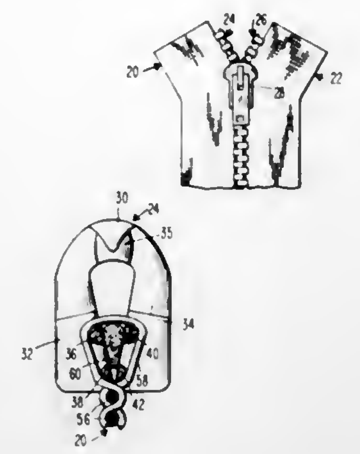
each of said coupling elements having a head portion and a pair of leg portions extending from opposite sides of the head portion,

each pair of said pairs of leg portions extending in substantially the same direction from the respective head portion,

at least four spaced connecting threads,

pairs of said connecting threads having respective spaced segments embedded in spaced relationship in respective leg portions of the pairs of leg portions to interconnect the coupling elements, and

thread means encircling the connecting threads between the coupling elements and securing the connecting threads to the one edge of the tape.



4,033,015

LOCK FOR A SAFETY BELT

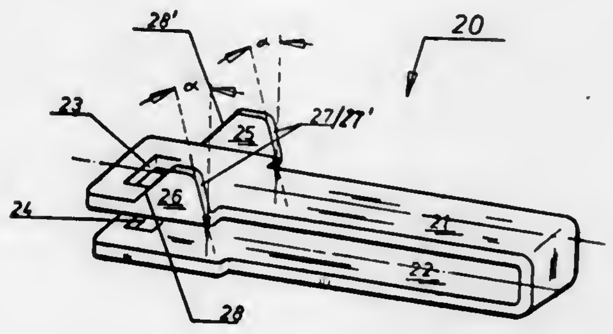
Peters Uwe, Hamburg, and Horst Minolla, Heidestieg, both of Germany, assignors to Klippan GmbH Hamburg, Hamburg, Germany

Filed Sept. 3, 1974, Ser. No. 503,009

Claims priority, application Germany, Nov. 15, 1973, 2356090

Int. Cl.^{2} A44B *19/00*

U.S. Cl. 24—230 AL **5 Claims**



1. A belt lock for a safety belt, especially a vehicle safety belt, having a housing in which is provided a push-button for actuating a spring-biased bolt, there being provided in the housing at least one lock plate having a guide channel, the longitudinal axis of which extends transversely to the direction in which a plate-like slide-in tongue with lateral locking notches slides, the bolt being movable in the guide channel and being directly connected to a guide part, which has two limbs which are disposed on the outer faces of the lock plate and are firmly connected to the bolt, and the faces of, on the one hand, the locking notches on the slide-in tongue and of, on the other hand, the bolt, which bear against each other in the locking position, being disposed obliquely in relation to the longitudinal central axis of the slide-in tongue, characterized in that the push-button and the guide part are formed as two separate elements which are each provided with an inclined face which slopes towards the longitudinal axis of the guide channel, the inclined face on one of the elements being presented to the inclined face on the other.

4,033,016

CRANKSHAFT WELDED TOGETHER FROM INDIVIDUAL ELEMENTS, AND METHOD OF MAKING SAME

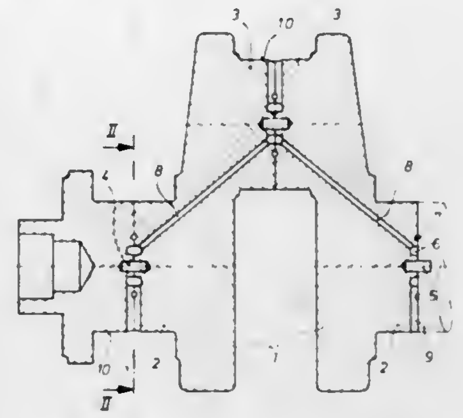
Karl Mayer, Nuremberg, Germany, assignor to Maschinenfabrik Augsburg-Nurnberg AG, Nuremberg, Germany

Division of Ser. No. 585,301, June 9, 1975. This application May 5, 1976, Ser. No. 683,333

Claims priority, application Germany, June 8, 1974, 2427801

Int. Cl.^{2} B21K *1/08*

U.S. Cl. 29—6 **1 Claim**



1. A method of making a crankshaft from a plurality of individual elements each comprising a crank pin section with an end face and bearing surface means, and also comprising a main shaft journal section with an end face and with bearing surface means, which includes in combination the sequential steps of: first forging the individual elements in a die as symmetrically embodied elements, then finish machining all crank pin half sections including their end faces, thereafter premachining all main shaft journal sections, subsequently drilling all lubricating oil grooves and conduit means communicating therewith, engaging with each other the crank pin end faced to be welded together and offsetting the same in the desired manner, specifically electron beam welding together the crank pin sections to be connected to each other while starting the electron beam on radially extending lubricating conduits and ending the same after only one revolution while setting the electron beam to a desired depth, finish machining the main shaft journal sections, placing together each two main shaft sections to be welded together and offsetting the same to the desired extent, thereafter specifically electron beam welding the main shaft journal sections together and honing the crank pin sections and main shaft journal sections, and finally machine-rounding the ends of the radial lubricating conduits in one working step.

4,033,017

MANUFACTURING METHOD OF A HERMETICALLY SEALED TERMINAL

Akira Watanabe, Funabashi, and Saburo Harada, Tokyo, both of Japan, assignors to Kabushiki Kaisha Seikosha and Koto Denki Kabushiki Kaisha, both of, Japan

Filed Jan. 28, 1976, Ser. No. 653,003

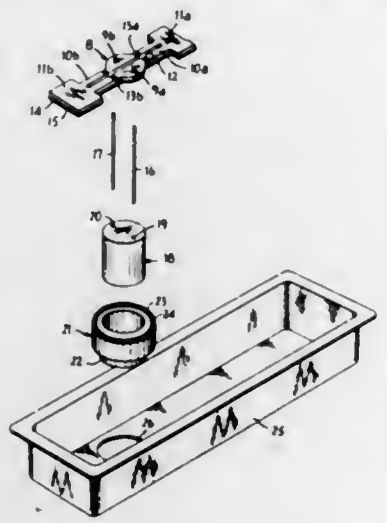
Claims priority, application Japan, Jan. 28, 1975, 50-11660; Jan. 28, 1975, 50-11661

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—25.35 **1 Claim**

1. A method of manufacturing a hermetically sealed terminal assembly comprising,

a. providing a terminal assembly comprised of a terminal plate element composed of conductive material having predetermined weakened sections and having a brazing compound on at least a part thereof, a plurality of lead wires, a glass material having through holes through which said lead wires extend, a metallic outer frame having said glass material inserted therein and having a brazing compound on a part thereof, and a metallic casing having said outer frame disposed thereon with the brazing compound in contact therewith and which encloses a quartz crystal resonator or the like, said terminal plate element being disposed on said glass material such that the brazing compound contacts said lead wires,



- b. heating the terminal assembly one time to a temperature at which said glass material softens and said brazing compounds on said terminal plate element and said outer frame become fused to thereby integrally connect the component parts of the terminal assembly, and
- c. breaking off end portions of said terminal plate element at said weakened sections to thereby provide a hermetically sealed terminal assembly.

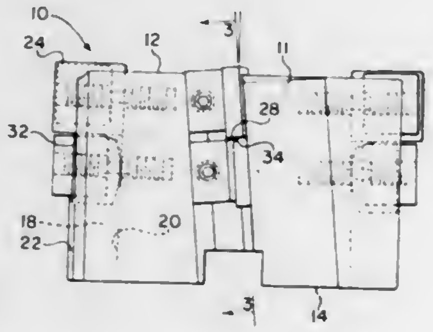
4,033,018
INDEXABLE MILLING CUTTER

Harry William Bloink, Redford, Mich., assignor to Illinois Tool Works Inc., Chicago, Ill.

Filed July 16, 1976, Ser. No. 705,975

Int. Cl.² B26D *1/12*

U.S. Cl. 29—105 A **5 Claims**



1. A cutting tool comprising an annular body with a central axis, a pair of end faces and an outer peripheral surface, a plurality of slots formed in the outer peripheral surface intersecting at least one end face of the body, each slot defining a generally longitudinally extending bottom wall surface and a pair of generally opposing side wall surfaces, an indexable cutting insert positioned in each slot and configured to define side surface faces, leading, trailing and bottom edges with the leading edge adjacent said at least one end face of the body, a wedge member positioned in the slot so as to bear against one side surface face of the cutting insert and one side wall surface of the slot securing the cutting insert therein, a backer plate positioned in the slots longitudinally behind each cutting insert, the backer plate also defining side surface faces, leading, trailing and bottom edges, the bottom edge of the backer plate being a narrow, non-linear surface extending from the leading edge to the trailing edge thereof, said non-linear surface including a point intermediate said leading and trailing edges which is lower than any other point on said bottom edge surface thereby permitting the backer plate to rock against the bottom wall into a position which provides accurate line contact between the leading edge of the backer plate and the trailing edge of the cutting insert, a wedge member positioned in the slot so as to bear against one side surface face of the cutting insert and one side wall surface of the slot.

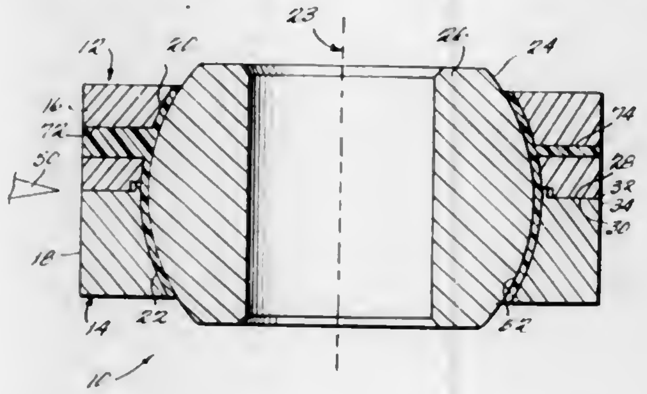
4,033,019
METHOD OF ASSEMBLING BEARINGS

Stanley S. Orkin, Rockville, Conn., assignor to Kamatics Corporation, Bloomfield, Conn.

Filed July 21, 1975, Ser. No. 597,632

Int. Cl.² B21D *53/10*

U.S. Cl. 29—149.5 B **4 Claims**



1. A method of assembling a self-aligning bearing comprising a truncated ball member, a first ring-shaped member having a generally planar mating surface and a second ring-shaped member having a generally planar mating surface, said ring-shaped members having inner annular surfaces, said mating surfaces of said first and second ring members each having a shallow circumferential recess formed therein adjacent said respective inner annular surfaces, and said inner annular surfaces of said first and second ring members being symmetrical about a common central axis, the method comprising the steps of:

disposing said truncated ball member in an opening defined by said inner annular surface of said first ring-shaped member,

placing the generally planar mating surface of said second ring-shaped in contact with said mating surface of said first ring-shaped member so that said inner annular surfaces of said first and second ring members are disposed symmetrically about said common central axis and said recesses in said respective mating surfaces of said ring-shaped members are immediately adjacent one another so as to define a circumferential cavity adjacent said inner annular surfaces of said ring members with said cavity extending circumferentially about said common central axis,

directing an energized beam at said mating surfaces substantially perpendicular to said common central axis and in the plane defined by said mating surfaces to fusion bond said mating surfaces of said first and second members beginning at the outer peripheral surface to a point closely adjacent to said cavity defined by said mating recesses.

4,033,020
METHOD OF MAKING A SLIP JOINT

Bernard C. Hudgens, West Lafayette, Ind., assignor to TRW Inc., Cleveland, Ohio

Filed Aug. 4, 1975, Ser. No. 601,481

Int. Cl.² B21D *53/10*

U.S. Cl. 29—149.5 NM **10 Claims**

1. A method of providing a slip joint between a pair of shafts, said method comprising providing a londitudinally extending tubular shaft,

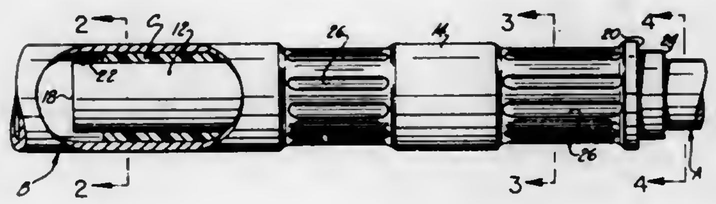
providing a second longitudinally extending shaft,

positioning end portions of the shaft in a telescopic relationship with the shafts extending in opposite directions from the area of the telescopic relationship between the shafts, the second shaft being circumscribed by and spaced apart from the tubular shaft in the area of the telescopic relationship between the shafts,

providing a layer of plastic material between the shafts in the area of the telescopic relationship between the shafts,

locking the layer of plastic material against axial movement relative to the tubular shaft by deforming at least a portion of the tubular shaft inwardly toward the second shaft in the area of the telescopic relationship between the shafts, said step of deforming the tubular shaft including the step of pressing the layer of plastic material inwardly against the second shaft while maintaining the tubular shaft spaced from the second shaft to grip the second shaft with the layer of plastic material, and

enabling the shafts to be freely moved axially relative to each other to vary the extent of the telescopic relationship between the shafts by heating to expand the layer of plastic material and then cooling to contract the layer of plastic material to provide clearance between the second shaft and the layer of plastic material due to the difference in coefficient of expansion of the second shaft and the layer of plastic material, said step of heating to expand the layer of plastic material including the step of expanding the layer of plastic material in an axial direction relative to the shaft to stress relieve said plastic layer and said step of cooling to contract the layer of plastic material including the step of contracting the layer of plastic material in a direction extending transversely to the longitudinal axes of the shafts.



4,033,021
GAS SEPARATION NOZZLES AND METHOD AND APPARATUS FOR PRODUCING SUCH NOZZLES

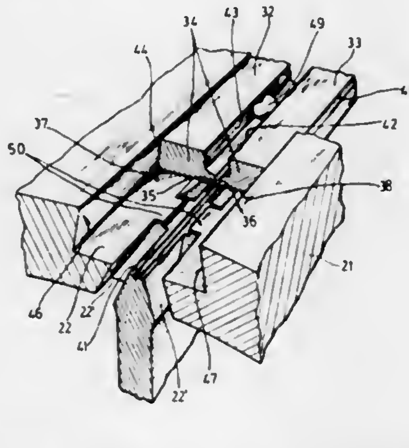
Gerd Tybus, Poing; Ludwig Ebner, Poerlng; Rudolf Waldhöer, Feldkirchen; Peter Bichler, Schondorf; Wilhelm Bier, Leopoldshafen; Peter Happe, Eggenstein, and Frowald Weis, Karlsruhe, all of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich and Gesellschaft fur Kernforschung m.b.H., Karlsruhe, both of, Germany

Filed Apr. 15, 1975, Ser. No. 568,301

Claims priority, application Germany, Apr. 20, 1974, 2419192

Int. Cl.² B23P *15/00, 13/00*

U.S. Cl. 29—157 C **11 Claims**



1. A method of producing gas separation nozzles for separating gases or vapors having different molecular weights from each other, comprising the steps of shaping a pair of sectional rods by pulling said rods along a high precision sliding track while pressing the rods against the track, and while removing material from the rods to form a pair of rod shaped separation elements having a projecting lip extending therealong, nozzle edges along said lip and vertically extending surfaces substantially opposite said lip, machining a holding body to form a dovetail groove therein and a deflection groove extending from the bottom of the dovetail groove, providing gas flow passages through said holding body to said deflection groove, assembling said pair of separation elements in said dovetail groove with their vertically extending surfaces facing each other to form a gap and their nozzle edges extending into said deflection groove, and inserting wedging pieces into said gap to press said separation elements away from one another and against the respective side of said dovetail groove.

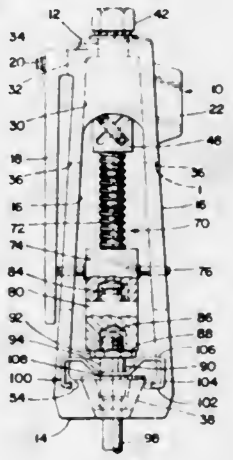
4,033,022
HAND OPERATED SWAGER

William E. Currie, Cleveland Heights; David W. Gunning, Novelty, and John G. Russell, Highland Heights, all of Ohio, assignors to Parker-Hannifin Corporation, Cleveland, Ohio

Filed Nov. 24, 1975, Ser. No. 634,865

Int. Cl.² B23P *19/02*

U.S. Cl. 29—237 **8 Claims**



1. Apparatus for swaging a fitting onto a hose comprising; a housing,

turning means rotatably mounted at one end of the housing and fixed against axial movement relative to the housing,

means on the other end of the housing for receiving a swaging die,

pusher means threadably engaged with said turning means, and

means interlocking said pusher means with said housing for preventing rotation of the pusher means relative to the housing whereby rotation of the turning means imparts axial motion to the pusher means without imparting rotation thereto,

said turning means comprising a bolt extending through an opening near the one end of the housing, and a ball nut assembly connected to the bolt and threadably engaging the pusher means whereby rotation of the bolt rotates the ball nut assembly to impart axial movement to the pusher means.

4,033,023
PROCESS FOR REFURBISHING METAL BUOYS

Albert E. Slaughter, and Nan Burke Slaughter, both of P.O. Box 855, Guayama, P.R. 00654

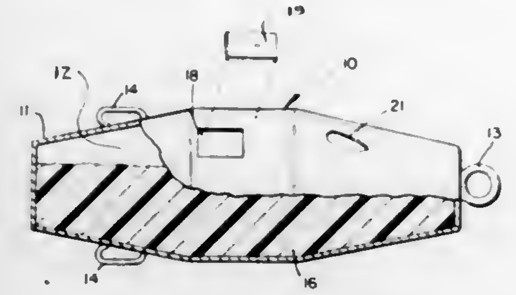
Filed Oct. 8, 1975, Ser. No. 620,824

Int. Cl.² B23P *7/00;* **B63B** *21/52, 51/02*

U.S. Cl. 29—401 B **3 Claims**

1. A method for repairing corroded metal buoys which comprises removing a metal section to form an aperture in

said buoy, filling the interior of the buoy through said aperture with polyurethane foam which is foamed in place from a foam precursor-catalyst mixture, replacing and rewelding said metal section, scraping marine growth and scale from said buoy exterior, and coating the exterior of said buoy with multiple plies of fiber glass-resin laminate.



4,033,024

METHOD FOR PRODUCING EXTRUDED STRUCTURAL PROFILES FROM SCRAP MATERIALS OF ALUMINUM BASED METAL

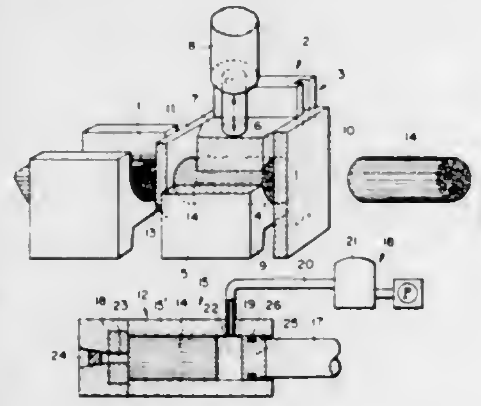
Toshiro Takahashi; Toshihiro Nagano; Katsuhiko Nakamura, all of Shizuoka; Masaru Kikuchi, Fuji, and Kazuo Suzuki, Shizuoka, all of Japan, assignors to Riken Keikinzoku Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed June 25, 1975, Ser. No. 590,289

Claims priority, application Japan, June 14, 1975, 50-72156

Int. Cl.² B21C *23/04;* **B23P** *7/00*

U.S. Cl. 29—403 11 Claims



1. A method for producing extruded structural profiles from elongated lengths of scrap materials of aluminum base metal which comprises the steps of mechanically compressing the lengths of scrap materials under pressure applied in a direction transverse to their length to form a self-sustaining, compacted and coherent substantially cylindrical body of scrap materials capable of being inserted into an extruder housing, said body having air passages extending in a longitudinal direction along its length between the lengths of material and opening to the exterior of said body, heating the body to a hot extrusion temperature, inserting the heated body into the extruder housing, applying suction to the interior of the extruder housing when in a closed condition to evacuate air from said air passages, and extruding the body from said housing through a die opening into a structural profile of the desired cross-section.

4,033,025

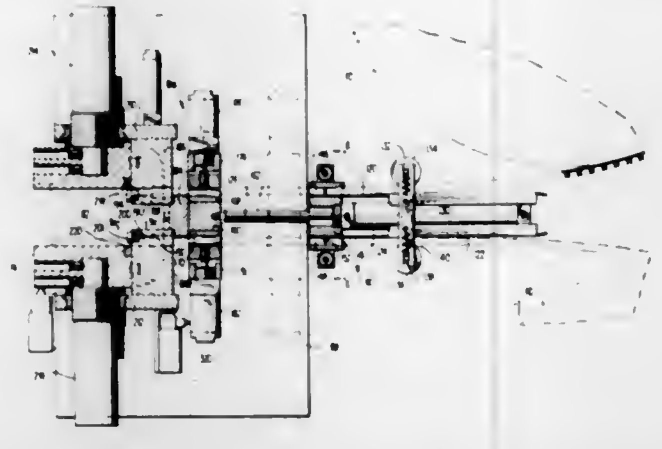
METHODS FOR FABRICATING WOODEN FRAMES AND THE LIKE

John Calvin Jureit, Coral Gables; Roy Leutwyler, Miami; Larry Brodsky, Miami; Benjamin Kushner, Miami, and Adolfo Castillo, Miami, all of Fla., assignors to Automated Building Componen's, Inc., Miami, Fla.

Division of Ser. No. 462,443, April 19, 1974, Pat. No. 3,939,548, which is a division of Ser. No. 317,095, Dec. 20, 1972, abandoned. This application July 30, 1975, Ser. No. 600,506

Int. Cl.² B23P *17/02*

U.S. Cl. 29—417 9 Claims



1. A method for joining transversely spaced generally parallel elongated wooden side members and elongated longitudinally spaced intermediate wooden members disposed between said side members to form a frame thereof by applying a sheet metal connector plate, of the type having integrally struck teeth projecting from one side thereof, to joints formed between the side and intermediate wooden members comprising the steps of:

1. providing first and second coils of connector stock of the type having integrally stuck teeth projecting from one side thereof,
2. feeding the connector stock from the coils to respective first and second pressheads, each presshead being movable along a predetermined path from a retracted to an extended position and each presshead carrying a cutting edge thereby defining relative to the cutting edge a predetermined line of cut along the connector stock,
3. providing a reaction surface cooperable with each cutting edge and comprised of a plurality of tines defining a plurality of laterally spaced recesses;
4. moving each presshead and locating each presshead adjacent a joint between a side member and an intermediate member;
5. guiding the stock from the coils to the presshead so that the teeth move along the recesses as the stock is fed into the path of movement of the pressheads;
6. displacing each presshead to engage the cutting edge and reaction surface tines along opposite sides of the stock and along its predetermined line of cut and, upon continued displacement of the presshead, cutting the stock to form first and second plates of predetermined length,
7. pressing the teeth of the first and second connector plates thus formed into a joint of a side member and an intermediate member,
8. advancing the partially joined frame of side members and intermediate members,

and locating another joint between a side member and an intermediate member in the paths of movement of said first and second pressheads and repeating steps (6) and (7).

4,033,026

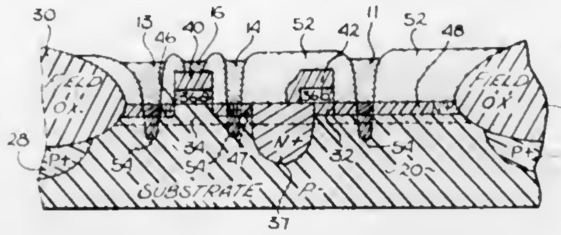
HIGH DENSITY/HIGH SPEED MOS PROCESS AND DEVICE

Richard D. Pashley, Mountain View, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Filed Dec. 16, 1975, Ser. No. 641,259

Int. Cl.² B01J *17/00*

U.S. Cl. 29—571 9 Claims



1. A process for fabricating an enhancement mode transistor and a depletion mode transistor on a p-type silicon substrate which includes the fabrication of a buried contact comprising the steps of:

doping a first region of said substrate with an n-type dopant to adjust the threshold of said depletion mode transistor;

forming a gate oxide layer on said substrate, said gate oxide layer covering at least a portion of said first region;

doping the upper surface of said substrate with a p-type threshold adjusting dopant to adjust the threshold of said enhancement mode transistor;

defining a window through said gate oxide layer to expose a portion of said substrate adjacent to said first region;

forming a first and second polycrystalline silicon gate on said gate oxide layer, said first gate spaced apart from said first region, said second gate formed on said oxide layer such that at least a portion of said first region is disposed beneath said second gate with said second gate extending into said window and contacting said substrate, including the doping of said gates with an n-type dopant and the formation of an n-type second region at said window, said second region contacting said first region;

forming a first source region and a first drain region in alignment with said first gate, said first source region contacting said second region, and forming at least a second drain region in alignment with said second gate spaced apart from said second region;

whereby an enhancement mode and a depletion mode transistor are fabricated with a buried contact which couples said gate and source region of said depletion mode transistor with said drain region of said enhancement mode transistor.

4,033,027

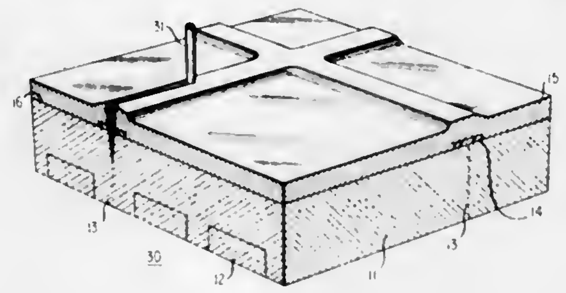
DIVIDING METAL PLATED SEMICONDUCTOR WAFERS

Richard Barton Fair, Sinking Spring; John Saylor Hayes, Fleetwood, and William Morgan Rosser, Sweet Valley, all of Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 26, 1975, Ser. No. 617,036

Int. Cl.² B01J *17/00*

U.S. Cl. 29—583 5 Claims



1. A process for fabricating semiconductor devices from a semiconductor wafer having a pair of opposed major surfaces comprising, (1) first forming a plurality of devices in a portion of the wafer adjacent one surface thereof, (2) next forming on the opposite surface of said wafer a photoresist pattern conforming to the separation lines between said devices, (3) next applying a layer of metal including at least one selected from the group comprising gold or an alloy of gold on said opposite surface and overlying said photoresist pattern, (4) applying mechanical cutting means to penetrate said metal layer, said photoresist pattern and at least a portion of said semiconductor body in accordance with said photoresist pattern, and (5) dividing said semiconductor wafer into a plurality of semiconductor devices in accordance with said pattern.

4,033,028

METHOD OF MAKING HEATING CABLES

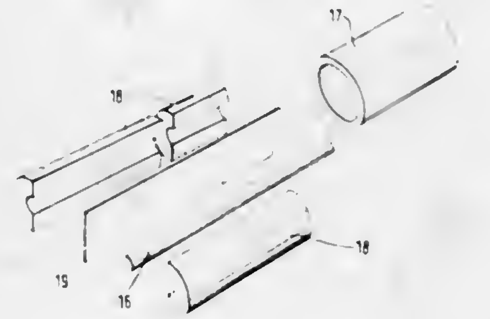
David Malcolm Howie, Carrying Place; Roy Victor W. McKenzie, Belleville, and James Ronald Snape, Brighton, all of Canada, assignors to Pyrotenax of Canada Limited, Trenton, Canada

Division of Ser. No. 587,161, June 16, 1975, Pat. No. 4,001,760. This application Apr. 22, 1976, Ser. No. 679,325

Claims priority, application United Kingdom, June 21, 1974, 27623/74

Int. Cl.² H05B *3/18*

U.S. Cl. 29—611 10 Claims



1. A method of making a mineral insulated electric heating cable, having the characteristic that for a given supply voltage the heat generated per unit length of the cable is substantially unaffected by the total length of the cable, comprising: forming an assembly comprising two or more ductile metallic conductors, namely a surrounding sheath and at least one other conductor within and spaced from it, at least one thin layer consisting of predominantly resistive material, which does not include an admixture of any significant amount of insulating material, supported by a carrier and individually or collectively contacting at least two of the conductors throughout the length thereof, and mineral insulating material substantially filling the remaining space within the sheath; and reducing the cross-section of the assembly to form the mineral insulating material into a homogeneous body of compacted insulating powder completely filling the remaining space whilst maintaining at least one layer of resistive material individually or collectively contacting at least two of the conductors throughout the length thereof.

4,033,029

METHOD OF ASSEMBLING CALIBRATED SWITCH

Denis G. Wolfe, Santa Ana, Calif., assignor to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 27, 1976, Ser. No. 718,288

Int. Cl.² H01H *11/00*

U.S. Cl. 29—622 8 Claims

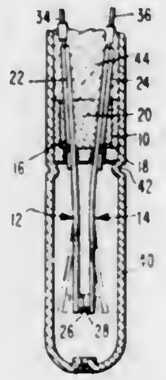
1. A method of assembling a thermally calibrated switch comprising the steps of

supporting a container in an upright position, said container having a pair of element receiving passages in the bottom thereof;

inserting a pair of elongated contact elements through the respective passages with supporting segments of the contact elements extending above the bottom of the container and with contact ends of the elements extending downward from the container, said passages being of sufficient size to allow pivotal movement of the contact ends of the elements together, said pair of contact elements having at least one temperature responsive bimetal portion, further said pair of contact elements being such that the supporting segments are inclined with respect to each other when the contact ends are engaged at a preselected operating temperature which is different from a hardening temperature for a hardenable material;

adjusting the temperature of the contact elements to the preselected operating temperature;

frictionally engaging the inclined supporting segments of the contact elements with a gravity biased positioning member such that the positioning member is wedged with the supporting segments to oppose movement of the supporting segments during a change of temperature from the preselected operating temperature to the hardening temperature, said frictional engagement exceeding resultant upward forces on the positioning member when the temperature is changed from the preselected operating temperature to the hardening temperature;



changing the temperature of the contact elements from the preselected operating temperature to the hardening temperature after the frictionally engaging step;

placing a quantity of the hardenable material into the container around portions of the supporting segments of the contact elements; and

hardening the quantity of hardenable material at the hardening temperature to secure the contact elements in a thermally calibrated position.

4,033,030

METHOD OF MANUFACTURING KEYSWITCH ASSEMBLIES

Max S. Robinson, Richland, Wash., and Thomas J. Studebaker, Boulder, Colo., assignors to Mohawk Data Sciences Corporation, Herkimer, N.Y.

Division of Ser. No. 505,389, Sept. 12, 1974, Pat. No. 4,018,999. This application Mar. 15, 1976, Ser. No. 666,732

Int. Cl.² H01H *11/00*

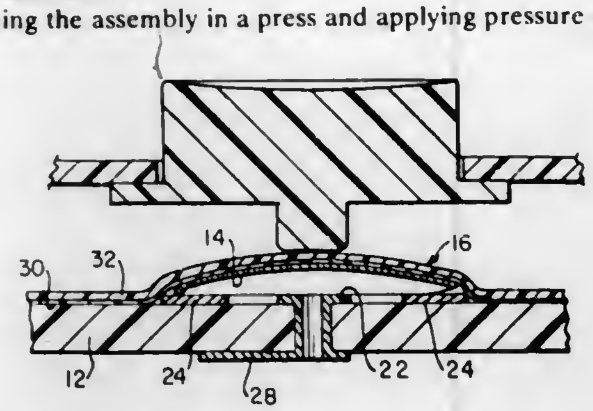
U.S. Cl. 29—622 **13 Claims**

1. A method of manufacturing a contact switch assembly for a keyboard comprising a circuit board having at least one first contact and at least one second contact provided on one side of said board, at least one electrically conductive curved resilient plate selectively electrically communicating between pairs of said first and second contacts and a retaining element comprising a film including a heat sealable thermoplastic material which maintains said resilient plates in position, comprising the steps of:

locating said electrically conductive curved resilient plates over said one side of said circuit board with at least a portion of their peripheries in electrical communication with respective ones of said second contacts;

placing said retaining element over said one side of said circuit board, said heat sealable thermoplastic material being in contact with said resilient plates and said circuit board side;

placing the assembly in a press and applying pressure to the assembly at an elevated temperature for a predetermined time thereby bonding said heat sealable thermoplastic material to said plates and to said one circuit board side; and



removing the assembly from the press.

4,033,031

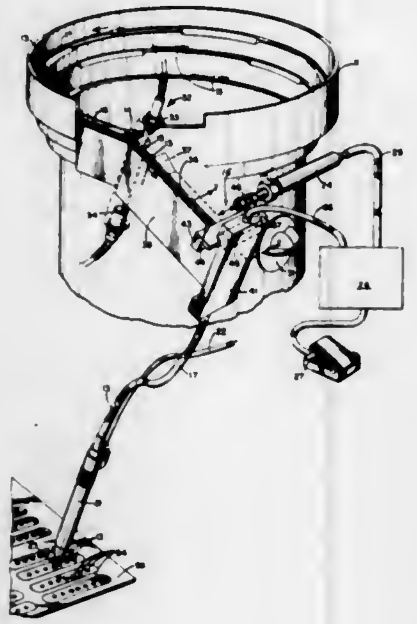
METHOD AND MACHINE FOR INSERTING ELECTRICAL CONTACTS INTO ELECTRICAL INTERCONNECTION BOARDS

George L. Ballew, North Attleboro, Mass., assignor to Augat, Inc., Attleboro, Mass.

Filed Apr. 22, 1976, Ser. No. 679,172

Int. Cl.² H05K *13/00*

U.S. Cl. 29—626 **19 Claims**



1. A machine for inserting elongated electrical contacts into holes in electrical interconnection boards, said machine comprising:

means for holding a multiplicity of said contacts;

means for feeding said contacts individually and separately in tandem parallel fashion from said holding means;

means extending from said feeding means for arranging a plurality of said contacts in parallel in at least one row, said individual contacts normally abutting adjacent said contacts in said row;

escapement means mounted to said arranging means;

insertion means having an exhaust nozzle;

means for flexibly connecting said insertion means to said escapement means, said escapement means being shaped and configured to remove said contacts individually from said arranging means and feed them to said insertion means through said flexible connecting means, said escapement means having means to maintain said row of separate contacts in said arranging means while one of said contacts is fed to said insertion means; and

means for controlling the operation of said escapement means to eject said contacts individually from said exhaust nozzle at a predetermined rate.

4,033,032

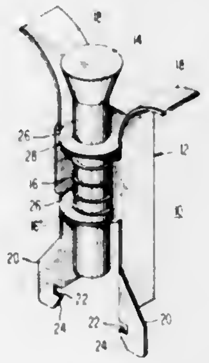
INTEGRATED CIRCUIT PACKAGE REMOVAL TOOL

Samuel Richard Romania, and George Joseph Sprenkle, both of Phoenixville, Pa., assignors to Burroughs Corporation, Detroit, Mich.

Filed Dec. 16, 1976, Ser. No. 751,176

Int. Cl.² H01R *43/00;* **H05K** *13/04*

U.S. Cl. 29—764 **7 Claims**



1. A tool for use in removing from a connector an integrated circuit package having a metallic heat sink member extending beyond an end of said connector and including a registration aperture, said connector having a retention post for engaging said registration aperture, said tool comprising:

a body member,

said body member having a pair of spring-like parallel spaced-apart side portions, said side portions including at one extremity thereof a respective pair of thin finger-like extensions angularly disposed with respect thereto, said finger-like extension having respective cutouts for engaging the opposite edges of said integrated circuit package heat sink member, said side portions being curved respectively at the other extremity thereof,

said body member further including a central portion disposed between and connecting said side portions, said central portion comprising a pair of parallel spaced-apart sections lying in planes oriented at right angles to those of said side portions, said last mentioned sections having respective like-diameter apertures therein in substantial alignment with each other,

a plunger,

said plunger being slidably mounted within the apertures of said sections of the central portion of said body member and positioned to initially contact said connector retention post in order that a force may be applied thereto, said curved side portions of said body member permitting an opposite force to be applied via said finger-like extensions to said heat sink member,

the simultaneous application of said opposing forces resulting in the movement of said package relative to its connector, and upon the transfer of contact by said plunger from said retention post to the surface of said heat sink member, the firm grasping of said package to accomplish its removal.

4,033,033

BUS MANUFACTURING MECHANISM AND METHOD

George R. Heffner, San Diego, Calif., assignor to Rohr Industries, Inc., Chula Vista, Calif.

Filed Feb. 23, 1976, Ser. No. 660,554

Int. Cl.² B23P *19/04*

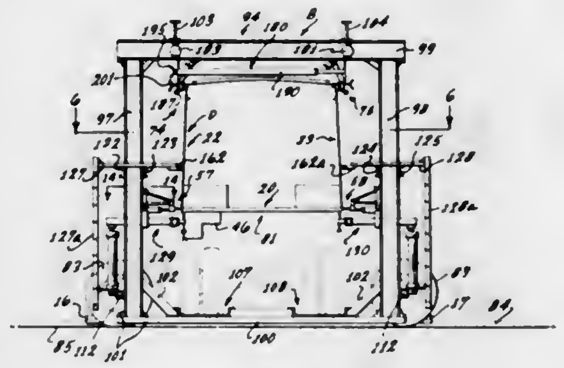
U.S. Cl. 29—824 **15 Claims**

1. Mechanism for assembling, in relative positions of final assembly, a selected plurality of sub-assemblies, each of said sub-assemblies comprising a major component of a transit vehicle and being respectively a floor assembly, a roof assembly and a left and right sidewall assembly, said mechanism comprising:

a collector in the form of a framework of a rectangular shape to receive therein the body of a transit vehicle, said framework being open on at least one end thereof to receive the various sub-assemblies of a transit vehicle to be assembled therein;

said framework having at least a plurality of transverse open frames each having upright side beams, a transverse top beam, and a transverse bottom beam;

said framework being mounted on wheels aligned transversely with respect to the open end of the collector so that the collector can travel between individual staging points where the different sub-assemblies may be loaded into the open end of the collector for assembly of a vehicle within the collector;



floor sub-assembly conveyor way means positioned within said collector framework to convey into said collector and to support therein in relative position of final assembly a floor sub-assembly, said floor sub-assembly conveyor way means being attached to the upright side beams of said transverse open frames, said sub-assembly conveyor way means being of a length approximating that of a vehicle floor assembly;

sidewall sub-assembly conveyor way means positioned within said collector framework to convey into said collector and support therein in relative position of final assembly sidewall sub-assemblies;

roof sub-assembly conveyor way means positioned within said collector framework to convey into said collector and support therein in relative position of final assembly roof sub-assemblies, and

means attaching said sidewall sub-assembly conveyor way means and said roof sub-assembly conveyor way means to said collector framework.

4,033,034

INNER BLADE MEMBER FOR ELECTRIC DRY SHAVER

Hirozo Imai, Hirakata, and Yasuo Maeda, Takarazuka, both of Japan, assignors to Matsushita Electric Works, Ltd., Osaka, Japan

Filed July 28, 1975, Ser. No. 599,770

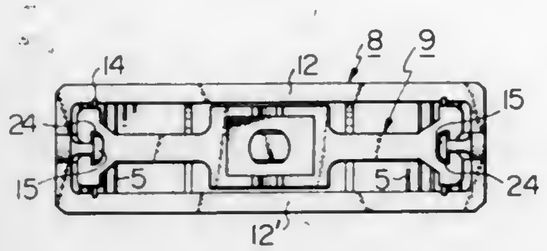
Claims priority, application Japan, July 31, 1974, 49-88341

Int. Cl.² B26B *19/04*

U.S. Cl. 30—43.92 **5 Claims**

1. An electric dry shaver having a body, a thin, semi-cylindrical outer blade defining a pattern of apertures, a cooperating inner blade assembly formed of a hollow rectangular frame and a stack of semi-annular cutting elements axially spaced in the frame presenting their semi-circular edges to the outer blade, said frame being formed of synthetic plastic with the cutting elements being permanently molded in place therein, a yoke member having arms extending axially in the hollow frame and having means for captively engaging the ends of the arms to the axial ends of the frame at the respective ends of the stack of cutting elements, the engaging means including

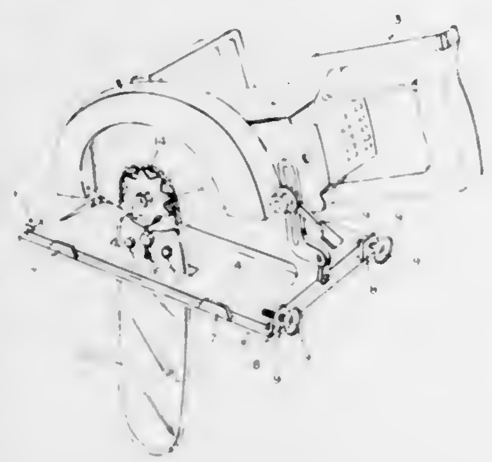
laterally extending frictional elements which exert purely lateral force in opposed directions against the side walls of the frame free of generation of longitudinal stress in the frame, a driving means including a motor in the body, said driving means further including a reciprocated driving member coupling the motor to the central portion of the yoke member for axially reciprocating the yoke member, the engaging means further including cooperating surfaces at one end of the yoke member and frame to provide positive endwise driving engagement for thereby reciprocating the frame of the inner blade assembly, and a push-up spring at the central portion of the yoke member for urging it and the inner blade assembly toward the outer blade.



4,033,035

BEAM CUTTING AND MITERING DEVICE

David G. Trimmer, 5541 Deodar, Montclair, Calif. 91763
Filed Aug. 3, 1976, Ser. No. 711,358
Int. Cl.^{2} B27B *17/14*
U.S. Cl. 30—122 **5 Claims**

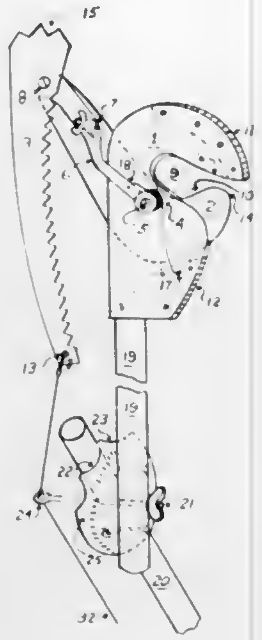


1. A cutting and mitering attachment for a portable power driven circular saw including a housing, a drive shaft wherein the saw blade has been removed therefrom and support shoe, a flat generally rectangular attachment plate, angle clip means at one end of said plate and guide flange means at the side edges thereof whereby said support shoe is flatly mounted thereon, and screw means at the other end of said plate for retaining said shoe and housing in position, a slot in said plate having a cutter bar extending therethrough so as to depend therefrom at right angles thereto, a sprocket arranged above the upper end of said cutter bar and mounted on said drive shaft, and an endless saw chain disposed on said cutter bar and extending over said sprocket so as to be driven thereby, whereby said plate may be flatly arranged on a beam and manually moved thereover so that the cutter bar and saw chain depending vertically therebelow will cut the beam as a circular saw.

4,033,036

MORRIS POLE TYPE PRUNER

Charles F. Morris, P.O. Box 223, Tenino, Wash. 98589
Filed Aug. 18, 1976, Ser. No. 715,547
Int. Cl.^{2} B26B *13/22*
U.S. Cl. 30—144 **5 Claims**

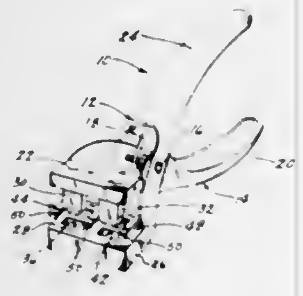


1. A pole type pruner comprising two duplicate flat sheet metal side plates, each of an overall basic right triangle shape but with one of the two angles to its hypotenuse rounded off and the other shortened by cutting the hypotenuse to a perpendicular to the longer opposite side, each side plate having at the bottom of its top widest half a U shaped notch or cut-out extending inwards and somewhat upwards in an oblique angle to the hypotenuse to a depth of about three inches or equivalent to a little more than twice the diameter of the maximum limb size to be cut and this notch just sufficient in width to accommodate this limb size; and a short appropiate distance below the inner rounded end of this U shaped notch in each side plate is a hole thru which a pin is installed as a pivot anchor point for the cutter blade; and these side plates are in fixed position parallel to each other and spaced a distance slightly more than the cutter blade thickness, with spacers so shaped and fixed between the sides in such position as to allow free movement of the blade in a pivot swing of about 150° and said side plates fixed sidewards at their straight back edge portion against a pole section.

4,033,037

METHOD AND MEANS FOR PUNCHING SHEET MEMBERS

Jerry A. Cooley, Rte. 1, New Virginia, Iowa 50210
Filed June 26, 1975, Ser. No. 590,699
Int. Cl.^{2} B26F *1/00*
U.S. Cl. 30—363 **6 Claims**



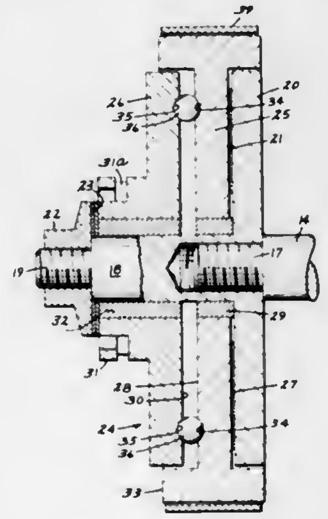
1. A device for punching a plurality of holes adjacent the edge of at least one sheet member, said device comprising:

a pair of elongated jaw members pivotally jointed intermediate their lengths in scissors-like fashion,
a punch adjacent one end of one of said jaw members,
an aligner on said one jaw member spaced a predetermined distance from said punch in a direction parallel to the pivotal axis of said jaw members;
said aligner and said punch each extending downwardly from said one jaw member and terminating in a lower end, said lower end of said aligner protruding downwardly a predetermined distance below said lower end of said punch.
a punch die sized to receive said punch and positioned on said other jaw member in registered alignment below said punch;
said jaw members being pivotal from an open position wherein said punch and aligner are spaced from said die to a closed position wherein said punch is matingly received within said die and said aligner is positioned beside said die
said lower end of said aligner being positioned below said lower end of said punch in both said open and said closed positions of said jaw members,
a stripper element mounted to said other jaw member including a plurality of spaced apart stripper members horizontally disposed in spaced relation above said other jaw member whereby at least one of said sheet members will fit in said space between said stripper members and said other jaw member, said stripper members being adjacent the inner and outer lateral margins of both said punch and said aligner as said jaw members move between said open and closed positions,
both said punch and said aligner being in spaced relation above said stripper members when said jaw members are in said open position.

4,033,038

CHAIN SAW COUPLING MECHANISM

James M. Lunde, Taylors Falls, and John G. Schwartz, Jr., South St. Paul, both of Minn., assignors to Osceola Clutch & Brake Company, Minneapolis, Minn.
Filed July 30, 1976, Ser. No. 710,176
Int. Cl.^{2} B27B *17/10;* **F16D** *15/00*
U.S. Cl. 30—382 **12 Claims**

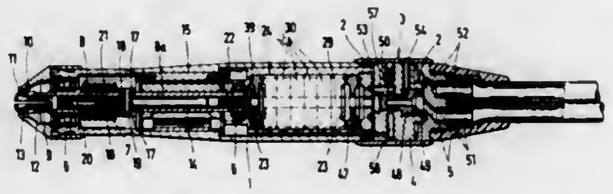


6. In a chain saw, in combination:
a. a power driven rotary drive shaft element;
b. a radially outwardly projecting driving clutch plate fixed on said drive shaft element;
c. annular reaction means on said drive shaft element axially spaced from said driving clutch plate;
d. an axially expansible and contractible clutching assembly mounted on said drive shaft element between said driving clutch plate and said reaction means and comprising;
  1. an annular driven clutch plate member journaled on said drive shaft element adjacent said drive clutch plate and having axially opposite surfaces one of which is disposed in face-to-face relationship with said drive clutch plate;
  2. an actuating and output member having means for drivingly engaging a cutting chain and being journaled for rotary and axial sliding movements of said drive shaft element between the other one of said surfaces of said driven clutch plate member and said reaction means and operatively engageable with said reaction means;
  3. an actuator means associated with said members for imparting relative axial clutch assembly expanding movement thereto in directions away from each other to apply frictional driving pressure to said driven clutch plate member against said driving clutch plate responsive to rotation of said driven clutch plate member at a greater speed than that of said actuating and output member in one direction of rotation thereof, said actuator means being operative to permit relative axial clutch assembly contracting movement of said members toward each other to reduce said frictional driving pressure when the speed of said driven clutch plate member is reduced below that of said actuating and output member in the same direction;
e. and means for releasably engaging said driven clutch plate member to arrest rotary movement thereof independently of said driving clutch plate.

4,033,039

DENTAL HANDPIECE

Gerd Lohn, Biberach an der Riss, and Anton Braun, Reute, both of Germany, assignors to Kaltenbach & Voigt, Biberach an der Riss, Germany
Filed Feb. 23, 1976, Ser. No. 660,315
Claims priority, application Germany, Mar. 10, 1975, 2510384
Int. Cl.^{2} A61C *1/10*
U.S. Cl. 32—26 **17 Claims**



1. Dental handpiece, a drive shaft; manipulating means mounted in said handpiece, clamping tongs arranged in the front end of a drive shaft for an insertable implement, the front end of the drive shaft and the clamping tongs being axially displaceable relative to each other into a displacement end position by actuation of said manipulating means mounted in the handpiece, a piston arrangement, said tongs being displaceable out of the said displacement end position by means of said piston arrangement in the handpiece said piston arrangement comprising a plurality of piston-cylinder units arranged one behind the other in longitudinal direction of the handpiece and subjected to pressure medium action, a control device, said manipulating means being connected with said control device releasing and shutting-off pressure medium supply to the piston-cylinder units, spring means for holding said tongs in open position, and pressure rod means for removing the force of said spring means applied to said tongs.

4,033,040

CLAMPING DEVICE FOR DENTAL TOOLS

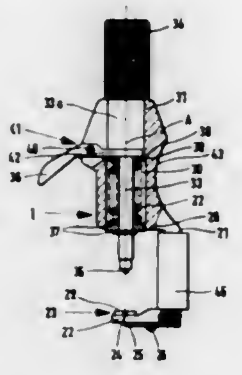
Erich Bareth, Ummendorf, and Hans Loge, Biberbach, both of Germany, assignors to Kaltenbach & Voigt, Biberach an der Riss, Germany

Filed Jan. 16, 1976, Ser. No. 649,806

Claims priority, application Germany, Dec. 10, 1975, 2555617

Int. Cl.^{2} A61C *1/10*; B25D *23/142*

U.S. Cl. 32—27 **9 Claims**



1. A device for clamping and unclamping dental tools in a dental handpiece with an angled head, comprising, in combination: two-part clamping means for holding a dental tool; one part of said clamping means having a collet for holding the dental tool and another part having a driven rotary hollow shaft located in the head, said collet being movable lengthwise inside said shaft, said collet and said shaft being threadable into one another by means of an outside thread on said collet and an inside thread in said shaft selectively to obtain clamped and unclamped positions, one of said parts of the clamping means having at the tool end of the head at least one key surface accessible from the exterior; the other part of said clamping means having on the end opposite to the tool end also a least one key surface accessible from the exterior; a U-shaped carrier having a first flange with a stationary key, the latter having engaging means for engagement with said key surface at the tool end, a second flange of said carrier having an axially movable pin-shaped key projecting into the area between said flanges; an exterior attachment of said second flange with an axial hollow space, said movable key being axially movable in said hollow space against the action of spring means in a direction away from said first flange; a knob on the key end projecting from said attachment for manually rotating said movable key; and engaging means on said movable key at the opposite end of said knob for engaging said key surfaces at said opposite ends of the tool and of said head; said movable key having a handle mounted on said carrier and actuatable with hand of the operator by finger pressure applied transversely to the longitudinal axis of said movable key to axially move the latter by the same hand of the operator against the action of said spring means; wherein said handle constitutes a first arm of a two-arm acutation lever pivoted in a portion of said carrier and jutting out therefrom for easy actuation by the same hand of the operator, a second arm of said lever being fork-shaped and extending substantially transversely to the longitudinal axis.

4,033,041

STEEL LINE MEASURE GUIDE

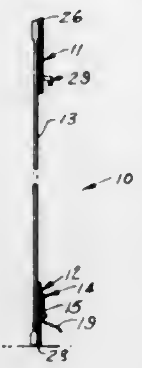
John Henry Allums, 4206 Northwood, Anchorage, Alaska 99503

Filed May 12, 1975, Ser. No. 576,880

Int. Cl.^{2} G01B *3/10*

U.S. Cl. 33—137 R **1 Claim**

1. A device for use with a measuring tape to aid in measuring a length of pipe, comprising in combination, an elongated lower member and an elongated upper member, said lower member having a receptacle which is adapted to receive a measuring tape reel, means to hold said tape reel in said receptacle including in series, a bolt, a turnbuckle, a chain and a hook that engages a handle of the tape reel to hold the reel in the receptacle, the lower end of said lower member having a lip that engages the lower end of a pipe to be measured to hold said lower member at the lower end of the pipe, the upper end of said lower member having a second lip for engaging the side of said pipe and a plurality of guides for receiving said tape and guiding it towards said upper member, said upper member having means to attach said tape to the upper end of the pipe, said upper member having means to hold said tape wrapped around the upper end thereof a predetermined distance, said predetermined distance being equal to the distance from the uppermost of said guides to the lower end of said lower member, so that said uppermost guide also serves as a measuring readout indicator.



4,033,042

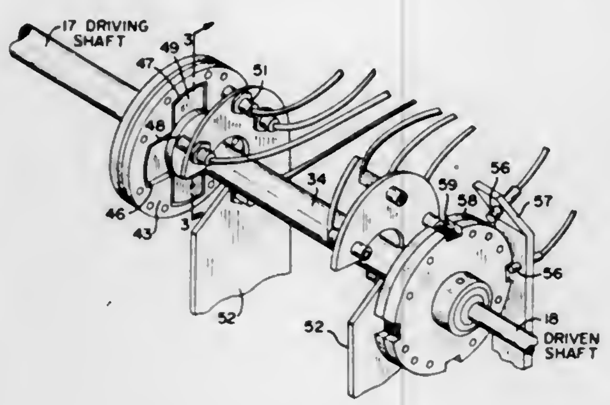
SHAFT ALIGNMENT APPARATUS AND METHOD

Donald E. Bently, Minden, Nev., assignor to Bently Nevada Corporation, Minden, Nev.

Continuation of Ser. No. 513,726, Oct. 10, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,293

Int. Cl.^{2} G01B *7/31*

U.S. Cl. 33—181 R **31 Claims**



1. In an alignment apparatus for a pair of machines in a machine train having first and second rotating shafts interconnected by a flexible coupling, the flexible coupling having at least one member connected to one of the shafts and being capable of accommodating at least some misalignment of the first and second shafts, one of said first and second shafts being considered as a reference shaft and the other of said first and second shafts being considered as a movable shaft, the alignment apparatus comprising means adapted to be carried by the shafts having surfaces spaced apart circumferentially with respect to the axis of rotation of the shafts which represent the orientation of one of said shafts and serve as reference surfaces, paddle means adapted to be carried by the flexible coupling having surfaces interposed between said reference surfaces and spaced apart circumferentially with respect to the axis of rotation of the shafts and representing the orientation of said one member of the flexible coupling, and probe means for sensing the position of said reference surfaces and said last named surfaces during rotation of the same to determine whether said shafts are placing on said member a force which is outside of the useful operating range of the member in the flexible coupling.

4,033,043

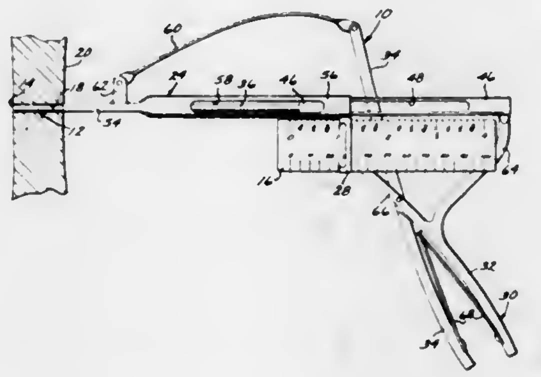
GAUGE FOR MEASURING LENGTH OF AN OPENING

Frank W. Cunningham, 2325 Palos Verdes Drive - West, Palos Verdes, Calif. 90274

Filed July 9, 1975, Ser. No. 594,268

Int. Cl.^{2} A61B *5/10*

U.S. Cl. 33—143 R **8 Claims**



1. A gauge for measuring the distance between the near and far edges of an elongated opening through an element, said gauge comprising:
- a rigid elongated probe including an outer extremity having a hook and an inner extremity having a first indicator means, said hook being engageable upon the far edge of the opening upon disposition of said outer extremity through the opening in the element;
- an elongated member longitudinally extensible alongside said probe for engagement upon the near edge of the opening, said member including a second indicator means cooperative with said first indicator means to indicate the distance between the portions of said hook and said member in engagement with said far and near edges, respectively, to thereby indicate the length of the opening;
- an elongated rod coupled to said member and extensible therewith to a projected position upon initial extension of said member, said rod having an outer extremity located adjacent said hook in said projected position to substantially fill said opening and prevent disengagement between said hook and said far edge; and
- handle means connected to said probe and to said member and operative to effect relative longitudinal movement therebetween.

4,033,044

LOCK ALIGNMENT TOOL

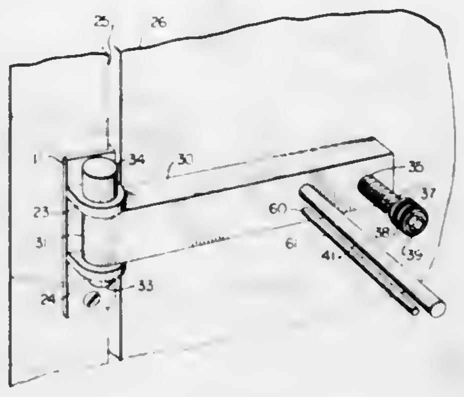
Bertram Michaels, Williston Park, N.Y., assignor to New York School of Locksmithing, Inc., Hempstead, N.Y.

Filed July 13, 1976, Ser. No. 704,849

Int. Cl.^{2} G01B *5/00*

U.S. Cl. 33—189 **4 Claims**

1. An alignment tool for indentifying and marking the proper location on a closure for the hole to receive the cylinder of a lock of the type having a plurality of laterally extending bolt housings and a strike with a plurality of flanges having openings to receive the bolts of the lock, the tool comprising
- an alignment bar substantially in the shape of a parallelepiped and dimensioned at least at one end to fit between said flanges;
- a substantially cylindrical hinge peg having a body portion and an enlarged head portion;
- means in said one end of said bar defining a first opening alignable with and of a size no greater than said bolt-receiving openings in said flanges for receiving said body portion of said peg;
- an externally threaded rod;
- means in said bar defining a second opening spaced from the first opening and having a central axis perpendicular to the axis of said first opening and having internal threads for receiving said rod in threaded engagement,
  - said rod being extendable from said bar to contact said closure, rotation of said rod being effective to adjust said bar so that it becomes parallel with said closure,
- a punch rod having a pointed end; and



- means in the bar defining a third opening for receiving said punch rod, said third opening having a central axis which is parallel with said second opening, said third opening being spaced from said first opening by a predetermined distance equal to the spacing between the bolts and cylinder of the lock;
- said punch rod being strikable to mark on said closure the proper point for the center of a hold to receive the lock cylinder.

4,033,045

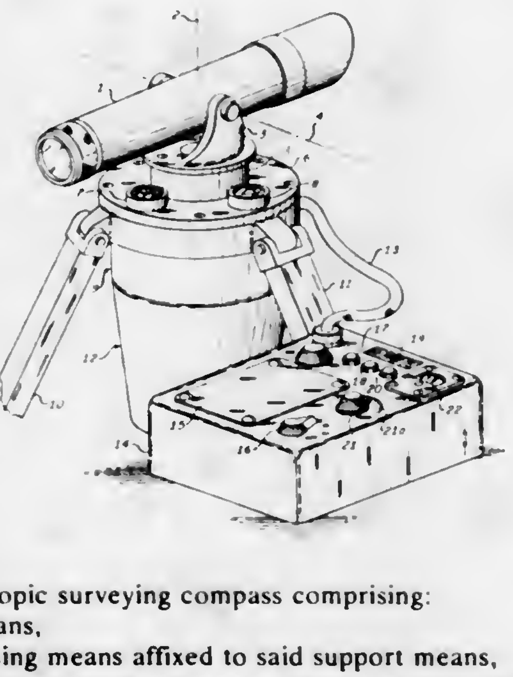
PORTABLE SURVEYING GYROCOMPASS APPARATUS

Willis G. Wing, Glen Head, N.Y., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,907

Int. Cl.^{2} G01C *19/38*, *1/02*

U.S. Cl. 33—275 G **32 Claims**



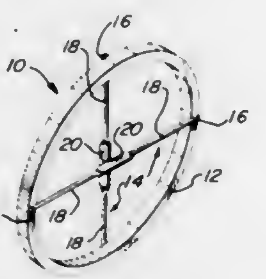
1. A gyroscopic surveying compass comprising:
- support means,
- external casing means affixed to said support means,
- sealed follow-up container means journaled for rotation normally about a vertical axis within said external casing means,
- floated gyroscopic assembly means within said follow-up container means buoyantly supported by liquid contained within said follow-up container means,
- gyroscope rotor means journaled about a normally horizontal axis within said floated gyroscopic assembly means,
- motive means responsive to the difference between the

azimuth position of said floated gyroscopic assembly means and said follow-up container means for driving said follow-up container means into alignment with said floated gyroscopic assembly means,
sighting means journaled for free rotation with respect to said follow-up container means, angle pick-off means responsive to the difference between the azimuth position of said follow-up container means and said sighting means, and
numerical display means responsive to said angle pick-off means.

20. In a gyroscopic compass:
support means,
follow-up container means journaled for rotation about a normally vertical axis with respect to said support means,
pendulous floated gyroscopic assembly means buoyantly supported by liquid within said follow-up container means,
gyroscopic rotor means journaled about a normally horizontal axis within said pendulous floated gyroscopic assembly means,
first vane means disposed symmetrically on said pendulous floated gyroscopic assembly means and having first respective opposed electrically conductive surface means at a first part thereof.
a first pair of inductor means pending within said follow-up container means at said first part,
means for supplying an alternating electric current to said inductor means,
said inductor means forming a first pair of opposed gaps for generating eddy current flow within said respective opposed electrically conducting surface means at said first part when excited by an alternating electric current, thereby generating when said gaps are unequal, a differential restoring force tending to equalize said first pair of opposed gaps.

4,033,046
RIFLESCOPE RETICLE

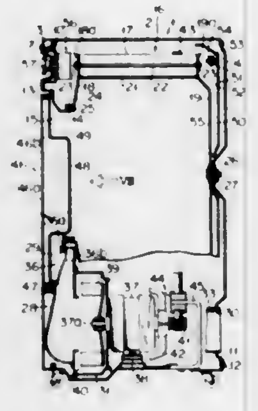
Donald J. Burris, Greeley, Colo., assignor to Burris Company, Greeley, Colo.
Filed Feb. 19, 1975, Ser. No. 551,167
Int. Cl.² F41G *1/38;* **G02B** *27/32*
U.S. Cl. 33—297 **7 Claims**



1. In a reticle for an optical sighting device, the improved aiming reference defining means which comprises: a pair of round wire filaments supported in crossed relation one behind the other, both of said filaments having portions thereof adjacent the intersection therebetween mashed to produced overlapped flattened sections of a thickness substantially less than that of the undeformed wire, said overlapped flattened sections being so located relative to one another and to the viewing axis of the sighting device that the viewer sees only the edges thereof.

4,033,047
CLOTHES DRYER

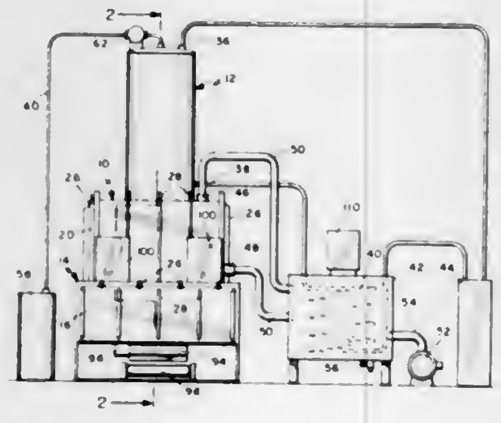
Tsuneo Kawai, Nagoya, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Aug. 5, 1975, Ser. No. 601,985
Claims priority, application Japan, Aug. 7, 1974, 49-94361
Int. Cl.² F26B *11/04*
U.S. Cl. 34—82 **13 Claims**



1. A clothes dryer comprising a cabinet body having at its front side an access opening through which an article to be dried is charged; a drum rotatably mounted within the cabinet body and having at its front side an access opening communicating with the access opening of the cabinet body; means for rotating the drum, a surrounding wall for defining a passage between the access opening of the drum and the access opening of the cabinet body; a door openable to gain access to the access opening of the drum and cabinet body and having an unperforated projection extending inward to define, when the door is closed, an annular air passage with respect to the surrounding wall, said annular air passage being such that the portion defined between the lower portion of the surrounding wall and of the projection is made narrower than the portion defined between the upper portions of the surrounding wall and of the projection; an exhaust duct situated below the air passage and communicating with the air passage; the portion of said annular air passage defined between the lower portion of the surrounding wall and said projection defines a restriction to prevent the passage of foreign matter into the exhaust duct; a lint retaining member provided at the exhaust duct; heating means provided within the body; and means for introducing from the rear side to the front side of the body an air heated by said heating means and guiding it through said air passage into said air duct.

4,033,048
FREEZE DRYING APPARATUS

Clayton Van Ike, 9264 Rockacres Drive, Lakeside, Calif. 92040
Filed Jan. 12, 1976, Ser. No. 648,094
Int. Cl.² F26B *13/30, 5/06*
U.S. Cl. 34—92 **3 Claims**

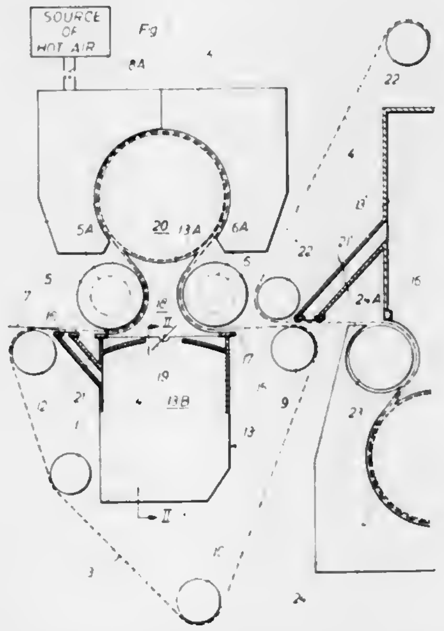


1. Freeze drying apparatus, comprising:

a freezing chamber with means for freezing a liquid product into powder;
a drying chamber open to and extending from said freezing chamber and subjected to the cooling therefrom;
conveyor means in said drying chamber for receiving powder from the freezing chamber and carrying the powder through the drying chamber;
a vacuum pump coupled to said drying chamber for applying a vacuum thereto;
a source of microwave radiation coupled to said drying chamber for irradiating the interior thereof;
means for controlling the microwave radiation to sublimate moisture from the powder without excessively heating the powder; and
collection means for continuously extracting the dried powder product from said drying chamber.

4,033,049
APPARATUS FOR CHANGING THE MOISTURE CONTENT OF PAPER WEBS OR THE LIKE

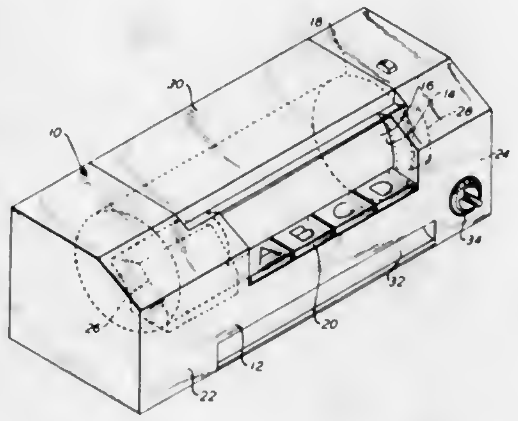
Christian Schiel, Heidenheim-Schnaitheim, and Hans Flämig, Heidenheim (Brenz), both of Germany, assignors to J. M. Voith GmbH, Heidenheim (Brenz), Germany
Filed Dec. 19, 1974, Ser. No. 535,049
Claims priority, application Germany, Dec. 22, 1973, 2364346
Int. Cl.² F26B *13/08*
U.S. Cl. 34—115 **15 Claims**



1. In an apparatus for changing the moisture content of webs which are advanced lengthwise in a predetermined direction, particularly for reducing the moisture content of paper webs, a combination comprising parallel first and second cylindrical rolls; a hollow rotary drum having a foraminous cylindrical wall, said drum being parallel with, closely adjacent to and disposed between said rolls said drum further comprising a pair of end walls and at least one partition disposed between said end walls and subdividing the interior of said drum into a plurality of compartments; and endless permeable screen having first, second and third portions respectively trained around said first roll, said drum and said second roll and directly contacting the peripheral surface of said drum, said screen further having a loop; and suction chamber disposed within said loop and having a portion disposed between said rolls and provided with an open side facing the peripheral surface of said drum intermediate said rolls, said chamber further having at least one second partition located in and subdividing said portion of said chamber into a plurality of second compartments each in register with one of said first mentioned compartments, a web to be treated being threaded between said first screen portion and said first roll, around said second screen portion, and between said third screen portion and said second roll, and said suction chamber having sealing means adjacent to said screen ahead of said first portion thereof, as considered in said direction.

4,033,050
TEACHING MACHINE HAVING RESPONSE DEPENDENT PROGRAMMING

Charles Edward Kaprelian, Franklin St., Bechtelsville, Pa. 19505
Filed Apr. 1, 1975, Ser. No. 564,046
Int. Cl.² G09B *7/06*
U.S. Cl. 35—9 R **9 Claims**

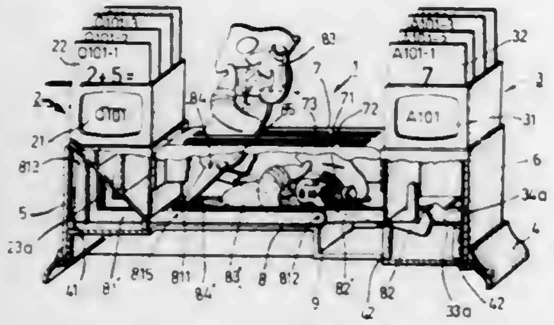


1. A device for programmed instruction comprising, in combination, a rotatable, cylindrical shaped support means, holding means on said support means, an information sheet covering substantially all of the surface of said holding means and exposing for view one of a plurality of statement and response areas each containing a statement and two or more response choices one of which is a correct choice and one or more of which are incorrect choices, user-operated response entry members corresponding in number to the number of response choices, coded means on said information sheet comprising an opaque area within each statement and response area, positioned in one of several locations, within each of said statement and response areas to indicate the correct choice of response to the statement for each of said areas, means for producing a mark within said statement and response area when an incorrect response choice is made on a response entry member, means for advancing said support means and said information sheet so as to expose subsequent statement and response areas to view, and means for automatically releasing the information sheet from said holding means by reversing the direction of rotation of said support means upon completion of viewing of the statement and response areas.

5. A worksheet for a programmed instruction device having holding means for securing the worksheet thereto wherein the user can select one of two or more responses to a statement comprising a flexible sheet of non-opaque light reflecting material having thereon a plurality of areas each containing a statement and two or more proposed responses thereto, each of said areas including a first sub-area on which is marked the coded correct response in the form of an opaque mark and a second sub-area on which only erroneous responses are automatically recorded, the coded response marks of said first sub-area consisting of an array of rectangular areas, said areas having lower optical reflectivity than the unmarked surface of the worksheet.

4,033,051
EDUCATIONAL TOY

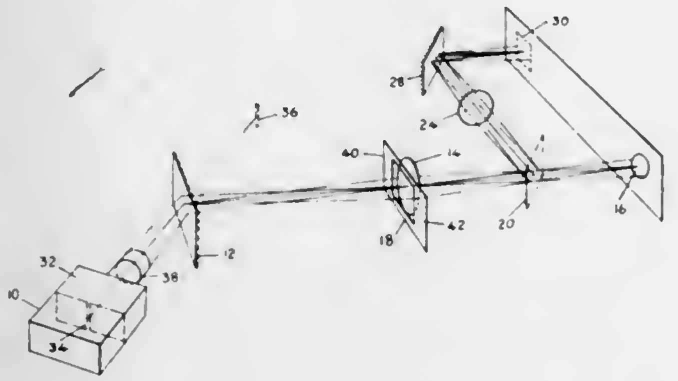
Hsing-Ching Liu, 3F, No. 213, Chuong Ching North Road, Sec. 4,, Taipei, China /Taiwan
Filed Aug. 8, 1975, Ser. No. 602,964
Int. Cl.² G09B *3/06*
U.S. Cl. 35—9 R **4 Claims**



1. An educational toy comprising a plurality of matched pairs of cartridges, each matched pair including a question cartridge displaying a question and an answer cartridge displaying the correct answer to the question, an elongated body member having two compartments for receiving questions and answer cartridges, respectively, arranged one at each end of the body member, mechanical sensing means extending to the compartments for sensing the shape of the inserted cartridges, and correct and wrong answer indicating means displaceable by the sensing means housed in a central section between the compartments comprising a pair of indicators of which one is arranged to rise upon insertion of a pair of cartridges into the said compartments, the cartridges being configured such that a correct answer indication is only produced when a matched pair of cartridges is inserted in the said compartments and an incorrect answer indication is only produced when a mismatched pair of cartridges is inserted in the same compartments.

4,033,052
OPTICAL TEACHING AID

Michael Failes, Mississauga, Canada, assignor to Canadian Instrumentation and Research Limited, Mississauga and Film Opticals of Canada Limited, Toronto, both of, Canada
Filed July 6, 1976, Ser. No. 702,720
Int. Cl.² G09B *23/22*
U.S. Cl. 35—19 B **11 Claims**

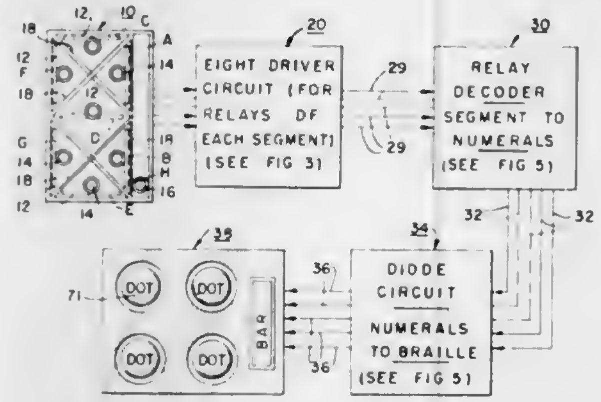


1. A teaching aid for demonstrating the principles of colour by direct comparison of spectral distribution and the perceived colour due to said distribution, which comprises:

a. a light source emitting light;
b. a diffraction means adapted to diffract said emitted light;
c. a selective spatial filter means adapted to selectively filter said diffracted light, said filter placed at the spectrum formed by said diffracted light;
d. a focusing means placed subsequent to and near said selective filter means adapted to focus said selectively filtered light to a subsequent first viewing position;
e. a beam splitting means adapted to split said focused and filtered light into at least one split beam and one transmitted beam, the beam splitting means subsequent to the focusing means and in front of the first subsequent viewing position.

4,033,053
DIGITAL SEGMENT DISPLAY TO BRAILLE CONVERTER

Theodore T. Engler, Rte. No. 3, Box 305-B, Perry, Fla. 32347
Filed Jan. 14, 1976, Ser. No. 648,991
Int. Cl.² G09B *21/00*
U.S. Cl. 35—35 A **6 Claims**

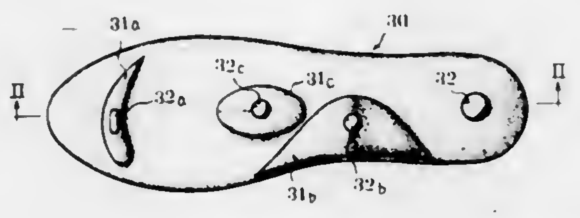

EIGHT DRIVER CIRCUIT (FOR RELAYS OF EACH SEGMENT) (SEE FIG 3)
RELAY DECODER SEGMENT TO NUMERALS (SEE FIG 5)
DIODE CIRCUIT NUMERALS TO BRAILLE (SEE FIG 5)
DOT
DOT
DOT
DOT
BAR

1. A converter for reading displays having a predetermined arrangement of light emitting segments for representing alphanumeric characters and delivering a Braille pattern of raised dot and/or bar members readable by a blind person as a tactile presentation, comprising:

a. reading head means having multiple light-responsive means each corresponding with a different one of said segments and respectively disposed to face toward and respond to one associated character segment when emitting light, whereby said reading head means determines which of said segments are illuminated;
b. electric decoder means having multiple inputs respectively coupled with said multiple light responsive means, and having outputs responsive to said inputs and representing when activated decoded alpha-numeric characters;
c. Braille means including a pattern with raiseable tactile members, and actuator means each connected to one of said members and operative when energized to raise the associated member in the pattern; and
d. electrical circuit means connected to the outputs of the decoder means and to said individual actuator means, and operative in response to activation of said outputs representing characters to energize appropriate actuator means to present in said pattern Braille presentations of the same characters.

4,033,054
FOOTWEAR

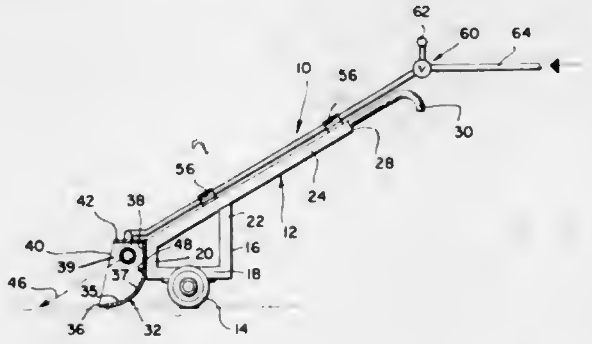
Tatsuo Fukuoka, No. 3-3, 2-chome, Shinminamifukushima, Tokushima, Japan
Filed Aug. 11, 1976, Ser. No. 713,596
Claims priority, application Japan, Aug. 11, 1975, 50-111838[U]
Int. Cl.² A43B *3/12, 7/22;* **A61F** *5/14*
U.S. Cl. 36—11.5 **16 Claims**



1. A footwear provided with at least one pressure projection adapted to pressure stimulate effective spots of a foot for pressure treatment, said pressure projection being provided on or near its top portion with a magnet.

4,033,055
SNOW REMOVER

Vincent Lazarecky, 28882 Gilbert Route, Warren, Mich. 48093
Filed Aug. 3, 1976, Ser. No. 711,258
Int. Cl.² E01H *5/10*
U.S. Cl. 37—16 **9 Claims**

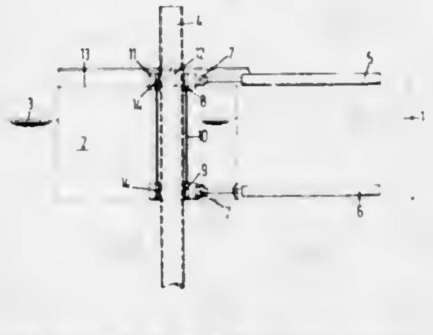


1. A snow removal machine, comprising:

a. a carriage assembly including ground engaging supporting wheels connected to and disposed beneath said carriage assembly and a handle extending from one end of said carriage assembly for manual control of the snow removal machine by the user thereof,
b. a snow plow mounted at the other end of said carriage assembly for engagement with the snow as the snow removal machine is advanced by the user thereof, said snow plow including a transversely extending scoop having a contoured bottom wall with an outer surface terminating at a leading edge for engagement with the snow and a pair of spaced apart side walls at each end of said bottom wall,
c. fluid outlet means mounted relative to said snow plow for providing a continuous application of two paths of heated fluid relative to said scoop, the first path being in a direction extending transversely in front of said leading edge to heat the snow, and the second path being in a direction extending transversely against said outer surface of said scoop to heat same, so as to obtain a continuous and progressive melting of the snow as the snow removal machine is advanced by the user thereof, said fluid outlet means includes:
  1. a fluid member mounted between said side walls,
  2. a fluid passageway extending through said fluid member,
  3. a first row of spaced apart apertures extending longitudinally along said fluid member in communicating relationship with said fluid passageway to form said first flow path, and
  4. a second row of spaced apart apertures extending longitudinally along said fluid member in communicating relationship with said fluid passageway and in angular spaced relation to said first row, to form said second path, and
d. coupling means operatively associated with said fluid outlet means for supplying a continuous flow of fluid thereto.

4,033,056
SPUD GUIDE MEANS IN A DREDGING VESSEL

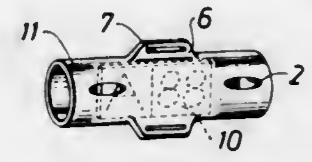
Arie Adolf Demmers, Alblasserdam, Netherlands, assignor to Bos Kalis Westminster Group N.V., Sliedrecht, Netherlands
Filed Dec. 15, 1975, Ser. No. 640,568
Claims priority, application Netherlands, Dec. 18, 1974, 7416509
Int. Cl.² E02F *3/90*
U.S. Cl. 37—73 **6 Claims**



1. A dredger having in its after-deck a well,
in the well a horizontal guide path;
at least one spud;
spud guide means for receiving the at least one spud for vertical movement; support means for vertically supporting the spud guide means relative to the horizontal guide path in the well;
at least two vertically spaced horizontal jacks, said jacks being at one end fixed to the vessel and having the other end connected to the spud guide means in spaced relationship;
control means in the vessel for controlling the jacks independently of each other.

4,033,057
MARKING TAPES FOR MARKING ARTICLES

Walther Jaffe, Lidkoping, Sweden, assignor to Lebema Eledtriska Aktiebolag, Nykoping, Sweden
Filed May 28, 1975, Ser. No. 581,959
Claims priority, application Sweden, May 29, 1974, 7407122
Int. Cl.² G09F *3/18*
U.S. Cl. 40—21 R **7 Claims**



1. A marking device for marking articles such as electric cables, pipe conduits and the like, and comprising at least one marking plate carrying marking indicia, a support for said marking plate in the form of a resilient, flexible, transparent tubular hose the greatest inner dimension of which is less than the width of said marking plate, said tubular hose assuming a shape of circular cross-section symmetrical about its center axis when relaxed, said marking plate being inserted into the

cover thereby resiliently distorting said cover from its symmetrical relaxed shape whereby said marking-plate is positively retained in said hose with the indicia of the marking plate readable through the support, means for attachment of said support and inserted marking plate to the article to be marked, said attachment means including spaced holes in said tubular hose along at least one straight line in the peripheral surface of said hose in parallel relation to the center axis thereof, and fastening elements for cooperation with said holes to attach said hose to the article to be marked.

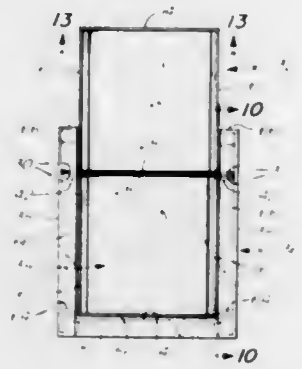
4,033,058
PICTURE DISPLAY STAND

Geroge F. Lyman, Weston, Mass., assignor to Data Packaging Corporation, Cambridge, Mass.

Continuation of Ser. No. 536,815, Dec. 27, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,132

Int. Cl.² G09F *11/14*

U.S. Cl. 40—97 **19 Claims**



1. A picture display device comprising:

a plurality of rectangular picture frames, each formed from a plurality of frame members;

hinge means connecting one of the frame members of each frame to a corresponding frame member of each adjacent frame;

a substantially flat, transparent panel extending across the face of each frame and being connected at its opposed ends to a pair of opposite frame member of each frame, the panel being contained within the region defined by the frame, the side edges of the panel being spaced from the other pair of opposite of said frame members; and

a pair of ribs secured to each frame and extending adjacent each of the side edges of the panel, each of the ribs overlying one of the spaces defined between the side edges of the panel and said other opposite frame members, each of the ribs lying in a plane which is offset from that in which the panel is disposed, thereby enabling a pair of pictures to be removably retained within each frame and in back-to-back relation to expose each of said pictures at opposite faces of each of the frames.

4,033,059
DOCUMENTS OF VALUE INCLUDING INTAGLIO PRINTED TRANSITORY IMAGES

Robert Gordon Hutton, Ashton, and Trevor Merry, Ottawa, both of Canada, assignors to American Bank Note Company, New York, N.Y.

Continuation of Ser. No. 278,980, Aug. 9, 1972, abandoned. This application Apr. 18, 1975, Ser. No. 569,563

Claims priority, application Canada, July 6, 1972, 146533

Int. Cl.² G09F *7/16*

U.S. Cl. 40—137 **22 Claims**

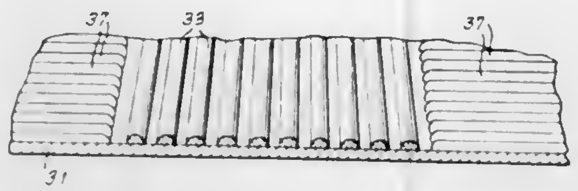
1. A security document or the like, comprising:

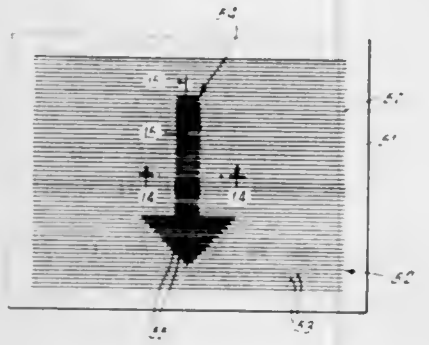
a. a substrate having a surface;

b. an imprint comprising spaced pattern elements raised from said surface, said raised elements being inked with a color visibly contrasting with the intervening portions of said surface, said intervening portions being visible between said pattern elements when viewed along a line of sight perpendicular to said surface;

c. said imprint including at least one image array and a background array, each array comprising a multiplicity of said pattern elements;

d. said image array and said background array being respectively disposed, in relation to said surface, for occluding their respective intervening portions of the surface in different degrees as the imprint is viewed at an oblique angle in at least one plane normal to said surface, thereby to produce variation in contrast between said one image array and said background array as the angle of view of said imprint varies in said one plane normal to said surface, the image and background arrays being further respectively so disposed that said one image array blends substantially with said background array from one angle of view but appears in clear contrast to said background array from another angle of view in said plane.





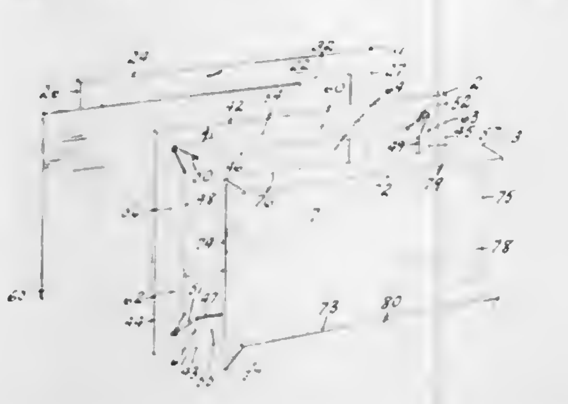
4,033,060
PICTURE FRAME CONSTRUCTION

Simone P. Lawrence, 33 E. 22nd St., New York, N.Y. 10010

Continuation-in-part of Ser. No. 607,124, Aug. 25, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 654,958

Int. Cl.² G09F *1/12*

U.S. Cl. 40—152.1 **9 Claims**



1. An improved picture frame construction for mounting photographic prints and the like comprising: a first planar frame element of generally rectangular configuration and defining a first rectangular through opening therein, said first frame element having rearward surface; a second planar frame element of overall size and configuration corresponding to that of said first frame element and having a peripheral portion joined in laminar relation to said rearward surface of said first frame element, said second frame element having a second rectangular through opening therein of larger dimensions than said first opening; whereby said second frame element partially overlies said rearward surface and leaves an exposed portion; said second frame element having a plurality of flaps foldably connected to said peripheral portion at the border of said second opening, and extending rearwardly from the plane thereof; and a third print-retaining element including a rectangular main body portion of size corresponding to that of said second opening, and selectively engaged between said exposed portion of said rearward surface of said first frame element and said flaps of said second frame element to be resiliently retained by the latter; said third element including a plurality of surfaces adapted to lie in congruent relation to said flaps on said second element.

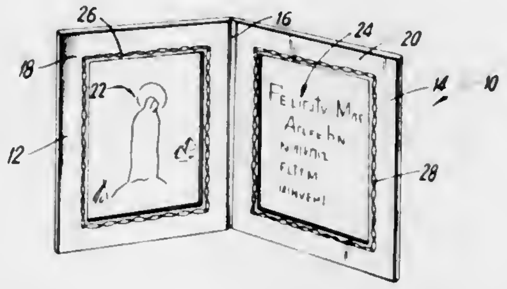
4,033,061
DISPLAY FOLDER

Thomas B. Schulhof, and Ronald M. Schulhof, both of New York, N.Y., assignors to Quadriga Art Co., Inc., New York, N.Y.

Filed Sept. 4, 1975, Ser. No. 610,321

Int. Cl.² G09F *1/10*

U.S. Cl. 40—158 R **12 Claims**



1. A display member comprising a base sheet of substantially rigid material, a sheet of display material having a display on one side thereof, first adhering means securing the opposite side of said sheet of display material to said base sheet, a top sheet of substantially rigid material disposed on said one side of said sheet of display material to sandwich said sheet of display material between said base and top sheets to define a panel assembly, said top sheet having an aperture therethrough larger than said display and smaller than said sheet of display material to define a frame around said display, second adhering means securing said one side of said display material to said top sheet, an overlay cover material completely enclosing said panel assembly and being continuous at the borders thereof, and third adhering means securing said cover material to the entire outer surface of said base sheet and the entire outer surface of said frame portion of said top sheet.

4,033,062
FISHING JIGS

Nick Denecky, 302 23 St. South, Lethbridge, Alberta, Canada

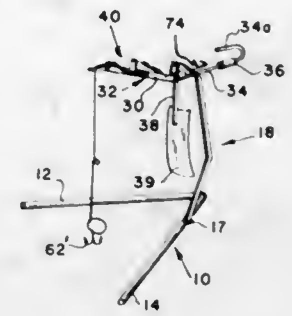
Filed Dec. 23, 1975, Ser. No. 643,828

Int. Cl.² A01K *97/10*

U.S. Cl. 43—15 **7 Claims**

1. A fishing jig comprising:

1. a portable support having an elevated, relatively stationary horizontal support bar,
2. a fishing rod rockingly mounted on said bar intermediate the ends of said rod and at the approximate balance point thereof;
3. hook setting means carried by the outer end of said rod comprising:
   a. an element pivoted to said rod and having an outer end which is spring biased to an elevated position relative to said rod;
   b. means for cocking said element so that its outer end is retained depressed relative to said rod;
   c. trigger means carried by said spring biased element for releasing said cocking means upon a downward pull on said trigger means; and
   d. means for suspending from said trigger means a fishing line with a hook thereon;



4. and stop means carried by said support and spaced from but in the rocking path of said rod and engageable by said rod to limit rocking movement thereof in response to the pull of a fish on the hook suspended from said trigger means so as to provide a positive reaction against said pull for effecting operation of said trigger means and the consequent release of said cocking means.

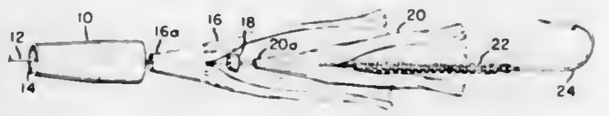
4,033,063
FISH LURE

Norman W. Mize, 7154 London Lane, Apt. C, Lemon Grove, Calif. 92045

Filed Jan. 19, 1976, Ser. No. 650,296

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.05 **7 Claims**



1. A fish lure comprising: a body having a truncated cone portion joined to a cylindrical portion, said body having an axial hollow therethrough of substantial diameter through which a leader for a hook assembly may be freely passed and simultaneously allow the free flow of water through said body hollow around said leader towards said hook assembly; at least one skirt having a hollow, truncated cone shaped front portion with a plurality of strands extending from the periphery of said front portion, the nose opening said front portion being of a diameter sufficient to freely receive said leader and simultaneously to allow free flow of water from said body hollow through the interior of said front portion; an flow diverter means slidably placed on said leader for insertion into said front portion of said skirt to hold said front portion in contact with the surface of said body hollow and being formed to direct the flow of water entering said front portion as a plurality of streams against the inner surfaces of said strands to move said strands outwardly.

4,033,064
MINNOW MOOCHER

Allan J. Phillips, 1928 Buenavista, Comox, British Columbia, Canada

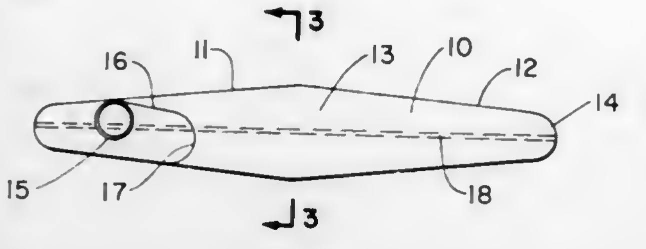
Filed Oct. 28, 1975, Ser. No. 626,176

Int. Cl.² A01K *85/00*

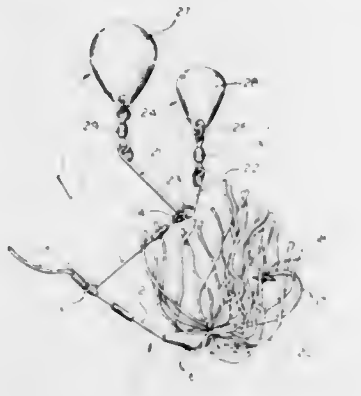
U.S. Cl. 43—42.39 **4 Claims**

1. A fishing lure simulating a minnow comprising a long, narrow, slightly tapered symmetrical arcuate body cast about an insert provided with holes for securing, said body having rounded ends and a uniform radius in cross-section, the body

being symmetrically tapered in the longest direction about a lengthwise axis; and symmetrically tapered from a maximum dimension at the midpoint in the length towards the rounded ends.



4,033,065
FISHING LURE
Jesse Max Shannon, 3445 Pratt Ave., Lincolnwood, Ill. 60645
Filed Aug. 16, 1976, Ser. No. 714,815
Int. Cl.^{2} A01K *85/00*
U.S. Cl. 43—42.13 **1 Claim**



1. A fishing lure comprising, a first pair of rearwardly diverging arms disposed in coplanar relationship and an eye member connecting adjacent ends of said arms for connection of a fishing line, weight means secured to one of said arms, hook and barb means carried by said weight means, a generally V-shaped member having legs of unequal lengths and pivotally connected at its apex to the other of said arms, a spinner swivelly connected to the end of each leg of said generally V-shaped member, one of said spinners having a larger surface area than the other of said spinners, said V-shaped member being free to swing relative to said pair of arms so that when the lure strikes water and begins a downward descent the spinners are caused to rotate about respective vertical axes thereby slowing the rate of descent of the lure while maintaining the diverging arms in a substantially vertical plane and in an attitude wherein the hook and barb means are disposed generally horizontally during such descent.

4,033,066
FISHING TACKLE BOX
Paul J. Morcom, Rte. No. 1, Box 235, Henderson, Tex. 75652
Filed July 18, 1975, Ser. No. 597,216
Int. Cl.^{2} A01K *97/04*
U.S. Cl. 43—54.5 R **22 Claims**

1. A tackle box comprising:

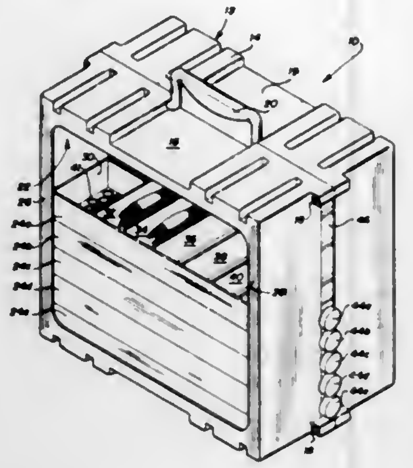
a substantially rectangular housing having a bottom wall, a top wall, opposing side walls and a front and back wall,

a plurality of open topped trays mounted within said housing for solely vertical movement within said housing,

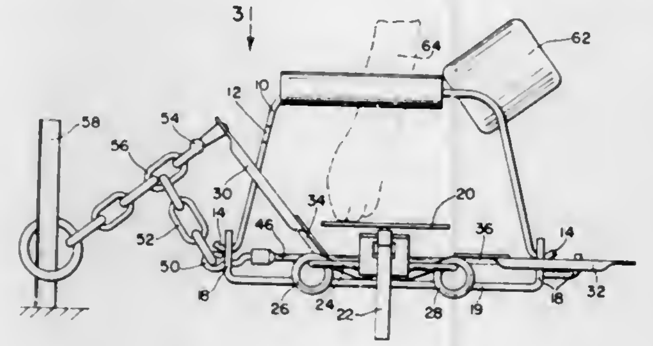
means on said housing defining a path for vertical movement of said trays,

said trays having compartments for receiving tackle devices, and

means for allowing or blocking access to any of said trays by selectively positioning said trays in any of a plurality of vertical positions in said housing.



4,033,067
HUMANE ANIMAL TRAP
John Kuehl, Brooks Village Road, Templeton, Mass. 01468
Filed Aug. 23, 1976, Ser. No. 716,760
Int. Cl.^{2} A01M *23/26*
U.S. Cl. 43—90 **10 Claims**



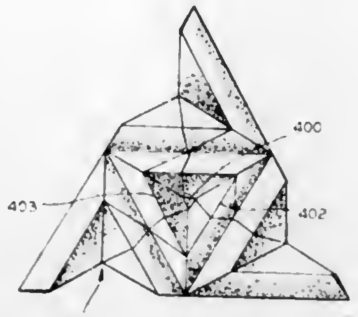
1. A humane animal trap comprising a frame, a pair of pivoted jaws on the frame, a pair of springs, a pair of jaw closers, each spring being separately operatively associated with a single one of said jaw closers, the jaw closers being located at opposite ends of the jaws,

means on said jaws forming a sleeve, said sleeve being at one end of said jaws adjacent to one of said closers,

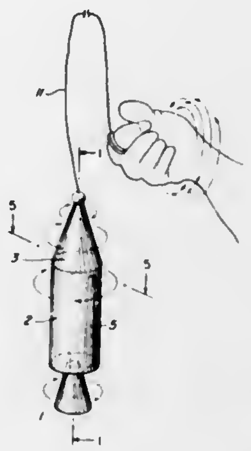
a pan, a latch for the pan, means causing the release of the one spring to activate the one of the jaw closers while the other jaw closer remains locked, and separate means for releasing said latter jaw closer.

4,033,068
STRUCTURAL MODULE
Jack J. Skillman, 727 E. 60th St., Chicago, Ill. 60637
Filed Sept. 8, 1975, Ser. No. 611,346
Int. Cl.^{2} A63H *33/16;* **A42B** *1/18*
U.S. Cl. 46—1 L **14 Claims**

1. A modular form made from material including a pair of oppositely directed points and a plurality of interior pockets, the points and pockets having complementary and non-perpendicular configurations, whereby a point on one module fits into a pocket on another module with said modules fitting together in a non-perpendicular configuration, said modular form fitting together in an open assembled configuration which does not inherently close upon itself in polyhedra with six or less faces.



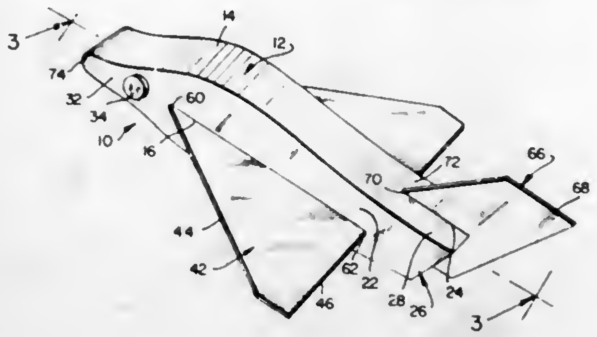
4,033,069
MELODY BIRD INSTRUMENT
Rurico Arzola, Calle San Martin, No. 69-Urb. Villa Sol, Mayaguez, P.R. 00708
Filed July 31, 1975, Ser. No. 600,912
Int. Cl.^{2} A63H *5/00*
U.S. Cl. 46—52 **17 Claims**



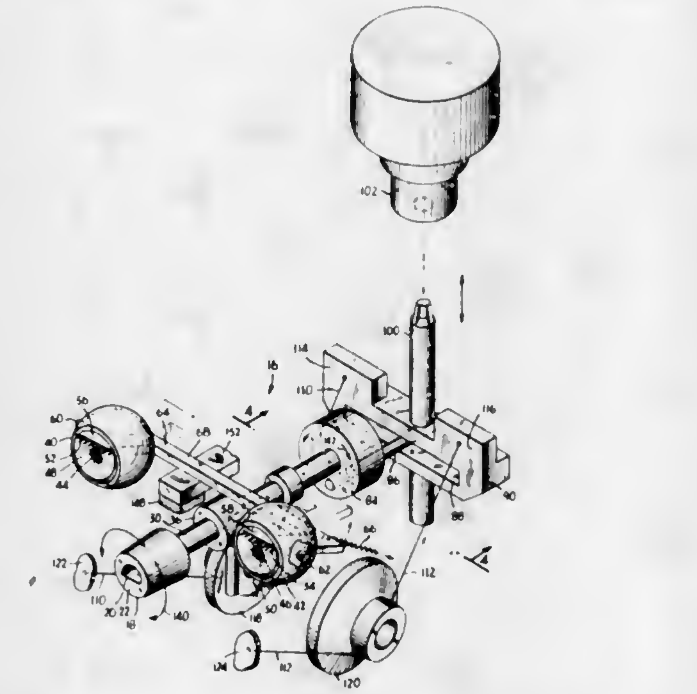
1. An instrument for simulating sounds of singing birds and nighttime animals and insects, said instrument comprising air chamber means for circulating air therethrough upon relative movement of said air chamber means with respect to the air, said air chamber means including an elongated aperture into which the air enters said air chamber means, said elongated aperture having a pair of beveled edges, each having a bevel angle of 30° into the interior of said air chamber means, and a second aperture through which the air circulating within said air chamber means exits, thereby producing melodious and harmonious sounds; and means for controlling the movement of said air chamber means with respect to the air.

4,033,070
TOY FOAM GLIDER
Ned Strongin, 936 Willow Bend Lane, Baldwin, N.Y. 11510; A. Edward Fogarty, and Bonnie Rose Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579
Filed July 2, 1975, Ser. No. 592,609
Int. Cl.^{2} A63H *27/00*
U.S. Cl. 46—79 **9 Claims**

1. A toy foam glider including a fuselage made of a soft, bendable, flexible and resilient foam material, a wing member comprising a thin flat panel of flexible light-weight plastic material, said fuselage having a width appreciably greater than the thickness of said wing member, means for removably mounting said wing member on said fuselage, said mounting means comprising a longitudinal slot extending through the width of said fuselage and sized to receive and retain a central portion of said wing member therein, said wing member having an over-all width greater than the length of said slot, and said central portion having a width substantially equal to the length of said slot, and a balance weight mounted on said fuselage and located forwardly of said wing member, said balance weight comprising a central cylindrical portion and a pair of end flanges, said fuselage having a hole extending transversely therethrough and receiving the cylindrical central portion of said balance weight.



4,033,071
SUCKING DOLL WITH CHEEKFLEXING MEANS OPERATED BY TURNING BOTTLE
Ned Strongin, 936 Willowbend Lane, Baldwin, N.Y. 11510; A. Edward Fogarty, and Bonnie Rose Fogarty, both of 3513 School Ave., Sarasota, Fla. 33579
Filed Mar. 18, 1976, Ser. No. 668,239
Int. Cl.^{2} A63H *13/02*
U.S. Cl. 46—118 **8 Claims**



1. A doll assembly comprising a hollow head portion having a mouth aperture and a pair of flexible cheek portions,

a frame immovably mounted within said head portion,

a rotatable member mounted on said frame for rotary movement about a transverse axis extending between the front and rear walls of the doll head portion, said rotatable member being positioned to be accessible through said mouth aperture,

an actuator member movably mounted on said frame,

means operatively coupling said rotatable member with said actuator member for movement of the latter to an actuating position when said rotatable member is turned in a first selected direction,

first coupling means connecting said actuator member to said flexible cheek portions for flexing the latter inwardly when said actuator member is moved to said actuating position by turning movement of said rotatable member in said selected direction,

said rotatable member having an end portion located adjacent to said mouth aperture, said end portion having an opening registering with said mouth aperture,

and a bottle having a portion sized for insertion through said mouth aperture into coupling engagement with said rotatable member for rotation of the latter when said bottle is turned manually.

4,033,072

HYDROPONIC CULTIVATION APPARATUS

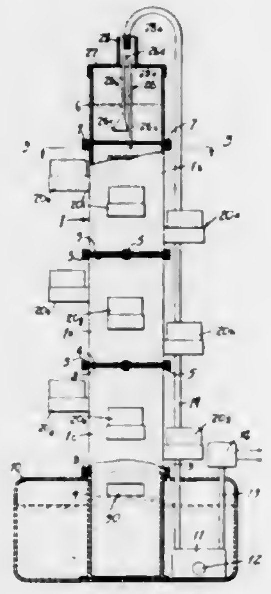
Hitoshi Kobayashi, 14-15, Tenjinchou, Koyfu, Yamanashi, and Jirou Tatemoto, 10-6, 2 chome Misaki, Koufu, Yamanashi, -both of Japan

Filed Dec. 29, 1975, Ser. No. 645,076

Claims priority, application Japan, Dec. 28, 1974, 49-149173; Dec. 28, 1974, 49-149172; Feb. 10, 1975, 50-016344; Feb. 13, 1975, 50-017437

Int. Cl.² A01G *31/00*

U.S. Cl. 47—62 **5 Claims**



1. Apparatus for hydroponic cultivation comprising a collector tank for a culture liquid, an upright cultivating tube erected on said collector tank, a plurality of plant holder units mounted on said cultivating tube, a cistern mounted on said cultivating tube at the top thereof, air mixing means in said collector tank for mixing air with culture liquid, an air pump connected to said air mixing means, a supply pipe connecting said air mixing means to said cistern, and siphon generating means in said cistern for feeding the liquid in said cistern to said cultivating tube, said cultivating tube being provided with a plurality of holes therealong, each plant holder unit comprising a tubular body and a gutter portion, said gutter portion being detachably inserted in the cultivating tube through a respective said hole to receive culture liquid from a unit thereabove and for discharging culture liquid to a unit therebelow.

4,033,073

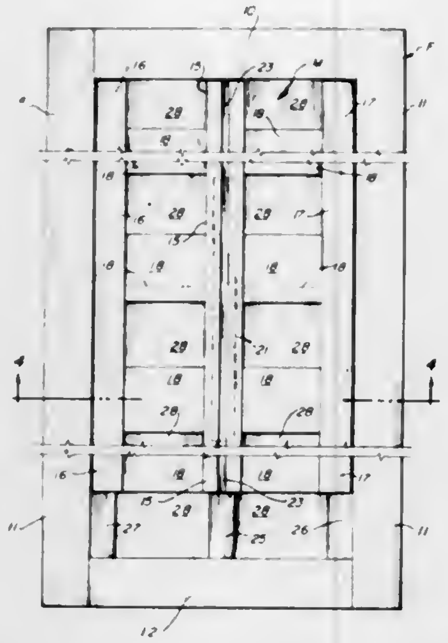
SHUTTER, GRILLE OR THE LIKE

Robert T. Bogan, P.O. Box 26208, Albuquerque, N. Mex. 87125

Filed Jan. 9, 1976, Ser. No. 647,660

Int. Cl.² E06B *7/02*

U.S. Cl. 49—38 **6 Claims**



1. A shutter, grille or like, comprising:

a stationary member having vertically and equally spaced cross bars connected by upright rail means including an upright center rail;

a movable member provided with corresponding vertically and equally spaced cross bars connected by upright rail means including an upright center rail, said cross bars of said movable member being in alignment with said cross bars of said stationary member when said movable member is in an open position and said cross bars of said movable member covering the spaces between said cross bars of said stationary member when said movable member is in a closed position;

said rail means of a first of said members being on the side of said cross bars adjacent the second of said members and said rail means of said second member being on the side of said cross bars opposite said first member, said center rail of said first member forming tongue and groove sliding connections with said second member, whereby said cross bars of said first member closely approach said cross bars of said second member;

longitudinal slots at opposed positions in said opposed center rails; and

a magnet disposed in each of said slots for holding said movable member in an adjusted position.

4,033,074

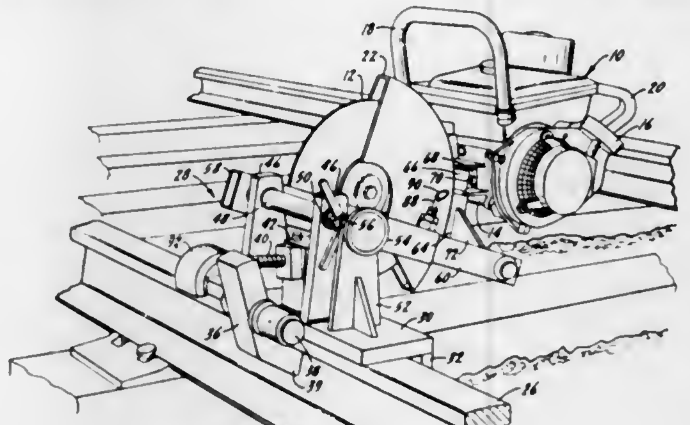
PORTABLE RAIL SAW

William M. Lutts, Nashville, Tenn., assignor to Safetran Systems Corporation, Louisville, Ky.

Filed Oct. 28, 1975, Ser. No. 626,359

Int. Cl.² B24B *23/00*

U.S. Cl. 51—178 **6 Claims**



1. A portable rail saw assembly including saw means having a rotatable blade, a clamp adapted to attach to a rail to be cut, an axial locater movably mounted on said clamp, means pivotally attaching said saw means to said axial locater, means for moving said axial locater and saw means in a direction generally parallel to the rails and relative to the clamp for positioning said saw means for cutting a rail, means permitting movement of said saw means toward and away from said axial locater and clamp and providing for swing-over movement of said saw means from one side of the rail to be cut to the opposite side including a pair of telescopic members, one of said telescopic members being pivotally connected to said saw means and the other being pivotally connected to said axial locater, the pivotal connection between said one telescopic member and said saw means providing for movement of said saw means about perpendicular axes whereby said saw means is capable of being positioned in an upright operating position on both sides of a rail to be cut, and detent means for holding said saw means in said upright positions on both sides of the rail.

4,033,075

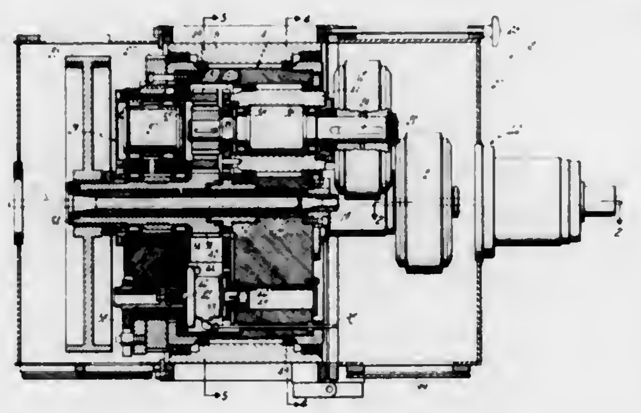
MECHANISM FOR ADJUSTABLY POSITIONING PLANETARY MACHINING ELEMENTS

Robert C. Verbickas, Wolcott, Conn., assignor to The Fenn Manufacturing Company, Newington, Conn.

Filed Oct. 6, 1975, Ser. No. 619,902

Int. Cl.² B21C *43/04*

U.S. Cl. 51—80 A **14 Claims**



1. In a planetary machining apparatus having a fixed rotor support, a rotor rotatably mounted on the rotor support, at least one drive spindle assembly having a rotary spindle support mounted on the rotor for angular adjustment about an axis generally parallel to and radially offset from the rotor axis and a drive spindle rotatably mounted on the spindle support for rotation about an axis parallel to and radially offset from the axis of the spindle support, a machining element mounted on each drive spindle, adjustment means for angularly adjusting each rotary spindle support for radially adjusting the respective spindle and machining element relative to the rotor axis, and drive means for rotating the rotor and each drive spindle for respectively providing planetary movement of each machining element about the rotor axis and rotation of each machining element about its spindle axis, the improvement wherein the adjustment means comprises bidirectional motor means operative in opposite directions thereof and mounted on the rotor for rotation therewith, transmission means operatively connecting the motor means to each spindle support for angularly adjusting each spindle support in its opposite angular directions by operation of the motor means in its opposite operative directions respectively, stationary selector means and connector means operatively connecting the selector means to the motor means, the selector means and connector means being operable for selectively operating the bidirectional motor means in each operative direction thereof during rotation of the rotor, said drive means comprising a planetary system having a first gear mounted for rotation coaxially with and relative to the rotor, an internally and externally toothed planetary ring gear for each drive spindle assembly, each ring gear being rotatably mounted on said drum for rotation about an axis coaxial with the respective rotary spindle support and with the external teeth of said ring gear in engagement with said first gear for planetary movement of said ring gear about the rotor axis upon rotation of the rotor, and a secondary planetary drive pinion secured to each drive spindle coaxially therewith and in engagement with the internal teeth of the respective ring gear for planetary motion relative to the ring gear axis upon angular adjustment of the respective spindle support.

4,033,076

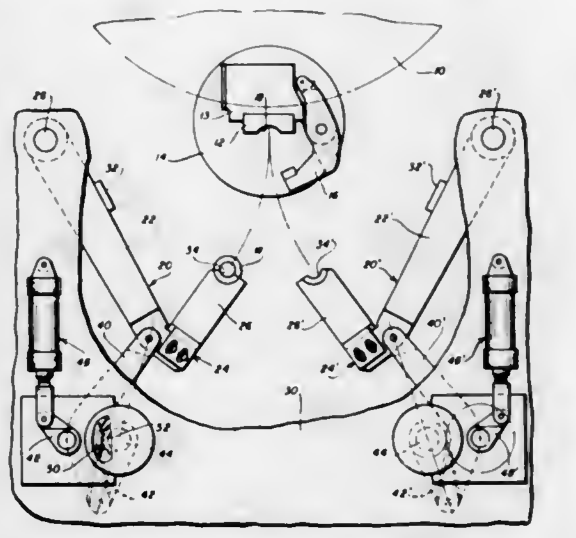
CYLINDRICAL GRINDING MACHINE WITH WORKPIECE LOADER AND UNLOADER

Ralph E. Price, Waynesboro, Pa., assignor to Landis Tool Company, Waynesboro, Pa.

Filed June 3, 1976, Ser. No. 692,703

Int. Cl.² B24B *41/00*

U.S. Cl. 51—105 R **5 Claims**



1. A cylindrical grinding machine comprising

workpiece clamping means including a throwblock and a jaw member,

a workpiece loader including workpiece engaging means,

a workpiece unloader including workpiece engaging means,

means for displacing said loader workpiece engaging means along an arcuate path from a retracted position to an advanced position whereat a workpiece will be placed in said throwblock,

means for displacing said jaw member along an arcuate path from a retracted position to an advanced position whereat a workpiece may be clamped within said throwblock,

means for displacing said unloader workpiece engaging means along an arcuate path from a retracted position to an advanced position, whereat said workpiece engaging means will engage a workpiece clamped within said workpiece clamping means,

said arcuate paths of said jaw member and loader and unloader workpiece engaging means being substantially tangent to a single straight line at their respective advanced positions.

4,033,077

PORTABLE POWER ANGLE TOOL AND SWITCH MECHANISM

Nelson Sherwood Chester, Reisterstown; Thomas Cecil Laughon, Columbia, and William Frank Sindelar, Towson, all of Md., assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Apr. 8, 1976, Ser. No. 675,119

Int. Cl.² B24B *23/00;* **H01H** *3/20*

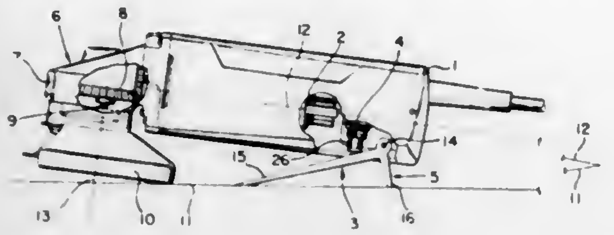
U.S. Cl. 51—170 T **28 Claims**

1. A portable, power angle tool comprising:

a housing;

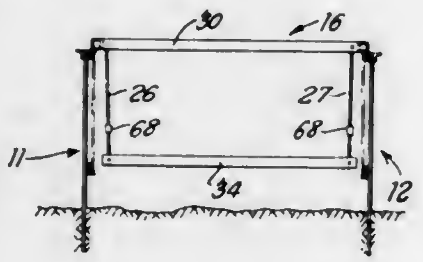
operating means for performing work on a workpiece; said operating means being mounted on said housing so as to conjointly define therewith an angular structure defining an enclosed angle, said angular structure being configured so that the angle tool can be manually placed to rest on a rest surface in such a manner that said enclosed angle and the rest surface conjointly describe a triangle;

power supply means for supplying energy to said operating means; and,
a switch mechanism including:
switch means for interrupting the flow of energy to said operating means; and,
an angle lever mounted on said angular structure so as to be



disposed inside the region included within said enclosed angle, said angle lever being pivotally mounted so as to have two arms extending from its pivot location and being pivotable between a first position whereat one of said lever arms actuates said switch means and a second position whereat said lever arms of said angle lever conjointly support said structure on the rest surface.

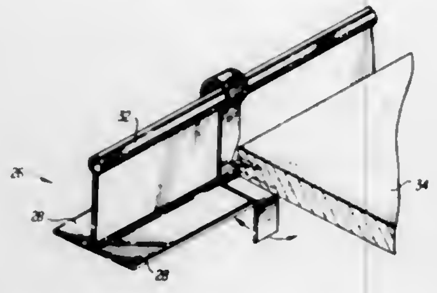
4,033,078
HOUSING SYSTEMS AND STRUCTURES
John R. Prewer, 82 Thomas More House, Barbican, London E.C.2, England
Filed June 25, 1975, Ser. No. 590,101
Claims priority, application United Kingdom, June 28, 1974, 28892/74
Int. Cl.² E04H *1/12*
U.S. Cl. 52—79.5 **21 Claims**



1. A housing structure comprising two parallel, laterally spaced and generally horizontal fixed load supporting longitudinal members and a plurality of separate housing units mounted between said longitudinal members, each of said housing units comprising a load supporting roof and a floor, the ends of said roof resting on, extending between, and being supported by said longitudinal members, and a plurality of load supporting members, said floor being suspended from adjacent the ends of said roof by said load supporting members, said load supporting members allowing for the adjustment of the spacing between said roof and said floor and for the collapse of said roof against said floor for transport.

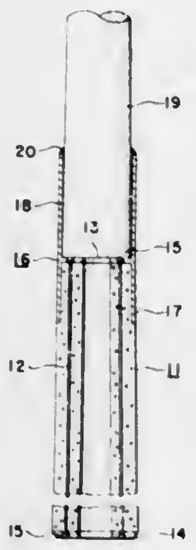
4,033,079
REPLACEMENT HOLD-DOWN CLIP FOR SUSPENDED-CEILING PANELS
Eason Cross, Jr., 2309 Glasgow Road, Alexandria, Va. 22307
Filed Jan. 30, 1975, Ser. No. 545,553
Int. Cl.² E04B *5/57*
U.S. Cl. 52—99 **12 Claims**

1. A ceiling panel hold-down clip of the type in which a portion thereof engages a supporting beam, said clip comprising:
a vertical support rib;
releasable engaging means connected with said support rib at one end thereof for engaging said supporting beam;
securing means connected with said support rib for attachment to a panel; and
manipulating means for manipulating an attached panel into a desired position with respect to said support beam, said manipulating means comprising a tab extending away from and substantially normal to the other end of said



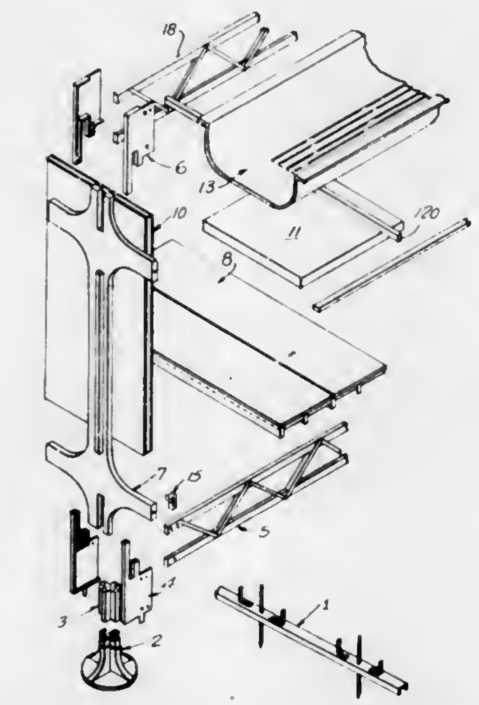
support rib, said tab having its terminal end bent such that the end portion of said tab extends downwardly away from the bottom surface of said ceiling panel when said securing means is attached to said panel thereby serving as a manipulating means for manipulating an attached panel into a desired position with respect to said support beam.

4,033,080
CONCRETE POLE TO BE CONNECTED WITH A WOOD POLE AND METHOD OF REPLACING THE LOWER PART OF THE WOOD POLE WITH THE CONCRETE POLE
Yoshikiyo Fukushima, Tokyo, Japan, assignor to Nippon Concrete Industries Co. Ltd., Tokyo, Japan
Filed Jan. 20, 1976, Ser. No. 650,664
Int. Cl.² E04C *3/34*; E02D *5/22*; B23P *7/00*
U.S. Cl. 52—223 R **4 Claims**



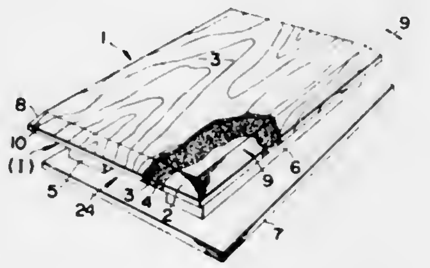
1. A means for connecting a round concrete pole to a second pole comprising:
a concrete pole;
a cylindrical metal connecting tube, one end of said connecting tube telescoped over one end of said concrete pole;
a first metal plate within said connecting tube and integral therewith, the flat surfaces of said first plate transverse to the longitudinal axis of said connecting tube, said first metal plate positioned against said pole end, the contiguous surfaces of said concrete pole and said connecting tube being integral by the process of molding said concrete within said connecting tube;
a second circular plate at the other end of said concrete pole;
headed bolts with nuts extending through said concrete between said first and said second plates to compress said concrete pole between said plates; and
the other end of said connecting tube being open to receive said second pole.

4,033,081
MODULAR BUILDING SYSTEM
Fred M. Perkins, Jr., 713 W. Second, Little Rock, Ark. 72201
Filed May 16, 1975, Ser. No. 578,193
Int. Cl.² E04B *1/00*
U.S. Cl. 52—263 **24 Claims**



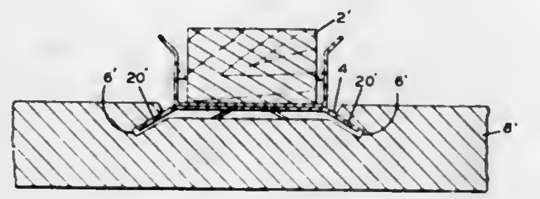
1. A modular building system, which comprises:
a substantially planar elongated frame member for providing vertical structural rigidity to the modular building system, said frame member having means for providing horizontal structural rigidity to said system, said means comprising a pair of members which extend integrally and transversely from said frame member near the upper and lower ends of said frame member, each of said ends having a longitudinal slot formed therein for slidable engagement with means for supporting said frame member.

4,033,082
PLATE BLOCK
Eiji Tashiro, Hoya, Japan, assignor to Tokyo Plywood Kabushiki Kaisha, Tokyo, Japan
Filed July 31, 1975, Ser. No. 600,765
Claims priority, application Japan, Aug. 12, 1974, 49-92150
Int. Cl.² E04C *1/00*
U.S. Cl. 52—316 **2 Claims**



1. A plate block comprising a decorative sheet, said decorative sheet comprising a substratum and a single face veneer sheet, said substratum having a front face and a rear face, said front face being smaller than said rear face such that beveled edge portions are formed on said substratum between said front and rear faces, said beveled edge portions extending about the entire periphery of said substratum, said beveled edge portions of said substratum being inclined from twenty to seventy degrees relative to said front and rear faces thereof, said single face veneer sheet having an overall area at least equal to the sum of the area of said front face of said substratum and the total area of said beveled edge portions of said substratum, said single face veneer sheet having peripheral edge portions, said single face veneer sheet being bent to conform to said beveled edge portions of said substratum with the bent section of said single face veneer sheet having means defining a notched section of facilitate adapting the single face veneer sheet to an abutting relationship with said beveled edge portions of said substratum, said single face veneer sheet being joined by adhesive means to said front face and to said beveled edge portions of said substratum, a base plate disposed in spaced parallel relationship relative to the rear face of said decorative plate, at least one intermediate member disposed between said base plate and said decorative plate, a first edge portion of said base plate projecting beyond a first edge portion of said decorative plate and a second edge portion of said decorative plate opposite said first edge portion thereof projecting beyond a second edge portion of said base plate, said second edge portion of said base plate being opposite said first edge portion thereof, said first edge portion of said base plate facilitating assembly of a plurality of plate blocks in juxtaposed and abutting array in that the first edge portion of the base plate of one plate block is adapted to abut the second edge portion of the base plate of another juxtaposed plate block and the first edge portion of the decorative plate of said one plate block is adapted to abut the second edge portion of the decorative plate of said other juxtaposed plate block, said projecting first edge portion of said base plate being readily accessible to have fastening means applied thereto for attaching said one plate block to a beam element or the like prior to placing said other plate block in said juxtaposed and abutting position.

4,033,083
BACK FASTENING OF MOBILE HOME CEILING BOARDS
Thomas W. Fritz, East Petersburg; Charles F. Gilbo, Lancaster, and Norman A. Johnson, Lititz, all of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.
Continuation of Ser. No. 267,431, June 29, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 672,547
Int. Cl.² E04B *5/52*
U.S. Cl. 52—484 **1 Claim**



1. A back fastening means for fastening a ceiling board to overlying structural ceiling members wherein the ceiling board has a back surface and a front surface which is visible to view and both surfaces are in a horizontal plane, slot means are provided in the back surface of the ceiling board at spaced intervals along the ceiling board, said slot means in the ceiling board are at least two oppositely directed, outwardly extending cuts within the ceiling board at a small angle relative to the plane of the back surface of the ceiling board and spaced from the back corners of the ceiling board, and fastening means are connected to the overlying structural ceiling members, said fastening means in a resilient spring clamp means which engages the sides of a joist which constitutes the overlying structural ceiling members, said clamp holding the fastening means in position relative to the joist, said fastening means having outwardly extending flange means which are positioned so that the flange means are inserted into the slot means and are

slideably movable along the slot means of the ceiling board, thereby holding the ceiling board in position relative to the structural members of the ceiling and permitting the ceiling board to be moved relative to the fastening means, said flange means extending outwardly from the lower corners of the clamp means, and said clamp means further being a separate component from the flange means and said flange means being releasably connected to the clamp means.

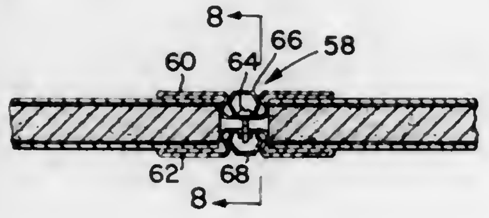
4,033,084
WALLBOARDS

Frank L. Shiflet, Waynesboro, Va., assignor to Hopeman Brothers, Inc., New York, N.Y.

Filed Oct. 31, 1975, Ser. No. 627,750

Int. Cl.² E04B *1/68, 1/94*

U.S. Cl. 52—573 **3 Claims**



1. A wall system comprising at least two wallboards arranged in edge-to-edge relationship to form part of a wall, and clamping means for securing said wallboards in said relationship, said clamping means comprising first and second clamping elements;

the first clamping element having first means for engaging the face of one wallboard on one side of the wall, second means for engaging the face of the other wallboard on said one side of the wall, and web means connecting said first and second means;

the second clamping element having third means for engaging the face of said on wallboard on the opposite side of the wall, fourth means for engaging the face of the other wallboard on said opposite side of the wall, and web means for connecting said third and fourth means; and

fastener means connecting said webs to each other and effecting clamping of one of said wallboards between said first and third means and the other of said wallboards between said second and fourth means;

the web of one of said clamping elements having elongated slots through which the fastener means extend, said slots permitting relative longitudinal movement of the clamping elements in the event of bending of the clamping means due to fire.

4,033,085
BRICK TIE

Norman William Haines, 71 Saltly St., South Kingsville, Victoria, Australia

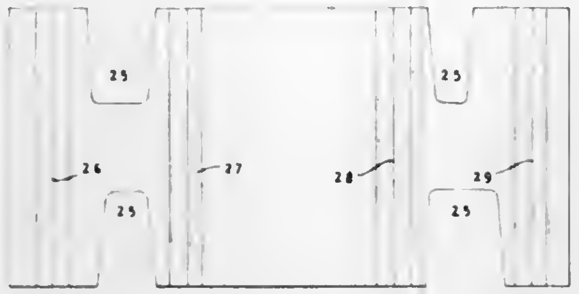
Filed Apr. 3, 1975, Ser. No. 564,980

Claims priority, application Australia, Apr. 4, 1974, 7156/74

Int. Cl.² E04B *1/38*

U.S. Cl. 52—698 **5 Claims**

1. A brick tie comprising a sheet metal strip having two opposite longitudinal edges, two notches in each longitudinal edge one adjacent each end thereof, each notch having a different nominal width and shaped to receive the edge portion of a flange of a structure member, two transverse ridges formed in the strip one projecting from each face of the strip one located between each end of the strip and the adjacent notches, and two further transverse ridges formed in the strip intermediate the notches one projecting from each face of the strip.



4,033,086
STRUCTURAL MEMBER FOR LOAD-BEARING PARTITIONS OR WALLS OF BUILDINGS

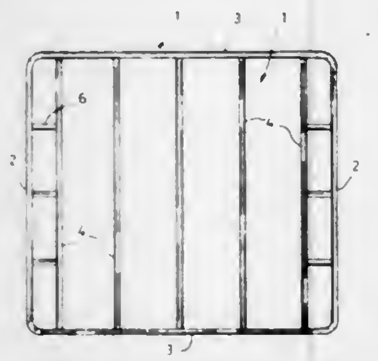
Jules Albert Marchot, Avenue des Hauts Taillis, 5, B-1330 Rixensart, Belgium

Filed Sept. 4, 1975, Ser. No. 610,370

Claims priority, application Belgium, Sept. 11, 1974, 148435; Apr. 10, 1975, 155273; July 15, 1975, 158336

Int. Cl.² E04B *2/74*

U.S. Cl. 52—656 **10 Claims**



1. In a load-bearing partition or wall for a building or the like, a structural frame forming a skeleton and comprising two vertical uprights, two horizontal cross-members and a plurality of laterally spaced vertical struts connecting the frame cross-member, said uprights and cross-members being fabricated throughout from a single tubular metal section which is bent at each corner of the frame and which is butt-welded to itself at its ends, said struts being of the same type tubular metal section as that of the uprights and cross-members, with the ends of the struts being welded to said cross-members, the tubular metal section of the uprights, the cross-members and the struts having identical cross-section with said tubular section being of rectangular cross-sectional configuration with the longitudinal walls to the tubular section being reinforced by longitudinal depressions within the middle of the walls and extending towards the hollow tubular interior, and wherein the corners of said tubular section walls being rounded to impart high strength to said frame to effectively withstand bending stresses and compression stresses when subjected to building loads.

4,033,087
THERMAL GLASS STRUCTURAL METHOD AND DEVICE

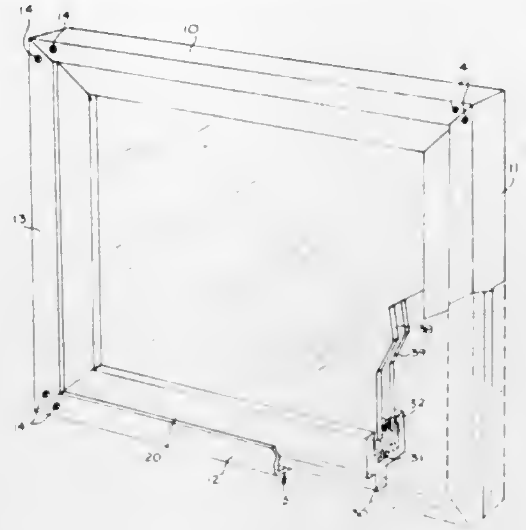
Lyle N. Shelver, 5020 Ambrose Drive, Reno, Nev. 89502

Division of Ser. No. 460,277, April 12, 1974. This application June 9, 1975, Ser. No. 585,299

Int. Cl.² E04B *1/00*

U.S. Cl. 52—741 **3 Claims**

1. The method of converting a single pane window to a double-walled thermal window, and where the single pane window frame, which holds the glass is basically of a U-shaped cross-section, including; (1) placing a sealant material within the members of an adaptive element suitable to hold two panes of glass at a spaced-apart relationship; (2) placing two panes of glass at a spaced-apart relationship within said sealant and within said adaptive element; (3) placing dessicant material between said panes; (4) and mounting said adaptive element within the U-shaped portion of the single pane window frame.



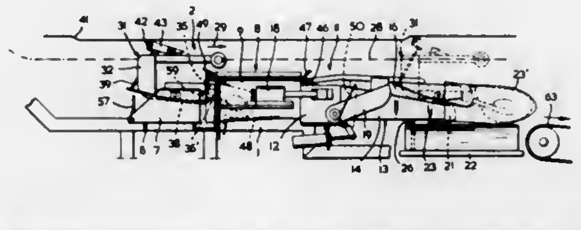
4,033,088
METHOD OF AND APPARATUS FOR PACKAGING POULTRY SPECIMENS

Georg H. Markert, Bennekom, Netherlands, assignor to Maschinefabriek Markert B.V., Ede, Netherlands

Filed Nov. 11, 1975, Ser. No. 631,135

Int. Cl.² B65B *5/04, 25/00, 39/02*

U.S. Cl. 53—29 **5 Claims**



1. A method for packaging specimens of prepared poultry in bags, so that each specimen eventually will be positioned in a bag with the legs folded and lying against the bottom side of the body, whereafter the bag with contents is discharged for further treatment, comprising the steps of catching each specimen to be packaged at the legs by means of catching means advanced by a conveyor belt, through pushing means acting on the legs producing an upward pushing motion in the direction of the poultry body, then by a translation, through said upward pushing in the same direction moving the specimen across an articulated funnel provided with abutting means, stopping temporarily the specimen at the abutting means while the translative movement of the legs of the specimen continues, involving and folding the legs of the specimen firmly against the bottom side of the body of the specimen, after which there is withdrawing of the abutting means when the pressure exerted by the body of the specimen on the abutting means exceeds a certain value of the resisting force of the abutting means and pushing the specimen with folded legs to proceed further with the pushing means, said funnel having jaws movable relative to each other, inserting jaws in converged condition in a bag kept stationary by retaining means, thereafter moving the jaws outwardly relative to each other so that the poultry specimen can leave the funnel via the jaws and arrive in the bag enveloping the funnel, thereafter retracting the funnel and advancing the bag with the poultry specimen contained therein by the pushing means, and through coaction of the pushing means and the retaining means of the bag releasing at least the filled bag portion from the retaining means.

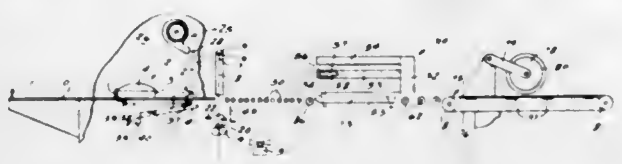
4,033,089
PACKAGE WRAPPING METHOD AND APPARATUS

Henry Lowell Byland, 160 Bent Grass Drive, Roswell, Ga. 30075

Filed July 21, 1976, Ser. No. 707,338

Int. Cl.² B65B *11/12*

U.S. Cl. 53—33 **12 Claims**



1. The method of automatically wrapping in a sheet of plastic film a tray filled with contents, comprising the sequential steps:

a. feeding said film between rollers driven in syncronization with tray travel and supporting said film at upper and lower edges thereof transversely to a path of advance of said tray;
b. preventing said film from wrinkling at its vertical edges and from prematurely catching upon said tray by directing a stream of air wider than said film onto said film from a side of advance of said tray;
c. advancing said tray horizontally into said film, and simultaneously releasing a bottom edge of said film to be drawn up and captured between a bottom of said tray and a support surface on which said tray is carried as the tray advances entirely past the initial position of said film;
d. lowering the top edge of said film down behind said tray to drape said contents of said tray with said film; and
e. inserting a tucker and undersealer device between said surface and said tray, simultaneously folding said top edge of said film beneath said tray and joining said film to itself in a lap joint, thereby forming a pair of tubes to each side of said tray.

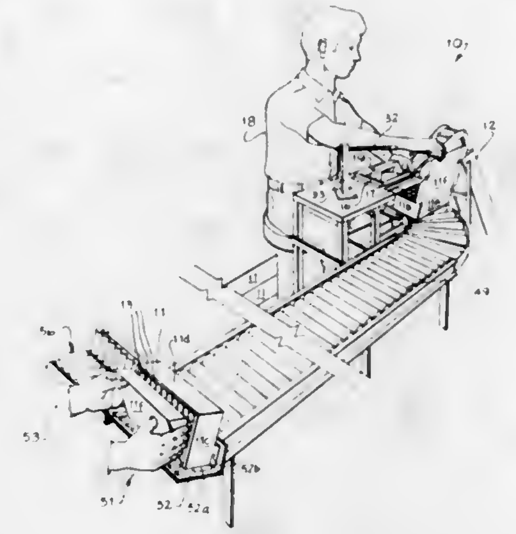
4,033,090
MACHINE FOR PACKAGING ROLLS OF COINS

Alvin R. Carlson, Pico Rivera, Calif., assignor to Bank of America National Trust & Savings Association, San Francisco, Calif.

Continuation of Ser. No. 576,592, May 12, 1975, abandoned. This application Sept. 22, 1976, Ser. No. 725,387

Int. Cl.² B65B *5/06, 35/50, 67/02*

U.S. Cl. 53—78 **7 Claims**



1. A machine for packaging a predetermined number of

rolls of coins, in successive overlying rows upon each other, endwise in a box relative to an open top thereof, comprising; a loading station at which a machine operator is located; an elongated inclined table at said station; conveyor means for suppiying rolls of coins onto said table in side-by-side contacting relationship thereon, the incline of said table causing said rolls of coins supplied thereto to move toward one end of said table under the effects of gravity; means at said station adjacent said table for movably supporting a box to be filled on its side in predetermined orientation with an open top thereof facing said table and with one side panel thereof initially generally aligned with the top of said table; said box supporting means comprising an incrementally downwardly movable platform upon which said box side panel rests, pulley and connector mechanism including at least one elongated flexible connector operatively engaged with said platform at one end of each such connector, and counter weight structure operatively connected with the other end of each such connector; said counter weight structure including a series of vertically spaced interfitted weight members the lowermost of which is engaged with said other end of its associated connector, each of said weight members corresponding generally in weight with the collective weight of a single row of rolls of coins to be inserted endwise into said box, support structure mounting said weight members independently of each other and in vertically spaced relationship for movement relative to each other so that successive weight members may be brought into contact with and move each other upwardly upon downward movement of said platform and said connector therewith; operator actuated pusher means movable transversely and sequentially across said table relative to said box in response to operator actuation to sequentially contact the ends of a predetermined number of rolls of coins and urge the same endwise into said box as discrete successive rows; said counter weight structure reacting in response to incremental movement of said platform downwardly in response to the combined weight of each successive row of rolls of coins inserted in sequence into said box in response to sequential actuation of said pusher means, so that each successive underlying weight member is moved upwardly into sequential contact with a successive overlying weight member, whereby the combined weight supported on said connector is progressively increased as successive rows of rolls of coins are inserted into said box, downward movement of said platform being positively halted in predetermined increments following insertion of each successive rows of rolls of coins into said box by each successive underlying weight member contacting its adjacent successive overlying weight member.

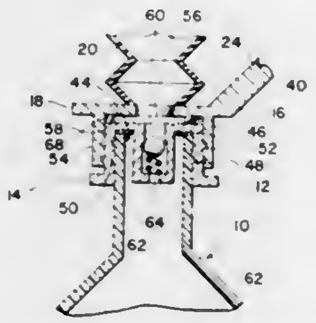
4,033,091
PRESSURIZING CLOSURE APPARATUS

Arthur Michael Saponara, 144-32 Barclay Ave., Flushing, N.Y. 11355

Filed Aug. 24, 1976, Ser. No. 717,114

Int. Cl.² B65B *31/04*

U.S. Cl. 53—88 **8 Claims**



1. A pressurizing closure apparatus for closing the opening in a container that contains a carbonated liquid or the like comprising in combination:

a closure device for removable engagement over said opening in said container, said closure device for sealing said opening;

first check valve means disposed in said closure device that passes air in a first direction through said closure device to the internal volume of said container and opposes the passage of said air in the reverse direction and out of said container;

a pump device for intermittantly generating compressed air within a cavity thereof, second check valve means disposed in the walls of said cavity, said second check valve means passing air in a second direction through said walls of said cavity to the internal volume of said cavity and opposing the passage of air in the reverse direction and out of said cavity, said pump device removably secured to said closure device utilizing pump device securing means therefor; and

handle means, said handle means for providing said compressed air within said cavity upon the application of manually applied force thereto.

4,033,092
VACUUM PACKAGING MACHINE FOR THE PRODUCTION OF PACKAGES FROM PACKAGING MATERIAL WEBS

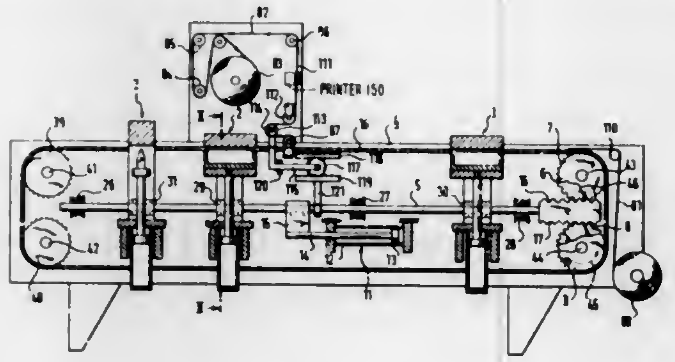
Arthur Vetter, Gronenbach, Germany, assignor to Multivac Sepp Haggenmueller KG, Wolfertschwenden, Germany

Filed July 25, 1975, Ser. No. 599,219

Claims priority, application Germany, Aug. 1, 1974, 7426251

Int. Cl.² B65B *31/04, 9/02*

U.S. Cl. 53—112 A **12 Claims**



1. A vacuum packaging machine for the production of packages from first and second packing material webs, wherein said second web is wound on a storage roll, comprising at least one working station and one sealing station, including means reciprocating said stations through a work cycle, means for feeding said first web to said working station and thence to said sealing station in a continuous manner, means operatively connecting said station reciprocating means to said first web feeding means, means for intermittently reeling off said second web from said storage roll, comprising movable guide means for converting the intermittent movement of the reeled off second web into a movement of a continuous manner feeding into said sealing station for sealing the second web to said first web, whereby the discontinuous movement of said second web is transformed into a movement of a continuous manner, and means operatively connecting said movable guide means to said station reciprocating means for moving said second web downstream of said movable guide means in unison with said first web.

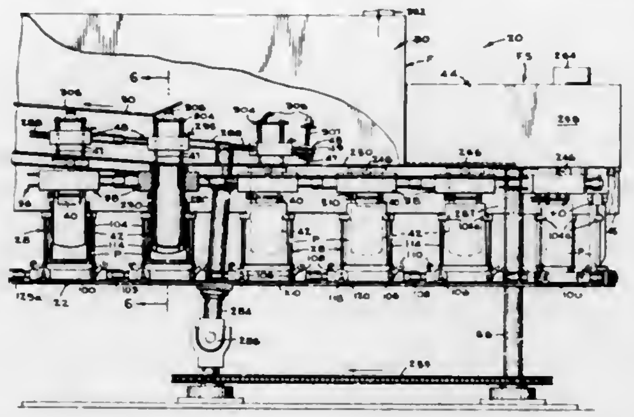
4,033,093
BOTTOM FILLING POUCH PACKAGING METHOD AND APPARATUS

Samuel A. Mencacci, San Jose, Calif., assignor to FMC Corporation, San Jose, Calif.

Filed Jan. 19, 1976, Ser. No. 650,346

Int. Cl.² B65B *31/06, 31/02*

U.S. Cl. 53—112 B **13 Claims**



1. An apparatus for packaging a particulate product in a pouch having an open upper end and a closed lower end comprising: an endless pouch conveyor, pouch carrier means on said conveyor for supporting a pouch, an endless filling tube conveyor disposed above said pouch conveyor, filling tube carrier means on said filling tube conveyor, a filling tube slidably supported by said filling tube carrier and disposed in alignment with the pouch therebelow, said filling tube having an open upper end and an open lower end, means defining a normally closed gate near the lower end of the filling tube, means defining a cam track including a first inclined portion and a second inclined portion operatively connected to said filling tube, said first inclined portion effecting lowering of the filling tube into the pouch to a lowermost position with the lower end of the filling tube disposed immediately adjacent the lower end of the pouch, means defining a rotary filler bowl disposed between said first and said second inclined portions of said track and having a floor with a discharge opening therein, said upper end of the filling tube when in its lowermost position adapted to register with said discharge opening for receiving an amount of the particulate product from said filling bowl sufficient to completely fill the portion of the filling tube above said gate means, said second inclined portion of the track being effective to raise the filling tube out of the pouch, means for opening the gate means as the filling tube is being raised out of the pouch by the second inclined portion of said track to allow the product to transfer from the filling tube through the open gate means into the pouch, and means for thereafter sealing the upper end of the pouch.

4,033,094
APPARATUS FOR ORIENTING AND FOR AUTOMATICALLY PILING UP BOBBINS OF YARN

Anton Schiffmann, Staad, Switzerland, assignor to Arova Rorschach AG, Switzerland

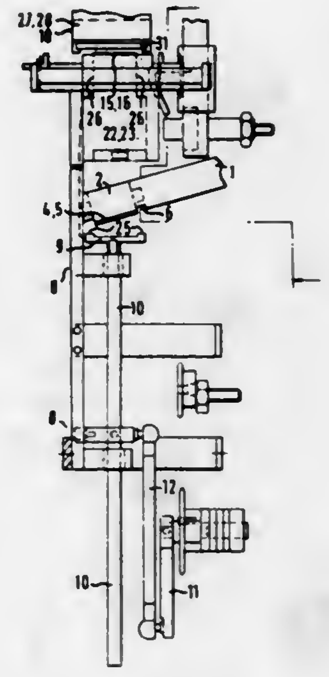
Filed June 22, 1976, Ser. No. 698,598

Claims priority, application Switzerland, June 24, 1975, 8219/75

Int. Cl.² B65B *5/10*

U.S. Cl. 53—242 **2 Claims**

1. Apparatus for orienting and for automatically collecting bobbins of yarn wound on a winding device of a winding-up maching, comprising an inclined channel member arranged for bobbins of yarn of a predetermined size to slide therealong from the winding-up machine, said channel having a width smaller than the length of a bobbin of yarn of said predetermined size and larger than the outer diameter of said bobbin of yarn so that said bobbins of yarn slide along said channel member with a constant orientation relatively thereto, a positioning device for locating each bobbin of yarn after travelling along said channel member in a fixed position at the lower end of said inclined channel member, said positioning device being formed with an aperture and shaped to locate a bobbin of yarn received from said channel above said aperture, a container temporarily mounted above said positioning device and formed with an opening in its base through which bobbins of yarn may be introduced in sequence into said container, a lifting unit including a thrust member shaped and arranged to raise through said aperture to engage a bobbin of yarn thereabove and carry said bobbin of yarn through said opening and closure means for said opening comprising two flaps respectively mounted on two spring-loaded upwardly extending support member which in the closing position of said closure means locate said flaps edge to edge across said opening, said support members being pivotally mounted and located to be thrust away from one another, so as to separate said flaps, by a bobbin of yarn rising on said thrust member into said container, said thrust member and said support members being mutually formed so as to permit said two flaps to approach one another and close said container beneath said bobbin of yarn immediately after said bobbin of yarn has been raised by said thrust member substantially wholly above said flaps.



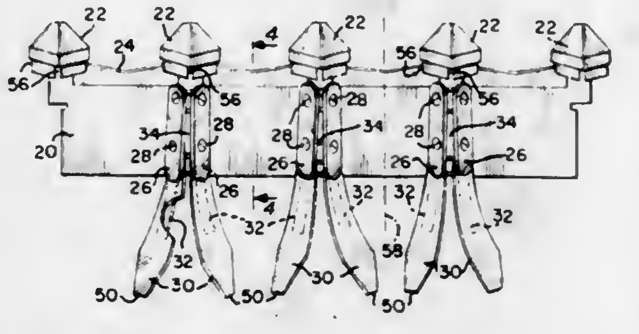
4,033,095
NECK-DOWN BOTTLE PACKING GRID

Anton J. Wild, 310 Springfield Ave., Westfield, N.J. 07092

Filed Sept. 8, 1976, Ser. No. 721,269

Int. Cl.² B65B *39/02*

U.S. Cl. 53—248 **14 Claims**



1. A neck-down bottle packing grid which eliminates metal to glass contact between the packing apparatus and the glass bottles which comprises:

a. a plurality of partitions extending approximately parallel with respect to one another;

b. a plurality of guide block mounts positioned at approxi-

mately equal distances along the upper edges of said partitions;
- c. a plurality of guide blocks of soft material mounted upon said guide block mounts;
- d. a plurality of finger blocks secured to said partitions and extending downwardly from each of said guide blocks on opposite sides of said partitions, said finger blocks including two outwardly facing guide surfaces being tapered obliquely from said partition to which said finger block is secured to define in combination with said guiding surfaces of adjacent finger blocks a plurality of bottle receiving cells;
- e. a plurality of covers of soft material secured to said guide surfaces of said finger blocks to be similarly tapered obliquely away from said partitions;
- f. a plurality of fingers of soft material secured to said guide surfaces of said finger blocks, said fingers including lower sections extending obliquely inwardly toward the center of said cells to guide downwardly falling bottles into individual orientation within individual cells;
- g. a plurality of inserts of soft material secured at the upwardly disposed edges of said partitions and extending from each guide block on one of said partitions to each adjacent guide block on said partition; and
- h. a plurality of insert retaining means adjacent said partition to hold said inserts in fixed relationship along the upper edges of said partitions.

4,033,096
APPARATUS FOR OPENING BAGS

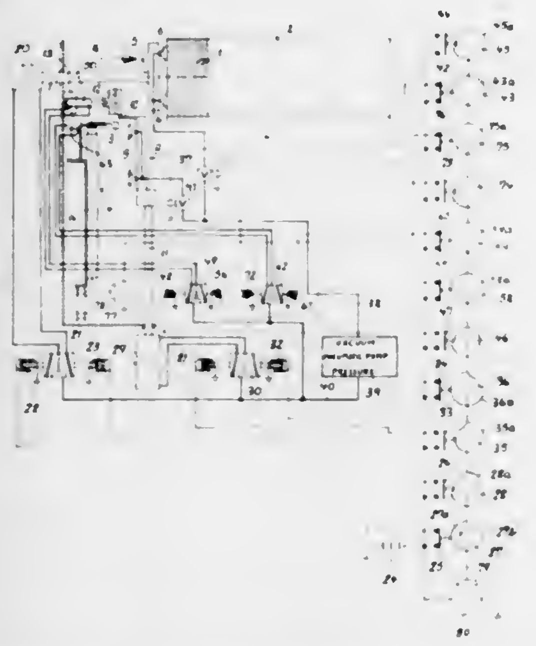
Georges Burgat, Saint-Didler-Au-Mont-D'Or, and Bernard Guillemaut, Lyon, both of France, assignors to Thimmonier S.A., Lyon, France

Filed May 11, 1976, Ser. No. 685,144

Claims priority, application France, May 12, 1975, 75.15559

Int. Cl.² B65B *43/30*

U.S. Cl. 53—386 **9 Claims**



9. An apparatus for opening a flat vertically disposed bag having a pair of opposite panels and open at the tops of said panels, said apparatus comprising:

a first member displaceable horizontally and formed with a first suction element juxtaposed with one of said panels and first means for displacing said member with forward movement and reverse movement whereby said first suction element is brought into engagement with said bag during said forward movement and entrains said bag during said reverse movement from a supply of such bags;

a second movable member and second means for displacing same vertically into a position between said first member and said supply, said second member having a suction element turned toward the suction element of the first member for engagement with said second panel upon a succeeding forward movement of said first member towards said second member, said first means displacing said first member thereafter away from said second member with said suction elements engaging said panels to spread said panels apart and open said bag, said second means displacing said second member vertically out of alignment with said first member into another position; and

conveyor means engaging said bag in said other position of said second member for carrying said bag away therefrom.

4,033,097
RIDING SADDLE

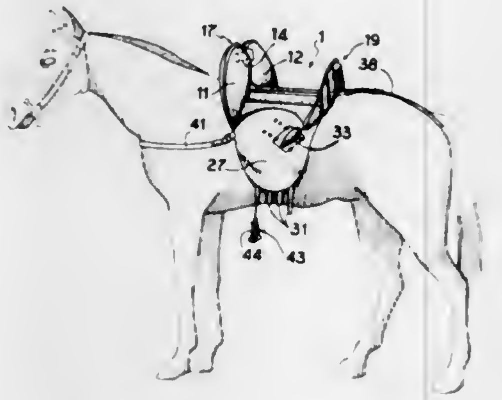
Michel Petit, 3, Avenue Branly, 78220 Viroflay, France

Filed June 9, 1975, Ser. No. 584,970

Claims priority, application France, June 12, 1974, 74.20366

Int. Cl.² B68C *1/00*

U.S. Cl. 54—44 **15 Claims**



1. A riding saddle structure comprising in combination: a seat for directly receiving the body of the rider, which seat consists essentially of two inflatable cushions disposed on each side of the median plane of the saddle structure; and a pommel which consists essentially of an upwardly projecting substantially flexible and substantially inflatable curved structure, a flexible interconnection of the curved structure and a front edge of the cushions, the front part of the saddle structure deriving a relative rigidity solely from the bending of said flexible interconnection to a downwardly concave configuration to the exclusion of a conventional bow, and means to attach the saddle to a horse.

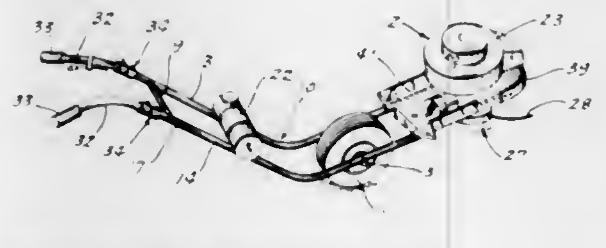
4,033,098
GRASS TRIMMING APPARATUS

Garry J. Green, Corydon, Iowa 50060

Filed May 30, 1975, Ser. No. 582,172

Int. Cl.² A01D *55/18*

U.S. Cl. 56—17.5 **4 Claims**



1. A grass trimming apparatus comprising
- a. an elongated frame structure including a pair of transversely opposite longitudinally extended side members each of which includes a forward horizontal base section, and an upwardly and rearwardly inclined rear section terminating in a downwardly and rearwardly inclined handle member,
- b. a first transverse member connecting together the rear sections of said members,
- c. a motor,
- d. a motor support means comprising a pair of longitudinally spaced mounting plates secured to said forward horizontal base section and extending within the confines of said forward horizontal base section,
- e. a single ground engaging wheel arranged between said base section adjacent the rear ends thereof,
- f. a transverse axle for said ground wheel carried on said base section,
- g. said motor and a cutter unit mounted on said support means said motor and cutter unit located within the transverse confines of said forward horizontal base section
- h. flexible cutting elements on said cutter unit extendible laterally outwardly from said forward horizontal base section on rotation of said cutter unit, said forward horizontal base section longitudinally tiltable about said transverse axle to move the cutting zone of said cutting elements to a first position such position being closer to the material being cut and laterally tiltable with said ground engaging wheel to move the cutting zone of said cutting elements to a second position to one side of the frame structure,
- i. a front bumper member having the ends thereof secured to the forward ends of said horizontal base section and projected forwardly thereof to form a protective guard for the lower forward side of said motor, and,
- j. means for adjustably supporting at least one of said handle members on a rear section corresponding thereto for rotational movement relative to the longitudinal axis of said corresponding rear section to adjusted positions extended laterally from from either one or the other of the sides of said rear section.

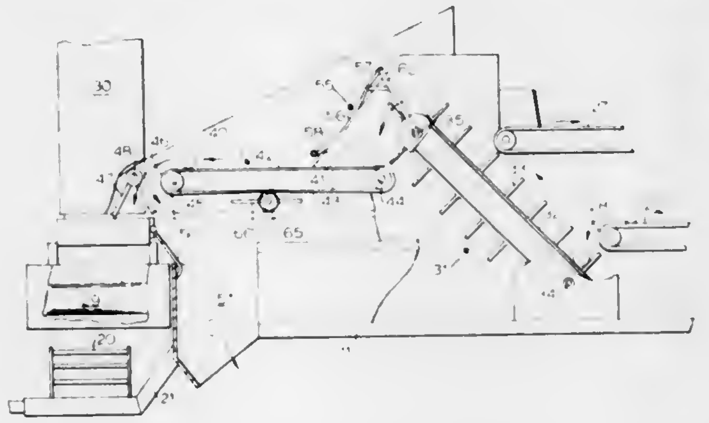
4,033,099
TOMATO HARVESTING EMPLOYING ELECTRONIC SORTING

William C. Friedel, Jr., Rio Vista; Thomas S. Bettencourt, Isleton, and Daniel L. Freeman, Rio Vista, all of Calif., assignors to The Regents of the University of California, Berkeley, Calif.

Filed Oct. 24, 1975, Ser. No. 625,542

Int. Cl.² A01D *46/00*

U.S. Cl. 56—327 R **14 Claims**



1. In a tomato harvester having pickup means for severing and picking up tomato plants from a field, elevating means for raising them to a desired height, separating means for detaching the tomatoes from the plants and separating them therefrom, tomato conveyor means for conveying the detached and separated tomatoes, and cross-conveyor means for receiving selected tomatoes after sorting, the combination of:

electronic sorting means positioned between said tomato conveyor means and said cross-conveyor means and comprising rejector means for rejecting culls and impelling them away from a normal trajectory,

a rejection chute into which said rejector means impels the rejected culls, said chute dropping the rejected culls on the ground, while the selected tomatoes, being nonrejected fruit, fall by said normal trajectory to said cross-conveyor means, and

preparatory means in between said tomato conveyor means and said electronic sorting means for impelling tomatoes at said normal trajectory toward said electronic sorting means.

4,033,100
WINDROWING MACHINE WITH ROTARY BRUSH AND DEPTH CONTROL UNIT

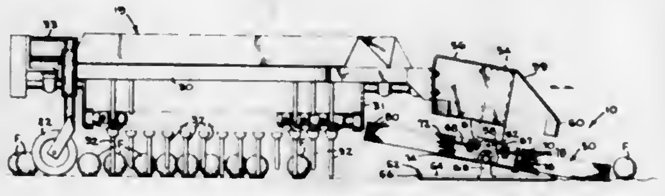
Leon R. McRobert, Ocoee, Fla., assignor to FMC Corporation, San Jose, Calif.

Division of Ser. No. 463,328, April 23, 1974, Pat. No. 3,914,925. This application Apr. 17, 1975, Ser. No. 568,882

The portion of the term of this patent subsequent to Oct. 28, 1992, has been disclaimed.

Int. Cl.² A01D *51/00*

U.S. Cl. 56—328 R **3 Claims**



1. In a windrowing machine for windrowing articles lying on the ground, which machine includes a mobile vehicle movable along a relatively soft article supporting surface, mechanism comprising; a generally horizontal frame pivotally connected to said vehicle and projecting outwardly from one side thereof and forwardly with respect to the direction of motion of the vehicle, means connected along the length of said frame for sweeping articles along said article supporting surface, a driven upstanding shaft journaled on said frame at the other end thereof, a flat circular frame supporting disc, and universal joint means connecting said disc to said shaft for rotation therewith and for universal movement relative thereto with the flat surface of the disc riding on said soft supporting surface.

4,033,101
CONTINUOUS LOAD STACK-FORMING METHOD AND MACHINE

David Paul Fritz, Newton; John Dale Anderson, Canton; Martin Eugene Pruitt; Deroy Ernest Mahagan, both of Hesston, and Richard James Buller, Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 13, 1975, Ser. No. 604,310

Int. Cl.² A01D *87/10*

U.S. Cl. 56—344 **17 Claims**

1. A continuous loading stack-forming machine including:

a mobile, hollow body for receiving crop material to be formed into a stack,

said body including a press for periodically compacting material received within the body;

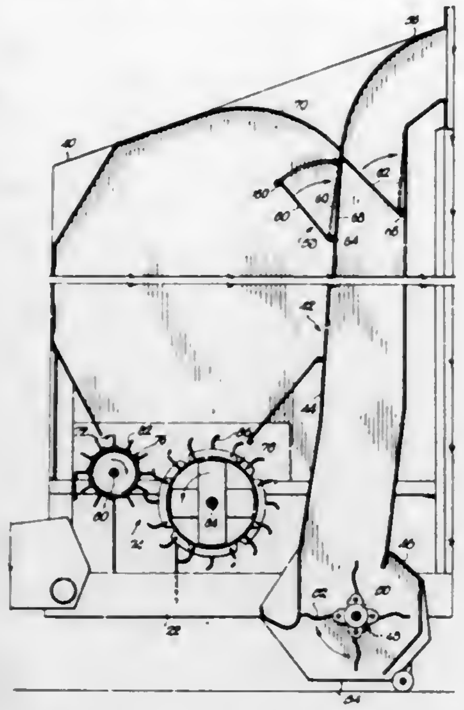
a loader adjacent said body for continuously lifting material from a field as the body is advanced and for delivering the material into the body;

an accumulating chamber ajacent said loader;

a diverter selectively operable to direct picked up material into the chamber instead of the body;

structure selectively operable to retain the diverted material in the accumulator or discharge the same for recirculation through said loader; and

mechanism controlling operation of said diverter and said structure for accumulating material in said chamber during actuation of the press and loading the accumulation along with new material into the body during the interval between successive actuations of the press.



4,033,102
METHOD AND APPARATUS FOR TWISTING CORE STRANDS

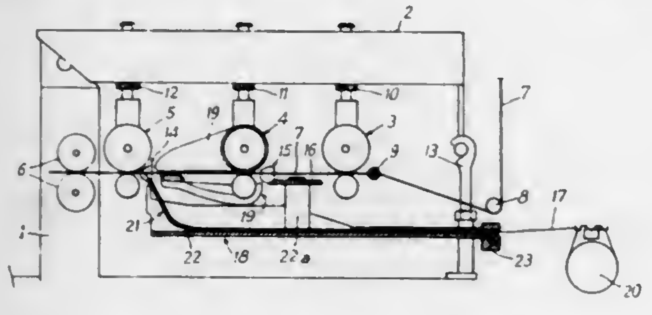
Michel E. Vanhelle, Wattrelos, France, assignor to Centre Technique Industriel dit: Institut Textile de France, Boulogne-sur-Seine and Etablissement Public dit: Agence Nationale de Valorisation, Neuilly-sur-Seine, both of, France

Filed Mar. 22, 1976, Ser. No. 668,987

Claims priority, application France, Mar. 21, 1975, 75.08951

Int. Cl.^{2} D02G *3/36*

U.S. Cl. 57—12 **9 Claims**



5. Apparatus for producing a core strand of the type comprising a sheath of fibers surrounding a central strand, said apparatus comprising a double sleeve drawing unit having downstream drawing cylinders for the drawing of at least one sliver of fibers; a feeding device having at least one feed tube for feeding under constant tension, at least one central strand through said tube and introducing said central strand into a sliver of fibers upstream of said downstream drawing cylinders; and a self-twisting unit located downstream of said drawing unit and having self-twisting cylinders for conferring a torsion successively in one sense and the other on said slivers of fibers, at least one of them having a central strand inserted therein, whereby a self-twisted core strand is obtained downstream of said self-twisting cylinders by the natural untwisting in one sense and in the other of said slivers of fibers.

4,033,103
PROCESS AND APPARATUS FOR PRODUCING A VARIABLE DIAMETER ALTERNATE TWIST YARN

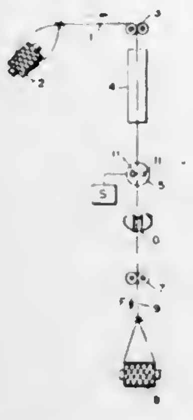
Tatjana Vukoje, Dusseldorf, Germany, assignor to Akzona Incorporated, Asheville, N.C.

Filed Mar. 6, 1975, Ser. No. 555,900

Claims priority, application Germany, Mar. 8, 1974, 2411074

Int. Cl.^{2} D02G *1/02, 3/34*

U.S. Cl. 57—34 HS **14 Claims**



1. In a process for the production of an effect yarn having thick and thin portions by a false twist texturizing under variable tension of a thread bundle consisting essentially of continuous synthetic thermoplastic filaments, the thread bundle being conducted in a normally linear path between a heating zone and a false twister for said texturizing, the improvement which comprises:

intermittently deflecting the thread bundle from its normally linear path and shortly before entry into said false twister by means of a twist blocking element placed in running contact with said thread bundle.

7. In a false twist texturizing apparatus including a false twister, a heater arranged at an interval before said false twister and forming therewith a false twist texturizing zone, and means to conduct a multifilament thermoplastic yarn through said false twist texturizing zone, the improvement for producing a thick-thin yarn with said apparatus which comprises:

a twist blocking means arranged in said false twist texturizing zone between said false twister and said heater, said twist blocking means having at least one yarn contacting surface which is reciprocally movable from a neutral position substantially free of contact with said yarn into a twist blocking position where said at least one yarn contacting surface engages said yarn in order to deflect it at an angle sufficient to block twist accumulating backwardly in the yarn from said false twister and then back to said neutral position to suddenly release the accumulated back twist.

4,033,104
METHOD AND DEVICE FOR REPLACING A SLIVER CONTAINER

Heinz Kamp, Rickelrath, Germany, assignor to W. Schlafhorst & Co., Monchen-Gladbach, Germany

Filed Aug. 16, 1976, Ser. No. 714,979

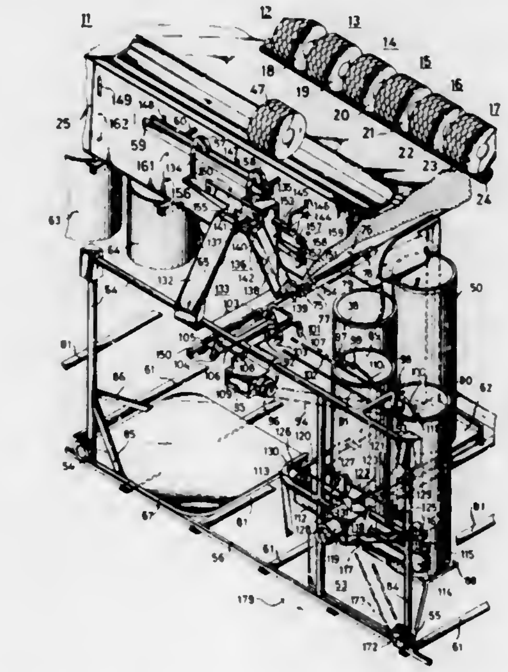
Claims priority, application Germany, Aug. 16, 1975, 2536435

Int. Cl.^{2} D01H *9/00*

U.S. Cl. 57—34 R **7 Claims**

1. Method of replacing a sliver container in a spinning machine formed of a plurality of individual spinning stations, sliver containers being disposed in tandem in two rows, by means of a transporting device carrying a limited supply of the containers and being constrained to travel on a given travel path along the spinning machine, which comprises disposing at the spinning machine a respective pair of sliver containers

in tandem on a carriage or slide movable transversely to the given travel path of the transporting device, loading the transporting device with filled sliver containers at one end of the spinning machine and unloading the transporting device of exchanged sliver containers at the same one end of the spinning machine or at the other end thereof, shuttling the transporting device back and forth, ready for operation, past the spinning stations of the spinning machine after the transporting device has been loaded with filled sliver containers, stopping the transporting device in front of a sliver container of a respective spinning station in response to a signal from the respective spinning station that sliver is missing from the respective sliver container and performing the following operations: drawing the carriage or slide up from a working station thereof to the level of the supply of containers on the transporting device, selecting the container with missing sliver that is to be replaced, replacing the container with missing sliver by a container filled with sliver, feeding a starting end of the sliver from the container filled with sliver to a sliver guide of the respective spinning station, returning the carriage or slide to the working station thereof, and resuming travel of the transporting device along the given travel path thereof.



2. Device for carrying out a method of replacing a sliver container in a spinning machine formed of a plurality of individual spinning stations, sliver containers being disposed in tandem in two rows, by means of a transporting device carrying a limited supply of the containers and being constrained to travel on a given travel path along the spinning machine, comprising carrying means disposed at the spinning machine for receiving thereof respective pairs of sliver containers disposed in tandem, said means being movable transversely to the given travel path of the transporting device.

4,033,105
YARN PROCESSING

David Leslie McNeight, Congleton, and William John Morris, Didsbury, both of England, assignors to Ernest Scragg & Sons Limited, England

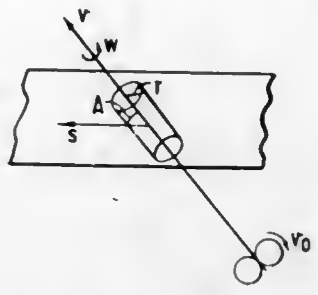
Filed Feb. 26, 1973, Ser. No. 335,727

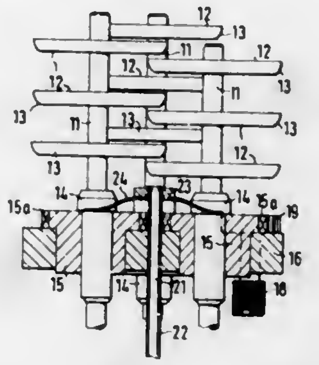
Claims priority, application United Kingdom, Mar. 6, 1972, 10328/72

Int. Cl.^{2} D02G *1/04;* **D01H** *7/92*

U.S. Cl. 57—77.4 **16 Claims**

9. Apparatus for friction false twisting yarn, comprising at least three sets of equally spaced parallel friction wheels with rounded edges, the sets being rotatable about respective common axes which are parallel and equally spaced and are distributed about a yarn path so that adjacent wheels of each set have between them a single wheel of each other set, the spacing of the axes and the axial disposition of the wheels being chosen to provide that the yarn path is so controlled that the angle of travel of the yarn over the rounded edges of the wheels is substantially equal to the twist angle desired to be imparted to the yarn.





4,033,106
FRICTION DISC FOR DRIVING TWIST TUBES ROTATING AT HIGH SPEEDS

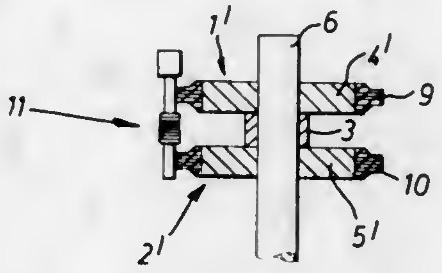
Josef Raschle, Butschwil, Switzerland, assignor to Heberlein & Co. Ag, Switzerland

Filed Oct. 28, 1975, Ser. No. 626,543

Claims priority, application Switzerland, Dec. 4, 1974, 16069/74

Int. Cl.^{2} D01H *1/243*

U.S. Cl. 57—77.45 **5 Claims**



1. A friction disc for using in a driving assembly for a twist tube in a false twist device for texturing synthetic filaments, wherein the twist tube is driven at high speed in contact with the edge of the friction disc, the friction disc comprising a support disc symmetrical about a central axis and having a peripheral surface of uniform axial width, said support disc comprising at least one non-resilient material and being formed for axial mounting on means for rotating the friction disc about said axis, and a friction ring of resilient synthetic material having an inner circumferential surface fixed to and substantially covering said peripheral surface of said support disc, and having an outer circumferential driving surface of less axial width than said peripheral surface and providing the edge for contact with the twist tube, said friction ring being tapered on all radii about said axis from said inner circumferential surface to said outer circumferential surface and said friction ring being symmetrical with respect to a median plane of the disc extending parallel to the plane of the disc.

4,033,107

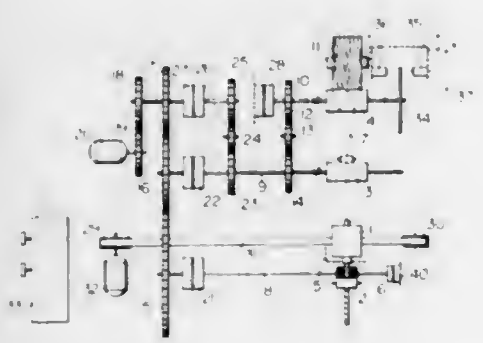
METHOD AND APPARATUS FOR CONTROLLING DRIVING OPERATION OF OPEN-END SPINNING FRAME

Chikanobu Sasayama, Fukui; Osamu Suzuki, Oobu; Takeshi Shimizu, and Kunji Chiba, both of Kariya, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Filed May 22, 1975, Ser. No. 580,058

Int. Cl.^{2} B65H *63/08, 61/00*

U.S. Cl. 57—81 **8 Claims**



1. In an apparatus for controlling the driving operation of an open-end spinning frame provided with a plurality of spinning units, a common driving motor for driving all the spinning units and driving gear trains for transmitting driving power from said common driving motor to each spinning unit, each spinning unit comprising a spinning rotor, a roller means for supplying fibers into said spinning rotor, a take-up roller means for delivering a yarn from said spinning rotor and a winding roller for forming a yarn package from said yarn delivered from said take-up roller means, an improved apparatus comprising, means for measuring the length of the yarn delivered from said spinning rotor, electromagnetic clutches which selectively transfer rotating power or stop transferring rotating power to said take-up roller means, winding roller or said roller means, for supplying fibers independently and selectively with said gear trains, electromagnetic brakes which stop the rotation of said take-up roller means, winding roller means for supplying fibers, an electric control circuit means for selectively energizing or releasing said electromagnetic clutches or said electromagnetic brakes under control of an output signal from said means for measuring the length of the yarn delivered from the spinning rotor in accordance with a predetermined program, said electric control circuit comprising means operative in response to the start of the driving operation of said spinning units for supplying reverse driving signals to both said take-up roller means and said winding roller, for supplying following a predetermined time after the start of the driving operation, forward driving signals to said roller means for supplying fibers and, following a predetermined time after the roller means for supplying fibers is energized, for supplying a stop motion followed by a forward motion signal to both said take-up roller means and said winding roller said electric control circuit means further comprising means operative in response to stopping the driving operation of said spinning units, for supplying a braking signal to said roller means for supplying fibers and, following a predetermined time after supplying said braking signal to said roller means for supplying fibers, for supplying braking signals to both said take-up roller means and said winding roller.

4,033,108

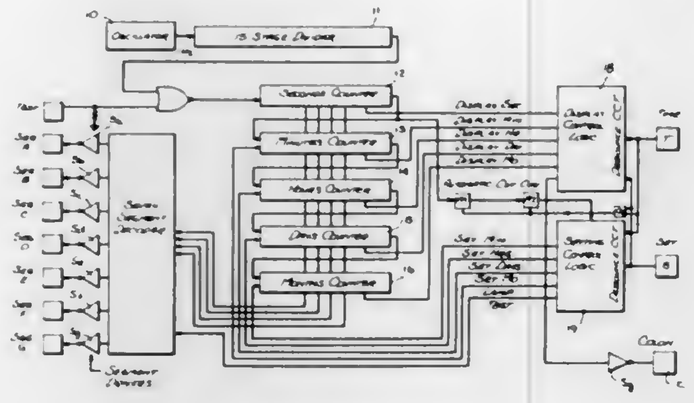
AUTOMATIC CUT-OFF SETTING SYSTEM FOR LED DISPLAY IN A SOLID-STATE WATCH

William O. Bennett, Bayside, and Robert F. Sagarino, Wheatley Heights, both of N.Y., assignors to Bulova Watch Company, Inc., New York, N.Y.

Filed Mar. 2, 1976, Ser. No. 663,139

Int. Cl.^{2} G04B *19/30;* **G04C** *3/00*

U.S. Cl. 58—50 R **7 Claims**



1. In a battery-operated multi-function electronic watch having a display formed by several light-emitting diode stations, the combination comprising:

A. a miniature electonic computer having a time base, a frequency divider coupled to said time base to produce low-frequency timing pulses and counters responsive to said pulses for producing signals which are decoded to actuate said stations, said stations normally being in a Normal-mode in which all stations are unactuated;

B. manually-operated releasable switching means associated with said computer for effecting in a Time-mode the selective actuation of said stations to present Hours-Minutes and other Time-mode functions and in a Set-mode to individually present the various readings constituting said functions, said switching means being constituted by a Time-mode button which when pressed and released in a particular manner produces said Time-mode functions, and a Set-mode button which when repeatedly pressed and released in a particular manner sequentially produces said readings to be set, said readings being thereafter updated by operation of said Time-mode button; and

C. automatic cut-off means associated with said switching means and acting both in the Time-mode and in the Set-mode to cause said display to revert to said normal-mode when said switching means are released or shortly thereafter.

4,033,109

TIME CORRECTION CIRCUITS FOR ELECTRONIC TIMEPIECES

Tsuneo Takase, and Tetsuo Yamaguchi, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

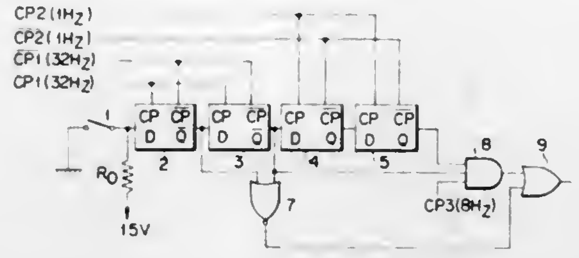
Filed Nov. 20, 1975, Ser. No. 633,834

Claims priority, application Japan, Nov. 21, 1974, 49-133131; Nov. 21, 1974, 49-133133; Jan. 31, 1975, 50-12374

Int. Cl.^{2} G04C *3/00*

U.S. Cl. 58—85.5 **10 Claims**

1. A time correction circuit for an electronic timepiece comprising a switch; a first shift register circuit including a plurality of cascade connected shift registers which are driven by a clock pulse having a first predetermined frequency for shifting an electric signal produced in response to the operation of said switch; a second shift register circuit including a plurality of cascade connected shift registers which are driven by a clock pulse having a second predetermined frequency lower than said first predetermined frequency for shifting the output signal from said first shift register circuit; a first logical circuit connected to receive the output signals from the shift registers of the first and last stages of said first shift register circuit for producing a pulse corresponding to the electric signal supplied to said first shift register circuit by said switch; and a second logical circuit connected to receive at least the output signals from said first and second shift register circuits and a clock pulse having a third predetermined frequency for producing clock pulses having said third predetermined frequency and whose number corresponds to the interval in which said switch is maintained open or closed when said switch is maintained open or closed for an interval longer than a predetermined interval.



4,033,110

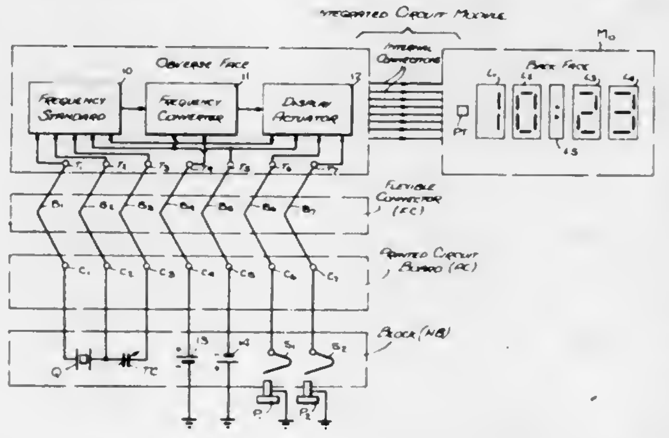
SOLID-STATE ELECTRONIC WATCH ASSEMBLY

Robert F. Sagarino, Wheatley Heights, N.Y., assignor to Bulova Watch Company, Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,135

Int. Cl.^{2} G04B *37/00*

U.S. Cl. 58—88 R **6 Claims**



1. In a solid state electronic watch assembly provided with a watch case having a window at one end thereof; a movement insertable in said case, said movement comprising:

A. a module constituted by a dielectric plate on whose obverse face is mounted the electro-optical stations of a time display, each station being formed by a pattern of display elements which are selectively activatable to define different digits, the back face of said plate having integratedcircuit chips mounted thereon to provide the circuits of an electronic timekeeping system which is operable in conjunction with discrete elements and is energized by at least one replaceable power cell, the integrated circuits on the back face being connected by leads passing internally through said plate to said display elements on the obverse face to afford a time display, said back face having a row of module termnals thereon which are connected to said integrated circuits;

B. a generally rectangular housing block having wells formed in its forward section to receive said discrete elements and at least one hatch formed in its rear section to receive said cell, said block having a ledge on its forward end on which said module is seatable with its obverse face viewable through said window to expose said time display;

C. a rigid printed circuit board overlying the forward section of the block, the discrete elements which are receivable in said wells being supported from the underside of the board, said board having at least one connecting finger extending therefrom which overlies the rear section to engage said cell receivable in said hatch, said discrete elements and said finger being connected by said printed circuit to a corresponding row of board terminals; and

D. a flexible connector joining said module to said board and having a array of contacts bridging the module and board terminal rows, the module and the board joined thereto by the connector constituting a unitary subassembly which when placed over the housing block with the module seated on the ledge, with the discrete elements received in the wells, and with the finger engaging the cell received in the hatch thereby completes the movement.

4,033,111

ELECTRONIC WATCH HAVING ANTIMAGNETIC CHARACTERISTIC

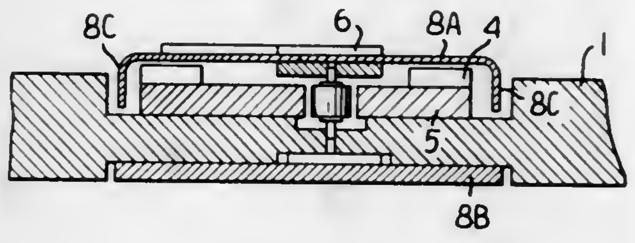
Eiichi Matsuura, Chiba, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed Dec. 19, 1975, Ser. No. 642,336

Claims priority, application Japan, Dec. 23, 1974, 502640[U]

Int. Cl.^{2} G04B *43/00*

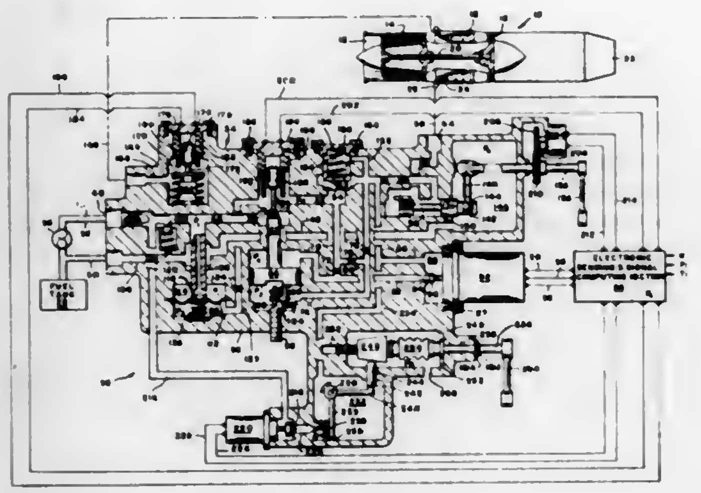
U.S. Cl. 58—106.5 **3 Claims**



1. In an electronic watch of the type having a watch movement including a base plate having a pair of opposed major surfaces, an electromechanical transducer mounted on a first of said major surfaces and including a rotor operable to rotate by energization of said transducer, means defining a bridge structure a distance above said first major surface wherein a portion of said bridge structure comprises mounting means mounting said rotor for rotation, the improvement which comprises: shielding means defining magnetic shields above and below said transducer for shielding the same from magnetic fields external to the watch; said shielding means comprising a first plate-like portion of antimagnetic material carried by said bridge structure at substantially the same distance from said base plate as said bridge structure and overlying a portion of said electro-mechanical transducer, and a second plate-like portion of antimagnetic material disposed at the second major surface of said base plate and underlying a portion of said transducer, said second major surface having a sufficiently deep recess therein for receiving said second plate-like portion of said shielding means so that said second plate-like portion does not extend above said second major surface, said first and said second plate-like portions respectively overlying and underlying said electro-mechanical transducer sufficiently to effectively shield said transducer from magnetic fields external to the watch, and said first and second plate-like portions being spaced a distance not exceeding a distance between said bridge structure and said second major surface whereby said shielding means does not contribute to a thickness of the watch movement.

4,033,112
FUEL CONTROL FOR GAS TURBINE ENGINE

Robert W. Schuster, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.
Filed Sept. 25, 1975, Ser. No. 616,731
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.28 R **12 Claims**



1. Fuel control apparatus for a combustion engine comprising:

a fuel supply conduit for conducting a flow of pressurized fuel from a pressurized source to said engine;

first positionable valve means operatively connected to said supply conduit for establishing a controlled flow of fuel therethrough to said engine;

first fuel pressure differential responsive means operatively connected to said first valve means for actuating the same;

second valve means operatively connected to said supply conduit in series flow relationship with said first valve means and downstream therefrom for creating a predetermined back pressure against fuel flow through said first valve means and restricting fuel flow to establish a predetermined fuel pressure differential in said supply conduit;

resilient means operatively connected to said second valve means for urging the same to a closed position in opposition to the fuel pressure upstream therefrom;

second fuel pressure differential responsive means vented to said supply conduit upstream and downstream from said second valve means and responsive to the fuel pressure differential therebetween for actuating said second valve means in an opening direction in opposition to said resilient means;

first passage means connected to said supply conduit in parallel flow relationship with said second valve means;

second passage means connecting said first fuel pressure differential responsive means to said supply conduit downstream from said second valve means;

a restriction in said first passage means;

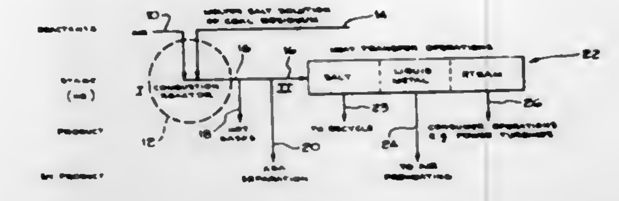
a variable area valve in said first passage means for controlling the fuel pressure intermediate said restriction and said variable area valve; and

control means responsive to a plurality of variable conditions of engine operation operatively connected to said variable area valve for actuating the same;

said first fuel pressure differential responsive means being verted to said first passage means intermediate said restriction and said variable area valve and responsive to the fuel pressure differential between said intermediate fuel pressure and said fuel pressure in said second passage means.

4,033,113
STEAM GENERATION WITH COAL

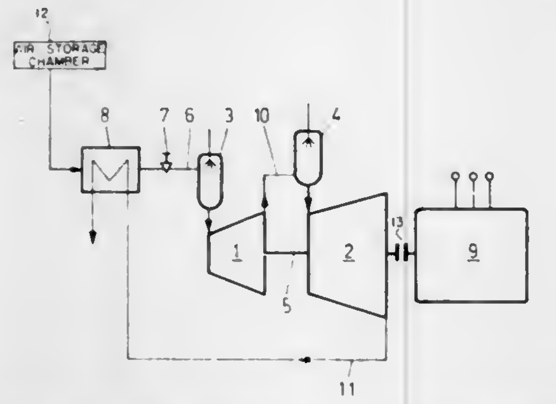
Frank B. Cramer, Mission Hills, Calif., assignor to Clean Energy Corporation, Burbank, Calif.
Division of Ser. No. 512,540, Oct. 7, 1974, Pat. No. 3,933,128. This application Oct. 3, 1975, Ser. No. 619,387
Int. Cl.² F02C *3/20*
U.S. Cl. 60—39.02 **54 Claims**



1. In the process for the generation and recovery of heat from highly aromatic, refractory carbonaceous fuel reactants which includes oxidizing the fuel in a molten salt matrix within a reaction zone and recovering heat of combustion from the salt matrix, dissolving the fuel in the salt to form a salt-fuel reactant solution, passing an oxidizing gas through said reactant solution to effect said oxidation, exhausting hot combustion gases from said solution, expanding and cooling said combustion gases through an expansion motor, and compressing said oxidizing gas with the energy of said expansion in advance of passing the same through said reactant solution.

4,033,114
METHOD FOR STARTING A GAS TURBINE PLANT WITH AN AIR ACCUMULATOR

Paul Zaugg, Baden, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland
Filed Nov. 26, 1975, Ser. No. 635,350
Claims priority, application Germany, Aug. 30, 1975, 2538756
Int. Cl.² F02C *7/26*
U.S. Cl. 60—39.02 **2 Claims**



1. In the method for starting-up a gas turbine system by means of compressed air delivered from an air-storage chamber, and wherein said turbine system is comprised of a high-pressure turbine and a low-pressure turbine operating on a common shaft, a high-pressure combustion chamber preceding said high-pressure turbine, a low-pressure combustion chamber preceding said low-pressure turbine in the air flow path, and a connection from said air-storage chamber to said high-pressure combustion chamber, and wherein a rotary load such as an electrical generator is connectible to said turbine shaft through coupling means, the improvement characterized by the following steps:

a. feeding compressed air from said storage chamber through said turbine system to accelerate the same to normal operating speed,

b. igniting said high-pressure combustion chamber during the acceleration of said turbine system and controlling fuel flow thereto such as to maintain the air admission temperature to said high-pressure turbine at a minimum value,

c. coupling the rotary load to said turbine shaft,

d. igniting said low-pressure combustion chamber,

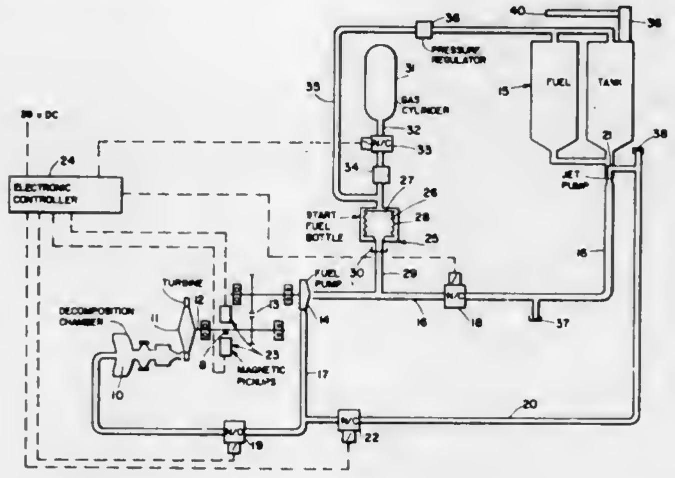
e. increasing the pressure at the high-pressure combustion chamber up to the full operating pressure thereby raising the quantity of air flow through said high- and low-pressure turbines to an amount greater than is normally maintained during the operating period of the turbine system,

f. increasing the admission temperature of the air at said low-pressure turbine until the full output of the turbine has been reached, and

g. increasing the admission temperature of the air at said high-pressure turbine linearly from said initially minimum value to the full operating temperature while simultaneously decreasing the flow rate of said air, the increasing increase in admission temperature of the air at said low-pressure turbine being made simultaneously with the increase in admission temperature of the air at said high-pressure turbine whereby the output of the turbine system will remain constant and the rate of air flow through the turbine system is reduced to its normal value.

4,033,115
EMERGENCY HYDRAULIC POWER SYSTEM (START BOTTLE)

Stephen S. Baits, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.
Filed June 2, 1976, Ser. No. 692,083
Int. Cl.² F02C *7/26;* **F02G** *3/00*
U.S. Cl. 60—39.09 R **12 Claims**



8. In an emergency hydraulic power system operable upon aircraft engine failure, said emergency system being of the type which includes a decomposition chamber, a power unit driven by gaseous decomposition products from the chamber, a monofuel tank, a pump driven by the power unit and having an inlet and an outlet, inlet conduit means connecting the tank to the pump inlet, an outlet conduit connecting the pump outlet to the decomposition chamber, and a system controller, the improvement comprising, in combination:

a start bottle which includes a cell containing monofuel, said cell having a movable wall;

conduit means connecting said cell with said outlet conduit;

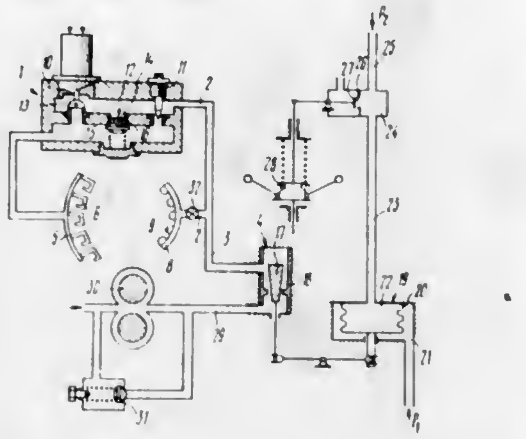
a gas pressure source;

means including an openable valve to deliver gas from said source to the cell movable wall to apply pressure to the monofuel therein;

and means associated with said conduit means for normally blocking flow from said cell to said outlet conduit but openable upon starting of the system to permit flow of monofuel under pressure past the fuel pump, into the outlet conduit and to said decomposition chamber.

4,033,116
FUEL DISTRIBUTION ARRANGEMENT

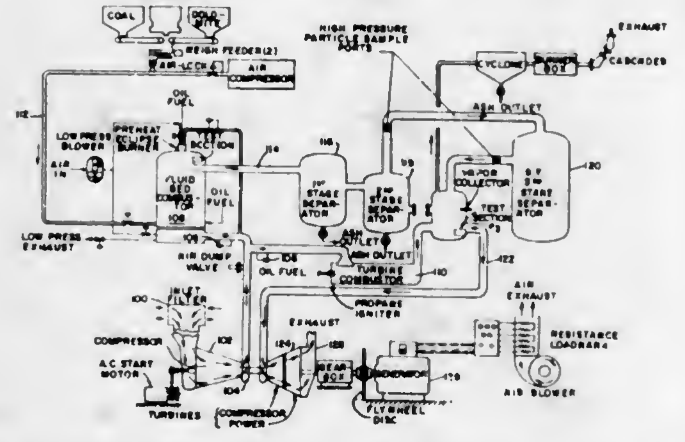
Vasily Petrovich Dmitriev, ulitsa Kalinina 10, kv. 20; Anatoly Mikhailovich Polyakov, ulitsa Gorkogo, 35, kv. 6; Alexandr Grigorievich Tomilin, ulitsa Kalinina 28, kv. 22, and Stanislav Mikhailovich Shushpan, ulitsa Pushkina 27/28, kv. 8, all of Stupino Moskovskoi oblasti, U.S.S.R.
Filed Sept. 23, 1975, Ser. No. 616,067
Int. Cl.² F02C *9/08*
U.S. Cl. 60—39.28 R **5 Claims**



1. Apparatus for distributing fuel between a main manifold and a pilot manifold of a gas-turbine engine via passages connecting said manifolds and a fuel delivery line with a metering element, said apparatus comprising: a jet and two valves installed in parallel in the passage connecting the fuel delivery line and the main manifold, the first of said two valves comprising a stationary sleeve, a plunger in said stationary sleeve for controlling flow of fuel to said main manifold and means applying spring-bias to said plunger at the fuel delivery side to said main manifold, and means coupled to the second of said two valves for operating the same in response to engine speed.

4,033,117
SOLID FUEL FIRED GAS TURBINE SYSTEM HAVING CONTINUOUSLY REGENERATING GRANULAR FILTER

Richard Dunham Smith, Palo Alto, Calif., assignor to The United States of America as represented by the Administrator, Environmental Protection Agency, Washington, D.C.
Filed Jan. 8, 1976, Ser. No. 647,540
Int. Cl.² F02C *3/20;* **F02G** *3/00*
U.S. Cl. 60—39.46 S **3 Claims**



1. A solid fuel fired gas turbine system for generating electric power comprising:

a. a generator for producing electric power;

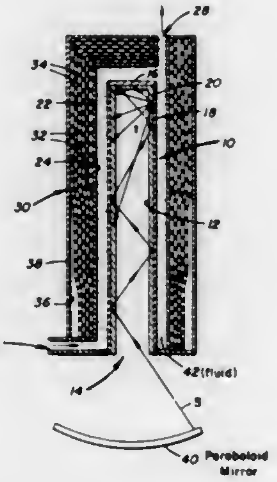
b. a gas turbine for operating said generator;

c. a combustion chamber for burning solid fuel to form gas at high temperature and pressure for operating said turbine;

d. particle separation stages located between said combustion chamber and said gas turbine;
e. at least one of said stages including a continuously regenerating granular filter adapted to operate at the high temperature and pressure of said gas in order to clean said gas of particulate matter without significant loss of gas pressure or temperature;
f. said granular filter further comprising a filter chamber adapted to operate at a positive pressure;
g. a gas inlet and a gas outlet disposed in the wall of said chamber to enable gas to be cleaned to be admitted into the chamber and cleaned gas to be emitted from said chamber;
h. a stationary filter bed disposed vertically in said chamber and located between the gas inlet and the gas outlet, said filter bed further comprising two vertical annular walls, each containing a plurality of louvers providing an inlet and an outlet surface for permitting gas to flow therethrough in a generally horizontal direction;
i. a granular filter medium disposed in the space between the annular walls for cleaning said gas;
j. the filter bed further including gas seal inlet means and gas seal outlet means located at each vertical end of said filter bed for simultaneously enabling the filter medium to move downwardly through the filter bed and preventing a gas from leaking into or out of the filter chamber;
k. filter medium cleaning means for cleaning the filter medium disposed external to said filter chamber;
l. filter medium circulating means associated with said gas seal outlet means and adapted to circulate the filter medium from said outlet means, through the cleaning means, to the gas seal inlet means, and downwardly through the filter bed, whereby the filter bed is continuously being provided with a clean supply of filter medium; and
m. pressurized gas cleaning means in the filter chamber disposed apart from and facing the inlet surface of the filter bed annular wall for periodically directing a gas under pressure downwardly at an angle against said inlet surface for cleaning deposits from said surface of the filter bed closest to the gas inlet, whereby said deposits are loosened from said inlet surface and fall downward where they are removed from the filter chamber through said gas seal outlet means.

4,033,118
MASS FLOW SOLAR ENERGY RECEIVER

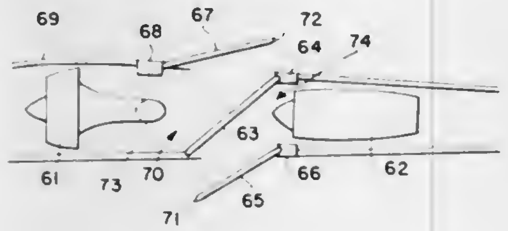
William R. Powell, 10403 May Wind Court, Columbia, Md. 21044
Filed Aug. 19, 1974, Ser. No. 498,529
Int. Cl.² F03G *7/02*; **F24J** *3/02*
U.S. Cl. 60—641 **18 Claims**



13. Apparatus for facilitating energy flow, comprising:
body means having walls which define a cavity and an entrance opening to the cavity, the walls being formed of material relatively near the entrance opening which is a good absorber of infrared radiation relative to the material of which the walls are formed at portions of the body means relatively further away from the entrance opening;
a flowable mass of material; and,
means for directing a flow of said mass along the walls of the body means to cool certan portions of said body means relative to other portions thereof.

4,033,119
DUAL CYCLE AIRCRAFT TURBINE ENGINE

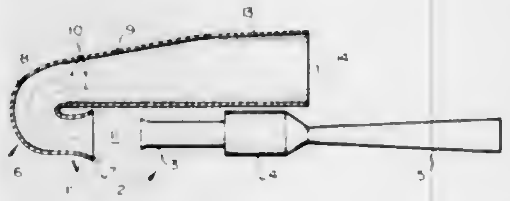
Mark R. Nichols, Newport News, Va., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Sept. 6, 1973, Ser. No. 394,898
Int. Cl.² F02K *3/06*
U.S. Cl. 60—226 R **6 Claims**



1. An aircraft multi-engine configuration which is comprised of:
a first turbofan engine followed in tandem by a second turbine engine;
duct means connecting the discharge of the first turbofan engine with the inlet of the second turbine engine;
means whereby the hot exhaust flow from the said first turbofan engine is removed from an internal airstream ahead of the air inlet of the said second engine and diverted to an external airstream without said engine configuration in such a manner as to maximize its thrust;
means whereby the fan-exit air from said first turbofan engine may be channeled either directly to the air inlet of said second engine or alternately away from said inlet and out of the configuration whereby independent thrust is furnished by said fan-exit air;
means whereby air independent of said first turbofan engine hot-exhaust and fan-exit air is directed into the inlet of said second engine when said first engine fan-exit air is directed out of the configuration; and
each of said aforementioned means being elements in said duct means.

4,033,120
THRUST AUGMENTING FLUID RECTIFIER FOR A PULSED COMBUSTOR

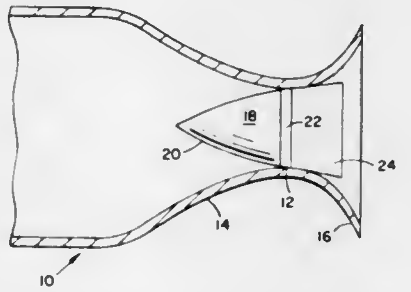
John A. C. Kentfield, Calgary, Canada, assignor to Canadian Patents and Development Limited, Ottawa, Canada
Filed Aug. 21, 1975, Ser. No. 606,525
Int. Cl.² F02K *7/02*
U.S. Cl. 60—249 **9 Claims**



1. A thrust augmenting fluid rectifier for a valveless pulsed combustor having an inlet duct, a combustion chamber, and an outlet duct, comprising ducting having a converging inlet section, a flow redirecting section, a diverging section and an outlet, the converging inlet section of the ducting having an inlet cross-sectional area larger than that of the combustor inlet duct, said converging inlet section being spaced upstream from the combustor inlet duct to define an air intake region and being operative to receive backflow from the combustor and secondary air from the intake region, said flow redirecting section being adapted to redirect fluid flowing through the ducting through substantially 180°.

4,033,121
NOISE CONTROLLABLE NOZZLE CLOSURE

Robert E. Betts, Huntsville; Lawrence B. Thorn, Madison, and Albert R. Maykut, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Division of Ser. No. 484,035, June 28, 1974, Pat. No. 3,968,646. This application Dec. 22, 1975, Ser. No. 643,411
Int. Cl.² F02K *1/00, 1/26*
U.S. Cl. 60—271 **7 Claims**

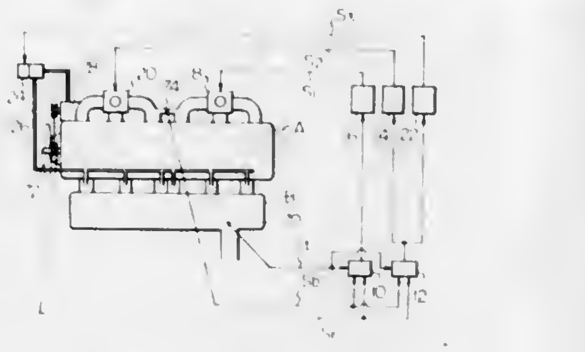


1. In a rocket motor having a nozzle including an entrance section, a throat section, and an exit section, closure means for controlling the opening of said nozzle responsive to ignition of said rocket motor comprising:
a. a forward section disposed in said entrance section of said nozzle, said forward section having surfaces tapered inwardly away from said throat section, whereby the largest diameter of said forward section is provided with a diameter substantially equal to the internal diameter of said throat;
b. an intermediate section disposed in said throat section; and,
c. an aft section disposed in said exit section of said nozzle,
d. said closure member having a predetermined density and mass for controlling the change of momentum of the closure member responsive to ejection thereof from said nozzle, whereby said nozzle opening is controlled incrementally or continuously.

4,033,122
METHOD OF AND SYSTEM FOR CONTROLLING AIR FUEL RATIOS OF MIXTURES INTO AN INTERNAL COMBUSTION ENGINE

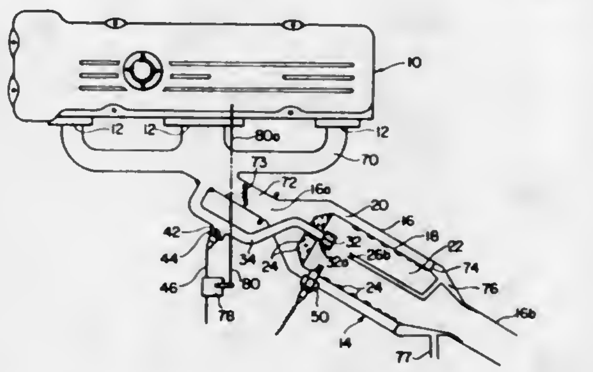
Kenji Masaki, and Hidehiro Minami, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Oct. 18, 1974, Ser. No. 516,077
Claims priority, application Japan, Nov. 8, 1973, 48-125683; Dec. 21, 1973, 48-143297
Int. Cl.² F02B *75/10*
U.S. Cl. 60—274 **6 Claims**

1. A method of reducing harmful components contained in exhaust gases from an internal combustion engine having at least two sequentially operative combustion chambers and a device to oxidize the hydrocarbon and cabon monoxide constituents of the exhaust gases, comprising the steps of
sensing an engine load,
setting a predetermined near stoichiometric air/fuel ratio of the mixture to be delivered to the engine,
delivering to one of said combustion chambers a lean mixture which is the leanest one at which stable combustion in the combustion chamber is maintained and which is kept substantially constant independently of variation in the engine load,
presetting an air/fuel ratio of the mixture variable in dependence on the engine load, at which oxidization of carbon monoxides in the oxidizing device takes place,
delivering to the other of said combustion chambers a rich mixture which is substantially richer than said preset air/fuel ratio and is variable in dependence on variation in the engine load, said rich mixture being leaner than said near stoichiometric ratio when the engine load exceeds a predetermined medium level,
delivering to all the combustion chambers an air/fuel mixture, the air/fuel ratio of which is substantially equal to said near stoichiometric ratio substantially when the engine load exceeds said predetermined medium level, and
delivering additional air into the engine exhaust gases substantially when the air/fuel ratio of the rich mixture reaches said near stoichiometric level.



4,033,123
INTERNAL COMBUSTION ENGINE EXHAUST GAS AFTER-BURNING SYSTEM

Kenji Masaki, and Yoshio Ookubo, both of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Division of Ser. No. 496,018, Aug. 8, 1974, abandoned. This application Jan. 6, 1976, Ser. No. 646,748
Claims priority, application Japan, Aug. 17, 1973, 48-92291
Int. Cl.² F01N *3/14*
U.S. Cl. 60—286 **4 Claims**



1. An exhaust gas after-burning system of an internal combustion engine, the engine having a plurality of exhaust ports and the system including:
a thermal reactor communicating with the plurality of exhaust ports and having an after-burning chamber wherein a spark plug is provided to ignite a combustible mixture for after-burning unburned noxious compounds contained in the exhaust gas received from the exhaust ports;
a secondary air injection nozzle disposed in the after-burning chamber for injecting secondary air thereinto and connected through a heatable chamber to a secondary air source;
a first conduit connecting the after-burning chamber to the

plurality of exhaust ports to receive exhaust gas for feeding into the after-burning chamber; and
a second conduit connected at one end to the first conduit to receive a portion of the exhaust gas;
a fuel injection nozzle disposed in the second conduit for spraying additional fuel to form additional fuel mist within the exhaust gas therein; and
a fuel vaporizer connected to the other end of the second conduit and disposed in the after-burning chamber to distribute the additional fuel mist in the after-burning chamber for instant vaporizing.

4,033,124
ARRANGEMENT FOR DERIVING INTAKE NEGATIVE PRESSURE FROM AN INTERNAL-COMBUSTION ENGINE

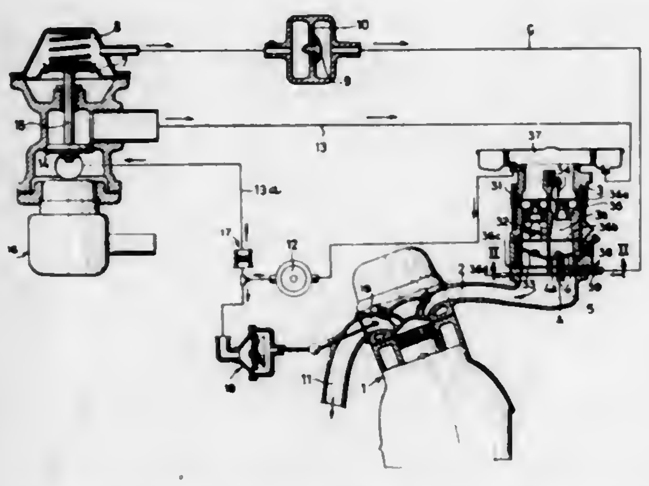
Urataro Asaka; Shuichi Yamazaki, both of Kamifukuoka; Mitsugi Niitsu, Higashikurume, and Sakuji Arai, Wako, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,938

Claims priority, application Japan, Dec. 27, 1974, 49-148904

Int. Cl.² F02B *75/10*

U.S. Cl. 60—290 **4 Claims**



1. An arrangement for deriving intake negative pressure from an internal-combustion engine, comprising a carburetor in the latter, with an intake for an air-fuel mixture, a throttle valve therein for regulating the mixture, and at least one longitudinal passage therein for guiding the mixture toward the engine; which latter also has an exhaust passage leading therefrom; wherein said throttle valve has a shaft substantially transversely disposed in one of said passages of the carburetor, the latter being fitted with at least one discharge opening in a side wall of said intake passage to derive negative pressure from said carburetor for regulating and controlling the engine operation; an insert member being interposed between a portion of said carburetor and said intake passage, and wherein a connecting tube is integrally formed in said insert member but projects therefrom, which tube is in communication with said dishcarge opening; the latter being provided downstream of said throttle valve in the flow of the mixture, in an area downstream from and sheltered by said valve shaft; whereby to avoid accumulation and discharge of condensed fuel from said carburetor to said discharge opening.

4,033,125
AIR FLOW CONTROL MEANS FOR AUTOMOBILE ENGINE EXHAUST GAS CLEANING MEANS

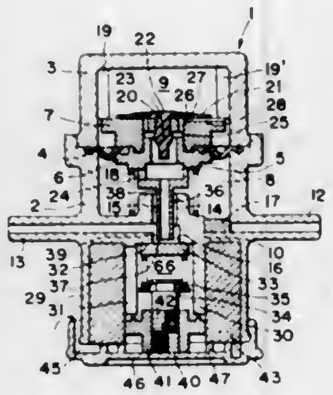
Masami Inada, Toyoake; Yasuhiro Kawabata, and Katsujiro Sato, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Sept. 18, 1975, Ser. No. 614,692

Claims priority, application Japan, Nov. 26, 1974, 49-136506

Int. Cl.² F01N *3/10*

U.S. Cl. 60—290 **2 Claims**



1. In an automobile engine utilizing an intake manifold and exhaust gas cleaning means which comprises an auxiliary air supply source for supplying auxiliary air through auxiliary air passage means and auxiliary air flow control means therein to an exhaust system of the automobile engine for effecting oxidation of unburnt constituents in engine exhaust gas, air flow control valve means for actuating said auxiliary air flow control means to permit the supply of auxiliary air flow to the exhaust gas cleaning means comprising:
a housing having chamber means therein, said housing being provided with a first inlet port communicating said chamber means with said engine intake manifold;
a second inlet port for introducing atmospheric pressure into an outlet port communicating said chamber means with said auxiliary air flow control means;
means housed in said chamber means in response to the engine intake pressure for moving from a normally unactuated position to an actuated position for interrupting the supply of said engine intake pressure from the first inlet port to the outlet port; valve means disposed between said second inlet port and said outlet port for normally closing the former;
valve actuating means for opening said normally closed valve means in response to the engine intake pressure level from said first inlet port;
said intake pressure responsive means including a diaphragm defining in said chamber means a first chamber and a second closed chamber, said first chamber being connected with said first inlet port and said outlet port;
said diaphragm carrying said valve actuating means which comprises a hollow projecting member;
said hollow projecting member being adapted to cooperate with said normally closed valve means to shift the same apart from the second inlet port when the diaphragm is deflected under the influence of the engine intake pressure; and
aperture means communicating said first chamber through the hollow interior of the projecting member with the outlet port, whereby when the projecting member engages said normally closed valve means to shift the same from the second inlet port, said communication of the first chamber with the outlet part through the hollow interior of the projecting member is interrupted and at the same time the atmospheric pressure is introduced into the outlet port from the second inlet port.

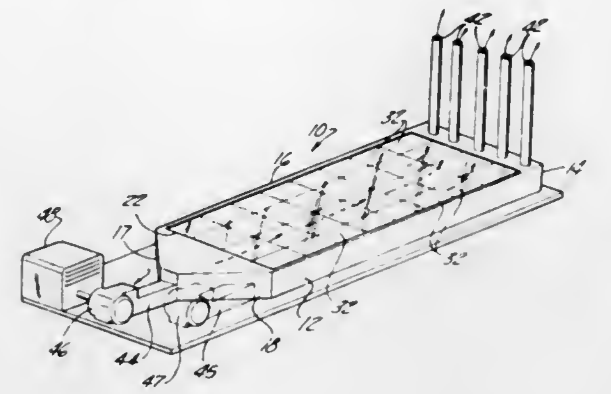
4,033,126
SOLAR ENERGY DEVICE

Elwood L. Newland, 2434 Clayward St., Flint, Mich. 48506

Filed Apr. 9, 1975, Ser. No. 566,213

Int. Cl.² F03G *7/02*

U.S. Cl. 60—398 **7 Claims**



1. Apparatus for the utilization of solar energy comprising a heat collector having an air inlet and an air outlet, an air powdered turbine coupled to the inlet so that the air passing into said inlet also passes through said turbine and at least one vertically extending exhaust stack attached to said outlet.

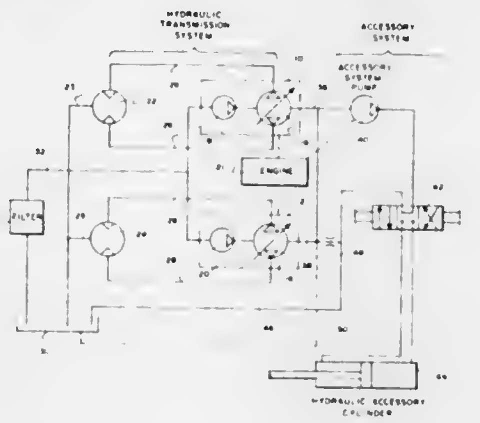
4,033,127
HYDRAULICALLY-POWDERED VEHICLE ACCESSORY SYSTEM SUPERCHARGED BY HYDRAULIC VEHICLE DRIVE SYSTEM

Jacob Amstutz, and Paul G. Amstutz, both of Canby, Oreg., assignors to Jacob Amstutz, Canby, Oreg.

Filed June 4, 1976, Ser. No. 692,949

Int. Cl.² F15B *13/06, 13/09*

U.S. Cl. 60—455 **3 Claims**



1. In a vehicle having an engine and a ground-engaging traction apparatus driven by said engine for moving said vehicle over the ground, the combination which comprises:
a. a hydraulic fluid reservoir mounted on said vehicle;
b. hydraulic transmission means mounted on said vehicle comprising hydraulic transmission motor means for driving said traction apparatus and hydraulic transmission pump means driven by said engine and hydraulically coupled with said transmission motor means for driving sayd transmission motor means, said transmission pump means having a sump line for receiving hydraulic fluid from said reservoir and discharge means for discharging hydraulic fluid from said transmission pump means;
c. a hydraulically-powered accessory system mounted on said vehicle comprising a hydraulic accessory pump separate from said transmission pump means and driven by said engine, and a hydraulically-powered accessory driven by the discharge from said accessory pump, the intake of said accessory pump being operatively coupled to said discharge means of said transmission pump means so as to receive said hydraulic fluid therefrom;
d. shunt means, operatively coupled to said discharge means of said transmission pump means in parallel relation to said intake of said accessory pump, connecting said discharge means to said reservoir for shunting to said reservoir hydraulic fluid discharged from said discharge means in excess of that received by said accessory pump; and
e. means associated with said shunt means for maintaining a superatmospheric pressure of said fluid at said intake of said accessory pump during operation of said accessory pump, said superatmospheric pressure being greater than the fluid pressure in said reservoir during said operation.

4,033,128
CONTROLS FOR A HYDRAULICALLY DRIVEN VEHICLE

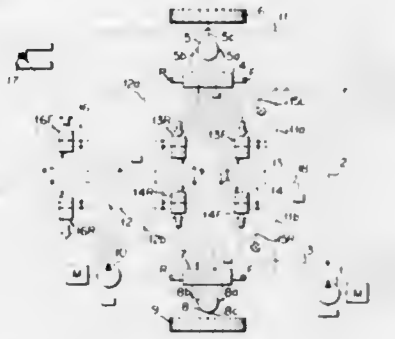
Ryozo Aoyama; Yukinobu Matsuda, and Mitsuo Urushima, all of Hirakata, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 8, 1975, Ser. No. 620,816

Claims priority, application Japan, Oct. 8, 1974, 49-120931[U]

Int. Cl.² F15B *11/16*

U.S. Cl. 60—484 **4 Claims**



1. Controls for a hydraulically driven vehicle, comprising:
a. a first hydraulic pressure source,
b. a first valve means connected in a continuous manner with said first hydraulic pressure source,
c. a pair of motors connected in a continuous manner with said first valve means,
d. a second hydraulic pressure source for a pilot circuit,
e. a second valve means for actuating said first valve means whereof one port thereof is connected in a continuous manner with said second hydraulic pressure source, and another port is connected in a continuous manner with an operating means for said first valve means, with said second valve means being connected to a tank,
f. first means for actuating said second valve means,
g. a third valve means for controlling right and left revolutions of the vehicle, said third valve means being disposed in a pilot operated circuit and held in a connected position, and
h. a second means for actuating the third valve means.

4,033,129
HYDRAULIC FEED CONTROL SYSTEM FOR ROTARY DRILL

Robert B. Hetzler, Emlenton, and Gerald L. Pierson, Franklin, both of Pa., assignors to Chicago Pneumatic Tool Company, New York, N.Y.

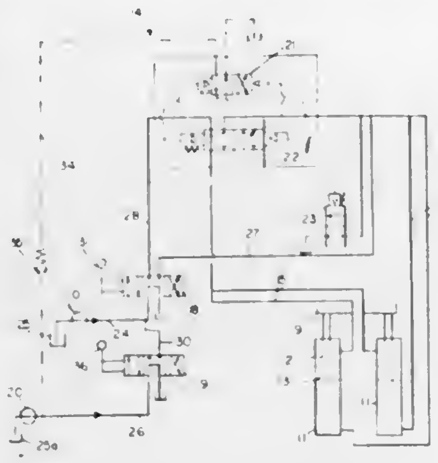
Filed June 1, 1976, Ser. No. 691,511

Int. Cl.² F15B *13/09, 15/22*

U.S. Cl. 60—486 **11 Claims**

1. An hydraulic feed control system for hydraulically feeding and retracting a rotary rock drill relative to the work, comprising an hydraulic piston cylinder selectively operable for feeding or retracting the drill, and hydraulic circuit con-

nected to opposite ends of the cylinder for applying fluid to a selected end of the cylinder and simultaneously draining fluid from the opposite end to a sump, an hydraulic feed pump connected for pumping fluid from the sump, a manipulative primary control valve having an inlet connection with a discharge end of the pump and having a discharge connection for admitting fluid from the pump to the circuit, the control valve being selectively operable for determining the end of the cylinder to which fluid from the pump is to be applied, pilot operable directional valve means in the circuit having response to fluid admitted to the circuit in accordance with a selected operation of the control valve to direct the fluid to the selected end of the cylinder to which it is to be applied and to direct fluid from the opposite end of the cylinder back to sump.



4,033,130

HEATING DEVICE COMPRISING A HEAT ACCUMULATOR

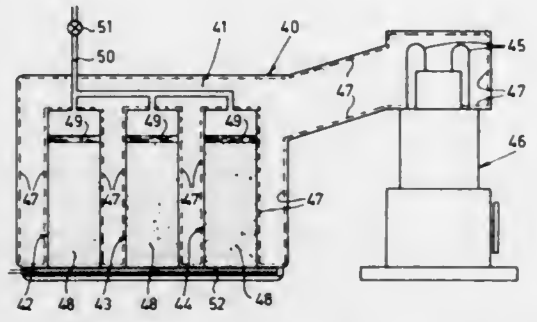
Matthias Leonardus Hermans, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 571,405, April 24, 1975, abandoned. This application June 18, 1976, Ser. No. 697,358

Claims priority, application Netherlands, May 3, 1974, 7405947

Int. Cl.² F28D *15/00;* **F03G** *7/06*

U.S. Cl. 60—523 **14 Claims**



4. In a heating system operable in a selected temperature range, including a first container which is a heat pipe formed by walls having inner surfaces which define a first closed space, and within said space a second container formed by walls having outer surfaces, and also having inner surfaces which define a second closed space containing a quantity of heat-accumulating material, and said heating system further including means for heating said heat-accumulating material, and in said first space a quantity of heat transport medium that cycles in the operating temperature range of the system, between vapor and liquid states, and continuous capillary material on and communicating between said inner and outer wall surfaces, the improvement in combination therewith comprising in said second space a quantity of pressure-equalizing vaporizable liquid which has in the operating temperature range of said heating system, vapor pressure characteristics generally similar to those of said heat-transport medium, whereby the vapor pressure in said first and second spaces is, in said operating temperature range, generally the same.

4,033,131

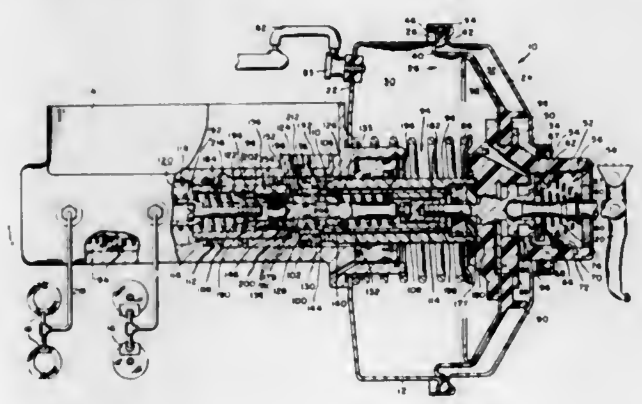
TWO STAGE SERVOMOTOR

Delbert J. Gardner, South Bend, Ind., assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 8, 1975, Ser. No. 611,288

Int. Cl.² B60T *13/20*

U.S. Cl. 60—553 **7 Claims**



1. In a power brake apparatus having a servomotor with a control means for transferring an output force of a wall means from a first piston means to a concentric second piston means to produce an additional operational force to activate the wheel brakes in a vehicle in response to an operator input force, said control means comprising:

- a housing having a first diameter bore and a second diameter bore therein, said first piston means being located in said first diameter bore to establish a first pressurizing chamber and a relief chamber therewith, said second piston means being concentrically located in the first piston means and extending into said second diameter bore to establish a second pressurizing chamber therewith;
- said second piston means having an axial passageway therethrough;
- sleeve means located in said axial passageway having a first radial bore therein;
- stop means connected to said second piston means for retaining said sleeve means in said axial passageway;
- resilient means located in said axial passageway for urging said sleeve means toward said stop means; and
- actuator means having a cylindrical body concentric to said sleeve means with a second radial bore therein, the first pressurizing chamber being connected with said axial passageway through said first and second radial bore body said cylindrical having a groove therein in communication with said relief chamber said actuator means intially operating said servomotor to allow said wall means to simultaneously move said first and second piston means in said first and second diameter bores to establish a first pressurizing force for activating said wheel brakes; a face on said sleeve means, a first seal means mounted adjacent said sleeve means, said first pressurizing force acting on said face to move said first radial bore away from the second radial bore by overcoming said resilient means, the first seal means interrupting communication-through said first and second radial bores; said actuator means thereafter moving said groove into communication with said first radial bore to allow fluid in said first pressurizing chamber to escape through said first radial bore and said groove into the relief chamber and permit said wall means to move said second piston means in said second diameter to develop said additional operational force.

4,033,132

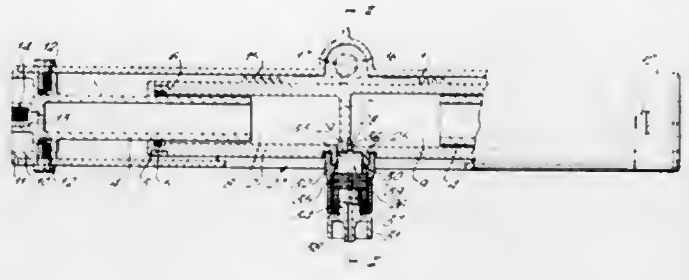
POSITION-TRANSMITTING EQUIPMENT

Anthony Victor Norton Priest, Harpenden, and Murray Arnold Schorr, Bletchley, both of England, assignors to Alfred Walter Barker, Guernsey, Channel Islands

Filed Aug. 4, 1975, Ser. No. 601,407

Int. Cl.² F15B *7/10, 7/08*

U.S. Cl. 60—572 **11 Claims**



1. Position-transmitting apparatus comprising:
A. a transmitter unit including
a. a housing having two ends,
b. a cylinder and
c. means for moving the cylinder axially within the housing in accordance with position information to be transmitted,
d. a transverse partition fixedly secured to and dividing said cylinder into two working chambers,
e. an individual tubular plunger fixed to each end of said housing and having sealing telescopic relationship to said cylinder so that axial movement of the cylinder with respect to the housing causes relative displacement of said plungers and the cylinder to effect differential adjustment of the volumes of said working chambers; and
B. a receiver unit including a double-acting hydraulic actuator having working chambers adapted for connection via said plungers to the working chambers of the cylinder of said transmission unit, thereby to respond to adjustment of said cylinder within said housing.

4,033,133

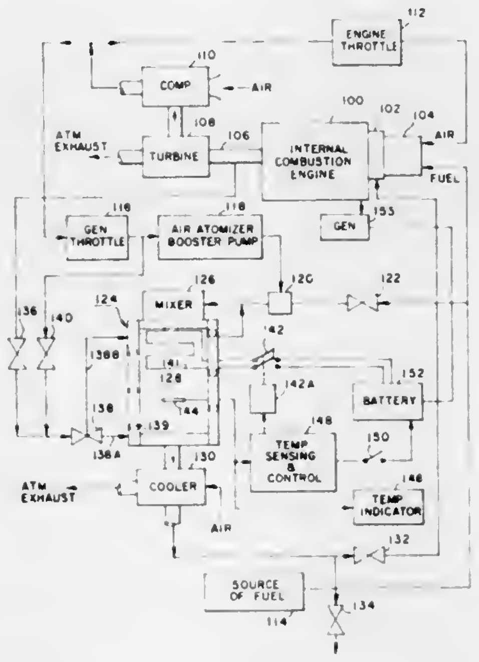
START UP SYSTEM FOR HYDROGEN GENERATOR USED WITH AN INTERNAL COMBUSTION ENGINE

John Houseman, Pasadena, and Donald J. Cerini, Flintridge, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Mar. 22, 1976, Ser. No. 668,783

Int. Cl.² F02B *33/44*

U.S. Cl. 60—606 **9 Claims**



1. In combination, an internal combustion engine, which produces hot exhaust gas when operative, and a hydrogen product gas generator,
- said internal combustion engine having means for applying an air/fuel mixture to said engine, and means attached to the engine for producing air under pressure,
- said hydrogen product gas generator including
- first walls defining a hollow chamber, said chamber having an input end, an output end, and a center portion,
- a catalytic bed positioned in said center portion,
- second walls forming a spiral passageway around said first walls, said spiral passageway having an input end and an output end,
- fuel atomizer means having a fuel input, an atomizing air input, a vaporizing air input and output,
- air/fuel mixer means having a first input connected to said fuel atomizer output, a second input adjacent sid first input connected to said spiral passageway output end, and an output connecting to said hollow chamber input end,
- first valve means having one position for permitting hot exhaust gas to be applied from said engine to said spiral passageway input end to thereby heat the enclosed catalytic bed to an operating temperature, and a second position for blocking further gas application,
- means defining a source of liquid hydrocarbon fuel,
- second valve means having one position for applying fuel from said source to said fuel atomizer means fuel input and a second position for blocking said fuel input,
- means for applying air from said means attached to the engine to said fuel atomizer means atomizing air input for atomizing fuel applied to said fuel atomizer means,
- third valve means having a first position for applying air from said means attached to the engine to said spiral passageway input end and a second position for terminating the application of air, and
- fourth valve means having a first position for connecting said hollow chamber output end to said means for applying an air/fuel mixture to said engine, and a second position for venting the hollow chamber output to the atmosphere whereby following engine start up, said first valve means is placed in its first position, said second, third and fourth valve means are placed in their second positions, thereby hot engine exhaust gas can heat said catalytic bed up to its operating temperature and then be exhausted to the atmosphere, and upon the catalytic bed reaching its operating temperature, said first valve means is placed in its second position and said second, third and fourth valve means are placed in their first positions whereby vaporized hydrocarbon fuel and air are applied to said catalytic bed to produce a hydrogen rich product gas which is applied to said engine.

4,033,134

HEAT ENGINE

Arthur P. Bentley, P.O. Box 327, Ulm, Mont. 59485

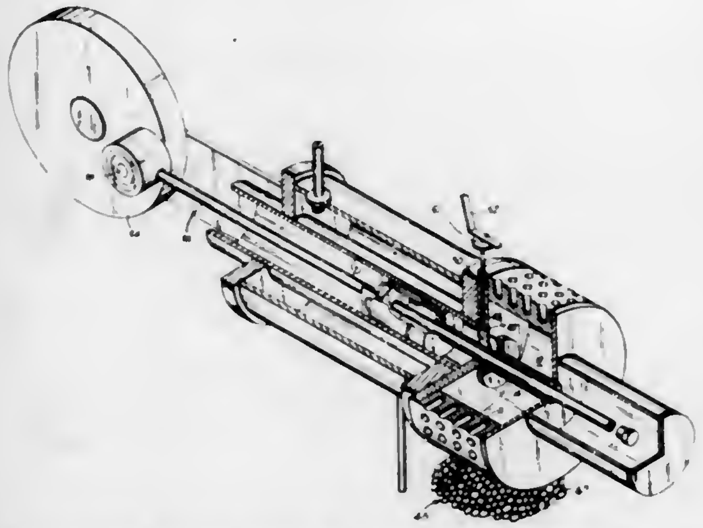
Filed June 11, 1976, Ser. No. 695,062

Int. Cl.² F03G *7/02;* **F02G** *1/04*

U.S. Cl. 60—641 **10 Claims**

1. In a heat engine in which air constitutes the fluid medium,
a. a heat chamber defined by a metallic heat ring, a first end wall of heat insulating material formed with a central opening, and a second end wall having a central opening coaxial with the opening in the first end wall;
b. a closed cylindrical extension mounted on said second end wall about the opening therein and extending away from said heat chamber;
c. a cylinder mounted on said first end wall about the opening therein, extending away from said first end wall and having an open end;
d. a cooling jacket about said cylinder and having a liquid inlet and a liquid outlet;

e. a piston reciprocal in said cylinder and having outer and inner ends;
f. a connecting rod having one end pivoted to the outer end of said piston and extending through the open end of said cylinder;
g. a fly wheel to which the other end of said connecting rod is pivotally connected;
h. a piston rod secured to the inner end of said piston and extending through the opening in the first end wall, the heat chamber, the opening in the second end wall and into said extension;
i. a valve in said heat chamber having a bore slideably receiving said piston end and moveable into a position closing the opening in the first end wall;



j. cooperating elements of a first dash pot on the inner end of said piston and said valve which are effective on an inward stroke of the piston to cushion impact of the piston with said valve and finally cause the valve to pop into a position clearing the opening in said first end wall;
k. cooperating elements of a second dash pot on said valve and said piston rod at the end thereof remote from said heat chamber;
l. a throttle passage in said first end wall communicating between said heat chamber and said cylinder; and
m. adjustable means for varying the effective area of said passage.

4,033,135
PLANT AND PROCESS FOR VAPORIZING AND HEATING LIQUID NATURAL GAS

Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Jan. 29, 1976, Ser. No. 653,594

Claims priority, application Switzerland, Feb. 7, 1975, 8943/75; July 9, 1975, 8943/75

Int. Cl.^{2} F01K *23/10*

U.S. Cl. 60—648 **12 Claims**

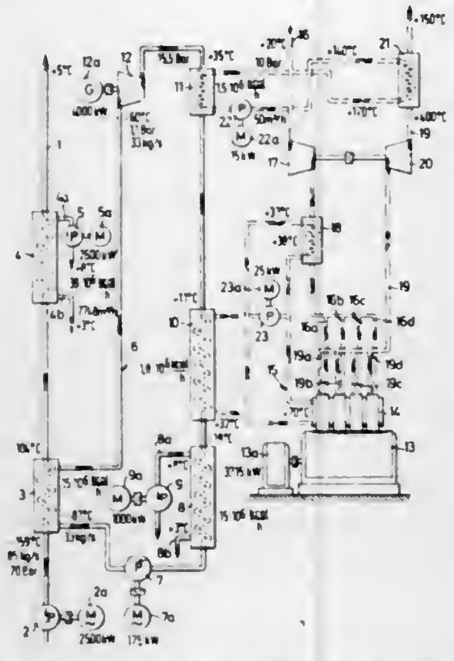
1. A plant for vaporizing and heating liquid natural gas comprising

means defining a predetermined flow path for a flow of liquid natural gas;

means in said flow path to place the flow of liquid natural gas in heat exchange relation with a first heating agent;

a circuit for a second heating agent including at least one heat exchanger for placing the second heating agent in heat exchange relation with the flow of liquid natural gas, a pump for pumping the second heating agent through said circuit, at least two secondary heat exchangers for heating of the second heating agent, and a turbine for expansion of the heated second heating agent to perform work;

a diesel engine plant including an air intake means, an exhaust gas outlet means and a coolant circuit for passing a coolant through said diesel engine plant and said air intake means, said coolant circuit being connected to one of said secondary heat exchangers of said second heating agent circuit in heat exchange relation with the second heating agent for heating of the second heating agent and



said exhaust gas outlet means being connected with the other of said secondary heat exchangers in heat exchange relation with the second heating agent for heating of the second heating agent.

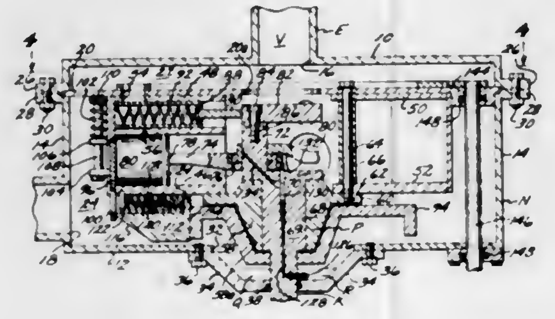
4,033,136
VAPOR ACTUATED POWER GENERATING DEVICE

Robert C. Stewart, Rte. 5, Box 374, Spokane, Wash. 99200

Filed Nov. 20, 1975, Ser. No. 633,679

Int. Cl.^{2} F01K *25/00*

U.S. Cl. 60—671 **7 Claims**



1. In combination with a first device for generating heat that transforms a low boiling point liquid into vapor under pressure that is discharged therefrom; a second device that receives said vapor and cools the same to return to the liquid state; a third device which receives said liquid from said second device and returns said liquid to said first device, a power generating device that receives pressurized vapor from said first device and discharges said vapor at reduced pressure to said second device, said power generating device including:
a. a housing assembly that includes a partition that divides the interior of said housing assembly into a first and a second compartment, said first compartment at all times in communication with said first device to receive said vapor under pressure therefrom, and said second compartment in communication with said second device;
b. a cylinder defining assembly disposed in a fixed position in said housing assembly, said cylinder defining assembly including a plurality of circumferentially spaced, radially extending first cylinders, said first cylinders having first open inwardly disposed ends in communication with said first compartment and second outwardly disposed open ends in communication with said second compartment;

c. a power output shaft rotatably supported in said housing assembly and extending outwardly therefrom;
d. a plurality of first pistons slidably and sealingly mounted in said first cylinders, said pistons having first and second ends, said first ends in communication with said first compartment and at all times exposed to said vapor under pressure;
e. a plurality of piston rods having first and second ends, said second ends pivotally connected to said first pistons;
f. eccentric means that rotate concurrently with said power output shaft, with said eccentric means pivotally engaged by said first ends of said piston rods;
g. a plurality of passage means that provide communication between said first compartment and each of said cylinders adjacent said second end of the latter;
h. a plurality of first independently movable means for closing said second ends of said cylinders;
i. a plurality of second independently movable means for closing said passage means;
j. first means actuated by the rotation of said power output shaft for sequentially moving each of said first movable means to an open position when said piston associated therewith has moved to the innermost position and so maintaining said first means as vapor under pressure in said first compartment forces said piston outwardly to the outermost position thereof, with said first means sequentially closing each of said second ends of said cylinders after said piston associated therewith has moved to said outermost position, and each of said pistons as it moves from said innermost to said outermost position by vapor under pressure in said first compartment causing said power output shaft to rotate due to the differential in vapor pressure on said first and second ends of said pistons; and
k. second means actuated by the rotation of said power output shaft to sequentially maintain each of said second movable means in an open position as said piston associated therewith moves from an outermost to an innermost position to permit said vapor in communication with said first and second ends of said piston to be at substantially equal pressure to minimize the energy required to move said piston from said outermost to said innermost position and said second means sequentially closing each of said passage means as said piston associated therewith starts to move from said outermost to said innermost position.

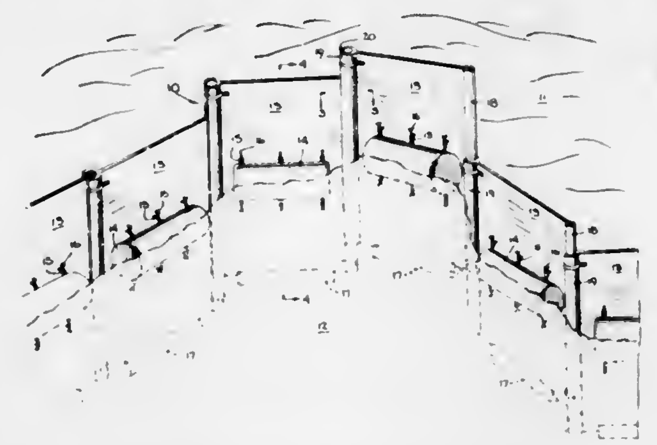
4,033,137
ARTICULATED FLOATING BARRIER

James J. Geist, 31 Tilton St., New Haven, Conn. 06511

Filed July 12, 1973, Ser. No. 378,419

Int. Cl.^{2} E02B *15/04*

U.S. Cl. 61—1 F **5 Claims**



1. An articulated floating barrier for containing oil or other debris on the surface of a body of water comprising:

a plurality of buoyant sections, each section being substantially rectangular in profile and having a top, a bottom, and two ends and having its center of buoyancy located above its center of gravity so that the section will float stably upright in a body of water with its top and bottom substantially horizontal and its ends substantially vertical and

sliding seal means attached to adjacent ends of adjacent sections for sealingly connecting the adjacent sections end to end while allowing relative vertical sliding motion between the sections in response to wave-created differential buoyant forces acting on the adjacent sections, wherein the sliding seal connecting means comprising:

a vertical disposed slide member sealingly attached to one end of one section and

a mating slotted member sealingly attached to the adjacent end of the adjacent section, the slotted member being open ended and slidably engaging the slide member to permit relative vertical sliding movement of the slide member beyond each end of the slotted member as a result of wave-created differential buoyant forces acting on the adjacent sections.

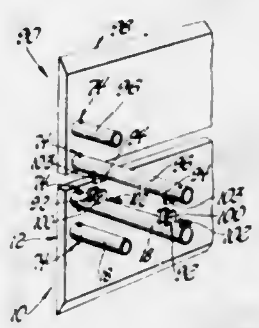
4,033,138
TRENCH SHORING ASSEMBLY WITH STACKING ACCESSORY

James L. Griswold, 513 Morningside Drive, Battle Creek, Mich. 49015

Filed Feb. 9, 1976, Ser. No. 656,150

Int. Cl.^{2} E21D *5/00*

U.S. Cl. 61—41 A **5 Claims**



1. A trench shoring assembly of the type including a pair of interconnected spaced wall means, said assembly comprising: connecting means for interconnecting the spaced wall means, said connecting means having ends adapted for attachment to the spaced wall means, and lug means extending transversely from said connecting means and spaced from said wall means along the length thereof for juxtaposed disposition and attachment to mating lug means extending from similar connecting means associated with a second pair of spaced wall means for interconnecting vertically stacked sets of spaced wall means.

4,033,139
PILE DRIVING HAMMER, APPARATUS AND METHOD

Leonard L. Frederick, 15 Crestview Terrace, Whippany, N.J. 07981

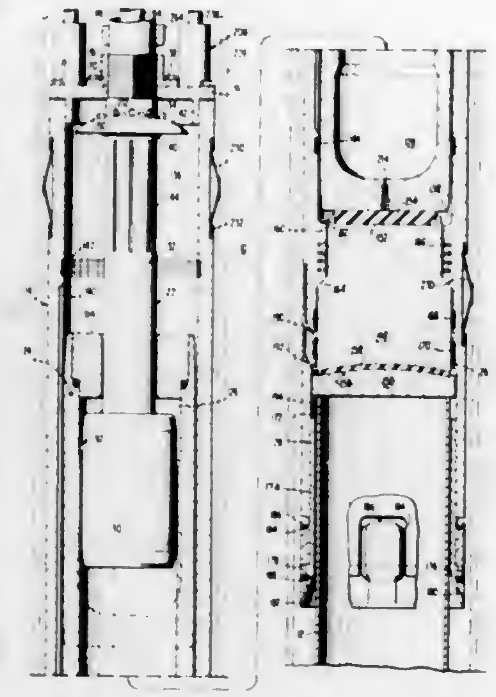
Division of Ser. No. 440,861, Feb. 8, 1974, Pat. No. 3,927,722. This application Aug. 28, 1975, Ser. No. 608,568

Int. Cl.^{2} E02D *7/10*

U.S. Cl. 61—53.5 **26 Claims**

1. An apparatus for driving a pile from an offshore installation, the installation including a structure having at least one conveyor means which extends below the surface of the water, the conveyor means defining a passage therethrough for the reception of a pile member to be driven, the apparatus comprising:
a. a pile driving hammer including an elongated housing member, means mounted to said housing for guiding said hammer within the passage of said conveyor means and retaining the alignment of said hammer with respect to said conveyor means, anvil means which engage the pile member to be driven, and a pocket formed by the housing

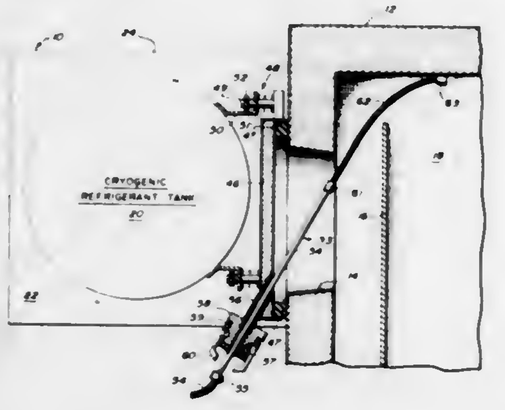
member and the anvil means in the area of engagement of the pile member and said anvil means into which a pressurized fluid is fed thereby displacing any water from the vicinity of engagement of the anvil means with the pile member to be driven;



b. a support structure mounted to said hammer for suspending said hammer throughout the span of its operation; and
c. means suspending said support structure throughout the span of operation of said hammer.

4,033,140
REFRIGERATION SYSTEM FOR SHIPPING CONTAINER

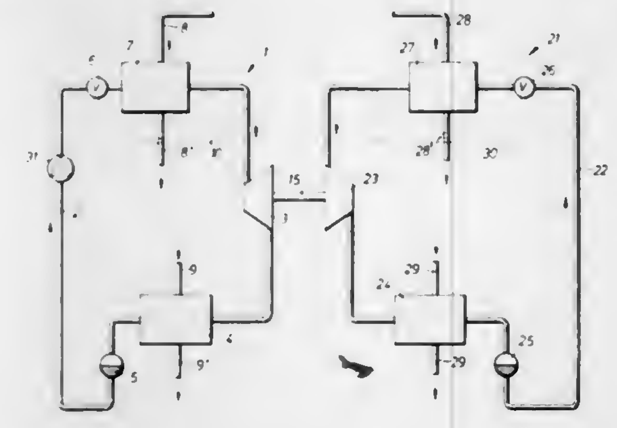
David J. Klee, and Jack H. Godtfring, both of Emmaus, Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Apr. 2, 1976, Ser. No. 673,336
Int. Cl.² F25B *41/04*
U.S. Cl. 62—223 **9 Claims**



1. A cryogenic refrigeration system, for detachable mounting on a shipping container having a porthole, comprising,
a. a cryogenic refrigerant storage tank,
b. support means including locking assemblies for detachably securing said storage tank to said container externally of the porthole,
c. a porthole cover permanently attached to and carried by said refrigeration system, said cover being positioned relative to said locking assemblies such as to automatically cover the porthole when said refrigeration system is mounted on the shipping container by said locking assemblies,
d. a refrigerant injection tube supported by said porthole cover and positioned at an angle relative to the vertical plane of said cover such as to pass through said porthole and having a length such as to terminate adjacent the upper, internal wall of the shipping container, said injection tube being connected by a refrigerant line to said refrigerant tank,
e. a temperature sensor for sensing the temperature in said container, said temperature sensor being connected to one end of a signal line,
f. a temperature controller connected to the opposite end of said signal line,
g. a refrigerant flow control valve in said refrigerant line intermediate said refrigerant tank and said injection tube,
h. a valve actuator connected to said refrigerant flow control valve, and
i. a signal line connected from said temperature controller to said valve actuator for controlling the flow of cryogenic refrigerant as a function of the temperature sensed in the container by said temperature sensor.

4,033,141
METHOD FOR THERMAL RUNNING OF A HEAT PUMP PLANT AND PLANT FOR CARRYING OUT THE METHOD

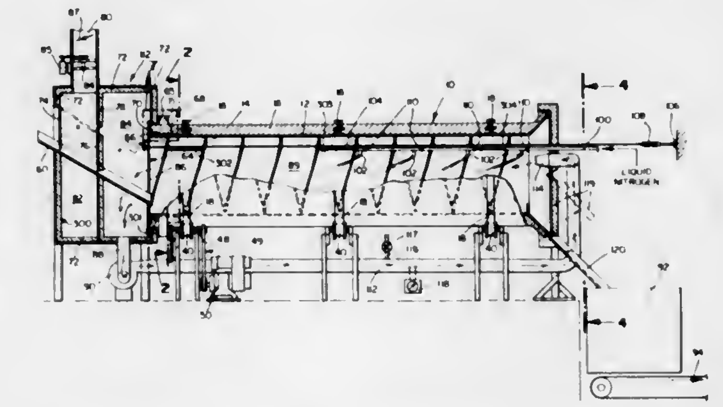
Berth Ulrik Gustafsson, Osterskar, Sweden, assignor to Projectus Industriprodukter AB, Stockholm, Sweden
Filed Aug. 27, 1975, Ser. No. 608,225
Claims priority, application Sweden, Sept. 5, 1974, 7411260
Int. Cl.² F25B *27/02*
U.S. Cl. 62—238 **16 Claims**



1. Method for thermal running of heat pump plant, characterized by
a. transferring heat in a first circuit by means of indirect heat-exchange from a first fluid medium from another source separate from the first circuit, at a first inlet temperature to a refrigerant flowing in the first circuit to vaporize the refrigerant,
b. driving an expansion motor by means of the vaporised refrigerant,
c. after the motor, condensing the refrigerant in a condenser by means of heat-exchange with a fluid coolant, and then recirculating the refrigerant for heat-exchange with the first medium,
d. transferring heat in a second circuit by means of heat-exchange from a fluid second medium from another source separate from the second circuit at a second inlet temperature to a refrigerant flowing in the second circuit to vaporize the refrigerant,
e. compressing the vaporized refrigerant of the second circuit by means of a compressor,
f. driving the compressor by means of the expansion motor in the first circuit, and
g. heating a third fluid medium to an outlet temperature higher than both the first inlet temperature of the first medium and the second inlet temperature of the second medium in a condenser in the second circuit by means of heat-exchange with the compressed vapour of the refrigerant of the second circuit, which after condensation in said condenser is recirculated for heat-exchange with the second medium.

4,033,142
APPARATUS FOR REFRIGERATING MATERIALS

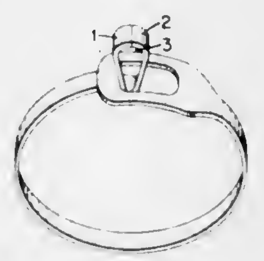
John B. Schorsch, Rydal; William E. Graul, Drexel Hill, both of Pa., and David Barash, Ridgefield, Conn., assignors to Union Corporation, Verona, Pa.
Continuation of Ser. No. 365,117, May 30, 1973, Pat. No. 3,906,743. This application June 17, 1975, Ser. No. 587,546
The portion of the term of this patent subsequent to Sept. 23, 1992, has been disclaimed.
Int. Cl.² F25D *25/02*
U.S. Cl. 62—381 **16 Claims**



1. A refrigeration means, comprising:
a. a rotatable drum having means to receive and to discharge material; said drum having an interior configuration which further comprises transport means for advancing the material longitudinally within said drum upon rotation of the drum; and wherein the drum is supported for rotation on a plurality of rings, said rings having, as part thereof, insulated force-transmitting members;
b. rotation means engaging said drum for rotating said drum; and
c. refrigeration means within said drum to refrigerate said material while it is within said drum.

4,033,143
CLIP RING

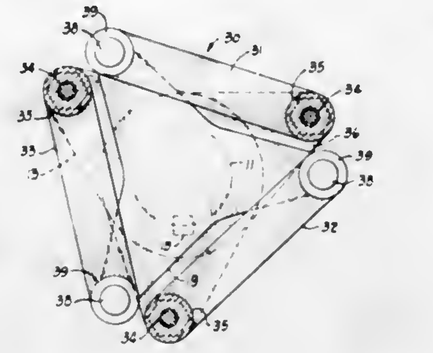
Doreen Elizabeth Michael, 4115 208th St., Langley, British Columbia, Canada (V3A 2H3)
Filed Feb. 11, 1976, Ser. No. 657,214
Int. Cl.² A44C *25/00;* **A44B** *13/02*
U.S. Cl. 63—2 **5 Claims**



1. Piece of jewelry formed from a resilient, single piece of material and having overlapping inner and outer ends; an opening adjacent but spaced from the extremities of the outer end; a prong attached to that part of the rim of the opening adjacent the extremity of the outer end; a radially oriented part of the inner end extending through said opening to abut said prong to maintain a predetermined shape for the ring.

4,033,144
FLEXIBLE COUPLING

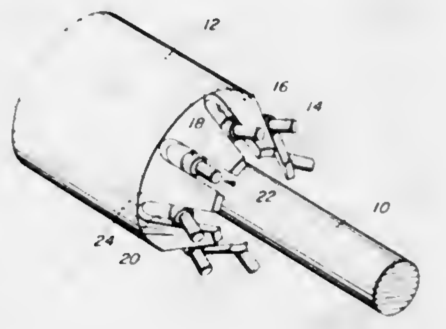
Clifford H. Allen, 13109 Westchester Trail, Chesterland, Ohio 44026
Filed Feb. 18, 1976, Ser. No. 659,129
Int. Cl.² F16D *3/62*
U.S. Cl. 64—12 **10 Claims**



1. A flexible coupling for connecting a rotary drive to a rotary load and for accommodating axial misalignment between said drive and load comprising:
an input hub on said rotary drive,
an output hub on said rotary load,
an intermediate member located between said hubs,
a tripodic connection assembly between said input hub and said intermediate member, and
a tripodic connection assembly between said intermediate member and said output hub,
said tripodic connection assemblies each comprising three linking elements generally arranged in triangular form in a plane perpendicular to the respective hub axis and connected at rigid connections to said intermediate member at one end and to the respective hub at the other end, said connections for corresponding ends being at symmetrically spaced locations around a circumscribing circle,
said linking elements being adapted to flex intermediate their ends to accommodate misalignment between the respective axes of said hubs, the flexing stresses consisting essentially of bending and torsion.

4,033,145
CONSTANT ANGULAR VELOCITY JOINT

John C. Warner, Ithaca, N.Y., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Dec. 5, 1975, Ser. No. 637,901
Int. Cl.² F16D *3/30*
U.S. Cl. 64—21 **23 Claims**



1. A universal joint for the transmission of rotational movements between two shafts; comprising:
a first driving member rigidly associated with one of said two shafts;
a pivot means rigidly fixed to said first driving member;
said pivot means extending obliquely to said first driving member and generally extending in a direction to overlie said first driving member;

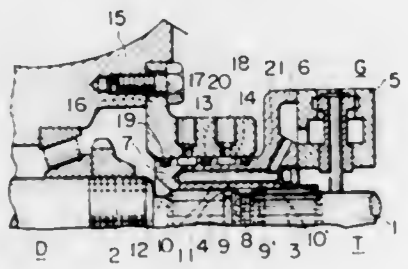
a second driving member rigidly associated with the other of said two shafts;

said second driving member having a cavity and grove means intersecting the cavity, said grove means corresponding in number and spacing to said pivot means, each grove means receiving a pivot means and said cavity receiving a part of said first driving member whereby said first driving member pivots about a point located in said cavity on the logitudinal axis of said second driving member and said pivot means move relative to said second driving member and in their respective grooves when the logitudinal axes of said driving member are angularly arranged with respect to one another.

4,033,146

GOVERNOR SUPPORTING MEMBER AND COUPLING MEANS

Kojiro Kuramochi, and Yutaka Taga, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed Mar. 2, 1976, Ser. No. 663,051
Claims priority, application Japan, Dec. 5, 1975, 50-143866
Int. Cl.² F16D *3/06*
U.S. Cl. 64—23 **5 Claims**



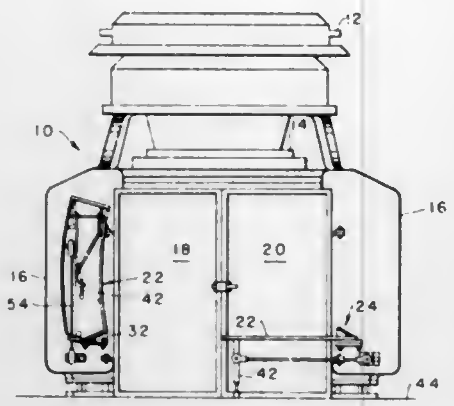
1. A governor supporting assembly serving as coupling means between a pair of shafts for mounting a governor to rotate jointly with one of said shafts comprising a governor housing having secured thereto a cylindrical extension member arranged for engagement around portions of both said shafts, external axially extending splines formed on said portions of both said shafts, internal axially extending splines formed in said cylindrical extension member in meshing engagement with said external splines of said portions of both said shafts and retaining means in engagement between said cylindrical extension member and either one of said shafts for preventing axial movement therebetween while permitting axial movement between said cylindrical extension member and the other of said shafts.

4,033,147

CIRCULAR KNITTING MACHINE WITH PIVOTALLY MOUNTED ACCESS PLATFORM

Herbert Ray King, Spartanburg, S.C., assignor to Milliken Research Corporation, Spartanburg, S.C.
Filed May 5, 1975, Ser. No. 574,502
Int. Cl.² D04B *9/00*
U.S. Cl. 66—8 **1 Claim**

1. A circular knitting machine having a frame and a means to produce a circular knitted fabric comprising: means mounting a platform to allowing said platform to be moved to positions substantially both perpendicular or parallel to the vertical centerline of said machine, said means including hinge means to allow said platform to be pivoted about the hinge both outwardly and vertically upward adjacent said frame,

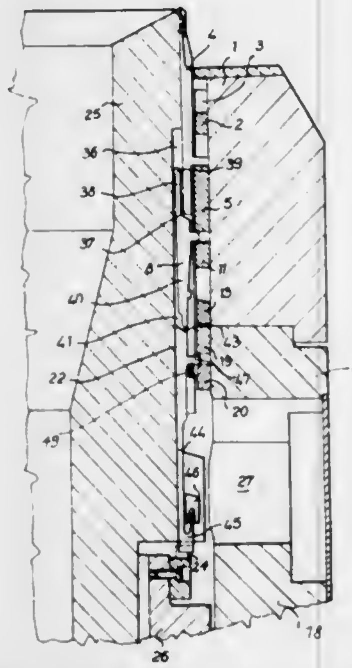


said hinge means being mounted at an acute angle to said platform and to said frame.

4,033,148

NEEDLE SELECTING DEVICE

Vladimir Mureso, Brno, Czechoslovakia, assignor to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi of Czechoslovakia, Brno, Czechoslovakia
Filed Aug. 8, 1975, Ser. No. 603,016
Int. Cl.² D04B *15/78*
U.S. Cl. 66—50 R **5 Claims**



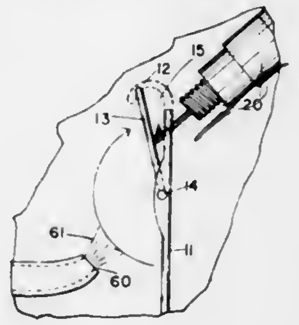
1. In a knitting machine having a support, a needle bed, the needle bed and support being mounted for relative rotation, a plurality of grooves disposed in spaced relation in the needle bed to form needle tricks, a needle slidably mounted in the upper portion of each groove, an elongated slider movably mounted in each groove below the needle and having a recessed upper end adapted for overlying cooperation with the lower end of the needle, an elongated selector slidably mounted in the groove below the portion of the slider, the improvement which comprises a needle selecting device wherein an energizable selecting magnet means and a permanant magnet means are fixedly associated with the support for engagement with means on one side of the lower portion of the selector, and cam means fixedly associated with the support and cooperable with the bottom surface of the lower portion of the selector for actuating the selector to engage the lower end of the slider when the selecting magnet means is energized, wherein the upper portion of the selector is restrained from radial movement in the groove; wherein the central portion of the selector is made resilient whereby the other side of the lower end of the selector may be acted upon

by said cam means, not withstanding the radial movement towards the permanent magnet means; wherein the upper end of the slider is confined between the bottom of the associated groove and the bottom portion of the overlying needle to define a fulcrum on the upper portion of the slider; and wherein the upper portion of the selector and the lower portion of the slider have cooperating camming surfaces whereby an upward movement of the selector along the groove causes a pivot of the lower portion of the slider about said fulcrum.

4,033,149

LATCH CLOSER IN COMBINATION WITH A CLOSED LATCH DETECTOR

Angel C. Avalle, Pomona, Calif., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Filed July 26, 1976, Ser. No. 708,908
Int. Cl.² D04B *35/18*
U.S. Cl. 66—111 **2 Claims**



1. A unit attachable to a knitting machine for the purpose of rotating the open latch of a knitting needle with a broken hook which had been previously controlled to form a tuck stitch to a closed position so as to trigger sensing equipment of the machine that is set to detect a latch in the closed position,

said unit in the form of a mount to which an air nozzle is fixed, said nozzle fitted with means to attach to a supply of pressurized air, and said nozzle shaped to blow air axially along said knitting needle of the machine towards the hook end of the said needle to close said latch before it passes said sensing equipment,

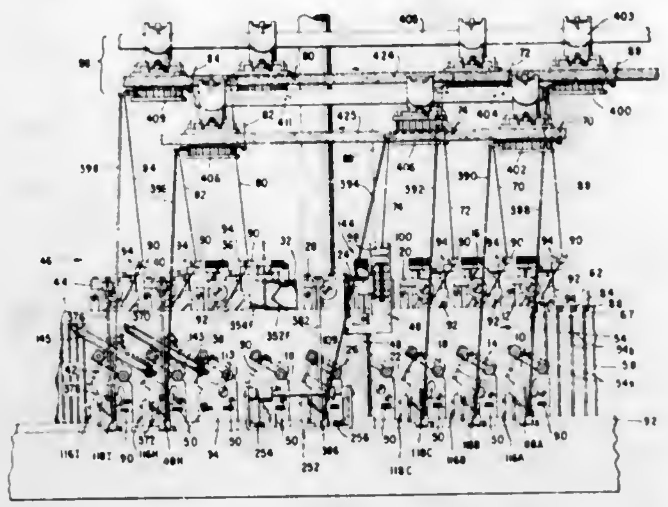
said mount fitted with means to attach to said machine.

4,033,150

CIRCULAR KNITTING MACHINE FOR PRODUCING DETACHABLE STRIPS OF KNITTED FABRIC

Lester Mishcon, Miami Beach, Fla., and John Christopoulos, Brentwood, N.Y., assignors to The Singer Company, New York, N.Y.
Continuation of Ser. No. 564,020, April 1, 1975, abandoned. This application Nov. 10, 1976, Ser. No. 740,513
Int. Cl.² D04B *15/58*
U.S. Cl. 66—138 **5 Claims**

1. In a cylinder and dial circular knitting machine for producing detachable strips of knitted fabric, the combination comprising a striping box; needle actuating camming at the striping box, and the striping box being selectively operable to feed yarn or draw thread to cylinder needles at the striping box associated camming; needle actuating cylinder and dial camming on each side of the striping box including adjustble cams movable between positions in which engaging needles are caused to perfom a knitting operation and positions in which needles are caused to weld; control means for positioning the adjustable cams, for causing the striping box to feed yarn when the adjustable cams are disposed to cause needles to perform a knitting operation, and for causing the striping box to feed draw thread when the adjustable cams are disposed to cause needles to welt; means for positively feeding yarns to needles at the adjustable cams and striping box when the positions of the adjustable cams is such as to cause needles to knit and the striping box is feeding yarn; and means for disengaging the yarns from the positive feed means when the

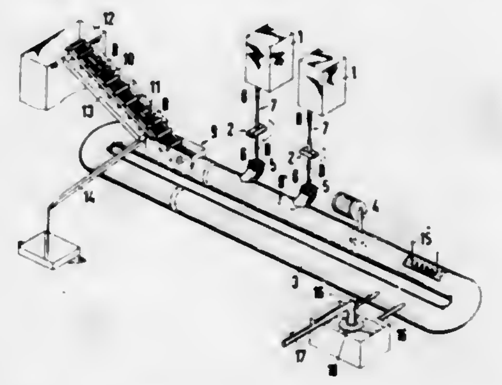


adjustable cams are moved to cause needles to welt and the striping box to feed draw thread.

4,033,151

LIQUID SEPARATION OF SOCK STRING

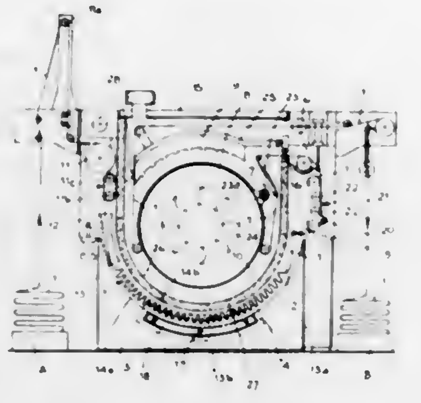
Josephus Johannes Maria Jansen, Schijndel, Netherlands, assignor to Koninklijke Textielfabrieken, Schijndel (N.B.), Netherlands
Filed May 19, 1975, Ser. No. 578,396
Claims priority, application Netherlands, May 21, 1974, 7406824
Int. Cl.² D04B *35/00*
U.S. Cl. 66—147 **5 Claims**



1. In apparatus for knitting socks comprising a circular knitting machine having a knitting cylinder on which socks can be knitted and courses of a soluble yarn can be knitted between the toe portion of each sock knit and the welt portion of each subsequently knit sock to produce a continuous string of such socks, and means for drawing the string of socks rotatingly downwardly out of the knitting cylinder, the improvement which comprises a conduit defining a closed flow course, a liquid in said conduit, means for circulating said liquid in said conduit, said conduit having entrance means through which said string of socks can be passed to introduce same into said liquid for dissolving said soluble yarn and thereby separating the socks one from another, and means communicating with said conduit for removing socks from said liquid.

4,033,152
APPARATUS FOR WASHING AND SUBSEQUENT DRYING OF BOLTS OF FABRICS

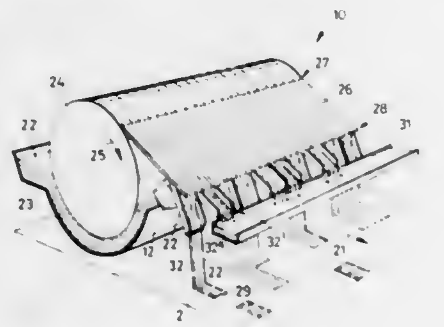
Bruno Marchesini, Trissino, and Fernando Martini, Piovene Rocchette, both of Italy, assignors to Rimar Meccanica S.p.A., Carpenedolo, Italy
Filed Mar. 3, 1976, Ser. No. 663,490
Claims priority, application Italy, Mar. 7, 1975, 21028/75
Int. Cl.² D06B *3/20, 21/02*
U.S. Cl. 68—19.1 **7 Claims**



1. Apparatus for washing and subsequently drying bolts of fabrics, which comprises: means for continuously delivering a fabric; a fixed basket for receiving said fabric and having outer and inner walls substantially semicylindrical and coaxial to each other; said outer wall being partially perforated; agitating means positioned in juxtaposition with said perforations and having a plurality of mobile paddles thereon; a chamber defined in part by said outer wall and containing said agitating means, and having side walls and bottom wall and being defined by said side walls, said bottom wall and said outer wall; said chamber serving to contain a liquid solvent therein; a perforated, rotatable drum coaxially mounted with respect to said inner and outer walls of said basket and having a diameter smaller than the diameter of said inner wall; means for forcing hot air through said perforated drum in a closed fluid circuit; and guiding means to guide said fabric from said basket tangentially onto a portion of said perforated drum.

4,033,153
APPARATUS FOR PRODUCING PATTERNS ON ADVANCING STRIPS

Karl-Heinz Ahrweiler, Krefeld, and Ferdinand Leifeld, Tonis-Vorst, both of Germany, assignors to Eduard Küstes, Krefeld-Forstwald, Germany
Continuation of Ser. No. 483,431, June 26, 1974, abandoned. This application Mar. 17, 1976, Ser. No. 667,482
Claims priority, application Germany, July 11, 1973, 2335234
Int. Cl.² D06B *1/04*
U.S. Cl. 68—205 R **20 Claims**

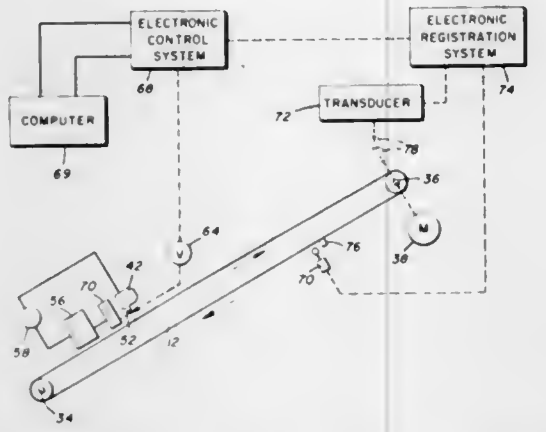


1. Apparatus for producing a pattern on a moving strip such as a textile web or the like comprising:

a. a trough located above the strip to be patterned containing therein a pattern producing liquid;
b. a roller supported above said trough for rotation therein to pick up on its surface said pattern producing liquid; and
c. means for scraping in contact with the circumference of said roller to scrape said pattern producing liquid thereoff, said means being inclined toward said strip; wherein the improvement comprises:
d. a catch pan;
e. a plurality of liquid conducting channels arranged side-by-side in close proximity across the width of said means for scraping;
f. a plurality of positioning means for moving said individual channels between a first position in which said channels direct the material flowing from said means for scraping to said catch pan and a second position wherein liquid is permitted to flow onto the strip and
g. said positioning means permitting individual, independent movement of said channels with respect to time as said moving strip moves therebelow, whereby different amounts of pattern producing liquid will be deposited on different areas of said strip with respect to time to cause a patterning thereof.

4,033,154
ELECTRONIC CONTROL SYSTEM FOR DYEING AND PRINTING MATERIALS

Harold L. Johnson, Spartanburg, S.C., assignor to Deering Milliken Research Corporation, Spartanburg, S.C.
Continuation of Ser. No. 477,461, June 7, 1974, abandoned. This application May 4, 1976, Ser. No. 683,224
Int. Cl.² D06B *1/02*
U.S. Cl. 68—205 R **25 Claims**

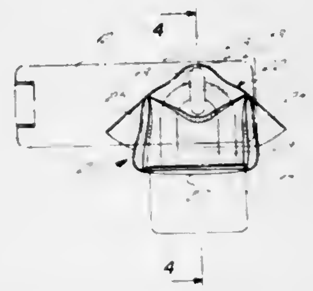


1. In apparatus for dyeing and printing textile material to form a pattern thereon including a conveyor for moving the textile material in a path of travel, a plurality of applicator means positioned along the conveyor, each said applicator means applying plural streams of liquid to the material during its passage thereby, means for storing pattern data, and means for periodically generating an enabling signal, the time between enabling signals being one cycle of operation, said storage means reading out said data in response to said enabling signal, the improvement comprising an electronic control system means for controlling said plural streams of liquid in accordance with the pattern data stored in said storage means, said electronic control system means comprising:

a. means for receiving during one cycle a block of pattern data from said storage means, said block including pattern data for each of said plurality of applicator means, said receiving means including a plurality of first output lines equal to said plurality of applicator means and means for routing said data to said first output lines;
b. a plurality of means, each having a first input connected to one of said first output lines and a plurality of second output lines equal to the number of said plural streams, for providing output signals on said second output lines corresponding to said pattern data on said first output lines, the duration of said output signals extending for a predetermined time period; and
c. a plurality of means, each having a second input connected to one of said second output lines, for individually directing said plural streams of liquid from said applicator means in accordance with said output signals whereby a predetermined amount of liquid is applied to said material.

4,033,155
PADLOCK PROTECTING DEVICE

Jerry S. De Lucia, 1013 Revere Ave., Bronx, N.Y. 10465
Filed May 24, 1976, Ser. No. 689,654
Int. Cl.² E05B *67/38*
U.S. Cl. 70—56 **2 Claims**

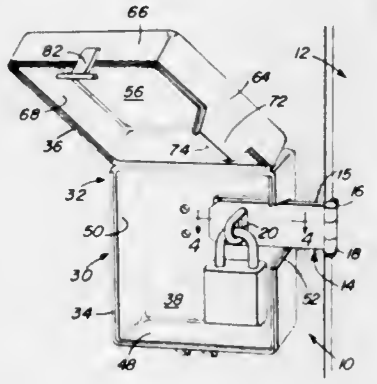


1. A protecting device for use in combination with a padlock in securing first and second members wherein a hasp is secured to said first member and a staple is secured to said second member, comprising:

a hood-like member having dimensions suitable for containing said padlock and staple therein, said member containing a rear wall having a staple receiving slot adjacent a top thereof, said member having said top, front and first and second side walls, said front wall having a relatively perpendicular outwardly protruding lip at the bottom edge thereof and a depending further front wall from the front of the outwardly projecting lip and a cross-member extending from the inside rear wall beneath said staple receiving slot to the inside front wall interior of said protruding lip, said cross-member to abut the staple and be enclosed by said padlock.

4,033,156
COVER FOR PADLOCK

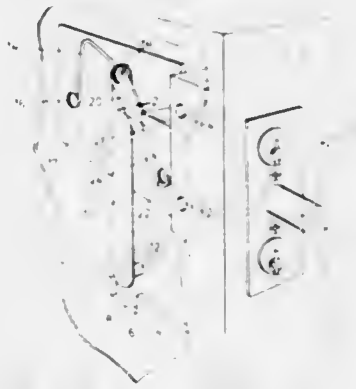
Michael H. Cottingham, 10222 Broadguage Road, Mechanicsburg, Ohio 43044
Filed Sept. 23, 1976, Ser. No. 725,706
Int. Cl.² E05B *67/38*
U.S. Cl. 70—56 **13 Claims**



1. An enclosure for enclosing the keeper for a hasp, the free swingable end of a hasp operatively associated with the hasp and a lock removably locking the free swingable end of the hasp over said keeper, said enclosure comprising a hollow housing having main and cover portions, said main portion including a base wall having inner and outer sides and adapted to have its outer surface abutted against a support to which the keeper for a hasp is to be secured, said base wall including peripheral walls extending about the peripheral edges thereof and projecting outwardly from the inner side thereof, said cover portion including an outer wall having outer and inner sides and peripheral walls extending about the peripheral edges thereof and projecting outwardly of the inner side thereof, the peripheral walls of said base and cover portions including pairs of corresponding side walls, hinge means hingedly securing the free edge portions of one pair of said corresponding side walls together for swinging movement of the cover portion relative to the base portion between an open position with said cover portion out of registry with the open side of said base portion and a closed position overlying and closing the open side of said base portion with the free edge portions of corresponding pairs of said side walls abutting each other, said base wall having a plurality of mounting apertures formed therethrough adapted to have the mounting apertures of the mounting plate of a hasp overlying the inner surface of said base wall registered therewith for securement of said mounting plate over the inner surface of said base wall and the latter to said support by means of fasteners secured through said registered apertures, a second pair of said corresponding side walls of said base and cover portions having a notch formed therein and an outwardly projecting tongue formed thereon, respectively, said notch including an inner extremity at least closely adjacent said base wall and disposed in a position aligned with a path extending between said apertures and the notched side wall, whereby said hasp may be swung into operative position over the mounting plate of said keeper through said notch, the outer free end of said tongue, when said cover is in said closed position being slightly spaced from said inner extremity, whereby said hasp may be received between said tongue free end and the inner extremity of said notch.

4,033,157
LOCKING MECHANISMS

John Williams, Georgetown, Canada, assignor to Canadian Business Machines Ltd., Mississauga, Canada
Filed Nov. 12, 1975, Ser. No. 631,219
Int. Cl.² E05B *65/46*
U.S. Cl. 70—85 **3 Claims**



1. A locking mechanism for locking the drawer of a cabinet or the like, of the type having latch means engagable with said drawer to prevent its opening and disengagable to allow its opening; said locking means comprising:

a housing adapted to be mounted on said cabinet and adjacent said drawer;
a bolt bore hole extending through said housing perpendicular to the front of said cabinet;
a locking bolt movable axially within said bolt bore hole and having a circumferential recess therein;
a pair of slots in said housing extending from opposite sides of said bolt bore hole normal to the axis thereof;
a locking pin in each of said slots, each said pin having a forwardly open notch therein, and being movable along

said slots into and out of a position of projection into said bolt bore hole and into said circumferential recess;

a pair of cylinder lock bore holes spaced from said bolt bore hole in the directions corresponding to said slots and extending parallel to said bolt bore hole to connect with said slots;

a cylinder lock in each of said cylinder lock bore holes having on the end thereof lugs projecting into said slots to engage said notches in said pins and operable in response to a key turned in said cylinder locks to move said pins in and out of said bolt bore hole,

one of said pins being urged towards said bolt by compression spring means mounted in its associated slot, and being movable away from said bolt against said spring means by operation of its respective cylinder lock;

the other of said pins being positionable to remain in an unlocked position removed from said bolt bore hole and a locked position projecting into said bolt bore hole in response to operation of its respective cylinder lock;

cam means on said bolt adapted to operate said latching means to engage or disengage same in response to axial movement of said bolt;

said recess of said bolt being positioned opposite said slots and adapted to receive said pins when said bolt is in the locking position.

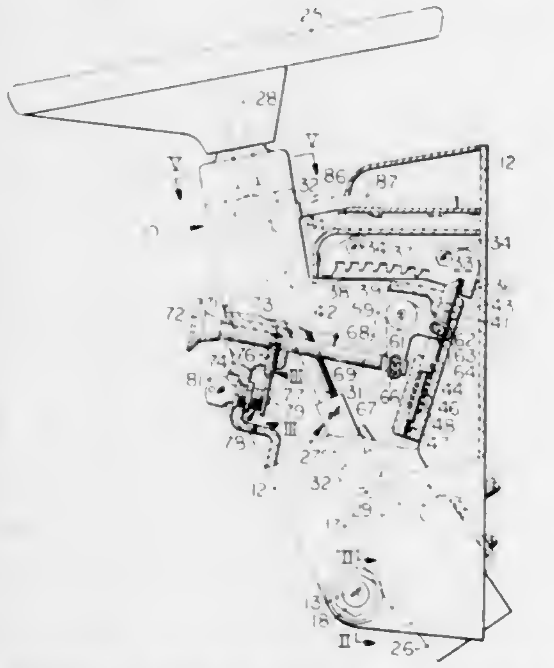
4,033,158
ADJUSTABLE STEERING WHEEL AND TRANSMISSION LOCK ARRANGEMENT

Richard W. Chamberlain, and Michael E. Moore, both of Aurora, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Feb. 23, 1976, Ser. No. 660,559

Int. Cl.² B60R *25/06*

U.S. Cl. 70—202 **10 Claims**



1. An adjustable steering wheel and transmission lock arrangement comprising:

a supporting structure,

a transmission shift lever being shiftable between a forward speed position, a neutral position, and a reverse speed position;

a steering column pivotally fastened to the supporting structure, said transmission shift lever being fastened to one side of the steering column, said steering column being pivotal in a vertical direction between a plurality of operating positions at all positions of the transmission shift lever and to a transmission locking position when the transmission shift lever is in the neutral position;

a positioning member secured to the support structure and having a plurality of spaced notches formed therein with one of the notches representing the transmission locking position and the other notches each representing an operating position of the steering column;

latching means carried by the steering column and being operative independent of the transmission shift lever for engagement with said one of the notches for latching the steering column in the transmission locking position and for engagement with any of the other notches for latching the steering column in one of the operating positions; and

a transmission locking member secured to the support structure, said transmission locking member being positioned in the pathway of the transmission shift lever for abutment therewith when the steering column is in the transmission locking position for locking the transmission shift lever in the neutral position.

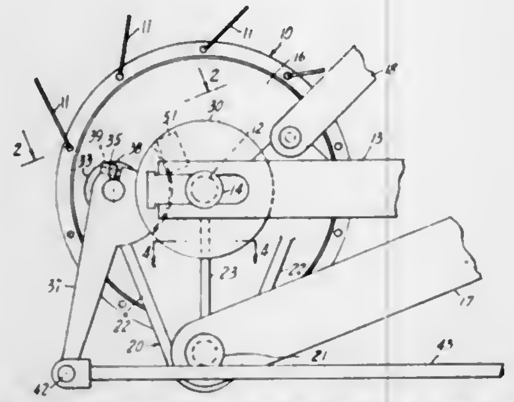
4,033,159
MOTORCYCLE LOCK

Bruce A. Bennett, Larkspur, Calif., assignor to Creative Innovations, Tiburon, Calif.

Filed Apr. 17, 1975, Ser. No. 568,977

Int. Cl.² B62H *5/00*

U.S. Cl. 70—233 **3 Claims**



1. In combination with a cycle having a rear axle and a frame member connected to said axle, a brake plate fixed relative to said axle, and a brake actuating lever swingably mounted on said plate, a lock for said cycle comprising:

a housing interposed on said axle between said frame member and said brake plate,

an extension integral with said lever and provided with a detent,

said housing being formed with an opening for receiving said extension therein,

a key actuated lock mounted in said housing and provided with a lock element adapted to engage said detent to prevent movement of said lever from brake actuating position.

4,033,160
BICYCLE LOCK

James J. Mima, 1351 Bluebell St., Oxnard, Calif. 93030

Filed Mar. 8, 1976, Ser. No. 664,919

Int. Cl.² B62H *5/00*

U.S. Cl. 70—233 **4 Claims**

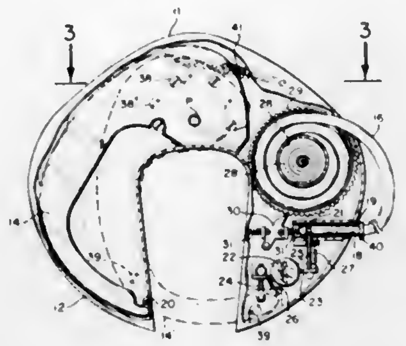
1. A bicycle lock comprising, in combination:

a. a housing having first and second legs extending downwardly in a given position to straddle opposite sides of a tire and rim portion of the bicycle wheel;

b. a C-shaped member pivotally mounted in an upper part of said housing such that the lower arm of the member can swing from an unlocked position in the lower end of said first leg of the housing into a locked position in the lower end of the second leg of the housing underneath said tire and rim of said bicycle wheel so that the tire and rim are wholly surrounded by the combination of the legs of the housing and the lower arm of the C-shaped member;

c. a cable coiled within said housing with one end extending

from a side of the housing such that the cable can be pulled from the housing and looped about a stationary object, said second leg of said housing having an entrance opening for receiving said one end of the cable; and



d. a single locking means in said second leg operable to separately or simultaneously lock the lower arm end of said C-shaped member and the one end of said cable in said second leg, and simultaneously unlock the same when operated whereby said bicycle is secured against theft.

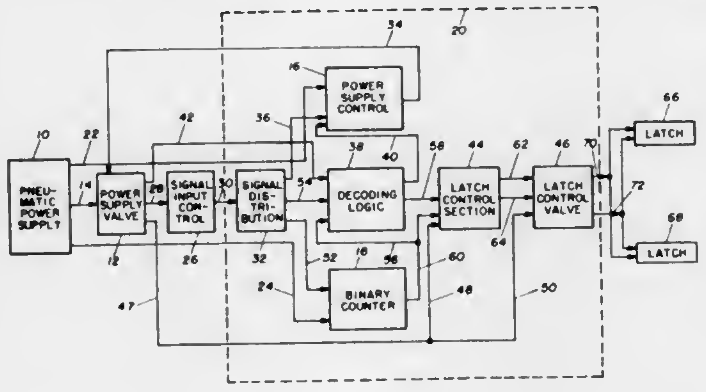
4,033,161
FLUID CONTROLLED SECURITY LOCK

Michael J. Goes, 3256-B Picatinny Arsenal, Dover, N.J. 07801

Filed Mar. 1, 1976, Ser. No. 662,317

Int. Cl.² E05B *51/02*

U.S. Cl. 70—275 **3 Claims**



1. A fluidic locking system for controlling access to a secured area which comprises:

means for providing pneumatic power to said fluidic locking system:

signal input control means, pneumatically connected to said means for providing pneumatic power, for generating a plurality of pneumatic output signals therefrom in response to mechanical stimuli;

fluidic logic control circuit means, pneumatically connected to said means for providing pneumatic power and to said signal input control means, for decoding said output signals received from said signal input control means and for generating a dud signal, a latch signal or an un-latch signal in response to said pneumatic output signals, which includes;

- signal distribution means, pneumatically connected to said signal input control means, for routing pneumatic signals from said signal input control means to said fluidic logic control circuit means;
- binary counter means having an input, pneumatically coupled to said means for providing pneumatic power and said signal distribution means, for monitoring the number of signals received from said signal input control means and for providing an output count signal equivalent to the number of signals received;
- decoding logic means, pneumatically connected to the output of said means for providing pneumatic power, and signal distribution means and said binary counter means, for comparing the value of the pneumatic signals, routed thereto from said signal distribution means, with the output count signal delivered thereto from said binary counter means, and for providing either said output un-latch signal or said output dud signal to said fluidic locking system;
- power supply control means, pneumatically coupled to said means for providing pneumatic power and signal distribution means and said decoding logic means, for controlling the operation of said means for providing power after said power supply control means receives a properly sequenced input signal from the output of said signal distribution means and said decoding logic means; and
- latch control means, pneumatically connected to said means for providing pneumatic power, said binary counter means, and said decoding logic means, for providing a lock signal in response to said dud signal, said lock signal maintaining said fluidic locking system in a closed position and for providing said un-latch signal to operate said fluidic locking system so that access may be gained to said secured area; and

latch means, pneumatically coupled to said fluidic logic control circuit means and responsive thereto, for opening said fluidic locking system to said secured area in response to said un-latch signal and for maintaining said locking system in a closed state in response to said dud signal and in response to said latch signal.

4,033,162
KEY CASE HEAD

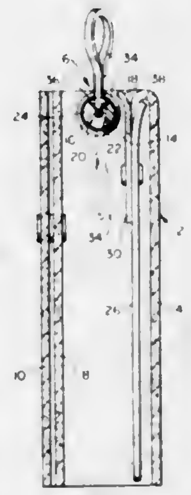
Giampiero Fontana, Milan, Italy, assignor to Buxton, Incorporated, Agawam, Mass.

Filed Nov. 10, 1975, Ser. No. 630,755

Claims priority, application Italy, Nov. 14, 1974, 29447/74

Int. Cl.² A47G *29/10*

U.S. Cl. 70—456 B **4 Claims**



1. A key case head for releasably retaining a key ring having an enlarged head portion at one end thereof, the key case head comprising an inner stationary assembly having means for attachment to a key case including a shaft, a longitudinal portion extending parallel to and coextensive with said shaft, and disc means mounted on said shaft and longitudinal portion for receiving said enlarged head portion of said key ring therebetween, and a cylindrical portion disposed upon said inner stationary assembly and having a circumferential slot therein smaller in width than the diameter of said enlarged head portion, and an enlarged slot portion larger in diameter than said enlarged head portion, said key case head longitudinal portion obstructing movement of said enlarged head portion through said enlarged slot portion, said cylindrical portion being rotatable against a spring bias to a position in which said enlarged slot portion is clear of said longitudinal portion,

whereby to permit passage of said enlarged head portion through said enlarged slot portion.

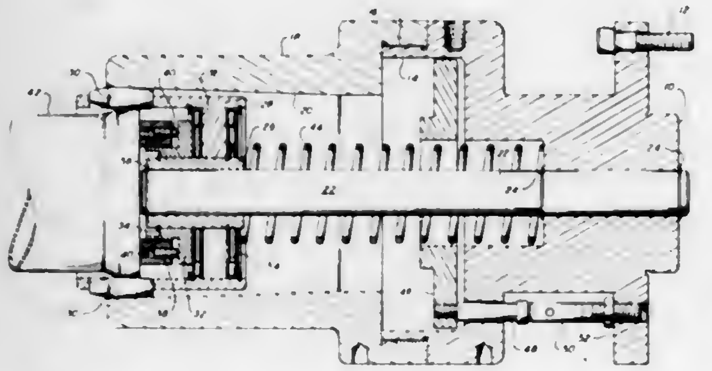
4,033,163
APPARATUS FOR SWAGING TUBULAR MATERIAL

James R. Duffey, Yellow Springs, and Joseph W. Smith, Dayton, both of Ohio, assignors to Carrier Corporation, Syracuse, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,486

Int. Cl.^{2} B21D *41/04*

U.S. Cl. 72—121 8 Claims



1. A swaging tool for working the outside diameter of the end portion of a tubular workpiece including;

a mandrel sleeve having an internal tapered surface, and

a series of rollers mounted within the mandrel for contact with the outside surface of a workpiece inserted into the mandrel,

said rollers being axially movable relative to the tapered surface by the workpiece during operation of the tool, whereby relative rotational movement between the mandrel and the workpiece will produce rolling contact between the rollers and the workpiece, and relative axial movement between the mandrel and the workpiece will produce axial movement of the rollers relative to the mandrel, thereby forcing the rollers against the surface of the workpiece and decreasing the outside diameter of the workpiece.

4,033,164
METHOD FOR ROLLING TUBES

Horst Biller, Kettwig, and Friedrich Hülls, Mulheim, both of Germany, assignors to Mannesmannrohren-Werke AG, Dusseldorf, Germany

Filed Aug. 28, 1975, Ser. No. 608,671

Claims priority, application Germany, Aug. 29, 1974, 2441493

Int. Cl.^{2} B21B *17/00*

U.S. Cl. 72—205 4 Claims

1. In a method of stretch-rolling tubular stock by means of a mill having a plurality of consecutively effective rolling locations and wherein the rolling speed in each location is reduced at least for the instant of engagement followed by raising of the speed, whereby the rolling speed of locations engaging the stock to be rolled earlier is reduced more than the speed of locations engaging the stock subsequently, and wherein normal operating speed of the rolls of the locations of the plurality is restored in steps and in dependence upon consecutive passage of the front of the stock through several of said locations, the improvement of causing the speed reductions to be proportional to the mean longitudinal tension in the stock during rolling.

4,033,165
APPARATUS FOR CONTROLLING FLATNESS OF METAL SHEET DURING ROLLING

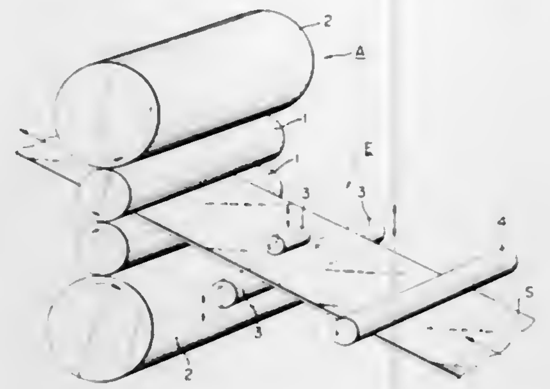
Toru Arimura, and Fumio Fujita, both of Yokohama, Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 15, 1976, Ser. No. 666,905

Claims priority, application Japan, Apr. 15, 1975, 50-44830

Int. Cl.^{2} B21B *15/00, 39/08*

U.S. Cl. 72—205 18 Claims



1. An apparatus for controlling the flatness of a metal sheet during rolling, comprising:

two edge-rollers provided at least at one of the entry and the exit sections of rolling mill rolls, said edge-rollers being located symmetrically in the width direction of a metal sheet during rolling substantially in the horizontal direction, respectively closely adjacent to and facing one of the upper and the lower surfaces of said metal sheet at the side edge portions thereof, the axial direction of said edge-rollers being perpendicular to the rolling direction of said metal sheet, and said edge-rollers causing a change in the tension distribution in the width direction of said metal sheet, by imparting a desired vertical displacement to the side edge portions of said metal sheet, thereby increasing the draft at said side edge portions of said metal sheet during rolling; and

a center-roller provided at least at one of the entry and the exit sections of said rolling mill rolls, said center-roller being located between said two edge-rollers, closely adjacent to and facing the other of the upper and the lower surfaces of said metal sheet which is opposite to said one surface which is closely adjacent to and facing said edge-rollers, said center-roller being located at the width center portion of said metal sheet, the axial direction of said center-roller being perpendicular to the rolling direction of said metal sheet and horizontal, said center-roller being vertically movable, and said center-roller causing a change in the tension distribution in the width direction of said metal sheet, by imparting a desired vertical displacement to the width center portion of said metal sheet, thereby increasing the draft at said width center portion of said metal sheet during rolling.

4,033,166
SEQUENCING DIE AND METHOD FOR FORMING TRUSS WEBS FROM METAL TUBING

Arthur L. Troutner, Boise, Idaho, assignor to Trus Joist Corporation, Boise, Idaho

Filed Jan. 2, 1976, Ser. No. 646,043

Int. Cl.^{2} B21D *28/06, 28/04, 28/26, 43/26*

U.S. Cl. 72—334 9 Claims

1. A method for forming truss joist webs with longitudinally opposed web ends from tubing comprising:

a. providing a length of tubing,

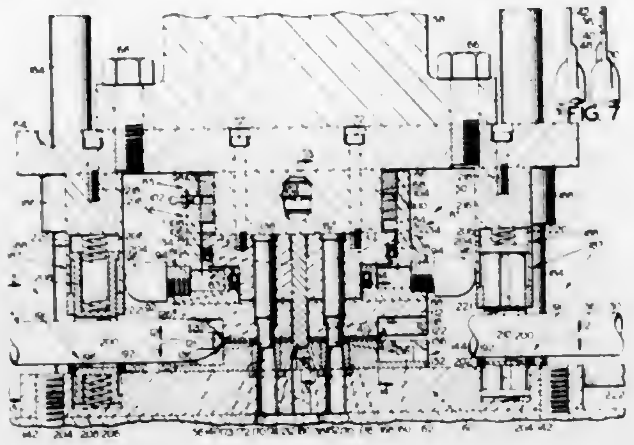
b. flattening the end portion of the tubing to form one of the flattened web ends, and

c. punching and shearing the flattened end portion without further flattening for forming a cross pin receiving hole and a terminal end portion,

d. advancing the tubing,

e. flattening the opposed end portion of the tubing for forming the opposed flattened web end, and

f. punching and shearing the opposed flattened end portion without further flattening for forming a cross pin receiving hole and a terminal end portion.



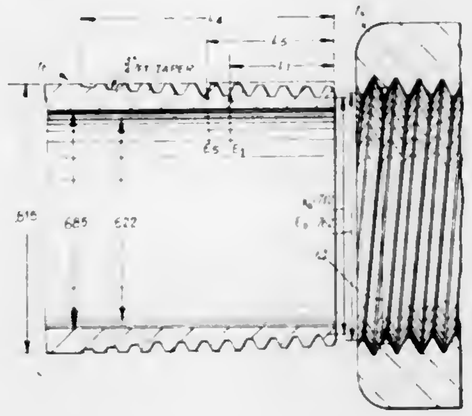
4,033,167
PROCESS FOR FORMING INTERMEDIATE METAL CONDUIT

Robert A. Philibert, Burlington, Conn., assignor to General Signal Corporation, New York, N.Y.

Continuation of Ser. No. 499,387, Aug. 21, 1974, abandoned. This application Mar. 5, 1976, Ser. No. 664,150

Int. Cl.^{2} B21D *51/00;* **F16L** *15/00*

U.S. Cl. 72—367 7 Claims



1. A method of producing intermediate metal conduit, in accordance with National Electrical Code standards and in conventional trade sizes, such that fittings designed for a particular size of rigid metal conduit can be used interchangeably with a corresponding size of such intermediate metal conduit, comprising the steps of:

a. forming the intermediate metal conduit with a wall thickness which is approximately sixty per cent of the wall thickness for the corresponding size of rigid metal conduit;

b. forming the intermediate metal conduit with a nominal outside diameter which corresponds with the lower end in the wide tolerance range for the outside diameter of the corresponding size of rigid metal conduit;

c. maintaining, during the aforesaid forming steps, a narrow total tolerance of the order of 0.010 inches for the smaller sizes, and increasing to the order of 0.020 inches for the larger sizes, on the nominal outside diameter such that the minimum value for the outside diameter of the intermediate metal conduit corresponds substantially with the minimum value in the wide tolerance range for the outside diameter of the corresponding size of rigid metal conduit;

whereby, when an external thread of predetermined taper is provided on said intermediate metal conduit as formed, the normally resulting break-through of such conduit due to the thread is prevented, and threaded fittings designed for the corresponding size of rigid conduit are then compatible with and engage said external thread on said intermediate metal conduit.

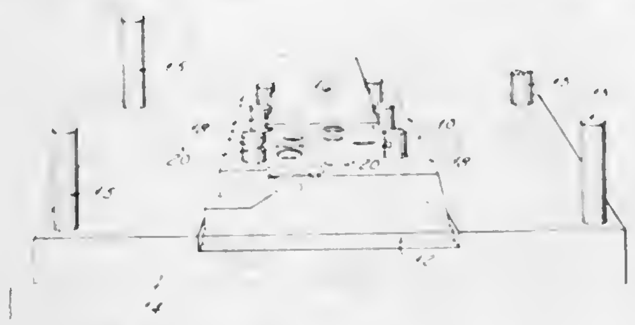
4,033,168
STRIP STOCK LIFTER

James C. Fisk, G-3219 E. Bristol, Burton, Mich. 48529

Filed Feb. 17, 1976, Ser. No. 658,387

Int. Cl.^{2} B21J *13/08, 13/14*

U.S. Cl. 72—420 21 Claims



1. A stock lifter device for use in pairs and at opposite edge portions of strip stock for separating and supporting the strip stock out of engagement with the working face of a die member during performance of die operations upon said stock; said stock lifter device including:

an upright post stationarily mounted so that the upper end portion of the post is projectible into the lower end section of a bore in the die member that extends through the die member and opens out on the working face thereof;

a stock lifter body adapted to slidably fit the bore in the die member for endwise movement therein perpendicular to the working face of the die member, the upper end of the body having a side opening recess for receiving and supporting a marginal edge portion of the strip stock;

a helically coiled spring encircling the post and acting on the lower end portion of the stock lifter body to yieldingly project the upper end of the body outwardly of the working face of the die member; and

a pin and slot connection coupling the stock lifter body to the post and enabling the body to move under the influence of said coiled spring or in response to opposing die operating forces overcoming that of the spring, said pin and slot connection being located within the bare and so shaped as to restrain the stock lifter body against rotation about its axis while guided in its reciprocal motion within the die member.

4,033,169
HYDROCARBON CONCENTRATION SENSOR FOR USE IN ENGINE EXHAUST GAS

Takeshi Fujishiro, Yokohama, and Naomasa Sunano, Fukuchiyama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama and Shinyei Kaisha, Kobe, both of, Japan

Filed Aug. 7, 1975, Ser. No. 602,891

Claims priority, application Japan, Aug. 9, 1974, 49-91246

Int. Cl.^{2} G01N *27/12*

U.S. Cl. 73—23 8 Claims

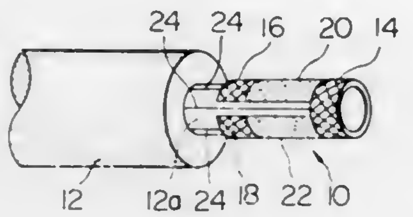
1. A sensor for sensing changes in the concentrations of unburned hydrocarbons in exhaust gas discharged from an internal combustion engine, comprising:

a support member of a dielectric and heat-resistant material;

a first layer of an *n*-type oxide semiconductor formed locally on a surface of said support member, the conductivity of said semiconductor increasing as the concentrations of the unburned hydrocarbons in the ambient atmosphere increase;

a second layer of a *p*-type oxide semiconductor formed on said surface of said support member locally and spaced from said first layer, the conductivity of said *p*-type oxide semiconductor decreasing as the concentrations of the unburned hydrocarbons increase; both said first and second semiconductors having negative temperature coefficients of resistivity;

a first electrode arranged in contact with both of said first and second layers;



a second electrode arranged in contact with said first layer and spaced from said first electrode;

a third electrode arranged in contact with said second layer and spaced from both of said first and second electrodes; and

two resistors connected in series with each other; said first and second layers and said two resistors being electrically connected to construct a four-arm bridge.

4,033,170

APPARATUS FOR MOUNTING EXHAUST GAS SENSOR

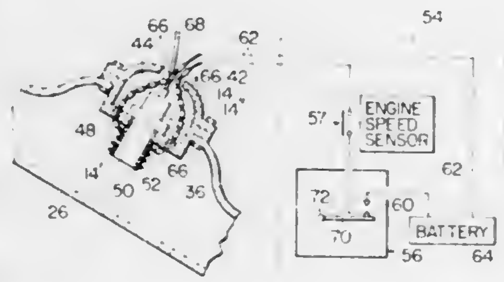
Yoshihisa Kawamura; Masaaki Saito, and Hidehiro Minami, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Oct. 29, 1975, Ser. No. 626,831

Claims priority, application Japan, Nov. 1, 1974, 49132673[U]; Dec. 29, 1974, 50-3432[U]

Int. Cl.² G01N *27/46, 31/00*

U.S. Cl. 73—23 **15 Claims**



4. An engine system comprising:

an exhaust conduit through which exhaust gases issuing from the engine flow;

first means having a wall portion that forms a part of the exhaust conduit, the wall portion contacting with the exhaust gases;

an exhaust gas sensor secured to the wall portion with a probe portion exposed to the exhaust gases flowing through the exhaust conduit;

an insulator member covering the probe portion, the insulator member being provided with a plurality of apertures by which the probe portion is in flow communication with the exhaust gases;

a coiled heater surrounding the insulator member;

a pair of contact circuited in series with the coiled heater; and

means for closing the pair of contacts in response to a predetermined operating condition of the engine,

in which said first means includes a cap member covering a remaining portion of the exhaust gas sensor, the cap member and the wall portion cooperating to form a substantially closed member around the remaining portion of the exhaust gas sensor.

4,033,171

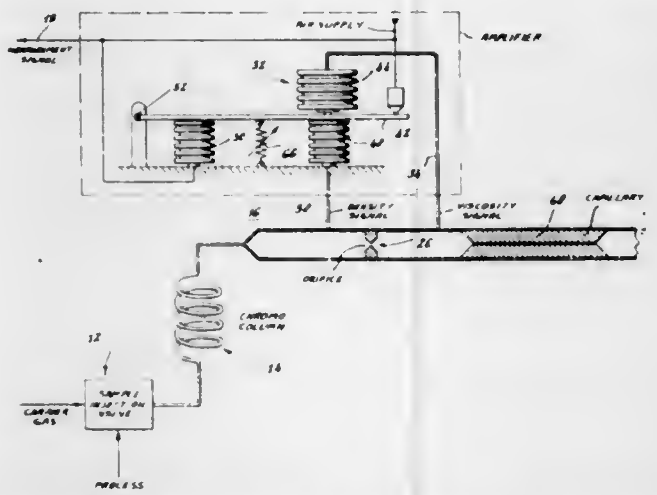
PNEUMATIC DETECTOR FOR CHROMATOGRAPHIC ANALYZER

Edwin L. Karas, Sharon, Mass.; Raymond Annino, Coldon, N.Y., and Richard W. Kalinoski, East Providence, R.I., assignors to The Foxboro Company, Foxboro, Mass.

Filed Feb. 14, 1975, Ser. No. 549,929

Int. Cl.² G01N *31/08*

U.S. Cl. 73—23.1 **6 Claims**



1. For use in a gas chromatograph including a separation column into which a sample mixture can be injected to be conducted through the column by a carrier gas so that the mixture components are physically separated to emerge from the column at different times;

a pneumatic detector for measuring the concentration of the separated components without significant error due to variations in fluid flow rate;

said detector comprising:

an orifice connected to receive the gas from the column and to produce a first pressure signal responsive to gas density and to gas flow velocity;

a capillary connected in series with said orifice to produce a second pressure signal responsive to gas viscosity and to gas flow velocity; and

means to subtractively compare said first and second pressure signals and to develope a concentration measurement signal in accordance with such comparison;

said comparison means includng a balanceable force bar;

first and second pressure-responsive means adapted to apply opposed forces to said force-bar;

means connecting said first and second pressure signals to said first and second pressure-responsive means respectively;

pneumatic means responsive to small movements of said force-bar and adapted to maintain said force-bar in balance;

said first and second pressure-responsive means being arranged to provide a force-effectiveness ratio different from unity so as to obtain effective cancellation of the flow-related elements of such signals, whereby said measurement signal is not significantly affected by variations in fluid flow rate.

4,033,172

APPARATUS FOR TESTING HOLLOW BODIES

Guy Flamand, Champforgeuil, France, assignor to Carnaud Total Interplastic, Chalon-sur-Saone, France

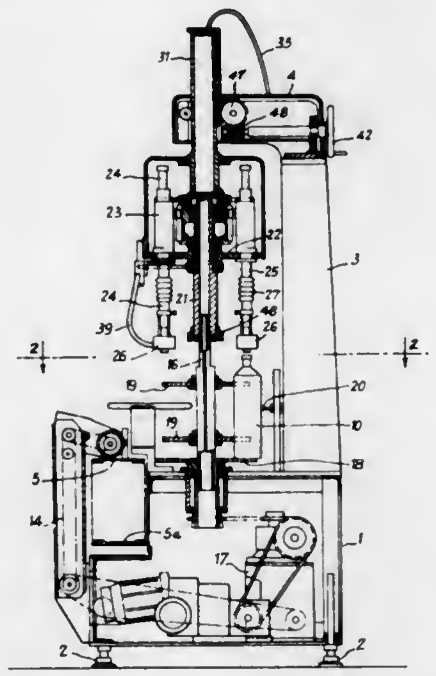
Filed Dec. 24, 1975, Ser. No. 644,034

Claims priority, application France, Dec. 30, 1974, 74.43298

Int. Cl.² G01M *3/02*

U.S. Cl. 73—37 **9 Claims**

6. In an apparatus for testing hollow bodies moving along a conveyor and having a frame, a vertically extending drive shaft mounted at its lower end for rotation in said frame, a support plate attached to the lower end of said drive shaft for rotation therewith at a location adjacent to said conveyor, means for successively moving hollow bodies from said conveyor onto said support plate for movement about said axis and for thereafter moving the hollow bodies from the support plate and back onto said conveyor, at least one testing head mounted on said drive shaft at a location spaced vertically above said support plate for rotation therewith in axial alignment with a hollow body supported on said plate and for simultaneous vertical movement into and out of engagement with the aligned hollow bodies, the improvement comprising:



a. a hollow shaft fixed to said frame against rotation and extending coaxially of said drive shaft into telescoping relation with its upper end;

b. bearing means coupling said drive shaft to said hollow shaft for rotation relative thereto;

c. a stationary cam fixed to said hollow shaft and having a cam surface extending around the axis of rotation of the drive shaft; and

d. cam follower means fixed to each of said testing heads and engaging said cam as the testing heads are rotated for effecting the vertical movement thereof.

4,033,173

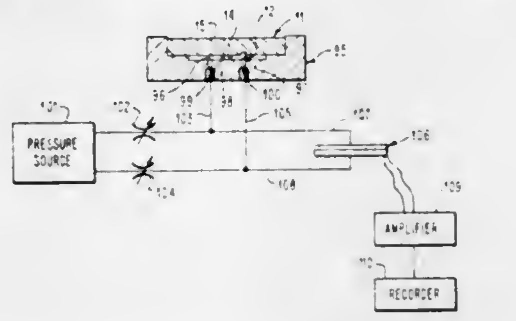
METHOD AND SYSTEM FOR SENSING AN IDENTIFYING MEANS

Asad Firdaus, Wappinger Falls, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 535,263, Dec. 23, 1974, Pat. No. 3,962,903. This application Feb. 11, 1976, Ser. No. 657,126

Int. Cl.² G01B *13/00*

U.S. Cl. 73—37 **17 Claims**



1. A system for detecting the orientation of a semiconductor substrate having a metallic surface and a surface substantially parallel thereto with the substantially parallel surface having identifying means therein including:

receiving means to receive the semiconductor substrate in a temporary stationary position without damage to the metallized surface if the semiconductor substrate is disposed so that the metallized surface is in the position in which the parallel surface is to be disposed for detecting the orientation of the semiconductor substrate;

first means to indicate if the semiconductor substrate is disposed in said receiving means so that the metallized surface is not engaging said receiving means;

means to sense the location of the identifying means without contact with the surface of the semiconductor substrate;

and a second means to indicate the orientation of the semiconductor substrate by the location of the identifying means relative to said receiving means.

4,033,174

DEVICE FOR TESTING ANY LEAKAGE OF VACUUM-TIGHT GLASS SEALS

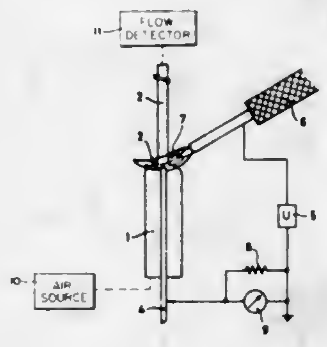
Helmut Samulowitz, Verlautenheide, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 489,372, July 17, 1974. This application Dec. 24, 1975, Ser. No. 644,067

Claims priority, application Germany, July 27, 1973, 2338192

Int. Cl.² G01M *3/16*

U.S. Cl. 73—40 **1 Claim**



1. A method of testing an open lamp envelope and an exhaust tube connected thereto which comprises:

testing for open fluid communication between said envelope and the end of the exhaust tube remote from said envelope by blowing a stream of gas through said envelope toward said exhaust tube and sensing flow out of said exhaust tube and

simultaneously testing for a leakage of said stream of gas at the juncture of said exhaust tube and said envelope by means of first and second electrodes disposed on opposite sides of said juncture, said electrodes being connected to a high voltage source to produce an electric breakdown through the glass seal in the event of leakage at said juncture, said first electrode being said stream of gas and said second electrode being a jet of burning gas from a burner.

4,033,175

GAS LEAKAGE MEASURING DEVICE

Takayuki Shiwaku, and Takeshi Miyazaki, both of Kure, Japan, assignors to Mitutoyo Manufacturing Co., Ltd., Tokyo, Japan

Filed May 11, 1976, Ser. No. 685,363

Claims priority, application Japan, Sept. 22, 1975, 50-114974

Int. Cl.² G01M *3/32*

U.S. Cl. 73—49.2 **3 Claims**

1. An apparatus for measuring gas leakage of a test specimen comprising:

a container having a gas inlet port and a gas outlet port, said outlet port being coupled to said test specimen;

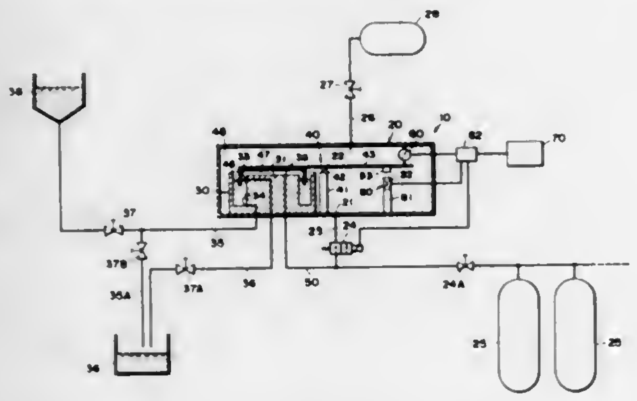
a liquid container provided in said container;

a balance mechanism provided in said container, said balance mechanism comprising a balance beam which is normally in an equilibrium position;

and inverted cup coupled to one end of said balance beam and floating in a liquid in said liquid container, said inside surface of said cup and the surface of said liquid defining a closed space;

a supply of reference gas coupled to said inlet port and to said closed space within said inverted cup via a first valve means;

a detector for detecting a deviation from said equilibrium position of said beam and for generating a signal corresponding to said deviation;



a means for measuring said deviation as a function of said signal from said detector;

means responsive to said signal from said detector for restoring said balance beam to said equilibrium position; and

a normally closed second valve means for coupling said closed space to said container, said second valve means being responsive to said signal from said detector whereby said second valve means is actuated to couple said closed space to said container whenever said means for restoring causes said balance beam to return to said equilibrium position.

4,033,176

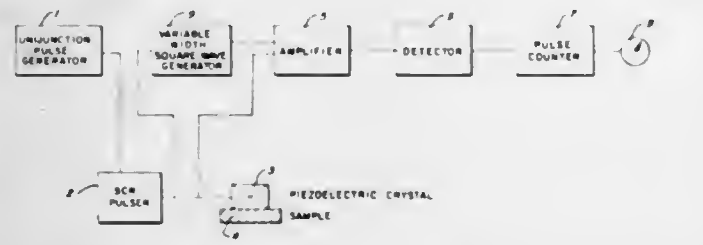
POCKET-SIZED, DIRECT-READING ULTRASONIC THICKNESS GAUGE

Frederick L. Eberle, Hammond, Ind., and Bernard Ostrofsky, Naperville, Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed July 11, 1975, Ser. No. 595,060

Int. Cl.² G01N *29/00*

U.S. Cl. 73—67.9 **19 Claims**



1. A method for measuring the time between two or more sequential signals which comprises:

receiving two or more sequential signals; sending a response signal in response to the received signals; controlling the sending of the response signal by a variable-width square wave gate; adjusting the width of the variable square wave gate so that the response signal will be sent corresponding to a discrete number of received signals; and measuring the duration of the gate.

4,033,177

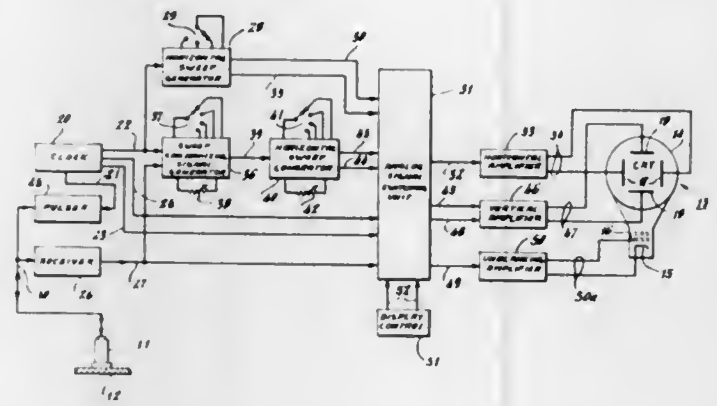
DUAL TRACE DISPLAY FOR ULTRASONIC TESTING APPARATUS

Dan Frank Case, Bethel, Conn., assignor to Automation Industries, Inc., Los Angeles, Calif.

Filed June 14, 1976, Ser. No. 696,139

Int. Cl.² G01N *29/04*

U.S. Cl. 73—67.9 **6 Claims**



1. An ultrasonic nondestructive testing instrument for use with transducer means adapted to transmit ultrasonic energy into a workpiece in response to an electrical signal and for deriving an electrical signal in response to ultrasonic energy reflected from within the workpiece, said instrument comprising:

a cathode-ray display device including an image-producing screen, means for projecting a beam of electrons toward said screen, beam-control means and means for deflecting said beam of electrons relative to said screen in first and second directions;

sweep means operative in synchronism with repetitive electrical pulses supplied to the transducer means for deriving a first sweep signal having repetitive components occurring during time intervals defined by alternate pairs of said repetitive pulses and a second sweep signal having repetitive components occurring during time intervals defined by remaining pairs of said repetitive pulses, said components of one of said sweep signals having a time rate of increase in amplitude different from that of said components of the other of said sweep signals;

means coupling said sweep means to said deflecting means for effecting deflection of said electron beam in said first direction relative to said screen;

means for supplying an electrical signal to said deflecting means for effecting deflection of said electron beam in said second direction relative to said screen in response to electrical signals from the transducer means;

means coupled to said last-named means for deriving an offset signal in synchronism with said repetitive pulses having one amplitude during said repetitive components of said first sweep signal and another amplitude during said repetitive components of said second sweep signal to deflect said electron beam in said second direction relative to said screen between two sections thereof displaced from one another in said second direction thereby to produce a display of reflected-energy signals in each of said sections; and

means coupled to said beam-control means for deriving a trace-modifying signal having components representing said repetitive components of said second sweep signal, and occurring during said repetitive components of said first sweep signal thereby to modify a portion of the display of reflected-energy signals in one of said sections of said screen in relation to the time duration of the display in the other of said sections.

4,033,178

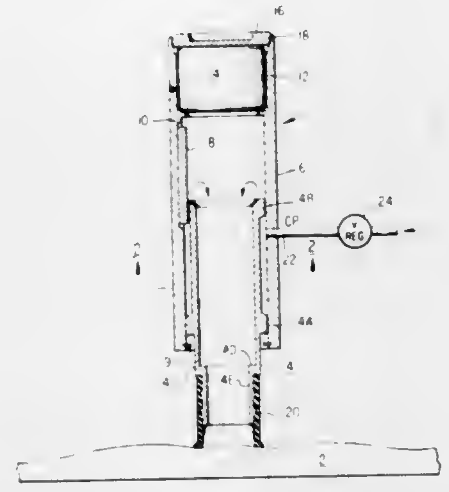
FLUID COUPLED TEST PROBE

Amos E. Holt, Lynchburg, and Ronald N. Roseveare, Evington, both of Va., assignors to The Babcock & Wilcox Company, New York, N.Y.

Filed Apr. 23, 1976, Ser. No. 680,014

Int. Cl.² G01N *29/00*

U.S. Cl. 73—71.5 US **8 Claims**



1. A fluid coupled test probe for the nondestructive testing of materials, comprising in combination, a cylinder having a closed end and an open end, a receptacle formed in said cylinder adjacent said closed end for receiving a transducer, a hollow piston having a head slidably engaging the wall of said cylinder and extending beyond the open end of said cylinder for engagement of the end thereof with the surface of a workpiece, and means for introducing a flow of couplant fluid under pressure into said cylinder between said closed end and said piston head through said hollow piston onto the surface of the workpiece to thereby obtain a solid column of couplant fluid between the transducer and the surface of the workpiece and to produce a force on said piston head positioning said piston in said cylinder forcing to maintain said piston end into engagement with the surface of the workpiece as said probe is moved relative to the workpiece.

4,033,179

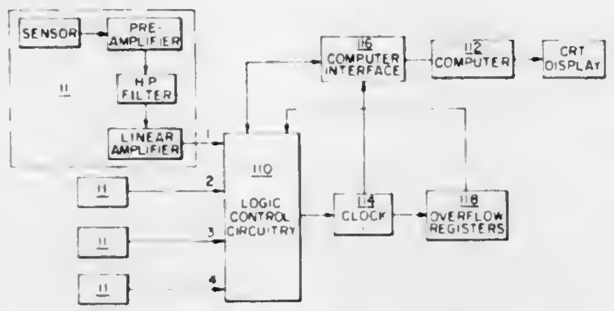
ACOUSTIC EMISSION MONITORING SYSTEM

Delwin M. Romrell, Richland, Wash., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 7, 1975, Ser. No. 556,354

Int. Cl.² G01N *9/18*

U.S. Cl. 73—71.4 **19 Claims**



1. A method of monitoring the presence and source location of acoustic emissions generated within or on a tubular, acoustically conductive medium comprising the steps of:

monitoring acoustic emissions respectively at a plurality of at least three separate spaced locations around the girth of the tubular surface;

measuring the time difference between the first reception at one of the monitoring locations of a particular acoustic emission and the next reception of the same emission at a second of the monitoring locations;

automatically blocking for a given period of time all further acoustic reception responses from the monitoring locations subsequent to the reception at the second monitoring location;

translating the time measurement into a position measurement around the tubular girth representative of the girth location most proximate the source of the emission; and

registering the position measurement.

4,033,180

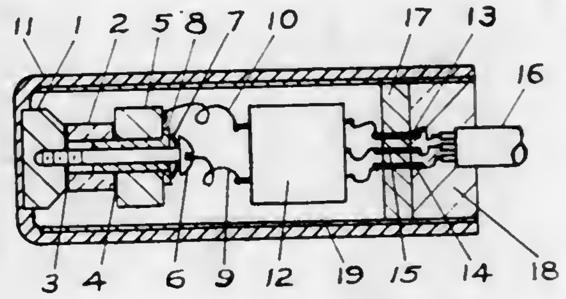
ULTRASONIC MICROPHONE FOR OPERATING WITH AN ACCUMULATED LAYER OF MUD OVER ITS VIBRATILE SURFACE WITHOUT CHANGE IN SENSITIVITY WITHIN ITS PRESCRIBED FREQUENCY RANGE

Frank Massa, Cohasset, Mass., assignor to Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of The Stoneleigh Trust u/d/t, Cohasset, Mass.

Filed Apr. 26, 1976, Ser. No. 680,425

Int. Cl.² H04R *7/00*

U.S. Cl. 73—71.5 US **6 Claims**



1. In combination in a microphone adapted for use in the measurement of ultrasonic sound signals transmitted in air in a dirty environment, such as when mounted underneath the body of an automobile, a vibratile element responsive to the presence of an ultrasonic sound signal whose pitch lies within a prescribed ultrasonic frequency band, said vibratile element including a diaphragm portion and an electroacoustic transducer portion, said vibratile element characterized in that the resonant frequency of said vibratile element lies above said prescribed ultrasonic frequency band, said vibratile element further characterized in that its diaphragm portion has a mass greater than 0.4 gram per sq. cm. of diaphragm area.

4,033,181

METHOD FOR DESTRUCTIONLESS PROOFING OF VISCOELASTIC PRODUCTS

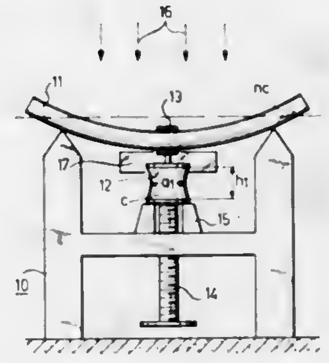
Konrad Oeser, Hohr-Grenzhausen, Germany, assignor to Metzeler Gummitechnik GmbH, Edingen, Germany

Filed June 13, 1975, Ser. No. 605,249

Claims priority, application Germany, June 15, 1974, 2428992

Int. Cl.² G01N *21/00*

U.S. Cl. 73—88 A **11 Claims**



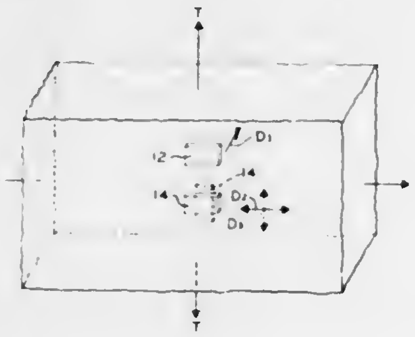
1. A method of forming holographic interferograms for the

non-destructive detection of inhomogeneities in bodies made of elastic and viscoelastic materials, including crankshafts, synthetic plastic components, rubber-metal structural components, and the like, the method comprising the steps of subjecting a test specimen at least part of which is made of viscoelastic material to a predetermined deformation, during the continuance of such deformation allowing the viscoelastic part of the test specimen to relax and creep, and during such relaxation and creeping forming the holographic interferogram by forming a first holographic photograph of at least part of the external surface of the test specimen at a first exposure moment and then after the elapse of a predetermined time interval and still during such relaxation and creeping forming at a second exposure moment a second holographic photograph superimposed upon the first.

4,033,182
METHOD FOR MEASURING BIAXIAL STRESS IN A BODY SUBJECTED TO STRESS INDUCING LOADS

Wayman N. Clotfelter, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,673
Int. Cl.² G01L *1/00*
U.S. Cl. 73—88 R **10 Claims**



9. A method for determining the magnitude of biaxial stress in matallic test articles, comprising the steps of:

A. serially subjecting a specimen having characteristics similar to the characteristics of an article to be tested to a series of incrementally increased stress loads of known magnitudes, electronically establishing a transit time indication for the second wave echo for a longitudinal wave propagated through the specimen along a given path as the specimen is subjected to each load of the series for thus obtaining a first series of first transit time indications;

B. electronically establishing a transit time indication for the first wave echo for each of a pair of orthogonally related shear waves propagated along paths paralleling said given path through said specimen for vibrating particles of the crystalline lattice thereof in the planes of a first and a second orthogonally related stress axis extended through the specimen as the specimen is subjected to each stress load of the series of known stress loads for thus obtaining a second and a third series of transit time indications;

C. comparing the indications of said first series of transit time indications with the indications of said second and third transit time indications for obtaining a first and a second series of transit time differentials, and dividing each of the transit time differentials by the total length of the paths through the specimen, for thus establishing a series of time differential values indicative of stress magnitude for the orthogonally related stress axes for said specimen;

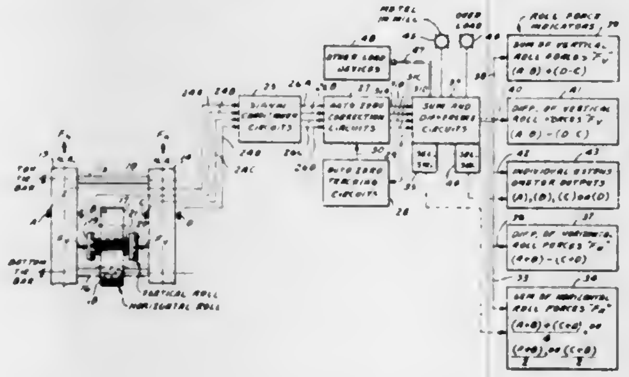
D. obtaining a pair of transit time differential indications between the second wave echo for a longitudinal wave propagated along a first path through a test article subjected to an unknown stress and the first wave echo for each shear wave of a pair of shear waves propagated along a second path extended through the test article paralleling said first path for vibrating the crystalline lattice thereof in the planes of a first and a second stress axis for said test specimen; and

E. comparing said pair of transit time differential values obtained for the test article to the series of time differential values established for the specimen for thus determining the magnitude of stress occurring along the first and second stress axes of the test article.

4,033,183
HORIZONTAL- AND VERTICAL-ROLL FORCE MEASURING SYSTEM

Harold A. List; Jack H. Baker, both of Bethlehem, Pa., and Jack Joyce, Westford, Mass., assignors to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed Oct. 8, 1976, Ser. No. 730,927
Int. Cl.² G01L *1/22;* G01B *7/18*
U.S. Cl. 73—88.5 R **10 Claims**



1. Apparatus for measuring horizontal- and vertical-roll forces exerted on a workpiece in a universal rolling mill, comprising:

a. first, second, third and fourth extensometer means adapted to be mounted in pairs along a common neutral axis on opposing strain sites on first and second rolling mill posts, each said extensometer means having a separate output signal which varies proportional to the total strain at a given strain site as a function of horizontal-roll force, vertical-roll force and a zero drift component,

b. first circuit means responsive to a zero switching signal for automatically and independently zeroing each extensometer output signal to correct for the zero drift component associated with a given site,

c. second circuit means for resolving the four zeroed extensometer output signals into simultaneous horizontal- and vertical-roll force signals associated with both said mill posts, said second circuit means adapted to produce said zero switching signal during the absence of the workpiece in said mill, and

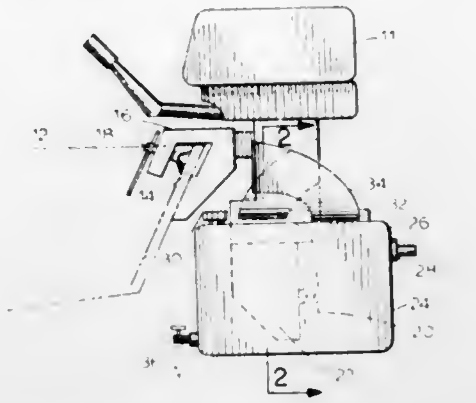
d. means for utilizing the signals from the second circuit means to simultaneously determine horizontal- and vertical-roll forces in said universal rolling mill.

4,033,184
OUTBOARD MOTOR SERVICE TANK

Maurice O. Christink, 3966 Bloor St. West, Islington, Ontario, Canada

Filed Aug. 24, 1976, Ser. No. 717,239
Int. Cl.² G01M *15/00*
U.S. Cl. 73—117.1 **5 Claims**

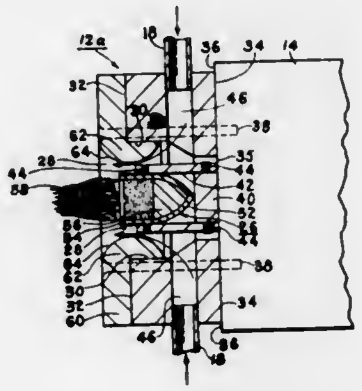
1. A sevicing tank for outboard motors and the like comprising a tank compartment having an upper portion defining a suitable opening for admitting an outboard motor's propeller and gear, and having lugs for attaching to the motor; and having an inlet fitting for liquid admission; and having an exhaust opening provided in a surface of the tank at a point lower than the inlet; the tank intended to contain cooling water; and the lower exhaust opening precluding backup into the inlet and permitting gas escape to reduce cavitation.



4,033,185
WIND-TUNNEL SIMULATOR

Thomas J. McNally, Levittown, Pa.; Sigfried Mehling, Emmelshausen, Hunsruck, Germany, and Walter J. Puchalski, Southampton, Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 18, 1976, Ser. No. 687,577
Int. Cl.² G01M *9/00*
U.S. Cl. 73—147 **7 Claims**



1. A wind-tunnel simulator for producing, about an object having zero linear velocity, a flow of a gas which simulates the flow of the gas over the object as though the latter were projected through the gas, said simulator comprising:

a fixture having opposite walls and an inner surface that extends between said opposite walls and defines an opening for receiving said object therein spaced from said inner surface,

a said opening having opposite ends in said opposite walls, respectively,

conduit means formed in said fixture and communicating with said opening,

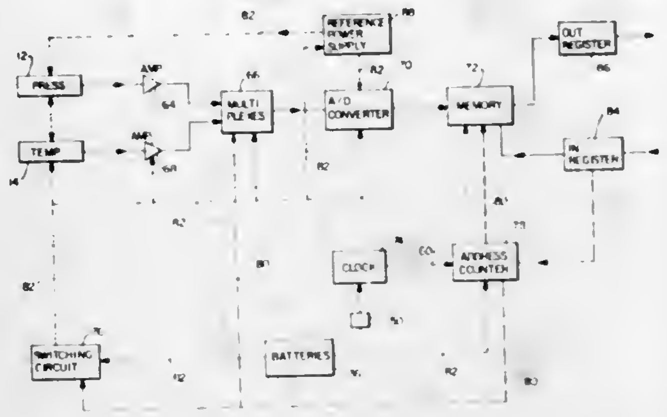
means to supply said flow of said gas through said conduit means, whereby to direct said gas over said object and through one of said ends of said opening,

motor means fixed to one of said walls of said fixture, and means coupled between said motor means and said object for spinning said object about an axis thereof.

4,033,186
METHOD AND APPARATUS FOR DOWN HOLE PRESSURE AND TEMPERATURE MEASUREMENT

Don Bresie, 8906 Little Walnut Parkway, Austin, Tex. 78758

Filed Aug. 6, 1976, Ser. No. 712,384
Int. Cl.² E21B *47/06*
U.S. Cl. 73—154 **24 Claims**



12. A down hole gauge apparatus for measuring and recording parametric conditions in an oil well, comprising:

parametric sensors each to produce a signal indicative of a selected parametric condition in said well;

individual amplifier devices for each of said signals;

a multiplexing device feeding each of said signals from said amplifier devices alternately to an analog to digital converter device, said converter device producing digital outputs each output representative of one of said alternating amplified sensor signals;

a storage device having a memory address for receiving and storing said digital output from said converter device;

an electrical power device to energize said apparatus;

an enclosure to enclosure said sensors, and said devices, said enclosure sealed from said well ambient environment, said sensors communicating with said well ambient environment.

4,033,187
WELL FLOW MEASURING APPARATUS

Yves Nicolas, Versailles, France, assignor to Schlumberger Technology Corporation, New York, N.Y.

Division of Ser. No. 596,492, July 16, 1975, which is a continuation of Ser. No. 485,059, July 1, 1974, abandoned. This application Aug. 6, 1976, Ser. No. 712,402
Int. Cl.² E21B *47/10*
U.S. Cl. 73—155 **2 Claims**

1. A flow-measuring tool adapted for movement through a well bore and comprising:

a body having longitudinally-spaced upper and lower portions and adapted for suspension in a well bore;

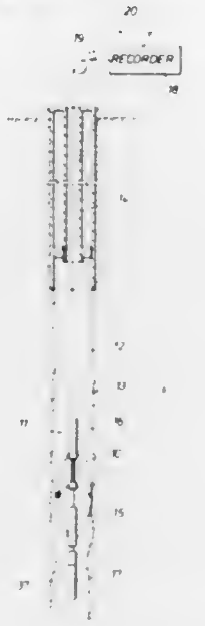
at least three elongated bow springs circumferentially spaced in upright positions around said body with the mid-point of each of said bow springs being laterally disposed from an intermediately-situated location on said body;

means pivotally securing a first end of each of said bow springs to a selected one of said body portions for limiting said first spring ends to only pivotal movement in relation to said one body portion as said spring mid-points respectively move between a laterally-extended position and retracted position adjacent to said intermediate body location;

means cooperatively intercoupling the second end of each of said bow springs for longitudinal movement together in relation to the other of said body portions;

means cooperatively arranged for maintaining said spring mid-points equidistant from said intermediate body location and including a coupling member slidably disposed on said body for longitudinal movement thereon between said first spring ends and said intermediate body location, a corresponding number of rigid links pivotally interconnecting said coupling number of rigid links pivotally interconnecting said coupling member to about said midpoints of each of said bow springs, and biasing means normally urging said coupling member toward said intermediate body location for coordinating the lateral movements of said bow springs and for imposing a progressively-increasing lateral force thereon as said bow springs move toward their respective extended positions;

an axial spindle on said body;



flow-responsive spinner means including a plurality of spinner blades symmetrically arranged around said spindle, means respectively pivotally coupling the inboard ends of each of said spinner blades to said spindle for pivotal movement respectively between extended laterally-directed, flow-responsive positions and retracted positions lying generally along said spindle; and

linkage means cooperatively coupled between said coupling member and said spinner blades for respectively moving said spinner blades between their said extended and retracted positions in accordance with movement of said coupling member along said body.

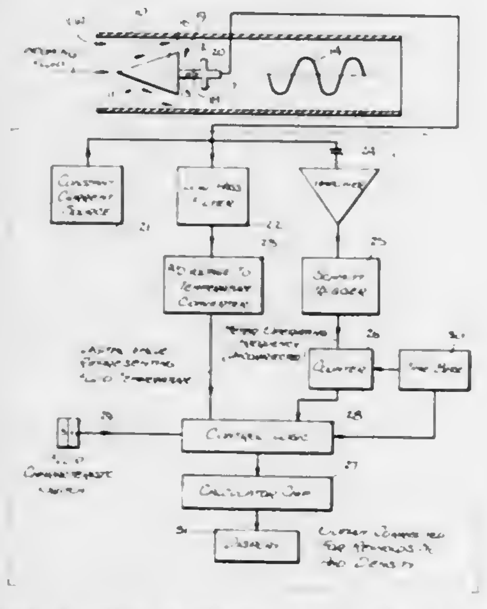
4,033,188
LINEAR VORTEX-TYPE FLOWMETER

Peter J. Herzl, Morrisville, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed May 30, 1975, Ser. No. 582,300

Int. Cl.^{2} G01F *1/32*

U.S. Cl. 73—194 VS **8 Claims**



1. A highly-accurate flowmeter for metering a fluid whose density and viscosity varies as a function of fluid temperature comprising:

- A. a flow tube having means therein to intercept the fluid to be metered to produce fluidic oscillations therein whose frequency is a function of the flow rate of the fluid passing through the tube;
- B. means to sense the frequency of the fluidic oscillations and to derive therefrom an uncorrected flow rate value in digital terms;
- C. means to sense the prevailing temperature of the fluid passing through the tube and to derive therefrom a temperature value in digital terms, said means to sense the frequency of the fluidic oscillations and said means to sense the temperature being constituted by a common sensor yielding a signal having a frequency component and a temperature component and further including means to segregate said frequency component from said temperature component to provide said uncorrected flow rate digital value and said digital temperature value;
- D. means to provide a fluid characteristics value in digital terms, depending on the relationship between the density and viscosity of said fluid and temperature; and
- E. digital computer means responsive to said uncorrected flow rate digital value, said digital temperature value and said fluid characteristics digital value to produce a digital output signal which represents the flow rate corrected for the effect of temperature on the characteristics of the fluid.

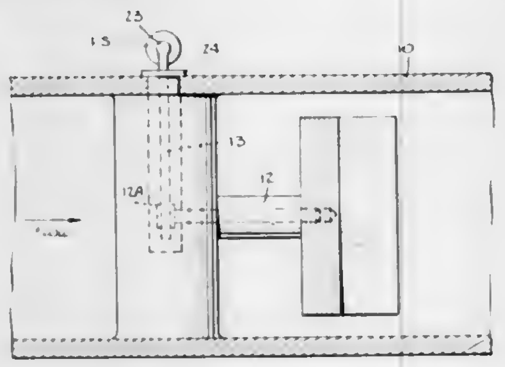
4,033,189
EXTERNAL-SENSOR VORTEX-TYPE FLOWMETER

Peter J. Herzl, Morrisville, and Harold W. Metzger, Willow Grove, both of Pa., assignors to Fischer & Porter Co., Warminster, Pa.

Filed Mar. 26, 1976, Ser. No. 670,998

Int. Cl.^{2} G01F *1/32*

U.S. Cl. 73—194 VS **8 Claims**



1. A vortex-type flowmeter operable with an external force sensor and comprising:

- A. a flow tube through which a fluid to be metered is conducted;
- B. an obstacle assembly disposed in said tube to create fluidic oscillations therein, said assembly being constituted by a fixed section mounted across the tube and a deflectable section cantilevered from the fixed section by a flexible beam whereby said deflectable section is excited into vibration by said fluidic oscillations at a frequency which is a function of flow rate; and
- C. means to transmit the vibration from the deflectable section to a coupling head outside said tube which is engageable by a force sensor to generate a sensor signal whose amplitude depends on the force applied thereto and whose frequency is indicative of flow rate, said transmission means having a mechanical advantage effecting force amplification whereby said signal has a relatively high level, said vibration transmission means being constituted by a lever attached at one end to said coupling head and pivoted about fulcrum to cause said head to exert an amplified force on said sensor, the vibrations of said deflectable section being applied to said lever at a point adjacent the other end thereof, said head being relatively close to said fulcrum.

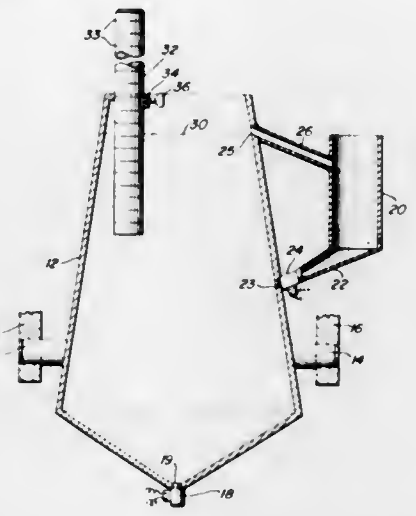
4,033,190
PRECISION MEASURING DEVICE

Henry S. Hudspeth, 12 Haley st., Pine Bluff, Ark. 71601

Filed Feb. 9, 1976, Ser. No. 656,698

Int. Cl.^{2} G01F *19/00*

U.S. Cl. 73—426 **10 Claims**



1. A precision measuring device comprising; means for accurately measuring large volumes of liquid in gallon quantities including, a first open top liquid measuring vessel, means for storing and saving any excess liquid poured into said vessel which exceeds a predetermined designated amount, means for emptying said first liquid measuring vessel of the predetermined measured amount of liquid contained therein after filling, and the means for emptying said first liquid measuring vessel including means pivotally mounting the entire apparatus so that the predetermined measured liquid may be dumped from the first liquid measuring vessel.

4,033,191
INDICATING INSTRUMENT AND CASING

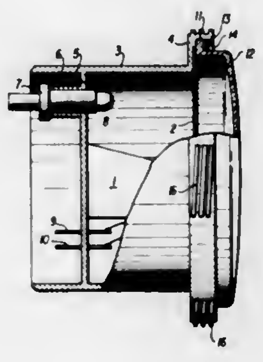
Alois Kreuz, Dornigheim, and Joachim Hahn, Oberursel, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Sept. 11, 1975, Ser. No. 612,543

Claims priority, application Germany, Sept. 13, 1974, 2443867

Int. Cl.^{2} G01D *11/24, 11/26*

U.S. Cl. 73—431 **10 Claims**



1. In an indicating instrument comprising a cup-shaped casing of plastics material, a measuring element within the casing, the measuring element including a display dial, the front end of the casing forming an extension of enlarged diameter interiorly threaded and being obturated by a window to form an observation aperture shield and being enveloped by a front frame provided on its back with a circular central recess which is larger than said observation aperture, the improvement comprising:

- A. at least two circumferentially-spaced ribs in said recess each having an edge inclined with respect to the front surface of said frame,
- B. at least two circumferentially-spaced ribs on and exteriorly of said extension, each having an edge inclined with respect to the front surface of said frame,
- C. all said ribs conjointly forming matting wedge-shaped screw joints cooperating to releasably secure the front frame on the casing,
- D. at least one end stop for the screw joints,
- E. a threaded holding ring engaging the threads of said extension and contacting the peripherally-flanged rim of said window to hold the same to the casing, and
- F. an elastic element arranged between the front surface of said extension and the front frame.

4,033,192
TEMPLATE FOLLOWING MECHANISM

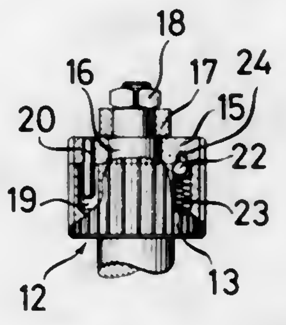
Hubert Junemann, Sudbrackstr. 68b, 48 Bielefeld, Germany

Filed Apr. 4, 1975, Ser. No. 544,630

Claims priority, application Germany, Jan. 28, 1974, 2403945

Int. Cl.^{2} F16H *19/04*

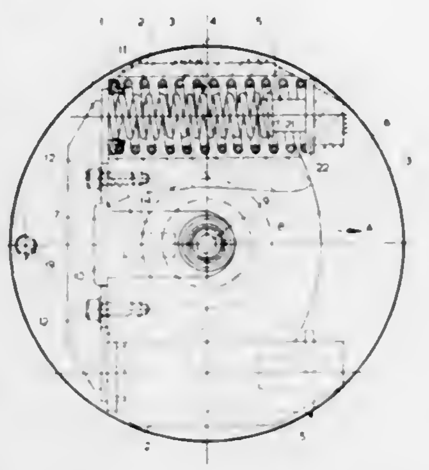
U.S. Cl. 74—29 **1 Claim**



1. A template follower mechanism including a template consisting of at least a first gear rack, a second gear rack adjustably arranged in relation to said first gear rack, means for clamping together said racks after adjusting, a driven roller caused to bear against said template and comprising a driven first pinion capable of meshing with the teeth of said first gear rack and provided with a shaft journal, a second pinion coaxial with said first pinion capable of meshing with said second gear rack and pivoted on said shaft journal, and having bores therein fastening means for securing said second pinion against axial movements, means for arresting and resetting said second pinion in a normal position wherein the teeth of said second pinion are in alignment with the teeth of said first pinion, said means including bores in said second pinion continuously distributed on a pitch circle, said first pinion having bores coaxial with said bores in said second pinion, balls received in said bores of said first pinion, and springs within said bores for biasing said balls against the lateral edges of said bores in said second pinion, and stop means for limiting the rotary motion of said second pinion about one tooth pitch, one half in clockwise direction and one half in counterclock direction relative to the normal position, said stop means including a stop pin secured to said second pinion and extending into a bore located in said first pinion, said bore having an inside diameter permitting a rotary motion of said second pinion according to one tooth pitch.

4,033,193
VIBRATORY DRIVE UNIT

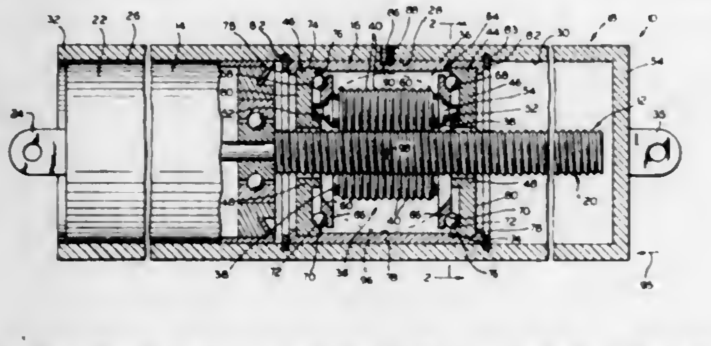
James Edward Brander, Strathfield, Australia, assignor to International Combustion Australia Limited, Australia
Filed Feb. 28, 1975, Ser. No. 554,218
Claims priority, application Australia, Mar. 4, 1974, 6795/74
Int. Cl.² F16H *33/00*
U.S. Cl. 74—61 **1 Claim**



1. Rotary vibrator drive unit comprising a disc-like support member secured to a driven shaft for rotation therewith, an unbalanced mass slidably secured to the support member for outward radial movement under the influence of centrifugal force, said unbalanced mass being slotted with the slot enclosing the driven shaft, a bridging crossbar across the open end of the slot, a pair of spring housings secured to the support member in diametrically opposed parallel relationship, a first helical coil spring within each housing held between the crossbar and a flange at the end of its spring housing remote from the crossbar, each said first helical coil spring when the drive unit is stationary being partially compressed and urging the unbalanced mass toward the position of minimum unbalance, a second helical coil spring within and coaxial with each first coil spring and being of shorter length than the first coil spring, each said second coil spring being secured at one end to the crossbar and with its other end slidable over a spigot on said flange so that each said second coil spring engages between the unbalanced mass and the support member only when the unbalanced mass has moved radially outward a predetermined distance, a housing surrounding the unbalanced mass and coil springs, and a damping oil filling the housing.

4,033,194
SYNCHRONIZED LINEAR ACTUATOR

Richard B. Stanley, 313 S. 2nd St., Oregon, Ill. 61061
Filed June 12, 1975, Ser. No. 586,155
The portion of the term of this patent subsequent to June 29, 1993, has been disclaimed.
Int. Cl.² F16H *27/02*
U.S. Cl. 74—89.15 **4 Claims**



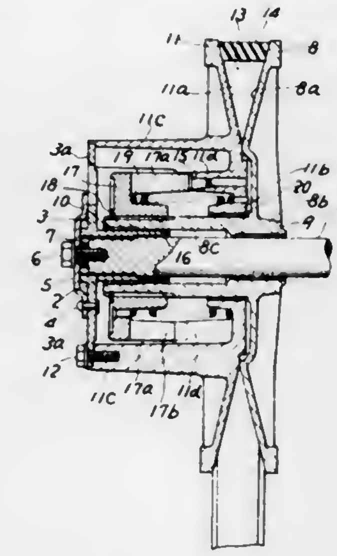
1. In a linear actuator including a threaded shaft, a linearly movable member to be moved linearly by the shaft and longitudinally of the shaft, a bearing unit operatively connected to said member and shaft for translating rotational movement of said shaft about its axis to linear movement of said member, and means for rotating the shaft about its axis, with said bearing unit comprising a plurality of discrete rollers having right flanges along their shanks spaced for rolling engagement with the shaft threading, said rollers at their ends defining bearing surfaces that are angled relative to their longitudinal axes, an outer race structure defining spaced apart raceway surfaces about the shaft axis about which said roller bearing surfaces respectively ride, and a roller support about which said rollers are received in free rolling nonjournaled relation thereto, said support being formed to be received over the shaft, said roller flanges being free of engagement with said outer race structure, said rollers having projecting end portions and said support being formed for cooperation with said roller end portions to support the rollers against substantial radial displacement radially inwardly of said raceways when the bearing unit is free of the shaft,

the improvement wherein:

said outer race structure comprises a pair of ring members, one of said ring members forming one of said raceway surfaces and the other of said ring members forming the other of said raceway surfaces,
with said raceway surfaces having their surfacing of circular contour transversely of the shaft axis and across the area of same that is engaged by said roller bearing surfaces,
with said raceway surfacing area being a surface of revolution that is smoothly contoured axially of the shaft axis, and said roller bearing surfaces being free of gearing,
said raceway surfaces being respectively radially aligned with the respective roller bearing surfaces, and being coaxial with the shaft axis,
said support comprising a pair of spaced apart rings coaxial with the shaft axis through which said shaft is received and between which said outer race structure ring members are disposed,
said support rings on the sides of same facing the respective roller end portions defining keying recesses in which the respective roller end portions are received for keying said roller end portions to the respective support rings against movement of said rollers about said shaft relative to said support rings, respectively,
said roller end portions being free of journalling in their respective recesses,
said support ring recesses of the respective support rings being disposed in circumferentially spaced relation about said support rings and being circumferentially aligned at a predetermined radial level about the shaft axis,
said raceway surfaces being radially outward of but adjacent said radial level for maintaining said rollers in continuous rolling engagement with the shaft threading,
said outer race structure ring members being journalled between and relative to said support rings for free rotational movement of said outer race structure about the shaft axis relative to said support rings,
and means for making said support rings fast to said linearly movable member against movement relative to said linearly movable member for holding said rollers against orbiting movement about said shaft on rotation of said shaft,
whereby on rotation of said shaft said outer race structure is rotated about said shaft by the rolling engagement of said rollers with said shaft and said outer race structure, with said rollers being held by said support rings against orbiting movement about said shaft and said rolling engagement of said rollers with said shaft effecting linear movement of said bearing unit and the linearly movable member longitudinally of the shaft, whereby said bearing unit and the linearly movable member linear movement is synchronized with the lead of the shaft threading.

4,033,195
DRIVEN CLUTCH DEVICE FOR V-BELT TYPE AUTOMATIC TRANSMISSION

Izumi Takagi, and Masayuki Asazuma, both of Akashi, Japan, assignors to Kawasaki Heavy Industries, Ltd., Kobe, Japan
Filed Jan. 2, 1976, Ser. No. 646,028
Claims priority, application Japan, Jan. 13, 1975, 50-7443
Int. Cl.² F16H *7/02, 55/52*
U.S. Cl. 74—230.17 M **1 Claim**



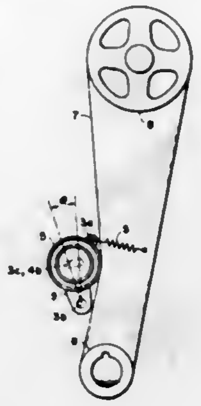
1. A driven clutch device for a V-belt automatic transmission having a drive shaft supported in a single bearing means and a driving pulley mounted thereon with a symmetrical V-shaped groove therein and a stationary sheave on the driving shaft adjacent the bearing means and a movable sheave on the shaft on the opposite side of the stationary sheave from the bearing means and movable toward and away from the stationary sheave for varying the size of the V-shaped groove, a V-belt around said driving pulley in said V-shaped groove, and a driven shaft supported in a single bearing means, said driven clutch device comprising a stationary sheave around said driven shaft having a cylindrical part extending coaxially with said driven shaft toward the free end of the driven shaft, a coupling attached to said cylindrical part and closing the open end thereof and attached to the end of said driven shaft, a movable sheave slidably mounted on said driven shaft between the stationary sheave and the bearing means for movement along said driven shaft and defining a symmetrical V-shaped groove in which said V-belt is positioned, said movable sheave having a cylindrical extension coaxial with said driven shaft and extending slidably through said stationary sheave, a cam bracket on said cylindrical extension within said cylindrical part and having cam surfaces thereon facing said stationary sheave, said stationary sheave having contact parts thereon projecting toward and contacting said cam surfaces for moving said cam bracket away from said stationary sheave on relative rotation in one direction, and a torsion spring means between said cam bracket and said stationary sheave urging said stationary sheave and said cam bracket apart, whereby said movable sheave is urged toward said stationary sheave.

4,033,196
TIMING BELT TENSIONER

Yorishige Maeda, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan
Filed July 6, 1976, Ser. No. 702,579
Claims priority, application Japan, Nov. 26, 1975, 50-159922
Int. Cl.² F16H *7/12, 7/10*
U.S. Cl. 74—242.11 R **5 Claims**

1. A timing belt tensioner for an internal combustion engine comprising:

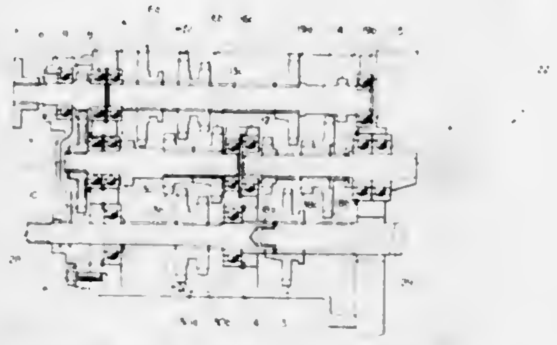
a base plate pivotally coupled to the front of said engine;
a first slot provided in said base plate;
a tensioner bearing holder disposed on said base plate over said slot;
a tensioner bearing means coupled to said bearing holder;
a second slot provided in said bearing holder over said first slot; and



a bolt means extending through said first and second slots for fixing the position of said timing belt tensioner on said engine; said first and second slots being shaped so as to permit the base plate and tensioner bearing holder to move relative to the bolt means extending through said first and second slots and along an arc having its center of curvature at the pivot axis.

4,033,197
TRANSMISSION FOR TRACTOR

Hajime Shikiya, Sennan; Seiichi Nakanishi, Sakai; Zitsuo Yoshida, Izumi, and Kenkichi Hirakawa, Sakai, all of Japan, assignors to Kuboto Tekko Kabushiki Kaisha, Osaka, Japan
Filed Apr. 8, 1975, Ser. No. 566,119
Int. Cl.² F16H *3/22, 3/30, 3/32, 57/02*
U.S. Cl. 74—331 **7 Claims**



1. A transmission for a tractor comprising:

an input shaft (7) to receive power from a prime mover (1),
a first speed change shaft (11) spaced from and in parallel with the input shaft (7), the first speed change shaft (11) being adapted for operative connection to the input shaft (7) by means of removably mounted speed change gears (10, 9,)
a second speed change shaft (14) disposed coaxially with the input shaft (7), the second speed change shaft (14) being adapted for operative connection to the first speed change shaft (11) by means of speed change gears (16*a*, 16*b*, 16*c*), (13*a*, 13*b*, 13*c*),
a casing (4) having means defining openings to support the input shaft (7) and the first and second speed change shafts (11), (14) by means of bearings (8) respectively, the input shaft (7) and the second speed change shaft (14) being supported in the opening in spaced end-to-end relation, and
a covering (5) adapted to extend over a side wall of the casing (4),

and removably attached to the casing (4), the covering being provided with an outwardly extending deformed position serving to receive the terminal end portion of the first speed change shaft (11) and the gear (10) attached thereto, and to contain the input shaft (7) and its complemental speed change gear (9).

4,033,198
DEVICE FOR REDUCING NOISE IN GEAR WHEEL COUPLINGS, WITH A HIGH SAFETY DEGREE

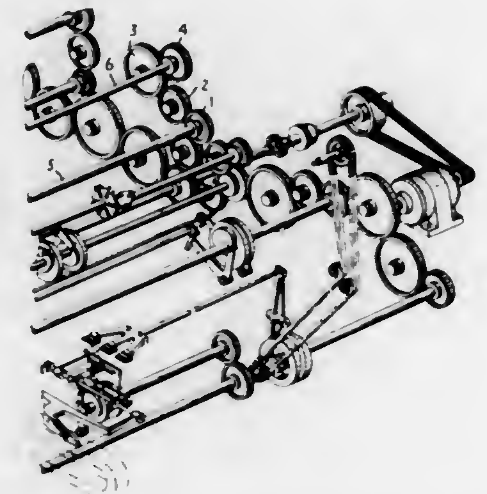
Enzo Seragnoli, Bologna, Italy, assignor to G. D. Societa per Azioni, Italy

Filed Jan. 29, 1976, Ser. No. 653,586

Claims priority, application Italy, Mar. 7, 1975, 3355/75

Int. Cl.^{2} F16H *55/14, 55/00*

U.S. Cl. 74—443 **2 Claims**



1. A device for safely reducing noise produced in gear wheel couplings in motion transmission and distribution lines, particularly of wrapping and packeting machines operating at very high output speed, operatively connected to a gear wheel in such a line, comprising two gears coaxial and contiguous with one another and having identical numbers and angularly coincident arrangements of teeth, one of the gears consisting of rigid metal material and the other consisting of tough and elastically yielding material.

4,033,199
TOE CLIP FOR PEDALS

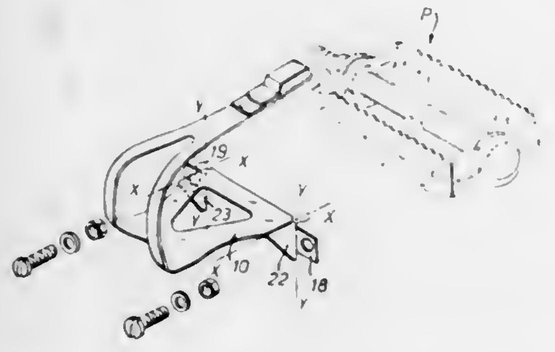
Paul C. Bouder, Soisy sur Montmorency, France, assignor to Etablissements Poutrait-Morin, France

Filed Nov. 17, 1975, Ser. No. 632,792

Claims priority, application France, Nov. 19, 1974, 74.38016

Int. Cl.^{2} G05G *1/14*

U.S. Cl. 74—594.6 **9 Claims**



1. Toe clip for bicycle pedals or other similar pedals of the type including a pedal frame mounted for rotation about a spindle, the pedal frame having a pair of opposed longitudinal faces for supporting the rider's foot and a pair of opposed lateral faces, said toe clip comprising a toe supporting portion for supporting the fore end of the rider's foot, a turned back portion continuing beyond one end of said toe supporting portion and thereabove for defining a toe receiving space therewith, wherein the improvement comprises reinforcing gusset plate means downwardly depending from the lateral sides of said toe supporting portion and remote from said turned back portion, said gusset plate means being oriented substantially perpendicular to the toe supporting portion, and fastening lugs extending from said gusset plate means adapted to brought flush against at least one face of the pedal frame.

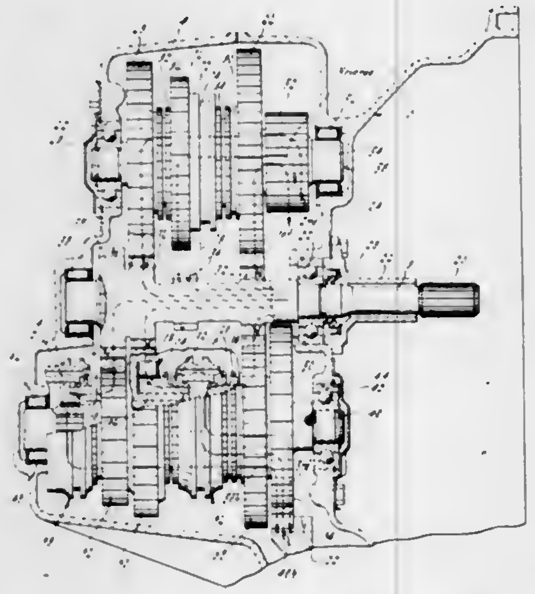
4,033,200
FIVE SPEED OVERDRIVE TRANSMISSION

Thomas R. Stockton, Ann Arbor, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Apr. 24, 1975, Ser. No. 571,337

Int. Cl.^{2} F16H *37/00, 3/08*

U.S. Cl. 74—740 **4 Claims**



1. A power transmission mechanism having multiple speed ratios including an overdrive ratio comprising an input shaft, a pair of countershafts situated in parallel disposition with respect to said input shaft, multiple torque input gears on said input shaft, countershaft gear elements journalled on said countershafts in meshing engagement with said input gears, each countershaft being connected driveably to a countershaft output gear, an output gear assembly connected driveably to said countershaft output gears, synchronizer clutch means for driveably connecting selectively said gear elements with their respective counter shafts, an overdrive gear connected to said input shaft, an overdrive gear element journalled on one of said countershafts, an overdrive clutch means for connecting selectively said overdrive gear element to its associated countershaft, and overrunning clutch means for establishing a one-way driving connection between one of said countershaft gear elements and its associated countershaft whereby an upshift to the overdrive speed ratio may be accomplished while the synchronizer clutch assembly associated with said one countershaft gear element remains engaged.

4,033,201
OIL PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION SYSTEM

Ichio Sakai, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 13, 1975, Ser. No. 586,809

Claims priority, application Japan, Dec. 13, 1974, 49-143273

Int. Cl.^{2} F16D *67/04;* **B60K** *41/10*

U.S. Cl. 74—869 **14 Claims**

1. An oil pressure control system for an automobile transmission system which includes a fluid torque converter, a transmission gear and friction engaging means for establishing a selected transmission engagement in said transmission gear, comprising;

a source of oil pressure;

a line pressure regulating valve which generates a regulated line pressure from the oil pressure of said source;

a throttle pressure regulating valve which generates a throttle pressure from said line pressure, said throttle pressure increasing as the throttle valve is opened;

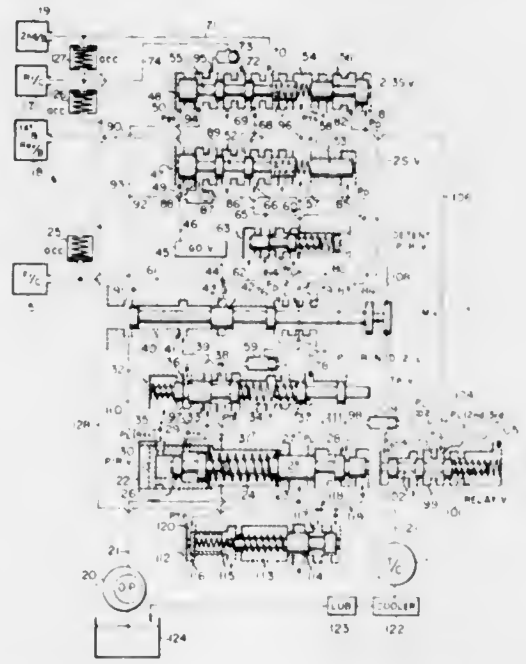
a governor pressure regulating valve which generates a governor pressure from said line pressure, said governor pressure increasing as the vehicle speed increases;

a plurality of speed shift valves which are shifted due to a balance between said governor pressure and said throttle pressure so as to supply oil pressure to a selected element or elements of said friction engaging means;

a manual shift valve which is operated by hand to supply oil pressure to a particular element or elements of said friction engaging means and apply a restriction to a selected one of said shift valves;

a torque converter pressure regulating valve which generates a torque converter pressure from said line pressure, said torque converter valve being supplied with said throttle pressure as a control pressure and generating a higher torque converter pressure in accordance with an increase in said throttle pressure;

a buffering accumulator for an element of said friction engaging means, said accumulator comprising a fluid displacement element and a back pressure chamber; and passage means to conduct said torque converter pressure to said back pressure chamber of said buffering accumulator.



4,033,202
SPEED RESPONSIVE ELECTRONIC CONTROLS FOR TRANSMISSIONS

Karl Gustav Ahlen, Stockholm, and Rolf Leonard Fabricius-Hansen, Alvsho, both of Sweden, assignors to S.R.M. Hydromekanik Aktiebolag, Sweden

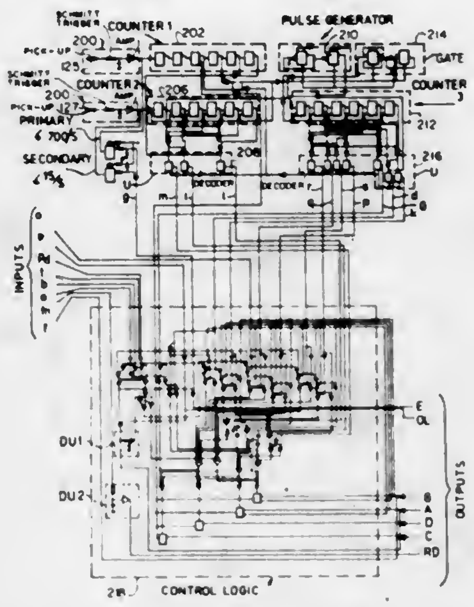
Filed Apr. 8, 1974, Ser. No. 459,179

Claims priority, application United Kingdom, Apr. 6, 1973, 16734/73

Int. Cl.^{2} B60K *21/00*

U.S. Cl. 74—866 **7 Claims**

1. A remote control system for controlling the operation of a vehicle transmission including an input shaft operatively connected to a power source and an output shaft operatively connected to the vehicle drive wheels, comprising first sensing means for sensing the rotational speed of said input shaft and producing a first series of pulses in accordance therewith; second sensing means for sensing the rotational speed of said output shaft and producing a second series of pulses in accordance therewith; and control means for producing a control signal when the ratio of the frequencies of said first and second series of pulses is either above or below a selected value, said control means including first and second n-bit binary ring counters which are connected to said first and second sensing means, respectively, and which are fed respectively with the first and second series of pulses, one of the counters directly controlling starting, stopping and return to zero of the other counter such that a signal representative of the actual value of said ratio is obtained in binary form; and a decoder means connected to said other counter for receiving said actual value signal, said control signal being derived from the output of the decoder means.



4,033,203
HYDRAULIC CONTROL SYSTEM FOR VEHICLE TRANSMISSION MEANS

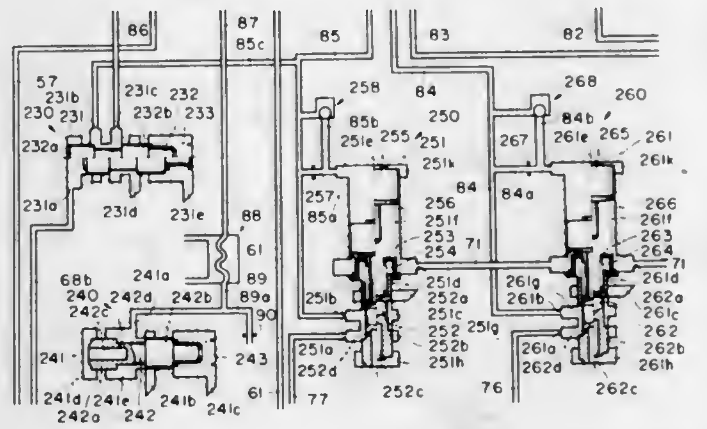
Koichiro Hirosawa, Kariya; Kazuo Ishikawa, Aichi; Tsunehiko Ogasawara, Kariya, and Noboru Murakami, Nagoya, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sept. 3, 1975, Ser. No. 610,074

Claims priority, application Japan, Sept. 17, 1974, 49-107274; Sept. 17, 1974, 49-107277

Int. Cl.^{2} B60K *21/00*

U.S. Cl. 74—869 **7 Claims**



1. A hydraulic control system for vehicle transmission means including a gear transmission provided with a plurality of frictional devices adapted to be selectively and hydraulically actuated to provide a plurality of driving stages of different speed ratios including a low speed range and a high speed range, said hydraulic control system comprising:

a. a hydraulic pressure source to provide a supply of pressurized hydraulic fluid;

b. pressure regulator valve means connected with the hydraulic pressure source for receiving the pressurized fluid and providing a regulated line pressure, said pressure regulating valve means including a pressure increasing chamber means which, when subjected to a pressure, increases the line pressure regulated by the pressure regulator valve means;

c. shift valve means connected with the regulator valve means for directing the line pressure from the regulator valve means to selected ones of said frictional devices;

d. pressure control valve means disposed between said shift valve means and at least those frictional devices which are actuated in said low speed range of the transmission for providing a delay of time in the increase of pressure to the frictional devices for the low speed range of the transmission, said control valve means comprising:

1. a valve housing which has inlet port means, outlet port means and exhaust port means;
2. a valve member disposed for axial movement in said housing and having land means for alternately connecting the outlet port means with the inlet and exhaust port means in response to the axial movement of the valve member;
3. means for resiliently biasing the valve member in a direction for establishing a communication between the inlet and outlet port means;
4. said valve housing including a first chamber at an end of said valve member and connected with said outlet port means whereby pressure is introduced from the outlet port means into the first chamber, forcing the valve member against said resilient bias means;
5. a piston disposed in said valve housing for axial movement at the end of the valve member opposite said first chamber;
6. second resilient bias means for urging the piston in a direction opposite to the valve member;
7. a second chamber designed in the valve housing at an end of the piston opposite to the valve member; and
8. means for connecting said outlet port means through a restriction orifice means with the second chamber, said piston having a portion which is adapted, when pressure is established in said second chamber and the piston is displaced toward the valve member under the influence of the pressure in the second chamber, to engage the valve member to force it against the function of the pressure in the first chamber to establish the connection between the inlet and outlet port means, said inlet port means being connected with the pressure regulating valve means to receive the regulated line pressure therefrom, and said outlet port means being connected to said frictional device; and

e. means for feeding back the pressure from the pressure control valve to the pressure increasing chamber means in the pressure regulator valve means so as to increase the line pressure therefrom.

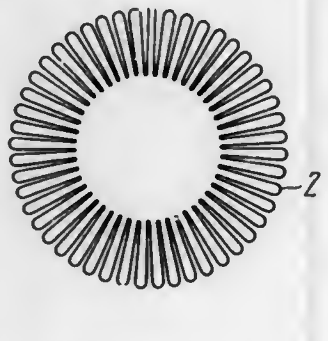
5. Pressure control valve comprising a valve housing which has inlet port means, outlet port means and exhaust port means, a valve member disposed for axial movement in said housing and having land means for alternately connecting the outlet port means with the inlet and exhaust port means in response to the axial movement of the valve member, means for resiliently biasing the valve member in a direction of establishing a communication between the inlet and the outlet port means, said valve housing including a first chamber at an end of said valve member and connected with said outlet port means whereby pressure is introduced from the outlet port means into the first chamber and force the valve member against the resilient bias means, a piston disposed in said valve housing for axial movement at the end of the valve member opposite to the first chamber, second resilient bias means for urging the piston in a direction opposite to the valve member, a second chamber defined in the valve housing at an end of the piston opposite to the valve member, and means for connecting said outlet port means through restriction orifice means with the second chamber, said piston having a portion which is adapted, when pressure is established in said second chamber and the piston is displaced toward the valve member under the influence of the pressure in the second chamber, to engage the valve member to force it against the function of the pressure in the first chamber to establish the connection between the inlet and outlet port means.

4,033,204
METHOD OF MAKING ROTARY CUTTERS
Viktor Samsonovich Salukvadze, 5 Parkovaya ulitsa 42, kv. 53, Moscow, U.S.S.R.

Filed Aug. 12, 1975, Ser. No. 604,075

Int. Cl.² B21K *5/12*

U.S. Cl. 76—101 A **3 Claims**



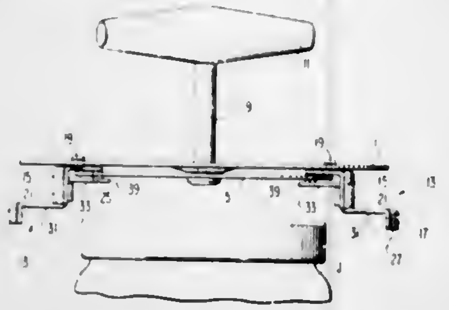
1. A method of making a rotary cutter, comprising corrugating a wire, which is to subsequently form a resilient member of the rotary cutter, to obtain a blank, each corrugation having a height at least equal to the length of a resilient member, adjacent corrugations being spaced apart a distance less than the diameter of said wire, placing the blanks thus obtained in an indexed position into a stack so that the corrugations extend perpendicularly to the longitudinal axis of rotation of the cutter and the blanks define outer working ends and inner non-working ends, subsequently pressing the resilient members, securing the non-working ends of the resilient members together and cutting off the outer ends of the resilient members to form the working surface of the cutter, the factor of filling of the working surface with said outer ends being within 0.05 to 0.7.

4,033,205
WRENCH FOR CONTAINER CLOSURES
Nathan D. Hoskins, 6 Maywood Drive, Jackson, Tenn. 38301

Filed June 4, 1976, Ser. No. 692,860

Int. Cl.² B67B *7/18*

U.S. Cl. 81—3.42 **9 Claims**



1. In a wrench for container closures, comprising a supporting plate, an operating plate parallel to and disposed on one side of said supporting plate, a shaft passing rotatably through said supporting plate and fixed to said operating plate, a handle on said shaft on the side of said supporting plate opposite said operating plate, and a pair of opposed grippers that slide toward and away from each other on the side of said supporting plate opposite said handle and that engage slidably in arcuate slots in said operating plate whereby rotation of said handle moves said grippers toward and away from each other; the improvement in which said grippers are of two-part sheet metal construction, with the parts of each gripper being fixedly secured to each other one on one side of said operating plate between said operating plate and said supporting plate and the other on the side of said operating plate opposite said supporting plate, said grippers being of stepped construction having gripping surfaces extending generally parallel to the axis of the shaft and spaced at different radial distances from the axis of the shaft thereby to grip container closures of different diameters.

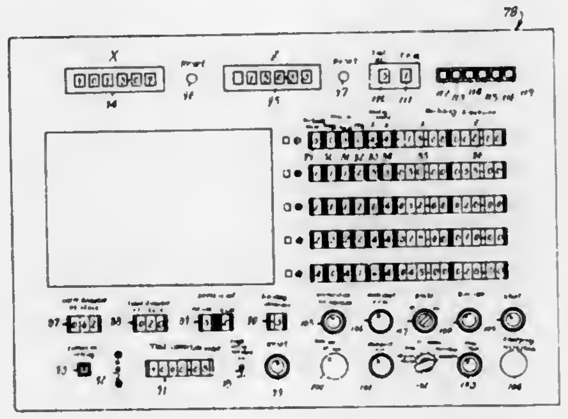
4,033,206
NUMERICALLY CONTROLLED MACHINE TOOL
Eiichi Morita; Akira Toda; Toru Kobayashi, and Hiroshi Fujii, all of Ikeda, Japan, assignors to Daihatsu Motor Co., Ltd., Osaka, Japan

Filed July 8, 1975, Ser. No. 593,969

Claims priority, application Japan, Oct. 19, 1974, 49-120670; Feb. 13, 1975, 50-18598; Apr. 3, 1975, 50-40879; Apr. 4, 1975, 50-41410; May 1, 1975, 50-53624; June 9, 1975, 50-69929; July 11, 1974, 49-79817

Int. Cl.² B23B *3/00*

U.S. Cl. 82—2 B **5 Claims**



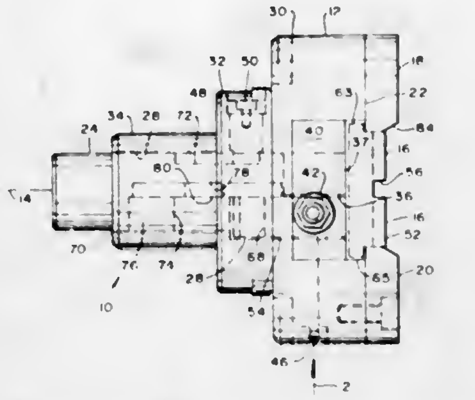
1. In a machine tool apparatus having a machine base, a drive shaft mounted on said base, a chuck operatively mounted on said drive shaft, means for driving said drive shaft, a bed mounted on the top of the base, slide table means operatively associated with the bed for longitudinally sliding movement relative thereto, means to move said slide table means in a longitudinal direction, cross-slide means mounted on said slide table means for transversely sliding movement relative thereto, means to move said cross-slide means in a transverse direction, tool rest means revolvably mounted on said cross-slide means, tool rest clamp lever means for locking said tool rest means to said cross-slide means, longitudinally positioned detector means operatively associated with said slide table means, and a transverse position detector means operatively associated with said cross-slide means, the improvement of a control unit operatively associated with said machine tool apparatus for operating same automatically, said control unit comprising electric circuit means corresponding to a mastern pattern for forming working mode patterns for a cutting tool in the longitudinal direction and the transverse direction respectively, means forming each working mode pattern of a cutting tool carried by the tool rest means into a fixed movement cycle, digital switch means for selecting and pre-setting each working mode pattern of the cutting tool, means actuated by each of said digital switch means for driving the slide table means and the cross-slide means in accordance with the master pattern to permit the cutting tool to achieve the desired machining.

4,033,207
GENERATING HEAD STRUCTURE
Bruce G. Peuterhaugh, Mount Clemens, Mich., assignor to J. P. Tool, Inc., Warren, Mich.

Filed Dec. 3, 1975, Ser. No. 637,300

Int. Cl.² B23B *29/034*

U.S. Cl. 82—2 E **5 Claims**



1. Generating head structure comprising a housing having an axis of rotation, a bore through said housing on the axis of rotation thereof, a slot extending transversely of one end of the bore radially enlarging the bore in one transverse direction, a slideway channel for receiving a slide over one end of the bore in the housing extending in the one transverse direction, a slide positioned over the one end of the bore in the channel having guide flanges on the opposite sides thereof extending in the direction of the channel, said slide further including a rectangular portion extending in the direction of the bore and in the direction of the slot across the one end of the bore and offset to one side of the axis, an opening through the rectangular portion of the slide adjacent the inner end of the slot across the one end of the bore, and means for securing a cutting tool to the slide on the surface thereof away from the one end of the bore, circular segment keeper plates secured to the one end of the housing having a straight side, which plates are removably connected to the one end of the housing and which straight side extends over the channel in the housing for securing the slide within the housing for transverse movement relative to the bore through the housing in the channel, a drawbar extending into the housing through the other end of the bore, the inner end of which has a circular segment cross section limited to the other side of the axis of the housing from the rectangular portion of the slide, which drawbar includes a flat face adjacent the axis having a cam channel extending diagonally of the drawbar and bore therein adjacent the rectangular portion of the slide, and a cam key including a cylindrical portion positioned within the opening through the rectangular portion of the slide and a rectangular portion positioned within the diagonal cam channel in the drawbar wherein on axial movement of the drawbar into and out of the other end of the bore in the housing the rectangular portion of the cam key is caused to move in the cam channel of the drawbar to produce movement of the slide transversely of the one end of the bore in the body member through the cam key.

4,033,208
FACING TOOL
Guy T. Gilmore, Crosby, Tex., assignor to Multi-Fab, Inc., Houston, Tex.

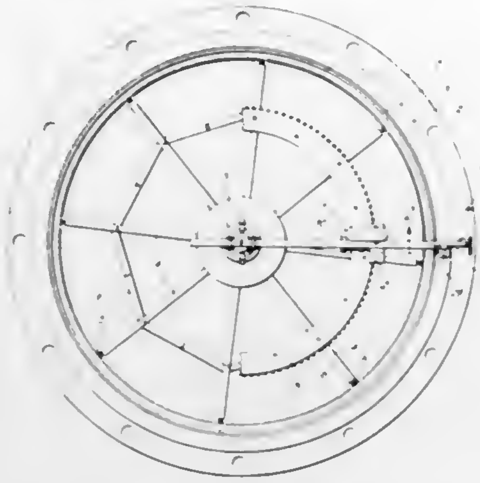
Filed Nov. 6, 1975, Ser. No. 629,641

Int. Cl.² B23B *5/16*

U.S. Cl. 82—4 C **6 Claims**

1. A cutting tool for facing or grooving flanges on tubular material, an anchoring means movable against the inside wall of a tubular member, a hub axially mounted in said anchoring means, means for controlled rotation of said hub, a boom mounted on said hub and having one end extended radially therefrom, a plurality of interchangeable templates of varied diameters, one of which is coaxially mounted on said anchor-

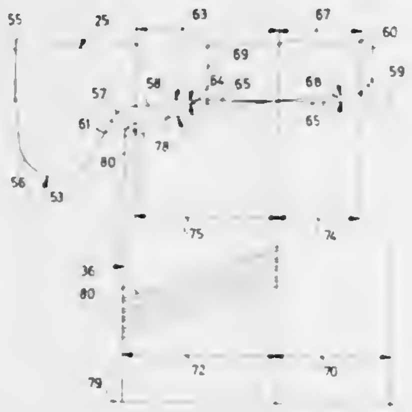
ing means, a link chain mounted on the periphery of said template, driving means mounted on said boom and confined



to said template and having a driving gear to mesh with said chain adapted to rotate said boom, cutting means mounted on the extended end of said boom.

4,033,209
SUPPORT ROLLS FOR SUPPORTING WHEELS OF A WHEEL SET DURING REPROFILING

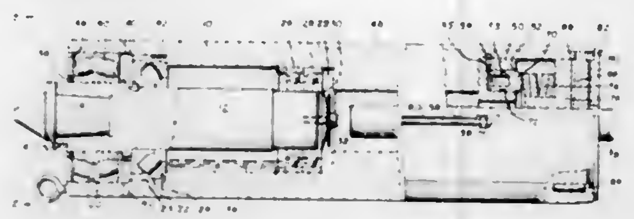
Theodor Dombrowski, Erkelenz, Germany, assignor to Wilhelm Hegenscheidt GmbH, Erkelenz, Germany
Filed Apr. 19, 1976, Ser. No. 677,883
Claims priority, application Germany, Apr. 22, 1975, 2517755
Int. Cl.² B23B *5/28*
U.S. Cl. 82—8 **11 Claims**



1. In an underfloor turning machine for remachining worn wheel profiles of a wheel set in a continuous operation, in which each wheel has a wheel rim at an inner end thereof, a combination comprising a pair of rolls for supporting each wheel of said set, the rolls of each pair of rolls being arranged spaced from each other substantially in a plane normal to the axis of the wheel set; and a turning tool for machining the profile of each wheel arranged between the rolls of each pair of rolls, each roll having a peripheral surface provided with an axially extending carrying zone and an axially extending transfer zone following the carrying zone in a direction toward a center plane of the wheel set and being inclined with respect to a horizontal line through an angle greater than the inclination of the desired profile to be machined into a portion of the wheel opposite said transfer zone, wherein the angle included between the transfer zone and a horizontal line is such that the radial distance between a point at an axial end of an active surface portion of the transfer zone facing the rim of the wheel in a plane including the wheel set axis and the roll axis from the opposite point of the desired wheel profile in said plane is equal to the maximum depth of a cut produced by the turning tool during one revolution of the wheel.

4,033,210
LIVE CENTER WITH HYDRAULIC PRESSURE INDICATOR

Henry F. Swenson, Roseland, N.J., assignor to J & S Tool Company, Inc., Livingston, N.J.
Filed Oct. 15, 1976, Ser. No. 732,806
Int. Cl.² B23B *23/04*
U.S. Cl. 82—31 **10 Claims**

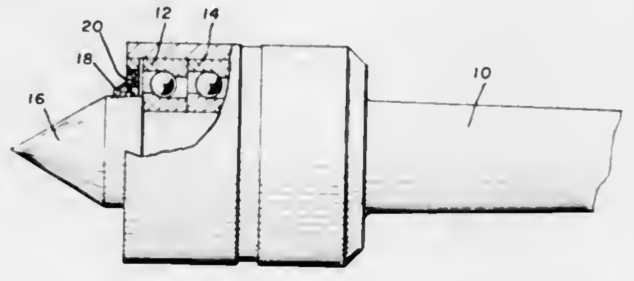


1. A heavy-duty live center for lathes, grinders and like machine tools in which the work load is in excess of 10 tons and includes visual means for indicating the thrust on the live center, said center including: (a) a hollow quill; (b) a rotatable spindle carried in this quill, the quill in mounted condition having a work load supporting and extending beyond the quill and with the intermediate portion of the spindle sized so as to provide sufficient clearance between the bore and spindle for the spindle to bow withe the application of a heavy load and when bowed the spindle turns freely in the quill; (c) a self-aligning roller bearing mounted on the foreportion of the spindle and adjacent thereto and to the rear thereof is a self-aligning spherical roller thrust bearing; (d) a front bore formed in this quill, the front portion of this bore precisely sized to receive and retain the outer race of the self-aligning roller bearing and the rear portion of this front bore is made a determined amount oversized in its diameter with regard to the diameter of the outer race of the thrust bearing, the rear of this front bore having a face surface normal to the axis of the bore, this face surface providing a stop surface for the rear face of the outer race of the thrust bearing, this thrust on the bearing being transferred to this face and thence to the quill; (e) antifriction bearing means mounted on the rear of the rotating spindle and when mounted in the bore of the quill adapted to receive and support the rear of the spindle; (f) a biasing means in association with the spindle and said bearing means on the rear of the spindle and adapted to provide a preload to the bearings carried in the front bore of the quill, (g) a shoulder provided on the fore-portion of the spindle, this shoulder adapted to engage the inner race of the self-aligning bearing and as urged by the applied preload to this spindle the bearing is drawn rearwardly and as this bearing is moved rearwardly its inner race moves the inner race of the self-aligning spherical roller thrust bearing rearwardly to cause the outer race of said thrust bearing to be brought into sliding engagement with the inner rear face surface of the front bore; (h) sealing means in association with the spindle and front bore of the quill to close the front bore to dirt, coolant and the like to retain a lubricant in the bearings without contamination and when a heavy load is placed on the extending end of the spindle, the spindle is bowed in accordance with the load and the stiffness of the spindle, the self-aligning bearing moving into alignment with the bowing of the spindle and the outer race of the thrust bearing is moved in the enlarged bore an amount equal to the bowing of the spindle at the inner race of the thrust bearing; (i) a hydraulic load cell carried by and in the rear portion of the quill and including a recess ring portion and a piston portion carried by and in this recess in a fluid tight manner, one member portion carried in a fixed condition by and in the quill and the other movable member slidably carried by the fixed member; (j) a nut-like member slidably carried in the quill and adapted to mate with and engage a threaded screw as carried by a tailstock of the machine tool; (k) a heavy-duty spring-like overtravel member carried by the nut-like member and interposed between this spring and the slidable mating member of the hydraulic load cell, and (l) a hydraulic conductor leading from the hydraulic load cell to

and connected to a hydraulic gage secured to the quill, the hydraulic gage indicating the pressure in the load cell as the work load is mounted and expands under working conditions, the spring-like overtravel member providing the needed bias to limit the movement of the quill under the increased thrust to a determined limit of travel.

4,033,211
REPLACEABLE FLINGER FOR LIVE CENTERS

Henry F. Swenson, Roseland, N.J., assignor to J & S Tool Company, Inc., Livingston, N.J.
Filed Aug. 19, 1976, Ser. No. 715,868
Int. Cl.² B23B *23/04*
U.S. Cl. 82—33 R **3 Claims**

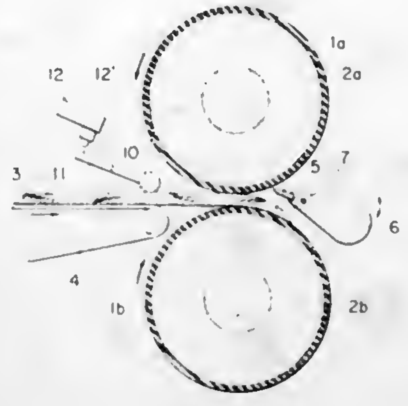


1. In combination a replaceable flinger removably mounted on the revolving center member of a live center and a grease seal removably mounted in a fixed spindle housing and with the lip portion of the seal adapted to rest upon a land portion of the flinger as and when mounted on the revolving center member, said flinger including: (a) a metal ring-like member sized to be a press fit on the revolving center member adjacent a front bearing by which the revolving center member is carried and toward a load carrying end of the center member and providing therewith a finished outer surface substantially parallel with the axis of the live center this land portion sized to receive an engaging lip of the replaceable grease seal, said flinger having a front shoulder portion which extends outwardly beyond said outer land portion providing a protection to the lip portion of the grease seal from chips and the like, said flinger further having a rearwardly and outwardly angled portion formed to provide a recess into which the lip portion of the grease seal extends to provide further protection to the lip portion of the grease seal as the live center members support a work piece being machined, the flinger and grease seal being replaceable and replaced without further disassembly when wear of the seal lip of the finished land of the flinger occurs and leakage past this seal lip portion is potentially present.

4,033,212
METHOD OF AND DEVICE FOR SEVERING A VENEER SHEET

Katsuji Hasegawa, Nagoya, Japan, assignor to Meinan Machinery Works, Inc., Ohbu, Japan
Filed Feb. 3, 1975, Ser. No. 546,605
Claims priority, application Japan, Sept. 19, 1974, 49-108114
Int. Cl.² B26D *5/06, 1/34*
U.S. Cl. 83—13 **14 Claims**

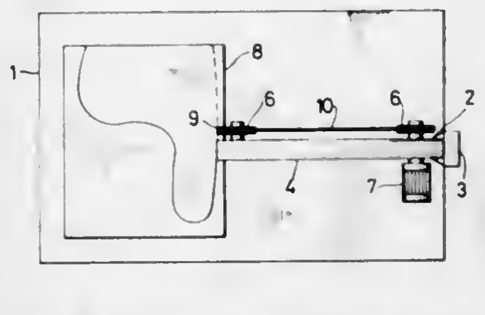
1. A method of severing a veneer sheet, comprising the steps of feeding a veneer sheet using a feeding means including a pair of members adapted to hold a veneer sheet therebetween, said feeding means being continuously driven to cause continuous feeding movement of said sheet between said members toward a cutter element, sensing a dimensional condition of said veneer sheet, and swingably displacing said cutter element transversely across the sheet in accordance with the sensing of said condition of the veneer sheet for cutting the veneer sheet due to the continuous feeding movement of the sheet toward the cutting element during the swinging thereof, said cutter element effecting cutting of the veneer sheet in each of the pivotal movements of the cutter element



which are made alternately in the clockwise and counterclockwise directions.

4,033,213
METHOD OF AND DEVICE FOR CUTTING BLOCKS OF FOAMED MATERIAL

Gunter Eiselt, and Rudolf Hossbach, both of Unkel, Germany, assignors to Gunter Eiselt, Unkel, Germany
Filed Jan. 2, 1975, Ser. No. 537,964
Claims priority, application Germany, Jan. 3, 1974, 2400204; Feb. 6, 1974, 2405554; Sept. 4, 1974, 2442353
Int. Cl.² B26D *1/46*
U.S. Cl. 83—56 **1 Claim**



1. A method of efficiently clean cutting blocks of foamed synthetic material along short radii which includes in combination the steps of: tensioning at a force of from 5 to 30 kg an endless cable of elastic wear resistant material having a rough surface and a diameter within the range of from 0.5 to 2 mm, driving said cable at a speed of rotation within the range of from 30 to 60 m per second, and moving the foamed material to be cut relatively toward said cable and along a plane extending in a direction transverse to the direction of movement of said cable simultaneously during said tensioning and driving thereof for cutting blocks of foamed synthetic material.

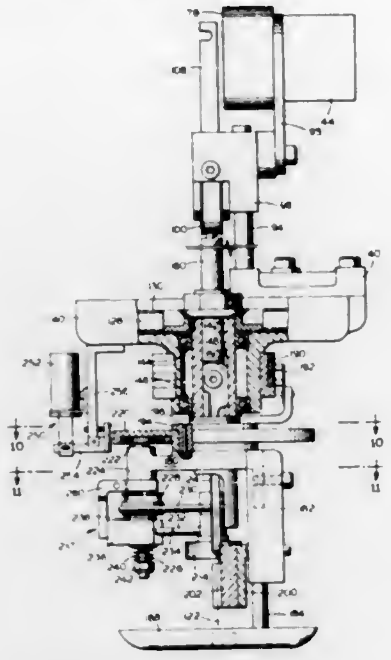
4,033,214
BLADE SHARPENER

David Raymond Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.
Continuation-in-part of Ser. No. 398,255, Sept. 17, 1973, Pat. No. 3,955,458. This application Jan. 12, 1976, Ser. No. 648,540
Int. Cl.² B24B *3/36;* **B26D** *7/12*
U.S. Cl. 83—174 **19 Claims**

1. A blade sharpener for a cutting apparatus with a cutting blade having a cutting edge and a blade support rotated by an orientation drive motor about an axis perpendicular to a work supporting planar surface to orient the blade in a cutting operation in a selected cutting direction comprising:

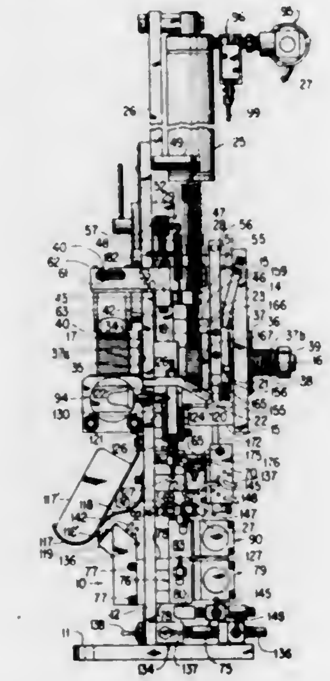
a sharpening wheel suspended from the blade support and adjacent the cutting edge of the blade for rotation about the perpendicular axis with the blade; and

drive means having an output member connected with the sharpening wheel and selectively engageable with the orientation drive motor which orients the blade to rotate the output member and drive the wheel about the wheel axis in conjunction with the rotation of the blade and blade support about the perpendicular axis.



4,033,215
APPARATUS FOR CUTTING STRIPS OF MATERIAL

Volker Schmidt, Rte. 7 Todds Road., Lexington, Ky. 40502
Filed May 4, 1976, Ser. No. 683,080
Int. Cl.² B26D *5/20*
U.S. Cl. 83—204 **14 Claims**



1. In an apparatus for cutting segments from a strip of material including feed means to feed the material, said feed means including means movable from a first position to feed the material, first inactivating means to inactivate said feed means to stop feeding of the material in response to a selected length of the material being fed by said feed means past a cutting position; cutting means to cut the feed material at the cutting position; first responsive means responsive to said feed means to activate said cutting means to cut the fed material substantially simultaneously with stopping of said feed means; second responsive means responsive to said cutting means completing cutting of the fed material to cause return of said cutting means to its inactive position; sensing means to sense when the thickness of the material being fed by said feed means exceeds a predetermined thickness and when the thickness of the material being fed by said feed means ceases to exceed the predetermined thickness after having exceeded the predetermined thickness or when the thicknss of the material being fed by said feed means is less than a predetermined thickness and when the thickness of the material being fed by said feed means ceases to be less than the predetermined thickness after having been less than the predetermined thickness; second inactivating means to cause inactivation of said feed means after said sensing means has sensed that the thickness of the material has ceased to exceed the predetermined thickness after having exceeded the predetermined thickness or has sensed that the thickness of the material has ceased to be less than the predetermined thickness after having been less than the predetermined thickness irrespective of whether said feed means has fed the selected length of material, said second inactivating means causing activation of said cutting means substantially simultaneously with inactivation of said feed means; the improvement comprising:

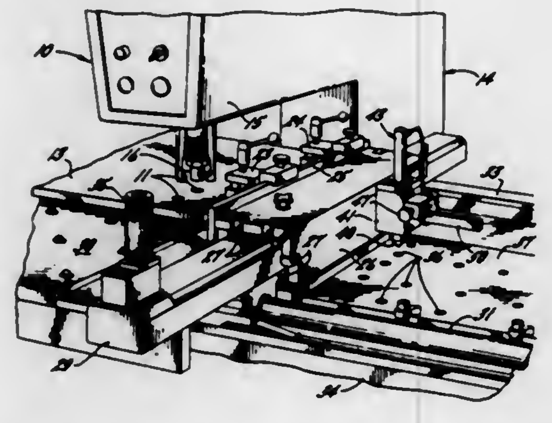
automatic means to cause activation of said feed means;

initiating means to activate said automatic means to cause initial activation of said feed means by said automatic means wherever said automatic means is ineffective, said automatic means causing activation of said feed means each time that said movable means of said feed means returns to its first position after said feed means is initially activated; and

third inactivating means to inactivate said automatic means in response to said second inactivating means being effective.

4,033,216
DUPLICATING PUNCH PRESS WITH STYLUS CONTROL

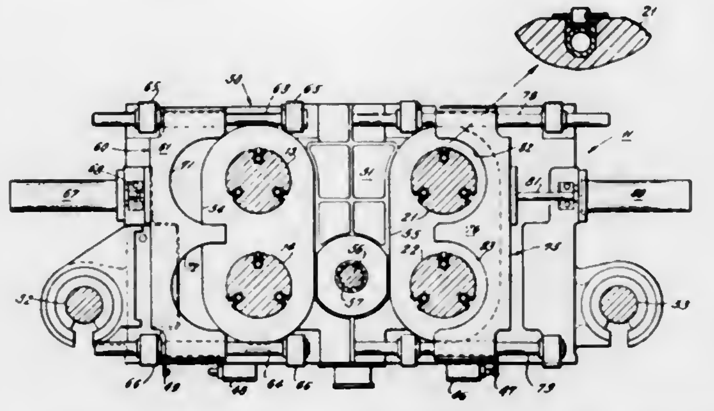
Theodore F. Brolund, and James F. Helgert, both of Rockford, Ill., assignors to W. A. Whitney Corporation, Rockford, Ill.
Filed Sept. 24, 1976, Ser. No. 726,246
Int. Cl.² B26F *1/02*
U.S. Cl. 83—413 **2 Claims**



1. A punch press for punching holes in a workpiece in locations determined by the position of holes in a template, said press comprising a punch, an actuator connected to said punch and selectively operable to advance said punch through said workpiece, a carriage having a clamp for holding said workpiece and adapted to be moved to locate said workpiece beneath said punch, a plunger mounted to move with said carriage, said plunger also being mounted to move relative to said carriage between a retracted position in which the plunger is spaced from said template and an advanced position in which the plunger is telescoped into one of said holes in said template; selectively operable means for moving said plunger to said advanced position prior to advancement of said punch, and means responsive to initial contact of said punch with said workpiece and operable to cause said plunger to automatically move to said retracted position as said punch continues to advance whereby said plunger is retracted out of said hole in said template to free said carriage, said clamp and said workpiece to shift in unison as said punch moves through said workpiece.

4,033,217
SLITTER HAVING CARRIER FOR SELECTIVE ADJUSTMENT OF A PLURALITY OF HEADS

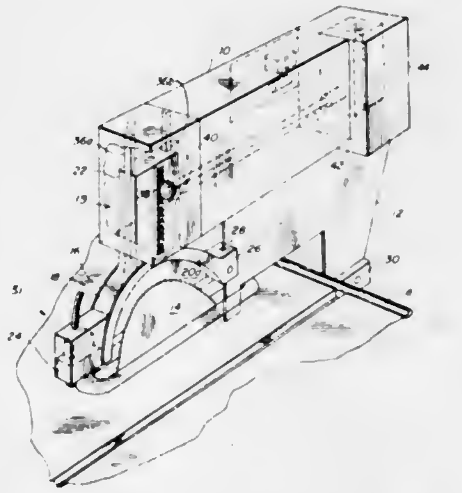
Stephen S. Flaum, New York; Francis A. Connolly, College Point, and Paul Chu, Amityville, all of N.Y., assignors to S&S Corrugated Paper Machinery Co., Inc., Brooklyn, N.Y.
Filed Jan. 13, 1976, Ser. No. 648,665
Int. Cl.² B23D *19/06;* **B26D** *1/24*
U.S. Cl. 83—425.4 **11 Claims**



1. Slitting apparatus for longitudinally cutting a relatively wide web of sheet material into a plurality of narrower webs while such wide web is moving longitudinally; said apparatus comprising first and second stations each including first and second parallel shafts mounted for rotation on fixed centers, a plurality of tool mounting head pairs rotated by said shafts and adjustable therealong; power driven adjusting means for operatively positioning the head pairs of said first station while the head pairs of the said second station are slitting a wide web as it moves through an operating area of said second station and for operatively positioning the head pairs of said second station while the head pairs of the first station are slitting a wide web as it moves through an operating area of said first station; each of said fixed centers remaining in the same respective position during slitting and during adjustment of said head pairs along said shafts.

4,033,218
TABLE-SAW GUARD

Leo P. Donatelle, Chicago, Ill., assignor to Spanjer Brothers, Inc., Chicago, Ill.
Filed June 4, 1976, Ser. No. 692,809
Int. Cl.² B27G *19/02*
U.S. Cl. 83—478 **8 Claims**



1. In a table-saw having a saw-motor drive with a motor starting circuit connected to a source of power and a saw guard mounted on one end of an overhead arm with a hinge-means mounted on the table at the other end of the arm for tilting said arm relative to the table, the combination with said table-saw of:

a. a saw-motor starting circuit switching means having a gate terminal operationally connected through the motor starting circuit to the source of power;

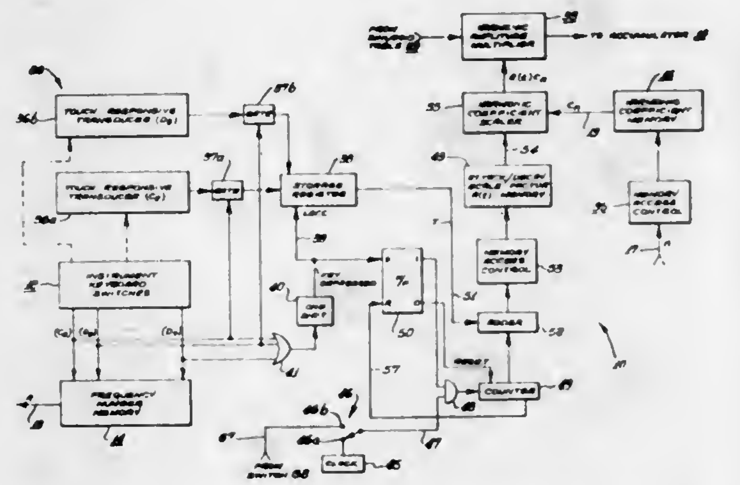
b. a vertical-positioning means for the guard mounted between the guard and the arm and operationally connected to ground from the source of power through a manually-operated reversing-polarity switching means. having a vertical position-sensing, saw-motor shut-off means mounted between the workpiece and the guard operationally connected through the saw-motor starting circuit switching means to ground for shutting off the saw-motor drive from said source of power when the guard is above the top surface of the workpiece by a predetermined space;

c. a horizontal, position-sensing, saw-motor shut-off means for the guard operationally mounted on the arm and operationally connected to the source of power through the saw-motor starting circuit switching means to ground for shutting off the saw-motor drive from said source of power when the guard is not horizontal; and

d. a vertical and horizontal, position-sensing, saw-motor drive time-delay shut-off means for the guard operationally mounted on the arm and between the workpiece and the guard and operationally connected from the source of power through the saw-motor starting circuit switching means to ground for providing the operator with a time delay during which the saw-motor will start and run as long as saw-cutting continues.

4,033,219
TOUCH RESPONSIVE CONTROL SYSTEM FOR A KEYBOARD ELECTRONIC MUSICAL INSTRUMENT

Ralph Deutsch, Sherman Oaks, Calif., assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Feb. 27, 1975, Ser. No. 553,585
Int. Cl.² G10H *1/02, 3/00*
U.S. Cl. 84—1.03 **13 Claims**



1. A touch responsive system for a keyboard electronic musical instrument of the type wherein a note is generated upon depression of a corresponding key on said keyboard, comprising;

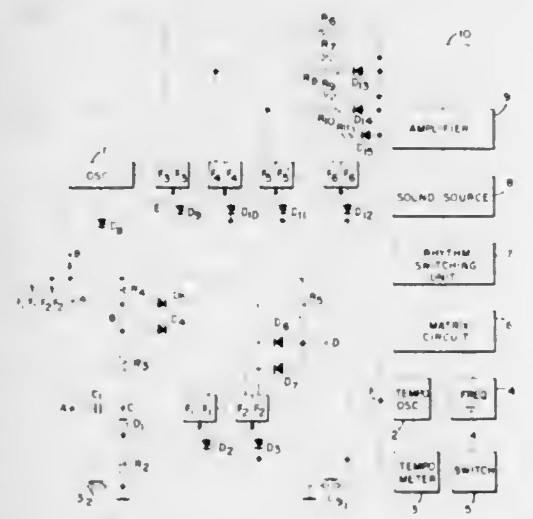
a touch responsive transducer associated with each key of said instrument, each transducer providing an output indicative of the force or velocity with which the corresponding key is depressed,

a memory storing a set of amplitude scale factors in consecutive memory address locations so that a predetermined amplitude envelope will result when said scale factors are accessed sequentially,

access means for accessing a subset of said scale factors from said memory in a preselected order, the accessed scale factors being utilized by said instrument to establish the amplitude envelope of the note generated upon depression of a selected key, said access means including circuitry for sequentially accessing storage locations in said memory, and control means, responsive to the output of the transducer of said selected key, for modifying the subset of scale factors accessed from said memory, so that said amplitude envelope is responsive to the touch with which said key is struck, said control means establishing, in response to said transducer output, the initial address at which said sequential accessing begins, so that the maximum envelope amplitude is established by the force or velocity with which said selected key is depressed.

4,033,220
TEMPO SETTING DEVICE

Masashi Shibahara, Kishiwada, Japan, assignor to Nihon Hammond Kabushiki Kaisha, Osaka, Japan
Filed June 9, 1975, Ser. No. 585,403
Claims priority, application Japan, June 12, 1974, 49-67466
Int. Cl.² G10F *1/00*
U.S. Cl. 84—1.03 **13 Claims**



1. A tempo setting device for an automatic rhythm instrument which includes a tempo oscillator having an output frequency determined by the magnitude of an input control signal comprising:

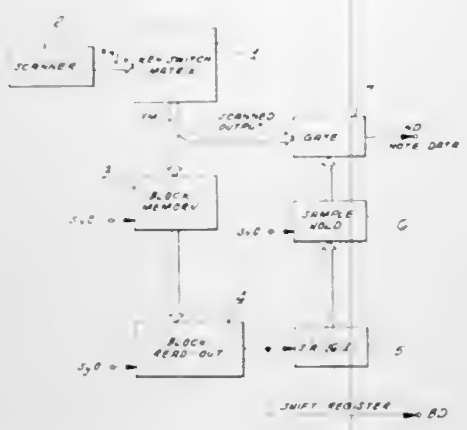
- control means actuatable repetitively by an instrument player for producing a plurality of signals at a rate corresponding to a desired tempo; and
- circuit means for converting said signals into an input control signal related in magnitude to said rate.

4,033,221
KEY SWITCH SYSTEM

Norio Tomisawa, Hamamatsu; Yasuji Uchiyama, Hamakita; Takatoshi Okumura, and Toshio Takeda, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan
Filed Aug. 11, 1975, Ser. No. 602,631
Claims priority, application Japan, Aug. 12, 1974, 49-92173
Int. Cl.² G10F *1/00*
U.S. Cl. 84—1.03 **7 Claims**

1. Key switch system comprising:

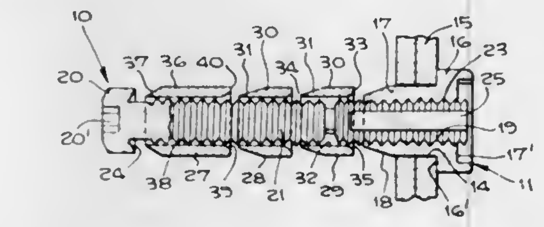
- a key time clock source;
- a key switch matrix including a plurality of scanning lines, a plurality of output lines each constituting a block, and a plurality of key switches at respective intersections of said scanning lines and said output lines;
- a scanner connected to scan said scanning lines sequentially and repetitively at a rate established by the key time clock, each complete scan of all scanning lines constituting a scanning cycle;
- a block time clock source producing a block time signal at the end of each complete scanning cycle;
- a block memory connected to said output lines and memorizing for each block any existence of a pulse in said output lines per scanning cycle, each such pulse representing a switch that is ON in said block;
- block read-out means connected to said block memory and generating in one scanning cycle after another respective block data consisting of one pulse per scanning cycle, the time slot of said one pulse within said scanning cycle indicating the block which contains a key switch that is ON; and



- note data generating means connected to said block read-out means and to said output lines for taking out the scanned output as the note data of that block which was indicated by the block data in the preceding scanning cycle.

4,033,222
MULTIPLE SLEEVE BLIND FASTENER

Leslie B. Wilson, Yorba Linda, Calif., assignor to Monogram Industries, Inc., Santa Monica, Calif.
Continuation-in-part of Ser. No. 606,720, Aug. 21, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,696
Int. Cl.² F16B *13/06*
U.S. Cl. 85—72 **11 Claims**



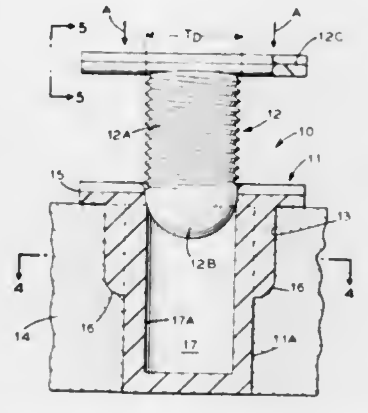
1. In a blind fastener system having a skin with reduced permanent deformation, said skin having a driving side and a blind side and a hole extending through the skin, a blind fastener having a nut with an internally threaded axial bore throughout with a generally conically shaped nose portion at one end and a head of larger diameter than said hole and an intermediate generally cylindrical portion between the nose portion and the head, at the other end, the nut being within the hole in the skin with the nose portion extending beyond the blind side, the head being on the driving side and abutting thereagainst, the intermediate portion extending into the hole and being substantially the same overall length as the depth of said hole, the head exerting an axial compressive force on the hole, a core bolt having a head and a threaded shank portion, the core bolt head extending outwardly from the nose portion of the nut and the threaded shank portion being threaded in the axial bore of the nut, and bearing surface means rotatably mounted on said threaded shank portion, said bearing surface means being in compressive engagement with the blind side of said skin and the head of the core bolt, said conical nose portion receiving said bearing surface means thereon and said bearing surface means exerting a direct compressive force on the conical nose portion only exteriorly of said skin, the improvement which comprises:

said bearing surface means includes at least a pair of expansible sleeves, each of said sleeves being comprised of an outwardly expansible ductile material and having

substantially the same outer diameter and having a first end, a second end and a main body portion interconnecting said first and second ends and an internal bore of substantially uniform diameter throughout, said core bolt head having core bolt head means for retaining said second ends thereagainst, and each of said sleeves having their first ends in compressive engagement only with the blind side of said skin and their second ends being compressed between the core bolt head means and said blind side, and the internal bore of one of said sleeves receiving the conical nose portion and exerting a direct compressive force on the conical nose portion only exteriorly of said skin, and the other of said sleeves receiving and substantially enclosing said one of said sleeves and being of a less ductile material than the other of said sleeves with the other of said sleeves exerting a direct compressive force on said one of said sleeves only exteriorly of said skin, the compressive engagement of the first ends of said sleeves on the blind side of said skin acting toward the driving side of said skin, said one of said sleeves being greater in overall length than the overall length of said other of said sleeves and having its first end extending generally parallel to said blind side and folded about itself thereby presenting a doubled up first end of said one of said sleeves bearing directly against said blind side, the first end of said other of said sleeves bearing against the side of the doubled-up first end of said one of said sleeves remote from said blind side at substantially the junction of the first end of said one of said sleeves with its main body portion, said doubled-up portion forming a bearing surface bearing against the blind side of said skin.

4,033,223
QUICK SET ADJUSTABLE FASTENER

Steven L. Marks, Alpine, N.J., assignor to Kettering Toys, Inc., Englewood Cliffs, N.J.
Filed July 26, 1976, Ser. No. 708,294
Int. Cl.² F16B *13/06*
U.S. Cl. 85—83 **2 Claims**

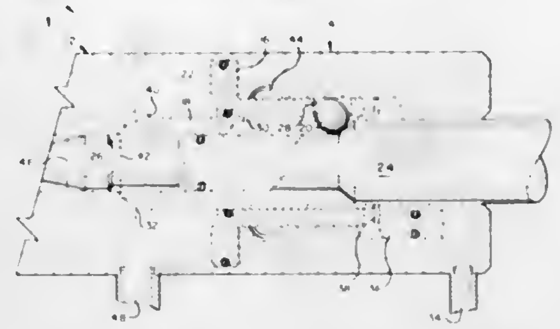


1. A quick set adjustable fastening device comprising:

- a sleeve unit adapted to be held in a hole formed in a workpiece,
- said sleeve nut having a smooth wall bore, the wall of said bore being formed of a resilient plastic material,
- a screw fastener,
- said screw fastener having an externally shank portion to be received in said bore,
- said shank having a rounded tip end portion,
- said rounded tip end portion having a diameter slightly greater than the internal diameter of said bore and substantially equal to the thread crest diameter of said shank, whereby said screw fastener is assembled to said sleeve by pushing the shank of said fastener into said bore.

4,033,224
LIQUID PROPELLANT GUN

John W. Holtrop, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Sept. 16, 1976, Ser. No. 723,880
Int. Cl.² F41F *1/04*
U.S. Cl. 89—7 **10 Claims**

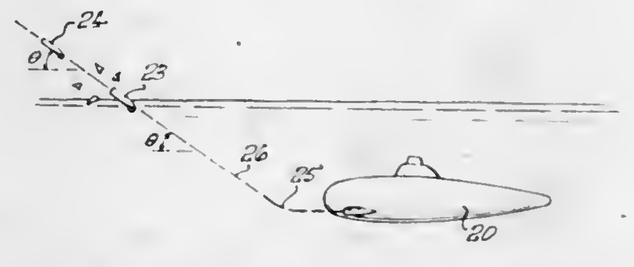


1. In a liquid gun having a barrel, a receiver, a chamber, a bolt slidably mounted in said receiver and chamber for reciprocating motion along the axis of said barrel, and means for injection of fuel for firing a round from said barrel, the improvement comprising:

- valve means in said receiver cooperating with said bolt for controlling access of fuel to said chamber;
- pump means in said receiver coaxial with said bolt and cooperating with said valve means and said bolt to pressurize fuel in said chamber.
- interconnecting means linking said valve means and said pump means and responsive to action of said bolt to effect injection of fuel from said chamber to a position between the bolt and the round.

4,033,225
HYDRODYNAMIC CONFIGURATION TO BE USED ON UNDERWATER LAUNCHED, UNPROPELLED BODIES

Roy M. Kartzmark, Jr., China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Feb. 6, 1974, Ser. No. 440,213
Int. Cl.² F41F *3/04*
U.S. Cl. 89—1.81 **1 Claim**



1. In a non-propelled submerged launched elongated buoyant body which has fore and aft end and which has a positive metacentric height, the improvement consisting essentially of:

- a pair of major fins mounted at the aft end of the body in a spaced apart relationship;
- each fin having a tab which is capable of deflecting from an upward position to a downward position with respect to the fin;
- the upward position of the tabs acting in combination to implement a pitching movement of the body toward a vertically upward path in the water;
- the downward position of the tabs acting in combination to implement a stabilized roll, pitch and yaw movement of the body in substantially a straight line upward non-vertical glide through the water from a position which is established by the pitching movement of the body;
- means for simultaneously changing the tabs from the up-

ward positions to the downward positions at a preselected time so that upward positions of the tabs will bring the body to a desired attitude and then a change of the tabs to the downward positions will maintain the body on a constant attitude upward glide path;

said fins extending beyond the body and being spaced approximately 90° from one another;

the body, except for the fins and tabs, having a smooth cylindrical configuration with a rounded nose and a generally ogive tail portion;

each fin being foldable inwardly to clear the cylindrical envelope of the body so that the body can be launched from a torpedo tube; and

the fold line of each fin being substantially coextensive with the inward edge of the respective tab.

4,033,226

CARTRIDGE HOLDERS

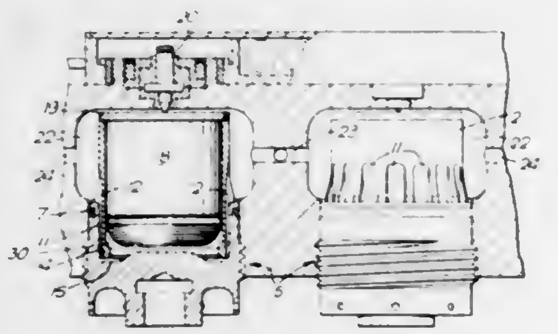
Samuel W. Craigie, Slough, England, assignor to M. L. Aviation Company Limited, Slough, England

Filed Apr. 26, 1976, Ser. No. 680,225

Claims priority, application United Kingdom, Dec. 30, 1975, 53136/75

Int. Cl.² F42B *3/00*

U.S. Cl. 89—1.5 F **7 Claims**



1. A cartridge holder for fitting into the breech opening of an ejection release unit, said holder comprising:

a base part having a bottom portion and a cylindrical wall portion extending therefrom to form with the bottom portion a cup shape,

a wall part formed as a continuous cylinder with one end thereof fitting into the cylindrical wall portion of the base part while the remote end of the wall part extends beyond the outer end of the wall portion to form an extension of the cup shape of the base part,

said wall part including means for holding a cartridge from said remote end thereof inwardly less than the full way to the said bottom portion of the base part to thereby provide a space between the cartridge and the said bottom portion of the base part,

limiting means for limiting and defining full insertion of the wall part within the base part,

means for providing a gas flow path from said space within the wall part to a location between the wall part and the wall portion of the base part upon full insertion of the wall part within the base part,

and further means for defining the engagement of the wall part within the base part to provide a further gas flow path communicating with the first gas flow path and extending along between the outer side of the wall part and the inner side of the said wall portion, and continuing to the exterior of the base part,

and connecting means on the outside of the base member for engaging the said breech opening to secure the cartridge holder in the ejection release unit.

4,033,227

MAGAZINE SPECIALLY INTENDED FOR TANK WITH LARGE-CALIBRE FIREARM

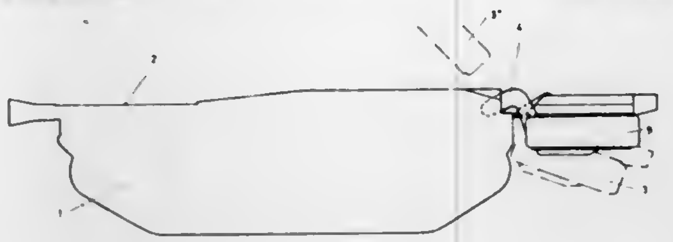
John Folke Eklund, and Sven-Håkan Svensson, both of Karlskoga, Sweden, assignors to AB Bofors, Bofors, Sweden

Filed Sept. 25, 1975, Ser. No. 616,519

Claims priority, application Sweden, Oct. 18, 1974, 7413124

Int. Cl.² F41H *7/06*

U.S. Cl. 89—34 **20 Claims**



1. A magazine for use on a tank having a large-caliber firearm, said magazine comprising a magazine body adapted to contain a plurality of rounds therein, said magazine body being separated from the tank chassis and being freely suspended on the outside of the tank at a position low on the tank at the rear end of said tank and in spaced relation to the tank chassis below the top of said chassis by means of at least one fastening member which extends between said magazine body and the rear end of said tank chassis, said fastening member being constructed to move flexibly relative to said tank chassis if said body should strike the underlying ground.

4,033,228

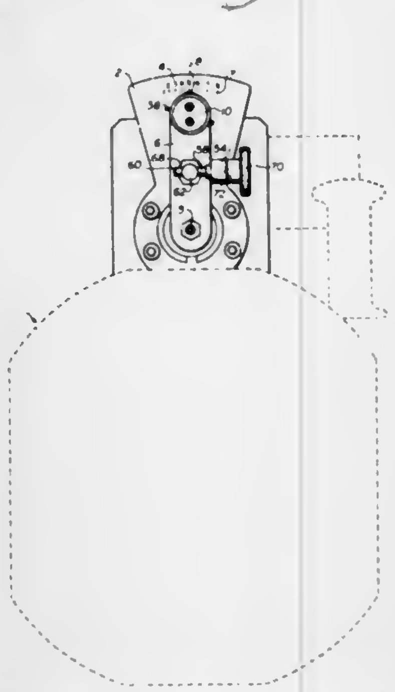
ZONE SETTING ASSEMBLY WITH TEMPERATURE COMPENSATOR FOR WEAPON SYSTEMS OF THE "SOFT RECOIL" TYPE

Harold Herman Wiese, Davenport, Iowa, and Steven Ray Schade, Rock Island, Ill., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,641

Int. Cl.² F41F *19/10*

U.S. Cl. 89—42 B **4 Claims**



1. In a soft recoil weapons system having a breech end and an adjustable velocity sensing device including a shaft for actuating automatic firing of the system when the gun tube velocity during travel toward the muzzle end has reached a predetermined value so that different zones may be targeted, the improvement comprising:

means for varying the velocity response of said sensing device including a dial face member with spaced calibrated zone setting indicia fixedly mounted on said breech end;

a plurality of spaced pin receiving apertures arranged in said dial face member calibrated to correspond to individual zone setting indicia;

a control member pivotably connected at one end to rotate said sensing device shaft;

a manually actuatable indexing pin handle movably carried at the other end of said control member adjacent the apertures in the dial face member;

a plurality of indexing pins carried for reciprocable movement by the handle, with each pin positioned to engage preselected ones of said apertures depending upon the position of said control handle; and

means biasing said pins toward said apertures, whereby, at preselected locations, one or the other of said pins seats in a preselected aperture corresponding to a desired zone setting indicia to latch said control handle in said zone setting position so that said sensor shaft is locked in the desired zone setting position, said pin indexing handle being movable relative to said control handle member to unseat said pins and permit free pivoting movement of said control member for resetting of the zone.

4,033,229

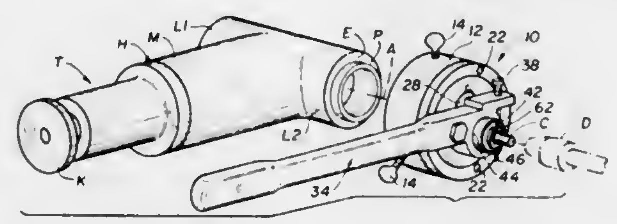
TOOL FOR ENLARGING THE BORE IN A WORKPIECE

Charles Sarnelli, Jr., 4 Hilltop Terrace, Staten Island, N.Y. 10304

Filed May 11, 1976, Ser. No. 685,299

Int. Cl.² B23C *1/20, 3/02*

U.S. Cl. 90—12 R **22 Claims**



1. A device utilizing a cutting tool for enlarging the interior bore in a workpiece, said device comprising:

collar means adapted to be rigidly mounted on the workpiece without relative rotation therebetween;

a plate rotatably mounted on said collar means, said plate including a slot therethrough;

a movable handle pivotally mounted on said plate;

and cutting tool receiving means mounted on said handle for movement together therewith, said cutting tool receiving means being positioned in and movable along the length of said slot by said handle whereby a cutting tool contained in said cutting tool receiving means may be moved to a position against the surface of a bore that is to be enlarged and then moved along the bore surface through an arc that is concentric with the bore in the workpiece.

4,033,230

PROFILE CUTTING MACHINE

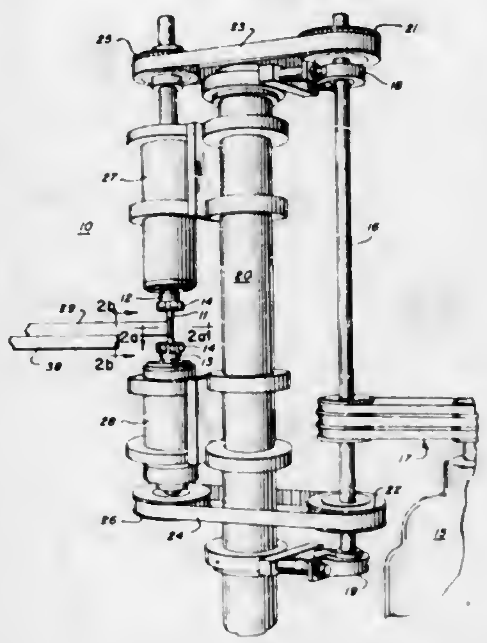
Rudolph F. Onsrud, 456 W. Frontage Road, Northfield, Ill. 60093

Filed July 2, 1973, Ser. No. 375,664

Int. Cl.² B23C *1/18, 5/26*

U.S. Cl. 90—13.4 **8 Claims**

1. A profile cutting machine comprising a slender cylindrically shaped axially extending elongated double-ended high speed cutting tool having a centrally located cutting portion, said tool being rotatable about said axis, chucking portions at opposite ends of said cutting portion, the length of said tool being substantially greater than any lateral dimension thereof and the lateral dimension of said tool being substantially uniform throughout said cutting portion; axially aligned and rotatably mounted chuck members releasably holding said tool chucking portions and overcoming dynamic cutting loads imposed on the tool during oblique and cross cutting through the full thickness of a workpiece when the latter is moved laterally of the rotary axis of said tool; drive means simultaneously rotating at high speed said chuck members and said cutting tool about said axis at the same angular velocity for overcoming rhythmic and cyclic torsional and bending loads imposed upon said tool during cutting of the workpiece; a



workpiece support mounted for movement in a plane disposed transversely to said axis of rotation for engaging a workpiece between said chuck members for intersecting the central cutting portion of said tool thereby, said workpiece support including a planar work engaging surface oriented transversely to said axis of rotation; and a chassis supporting said chuck members, said drive means and said workpiece support in a predetermined relation for allowing the material cut from the workpiece to fall away from said cutting tool while the workpiece moves past the central portion of said cutting tool.

4,033,231

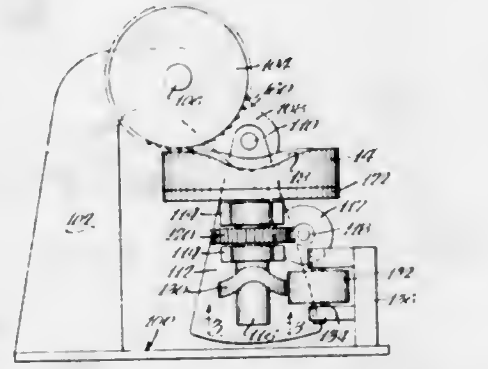
APPARATUS FOR MACHINING END HOUSINGS

Alexander Goloff, East Peoria, and Hiram A. Brubaker, Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 675,023

Int. Cl.² B23D *5/04;* **B24B** *17/02*

U.S. Cl. 90--24.3 **7 Claims**



1. Apparatus for machining the end walls of slant axis rotary mechanisms, comprising:

a base;

a support pivoted on said base for rotation in a single plane about a first axis;

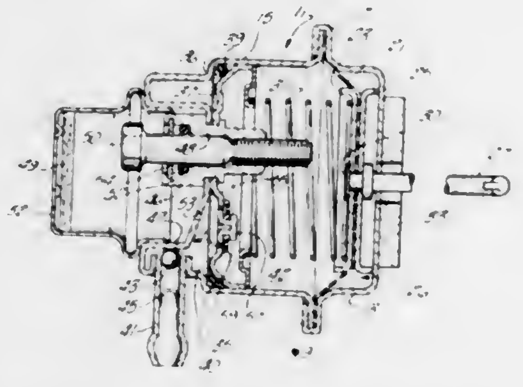
a shaft journalled on said support for rotation about a sec-

ond axis nonparallel to said first axis and movable with said support in said single plane;
a work holder carried by and rotatable with said shaft for receiving a housing element of a slant axis rotary mechanism to have an end wall machined thereon said work holder being shiftable with said shaft only in said single plane;
means, including a tool adjacent said work holder operable to perform a machining operation on a housing element received on said work holder;
means for rotating said shaft; and
means responsive to rotation of said shaft for oscillating said support about said first axis in timed relation to rotation of said shaft,
whereby a housing element will be rotated and oscillated against said tool to machine an end wall thereon.

4,033,232
CHARGE FORMING DEVICE

Benjamin C. Benjamin, Flint, and Glenn A. Schautz, Lennon, both of Mich., assignors to Schmelzer Corporation, Durand, Mich.

Division of Ser. No. 507,128, Sept. 18, 1974, Pat. No. 3,965,223. This application Dec. 29, 1975, Ser. No. 645,084
Int. Cl.² F15B *13/042, 15/24*
U.S. Cl. 91—47 **4 Claims**



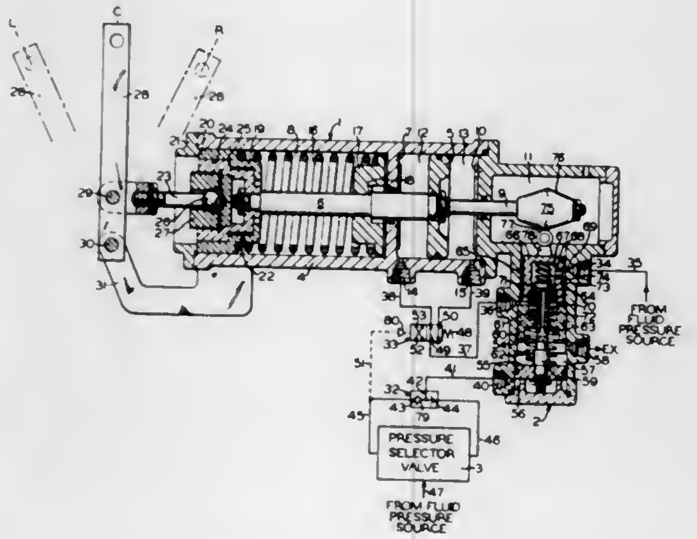
1. A vacuum responsive device comprising: a casing, a flexible diaphragm dividing the casing into two main chambers, resilient means urging the diaphragm to a first position, a rigid wall assembly separating one of the main chambers into first and second subchambers, at least one aperture in said rigid wall assembly, a valve member normally engaging said rigid assembly and closing said aperture against air flow from the first subchamber, bypass means permitting restricted fluid flow in either direction between said subchambers, a vacuum passage adapted to connect said second subchamber with a source of vacuum, a passage means adapted to connect said second subchamber with the atmosphere, the other of said main chambers being in communication with the atmosphere, adjusting means for limiting the extent of movement of the diaphragm toward a second position, said valve member being axially offset from the axial center of the device, said adjusting means comprising a stop member extending through said rigid wall assembly into said first subchamber for engagement with said diaphragm, said stop member also being axially offset from the axial center of the device on the opposite side from the valve member.

4,033,233
FLUID PRESSURE OPERABLE SERVO POSITIONER

Toshio Toi, Kobe, Japan, assignor to Nippon Air Brake Company Ltd., Kobe, Japan

Filed July 7, 1975, Ser. No. 593,742
Claims priority, application Japan, Aug. 30, 1974, 49-99771
Int. Cl.² F15B *13/16, 9/10*
U.S. Cl. 91—374 **2 Claims**

1. Servo positioner apparatus for selectively positioning a mechanical member in a desired position until a change is effected, said servo positioner apparatus comprising:
a. a double acting piston device including a power piston connected to the mechanical member and alternatively subjectable on opposite sides to operating fluid pressure for effecting operation of the mechanical member to respective pluralities of different positions in opposite directions from a normal central position, depending upon which of said opposite sides is subjected to said operating fluid pressure and the degree thereof;
b. control valve means having a cut-off position in which a supply communication, via which operating fluid pressure may be supplied to said power piston, is closed, and being operable, in response to a variable control fluid pressure, to one of a plurality of supply positions in which said supply communication is open for supplying said operating fluid pressure to said power piston at a degree commensurate with the degree of said control fluid pressure;
c. force balancing means including:
 i. a spring disposed at one side of said power piston for exerting a biasing force on and urging the power piston toward its said normal central position in opposition to the operating pressure acting thereon, said power piston and the mechanical member assuming one of said plurality of different positions upon attainment of a balanced state between the opposing forces of said spring and said operating pressure acting on the power piston, and

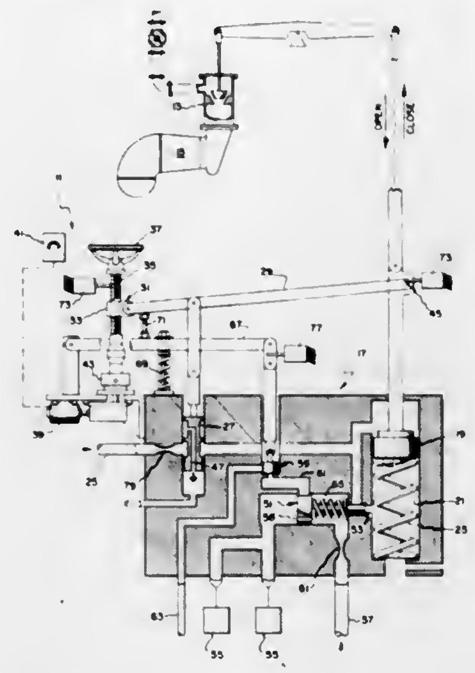


 ii. a cam member connected to and positionally movable with said power piston and having a cam surface of predetermined contour operatively engaging said control valve means, said cam surface being operable to one of a plurality of cam positions relative to the control valve means, such cam position corresponding to said one of said plurality of different positions of the mechanical member, for exerting a counter force on said valve means in opposition to said control fluid pressure to produce a balanced state therebetween and in which said control valve means is maintained in said one of said plurality of supply positions;
d. respective delivery pipes connecting to said opposite sides of said power piston; and
e. a changeover valve device interposed between said delivery pipes and said control valve means,
f. said changeover valve device normally biased to a first position in which one of said delivery pipes is communicated with the control valve means for effecting supply of operating pressure to one of said opposite sides of the power piston, and being operable responsively to actuating fluid pressure to a second position in which said one of said delivery pipes is cut off from said control valve means and the other is communicated therewith for effecting supply of operating pressure to the other of said opposite sides of the power piston.

4,033,234
THROTTLE VALVE OPERATOR

Norman E. Nutter, and Herbert N. Hoffman, both of Lunenburg, Mass., assignors to General Electric Company, Schenectady, N.Y.

Filed June 2, 1975, Ser. No. 582,705
Int. Cl.² F15B *9/10*
U.S. Cl. 91—384 **1 Claim**



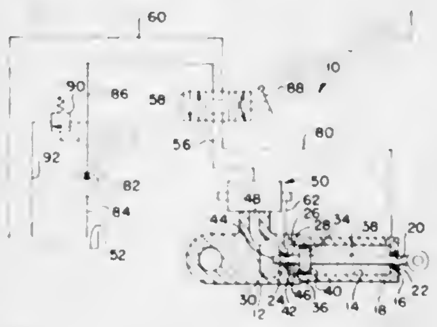
1. A valve operator for opening and closing a main valve to which the valve operator is connected, said valve operator comprising:
a manifold block including a hydraulic cylinder having a main valve actuating piston slidable therein and biased by spring means in a valve close direction;
a first fluid inlet conduit for supplying hydraulic fluid to said hydraulic cylinder; a pilot inlet and exhaust valve disposed within said first fluid inlet conduit for controlling the flow of hydraulic fluid to said hydraulic cylinder; means for positioning and repositioning said pilot valve according to a desired main valve position including a first lever interconnecting a linearly movable fulcrum with said valve actuating piston and said pilot valve;
a pressure responsive trip relay valve connecting the first conduit and hydraulic cylinder with a first drain, said trip relay valve biased by spring means in an open direction;
trip device for controlling said trip relay valve;
a second fluid inlet conduit for supplying hydraulic fluid to close the trip relay valve upon the reset of said trip device; and,
a reset pilot valve for placing in fluid communication a drain and said second inlet conduit through said trip relay valve when said trip relay valve is in an open position; a pivotally mounted second lever connected to said reset pilot valve to direct said reset pilot valve to a closed position, said second lever including means for following said first lever in the main valve open direction, said second lever being biased by spring means to open said reset pilot valve in following said first lever after the trip relay valve has been closed.

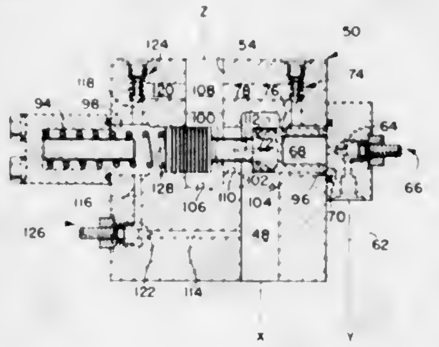
4,033,235
FLUID OPERATED RAM

Lawrance F. Berg, Lockport, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 26, 1976, Ser. No. 652,357
Int. Cl.² F15B *15/22*
U.S. Cl. 91—396 **7 Claims**

1. A fluid operated ram with means for reducing impact as the ram closes, comprising:
1. a housing defining a generally cylindrical ram bore having a first wall at a first end thereof with a first hole generally centrally therethrough and a second wall at a second end thereof with a second hole generally centrally therethrough leading to a chamber;
2. a piston within said ram bore having a piston rod extending therefrom through said first hole and a snubber extending from an opposite side thereof towards said second hole, said snubber being sized to pass into said second hole in spaced flow restrictive relation thereto towards said chamber to create a relatively higher pressure in said ram bore adjacent said second end thereof than in said chamber;
3. first conduit means communicating with said chamber;
4. valve means arranged to communicate between said first conduit means and a sump, said valve means including means biasing said valve means to provide a substantially unrestricted flow path from said first conduit means to said sump to pass a first fluid flow, said flow path being progressively restricted responsive to shifting of said valve means against said biasing means;





5. second conduit means adjacent said second end of said ram bore and communicating a second fluid flow therefrom with said valve means to shift said valve means in opposition to said biasing means responsive to pressure in said second conduit means exceeding pressure in said first conduit means as said snubber restricts fluid flow from said ram bore to said chamber as said snubber moves towards said chamber, said second conduit means including a first adjustable orifice therein to modify the pressure of said second fluid flow to said valve means and first relief valve means communicating said first orifice and said valve means with said sump to limit the pressure of said second fluid flow;
6. third conduit means communicating with said ram bore adjacent said first wall; and
7. pump means for providing a third fluid flow from said sump selectively to a respective one of said first conduit means and said third conduit means.

4,033,236
ALL HYDRAULIC MOTOR GRADER CIRCUITRY

Howard L. Johnson, and John A. Junck, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

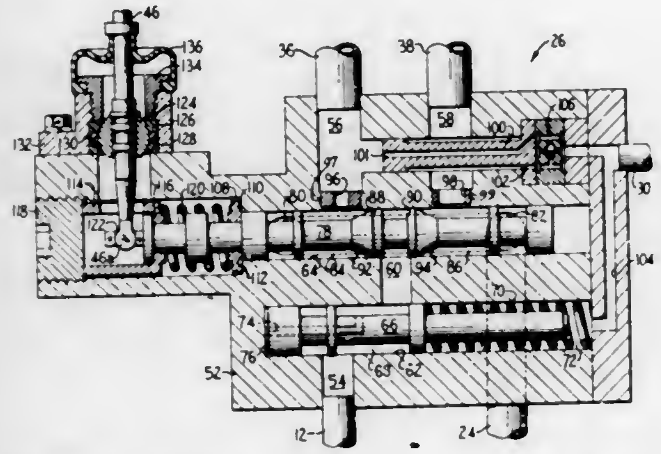
Continuation of Ser. No. 212,184, Dec. 27, 1971, abandoned. This application Feb. 4, 1974, Ser. No. 652,939
Int. Cl.² F15B *11/08, 13/04*
U.S. Cl. 91—463 **9 Claims**

1. The combination of a control valve and a double acting hydraulic motor including a housing having a cylindrical

chamber divided by a piston and rod assembly into a head end and a rod end having different fluid volumes, said valve comprising:

a valve body having an inlet passage and a pair of motor control passages one of said motor control passages connected to the head end of said motor and the other of said motor control passages connected to the rod end of said double acting motor;

a cylindrical bore in said housing communicating with said inlet passage and said motor control passage;



a valve spool reciprocably mounted in said bore and movable from a neutral position for controlling the flow of fluid between said inlet passage and said motor control passages; and,

restricting means in the one of said control passages connected to the rod end of said motor for fixing the size of said one passage in relation to the size of said other passage to the same proportion that the volume of the rod end of said motor bears to the head end of said motor proportioning the flow of fluid to said motor through said control passages for thereby providing the same velocity movement of said motor in either direction.

4,033,237

HYDROSTATIC PISTON MACHINE HAVING SMALL CLEARANCES BETWEEN BEARING SURFACES

Peter Rutz, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 29, 1974, Ser. No. 518,983

Claims priority, application Switzerland, Nov. 2, 1973, 15420/73

Int. Cl.² F01B *13/06;* **F16C** *35/00*

U.S. Cl. 91—484 **6 Claims**

1. A hydrostatic piston machine comprising

a pin having at least one bearing surface;

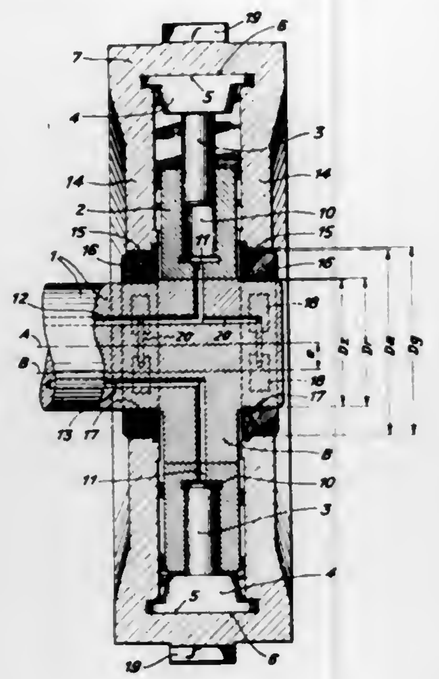
a guide member having a plurality of plane guide surfaces disposed tangentially of a circular cylinder having an axis, said guide member being rotatably mounted about said axis;

a cylinder block rotatably mounted on said pin;

a plurality of movably mounted pistons in said cylinder block disposed radially of said block, each said piston having a foot including a plane bearing surface guided on a respective guide surface of said guide member;

a bearing ring disposed between said guide member and said bearing surface in spaced relation to each of said guide member and bearing surface, said ring having a first clearance from said bearing surface of less dimension than a second clearance from said guide member, said first clearance being sufficient to allow hydrostatic mounting of said ring on said bearing surface and said second clearance being sufficient to permit thermal expansion of said pin and said bearing ring, said first and second clearances being dimensioned such that said bearing ring rotates relative to said pin and remains stationary in said guide member; and

means including lubricating pockets in said bearing surface for feeding lubricant to said bearing surface to form a hydrostatic bearing.



4,033,238

AXIAL PISTON MACHINE WITH A TILTABLE, REVOLVING CYLINDER DRUM

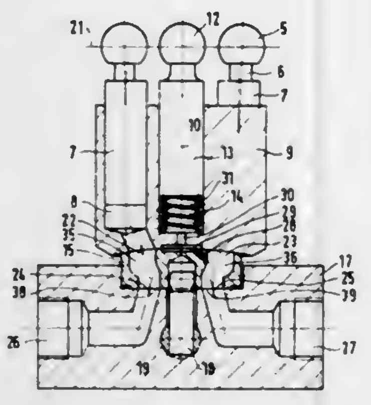
Ludwig Wagenseil, Vohringen, Germany, assignor to Hydromatik GmbH, Germany

Filed Feb. 11, 1976, Ser. No. 657,151

Claims priority, application Germany, Mar. 26, 1975, 2513549

Int. Cl.² F01B *13/04*

U.S. Cl. 91—505 **4 Claims**



1. An axial piston machine having a tiltable, rotating cylinder drum and a drive-connected drive pulley stationarily supported in a casing, pistons movable in cylinder bores of the drum articulated to the drive pulley via ball socket joints, a control mirror member with reniform control ports which face the outlets of the cylinder bores, the control mirror member being tiltable by an adjusting device to adjust the stroke of the pump, the control mirror member having a cylinder surface shaped rear side facing away from the control mirror and supported on a suitable shaped slideway of the casing, orifices in the slideway of the casing connected with suction and pressure ducts for the pressure medium, the orifices being connected via ducts with the reniform control ports in all positions of tilt of the control mirror member, a central pivot supported on the drive pulley for centering the cylinder drum, the pivot extending in a central bore of the cylinder drum and supported against the cylinder drum via an intermediately located compression spring and including connecting duct means extending from the pressure carrying duct through the mirror member and to the central bore for transmitting the pressure from the pressure carrying duct to the central bore and recess means between the cylinder drum and the mirror member providing a pressure field and a reaction surface on the mirror member on which the pressure in the central bore exerts a force in a direction to maintain the mirror member engaged with the slideway.

4,033,239

RADIAL PISTON MACHINE

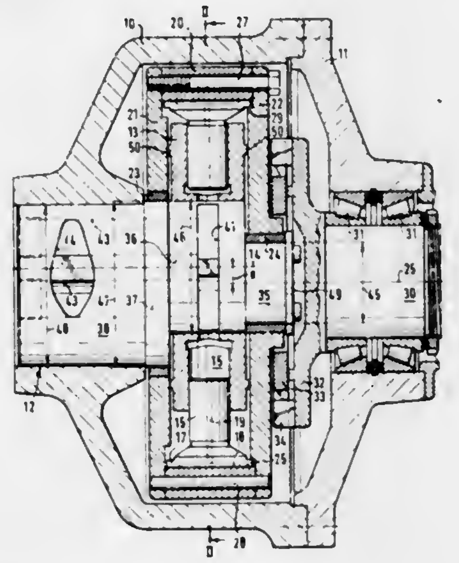
Wilhelm Gsching, deceased, late of Heidenheim, Germany (by Irmgard Gsching, heiress), assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Apr. 10, 1975, Ser. No. 566,810

Claims priority, application Germany, Apr. 13, 1974, 2418164

Int. Cl.² F01B *13/06*

U.S. Cl. 92—58 **2 Claims**



1. A radial piston machine comprising

a housing;

a control journal having a cylindrical part of predetermined diameter fixedly mounted in said housing;

a cylinder block rotatably mounted about an axis of rotation on a first cylindrical bearing surface of said control journal;

a plurality of pistons circumferentially disposed in said cylinder block for radial displacement relative to said control journal, each said piston having a bearing shoe thereon;

a piston-piloting ring mounted around said pistons and said cylinder block, said ring having a plurality of plane surfaces thereon, each said surface being disposed opposite to and in bearing relation with a respective piston bearing shoe, said ring having an axis of rotation offset from said axis of rotation of said cylinder block by a preset eccentricity; and

a pair of rotatable support disks secured to said piston-piloting ring on opposite sides of said cylinder block, an inner one of said disks being rotatably mounted about a second cylindrical bearing surface of said control journal of a diameter greater than said first bearing surface of said cylinder block by at least twice said eccentricity and an outer one of said support disks being rotatably mounted about a third cylindrical bearing surfce of said control journal, said third cylindrical bearing surface being of a diameter smaller than said first bearing surface of said cylinder block by at least twice said eccentricity.

4,033,240

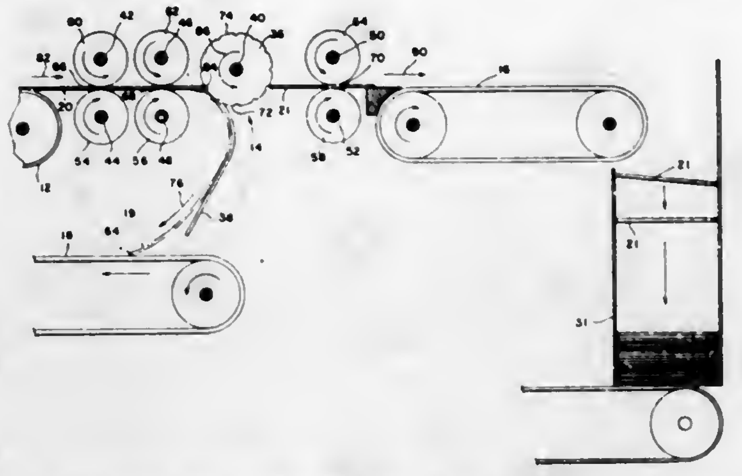
ROTARY STRIPPING WHEEL

Clovis F. Deslauriers, 25-52 Borough Place, Woodside, N.Y. 11377

Filed May 14, 1975, Ser. No. 577,477

Int. Cl.² B26F *3/00;* **B31B** *1/14*

U.S. Cl. 93—36 A **7 Claims**



1. A waste stripping apparatus of the type employing rotary stripping wheels to remove waste material from the finished product, wherein previously die cut sheets having a leading edge and a plurality of transversely spaced waste rows are fed along a plane to the stripping wheels, which comprises

a plurality of rotary stripping wheels each having a portion of its outer periphery extending below the plane of sheet travel,

at least a portion of the outer periphery of the wheels being provided with surface indentations,

at least one said surface indentation being positioned below the said plane at all times,

said surface indentations being movable into alignment with said plane;

and means to transversely space at least some of the stripping wheels to align a stripping wheel with a waste row,

whereby said indentations can be positioned to contact the leading edges of the sheets to aid in stripping waste from finished product.

4,033,241

APPARATUS FOR MANUFACTURING CARDBOARD TUBES

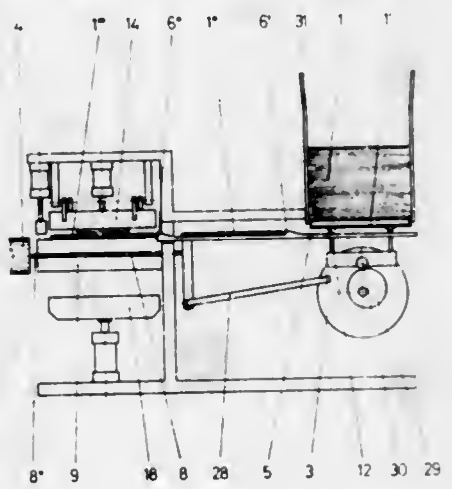
Emilio Roda, Viganello, Switzerland, assignor to Roda Macchine S.A., Noranco, Switzerland

Filed Mar. 17, 1975, Ser. No. 559,045

Claims priority, application Switzerland, Mar. 25, 1974, 4290/74

Int. Cl.² B31B *3/74*

U.S. Cl. 93—39.1 R **2 Claims**



1. A machine for the manufacture of tubes of cardboard or the like sheet material that have a length substantially greater than their width, comprising a core means reproducing the inner shape of the tube to be formed, advancing means for

advancing a sheet to be formed along a generatrix of said core means, guide means for ensuring the exact disposition of the sheet on the generatrix of the core means, holding means for holding the sheet against the generatrix of the core means, two shaping jaws each reproducing about half the outer profile of the tube, the jaws being mounted for rotation around an axis from an initial position to an operative position in which each jaw presses half of the sheet against the outer surface of the core means, the movements of the jaws being phased so as first to compress one half of the sheet against the core and successively the other half to cause superimposing of the free edges of the sheet to be joined together, a presser means arranged to act to press together the two said edges when overlapped to join same together, retractable thrust means for detaching tubes from the inner core upon return of the jaws to their mutual positions, and support means for preventing the bending of the core during the pressing together of the overlapped edges by the presser means, said retractable thrust means of the tube comprising rods slidably located within complementary grooves in the core means, said rods being provided with thrust wings which protrude from said grooves.

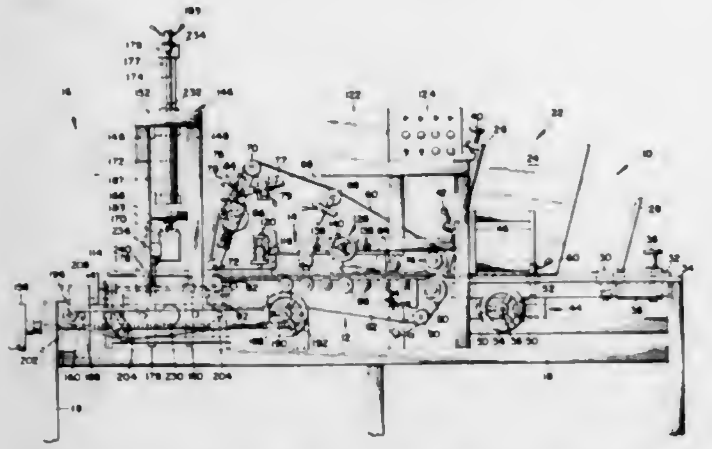
4,033,242
CARTON FORMING MACHINE

William A. Rice, Vernon, and Clifford B. Rice, Warehouse Point, both of Conn., assignors to Rice Packaging, Inc., Ellington, Conn.

Filed Sept. 26, 1975, Ser. No. 617,016

Int. Cl.² B31B *3/26*

U.S. Cl. 93—51 R **4 Claims**



1. A machine for forming cartons from a stack of pre-cut and pre-scored blanks comprising: conveyor means for moving the blanks linearly in seriatim away from the stack, front and rear and side formers adjacent the end of the conveyor means and defining a well, a forming block and means for moving the forming block into and out of the well for forming the carton, first positioning means for positioning the well and forming block relative to the conveyor means, second positioning means for moving the side formers relative to each other, third positioning means for moving the front and rear formers relative to each other, and a flap bending and hot melt applicator subassembly adjacent the conveyor means including means for deflecting certain of the flaps of the blank being fed by the conveyor means, means for retaining certain other of the flaps of said blank against deflection, and means for applying hot melt to said certain other of the flaps of said blank which have been retained against deflection.

4,033,243
CONTAINER FASTENER SYSTEM

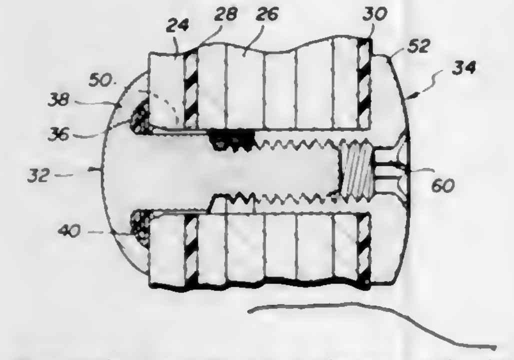
Hail Kirrish, and Albert J. Provenzano, both of Rockford, Ill., assignors to Textron, Inc., Providence, R.I.

Filed Jan. 30, 1976, Ser. No. 653,925

Int. Cl.² F16B *35/04, 39/282*

U.S. Cl. 85—4 **10 Claims**

1. In combination, a section of composite panel or the like and a rigid frame section wherein both said panel and frame section define a through bore, and a fastener assembly disposed in said bore in clamping engagement with said panel and frame section to define a joint therebetween, said fastener assembly comprising; a bolt member having a first enlarged head portion at one end and an elongate shank, said shank including an externally threaded segment and an external unthreaded segment disposed intermediate said threaded segment and said enlarged head portion, and a nut member including an elongate sleeve segment having an exterior, unthreaded surface and an internal bore having an internally threaded surface portion engaged with said threaded segment of the bolt member, and a second enlarged head portion on said nut member, such that said enlarged head portions engage said panel and frame sections to effect said clamping engagement, the one of said members having its head portion engaged with said frame section including a plurality of axially extending splines formed on the exterior unthreaded surface portion of said one member and engaged with said bore, said splines having a maximum diameter greater than the diameter of said bore and the diameter of the unthreaded external surface portion on said other member, with the root diameter of said splines being less than the diameter of said bore, and annular axially facing groove means on the enlarged head portion of said one member, with a sealing member disposed in said groove means and compressed into tight sealing contact with said frame section, and the unthreaded exterior surface of said other member being received in said bore and rotatable with respect to said bore, and drive tool accomodating means formed on said enlarged head portion of said other member to permit driving of said other member to obtain said clamped engagement, said one member being engaged in said frame section bore with the relationship of said splines maximum and root diameter to said bore diameter tending to center said one member relative to said bore during initial engagement, while permitting said member to move axially inward during engagement of said threaded surfaces pursuant to driving of said other member to attain clamped engagement, said splines and the unthreaded surface upon which they are formed both having an axial length such that they extend beyond the portion of the bore defined by said frame section, into that portion formed by said panel section to provide increased resistance to the shearing forces applied to said member at the interface of said panel and frame sections.



4,033,244
SCREW AND SCREW DRIVER

Ralph Spencer Jacobson, 27970 Le Dunne Ave., Aldergrove, British Columbia, Canada

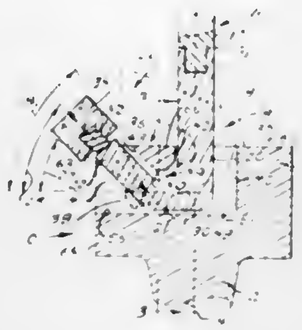
Filed Apr. 27, 1976, Ser. No. 680,715

Int. Cl.² F16B *23/00*

U.S. Cl. 85—45 **7 Claims**

1. A screw for use with a screw driver; the screw driver having a shank and a generally V-shaped screw engaging means at an end of the shank, the screw engaging means having a root portion, a transverse portion and an oblique portion, the root portion extending from the shank as an axial extension of the shank to join the transverse portion, the transverse portion interconnecting the root and oblique portions, and the oblique portion extending obliquely from the transverse portion so as to define the generally V-shaped screw engaging means; the screw having a threaded body and a screw head disposed on a central axis of the screw, the screw head having an outer surface, and a driver engaging means characterized by:

- a. a bridge portion adjacent the outer surface of the screw head remote from the body, the bridge portion having a bridge axis coincident with a chord of the screw head being displaced radially outwardly from a diameter of the screw head with the entire bridge portion being located to one side of said diameter, the bridge portion also having spaced opposed bridge inner and outer side walls, the bridge inner side wall being parallel to and radially displaced from said diameter of the screw head an amount sufficient to permit the screw engaging means of the screw driver to be retained in the screw with the shank of the screw driver aligned with the central axis of the screw,
- b. a clearance passage extending under the bridge portion to accept the V-shaped screw engaging means, the passage having clearance at inner and outer ends thereof for insertion and removal of the V-shaped engaging means.



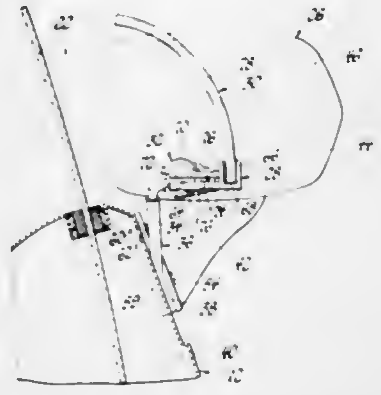
4,033,245
VEHICLE AIR DEFLECTOR

Delbert D. DeRees, Utica, Mich., assignor to American Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1976, Ser. No. 672,948

Int. Cl.² B60J *1/20*

U.S. Cl. 98—2.12 **9 Claims**



1. A vehicle air deflector for use with a vehicle side door including a vertically movable window, a rear view mirror, and a detachable mirror support for mounting the mirror on the exterior of the door adjacent the front extremity of the window, the air deflector comprising: an air scoop; a support member having a support portion that supports the air scoop and a plate-like mounting portion having inwardly and outwardly facing surfaces; said inwardly and outwardly facing surfaces of the mounting portion on the support member being respectively engaged with the door and the detachable mirror support during mounting so as to be maintained in position on the door; the plate-like mounting portion of the support member having an opening for receiving rear view mirror remote controls; securement screw apertures in the mounting portion of the support member on opposite sides of the opening therein; and an adjustable connection that mounts the air scoop on the support portion of the support member.

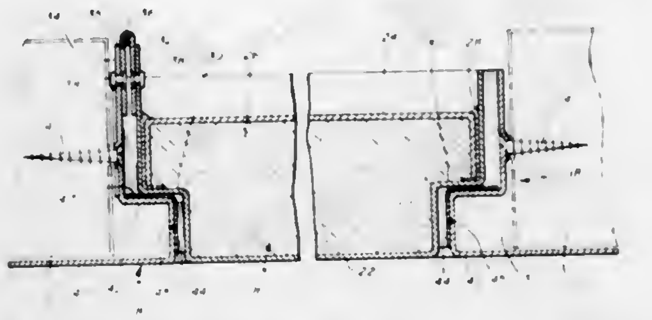
4,033,246
VENT

Arthur P. Jentoft, Kennebunkport, and Paul A. Couture, Emery Mills, both of Maine, assignors to Wasco Products, Inc., Sanford, Maine

Filed Feb. 9, 1976, Ser. No. 656,131

Int. Cl.² F24F *7/00, 13/00*

U.S. Cl. 98—42 R **22 Claims**



1. A vent for venting smoke from a floor of a multi-story building and carrying the smoke via a vertical shaft in the building, said vent comprising;

a metallic frame comprising peripheral wall means,

means for securing the wall means of the frame in an opening in a wall defining the shaft,

said peripheral wall means comprising vertical walls including on one side of the frame at the inner side of the shaft wall an inwardly facing hinge receiving edge,

a door dimensioned to fit within the wall means defining the frame,

hinge means including one hinge part secured along the hinge receiving edge of the wall means and another hinge part secured to the door for hingedly supporting the door from the frame along a non-vertical axis so that the door is permitted to swing open by gravity into the shaft,

and latch means including latch parts carried by the door and frame, respectively,

and means disposed outwardly of the door and frame for releasing the latch parts to permit the door to open.

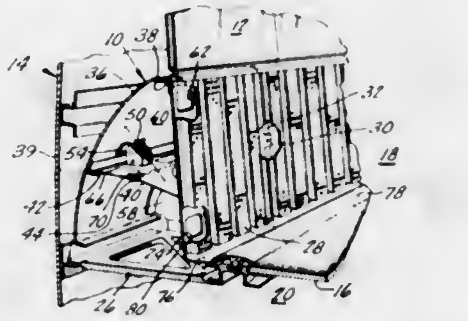
4,033,247
VENT STRUCTURE

Dennis E. Murphy, Costa Mesa, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Dec. 17, 1975, Ser. No. 641,429

Int. Cl.² F23L *17/00*

U.S. Cl. 98—119 **18 Claims**



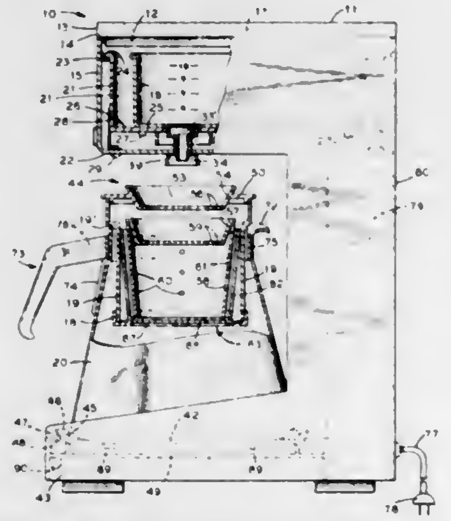
1. A vent for equalizing the pressure on opposite sides of a structure comprising:

a movable vent panel which in a first position restricts the flow from a first side of the structure to a second side thereof; and

a plenum chamber pneumatically connected to the first side of the structure, said chamber having at least one movable wall having first and second sides, said first side of said movable wall being in pneumatic connection with the first side of the structure and said second side of said movable wall being in pneumatic connection with the second side of the structure so that differential pressure across the structure applies force to said wall, and bias means for urging said movable wall into a first position, said movable wall being operatively connected to said vent panel to maintain said movable vent panel in said first position thereof when said movable wall is in its first position whereby a predetermined differential pressure is capable of overpowering said bias means to move said movable wall to a position which allows said movable vent panel to move to a second position wherein flow from the first side of the structure to the second side is less restricted.

4,033,248
AUTOMATIC COFFEE MAKER

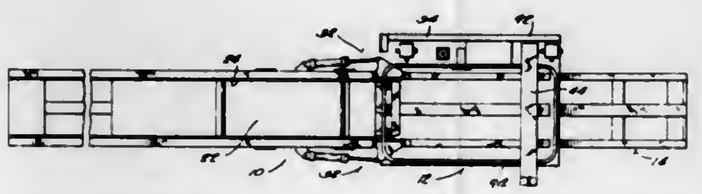
Marco DiSalino, 129 E. 90th St., New York, N.Y. 10028
Filed Aug. 18, 1976, Ser. No. 715,398
Int. Cl.² A47J *31/00*
U.S. Cl. 99—281 **9 Claims**



1. An automatic beverage maker comprising
an upper housing, vertical support walls, a removable back and a base,
a compartment unit and water reservoir within said upper housing,
said upper housing having a bottom,
a top cover for said upper housing, having means to direct any water or condensed steam from leaving said upper housing,
a heating element for supplying heat to said water reservoir,
a ceramic member having a central pipe passing through the bottoms of said compartment unit and said water reservoir,
a thermal valve associated with said ceramic member to permit the heated water to drain from the reservoir,
a heat shield between said heating coil and pipe,
a circular flange on the bottom of said upper compartment unit surrounding the lower end of said pipe,
means to permit the heated water within the reservoir to enter said pipe,
a thermal valve to permit the heated water to drain out of said water reservoir,
a carafe for receiving the heated and filtered coffee,
a handle for said carafe,
a basket for seating upon said carafe,
a removable cap at the base of said basket,
said removable cap having a silk screen,
said basket having a circular spreader cover,
said spreader cover having a dished central portion,
openings on the bottom of said spreader cover,
a paper filter cup for positioning within said basket,
a support wall member within said paper filter cup,
said support wall member having opening, in its wall,
a dished cover for said support member,
said dished cover having openings to permit the hot water to drain into said support member, said filter cup and into said carafe,
a metal circular warming plate for placing said carafe thereon,
said base of said beverage maker having legs raising said base of said beverage maker above the surface upon which it rests,
electrical wiring and thermal control means to permit the water in said reservoir to be heated to the desired temperature and to maintain said warming plate at the desired temperature for serving beverage.

4,033,249
METHOD FOR FORMING BALES

Roman Schmalz, Milwaukee, and Robert J. Wolf, Waukesha, both of Wis., assignors to Logemann Brothers Company, Milwaukee, Wis.
Division of Ser. No. 435,241, Jan. 21, 1974, Pat. No. 3,942,429. This application Jan. 2, 1976, Ser. No. 645,977
Int. Cl.² B65B *13/02*
U.S. Cl. 100—3 **1 Claim**



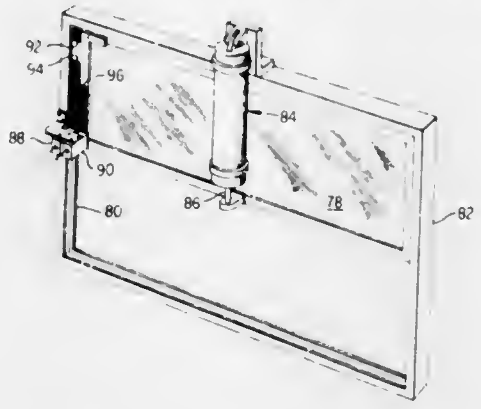
1. A method of forming a strapped bale comprising the steps of:
a. positioning a strapped bale between upper and lower bale restraining members with one end of the bale positioned adjacent the exit end of a baling chamber in which a compression ram is mounted for reciprocal movement, the exit end of the baling chamber having a pair of bale material restraining gate members mounted on opposite sides thereof;
b. introducing bale material into the baling chamber;
c. reciprocating the compression ram to progressively form a bale against said one end of the strapped bale and at the same time pushing the newly formed bale between the upper and lower bale restraining members to thereby force the strapped bale out from between the upper and lower bale restraining members;
d. separating the adjacent ends of the unstrapped and strapped bales from each other after the strapped bale has been pushed completely out from between the upper and lower bale restraining members;
e. retracting the bale material restraining gate members to expose all four sides of the unstrapped bale after it has been pushed between the upper and lower bale restraining members; and
f. applying horizontal straps to the unstrapped bale.

4,033,250
PNEUMATIC BUFFERING SYSTEM

Carlos Dean Pinkstaff, Chardon, Ohio, assignor to The Babcock & Wilcox Company, New York, N.Y.
Filed June 18, 1975, Ser. No. 587,943
Int. Cl.² B21D *43/00;* **B21J** *13/08;* **F15B** *15/22;* **F16P** *1/00*
U.S. Cl. 100—53 **6 Claims**

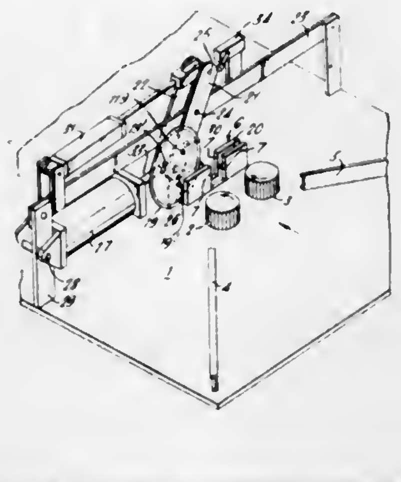
1. A pneumatic system for controllably driving down a vertically raised press safety curtain to the end position of a predetermined vertical path comprising:
a first pneumatic pressure source having a first pressure level;
a second pneumatic pressure source having a second pressure level higher than said first pressure level;

a linear actuator having a pair of opposed pressure chambers;
a piston movable in said linear actuator in response to the pressure difference in the opposed pressure chambers of said linear actuator, said piston being coupled to the press safety curtain to move the press safety curtain with movement of said piston;
sensing means for detecting the position of the press safety curtain along the predetermined path and establishing control signals indicative thereof; and
valve means responsive to the control signals of said sensing means for sequentially applying said first pressure level from said first pressure source to one of the opposed pressure chambers of said linear actuator to quickly drive the press safety curtain through a first downward part of the predetermined path, applying said second higher pressure level from said second pressure source to the other of the opposed pressure chambers of said linear actuator while exhausting pressure from said one pressure chamber to buffer the speed and momentum of the press safety curtain through a second part of the predetermined path and exhausting the other pressure chamber of said linear actuator to drive the press safety curtain through the remaining part of the predetermined path to quickly close it without causing a shock to the safety curtain and press.



4,033,251
STRUCTURAL CELLULAR MATERIALS

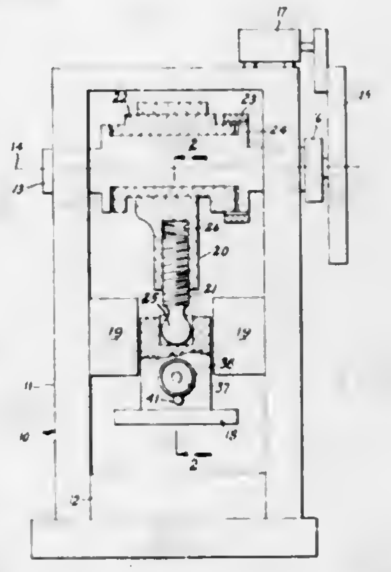
Peter John Thwaites, Eltisley, and Peter Waterworth Joyce, Eynesbury, both of England, assignors to Dufaylite Developments Limited, England
Filed July 20, 1976, Ser. No. 707,472
Claims priority, application United Kingdom, July 23, 1975, 30722/75
Int. Cl.² B30B *3/04*
U.S. Cl. 100—95 **17 Claims**



1. Apparatus for treating continuous unexpanded structural honeycomb material formed of permanently creasable material which comprises roller means for drawing the material in the expansion direction thereof whilst compressing it perpendicularly to the expansion direction to a second unexpanded state and advancing it in the second unexpanded state, a guide for receiving the advancing material from said rollers and guiding it forward whilst permitting it to expand to a slightly re-expanded state and, for severing the slightly re-expanded material in the slightly re-expanded state, a double acting severing device and an actuator operable to move the double acting severing device across the material in forward and return cutting strokes.

4,033,252
PRESSES

Cyril Walter Baker, Birmingham, England, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio
Filed Mar. 15, 1976, Ser. No. 666,924
Int. Cl.² B30B *15/00*
U.S. Cl. 100—99 **5 Claims**



1. In a press mechanism having means for adjusting the shut height, a device for indicating the instantaneous position of a movable slide relative to a fixed frame comprising:
a. a first rack slidably supported in the slide and adapted to engage the frame and remain stationary relative thereto when biased in one direction outward from the slide;
b. means alternatively for yieldably biasing said first rack in the one direction and for moving the first rack in the other direction for withdrawal into the slide and away from contact with the frame;
c. a pinion carried by the slide and in mesh with the first rack; and
d. an indicator on the slide driven by the pinion and operative to display the position of the slide relative to the frame when the first rack engages the frame.

4,033,253
FRUIT PRESS

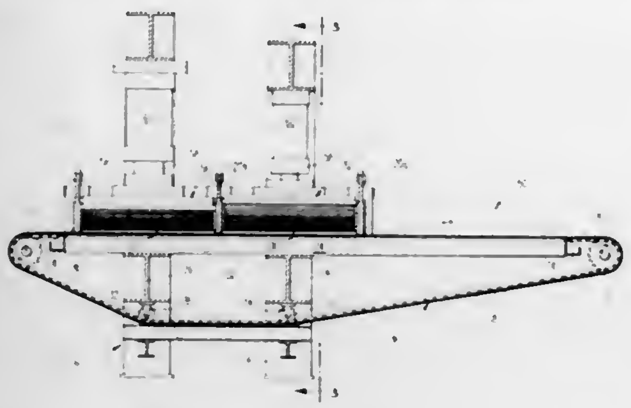
Hubert C. Stollenwerk, P. O. Box 242, and Hubert F. Stollenwerk, R.R. 3, Box 82, both of Egg Harbor, N.J. 08215
Filed Aug. 27, 1975, Ser. No. 608,049
Int. Cl.² B30B *9/04, 9/24*
U.S. Cl. 100—118 **9 Claims**

1. In an apparatus for deliquifying compressible material comprising a frame, at least one vertically operable hydraulic cylinder dependingly mounted on said frame and having a depending platen, with opposing sides and opposing ends, the improvement comprising:
a. A rigid table beneath said platen;
b. A permeable endless conveyor having a surface overlying said table;
c. Rigid, permeable side means, one on either side of said platen, and substantially coextensive therewith and comprising a plurality of vertically spaced slats, each of said side means having an inner face;

d. Screen means substantially covering the inner face of each of said sides;

e. Indexing means mounted to said frame and each of said sides to index said sides toward and away from each other;

f. Rigid, vertically extending restraining means, one at either end on said platen and transverse to said side means and substantially coextensive with said platen;



g. Means vertically movably mounting each of said restraining means;

h. Said conveyor means, side means, restraining means and platen when brought together forming a substantially sealed rigid container within which said mass may be compressed to release juice substantially only through said side means and said conveyor means while maintaining the non-liquid portion of said mass in single compacted form.

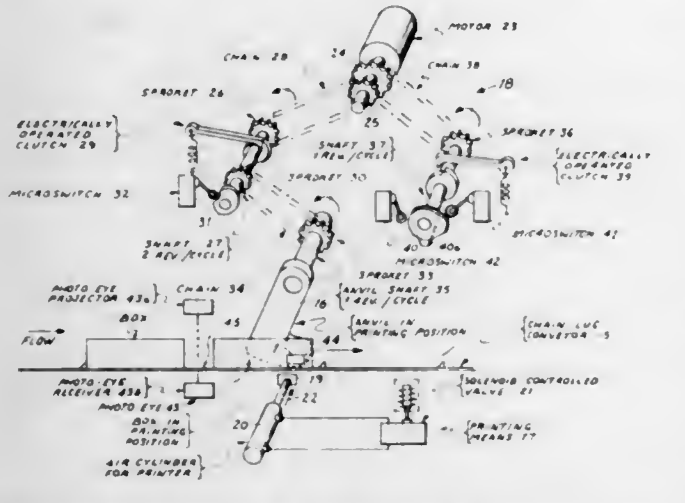
4,033,254
METHOD AND APPARATUS FOR PRINTING ON THE SIDE OF EMPTY BOXES

Hubert Earl Tobey, Milltown; John William Hood, East Brunswick; Alphonse Michael Masiuk, Englishtown; Dee Lavern Irvin, Moonachie, and George Otto Moller, Dumont, all of N.J., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 29, 1976, Ser. No. 653,424

Int. Cl.^{2} B41F *17/24*

U.S. Cl. 101—44 **9 Claims**



1. Printing apparatus in association with a conveyor conveying in sequence a plurality of boxes to a printing position for printing on a selected side panel of each of said boxes comprising:

a rotatable L-shaped anvil having a toe positioned to engage an interior portion of each of said boxes in sequence and to place said toe of said anvil and each of said boxes in said printing position, said toe of said anvil remaining in engagement with said interior portion of each of said boxes during said printing;

printing means disposed at said printing position and adjacent the exterior of said selected side panel; and

control means coupled to said anvil and said printing means to control the rotation of said anvil into said printing position and to actuate said printing means when said toe of said anvil and each of said boxes are in said printing position to cause printing on said selected panel.

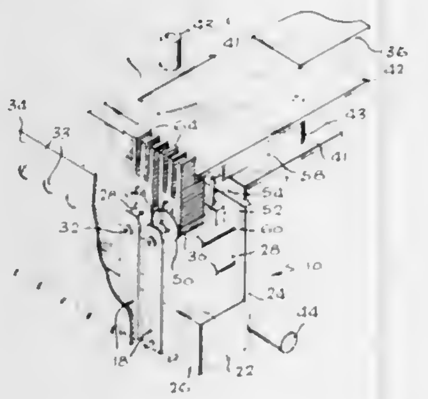
4,033,255
PRINT HAMMER ACTUATOR FOR DOT MATRIX PRINTERS

Robert A. Kleist, Anaheim, and Jerry Matula, Culver City, both of Calif., assignors to Printronix, Inc., Irvine, Calif.

Filed Nov. 13, 1975, Ser. No. 631,449

Int. Cl.^{2} B41J *7/70*

U.S. Cl. 101—93.04 **9 Claims**



1. An actuator system for a dot matrix printer having a plurality of hammer elements disposed along a printing line position and comprising:

a plurality of energizing coils disposed along the printing line position and each in operative relation to a different hammer element;

a plurality of heat conductive elements, each coupled in thermally conductive relationship to a different one of said energizing coils and having a plurality of spaced-apart fins, the fins of the heat conductive elements lying in a common plane;

means for moving the energizing coils and the heat conductive elements along the printing line position;

means for directing an air flow onto the heat conductive elements in a direction generally normal to the common plane; and

means responsive to movement of the energizing coils and the heat conductive elements along the print line for directing a second air flow onto the heat conductive elements in a direction generally parallel to the common plane.

4,033,256
PRINTER

Seiji Hanaoka, Shiojiri, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

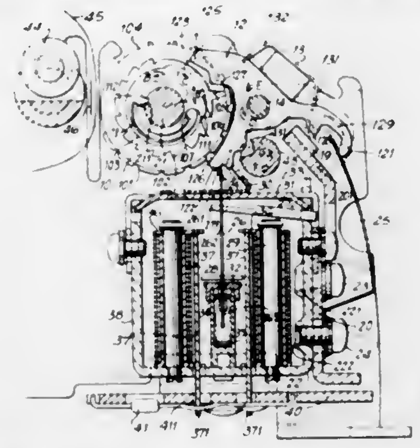
Filed May 9, 1975, Ser. No. 575,814

Claims priority, application Japan, May 9, 1974, 49-51470

Int. Cl.^{2} B41J *1/44*

U.S. Cl. 101—99 **8 Claims**

1. An improved printer comprising a rotatable drive shaft means at least one character ring having a plurality of characters on the periphery thereof, said character ring being rotatably supported on said drive shaft means, each character ring having a ratchet wheel including a stop tooth radially mounted thereon, pawl means associated with each said character ring, each said pawl means being coordinately displaceable between a rest position and an engaging position, each said pawl means being adapted to engage the ratchet wheel on said associated character ring when said pawl means is in said engaging position to thereby stop the rotation of said character ring, each said pawl means having a first extension and a second extension, said first extension being constructed and arranged to contact the stop tooth on said ratchet wheel when said ratchet wheel is rotated by said drive shaft means to a predetermined rotary position of said ratchet wheel, said stop tooth imparting motion to said pawl means, a biasing means associated with each pawl means for displacing said pawl means from said rest position to said engaging position, restraining means associated with each said pawl means for selectively engaging said pawl means and holding same at said rest position, release means associated with each said restraining means for displacing said restraining means out of engagement with said pawl means to thereby permit said biasing means to effect displacement of said pawl means from said rest position to said engaging position, return means for returning each of said pawl means from said engaging position to said rest position, and resilient means disposed proximate to said second extension on each said pawl means when said pawl means is in said rest position so that said resilient means is engaged by said pawl means and absorbs the motion imparted to said pawl means when the first extension of each said pawl means is engaged by said stop tooth on said ratchet wheel, when said ratchet wheel is rotated to said predetermined position, and print means for imprinting a selected character carried on each of said character rings when said character ring is stopped by said pawl means associated therewith.



4,033,257
ROTARY DATE STAMP

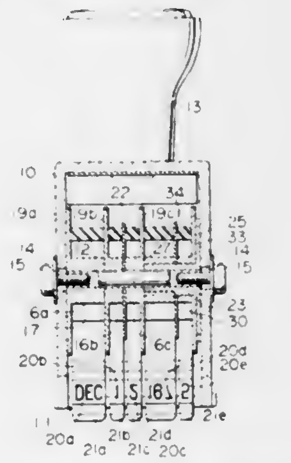
Takaji Funahashi, No. 1, 2-chome, Kitatakasho, Nishi, Nagoya, Aichi, Japan

Filed Jan. 22, 1976, Ser. No. 651,255

Claims priority, application Japan, Feb. 10, 1975, 50-18728[U]; Mar. 19, 1975, 50-37046[U]

Int. Cl.^{2} B41J *1/60*

U.S. Cl. 101—111 **3 Claims**



1. A rotary date stamp comprising a frame having a substantially reverse U-shaped form, a bridge built on the lower end portions of said frame, a fixed shaft mounted on substantially intermediate portions of said frame, a plurality of first rotary members supported rotatably on said fixed shaft inside the U-shaped form of said frame, each of said first rotary members having a first annular disc having teeth on the periphery thereof and being fixed to one end each of said first rotary members, said first annular discs being disposed inside the U-shaped form of said frame, a cylindrical shaft supported rotatably on said fixed shaft inside the U-shaped form of said frame and having a second annular disc having teeth on the periphery thereof and fixed to one end of the cylindrical shaft, said second annular disc being disposed inside the U-shaped form of said frame, a second rotary member fixedly supported on said cylindrical shaft so that it can rotate together with said cylindrical shaft, a third rotary member having a third annular disc having teeth on the periphery thereof and fixed to one end of said third rotary member, said third rotary member being loosely supported on said cylindrical shaft, a plurality of endless belts, including first endless belts and a second endless belt, each of said first endless belts being hung around both said bridge and each of said first and third rotary members and having on a surface thereof a plurality of first letters which are frequently used, said second endless belt being hung around said bridge and said second rotary member and having on a surface thereof a plurality of second letters which are not frequently used, an annular partition plate interposed between the second rotary member with said second corresponding endless belt and the third rotary member with said first corresponding endless belt, said annular partition plate having a smaller width than said annular discs, and said second annular disc being smaller in both diameter and width than said first and third annular discs.

4,033,258
PRINTING APPARATUS

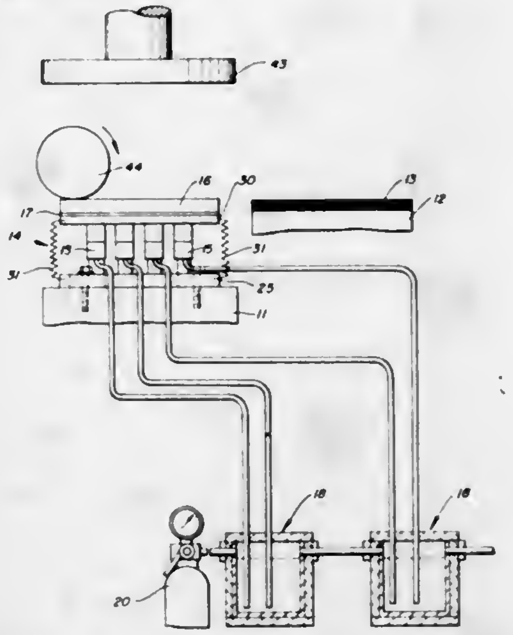
Harold F. Farrow, Hitchin, England, assignor to Colorflo Limited, London, England

Filed May 29, 1973, Ser. No. 364,304

Claims priority, application United Kingdom, May 30, 1972, 25329/72

Int. Cl.^{2} B41M *1/10;* **B41F** *3/00*

U.S. Cl. 101—158 **11 Claims**



1. A printing apparatus comprising a printing station, an inking station spaced apart from said printing station, a printing plate at said inking station, said printing plate including a face surface with a design formed thereon and a plurality of passages extending through said printing plate into fluid communication with said design, a plurality of resiliently compressible injector units disposed at said inking station and connected in fluid communication with the face surface of said printing plate through said passages, each of said injector units including means for enabling ink to flow from the injector unit through at least one of said passages in said printing plate onto the face surface of said printing plate upon compression of the injector unit, means for compressing said injector units to provide a flow of ink from said injector units through said passages in said printing plate and onto the face surface of said printing plate, and transfer means for transferring ink from the face surface of said printing plate to sheet

material disposed at said printing station, said transfer means including surface means for engaging the face surface of said printing plate at the inking station to thereby apply ink to said surface means, and means for moving said surface means with ink disposed thereon from said inking station to said printing station and for effecting a transfer of ink from said surface means to sheet material at said printing station.

4,033,259

DEVICE FOR ADJUSTING PRINTING PLATES ON THE PLATE CYLINDER OF PRINTING PRESSES

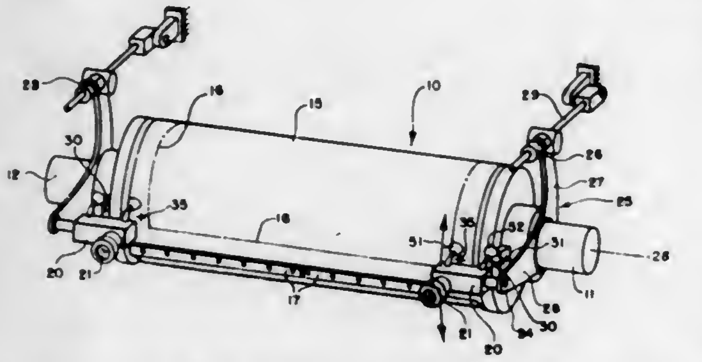
Siegfried Schuhmann, Offenbach, Germany, assignor to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed June 14, 1976, Ser. No. 695,421

Claims priority, application Germany, June 13, 1975, 2526446

Int. Cl.² B41F *13/12*

U.S. Cl. 101—174 **6 Claims**



1. Apparatus for facilitating peripheral adjustment of a printing plate on a printing cylinder of a multi-color press comprising, in combination, a frame, means for journaling the cylinder in the frame, means fixed at the end of the cylinder for carrying a peripheral reference mark, an index mark on the plate positionally related to the image thereon and in a position on the plate which is adjacent the reference mark on the cylinder, an optical viewing device having magnifying optics including a single eye piece and two objectives, the objectives being spaced for simultaneous viewing of the reference mark and index mark superimposed in the same field of view, the optical viewing device having a screen including an optical reference generally centered in the field of view, means including a bracket secured to the frame for permanently supporting the optical viewing device on the press in a viewing position, means including a threaded adjusting element interposed in the bracket between the frame and the viewing device for adjusting the peripheral position of the viewing device about the cylinder thereby to bring the reference mark and index mark within the field of view of the viewing device, and means including a scale associated with the viewing device for measuring the disparity in peripheral register between the index mark and the reference mark as a criterion for peripheral adjustment of the plate into a condition of peripheral register.

4,033,260

CONTROL SYSTEM FOR MULTI-COLOR ROTARY PRINTING MACHINES, ESPECIALLY FOR ALTERNATE ONE-SIDE AND TWO-SIDE PRINTING

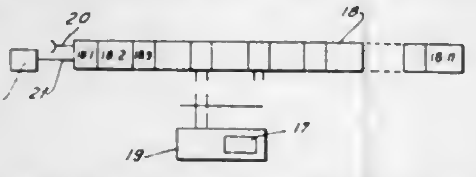
Werner Lein; Kurt Reichenberger, both of Radebeul, and Klaus Schanze, Coswig, all of Germany, assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed July 29, 1975, Ser. No. 600,070

Int. Cl.² B41F *36/16*

U.S. Cl. 101—232 **1 Claim**

1. In a control system for a multicolor rotary printing machine comprised of a plurality of independently actuatable functional units arranged along the path of travel of sheets through the machine, the machine being of the type capable of printing in a one-side printing mode and in a two-side printing mode in which the sheet path length is longer than in the one-side mode, the path length change resulting upon a printing mode changeover being composed of a fixed component determined by the dimensions of the parts of the machine and a variable component determined by the length of the sheets to be printed, the control system including, in combination, a plurality of actuating means each operative for effecting a predetermined change of state of a respective one of said functional units, each comprised of a first moving means and a second moving means, the first moving means having an activated and an unactivated setting, the second moving means performing in synchronism with machine operation a cycle of motion composed of a longer non-working portion and a shorter working portion, the second moving means being operative for effecting a change of the state of activation of a respective functional unit if and only if the respective first moving means is in the activated setting during the working portion of the cycle of the second moving means; means for causing each second moving means to undergo a sheet-length-dependent phase shift of its cycle of motion upon a printing mode changeover, whereby to compensate for the variable component of the sheet path length change; a shift register; means for applying to the information-signal input of the shift register a sheet-representing signal; means for causing the sheet-representing signal to travel through the successive shift-register stages in simulation of travel of a sheet through the machine, comprising means for applying to the shift-signal input of the shift register a train of shifting signals synchronized with the cycles of machine operation, the train being comprised of a plurality of component pulse trains phase shifted relative to each other by a fixed angle other than 180° so that a sheet-representing signal will be registered by different ones of the stages for different respective time intervals; a plurality of signal detectors each connected to a respective shift-register stage and operative upon detection of the arrival of a sheet-representing signal at the respective stage for causing a respective first moving means to assume the activated setting; and means operative upon a printing mode changeover for effecting compensatory disconnections of predetermined ones of the signal detectors from the respective shift-register stages and reconnections of such units to predetermined other ones of the stages to compensate for the fixed component of the sheet path length change.



4,033,261

DEVICE FOR DRIVING THE PLATE CYLINDER IN ROTARY PRINTING PRESSES, PARTICULARLY OFFSET PRINTING PRESSES

Eloy Fernandez, Heusenstamm; Claus Simeth, Offenbach, and Georg Herzan, Eschborn, all of Germany, assignors to Roland Offsetmaschinenfabrik Faber & Schleicher AG, Germany

Filed Nov. 1, 1976, Ser. No. 737,208

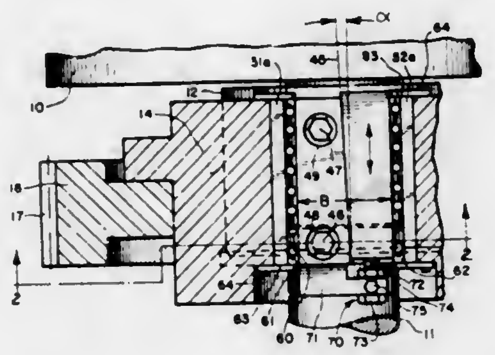
Claims priority, application Germany, Nov. 12, 1975, 2550719

Int. Cl.² B41F *13/14*

U.S. Cl. 101—248 **5 Claims**

1. A drive connection between a plate cylinder of a printing press and the driving gear therefor, the driving gear being axially located with respect to the press frame, comprising, in combination, a sleeve secured to the shaft of the plate cylinder and having a cylindrical outer surface, a hub on the gear having a cylindrical inner surface which is freely telescoped over the outer surface of the sleeve, the sleeve and hub having

respective radially opposed axial grooves keyed together by an entrainer, the entrainer presenting parallel lateral surfaces for registering with the groove in the hub, the entrainer being formed of a base wedge portion and a slide wedge portion mated in complimentary fashion along a substantially radially extending plane which is arranged at a shallow angle with respect to the cylinder axis, the base wedge portion having means for securing it in seated position in the groove formed in the sleeve, and axial adjusting means captively interconnecting the wedge portions for adjusting the relative axial positions of the wedge portions in opposite directions thereby to vary the spacing between the parallel lateral surfaces to achieve a precise sliding fit with the groove in the hub thereby to take up any rotational play between the sleeve and the hub while enabling relative axial shifting of the cylinder for the purpose of adjusting axial register of the printing plate.



4,033,262

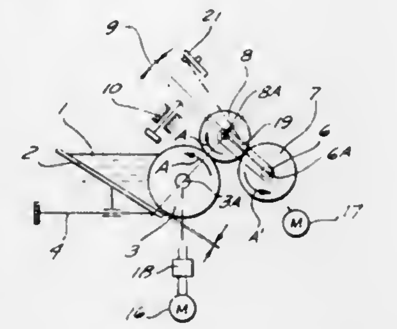
INK APPLICATOR FOR PRINTING APPARATUS

Hans Johne, Radebeul; Arndt Jentzsch, Coswig, and Gunter Schumann, Radebeul, all of Germany, assignors to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen, Leipzig, Germany

Filed Mar. 18, 1976, Ser. No. 668,923

Int. Cl.² B41L *27/16*

U.S. Cl. 101—350 **7 Claims**



1. A liquid-applying apparatus comprising a bath of a liquid; a pickup roller having and being rotatable about a central axis and partially immersed in said bath; means for rotating said pickup roller about its axis in a predetermined rotational sense; an applicator roller spaced from said pickup roller and having and being rotatable about an axis parallel to the pickup roller axis; means for continuously rotating said applicator roller about its axis in the same rotational sense as said pickup roller at a predetermined peripheral speed; a transfer roller in radial contact with said applicator roller and having and being rotatable about an axis parallel to the pickup roller and applicator roller axes; means including a plurality of meshing gears one of which is fixed to said transfer roller and another of which is fixed to said applicator roller for continuously rotating said transfer roller about its axis in a rotational sense opposite to that of said pickup roller and that of said applicator roller and at a peripheral speed different from and forming a fixed ratio with said peripheral speed of said applicator roller; and means for oscillating said transfer roller about the applicator roller axis into periodic radial contact with said pickup roller.

4,033,263

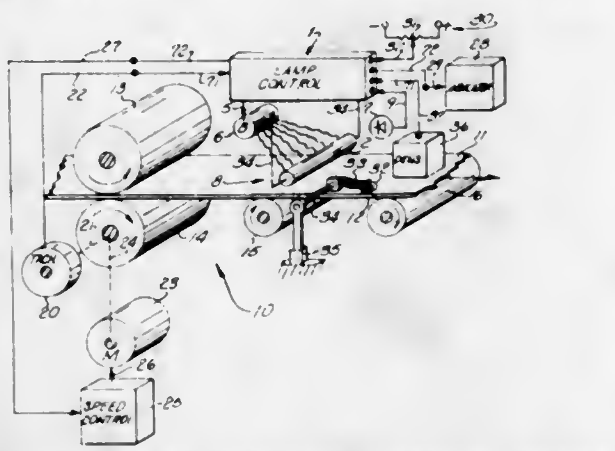
WIDE RANGE POWER CONTROL FOR ELECTRIC DISCHARGE LAMP AND PRESS USING THE SAME

Abraham W. Richmond, West Melbourne, Fla., assignor to Harris Corporation, Cleveland, Ohio

Division of Ser. No. 532,172, Dec. 12, 1974. This application Oct. 20, 1975, Ser. No. 623,680

Int. Cl.² B41F *23/00*

U.S. Cl. 101—416 A **7 Claims**



1. In a printing press for printing electromagnetic radiation curable printed matter on sheet material and an arc discharge lamp for emitting electromagnetic radiation to effect curing of the printed matter, apparatus for controlling the energization of said lamp comprising:

a transformer having a primary winding and a secondary winding;

means for connecting said secondary winding to said lamp;

A.C. power supply control means for connecting said primary winding to A.C. power supply lines for supplying A.C. voltage to said lamp through said transformer of sufficient amplitude to ionize the gas in said lamp so that said lamp fires to emit electromagnetic radiation and controlling the level of A.C. power supplied to said lamp from said A.C. power supply lines, said control means being responsive to a control signal for varying the amount of power supplied to said lamp in dependence upon the value of said control signal;

feedback means for providing said control signal and including detection means for detecting the amount of power supplied to said lamp to provide an output signal, and means for comparing said output signal with a reference signal indicative of desired lamp output intensity and providing said control signal having a value in dependence upon any difference therebetween; and,

said feedback means also including means for further varying said control signal so as to have a value dependent upon the speed of said printing press so that the intensity of radiation emitted by said lamp varies in dependence upon the speed of said printing press.

4,033,264

EXPLOSIVE CARTRIDGE

Frederick Bolza, East Hawthorn; Lubos Vojtech Sadek, Essendon, and Richard Fox, Rosanna, all of Australia, assignors to ICI Australia Limited, Victoria, Australia

Continuation-in-part of Ser. No. 506,542, Sept. 16, 1974, abandoned. This application Apr. 16, 1975, Ser. No. 568,684

Int. Cl.² C06C *11/00*

U.S. Cl. 102—24 R **22 Claims**

1. An explosive cartridge comprising a container formed from a sheet of non-resilient pliable material and within the container a water-bearing friable gelled explosive composition which comprises at least 50% w/w water-soluble inorganic oxygen releasing salt, at least one fuel and from 5 to 14% by weight of water gelled with from 0.1 to 5% by weight of the said composition of at least one complex which has been prepared by a process comprising the steps of (1) reacting

under polymerising conditions a first water soluble monomer with at least one further monomer which carries a group which reacts with a metal ion or which may be converted to a form capable of reaction with a metal ion for a time sufficient to form a copolymer which is soluble at least in part in an aqueous medium and (2) forming a complex by reacting the copolymer so obtained with a redox system or a product or products derived from the redox system which comprises at least one metal ion.

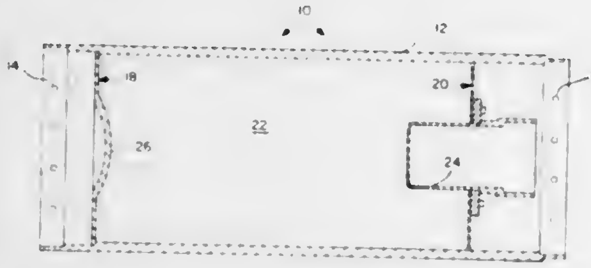
4,033,265
ANTI-COMPROMISE DEVICE

Clifford T. Johnson, and Melvin J. McCubbin, both of Ridgecrest, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Mar. 25, 1976, Ser. No. 670,197

Int. Cl.² F42B *13/12*

U.S. Cl. 102—56 SC **2 Claims**



1. In a warhead section for a guided missile or the like the combination comprising:
   a substantially cylindrical casing;
   forward and aft bulkheads fastened within said casing and forming therebetween a chamber for containing a high explosive material;
   said rear bulkhead having means associated therewith for detonating said explosive material; and
   said forward bulkhead including a planar peripheral portion and means associated therewith so constructed as to form a forward jet of molten metal when said explosive is detonated;
   said last mentioned means including a centrally located spherical contoured portion of malleable ferrous metal bulging inwardly with respect to said chamber and having a thickness greater than said planar peripheral portion.

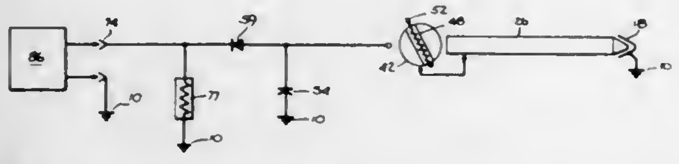
4,033,266
ELECTRICAL FUZE WITH SELECTABLE MODES OF OPERATION

Richard T. Ziemba, Burlington, Vt., assignor to General Electric Company, Burlington, Vt.

Division of Ser. No. 545,843, Jan. 31, 1975. This application June 29, 1976, Ser. No. 701,005

Int. Cl.² F42C *11/00, 17/00*

U.S. Cl. 102—70.2 R **3 Claims**



1. A method of manufacturing and operating an ordnance projectile having an impact detonated type fuze to provide a selectively variable delay in the time between impact of the projectile with a target and the detonation of said fuze, said projectile including a resistance type primer, a capacitor, a detonator, and a normally open switch which closes on impact, comprising:
   providing as said detonator a resistance type detonator whose firing time increases as a function of a decrease in applied firing current;
   applying a voltage concurrently and in parallel across said primer and said capacitor initially to charge said capacitor to a selectively variable voltage level which is a predetermined function of the firing current to be applied to said detonator, and subsequently to ignite said primer;
   closing said switch to discharge the voltage on said capacitor across said detonator, the time interval between the closing of said switch and the combustion of said detonator being a predetermined function of the voltage level of said capacitor.

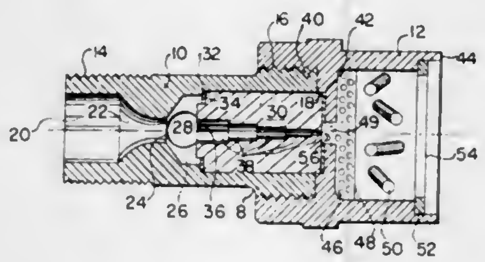
4,033,267
FLUERIC CARTRIDGE INITIATOR

Joseph W. Morris, Indian Head, Md.; Bryan L. Cram, Washington, D.C., and Vincent P. Marchese, Morris Township, Morris County, N.J., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 1, 1976, Ser. No. 728,806

Int. Cl.² F42C *5/00*

U.S. Cl. 102—70 R **9 Claims**



1. In combination with a flueric cartridge initiator of the type wherein a housing being defined by aft and forward ends, includes a convergent-divergent nozzle axially incorporated through said aft end, a transverse vent passing through the divergent zone of said nozzle and axially oriented with said nozzle, a resonance tube having a plurality of resonance cavities aligned in decreasing size order along the longitudinal axis of said resonance tube, and wherein a pyrotechnic transfer charge in juxtaposition with said resonance tube is ignited by thermal energy generated as a gas introduced into said flueric cartridge initiator through said nozzle undergoes periodic compression and expansion within said resonance cavities, the improvement which comprises: means for sealing said flueric cartridge initiator so as to prevent gas blowback, wherein said means includes:
   said convergent-divergent nozzle also forming a tube holder having an externally threaded forward end, said forward end being machined along its longitudinal axis so as to accept a deformable input washer;
   said resonance tube, inserted into said tube holder so as to form a leak-tight seal with said input washer when said flueric cartridge initiator is fully loaded,
   an output charge holder having an internally threaded aft end for mating with forward end of said tube holder;
   a deformable output washer, for creating a leak-tight seal between the forward end of said resonance tube and said output charge holder; and
   a high strength thermal disk for preventing gas blowback from said transfer charge; and

   said transfer charge, including a small diameter section of ignition material adjoining a larger thin layer section of ignition material, thereby permitting ignition of said transfer charge.

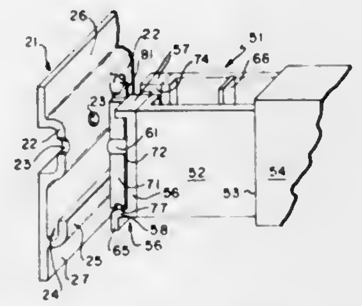
4,033,268
END FITTING FOR CARGO BAR

Virginia M. Klekar, 1719 Mendocino Drive, Concord, Calif. 94521

Filed Mar. 19, 1975, Ser. No. 559,926

Int. Cl.² B61D *45/00*

U.S. Cl. 105—497 **12 Claims**



1. An end fitting for a cargo bar formed for use in coupling said cargo bar to a first belt rail, said first belt rail being formed as a horizontally extending strip having a horizontally extending outwardly protruding section with a plurality of side-by-side openings therein, a second belt rail formed as a horizontally extending strip having a horizontally extending outwardly protruding section with side-by-side vertically extending slots therein, and a third belt rail formed as a vertically extending strip having a vertically extending protruding section with vertically extending generally aligned slots therein, said end fitting including a shank formed for mounting to an end of said cargo bar, said shank terminating in a coupling end, and a first coupling means and a second coupling means extending from said coupling end and formed to secure and couple said end fitting to said first belt rail, said second belt rail and said third belt rail, respectively, wherein the improvement comprises:
   a pair of spaced apart flange means extending outwardly from said coupling end, said flange means being formed and dimensioned for cooperative engagement of said first belt rail with said first coupling means and further for cooperative engagement of said second belt rail with said second coupling means so as to assist in preventing uncoupling of said cargo bar under cargo loading forces when coupled to either of the belt rails,
   said flange means extending horizontally over and under said outwardly protruding section of said first belt rail and being formed to extend outwardly from said coupling end to substantially the same distance therefrom for engagement with and bearing upon said first belt rail above and below said protruding section, at least one of said first and said second coupling means being mounted to said coupling end for selective movement to a first position enabling coupling with one of the belt rails and to a second position enabling the remainder of said first and said second coupling means to be coupled to the remainder of the belt rails,
   said first coupling means being formed as at least one pin disposed intermediate said flanges and formed and dimensioned for mating insertion into said opening in said first belt rail, said pin being mounted for selective movement to and from said first position at which said pin is inserted in said openings in said first belt rail and to and from said second position at which said pin bears upon said protruding section of said second belt rail intermediate said slots.

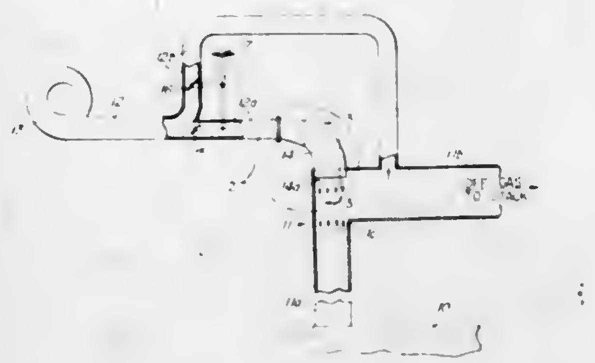
4,033,269
METHOD AND APPARATUS FOR CONTROLLING GAS FLOW

Alma M. Little, Salt Lake City, Utah, and Harry R. Ralston, Silver City, N. Mex., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,149

Int. Cl.² F23L *11/02*

U.S. Cl. 110—160 **5 Claims**



1. A method of controlling flow of gas through a conduit of a gas handling system, which conduit has an abrupt bend therein, comprising introducing a control gas into the conduit in direct opposition to the normal through-flow of gas into said bend and at a flow rate effective to accomplish the degree of control of said normal through-flow desired through a range of substantially no normal flow to substantially full normal flow, the introduction of control gas being in the form of a multiplicity of jet streams arranged in side-by-side adjacency and extending substantially entirely along one cross-sectional dimension of the conduit in a series which extends along the other cross-sectional dimension of the conduit substantially normal to said one cross-sectional dimension thereof, and said introduction of control gas being substantially without reduction of the cross-sectional area of said conduit or interference with gas flow through said conduit at said location at introduction when full normal flow is desired.

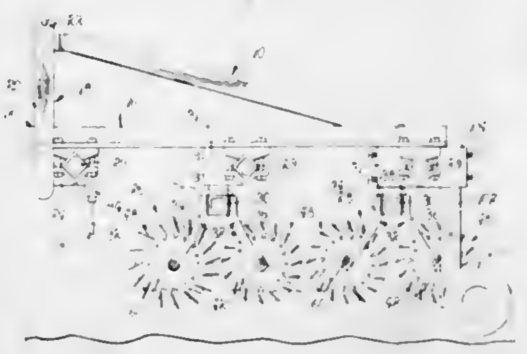
4,033,270
AGRICULTURAL SOIL CHEMICAL INCORPORATOR

Paul A. Bezzerides, 14092 Ave. 416; Robert A. Bezzerides, 14142 Ave. 416, and Dave W. Vradenburg, 14092 Ave. 416, all of Orosi, Calif.

Filed May 19, 1975, Ser. No. 578,485

Int. Cl.² A01C *23/00;* **A01B** *35/16*

U.S. Cl. 111—6 **14 Claims**



7. A soil chemical incorporator implement comprising:
   a frame disposed for movement over a field having seed beds formed therein along a path aligned with said seed beds, said frame having a front end, a rear end and a pair of oppositely disposed sides, said frame having attachment points suitable for mounting said implement on a three point suspension mounting of a tractor, and wheel means disposed to support said frame in a ground related condition;

a plurality of spider wheels, each having a central mounting hub, a wheel body extending radially outward from said hub, and a plurality of spokes projecting radially outwardly from said wheel body, and having blade means attached to the distal ends of said spokes;

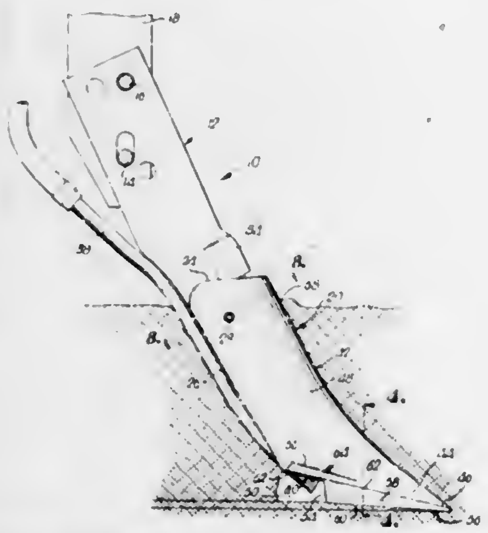
a plurality of mounting arms, each having a proximal end disposed for interconnection with said frame and a distal end disposed to rotatably mount the hub of one of said spider wheels;

a first spider wheel gang bar attached to said frame and disposed to mount the proximal ends of a pair of said mounting arms with the distal ends of said mounting arms depending therefrom and with a first arm of said pair disposed with its distal end extending forwardly of said gang bar to dispose the spider wheel mounted thereon in a generally vertical plane and at an acute angle to the path of travel of said frame in the direction of a first side thereof, and the second arm of said pair disposed with its distal end extending rearwardly from said gang bar to dispose the spider wheel mounted thereon at an acute angle to the path of travel of said frame in the direction of the other side thereof, with the forward portion of said spider wheel on said second arm being in substantial alignment with the rear portion of the spider wheel on said first arm along the path of travel of said frame; and

a soil chemical dispenser disposed in front of said frame ahead of the forwardmost of said spider wheels.

4,033,271
APPARATUS FOR SUBSOIL APPLICATION

Donald E. Williams, and Forrest E. Robertson, both of Garden City, Kans., assignors to Acra-Plant, Inc., Newton, Kans.
Continuation of Ser. No. 520,732, Nov. 4, 1974, abandoned, which is a division of Ser. No. 395,587, Sept. 10, 1973, abandoned. This application Feb. 13, 1976, Ser. No. 657,720
Int. Cl.² A01C *23/02*
U.S. Cl. 111—7 **6 Claims**



1. In a subsoil knife, a body having:

an elongated blade having a front, a rear, a bottom, a top, and a pair of opposite sides with respect to the normal path of travel of the body,

the longitudinal axis of the blade extending between said top and bottom thereof,

said blade having a soil-slicing, line edge all along the front thereof which is devoid of flat surfaces extending transversely of said normal path of travel of the body,

said sides of the blade progressively diverging from said line edge as said rear of the blade is approached,

said bottom of the blade sloping upwardly and rearwardly from said front of the blade in the same plane as a pair of diagonally extending line edges on said opposite sides of the blade;

an elongated soil-firming wedge integral with said blade along said bottom of the latter, the longitudinal axis of said wedge extending between said front and rear of the blade,

said wedge having a pair of lateral triangular faces converging downwardly and inwardly to a common lowermost, soil-creasing, fore-and-aft extending line edge and diverging upwardly to form said diagonal line edges with the sides of the blade,

said soil-slicing line edge, said soil-creasing line edge, and said diagonal line edges leading to and converging forwardly in a soil-piercing point on the body,

said wedge terminating rearwardly at a location spaced forwardly from said rear of the blade to thereby define a recess topped by said bottom of the blade and fronted by the rear termination of said wedge; and

a pair of elongated, fore-and-aft extending wing projecting outwardly from said opposite sides of the blade directly above said recess,

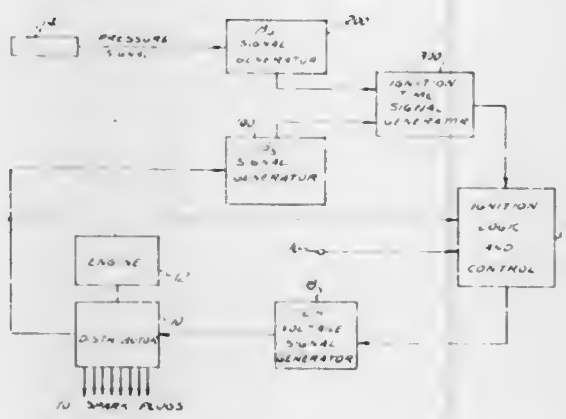
said wings having lower surfaces serving as lateral extensions of said bottom of the blade and lying in the same diagonal plane as said diagonal line edges, said wings further having upper surfaces sloping downwardly and forwardly toward said diagonal line edges,

said wings converging laterally and forwardly toward said point at the same rate and in linear alignment with said diagonal line edges,

said diagonal line edges being at the lateralmost extremity of the body from said point rearwardly to said wings, whereupon, from the wings rearwardly, the wings represent the lateralmost extremity of the body.

4,033,272
ELECTRONIC IGNITION TIMING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

Robert Samuel Henrich, Farmington Hills, Mich., assignor to The Bendix Corporation, Southfield, Mich.
Filed May 14, 1975, Ser. No. 577,490
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 R **30 Claims**



1. In combination with an internal combustion engine having a crankshaft, a plurality of combustion chambers, each of said combustion chambers having an associated ignition means, means for generating a high voltage ignition signal in response to ignition time signals, distributor means connected in a first predetermined timing relationship with said crankshaft to communicate high voltage ignition signals to each of said ignition means in a predetermined sequence, sensor means generating load signals indicative of the engine's load and ignition reference signal generating means connected in a second predetermined timing relationship with said crankshaft to generate at predetermined rotational intervals of said crankshaft ignition reference signals for each of said combustion chambers; an ignition timing systemm for generating ignition time signals for triggering said means for generating high voltge ignition signals comprising:

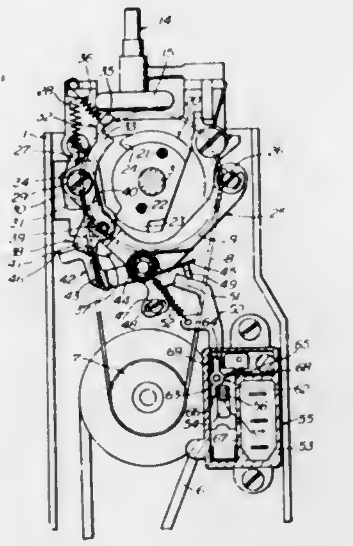
means responsive to said ignition reference signals for generating β_S signals inversely proportional to the ignition advance requirements of the engine as a function of speed, said $\beta_S$signals switching from one predetermined value to another predetermined value in a predetermined sequence and at predetermined time intervals;

means responsive to said load signals for generating β_P signals inversely proportional to the ignition advance requirements of the engine as a function of engine load; and

means integrating said β_S signal between the occurrence of two consecutive ignition reference signals, and dissipating said integrated $\beta_S$signal as a function of said β_P signal between the second of said two successive ignition reference signals, a third consecutive ignition reference signal for generating ignition time signals having a time advance from the occurrence of said third consecutive ignition reference signal which is a function of both engine speed and engine load, said ignition time signals triggering said means for generating high voltage ignition signals.

4,033,273
SEWING MACHINE

Noboru Kasuga, Hachioji, Japan, assignor to Janome Sewing Machine Co., Tokyo, Japan
Filed Apr. 17, 1975, Ser. No. 569,178
Claims priority, application Japan, Apr. 20, 1974, 49-43894; Apr. 20, 1974, 49-43895; Apr. 20, 1974, 49-43896; Apr. 20, 1974, 49-44131[U]; Apr. 20, 1974, 49-48270
Int. Cl.² D05B *69/00*
U.S. Cl. 112—274 **6 Claims**

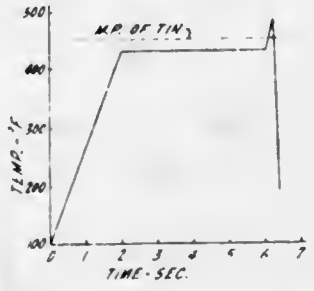


1. In a sewing machine, a combination comprising a machine frame; a main shaft rotatably mounted in said machine frame for reciprocating a needle during rotation of said main shaft; drive means for rotating said main shaft; control means movable by an operator between a first position actuating said drive means and a second position deactivating the drive means; stopping means movable between an active position stopping said main shaft and an inoperative position; means cooperating with said stop means for moving the same from said active to said inoperative position when said control means is moved to said second position; further means cooperating with said stopping means for moving it back to its active position while said main shaft makes one revolution upon moving said control means to said first position; and selecting means selectively operable between a plurality of positions, in one which it renders said stopping means operative so that the latter stops said main shaft and in the other of which it renders the stopping means inoperative so that the main shaft rotates continuously when said control means actuates said drive shaft.

3. In a sewing machine, a combination comprising a machine frame; a main shaft rotatably mounted in said machine frame for reciprocating a needle during rotation of said main shaft; drive means for rotating said main shaft; control means for actuating and de-actuating said drive means; stopping means for stopping said main shaft in a predetermined position while said drive mean are actuated by said control means, said stopping means comprising a first cam mounted on said main shaft for rotation therewith, a pawl cooperating with said first cam to stop said main shaft, a second cam mounted on said main shaft for rotation therewith, an actuating member turnably mounted on said pawl and cooperating with said second cam to shift said pawl to a position for cooperation with said first cam, and spring means yieldably biasing said pawl and said actuating member to an inoperative position; and selecting means selectively operable to render said stopping means operative and inoperative.

4,033,274
CONTAINERS

Ronald E. Beese, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.
Filed Dec. 31, 1975, Ser. No. 645,685
Int. Cl.² B21D *51/26*
U.S. Cl. 113—120 A **8 Claims**



1. A method of developing a substantially continuous stratum of tin-iron alloy in a seamless shell to serve as a container, obtained from a steel substrate having an adherent unalloyed tin layer on at least one side thereof and comprising:

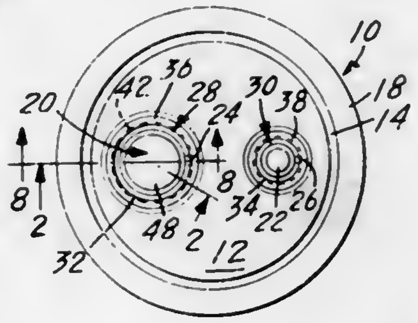
a. selecting a steel substrate in which the tin layer has a weight of at least 0.375 pounds/BB on the side corresponding to the inner diameter of the shell;

b. drawing the substrate to form an elongated shell of predetermined dimension; and

c. baking the shell at a temperature and for a time sufficient to develop a substantially continuous tin-iron alloy next to the steel substrate, the resultant alloy having a weight of no less than about 0.03 pounds per BB, leaving the balance of the tin in unalloyed form.

4,033,275
METHOD OF FORMING AN OPENING TAB IN SHEET METAL CONTAINER END CLOSURES

Charles S. Radtke, Little Ferry, N.J., assignor to American Can Company, Greenwich, Conn.
Filed Nov. 3, 1975, Ser. No. 628,501
Int. Cl.² B21D *51/40*
U.S. Cl. 113--121 C **6 Claims**



1. A method of forming a tab for closing an opening in the panel of a metal end closure for a container, which comprises:

deforming a portion of said panel to form therein an outwardly projecting bulge having a sidewall portion thereon;

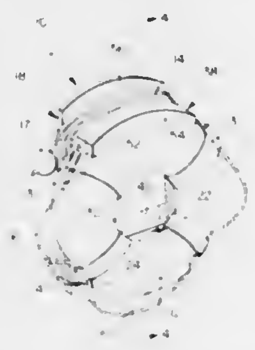
severing said panel substantially entirely about said bulge to produce a tab with a free edge brim portion adjacent the base of said sidewall portion, a narrow, integrally-formed hinge portion connecting said tab to the remainder of said panel, and an opening in said panel defined by a rim portion thereon;

displacing at least said brim portion of said tab to dispose said brim portion inwardly of said rim portion of said panel; and

reforming said tab to partially collapse said bulge and to thereby displace said brim portion laterally to a position underlapping said rim portion, said reforming step being effected with mating dies including a male member having a part thereon which is dimensioned and configured to conform closely to at least a part of said sidewall portion of said bulge, so that upon contact of said die and bulge parts the male member will constrain said tab against lateral shifting relative to said opening of said panel, said male member being configured to displace said brim portion to said underlapping position while maintaining the unshifted position of said tab, whereby a substantially uniform underlap is produced.

4,033,276
SUPPORT FOR LIFE RING AND ASSOCIATED RETRIEVAL LINE

Douglas Barr, Cambridge, Mass., assignor to Engineered Safety Products, Inc., West Warwick, R.I.
Filed Sept. 7, 1976, Ser. No. 720,932
Int. Cl.² B63C *9/22*
U.S. Cl. 114—190 13 Claims



1. A combination support for a relatively rigid life ring and its associated retrieval line comprising, a frame adapted for mounting in a generally vertical disposition and having upper and lower portions each having an outwardly extending member adapted for retaining contact with portions of said ring, each of said frame portions having means for engaging portions of said line when said line is coiled about said frame, said frame portions being vertically movable with respect to each other from an open extended storage position wherein said line is relatively taut to a closed use position wherein said portions are relatively proximal to each other and said line is loosely supported thereby.

4,033,277
UNDERHULL QUICK DISCONNECT MOORING SYSTEM

Manfred Schaper, Calgary, Canada, assignor to Canadian Marine Drilling Ltd., Canada
Filed June 11, 1976, Ser. No. 694,975
Claims priority, application Canada, June 11, 1975, 229113
Int. Cl.² B63B *21/00*
U.S. Cl. 114—230 18 Claims

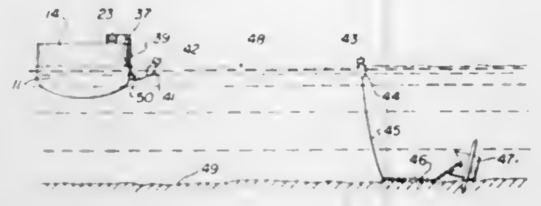
1. A mooring line system for a vessel including a hull, adapted to float on water at a waterline, said mooring line system being in the general form of a catenary comprising:

a. a winch;

b. a sheave associated with said winch;

c. a mooring line or cable secured to the winch, entraining the sheave and secured to a first spar buoy;

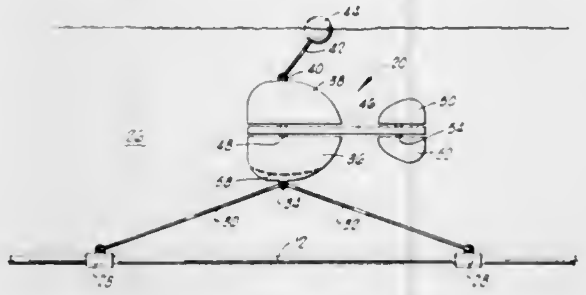
d. an anchor chain secured at one end to an anchor and at the other end to a second spar buoy; and



e. a remotely controlled quick disconnect two-part member, one part being secured to first spar buoy and the other part being secured to said second spar buoy, said two parts being adapted to connect the first spar buoy and the second spar buoy together, thereby to provide an anchored mooring line.

4,033,278
APPARATUS FOR CONTROLLING LATERAL POSITIONING OF A MARINE SEISMIC CABLE

Kenneth H. Waters, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.
Filed Feb. 25, 1976, Ser. No. 661,065
Int. Cl.² B63B *21/56, 17/00*
U.S. Cl. 114—245 5 Claims



3. In a paravane which includes controllable elements for maintaining lateral positioning of a marine seismic cable, said paravane having a frame portion resiliently supporting said cable in water with at least one hydrofoil extending from said frame means, an improved hydrofoil comprising:

frame means rigidly defining the peripheral shape of said hydrofoil means;

resilient skin material completely covering said frame means;

a plurality of rigid plates bonded to the inside of said resilient skin means on each side of the hydrofoil means which are independently movable relative to said frame means; and

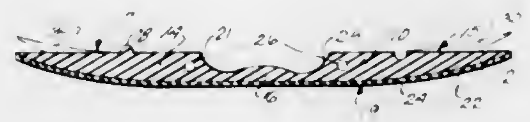
a screw jack assembly affixed between opposite side plates and being movably affixed relative to said frame means such that said screw jack assembly functions to vary the camber and direction of camber of said hydrofoil.

4,033,279
FAIRED CABLE FOR ANCHORING OFFSHORE STRUCTURES

Kenneth M. Stiles, San Dimas, Calif., assignor to Sea-Log Corporation, Pasadena, Calif.
Filed Feb. 27, 1976, Ser. No. 662,218
Int. Cl.² B63B *21/00*
U.S. Cl. 114—243 5 Claims

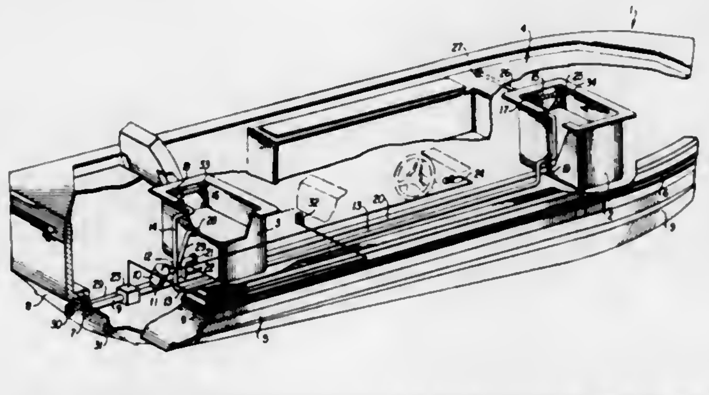
1. A fairing assembly for cables which comprises:

a. a pair of elongate elastomeric, wedge shaped body members each having an essentially planar inner surface, a tapered outer surface connected to one edge of each planar inner surface and extending outwardly therefrom to an elongate flexible web interconnecting said pair of body members at said tapered outer surfaces, and a contoured end wall connected to the edge opposed to said one edge of each planar inner surface and extending to a contoured inner surface provided by the flexible web, one of said body members having at least one shaped projection extending outward from the planar inner surface thereof, the projection progressively increasing in width from the point of connection to the planar surface to a point along the elevation of the projection from the planar surface, then progressively decreasing in width to the apex thereof, the other of said bodies having a receptacle adapted to receive said projection in interlocking relation, the contoured end walls cooperating with the contoured inner surface provided by the web to form an opening having the shape of the cable to be faired when the shaped projection of one of said body members is interlocked with the receptacle of the other body member and each one edge of each planar inner surface, at the edge of connection to the tapered outer surface, being upwardly turned to form a biased compressive seal when said body members are connected in interlocking relation.



4,033,280
LIVE WELL FOR HIGH SPEED OPEN FISHING BOAT

Forrest L. Wood, and Maurice (Mickey) Carroll Wood, both of Flippin, Ark., assignors to Wood Manufacturing Company, Incorporated, Flippin, Ark.
Filed May 28, 1976, Ser. No. 691,014
Int. Cl.² B63B *35/14*
U.S. Cl. 114—255 7 Claims



1. In a boat construction having a hull portion, a top liner portion joined to said hull portion, a live well assembly formed integral with said top liner portion and positioned so that its center of gravity is located on the longitudinal centerline of said top liner portion, the improvement comprising:

a. a common water inlet-outlet port substantially flush with and located in the rear of said hull portion;

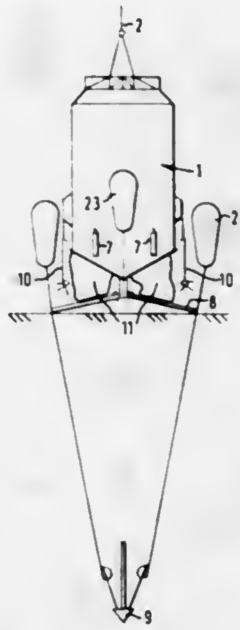
b. an aeration means connected in said live well assembly for spraying water therein;

c. a pipeline system connecting said inlet-outlet port with said aeration means; and

d. a remotely controlled cut-off control valve means connected in said pipeline system for opening and closing water flow through said inlet-outlet port.

4,033,281
EXTRA HEAVY DUTY HYDROSTATIC ANCHOR TOGETHER WITH ITS EXTRA HEAVY DUTY TETHER CABLE

Roy W. Lundh, Glendora, Calif., assignor to Poseidom Marketing and Development Co., Arcadia, Calif.
Filed Jan. 7, 1976, Ser. No. 646,996
Int. Cl.² B63B *21/28*
U.S. Cl. 114—295 9 Claims



1. A tethered vehicle for placing a hydrostatic anchor on the sea floor comprising:

a plurality of bins containing concrete;

a big gun placed between said bins for firing a projectile into said sea floor;

said projectile having a plurality of flukes attached thereto, said flukes having at their unattached ends tether cables, each of which is attached to a buoy;

a base plate attached to said vehicle at the lower end of said bins;

a triggering means attached to said vehicle, said triggering means being activated by impact of said vehicle with said sea floor, said triggering means upon activation firing said projectile into said sea floor, releasing said base plate such that it is located on the sea floor above said projectile, and dumping said concrete upon said base plate;

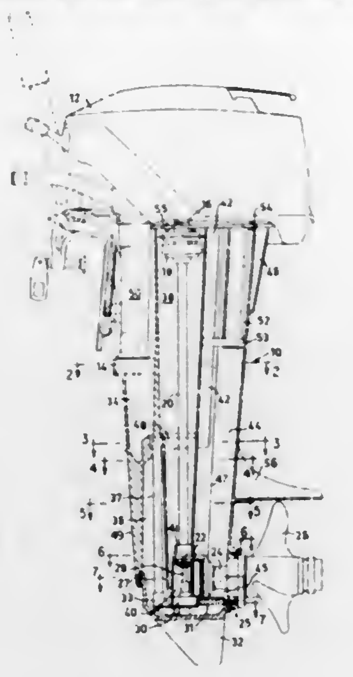
whereby said tethered cables are securely anchored to the sea floor and said base plate forms a hydrostatic anchor.

4,033,282
HOUSING FOR OUTBOARD MOTORS

Heinz Pichl, Bergfallsvagen 3, Uppsala 75256, Sweden
Filed Sept. 30, 1975, Ser. No. 618,118
Claims priority, application Sweden, Oct. 2, 1974, 7412395
Int. Cl.² B63H *21/26*
U.S. Cl. 115—17 12 Claims

1. In an outboard drive for a boat, an upright unitary die cast housing leg member having an upper end, a lower end, a leading edge and a trailing edge, said member comprising intregral interior walls including walls defining an upright drive shaft cavity and a separate upright exhaust gas cavity, each said cavity opening through said upper end, said drive shaft cavity being terminated downwardly by a lower end wall portion, said lower end wall portion being apertured alignedly with said upright cavity to provide a drive shaft opening therethrough, said drive shaft cavity tapering downwardly toward said lower end wall portion, and further walls defining a gear cavity disposed below said end wall portion and aligned with said aperture, and further walls defining a generally horizontal propeller shaft cavity opening forwardly into said gear cavity and opening rearwardly through said trailing edge, said exhaust gas cavity opening downwardly into said propeller shaft

cavity, said member having a downward lower end opening providing upward access into said gear cavity, and a closure member detachably attached to said lower end of said housing member in covering relation to said lower end opening.



4,033,283

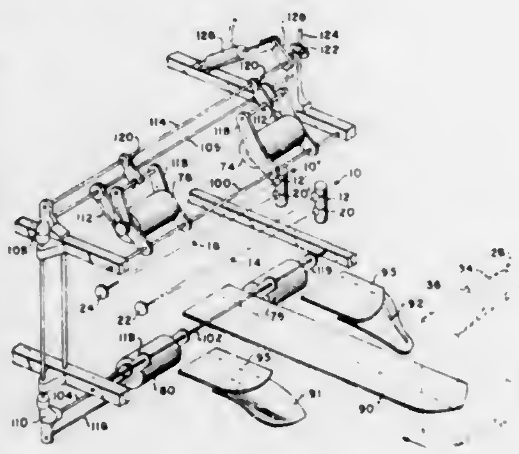
APPARATUS FOR INTERACTING WITH ARTICLES PASSING THERETHROUGH

Thomas P. Rusk, Macon, Ga., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed July 7, 1975, Ser. No. 593,255

Int. Cl.² B05C *1/02*

U.S. Cl. 118—1 **4 Claims**



1. An apparatus for interacting with a predetermined portion of members passing therethrough comprising:

a. first and second detecting means separated a predetermined distance along a given pathway to detect the leading and trailing edges of members moving along said pathway, each of said detecting means having detecting and non-detecting states;

b. control means having first and second circuits, said control means generating an activating signal upon completion of either of said circuits;

c. a first pair of ganged contacts comprised of a first contact in said first circuit and a second contact in said second circuit, said first pair of ganged contacts being operably connected to said first detecting means to open one of said contacts and close the other of said contacts in response to a change in the state of said first detecting means;

d. a second pair of ganged contacts comprised of a first contact in said first circuit and a second contact in said second circuit, said second pair of ganged contacts being operably connected to said second detecting means to open one of said contacts and close the other of said contacts in response to a change in the state of said second detecting means;

e. said first and second pairs of ganged contacts being arranged to complete a circuit only when said detecting means are in dissimilar states; and

f. means for interacting with a predetermined portion of said members in response to said activating signal.

4,033,284

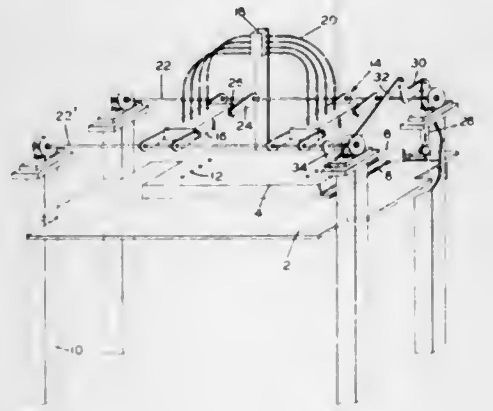
APPARATUS FOR APPLYING ADHESIVE TO A FURNITURE COMPONENT

William G. Gross, York, Pa., assignor to Armstrong Cork Company, Lancaster, Pa.

Filed June 2, 1976, Ser. No. 692,107

Int. Cl.² B05C *11/00*

U.S. Cl. 118—3 **1 Claim**



1. An apparatus for applying adhesive to a furniture component containing a number of apertures designed to receive an application of adhesive and then subsequently assembled to other furniture components, comprising:

a. a surface upon which said furniture component is positioned, a plurality of guide structures to fixedly position said furniture component in a specific position upon said surface,

b. an adhesive-applying structure composed of a mounting structure and several adhesive-applying nozzles, said mounting structure being a mounting block within which the adhesive-applying nozzles are positioned, said mounting block being positioned above the furniture component and said adhesive-applying nozzles being positioned above the apertures to receive adhesive,

c. means mounting said mounting block for movement towards and away from said furniture component, said mounting means moving said mounting block and nozzles into position with said nozzles within said apertures to receive adhesive,

d. means dispensing adhesive from said nozzles into said apertures, said moving means then moving said mounting block and nozzles away from said furniture component after adhesive has been applied to said apertures, and

e. said moving means consisting of

1. two parallel rods,
2. a plurality of levers, said levers being fixedly positioned at their one ends to the rods and on their opposite ends being fastened pivotedly to the mounting block,
3. said parallel rods being mounted for oscillating movement and being positioned one on either side of the mounting block, one said parallel rod moving in a clockwise direction while said other parallel rod moves in a counterclockwise direction, and
4. the oscillating movement of the parallel rods causes the levers fixedly positioned thereon to have an oscillating movement also, said levers being affixed to the mounting block, thereby causing the mounting block to have an oscillating movement up and down relative to the surface upon which the furniture component is positioned.

4,033,285

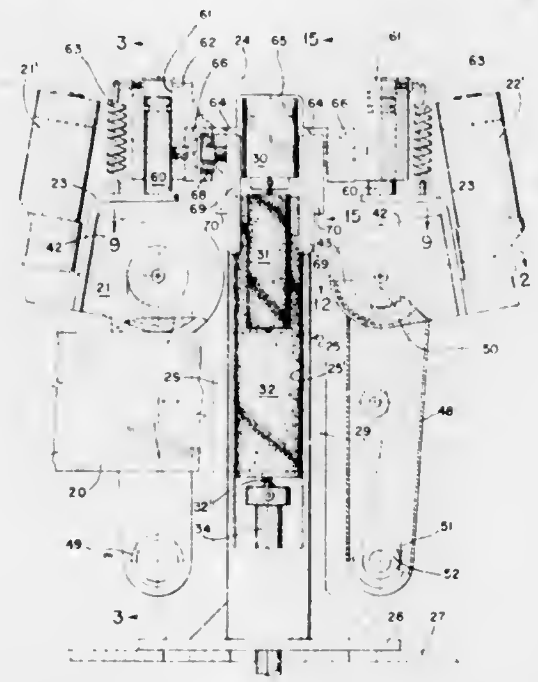
AUTOMATIC OVERHEAD RAIL CLEANER AND OILER

Thomas E. Dugle, and Thomas L. Webb, both of Cincinnati, Ohio, assignors to Klenco Corporation, Massillon, Ohio

Filed Aug. 10, 1976, Ser. No. 713,137

Int. Cl.² B05C *5/00;* E01H *8/00*

U.S. Cl. 118—4 **19 Claims**



1. An automatic cleaner for riding on and cleaning an overhead conveyor rail, comprising a crosshead, a pair of brackets rotatably supported on said crosshead, a supporting wheel journaled in said brackets for rolling on top of the conveyor rail, a drive motor on each bracket for driving each wheel, an upright tubular post laterally movably mounted at its upper end in said crosshead, a housing secured to the lower end of said post, vertically disposed axially rotatable brushes for contacting opposite sides of said rail, one of said brushes positioned in said post, fluid motor means below and secured to said housing for raising and lowering said one brush, means for continuously rotating said one brush, and means operatively connecting said brushes for simultaneous rotation and vertical movement.

4,033,286

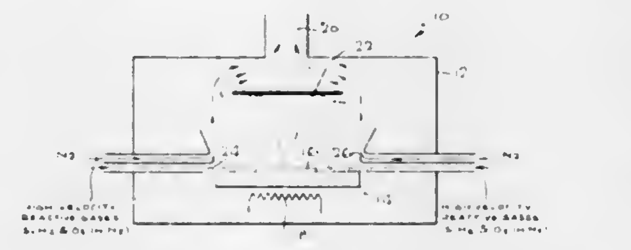
CHEMICAL VAPOR DEPOSITION REACTOR

Shy-Shiun Chern, Los Angeles, and Joseph Maserjian, La Crescenta, both of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed July 12, 1976, Ser. No. 704,468

Int. Cl.² C23C *11/08;* B05D *5/12*

U.S. Cl. 118—49 **6 Claims**



1. A chemical vapor deposition reactor comprising:
a housing;
a horizontaly oriented heating platform positioned within said housing, said platform having an upper surface on which substrates are positioned;
an exhaust from said housing, said exhaust including an outlet chimney position over said heating platform for receiving and removing effluent gases from adjacent said heating platform;
a baffle positioned over said heating platform and beneath said outlet chimney, said baffle being a planar member positioned in parallel alignment with the upper surface of said heating platform;
reactive gas inlet means positioned adjacent said heating platform along the edge of said heating platform for directing reactive gases over the top of said heating platform and across a substrate positioned thereon to have reactive gases flow toward the center of said heating platform from said edge thereof; and
curtain gas inlet means situated adjacent and over said reactive gas inlet means for providing a curtain of nonreactive gas to prevent backflow of said effluent gases.

4,033,287

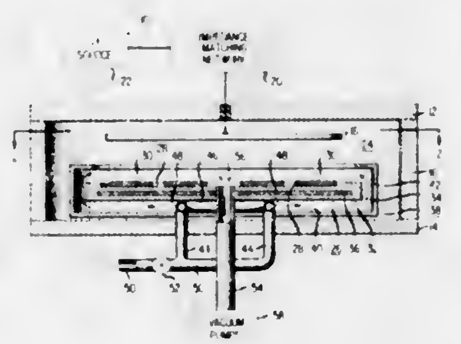
RADIAL FLOW REACTOR INCLUDING GLOW DISCHARGE LIMITING SHIELD

Frank Bernard Alexander, Jr., Paterson; Cesar Deduyo Capio, Fords, both of N.J.; Victor Emerald Hauser, Jr., Palmerton, Pa.; Hyman Joseph Levinstein, Berkeley Heights, N.J.; Cyril Joseph Mogab; Ashok Kumar Sinha, both of Murray Hill, N.J., and Richard Siegfried Wagner, Bernardsville, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 22, 1976, Ser. No. 651,555

Int. Cl.² C23C *13/08*

U.S. Cl. 118—49.1 R **5 Claims**



1. Coating apparatus comprising:
an evacuable chamber;
a member located in said chamber having a support region adapted to support at least one object and a central region which defines an aperture therethrough;
means for facilitating a radio frequency discharge within the chamber adjacent the object to form a flow discharge plasma from reactant gases introduced into the chamber;
exhaust means in communication with the centrally disposed aperture in the member; and
coating gas-vapor feed means located adjacent the support region of the member such that gas-vapor feed is induced to flow across the support region of the member in a radial flow and out through the exhaust means, the coating gas-vapor feed means being adapted to substantially inhibit any glow plasma discharge reaction from occurring until reactant gases introduced into he apparatus through the coating gas-vapor means reach the support region of the member.

4,033,288
APPARATUS FOR COATING MAGNETIC DISKS

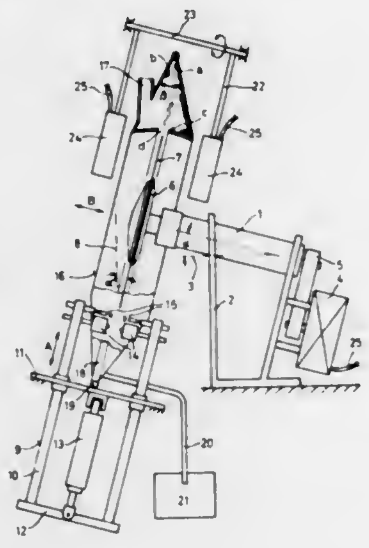
Josef Woellhaf, Ludwigshafen; Werner Balz, Willstaett; Roland Falk, Achern; Dieter Scheffel, Neuhofen; Volker Richter, Heidelberg, and Paul Willmann, Renchen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Division of Ser. No. 550,363, Feb. 18, 1975, abandoned, which is a continuation of Ser. No. 306,672, Nov. 15, 1972, abandoned. This application July 26, 1976, Ser. No. 708,602

Claims priority, application Germany, Nov. 20, 1971, 2157650; Jan. 3, 1972, 2200023

Int. Cl.² B05C *11/08*

U.S. Cl. 118—52 **7 Claims**



1. An apparatus for coating both sides of a disk with magnetic material comprising:

a rotatable support means whereon said disk is supported in an inclined generally vertical position;

an annular housing which is radially of a generally triangular cross-section and having an inner diameter which is larger than said disk;

means to traverse a pair of opposed coating material projecting nozzles from an inner part of said disk outwardly past the extent of the disk at a lower section thereof whereby to apply coating material to each side of the disk;

means to rotate said support at speeds whereby said coating material is subjected to centrifugal forces to distribute the applied material uniformly over said sides and excess applied material is spun off;

the inner wall of said housing being disposed generally transversely to the plane of said disk, having a generally centrally disposed annular slot aligned with and effectively wider than said disk, whereby to receive said spun off material, and being configurated so as to direct and retain said coating material from returning through said slot;

the plane through the apex of the remaining walls of said housing being offset from the plane of said disk whereby said spun off material received through said slot strikes an inclined internal wall surface of said housing; and

said apparatus including means to dry the coated substrate.

4,033,289
FLUID FLOW DISTRIBUTION DEVICE AND STRIP OILER SYSTEM UTILIZING THE SAME

Herbert E. Taylor, Longmeadow, Mass., and Frederick P. Evans, Bloomfield, Conn., assignors to P/A Industries, Inc., Bloomfield, Conn.

Filed Sept. 29, 1975, Ser. No. 617,634

Int. Cl.² B05C *1/08;* F16N *25/04*

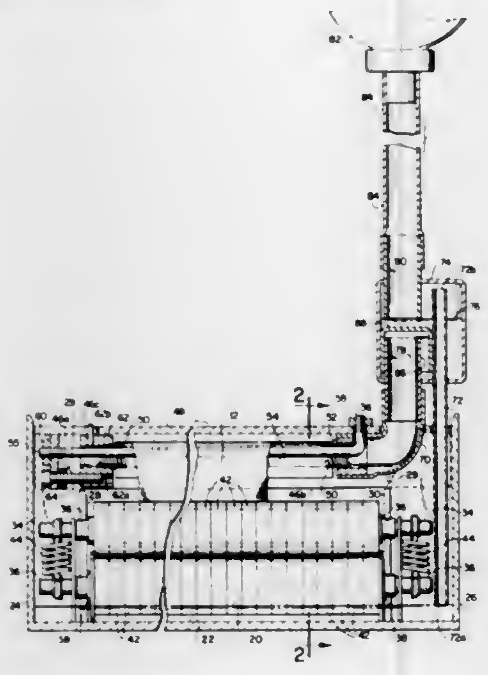
U.S. Cl. 118—227 **12 Claims**

1. A system for distributing oil to at least the upper surface of a continuously moving strip of material said system comprising:

an oil applicator associated with the upper surface of the strip to be oiled,

said applicator including a device for distributing oil transversely of the strip, said device having a tension spring with its longitudinal axis oriented transversely of the strip

oil supply means for said oil distributing device, and including means for feeding oil to said device at a rate which is always in excess of the oil to be applied to the upper surface of the strip,



oil bypass means comprising the interior of said tension spring one end of said spring receiving oil from said supply means,

a sump for the excess oil, and said spring having an end opposite said one end for depositing the excess oil reaching said opposite end into said sump,

means for exerting a desired tension on said spring to spread its convolutions and drip oil downwardly in a uniform manner transversely of the strip at a rate which is adjustable, and

means responsive to the level of the oil in said sump for controlling the rate of flow from said oil supply means.

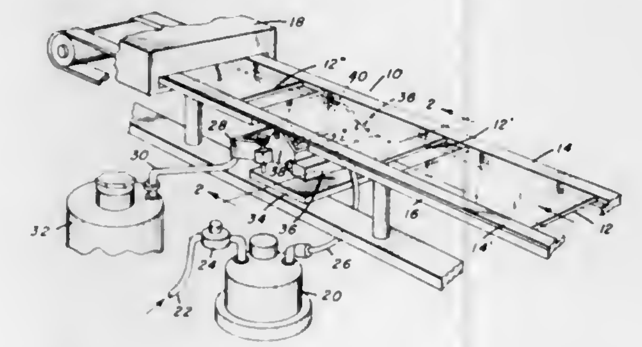
4,033,290
APPARATUS FOR COATING SHEET MATERIAL

Henry Albert Dude, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,556

Int. Cl.² B05C *11/00*

U.S. Cl. 118—266 **17 Claims**



1. A coating apparatus for coating sheet material with a liquid coating composition, said apparatus comprising

1. a reservoir for holding said liquid coating composition;

2. an absorption wick in communication with said reservoir to receive coating composition therefrom, said absorption wick having an arcuate surface;

3. a transfer wick in conforming contact with the arcuate surface of said absorption wick to receive coating composition therefrom, one end of said transfer wick being free to move toward and away from said arcuate surface; and

4. means for advancing the sheet material to be coated across and in contact with the end of said transfer wick which is free to move to apply a uniform layer of said coating composition to the surface of said sheet material.

4,033,291
APPARATUS FOR LIQUID-PHASE EPITAXIAL GROWTH

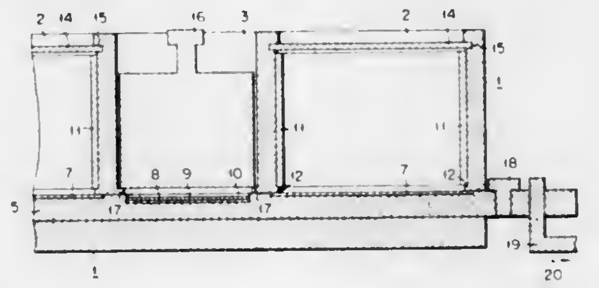
Makoto Naito, Kamakura; Masaru Kawachi, Tokyo; Tetuo Sekiwa, Kawasaki; Minoru Akatsuka, Yokohama; Akinobu Kasami, Yokohama, and Masaharu Toyama, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 361,543, May 18, 1973, abandoned. This application July 10, 1975, Ser. No. 594,950

Claims priority, application Japan, Mar. 9, 1973, 48-27127

Int. Cl.² B05C *3/09*

U.S. Cl. 118—412 **8 Claims**



1. An apparatus for liquid phase epitaxial growth comprising a boat made of synthetic graphite, a first well formed in the upper surface of the boat to receive an epitaxial solution, a second well formed in the upper surface of the boat to receive a substrate and disposed adjacent to said first well, a lower passage extending longitudinally through the boat from one end to the other end and extending across the bottoms of said two wells, a slide made of synthetic graphite moveable through the lower passage so that the top surface of the slide forms the bottom surface of said two wells, the top surface of the slide having a recess in which the substrate is placed, a fused quartz cylinder the outer periphery of which is contacted with the inner surface of said first well, said first well including an annular stop projected on the lower end of the inner periphery to prevent the fused quartz cylinder from falling from said first well, and a fused quartz layer attached to at least that part of the top surface of the slide which forms said bottom surface of said first well when said recess is beneath said second well.

4,033,292
APPARATUS FOR DEVELOPING LATENT ELECTROSTATIC IMAGES

Gordon U. Klingenberg, Bloomington, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 21, 1974, Ser. No. 525,698

Int. Cl.² G03G *15/08*

U.S. Cl. 118—629 **4 Claims**

1. Apparatus for developing a latent electrostatic image formed on the surface of an insulating member, said insulating member overlying a conductive substrate comprising:

a chamber having a pair of opposed sidewalls,

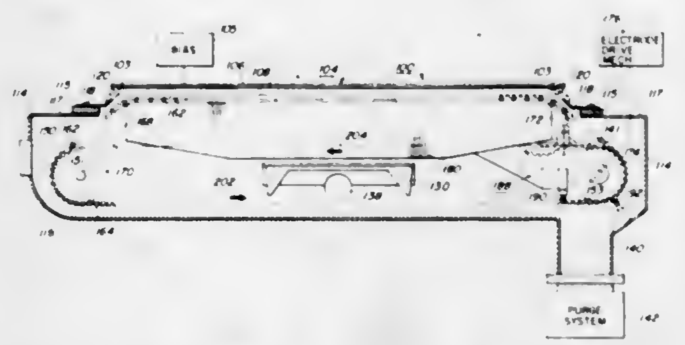
means for supporting said insulating member, said surface facing said chamber,

means for supporting a cloud of charged developer particles to said chamber through a port in one of said opposed sidewalls,

means for supplying gas to said chamber through a port in the other of said opposed sidewalls,

means overlying said ports through which said developer particles and said gas are introduced into said chamber whereby said gas and developer particles are mixed and are directed thereafter to said insulating surface for a predetermined time period to develop said latent electrostatic image,

a development electrode positioned between said insulating surface and said overlying means, said development electrode adapted for movement past said insulating surface during said development period, said development electrode comprising a plurality of substantially parallel conducting elements which extend across the area of the insulating surface upon which the latent electrostatic image is formed, said conducting elements being coupled at each end to a continuous loop member,



drive means for moving said development electrode past said insulating surface, said drive means being coupled to said continuous loop members whereby said development electrode is caused to move past said insulating surface in a direction substantially perpendicular to said parallel conducting elements, and

means for biasing said conductive substrate and said development electrode to a first polarity whereby said latent electrostatic image is developed.

4,033,293
DEVELOPING DEVICE OF AN ELECTROPHOTOGRAPHIC COPYING MACHINE

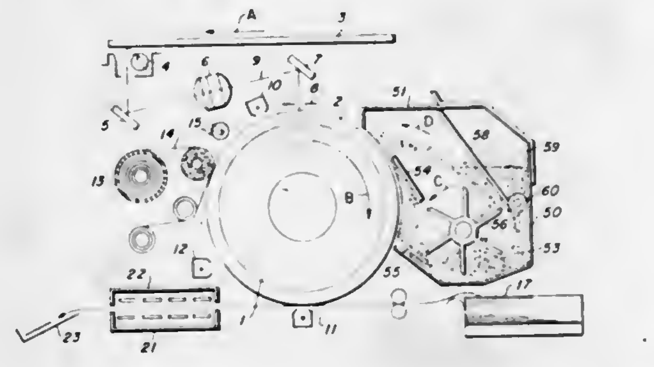
Hitoshi Ohmori, Mino, and Kiyoshi Horie, Atsugi, both of Japan, assignors to Rank Xerox Ltd., London, England

Filed Sept. 13, 1976, Ser. No. 722,946

Claims priority, application Japan, Nov. 20, 1975, 50-138757

Int. Cl.² B05B *5/02*

U.S. Cl. 118—653 **3 Claims**



1. An improved developing device for developing an electrostatic latent image on a photoconductive surface of a copying machine, the device having means for holding a mixture of carrier particles and toner particles, and means for transporting at least a portion of the mixture onto the photoconductive surface, wherein the improvement comprises:

a coating on the surface of the transporting means, the coating having no affinity with the toner particles.

4,033,294

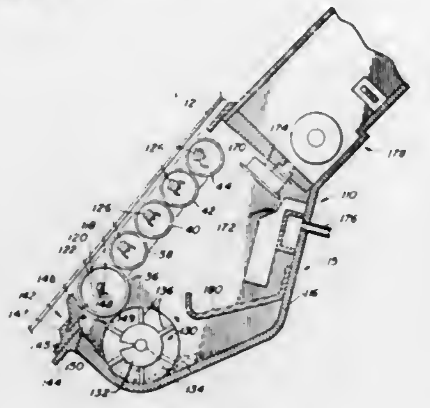
DEVELOPER MIXING AND TRANSPORTING AUGER FOR MAGNETIC BRUSH DEVELOPING APPARATUS

Terrence D. Charland, Pittsford, and Stanley D. Klett, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 255,721, May 22, 1972, abandoned. This application Feb. 4, 1974, Ser. No. 439,197

Int. Cl.^{2} B01F *7/02;* **G03G** *13/00*

U.S. Cl. 118—658 **2 Claims**



1. In a magnetic brush developing apparatus for applying developing material to a photoconductive surface to develop electrostatic latent images thereon in an electrostatic printing machine including at least one rotatable magnetic brush roller, and a housing defining a sump zone, said housing incorporating baffle means for cross mixing developing material as said developing material enters the sump zone, a device in said housing for locally intermixing and transporting developing material in the sump zone to said magnetic brush roller comprising:

a rotatable drive shaft, said drive shaft being substantially parallel with said magnetic brush roller;

means downstream of said baffle means for locally intermixing said developing material without substantial axial displacement of said developing material, said intermixing means including a plurality of auger elements on said shaft to promote mixing of said developing material in said sump zone, said auger elements being spaced apart to form a segmented auger, the periphery of said auger elements being circular, and

a plurality of flat bars on the periphery of said auger elements at spaced intervals therearound, said bars extending radially outwardly from said shaft, said bars transporting intermixed developing material from said auger elements to said magnetic brush roller on rotation of said shaft.

4,033,295

ARRANGEMENT FOR REDUCING VACUUM IN MILKING MACHINES

Leif Ake Soderlund, Ronninge, Sweden, assignor to Alfa-Laval AB, Tumba, Sweden

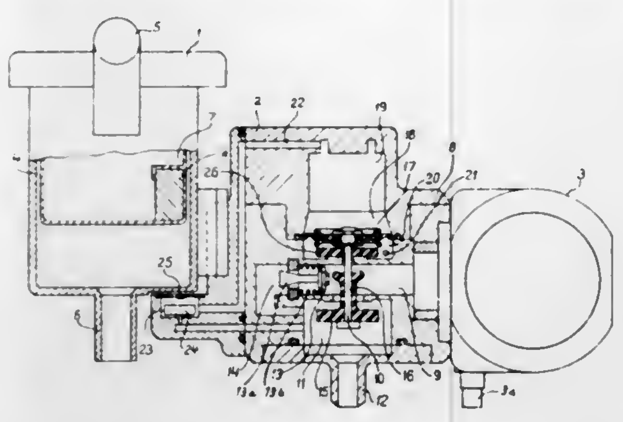
Filed June 12, 1975, Ser. No. 586,277

Claims priority, application Sweden, June 14, 1974, 7407854

Int. Cl.^{2} A01J *5/04*

U.S. Cl. 119—14.44 **6 Claims**

1. In combination with a conduit of a milking machine, a vacuum source and means forming a flow connection between said source and conduit, apparatus for effecting a reduced working vacuum in the conduit, said apparatus comprising a valve body disposed in said flow connection and movable to and from a position in which the reduced working vacuum is obtained, means forming a chamber, an element in said chamber dividing said chamber into two sub-chambers, said element being connected to said valve body for moving said body to and from said position, means forming a passage for connecting one sub-chamber to the vacuum source independently of the positioning of said valve body, said element being movable in response to a pressure change in said one subchamber, and a device operable to open and close said passage to effect movement of the valve body by said element, said passage communicating with the vacuum source by way of said flow connection, said device including means operable to allow entrance of air at atmospheric pressure to said one sub-chamber when said passage is closed and to prevent said air entrance when said passage is open.



4,033,296

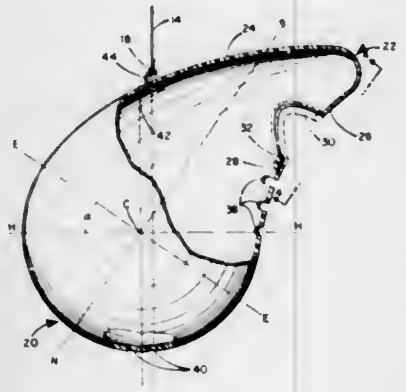
AERODYNAMIC HANGING BIRDHOUSE

Patrick J. Cudmore, 28 Linden Lane, Duxbury, Mass. 02332

Filed Oct. 28, 1975, Ser. No. 626,281

Int. Cl.^{2} A01K *31/00*

U.S. Cl. 119—23 **15 Claims**



1. A birdhouse adapted to be hung from an overhead support comprising:

a. a hollow structure having an asymmetrical teardrop shape including a substantially hemispherical leading portin, and a downwardly drooping, substantially pointed trailing portion having a convex upper side and a substantially concave lower side, when viewed in cross-section;

b. an entry hole formed in said trailing portion lower side;

c. at least one ventilation aperture formed in said trailing portion lower side and located between said entry hole and said leading portion; and

d. means for hanging said birdhouse from an overhead support, said hanging means including a flexible line attachment point located on said trailing portion upper side;

e. the aerodynamic teardrop shape of said hanging hollow structure causing said entry hole to rotate horizontally to the downwind direction in the presence of wind.

4,033,297

PROTECTION OF SUPERHEATER TUBES AGAINST CORROSION

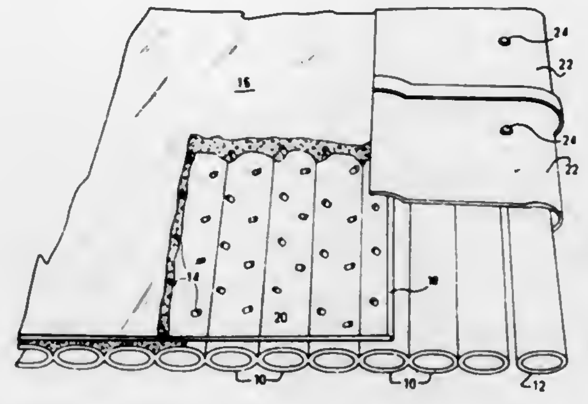
Andre Moreau, Paris, France, assignor to Electricite de France (Service National), Paris, France

Filed Mar. 12, 1976, Ser. No. 666,491

Claims priority, application France, Mar. 28, 1975, 75.09896

Int. Cl.^{2} F22G *3/00*

U.S. Cl. 122—476 **13 Claims**



1. A method of providing a boiler superheater with tubes protected against corrosion comprising the steps of assembling tubes side to side so as to make a panel, coating at least a part of the surface of the panel with a continuous sheet of a refractory lining material which has a satisfactory thermal conductivity and is chemically inert with respect to the products of combustion in the boiler, the lining material including a binder which provides the material with resistance to collapse in the cold state, and then setting the coated panel of tubes inside the superheater at its required position.

5. A panel of tubes for a boiler, the panel comprising a rigidly interconnected set of metal tubes with a continuous sheet of a refractory lining material which has a satisfactory thermal conductivity and is chemically inert with respect to combustion products covering at least a portion of the surface of the set of tubes, the lining material including a binder which provides the sheet with resistance to collapse in the cold state.

4,033,298

BOTTOM SUPPORTED, HOPPER BOTTOM FURNACE FOR PULVERIZED COAL FIRING

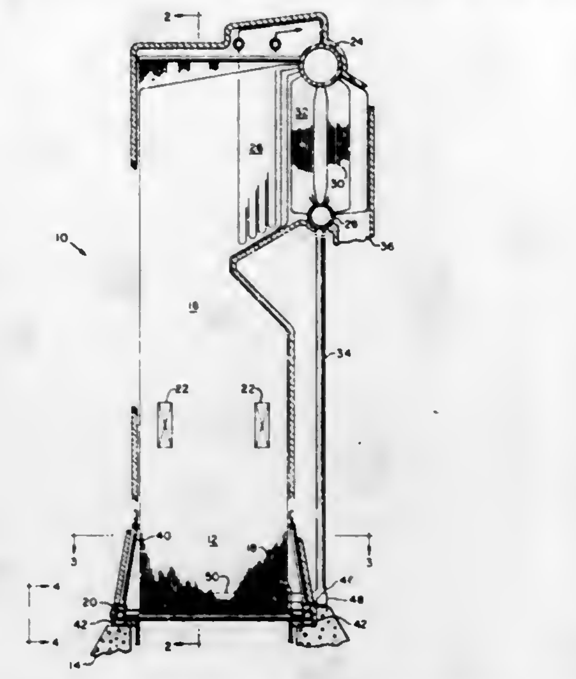
Robert Patton Sullivan, Chattanooga, Tenn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Filed June 23, 1976, Ser. No. 699,107

Int. Cl.^{2} F22B *37/24*

U.S. Cl. 122—510 **3 Claims**

1. A bottom supported steam generator including a furnace means for supplying coal and air to the furnace, water cooled tubes lining all four walls of the furnace, said tubes being welded together so as to form a gas tight structure, a hopper bottom for the furnace, inlet header means below and encircling the hopper bottom, the tubes lining all four walls of the hopper bottom and the rest of the furnace being connected to and supplied with water from the inlet header means, a plurality of structural metal struts extending between the inlet header means and each of the four furnace walls at a level above the hopper bottom, each of the tubes lining the hopper bottom walls containing a bend therein adjacent the struts so as to be flexible enough to prevent excessive thermal and excessive mechanical stresses therein, and each of the tubes lining all four walls of the furnace above the level of the strut connections extending in a straight vertical line.



4,033,299

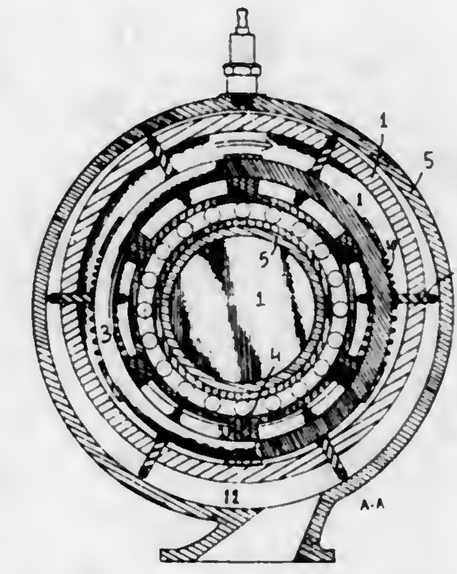
ROTARY ENGINE

Sergio C. Manzoni, 25 Reno Avenue, Hamilton, Ontario, Canada (L8T 2S5)

Filed Jan. 22, 1975, Ser. No. 542,918

Int. Cl.^{2} F02B *53/08*

U.S. Cl. 123—8.43 **2 Claims**



1. A rotary internal combustion engine comprising in combination:

a stationary housing comprising an inner and outer concentric cylinder, assembled in between walls or end plates forming an annular chamber, an annular rotor eccentrically located into said annular chamber forming the inner and outer working chambers, a shaft secured to the rotor on one side and extending through the housing and being fastened in an end plate, a flange embodied to the rotor on the side opposite the shaft, said rotor including radially disposed and movable vanes for continuous engagement with the interior of the casing during rotation of the rotor, said rotor being concentrically mounted on said shaft and eccentrically oriented in relation to the casing for providing expanding and contracting chambers between adjacent vanes during the rotation of the rotor, means interlocking the vanes for restraining them radially inwardly and outwardly against the interior of the casing, said casing including means admitting a compressible and combustible mixture into the inner chambers, passage means for transferring the mixture from the inner chambers to the outer working chambers for compression and ignition by rotation of the rotor therein, passage means communicating the outer working chambers with the exterior of the casing after combustion, said means interlocking the vanes including an annular ring journalled through the vanes, said annular ring being concentric with the center of the casing, rotatable means journalled on the inner cylinder of the casing including a bearing with connecting joints securing said annular ring, thereby maintaining the vanes under control at all times.

4,033,300

ROTARY INTERNAL COMBUSTION ENGINE

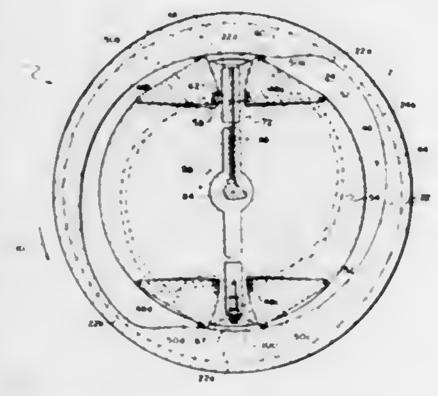
Dallas J. Larson, 2001 S. 2300 East, Salt Lake City, Utah 84108

Continuation-in-part of Ser. No. 633,346, Nov. 19, 1975, Pat. No. 3,986,483. This application Aug. 12, 1976, Ser. No. 713,942

The portion of the term of this patent subsequent to Sept. 7, 1993, has been disclaimed.

Int. Cl.² F02B *55/14*

U.S. Cl. 123—8.45 **16 Claims**



1. A rotary engine comprising

a generally annular stator member having a first and second pair of spaced apart sockets located in the periphery thereof and having a shaft extending from one side thereof;

a first and second pair of wedges each pivotally mounted at one of their vertices on the periphery of the stator member to pivot in and out of respective ones of said sockets as said rotor member rotates about the stator member, said wedges being mounted relative to said stator member such that a base of each wedge pivots along an arc generally towards the center of the stator member, and such that each of said bases of the wedges in each pair face each other so that a space is formed by said bases of each pair of wedges,

a rotor member having side walls and an interior peripheral wall and mounted to rotate about said stator member, said rotor member formed to define a combustion cavity and a compression cavity between the portions of the periphery of the stator member between the bases of the wedges and the interior peripheral wall of the rotor member, said combustion cavity and compression cavity being disposed substantially 180° apart about the periphery of the stator member, said peripheral wall having two innermost portions thereof substantially parallel to the outer periphery of the stator member, said portion extending at least the distance between the bases of the wedges of each pair thereof, and said portions being disposed substantially 180° apart, said portions of the peripheral wall being joined tangentially by two curved portions thereof which each first curve convexly and outwardly away from the stator member and then curves concavely and inwardly toward the stator member,

a cam track defined in at least one side wall of said rotor member,

cam followers extending from at least one side of each wedge and guided by said cam track to cause said wedges to pivot in and out of said sockets and to maintain sliding contact with the interior peripheral wall of said rotor member,

means for introducing a fuel mixture into the spaces between each pair of wedges.

means for igniting the fuel mixture between each pair of wedges,

means for timing the ignition of the fuel mixture to selectively coincide with or slightly precede the time the said portions of the rotor peripheral wall are each disposed substantially entirely across the spaces defined between each pair of wedges,

means for exhausting the combustion products from the spaces between each pair of wedges.

4,033,301

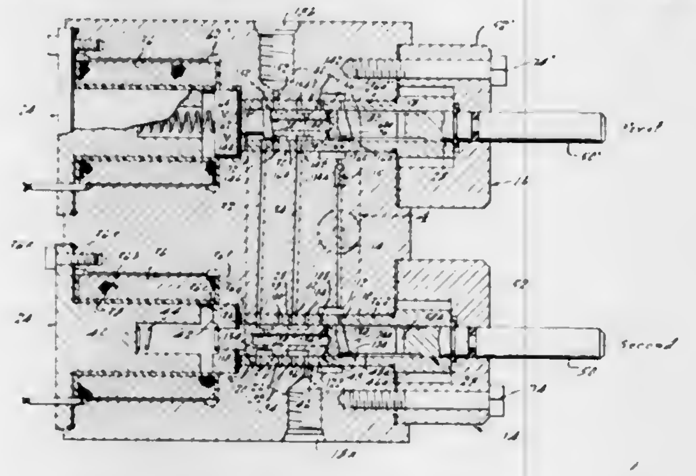
FLUID DISTRIBUTOR LOGIC

Erlen B. Walton, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed July 10, 1975, Ser. No. 594,832

Int. Cl.² F16K *13/04*

U.S. Cl. 123—32 G **22 Claims**



13. A dual metering valve for a pilot fuel injection system of the type including a source of pressurized fuel, a nozzle for delivering the fuel to a piston cylinder of an internal combustion engine, and means for actuating said dual valve in a timed relation to the engine, said dual valve comprising:

housing means having a fuel inlet connected to said source and a fuel outlet connected to said nozzle;

pilot and main valve assemblies disposed in said housing and each including

a valving member movable between first and second positions in response to signals from said actuating means, and

metering means including a metering passage defined by the valving member and movable therewith for metering fluid from said inlet to said outlet when the valving member is moving between said first and second positions, said metering passages blocked from communication with said outlet when the valving member is in said first and second positions; and

logic means for controlling fluid communication between said inlet and the metering passages defined by the pilot and main valving members of said pilot and main valve assemblies, respectively, said logic means including

a first logic passage defined by said pilot valving member and movable therewith, said pilot valving member operative to block communication between said inlet and said metering passage defined by said main valving member when in said first position and communicate said inlet and metering passage via said logic passage when in said second position, and

a second logic passage defined by said main valving member and movable therewith, said main valving member operative to communicate said inlet and said metering passage defined by said first valving member via said second logic passage when in said first position and block communication when in said second position.

4,033,302

FOUR-STROKE, MULTICYLINDER, SPARK IGNITION, FUEL INJECTION INTERNAL COMBUSTION ENGINE

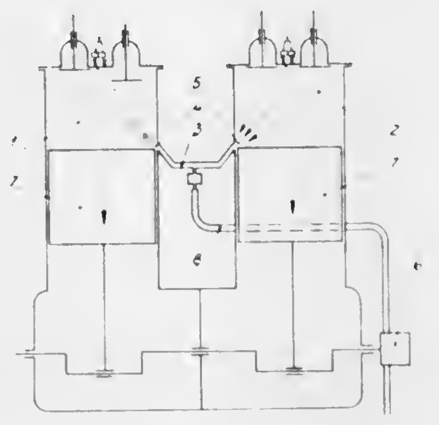
Stanislaw Jarnuszkiewicz, Krakow, Poland, assignor to Politechnika Krakowska, Krakow, Poland

Filed June 17, 1975, Ser. No. 587,621

Claims priority, application Poland, June 18, 1974, 172037

Int. Cl.² F02B *75/20*

U.S. Cl. 123—59 BM **8 Claims**



1. In a four-stroke multicylinder internal combustion engine having first and second cylinders defining working space, inlet and outlet valves in said cylinders at the upper ends thereof and respective pistons moving in unison in the cylinders and wherein combustion takes place in alternation in the cylinders at intervals of 360° of crankshaft revolution, the improvement comprising valveless duct means interconnecting the working spaces of the cylinders for flow of exhaust gases between the cylinders, and means for supplying fuel to said duct means such that the fuel is transported with the flow of exhaust gases from one cylinder to the other.

4,033,303

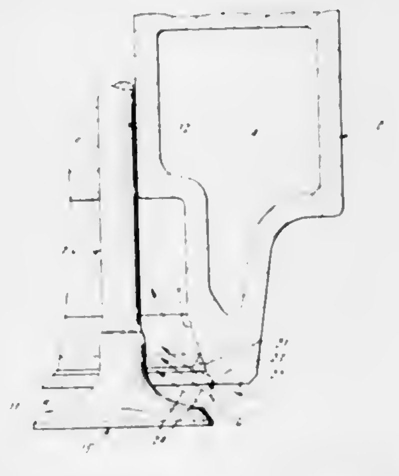
ENGINE EXHAUST VALVE COOLING

Hai Wu, Northville, and Charles M. Jones, Detroit, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Feb. 25, 1976, Ser. No. 661,216

Int. Cl.² F01P *3/12*

U.S. Cl. 123—41.85 **6 Claims**



1. A cylinder head having an exhaust valve port comprising a throat defined by a wall of substantially circular cross section,

and a bevelled valve seat circumscribing the wall having an axially extending annular surface thereof adapted to be engaged by a valve head to close the port,

the bevelled valve seat extending outwardly from the axis of the throat at an angle to the wall,

wherein the improvement comprises:

an annular diverter means concentric with the axis of the wall,

the diverter means being constructed and arranged to cause separation from the valve seat surface of high temperature exhaust gas flowing into the exhaust port between the valve head and the valve seat when the port is open,

whereby when the gas flow is forced to separate from the seat the resulting film coefficient is lowered and the valve seat operates at a lower temperature to provide a cooling effect on the valve seat engaging portion of the valve head when the latter makes contact with the valve seat.

4,033,304

PISTON-TYPE INTERNAL COMBUSTION ENGINE

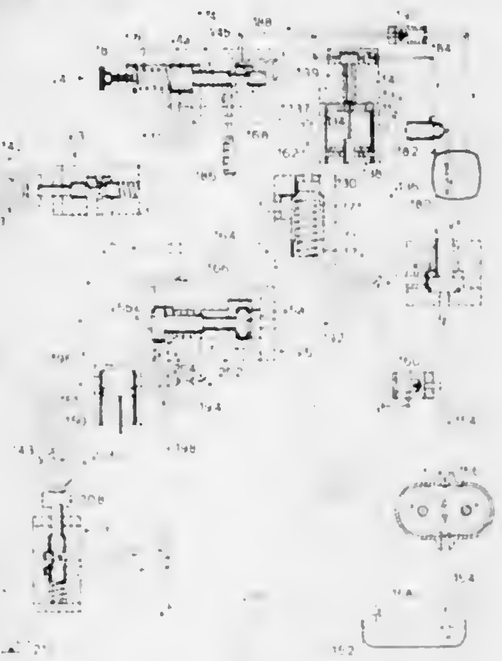
David Luria, 11 Pelechovsky St., Tel-Aviv, Israel

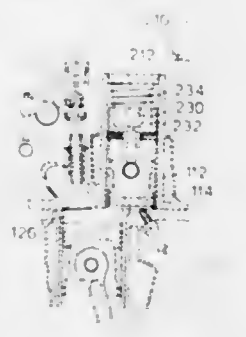
Filed June 10, 1975, Ser. No. 585,652

Claims priority, application Israel, June 14, 1974, 45039; Apr. 8, 1975, 47050; Apr. 8, 1975, 47051

Int. Cl.² F02B *75/04*; **F01L** *1/34*

U.S. Cl. 123—78 A **20 Claims**





1. An internal combustion engine operable through induction, compression, expansion and exhaust strokes, comprising: a main cylinder and a main piston movable therein; an auxillary cylinder and an auxillary piston movable therein; the inner ends of the two cylinder being in communication with each other and defining a common chamber with their respective pistons; means including a fuel intake valve for effecting the induction of gases into said common chamber; a control member movable to control the engine output; a variable valve timing device controlling the timing of the intake valve; a coupling between said movable control member and the variable valve timing device effecting a delay in the closing of the intake valve in response to the movement of the control

member, which delay is increased when the control member is moved to lower the engine output and decreased when the control member is moved to raise the engine output; said auxillary piston being floatingly displaceable in its auxillary cylinder to increase or decrease the volume of the common chamber; a spring urging the auxillary piston to its innermost position within the auxillary cylinder; and limiting means controlled by said control member and acting on said auxillary piston independently of said spring for limiting the outermost position of the auxillary piston within its auxillary cylinder to increase or decrease the volume of said common chamber in accordance with the engine output so as to provide a substantially constant compression ratio and substantially complete exhaust during all loads.

4,033,305

ELECTRONIC IGNITION SYSTEMS FOR AN INTERNAL COMBUSTION ENGINE

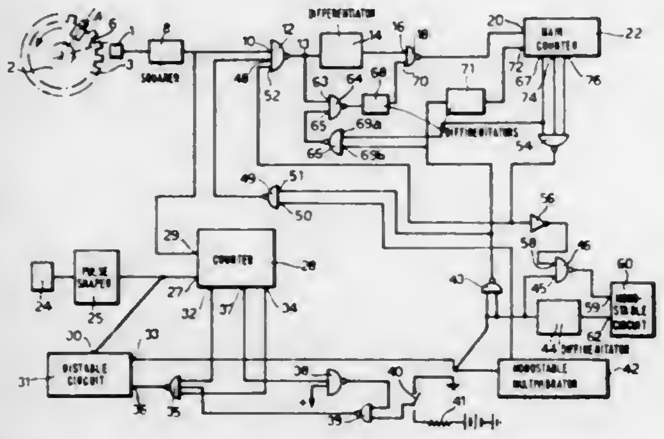
Mauro Maioglio, Turin, and Rafael Jacoel, Milan, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed May 10, 1976, Ser. No. 684,820

Claims priority, application Italy, June 25, 1975, 68628/75

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 D **4 Claims**



1. A device for automatic variation of the ignition spark advance angle in an electronic ignition system for an internal combustion engine, of the type comprising an ignition spark discharge control circuit, and a device for varying the instant of discharge of the ignition spark, wherein said device comprises:

reference means located on a rotating member of the engine which turns with the crankshaft, said reference means comprising:

at least one protuberance phase displaced in advance of a position on said rotating member representing the top dead centre position of said crankshaft of said engine by an angle θm equal to the maximum spark advance angle required, said protuberance defining a reference position of said crankshaft, and

a series of teeth on said rotating member,

first pick-up means sensitive to the passage therepast of said teeth on said rotating member and responsive thereto to produce a train of pulses representing the speed of rotation of said rotating member;

first counting means for counting said train of pulses from said first pick-up means during each ignition timing cycle of said engine,

second pick-up means responsive to the passage therepast of said at least one protuberance to produce a pulse indicating said reference position of said crankshaft,

means responsive to the output of said first counting means operating to initiate the ignition spark when said first counting means reach a predetermined count,

first logic gating means connected to the output of said first pick-up means, means connecting the output from said first logic gating means to the input of said first counting means, said first logic gating means selectively permitting the passage of pulses fed thereto to said first counting means,

second counting means for counting the pulses produced by said first pick-up means from the moment when said protuberance passes said second pick-up means indicating that said crankshaft of said engine is at said reference position,

timing circuit means operating to produce a timing signal output a predetermined time T after an input signal has been fed thereto,

logic switching circuit means having a control input connected to the output from said second counting means, the output from said switching circuit means being connected to the input of said timing circuit, means connecting the output of said timing circuit, to a second input of said first logic gating means,

frequency doubling means connected between said first logic gating means and said first counting means, said frequency doubling means operating to double the frequency of the pulses produced by said first pick-up means in the time interval between the instant when said crankshaft is in said reference position and the instant of discharge of the ignition spark, and if the speed of the engine is lower than a predetermined threshold n_1, also during said timing interval T or part thereof.

4,033,306

EXHAUST GAS RECIRCULATION SYSTEM

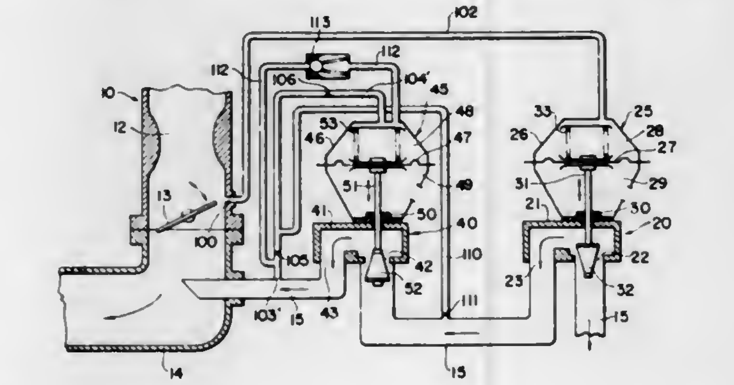
Sugihara, Kunihiko; Kazuo Hioki, and Shigeo Muranaka, all of Yokohama, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed June 9, 1975, Ser. No. 585,055

Claims priority, application Japan, June 11, 1974, 49-66938

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **4 Claims**



1. An exhaust gas recirculation system for an internal combustion engine having an intake pipe connected with an intake manifold, a throttle flap in the intake pipe and exhaust pipe to discharge exhaust gas from the engine, said system comprising: and exhaust gas recirculation conduit feeding part of the exhaust gas to the intake manifold; a first variable-orifice valve disposed in the exhaust gas recirculation conduit and being spring-biased in a direction toward a valve closing position; a second variable-orifice valve disposed in the exhaust gas recirculation conduit downstream of said first valve with respect to exhaust gas flow therein and being spring-biased in a direction toward a valve opening position; means defining a vacuum port opening to the intake pipe in the neighbourhood of the preiphery of the throttle flap in its closed position; means defining an intake manifold vacuum sensing port opening to a portion of the recirculation conduit downstream of the second valve; a first vacuum servo means connected with said vacuum port to increase the open area of the first valve in dependence on the increase in vacuum at said vacuum port; a second vacuum servo means connected with said intake manifold vacuum sensing port to decrease the open area of the second valve in dependence on the increase in vacuum in said vacuum sensing port; a first conduit connecting said vacuum port to said first servo means; a second conduit connecting the intake manifold vacuum sensing port to said vacuum servo means and having two metering orifices formed at the respective end portions thereof; and a third conduit branching off from a portion of the second conduit between the two metering orifices and having a port opening to a portion of the recirculation conduit between the first valve and the second valve.

4,033,307

PROCESS AND DEVICE FOR PREPARING IGNITABLE FUEL MIXTURES

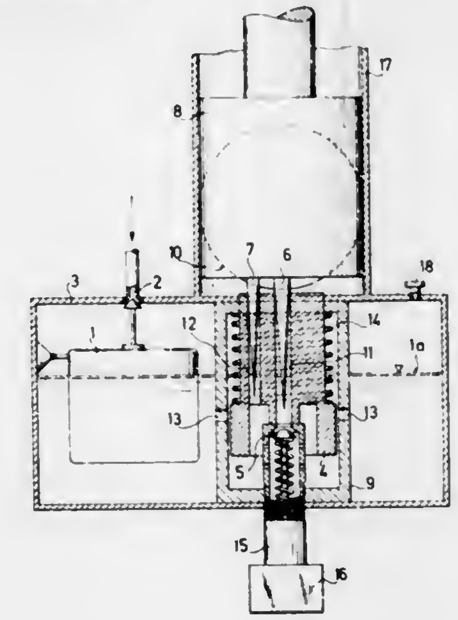
Veit John, Wiesbaden, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

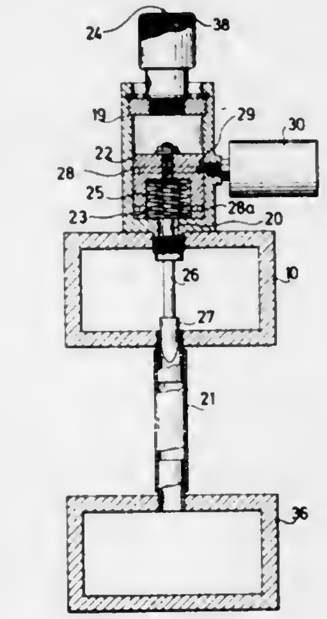
Filed July 8, 1975, Ser. No. 594,129

Claims priority, application Germany, July 10, 1974, 2433061; Oct. 30, 1974, 2451470

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **5 Claims**





1. A device for preparing an ignitable mixture of fuels having different calorific values in internal-combustion engines, comprising a float chamber and a dosing device in the interior of said chamber and immersed in the fuel, the dosing device being provided with at least two bores, nozzle pins above the said bores by means of which the free cross sectional areas of the bores are varied, a piston slidable in the direction of the bores with which the nozzle pins are connected, closing means for at least one bore to shut the bore(s) independent of the variation of the free cross sectional area thereof, and a suction tube into which the bores discharge.

2. The device claimed in claim 1, in which the suction tube between the piston actuating the nozzle pins and the internal-combustion engine a dosing device for hot gases is mounted, which dosing device is operated in dependency on the load on the engine and comprises an inlet pipe for hot gas and a casing, an element movably mounted in the interior of said casing, the said element being under atmospheric pressure on one side and under the pressure of the suction tube on the other side, a piston rod connected with the said element and protruding into the suction tube and a piston valve at the free end of the piston rod to close the inlet pipe.

4,033,308

EXHAUST GAS RECIRCULATION CONTROL SYSTEM

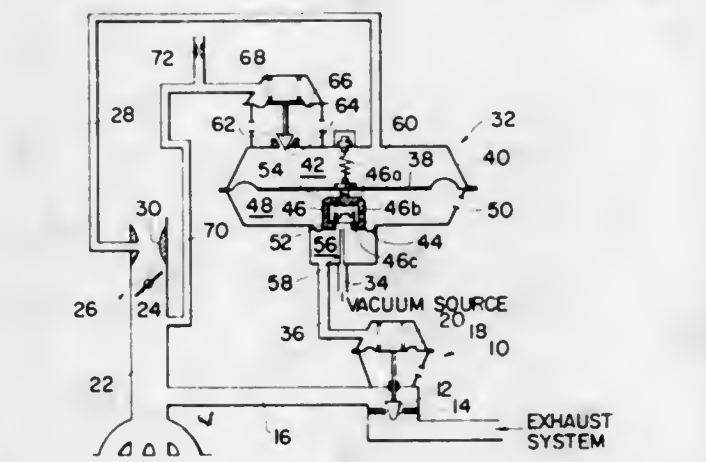
Yoshimasa Hayashi, Yokohama; Yasuo Nakajima, Yokosuka; Kunihiko Sugihara, and Syunichi Aoyama, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed June 19, 1975, Ser. No. 588,237

Claims priority, application Japan, June 24, 1974, 49-72082

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **12 Claims**



1. An exhaust gas recirculation control system for a motor vehicle driven by an internal combustion engine whereby exhaust gas is recirculated to the engine combustion chambers to lower exhaust gas emission of NOx, the system comprising:

a vacuum operated exhaust gas recirculation control valve;

vacuum source means for providing an operating control vacuum to said exhaust gas recirculation control valve during engine operation;

carburetor venturi vacuum means for providing a carburetor venturi vacuum control signal during engine operation;

control means responsive to the venturi vacuum control signal and for modulating, in accordance with the venturi vacuum control signal, the operating control vacuum provided to the exhaust gas recirculation control valve by said vacuum source; and

compensating means for venting said venturi vacuum means in accordance with an engine intake vacuum signal generated downstream of the throttle valve of the carburetor, which signal is provided by engine intake vacuum source means, thereby decreasing the magnitude of the venturi vacuum control signal in proportion to the magnitude of the engine intake vacuum signal generated downstream of the throttle valve.

4,033,309
EXHAUST GAS RECIRCULATION SYSTEM WITH CONTROL APPARATUS FOR EXHAUST GAS FLOW CONTROL VALVE

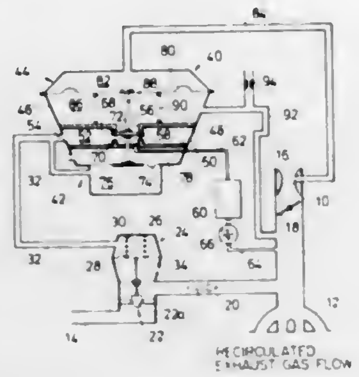
Yoshimasa Hayashi, Yokohama; Yasuo Nakajima, Yokosuka; Kunihiko Sugihara, and Shin-ichi Nagumo, both of Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed June 19, 1975, Ser. No. 588,240

Claims priority, application Japan, June 24, 1974, 49-72084

Int. Cl.² F02M *25/06*

U.S. Cl. 123—119 A **7 Claims**



3. In an internal combustion engine having an intake passage having a venturi and a throttle valve and an exhaust passage, an exhaust gas recirculation system comprising:

a recirculation conduit to recirculate a portion of exhaust gas from the exhaust passage to the intake passage;

an exhaust gas flow control valve to control exhaust gas flow in said recirculation conduit;

a valve actuator including a pressure chamber and a diaphragm operatively connected to said exhaust gas flow control valve to operate said exhaust gas flow control valve in response to changes in pressure in said pressure chamber;

a source of pressure; and

a control apparatus including a pressure responsive regulator valve fluidly intermediate said valve actuator and said source of pressure and having means movable between an open position in which said pressure chamber is permitted to communicate with said source of pressure and a closed position in which said pressure chamber is prevented from communicating with said source of pressure, means defining a port communicating with the intake passage, means fluidly connected to the venturi for moving said regulator valve toward its open position responsive to vacuum at the venturi and means fluidly connected to said port communicating with the intake passage downstream of the throttle valve for moving said regulator valve toward its closed position responsive to vacuum at said port.

4,033,310
FUEL PUMPING APPARATUS WITH TIMING CORRECTION MEANS

Wilfrid Edward Walter Nicolls, East Molesey, England, assignor to C.A.V. Limited, Birmingham, England

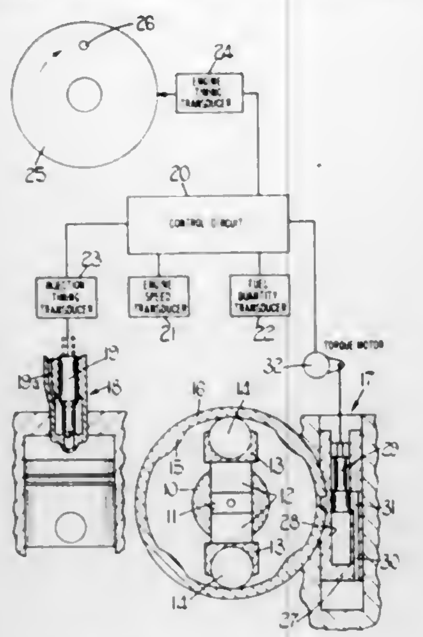
Filed Oct. 4, 1973, Ser. No. 403,717

Claims priority, application United Kingdom, Oct. 4, 1972, 45722/72

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AP **11 Claims**

1. A liquid fuel pumping apparatus for supplying fuel to an internal combustion engine the apparatus comprising an injection pump adapted to be driven by an associated engine for supplying fuel to at least one injector in timed relationship to the engine, first means for adjusting the quantity of fuel supplied to the engine at each injection stroke of the injection pump, second means operable to adjust the timing of delivery of fuel by the injection pump, third means for providing an electrical signal indicative of the actual instant at which delivery of fuel takes place to the engine, fourth means for supplying a periodic signal indicative of the position of the parts of the engine, and control circuit means, responsive to said signals, for controlling said second means and adjusting the timing of delivery of fuel by the pump to the engine.



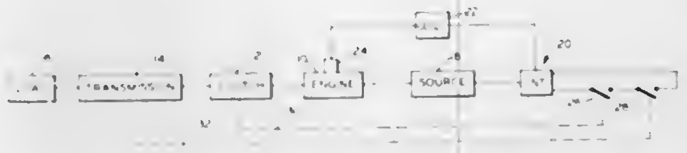
4,033,311
IGNITION SYSTEM WITH HAZARDOUS-START INHIBITING INTERLOCK

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Dec. 26, 1974, Ser. No. 536,597

Int. Cl.² F02N *17/00*

U.S. Cl. 123—179 K **10 Claims**



1. An ignition system for an internal combustion engine connected in driving relationship with at least one device having a member movable between a safe position for engine starting and an unsafe position for engine starting comprising:

a spark plug for the internal combustion engine;

an ignition transformer including a low tension primary and a high tension secondary winding connected with the spark plug for producing a sparking potential to fire the plug;

a source of low tension current pulses supplied in timed relationship with the engine cycle; and

an interlock connected between the source and the primary winding of the ignition transformer for controlling the transmission of current pulses from the source to the primary winding, the interlock comprising:

- a first circuit path between the source and the primary winding having a first switch operably connected with the movable member and placing the first circuit in a pulse-transmitting condition when the movable member is in the safe position and a non-transmitting condition when the member is in the unsafe position;
- a second circuit path parallel with the first path between the source and the primary winding and having a second switch with a control element operable to change the second switch and second circuit path between a nontransmitting condition and a transmitting condition for the pulses independently of the movable member and the first switch; and

actuating means connected with the first and second circuit paths and with the control element of the second switch and having a pulse sensing circuit including a capacitor receiving and charged by current pulses transmitted by the first and second circuit paths to the primary winding for placing the second switch in the transmitting condition to transmit further pulses to the primary winding and including release means having a resistive means for discharging the capacitor and permitting the second switch to return to the non-transmitting condition in the absence of further current pulses.

4,033,312
CRANKCASE FOR MULTI-CYLINDER RECIPROCABLE PISTON INTERNAL COMBUSTION ENGINES

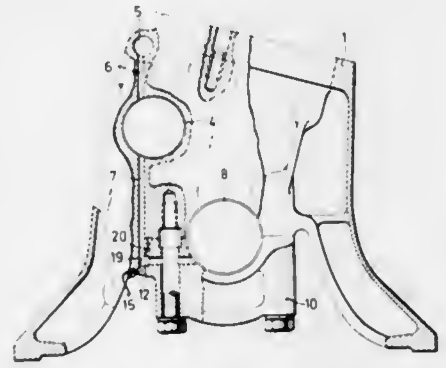
Hans-Ulrich Howe, Kippekausen, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed Jan. 16, 1976, Ser. No. 649,854

Claims priority, application Germany, Jan. 17, 1975, 2501772

Int. Cl.² F01M *1/00, 1/04*

U.S. Cl. 123—196 R **9 Claims**



1. A crankcase for a multi-cylinder reciprocable piston internal combustion engine of the single row type which includes: camshaft bearing means, crankshaft bearing means divided along a plane of division and arranged in a suspended manner and provided with cover means detachably connected to said crankcase along mutually abutting surfaces, said cover means and said crankcase being provided with aligned bores, the bore in said crankcase being threaded, screw bolt means extending into said bores and threadedly engaging the respective bore in said crankcase, first lubricant conveying conduit means arranged in the vicinity of said camshaft bearing means and extending in the longitudinal direction of said crankcase, second lubricant conveying conduit means leading from said first lubricant conveying conduit means to said camshaft bearing means, third lubricant conveying conduit means leading from said camshaft bearing means to said crankshaft bearing means, said third lubricant conveying conduit means comprising a plurality of sections respectively located in said crankcase and said cover means while intersecting that portion of said screw bolt receiving bore which is located in said cover means, said third lubricant conveying conduit means leading into said crankcase in the vicinity of said plane of divisions of said crankshaft bearing means.

4,033,313
TOY ELASTIC BAND PROJECTILE-FIRING GUN

James Ryan, 105-24 64th Road, Forest Hills, N.Y. 11375

Filed Jan. 19, 1976, Ser. No. 650,155

Int. Cl.² F41B *7/08*

U.S. Cl. 124—17 **5 Claims**

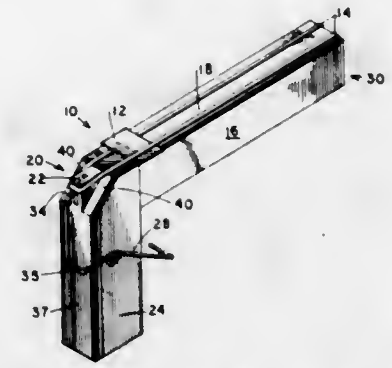
1. A toy elastic band projectile-firing gun comprising:

an elongated barrel having a substantially flat upper surface and a vertical slot in the rear end thereof;

a handle connected to said barrel adjacent the rear end thereof;

an elsstic band connected to the front end of said barrel and stretchable across the upper surface thereof such that the rear end of said band is retained in its cocked position by the rear end of the barrel with the parallel reaches thereof disposed on the upper surface of said barrel;

a wire trigger element mounted pivotally at an intermediate location thereof on the exterior side faces of said handle such that one segment thereof extends forwardly of the handle and terminates in a first transverse section projecting across the front of the handle, another segment of said trigger element extending rearwardly from said intermediate location and having a second transverse section



projecting across the rear of the handle, said second transverse section having integral therewith an unwardly extending section which is bent forwardly at the outer extremity thercof and is dimensioned to be positioned within and to slide within said vertical slot between a first lower position below a level at which the elastic band is retained exteriorly on the rear end of said barrel and a second upper position at which said bent outer extremity of the trigger element engages said elastic band and forces same off the rear end of the barrel, said first and scond transverse sections of said trigger element being engageable with the front and rear portions of said handle to thereby establish the slidable movement limits of said bent outer extremity of the trigger element within said vertical slot.

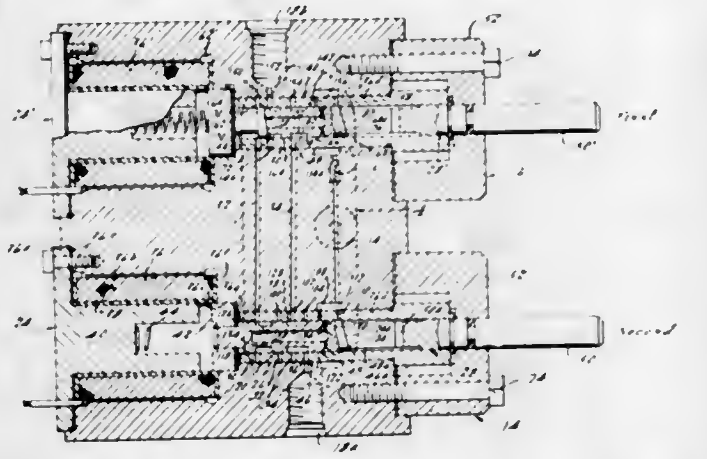
4,033,314
METERING CONTROL

Erlen B. Walton, Farmington Hills, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Filed Aug. 8, 1975, Ser. No. 603,078

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 R **23 Claims**



8. A metering valve for a fuel injection syetem of the type including a source of pressurized fuel, a nozzle for delivering the pressurized fuel to a piston cylinder of an internal combustion engine, means for communicating the source with the nozzle, and distributor means for blocking and unblocking

said communicating means in a timed relation to the cyclic operation of said engine, said metering valve comprising:

a valve housing having a fuel inlet port connected to said source by said communicating means, a fuel outlet port connected to said nozzle by said communicating means, and a fuel return passage;

a valving member moveable in said housing along a path extended from a first position in which it blocks communication between said ports to a second position;

means operative to move said valving member from said first position to said second position at velocities independent of the speed of said engine;

passage means in said valving member operative at some point during movement of said valving member along said path to define a continuous passage through said valve housing by serially connecting said inlet port, said passage means, and said outlet port at the same time said distributor means unblocks said communicating means;

means for connecting one of said ports with said return passage at some point during such movement; and

means for varying the point along said path at which said port is connected with said return passage.

4,033,315

IGNITION DISTRIBUTOR CONSTRUCTION FOR INTERNAL COMBUSTION ENGINES

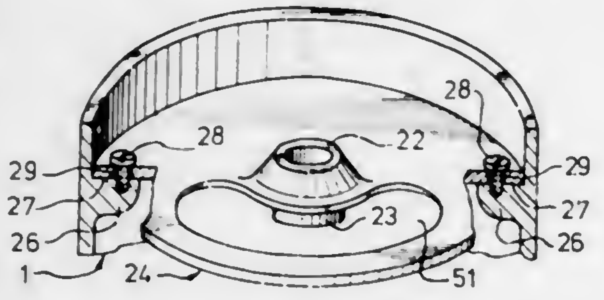
Uwe Kröger, Hofingen; Friedrich Jaki, Erdmannhausen; Hartmut G. Brammer, Vaihingen, Enz; Karl Ehrmann, Stuttgart; Herbert Mägdefrau, Sonthofen; Günter Brand, Stuttgart; Harald Kalippke, Hohenacker, and Rolf Rink, Markgroningen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Oct. 9, 1975, Ser. No. 621,018

Claims priority, application Germany, Oct. 25, 1974, 2450753

Int. Cl.^{2} F02P *7/02*

U.S. Cl. 123—146.5 A **12 Claims**



1. Ignition distributor construction for internal combustion engines having a cup-shaped housing (1) having end walls and including a distributor cap (2), a shaft (3) located within the housing and extending into the distributor, upper and lower bearings (21, 22) located in the distributor, the lower bearing (21) being positioned at the bottom thereof, and the upper bearing being positioned adjacent the upper portion of the shaft;

an upper bearing support plate (24) extending essentially transversely of the housing and to the axis of the distributor shaft (3), said upper bearing (22) being secured to said upper bearing support plate centrally thereof;

an abutment shoulder formed by a section of the inner wall of the housing of increased wall thickness, the upper bearing support plate (24) being located on said shoulder;

a portion of the housing (1) adjacent the upper bearing support plate being upset and deformed to form a holding lug (44) pressing against the upper support plate and pressing the upper support plate (24) against the abutment shoulder formed in the housing;

a breaker contact assembly (7) located beneath said plate (24);

and an opening (51) formed in said plate and having a size sufficient to permit passage of the breaker contact assembly through the opening to permit removal of the breaker contact assembly from the distributor housing and replacement thereof without removal or disturbance of said plate from, or with respect to said housing.

4,033,316

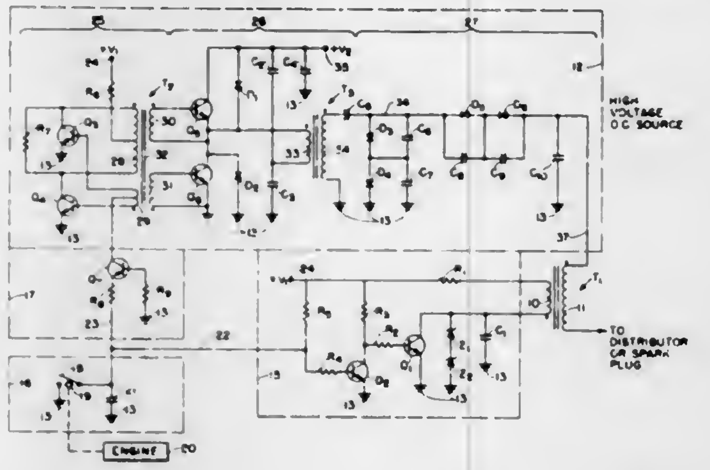
SUSTAINED ARC IGNITION SYSTEM

Arthur G. Birchenough, Brook Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed June 3, 1975, Ser. No. 583,485

Int. Cl.^{2} F02P *1/00*

U.S. Cl. 123—148 E **17 Claims**



1. An internal combustion engine ignition system comprising:

a step-up voltage coil having a primary winding and a secondary winding, said secondary winding having a first end and a second end, said second end being connected to common ground through a spark gap and which system produces a spark across the spark gap when current through the primary winding is periodically interrupted at controlled times;

means for supplying periodically interrupted current to said primary winding;

a high voltage d-c source connected between said first end of said secondary coil and ground; and

means for activating said high voltage source when current through the primary is switched off but before said spark across the spark gap terminates and for deactivating said high voltage d-c source substantially later than the normal extinguish time of the spark.

4,033,317

INTERNAL COMBUSTION ENGINES

Frank Metcalf Aspin, Knutsford, England, assignor to Aspin Power Limited, England

Filed June 4, 1975, Ser. No. 583,528

Claims priority, application United Kingdom, June 5, 1974, 24865/74

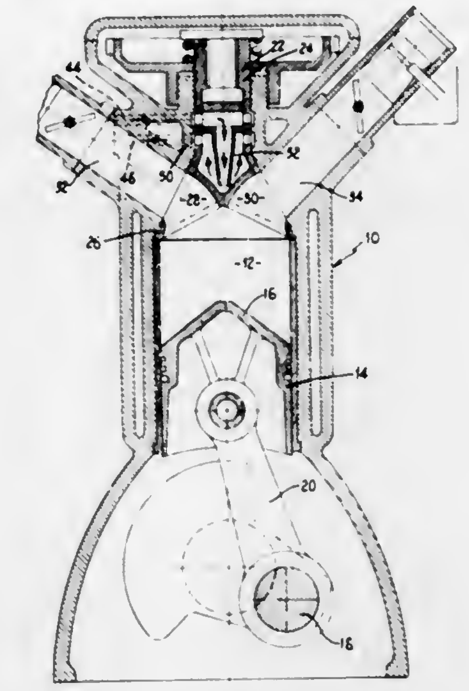
Int. Cl.^{2} F01L *7/00*

U.S. Cl. 123—190 D **12 Claims**

1. An internal combustion engine comprising:

a structural within which is defined at least one cylinder block accommodating a reciprocable piston having a crown, and within which is disposed a valve rotor mounted at the compression end of the, or each, cylinder for rotation about the longitudinal axis of the cylinder and having a number of valve rotor passages therethrough each extending between the cylinder interior and a portion of the structure having inlet and exhaust ports corresponding in number to the number of valve rotor passages, to allow for conventional four-stroke operation with said valve rotor rotating at an appropriate fraction of crank-shaft speed, the construction being such that at top dead centre following a compression stroke each valve rotor passage forms a substantially independently enclosed combustion space at the compression end of the cylinder adjacent the crown of the pistion, and

a supply passage leading to and for supplying air only through at least one inlet port, and a supply passage leading to and for supplying a fuel and air mixture through at least one inlet port, the supply passage leading to each inlet port to which air only is fed being inclined so as to direct the air through the valve rotor to the cylinder walls whereas the supply passage leading to each inlet port to which a fuel and air mixture is fed is inclined so as to direct the fuel and air mixture through the valve rotor to the inner part of the cylinder.



4,033,318

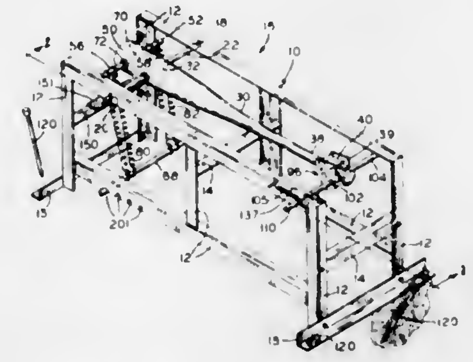
SPRING TYPE BALL PITCHING DEVICE

Thomas Raymond O'Grady, 2415 Stanford Ave., Fort Wayne, Ind. 46808

Filed Nov. 7, 1975, Ser. No. 629,692

Int. Cl.^{2} F41B *3/04*

U.S. Cl. 124—7 **10 Claims**



1. A ball-pitching device comprising a rigid box-type frame, an axle serving as a fulcrum transversely mounted in said frame, a bat-shaped throwing arm having the larger diameter end mounted on said axle and comprisng a relatively short driving section and a relatively larger driven section comprised of the smaller diameter bat section and including a ball-holding device at the remote end of such driven section, extendable coil spring driving means disposed on each side of said throwing arm and fastened between a portion of said rigid box-type frame and the driving end of said bat to effect forcible rotation of said throwing arm about its fulcrum in a ball-throwing direction, said throwing arm being rotatable about its fulcrum by said spring driving means in a ball-throwing direction and the relationship between said spring-driving means and said throwing arm being such that throwing arm rotation is limited in its rotational movement only by the re-stretching of said coil spring driving means after the throwing arm has moved beyond a perpendicular position relatively to the longitudinal axis of the machine to obviate a positive stop for said throwing arm, said spring driving means being stretched to the maximum extent when said throwing arm is disposed horizontally with the ball received in said holding device, and locking means for holding said throwing arm in its horizontal firing position against the resistance of said stretched springs, said locking means being movable to a position releasing said throwing arm.

4,033,319

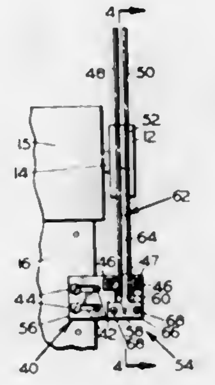
BLADE GUIDE AND SLAB SUPPORT FOR LAPIDARY SAW

Eugene S. Winter, 415 SE. Date St., College Place, Wash. 99324

Filed July 25, 1975, Ser. No. 599,176

Int. Cl.^{2} B28D *1/04*

U.S. Cl. 125—13 R **1 Claim**



1. A blade guide for lapidary saws having dual, parallel, arbor-mounted rotary saw blades, separated by an intermediate arbor, for the cutting of an intermediate slab therebetween, carried by a rigid saw table, the blade guide comprising:

a. a plate having a slot therein arranged to receive freely the peripheral portions of the rotary saw blades,

b. means for mounting the plate on the rigid saw table with the rotary saw blades received freely in the slot,

a first block secured removably to the plate on one side of the slot for sliding engagement with the outer side of one of the saw blades,

d. a second block secured removably to the plate on the opposite side of the slot for lateral adjustment relative to the slot for sliding engagement with the outer side of the other saw blade, and

e. an elongated finger secured removably to the plate and extending inwardly between the saw blades from the outer periphery thereof sufficiently to bear on the intermediate arbor between the saw blades for supporting an intermediate slab cut by and located between the saw blades and to bias the intermediate slab upwardly against the direction of saw rotation, the finger having a width substantially equal to the spacing between the saw blades.

4,033,320

FURNACE AND COLD AIR RETURN SYSTEMS

Gene R. Jury, 125 Ridgeway Drive, Greenwood, Mo. 64034

Division of Ser. No. 488,564, July 15, 1974, Pat. No. 3,926,173. This application Oct. 2, 1975, Ser. No. 618,942

Int. Cl.^{2} F24H *3/00, 3/02*

U.S. Cl. 126—110 R **15 Claims**

1. Apparatus for extracting heat from a heat source exhaust-

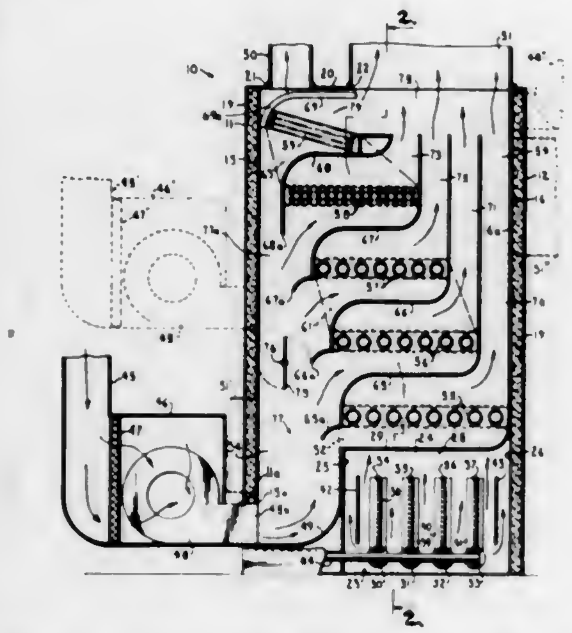
ing heated gases adjacent a forced air circulating heating system, said forced air system having at least one cold air return duct and a hot air circulation duct positioned adjacent one another, comprising, in combination:

a heat extraction chamber positioned at least in part below a length of the hot air duct,

means for passing cold air from the cold air return duct into the lower part of the heat extraction chamber,

means for passing heated air from the upper part of the heat extraction chamber into the hot air circulating duct,

a plurality of sets of heat exchange tubes extending at least substantially across the heat extraction chamber at a plurality of vertically spaced levels therewithin,



means for flowing exhaust gases from the heat source into one end of the lowermost set of heat exchanging tubes,

manifolding means interconnecting the ends of the sets of heat exchange tubes with one another so that

the exhaust gases flow back and forth through the banks of tubes in ascending fashion through the chamber,

means for venting the exhaust gases from one side of the uppermost set of heat exchange tubes,

wall means in said chamber dividing same into a plurality of ducts each of which includes one set of heat exchanging tubes, and

means for exhausting air overhead from said chamber out of said ducts into said hot air circulating duct.

4,033,321
WINDOWED OVEN DOORS

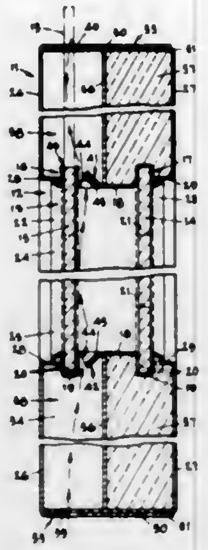
Jacob Krebs, St. Clair Shores, Mich., assignor to Shatterproof Glass Corporation, Detroit, Mich.

Filed Jan. 14, 1976, Ser. No. 649,053

Int. Cl.^{2} F23M *7/04*; F24C *15/04*

U.S. Cl. 126—198 **9 Claims**

1. In an oven door structure, in combination, spaced front and rear door panels joined together around their perimeters to provide a top wall, a bottom wall and opposite side walls, said door panels being provided with a window opening, spaced outer and inner glass panels mounted in and closing said window opening, the bottom wall of the door being provided with openings to permit cooler air to flow upwardly into the space between the glass panels and the top wall of said door being provided with a relatively narrow elongated opening through which the hotter air, flowing from the space between said glass panels, exits from the door, said narrow elongated opening being vertically spaced from and in alignment with the outer glass panel and dimensional for passage of said panel therethrough, and means for slidably mounting the outer glass panel in the window opening for vertical movement whereby said outer panel can be removed vertically from the door through the aligned opening in the top wall thereof by upward sliding movement of the said panel.



4,033,322
OVEN DOOR STRUCTURE

Harry W. Seidel, Mertztown, Pa., assignor to Raytheon Company, Lexington, Mass.

Filed Jan. 5, 1976, Ser. No. 647,260

Int. Cl.^{2} F23M *7/00*; F24C *15/04*

U.S. Cl. 126—200 **6 Claims**

1. An oven comprising a heating compartment having a door opening therein, at least one heating device within the compartment, and a door located in closing relation to said door opening and having a window opening therethrough, a first transparent pane covering said window opening on the inner side of the door, a second transparent pane covering said window opening and adjacent portion of the outer surface of the door and means for supporting said second pane in spaced relation to the adjacent portion of the outer surface of the door and providing a dead air space therebetween and with said first transparent pane said adjacent portion of the outer surface of the door around the window opening being provided with a continuous recess communicating with the space between the panes, said second pane overlying the entire recess in spaced relation with it the outer surface of the door being provided with a continuous raised portion which extends completely around and outwardly of said recess to define a mounting surface generally parallel to said recess, and said second pane being mounted on said raised portion.

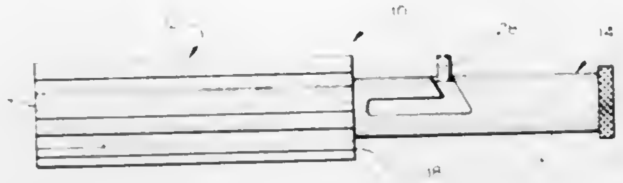
4,033,323
HEAT TRANSFER SLEEVE FOR CHEMICAL HEATERS

John H. Trumble, Elm Grove, and Akos Szekely, Colgate, both of Wis., assignors to Thermology, Inc., Milwaukee, Wis.

Filed June 16, 1975, Ser. No. 586,905

Int. Cl.^{2} F24J *1/02*

U.S. Cl. 126—263 **6 Claims**



1. A device for transferring heat from a heat source disposed at the interior thereof to the surrounding environment, said device comprising:

means defining an elongate, hollow thermo-conductive body, said body being open at a first portion for insertion of said heat source therein,

a heat source within said body, means for supporting the heat source within said body, said supporting means defining a plurality of air spaces between said heat source and said body means and comprising a screen interposed between said heat source and said body means, and

said supporting means being adapted for conducting heat from said heat source to the exterior of said body, said air spaces retarding the rate of such heat conduction.

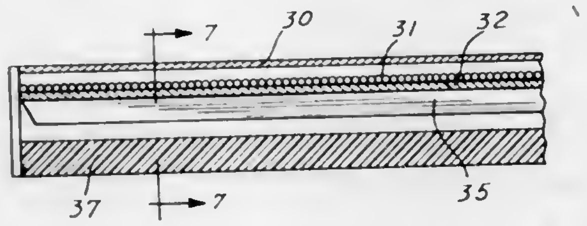
4,033,324
SOLAR HEAT COLLECTOR

Robert E. Eckels, 2101 Youngfield St., Golden, Colo. 80401

Filed Mar. 10, 1975, Ser. No. 556,807

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—270 **6 Claims**



1. In a solar radiation collector utilizing a heat absorbing substrate to absorb heat energy from solar radiation which may then be picked up by a fluid heat transfer medium, the improvement of:

a black heat absorbing, planar substrate;

a focusing member including a plurality of essentially touching, transparent spheres as focusing elements disposed and maintained as a monolayer in a single plane on and contacting said black absorbing substrate to induce a variable focusing effect of solar radiation on said black heat absorbing planar substrate to provide a variable increase of the temperature of impinging solar radiation; and

means for securing said spheres in said position on said planar substrate, so as to provide a solar radiation pick up with a variable focus area from each of said spheres transmitted to different portions of the substrate at different times of a day, and thereby produce a net increase of temperature of the substrate at a wide range of angles of incidence of solar radiation.

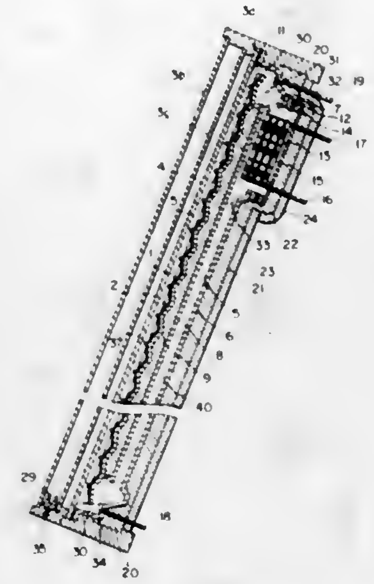
4,033,325
FLUID SHEET SOLAR COLLECTOR

James Edwin Walker, Rte. 5, Box 150, Charlottesville, Va. 22901

Filed May 11, 1976, Ser. No. 685,258

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **8 Claims**



1. A solar energy transformation device for converting solar spectrum radiation to fluid mass heat content by means of an efficient solar spectrum absorber in or on a base material which is not necessarily flat configuration and is not necessarily of high thermal conductivity but is necessarily in intimate thermal contact over its entire surface with a thin collector fluid sheet of ⅜ inch or less average thickness, means for retaining such fluid in sheet form between two material surfaces, one of which may contain the solar spectrum absorber, under the combined actions of body stresses in the materials and of reduced fluid body pressure with respect to ambient pressure such to achieve net compressive and shear stresses in the juncture of the two materials at their edges, means for connecting the collector fluid sheet at top and at bottom through a channel structure to provide continuity of the fluid mass throughout the sheet and the channel structure and to provide facility for fluid mass circulation loopwise throughout the sheet and channel configuration under the thermodynamic influence of fluid material heating in contact with the solar absorber material and/or fluid material cooling in the channel structure, either to produce a net lesser mean density of fluid in the sheet than in the channel at a characteristic vertical elevation, and consequently to effect an upward flow of fluid in the sheet with a corresponding downward flow of fluid in the channel structure, means for incorporating a heat exchanger element in the upper portion of the channel structure, and means for effecting thermal isolation between the fluid sheet and the fluid channel flow patterns and for thermal isolation of the sheet and of the channel from the ambient environment.

4,033,326
INFLATABLE SOLAR COLLECTOR FOR SWIMMING POOL

Lionel J. Leitner, Egbert Hill, Morristown, N.J. 07960

Filed Feb. 23, 1976, Ser. No. 660,331

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **10 Claims**

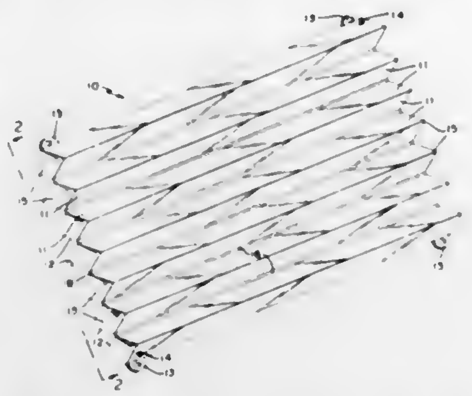
1. An inflatable solar collector for heating a swimming pool comprising:

a plurality of individual solar heating sections;

each of said sections having an upper portion which is transparent or translucent and a lower portion having an internal surface which absorbs solar energy, said lower portion being connected to said upper portion to provide a substantially enclosed intermediate dead air space;

said sections having a major plane which is substantially parallel to the surface of the water in the pool;

when inflated, said upper portions intersecting said plane at at least two locations such that the angles formed by the intersections of said upper surface with said plane are about 40° to 70°;



a plurality of tabs interconnecting said sections and providing air passageways therebetween; and

inflating means to permit said sections to become inflatable by gas pressure, said collector when inflated being floatable on the water surface.

4,033,327

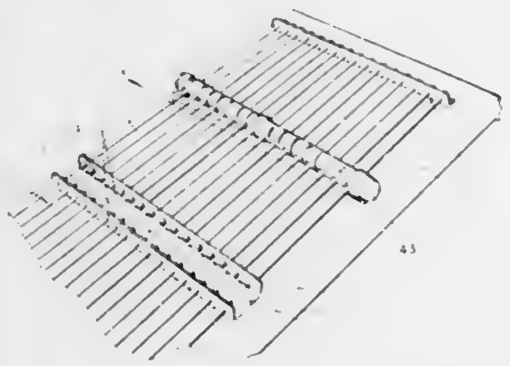
SOLAR ENERGY COLLECTOR MODULE SYSTEM

Yu K. Pei, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Nov. 24, 1975, Ser. No. 634,714

Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **22 Claims**



1. A solar energy collector module comprising

a plurality of tubular collector elements having the same outside diameter and each including a circumferentially transparent outer tube having a closed end and an open end, and, interiorly of said outer tube, a hollow elongated absorber tube spaced from said outer tube, having a closed end and an open end and including a solar energy absorbing surface disposed between its ends, means annularly sealing the outer tube and the absorber tube together adjacent the open end of one of said tubes to provide a closed space between the two, said space being evacuated to sub-atmospheric pressure, the absorber tube having an interior chamber,

an elongated manifold having lateral, outwardly facing cups for receiving the open ends of said tubular collector elements, each said cup comprising an annular flange at its outer open end, an O-ring gasket, and annular retaining means in said flange for holding said gasket, the gasket forming a fluid seal in the cup encircling said collector elements,

a supply of working fluid,

an inlet header pipe connected to said fluid supply and to at least one of said cups, means interconnecting the cups for flow of fluid through the absorber tubes and between the cups,

an outlet header pipe connected to at least one of said cups for receiving fluid therefrom, and an insulation jacket member of low density cellular material surrounding all of said cups, the interconnecting means therefor and said inlet and outlet header pipes, said jacket including apertures coaxial with said cups for connecting the tubular collector elements into said cups of the manifold, and

means supporting the tubular collector elements sealingly in said cups of the manifold.

4,033,328

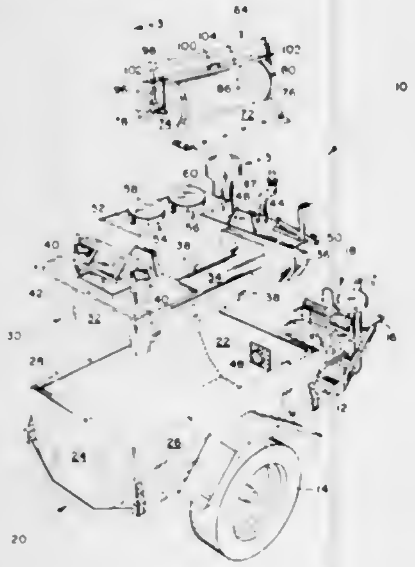
TAR MELTING KETTLE

John H. Lohman, and Richard C. Brooke, both of San Antonio, Tex., assignors to Blackwell Burner Company, San Antonio, Tex.

Filed Nov. 26, 1975, Ser. No. 635,428

Int. Cl.^{2} E01C *19/45*

U.S. Cl. 126—343.5 A **12 Claims**



1. A kettle for melting tar, said kettle having a base frame with means for moving said kettle attached thereto, burner means for melting tar in a vat of said kettle, means for removing melted tar from said vat, improvement of said kettle comprising:

lid means for said vat. said lid means sealing with an upper edge of said vat;

stationary housing adapted for receiving a rotating cylinder means, said stationary housing being mounted in said lid means;

pin means in opposing ends of said stationary housing;

rotating cylinder means inside said stationary housing mounted on said pin means inside said stationary housing;

first opening in said stationary housing and a second opening in said rotating cylinder means adapted so that blocks of tar may be inserted through said first opening and said second opening, after rotating said rotating cylinder means via said pin means, said blocks of tar drop through said second opening and a third opening located in said stationary housing into said vat;

said rotating cylinder means being rotatable by a turning means outside said stationary housing connected to said pin means, upon moving said turning means to a first position said first opening and said second opening are in line to allow insertion of said blocks of tar therethrough into said rotating cylinders, upon moving said turning means to a second position said second opening and said third opening are in line to allow said blocks of tar to drop into said vat;

cover means adapted to cover said first opening rotatably mounted on said stationary housing.

4,033,329

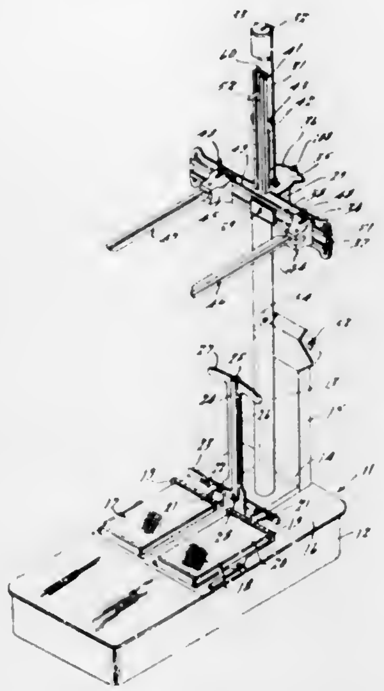
MACHINE FOR DETERMINING VERTEBRAE LOCATIONS IN THE HUMAN BODY

Ralph R. Gregory, and Peter Benesh, both of Monroe, Mich., assignors to National Upper Cervical Chiropractic Research Association, Inc., Monroe, Mich.

Filed May 3, 1976, Ser. No. 682,518

Int. Cl.^{2} A61B *5/10*

U.S. Cl. 128—2 S **17 Claims**



1. In a checking machine for skeletal structure, a base, a top plate for said base, a column extending upwardly from said top plate near one end of the base, a cylindrical sleeve on said column for moving upwardly and downwardly and angularly thereon, a fixed transverse plate on said sleeve for rotation and vertical movement therewith, a cross bar pivotedly secured to said plate forwardly thereof, a pair of slidable housings movable toward and away from each other on said cross bar, and arms secured to said housings and movable angularly from a horizontal plane to indicate tilt and movable laterally of each other to increase or decrease the distance therebetween.

4,033,330

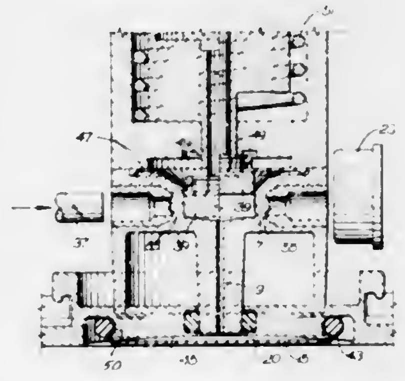
TRANSCUTANEOUS pH MEASURING INSTRUMENT

Barry G. Willis, Palo Alto; Henry A. Schade, Jr., Mount View, and Michael J. Farrell, Woodside, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sept. 8, 1975, Ser. No. 611,387

Int. Cl.^{2} A61B *10/00*

U.S. Cl. 128—2 G **7 Claims**



1. A device for measuring the concentration of a substance in the blood, said device comprising:

a housing;

optical radiation source means mounted within said housing for providing optical radiation having at least one predetermined frequency component;

detector means mounted within said housing for detecting radiation at said at least one predetermined frequency;

a measuring chamber positioned within said housing in an optical path between said source means and said detector means;

means in the housing for maintaining a volumetric region adjacent an area of skin surface of the body when the device is brought into intimate contact with said area, said means allowing said substance in the blood to pass freely between the skin surface and said volumetric region while preventing the passage of undesired substances therebetween;

a measuring fluid in said volumetric region, said fluid having radiation absorption characteristics as a function of wavelength which vary as a function of the concentration of said substance in the blood; and

means for drawing measuring fluid from said volumetric region into said measuring chamber and forcing measuring fluid from said measuring chamber into the volumetric region.

4,033,331

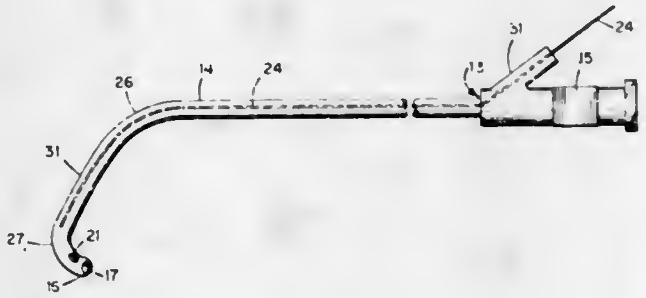
CARDIAC CATHETER AND METHOD OF USING SAME

Stephen B. Guss, 30 Jefferson Ave., Morristown, N.J. 07960; Mark R. Goldman, 1 Emerson Place No. 14A, Boston, Mass. 02114, and Leonard M. Zir, 7 Elwin Road, Natick, Mass. 01760

Filed July 17, 1975, Ser. No. 596,644

Int. Cl.^{2} A61M *25/00*

U.S. Cl. 128—2 M **8 Claims**



1. A coronary catheter comprising:

an elongated flexible tube having a main lumen extending throughout its length and open from the proximal end through the distal end, and having a smaller wire lumen extending from the proximal end to the distal end, the distal end of said wire lumen being closed, said main lumen and said wire lumen being parallel; and

a freely longitudinally movable contour wire residing within said wire lumen of said tube;

a portion of said distal end of said tube being formed with a predetermined deformable curved contour with different degrees of curvature at different distances from said distal end, said distal end assuming one contour curve when said contour wire extends fully to the closed distal end of said wire lumen and assuming a plurality of different complex contour curves when said contour wire is longitudinally moved within said wire lumen to different locations with respect to said closed distal end thereof.

4,033,332

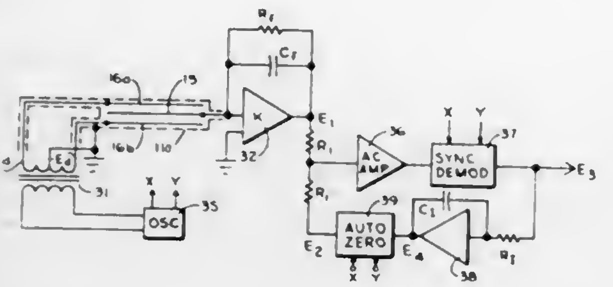
ACTIVITY AND RESPIRATION MONITOR

Edward V. Hardway, Jr., Houston, and William H. Holtman, LaPorte, both of Tex., assignors to Cavitron Corporation, New York, N.Y.

Division of Ser. No. 287,844, Sept. 11, 1972, Pat. No. 3,926,177. This application July 21, 1975, Ser. No. 597,726

Int. Cl.² A61B *5/10*

U.S. Cl. 128—2 S **7 Claims**



1. Apparatus for monitoring a condition of the body of a human or animal by sensing the breathing movements of said body, comprising in combination:

- a resilient pad for supporting a substantial portion of the weight of said body and including a capacitor having a plurality of electrodes including a driven electrode, a receptor electrode and a dielectric layer of elastomer foam separating said electrodes to permit one of said electrodes to move toward and away from the other electrode to cause relatively long term changes in capacitance between the electrodes in response to activity of the body and relatively short term changes in capacitance between the electrodes in response to said breathing movements; and
- an electronic sensing circuit including (a) means connected to said driven electrode for applying an A.C. drive signal at a frequency that is high enough to be non-hazardous at the voltage levels in use, (b) an amplifier connected to said receptor electrode so that changes in capacitance modulate the output of said amplifier, (c) a demodulator coupled to said amplifier to demodulate the output thereof to produce a fluctuating D.C. signal having fluctuations representative of the changes in capacitance between said electrodes, and (d) high pass filter means coupled to said demodulator for substantially rejecting changes in said D.C. signal representative of relatively long term changes in said capacitance, said sensing circuit being operable to convert said short term capacitance changes to a D.C. output signal representative of said breathing movements.

4,033,333

ELECTRODE ARRANGEMENT FOR TAKING ELECTROCARDIOGRAMS

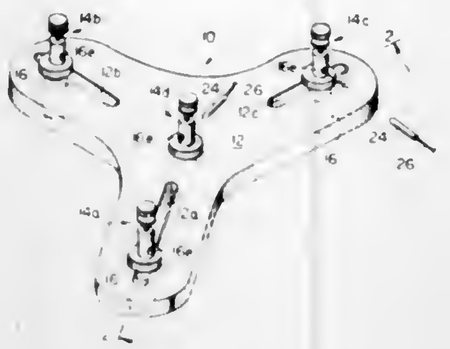
Ernest J. DeSalvo, Teaneck, N.J., and Marco D. Zarlengo, New York, N.Y., assignors to Combined Scientific Resources Corporation, Teaneck, N.J.

Filed Dec. 10, 1975, Ser. No. 639,368

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.06 E **2 Claims**

1. An electrode arrangement for use in the taking of electrocardiograms comprising a rigid nonconductive plate having three slots extending radially outward from the center thereof; a first electrode post fixed in the center of said plate; second, third and fourth electrode posts each mounted for movement within a respective one of said slots, each of said moveable electrode posts including means for enabling said post to be moved within its respective slot and to be secured in a desired position; all of said electrode posts projecting outwardly from one side of said plate for connection to electrocardiographic machine cables and projecting outwardly from the other side of said plate for contacting the skin of a patient; and means in each of said electrode posts on that part thereof which projects outwardly from said one side of said plate for securing thereto a cable from an electrocardiographic machine; the angle between a first and second slot being in the range 80–100°, the third slot being symmetrically disposed relative to said first and second slots, and two edges of said plate having the general contour of the left and right edges of a Y.



4,033,334

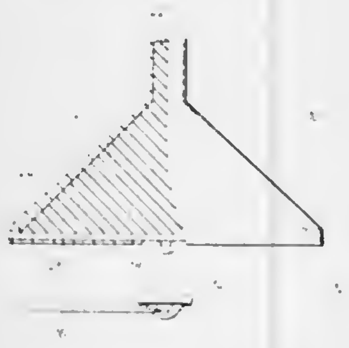
SNAP-IN COMPRESSIBLE BIOMEDICAL ELECTRODE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; James D. Frost, Jr., Houston, and Carl E. Hillman, Jr., Bellaire, both of Tex.

Filed Dec. 3, 1975, Ser. No. 637,269

Int. Cl.² A61B *5/04*

U.S. Cl. 128—2.1 E **6 Claims**



1. A biomedical electrode assembly for use in obtaining EEG signals from a subject comprising:

- a resilient sponge-like body;
- an electrically conductive plastic base member attached to said sponge-like body, said base member having a generally planar surface;
- an electrolyte gel filling said sponge-like body;
- electrically conductive snap connector means embedded into said base member and extending outward therefrom;
- plastic coating means surrounding completely said sponge-like body and said plastic base member except for an area immediately surrounding said snap connector means extending outward therefrom, said coating means providing a leakproof barrier for said electrolyte gel;
- cap means formed of stretchable material for positioning in a predetermined pattern a plurality of said sponge-like bodies at desired locations about the head of a subject for obtaining EEG signals; and
- electrically conductive snap connector means attached to said cap means for releasably connecting both electrically and mechanically to one or more of said sponge-like bodies through corresponding snap connector means embedded into said base members thereof.

4,033,335

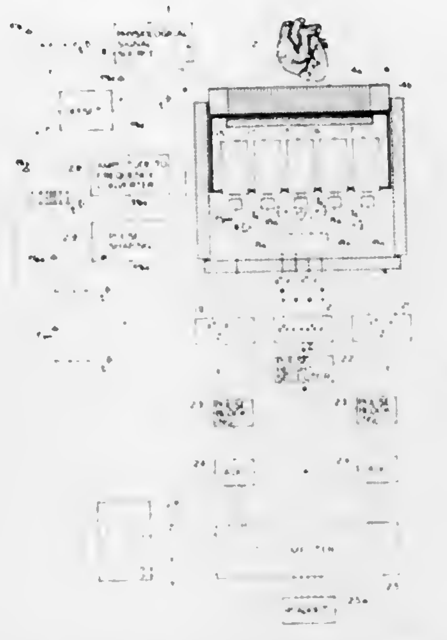
METHOD AND APPARATUS FOR MULTIPLEXING OF PHYSIOLOGICAL SENSOR SIGNALS WITH GAMMA RAY CAMERA DATA SIGNALS

Robert J. Nickles, Madison, Wis., assignor to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed June 12, 1975, Ser. No. 586,200

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 R **5 Claims**



2. A device for multiplexing time varying amplitude physiological data signals with the output signals provided by the output circuitry of the photomultiplier tubes of a gamma ray scintillation camera, comprising:

- a. amplitude to frequency converter means for receiving a time varying amplitude physiological data signal which does not change in sign and for providing a series of uniformly shaped output pulses, the frequency of said series of output pulses being directly proportional to the amplitude of the physiological data signal;
- b. pulse shaping means for receiving said series of output pulses from said amplitude to frequency converter means and for shaping each pulse of said series of pulses to have approximately the same shape as an output pulse provided by the output circuitry of a photomultiplier tube when the photomultiplier tube is struck by light emanating from a gamma ray scintillation; and
- c. circuit means for transmitting said shaped pulses from said pulse shaping means to the output circuitry of a photomultiplier tube such that said shaped pulses are combined with the output pulses provided by the output circuitry of the photomultiplier tube.

4,033,336

SYSTEM FOR SENSING AND RECORDING MEDICAL INFORMATION

Frank H. Murawski, Tarpon Springs; James W. Elliott, Seminole; Fred W. Richards, and Gordon L. Johns, both of Clearwater, all of Fla., assignors to Medical Scientific International Corporation, Clearwater, Fla.

Filed Nov. 19, 1975, Ser. No. 633,411

Int. Cl.² A61B *5/00*

U.S. Cl. 128—2.05 R **8 Claims**

1. A system for measuring and recording various characteristics relating to the human body on a magnetic tape cassette, comprising:

- an anthropometer for measuring height, weight and girth of the human body;
- a blood pressure monitor including a cuff and microphone pickup mounted on said cuff for sensing the sounds produced by pulsations of the blood stream;
- an electrocardiogram unit comprising a plurality of input electrodes for connection to the limbs of the human body and a sensing circuit responsive to said output electrodes for providing the standard electrocardiogram leads;
- each of said anthropometer, blood pressure monitor and electrocardiogram unit producing analog data signals representative of the various mesurements taken;
- a plurality of controls for selectively actuating said anthropometer, blood pressure monitor, and electrocardiogram unit;
- control means including a test code generator responsive to actuation of said controls for producing different test code signals corresponding to the various measurements to be performed;
- an analog to digital converter for converting said test code signals and said analog data signals into digital code signal and digital data signals, respectively;
- multiplexer means responsive to said test code signals for selectively supplying said analog data signals from said anthropometer, blood pressure monitor and electrocardiogram unit to said analog to digital converter; and
- means for recording said digital code signals and said digital data signals produced by said analog to digital converter in a predetermined relationship on a magnetic tape cassette.

4,033,337

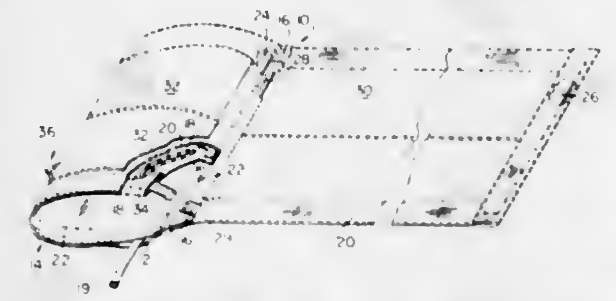
SELF-DONNED SPHYGMOMANOMETER CUFF

Jan Raczkowski, Glendale, N.Y., assignor to Propper Manufacturing Company, Inc., Long Island City, N.Y.

Filed Jan. 14, 1976, Ser. No. 648,867

Int. Cl.² A61B *5/02*

U.S. Cl. 128—2.05 C **8 Claims**



1. A sphymomanometer cuff adapted to be applied by a patient on his limb without assistance comprising a cuff body made of a flexible unstretchable sheet material terminating in first and second ends and having a pocket portion adapted to receive an inflatable bladder disposed between said first end and a point intermediate said ends; at least one elastic band having a portion passing between said intermediate point and said first end to form said body between said intermediate point and said first end into an expandable loop, and a portion extending along said body to a fastening point thereon; means for guiding said at least one band with respect to said body so that both portions of said at least one band are stretched when said expandable loop is applied over said limb; and means for removably securing the portion of said body lying between said intermediate point and said second end to said loop to form an unyielding loop.

4,033,338

VIBRATORY FEMININE HYGIENE VACUUM DEVICE

Kingsley Igwebike, 4152 Somerset Drive, Los Angeles, Calif. 90008

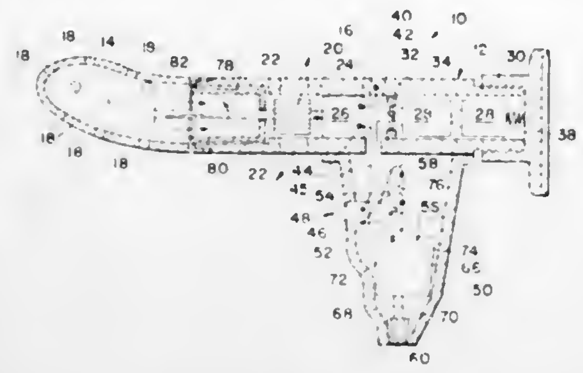
Filed June 4, 1976, Ser. No. 692,725

Int. Cl.² A61H *1/00*

U.S. Cl. 128—36 **2 Claims**

1. A feminine hygiene vacuum device comprising: a housing including an elongated tubular flexible intake portion for insertion into the vaginal tract; a plurality of spaced-apart intake ports formed in the tubular wall of said intake portion; motor means with said housing; an impeller within said hous-

ing driven by said motor means, said impeller being positioned for setting up a path of air flow radially inward through said intake ports and longitudinally along the interior of said intake portion; and a collection bag within said housing intermediate said path of air flow.



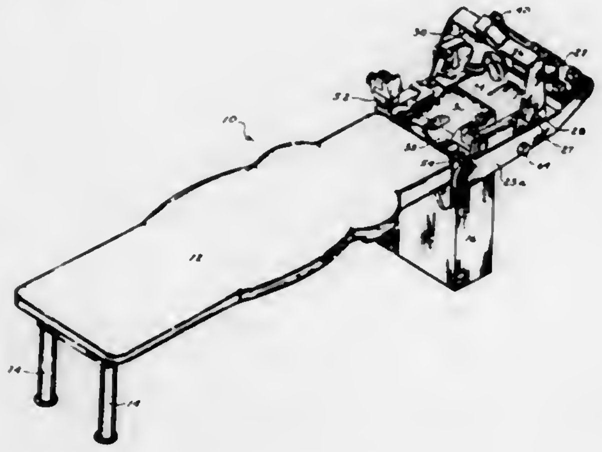
4,033,339
CERVICAL SIDE POSTURE TABLE HAVING EFFECTIVE HEAD RESTRAINT MEANS

William Powell Roberts, Tampa, Fla., and Gratz Linwood Roberts, Jr., Aedelphi, Md., assignors to said William P. Roberts, by said Gratz L. Roberts

Filed Aug. 12, 1975, Ser. No. 604,030

Int. Cl.² A61F *5/00*

U.S. Cl. 128—68 **30 Claims**



1. In a headrest assembly for use in treating patients, means for contacting the head of a patient and painlessly immobilizing the head against motion during treatment of the patient, one of said means being a contoured mastoid support member providing at least a portion of the support for the head and configured to contact and bear against a lower portion of the mastoid bone, and pressure applying means disposed above the level of said mastoid support member for applying pressure on another portion of the head, to assert force in a direction serving to cause additional pressure on the head against said mastoid support member, thus to effectively minimize unwanted head motion.

4,033,340
SURGICAL COMPRESSION-DISTRACTION INSTRUMENT

Viktor Konstantinovich Kalnberz, ulitsa Stendera, 13, kv. 2, Riga, U.S.S.R.

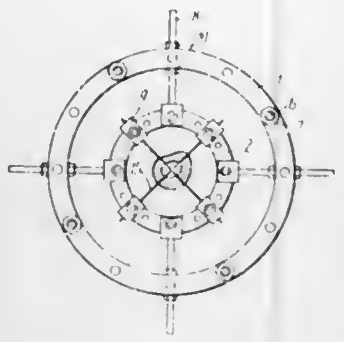
Filed Dec. 9, 1974, Ser. No. 531,192

Claims priority, application U.S.S.R., Dec. 14, 1973, 1973053

Int. Cl.² A61F *5/04*

U.S. Cl. 128—92 A **4 Claims**

1. A surgical compression-distraction instrument for treating injuries and diseases of bones and joints, comprising: needles that can be passed through affected bone fragments of a limb to be joined; ring frame means having attachments for immobilizing said needles; longitudinal members interconnecting said ring frame means to form a single frame system about the affected limb, at least one of said ring frame means being formed as a set of two concentric, spaced-apart rings, substantially in the same plane, namely an inner ring and an outer one, capable of withstanding lateral, rotary and angular tensional forces, said inner ring carrying said needles and rods that radially protrude therefrom, said rods being also fastened to said outer ring, while the latter is connected with said longitudinal members, and load-bearing threaded attachments for fastening said rods to said outer ring at any point along said rods as well as over a selected section along the circumference of said outer ring, so that said inner ring, and hence the affected bone fragments, can be set to any desired position within said outer ring.



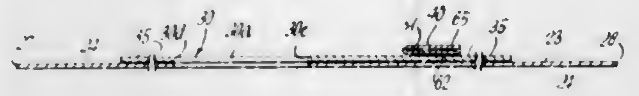
4,033,341
SURGICAL DRAPE HAVING IMPROVED RETAINING MEANS

George W. Scrivens, Edison, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 3, 1976, Ser. No. 663,958

Int. Cl.² A61B *19/06*

U.S. Cl. 128—132 D **28 Claims**



1. A surgical drape comprising a main sheet of flexible, drapable material, said main sheet having an upper surface, a lower surface, a top edge, a bottom edge, and a pair of opposed side edges, said main sheet having secured to its upper surface along a single line of attachment at least one retainer member made from a generally flexible material and comprising an elongated, open-ended conduit through which flexible elements such as suction tubing and the like may be threaded and thereby retained in desired position on the drape.

4,033,342
NASAL PROTECTIVE SPLINT

Norman M. Lake, 1705 Newport Drive, Lancaster, Pa. 17602

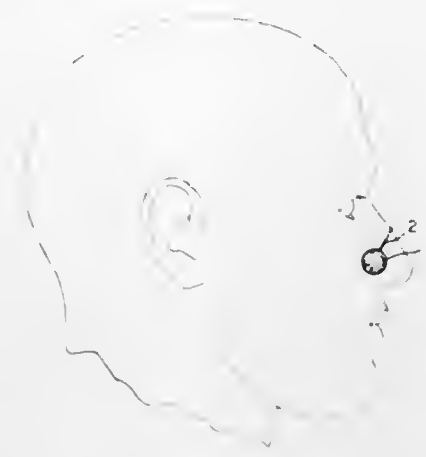
Filed Sept. 5, 1975, Ser. No. 610,655

Int. Cl.² A61M *16/00*

U.S. Cl. 128—140 N **2 Claims**

1. A new process of employing a particular nasal splint for helping the human nose maintain its mucous membranes in good condition, said splint comprising a U-shaped wire spring for straddling the nose and having two nubs each circular in outline with two convex side faces, each leg of the U-shaped spring being embedded in a different one of the nubs, said nubs being biased towards each other by said spring, said process comprising locating the splint such that the spring of the splint presses the nubs in on the sides of the nose in the

area defined by the portion above the alae and by the upper portion of the alae, this being done to a degree sufficient to trap or minimize inhalation of airborne irritants into the nose, but insufficient to block breathing and watery secretions therefrom, thus helping the human nose protect against the numerous irritants breathed into the nose during certain seasons of the year.



4,033,343
LUNG VENTILATION EQUIPMENT

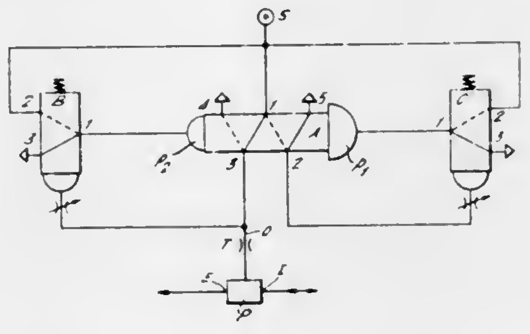
Norman Stewart Jones, Leighton Buzzard, England, assignor to Pneupac Limited, London, England

Filed Nov. 18, 1975, Ser. No. 632,963

Claims priority, application United Kingdom, Nov. 26, 1974, 51251/74

Int. Cl.² A61M *16/00*

U.S. Cl. 128—145.8 **7 Claims**



1. Lung ventilation equipment comprising: an upstream gas pulse source adapted to deliver pulses of breathable gas under pressure at an operating flow rate; downstream patient valve; a line connecting the gas pulse source to the patient valve for delivering the gas pulses from the source to the patient valve; and a sonic-flow restrictor in the line, the restrictor being adjustable for control of the flow rate and having means causing a pressure drop during each breathable gas pulse delivered by the pulse source through the line to the patient valve, the means being arranged to cause the pressure drop predominantly due to choking as a result of sonic flow velocity and negligibly due to resistive impedance, the flow thus being independent of changes in the downstream pressure.

4,033,344
RECOVERY OF CHORIONIC GONADOTROPIC HORMONE FROM PREGNANT MARES

Jack Owen Reed, 1585-B Bergen Blvd., Leonia, N.J. 07605

Filed Apr. 28, 1975, Ser. No. 572,625

Int. Cl.² A61M *5/00*

U.S. Cl. 128—214 R **4 Claims**

1. A method for recovery of chorionic gonadotropic hormone (s) from pregnant mares which comprises:

a. large volume bleeding a pregnant mare;

b. then separating the blood removed from said mare into cellular constituents and plasma;

c. thereafter subjecting the plasma to molecular fractionation separating the plasma into a first plasma fraction containing substances of molecular weight in excess of about 40,000 and a second plasma fraction containing substances of molecular weight less than about 40,000 the last containing the chorionic gonadotropic hormone (s); and

d. returning to the blood stream of the mare the cellular constituents and the first plasma fraction.

4,033,345
AUTOLOGOUS TRANSFUSION FILTER SYSTEM AND METHOD

James L. Sorenson; Karl A. Pannier, Jr., both of Salt Lake City, and Gordon S. Reynolds, Bountiful, all of Utah, assignors to Sorenson Research Co., Inc., Salt Lake City, Utah

Continuation-in-part of Ser. No. 631,584, Nov. 13, 1975, which is a continuation-in-part of Ser. No. 580,087, May 22, 1975. This application Jan. 21, 1976, Ser. No. 651,376

Int. Cl.² A61M *1/02, 5/14*

U.S. Cl. 128—214 R **12 Claims**

1. An autologous transfusion system comprising in combination:

means for aspirating blood from a patient;

a first blood-receiving receptacle comprising means connected to the aspirating means for conducting blood from a patient to the interior of the first receptacle, means for imposing a negative pressure within the first receptacle of sufficient magnitude to accommodate aspiration of blood through the aspirating means;

a second blood-receiving receptacle connected to the first by a hollow conduit which communicates the interior of the second receptacle with the interior of the first and means for unidirectionally controlling blood flow from the first to the second receptacle;

means for reducing the fluid pressure in the second receptacle below the fluid pressure in the first receptacle so as to transfer blood from the first receptacle to the second receptacle;

a blood transfer bag communicating witht the second receptacle so that a blood flow path from the second receptacle to the blood transfer bag is formed;

a filter cartridge comprising at least one filter transecting the blood flow path, said cartridge being interposed between the blood transfer bag and the second receptacle; and

means for delivering positive fluid pressure greater than atmospheric to the second receptacle of sufficient magnitude to forcibly expel the blood from the second receptacle through the filter and into the blood transfer bag without interrupting the negative pressure in the first receptacle.

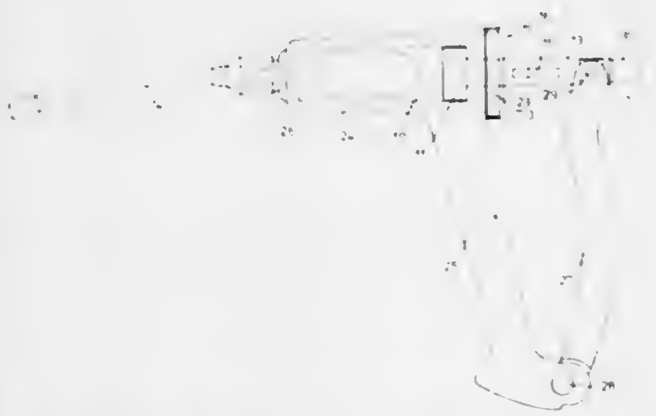
4. An autologous blood transfusion system comprising in combination:

a first rigid blood-receiving receptacle comprising means for receiving blood from a patient and means for impos-

ing a negative pressure within the first receptacle to thereby urge blood from the receiving means to the first receptacle;
a second rigid receptacle, flexible liner normally mounted within the second receptacle and means accommodating unidirectional blood flow from the first receptacle to the interior of the liner, the liner further comprising a blood outlet means through which blood within the liner may be expelled;
at least one filter transecting the flexible liner; and
means for alternately communicating negative and positive fluid pressure between the flexible liner and the rigid receptacle to (1) control the flow of blood into the liner from the first receptacle, and (2) force the blood through the filter and out of the liner through the expelling means.

4,033,346
ADJUSTMENT DEVICE FOR DRENCH GUNS OR SYRINGES

Ian Ross Phillips, Pymble, and Mervyn Frank Reynolds, Dee Why, both of Australia, assignors to N. J. Phillips Pty. Limited, Dee Why, Australia
Filed Aug. 9, 1976, Ser. No. 712,976
Claims priority, application Australia, Aug. 21, 1975, 2874/75
Int. Cl.² A61D *7/00*
U.S. Cl. 128—223 **12 Claims**

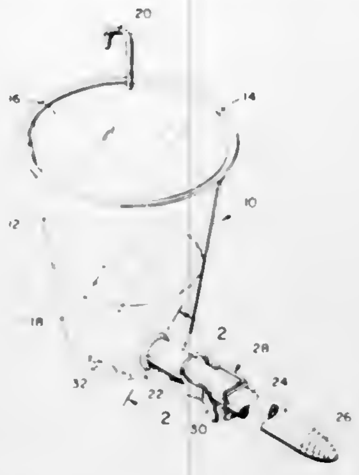


1. A drench gun having an interacting bore and piston, a piston rod extending from said piston, and adjustment means to limit the travel of said piston and piston rod to thereby determine either the dosage delivered by or drawn into the gun, said adjustment means comprising a projection extending radially from the peripheral surface of said rod, recessed means rotatable about and located adjacent said rod, a recess in said recessed means extending longitudinally adjacent said rod and dimensioned and positionable to allow said projection to enter into or pass therethrough, whereby said projection when not aligned with said recess limits the travel of the rod in one direction by engagement with said recessed means while when aligned said projection is allowed to travel further in said direction by entering said recess.

4,033,347
DISPOSABLE SYRINGE

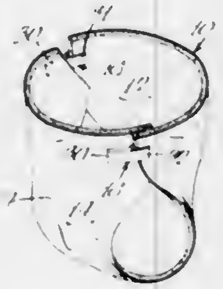
Calvin R. Mapp, 1125 NW. 88th St., Miami, Fla. 33150
Filed Apr. 5, 1976, Ser. No. 673,900
Int. Cl.² A61M *3/00*
U.S. Cl. 128—227 **4 Claims**

1. A disposable syringe comprising:
a ring, collapsible bag, and a u-shaped hook, said ring and said hook being of unitary construction, said bag depending from said ring, said ring forming the mouth of said bag, whereby said bag may be filled with a liquid and hung by said hook from a convenient support, and
a length of flexible hose adapted to be connected to a side wall of said bag and a tubular connector on the sidewall of said bag for receiving said flexible hose, one end of said flexible hose including a contoured tip for insertion into a body cavity.



4,033,348
DISPOSABLE DIAPER HAVING A TAB FASTENER WITH A BIFURCATED FIXED END

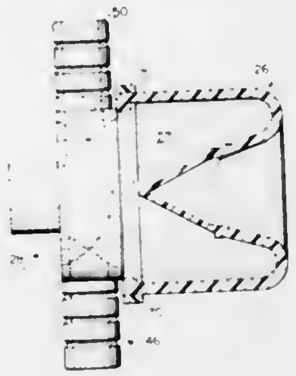
Talivaldis Cepuritis, Kenilworth, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.
Filed Sept. 16, 1975, Ser. No. 613,778
Int. Cl.² A61F *13/16*
U.S. Cl. 128—287 **11 Claims**



1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet in juxtaposition with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and an adhesive tab fastener means at each side marginal edge of the diaper and which comprises:
a unitary elongated tape segment attached to said diaper at a marginal location thereof, having a free working end and a bifurcated fixed end including first and second anchoring legs which are unitary continuations of said working end and which merge together into said working end at a fixed location, opposing faces of said first and second anchoring legs being provided with an adhesive coating; and
a pressure-sensitive adhesive coating covering a discrete area of one face of said free end adjacent the terminus thereof and in spaced relationship outwardly of said fixed location to provide an adhesive free region therebetween; and
release means cooperating with said adhesive coating on said free end and one of said anchoring legs for releaseably retaining said free end in a storage position disposed inwardly of the side marginal edge of the diaper;
said bifurcated fixed end receiving a marginal portion of said diaper between said anchoring legs, said first anchoring leg being permanently attached to said diaper inside surface by the adhesive coating on said first anchoring leg and said second anchoring leg being permanently attached to said diaper outside surface by the adhesive coating on said second anchoring leg;
said adhesive free region on said one face of said free end being unattached to the adjacent surface of said one anchoring leg, whereby said free end is separable from said release means to make said adhesive coating free end of said tape segment available for use in securing said diaper about an infant.

4,033,349
CORNEAL SEAL DEVICE

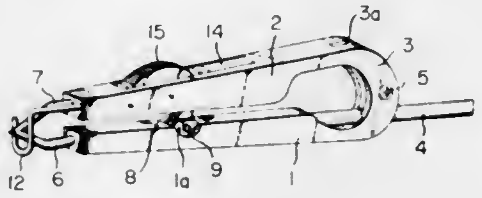
Edward F. Baehr, Berea, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.
Filed Apr. 13, 1976, Ser. No. 676,433
Int. Cl.² A61F *9/00;* **A61B** *17/00*
U.S. Cl. 128—303 R **9 Claims**



1. A corneal seal device for assisting in eye surgery, said device comprising:
a tube member adapted to be introduced into the eye and defining an entry passageway for a surgical tool; and
means defining a seal chamber in fluid communication with the one end of said tube member and including sealable tool entry means therein for sealably engaging a surgical tool introduced into said chamber for passage therethrough into said tube member, and means for connecting said tube member to a source of irrigation fluid for maintaining the intraocular pressure at a desired level.

4,033,350
HAIR TWEEZER DEVICE

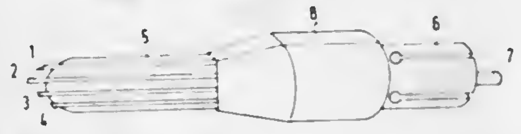
Sadao Hoshi, Tokyo, Japan, assignor to Chitose Corporation, Tokyo, Japan
Filed Sept. 18, 1975, Ser. No. 614,743
Claims priority, application Japan, June 10, 1975, 50-69060
Int. Cl.² A61N *3/04;* **A61B** *17/30*
U.S. Cl. 128—303.13 **1 Claim**



1. A hair tweezer device comprising:
a. a main body substantially in the form of a letter U and including two elongated legs and a curved portion, said curved portion being slightly flexible;
b. a high frequency wave conductor introduced into one of said legs of said main body;
c. a pair of hair clamping members each extending axially forward from a forward end of one of said legs, said hair clamping members being disposed in a spaced juxtaposed relationship and including tips adapted to be brought into and out of engagement with each other, said hair clamping members being connected to said high frequency wave conductor;
d. a safety guide movably arranged in one of said legs of the main body and extending axially forward and outward from said leg thereof, said safety guide including a bent forward portion adapted to move forward and rearward relative to the tips of the hair of clamping members;
e. a setting lever mounted in one of said legs and partially exposed to the outside; and
f. a link mechanism operatively connected to said setting lever and mounted in said two legs, said link mechanism including a setting link and adapted to be rendered operative, upon actuation of said setting lever, to move the setting link in pivotal motion to thereby cause said safety guide to project forward a greater distance from the forward end of the leg than the tips of said hair clamping members, said link mechanism also being operative to bring the tips of the hair clamping members into and out of engagement with each other by utilizing the flexibility of the curved portion of the main body to clamp a hair and hold the same for a predetermined time interval, whereby the hair can be plucked out by the action of high frequency waves while avoiding direct contact on the tips of the hair clamping members with the skin by means of the safety guide.

4,033,351
BIPOLAR CUTTING ELECTRODE FOR HIGH-FREQUENCY SURGERY

Gert Hetzel, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Continuation of Ser. No. 570,792, April 23, 1975, abandoned. This application Sept. 14, 1976, Ser. No. 723,170
Claims priority, application Germany, June 14, 1974, 2428886
Int. Cl.² A61B *17/36*
U.S. Cl. 128—303.14 **2 Claims**



1. In a bipolar cutting electrode for high-frequency surgery, including a source of high frequency voltage, a plurality in excess of two, of mutually insulated, high-frequency voltage-conductive metallic tip potions in fixed spacing relative to each other, means for connecting said tip portions to said source of high frequency voltage, said metallic tip portions comprising ground ends of wire-shaped elements, an insulating member having a tip, said metallic tip portions being inserted into the tip of said insulating member so that the ground ends project therefrom forming the cutting zone of the electrode; the improvement comprising: said insulating member being substantially flat in the region of the cutting zone, said metallic tip portions being displaced relative to each other in the longitudinal direction of said electrode at the tip of said flat insulating member in a row along an arc, said cutting electrode being able to leave thereby a substantially smooth cut in a relatively narrow cavity of a body whereby a high frequency contact between at least two metallic tip portions is always maintained under an inclined holding of the cutting electrode.

4,033,352
CASTRATING DEVICE

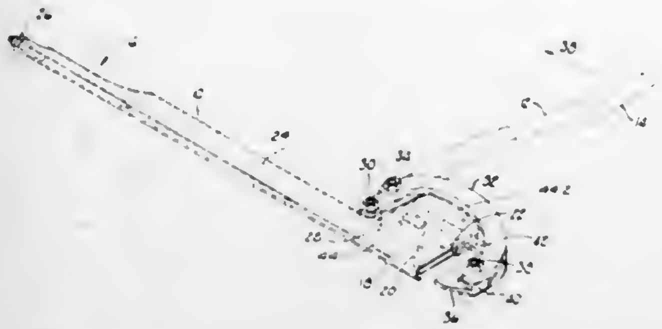
Jacob Hellmuth van Reenen, Private Bag 20, P.O. Headlands, Rhodesia

Filed Sept. 29, 1975, Ser. No. 617,866

Claims priority, application Rhodesia, Sept. 30, 1974, 386

Int. Cl.² A61D *1/06;* **A61B** *17/00*

U.S. Cl. 128—306 **10 Claims**



1. In a castrating device which has two jaw plates and two arms, the two arms being pivotally moveable with respect to each other and comprising means for moving the jaw plates rectilinearly so that they may be separated from each other or brought to a closed position in which they are substantially in contact with each other over virtually their entire respective lengths the improvement wherein:

a. The relative movement of the jaw plates is along a straight path and

b. wear-compensating means is operatively connected to at least one jaw plate to adjust any pressure between the jaw plates when the latter are in the closed position.

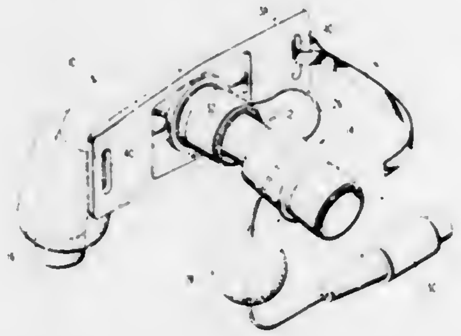
4,033,353
TRACHEOSTOMY TUBE

John La Rosa, Warwick, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Oct. 16, 1975, Ser. No. 623,115

Int. Cl.² A61M *16/00, 25/02*

U.S. Cl. 128—351 **38 Claims**



1. A tracheostomy tube comprising:

an outer cannula for insertion into a trachea, said outer cannula having interior and exterior extremities, said exterior extremity of said outer cannula having means for connection to a respirator;

an inner cannula disposed to fit removably within said outer cannula, said inner cannula having interior and exterior extermities;

means for preventing significant gas flow between said inner and outer cannulae; and

an adaptive member having an interior nutating connection to said inner cannula, said adaptive member also including at its inner end means for connection to said exterior extremity of said outer cannula and at its outer end means for connection to a respirator, said nutating connection comprising an exterior annular groove on the exterior extremity of said inner cannula and an interior annular ridge within said adaptive member, said ridge fitting within said groove and connecting said inner cannula to said adaptive member while allowing limited movement therebetween, the width of said groove being significantly greater than the width of said ridge and the inside diameter of said groove being significantly less than the diameter of the inner surface of said annular ridge.

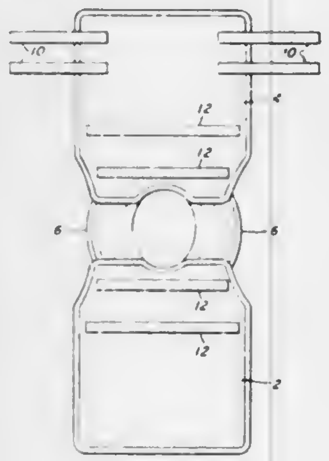
4,033,354
COOLING GARMENT

Maria I. De Rosa, 1928 Strawbridge Drive, Library, Pa. 15129

Filed Dec. 5, 1975, Ser. No. 595,238

Int. Cl.² A61N *5/00*

U.S. Cl. 128—379 **10 Claims**



1. A vest-like garment for cooling the body of the wearer, comprising:

an insulated front panel;

an insulated rear body panel;

shoulder straps connecting the top of the front body panel to the top of the rear body panel;

first matable strip fasteners secured to the sides of the front body panel;

second matable strip fasteners, releasably attachable to the first matable strip fasteners, secured to the sides of the rear body panel, such that when the first matable strip fasteners are secured to the second matable strip fasteners, the garment is secured to the body of the wearer;

third matable strip fasteners attached to the inside of the front and rear body panels;

a plurality of sealed waterproof bags filled with water;

fourth matable strip fasteners, releasably attachable to the third matable strip fasteners, each of said fourth matable strip fasteners being secured to a plurality of the sealed waterproof bags, such that, when the sealed waterproof bags are frozen and releasably secured to the inside of the garment by securing the fourth matable strip fasteners to the third matable strip fasteners, the garment cools the body of the wearer.

4,033,355
ELECTRODE LEAD ASSEMBLY FOR IMPLANTABLE DEVICES AND METHOD OF PREPARING SAME

David Charles Amundson, Minneapolis, Minn., assignor to Cardiac Pacemakers, Inc., St. Paul, Minn.

Filed Nov. 28, 1975, Ser. No. 635,909

Int. Cl.² A61N *1/00*

U.S. Cl. 128—404 **6 Claims**

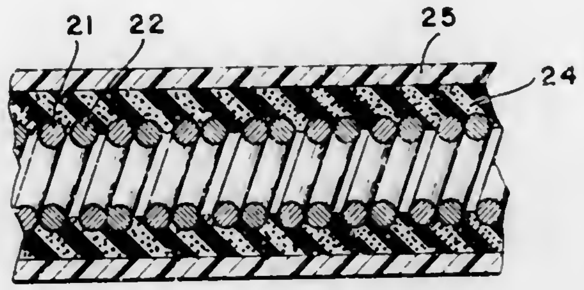
1. In an implantable electrode lead assembly for coupling an electrical stimulator pulse generator to an electrode tip means in contact with an internal organ to be stimulated, said electrode lead assembly comprising:

a. conductor means encapsulated generally coaxially within a flexible cylindrical sleeve means and with said conductor means and said sleeve extending continuously between said pulse generator and said electrode tip means, said conductor means defining a conductive path from said pulse generator to said electrode tip means;

b. said conductor means including a coiled electrical conductor would generally helically about a central axis and having a generally uniform outer diameter;

c. said flexible cylindrical sleeve means comprising first and second coaxially disposed tubular elements enclosing said coiled conductor means and encapsulating said conductor means therewithin, with the inner diameter of said first tubular element being less than the outer diameter of said coiled conductor and compressively gripping the outer diameter of said conductor and with the inner diameter of said second tubular element being less than the outer diameter of said first tubular element and compressively gripping the outer diameter of said first tubular element;

d. said first tubular element comprising a semi-conductive silicone rubber having a resistivity of below about 130 ohm-cm., with said second tubular element comprising an electrically insulating silicone rubber.



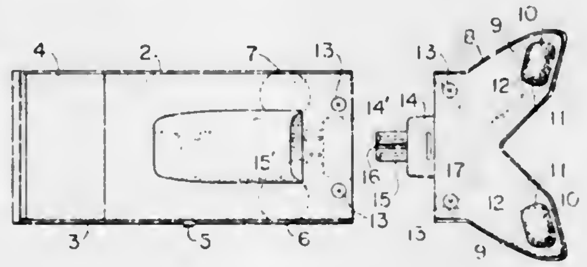
4,033,356
APPARATUS FOR THERAPEUTICAL TREATMENT AND STIMULATION OF MUSCLES BY LOW-FREQUENCY OSCILLATING ELECTRIC CURRENT

Takaaki Hara, Tokyo, Japan, assignor to Hakuju Institute for Health Science Co., Ltd., Japan

Filed Aug. 20, 1975, Ser. No. 606,091

Int. Cl.² A61N *1/04*

U.S. Cl. 128—405 **3 Claims**



1. Apparatus for therapeutical treatment and stimulation of muscles using a low-frequency oscillator circuit, said apparatus comprising a hand-held housing containing a low-frequency oscillator circuit and a power source for said circuit comprising dry cells, an electrode section having two electrodes separated from each other, and a plug for detachably connecting said electrode section to the housing so as to complete an electrical connection between said electrodes and said oscillator circuit so that, in use of said apparatus, electric current is applied to the muscles of the human body so as to remedy pain and fatigue and strengthen the muscles by stimulation, said housing having a plug receptacle into which the plug of the electrode section is fitted, said electrode section including first and second outwardly extending arms arranged in a V-shaped configuration and forming an oblique angle with respect to said housing, each of said arms containing an electrode at the end thereof, each said electrode comprising a bowl-shaped sheet of metal and a sponge member of a shape conforming to the outer configuration of said bowl-shaped sheet adhesively secured thereto.

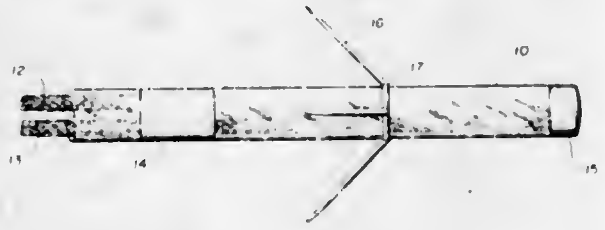
4,033,357
NON-FIBROSING CARDIAC ELECTRODE

John R. Helland, and Kenneth B. Stokes, both of Minneapolis, Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 547,822, Feb. 7, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,355

Int. Cl.² A61N *1/04*

U.S. Cl. 128—418 **11 Claims**



1. A non-fibrosing low stimulation threshold lead assembly for permanent implantation in an animal body comprising:

a. at least one electrode formed from conductive material with at least the body tissue exposed surface thereof formed from a non thrombogenic material; and

b. a conductive lead connected to said at least one electrode; and,

c. encapsulating means with tissue contacting surfaces formed from a non-thrombogenic insulating material, said encapsulating means covering said conductive lead and the connection of said conductive lead to said at least one electrode while leaving a portion of the exposed surface of said at least one electrode exposed for contact with body tissue to be stimulated.

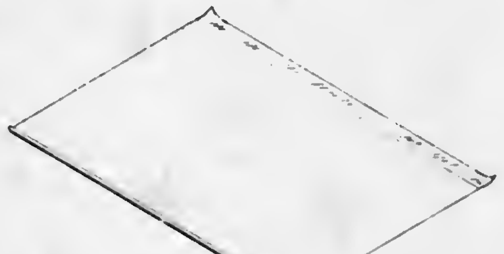
4,033,358
INTEGRAL CIGARETTE PAPER HOLDER ELEMENT

Duane Earl Harrington, 26843 Calaroga Ave., Hayward, Calif. 94545

Filed Apr. 6, 1976, Ser. No. 674,213

Int. Cl.² A24D *1/08;* **A24F** *9/14*

U.S. Cl. 131—15 R **7 Claims**



1. A cigarette paper with an integral cigarette holder comprising a thin paper material having a substantially noncombustible, thin, elongated support element integrally secured to said paper, said element being longitudinally arranged along the length of a cigarette rolled with said paper, said element being exposed in part on consumption of the cigarette by smoking, wherein said exposed part comprises a holder means for support of the cigarette.

4,033,359
SMOKING MIXTURE

James Borthwick, Glasgow, and James Forrester Morman, Troon, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 125,809, March 18, 1971, abandoned. This application Mar. 5, 1974, Ser. No. 448,356

Claims priority, application United Kingdom, Mar. 23, 1970, 13866/70

The portion of the term of this patent subsequent to May 27, 1992, has been disclaimed.

Int. Cl.² A24B *3/14*

U.S. Cl. 131—17 AC **11 Claims**

1. A smoking mixture in fabricated form comprising
- a. 15–60% by weight of tobacco, based on the weight of said mixture,
- b. binder in amount sufficient to fabricate this mixture into the desired form, and
- c. from 40 to 65% by weight of a harmless filler, the combination of cations and anions in the filler being such that the smoking mixture has a puff number of 10–12. determined by subjecting a 1.1 g cigarette 70 mm long and 25 mm in circumference to a smoking procedure with puffs of 25 ml in 2 seconds followed by a 58 second rest period and the cigarette smoked down to a butt length of 20 mm, the anion of the filler being formate, oxalate, citrate, tartrate, silicate, carbonate, chloride, sulphate, phosphate, borate, oxide, dioxide or aluminate and the cation of the filler being sodium, potassium, calcium, magnesium, iron or titanium.

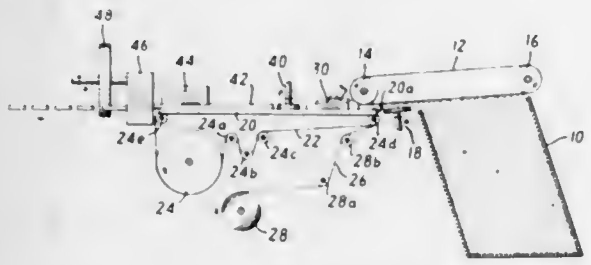
4,033,360
APPARATUS PROVIDING OUTPUT INDICATION OF TOBACCO ROD FIRMNESS

John F. Nienow; Charles T. Higgins, and Leo F. Meyer, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Dec. 5, 1975, Ser. No. 638,080

Int. Cl.² A24B *7/14;* **A24C** *5/32*

U.S. Cl. 131—21 B **11 Claims**



1. In cigarette making apparatus of type having a garniture for imparting curvature to a garniture tape, and thereby to cigarette paper and tobacco disposed on said tape, and short tongue means including (a) a foot member engageable with said tobacco and cooperative with said garniture for imparting generally cylindrical shape to said tobacco to form a tobacco rod (b) a base member fixedly supported in said apparatus and (c) an elongate beam member fixedly secured at one end thereof to said base member, said one end being thereby restrained against movement, and supporting said foot member at the other end thereof for movements according with change in firmness of said tobacco rod, the improvement comprising first and second strain gage means supported on respective opposed sides of said beam member in such locations that said first strain gage exhibits stress change of sense opposite to the stress change exhibited by said second strain gage means on such movement of said foot member.

4,033,361
TOBACCO-SMOKE FILTERS

Henry George Horsewell, Totton, and Ian Richard Harris, Alton, both of England, assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed June 11, 1975, Ser. No. 585,983

Claims priority, application United Kingdom, June 17, 1974, 26780/74

Int. Cl.² A24D *1/06*

U.S. Cl. 131—262 A **12 Claims**

1. A tobacco-smoke filter containing, as adsorbent for volatile tobacco-smoke constituents, a particulate macroporous amine-type anion-exchange resin which contains substantially primary amino groups only.

4,033,362
FILTER FOR TOBACCO SMOKE

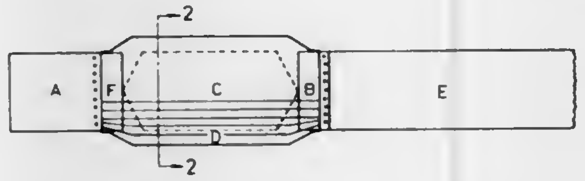
Sven-Olof Almqvist, Saltsjobaden; Curt R. Enzell, Lidingo; Lasse O. Hjern, Vallentuna, all of Sweden; Antoine Artho, Boncourt, and Robert Koch, Porrentruy, both of Switzerland, assignors to Svenska Tobaks AB, Stockholm, Sweden and F.J. Burrus & Cie, Boncourt, Switzerland

Filed Feb. 26, 1975, Ser. No. 553,309

Claims priority, application Sweden, Mar. 13, 1974, 74033473

Int. Cl.² A24D *1/04*

U.S. Cl. 131—264 **2 Claims**



1. Filter for tobacco smoke, comprising a diffusion portion consisting of a membrane separating the smoke stream from the outer air and being permeable to low molecular compounds in the gaseous phase of the smoke for selective removal of low molecular compounds from said tobacco smoke to the surrounding air.

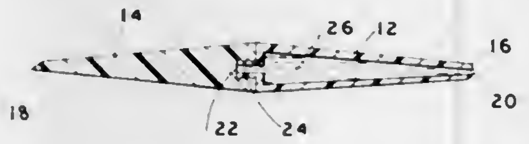
4,033,363
CUTICLE INSTRUMENT

Robert LaCourte, New York, N.Y., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest

Filed Apr. 14, 1976, Ser. No. 677,010

Int. Cl.² A45D *29/16*

U.S. Cl. 132—73.5 **2 Claims**



1. A cuticle instrument for applying a compound to soften a cuticle and for moving cuticles towards the base of a nail comprising a hand-held stick-like instrument having a first section and a second section, said first section terminating in a first bevelled edge and said second section terminating in a second bevelled edge, said first and second bevelled edges being adapted to engage a cuticle, said first section comprising a flexible reservoir having a discharge opening at said first edge and a filler opening at the opposite end thereof, said reservoir being squeezeable between the fingers to discharge a cuticle softening compound through said discharge opening and for retrieving an excessive application of cuticle softening compound by relaxing finger pressure applied to said flexible reservoir, said filler opening having thread means thereon, said second section having thread receiving means at the end thereof opposite said second edge, said thread receiving means being adapted to threadably engage said thread means.

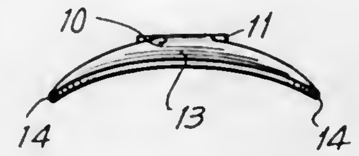
4,033,364
EYE MAKE-UP SHIELD

Margaret Inzana, 274 Logan Ave., Bronx, N.Y. 10465, and Joann Terrett, 3260 Cruger Ave., Bronx, N.Y. 10467

Filed Aug. 13, 1975, Ser. No. 599,513

Int. Cl.² A45D *40/30*

U.S. Cl. 132—88.5 **6 Claims**



1. An eye make-up shield for use in applying mascara to the eyelashes, said shield comprising a handle portion and connected thereto, an eyelid covering portion, said eyelid covering portion simultaneously having a crescent-like shape generally conforming to the shape of a human eyelid and a curvature generally conforming to the curvature of a human eyelid, whereby to enable a user to substantially completely shield her eyelid while leaving her eyelashes exposed when positioning the shield on said eyelid with one hand and to apply mascara to said exposed eyelashes with a separate mascara applicator with the other hand.

4,033,365
FLAVORED DENTAL ARTICLES

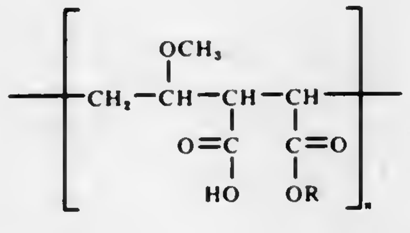
Philip B. Klepak, Bloomsbury; David I. Richardson, Somerset, and Robert G. Fourman, East Brunswick, all of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Filed Jan. 23, 1976, Ser. No. 651,766

Int. Cl.² A61C *15/00*

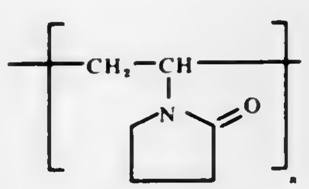
U.S. Cl. 132—89 **12 Claims**

1. A stabilized flavored article for cleaning the teeth comprising a plurality of filaments of a substrate material formed into a larger thread of a sufficiently small diameter to permit insertion between the teeth, said thread impregnated with a polymeric coating containing spray-dried flavor particles, wherein the polymeric coating is selected from the group consisting of
- a. alkyl monoesters of poly(methyl vinyl ether/maleic acid) of the formula:



$$-\!\!\left[\mathrm{CH_2}-\overset{\displaystyle \mathrm{OCH_3}}{\overset{|}{\mathrm{CH}}}-\underset{\underset{\displaystyle \mathrm{HO}}{|}}{\underset{\mathrm{O{=}C}}{\underset{|}{\mathrm{CH}}}}-\underset{\underset{\displaystyle \mathrm{OR}}{|}}{\underset{\mathrm{C{=}O}}{\underset{|}{\mathrm{CH}}}}\right]_n\!\!-$$

  wherein R is an alkyl group containing from 1 to 4 carbon atoms or hydrogen and wherein *n* is from about 3000 to 3400;
- b. polyvinyl pyrrolidones of the formula:



  wherein *n* is from about 100 to 360;
- c. acrylamide/acrylate/butylaminoethyl methacrylate polymers;
- d. vinyl acetate/crotonic acid/vinyl neodecanoate terpolymers;
- e. vinyl acetate/crotonic acid copolymers; and
- f. terpolyamides comprised of the copolymerization products of dicarboxylic acid-diamine reaction product, a second but dissimilar dicarboxylic acid-diamine reaction product and a lactam wherein said terpolyamides have a molecular weight of from about 12000 to about 24000.

4,033,366
UMBRELLA TENT

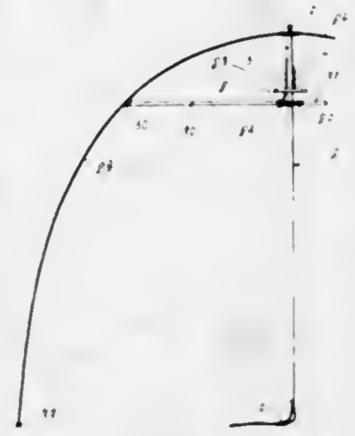
Léonel Forget, 161 Scott St., St. Jerome, Quebec, Canada

Filed Feb. 5, 1976, Ser. No. 655,379

Claims priority, application Canada, May 20, 1975, 227293

Int. Cl.² A45F *1/04, 1/16*

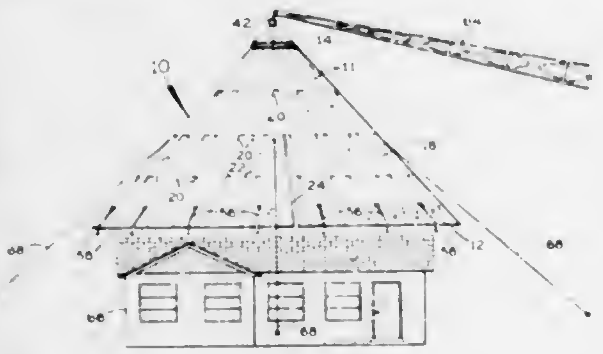
U.S. Cl. 135—2 **1 Claim**



1. An umbrella tent having a height that permits a person to stand upright inside the erected tent comprising a central post defining an upper end and a lower end, resilient one-piece ribs radially mounted around the central post and pivotally connected at their upper ends to the upper end of the central post for movement of each rib in a respective plane substantially coplanar with said post, a flexible tent cloth laid over said ribs and having a central portion attached to the upper end of said post and a peripheral portion attached to the lower ends of said ribs, a first ring surrounding the central post and slidable along the latter, rigid rods, equal in number to the number of ribs, radially projecting endwise around said first ring, and each defining an inner end pivotally connected to said first ring and an outer end pivotally connected to an intermediate portion of a respective one of said ribs, a post extension post and coaxial therewith and having an outside diameter substantially equal to the outside diameter of said central post, said first ring slidable along said central post and along said post extension during opening and closing movements of said tents, between an uppermost position at the lower end of said central post and a lowermost position intermediate the ends of said post extension, a foot-rest fixed to the lower end of said post extension and engageable by one's foot for opening the tent by downward foot pressure exerted thereon while one's hands prevent downward movement of said first ring to thereby cause downward movement of said post extension and central post through said first ring and consequent spreading of said ribs to open-tent position, a locking device mounted on said central post near the lower end thereof and releasably holding said first ring in its uppermost position at the lower end of said central post with said rods and ribs outwardly pivoted to open-tent position, thereby allowing removal of the post extension cleared by the first ring, said ribs, in open-tent position, being maintained in a convex arc-shaped by the outward thrust of said rods on said intermediate portions of said ribs and the inward restraining force of said tent cloth exerted on the lower outer ends of said ribs, said ribs in open-tent position having a length to extend down and rest on the ground and said post extension, when fitted to said central

post, terminating above ground level, and further including a spreader ring slidably mounted on said central post and said post extension, overlying said first ring and independent of the same, and spreading ring having a larger effective diameter than that of said first ring and taking a position just above said first ring in the open-tent position with said rods in substantially horizontal position underneath said spreader ring, movement of said first ring downwardly along said central post and said post extension to collapse the tent allowing downward sliding movement of said spreader ring along said central post and said post extension until said spreader ring is engaged by said rods, so that said spreader ring takes, in the fully collapsed position of said tent, an intermediate position along said post extension wherein it is spaced well above said first ring and forms an inward abutment for said rods to maintain said rods in a limit collapsed position wherein they are upwardly and outwardly inclined from said first ring to facilitate subsequent opening of said tent, said locking device comprises an elongated hook member having one end attached to the central post and the other end releasably hooking the first ring in said uppermost position to said central post in the open-tent position, said spreader ring being formed with an aperture therethrough and through which freely extends said elongated hook member in the open-tent position.

4,033,367
TENT APPARATUS FOR FUMIGATION OF BUILDINGS
Taylor C. Johnston, 3745 S. Lake Drive, Miami, Fla. 33155
Filed Dec. 4, 1975, Ser. No. 637.521
Int. Cl.² A45F *1/12*; A01G *13/02*
U.S. Cl. 135—8 **2 Claims**



1. In a tent for enclosing a building to be fumigated, said tent having a plurality of adjoining flexible panels of substantially gas-tight material which are elongated and progressively narrower from the bottom to the top of the tent, the improvement wherein:

alternate panels in succession around substantially the entire peripheral extent of the tent each have a plurality of manually connectable ties near each side edge of the panel at intervals along the panel length from bottom to top for the connection of any tie to a correspondingly positioned tie on the near side of the next alternate panel to fold behind them the panel which is between said alternate panels for wrapping the tent relatively closely around discontinuities in the building.

4,033,368
GOVERNOR PRESSURE CONTROL APPARATUS FOR VEHICLE AUTOMATIC TRANSMISSION
Noboru Murakami, Nagoya, and Tsunehiko Ogasahara, Kariya, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Toyota, Japan
Filed Sept. 4, 1975, Ser. No. 610,410
Claims priority, application Japan, Oct. 3, 1974, 49-114193
Int. Cl.² G05D *13/36*
U.S. Cl. 137—54 **3 Claims**

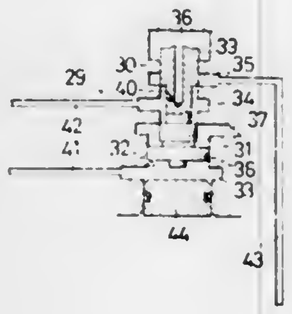
1. A governor pressure control apparatus for vehicle transmission, comprising:

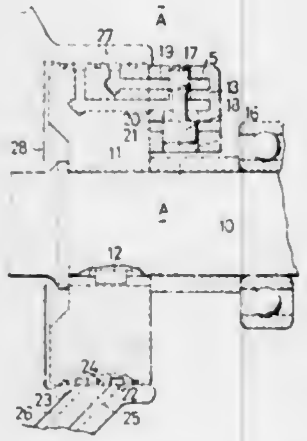
a source of fluid pressure;

governor pressure generating means (28) mounted on a rotational shaft (10) for generating a governor pressure according to the rotation of said rotational shaft (10) and provided with an inlet port (19) fluidically communicated with said source of fluid pressure and an outlet port (20) for supplying a governor pressure; and

governor pressure regulating means (29) including a valve body (30), a valve (31) slidably disposed within said valve body (30) and having a large diameter land (38) and a small diameter land (39), an inlet port (35) fluidically communicated with said source of fluid pressure, an outlet port (34) for supplying a governor modulated pressure, a port (33) for introducing said governor pressure from said outlet port (20) of said governor pressure generating means (28), and a regulating chamber (36) for acting against said governor pressure in order to regulate said inlet port (35) thereof;

whereby the governor pressure generated by said governor generating means (28) is applied against said large diameter land (38) of said governor pressure regulating means (29) and a governor modulated pressure is provided at outlet port (34) by said small diameter land (39) of said governor pressure regulating means (29) in accordance with the rotational speed of said rotational shaft (10).





4,033,369
SAFETY CONNECTOR FOR PRESSURE TANK
Russell D. Keller, Clackamas, Oreg., assignor to Temco Metal Products Company, Inc., Clackamas, Oreg.
Filed Nov. 3, 1975, Ser. No. 628,377
Int. Cl.² F16K *17/00*
U.S. Cl. 137—68 R **10 Claims**

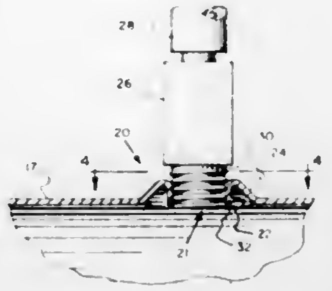
1. In a brake system for a vehicle, the improvement of a tank safety connector apparatus comprising:

a pressure tank for holding gas at greater than atmospheric pressure, having a cylindrical side wall portion and a pair of opposite end portions closing the opposite ends of said side wall portion;

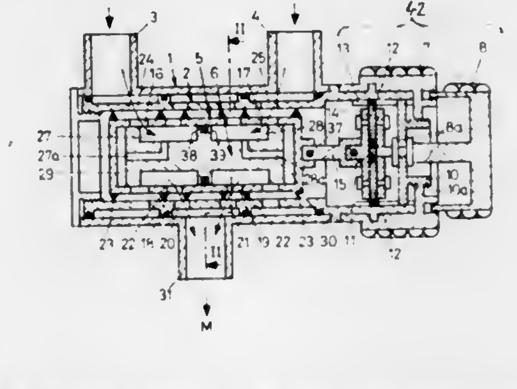
means for connecting said tank to said brake system;

safety connector means provided on the side wall portion of said tank for transmitting said gas through an opening in said side wall portion; and

said connector means including a threaded connector portion surrounding said opening, adapted to receive an insert member, said threaded connector being formed integral with the cylindrical side wall portion of the tank so that said threaded connector deforms when the pressure within the said tank exceeds a predetermined pressure below the bursting pressure of said tank and acts as a safety valve to cause the gas with said tank to slowly leak out through the resulting space between the insert member and said threaded connector.

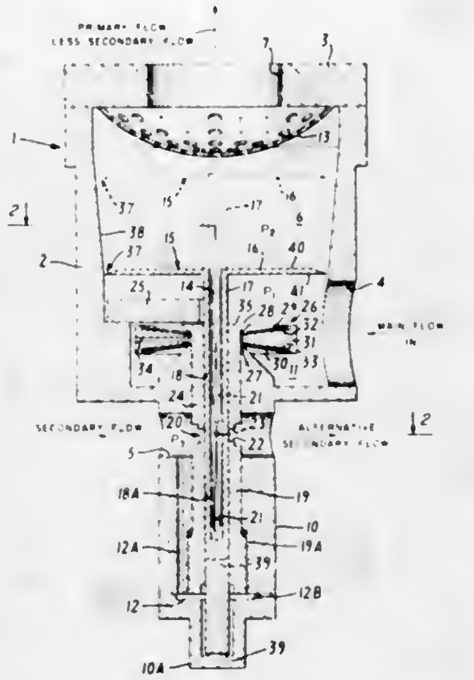


4,033,370
MIXING VALVE FOR CONTROLLING PRESSURE AND TEMPERATURE OF A LIQUID
Werner Egli, Eglisau, Switzerland, assignor to Armaturenfabrik Wallisellen AG., Wallisellen, Switzerland
Filed Oct. 15, 1975, Ser. No. 622,785
Claims priority, application Switzerland, Oct. 15, 1974, 13832/74
Int. Cl.² F16K *11/02*
U.S. Cl. 137—100 **7 Claims**



1. In a mixing valve for mixing two input liquids having different temperatures and pressures, more particularly for mixing cold and hot water having variable openings of passage for controlling both the temperature and quantity of liquid output using a pressure equalizing cartridge, the improvement comprising: said cartridge having a cylindrical housing, a liner member disposed about said cartridge; a plurality of radial discharge openings on said housing, a piston within said cartridge and axially movable in response to pressure variations; a combined control means for controlling liquid temperatures and quantities, said openings forming a part of said control means; said liner having two series of discharge ports and said control means operable to completely block each of the two series of discharge ports in sections of the liner pipe said discharge ports disposed in operative variable connection with the discharge openings; said cartridge disposed for both rotatory and axial movement relative to the liner to vary the operative connection of said discharge ports and discharge openings; said relative axial movement of the pressure equalizing cartridge with a corresponding section of the liner pipe varying the proportions of the input liquids to control the temperature, and said relative rotary movement of the pressure equalizing cartridge with the sections of the liner pipe blocking said discharge ports to control quantity.

4,033,371
PROPORTIONING VALVE FOR VOLUMETRIC PROPORTIONING OF FLOW
Cyril A. Keedwell, Lovedean, England, assignor to Pall Corporation, Glen Cove, N.Y.
Filed June 24, 1976, Ser. No. 699,743
Int. Cl.² G05D *11/00*
U.S. Cl. 137—100 **5 Claims**



1. A proportioning valve for volumetric proportioning of flow in an influent fluid line between two effluent fluid lines, comprising, in combination, a housing; valve chamber; an influent flow passage and two effluent flow passages in the housing in fluid flow connection via the valve chamber; a first valve element interposed across the line of flow between influent and effluent flow passages in a manner to sense influent flow and apportion influent flow between the two effluent flow passages, and mounted in the valve chamber for movement between limiting positions and a multiplicity of intermediate pressure-balanced positions therebetween; the first valve element having a first pressure surface exposed to upstream fluid pressure in the influent flow passage tending to move the valve element in one direction; a second pressure surface exposed to downstream fluid pressure in the valve chamber, tending to move the valve element in the opposite direction; and a third pressure surface exposed to downstream fluid pressure in one effluent flow passage tending to move the element in said opposite direction; the first valve element assuming a position with respect to the limiting positions responsive to influent volumetric flow, and in proportion to such flow and a balancing differential pressure-related force acting on the second and third pressure surfaces; the first valve element defining with side walls of the valve chamber a first variable opening for fluid flow into the chamber from the influent flow passage, the open area of said first opening available for flow being related to the valve position, the first valve element also defining with a wall of said one effluent line passage a second variable opening for fluid flow into the said passage from said chamber, the open area of said second opening available for flow being related to the valve position; the first valve element defining the opening size in proportion to volumetric flow in the influent line into the valve chamber; a second valve element movable independently of and cooperating with the first valve element in defining the size of the second variable opening; the second valve element having a first pressure surface exposed to upstream fluid pressure in the influent flow passage tending to move the valve element in one direction, and a second pressure surface exposed to downstream fluid pressure in the said one effluent line passage tending to move the valve in the opposite direction; bias means urging the second valve element in one direction, and

resisting movement of the second valve element in the opposite direction, but permitting movement in that direction at pressures exceeding a predetermined minimum, in a manner such that its resistance to that movement increases as the valve element moves in that direction; the second valve element being movable against the bias means in response to a sufficient differential pressure between the influent passage and the said one effluent flow passage, to define the variable opening size in response to said differential pressure, the first and second valve elements in combination controlling flow in said one effluent flow passage at a desired volume and pressure in relation to pressure and flow in the influent flow passage.

4,033,372

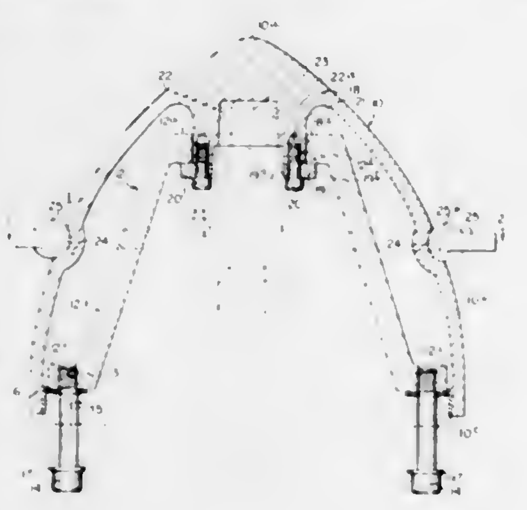
FIRE HYDRANT LOCKING DEVICE

Harold M. Bowman, 29355 Ranney Parkway, Cleveland, Ohio 44145

Filed June 16, 1976, Ser. No. 696,757

Int. Cl.² F16K *35/06*

U.S. Cl. 137—296 **8 Claims**



1. A fire hydrant locking device comprising a rigid spider having a top and a plurality of downwardly extending legs integral with said top at the periphery thereof, each of said legs terminating in a foot adapted to be firmly attached to a fire plug of known type, there being a central circular opening through said spider top, a dome encompassing said spider having a downwardly extending annular skirt of a size to fit snugly around said fire plug, said dome being imperforate and having an apex, said dome having a plurality of inwardly extending wrench-receiving recesses located at a common level part way down the skirt of said dome, having at its apex a downwardly extending enlargment terminating at its lower end in a circular projection axially of said dome and adapted to just extend through and to rotate inside said circular opening in said spider top, said circular projection having a flat bottom surface, a retaining ring having a flat top and being of an outside diameter greater that of said circular opening and adapted to abut said spider top and having an inside diameter permitting attachment to the bottom of said circular projection, removable means for such attachment, and said enlargement having an axial central recess opening downwardly, said last named recess terminating at its upper end in a non-circular opening adapted to snugly fit the operating nut of the hydrant structure of said fire plug, whereby said hydrant may be turned in an opening direction only by a special wrench having projections arranged to fit in said wrench-receiving recesses to rotate said dome.

4,033,373

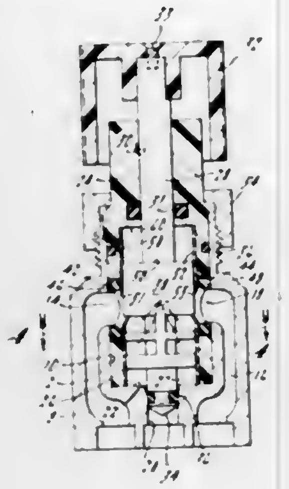
SINGLE HANDLE WATER FAUCET VALVE

Alex Manoogian, Grosse Pointe Farms, Mich., and Eric V. Pullen, Boca Raton, Fla., assignors to Masco Corporation of Indiana, Greensburg, Ind.

Filed June 3, 1976, Ser. No. 692,451

Int. Cl.² F16K *11/02, 19/00*

U.S. Cl. 137—454.6 **13 Claims**



1. A single handle water faucet valve including a housing having a central chamber open at one of its ends, hot and cold water input passages formed therein being connectable to pressurized sources of hot and cold water, respectively, and each communicating with said housing chamber through openings in a wall thereof and a water discharge passage formed therein communicating between said housing chamber and exterior of said housing, the improvement comprising: a valve casing at least partially telscopically received in said housing chamber, a first valve member in said housing chamber and contiguous said chamber movable selectively between positions allowing or blocking water flow from said input passages into said housing chamber, a second valve member in said housing chamber movable selectively between positions allowing or blocking water flow from said housing through said discharge passage, a manually operable handle connected to both said first and second valve members for unitary movement therewith, said handle carried by and extending through said casing from said chamber to exterior of said faucet, first sealing means carried by said casing and forming a watertight seal between said housing and said casing about said water input openings, and second sealing means carried by said casing and forming a watertight seal between said casing and said first valve member, said casing first valve member, second valve member, handle, first sealing means and second sealing all comprising a valve cartridge subassembly capable of insertion and removal from said housing as a unit.

4,033,374

LATCH ASSEMBLY FOR SLAM-SHUT VALVES

Joseph Solomon Danon, El Toro, Calif., assignor to The Singer Company, New York, N.Y.

Filed June 2, 1976, Ser. No. 692,162

Int. Cl.² F16K *17/00*

U.S. Cl. 137—461 **6 Claims**

1. A slam-shut valve comprising:

a. a housing having an inlet and an outlet in communication with a chamber therebetween,

b. a diaphragm housing connected to the valve housing above the chamber,

c. a diaphragm mounted in the diaphragm housing,

d. a pressure chamber formed on one side of the diaphragm in communication with line pressure to signal an overpressure condition which will cause the diaphragm to expand,

e. a release shaft journaled in the diaphragm housing,

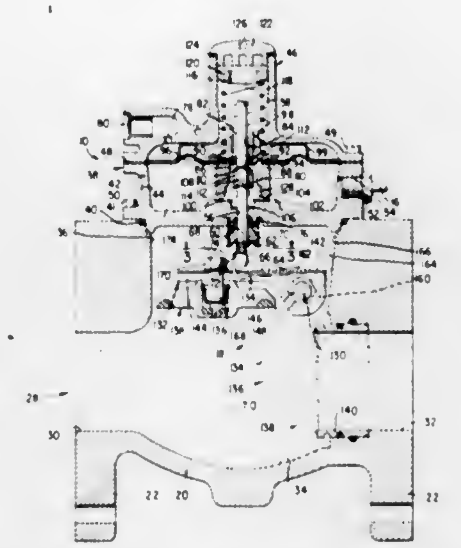
f. a release mechanism connected to the diaphragm normally to hold the release shaft in locked raised position

and upon expansion of the diaphragm to release the shaft and to permit the shaft to drop vertically downwardly,

g. the release shaft having one end extending into the chamber, with a groove formed adjacent said end,

h. a reset shaft journaled in the chamber and adapted to be rotated about its axis therein,

i. a lever pivotally mounted upon the reset shaft and adapted to be raised upon rotation of the reset shaft,



j. a valve element connected to the lever adapted to close the outlet of the valve, and

k. a spring latch affixed to the lever to be unidirectionally yieldable upon raising of the lever, and normally to be engaged within the groove of the release shaft to hold the lever and valve element within the chamber in raised position.

4,033,375

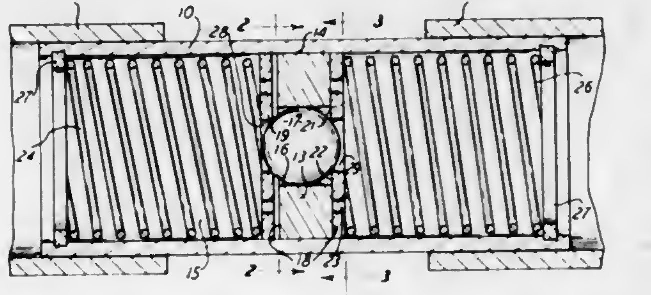
TWO-WAY FLUID PRESSURE RELIEF VALVE

Arthur Edward Hirsch, Terre Haute, Ind., assignor to J. I. Case Company, Racine, Wis.

Filed May 7, 1976, Ser. No. 684,400

Int. Cl.² F16K *15/00*

U.S. Cl. 137—493.9 **3 Claims**



1. A two-way fluid pressure relief valve comprising a valve body having a fluid-flow chamber extending therein, two valve seats disposed spaced apart in said chamber and faced oppositely from each other, a movable valve closure disposed in said chamber and having a plurality of pieces with two of said pieces being movable and fluid-tightly seatable on a respective one of said two valve seats, a spring in said body and operative on each of said two closure pieces and yieldably urging said pieces to their respective seated positions on said valve seats, said valve closure including a spherically-shaped piece disposed between said valve closure two pieces and exposed to fluid pressure in said chamber and movable in response to fluid pressure in said chamber and engagable with said two pieces for respective unseating of said two pieces against the urging of said spring, the diameter of said spherically-shaped piece being greater than the spacing between said two valve seats, such that only one at a time of said valve closure two pieces can seat on its said valve seat.

4,033,376

ROTARY DRUM PLANT WITH WATER INTRODUCTION SYSTEM

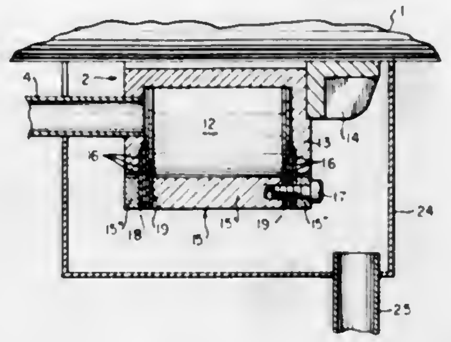
Ib Verner Trelby, Copenhagen, Denmark, assignor to F. L. Smidth & Co., Cresskill, N.J.

Filed Apr. 30, 1976, Ser. No. 681,835

Claims priority, application United Kingdom, May 7, 1975, 19187/75

Int. Cl.² F16L *27/00*

U.S. Cl. 137—580 **20 Claims**



1. A rotary drum plant which comprises a rotatable drum and a shaft connected thereto for rotation therewith, a generally U-configured inner ring member secured to said rotating shaft so as to rotate therewith, with the opening of the U-configured ring member facing radially outwardly, at least one outer stationary ring member having a generally rectangular cross-sectional configuration position about said rotatable U-shaped ring member to form a generally annular chamber with said inner U-configured ring member around said rotatable shaft, at least one conduit connected to the outer stationary ring member and adapted to direct a liquid medium to the chamber, at least one conduit communicating with a rotatable will of said U-configured ring member and adapted to direct a liquid medium from said chamber to said rotatable drum, and sealing means positioned between the stationary and rotatable ring members, each sealing means being comprised of at least one annular sealing element mounted on said stationary ring member and positioned to contact inner surface portions of adjacent corresponding radial wall portions of said U-configured rotatable ring to form a liquid seal between said ring members.

4,033,377

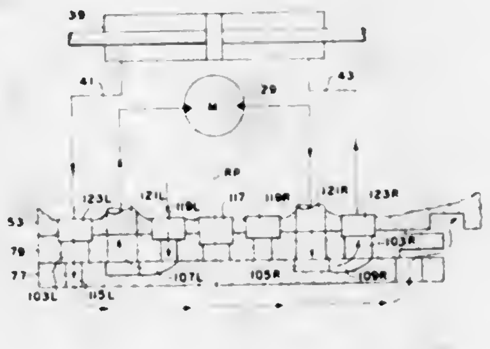
CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES

Oliver Wendell Johnson, Chaska, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation of Ser. No. 507,015, Sept. 18, 1974, abandoned. This application Apr. 23, 1976, Ser. No. 679,607

Int. Cl.² B62D *5/08*

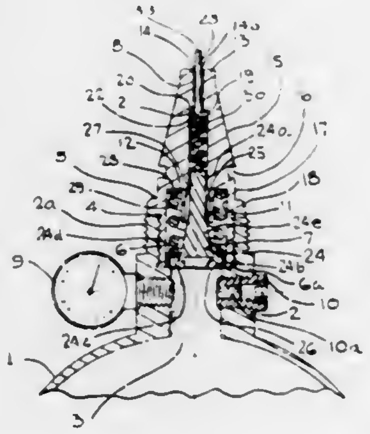
U.S. Cl. 137—596 **18 Claims**



12. A controller for fluid pressure operated devices, said controller comprising:

a. a housing;
b. valve means disposed in said housing including a primary, rotatable valve member and a cooperating, relatively rotatable follow-up valve member, said valve members defining a neutral position relative to each other and having generally coincidental axes of rotation;
c. means coupling said follow-up valve member to said primary valve member for limited movement relative to said neutral position and for common rotary movement therewith;
d. a fluid meter including a metering member movable to measure the volume of fluid which passes therethrough;
e. means coupling said metering member to said follow-up valve member for imparting follow-up movement thereto responsive to movement of said metering member;
f. said controller including an inlet port, an outlet port, and first and second control fluid ports for connection to a fluid pressure operated device, said primary and follow-up valve members cooperating with said housing to define a first plurality of fluid passages connecting said inlet port in fluid communication with said first control fluid port through said fluid meter when said valve members are relatively displaced in one direction from the neutral position, and a second plurality of fluid passages connecting said inlet port in fluid communication with said second control fluid port through said fluid meter when said valve members are relatively displaced in the other direction from the neutral position;
g. said first and second pluralities of fluid passages being oppositely and approximately equally disposed about a reference plane perpendicular to the axes of rotation of said valve members to provide a controller having uniform response in either direction of relative displacement of said valve members.

4,033,378
COMPRESSED GAS VALVE WITH CONSTANT FLOW
Richard S. Pauliukonis, 6660 Greenbriar Drive, Cleveland, Ohio 44130
Filed Dec. 10, 1973, Ser. No. 423,546
Int. Cl.² F16K *11/10*
U.S. Cl. 137—614.19 **2 Claims**



1. A pressure regulating valve comprising:

a valve housing including a first opening means for direct contact with compressed gas at a first housing end and a second opening means for fluid exhaust to the atmosphere at a second housing end, a pressure reducing means in said first opening means slidable from a first neutral position to a second control position regulating fluid flow automatically and in response to the cylinder pressures by means of biasing force means incorporated therein, a main valve means in said second opening means slidable from a first position blocking fluid communication between said first and second opening means to a second position allowing fluid exhaust therefrom, means for shifting said main valve means from one of said positions to the other of said positions, means for maintaining said main valve means in one of said positions including means for substantially constant exhaust of gas flow regardless of pressure variation therein, and control means of siad pressure reducing means when said main valve means are open urging an automatic regulation of fluid flow therethrough, said pressure reducing means including a metering valve sized so that when said first opening means experiences pressure variation said metering valve proportionally varies prevalent flow passages leading to said main valve means for exhaust, said proportionality between said pressure and said flow achieved through use of a needle inside an orifice of said metering valve controlling closely throttle of gas flown therebetween,

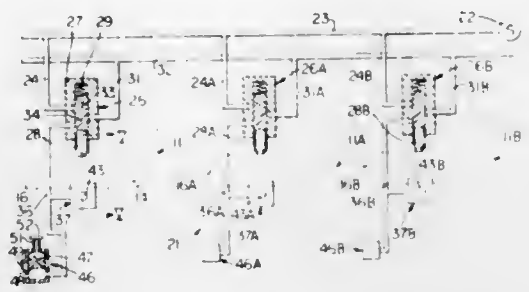
said needle including an elongated taper between a reduced diameter straight stem with and end and an opposite, larger diameter flange which may be skirted,

a metering valve nozzle with an orifice adaptable to receive said stem end with said elongated taper which in operation moves inside said orifice with pressure variation inside cylinder regulated by said valve, including a spring between said needle flange and said orifice providing said biasing force means for said automatic fluid flow regulation, said nozzle also including a flange,

said main valve means including an elongated pin with a head on one end thereof to keep valve closed,

said first valve housing end is provided with a counterbore for housing said metering valve with said nozzle, said second housing end is provided with a central passage therein initiating with a small opening comprising said second opening means of said valve housing serving as fluid exhaust which initiates at said nozzle inside said counterbore, said small opening continuing inwardly from said second housing end toward said first housing end and including a third opening therebetween of a diameter slightly larger than said second opening and slightly smaller than said counterbore, a first shoulder between said first and third openings receiving said flange of said metering valve nozzle while said nozzle facing said first opening, a second shoulder between said second and third openings having said central passage of said second opening to serve as a seat for said head of said elongated pin, a spring in said third opening abutting said head of said elongated pin at one spring end and said stem of said needle entering said third opening slidably for participation in pressure reduction during said valve throttling at the other end, including means for maintaining said main valve means in one of said positions by pressure of compressed gas on said pin head inside said third opeining, said pin protruding said second opening means of said nozzle central passage for shifting said main valve means from said first position blocking fluid communication between said first and second openings to said second position allowing fluid exhaust when said main valve pin is externally depressed, including an automatic valve return to said first position by said gas pressure together with said spring in said third opening as soon as said external pin actuation by depression is discontinued, means for securing said valve housing to a boss of a gas cylinder by said first housing end so as to have said skirted flange of said needle resting on a shoulder provided inside said boss during the initial valve assembly thereto with ability to subsequently move axially therefrom toward said counterbore for flow control during the withdrawal of gas through said nozzle and said metering needle valve regardless of pressure variation in said gas cylinder enabling a regulated atmospheric exhaust at constant gas flow therefrom when said pin is depressed.

4,033,379
PNEUMATIC VALVE INTERLOCK SYSTEM
Clyde E. Tooley, Vicksburg, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.
Filed Dec. 18, 1975, Ser. No. 642,074
Int. Cl.² F16K *35/14*
U.S. Cl. 137—637.1 **11 Claims**



10. In combination with a plurality of remotely located valve assemblies each having a movable external valve operator which is normally maintained in a preselected position, and a fluid-actuated interlock system cooperating with said operators for permitting only a single valve operator to be moved away from its preselected position at any one time, said interlock system being operated solely in response to movement of said operators and independently of flow through said valve assemblies, said interlock system comprising:

a fluid-actuated locking device disposed adjacent and associated with each valve operator to prevent movement of the respective valve operator away from its preselected position when said locking device is actuated, said locking device including a locking member movable between a released and an actuated position, said locking member when in said actuated position preventing any significant movement of said valve operator away from said preselected position;

means associated with each said locking device for normally maintaining the respective locking member in said released position;

conduit means connected to the locking devices for supplying pressure fluid thereto to permit energization thereof;

flow control valve means associated with said conduit means for controlling the flow of pressure fluid to said locking devices, said flow control valve means normally preventing pressure fluid from being supplied to said locking devices; and

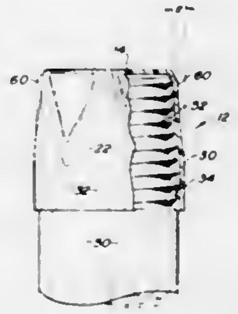
sensing means associated with each said valve operator and interconnected to said flow control valve means for causing opening of said valve means when said sensing means senses the movement of one of said valve operators away from its preselected position, the opening of said flow control valve means by said sensing means causing pressure fluid to be supplied to said locking devices as associated with at least the remaining valve operators to lock same in same preselected positions.

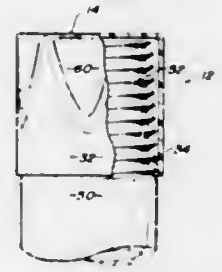
4,033,380
THREAD PROTECTOR
Richard C. Weber, 2589 Sears Road, Stow, Ohio 44224
Continuation of Ser. No. 539,366, Jan. 8, 1975, abandoned, which is a continuation of Ser. No. 348,061, April 5, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,036
Int. Cl.² B65D *59/08*
U.S. Cl. 138—96 T **12 Claims**

1. A thread member and thread protecting device received over at least the threaded portion of said member in a close spaced thread protecting relationship therewith comprising in combination:

said member having standard, tapered pipe threads disposed axially along at least a portion thereof from one end which has a minimum outside thread diameter toward an area spaced inwardly from said one end having a maximum outside diameter; and,

said thread protecting device having a generally cup-shaped body portion including a thin resilient continuous side wall with inner and outer surfaces, a closed bottom end and an open upper end, said cup-shaped body portion increasing in cross-sectional dimension over at least a portion of the axial length thereof from said closed bottom end toward said open upper end; at least said inner surface of said body portion side wall having a generally frusto-polygonal cross-sectioned portion adjacent said closed bottom end and a generally cylindrical portion adjacent said open upper end with said frusto-polygonal and cylindrical portions merging together at a merger zone spaced axially along said body portion inner surface from said closed bottom end toward said open upper end; said frusto-polygonal portion of said inner surface being comprised of alternating sides and transition zones with each of said sides including a pair of corner edges extending generally axially of said side wall inner surface, said frusto-polygonal portion having a minimum inside diameter slightly less than said minimum outside thread diameter and tapering outward from said closed bottom end at an angle greater than the taper angle of said threads with said cylindrical portion having an inside diameter greater than said maximum outside thread diameter, said frusto-polygonal portion sides closely engaging only a portion of at least some of said pipe threads adjacent said threaded member one end.

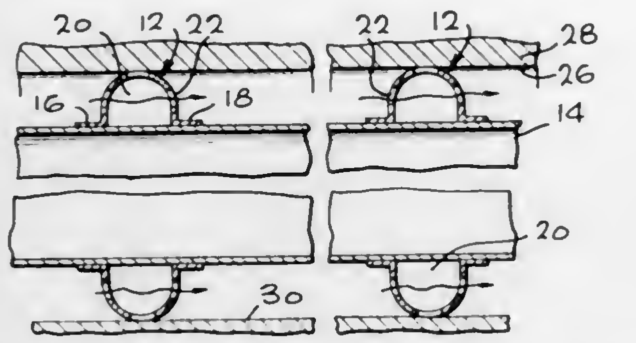




4,033,381
HOT AIR DUCT
Ray Newman, Sun Valley, and Steve Affa, Torrance, both of Calif., assignors to General Connectors Corporation, Burbank, Calif.
Filed June 27, 1975, Ser. No. 590,878
Int. Cl.² F16L *9/18*
U.S. Cl. 138—113 **1 Claim**

1. A hot air duct for use in aircraft comprising a thin walled tube, a plurality of linearly spaced reinforcing rings secured to the external surface of the tube to prevent the tube from collapsing if the internal pressure of the tube drops substantially, each of said reinforcing rings formed from sheet material and comprising a channel-shaped portion with oppositely extending flange mounting portions attached to the channel shaped portion, said reinforcing rings mounted on the external surface of the tube so the channel shaped portions project radially outwardly providing a heat radiating and a spacing

surface around the tube with the channel shaped portion opening inwardly and facing and completely closed off by the external surface of the tube to reinforce the tube, defining thereby a ring shaped chamber around the tube, said oppositely extending flange mounting portions rigidly fastened to the external surface of the tube, an aligned opening formed in each side of each of the channel shaped portions providing thereby communication between the interior and exterior of the channel-shaped portion, said reinforcing rings mounted on the thin walled tube so that the aligned openings in each channel shaped portion of the reinforcing ring are all in linear alignment with each other to define continuous air channels running parallel to the axis of the tube along the length of the tube whereby the external surface of the tube can be cooled readily if a flow of cold air is directed through the said aligned openings in the ring shaped chambers of the reinforcing rings, when said rings engage and serve as a spacer between said duct and a surrounding surface said channel shaped portions extending radially outwardly far enough so if said hot air duct is mounted closely adjacent a surface in the aircraft said channel shaped portions serve as spacers to keep the surface of the tube from rubbing against the surface of the aircraft.



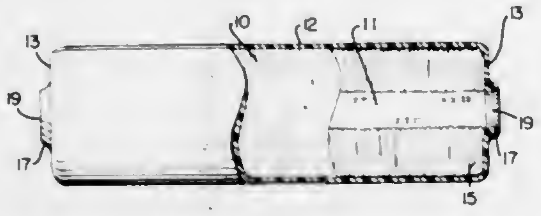
4,033,382
SELF-SUSTAINING STICK OF SHIRRED FOOD CASING

Harry P. Eichin, Western Springs, Ill., assignor to Union Carbide Corporation, New York, N.Y.

Filed Nov. 18, 1974, Ser. No. 524,719

Int. Cl.^{2} F16L *11/08, 11/10*

U.S. Cl. 138—118.1 **4 Claims**



1. A self-sustaining length of shirred and compressed tubular food casing comprising in combination:

a. a stick of shirred and compessed tubular food casing having a bore extending therethrough; and

b. a thin, flexible sheathing material having an aperture with a reinforced edge at each end thereof that is closely drawn and tensioned about the periphery of the full length of said stick of shirred casing and with each of the ends thereof being closely drawn down about at least a portion of the pleats at each end of said stick, and terminating in an aperture with an integral fused bead of sheathing material forming the edges thereof, said reinforced apertures being smaller than the outer diameter of said shirred stick and substantially aligned with the bore through said shirred casing stick, said sheathing material totally retaining said stick of shirred food casing therein and forming a self-sustaining length thereof.

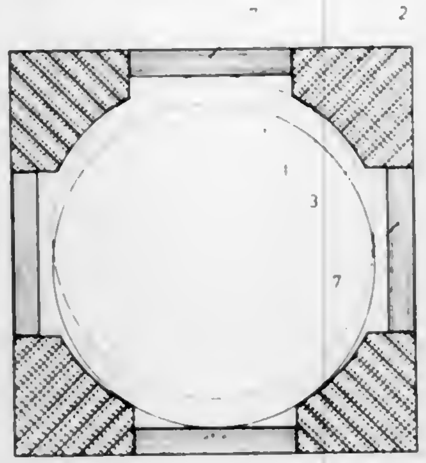
4,033,383
THERMAL INSULATION ASSEMBLY

Peter Josef Heptner, Voerde, Germany, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Continuation-in-part of Ser. No. 535,786, Dec. 23, 1974, abandoned. This application Mar. 1, 1976, Ser. No. 662,668

Int. Cl.^{2} F16L *9/14, 3/00;* **E04B** *1/98*

U.S. Cl. 138—149 **1 Claim**



1. A thermal insulation assembly for enclosing a pressurized duct within an enclosure having four corners comprising:

a pressurized duct;

an enclosure formed around said duct to have four corners;

corrugated energy absorbing insulating means formed at each corner of said enclosure to have a series of layers for insulating the corners of said enclosure and for allowing the enclosure to absorb the forces arising from a rupture of the pressurized duct, each of said series of layers being formed by a plurality of aligned corrugated metal sheets spaced from each other and extending diagonally across each of the corners of the enclosure to minimize thermal conductivity therebetween; and

a series of spaced planar sheets extending between adjacent corrugated insulating means to thermally insulate the pressurized duct along the remainder of the enclosure not insulated by said corrugated insulating means to completely surround said duct by thermal insulation.

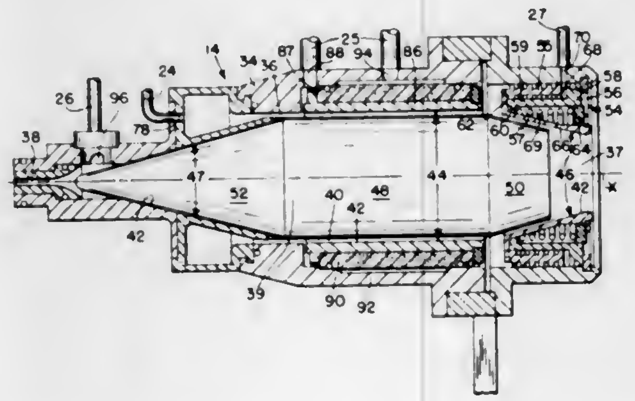
4,033,384
MEANS FOR AND METHOD OF SUPPLYING WEFT YARN TO AN OUTSIDE FILLING SUPPLY LOOM

Karl W. Wueger, North Brookfield, Mass., assignor to Crompton & Knowles Corporation, Worcester, Mass.

Filed Aug. 26, 1974, Ser. No. 500,427

Int. Cl.^{2} D03D *47/36*

U.S. Cl. 139—452 **10 Claims**



1. Apparatus for preparing a length of weft yarn in a magazine for weft insertion in a shuttleless loom comprising:

a. a housing having a chamber which is circular in cross section, an inlet opening connected to one end of said chamber, and an outlet opening connected to the opposite end of said chamber;

b. means for feeding weft yarn to said inlet opening from a supply package;

c. a core movable along its longitudinal axis within said chamber and which cooperates with the inner wall of said chamber to form an annular space therebetween;

d. first actuator means for creating an air flow from said inlet opening to said annular space and for creating a helical air flow within said annular space for depositing a length of weft yarn within said annular space in a helix; and

e. second actuator means for axially withdrawing said length of weft yarn from said annular space through said outlet opening for insertion in a shuttleless loom.

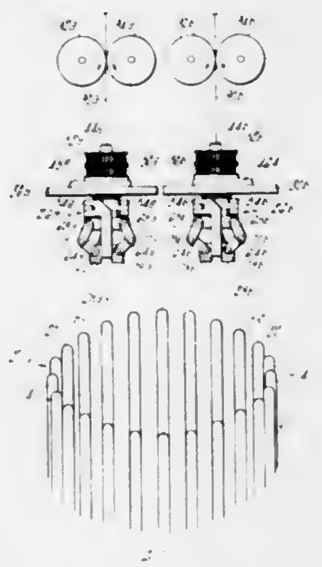
4,033,385
APPARATUS AND METHOD FOR FORMING DYNAMOELECTRIC MACHINE FIELD WINDINGS BY PUSHING

Donald R. Taube, Fort Wayne, Ind., assignor to Essex Group, Inc., Fort Wayne, Ind.

Filed Sept. 2, 1976, Ser. No. 720,039

Int. Cl.^{2} B21F *3/00;* **H02K** *15/04*

U.S. Cl. 140—92.1 **36 Claims**



1. The method of placing magnet wire in slots respectively defined by spaced blades of coil transfer apparatus to form a dynamoelectric machine field winding, said method comprising the steps of: (a) advancing said wire by pushing the same on its axis without applying tension thereto; (b) guiding said advancing wire through a rotating nozzle having a wire dispensing exit at a fixed radial distance from the rotational axis of said nozzle whereby said wire is pushed in a direction away from said dispensing exit; and (c) cyclically varying the relationship of the rate of said pushing to the angular velocity of said nozzle such that said wire is directed from said dispensing exit along a predetermined path having an alternately increasing and decreasing radius in relation to said rotational axis, said path having sections respectively aligned with the open ends of two of said slots whereby said wire is pushed into said slots through said open ends.

4,033,386
WIRING HEAD WITH RESILIENTLY LOCKED AND RESETTABLE GUIDE TUBE MOUNTING ASSEMBLY

Virgil W. Wood, Rockwall, Tex., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Dec. 18, 1975, Ser. No. 642,044

Int. Cl.^{2} B21F *27/00*

U.S. Cl. 140—92.1 **18 Claims**

1. A wiring head for use in guiding wire along a predetermined path, said wiring head including:

housing means having an opening extending centrally therethrough;

multi-directional rotatable means mounted within said opening, and confined for movement about a fixed axis center of rotation, said rotatable means having a central bore extending therethrough;

expandable spring means communicating with said opening for normally resiliently locking said rotatable means into a predetermined position whereat the bore therethrough communicates with the opening through said housing, said spring means upon being expanded allowing the orientation of said rotatable means into an unlocked position encompassing all possible angles of orientation falling within a predetermined maximum degree of angular displacement in any given direction relative to said locked position, and

a wire guide tube secured to said rotatable means, with the bore through the former communicating with the bore through the latter, said guide tube thereby being capable of being tilted from a normal resiliently locked position to any other angle of inclination corresponding to that acquired by said rotatable means, with any force-induced tilting of said guide tube causing said spring means to expand.

4,033,387
METHOD OF MAKING A REINFORCING STRIP

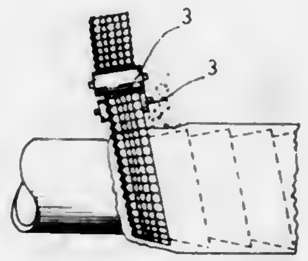
Marc Nijs, Harelbeke; Frits Vanassche, Zwevegem, both of Belgium, and Johannes Arnoldus De Kok, Hoogezand, Netherlands, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed Sept. 17, 1975, Ser. No. 614,227

Claims priority, application United Kingdom, Sept. 27, 1974, 42142/74

Int. Cl.^{2} B21F *27/22*

U.S. Cl. 140—105 **16 Claims**

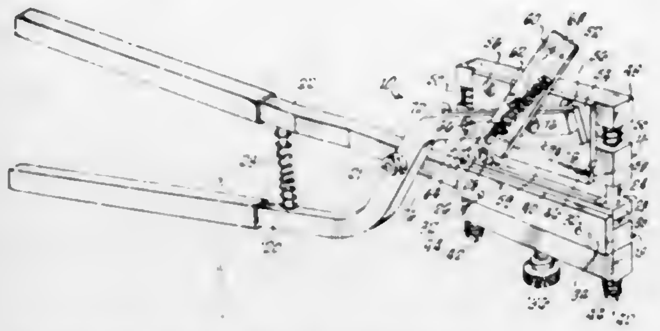


1. A method of making a reinforcing strip comprising providing a strip of welded wire mesh comprising a plurality of longitudinal wires and a plurality of spaced-apart transverse wires welded to said longitudinal wires, the length of longitudinal wire between adjacent transverse wires being substantially uniform across the width of said strip, and deforming at least some of said longitudinal wires to produce a deformation in said at least some of said longitudinal wires which deformation increases progressively across said strip.

4,033,388
BENDING AND CUTTING TOOL

Richard A. Ruegger, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 3, 1976, Ser. No. 682,693
Int. Cl.² B21F *1/00*
U.S. Cl. 140—106 **4 Claims**

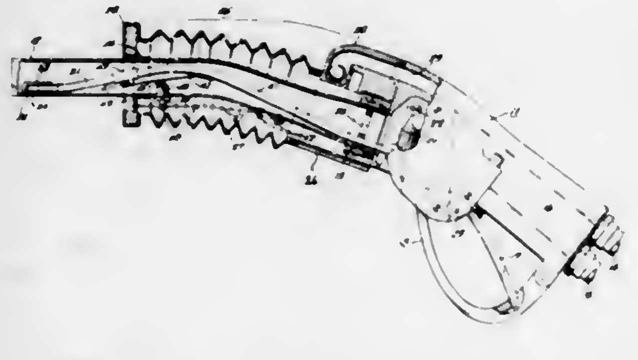


1. A portable scissor-like tool comprising:
- a pair of jaws each having a handle for working an article positioned therebetween;
- said jaws being open at one side to laterally receive the article therebetween;
- means for mounting said jaws for movement in parallel relationship to each other;
- each of said jaws having opposing clamping members for first gripping the article when the handles are initially squeezed together;
- each of said jaws having opposing bending members for bending an end of the clamped article protruding beyond said clamping members upon further squeezing of the handle;
- a cutting member mounted on one of said handles adjacent a corresponding jaw;
- an actuating member resiliently connected to one of said jaws for applying pressure to the respective clamping member of said one jaw adjacent the cutting member;
- a manually operable pivotal link connecting said actuating member to said handle;
- said pivotal link being releasable from said actuating member to enable the handles to be further squeezed together and the cutting member moved relative to the actuating member for trimming off any portion of the article extending beyond the bending members.

4,033,389
INTERLOCK AND LATCHING SYSTEMS FOR A DISPENSING NOZZLE

William B. Hansel, Media, and Myrl A. Lindeman, Newtown Square, both of Pa., assignors to Suntech, Inc., St. Davids, Pa.

Filed Feb. 17, 1976, Ser. No. 656,997
Int. Cl.² B65B *31/00;* **B67C** *3/34*
U.S. Cl. 141—207 **7 Claims**

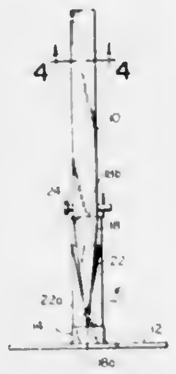


1. A nozzle for dispensing fuel into a fillpipe of a motor vehicle fuel tank and having a system for shutting off the fuel being dispensed when fuel backs up into a fillpipe and comprising:
- a. a discharge spout for insertion into a fillpipe of a motor vehicle fuel tank;
- b. a shut-off valve for shutting off fuel being dispensed by the nozzle;
- c. actuating means for closing said shut-off valve in response to fuel backed up into a fillpipe and including a vent line extending into said discharge spout and having an open end at the discharge end of the discharge spout, said vent line being supplied with a vacuum such that when gasoline covers the open end of the vent line, the pressure in the vent line drops and the pressure drop may be sensed to actuate said shut-off valve; and
- d. an interlock system which prevents the dispensing of liquid through the nozzle until the discharge spout of the nozzle is properly inserted in a fillpipe, and comprising an interlock valve means coupled to the vent line, said valve means having an open position wherein the vent line is open to the inside of the discharge spout so that in the event dispensing is attempted, fuel enters the vent line causing the pressure in the vent line to drop to cause said actuating means to close said shut-off valve and having a closed position wherein the vent lint is not open to the inside of the discharge spout which permits normal operation of the nozzle, and
- e. means, responsive to the nozzle being properly inserted in a fillpipe, for closing said interlock valve means, whereby normal operation of the nozzle is permitted when the nozzle is properly inserted in a fillpipe.

4,033,390
WOOD SPLITTER

Carl Piontkowski, Old Saybrook, Conn., assignor to C & D. Distributors, Inc., Old Saybrook, Conn.

Filed Feb. 2, 1976, Ser. No. 654,636
Int. Cl.² B27L *7/00*
U.S. Cl. 144—193 D **9 Claims**

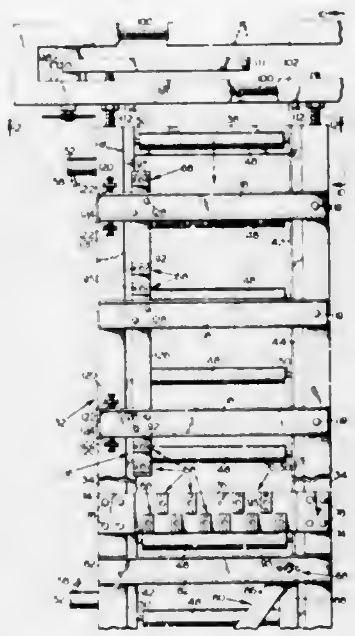


1. A device for splitting logs or the like, and comprising a horizontally extending base for supporting a log to be split in a generally upright orientation, a fixed post carried by the base and extending upwardly therefrom, wedge means slidably mounted on said post for movement toward and away from said base, said wedge means including an elongated sleeve slidably received on said post and a tapered downwardly pointed wedge member spaced from the sleeve, said wedge member having an upwardly facing abutment surface adapted to be struck to drive the lower chisel edge of said wedge member into the log, said wedge means further including bracket means connecting said wedge member to said sleeve and a second wedge member also of downwardly tapered configuration and having a pointed lower chisel edge which defines an included angle slightly greater than that defined by said first mentioned wedge member.

4,033,391
APPARATUS AND METHOD FOR FORMING PLANKS FOR USE IN CHORD COMPONENTS OF INTEGRAL TRUSS-SUPPORTED DECKS

Arthur L. Troutner, Boise, Idaho, assignor to Trus Joist Corporation, Boise, Idaho

Filed Mar. 26, 1976, Ser. No. 670,836
Int. Cl.² B27C *3/04;* **B23P** *3/00*
U.S. Cl. 144—321 **9 Claims**



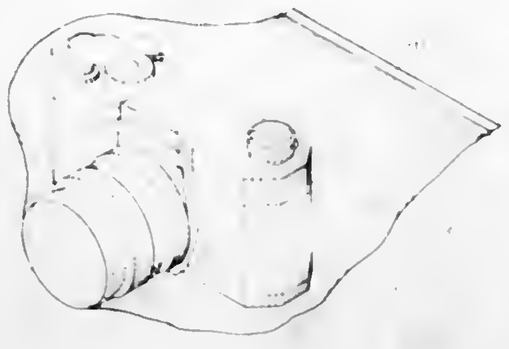
1. An apparatus for forming planks for use in chord components of integral truss-supported decks formed from a plurality of planks interconnected at their leading and trailing edges by splice plates and at their sides by side connectors, comprising:
- a. an elongate frame for supporting the planks,
- b. an end stop located at a first end of the frame for accurately positioning the planks longitudinally in the frame,
- c. a side stop located on one side of the frame for accurately positioning the planks laterally in the frame,
- d. registering means on the frame for registering one of the longitudinal margins of the planks positively with the side stop,
- e. a leading edge drill jig located at the first end of the frame above the leading edge of the planks adjacent the end stop, and a plurality of drill guide means, located in a spaced array in the leading edge drill jig for drilling splice plate attachment holes in a predetermined pattern in the leading edge of the planks,
- d. a trailing edge drill jig located at the opposite end of the frame above the trailing edge of the planks, and a plurality of drill guide means, located in the trailing edge drill jig in a spaced array for drilling splice plate attachment holes in a predetermined pattern in the trailing edge of the planks, and
- g. an edge drill jig located above the frame, and a plurality of drill guide means positioned in the edge drill jig for drilling side connector holes in a longitudinally spaced relation along the sides of the planks.

4,033,392
WEATHERPROOFING DEVICE FOR CAMERAS

Henry R. Less, 248 Bancroft Bay, Winnipeg, Canada

Filed Apr. 23, 1976, Ser. No. 679,673
Int. Cl.² G03B *17/56*
U.S. Cl. 150—52 J **6 Claims**

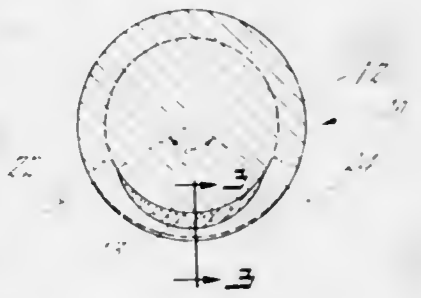
1. A flexible enclosure for cameras which include a lens assembly and a filter screw threadably engageable with the front end of said lens assembly, said enclosure comprising in combination a flexible transparent enclosure, access means to said enclosure, detachable closure means for said access means, a circular aperture formed through the wall of said enclosure remote from said access means, reinforcing means around the edge of the wall defining said circular aperture and means to detachably secure said enclosure to said camera with said camera inside said enclosure, said last mentioned means including a front ring and a rear ring screw threadably engageable together with said reinforcing means being clamped there between in sealing relationship, said rear ring including an inwardly extending flange clampable between the associated filter and the end of the camera lens when said camera is within said enclosure.



4,033,393
SELF-LOCKING FASTENER

Ram D. Bedi, Southfield, Mich., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. Nos. 121,664, March 8, 1971, Pat. No. 3,818,525, and Ser. No. 191,196, Oct. 21, 1971, abandoned. This application May 23, 1973, Ser. No. 362,996
Int. Cl.² F16B *39/01, 39/28*
U.S. Cl. 151—14.5 **19 Claims**



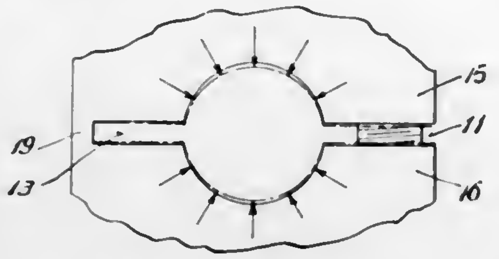
1. A reusable self-locking metallic fastener comprising a body and a thread convolution formed on said body about a central axis, said thread convolution being adapted for engagement with a mating thread convolution, said thread convolution on said body including axially spaced thread crests and interposed troughs between the crests, means disposed on said thread convolution on said body for providing an interfering locking engagement with the mating thread convolution to retard relative rotational movement between said thread convolution on said body and the mating thread convolution to effectively lock the thread convolutions together, said means for providing an interfering locking engagement comprising a metallic patch of lower modulus of elasticity than said thread convolutions bonded to said body and extending axially over surfaces defining a plurality of said crests and substantially filling at least one of said troughs, said patch being thicker in said thread troughs than on the adjacent thread crests, said patch having an effective circumferential extension of not more than 180°, said patch extending radially outwardly from said thread convolution on said body to engage said mating thread convolution when said thread convolutions are in threaded engagement at a point axially coincident with said patch, said metallic patch comprising at least one layer of metallic material bonded to said body, said metallic material being substantially resiliently compressible in a radial direc-

tion to provide said interfering engagement of said thread convolutions at a point circumferentially opposite said patch.

4,033,394
CLAMPING SPLIT LOCK NUT

Terry D. Capuano, Newington, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

Filed June 23, 1975, Ser. No. 589,011
Int. Cl.² F16B *39/02*
U.S. Cl. 151—21 C **5 Claims**

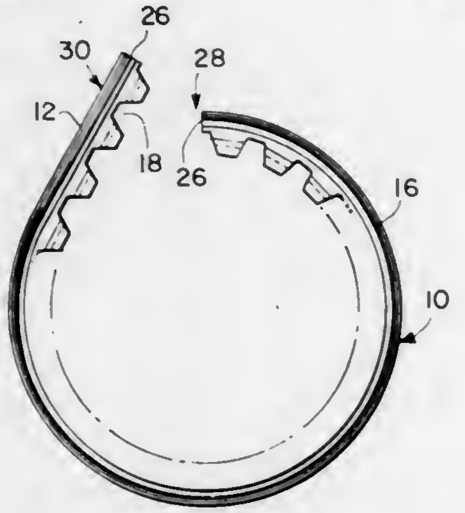


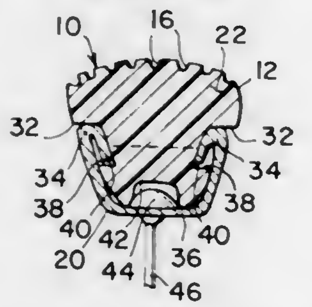
1. A clamping lock nut comprising a nut having an internal bore and an outer periphery, a through radial slot formed to extend from the periphery to the bore, a partial slot formed to extend essentially diametrically opposite the through slot with there being a remaining portion of the nut and means for exerting a closing force on the through slot; in which the cross-sectional area of the remaining portion of the nut is made to provide a tensile strength that is related to the closing force; in which the means for exerting a closing force includes a screw having an end portion threaded into a portion of the nut on one side of the through slot and a head abutting a ledge formed on another portion on the other side of the through slot; in which the maximum force is the actual load to yield force of the screw and in which the cross-sectional area of the remaining portion is substantially equal to three-fourths of the load to yield strength of the screw divided by the yield strength of the nut material.

4,033,395
CONTINUOUS PLASTIC TIRE BODY AND TIRE

Winfred M. Berg, and Daniel T. Berg, both of 89 Grant Ave., E. Rockaway, N.Y. 11518

Filed Mar. 6, 1975, Ser. No. 555,783
Int. Cl.² B60C *7/00, 7/12, 7/24*
U.S. Cl. 152—323 **30 Claims**



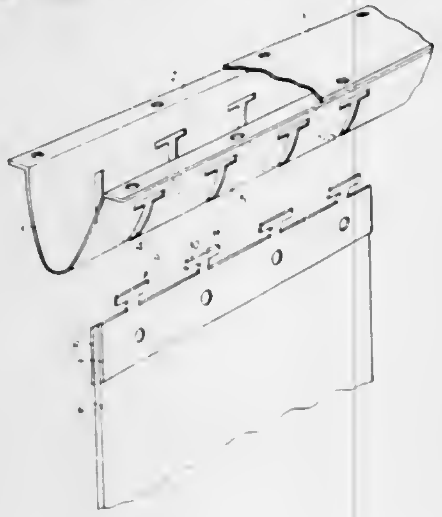


1. A tire, sized to be stretch-snapped over a rim, comprising a selected cut portion of tire body material in finished form, having a first end and a second end, said selected cut portion having been cut from a strip of flexible heat spliceable plastic tire body material of indeterminate length comprising tread means and rim fit means, said selected cut of material having been curved into an annular shape with said first end and said second end held in abutting relationship and spliced with means comprising a thin hot blade held temporarily between said abutting ends.

4,033,396
OSCILLATING SUSPENSION FOR STRIPS OF PLASTIC MATERIAL

André Alphonse Thomasset, Caluire, France, assignor to Planet-Wattohm, Paris, France

Filed Aug. 16, 1976, Ser. No. 714,491
Int. Cl.² A47H *1/00*
U.S. Cl. 160—332 **8 Claims**

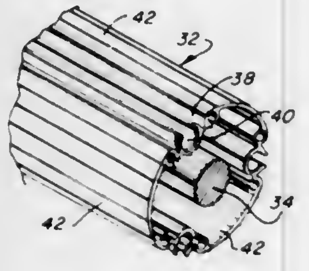


1. Device for suspending strips of plastic material adapted to constitute curtains for doorways which comprises a hollow beam having a generally U-shaped section adapted to be attached to the upper part of the doorway, oscillation slots formed in the lower part of the hollow beam transversely to its longitudinal axis, and suspension means fixed to the upper ends of said strips, said suspension means comprising hooks, each of which has a portion which passes freely through one of the slots of the beam and a retaining head having a width greater than that of said slot and bearing on the inner surface of the hollow beam so as to at least partially support a strip associated therewith.

4,033,397
ROLL BAR DEVICE FOR RETRACTABLE AWNINGS

Donald S. McKee, Louisville, Colo., assignor to The Scott & Fetzer Company, Lakewood, Ohio

Filed Nov. 26, 1975, Ser. No. 635,709
Int. Cl.² A47H *13/00;* **E04F** *10/00*
U.S. Cl. 160—393 **6 Claims**

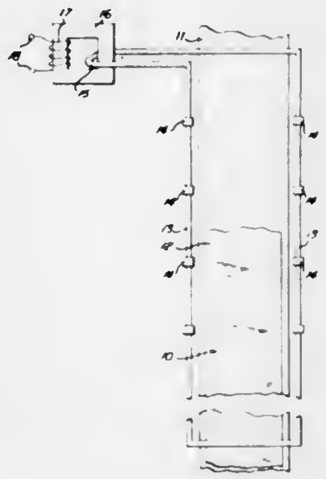


1. A roll bar for receiving and retaining one edge of an awning sheet so that the awning sheet can be wrapped therearound, including an elongated tubular element having a transverse cross-section defined by at least two spaced circular arcuate segments with a common center, inward indentations separating the arcuate segments, and lip projecting upwardly from spaced locations in the indentations having the outer edges thereof spaced to define a gap therebetween, said lips and indentations cooperating in defining an open groove in which said one edge of an awning sheet can be retained.

4,033,398
METHODS OF MANUFACTURING LAMINATED METAL STRIP BEARING MATERIALS

Eric Roberts Laithwaite, Ditton Hill, England, assignor to Vandervell Products Limited, England

Filed Feb. 27, 1976, Ser. No. 662,243
Int. Cl.² B22D *11/16, 27/02*
U.S. Cl. 164—49 **13 Claims**



1. A method of manufacturing a laminated metal strip comprising casting on a metal backing strip a layer of molten further metal and while the further metal is still molten causing alternating currents to flow in both the metal backing and the molten further metal such that the phase of the alternating currents changes progressively from at least one edge of the metal backing strip so as to produce a travelling magnetic field that restrains flow of molten metal adjacent the said edge of the strip by interaction between the induced currents and the said moving magnetic field.

4,033,399
METHOD FOR CLADDING COPPER AND COPPER ALLOYS TO STEEL SUBSTRATES

Chester E. Bieniosek, McKeesport; Robert H. Kachik, Washington Township, Westmoreland County, and Arthur J. Pignocco, Franklin Township, Westmoreland County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

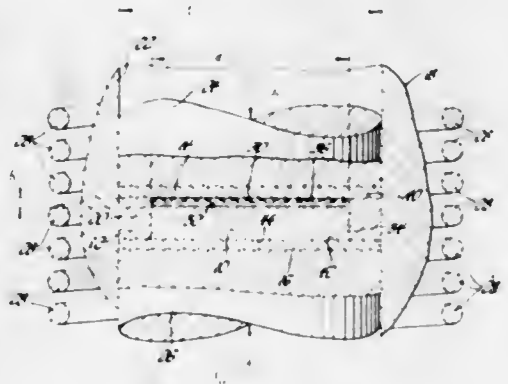
Filed July 16, 1976, Ser. No. 705,848
Int. Cl.² B22D *19/08;* **B23K** *23/00*
U.S. Cl. 164—54 **3 Claims**

1. A method of cladding a steel substrate with copper and copper alloys comprising:
- a. placing a refractory perimeter system onto said steel substrate,
- b. depositing onto said substrate within said perimeter system an aluminothermic reduction mixture consisting essentially of 50–65 wt.% cupric oxide, 1.8–2.4 wt.% aluminum; 10–13 wt.% of a calcium-silicon alloy; and 20–38 wt.% of a metal selected from the group consisting of copper, metal desired to be alloyed with copper and mixtures thereof; said calcium-silicon alloy consisting essentially of 30–33 wt.% calcium, 60–63 wt.% silicon and the balance being normal impurities,
- c. igniting the mixture to form a molten metal phase and molten slag phase,
- d. allowing the molten phases to solidify and cool,
- e. removing the refractory perimeter system and slag phase to reveal a tightly adherent metallic cladding on the steel substrate.

4,033,400
METHOD OF FORMING A COMPOSITE BY INFILTRATING A POROUS PREFORM

William E. Gurwell, West Bloomfield, Mich., and Amos J. Shaler, State College, Pa., assignors to Eaton Corporation, Cleveland, Ohio

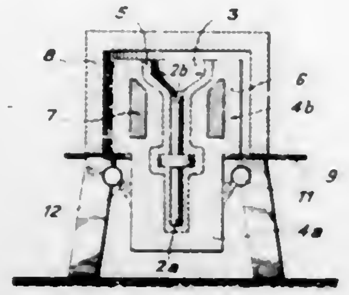
Continuation-in-part of Ser. No. 376,503, July 5, 1973, abandoned. This application Apr. 3, 1974, Ser. No. 457,540
Int. Cl.² B22D *19/02*
U.S. Cl. 164—98 **4 Claims**



1. A method of making a composite material comprising a porous ceramic skeletal body and a metallic infiltrant material filling the pores of the skeletal body including the steps of:
- selecting a porous skeletal ceramic host;
- selecting a material to be infiltrated within the pores of the porous host;
- placing the porous skeletal host within a press having a plunger, the host body being surrounded about its periphery by a peripheral sealing means substantially impervious to liquid metal, a chamber being formed at one side of the host generally inwardly of the peripheral sealing means;
- placing a predetermined quantity of a metallic material, to be infiltrated into the porous host, into the chamber adjacent the host body;
- applying an end plate sealing means to the peripheral sealing means so as to completely enclose the chamber, at least a portion of the end plate sealing means being deformable;
- placing the press plunger against the end plate sealing means;
- heating the metallic material at least to its liquidus temperature;
- applying force to the plunger to cause the end plate sealing means to deform towards the host and positively displace the peripheral sealing means, thereby reducing the volume of the chamber and displacing the liquid material into the porous skeleton structure; and
- maintaning the force on the plunge until the chamber's volume has been sufficiently reduced to accomplish the desired degree of infiltration.

4,033,401
PRECISION CASTING PROCESS

Robert Wlodawer, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland
Filed May 12, 1975, Ser. No. 576,877
Claims priority, application Switzerland, May 29, 1974, 7307/74
Int. Cl.² B22D *27/04*
U.S. Cl. 164—121 **5 Claims**



1. A precision casting process for producing a casting comprising the steps of

preheating a ceramic casting mold having a differing wall thickness to a temperature above the maximum local casting temperature of the mold;

thereafter cooling a predetermined location in the mold to a predetermined temperature below said maximum casting temperature while allowing the remaining locations in the mold to cool at different rates;

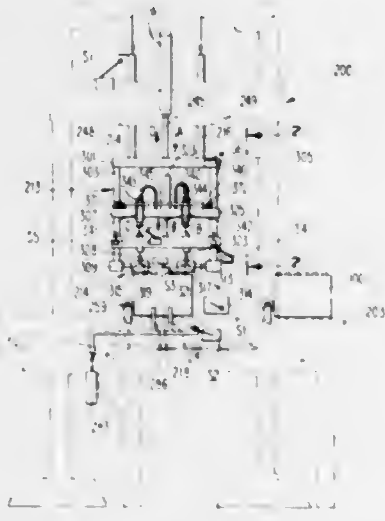
maintaining the temperature of the mold in the desirable direction of solidification of the casting at a decrease of at least 10° C per centimeter of distance from a feed end of the cavity towards an opposite end;

subsequently pouring a molten metal into the mold; and

varying the solidification time of the melt in the mold cavity in the desirable direction of solidification at a controlled rate, the solidification time being lower in the colder portions of the mold than in the warmer portions.

4,033,402
AUTOMATED POST BURN STATION

William J. Eberle, Reading, Pa., assignor to General Battery Corporation, Reading, Pa.
Continuation-in-part of Ser. No. 618,772, Oct. 2, 1975, Pat. No. 3,980,126, which is a continuation-in-part of Ser. No. 432,545, Jan. 11, 1974, Pat. No. 3,954,216, which is a continuation-in-part of Ser. No. 395,528, Sept. 10, 1973, Pat. No. 3,861,575, which is a division of Ser. No. 184,338, Sept. 28, 1971, abandoned. This application Mar. 24, 1976, Ser. No. 669,749
Int. Cl.² B22D *19/04*
U.S. Cl. 164—150 **5 Claims**



1. An automated apparatus for sequentially forming integrally fused battery terminals on a plurality of storage batteries, each of which comprises at least one battery post element and adjacent bushing element, said apparatus comprising:

a. a frame;

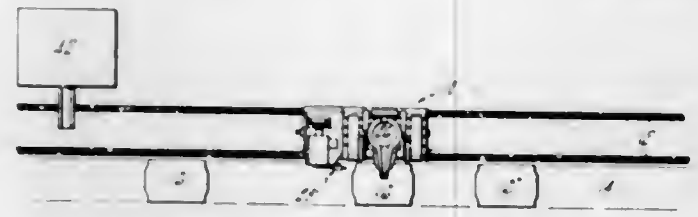
b. a mold means movable between first standby, and second molding positions, said mold means further comprising at least one interchangeable mold and at least one mold carriage block means for establishing a direct heat transfer relationship between said carriage block means and said mold when said mold is disposed in mating engagement with at least a portion of said carriage block means;

c. a burning means for melting and fusing said battery elements; and

d. at least one thermocouple means for directly sensing the temperature of said mold for determining the effectiveness of said heat transfer relationship between said mold and said carriage block means and for preventing said mold means for moving from said molding position to said standby position while said mold exceeds a preselected mold temperature.

4,033,403
SYNCHRONIZING VELOCITY AND POSITION CONTROL

William W. Seaton, Dexter, and George C. Miller, Ann Arbor, both of Mich., assignors to Seaton Engineering Company, Ann Arbor, Mich.
Filed Sept. 17, 1975, Ser. No. 614,088
Int. Cl.² B22C *25/00*
U.S. Cl. 164—155 **20 Claims**



1. Apparatus for controlling the velocity and position of movable tool with respect to a moving workpiece comprising:

linkage means, said linkage means including a moving beam and defining a parallelogram;

a workpiece contacting probe mounted on said beam, said probe being movable along an arcuate path;

a first cam, said first having an operating surface contour which defines a plurality of response zones;

means coupling movements of said linkage means resulting from contact between said probe and a workpiece to said first cam to cause rotation of said first cam;

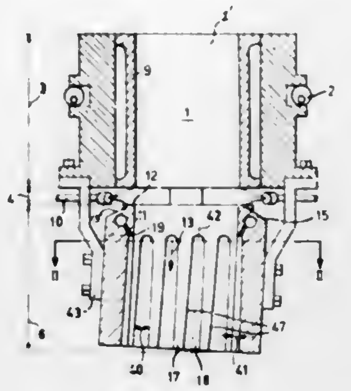
signal generator means, said signal generator means contacting said first cam operating surface whereby said signal generator provides an output signal which varies in accordance with the rotational position of said cam; and

means responsive to said signal generator means output signal for varying the velocity of the tool.

4,033,404
OSCILLATORY MOLD EQUIPPED WITH A HOLLOW MOLD CAVITY WHICH IS CURVED IN THE DIRECTION OF TRAVEL OF THE STRAND

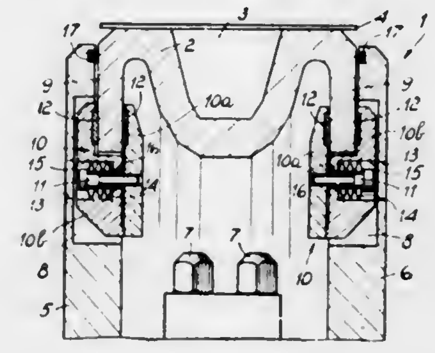
Markus Schmid, Zurich, Switzerland, assignor to Concast AG, Zurich, Switzerland
Filed Apr. 26, 1975, Ser. No. 571,937
Claims priority, application Switzerland, May 15, 1974, 6694/74
The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.
Int. Cl.² B22D *11/12*
U.S. Cl. 164—260 **7 Claims**

1. An oscillating continuous casting mold having a hollow mold cavity bounded by four mold walls and which hollow mold cavity is arc-shaped in the direction of travel of the strand for cooling a strand which is forming, two of said mold walls being operably associated with straight sides of the strand and the other two mold walls being operably associated with the curved sides of the strand, said oscillating continuous casting mold comprising a first cooling device for the indirect cooling of the strand and a second cooling device having substantially strip-shaped support surfaces and intermediately disposed cooling water channels, the width of said cooling water channels increasing in the direction of travel of the strand, coolant water infeed means provided for said cooling water channels, an intermediate space which is open at all sides disposed between the first cooling device and the second cooling device, the course of the cooling water channels in the second cooling device at both mold walls which are associated with the straight sides of the strand substantially following the arc of the hollow mold cavity in the direction of travel of the strand.



4,033,405
CASTING WHEEL FOR A CONTINUOUS CASTING MACHINE OF THE WHEEL AND BELT TYPE

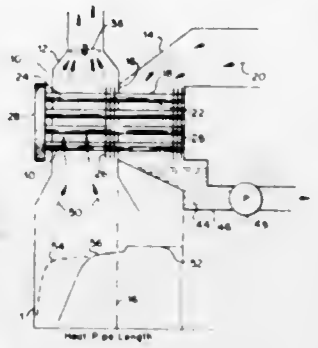
Giulio Properzi, Via Pietro Cossa, 1, Milan, Italy
Filed Nov. 17, 1975, Ser. No. 632,877
Claims priority, application Italy, Dec. 2, 1974, 30083/74
Int. Cl.² B22D *11/06*
U.S. Cl. 164—278 **5 Claims**



1. A casting wheel for a continuous casting machine of the wheel and belt type, having at least one drive flange and a casting ring mechanically coupled thereto, wherein at least said drive flange comprises a plurality of cavities distributed at its periphery and open towards the interior of the casting wheel, the casting wheel further comprising a plurality of clamp means each housed in a corresponding one of said cavities and each having two spaced apart clamping projections engaging therebetween by friction a peripheral rim of said casting ring and permitting relative movement between said casting ring and said drive flange.

4,033,406
HEAT EXCHANGER UTILIZING HEAT PIPES

Algred Basiulis, Redondo Beach, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.
Continuation of Ser. No. 502,594, Sept. 3, 1974, abandoned. This application July 21, 1976, Ser. No. 707,410
Int. Cl.² F28B *1/06;* **F28D** *15/00*
U.S. Cl. 165—32 **10 Claims**



7. A dry cooling tower using ambient atmosphere as a cooling medium comprising:

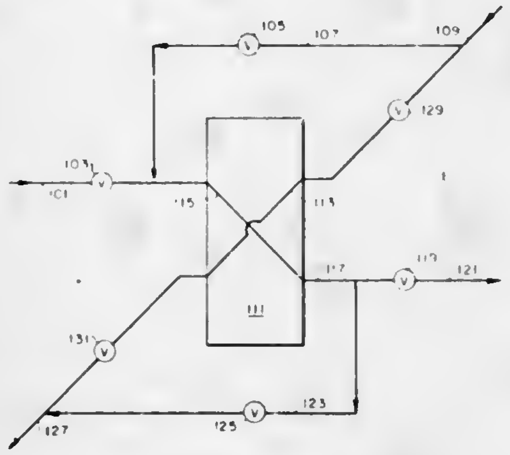
first and second chambers;

means for conveying the cooling medium through said second chamber; and

at least one heat pipe having portions extending between said chambers and including means in said second chamber and responsive to temperatures therein for maintaining a preset temperature in said heat pipe portion is said first chamber and for preventing solidification of a fluid to be cooled in said first chamber during temperature changes within a range of temperatures in said second chamber even when the temperature of the cooling medium falls below the temperature at which said fluid to be cooled solidifies.

4,033,407
HEAT EXCHANGER CLEANING SYSTEM

Robert L. Quintilliano, Whitehall, Mich., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.
Filed Sept. 2, 1975, Ser. No. 609,864
Int. Cl.² F28F *27/02*
U.S. Cl. 165—95 **9 Claims**



8. In a method for operating a titanium plate heat exchanger through which pass in heat exchange relationship a first liquid comprising an acidulated solution of chlorine in water and a second liquid comprising brine, the improvement wherein said first liquid is introduced into and conducted from said heat exchanger through thermoset unsaturated polyester resin piping and is periodically passed into the region of said heat exchanger wherein said second liquid is normally passed for sufficient time to remove scale produced by said second liquid.

4,033,408

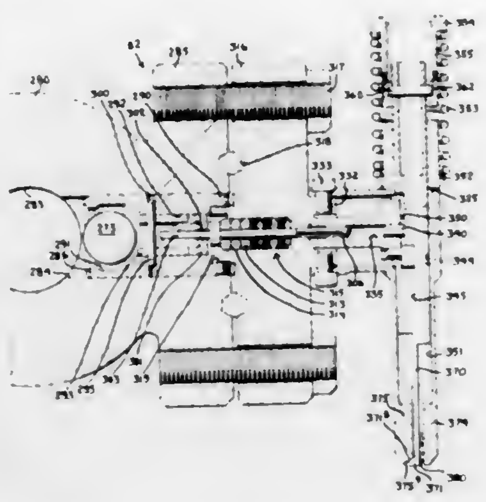
GO-DEVIL STORAGE AND DISCHARGE ASSEMBLY

John V. Fredd, Dallas, Tex., and William G. Hill, Lake Charles, La., assignors to Continental Oil Company, Ponca City, Okla.

Division of Ser. No. 516,205, Oct. 21, 1974, Pat. No. 3,955,624. This application Mar. 18, 1976, Ser. No. 668,269

Int. Cl.² E21B *23/00, 43/12*

U.S. Cl. 166—75 R **5 Claims**



3. A go-devil storage and discharge assembly for use in a well system including a go-devil actuated well safety valve, said storage and discharge assembly comprising: a body having a first bore communicating with the bore through said flow conductor when said body is connected with said flow conductor and said body having a second bore communicating with said first bore for housing a go-devil; a go-devil pusher in said second bore adapted to move in said second bore in a direction to push a go-devil from said second bore into said first bore; means connected between said pusher and said body for moving said pusher linearly in response to rotation of said pusher; an operating rod extending into said second bore and connected with said pusher for actuating said pusher responsive to a rotational motion only of said operating rod; and means supported on said body and coupled with said operating rod for rotating said operating rod responsive to a predetermined well system operating condition.

4,033,409

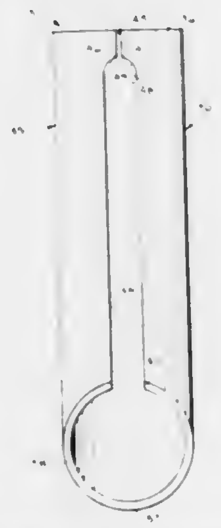
WELL TUBING MANDREL WITH ORIENTING SLEEVE WITH TRASH RELIEVING SLOT

Gerald P. Hebert, Lafayette, La., assignor to Production Specialties, Inc., Lafayette, La.

Filed Sept. 13, 1976, Ser. No. 722,520

Int. Cl.² E21B *23/00*

U.S. Cl. 166—117.5 **2 Claims**



1. In a mandrel for use in a well tubing in which the mandrel body has an open bore for alignment with the well tubing and a pocket offset from the open bore for flow control devices, the invention comprising:

a. an orienting sleeve in the open bore above the pocket for aligning a flow control device to be positioned in the pocket, said orienting sleeve including:
   1. an elongated hollow tubular body having an upper and lower end;
   2. said lower end extending upwardly at an angle relative to the longitudinal axis of said tubular body to form a sloping guide surface which extends upwardly and away from the offset pocket;
   3. a first slot extending longitudinally of said tubular body from the highest portion of said guide surface, said first slot terminating in spaced relation to said upper end of said tubular body;
   4. a second slot extending from the upper end of said first slot to the upper end of said tubular body; and
   5. said second slot being substantially smaller in width than said first slot to form a pair of aligned shoulders at the juncture of said first and second slot which are spaced from each other by said second slot whereby debris may discharge from said first slot through said second slot and into the tubing.

4,033,410

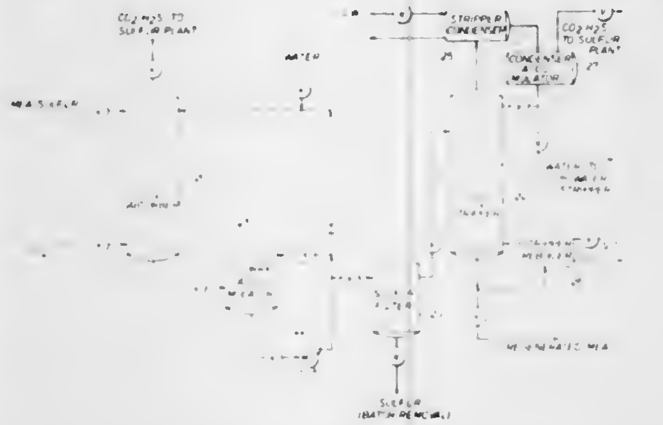
MONOETHANOLAMINE PROCESS FOR SULFUR REMOVAL FROM CIRCULATING OIL USED IN SOUR GAS WELLS

David Kauffman, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Feb. 20, 1976, Ser. No. 659,862

Int. Cl.² E21B *43/00;* **B01D** *53/34*

U.S. Cl. 166—244 C **5 Claims**



1. A process for inhibiting sulfur deposits in a hydrocarbon gas well or associated gathering lines containing hydrocarbon gas laden with sulfur in the form of hydrogen sulfide and dissolved elemental sulfur, comprising, contacting the hydrocarbon gas with oil in the well or gathering lines, absorbing the sulfur into the oil, removing the oil from the well or gathering lines, contacting the oil with an aqueous solution of an organic amine, dissolving the sulfur from the oil into the organic amine solution, separating the oil and organic amine solution, and regenerating the organic amine solution after contact with the oil by precipitating sulfur from the organic amine solution with CO_2.

2. A process for separating dissolved sulfur from aqueous organic amine solution comprising contacting the solution with CO_2 to precipitate the sulfur and separating the organic amine solution and precipitated sulfur.

4,033,411

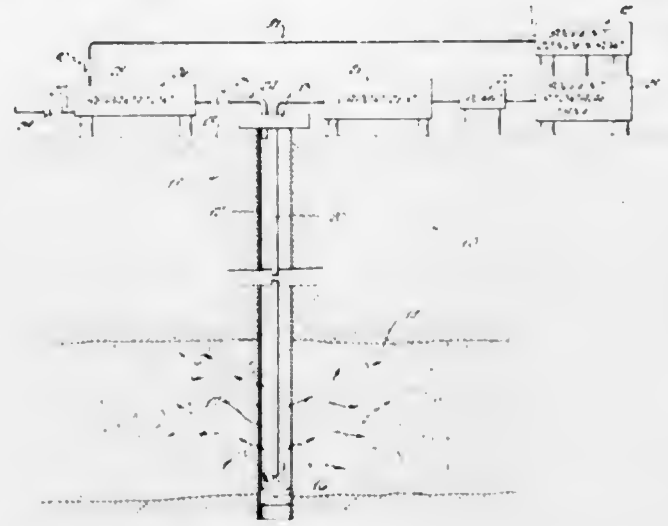
METHOD FOR STIMULATING THE RECOVERY OF CRUDE OIL

John T. Goins, 2301 Nassau Drive, Seabrook, Tex. 77586

Continuation-in-part of Ser. No. 547,355, Feb. 5, 1975, abandoned. This application Jan. 2, 1976, Ser. No. 646,253

Int. Cl.² E21B *43/24*

U.S. Cl. 166—257 **13 Claims**



1. A method for stimulating the recovery of crude oil from a formation which is penetrated by a well bore, wherein a mixture of vapors of a solvent for the crude oil and gas which is a product of combustion of injected into the formation.

4,033,412

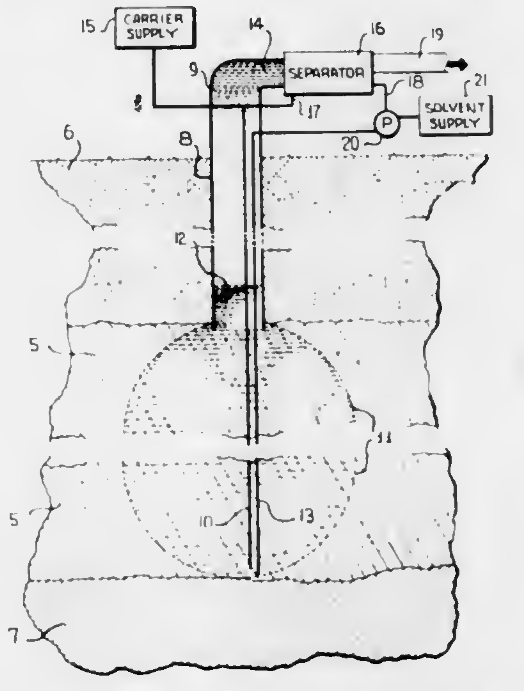
FLUID CARRIER RECOVERY SYSTEM AND METHOD

George M. Barrett, R.R. No. 5, Galt, Ontario, Canada

Filed June 18, 1976, Ser. No. 697,447

Int. Cl.² E21B *43/12, 43/22, 39/00*

U.S. Cl. 166—267 **12 Claims**



1. A method of recovering oil and the like from an underground source wherein the oil is deposited in an unpumpable form, said method comprising the steps of providing a flow passage down to an upper part of the oil deposit, flowing a liquid carrier into the oil deposit generally in alignment with and below said flow passage until a large volume of the oil deposit below the flow passage is filled with the carrier and the carrier reaches a predetermined level within the flow passage above the oil deposit, and then flowing a solvent for the oil into the volume of the oil deposit filled by the carrier, the solvent having a specific gravity less than the carrier and when combined with oil having a specific gravity less than the carrier whereby as mixtures of oil and solvent are formed the mixtures will float to the surface of the carrier within the flow passage for recovery.

10. Apparatus for recovering oil and the like from an underground source wherein oil is deposited in an unpumpable form, said apparatus comprising means for defining a flow passage generally from the surface of the earth to an upper portion of the source, carrier supply means for flowing a liquid carrier into a lower portion of the source generally in vertical alignment with the flow passage to fill a volume of the source and a major portion of said flow passage with a carrier, solvent supply means for directing a solvent into a lower portion of the volume, and collector means connected to the upper end of said flow passage for receiving an oil-solvent mixture floating on the carrier within said flow passage.

4,033,413

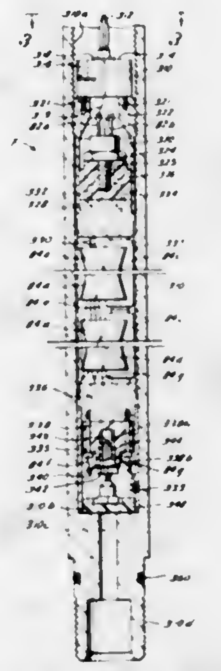
WIRE LINE WELL TOOL AND METHOD

Austin S. Rogers, Houston, Tex., assignor to W. R. Grace & Co., New York, N.Y.

Division of Ser. No. 465,081, April 29, 1974, Pat. No. 3,942,373. This application Dec. 4, 1975, Ser. No. 637,676

Int. Cl.² E21B *47/02, 47/06, 47/12*

U.S. Cl. 166—301 **5 Claims**



1. A method of increasing the electrical current level to energize a wireline operated stuck pipe loosening apparatus in a well bore, comprising the steps of:

a. sending alternating current down the wireline to the pipe loosening apparatus at a reduced current level;

b. increasing the level of current received at the apparatus from the wireline; and

c. energizing the pipe loosening apparatus with the increased current.

2. In an apparatus for loosening pipe which is stuck in a well bore when energized by an electrical current over a wireline from the surface, the improvement comprising:

means in said apparatus receiving the electrical current from the wireline and for increasing the level of current sufficiently to energize said apparatus, whereby reduced current levels may be sent from the surface, and whereby power loss in the wireline is reduced.

4,033,414

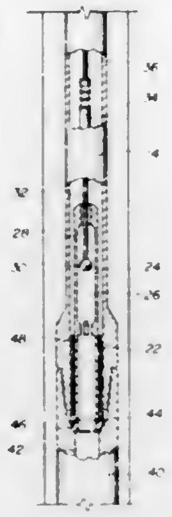
METHOD AND APPARATUS FOR RELEASING A DRILL STRING HELD BY DIFFERENTIAL PRESSURE

Michael F. Stroble, 1610 Pine Chase, Houston, Tex. 77055

Filed Aug. 2, 1976, Ser. No. 710,610

Int. Cl.² E21B *31/00, 33/128, 41/00*

U.S. Cl. 166—301 10 Claims



1. A method of releasing a portion of a drill string that is stuck in a well bore due to differential pressure holding it against the wall of the well bore, comprising the steps of placing a seal between the drill string and the well bore to prevent the downward flow of fluid in the annulus above the seal and lowering the fluid level in the drill string to release the pressure differential holding the stuck portion until it can be pulled free of the wall of the well bore.

3. Apparatus for recovering a drill string held against the wall of a well bore by differential pressure sticking, comprising means providing a seal between the drill string and the well bore above the stuck portion and means for lowering the level of drilling fluid in the drill string to reduce the hydrostatic pressure of the drilling mud sufficiently to allow the pipe string to be moved away from the wall of the well bore.

4,033,415

METHODS FOR FRACTURING WELL FORMATIONS

Marlin D. Holtmyer; Charles J. Githens, and John M. Tinsley, all of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Division of Ser. No. 346,546, March 30, 1973, which is a continuation-in-part of Ser. No. 98,157, Dec. 14, 1970, abandoned, which is a continuation-in-part of Ser. No. 881,314, Dec. 1, 1969, abandoned. This application Oct. 14, 1976, Ser. No. 732,247

Int. Cl.² E21B *43/26*

U.S. Cl. 166—308 30 Claims

1. A method of fracturing a subterranean formation penetrated by a well bore which comprises introducing a crosslinked aqueous fracturing gel into said formation through said well bore at a rate sufficient to fracture said formation wherein said fracturing gel consists essentially of the reaction product of a hydratable polysaccharide, which has been hydrated with an aqueous liquid, and a crosslinking agent;

wherein said hydratable polysaccharide is present in the range of about 0.3% by weight of said aqueous liquid, said crosslinking agent is present in the range of about 0.001% to about 0.5% by weight of said aqueous liquid and said reaction product is produced at a pH in the range of about 1.5 to about 5.5; further

wherein said hydratable polysaccharide has a molecular weight of at least about 100,000 and is selected from the group consisting of galactomannan gums, glucomannan gums and cellulose derivatives having hydrophillic constituents; and still further

wherein said crosslinking agent is selected from compounds which will provide antimony (V) ions.

8. A method of fracturing a subterranean formation penetrated by a well bore which comprises introducing a crosslinked aqueous fracturing gel into said formation through said well bore at a rate sufficient to fracture said formation wherein said fracturing gel consists essentially of the reaction product of a hydratable polysaccharide, which has been hydrated with an aqueous liquid, and a crosslinking agent selected from potassium permanganate and sodium permanganate;

wherein said hydratable polysaccharide is present in the range of about 0.3% to about 3% by weight of said aqueous liquid, said crosslinking agent is present in the range of about 0.001% to about 0.5% by weight of said aqueous liquid and said reaction product is produced at a pH in the range of greater than about 5 to about 7; further

wherein said hydratable polysaccharide has a molecular weight of at least about 100,000 and is selected from the group consisting of galactomannan gums and glucomannan gums.

4,033,416

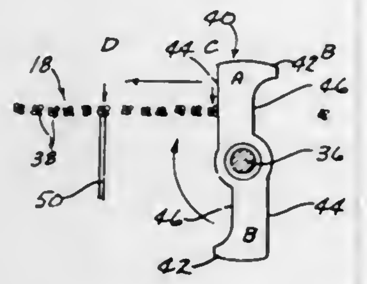
BLADE MEANS FOR ROW CROP THINNING MACHINE

Henry K. Orthman, Lexington, Nebr., assignor to Orthman Manufacturing, Inc., Lexington, Nebr.

Filed Apr. 17, 1975, Ser. No. 569,301

Int. Cl.² A01B *41/04, 41/06*

U.S. Cl. 172—61 3 Claims



1. A row crop thinning machine comprising,

a frame having a horizontally disposed rotatable blade rotatable about a vertical axis adjacent a row of plants, said blade being elongated and including front and rear substantially straight cutting edges and an outer free end, and said outer free end of said blade including a tail portion extending rearwardly and perpendicularly of said rear cutting edge through and beyond the vertical plane containing said rear cutting edge,

means for moving said blade forwardly along said row with said blade being positioned in said row for cutting engagement of said front cutting edge with some of said plants,

power means for intermittently rotating said blade rearwardly in said row for cutting engagement of said rear cutting edge with others of said row of plants and to a position in said row ahead of an uncut plant with said tail portion extending rearwardly along said uncut plant on the side of the uncut plant furthest from said vertical axis of rotation.

4,033,417

AGRICULTURAL MACHINE

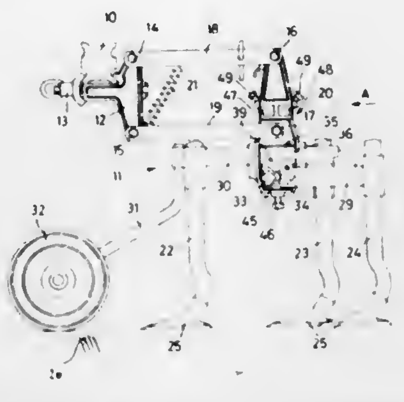
Willy Rau, Weilheim, Teck, and Christian Taus, Kirchheim, Teck, both of Germany, assignors to Maschinenfabrik Rau oHG, Wilheim, Teck, Germany

Filed Apr. 2, 1975, Ser. No. 564,442

Claims priority, application Germany, Apr. 10, 1974, 2417496; Sept. 12, 1974, 7430647

Int. Cl.² A61B *65/00*

U.S. Cl. 172—613 13 Claims



2. In an agricultural machine, a combination comprising support means having a passage; a plurality of agricultural tools; mounting means mounting said tools on said support means with freedom of adjustment to respective selected positions, said mounting means comprising at least one bar-shaped mounting member received in said passage; a wedge-shaped member having wedge faces extending into said passage transversely of the elongation thereof; and a single arresting element for arresting all of said tools in their respectively selected positions, said aresting element pressing said mounting member against one of said wedge faces.

4,033,418

TINE MOUNTING FOR ROTARY HARROW INCLUDING U-SHAPED RECESS

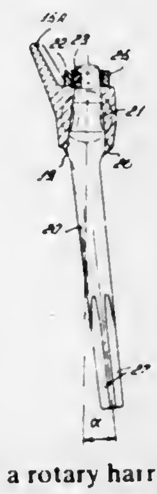
Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland

Filed Jan. 29, 1975, Ser. No. 545,037

Claims priority, application Netherlands, Jan. 31, 1974, 7401323

Int. Cl.² A01B *15/00*

U.S. Cl. 172—763 7 Claims



1. A tine mounting for a rotary harrow including a generally horizontal support with at least one tine holder on said support, a tine having a fastening portion and said portion being fitted in an internal bore of said holder, said fastening portion having at least one recess, said recess, viewed lengthwise of the longitudinal axis of said fastening portion, being substantially U-shaped, tightening means on said mounting and said tightening means engaging a flat wall of said U-shaped recess and urging the said fastening portion into tight engagement with said bore.

4,033,419

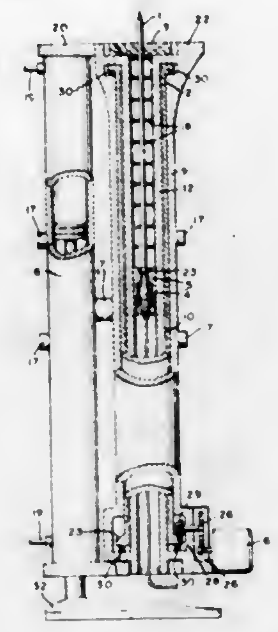
VIBRATOR AND PUSHING APPARATUS FOR DRIVING METAL PINS IN ROCK FACES IN MINES

James R. Pennington, Basking Ridge, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Filed Apr. 4, 1973, Ser. No. 347,936

Int. Cl.² E21D *20/00*

U.S. Cl. 173—34 8 Claims



1. An apparatus for driving metal pins into a rock face in an underground mine, comprising:

a. a housing with an inner cylindrical surface;

b. a hollow cylinder adapted for receiving a pin in its upper open end, said cylinder being concentrically disposed for rotation within the housing, with its outer surface contiguous with the inner surface of the housing, said hollow cylinder having a female thread extending substantially throughout its full length;

c. means for rotating the rotatable cylinder;

d. a movable driving member disposed within the rotatable cylinder on which the head of the pin rests, said member having a male thread for cooperative engagement with the female thread of the rotatable cylinder;

e. vibrating means incorporated into the movable driving member; and

f. means for preventing rotation of the driving means.

4,033,420

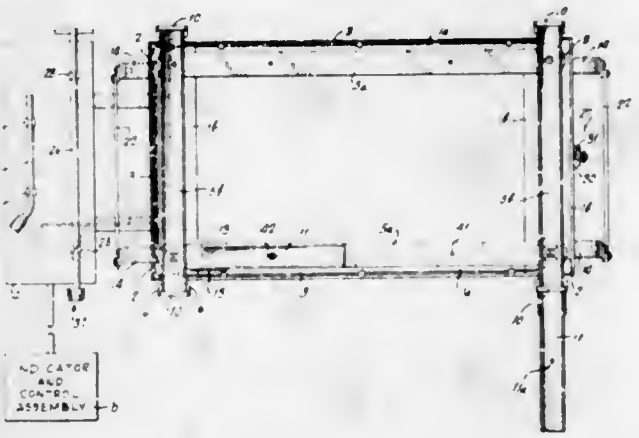
WEIGHING SCALE

James J. De Masters, Elmhurst, N.Y., assignor to Brookline Instrument Company, Inc., Wallingford, Conn.

Filed May 20, 1976, Ser. No. 688,321

Int. Cl.² G01G *21/00, 19/03;* **B62D** *21/14*

U.S. Cl. 177—126 12 Claims

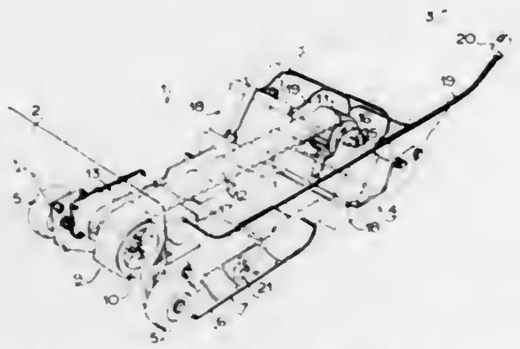


1. A scale for weighing a wheeled load, comprising:

a. a frame for supporting the load during weighing, including rails for receiving and guiding the wheels;
b. ramps for supporting and guiding the wheels during movement of the load onto the rails;
c. load cell means supporting said frame and any load thereon;
d. indicator means operated by the load cell means; and
e. means for removably connecting one end of each ramp to one end of each rail, said removable connecting means comprising a crossbar under each rail adjacent an end thereof and projecting from opposite sides thereof, and a pair of projections on the outer sides of one end of each ramp, said projections having recesses to engage the projecting ends of the crossbars.

4,033,421
STAIRWAY-CLIMBING CART

Yasuaki Ikarimoto, Sendai, Japan, assignor to Sunwa Sharyo Mfg. Co., Ltd., Tokyo, Japan
Filed Nov. 20, 1975, Ser. No. 633,915
Claims priority, application Japan, Nov. 26, 1974, 49-143654[U]
Int. Cl.² B62B *5/02*
U.S. Cl. 180—8 A **6 Claims**

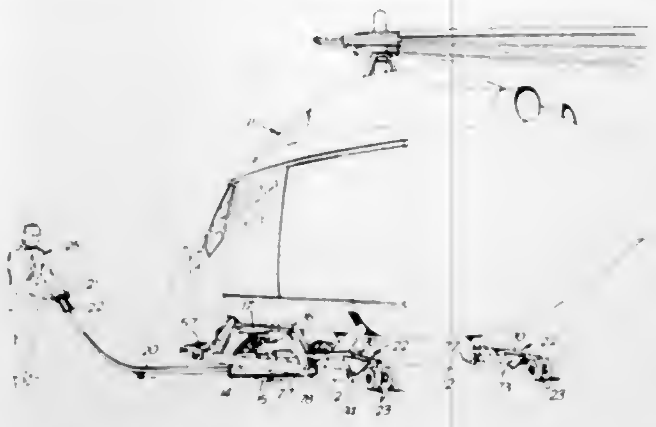


1. A stairway climbing cart comprising
a carrier frame defining sides thereof having front portions,
a pair of front wheels having a tread and disposed in front portions of both sides of said frame,
a pair of sledge members disposed at the sides of said frame substantially laterally extending away from said frame beyond said wheels adjacent said front wheels, respectively, and elongated rearwardly, said sledge members including slipping surface means at a lower surface thereof for slidably contacting steps of a stairway during a climbing operation,
a driving belt crawler disposed in a central portion of said carrier frame and having a driving wheel, a driven wheel and an endless belt operatively engaged with said driving and driven wheels, and having a crawling surface of said endless belt positioned at a slightly lower level than that of said tread of said front wheels, and being rearwardly retracted from said front wheels, and having a length spanning at least two steps of the stairway.

4,033,422
APPARATUS FOR MANOEUVRING AIRCRAFT

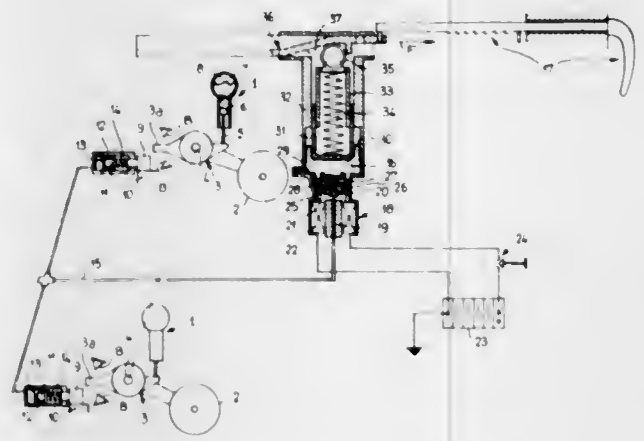
Vernon A. Benning, Slough, England, assignor to M. L. Aviation Company Limited, Slough, England
Filed May 5, 1975, Ser. No. 574,687
Claims priority, application United Kingdom, May 6, 1974, 19858/74
Int. Cl.² B64F *1/22*
U.S. Cl. 180—14 C **16 Claims**

1. An aircraft handler for manoeuvring aircraft fitted with skids, said handler comprising a self-propelled frame having at least two coaxial wheels, a motor connected to drive said wheels, a jacking system for engagement with a strong point on the underside of said aircraft, a steering arm which extends rigidly from one end of said frame and controls for said driving motor and jacking system, said controls being located at the end of said arm remote from said frame, and wherein said driving motor is an electric motor and is mounted on said frame, and including a differential gear provided between said motor and said wheels.



4,033,423
HYDRAULIC HEIGHT-ADJUSTMENT VEHICLE SUSPENSION

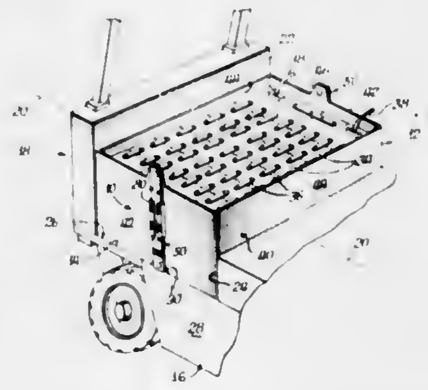
Albert Grosseau, Paris, France, assignor to Societe Anonyme Automobiles Citroen, Paris, France
Filed Nov. 17, 1975, Ser. No. 632,721
Claims priority, application France, Nov. 25, 1974, 74.38567
Int. Cl.² B60G *17/00*
U.S. Cl. 180—41 **5 Claims**



1. In a vehicle of the type including a chassis, a hand brake control operably movably from a non-brake applying position to a brake applying position, a suspension system including at least one suspension member movable with respect to said chassis, and means for blocking-up said suspension system to prevent said suspension system from collapsing when the vehicle is stationary for a prolonged period of time; the improvement wherein said blocking-up means comprises:
a retractable buffer movable from a first retracted position to a second blocking position between a portion of said chassis and said suspension member;
first spring means urging said buffer to said retracted position;
hydraulic receiver means, acting against the force of said spring means, for receiving therein hydraulic fluid and for moving said buffer against said first spring means into said blocking position;
a hydraulic control chamber having therein hydraulic fluid and being in fluid communication with said receiver means;
a movable member mounted in said control chamber;
second spring means, mounted between said movable member and said hand brake control, for biasing said movable member into said control chamber against said hydraulic fluid within said control chamber; and
actuator means, operably associated with said hand brake control, for, upon movement of said hand brake control to said brake applying position thereof, moving said second spring means and thereby said movable member toward said control chamber, thereby forcing hydraulic fluid from said control chamber into said receiver means, and thus moving said buffer against said force of said first spring means into said blocking position, said vehicle further including an ignition circuit having an ignition switch, and further comprising a solenoid valve positioned between said control chamber and said receiver means, said solenoid valve having a coil which is part of said ignition switch circuit of the vehicle, said solenoid controlling the flow of hydraulic fluid between said control chamber and said receiver means.

4,033,424
ARTICLE HOLD-DOWN DEVICE

Dafydd W. Evans, Euclid, Ohio, assignor to Towmotor Corporation, Mentor, Ohio
Filed Apr. 9, 1976, Ser. No. 675,428
Int. Cl.² B60R *18/02*
U.S. Cl. 180—68.5 **8 Claims**

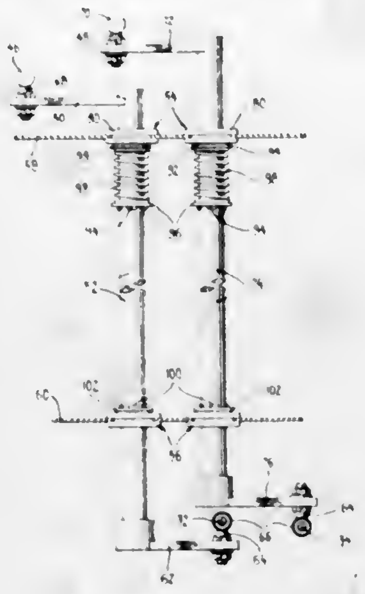


1. An article hold-down device for restraining movement of an article away from a supporting platform, comprising:
a lower clamping member having a plurality of serrations and being connected to the platform;
an upper clamping member having a plurality of serrations connected to the article;
a releasable coupling element slidably movable along the clamping members between a released position at which the serrations of the clamping members are spaced apart and the upper clamping member is movable relative to the platform and a locking position at which the serrations of the clamping members are interlockingly engaged and the upper clamping member is maintained at a preselected position relative to the platform; and
cam means effective in the locking position of the coupling element and interacting between the coupling element and the clamping members for resiliently biasing the clamping members together and restraining movement of the article.

4,033,425
VEHICLE CONTROL SYSTEM

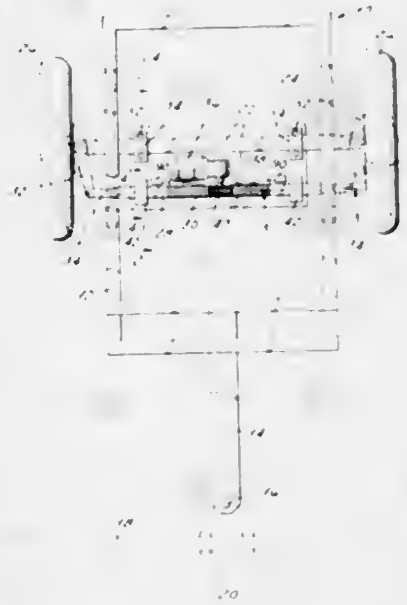
Otto Mueller, Jr., Detroit, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.
Filed Dec. 22, 1975, Ser. No. 643,418
Int. Cl.² B60K *26/00*
U.S. Cl. 180—77 R **10 Claims**

1. A control system for a vehicle having an operators station including an apertured partition resiliently supported relative to the vehicle chassis, the combination of; a movable control member at one side of said partition, a mechanism to be controlled at the other side of said partition, a shaft passing through an aperture in said partition, mounting means on said partition supporting said shaft for rotational and axial movement, said mounting means including a bearing element engagable with said shaft and a resilient seal disposed between said bearing element and said partition, stop means on said shaft engagable with said bearing element to limit axial movement of said shaft in one direction relative to said partition, resilient means urging said shaft in said one direction to maintain said bearing element in sealing engagement with said seal, and means connecting said shaft to said control member and to said mechanism to transmit movement of said control member to said mechanism.



4,033,426
APPARATUS FOR STEERING TRAILER VEHICLES

Eugene J. Williams, 109 Detroit Ave., Trenton, Mich. 48183
Filed Jan. 15, 1976, Ser. No. 649,529
Int. Cl.² B62D *5/04*
U.S. Cl. 180—79.1 **8 Claims**



1. A steering and control apparatus for a trailer having a frame supported upon at least one axle of the trailer and a pair of wheels pivoted thereto, the trailer adapted to be coupled to a towing vehicle, and comprising:
a reversible electric motor mounted upon said axle and operably connected to said pair of wheels for turning the same toward one side or the opposite side of the trailer;
an electric circuit connected at one end to the electric

motor and connectable at the other end to the electrical power source of the towing vehicle;

switch control means incorporated into said circuit and mounted upon the towing vehicle, said switch control means being operable in one position to disconnect the motor from the electrical power source, operable in a second position to connect the motor to the electrical power source so that the electric current in the circuit operates the motor to pivot said pair of wheels in the direction to steer the trailer to the right of its already assumed position, and operable in a third position to connect the motor to the electrical power source so that the electric current in the circuit operates the motor to pivot said pair of wheels in the direction to steer the trailer to the left of its already assumed position;

said operable connection between the electric motor and said pair of wheels comprising a member movable along a path of travel extending parallel to the axle of the trailer upon which the motor is mounted and being connected by mechanical linkages to said pair of wheels to turn the same, and gear reduction means being operatively coupled between said motor and said member for effecting travel of the member in one or the opposite direction along said path depending upon the direction of rotation of the motor thereby to apply reversible turning movement to said pair of wheels;

said movable member being in the form of a rack bar having its teeth operatively engaged with a gear of said gear reduction means; and

springs means interposed between the trailer frame and the trailer axle for yieldingly supporting the frame from said pair of wheels, and an approximately horizontal extending supporting plate mounted to said axle for serving as a common support for said motor and said rack bar.

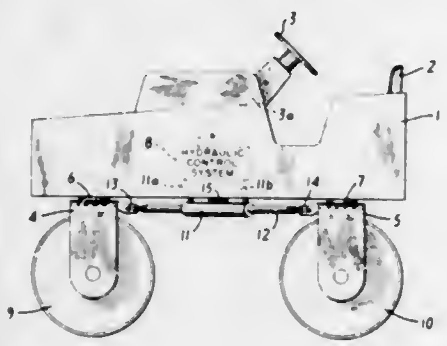
4,033,427
STEERING APPARATUS FOR ROAD ROLLERS

Rune Sturesson, Lyckeby, Sweden, assignor to Dynapac Maskin AB, Solna, Sweden

Filed Dec. 10, 1975, Ser. No. 639,282

Int. Cl.² B62D ***5/06***

U.S. Cl. 180—140 **3 Claims**



1. In a self-propelled roller having a chassis, two drums at least one of which is driven and each of which is journalled so as to rotate in a frame mounted pivotally on the chassis, and an actuatable steering device for selecting the direction of travel of the moving roller, the improvement comprising a steering cylinder and a piston slidably mounted in the cylinder, a piston rod pivotally connected at one end to one of the drum frames at a point laterally spaced in one direction from an axis passing through the frame pivots, the rod being pivotally connected at its other end to the other of the drum frames at a point laterally spaced in the opposite direction from the frame pivot axis, the piston rod being connected to the piston and passing through said steering cylinder, bearing means pivotally mounting the steering cylinder to the chassis, a control system for transmitting and receiving a pressure medium through a pair of lines, said lines being connected to the cylinder and conveying the pressure medium to opposite sides of the piston, the control system being responsive to actuation of the steering device to supply the pressure medium selectively through said lines to the steering cylinder to cause movement of the piston in the cylinder whereby the piston rod causes simultaneous rotation of the drum frames and proper tracking of the drums.

4,033,428
MUFFLER FOR INTERMITTENT BLASTS OF AIR FROM PNEUMATIC TOOLS, VALVES AND THE LIKE

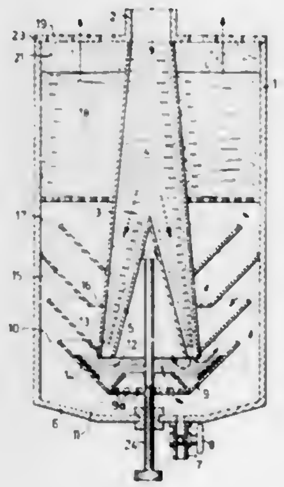
Karl Filip Wennerstrom, Stockholm, Sweden, assignor to Ab Fi-Wes Maskinservice, Stockholm, Sweden

Filed Dec. 9, 1975, Ser. No. 639,050

Claims priority, application Sweden, Dec. 11, 1974, 7415563

Int. Cl.² F01N ***3/06***

U.S. Cl. 181—36 C **16 Claims**



1. A muffler for dampening noise from pneumatic tools while simultaneously separating lubricating oil from the used compressed air during expansion thereof comprising

a container having an inlet and an outlet for the air;

a tube for guiding the air from said inlet into said container;

an oil-separating plate aligned with the inner end of said tube for impingement thereon by the incoming air and altering the direction of the air flow for extracting a substantial portion of the oil from the air;

labyrinth means for guiding said air flow from said plate toward said outlet, and

filter means positioned in said passage and between said labyrinth means and said outlet for passing of the air therethrough for removal of oil from the air before discharge of the air to the atmosphere.

4,033,429
DOWNHOLE SEISMIC SOURCE

John B. Farr, Houston, Tex., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Feb. 18, 1976, Ser. No. 659,072

Int. Cl.² G01V ***1/04, 1/40***

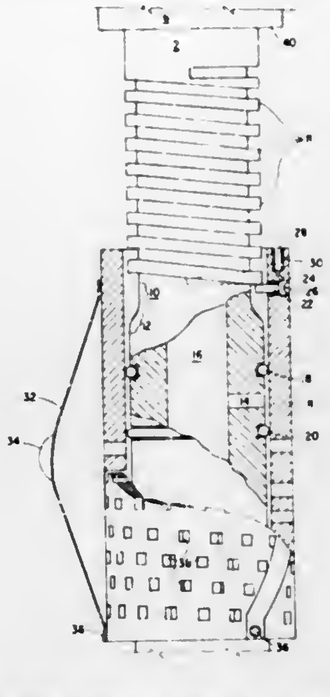
U.S. Cl. 181—106 **12 Claims**

1. A seismic signal source for use in a borehole comprising:

a section of drill pipe having a rotary cam on its outer surface and also having a port from the center to the outer surface of the section;

a cylindrical sleeve positioned on a portion of said drill pipe section and having an inner diameter larger than the outer diameter of said drill pipe section, said sleeve having a cam follower for engagement with the cam in said drill pipe section to cause said sleeve to move axially a preselected distance relative to said drill pipe in response to rotation of said drill pipe, and said sleeve having a plurality of ports from its inner to outer surfaces, said ports spaced to pass sequentially by said drill pipe section port as said sleeve moves axially on said drill pipe; and,

rotation preventing means attached to said sleeve and extending therefrom to contact a borehole wall for resisting



rotation of said sleeve while allowing axial movement of said sleeve.

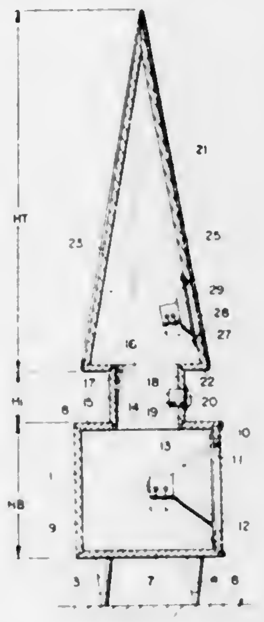
4,033,430
SPEAKER ENCLOSURE

Edward J Bolden, Bronx, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed June 9, 1976, Ser. No. 694,088

Int. Cl.² H05K ***5/00;*** **A47B** ***81/06***

U.S. Cl. 181—144 **2 Claims**



1. A speaker enclosure, comprising

a substantially rectangular parallelipiped base cabinet mounted on legs supporting it at a predetermined distance above a supporting surface, said base cabinet having a bottom, a top spaced from and parallel to the bottom and four sides perpendicular to the top and bottom, a side hole formed through one of the sides and covered by a grill and accommodating a full range speaker and a top hole formed through the top;

a substantially rectangular parallelepiped intermediate cabinet of smaller dimensions than the base cabinet mounted on said base cabinet, said intermediate cabinet having an open bottom, an open top and four sides perpendicular to the top of the base cabinet and surrounding the top hole of the base cabinet and a side hole formed through one of the sides for accommodating a tweeter control; and

a substantially pyramidal top cabinet mounted on the intermediate cabinet and having a bottom and four triangular sides, a bottom hole formed through the bottom and coincident with the open top of the intermediate cabinet and a side hole formed through one of the sides and covered by a grill and accommodating a tweeter.

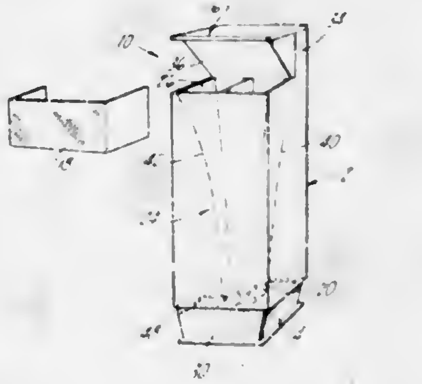
4,033,431
ACOUSTIC CROSSOVER SPEAKER ENCLOSURE

James G. Ebejer, 4951 Bantry, West Bloomfield, Mich. 48033

Filed Nov. 19, 1975, Ser. No. 633,371

Int. Cl.² G10K ***9/14, 11/10***

U.S. Cl. 181—152 **2 Claims**



1. A speaker enclosure comprising:

an enclosed cabinet disposed in an upright position having an opening at the top end;

a horn disposed in an upright position within said cabinet, said horn having a throat opening at the near bottom end of said cabinet, said horn having a mouth opening through said top end of said cabinet, the exterior walls of said horn and the interior wall of said cabinet defining an annular air chamber extending 360° around said horn exterior walls and substantially along the full length of said horn between said throat, and means mounting said horn in said cabinet to define said 360° annular air chamber; and

a driver carried at the throat end of said horn such that the front of said driver projects therein for radiating compression waves therein, the back side of said driver projecting compression waves into said annular air chamber, said cabinet having a back wall with a port extending therethrough, said air chamber communicating the sound waves radiated from the rearward side of said driver to said port; a deflection panel carried at the top end of said cabinet adjacent the mouth of said horn such that sound waves emitted from the mouth of said horn are laterally deflected by said deflection panel for deflecting the sound from the front of said cabinet into the listening area, whereby the energy emitted in a rearward direction by said driver is communicated via said air chamber to said port to add said rearwardly emitted radiation of said driver to the radiation emitted from the front of said driver which is directed through said horn.

4,033,432
CRANKCASE OIL DRAINAGE AND CONTAINMENT APPARATUS

Bertram J. Bernstein, 3144 Briand Ave., San Diego, Calif. 92122

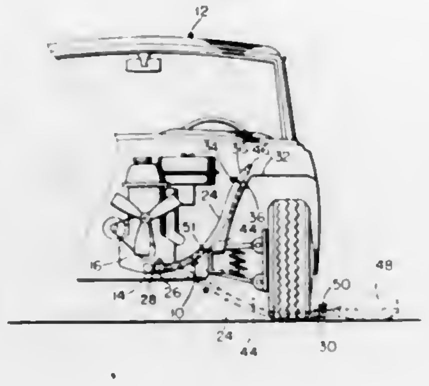
Filed Aug. 29, 1975, Ser. No. 609,110

Int. Cl.² F01M ***11/04***

U.S. Cl. 184—1.5 **3 Claims**

1. Method for draining an automotive crankcase utilizing a flow through nipple for threaded attachment to the outlet of said crankcase, said nipple having an outlet enabling an unrestricted flow of oil therethrough, a long flexible drainage hose, said drainage hose connected to said nipple at one end and a

free end of sufficient length so as to be able to project upwardly through the engine compartment to a stored elevated position where it is conveniently accessible to the user when the hood of the vehicle is open, attachment means for releasably securing said free end of said hose being within said engine compartment above the oil level in said crankcase and a retrieval line connected to said free end of said hose, the length of which is at least substantially the height between the securing means and ground level, said method comprising the steps of:



releasing said free end of said hose from said attachment means;
attaching a container in a sealed relationship with said free end of said hose prior to lowering to a drain position;
lowering said free end of said hose to a position below said crankcase;
allowing all of said oil to drain from said crankcase;
removing said container when all of said oil is drained from said crankcase; and
returning said free end of said hose to said stored position.

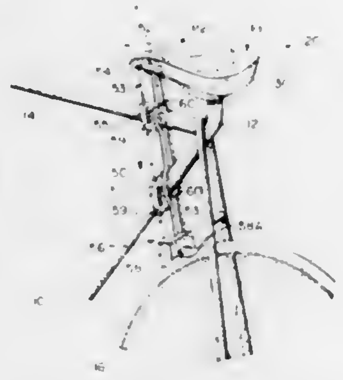
4,033,433
BODY MOTION BICYCLE SEAT BRAKE

Norbert A. Kirk, 2970 Sherldan Road, Chicago, Ill. 60657

Filed Oct. 18, 1976, Ser. No. 733,401

Int. Cl.^{2} B62L *1/04*

U.S. Cl. 188—25 **10 Claims**



1. In a bicycle having a frame which includes a seat tube, and a rear wheel mounted in the frame, a body motion seat brake system comprising a seat, resilient means for mounting said seat on the seat tube such that at least the forward end of said resilient means may be deflected downwardly by the action of a rider shifting his weight forwardly relative to said forward end, and an elongated brake member having means for pivotably mounting one end thereof to said forward end of said resilient means and for mounting said brake member at an intermediate location thereof on the seat tube, such that the distal end of said brake member is disposed in spaced proximity to the rear wheel when said forward end of said resilient means is in a relatively undeflected position and is urged into abutting, braking relationship with the rear wheel when said forward end of said resilient means is deflected as a result of a forward shift of the rider's weight.

4,033,434
SELF ADJUSTING BRAKE SYSTEM

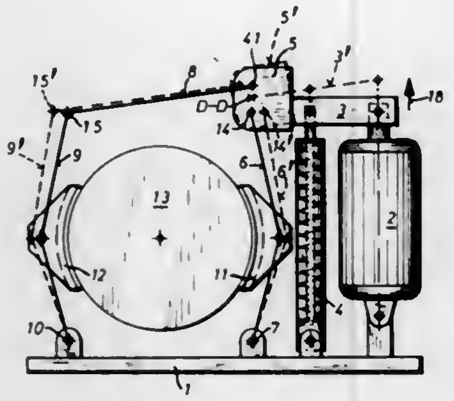
Helmut Henrich, Burbach-Niederdresselndorf, Germany, assignor to Firma Siegerland-Bremsen, Haiger-Rodenbach, Germany

Filed Feb. 26, 1976, Ser. No. 661,753

Claims priority, application Germany, Feb. 26, 1975, 2508240

Int. Cl.^{2} F16D *49/16*

U.S. Cl. 188—75 **9 Claims**



1. A brake system comprising a pivotally mounted operating lever, first and second brake levers each having a brake shoe thereon acting in opposed relationship against a brake drum and having one end thereof pivotally mounted, the other end of said first brake lever being pivotally connected to said operating lever and rod means pivotally connected between the other end of said second brake lever and said operating lever such that pivoting of said operating lever in one direction applies said brake shoes and pivoting in the other direction releases said brake shoes, means connected to said operating lever for actuating said operating lever in the non-braking direction, spring means acting to pivot said operating lever to apply said brake shoes, and means on said rod means and operating lever for adjusting the length of said rod means when said operating lever is moved in one direction in response to wear of said brake shoes, said adjusting means comprising uni-directional drive means on said rod means at its end connected to said operating lever such that rotation of said drive means in one direction increases the effective length of said rod means, an actuating lever extending from said drive means, and first and second opposed cams on said operating lever engageable with said drive means actuating lever upon pivoting of said operating lever.

4,033,435
RETAINER MECHANISM FOR VEHICLE BRAKE ACTUATORS

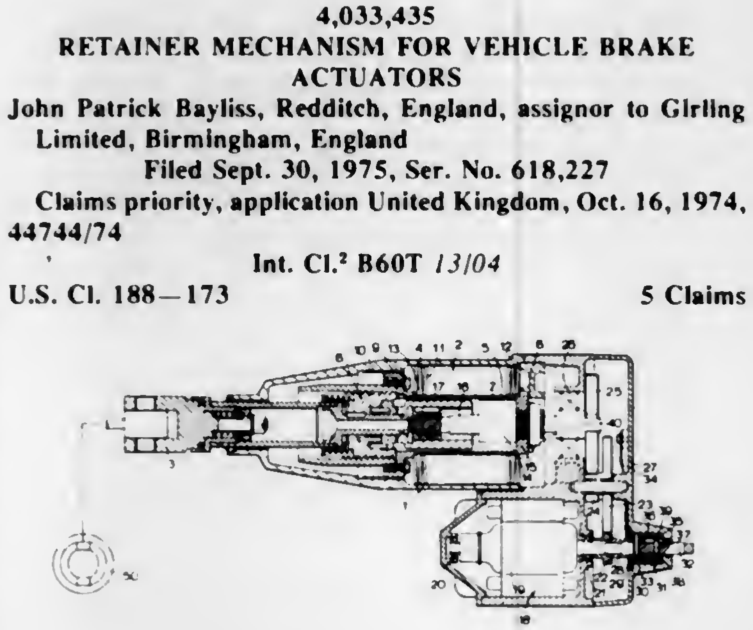
John Patrick Bayliss, Redditch, England, assignor to Girling Limited, Birmingham, England

Filed Sept. 30, 1975, Ser. No. 618,227

Claims priority, application United Kingdom, Oct. 16, 1974, 44744/74

Int. Cl.^{2} B60T *13/04*

U.S. Cl. 188—173 **5 Claims**



1. In a brake actuator for a vehicle comprising a brake

applying mechanism for applying a brake, pre-load resilient means acting on said mechanism to apply said brake, a retractable carrier on which said resilient means is mounted, a nut coupled to said carrier, means preventing relative rotation of said nut and said carrier, a threaded spindle engaging threadably with said nut, and retainer means for holding said pre-load resilient means in a retracted compressed energy-storing position when the brake is in an off position and releasable to release said resilient means when the brake is to be applied, said retainer means comprises an electric motor operable in response to an operational voltage to urge said resilient means into said retracted energy-storing position and to retain said resilient means in the said retracted position, and a reduction gearing arrangement, said spindle being coupled to said gearing arrangement, and said electric motor acting on said spindle through said gearing arrangement whereby rotation of said spindle acts through said nut to impart axial movement to said carrier.

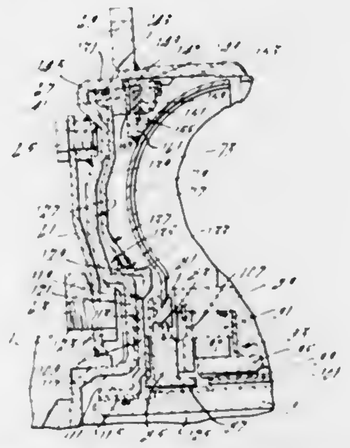
4,033,436
TRANSMISSION AND TORQUE CONVERTER WITH LOCK-UP CLUTCH

Robert Arthur Hoetger, St. Clair Shores; James Albert Hagaman, Madison Heights, and William Nortman, Grosse Pointe, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed May 12, 1975, Ser. No. 576,402

Int. Cl.^{2} F16H *41/18*

U.S. Cl. 192—3.3 **9 Claims**



1. A power transmission unit for a motor vehicle comprising a driving member (**1**), a hydrokinetic torque converter having an impeller wheel (**71**), means (**61, 67**) drivingly connecting said driving member to said impeller wheel, an input shaft (**9**), an output shaft (**43**), a planetary gear train (**13, 15**) drivingly connecting said output shaft, a runner wheel (**73**), means (**85, 87**) drivingly connecting said runner wheel to said input shaft, a guide wheel (**75**), a sleeve (**101** surrounding said input shaft, a one-way brake device (**93**) located between said sleeve and said guide wheel, and lock-up clutch means (**109, 147 – 161**) adapted to positively connect the impeller wheel to the runner wheel, said means drivingly connecting said driving member to said impeller wheel including a casing (**71**) having a first annular plate means (**121**) extending generally radially with respect to the axis of rotation of said driving member, a second annular plate means (**67,** between **131** and **133**) extending generally radially and offset forwardly with respect to said vehicle from said first annular plate means, an anular axially extending shoulder (**129**) connecting said first and second annular plate means, and an annular axially extending cylinder wall portion (**131**) extending rearwardly with respect to said vehicle from the outer periphery of said second annular plate means, said lock-up clutch means including an annular support plate (**109**) secured to the rearward face of said first annular plate means (**121**), said annular support plate having a forwardly extending annular flange (**133**) forming an annular, axially extending clinder wall portion, at last one of said annular support plate and said first annular plate means having a recess (**123**) therein extending from the radially inner edge of the junction thereof to the radially outer edge of the juncture thereof, said clinder wall portions (**131, 133**) and said second annular plate portion forming a cylinder (**127**), first annular clutch disc means (**147**) drivingly connected to said casing, and second annular clutch disc means (**155**) drivingly connected to said runner wheel, an annular piston (**137**) in said cylinder adapted to move rearwardly and couple said annular clutch disc means together when fluid flows under pressure through said recess into said cylinder, said support plate (**109**) further including a forwardly extending annular collar (**111**) surrounding the forward end of said input shaft, and bushing means (**115**) between said forward end of said input shaft and the inside of said collar.

4,033,437
SYNCHRONIZER WITH ROCKING KEY DISENGAGEMENT

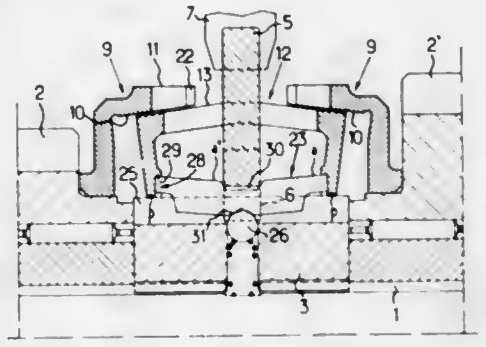
Pierre Labat, Chatillon, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques (SAVIEM), France

Filed Mar. 10, 1976, Ser. No. 665,366

Claims priority, application France, Mar. 19, 1975, 75.08618

Int. Cl.^{2} F16D *23/06*

U.S. Cl. 192—53 F **3 Claims**



1. In a synchronizing and coupling device for a motor vehicle gearbox of the kind including a drive shaft and two pinions for selective coupling to said drive shaft, a set of dog teeth on each pinion, and a conical friction surface on each pinion under said dog teeth, said device comprising a driving collar adapted for driving engagement with said drive shaft, a coupling ring, a plurality of radial bars on said coupling ring, means mounting said coupling ring on said driving collar for rotation therewith and axial movement therealong to engage said bars with said dog teeth of either of said pinions, a double synchronizer ring, a pair of conical friction surfaces on said double synchronizer ring, means mounting said double synchronizer ring for movement by said coupling ring selectively to engage one of said friction surfaces on said synchronizer ring with the friction surface of one of said pinions, locking surfaces on said synchronizer ring and on said bars of said coupling ring co-operable to prevent further axial movement of said coupling ring to engage said bars with said dog teeth on said pinion until the speeds of said coupling ring and said pinions are synchronized, the improvement wherein said device further comprises a plurality of rocking keys bracing said double synchronizer ring, means defining a plurality of axial grooves in said driving collar, each of said grooves receiving and locating one of said rocking keys, a plurality of radial thrusters in said grooves and on which said rocking keys are adapted to rock, radially inner and outer faces of each of said rocking keys, first notch means near the middle of said outer face of each rocking key, sloping sides to said first notch for co-operation with said coupling ring, second notch means near the middle of said inner face of each rocking key, and sloping sides to said second notch for co-operation with said thruster whereby when said coupling is moved to uncouple it from one of said pinions said rocking keys move to re-center said second notches on said thrusters and thereby disengage

said friction surfaces, of said synchronizer ring and said pinions.

4,033,438

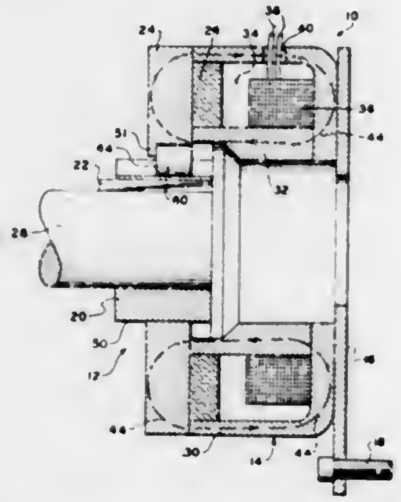
ROLLER SPLINE

Howard E. Wiltsey, Racine, Wis., assignor to Eaton Corporation, Cleveland, Ohio

Filed Feb. 26, 1976, Ser. No. 662,051

Int. Cl.² F16D *27/10, 3/64;* F16B *3/00*

U.S. Cl. 192—84 A **5 Claims**



1. An electromagnetic coupling comprising an armature plate, a hub member disposed substantially concentric to said armature plate for supporting said armature plate for rotation therewith, a pole assembly, said pole assembly and armature plate having an engaged position establishing a driving relationship therebetween and a disengaged position, a coil energizable to effect engagement of said pole assembly and armature plate, roller coupling means for coupling said armature plate and hub member and compensating for misalignment therebetween,

said hub member including an outer surface having a plurality of first arcuate recesses disposed therein,

said armature plate including an inner surface having a plurality of second arcuate recesses disposed therein,

said plurality of first and second arcuate recesses forming a plurality of sets of first and second complementary recesses, each of said plurality of sets of complementary recesses defining a substantially cylindrical opening between said outer surface of said hub and said inner surface of said armature plate, and

said roller coupling means including a plurality of rotatable cylindrical pins, one of which is disposed in each of said cylindrical openings for coupling said armature plate and hub member together,

said cylindrical pins having a diameter less than the diameter of said cylindrical openings to establish a diametric clearance between said cylindrical pins and said cylindrical openings which allows relative axial movement between said armature plate and hub member in a direction parallel to the axis of rotation of said armature plate and hub member and which compensates for misalignment therebetween,

said cylindrical pins being deformable to enable said cylindrical pins to conform to the shape of said substantially cylindrical openings while compensating for misalignment of said armature plate and hub member.

4,033,439

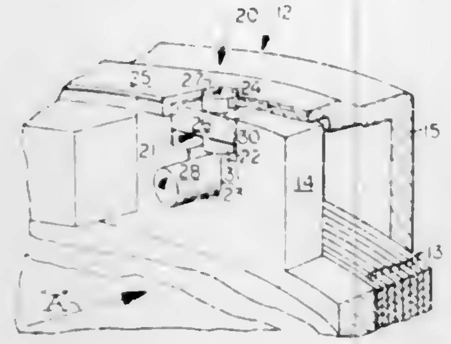
REMOVABLE SPLINE BETWEEN CLUTCH PISTON AND CYLINDER

Robert P. Nichting, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 2, 1976, Ser. No. 673,242

Int. Cl.² F16D *25/00*

U.S. Cl. 192—85 AA **4 Claims**



1. In a rotating clutch a vehicle having positioned between a movable clutch piston and a base element, the improvement comprising:

said clutch piston having an axis and at least one slot on the outer periphery, said slot having first said second portions adjacent an opening through the base element; and

means for connecting the clutch piston to the base element for rotating one with the other as a unit and movement of the clutch piston in directions toward and from the base element and intervening clutch disc, said means comprising:

a guiding block positioned within the first portion of the clutch piston slot, said clutch piston being slidably movable along the axis and relative to the block;

a locking pin extending from the guiding block through the opening of the base element; and

a retaining pin positioned in the second portion of the clutch piston slot, said retaining pin being of size sufficient for removably maintaining the locking pin in the base element opening.

4,033,440

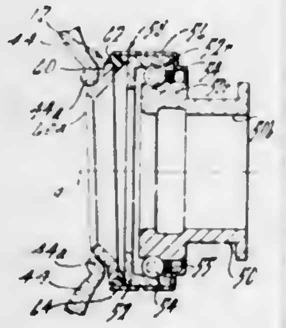
SELF-ALIGNING CLUTCH BEARING ASSEMBLY

Eli M. Ladin, Ann Arbor, Mich., assignor to Federal-Mogul Corporation, Southfield, Mich.

Division of Ser. No. 427,486, Dec. 26, 1973, Pat. No. 3,931,875. This application July 7, 1975, Ser. No. 593,627

Int. Cl.² F16D *23/14*

U.S. Cl. 192—98 **3 Claims**



1. In a bearing assembly having inner and outer race means and a plurality of anti-friction bearing elements constrained between said inner and outer race means, the invention wherein an annular wear plate having inner and outer peripheries is disposed substantially perpendicular and concentric to the axis of the bearing assembly and has one of its peripheries supported from said outer race means by a resilient annular element so as to permit limited deflection of said wear plate in a direction perpendicular to the axis of said bearing assembly and in directions angularly tilted with respect to the axis of said bearing assembly relative to said outer race means and thereby providing said bearing assembly with a self-aligning capability, said resilient annular element having inner and outer peripheries, one of said peripheries of said resilient annular element being affixed to said outer race means and the other periphery of said resilient annular element being affixed to one of the peripheries of said annular wear plate, the inner and outer peripheries of said resilient annular element being offset both radially and axially relative to each other with the bulk of said resilient annular element being disposed there between, said annular wear plate having an annular conical flange extending around the other periphery thereof.

4,033,441

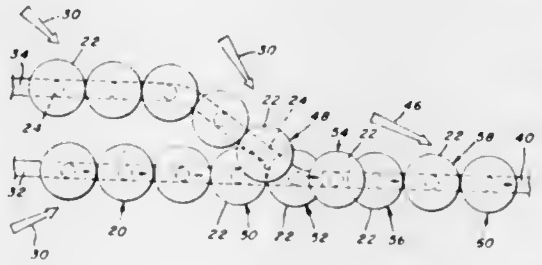
MERGING OR BLENDING TECHNIQUES FOR SMALL PARTS

William V. Pataki, Ephrata, Pa., assignor to Aluminum Company of America, Pittsburgh, Pa.

Continuation-in-part of Ser. No. 587,170, June 16, 1975, abandoned. This application Sept. 30, 1976, Ser. No. 728,271

Int. Cl.² B65G *11/00*

U.S. Cl. 193—38 **3 Claims**



1. A method of combining two merging streams of parts having heads and shanks, comprising:

progressing the stream of parts in different vertical planes with the parts in each stream having their shanks vertically oriented and their heads aligned, and with both streams of parts progressing generally in the same direction;

leading the steams of the progressing parts at different levels such that at least a portion of the shank of the parts in the upper stream lies in the same plane as the heads of the parts in the lower stream in overlapping relationship; and

while maintaining the overlapping relationship, progressively merging the streams at the last part of the progression in the horizontal direction to bring the parts in the merged stream into the same vertical plane;

whereby the shanks of the parts in the upper stream become interposed between the heads of the parts in the lower stream as the streams are merged into a single stream without stoppage.

4,033,442

LOCKING AND RELEASING MECHANISM FOR A VENDING MACHINE

Arthur N. Wirstlin, Altoona, and Henry J. Albright, West Des Moines, both of Iowa, assignors to Fawn Engineering Co., Des Moines, Iowa

Filed Apr. 30, 1976, Ser. No. 681,913

Int. Cl.² G07F *5/02*

U.S. Cl. 194—17 **10 Claims**

1. A mechanism for selectively locking and releasing an actuating means for an item vending machine comprising:

a frame having an abutment surface thereon;

actuating means connected to said frame for releasing an item from said vending machine upon movement of said actuating means from a first position to a second position;

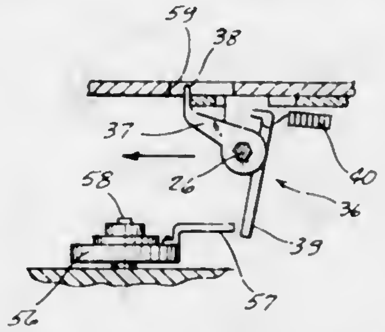
a plate member movably attached to said frame;

means for operatively linking said plate member to said actuating means whereby movement of the actuating means causes movement of the plate member;

a shaft connected to said plate member;

arm means connected to said shaft and having a first pivotal position wherein one end of said arm means is in juxtaposition with a portion of said plate member on one side of said one end, and in juxtaposition to said abutment surface on the other side of said one end thereof whereby said actuating means is locked from substantial movement, said arm means having a second pivotal position spaced from said abutment surface for unlocking said actuation means;

biasing means for biasing said arm means to said first pivotal locking position;



coin registering means attached to said frame for registering the amount of money deposited in the mechanism, said coin registering means having a projection means thereon, said projection means moving to specific locations upon deposit of specific amounts of money deposited in the mechanism, said projection means being spaced from said arm means in one position thereof for maintaining said actuating means in a locking position and being adjacent to said arm means in a second position thereof for unlocking said actuating means by allowing movement of the actuating means to move the arm means against said projection means, thereby pivoting said arm means to said second position thereof away from said abutment surface.

4,033,443

LOGIC CIRCUIT FOR GREY-TONE PRINTER

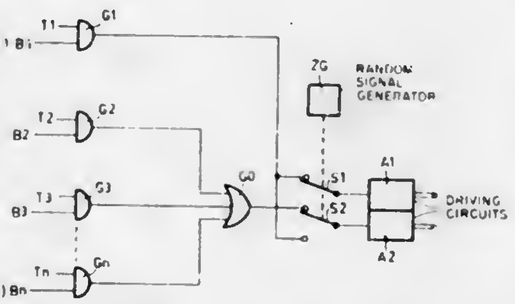
Ernst Bunge, Hamburg; Ulf Rothgordt, Norderstedt; Bernd Ehlers, Tornesch, and Herbert Piotrowski, Kaltenkirchen, all of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed July 17, 1975, Ser. No. 596,955

Claims priority, application Germany, July 22, 1974, 2435090

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **2 Claims**



1. A logic circuit for a grey-tone image printer, comprising

a clock pattern generator having a plurality of outputs, each of said outputs producing a distinct clock pulse pattern with a different predetermined number of clock pulses within a predetemined time interval,

input means for supplying a digital representation of the density value of an image to be printed;

a first and second group of AND-gates, each of said groups comprising at least one AND-gate, each of said AND-gates having a first input to a corresponding bit of said digital representation, a second input connected to a corresponding output of said clock pattern generator, and an output;

an OR-gate, having a plurality of inputs connected to said outputs of said first group of said AND-gates, and an output;

first and second driving circuits for printing a dot pair, having first and second inputs respectively for activation of the corresponding driving circuits, said first driving circuit for printing the first dot, and said second driving circuit for printing the second dot of said dot pair;

a change-over switch, connecting said first and second inputs of said driving circuits with said output of said OR-gate, and said outputs of said second group of AND-gates; and

means for switching said change-over switch comprising a random signal generator with a synchronized output.

4,033,444

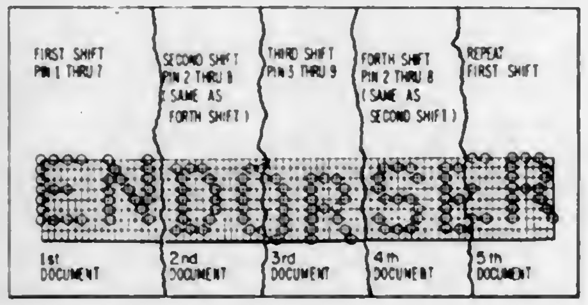
SYSTEM FOR EXTENDING THE LIFE OF A PIN PRINTER USING PIN SHIFTING

Jack Beery, Farmington, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Jan. 20, 1976, Ser. No. 650,723

Int. Cl.² B41J *3/04*

U.S. Cl. 197—1 R **10 Claims**



1. Apparatus for shifting the operation of the pins or styli of a matrix pin printer so as to minimize the wear of the most used pin combination comprising,

a matrix of individual styli capable of movement from a non-print to a print position and return on command,

means to store a desired print font combination for causing said matrix to produce one of a number of desired printing fonts on a document as a result of a printing operation,

said means to store print font information also including character generation means responsive to interrogation of intelligence carried by a document for producing characters in accordance with the data derived from said document,

logic circuit means for energizing said stylii matrix in accordance with said character generation data and said stored print font information to cause said matrix to print on said document the desired character font in a given character font orientation and size, and

means for altering the pin selection combination of the matrix while maintaining the same given character font orientation and size whereby the specific set of stylii for each actuation of the matrix is shifted so as to distribute the utilization of the various pins of the matrix in accordance with a prescribed, prearranged pin selection pattern.

4,033,445

RIBBON FEED DEVICE FOR OFFICE MACHINES

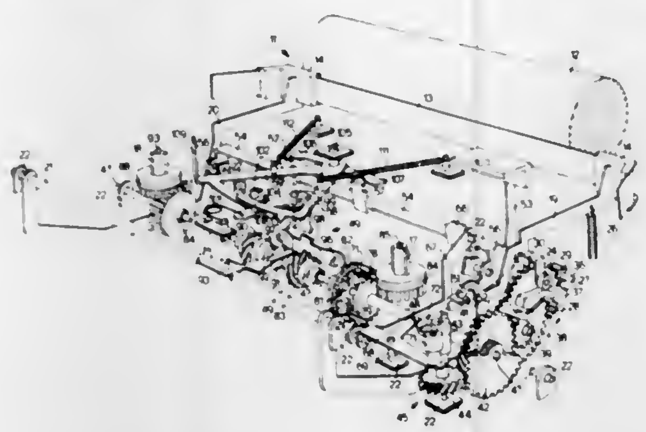
Giuseppe Oddicini, Banchette (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy

Filed Apr. 22, 1975, Ser. No. 570,528

Claims priority, application Italy, Apr. 24, 1974, 68293/74

Int. Cl.² B41J *33/14*

U.S. Cl. 197—151 **14 Claims**



2. A carbon coated ribbon cartridge removably mountable in a typewriter of the type which utilizes both ink and carbon coated ribbon cartridges wherein the ribbon is wound around two spools and having a platen with a printing area defined thereon, a type head mounted in front of the printing area and a feed device for feeding a ribbon between the type head and the printing area including two rotatable hubs, each one engageable with one associated spool of said two spools, sensing means for sensing that a predetermined minimum quantity of wound ribbon is available for use including two pivotally mounted levers associated with said hubs and each having a projection at the end portion thereof for cooperating with the ribbon wound on the one associated spool, motive means responsive to the position of said levers for driving one or the other of said spools for bidirectionally feeding the ribbon in front of said printing area roller means including a pressure roller and a motive roller engageable with said carbon ribbon for unidirectionally feeding the ribbon from the printing area to one of the hubs, said cartridge comprising:

a case including upper and lower substantially parallel walls and sidewalls;

a take-up spool of said two spools rotatably mounted in said case and engageable with said one hub and around which a carbon coated ribbon is to be taken-up during use;

a feed spool of said two spools rotatably mounted in said case and engageable with the other hub and around which a carbon coated ribbon is wound for feeding by said feed device during use;

means defining two slots in one sidewall of said case which faces the printing area when the cartridge is mounted, one of said slots providing an exit from the case and the other slot providing entry into the case through which a run of ribbon is looped;

means for guiding the ribbon from said other slot to the outside of said take-up spool along a predetermined path;

means defining an access aperture in a portion of said case opposite from said one sidewall configured to receive said pressure roller and said motive roller to permit engagement of the ribbon by said roller means between said guide means and the take-up spool when the cartridge is mounted along said path;

means defining another aperture in the lower wall of said case configured to receive the two projections of the two levers therein during use of the cartridge; and

control means cooperative with one of said levers, when the cartridge is mounted, and avoiding the projection of said one lever to cooperate with the ribbon wound on said corresponding spool for causing said motive means to

rotate said one hub, thereby winding on said take-up spool the ribbon fed thereto by said roller means.

4,033,446

THREE-POSITION RIBBON GUIDE FOR PRINTER

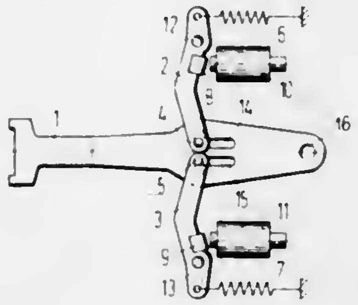
Werner Taubert, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 8, 1976, Ser. No. 664,874

Claims priority, application Germany, Mar. 20, 1975, 2512337

Int. Cl.² B41J *35/10, 35/20*

U.S. Cl. 197—157 **6 Claims**



1.A ribbon guide bar for a printer assembly comprising a pair of armature levers carried pivotally on pins spaced transversely to an axis of said guide bar in a horizontal, center position for movement in a plane formed by said guide bar, each said lever being actuated by an electromagnet in one direction and by a spring in an opposite direction and carrying at an end thereof a coupling pin, the ribbon guide bar being pivoted at one end about an axis parallel to said armature lever pins and carrying a ribbon guide at an opposite end and comprising:

a pair of guide slots formed in said bar between said ends, spaced apart transversely of said guide bar axis, each said slot slidably but snugly receiving one of said coupling pins of said levers and comprising

a first, generally vertical portion having an end spaced adjacent said guide bar axis, and

second horizontal portion extending parallel to said guide bar axis and having an end coinciding with said end of said first slot portion, whereby each coupling pin may travel freely between said first and second guide slot portions,

whereby said guide bar may be locked in any of three positions by said coupling pins in said guide slots depending upon actuation of said electromagnets.

4,033,447

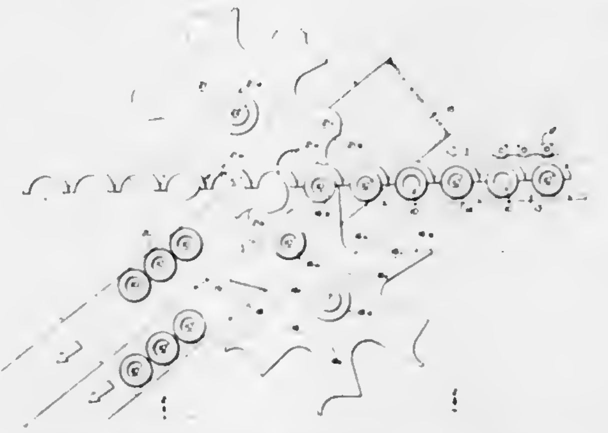
CONTAINER LINE DIVIDER

Robert J. Heier, Whitehouse, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Aug. 11, 1975, Ser. No. 603,410

Int. Cl.² B65G *47/26*

U.S. Cl. 198—441 **5 Claims**



1. Container handling apparatus for transferring containers comprising a first horizontal straight line conveyor movable at a substantially uniform speed in one direction including a side-open pocket chain having the pockets at equally spaced intervals therealong and adapted to carry containers in a straight line, a guide means adjacent the first conveyor and spaced opposite said open side of the pockets for retaining containers in the pockets,

a second horizontal conveyor means at the same elevation as said first conveyor and including a straight section movable across the path of the first conveyor at an obtuse angle, said pocket chain conveyor extending across said second conveyor means, the second conveyor means adapted to be driven in a diverging direction away from the side open pockets and at obtuse angular relationship with said chain conveyor, said guide means terminating adjacent said second conveyor means permitting containers to leave said side open pockets thereafter upon being carried onto said second conveyor means,

a first horizontal rotary cam member carried on a vertical shaft mounted for rotation and spaced from the side open pockets and in the direction of movement of the second conveyor means, said first cam having alternating primary and secondary lobes, the primary lobes engaging alternate containers in the side open pockets as they pass the terminal end of the guide means and retaining them in said pockets until carried to a first position on the second conveyor means by the side open pockets, whereupon rotary movement of the first lobes away from the path of the pocket chain releases the containers for egress from their said pockets for thereafter conveying them in a first line on the second conveyor means, and the secondary lobes of said cam permit alternate containers in said chain pockets to be released therefrom at a second position on the second conveyor means, said second lobes restraining such containers at said second position during cam rotation to release them in a second line spaced from said first line on the second conveyor means,

a second horizontal rotary cam member carried on a vertical shaft mounted for rotation on the opposite side of the pocket chain from said first cam, said second cam having primary and secondary lobes, the primary lobes adapted to engage containers in the chain pockets and guide them to said second position on the second conveyor means and the secondary lobes adapted to receive containers retained in the pockets by the primary lobes of the first cam to guide them to said first position on the second conveyor means,

means connected to the shafts of said first and second cam members for driving them in opposite directions of rotation and in synchronism,

a center guide member, and

means mounting said guide member longitudinally of the second conveyor intermediate the first and second lines of containers formed thereon, the guide means extending from the transfer zone on the second conveyor and in the downstream direction thereon.

4,033,448

CONVEYOR TRANSFER APPARATUS PICKUP AND DROPOFF SENSOR

Thomas R. MacFarlane, and Frank R. Skinner, II, both of St. Joseph, Mich., assignors to Whirlpool Corporation, Benton Harbor, Mich.

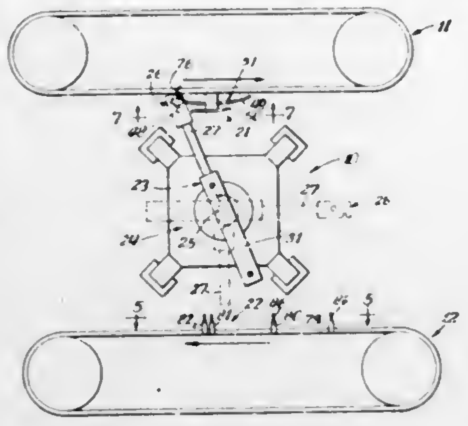
Filed Oct. 24, 1975, Ser. No. 625,519

Int. Cl.² B65G *47/00*

U.S. Cl. 198—465 **11 Claims**

1. In an apparatus for transferring an article from a first moving conveyor to a second moving conveyor, said apparatus having a carrier provided with a pickup device, means for raising the carrier to cause the pickup device to engage the article at a pickup position and pick up the article from the first conveyor, and means for moving the carrier to bring the

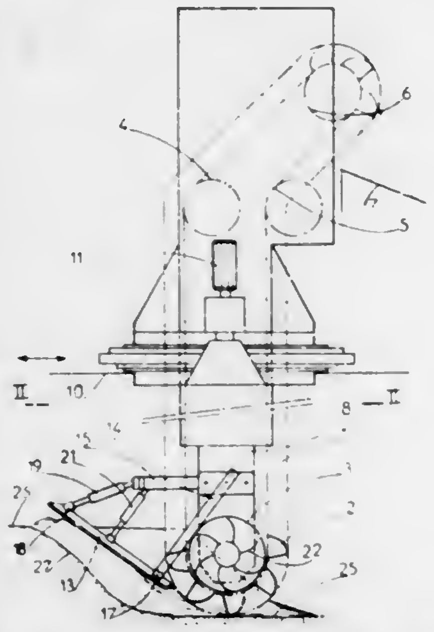
picked up article from the pickup position to a dropoff position adjacent the second conveyor whereat the article may be transferred to the second conveyor, the improvement comprising: a control disposed to be actuated by the article reaching a preselected position spaced from said pickup position; means for causing the pickup device to be juxtaposed to the



article as an incident of actuation of said control; sensing means for sensing the juxtaposition of the article to the pickup device at said pickup position; and means responsive to the sensing of said juxtaposition to initiate raising of the carrier to cause said pickup device to pick up the article and prevent operation of the moving means until said article is fully picked up by said pickup device.

4,033,449
APPARATUS FOR HANDLING BULK MATERIALS

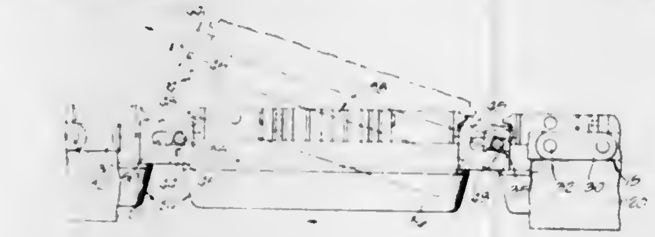
Jacques Pradon, 19 Avenue de la Tourelle, Saint-Maur-des-Fosses, France
Continuation of Ser. No. 242,378, April 10, 1972. This application Jan. 24, 1975, Ser. No. 543,979
Claims priority, application France, Apr. 15, 1971, 71.13234; Mar. 24, 1972, 72.10357
Int. Cl.² B63B ***27/00***
U.S. Cl. 198—520 **4 Claims**



1. Bulk handling apparatus for removing material from the sloping face of a pile of material comprising a substantially vertical bucket elevator, a discharge for said bucket elevator, means for removing handled substances at said elevator discharge, a substantially vertical moveable arm supporting said bucket elevator, means for rotating said arm around its vertical axis, means for supporting said moveable arm for horizontal movement of said arm along the face of the pile of material, slat cutting means mounted for articulation around a long axis adjacent the bottom of said arm and means for positioning said slat cutting means substantially parallel to the slope of the face of the pile of material and substantially in a plane extending through the buckets of the elevator, said positioning means holding said slat cutting means in position during use with the upper end of said slat leading the bottom end of said slat during horizontal movement of said arm and of said slat along the face of the pile.

4,033,450
CONVEYOR WITH REMOVABLE RECEPTACLES

Paul F. Paddock, Riverside, and Jerry W. Cramer, Upland, both of Calif., assignors to Sunkist Growers, Inc., Sherman Oaks, Calif.
Division of Ser. No. 401,886, Sept. 28, 1973, Pat. No. 3,945,489. This application Nov. 24, 1975, Ser. No. 634,497
Int. Cl.² B65G ***15/00***
U.S. Cl. 198—648 **1 Claim**

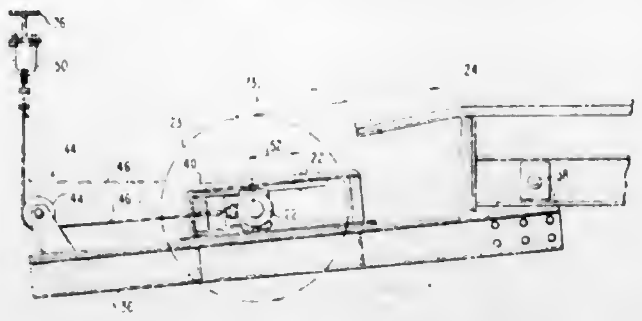


1. In a conveyor wherein a row of receptacles are linked together to form a conveyor chain with
transverse rods respectively at the junctures of the receptacles, the improvement in which:
each receptacle is provided with an open longitudinal slot connection means at one of its ends releasably straddling a transverse rod, and
with a laterally open slot connection means at the other of its ends releasably straddling an adjacent transverse rod;
said slot connection means at said ends coacting to normally retain the receptacles connected to the chain, but permitting a receptacle to be removed from the row of receptacles by first disconnecting said other end of the receptacle from its transverse rod by lateral movement of said other end and thereafter disconnecting said one end of the receptacle from its transverse rod;
said conveyor chain being supported for movement in a continuous circuit including an upper run and a lower run;
the laterally open slot connection means comprising a pair of similar entrance slots which are upwardly inclined when the receptacle is on the upper run to retain the receptacle on the transverse rod, and downwardly inclined when the receptacle is on the lower run so as to permit disengagement from the transverse rod.

4,033,451
SELF-COUNTERWEIGHTED TAKE-UP

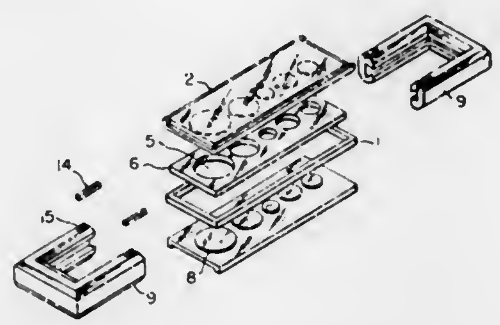
Frederick A. Kelsall, Milwaukee, Wis., assignor to Rexnord Inc., Milwaukee, Wis.
Filed Sept. 12, 1975, Ser. No. 612,985
Int. Cl.² B65G ***15/30***
U.S. Cl. 198—815 **46 Claims**

1. An endless conveyor system having a self-counterweighted take-up assembly, said conveyor system comprising:
a. a headshaft;
b. a first return training means carried by said headshaft;
c. a footshaft;
d. a second return training means carried by said footshaft;
e. an endless conveyor trained around said first and second return training means;
f. a first frame which is immobile relative to said headshaft;
g. a second frame;
h. take-up bearings mounted on said second frame for journalling the ends of said footshaft for longitudinal sliding;
i. first means for pivotably mounting said second frame about an axis parallel to said footshaft and spaced from said footshaft on one side of said take-up bearings; and
j. second means for permitting said second frame to pivot about its axis as the ends of said footshaft move in said take-up bearings during use of the conveyor system, whereby tension is maintained in said endless conveyor as said endless conveyor varies in length by the force of gravity acting on said footshaft and said second return training means.



4,033,452
DISPLAY CONTAINER

Norman W. Therrien, Box 1106, Pittsfield, Mass. 01201
Continuation of Ser. No. 392,897, Aug. 30, 1973, Pat. No. 3,957,157. This application May 14, 1976, Ser. No. 686,440
Int. Cl.² A45C ***11/28***
U.S. Cl. 206—.83 **5 Claims**

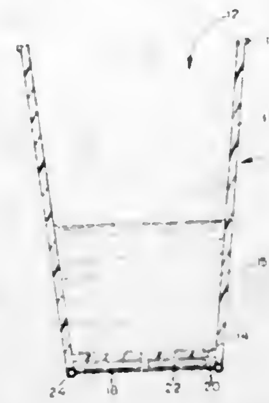


1. A container comprising first and second air-impermeable retaining plates each having two main faces and arranged with one main face of the first plate confronting one main face of the second plate, at least one recess in said one main face of said first plate, and a resilient, air-impermeable sealing member positioned between the retaining plates continuously about the recess, the two retaining plates being fitted in a frame defining a channel-section recess which extends about the periphery of the retaining plates and in which edge portions of the retaining plates are received to compress the retaining plates against the sealing member thereby to form air-tight seals between the sealing member and the retaining plates respectively, the frame including at least two frame members both of which are readily removable to permit disassembly of the container and are readily replaceable to facilitate reassembly of the container.

4,033,453
COMBINATION DRINKING CUP AND STORAGE CONTAINER

Joseph Giaimo, c/o JMC Tool Co., 845 Fairfield Ave., Kenilworth, N.J. 07033
Filed June 18, 1976, Ser. No. 697,424
Int. Cl.² B65D ***77/04, 77/28, 77/36***
U.S. Cl. 206—217 **8 Claims**

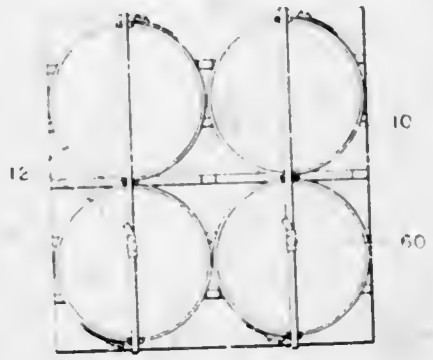
1. A combination disposable drinking tumbler and commestible storage container comprising a walled receptacle open at one end and adapted to receive a liquid and said commestible therein, a floor adjacent the end opposite said open end, a tearable base portion coaxially aligned with said floor, spaced apart therefrom and forming the opposite end of said receptacle, said base portion being in planar alignment with the lower end of said wall, a removeable rib removeably affixed between said base and said wall, a quantity of liquid



soluble commestible disposed in the space formed beween said floor and said base, the removal of said rib causing the tearing of said tearable base portion and the subsequent release of said commestible.

4,033,454
METHOD AND STRUCTURE FOR RETAINING SHIPPING DRUMS ON PALLETS

Cesar Santoni, Hamilton, Canada, assignor to Greif Bros. Corporation, Delaware, Ohio
Filed July 6, 1976, Ser. No. 702,458
Int. Cl.² B65D ***19/00***
U.S. Cl. 206—386 **31 Claims**



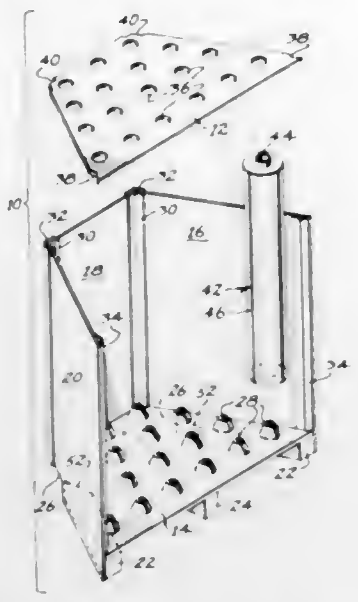
1. A large drum adapted to be mounted on a pallet comprising; a tubular body having a bottom closure sealing the bottom end of the tubular body and a top closure sealing the top end of the tubular body, the drum adapted to be positioned on the pallet for engagement by at least one strap coupling the drum to the pallet, and confining means on the drum adapted to receive and retain the at least one strap from slipping off the drum used to fasten the drum to the pallet.

4,033,455
CONTAINER

Charles D. Robison, 4309 Estes Road, Nashville, Tenn. 37215
Filed Sept. 27, 1976, Ser. No. 726,846
Int. Cl.² B65D ***85/66, 19/00, 21/04***
U.S. Cl. 206—391 **5 Claims**

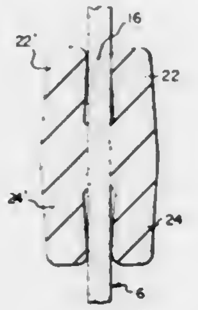
1. A film transporter comprising a container having three

sides and at least one upright end having a plurality of openings therein adapted for extension therethrough of ends of



cores of rolls of sheet and wherein 2 sides of the container extend from the third at oblique angles.

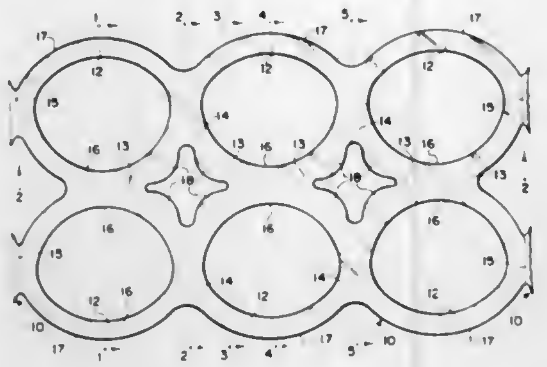
4,033,456
TERMINAL STRIP HAVING PLASTIC CARRIER STRIP
Donald Andrew Wion, Harrisburg, and Christopher Kingsley Brown, Camp Hill, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.
Filed May 25, 1976, Ser. No. 689,883
Int. Cl.² B65D *73/02, 85/42, 85/24*
U.S. Cl. 206—347 **4 Claims**



1. A continuous strip of terminal posts, said posts being intended for insertion into a printed circuit board by an insertion apparatus of the type having an insertion punch which engages one end of each pin and pushes it axially into the printed circuit board, said strip comprising:

- a continuous carrier strip of thermoplastic material, said strip having a web portion and a pair of continuous post holding flanges extending from the edges of said web portion on both sides of said web portion,
- a plurality of terminal posts extending through and held in said web, the axes of said posts extending substantially normally of said web,
- portions of said posts which are between said flanges on both sides of said web portion being confined against lateral movement by said flanges whereby said posts are stabilized in a common plane, said posts being individually removable from said strip during insertion into a printed circuit board by axially aligning the leading post of said strip with an insertion punch and thereafter moving said punch towards said leading post whereby said punch will push said leading post from said strip and into said printed circuit board located beneath said strip.

4,033,457
REEL-WINDABLE CONTAINER CARRIER STOCK
William Norfred Weaver, Glen Ellyn, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Continuation of Ser. No. 541,742, Jan. 17, 1975, abandoned. This application June 14, 1976, Ser. No. 695,665
Int. Cl.² B65D *85/66*
U.S. Cl. 206—390 **3 Claims**



1. A roll of container carrier stock wound in superposed layers and having a central annular circumferential hump, said stock comprising a strip of multiple container carriers connected in series in an end-to-end relationship, each of the multiple container carriers in said strip comprising a plurality of pairs of container encircling bands and integral webs interconnecting the bands of each pair of bands and the adjacent pairs of bands in said carrier, integral connections between the ends of adjacent carriers in said strip, each of said bands having a inner peripheral edge and an outer marginal edge extending between said webs and said integral connections, said pairs of bands in each carrier arranged transversely of said strip, said bands and webs and said integral connections between adjacent carriers in said strip being formed from a thin resilient plastics sheet material, said inner peripheral edge and said outer marginal edge of each of said bands in each carrier including said outer marginal edge extended through said webs and through said integral connections being substantially parallel circumferentially thereof, and each of said carriers including radially outward curvilinear tabs integrally extending from the outer marginal edges of the portions of each two adjacent bands in each carrier which are circumferentially between the webs interconnecting the bands of each pair of bands and the webs interconnecting said adjacent bands to substantially increase the mass of said plastics sheet material on each side of the longitudinal center line of said strip and to form said central annular circumferential hump.

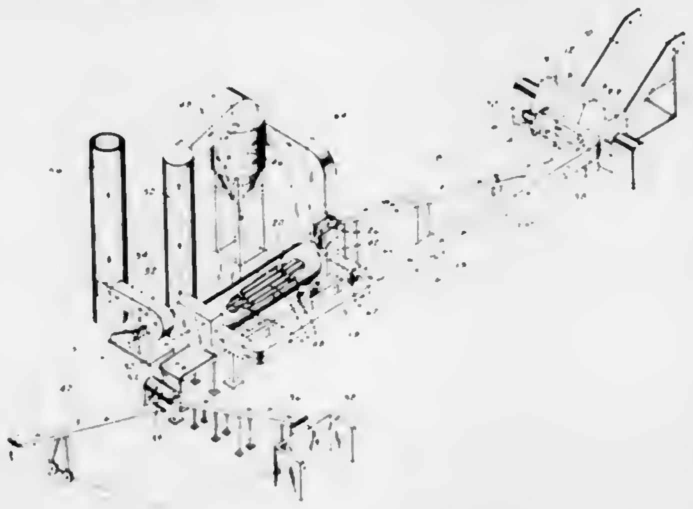
4,033,458
METHOD AND APPARATUS FOR CLEANING SHREDDED SCRAP
Julius L. Chazen, 936 Mountain Creek Road, Chattanooga, Tenn. 37405, and James Donald Brock, 524 Northcrest, Chattanooga, Tenn. 37404
Filed Mar. 19, 1975, Ser. No. 560,017
Int. Cl.² B03B , B07B
U.S. Cl. 209—11 **8 Claims**

1. A method of cleaning shredded scrap from a heat-generating shredder for metal articles comprising conveying relatively heavy shredded material away from the shredder along a first path, utilizing an air stream to convey scavenge air away from the shredder in a confined second path, directing the material from the first path into a tumbling drum and causing the material to be moved through said drum and to be discharged therefrom, directing the air stream with said scavenge air from said second path into said tumbling drum to entrain particulate material which has entered said drum with said heavy shredded material, directing said air stream with the scavenge air away from the tumbling drum, separating said particulate material from said air stream, bypassing a portion of said air stream from said second path around said tumbling

drum to vary the velocity of air flow though said drum, and then merging said bypassed air stream with the air stream leaving said tumbling drum.

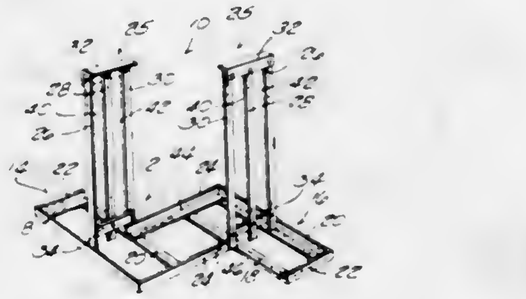
3. A method of cleaning shredded scrap from a heat-generating shredder for metal articles comprising conveying relatively heavy shredded material away from the shredder along a first path, utilizing an air stream to convey scavenge air away from the shredder in a confined second path, directing the material from the first path into a tumbling drum and causing the material to be moved through said drum and to be discharged therefrom, directing the air stream with said scavenge air from said second path into said tumbling drum to entrain particulate material which has entered said drum with said heavy shredded material, directing said air stream with the scavenge air away from the tumbling drum, separating said particulate material from said air stream, utilizing metal duct work to confine the air stream in said second path, and raising the temperature of the air stream sufficiently to cause heating of the duct work above the dewpoint to thereby prevent condensation of moisture and build-up of particulate matter on the interior of said duct work.

6. Apparatus for cleaning shredded scrap from a heat-generating shredder for metal articles comprising a tumbling drum, means for conveying relatively heavy shredded material from said shredder to said tumbling drum, said drum having means for causing the heavy material to be moved through said drum as it is being tumbled therein and to be discharged from the opposite end thereof, conduit means connected between said drum and the outlet of said shredder for receiving an air stream with scavenge air from said shredded scrap and for conveying it to said tumbling drum, means for causing movement of said air stream through said shredder, and through said conduit means and drum to remove particulate material from the tumbling scrap in the drum, means for directing said air stream with particulate material therein away from said tumbling drum, means for separating said particulate material from said air stream, bypass means for bypassing a portion of said air stream from said conduit means around said tumbling drum to control the velocity of air flow through said drum and thus to control the size of the particulate material removed from said shredded scrap in said tumbling drum.



8. Apparatus for cleaning shredded scrap from a heat-generating shredder for metal articles comprising a tumbling drum, means for conveying relatively heavy shredded material from said shredder to said tumbling drum, said drum having means for causing the heavy material to be moved through said drum as it is being tumbled therein and to be discharged from the opposite end thereof, conduit means connected between said drum and the outlet of said shredder in such a location as to receive a heated air stream with scavenge air from said shredded scrap and convey it to said tumbling drum to provide the air supply therefor, means for causing movement of said air stream through said shredder, and through said conduit means and drum to remove particulate material from the tumbling scrap in the drum, means for directing said air stream with particulate material therein away from said tumbling drum, means for separating said particulate material from said air stream, the connection of the conduit with the shredder being in such a location as to receive an air stream heated by heat generated by the shredder to cause the temperature of the air stream in the conduit means to be raised above the dewpoint, thereby preventing condensation of moisture on the interior of said conduit means, and thereby preventing buildup of particulate material on the interior of said conduit means, there being heating means connected with said conduit means whereby the temperature of the air stream in said conduit means is raised above the dewpoint to prevent condensation of moisture on the interior of said conduit means, thereby preventing build-up of particulate material on the interior of said conduit means.

4,033,459
MODULAR BICYCLE RACK
Donald J. Zach, 5824 Glen Flora Drive, Greendale, Wis. 53129
Filed Sept. 29, 1975, Ser. No. 617,461
Int. Cl.² B62H *3/00*
U.S. Cl. 211—20 **1 Claim**



1. A modular stand for bicycles each modular unit comprising a base having two cradle sections for receiving and supporting bike wheels, each cradle section including parallel spaced side runs and parallel spaced end runs which define ground engaging rectangular frames and sized to support two bicycle wheels from opposed directions, vertically extending frame portions including a dividing frame portion defining two wheel receiving slots connected to and centered on each of said cradle sections, and means for connecting and spacing said cradle sections and said wheel receiving slots in staggered relationship with the vertically extending frame portions oriented along fixed spaced parallel axes to afford storage of two bikes in each of said cradles from opposite directions without handlebar interference and wherein said connecting means for connecting said cradles comprise extensions on one of the end runs of each cradle which extend beyond said cradle side runs with the end runs having the extensions being connected to the side runs of the adjacent cradle adjacent the vertically extending frame portions.

4,033,460
HOLDER FOR SKIS, SKI POLES AND SKI BOOTS
Arthur E. Alexandre, 26292 Papagayo, Mission Viejo, Calif. 92675
Filed Mar. 22, 1976, Ser. No. 669,142
Int. Cl.² A47F *7/00*
U.S. Cl. 211—60 SK **9 Claims**

1. A wall bracket for supporting a pair of skis, ski poles and ski boots mounted to a ski boot carrier off the floor, comprising:

- wall means disposed at the rear of the bracket;
- a pair of fingers secured to the wall means and projecting forwardly therefrom at least the width of a ski and laterally spaced at least twice the thickness measured from the top of the ski to the underside of the ski for vertically

supporting a pair of skis via the front ski boot binding positioned thereon;

ski pole gripping and holding means secured to each of the outside and sidewardly facing portions of the pair of fingers for releaseably gripping and holding a ski pole in vertical disposition; and

one of the fingers being longer than the other finger and having means disposed on the longer finger adjacent the forwardmost end of the finger whereupon a ski boot carrier may be hung.

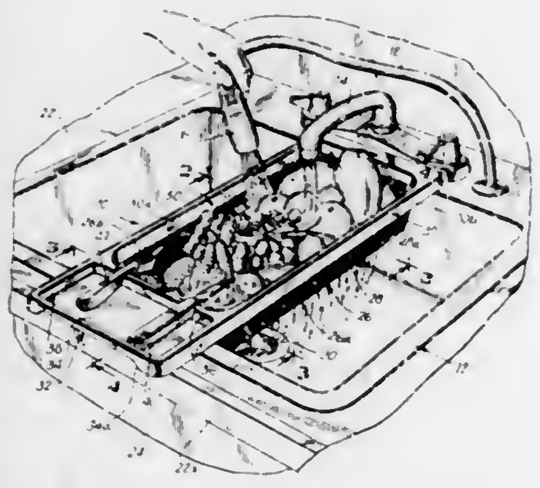
4,033,461
CLEANING AND DRAINING DEVICE FOR SINK

Bela B. Nevai, Dobbs Ferry, N.Y., assignor to Belaco International Ltd., Dobbs Ferry, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,416

Int. Cl.² A47J *19/00*

U.S. Cl. 211—86 **22 Claims**



1. A cleaning and draining device for a sink comprising a generally rectangular basket having a bottom, side and end walls, and an open top end; at least one of said walls being foraminous to permit water drainage therethrough; support portions extending outwardly from opposite sides of said basket adapted to rest on and be slidably supported on opposite upper edges of a sink, at least one of said support portions being generally planar to form a tray adapted to support cleaning tools, soap and the like, said tray being arranged in a generally horizontal plane when said support portions rest on the edges of the sink, and said tray including a recessed bottom wall provided with an upwardly projecting surface extending about the periphery of said bottom wall to permit drainage of water accumulated on said tray only into said basket.

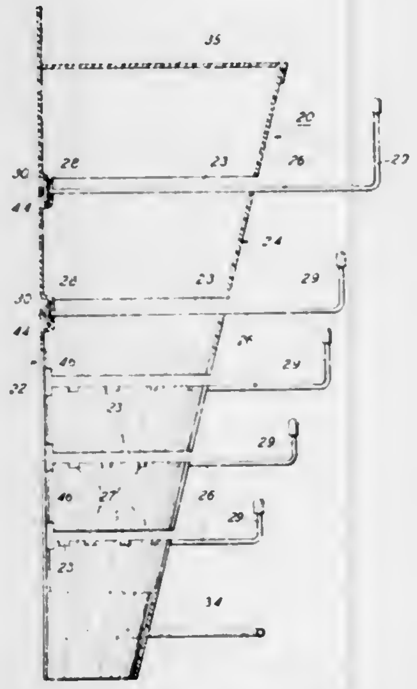
4,033,462
ARTICLE SUPPORT/DISPLAY DEVICE

Diana C. De Fabritis, Aunt Hack Road, Danbury, Conn. 06810

Filed Apr. 30, 1976, Ser. No. 681,795

Int. Cl.² A47F *5/08*

U.S. Cl. 211—94 **14 Claims**



1. An article holding device comprising:

A. a first portion incorporating a plurality of elongated tracks;

B. a second portion incorporating
   a. a front surface in juxtaposed spaced relationship to said first portion and slanted with respect thereto with the lower edge of the front surface closer to said first portion than the upper edge of the front surface, and
   b. a plurality of hook support zones formed in the front surface in juxtaposed spaced relationship to said elongated track;

C. a plurality of anchoring members slidably engaged engaged within the elongated tracks of the first portion; and

D. a plurality of sets of hook members
   a. individually secured at one end thereto to one of said anchoring members and extending therefrom to a forward holding position with a portion thereof engaging said support zone of said second portion,
   b. each member of a set having a substantially equal length, and at least two of said sets having different lengths, and
   c. each set of hook members being engaged in one of said tracks with the shortest length set engaged in the track wherein the distance between the second portion and the first portion is the smallest, and the longest length set engaged in the track wherein the distance between the second portion and the first portion is the largest;

whereby said hook members can be positioned at any location along the track for variable engagement in a plurality of different positions along said hook support zone thereby enabling articles depending from one set of hook members to be positionable thereon without interfering with any other set of hook members.

4,033,463
WORK-FACILITATING APPARATUS FOR LINING CONVERTERS, METALLURGICAL FURNACES, HOLDING VESSELS AND LIKE EQUIPMENT

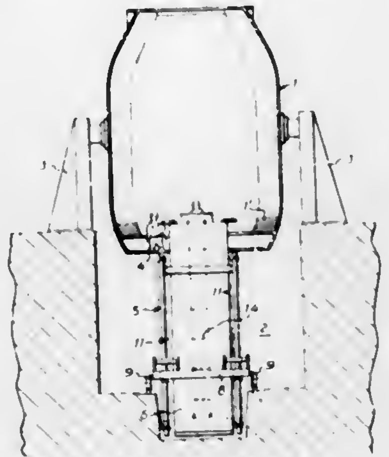
Gunnar Cervin, Malmo, Sweden, assignor to Cervinter AB, Malmo, Sweden

Filed Feb. 17, 1976, Ser. No. 658,667

Claims priority, application Sweden, Feb. 17, 1975, 7501704; Apr. 7, 1975, 7503930; Sept. 12, 1975, 7510234

Int. Cl.² B66B *9/20*

U.S. Cl. 214—1 H **23 Claims**



1. An apparatus for facilitating the conveyance of material and the erection of walls of closed circumference from bricks, such as refractory bricks, and particularly for lining converters, metallurgical furnaces, such as blast-furnaces, holding vessels and like equipment, said apparatus comprising:

a vertical frame supporting a working platform;

conveyer means including a vertical conveyance path for conveying material to a discharging position at a level above said working platform and a supply path for conveying the material to said vertical conveyance path, said vertical conveyance path and said supply path being formed by two conveyer runs, one of said runs being extendable by shortening of the other of said runs and vice versa; and

substantially horizontal conveying means, supported by and surrounding said frame, for receiving material delivered to said discharging position by the said conveyer run forming said vertical conveyance path and for transferring the thus received material in a substantially circular path and then to a selected construction position.

4,033,464
CLIP FOR REFLECTIVE INSULATION

Richard Wallace Carr, Lancaster, Ohio, assignor to Diamond Power Specialty Corporation, Lancaster, Ohio

Filed Dec. 8, 1975, Ser. No. 638,788

Int. Cl.² B65G *1/14*

U.S. Cl. 214—10.5 R **6 Claims**

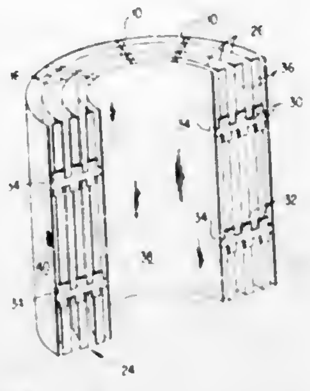
1. A clip for spacedly supporting a series of flanged sheets of reflective insulation comprising:

a series of flanged sheets of reflective insulation;

an elongated strip section mountable transverse to the flanged sections of the series of sheets of reflective insulation;

spacer means formed along one edge of said elongated strip section extending substantially perpendicularly to the plane of said elongated strip section for maintaining a space between each of the series of sheets of reflective insulation; and

retention member means formed along the opposite edge of said elongated strip section extending perpedicularly to said elongated strip section and perpendicularly to said spacer means in a first position and being bendable over the flanged section of each of the flanged sheets of reflective insulation in a second position to capture said flanged sheets to said clip.



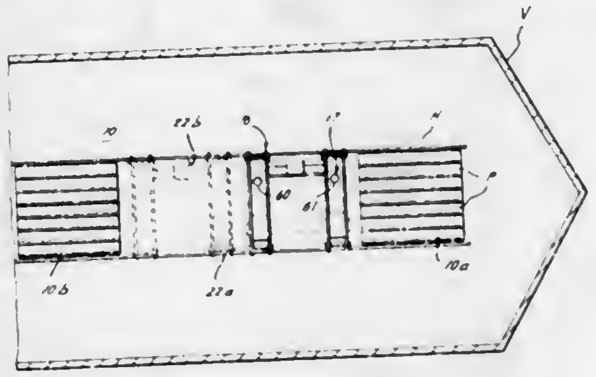
4,033,465
PIPE HANDLING SYSTEM FOR VESSELS

Joe C. Stine, Houston, Tex., assignor to Houston Systems, Inc.

Filed May 20, 1974, Ser. No. 471,215

Int. Cl.² B63B *35/30*

U.S. Cl. 214—13 **8 Claims**



1. A pipe transfer system for transferring pipe from the hold of a vessel to the deck of said vessel and into position for attachment with an underwater pipeline, comprising:

a pipe laying station positioned on the deck of said vessel for laying an underwater pipeline;

overhead crane means mounted in said vessel hold for moving a pipe length from storage in said vessel hold to a position of alignment with a deck hatch;

elevator means for receiving said pipe length from said overhead crane means and for moving said pipe length upwardly from said vessel hold to said vessel deck;

first conveyor means mounted on said deck for receiving said pipe length from said elevator means and for moving said pipe length longitudinally of said vessel; and

second conveyor means for receiving said pipe length from said first conveyor means and for moving said pipe transversely of said ship to said pipe laying station.

4,033,466
GRAIN DRYING AND STORAGE APPARATUS

Harlan J. Easton, Box 607 - Rte. 3, Blooming Prairie, Minn. 55917

Filed July 12, 1976, Ser. No. 704,126

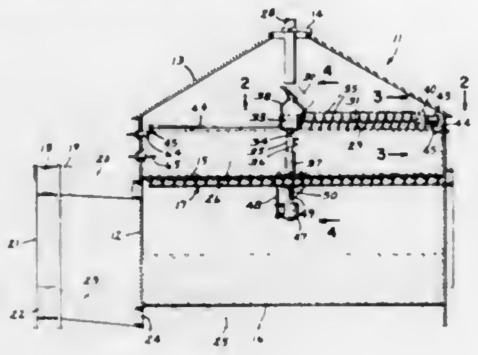
Int. Cl.² B65G *65/32*

U.S. Cl. 214—17 CB **8 Claims**

1. Apparatus for distributing granular material to a given depth over a surface of predetermined size, comprising:

a. an elongated distributing auger having first and second ends, the first end being disposed at the approximate center of said surface;

b. feeding means for delivering granular material to said surface adjacent said first end of said auger;
c. pivot means for pivotally supporting said auger at said first end;
d. drive means for impating material distributing rotation to said auger; l
e. means for supporting said auger at said second end thereof;
f. driving mechanism for imparting pivotal movement to said auger about said pivot means;



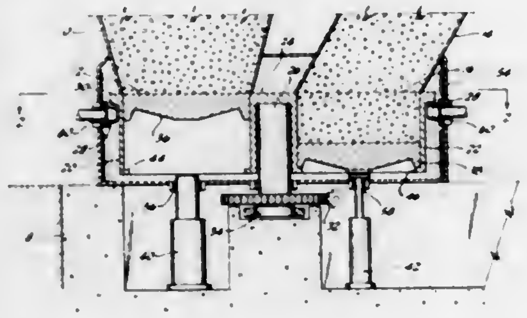
g. an elongated leveller member
h. and support means mounting said leveller member at its opposite ends at said first and said second ends of said auger and disposing said leveller member in spaced generally parallel trailing relationship to said auger during said pivotal movements of the auger, and for raising and lowering of at least one of said opposite ends relative to said auger.

4,033,467

DUAL CYLINDER ROTATING SOLIDS FEEDER AND METHOD

William L. Bewley, Fullerton, and Herbert F. Wilkinson, deceased, late of Anaheim, Calif. (by Alice E. Wilkinson, executrix), assignors to Union Oil Company of California, Brea, Calif.

Filed June 1, 1976, Ser. No. 691,634
Int. Cl.² C10B ***31/02***
U.S. Cl. 214—23 **15 Claims**



1. A solids feeder for introducing particulated solids into a solids upflow vessel having a bottom solids inlet opening, which comprises:
a carriage adapted for rotation about a central vertical axis;
a solids feed chute communicating with an elevated solids feed reservoir for transporting particulated solids from said solids feed reservoir by gravity flow, said solids feed chute terminating in a bottom outlet opening located in the same horizontal plane as the bottom solids inlet opening of said solids upflow vessel, said solids inlet opening of said solids upflow vessel and the bottom outlet opening of said feed chute being equally spaced from the central vertical axis of said rotatable carriage along a horizontal axis intersecting the axis of rotation of said carriage;
carriage support means for rotatably supporting said carriage in a horizontal position below said solids upflow vessel and said solids feed chute;
first and second vertical solids feed cylinders mounted on said carriage in spaced relationship, said cylinders being equally spaced from the central axis of said rotatable carriage along a diameter therof, said first solids feed cylinder being axially aligned with and immediately below the bottom solids inlet opening of said solids upflow vessel and said second cylinder being axially aligned with and immediately below the bottom outlet opening of said solids feed chute when said carriage is in a first stationary position, and said first solids feed cylinder being axially aligned with and immediately below the bottom outlet opening of said solids feed chute and the second solids feed cylinder being axially aligned with and immediately below the bottom solids inlet opening of said solids upflow vessel when said carriage is in a second stationary position;
carriage drive means for rotating said carriage between said first and second stationary positions;
a first free-floating solids feed piston movably mounted in said first solids feed cylinder;
a second free-floating solids feed piston movably mounted in said second solids feed cylinder;
a first hydraulic ram vertically mounted below said bottom solids inlet opening of said solids upflow vessel to alternately move said first and second pistons in their respective cylinders upwardly to displace particulated solids from said cylinders upwardly into said solids upflow vessel;
a second hydraulic ram vertically mounted below said outlet opening of said feed chute to alternately control the movement of said first and second piston in their respective cylinders to fill said cylinders with particulated solids from said solids feed chute;
piston support means for supporting said first and second free-floating pistons at the bottom of a filled solids feed cylinder and at the top of an empty solids feed cylinder;
solids sealing means for sealing said bottom outlet opening of said solids feed chute and the solids inlet opening of said solids upflow vessel when said first and second solids feed cylinders are not axially aligned therewith; and
control means for synchronizing the rotation of said carriage and the movement of said first and said second solids feed pistons.

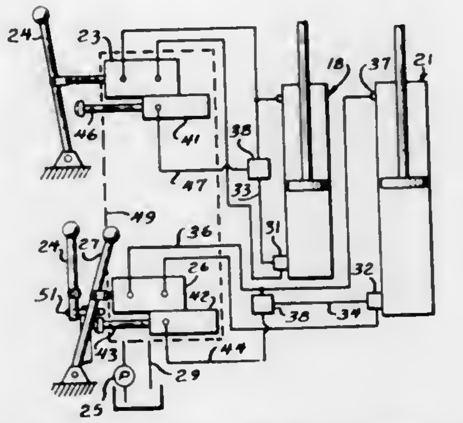
12. A method for transporting particulated solids from an elevated solids feed reservoir and introducing said solids into a solids upflow vessel having a bottom solids inlet opening, which comprises:
transporting said particulated solids by gravity flow from said solids feed reservoir to a first station located adjacent to the bottom solids inlet opening of said solids upflow vessel;
positioning a first solids feed cylinder fitted with a first free-floating piston and filled with particulated solids directly below said solids inlet opening of said solids upflow vessel and a second solids feed cylinder fitted with a second free-floating piston directly below said first station;
simultaneously moving said first free-floating piston upwardly to displace the solids from said first cylinder upwardly into said solids upflow vessel and moving said second free-floating piston downwardly to fill said second cylinder by gravity flow with particulated solids;
maintaining said first piston at the top of said first cylinder and said second piston at the bottom of said second cylinder while moving each of said cylinders along an arcuate path of 180° so that said first cylinder is positioned directly below said first station and said second cylinder is positioned directly below said solids inlet opening of said solids upflow vessel; and
simultaneously moving said second free-floating piston upwardly to displace the solids from said second cylinder upwardly into said solids upflow vessel and moving said first free-floating piston downwardly to fill said first cylinder by gravity flow with particulated solids.

4,033,468

HYDRAULIC BOOM-LIFT SYSTEM WITH SELECTIVE SPEEDS

Wilburn Kelly Brown, Morton Grove, Ill., assignor to Pettibone Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 558,782, March 17, 1975. This application July 7, 1975, Ser. No. 593,374
Int. Cl.² B66C ***23/00***
U.S. Cl. 214—130 R **8 Claims**



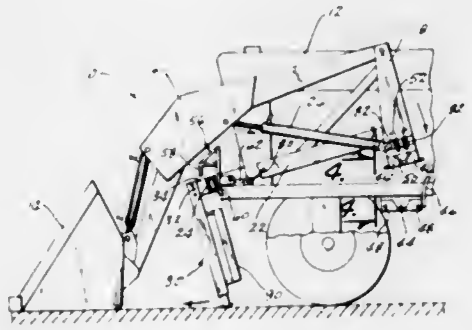
1. A hydraulic system for raising and lowering a boom at three different speeds, when using a generally constant-speed supply of pressured oil, including an oil reservoir, a first cylinder means, a second cylinder means of different effective cross-sectional area, and valving means including a reversing valve shiftable to reverse and throttle the flow through the connections of supply and return to cylinder means by a single manual actuator, said valving means including means for supplying pressured-oil from said supply as a single source optionally:
[illegible] to the first cylinder means while the second cylinder means is allowed to float, for one speed when not throttled,
b. to the second cylinder means while the first cylinder means is allowed to float, for a second speed when not throttled, or
c. to both cylinder means simultaneously to achieve the maximum lifting force available, and slowest speed when not throttled, by supplying said oil pressure to the combined piston areas of both cylinder means.

4,033,469

FRONT END LOADER AND METHOD OF MOUNTING SAME ON TRACTOR

Eldon M. Frank, Lake View, Iowa, assignor to F & W Company, Inc., Lake View, Iowa

Continuation-in-part of Ser. No. 260,465, June 7, 1972, Pat. No. 3,863,786. This application Feb. 3, 1975, Ser. No. 546,432 The portion of the term of this patent subsequent to Feb. 24, 1993, has been disclaimed.
Int. Cl.² E02F ***3/72***
U.S. Cl. 214—131 A **18 Claims**



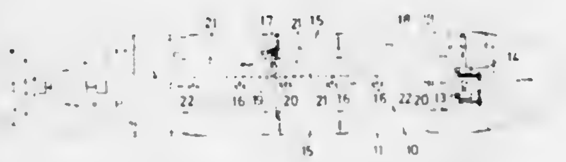
2. A tractor having a quick mount and dismount front end loader comprising,
a front end loader having a U-shaped frame with opposite side frame members extending rearwardly from a forwardly positioned cross frame member having front and back sides, uprights connected to the rear ends of said side frame members and a boom having its rear end connected to the upper end of said uprights, power cylinders extending between the boom and the uprights,
a tractor having side support brackets on opposite sides thereof for engagement with the lower ends of said uprights, a vertically disposed guide support bracket across the front endof said tractor for engagement with the back side of said cross frame member, said guide support bracket being U-shaped and open downwardly,
a stand rigidly connected to the forward end of said U-shaped frame for pivotal movement therewith during the mounting and dismounting operations,
locking means for detachably securing said cross frame member to said forward guide support bracket and said uprights to said side support brackets, said locking means including a pin carried on the U-shaped bracket for engagement with an opening in said cross frame, and the rear leg of said U-shaped bracket tapering downwardly and rearwardly for guiding said cross frame into and out of said U-shaped bracket, and
said power cylinders upon being extended causing said loader to pivot counterclockwise about a pivotal axis through said cross frame member thereby disengaging said uprights from said support brackets when said associated lock means has been opened, and upon said power cylinders being contracted with said cross frame member engaging said guide member and said U-shaped frame extending rearwardly and upwardly said U-shaped frame will pivot clockwise downwardly about a transverse axis through said cross frame member whereby said uprights move into engagement with said support brackets.

4,033,470

SAND AND GRAVEL DREDGES

James Venus, Appledore, England; David Charlton, deceased, late of North Shields, England, and by Martha Charlton, administratrix, 1Eleanor Street, Cullercoats, North Shields, Northumberland, NE30 4PG, England

Filed June 13, 1974, Ser. No. 479,129
Claims priority, application United Kingdom, June 13, 1973, 28220/73
Int. Cl.² B65G ***53/30***
U.S. Cl. 214—152 **3 Claims**



1. A method of unloading a cargo of dredged sand or gravel or the like from a hold of a ship, said ship having a longitudinally extending duct keel below the floor of the hold, comprising the steps of:
a. pumping a stream of water from tank storage along the duct keel and thence up to deck level;
b. injecting high pressure jets of water into the cargo at a level just above the floor of the hold and oscillating those jets, the jet water pressure being not less than 100 psi, thereby to create a highly turbulent region in which the cargo is decompacted and re-slurried;
c. opening valves to admit decompacted and re-slurried cargo material from this turbulent region into the stream of water flowing along the duct keel;
d. pumping said cargo material from the duct keel up to deck level;
e. de-watering said cargo material at deck level;
f. discharging the de-watered material outboard.

4,033,471

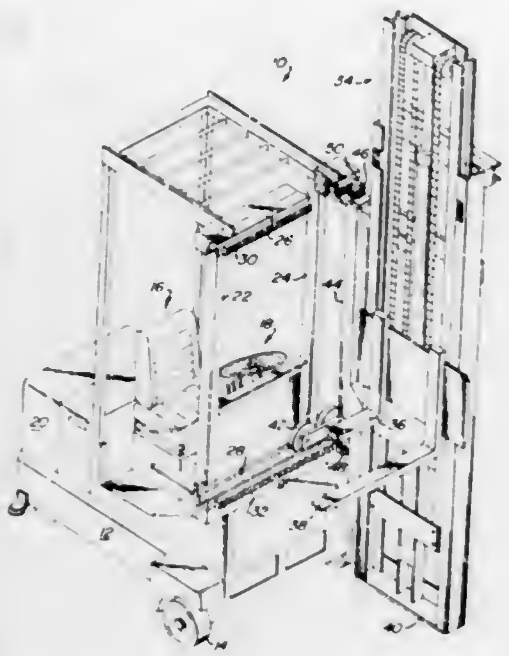
LIFT TRUCK

D. T. Warner, 10 Waldron Drive, Oadby, Leicestershire, England

Filed June 16, 1976, Ser. No. 696,466

Int. Cl.² B66F *9/20*

U.S. Cl. 214—671 **4 Claims**



1. A lift truck comprising a truck body supported by wheels, a mast having vertically movable lift arms thereon, said mast being supported on a front end of said body for transverse movement across said front end, upper and lower racks on said body, an upright shaft rotatably supported by said mast, an upper pinion on said shaft in mesh with said upper rack, a lower pinion on said shaft in mesh with said lower rack, said shaft interconnecting said pinions for causing said pinions to rotate through the same degree of rotation, said upper pinion having more teeth than the lower pinion, and said pinions having the same diametral pitch, whereby said post is vertically disposed when on the center line of said truck body and is tilted with respect to the vertical when disposed to one side of said truck body center line.

4,033,472

CLOSURE FOR CONTAINERS

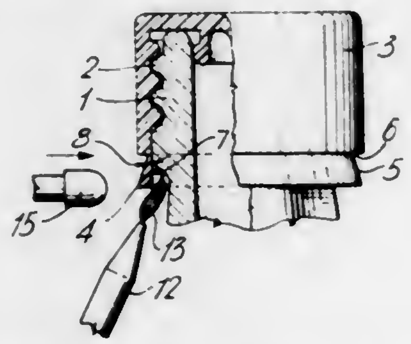
Dietmar Aichinger, Arlesheim, Switzerland, assignor to Albert Obrist AG, Reinach, Switzerland

Filed Apr. 8, 1975, Ser. No. 566,096

Claims priority, application Switzerland, Aug. 19, 1974, 11218/74; Nov. 9, 1974, 15217/74

Int. Cl.² B65D *41/34, 41/40*

U.S. Cl. 215—256 **17 Claims**



1. A closure for containers consisting of a cap having a downwardly depending band at least partially severable therefrom along a substantially annular predetermined tear line, at least the depending band being of heat deformable thermoplastic material, the depending band increasing in thickness downwardly from the predetermined tear line, the depending band after positioning of the cap on a container being heat deformable into shape-locking engagement with the container, said band as it increases in thickness being devoid of abrupt changes in the contour of its walls such as would preclude axial removal of the cap and band from a nonexpanding mold engaging the band during formation in a molding process.

4,033,473

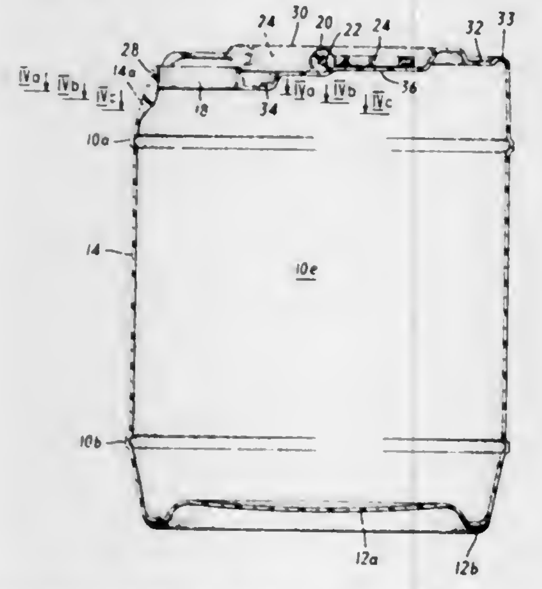
MOLDED PLASTIC CONTAINER

Paul H. Raley; George H. Dunbeker, both of Hightstown, and Eugene E. Stark, Milltown, all of N.J., assignors to Rheem Manufacturing Company, New York, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,982

Int. Cl.² B65D *7/42, 25/28, 7/02*

U.S. Cl. 220—66 **14 Claims**



1. A container having a hollow integrally structured body comprising a base, a sidewall extending upright from said base and a top closure having a surface expanse with an access port extending therethrough, said sidewall having a portion contiguous with said access port and extending downwardly and outwardly with progressively decreasing thickness for defining an interior surface extending from said access port continuously arcuately to the expanse of said sidewall adjacent said sidewall portion.

4,033,474

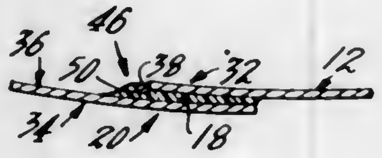
TUBULAR BODY WITH A LAP SIDE SEAM

Kenneth Richard Rentmeester, Barrington, Ill., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 75,530, Sept. 25, 1970, Pat. No. 3,760,750. This application Mar. 28, 1973, Ser. No. 345,548

Int. Cl.² B65D *1/16*

U.S. Cl. 220—75 **1 Claim**



1. A tubular body, comprising:

a body blank with opposed longitudinal marginal edge portions forming an adhesively-bonded lap side seam wherein one longitudinal edge portion is uncreased and the other is creased;

a side seam adhesive on the inside surface of said marginal edge portion which is uncreased and forms the outer lap; and

an outwardly extending crease on the other of said marginal edge portions which forms the inner lap and which points angularly in a single direction toward the outer lap, said crease being imbedded in the side seam adhesive on the outer lap such that a raw metal edge on the creased inner lap is buried in and contacts only the side seam adhesive.

4,033,475

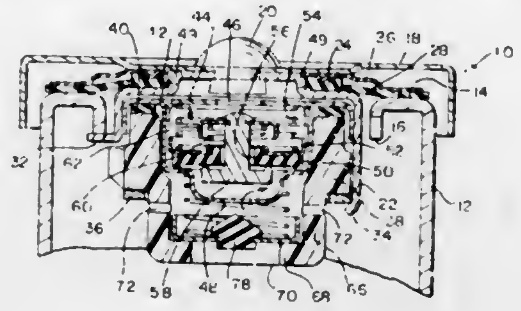
ROLL-OVER GAS CAP

John H. Evans, Connersville, Ind., assignor to Stant Manufacturing Company, Inc., Connersville, Ind.

Filed June 9, 1975, Ser. No. 584,763

Int. Cl.² B65D *51/16*

U.S. Cl. 220—202 **8 Claims**



7. (Amended) In a venting system for a liquid-containing tank having pressure-venting means for venting said tank to atmosphere whenever the pressure differential therebetween exceeds set limits, the improvement comprising roll-over valve means between said tank and said pressure-venting means, said roll-over valve means including means providing at least one venting passageway of sufficient size to allow free passage of vapor therethrough and small enough to impede the flow of liquid *from said tank* therethrough, and an inhibiting valve *disposed to be contacted by liquid from said tank*, the flow of said liquid *through said venting passageway* being sufficiently impeded in a roll-over situation to allow pressure of said liquid against said inhibiting valve to trigger said inhibiting valve into a closed position for preventing pressure of liquid from said tank.

4,033 476

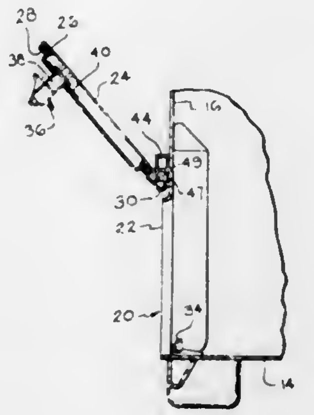
SIDE DOOR BIN WITH IMPROVED HINGE SUPPORT

Duane R. Greenquist, Beatrice, Nebr., assignor to Hoover Ball and Bearing Company, Saline, Mich.

Filed Sept. 3, 1976, Ser. No. 720,147

Int. Cl.² B65D *43/14, 51/04*

U.S. Cl. 220—334 **5 Claims**



1. In a bin for storing and transporting bulk material and having a top wall, vertical side walls, a horizontal bottom wall, a discharge opening in one of said side walls and a door mounted on said one side wall for movement to a closed position overlying said opening, the improvement comprising hinge means mounted on said one side wall at a position above said discharge opening for hingedly mounting said door on said bin, said hinge means comprising a hinge bar mounted on said one side wall in a generally horizontally extending position above said opening, said bar having a pair of horizontally spaced ends, substantially horizontally aligned door support pins mounted on said bar ends and positioned therebelow so that said pins extend toward each other and terminate in a horizontally spaced relation, said door having inverted U-shaped sections on the upper end thereof rotatably supported on said pins.

4,033,477

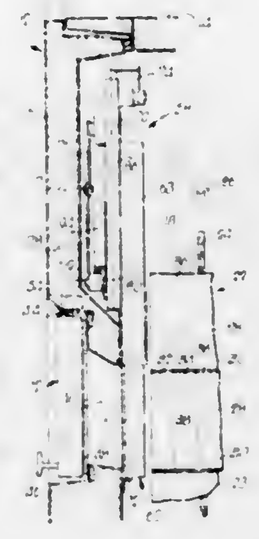
DISPENSING APPARATUS HAVING PRODUCT ACCESS DOOR SEQUENTIAL CONTROL MECHANISM

William C. Hoppe, and Theodore L. Hanson, both of Kansas City, Mo., assignors to The Vendo Company, Overland Park, Kans.

Filed Mar. 25, 1976, Ser. No. 670,266

Int. Cl.² B65G *59/00*

U.S. Cl. 221—114 **15 Claims**



1. In product dispensing apparatus:

product enclosing means for housing products to be dispensed,

said enclosing means having an internal zone including a plurality of individual stations from which products are to be dispensed by user removal thereof,

said enclosing means being provided with aperture means for presenting paths for user access to each of said stations respectively;

individually shiftable closure means for each of said paths respectively mounted on said enclosing means for obstructing the corresponding path to user access when said closure means is in a closed position thereof and clearing the corresponding path for user access when said closure means is shifted to an open position thereof;

releasable holding means for each of said closure means respectively mounted on said enclosing means for normally holding the corresponding closure means in its closed position;

actuating means mounted on said enclosing means for initiating a successive product dispensing cycle of said apparatus in response to each successive actuation of said actuating means;

dispensing control means mounted on said enclosing means and including releasing means operably associated with said holding means and operable in response to each successive actuation of said actuating means for releasing one of said holding means, while leaving the remaining holding means in their holding condition, with the various holding means being so released sequentially in a predetermined order during successive dispensing cycles of said apparatus,

said dispensing control means further including opening means operably associated with said closure means and operable in response to each successive actuation of said actuating means for shifting an individual closure means whose corresponding holding means has been released from said closed position to said open position thereof, while leaving the remaining closure means in their closed position, with the various closure means being so opened sequentially in said predetermined order during successive dispensing cycles of said apparatus,

said releasing means and said opening means also including movable means common to said holding means and said closure means and movable relative thereto between standby and fully displaced positions of said movable means, indexable means shiftably carried by said movable means and including means shiftable into respective positions thereof for first engaging a corresponding one of said holding means to release the latter and then engaging means on the corresponding closure means to shift the latter from its closed position to its opened position during movement of said movable means from its standby position to its fully displaced position and finally engaging the closure means that has been shifted to its opened position for finally shifting the latter from its opened position back to its closed position during movement of said movable means from its fully displaced position back to its standby position, indexing means operably coupled with said indexable means for shifting the latter into successive ones of said respective positions thereof sequentially in said predetermined order during successive return movements of said movable means from its fully displaced position to its standby position, and drive means operably coupled with said movable means for moving the latter from its standby position to its fully displaced position, then back to its standby position, during each successive dispensing cycle of said apparatus; and

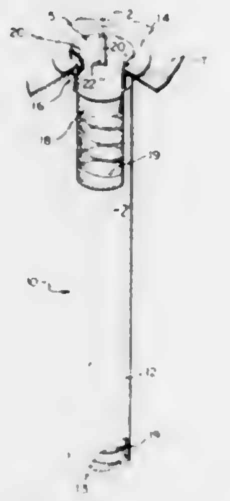
normally closed, shiftable, outer, access door means common to all of said paths for preventing user access to any of said paths unless said outer door means is open,

said control means including means for inhibiting said drive means from moving said movable means from its fully displaced position to its standby position to close an opened closure means unless and until said outer door means is in its closed condition.

4,033,478
CUP DISPENSER

Bruce F. House, Miami, Fla., assignor to Shelley Manufacturing Company Division of Alco Food Service Equipment Company, Miami, Fla.

Filed Dec. 22, 1975, Ser. No. 642,783
Int. Cl.^{2} B65G *59/00*
U.S. Cl. 221—279 **1 Claim**

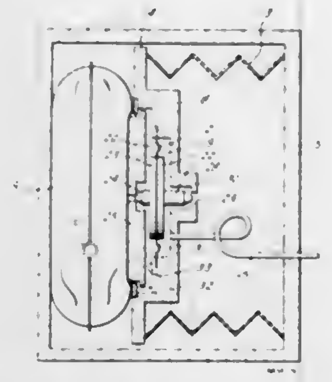


1. A self-service dispenser for disposable paper cups and the like comprising, in combination, a vertically-extending, open-top container, a plurality of arcuate leaf springs arranged within the upper end of said container in radially-inwardly-extending, downwardly-directed disposition, means for securing the upper ends of said arcuate leaf springs with respect to the upper end of said container in peripherally-spaced relation thereabout, a plurality of side openings in said container, one for each of said leaf springs, the lower ends of said arcuate leaf springs extending one each through said side openings for free movement therethrough upon radially outward flexure of said springs, and means for resiliently urging upside-down stacked frusto-conical cups in said container in the upward direction so that the peripheral lower end of the uppermost cup of the stack contacts underside portions of said arcuate leaf springs, said leaf springs being of such size and so positioned at the upper end of said container that the uppermost cup of the stack will project outwardly of the upper end of said container for convenient grasping for removal during a self-service cup dispensing operation, an annular flange secured to and extending outwardly of the upper end of said container; said means for resiliently urging stacked cups in said container in the upward direction comprising a cylindrically skirted pressure head slidably fitted in said container, spring support means at the lower end of said container, and a helical compression spring constrained between said spring support means and the underside of said pressure head; means preventing inward movement of said lower ends of said arcuate leaf springs through their respective side openings in said container; said means preventing inward movement of said lower ends of said arcuate leaf springs comprising downwardly-bent portions integrally formed at the lower ends of each of said springs and operative to abut outer wall portions of said container; said annular flange being integrally formed with an inner cylindrical skirt telescopingly secured within a marginal upper end portion of said container; and said means for securing the upper ends of said leaf springs with respect to the upper end portion of said container comprising peripherally-spaced slots in said flange skirt portion through which upper end portions of said leaf springs extend, and spot welds securing terminal upper end portions of said leaf springs to the underside of said annular flange.

4,033,479
PRESSURE MODULATING VALVE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of, and David S. Jacob, Irvine, Calif.

Filed July 26, 1976, Ser. No. 708,795
Int. Cl.^{2} B67D *5/28, 5/14*
U.S. Cl. 222—61 **11 Claims**



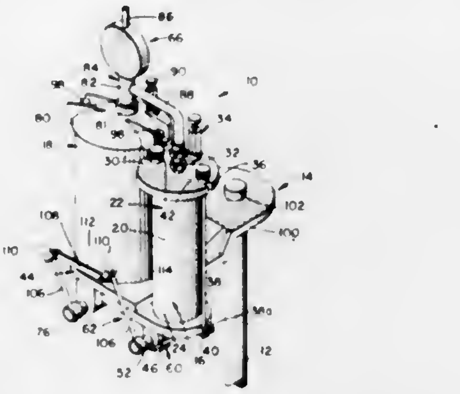
1. A modulating valve device comprising first and second relatively movable wall means, respectively for transmitting force applied by a fluid motor to a work instrumentality and for sensing the reactive pressure of the work, a valve housing having a movable wall and forming a pressure chamber, first and second ports in the wall of said chamber, respectively, for admitting actuating fluid to said chamber and directing said fluid to the fluid motor, a valve actuable by said movable wall and cooperable with said second port, and a connection between said sensing wall means and said movable wall acting on said movable wall in opposition to the effect of the actuating fluid thereon.

4,033,480
MULTIPLE FLUID DISPENSER

Anthony E. Di Maio, Georgetown, Mass., assignor to Marson Corporation, Chelsea, Mass.

Filed June 17, 1975, Ser. No. 587,655
Int. Cl.^{2} B67D *5/54*
U.S. Cl. 222—129 **14 Claims**

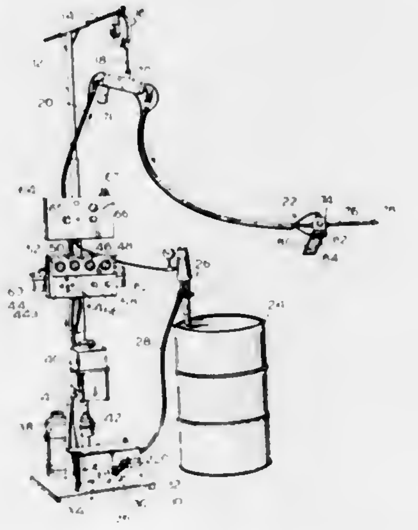
1. Apparatus for dispensing a plurality of materials in a predetermined ratio comprising at least two separate container means each of which contains a material, valve means including a valve member associated with each of said container means and being actuatable for enabling flow discharge of the material from each of said container means in a predetermined amount and second means including an interconnecting member being operatively interconnected to each of said valve members for actuating said valve means and thereby enabling the simultaneous discharge accurate control of the materials from said two container means said valve means includes an outlet opening having a predetermined size, said adjustment means includes a manually grippable and generally flat rotatable metering plate having a plurality of different dimensioned dispensing orifices, each with dimensions smaller than said outlet opening and being circumferentially spaced from each other for permitting the flow of fluid therethrough, and detent means for selectively locking each of said dispensing orifices adjacent said outlet opening for enabling adjustment of the flow rate from said one container means.



4,033,481
LIQUID MATERIAL-DISPENSING APPARATUS

Prentiss C. Hicks, and Fred C. Turrentine, both of Portland, Oreg., assignors to Artek Industries, Inc., Portland, Oreg.

Division of Ser. No. 332,345, Feb. 14, 1973, Pat. No. 3,876,114. This application Dec. 26, 1974, Ser. No. 536,534
Int. Cl.^{2} B67D *5/34*
U.S. Cl. 222—134 **5 Claims**

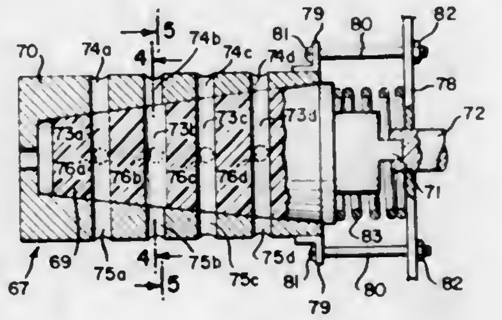


1. In a liquid-dispensing system sherein first and second liquid components are caused to flow separately to a mixing and dispensing means,
said mixing and dispensing means comprising:
a dispensing head,
means defining a component-mixing chamber in said head,
means defining a first component infeed passage leading into said head and having a first component infeed port within said head opening into said mixing chamber,
means defining a second component infeed passage leading into said head and having a second component infeed port within said head opening into said mixing chamber,
a dispensing passage means leading from said mixing chamber through said dispensing head,
a fluid pressure-operated piston movable within a piston cavity in said dispensing head, said piston cavity being sealed from communication with said mixing chamber and said infeed passages,
piston-operated means in said head for simultaneously opening and closing said first and second infeed ports upon movement of said piston in opposite directions within said cavity,
fluid passage means extending into said head and opening into said piston cavity for admitting fluid under operating pressure to one side of said piston for moving said piston in a direction for opening said ports,
and means in said head on the opposite side of said piston urging said piston in a direction for closing said ports,
said mixing chamber, said first infeed port, said second infeed port and said piston cavity being in axial alignment, said piston-operated means comprising first and second movable valve members in said head at said infeed ports and a piston rod means extending axially from said piston in said piston cavity into operable association with said movable valve members.

4,033,482
CONICAL LIQUID METERING DEVICE

Jack Kushner, Lindenhurst, and Henry G. Zwirblis, Nesconset, both of N.Y., assignors to Delta Scientific Corporation, Lindenhurst, N.Y.

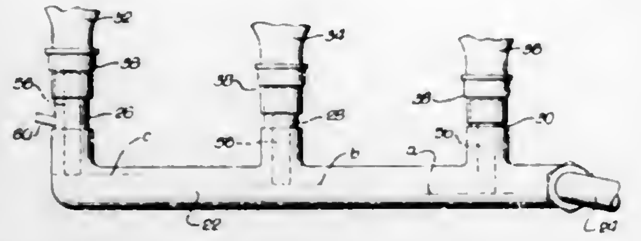
Division of Ser. No. 501,875, Aug. 30, 1974, Pat. No. 3,999,945. This application Nov. 20, 1975, Ser. No. 633,856
Int. Cl.^{2} B67D *5/52*
U.S. Cl. 222—136 **11 Claims**



1. A device for precisely metering out quantities of fluid, comprising:
a. a tapered rotor having a chamber having first and second openings which are in fluid communication with each other;
b. a mating housing for receiving said rotor, said housing having:
  1. an input port for communicating with one opening of said chamber when said rotor is in a first position with respect to said housing,
  2. an overflow port for communicating with the other opening when said input port is in communication with said one opening,
  3. a pressure port for communicating with one opening when said rotor is in a second position with respect to said housing, and
  4. an output port for communicating with the other opening when said pressure port is in communication with said one opening; and
c. overflow receiving means connected to said overflow port.

4,033,483
REMOTE LIQUOR DISPENSING SYSTEM

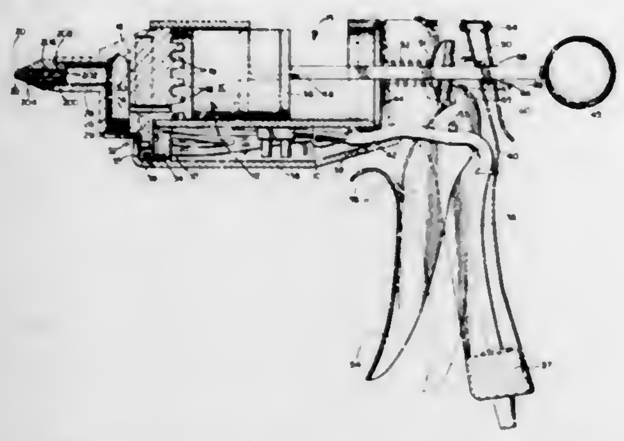
Samuel W. Neidorf, 4615 Rubio Drive, Encino, Calif. 91316
Filed Nov. 28, 1975, Ser. No. 636,305
Int. Cl.² B67D *5/60*
U.S. Cl. 222—145 **3 Claims**



1. In a gravity feeder for a liquor distribution system:
a. a manifold having a vented chamber;
b. means forming an outlet from the chamber adapted to connect with a liquor supply line;
c. a plurality of upwardly opening nipples for individual cooperation with upended liquor bottles, the openings of said nipples being at various levels, said nipples communicating with said manifold chamber;
d. a plurality of feeder caps each cooperable with a liquor bottle and with a nipple for establishing communication therebetween, each feeder cap having one end detachably engageable with the neck of its companion bottle and having its other end provided with a register telescopicaly surrounding the corresponding nipple, each feeder cap having an abutment engaging the nipple to limit telescopic movement and to transmit the weight of the bottle of the nipple;
e. a flexible feeder tube for each cap and projecting into the manifold through the corresponding nipple for establishing communication between the corresponding bottle and said manifold chamber;
f. the feeder tubes of the companion feeder caps being of the same nominal length whereby the lower ends of said feeder tubes terminate at various levels in the manifold chamber corresponding to said levels of said nipple openings whereby the bottles come on line in sequence determined by the nipple opening level.

4,033,484
HOT MELT CARTRIDGE ADHESIVE GUN

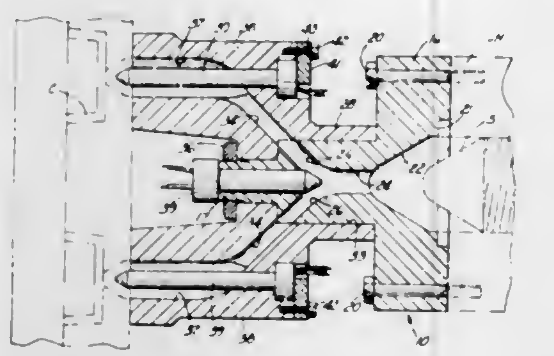
Robert L. Ornsteen, Cape Neddick, Maine, assignor to Ornsteen Chemicals, Inc., Seabrook, N.H.
Continuation-in-part of Ser. No. 562,212, March 26, 1975, abandoned. This application Jan. 29, 1976, Ser. No. 653,598
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 HE **13 Claims**



1. A hot melt adhesive gun for use with a cartridge of normally solid thermoplastic adhesive, said gun comprising:
a handle;
a gun housing of thermally insulative non-stick material mounted on the handle and defining a chamber having an opening in a wall thereof for insertion of said cartridge, said chamber being sufficiently cool to retain said adhesive cartridge in substantially solid form;
adhesive cartridge driving means disposed for slidable movement in said chamber through a predetermined distance and including a plunger rod extending through the rear wall of said chamber and rearwardly of said gun;
infinitely resolvable ratchet means supported by said handle and in operative engagement with said driving means;
an actuating trigger supported by said handle and coupled to said ratchet means and operative throughout its rearward travel to urge said driving means forward against said cartridge;
retraction means disposed about said rod extending rearwardly of said gun and operative upon release of said actuating trigger to permit retraction of said driving means by a predetermined amount;
nozzle means having a discharge orifice for molten adhesive;
valve means communicating with the nozzle means and operative to open the nozzle orifice when the trigger is actuated;
a heater block coupled to said nozzle means and disposed at the forward end of said chamber and including;
a face confronting said chamber and into engagement with which the front of said adhesive cartridge is urged for melting;
at least one electrical heating element disposed in said block for heating said block to an operating temperature sufficient to melt said adhesive in engagement with said face;
a reservoir in said block for maintaining a quantity of molten adhesive therein;
a first passage in said block coupling said face to said reservoir; and
a second passage in said block coupling said reservoir at a level above the level of said first passage to said nozzle means;
whereby when said drive means is urged against said cartridge, pressure is provided to deform a partially melted portion of said cartridge against the walls of said chamber to provide a seal against backflow of molten adhesive and to force molten adhesive through said first passage and said reservoir and to open said valve means to permit flow of molten adhesive through said second passage, and out through said nozzle; and whereby upon release of said actuating trigger, retraction of said driving means causes relief of pressure to permit closure of said valve means to minimize dripping of molten adhesive from said discharge orifice.

4,033,485
MULTIPLE PASSAGE PLASTIC INJECTION NOZZLE WITH HEATERS

Arthur Kohler, 3942 E. 364th St., Eastlake, Ohio 44094
Filed Sept. 19, 1975, Ser. No. 616,758
Int. Cl.² B29F *1/06, 1/08*
U.S. Cl. 222--146 HE **5 Claims**

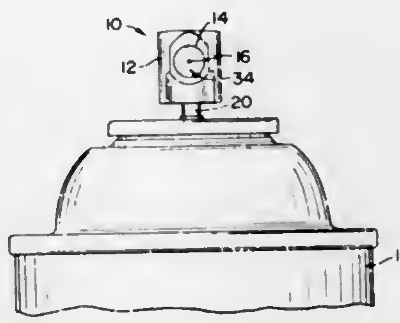


1. Apparatus for distributing a single stream of liquid plastic into a multiplicity of streams for injection molding comprising,

a plastic receiving member and a plastic discharge member,
said plastic receiving member having plastic receiving means including a receiving passage and including an opening for receiving plastic from an injection molding machine, a heater disposed within said plastic passage, and a plurality of plastic conveying channels communicating with said receiving means each having outlet openings,
said plastic discharge member having a plurality of plastic discharge means each extending from an entrance opening to a discharge opening,
means to detachably interconnect said receiving member and said discharge member as a unitary assembly.
said conveying channels and said discharge means being selected in number and positioned such that the outlet opening at each of the conveying channels communicates with the entrance opening of one of the discharge means when said members are interconnected.

4,033,486
ANTI-FOAMING ASSEMBLY AND METHOD

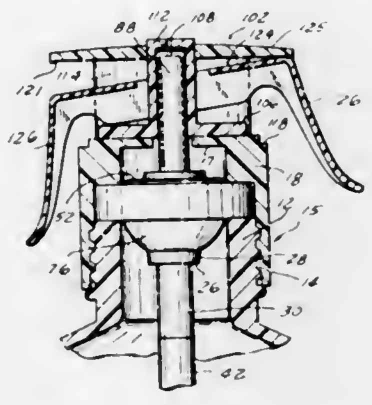
David L. Kirkel, Mount Prospect, Ill., assignor to Seaquist Valve Company, Cary, Ill.
Filed Nov. 13, 1975, Ser. No. 631,667
Int. Cl.² B67D *5/58*
U.S. Cl. 222—190 **10 Claims**



1. A terminal orifice assembly for use with aerosol and finger pump type dispensers, said assembly having terminal orifice means formed therein and an anti-foaming composition disposed in continguous relation to said terminal orifice means and in communicating relation with foam issuing from said terminal orifice means, said anti-foaming composition being disposed on the exterior surface of said assembly adjacent said terminal orifice means.

4,033,487
DOUBLE TRIGGER PUMP

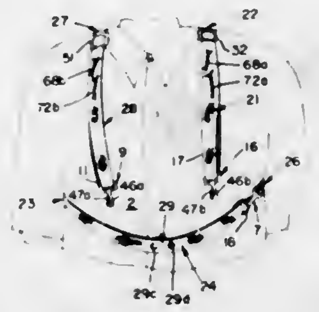
Lewis A. Micallef, Fort Lee, N.J., assignor to Leeds and Micallef, Fort Lee, N.J.
Filed Oct. 8, 1975, Ser. No. 620,565
Int. Cl.² G01F *11/08*
U.S. Cl. 222—207 **18 Claims**



1. A double acting trigger mechanism for a dispensing pump of the type employing a reciprocal plunger having an axis and a passage for communicting the pump with a nozzle, the trigger mechanism including a housing, a body portion at least partly within the housing and being disposed transversely of the axis, a pair of spaced handles extending transversely from the body portion exteriorly of the housing and to permit manual engagement therewith, coupling means for coupling the trigger mechanism with the plunger, means forming a slide surface in the housing on which the body portion is adapted to slide, pivoting means for permitting pivoting of the trigger mechanism so that manual movement of either handle in a direction transverse of the axis will pivot the body portion and slide the body portion on the slide surface and move the plunger in an axial direction and release of such handle will permit the plunger to reciprocate to the original position by pivoting the body portion and handle to their original position.

4,033,488
HARNESS ARTICLE CARRIER

Robert A. Brewer, 15 Castle Park Way, Oakland, Calif. 94611
Continuation-in-part of Ser. No. 422,734, Dec. 7, 1973, Pat. No. 3,884,403. This application Mar. 17, 1975, Ser. No. 558,781
The portion of the term of this patent subsequent to May 20, 1992, has been disclaimed.
Int. Cl.² A45F *5/00*
U.S. Cl. 224—5 V **1 Claim**



1. In combination, a first article, and a harness which is convertible to a neck strap which are both adapted to releasably hold said article against the chest of the wearer in a carrying position and permit selective eye level positioning in an operating position in either the neck strap of harness mode comprising:
a. said first article having a pair of apertured coupling elements thereon;
b. a neck strap consisting of a single flexible non-elastic elongated member;
c. a first spring releasable coupling member attached to a first end of said neck strap and dimensioned to releasably couple to one of said apertured coupling elements on said article when used in said neck strap mode;
d. connecting means attaching said second end of said neck strap to said first article;
e. an extension strap consisting of a single flexible non-elastic elongated member for selective use in said harness mode;
f. a second spring releasable coupling member attached to a first end of said extension member and dimensioned to releasably couple to the other of said apertured coupling elements on said first article;
g. a coupling means attached to the second end of said extension member for releasably coupling to said first spring releasable coupling element when used in said harness mode;
h. said extension strap and neck when coupled together in said harness mode consists of a flexible non-elastic elongated member having the following portions and having a length adapted to span the distance from the wearer's chest (first chest portion), over one shoulder (first shoulder portion), under the arm (first under arm portion), across the chest (transverse chest portion), under the second arm (second under arm portion), over the second

shoulder (second shoulder portion), and back to the chest (second chest portion);

- i. first quick release fastener means mounted on said first article below said apertured coupling element for releasably connecting said article to said extension member;
- j. second quick release fastener means connected to said strap extension member adjacent said second end whereby said second quick release fastener means is adapted for location in the mid-portion area of the front of the wearer's chest;
- k. said first quick release fastener means on said first article includes a portion of a snap coupling; and
- l. said second quick release fastener means includes the mating portion of said snap coupling.

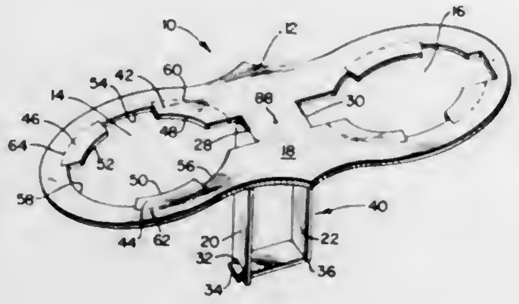
4,033,489
DISPOSABLE CUP HOLDER

Gary K. Fowler, 720 10th Ave., Apt. No. 4, Fairbanks, Alaska 99701

Filed Nov. 7, 1975, Ser. No. 629,892

Int. Cl.² A47G *23/06*

U.S. Cl. 224—48 C **13 Claims**



1. An integral one piece disposable holder for paper cups and the like comprising: a sheet of inexpensive disposable material, said sheet having at least two openings, each being shaped to hold a cup, a lateral rib between said openings, two elongate strips of material each having one of its ends integral with an opposed edge of said rib and adapted to depend from the portion of the periphery of an associated opening formed by said rib, means enabling portions of said two strips of material adjacent their other ends to be secured directly to each other to thereby constitute a depending central means to provide lateral support for cups placed within said openings.

13. An integral one piece disposable holder for paper cups and the like consisting of a sheet of inexpensive disposable material, said sheet having at least two openings, each being shaped to hold a cup, a lateral rib means between said openings, the periphery of at least one of said openings having at least three radially inwardly projected lug means circumferentially spaced apart around the periphery of the opening to provide discontinous annular cup engaging means, and portions of said sheet material derived from material within each of the openings depend from and are structurally integrally joined to said lateral rib means, said portions providing a depending hand hold support.

4,033,490
MANUFACTURE OF A WINDOW BY BREAKING THE EDGES OF A SHEET OF GLASS ALONG A SCORE

Moreno Ulivi, Pisa, Italy, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France

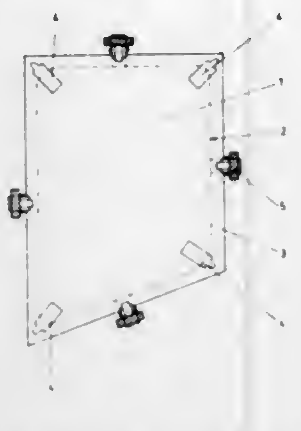
Filed July 28, 1976, Ser. No. 709,405

Claims priority, application France, Aug. 1, 1975, 75.24075

Int. Cl.² B26F *33/06;* C03B *33/04*

U.S. Cl. 225—1 **9 Claims**

1. An apparatus for severing the peripheral portion of a sheet of glass along a line of varying curvature scored on the surface of the glass comprising means for applying heat to the glass adjacent markedly curved sections of said score to at least partially sever said portion and mechanical means for breaking off said portion in the event it is not severed by application of heat, said mechanical means acting on the glass adjacent a straighter section of said score and subsequent to the application of heat by said first named means.



4,033,491
TAPE RECORDER MECHANISM RESPONSIVE TO TAPE STOPPAGE

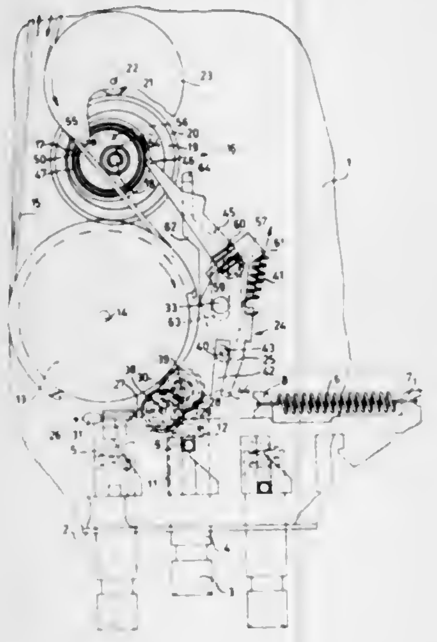
Ghislanus Matheus Antonius Maria Aldenhoven, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,015

Claims priority, application Netherlands, Sept. 2, 1974, 7411602

Int. Cl.² B65H *25/12, 25/32*

U.S. Cl. 226—11 **13 Claims**



1. In a tape recorder comprising:

a chassis;

a command member movably connected to the chassis and biased toward a switched-off position;

means for moving the commmand member to an operative position;

biased latching means for latching said command member in the operative position;

a flywheel mounted to the chassis for rotation;

means for rotatably driving the flywheel and for causing transport of tape in said tape recorder;

means for detecting stoppage of tape transport while said command member is in said operative position, and

means responsive to said detecting means, for switching off said driving means, comprising a frame plate movably mounted to the chassis for a given motion from an initial position upon detection of tape stoppage, a force transmitting member arranged to operatively engage said latching means so as to unlatch said command member, and means for applying operative force to said force transmitting member in response to said given motion of the frame plate,

the improvement comprising:

a drive wheel rotatably journalled on the frame plate, and means responsive to said given motion for engaging said drive wheel for frictionally driven rotation responsive to the flywheel rotation, and wherein

said force transmitting member is drivably coupled to said drive wheel for applying said operative force to said force transmitting member.

4,033,492
LOOPER

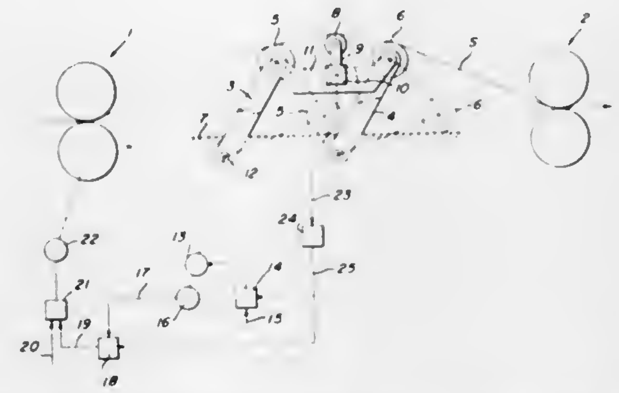
Isao Imai, Yokohama, Japan, assignor to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Apr. 19, 1976, Ser. No. 678,412

Claims priority, application Japan, Apr. 30, 1975, 50-52234

Int. Cl.² B65H *25/00;* B21B *37/06*

U.S. Cl. 226—25 **6 Claims**



1. A looper wherein a sensor means capable of detecting the tension is attached to a looper arm which may be rotatable or tiltable vertically and wherein a roller bearing box in which a looper roller is rotatably supported is vertically pivotably to the upper end of said looper arm, and mounted on said looper arm are sensor means which support said roller bearing box and an accelerometer for detecting the acceleration of said looper roller.

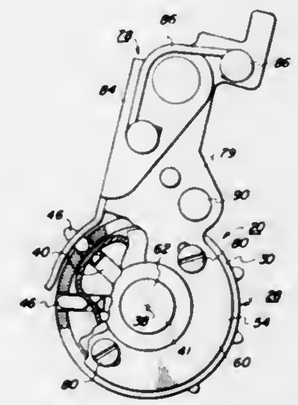
4,033,493
PIN WHEEL FEEDING DEVICE

Leo Levinson, Berkeley, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 23, 1976, Ser. No. 660,556

Int. Cl.² G03B *1/24*

U.S. Cl. 226—81 **12 Claims**



1. A pin wheel feeding device comprising:

a housing capable of being rotated about an axis and having a peripheral wall containing a plurality of oenings formed therein, each opening lying along a radial line extending from said axis;

a plurality of substantially identical pins disposed within said housing in respective alignment with said plurality of openings, each pin capable of being moved along the respective radial line from a first position in which it is substantially entirely located within said housing to a second position in which it projects a predetermined distance from the respective aligned opening, each pin including a pair of opposing guide members, the point on each guide member located closest the opposing guide member lying substantially along the respective radial line; and

a cam member disposed within said housing and capable of being fixed in position relative to said housing, said cam member having a track formed thereon with which each of said pins is engaged with the pair of guide members thereof being located on either side of said track, said pins following the path of said track during rotation of said housing relaive to said cam member, said track having a first segment capable of maintaining a pin engaged therewith at said first position, a second segment capable of maintaining a pin engaged therewith at said second position, and a third segment intermediate and contiguous with said first and second segments for enabling a pin engaged therewith to move between said first and second positions during rotation of said housing, the width of said track at said first, second and third segments being substantially coextensive with the locus of points traced by the closest adjacent points on the pair of guide members of each pin during movement of the pins along the first, second and third segments of said track.

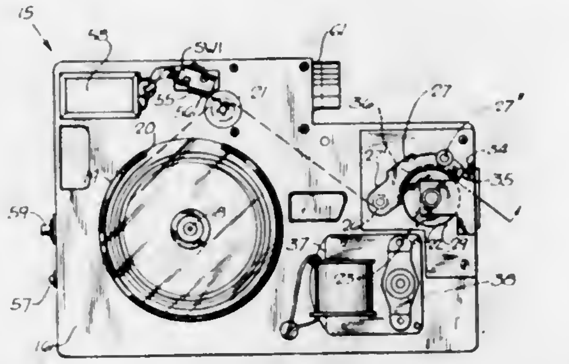
4,033,494
STAMP DISPENSING MECHANISM

Charles G. Middleton, Arlington Heights, and Vincent F. Volpe, Niles, both of Ill., assignors to Gard, Inc., Niles, Ill.

Filed June 17, 1976, Ser. No. 697,025

Int. Cl.² B65H *17/22*

U.S. Cl. 226—83 **14 Claims**



1. A dispensing mechanism for units of equal dimensions as a strip having equally spaced transverse rows of perforations, such as a strip of stamps, which comprises:

- support means including a vertical support plate having front and rear portions, said support means being constructed to support on the rear portion of one side of said plate a roll of a strip having equally spaced transverse rows of perforations for rotation of the roll about a horizontal axis;
- a Geneva drive system comprising:
  - a Geneva star wheel assembly that includes:
    - a star wheel having a central hole for rotatably mounting said wheel by a shaft that is mounted on said support plate, said star wheel having a number of equally spaced radial slots extending inwardly from the peripheral surface of said star wheel to provide a number of teeth, said teeth at their distal ends providing a cylindrical outer peripheral surface of said

wheel except for an intermediate portion of the outer surface of each tooth that has a concave surface having the same radius of curvature for all teeth; and

a Geneva driver assembly including:

a driver pin; and

pin-mounting means that has a hole for mounting on a shaft that is mounted on said support plate, with said pin being mounted on said pin-mounting means to extend with the axis of the pin parallel to and spaced from and at one radius from said hole of said pin-mounting means, said pin-mounting means having a portion that extends in the same direction that said pin extends and that is between two radii from said hole other than the radius at which said pin is mounted, said extension of said portion of said pin-mounting means having a cylindrical peripheral surface:

that is between parallel planes passing through and normal to the longitudinal axis of said pin;

that has its center of curvature at the center of said hole;

that has a radius of curvature that is approximately the radius of curvature of the concave surface portion of each tooth of said star wheel; and

that has its ends at a plane that is parallel to the axis of said pin and that passes through the radius from said hole to said pin,

said Geneva drive system being mounted on said shafts on said support plate so that said star wheel and said pin-mounting means are rotatable at horizontal axes that are spaced from each other so that said driver pin, during rotation of said pin-mounting means moves into and then out of one radial slot of said star wheel during one revolution of said pin-mounting means to move said star wheel one step of its rotation, after said extension of said portion of said pin-mounting means has its cylindrical surface moves from the cavity of a tooth and before it enters a cavity of another tooth;

motor means mounted on said support plate,

means operatively connecting said motor means to said pin-mounting means at its said hole to rotate said pin-mounting means about a horizontal axis during the operation of said motor means;

a strip-feeding wheel assembly mounted on the front portion of said one side of said support plate for rotation about a horizontal axis, said strip-feeding wheel assembly including a feed wheel having a generally cylindrical peripheral surface with equally spaced rows of projections extending outwardly from said cylindrical surface, each row of projections being parallel to the longitudinal axis of said feed wheel and the distance between adjacent rows of projections being equal to the distance between adjacent rows of the perforations of said strip;

means operatively connecting said strip-feeding wheel assembly to said star wheel to step move said feed wheel when said star wheel is step moved, said feed wheel being in alignment with a roll of the strip mounted on said support means; and

guide means mounted on said one side of said support plate adjacent said feed wheel and including:

an enclosure at the end of the front portion of said support plate and having a horizontal opening through which the strip of stamps being moved by said feed wheel is dispensed after leaving said feed wheel;

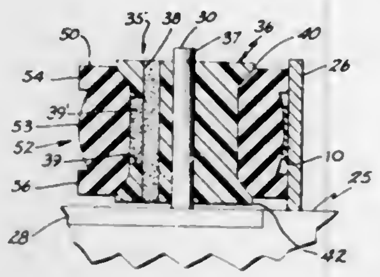
an arcuate guide pivotally mounted on one side end portion for movement about a horizontal axis that is adjacent said feed wheel and that is at a vertical plane between said feed wheel and said position of mounting of the roll of the strip, said arcuate guide having an arcuate surface with the radius of curvature approximately that of the radius of said feed wheel so that the arcuate surface can be positioned close to a portion of the cylindrical surface of said feed wheel during the operation of the mechanism, to maintain the strip in engagement with said rows of projections on said feed wheel during the dispensing operation, and so that, before starting the use of the mechanism, said arcuate guide can be pivoted away from said feed wheel to train the strip around a portion of said feed wheel after a roll is loaded on said mechanism and then returned to the position in which the arcuate surface is closely spaced from said feed wheel, said arcuate surface of said arcuate guide having arcuate grooves that are coplanar with said rows of projections of said feed wheel so that said rows of projections of said feed wheel can pass through said grooves with clearance during the turning of said feed wheel;

a locking pin mounted on the distal end portion of said arcuate guide; and

spring means biasing said pin into a hole in said support plate that locks said arcuate guide in the position at which said arcuate surface is closely spaced from said feed wheel.

4,033,495
TAPE DRIVE APPARATUS

Stephen A. Platt, Grand Haven, Mich., assignor to Stephen A. Platt and Vernet B. Platt, both of Grand Haven, Mich.
Filed Feb. 6, 1976, Ser. No. 655,711
Int. Cl.² B65H *17/22*
U.S. Cl. 226—186 **2 Claims**



1. For use in a magnetic tape playback apparatus, a pinch roller movable between operative and inoperative positions for cooperting with a tape drive capstan, said pinch roller comprising: a spool having a central aperture and a tire mounted to said spool, said tire including a circumferentially recessed and convexly curved portion defining annular shoulders on opposite sides of said recess such that tape positioned between said annular shoulders is held between said pinch roller and said capstan with said shoulders engaging the capstan for providing positive drive between the pinch roller and the capstan when said roller is in the operative position, and wherein said spool further includes a plurality of tire mounting apertures extending longitudinally through said spool and radially spaced from said central aperture each tire mounting aperture including a slot extending radially outwardly through said spool to communicate with said tire, and a bonding adhesive filling said slots to bond said tire to said spool.

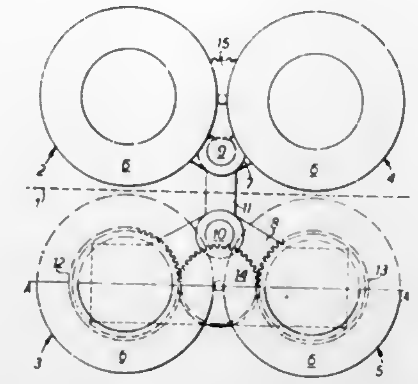
4,033,496
APPARATUS FOR HAULING CABLES OR OTHER ELONGATE BODIES

Hugh Hieron Rolfe, Harlow, England, assignor to The Post Office, London, England
Filed Jan. 7, 1976, Ser. No. 647,145
Claims priority, application United Kingdom, Jan. 13, 1975, 1406/75
Int. Cl.² B65H *17/12*
U.S. Cl. 226—188 **17 Claims**

1. An apparatus for hauling an elongate body such as a cable, the apparatus including:

a plurality of pairs of traction wheels, each pair being mounted tandem fashion relative to the other of the pairs so as to define a path for the elongate body,

resilient wheel bias means to resiliently bias the wheels of each pair into contact with the elongate body on opposite sides of the axis thereof, which body is therefore gripped, in use, by the wheels,

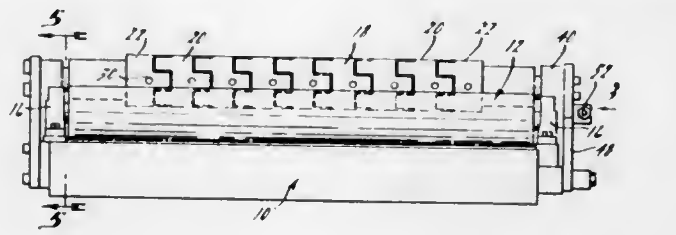


a plurality of motors to drive the traction wheels, each pair of traction wheels having at least one respective motor, and

a mechanical coupling constraining one wheel of one pair to rotate conjointly with one wheel of another pair.

4,033,497
COMBINATION QUICK REMOVAL AND ADJUSTABLE WIDTH WORK PRESSURE BACK-UP ROLL OR BILLET ROLL

Witold C. Przygocki, Southfield, Mich., assignor to Acme Manufacturing Company, Ferndale, Mich.
Filed July 30, 1976, Ser. No. 710,257
Int. Cl.² B65H *17/20*
U.S. Cl. 226—194 **5 Claims**



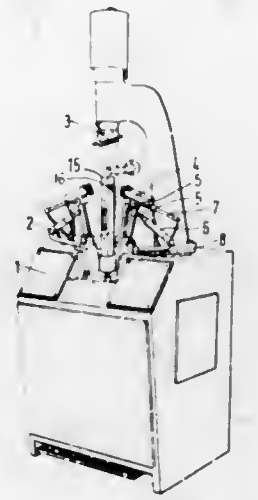
1. The combination of billet and support rolls with means for mounting such rolls, such mounting means including fixed bearings for mounting a pair of support rolls, a billet roll retainer for mounting said billet roll at one end, split retainer halves for mounting said billet roll at its opposite end, pivot arms connected to said split retainer halves to pivot and open said split halves for removal of said billet roll, means to secure said pivot arms and said split halves together, said fixed billet roll retainer and said split bearing being constructed to permit said billet roll to freely float vertically within its retainer and thus mount said billet roll for support of said support rolls.

4,033,498
APPARATUS FOR STAPLING HEELS

Manuel Morales Roman, Angel Castana Martinez, 45 Elche, Alicante, Spain
Filed Jan. 12, 1976, Ser. No. 648,365
Claims priority, application Spain, July 5, 1974, 204415
Int. Cl.² B27F *7/00*
U.S. Cl. 227—30 **3 Claims**

1. Apparatus for stapling an element to an item of footwear comprising:

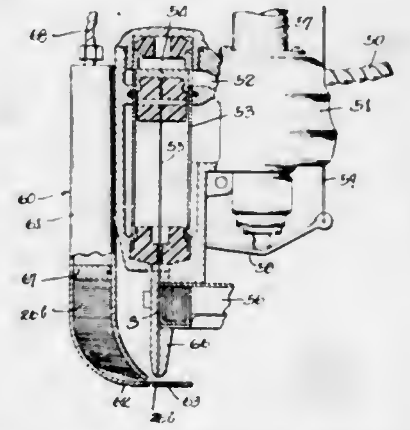
a. a base;
b. a column attached to said base;
c. said column having an upper portion shaped to conform to the counter portion of said footwear;
d. a plurality of longitudinal slots in said column;
e. a plurality of hammers moveable in said slots;
f. means pivotably mounted exterior of said column for loading one staple into each of said plurality of longitudinal slots;
g. means for moving said means for loading into abutment with said column prior to said loading and clear of said column after said loading; and



h. means for driving said hammers whereby said staples are driven along said slots into said footwear and said element.

4,033,499
FASTENER APPLICATORS

David J. Butler, 1324 SE. 37th Lane, Cape Coral, Fla. 33904
Filed Oct. 20, 1975, Ser. No. 623,814
Int. Cl.² B25C *1/00*
U.S. Cl. 227—120 **2 Claims**



1. A fastener applicator, adapted to be held against a workpiece during operation thereof, comprising:

apparatus for driving fasteners into said workpiece, including a driver movable through a drive stroke,

a first magazine containing a plurality of fasteners, and means feeding individual fasteners to alignment with said driver so that upon movement of the latter through its drive stroke it strikes the aligned fastener and drives it from said driving apparatus and into said workpiece wherein an outer portion of said fastener overlies said workpiece,

a second magazine connected to said driving apparatus and having a plurality of thin tabs stored therein, each tab having a surface area larger than said fastener outer portion.

said second magazine comprising an elongated tubular portion wherein the tabs are contained crosswise thereof and in face-to-face relation, said tubular portion having a tab-exit part curved in the direction toward the place where said individual fasteners are fed to alignment with said driver, said exit part terminating in a narrow slit through which individual tabs are fed for alignment with the driver and driven fastener.

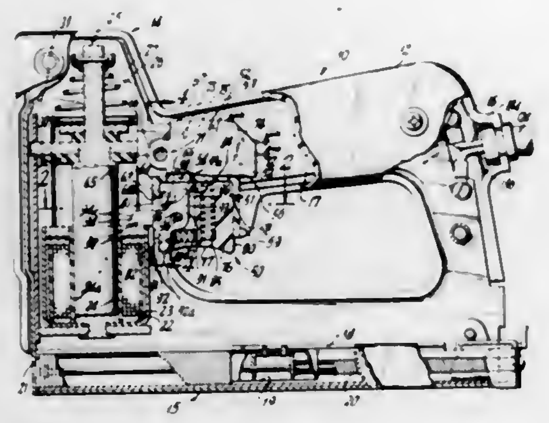
4,033,500
ELECTROMAGNETIC STAPLER AND SAFETY TRIGGER THEREFOR

George Frank Manganaro, Garfield, N.J., assignor to Electro-Matic Staplers, Inc., Saddle Brook, N.J.

Filed Mar. 26, 1976, Ser. No. 670,649

Int. Cl.^{2} B25C *5/06*

U.S. Cl. 227—131 **10 Claims**



1. A staple driving tool comprising a body, a load coil in said body, said coil having an opening, armature means disposed in said body and slidable in said opening for movement by said coil when the coil is energized, staple driving means fixed to said armature means and disposed at the front of the body, a staple magazine at the lower end of said body, a switch on said body, control circuit means interconnecting line current supply to said coil and switch, said control circuit means comprising means to energize said coil to a charge so that said staple driving action is at the desired force, and further comprising time delay pulse means so that the time delay pulse between shots is greater than the time to disengage the switch, a trigger, said trigger comprising a housing, a trigger member slidably engaging said housing and being depressable by the user in relation to the housing, motion responsive means adjacent said trigger to transmit the depressing motion to actuate the switch for completing the control circuit means, said motion responsive means being movably mounted to said housing whereby upon movement of said armature means, said armature means strikes said motion responsive means so as to disengage said motion responsive means from said switch while said trigger is in the depressed condition, whereby depression of said trigger actuates said switch causing the staple driving action only at the desired force and whereupon disengagement of the switch by the staple driving action, the switch opens the control circuit means so as not to energize the coil until the trigger is again depressed.

4,033,501
FRICTION WELDING MACHINE

Peter C. Ambrose, Jr., Manchester, and Ronald F. Knapp, Coventry, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed June 9, 1976, Ser. No. 694,403

Int. Cl.^{2} B23K *28/00*

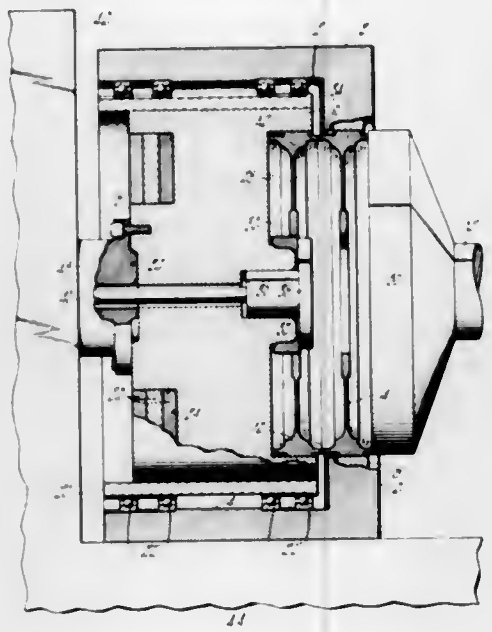
U.S. Cl. 228—2 **11 Claims**

1. In a friction welding machine for bonding workpieces together, the improvement comprising a unitized headstock and tailstock assembly including:

a. a rigid tailstock housing having an internal wall which defines a cylindrical bore extending therethrough, tailstock workpiece fixturing means being integrally connected to and rigidly supported against said wall;

b. a cylindrical headstock flywheel rotatably and slidably supported in the bore against the internal wall of the tailstock housing, headstock workpiece fixturing means being securely supported by the end of the flywheel facing the tailstock workpiece fixturing means, said headstock and tailstock fixturing means establishing predetermined workpiece alignment,

said flywheel and housing having sufficient rotational and sliding motion imparted therebetween to effect frictional workpiece engagement at a common interface, said predetermined workpiece alignment being maintained throughout such engagement by the supported workpiece fixturing means adjacent the interface and by the unitized headstock and tailstock which are incapable of radial movement with respect to one another.



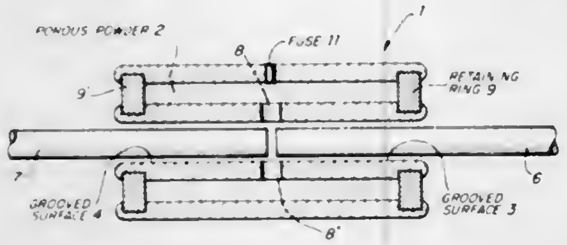
4,033,502
ECONOMICAL AND LABOR SAVING REINFORCING BAR COUPLER

Ronald D. Rothchild, 106 Rynda Road, South Orange, N.J. 07079

Filed June 26, 1975, Ser. No. 590,423

Int. Cl.^{2} B23K *23/00*

U.S. Cl. 228—56 **28 Claims**



1. A non-removable coupling device which eliminates the need for external crucibles or removable molds for coupling together first and second elongated structural members, such as reinforcing bars, comprising:

a. a first annular chamber portion formed completely within said coupling device containing means for releasing under pressure molten material upon being activated; and

b. a second chamber portion disposed centrally within said first chamber portion and opened to the atmosphere and communicating with said first chamber portion for receiving said first and second elongated structural members and said molten material therein, the width of said second chamber portion being slightly larger than the corresponding width of said elongated structural members to form a clearance gap between said elongated structural members and said coupling device for receiving said molten material.

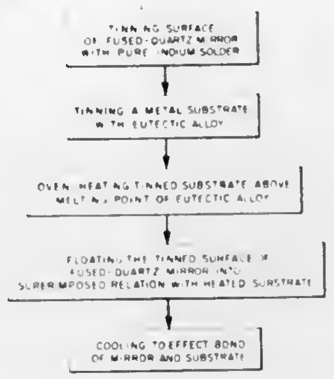
4,033,503
METHOD FOR ATTACHING A FUSED-QUARTZ MIRROR TO A CONDUCTIVE METAL SUBSTRATE

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; George Sonnenschein, San Diego, and Daniel McKeown, La Jolla, both of Calif.

Filed Aug. 27, 1976, Ser. No. 718,267

Int. Cl.^{2} B23K *1/02*

U.S. Cl. 228—124 **4 Claims**


TINNING SURFACE OF FUSED-QUARTZ MIRROR WITH PURE INDIUM SOLDER
TINNING A METAL SUBSTRATE WITH EUTECTIC ALLOY
OVEN HEATING TINNED SUBSTRATE ABOVE MELTING POINT OF EUTECTIC ALLOY
FLOATING THE TINNED SURFACE OF FUSED-QUARTZ MIRROR INTO SUPERIMPOSED RELATION WITH HEATED SUBSTRATE
COOLING TO EFFECT BOND OF MIRROR AND SUBSTRATE

1. A method for attaching a fused-quartz mirror to a conductive metal substrate comprising the steps of:

A. tinning one substantially planar surface of a fused-quartz mirror with a solder of a class including pure indium solder;

B. tinning a metal substrate with an indium eutectic alloy consisting essentially of indium, bismuth, lead and tin, having a melting point substantially below that of the solder;

C. heating the alloy to a temperature substantially above its melting point, but below that of the solder;

D. establishing a contiguous relationship between the tinned surface of the mirror and a surface of the alloy while maintaining the temperature of the alloy substantially above the melting point of the alloy; and

E. cooling the alloy to a temperature substantially below its melting point while maintaining the established contiguous relationship between the surfaces of the mirror and the alloy.

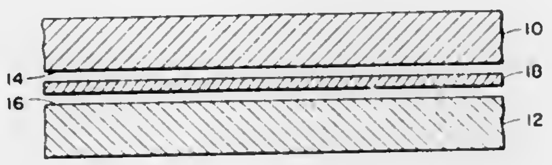
4,033,504
BIMETALLIC JUNCTIONS

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of; Frank G. Arcella; Gerald G. Lessmann, both of Pittsburgh, Pa., and Russell A. Lindberg, Westlake, Ohio

Filed Oct. 24, 1975, Ser. No. 625,733

Int. Cl.^{2} B23K *15/00, 19/00*

U.S. Cl. 228—190 **4 Claims**



1. In a method of metallurgically joining dissimilar metallic materials which have widely differing melting points and interdiffused or form concentration gradients at elevated temperatures, the improvement comprising

separately forming at least one alloy layer homogeneously composed of the two dissimilar metallic materials,

positioning said alloy layer between said dissimilar metallic materials, and

welding said two dissimilar metallic materials together whereby said alloy layer forms a dissimilar metal junction.

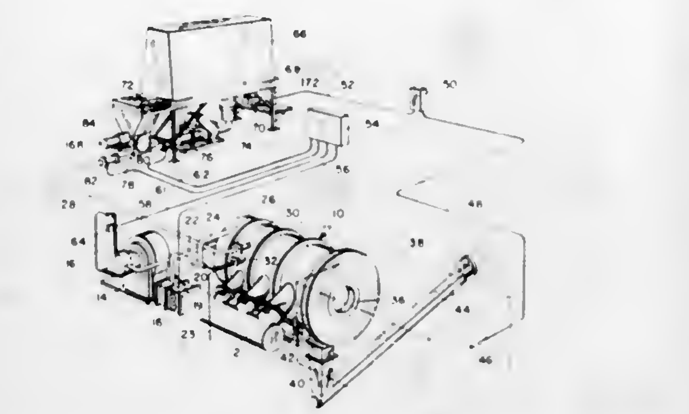
4,033,505
CYCLONIC, MULTIPLE VORTEX TYPE FUEL BURNER WITH AIR/FUEL RATIO CONTROL SYSTEM

Kenneth Vaughn Lutes, Escondido; Leland Golde Desmon, San Diego, and Edward Dana Dodge, Poway, all of Calif., assignors to Energex Limited, Portland, Oreg.

Filed Nov. 17, 1975, Ser. No. 632,205

Int. Cl.^{2} F23N *1/00*

U.S. Cl. 236—15 BD **10 Claims**



1. A fuel/air ratio control system for controlling combustion within a burner independently of changes in the fuel mass flow rate caused by fluctuations in the density of fuel being supplied to said burner, said system comprising:

a. fuel mass flow rate detection means for detecting the mass flow rate of a fuel being supplied to said burner independently of fluctuations in the density of said fuel, said mass flow rate detection means including a mixing conduit having a first inlet means for permitting the introduction of a first fluid to said mixing conduit, outlet means for discharging fluid from said mixing conduit, and a second inlet means intermediate said first inlet means and said outlet means for permitting the introduction of said fuel into said mixing conduit, said mass flow rate detection means further including pressure difference detection means for detecting the pressures of fluid within said conduit at a first point between said first inlet means and said second inlet means and a second point between said second inlet means and said outlet means, respectively, and providing a signal responsive to the difference between said pressures;

b. air flow detection means for detecting the flow rate of air being supplied to said burner;

c. first comparison means for comparing said flow rate of air with said fuel mass flow rate and thereby providing an actual fuel/air mass ratio;

d. variable selection means for selecting a predetermined fuel/air mass ratio;

e. second comparison means for comparing said actual fuel/air mass ratio with said predetermined fuel/air mass ratio and providing an air flow rate change signal responsive to said second comparison; and

f. control means for variable controlling said air flow rate automatically in responsive to said air flow rate change signal so as to provide said predetermined fuel/air mass ratio independently of changes in said fuel mass flow rate caused by fluctuations in said fuel density.

4,033,506
ELECTROSTATIC COATING GUNS

Franz Braun, Wartbuchel 14, 9422 Staad, near Rorschach, Switzerland

Filed Aug. 1, 1975, Ser. No. 600,975

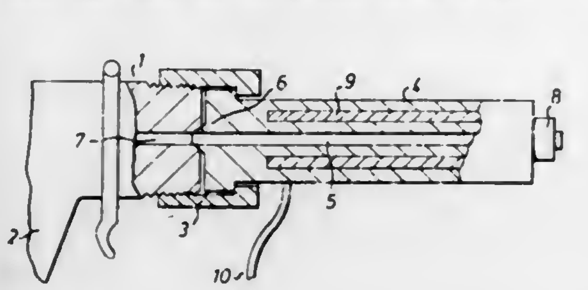
Claims priority, application Switzerland, Aug. 6, 1974, 10761/74; Aug. 6, 1974, 10762/74; Aug. 6, 1974, 10763/74

Int. Cl.^{2} B05B *5/02*

U.S. Cl. 239—15 **13 Claims**

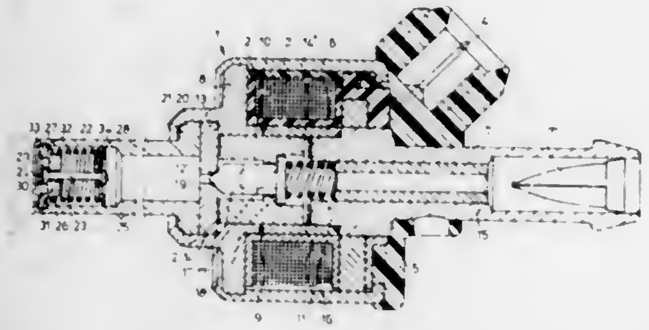
1. A spray gun comprising a capacitor assembly for applying

an electrostatic field to coating material being sprayed, said capacitor assembly having at least three capacitor plates of electrically conducting material, a solid dielectric formed with opposite faces on which said capacitor plates are mounted, said plates being mounted in alternation on said opposite faces with at least one plate on one of said faces partially overlapping two plates on the other of said faces thereby forming at least two part capacitors, each part capacitor consisting of a part of one of said plates on one of said faces, a part of another of said plates on the other of said faces and said dielectric, and the number of said part capacitors being in all less by one than the number of said plates, and means for connecting said part capacitors in series.



4,033,507
FUEL INJECTION VALVE

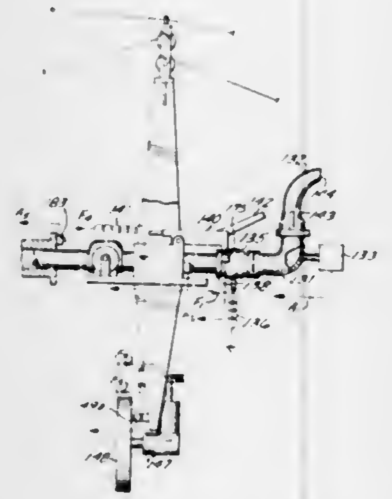
Gerhard Fromel, Hallstadt, and Peter Langenberger, Forchheim, both of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany
Filed Jan. 14, 1976, Ser. No. 648,481
Claims priority, application Germany, Jan. 15, 1975, 2501283
Int. Cl.^{2} B05B *1/08, 1/26, 1/32*
U.S. Cl. 239—102 **4 Claims**



1. A fuel injection valve for an internal combustion engine, said valve including a housing, and within the housing a coaxial arrangement of an internal solenoid coil, a magnetic core, a movable armature, a valve seat member, and a valve needle carried by said armature and cooperating with the valve seat in said valve seat member for metering fuel past the valve seat member, the improvement comprising:
- a connecting cylinder, attached to said valve housing; and
- a mechanical fuel preparation means, located in said connecting cylinder separately from and downstream of said valve seat member and said valve needle, said connecting cylinder further including a first spring support cup;
- a pestle with two enlarged ends, one of said ends penetrating a central hole in said first support cup;
- a second spring support cup with a central hole penetrated by the second of said two enlarged ends of said pestle; and
- a spring, disposed between and urging apart said first and said second spring support cups, thereby pressing them against the enlarged ends of said pestle.

4,033,508
AUTOMATED IRRIGATION SYSTEM

Edgar F. Jacobi, 15962 Sunburst Lane, Huntington Beach, Calif. 92647, and Mark R. Madden, Rte. No. 2, Plainfield, Wis. 54966
Filed May 13, 1976, Ser. No. 686,104
Int. Cl.^{2} B05B *3/12*
U.S. Cl. 239—177 **6 Claims**

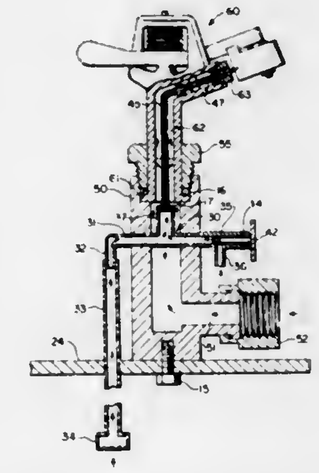


1. In a center pivot irrigation system having a tubular water dispensing assembly pivotally mounted on one end and supported on a first powered carriage proximate the other end for advancing in a circular patterm, the improvement comprising:
- a deployable extension adapted for telescopic receipt within said other end of said dispensing assembly;
- spray dispensing means mounted on said extension;
- a second powered carriage connected to slidably support said extension including sterring means for controlling the alignment thereof relative said first carriage;
- limiting means connected between said other end of said dispensing assembly and said second carriage for limiting the separation distance therebetween;
- latching means mounted on said second carriage for selectively retaining the free end of said extension adjacent said second carriage; and
- sequencing means operatively connected between said pivot and said dispensing assembly for producing a plurality of control signals in a sequence associated with the angular positions of said assembly, selected ones of said control signals being connected to control respective ones of said second carriage means and said latching means.

4,033,509
LAWN SPRINKLER AND FERTILIZER DISPENSER

Kerney T. Sheets, P.O. Box 637, Duplessis, La. 70728
Filed Mar. 6, 1975, Ser. No. 555,957
Int. Cl.^{2} B05B *3/02*
U.S. Cl. 239—226 **27 Claims**

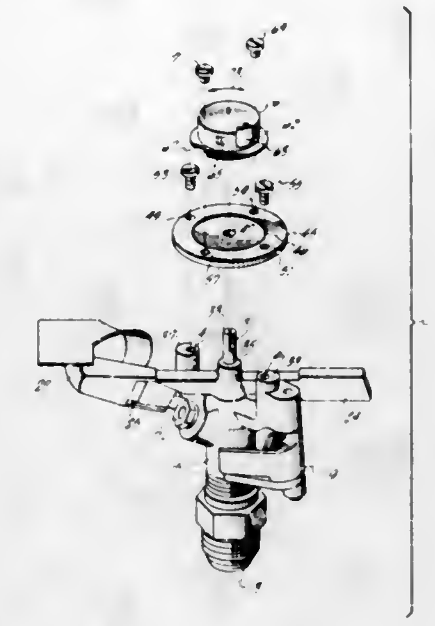
1. A lawn, farm and orchard sprinkler comprising:
- a. reservoir means for containing fluid solutions, suspensions, or mixtures of chemicals,
- b. coupling means connected to said reservoir means, said coupling means having chamber means for conveying liquids under pressure, said coupling means including liquid inlet means for introducing liquids under pressure to said chamber means,
- c. sprinkler head means rotatably connected to said coupling means, for sprinkler head means including:
  - i. nozzle means for spraying fluids,
  - ii. channel means connected to said nozzle means and to said chamber means for conveying liquids under pressure from said chamber means to said nozzle means;
- d. manifold means connected to said coupling means for conveying fluids from said reservoir means to said nozzle means, said manifold means having a first inlet for admitting said fluids from said reservoir means, a second inlet for admitting air, and an outlet inside said chamber means for said air and said fluids;
- e. flow regulating means connected to said manifold means for regulating the rate of flow of fluids from said reservoir means to said nozzle means, said flow regulating means comprising valve means for admitting air to said manifold means to mix with fluids conveyed from said reservoir means prior to the exit of said fluids from said outlet of said manifold means, said valve means comprising hollow tube means contained within said manifold means and rotatably connected to said manifold means, said tube means having one open end and one closed end, said tube means having at least one hole in the side thereof positioned for alignment with said second inlet for admitting air upon rotation of said tube to an aligning position to permit air to enter said manifold means through said hole;
- f. aspirator means located in said channel means and rotatably connected to said outlet for said air and said fluids for conveying said air and said fluids from said manifold means to said nozzle means, the outlet end of said aspirator means being located in said channel means upstream from said nozzle means; and,
- g. pipe means connected to said first inlet means for conveying fluids from said reservoir to said manifold means.



4,033,510
ARC-TRAVERSING WATER SPRINKLER

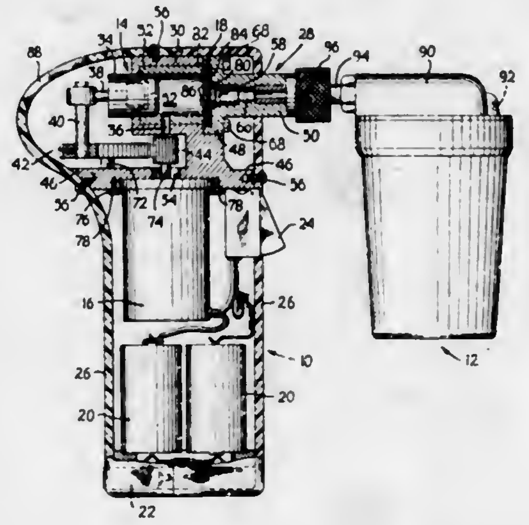
James M. Jennison, Anaheim, and Henry Thomas Williams, Corona del Mar, both of Calif., assignors to Thompson Manufacturing Company, Los Angeles, Calif.
Filed Aug. 26, 1975, Ser. No. 607,891
Int. Cl.^{2} B05B *3/14*
U.S. Cl. 239—230 **9 Claims**

1. In an oscillating sprinkler including a body structure having a discharge nozzle, and an oscillating mechanism actuated by the water jet issuing from said nozzle to effect turning of said body structure, the improvement therein comprising:
- first a pin fixedly located on said body structure;
- a closed-end journal bearing on said oscillating mechanism for receiving said first pin, said oscillating mechanism being supported by and pivoting on said first pin a second pin fixedly located on said oscillating mechanism; and
- a spring mechanism attached to said second pin and said body structure.



4,033,511
PORTABLE ATOMIZER APPARATUS

Edward B. Chamberlin, 112 Fifth St., Garden City, N.Y. 11530
Filed Nov. 24, 1975, Ser. No. 634,660
Int. Cl.^{2} B05B *7/30*
U.S. Cl. 239—346 **1 Claim**



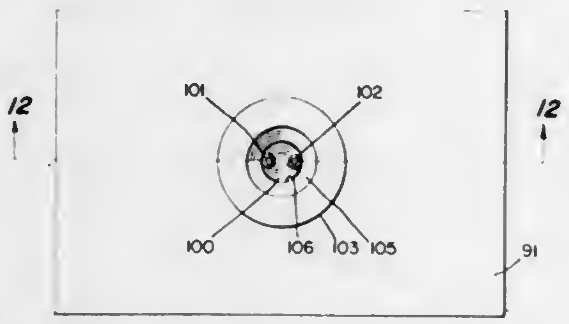
1. A portable atomizer, comprising a liquid dispenser including a cap connected directly to the dispenser, the cap having an aspirator and a spray orifice communicating directly with the aspirator, the orifice being integral with the cap; a pistol grip-type handle housing a reciprocating pump for directly supplying compressed air to the aspirator through a conduit extending outwardly from the surface of the handle adjacent the dispenser and communicating between the pump and the aspirator, a check valve between the pump and the conduit for permitting compressed air to flow only from the pump to the aspirator, an electric motor for driving the pump, a rechargeable battery electrically connected to the motor for powering the motor, a charger plug electrically connected to the battery and adapted to receive a converter for recharging the battery, and a trigger switch extending outwardly from the surface of the handle adjacent the dispenser and electrically connected to the battery and the motor for controlling the operation of the motor, wherein upon operation of the motor compressed air is delivered directly to the aspirator from the pump to immediately draw liquid from the dispenser, automatically atomize liquid drawn from the dispenser and instantaneously spray atomized liquid and compressed air from the

orifice; and means for releasably connecting the dispenser to the pump and for permitting the dispenser, cap and spray orifice to be replaced unitarily, whereby a plurality of dispensers containing the same or different liquids may be used interchangeably without cross-contamination from one liquid to another.

4,033,512

NOZZLE ASSEMBLIES FOR ATOMIZING AND MIXING DIFFERENT FLUIDS AND COMBINING THE MIXTURE WITH SOLIDS AND THE LIKE

Louis Beck, 6399 Crossview Road, Seven Hills, Ohio 44131
Division of Ser. No. 610,656, Sept. 5, 1975, Pat. No. 3,986,673. This application July 15, 1976, Ser. No. 705,513
Int. Cl.² B05B *7/00*
U.S. Cl. 239—423 **1 Claim**

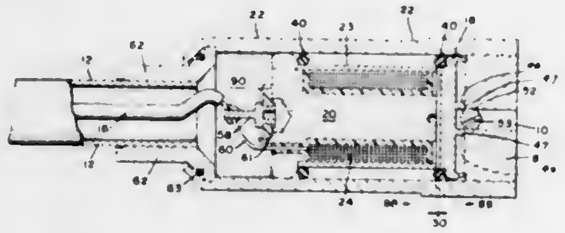


1. In a nozzle assembly of the character described, a body, a nozzle stem mounted in said body and having an axis and a plurality of passageways parallel with the axis of said nozzle and spaced equidistantly from said axis, said stem terminating at one end in a seat comprising a flat circular central portion, and a conical portion extending from the periphery of said circular portion to the external surface of said stem, said passageways extending to the conical portion of said seat, a cap or head seated on said seat, and provided with ports extending therethrough and communicating with said passageways, said ports being inclined toward each other, whereby to project fluids passing therethrough toward a common point or area spaced forwardly of said axis and substantially in alignment with said axis, and a ring or collar threadedly secured to said body and provided with a flange engaging said cap or head for retaining said cap or head in seated position.

4,033,513

ELECTROMAGNETICALLY OPERATED VALVE

E. David Long, Elmira, N.Y., assignor to Allied Chemical Corporation, Morris Township, N.J.
Filed Nov. 6, 1975, Ser. No. 629,450
Int. Cl.² B05B *1/30*
U.S. Cl. 239—585 **19 Claims**

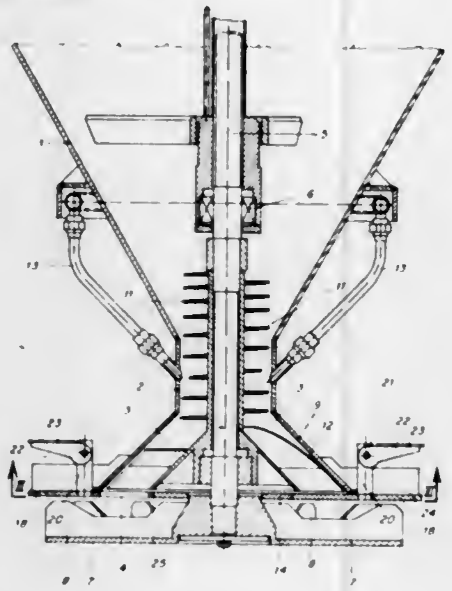


1. An electromagnetically operated valve, comprising:
a discharge means;
a sealing means for intermittently opening and closing said discharge means;
a fluid conduit for supplying fluid from a fluid inlet to said discharge means;
an electrical conductor for supplying an electrical signal to actuate said valve;
an electromagnet circuit comprising: an armature, a pole having a downstream end, a housing, a coil means for magnetizing said electromagnetic circuit in response to said electrical signal, and a flux path, said armature being a disc having a major diameter and a thickness substantially less than said major diameter, said disc having an upstream face and a downstream face and being slidably disposed at a terminal end of said housing adjacent to and between said pole and said discharge means, said armature having an upstream position, a downstream position, a travel distance between said upstream position and said downstream position, and a substantially close fitting relationship with said housing;
said armature, said pole, and said housing cooperating to define a single series air gap in said flux path between said upstream face of said armature and said downstream end of said first pole;
a travel limiter disposed coaxially around said coil for limiting travel of said armature in an upstream direction toward a downstream end of said pole, said travel limiter maintaining a residual air gap between said upstream face of said disc and said downstream end of said pole when said armature is in said upstream position, said residual air gap forming part of said single series air gap; and
a biasing means disposed within said housing for biasing said armature in its downstream position.

4,033,514

APPARATUS FOR BUILDING UP AND REPAIRING A REFRACTORY LINING

Franz Weiss, Vienna; Friedrich Baumgartner, and Werner Zach, both of Dorf-Veitsch, all of Austria, assignors to Veitscher Magnesitwerke-Actien-Gesellschaft, Vienna, Austria
Filed Nov. 10, 1975, Ser. No. 630,187
Claims priority, application Austria, Nov. 11, 1974, 8997/74
Int. Cl.² B05B *3/10*
U.S. Cl. 239—662 **8 Claims**

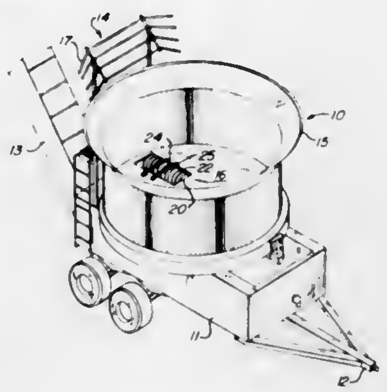


1. For use in an industrial oven or like hot-running vessel having a vertically extending refractory lining and an apparatus for building up and repairing the lining, the apparatus comprising a disc extending in a horizontal plane and rotatable in the plane for centrifugally depositing a granular refractory material on a portion of the lining to be built up or repaired, a conduit for feeding the granular refractory material to the disc, the conduit having an outlet opening above the disc, a stationary cover means over the outlet opening, the cover means having circumferentially distributed outlet ports directed towards the centrifugal disc, and plates slidable into and out of the outlet ports in a radial direction for changing the size and closing the outlet ports.

4,033,515

METHOD AND APPARATUS FOR REDUCING HAMMERMILL SLUGGING FOR LIVESTOCK FEED GRINDERS AND THE LIKE

Ernest A. Barcell, Lafayette, and James L. Pusch, Golden, both of Colo., assignors to Easy Engineering Corporation, Broomfield, Colo.
Filed July 10, 1975, Ser. No. 594,860
Int. Cl.² B02C *13/13*
U.S. Cl. 241—27 **10 Claims**



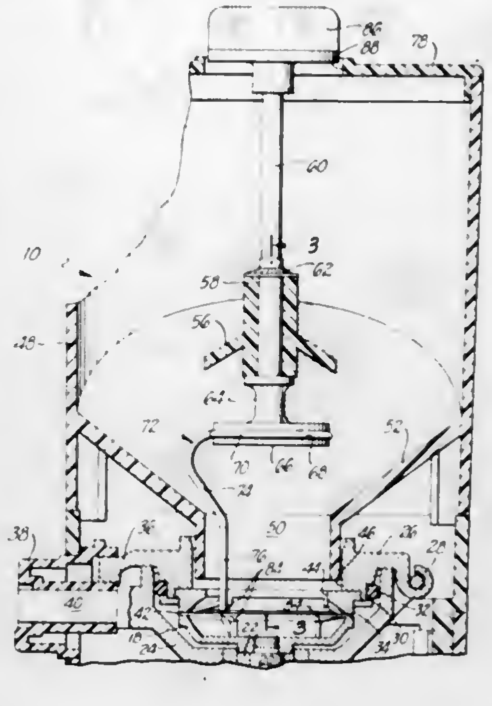
1. A method for grinding livestock feed and the like, comprising the steps of:
introducing the feed into a hollow container having an opening in the lower floor thereof for communicating with a hammermill contained within a chamber below the floor,
imparting a rotary motion to the feed along the lower floor surface so that it passes over the floor opening and drops into the hammermill,
supporting the feed over the opening in the plane of the surface of the lower floor by extending the floor surface across the opening at a plurality of narrow sections extending transversely of the opening and generally parallel to the movement of the feed in response to said rotary motion imparting step so that large clumps of the feed will not jam between the hammermill and its chamber, and
pivoting hammers of the hammermill in arcs extending above the surface of the floor for breaking up relatively dense clumps supported above the hammermill.

4,033,516

GRINDING APPARATUS AND METHOD

Paul M. Moskowitz, Brooklyn, N.Y., assignor to Salton, Inc., Bronx, N.Y.
Filed June 9, 1976, Ser. No. 694,176
Int. Cl.² B02C *7/11*
U.S. Cl. 241—30 **12 Claims**

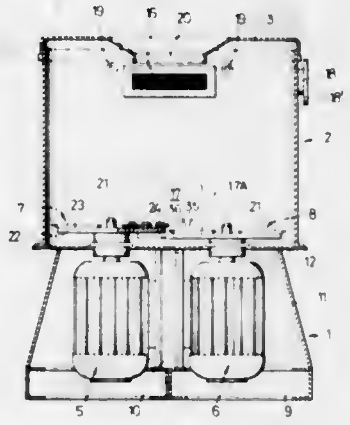
11. A process of agitating a material within a hopper so as to promote the flow of said material from within said hopper through an opening in a grinding wheel to generally between said wheel and another grinding wheel as there is relative rotation occurring between said wheels in which the improvement comprises:
operating said wheels so that there is some backflow of material from generally between said wheels generally away from said wheels and toward said hopper, allowing the material caused to back-flow as a result of the operation of said wheels to hit against an agitating member movably mounted in a position in which movement of said agitating member will tend to promote flow from said hopper toward said wheel, the contact of said material causeed to back-flow because of the operation of said wheels with said agitating member causing said agitating member to move to promote the flow of material from within said hopper through said opening to generally between said wheels.



4,033,517

DEVICE FOR GRANULATING THIN-WALLED PLASTIC WASTES INTO PLASTIC GRANULATED MATERIAL

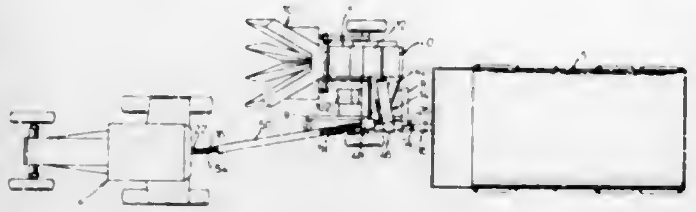
Helmut Weiss, Weiherstrasse 10, 6340 Dillenburg-Manderbach, Germany
Filed July 21, 1975, Ser. No. 597,472
Claims priority, application Germany, Sept. 5, 1974, 2442497
Int. Cl.² B02C *13/06*
U.S. Cl. 241—46.11 **9 Claims**



1. A device for crushing, subsequent plastification and then following agglomeration of thin-walled wastes of thermoplastic plastics having a stationary container and rotatable crushing tool means which is arranged adjacent and above the bottom wall of said container, said crushing tool means being used to produce frictional heat, comprising the improvement wherein said crushing tool means comprises at least two rotatable shafts having beaters thereon and rotatable therewith, wherein the peripheral circles described by the outer ends of said beaters are closely adjacent to effect said crushing of said wastes at a location between the place of intersection of said peripheral circles with a line joining the axes of said two rotatable shafts.

4,033,518
FORAGE HARVESTER

Phillip F. Fleming, and Steven J. Campbell, both of West Bend, Wis., assignors to Gehl Company, West Bend, Wis.
Filed May 24, 1976, Ser. No. 689,594
Int. Cl.² B02C *18/22*
U.S. Cl. 241—47 **10 Claims**

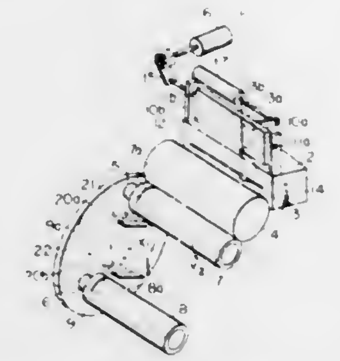


1. A forage harvester for use with a towing vehicle and connectable to a said towing vehicle for movement therewith, the forage harvester including:

- a frame;
- means for attaching the frame to a said towing vehicle whereby the forage harvester can be towed;
- a transmission supported by the frame and including an input shaft, the input shaft being rotatable about an axis disposed at an acute angle with respect to the direction of movement of the forage harvester when viewed in plan;
- a rotatable drive shaft having opposite ends, one of said opposite ends connectable to said towing vehicle and the other of the opposite ends connected to the input shaft of the transmission, the input shaft and the drive shaft being substantially co-linear when viewed in plan;
- a blower supported by the frame and including a fan rotatable around a horizontal axis substantially parallel to the axis of the input shaft and the rotatable drive shaft; and
- meanns for operably connecting the fan and the input shaft for rotating the fan.

4,033,519
METHOD AND APPARATUS FOR AUTOMATICALLY CHANGING BOBBINS AND WINDING YARN CONTINUOUSLY

Isamu Abe, and Takami Sugioka, both of Matsuyama, Japan, assignors to Teijin Limited and Teijin Seiki Co., Ltd., both of Osaka, Japan
Filed May 28, 1975, Ser. No. 581,590
Claims priority, application Japan, June 6, 1974, 49-63351; Nov. 26, 1974, 49-135191
Int. Cl.² B65H *54/06, 67/04*
U.S. Cl. 242—18 A **7 Claims**



1. In an apparatus for automatically changing bobbins and winding a yarn thereupon continuously which comprises a turnable turret on which a plurality of bobbin holders for holding bobbins are rotatably mounted, means for rotating bobbins held on said bobbin holders, and traverse means for traversing said yarn upstream of said bobbin holders in the axial direction thereof, means for turning said turret to alternate exchange positions of bobbins held on said bobbin holders between a winding position and a standby position, the improvement wherein said bobbin rotating means comprises a motor, a friction roller driven by said motor for driving said bobbin held on said bobbin holders when the peripheral surface of said bobbin contacts with said friction roller, a power transmission means for transmitting a driving power from said motor to said friction roller, auxiliary means for driving said bobbin for contacting said bobbin with said friction roller and comprising an arm swingably mounted on a shaft of said turret, an auxiliary roller rotatably mounted on said arm, a further motor disposed on a machine frame, and a power transmission means for transmitting driving power of said further motor to said friction roller, and wherein said turret turning means comprises means for turning said turret in a direction opposite to the rotational direction of said bobbins at the time of bobbin exchange, a guide disposed upstream of said yarn traverse means for disengaging said yarn from said yarn traverse means, and a yarn catching groove formed at a peripheral portion of each bobbin.

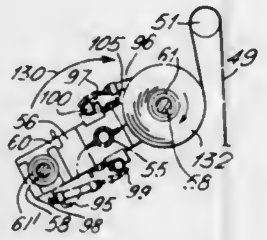
4,033,520
NOISE REDUCING TEXTILE TRAVERSE ROD

Herman D. Mims; John A. Willes, and Baylor D. Gibson, all of Charlotte, N.C., assignors to Celanese Corporation, Charlotte, N.C.
Filed July 28, 1975, Ser. No. 599,509
Int. Cl.² B65H *54/28, 57/00*
U.S. Cl. 242—43 R **8 Claims**

1. A textile traverse rod guide for a textile winder for reduced noise output comprising a unitarily fabricated traverse rod guide having cam engagement means, elongated shaft means and thread guide means, said cam engagement means connecting said thread guide means through said shaft means as a single fabricated structure, said structure being of an engineering plastic and wherein said cam engagement means and thread guide means are in fixed relationship to each other as they are joined by said shaft means, said shaft means being flexible about its axis such that when said cam engagement means and said thread guide means are twisted about said flexible shaft means, a torsional tension is created to return said cam engagement means and thread guide means to their fixed relationship.

4,033,521
WINDING MACHINES

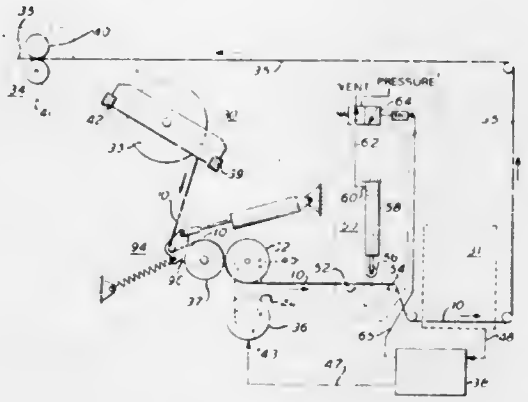
Anthony Neiman Dee, Kenwood Lee, Sheldon Avenue, Highgate, London, England
Filed Dec. 5, 1975, Ser. No. 638,275
Claims priority, application United Kingdom, Nov. 7, 1975, 46211/75
Int. Cl.² B65H *19/26, 35/02*
U.S. Cl. 242—56 A **12 Claims**



1. A core change-over arrangement for a turret machine having a centre shaft, which arrangement comprises first and second shafts each arranged for drivingly supporting at least one core, whereby a web may be wound upon a core upon one shaft or upon a core upon the other shaft, the first and second shafts having their axes parallel to and spaced from a further parallel axis around which the pair of shafts are rotatable, a knife member carried by the centre shaft and being mounted for pivotal movement about an axis located intermediate and parallel to the axes of the said first and second shafts, such that the cutter element of the knife member pivots about such axes from an inoperative position to an operative position, whereby rotation of the pair of shafts about the further axis causes the web being wound on to a core on one of the shafts to contact an empty core on the other of the shafts and whereby movement of the cutter element of the knife member into the operative position subjects the moving web to increased tension so as to sever it between the respective cores to allow further winding of the web on to the empty core.

4,033,522
MACHINE FOR ADVANCING STRIP MATERIAL THROUGH A UTILIZATION APPARATUS

W. Richard Chesnut, West Caldwell, and Daniel Calligaro, Little Falls, both of N.J., assignors to W. R. Chesnut Engineering, Inc., Fairfield, N.J.
Filed Feb. 13, 1976, Ser. No. 657,841
Int. Cl.² B65H *23/06*
U.S. Cl. 242—75.4 **19 Claims**



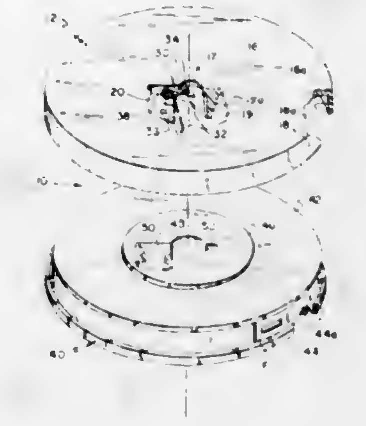
1. A machine for advancing strip material from a reel of the strip material through a utilization apparatus, the machine comprising:

- a. support means for securing component parts of the machine in a predetermined spatial relationship;
- b. reel carrier means, secured to said support means, said reel carrier means for carrying said reel of strip material and for applying a controlled drag and restoring torque to said reel of strip material;
- c. metering roll means, rotatably secured to said support means so as to receive said strip material intermediate said reel of strip material and said utilization apparatus, said metering roll means for advancing said strip material;
- d. spent strip material receiving means, secured to said support means so as to receive said spent strip material exiting said utilization apparatus, said spent strip material receiving means for receiving said spent strip material and for maintaining, within predetermined limits, tension of said spent strip material exiting said utilization apparatus;
- e. electric motor means, secured to said support means and having a shaft which is mechanically coupled to said metering roll means, said electric motor means for causing rotation of said metering roll means; and
- f. electronic control means, electrically connected to said motor means, said electronic control means for electrically energizing said motor means to cause rotation of said motor shaft through a predetermined program sequence;

whereby strip material is advanced from said reel of strip material through said utilization apparatus in response to energization of said electric motor means, by said electronic control means, in accordance with said predetermined program sequence.

4,033,523
FILM CARTRIDGE

Robert Justin Roman, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 11, 1975, Ser. No. 639,950
Int. Cl.² G03B *23/02*
U.S. Cl. 242—198 **8 Claims**

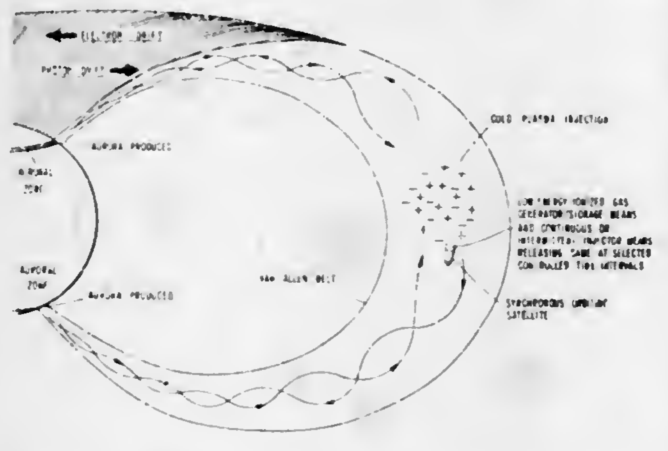


1. A film cartridge adapted to be received by a spindle, said cartridge including film supporting means adapted to have a film strip wound thereon and a cover having a cavity defined therein to receive the film supporting means in a nested position, the cartridge further comprising:

- latch means including a member pivotally supported by said cover for cooperating with the spindle when the cartridge is mounted thereon, said member being movable by said spindle from (1) a first position wherein said member releasably maintains said film supporting means in said nested position toward (2) a second position wherein said film supporting means is released from said nested position.

4,033,524
METHOD AND APPARATUS FOR CONTROLLING EARTH ORBITING SATELLITES AND VEHICLES INTER ALIA

Neil M. Brice, deceased, late of King Ferry, N.Y., and by Marilyn J. Brice, executrix, R.R. No. 1, King Ferry, N.Y. 13081
Continuation-in-part of Ser. No. 164,793, July 21, 1971. This application Aug. 23, 1971, Ser. No. 174,048
Int. Cl.² B64G *1/10*
U.S. Cl. 244—158 **6 Claims**


ELECTRON DRIFT
PROTON DRIFT
COLD PLASMA INJECTION
AURORA PRODUCED
AURORAL ZONE
LOW ENERGY IONIZED GAS GENERATOR/STORAGE MEANS AND CONTINUOUS OR INTERMITTENT INJECTOR MEANS RELEASING SAME AT SELECTED CONTROLLED TIME INTERVALS
AURORAL ZONE
VAN ALLEN BELT
AURORA PRODUCED
SYNCHRONOUS ORBITING SATELLITE

1. A method of changing the orbital parameter of an earth orbiting satellites traversing the earth's magnetosphere, which comprises the step of inducing an artificial atmospheric drag on the satellite by causing a precipitation of charged particles from the earth's radiation belt.

4,033,525

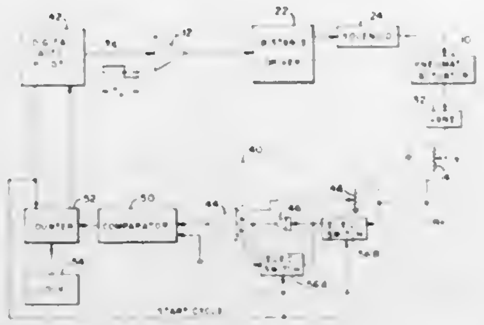
FEEDBACK PDM ENCODER AND METHOD FOR ACTUATING A PNEUMATIC ACTUATOR WITH A DIGITAL AUTOPILOT

John P. Leonard, and Robert E. Yates, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Dec. 8, 1975, Ser. No. 638,476

Int. Cl.² F42B *13/30*

U.S. Cl. 244—3.15 **4 Claims**



1. In a guidance control system having a digital autopilot coupled to control a pneumatic PDM actuator and related missile vanes, the improvement comprising: a feedback PDM encoder; a position indicating potentiometer disposed along the vane positioning shaft of said actuator for coupling a potential change relative to said shaft position as an input to said encoder; a cycling input to said encoder from said digital autopilot for activating said encoder to receive and process input signals from said potentiometer; a digital output from said encoder to said digital autopilot for indicating the actuator position; and said feedback PDM encoder comprising an integrator having an input and an output; a comparator having an input and an output; a summing amplifier having a plurality of inputs and an output, said summing amplifier output being coupled as said comparator input, a first input of said plural inputs being coupled to said indicating potentiometer, and a second of said plural inputs being coupled to said integrator output; a counter coupled to the output of said comparator for coupling an output pulse to said digital computer; and the input of said integrator is coupled to said indicating potentiometer.

4,033,526

AERODYNAMIC FLOW BODY

William Benson, P.O. Box 5194, San Bernardino, Calif. 92408

Continuation of Ser. No. 474,938, May 31, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 667,245

Int. Cl.² B64C *15/02*

U.S. Cl. 244—15 **8 Claims**

1. Aerodynamic-lifting vehicle of the short take off and landing type having a longitudinal axis and a maximum dimension and having a bilaterally symmetric planform taken about the longitudinal axis thereof, said vehicle comprising:

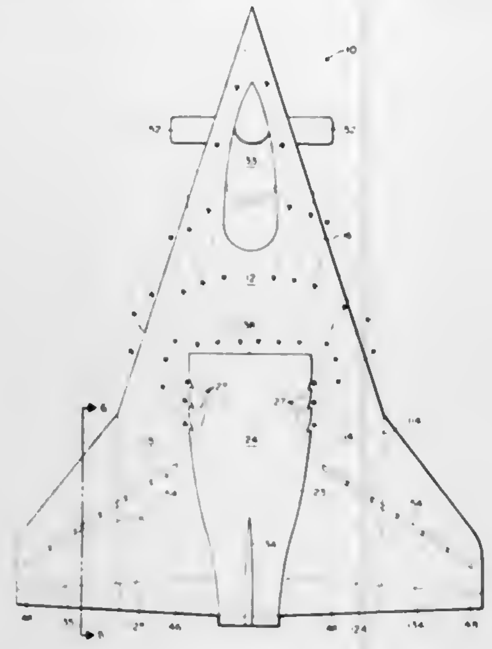
a forward section having upper and lower surfaces, said forward section being of substantially delta-shaped planform, said forward section presenting an airfoil shape in side elevation section;

an aft section in tandem and integral with said forward section, said aft section presenting an airfoil shape in side elevation section;

engine means mounted on said aft section and including a housing having inlet means positioned to induce airflow over said upper and lower surfaces of said forward section during operation of said engine means irrespective of motion of said vehicle;

a line taken along the longitudinal axis from the forward tip of said forward section to the rear tip of said aft section defining the root chord of said vehicle;

a pair of side panels, one of said side panels extending transversely from the longitudinal axis in either direction from said aft section of said vehicle, each of said side panels being of progressively increasing length, in a direction transverse to the longitudinal axis, from the forwardmost portion of said side panels aftward to at least one-half the distance of the aftmost portion of said side panels, the remainder of said side panels defining the tip chord of said vehicle, and each of said side panels presenting an airfoil shape in side elevation section;



a line taken perpendicular to said root chord and along the maximum dimension of said vehicle across said aft section of said side panels defining the total span of said vehicle;

the ratio of the root chord to the total span being between 1.0 and 1.33; and

the ratio of the tip chord to the root chord being between 1/20 and ⅛.

4,033,527

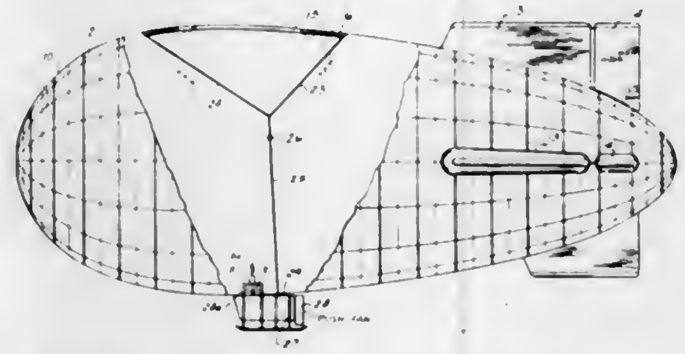
DEFLATION CAP FOR PRESSURIZED HOT AIR AIRSHIP

Roger R. Parsons, Sioux Falls, S. Dak., assignor to Raven Industries, Inc., Sioux Falls, S. Dak.

Filed Feb. 3, 1976, Ser. No. 654,858

Int. Cl.² B64B *1/62*

U.S. Cl. 244—99 **11 Claims**



1. A thermal airship comprising in combination:

a horizontally elongate airship envelope of flexible material;

tail members at the aft end of said airship for guiding and directing the direction and attitude of flight;

a gondola connected to the envelope for carrying a load;

hot air generating means carried by the gondola for pressurizing the envelope during flight;

propelling means carried by the gondola for propelling said airship in flight;

means including opening edges and side edges defining a deflation opening in the airship envelope;

a cap of flexible material having end and side edges extending over the opening;

connecting means detachably connecting the cap to the opening edges so that in a deflating position the side edges of the cap remain attached to the side edges of the opening while the cap end edges are displaced from their original position;

and reinforcing means extending across the opening secured to the edges of the opening and positioned outwardly of the cap relative to the envelope interior preventing the cap from being forced outwardly by hot air within the envelope.

4,033,528

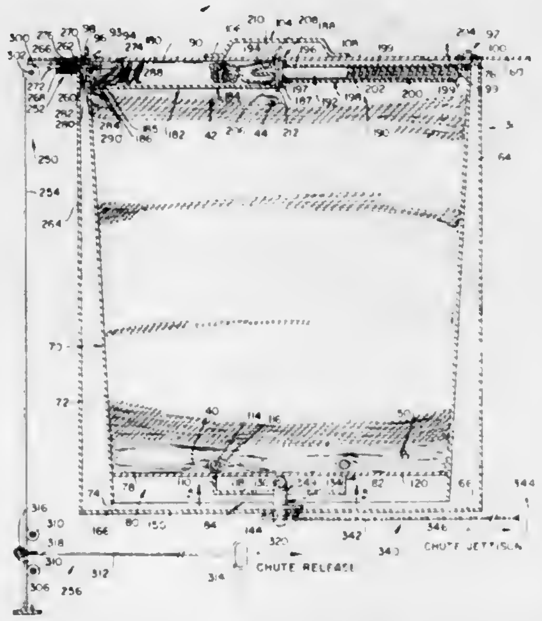
AIRCRAFT PARACHUTE SYSTEM

Richard E. Diggs, 12A Road, Carthage, Mo. 64836

Filed July 1, 1976, Ser. No. 701,630

Int. Cl.² B64D *17/00*

U.S. Cl. 244—139 **17 Claims**



1. A parachute system for stably lowering an aircraft having a fuselage, comprising:

a container receiving well defined in the fuselage;

a container for storing a main parachute, said container being portable and positionable in said receiving well prior to take-off of the aircraft and including an open top and a bottom, a keeper device attached to said bottom and having a plate thereon which is spaced from said bottom and which has an elongated slot defined therein, and a lid for covering said container top, said lid being biased open, said main parachute being connected to said container;

a drogue parachute storage means attached to said container for storing a drogue parachute in said container;

drogue parachute deploying means attached to said container lid for deploying said drogue parachute from an open container;

lid locking means on said receiving well for locking said lid over said container top to close said container, said lid locking means including means for releasably holding said lid closed;

parachute releasing means attached to said container for releasing said lid so that said lid opens to open said container, so that said drogue parachute is deployed by said drogue parachute deploying means;

said drogue parachute being connected to said main parachute, so that said deployed drogue parachute deploys said main parachute from said open container; and

container jettisoning means connecting said container to the fuselage in a releasable manner, so that said container can be released from the fuselage to detach said parachute from the aircraft, said container jettisoning means including a lug having a head engageable with said plate via said slot and a body connected to said head and depending therefrom a distance sufficient to locate a free end of said body outside said container when said head is engaged in said slot and a jettison pin removably positioned in said body outside said container for preventing said body from disengaging from said container, and pin removing means for removing said pin from said lug.

4,033,529

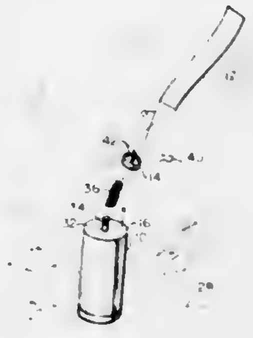
DROGUE RELEASE APPARATUS

Armand E. Bourgeois, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Feb. 27, 1976, Ser. No. 662,196

Int. Cl.² B64D *17/38*

U.S. Cl. 244—151 B **6 Claims**



1. Apparatus for releasably coupling drogue apparatus to an article ejected into the earth's atmosphere comprising:

a release unit;

means for attaching said drogue apparatus to said release unit;

spring biasing means for projecting said release unit away from said article; and

means for locking said release unit to said article during descent and for unlocking said release unit at impact including: a member attached to and projecting above said article, said member having detent receiving means adjacent the top thereof; a detent spring located on top of said release unit and adapted to engage said detent receiving means to prevent movement of said release unit away from said article; and means at the top of said release unit which engages one end of said detent spring for maintaining said detent spring in a position other than its normal rest position and in coacting engagement with said detent receiving means when said release unit is in a predetermined assembled position and for releasing said detent spring upon translation of said release unit against said spring biasing means and away from said predetermined assembled position due to impact.

4,033,530

PROTECTIVE MOUNTING FOR OUTBOARD MOTORS

Garrett H. Harris, 157 S. Denver St., Jackson, Miss. 39209

Filed Feb. 18, 1975, Ser. No. 550,666

Int. Cl.² B63H *21/26*

U.S. Cl. 248—4 **21 Claims**

1. A mounting assembly for an outboard motor which comprises a base plate, means for mounting the base plate on a deck of a boat, a first link means, means pivotally mounting the first link means on the base plate, an extendible second link means, means pivotally mounting the extendible second link means on the base plate, a motor support bracket pivotally connected to the first link means and to the second link means, resilient means urging the second link means to a normal position, the link means and the motor mounting bracket being swingable between an operative position in which the motor mounting bracket is adapted to support the motor in upright position outboard of the boat and a storage position in which the motor mounting bracket is adapted to support the motor in substantially horizontal position overlying the deck, pivots between the motor mounting bracket and

the link means being vertically spaced when the motor mounting bracket is in operative position, the extendible link being adapted to yield when the assembly is in operative position and the motor hits an obstruction.

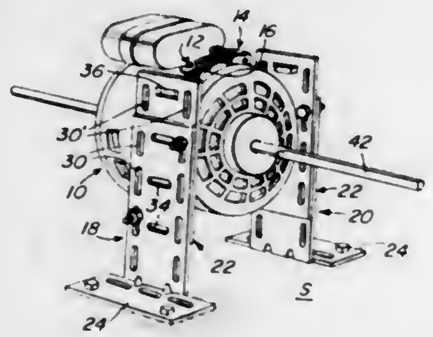
4,033,531
MOUNTING ASSEMBLY WITH SELECTIVELY USED ONE-PIECE OR TWO-PIECE BRACKETS

Fred Levine, 1330 - 99th St., Bay Harbor Island, Fla. 33154

Filed Apr. 27, 1976, Ser. No. 680,797

Int. Cl.² F16M *11/04, 1/00*

U.S. Cl. 248—16 **9 Claims**



1. A kit for mounting electric motors, refrigerant tanks, and the like, on a support surface, having mounting holes differing from the mounting dimensions of the article to be mounted, the kit comprising, in combination:

a. clamp means including a strap for embracing an article to be mounted; and

b. a pair of support brackets, each of the brackets having an upstanding leg portion and a base portion disposed substantially at a right angle to the leg portion and abutting a support surface, with the brackets being provided with attachment means for receiving the strap of the clamp means and supporting the article to be mounted above the support surface, the attachment means including an elongated aperture provided in the leg portion of each bracket, the aperture arranged extending perpendicular to the base portion of the bracket, and a slot arranged extending perpendicular to the aperture, with the strap of the clamp means being slidably disposed in one of the aperture and slot of each bracket.

4,033,532
POWER TOOL SUPPORT

Arne Erik Bergquist, Stockholm, and Sven Peter Jonas Westerberg, Saltsjo-Boo, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Nov. 17, 1975, Ser. No. 632,305

Claims priority, application Sweden, Nov. 22, 1974, 74146804

Int. Cl.² B25B *15/00, 7/00*

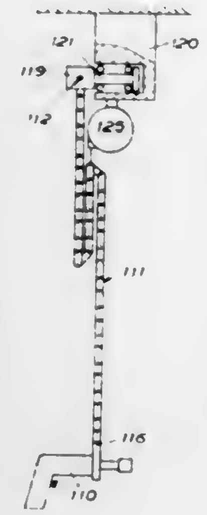
U.S. Cl. 248—17 **12 Claims**

1. A reaction support for balancing the reaction torque of a power tool, said power tool having a rotating output shaft, comprising:

a stable reaction point,

a chain of a plurality of links, substantially greater than three in number, which are pivotably connected to each other, and

means for pivotally connecting said link chain to the power tool and to the reaction point with a plurality of chain links interposed between said power tool and said reaction point,



all of said pivotable connections providing pivoting axes which are parallel to each other but perpendicular to the rotation axis of the power tool output shaft, said chain being stiff in a transverse direction thereof to resist bending strains resulting from the power wrench reaction torque.

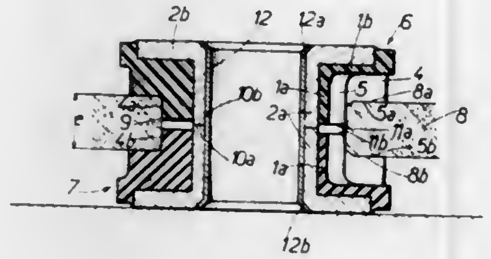
4,033,533
VIBRATION ABSORBER

Gérard Maurice Gaspard Evrard, Livry Gargan, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Jan. 9, 1976, Ser. No. 647,792

Int. Cl.² B60G *11/18*

U.S. Cl. 248—358 R **4 Claims**



1. A vibration absorber for connecting a vibratory element to a non-vibrating element, comprising:

two resilient members each comprising a ring of elastomeric material having a smooth bore, a smooth annular outer end surface, and an annular inner end surface formed with a plurality of radially extending ribs having extreme edge level surfaces situated in a plane perpendicular to said bore, and a rigid fastening having an end flange bonded to said annular outer end surface, and a tubular portion bonded to said bore and having an inner end which projects beyond said ring of elastomeric material;

at least one of said rings comprising a hub which extends beyond said plane and has an outer peripheral surface formed with a plurality of serrations projecting thereon;

a plate shaped portion of one of said elements, having an opening formed therethrough, of a diameter substantially equal to the overall outer diameter of said serrated hub; and

brace means extending through said tubular portion of each said member for pulling said fastening of each said member together whereby to draw said inner end of each said tubular portion toward each other across said opening with said serrations engaging the same, and to cause said ribs of each said member to engage both sides of said plate shaped portion, and for connecting said fastening of each said member to the other one of said elements.

4,033,534
POSITIONING DEVICE FOR TUBES TO BE EMBEDDED IN SURROUNDING CAST MATERIAL

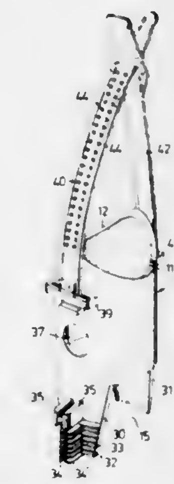
Håkan Georg Frithiof Bergkvist, Majorsgatan 31, Varnamo, Sweden

Filed Sept. 22, 1975, Ser. No. 615,826

Claims priority, application Sweden, Sept. 24, 1974, 7411995

Int. Cl.² F16L *3/12*

U.S. Cl. 248—49 **5 Claims**



1. A device for firmly supporting a length of tube in predetermined spaced relationship from a surface, which comprises a hollow normally vertical cylindrical body the upper end of which is arcuately shaped to provide a bed for a tube, and the lower end of which is shaped to provide members adapted to support said device on a surface and channels adapted to permit cement to flow into and fill the interior of said body when flowed thereon; circumferential, uniformly spaced guide scoring on said support members adapted to guide cuts to shorten said members by a predetermined amount; a center apertured lug on each of said support members spaced from said lower end, said lug being adapted to permit said device to be nailed or bolted to a surface, and openable locking means adapted to secure a length of tubing in said bed, a plurality of fin pairs under said lug, each fin pair extending horizontally from each score in said guide scoring, the fins of said fin pairs being spaced horizontally apart by a distance about equal to the bore of said lug, the spaces thus formed being in vertical register with the bore of said lug; said fin pairs being adapted to provide support for said device when said support members are shortened by cuts through said guide scoring.

4,033,535
STRAIN-RELIEF BUSHING

Thomas M. Moran, Cleveland, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Filed May 18, 1973, Ser. No. 361,737

Int. Cl.² F16L *5/00*

U.S. Cl. 248—56 **2 Claims**

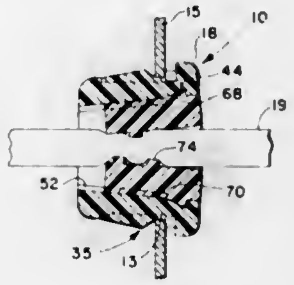
1. A one-piece, molded strain-relief bushing for holding an electric conductor fixed relative to an aperture in a support panel through which the conductor extends and adapted to be applied to and permanently locked in said aperture by means of a tool, said bushing comprising:

first and second complementary portions and a flexible web portion securing said first portion to said second portion and permitting said portions to be folded into face-to-face relationship;

each complementary portion including a grip block segment having a generally cylindrical exterior surface and a shank segment having a generally cylindrical interior surface, said grip block segment axially aligned with said shank segment and frangibly secured thereto at an end thereof;

cam means on the external surface of said shank segment to secure said shank segment within said aperture; and

locking means to permanently secure (a) said shank segments within said aperture when said bushing is inserted therein, (b) said grip block segments within said shank segments when said grip block segments are telescopically received within said shank segments, and (c) said conductor within said grip block segments when said grip block segments are folded about said conductor and are telescopically received within said shank segments, said locking means including:



aligning means to assure a proper predetermined position of said grip block segments within said shank segments when said bushing is locked in said aperture by said tool;

said interior surface of each shank segment having an annular rib adjacent said end to which said grip block segment is frangibly secured, said interior surface further including a generally cylindrical portion tapering inwardly in a direction from said annular rib toward the end of said shank segment oppositely disposed from said grip block segment and

said interior surface defining a recess disposed between said annular rib and said generally cylindrical portion.

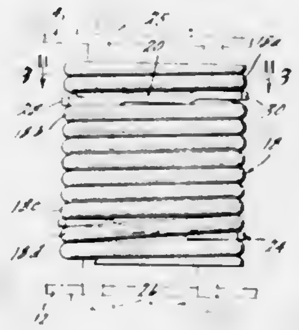
4,033,536
MOUNTING BRACKET COIL SPRING

David U. Hillstrom, Novi, Mich., assignor to Robert Sarkisian, Bloomfield Hills, Mich.

Filed Apr. 8, 1976, Ser. No. 674,873

Int. Cl.² F16M *13/00*

U.S. Cl. 248—160 **4 Claims**



1. An improved mounting apparatus for mounting a structure to a base by an extension spring wherein the mounting surface of said structure is substantially parallel to the mounting surface of said base, comprising

a first bracket for fastening said coil spring to said mounting surface of said structure disposed between a first pair of adjacent coils proximate to one end of said spring and secured to said spring at radially opposed points thereof by the extension force to said coils, said bracket having formed therethrough at least two radial spaced holes normal to said bracket and located proximate to the parts of said brackets disposed between said first pair of adjacent coils, siad parts of said bracket having different levels thereof such that the axes of said holes are parallel to the axis of said coil spring dispite the inclination in said first adjacent pair of coils between siad radially opposed points which said first bracket is secured to said spring;

a third part intermediate said parts of said first bracket disposed between said first pair of adjacent coils having a stepped level intermediate the levels of said aforementioned parts of said first bracket,

first fastening means adapted to fasten said first bracket to said mounting surface of said structure by thrededly engaging said holes of said bracket;

a second bracket for fastening said coil spring to said mounting surface of said base disposed between a second pair of adjacent coils proximate to the other end of said spring and secured to said spring at radially opposed points thereof by the extension force of said coils, said bracket having formed therethrough at least two radial spaced holes normal to said bracket and located proximate to the parts of said bracket disposed between said second pair of adjacent coils, said parts of said bracket having different levels thereof such that the axes of said holes are paralell to the axis of said coil spring despite the inclination in said second adjacent pair of coils between said radially opposed points at which said second bracket is secured to said spring;

a third part intermediate said parts of said first bracket disposed between said first pair of adjacent coils having a stepped level intermediate the levels of said aforementioned parts of said first bracket,

second fastening means adapted to fasten said second bracket to said mounting surface of said base by threadedly engaging said holes of said bracket.

4,033,537

KNITTING MACHINE STAND

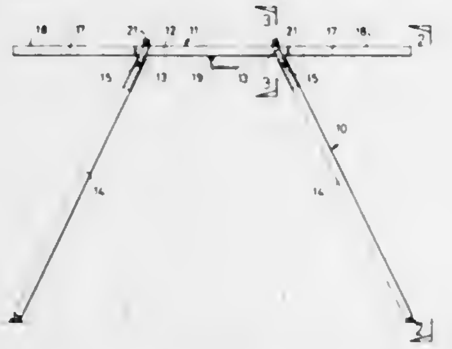
Brian Frederick Pridham, 20 Firebrace St., Horsham, Victoria, Australia (3400)

Filed July 16, 1974, Ser. No. 489,039

Claims priority, application Australia, July 18, 1973, 4128/73; Aug. 3, 1973, 4345/73

Int. Cl.² F16M *11/32*

U.S. Cl. 248—165 **5 Claims**



1. A stand for a knitting machine having a main support frame and two support sections pivotally supported on said support frame to extend away from either end of the main support frame for rotation between one operating position and a tilted operating position and adapted, in use, for supporting a knitting machine attached at either end thereof to the respective support sections, said support sections being mounted on a common support axle extending through the main support frame, clamping means supported on said main frame to engage said common support axle to releasably hold said support axle fixed with respect to said main frame at either operating position, and stop means provided on said main support frame and cooperating with said common support axle for restricting the movement of said support axle to movements between said operating positions.

4,033,538

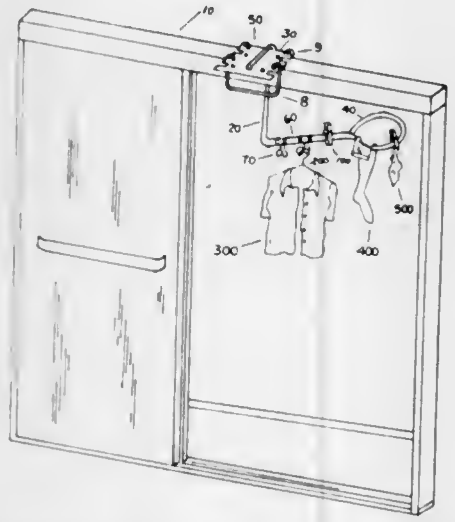
ADJUSTABLE DRIP DRY SUPPORT APPARATUS

Harold Levy, P.O. Box 600015, North Miami Beach, Fla. 33160

Continuation-in-part of Ser. No. 569,194, April 17, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,776

Int. Cl.² E04G *3/00*

U.S. Cl. 248—214 **4 Claims**



1. An adjustable clothes drying device usuable with a bathtub enclosure having a shower door beam of square cross section, the device comprising an adjustable clamp for fitting over the door beam and a cantilever arm horizontally extending outwardly from the clamp toward the interior of the bathtub enclosure, the clamp being constructed from a rectangular plate of sheet material having a first set of holes parallel to a first edge and a second set of holes parallel to a second edge opposite said first edge, a first set of slots in said first edge corresponding in number to and adjacent said first set of holes and a second set of slots in said second edge corresponding in number to and adjacent said second set of holes, said clamp further including a pair of spaced apart U-shaped clamping members, each clamping member having one leg engaging a corresponding hole and slot of said first sets of holes and slots and the other leg engaging a corresponding hole and slot of said second sets of holes and slots, the holes and slots of said first and second sets being at least three in number, whereby the position of said clamping members may be selected in accordance with the size of said door beam such that when the rectangular plate is positioned against the top of the door beam the clamping members straddle to door beam to stabilize the drying device.

4,033,539

OPTICAL RAIL SYSTEM

Arpad Bardocz, Rumannstrasse 57, 8 Munich 23, Germany

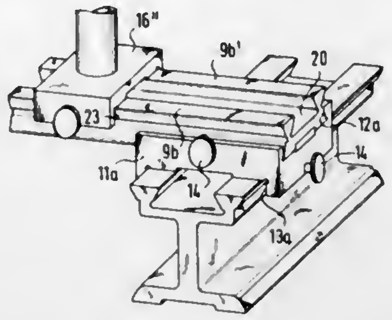
Filed Mar. 22, 1971, Ser. No. 126,562

Claims priority, application Germany, Apr. 3, 1970, 2016067

Int. Cl.² F16M *13/00*

U.S. Cl. 248—228 **4 Claims**

1. An integral optical rail comprising a uniform cross-sectional shape throughout its length, two spacedapart top longitudinally extending flat bearing surfaces, a bottom longitudinally extending flat bearing surface parallel to said top surfaces, each of said top surfaces being equal in width and the overall widths of the top and bottom of the rail being equal, four flat locating surfaces on the sides of the rail, each locating surface extending towards a central plane of the rail perpendicular to the hearing surfaces from a line contiguous to the edge of a said bearing surface at an angle of substantially sixy degrees to the horizontal for cooperation with corresponding surfaces in grooves of couplings and optical carriers, said grooves also having surfaces for cooperating with the bearing surfaces, a fifth and a sixth flat locating surface each extending inwardly and towards an outer edge side of the rail from a line contiguous to an inner edge of a top bearing surface at an angle of substantially sixty degrees to the horizontal, plural portions of said rail cros-section in a plane parallel to the bearing surfaces narrowing to a width in the range of one third to one fourth of the width of a top bearing surface at two locations spaced from a central plane perpendicular to said bearing surfaces, and a horizontal web extending between regions contiguous to said locations.



4,033,540

SHELF SUPPORTS

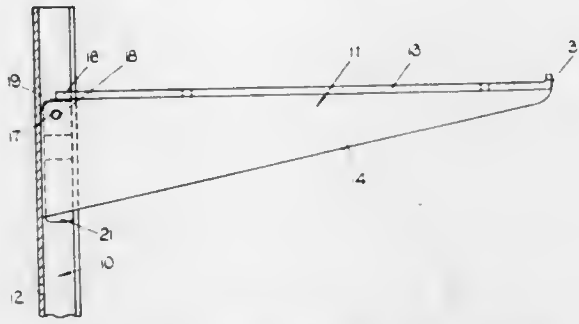
Richard David Hamblin, Birmingham, England, assignor to Archibald Kenrick and Sons Limited, West Bromwich, England

Filed Apr. 21, 1975, Ser. No. 569,994

Claims priority, application United Kingdom, May 16, 1974, 21731/74

Int. Cl.² A47G *29/02*

U.S. Cl. 248—246 **3 Claims**



1. A shelf support comprising a member adapted for attachment vertically to a wall or other structure, said member including an internal channel of uniform dimensions throughout its length and an outwardly facing slot formed by a pair of opposing lips;

a bracket having a shelf-supporting portion and a generally triangular flange depending from the shelf-supporting portion, said flange including a blade portion extending into said channel through said lips;

a pair of projections extending outwardly from the upper edge of said blade portion for engaging the inner surfaces of said lips; and

a pair of channel-engaging wedges pivotably supported by said blade portion and extending along the surfaces of the blade portion extending into said channel, said blade portion being frictionally inserted between said wedges and having a surface for engaging the inner rear surface of said member for rigidly supporting said bracket against movement in said channel, both by the oppositely acting purely frictional engagement between the lip-engaging projections and the channel-engaging surface of the blade portion, and the frictional engagement of said wedges with the channel by insertion of the blade portion for infinite adjustability of said bracket.

4,033,541

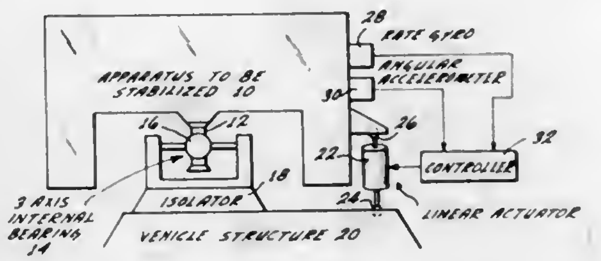
TORQUE REJECTION SOFT MOUNTED PLATFORM

Richard M. Malueg, Glendora, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed May 30, 1975, Ser. No. 582,096

Int. Cl.² F16F *15/08, 11/00*

U.S. Cl. 248—358 R **16 Claims**



1. In combination with apparatus to be stabilized against motion in a predetermined rotational direction and isolated from translational vibrations of its support, a stabilization system comprising in combination:

a. bearing means having a fixed part and a rotatable part, said rotatable part being adapted to be attached to the apparatus to permit it to rotate in the predetermined rotational direction;

b. isolation means connecting said fixed part of said bearing means to a supporting frame, said isolation means including a member relatively compliant in the direction of the translational vibrations of said support frame;

c. dynamic correcting means including an actuator, connecting the apparatus with said supporting frame in parallel with the series combination of said bearing means and said isolation means, and disposed to apply torque to said apparatus in the predetermined direction in response to applied correcting signals;

d. motion sensing means coupled to the apparatus for signaling rotation of the apparatus in the predetermined rotational direction; and

e. feedback control means connected to said motion sensing means and said dynamic correcting means for generating correcting signals to drive said dynamic correcting means in accordance with a predetermined function of said motion sensing means signal,

whereby said actuator applied restoring torques to the apparatus to oppose applied torques in the predetermined rotational direction.

4,033,542

DUAL SPRING SUPPORT

Kenneth Albert Moehle, and Raymond George Taschner, both of Racine, Wis., assignors to J. I. Case Company, Racine, Wis.

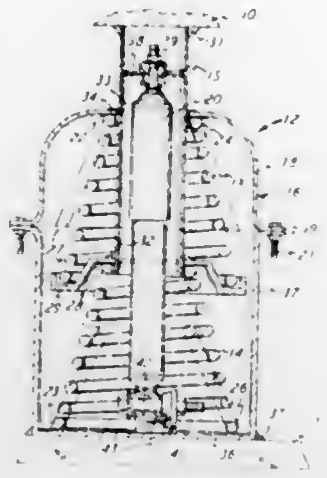
Filed Aug. 11, 1976, Ser. No. 713,518

Int. Cl.² B62A *33/06, 39/00*

U.S. Cl. 248—358 AA **1 Claim**

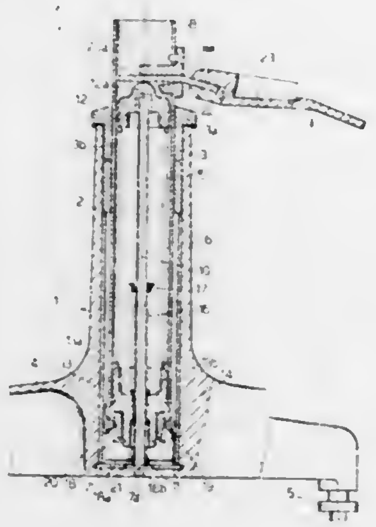
1. A dual spring and shock absorber support assembly, comprising two spaced-apart members which are movable toward and away from each other, a tubular connector being affixed to one of said two members and extending toward and spaced from the other of said members, an enclosure affixed to said other of said members and extending toward and spaced from said one of said members and aligned with and surrounding and extending end of said tubular connector and having two parallel and spaced-apart abutment surfaces, an abutment piece affixed to and surrounding the extending end of said tubular connector and located within said enclosure half way between said abutment surfaces and extending paral-

lel to said abutment surfaces, and being spaced from said enclosure to be freely movable therewithin, two compression coil springs of equal strength co-axially disposed in end-to-end relation respectively between said abutment piece and said abutment surfaces and co-axial with the longitudinal axis of said tubular connector for dampening the movement of said members in both the toward and away directions, and a shock absorber extending in said tubular connector and co-axial with said two springs and being operatively connected at its respective ends with said two members for dampening shocks imposed upon said two members.



4,033,543
DEVICE FOR ADJUSTING THE HEIGHT OF THE SEAT OF ARM-CHAIRS AND THE LIKE

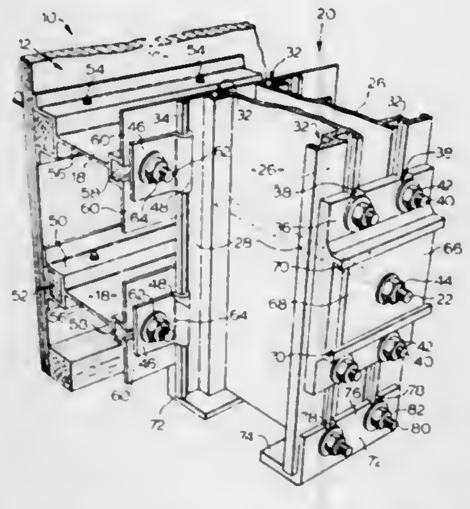
Giulio Ponzellini, Bologna, Italy, assignor to Anonima Castelli S.p.A., Bologna, Italy
Filed July 15, 1975, Ser. No. 596,017
Claims priority, application Italy, Apr. 11, 1975, 49051/75
Int. Cl.² F16M *11/00*
U.S. Cl. 248—412 **10 Claims**



1. A device for adjusting the height of a seat of a chair or the like comprising a vertical hollow shaft fixed to the lower surface of the seat and depending therefrom; a base adapted to rest on a supporting surface and having a vertical hollow column dimensioned to telescopically receive said vertical shaft and provided on its inner surface with a bearing surface; a bushing provided at the upper end of said column dimensioned to guide said hollow shaft during its axial movements with respect to said column; a coaxial rod slidably received into said hollow shaft; control lever means movably mounted on said hollow shaft movable between operative and inoperative positions for axially displacing said coaxial rod relative to said hollow shaft; a plug member fixedly mounted on the lower end of said hollow shaft and provided with a central opening aligned with the axis of said hollow shaft and dimensioned to receive said coaxial rod therein for relative sliding movements therebetween, said plug member having a downwardly and inwardly directed tapered surface in the shape of a truncated conical body; a coaxial ball retainer means coupled to said coaxial rod and having a portion thereof disposed between said tapered surface and said bearing surface, said retainer means portion being provided with a plurality of angularly spaced radial holes; a plurality of balls each dimensioned to be partially received within one of said radial holes and adapted to abut against said tapered and bearing surfaces; a first spring acting between said retainer means and said plug member arranged to urge said balls towards the smaller diameter end of said tapered surface; a collar member mounted on an intermediate portion of said coaxial rod; a second helical spring acting between said collar member and the upper end of said plug member to urge said coaxial rod towards said control lever means, said conical body having its greatest and smallest diameters dimensioned to permit said plug member to radially move said balls into abutment against said bearing surface respectively with greater and smaller pressures when said coaxial rod and retainer means are lowered with respect to said plug member; and a third spring acting on said control lever means for urging said control level means to its inoperative position once said plug member and said hollow shaft are locked in position relative to said column.

4,033,544
WALL FORMING STRUCTURE FOR POURED CONCRETE WALLS

Ronald J. Johnston, Georgetown, Canada, assignor to Aluma Building Systems Incorporated, Downsview, Canada
Filed June 3, 1976, Ser. No. 692,598
Int. Cl.² E04G *17/06*
U.S. Cl. 249—40 **10 Claims**



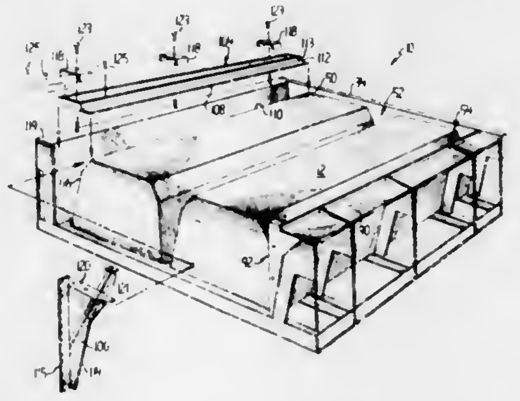
1. A wall forming structure intended for use during the construction of poured concrete walls, comprising a pair of opposed panels spaced apart so as to provide a cavity into which fluid concrete is placed to form a wall; where each of said panels comprises substantially planar sheathing secured to a plurality of studs placed substantially parallel one to another, and said studs are secured to at least a pair of strongbacks placed perpendicularly to said studs, each of said panels being thereby capable of being moved as an integral unit: and where a plurality of ties extend across said cavity and through said sheathing from a strongback of one panel to a strongback of the other panel; the improvement where:

each strongback comprises a pair of channel-shaped members placed in spaced back-to-back relationship; where each channel-shaped member has a pair of side walls and a base, an outwardly facing T-shaped slot suitable for receiving the head of a bolt in each side wall near said base, and an inwardly facing flange at the end of each side wall remote from said base;

and a plurality of plates each having an opening through its thickness secured to each said pair of channel-shaped members by bolts placed in the outwardly facing T-shaped slot in the side wall of each of said channel-shaped members which is remote from said sheathing, the openings in said plates being positioned between the respective channel-shaped members so that a tie may pass between the opposed bases of said pair of channel-shaped members and extend through the respective opening.

4,033,545
APPARATUS FOR MAKING INTERLOCKING CRYPT MODULES

Edward Carl Duwe, 3840 Highland Shores, and William Edward Duwe, 1203 Washington Ave., both of Oshkosh, Wis. 54901
Filed Oct. 14, 1975, Ser. No. 622,060
Int. Cl.² B28B *7/22*
U.S. Cl. 249—98 **16 Clalms**



1. Apparatus for casting differently configured concrete crypt modules which interlock with one another when assembled in a modular mausoleum crypt structure, comprising:

a supporting frame;

a configured unitary casting member affixed to said frame, said casting member having first and second ends and including substantially vertically oriented wall members and substantially horizontal closed bottoms extending longitudinally between said first and second ends to form open-ended, spaced casting cavities, said spaced cavities having upper openings which communicate with each other for receiving a fluent casting material therein, said casting member further including vertical end walls at said second end of said casting member extending transversely of said open-ended cavities between the wall members of adjacent casting cavities;

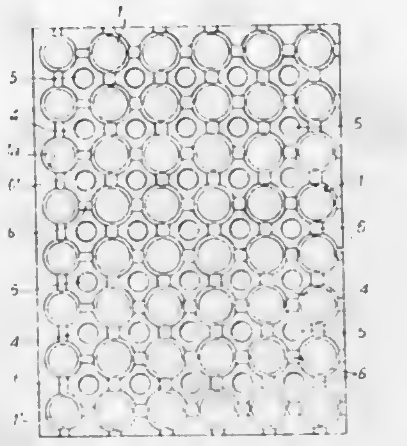
a first closure means positioned at said first end of said casting member for abutting against and closing the open ends of the casting cavities at said first end;

a second closure means pivotally mounted at the second end of said casting member and spaced from said end walls to provide a transverse cavity which communicates with said longitudinally extending spaced cavities; and

removable insert means cooperating with said casting member for altering the configuration of the module being cast, said insert means including a plurality of insert elements, a first combination of selected ones of said insert elements comprising means for forming predetermined shaped portions on a first crypt module cast from said casting material and a second combination of selected ones of said insert elements different from said first combination of insert elements comprising means for forming means for forming predetermined shaped portions on a second crypt module cast from said casting material, the predetermined shaped portions of the first crypt module having a configuration which interlocks with the predetermined shaped portions of the second crypt module when said first and second crypt modules are assembled together.

4,033,546
SHOCK ABSORBER PAD OF MOLDED FIBERS FOR THE DROP CASTING OF INGOTS

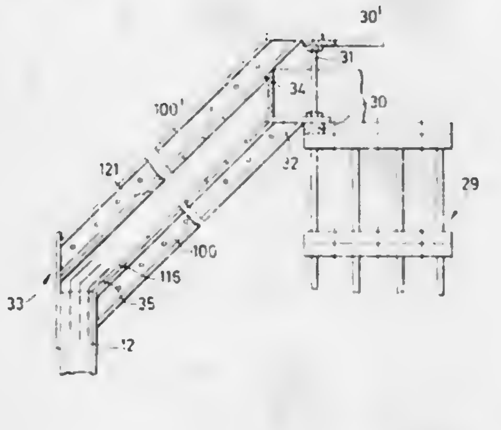
Yves Guegan, 28 Rue Guersant, Paris 17eme, France
Filed Sept. 12, 1975, Ser. No. 612,739
Claims priority, application France, Sept. 16, 1974, 74.31234
Int. Cl.² B22D *7/12*
U.S. Cl. 249—174 **3 Claims**



1. In combination with an ingot mold for the drop casting of ingots a shock absorber pad of molded fibers constituted by a plate of molded fibers insertable in said ingot mold, said plate comprising an assembly of cups disposed in files and rows connected by a flat thick web uniting their upper edes, said web having perforations therethrough between the edges of said cups.

4,033,547
FORM FOR POURING CONICALLY TAPERING CONCRETE STRUCTURES

Otto Heinzle, Sonderberg 19, A-6840-Gotzis (Vorarlberg), Austria
Filed Nov. 7, 1975, Ser. No. 630,036
Claims priority, application Austria, Nov. 8, 1974, 8986/74
Int. Cl.² E04G *11/04*
U.S. Cl. 249—193 **7 Claims**



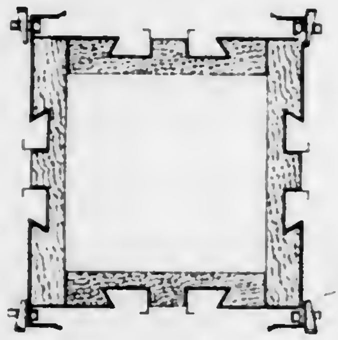
1. A form for pouring a concrete structure having an axis and substantially conically tapering in the direction of said axis comprising:

- a. a plurality of elongated beam members obliquely inclined relative to said axis and radiating longitudinally in a direction from a common point in said axis in angularly offset relationship;
- b. a plurality of connecting members, elongated in a circumferential direction and connecting each of said beam members to the two angularly adjacent beam members,
  - 1. said connecting members being spaced from each other longitudinally of the connected beam members and sequentially increasing in length in a direction away from said axis,

2. each connecting member including two longitudinally elongated, longitudinally coextensive, transversely spaced elements and two sleeve members transversely interposed between respective pairs of longitudinally terminal end portions of said elements in fixed spatial relationship,
3. said sleeve members having each an axis and being formed with an axial bore, the axis of the bore in each sleeve member being angularly offset from the axis of the bore in the other sleeve member and from the direction of elongation of said connecting member;

c. threaded fasteners connecting the two longitudinally terminal portions of each connecting member to respective connected beam members, one of said threaded fasteners being received in the bore of each sleeve member; and
d. sheeting covering said connecting members and fastened to said beam members to constitute a substantially conically tapering wall extending about said axis in a closed loop.

4,033,548
CONCRETE SHUTTERING CONNECTING MEANS
Moshe Shahar, 34 Semadar St., Ramat Gan, Israel
Filed May 12, 1975, Ser. No. 576,312
Claims priority, application Israel, Aug. 30, 1974, 45574
Int. Cl.² E04G *17/02*
U.S. Cl. 249—194 **2 Claims**

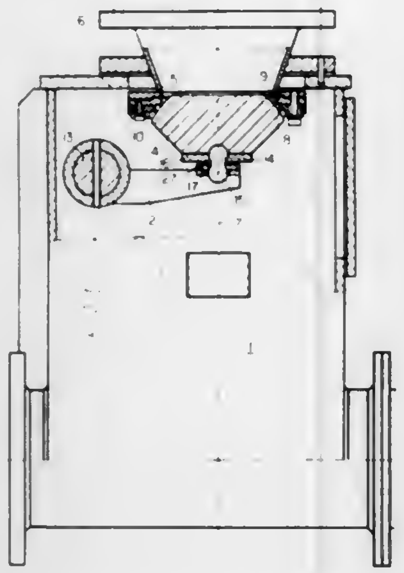


1. A set of elements for the assembly of casting molds, comprising:

a plurality of planks each having a casting surface, an opposite surface and two edges, and adapted to be joined together adjacent one another to form a portion of a casting mold, with a second edge of a first plank being joined adjacent to a first edge of a second plank; the casting surface of each of said planks being adapted to have cast thereagainst a fluent castable material for hardening thereagainst and from which said planks can be readily stripped; each of said planks being provided with two grooves on its opposite surface, each of said two grooves being located adjacent a respective one of the two edges of each plank, each of said two grooves having an undercut dove-tail side closest to the respective edge to which it is adjacent; and

means to join two said planks to one another to define a portion of a casting mold, said joining means comprising a pair of profiled rails, each of said rails having a tongue complementary in shape to the grooves in said planks, and connector means to tighten said rails together when the tongues of said rails interlock with the grooves of said planks to tightly hold said planks together.

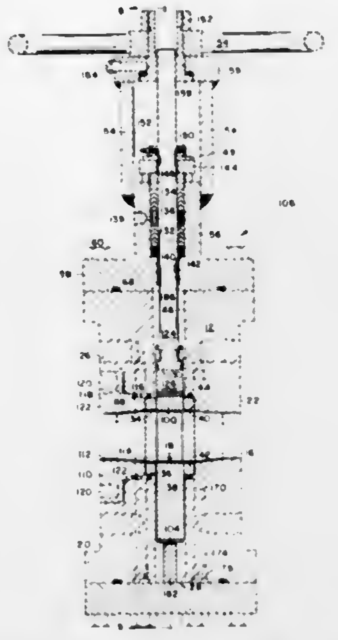
4,033,549
VALVE SYSTEM FOR PROTECTION OF THE VALVE FROM ABRASION
Walter Stamer, Hamburg, Germany, assignor to Claudius Peters AG, Hamburg, Germany
Filed Dec. 27, 1974, Ser. No. 536,747
Claims priority, application Germany, Dec. 28, 1973, 2364904
Int. Cl.² F16K *25/00*
U.S. Cl. 251—86 **6 Claims**



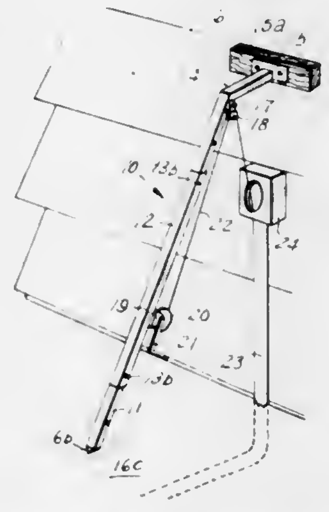
1. A flap valve type closure comprising, a housing having a vertical first axis and a top wall defining a circular material-inlet orifice symmetrical about said first axis, an annular valve seat in said housing contiguous to, below and coaxial with said orifice, said orifice having a radius less than that of said seat, a control shaft journaled in said housing for pivoting about a second axis normal to and offset from said first axis, an arm fixed at one end to said shaft and pivotable therewith from a first position wherein its distal end lies on said first axis, to a second position wherein said distal end is offset from said first axis, a flap valve carried by the distal end of said arm and having a surface formed as a portion of the surface of a sphere engageable with said seat in sealing relation therewith, said surface having a geometrical center essentially on said first axis when said arm is in its said first position, and a rod connected at its upper and lower ends to said flap valve and arm, respectively, and mounting said valve for limited universal pivoting about said geometrical center, said arm in its said second position moving said valve to position laterally offset from said first axis.

4,033,550
WATER GATE VALVE
Charles Wheatley; Ronald A. Schuller, and Al Hogan, all of Tulsa, Okla., assignors to Wheatley Company, Tulsa, Okla.
Continuation-in-part of Ser. No. 440,670, Feb. 8, 1974, abandoned, which is a continuation of Ser. No. 279,214, Aug. 9, 1972, abandoned. This application Aug. 19, 1975, Ser. No. 605,855
Int. Cl.² F16K *3/02*
U.S. Cl. 251—328 **3 Claims**

1. A gate valve comprising a housing having aligned bores providing a fluid passageway therethrough, a gate member reciprocally interposed between the aligned bores to provide alternate open and closed positions for the valve, valve seat means disposed in the aligned bores and on opposite sides of the gate member for engagement thereby, means extending into the housing and operably connected with the gate member for reciprocating thereof, said gate member being provided with a transverse aperture in alignment with the aligned bores in one position of the gate to provide said open position for the valve and out of alignment with the aligned bores in a second position of the gate member to provide said closed position for the valve, said gate member comprising a slab-like body, said housing being of a slim overall length and having oppositely disposed substantially parallel flat faces for facilitating installation of the valve in a minimum longitudinal space, one of said flat parallel faces having a removable block means therein whereby said valve seat means may be assembled in said valve about said gate member, said block means being stepped for securing said valve seats against said gate member and simultaneous forming a part of one of said parallel flat faces, said block means sealing with said valve, shim means being used between said block means and said valve to insure a good seal between said gate means and said valve seat means.

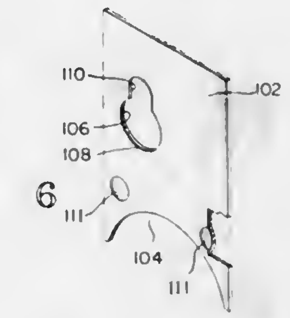


4,033,551
TOOL FOR PULLING UNDERGROUND SERVICE WIRE UP A CONDUIT
Ralph E. Lindstrom, 1915 Sylvan Way, Bremerton, Wash. 98310
Filed July 6, 1976, Ser. No. 702,437
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 R **1 Claim**



1. An underground service entrance wire puller, comprising in combination, a tube assembly comprised of a plurality of inter-telescoping tubes each of which is of rectangular cross-sectional configuration and consisting of an intermediate tube which at a lower end thereof adjustably engages a ground-abutting tube and which at its other end engages a wall-abutting tube; each said tube having a plurality of spaced apart, transverse openings extending therethrough, said openings selectively receiving pin fasteners therethrough for securing said tubes together at any desired telescoping length; said intermediate tube having a winch secured to one side thereof by means of a bracket, said winch including a handle grip for operation of said winch, a line wound on said winch; said ground abutting tube having a base on its lower end for engaging a ground, said wall-abutting tube being of angular configuration by including an obtuse angle between straight opposite end portions thereof, one of said end portions for abutting a wall including a foot secured on its end and a nonmarring block affixed adjacent an end of said foot for engaging a surface of said wall, said block being substantially longer horizontally than said foot, and a lug affixed to said wall-abutting tube in a vicinity of said angle, said lug supporting a pulley, said pulley receiving a free end of said line therearound.

4,033,552
WINCH AND METHOD OF ASSEMBLING THE SAME
Encho Janaki Kuzarov, Milwaukie, Oreg., assignor to Warn Industries, Inc., Kent, Wash.
Filed Sept. 23, 1975, Ser. No. 615,936
Int. Cl.² B66D *3/00*
U.S. Cl. 254—166 **17 Claims**



1. A winch, comprising:

a. a drum mounted for rotation about a longitudinal axis and having a drive end and an idler end,
b. an idler end support housing for the idler end of the drum,
c. a drive end support housing for the drive end of said drum, said drive end support housing comprising:
   1. a bottom section of box-like construction with integral front, rear and side walls, and a top opening,
   2. a top section to enclose the top opening of the bottom section,
d. the bottom section having:
   1. a main axially aligned side opening to receive in radial bearing relationship the drive end of said drum,
   2. a secondary side opening spaced transversely from the main side opening,
e. an intermediate drive member positioned within the bottom section in driving engagement with the drive end of the drum, said intermediate drive member being mounted in said secondary side opening in radial bearing relationship,
f. a retaining plate positioned in the bottom section and extending vertically from said top opening in a transverse direction into said top section, said retaining plate having:
   1. a downwardly facing recess having an edge portion to engage a matching annular groove in the drive end of the drum and restrain axial movement of said drum relative to the bottom section,
   2. a retaining plate opening having an edge portion to engage a matching annular groove in the intermediate drive member so as to retain the intermediate drive member axially in the bottom section,

whereby the drive end of the drum and the intermediate drive member can be inserted axially into the bottom section and placed into driving engagement with each other, and the retaining plate inserted vertically through the top opening of the bottom section and into engagement with the drive end of the drum and the intermediate drive member, and with the bottom section maintaining its integral box-like construction to withstand forces exerted thereon.

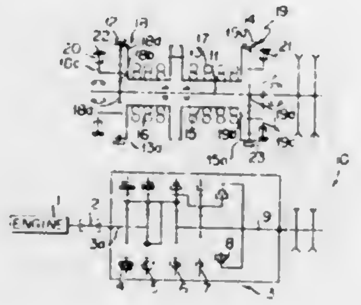
17. A method of assembling winch components, said method comprising:

a. providing a drive end support housing having a bottom section of box-like construction with integral front, rear and side walls, and a top opening, and a top section to enclose the top opening of the bottom section,
b. inserting through a main axially aligned side opening in the bottom section a drive end of a winch drum, to be received in said main side opening in radial bearing relationship,
c inserting through a secondary side opening in the bottom section at a location spaced transversely from the main side opening an intermediate drive member to be positioned within the bottom section in radial bearing relationship in the secondary side opening, and
d. inserting a retaining plate through the top opening of the bottom section to engage with a downwardly facing recessed edge portion of the retaining plate an annular groove in the drive end of the winch drum so as to restrain axial movement of the winch drum relative to the bottom section, and also engaging with a locking slot portion of an opening in the retaining plate, a matching annular groove in the intermediate drive member when the retaining plate is lowered so as to retain the intermediate drive member axially in the bottom section,

whereby the winch drum and intermediate drive member are properly retained within the bottom section, and the bottom section maintains its integral box-like construction to withstand force loads imparted thereto.

4,033,553
DOUBLE-DRUM WINCH

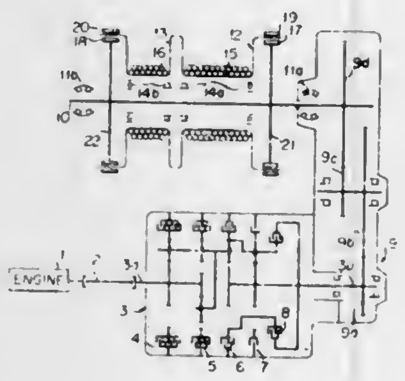
Yutaka Sugimoto, Hiratsuka, Japan, assignor to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed June 26, 1975, Ser. No. 590,569
Int. Cl.² B66D *1/26*
U.S. Cl. 254—185 B **2 Claims**



1. Double-drum winch having a power source, a clutch mechanism with its input connected to said power source and comprising a forward driving connection clutch, a reverse driving connection clutch and speed changing clutches, a speed reduction means with its input connected to the output of said clutch mechanisms, a drum shaft connected to the output of said speed reduction means, a hook drum rotatably mounted on said drum shaft and adapted to wind up or unwind a hook through a hook wire wound around said hook drum and a boom drum rotatably mounted on said drum shaft and adapted to lift or descend boom means supporting said hook through a boom wire wound around said boom drum, wherein the improvement comprises a first planetary gear system mounted on said drum shaft with its sun gear secured to said drum shaft, planetary pinion gears mounted on a rotatable carrier, meshing with said sun gear and engaged with said hook drum so as to drive said hook drum through said first planetary gear system by said drum shaft, a second planetary gear system mounted on the other end of said drum shaft with its sun gear secured to said drum shaft, planetary pinion gears mounted on a rotatable carrier, meshing with said sun gear and engaged with said boom drum so as to drive said boom drum through said second planetary gear system by said drum shaft, a hook clutch arranged so as to engage and disengage said carrier of said first planetary gear system with and from a stationary portion of said winch thereby permitting said hook drum to be driven by said drum shaft when said hook clutch is engaged, a boom clutch arranged so as to engage and disengage said carrier of said second planetary gear system with and from a stationary portion of said winch thereby permitting said boom drum to be driven by said drum shaft when said boom clutch is engaged, a hook brake adapted to arrest the rotation of said hook drum when engaged, a boom brake adapted to arrest the rotation of said boom drum when engaged, a first hydraulic control system for actuating said hook clutch, said hook brake, said forward driving connection clutch and said reverse driving connection clutch so as to wind up or unwind said hook, a first manually operable means coupled with said first hydraulic control system for actuating the same, a second hydraulic control system for actuating said boom clutch, said boom brake, said forward driving connection clutch and said reverse driving connection clutch so as to lift or descend said boom means, a second manually operable means coupled with said second hydraulic control system for actuating the same, a third hydraulic control system for actuating said speed changing clutches so as to vary the speed of the output of said clutch mechanism and a third manually operable means coupled with said third hydraulic control system for actuating the same, thereby permitting the winding up or unwinding of said hook, the lifting or descending of said boom means and the speed changing of said clutch mechanism to be selectively and independently effected by the selective operation of any one or more of said first to third manually operable means.

4,033,554
DOUBLE-DRUM WINCH

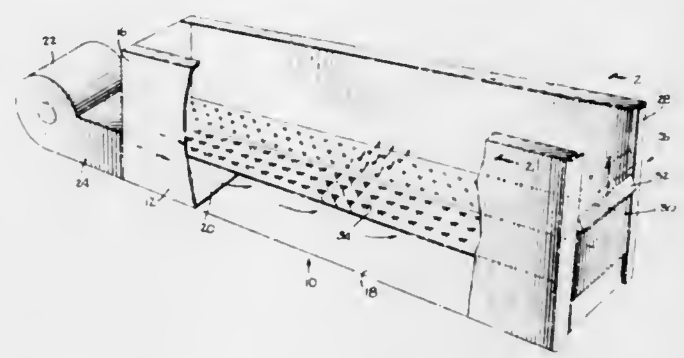
Yutaka Sugimoto, Hirakata, and Ryoji Shiota, Katano, both of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan
Filed June 27, 1975, Ser. No. 590,863
Int. Cl.² B66D *1/26*
U.S. Cl. 254—185 B **2 Claims**



1. Double-drum winch having a power source, a clutch mechanism with its input connected to said power source and consisting of a forward driving connection clutch, a reverse driving connection clutch and speed changing clutches, a reduction gear box with its input connected to the output of said clutch mechanism, a drum shaft connected to the output of said reduction gear box, a hook drum rotatably mounted on said drum shaft and adapted to wind up or unwind a hook through hook wire wound around said hook drum and a boom drum rotatably mounted on said drum shaft and adapted to lift or descend boom means supporting said hook through a boom wire wound around said boom drum, wherein the improvement comprises a hook clutch mounted on said drum shaft for connecting and disconnecting said hook drum to and from said drum shaft, a boom clutch mounted on said drum shaft for connecting and disconnecting said boom drum to and from said drum shaft, a hook brake adapted to arrest the rotation of said hook drum when engaged, a boom brake adapted to arrest the rotation of said boom drum when engaged, a first hydraulic control system for actuating said hook clutch, said hook brake, said forward driving connection clutch and said reverse driving connection clutch so as to wind up or unwind said hook, a first manually operable means coupled with said first hydraulic control system for actuating said first hydraulic control system, a second hydraulic control system for actuating said boom clutch, said boom brake, said forward driving connection clutch and said reverse driving connection clutch so as to lift or descend said boom means, a second manually operable means coupled with said second hydraulic control system for actuating said second hydraulic control system, said first and second hydraulic control systems causing engagement of respective hook and boom clutches when respective hook and boom brakes are disengaged, a third hydraulic control system for actuating said speed changing clutches so as to vary the speed of the output of said clutch mechanism, and a third manually operable means coupled with said third hydraulic control system for actuating said third hydraulic control system, thereby permitting the winding up or unwinding of said hook, the lifting or descending of said boom means and the speed changing of said clutch mechanism to be selectively and independently effected by the selective operation of at least one of said first, second or third manually operable means.

4,033,555
FLUIDIZED BED FOR TREATING GRANULAR MATERIAL

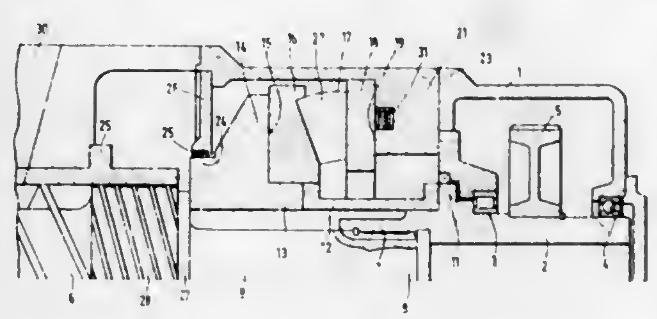
Leong Q. Fong, San Jose, Calif., assignor to The Motch & Merryweather Machinery Company, Hayward, Calif.
Continuation of Ser. No. 359,057, May 10, 1973, abandoned, which is a continuation of Ser. No. 105,372, Jan. 11, 1971, abandoned. This application Dec. 4, 1974, Ser. No. 529,981
Int. Cl.² B01F *15/00*
U.S. Cl. 259—4 R **21 Claims**



1. A fluidized bed for treating granular material with a gas comprising a deck plate, a plurality of side wall members extending along the deck plate to define a fluid bed chamber for receiving said material, a plenum chamber underlying said deck plate, means for supplying gas under pressure to said plenum chamber, a plurality of openings in said deck plate arranged in at least one row extending along and in spaced relation to one of said side wall members, each of said openings being formed by an incision through the deck plate with the deck plate displaced on one side of the incision to define the opening, each opening for issuing pressurized gas from the plenum in the form of a gas jet, each gas jet being formed to flow in a unitary stream with a predominant flow component along the surface of the deck plate, said plurality of openings lying in at least one row extending along and in spaced relation to a side wall member, the openings in said row being oriented to direct its gas jet toward said side wall member to induce circulation of the material from the bottom of the bed outwardly and upwardly along the said side wall and to provide substantially uniform mixing action and uniform controlled spouting.

4,033,556
END THRUST BEARING ARRANGEMENTS FOR SCREW EXTRUDERS

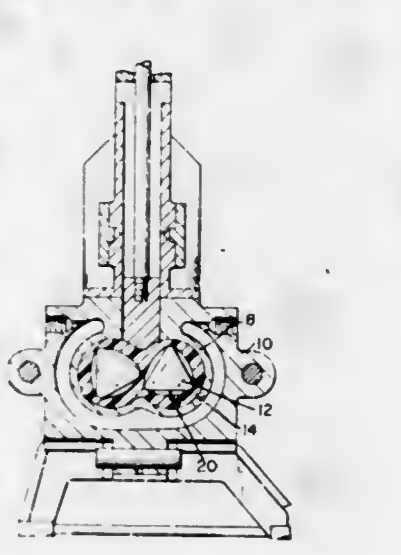
Dietmar Anders, Hannover, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Wiese, Germany
Filed June 11, 1976, Ser. No. 695,041
Claims priority, application Germany, June 19, 1975, 2527365
Int. Cl.² B29B *1/06*: F16C *25/00*
U.S. Cl. 259—191 **2 Claims**



1. In an extruder having a screw driven through a reduction gearing, with a tapered roller bearing supporting said screw in an axial direction, the improvement comprising a co-rotating thrust member provided between the screw and the tapered roller bearing, an end of a shaft of said screw projecting through said thrust member and being coupled to an output shaft of said gearing to be rotated thereby and an elastically deformable sleeve surrounding said end of said shaft of said screw and coaxial therewith, one end of said elastically deformable sleeve being attached to said thrust member and the other end being attached to said output shaft of said gearing.

4,033,557
METHOD OF RECOVERY OF MATERIAL TEST SAMPLES

Heiner M. Kromer, New York, N.Y., and John Ossman, Clifton, N.J., assignors to Haake, Inc., Saddle Brook, N.J.
Filed Aug. 2, 1976, Ser. No. 710,795
Int. Cl.² B29B *1/06*
U.S. Cl. 259—192 **3 Claims**



1. A method of recovery of material test samples, comprising the steps of:

a. placement of granulated solid material within a multi-sectioned apparatus having an angulated interior surface;
b. rotatably mixing the material of said sample through the use of rotors axially disposed within the chambers of the apparatus wherein the exterior surface of said rotors exhibits an angulation which is opposite in slope to the angulation of the interior surface of mixing chambers;
c. controllably heating the material of the sample until a state of flux is obtained;

- d. monitoring the viscosity of the sample in order to ascertain the point at which cross-linking is attained;
- e. continuing the above steps until a hardened solid-state is reached;
- f. opening of the test chamber; and
- g. removing the hardened test sample which, by virtue of said opposing angulations of the test chambers and rotors, imparts to the cross-linked sample a self-releasing physical characteristic which enables it to become readily separated from the walls of the mixer and surfaces of the rotor without damage to either the sample or to the mixing apparatus.

4,033,558

APPARATUS FOR CUTTING A STEEL STRAND LOCATED IN A SUPPORTING GUIDE ARRANGEMENT OF A CONTINUOUS CASTING INSTALLATION

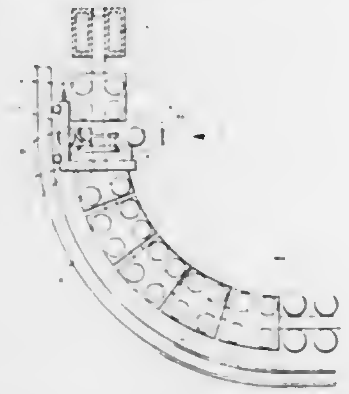
Friedrich Flückiger, Einsiedeln, Switzerland, assignor to Concast AG, Zurich, Switzerland

Filed Sept. 29, 1976, Ser. No. 727,762

Claims priority, application Switzerland, Oct. 10, 1975, 13220/75

Int. Cl.² B22D *11/12*

U.S. Cl. 266—50 **5 Claims**



1. An apparatus for cutting a continuously cast strand, especially a steel strand, located within a support guide arrangement of a continuous casting arrangement by means of a torch cutting device, comprising a support guide arrangement incorporating strand support elements for guiding the continuously cast strand along a predetermined direction of travel, a cutting torch device, means mounting said cutting torch device to be transversely displaceable with respect to the direction of travel of the strand for cutting the strand, a change mechanism for the elements of the support guide arrangement, said change mechanism including a support member, the cutting torch device being arranged upon the support member of the change mechanism and displaceable by means of said support member to desired locations of the support guide arrangement.

4,033,559

APPARATUS FOR CONTINUOUS PASSIVATION OF SPONGE IRON MATERIAL

Wolfgang B. Pietsch, Matthews, N.C., assignor to Midrex Corporation, Charlotte, N.C.

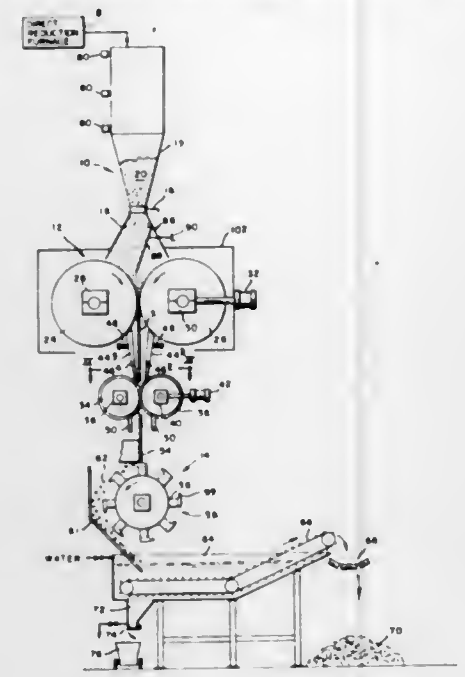
Division of Ser. No. 584,184, June 5, 1975. This application Apr. 5, 1976, Ser. No. 673,787

Int. Cl.² C22B *1/26*

U.S. Cl. 266—122 **15 Claims**

1. Apparatus for continuously passivating hot, reactive, particulate metal material comprising:

- a. means for feeding said particulate metal material to a compacting apparatus, said feeding means including means for excluding substantially all atmospheric air therefrom;
- b. means for compacting said particulate metal to form a dense elongated metal mass;
- c. shearing means comprising two opposed cutting edges of metal coacting along a shear plane for simultaneously dividing said elongated metal mass substantially normal to its longitudinal dimension and densifying the newly created surface by induced high shear forces, whereby a completely passivated product is produced suitable for bulk handling, storing and shipping.



4,033,560

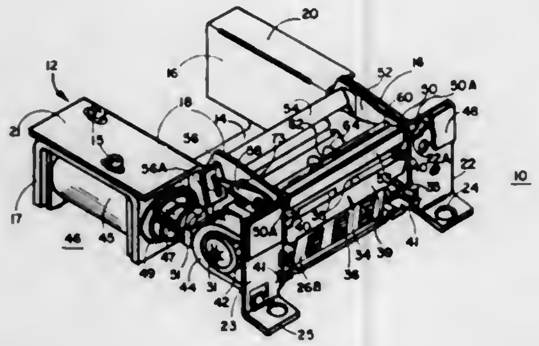
PAPER ADVANCING MECHANISM

Frederick E. Frey, Irvine, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Aug. 6, 1975, Ser. No. 602,360

Int. Cl.² B65H *17/22*

U.S. Cl. 226—157 **16 Claims**



1. An apparatus for advancing a web material in incremental steps comprising:

a support structure;

roller means supported by said support structure;

web stripper means supported by said support structure and guide means forming a path for receiving said web material from said roller means and for exiting said web material;

ratchet means attached to said roller means;

driver means for selectively engaging and driving said ratchet in order to cause movement of said roller means to advance said web material when said driver means moves in a first direction;

pressure means supported by said support structure for applying pressure to said web material; and

retracting means for retracting said pressure means in response to operation of said driver means in a second direction.

4,033,561

COOLING PLATES FOR BLAST FURNACES

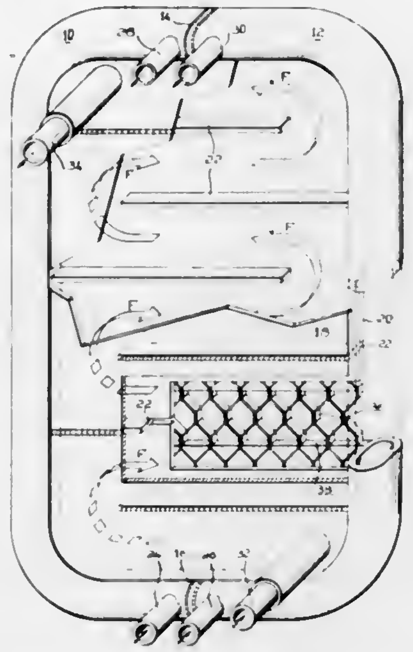
Patrick Dhelft, Paris, France, assignor to SOFRESID, Societe Francaise d'Etude d'Installations Siderurgiques, Montreuil, France

Filed Aug. 16, 1976, Ser. No. 714,964

Claims priority, application France, Sept. 3, 1975, 75.26978

Int. Cl.² C21B *7/10*

U.S. Cl. 266—193 **8 Claims**



1. A cooling plate for circulating fluid for cooling the walls of shaft furnaces and particularly blast furnaces, the plate being placed between the refractory material to be cooled and the facing of the furnace to be protected, said cooling plate comprising:

- a frame formed by two bent tubular elements welded at their ends to separator plates, an independent stream of cooling fluid passing through each tubular element; and
- a flat hollow central element comprising an inner double-walled panel welded to the inner periphery of the frame, said inner panel forming an enclosure through which passes an independent stream of the cooling fluid.

4,033,562

FURNACE FOR MELTING SOLID FERROUS PIECES

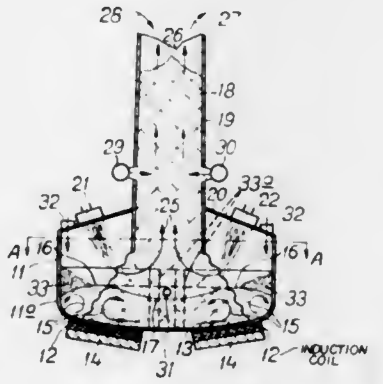
Per Harald Collin, Falun, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden

Filed June 13, 1974, Ser. No. 479,078

Claims priority, application Sweden, June 18, 1973, 7308499

Int. Cl.² C21C *7/00*

U.S. Cl. 266—216 **3 Claims**



1. A furnace for melting solid pieces of metal and comprising a horizontally elongated furnace enclosure having a length-to-width ratio of at least about 4:1, said enclosure having a bottom portion forming a hearth and a roof spaced above the hearth, a vertical stack down through which the pieces of metal are charged and positioned centrally through said roof and having a bottom positioned so the charged pieces form a column down to a melt in said hearth, electric induction means below said hearth for inductively stirring the melt to form interspaced ridges in the melt's top level and a valley between the ridges with the valley below the stack spout's said bottom, burner means for directing carbonaceous fuel and oxygen flames of low oxygen potential towards said hearth and melt and forming reducing gases leaving said furnace enclosure upwardly via said stack containing the metal pieces above said column, and injection means for injecting oxygen into said stack to cause complete combustion of said gases, the pieces in the stack gradually increasingly preheating downwardly in the stack to temperatures where they are combustible in the presence of oxygen, said injection means being positioned high enough in the stack to be above the level where the pieces have preheated to said temperatures.

4,033,563

DEVICE FOR THE SEPARATION OF MIXTURES OF AT LEAST PARTIALLY MOLTEN METALS, METAL COMPOUNDS AND/OR METAL-CONTAINING SLAGS IN A CENTRIFUGAL FORCE FIELD

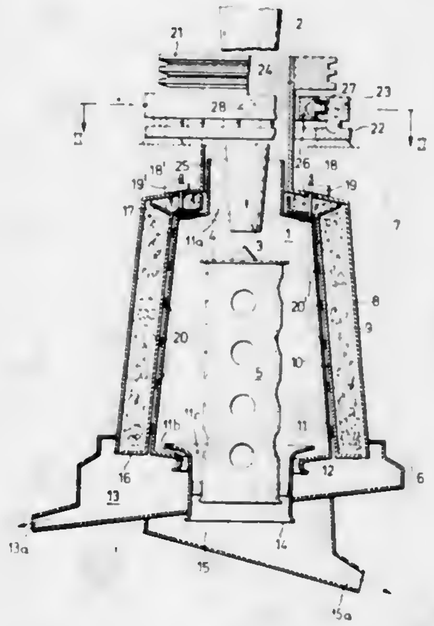
Willy Jakobs, and Alfred Kryczun, both of Cologne, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 27, 1976, Ser. No. 680,673

Claims priority, application Germany, Apr. 28, 1975, 2518796

Int. Cl.² C22B *9/02*

U.S. Cl. 266—204 **13 Claims**



1. A mechanism for the centrifugal separation of hot liquid materials such as mixtures of molten metals and slag comprising in combination:

- a rotary housing for rotation about a central axis having a separation chamber therein with an inlet opening at one end for material to be separated and outlet openings at the other end for separated materials;
- mounting means for supporting the housing for rotation;
- an annular outer wall for said housing;
- an insert sleeve concentric with and spaced inwardly from said outer wall;
- an inner casing concentrically mounted within the sleeve forming said chamber;
- a mounting between the outer wall and sleeve;
- a layer of insulation between said sleeve and outer wall;
- and spacers between the casing and sleeve supporting the casing concentrically therein.

4,033,564
CRUCIBLE FOR MELTING, HEAT RETENTION AND POURING OF METALS

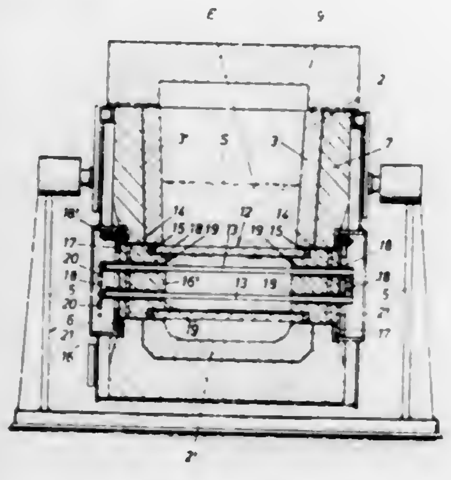
Paul Junghanns, and Friedhelm Bürger, both of Heiligenhaus, Germany, assignors to Wilh. Engstfeld, a Kommanditgesellschaft, Heiligenhaus, Germany

Filed Feb. 5, 1976, Ser. No. 655,516

Claims priority, application Germany, Feb. 6, 1975, 2504918

Int. Cl.² F27B *14/02, 14/06*

U.S. Cl. 266—242 **12 Claims**



1. A crucible for melting, heat retention and pouring of metals, in particular light metal- or zinc- alloys, comprising
a crucible having crucible walls and adapted to hold a melt therein,
heat source means operatively arranged within the melt for heating the melt comprising,
a completely peripherally closed heat source tube having ends, said heat source tube extending bridge-like between said crucible walls,
electrical heating elements entering from at least one of said ends of said tube and passing therethrough,
stoppers closing said ends, respectively, of said heat source tube, said stoppers being formed with longitudinal carrier openings passing therethrough, said electrical heating elements extend through said carrier openings,
outer flange plates outwardly supporting and covering said stoppers, respectively.

4,033,565
MUD GUN HAVING CLAMPING DEVICE

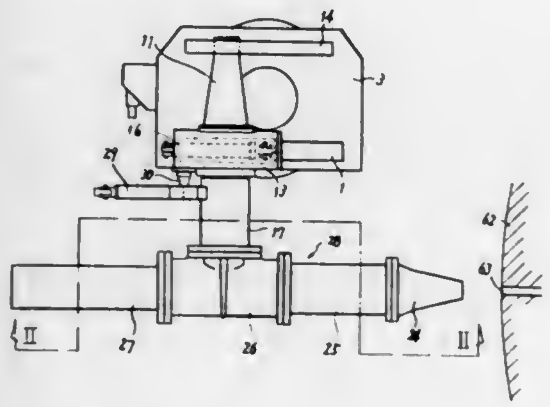
Masayuki Ueno, and Fumiaki Sano, both of Yokohama, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Jan. 3, 1977, Ser. No. 754,672

Claims priority, application Japan, Aug. 10, 1976, 51-95238

Int. Cl.² C21B *7/12*

U.S. Cl. 266—273 **4 Claims**



1. A mud gun having
a clamping device comprising
a. a latch which has no movable part and is anchored securely to a foundation at a position spaced apart from a shell of a furnace by a suitable distance,
b. a hook which is pivoted to a hook mount mounted on a turret of said gun and which is so actuated in response to the traverse of said turret that first a tapered portion of said hook rides on said latch whereby said hook is moved upwardly and then an engaging groove of said hook is brought into engagement with said latch,
c. spring means loaded between said hook and said latch for absorbing and storing therein the whole energy for traversing the mud gun in such a way that the mud gun may be gradually brought to rest and then it may be reversed through a predetermined angle, and
d. means mounted on said hook mount for causing said hook to rotate away from said latch.

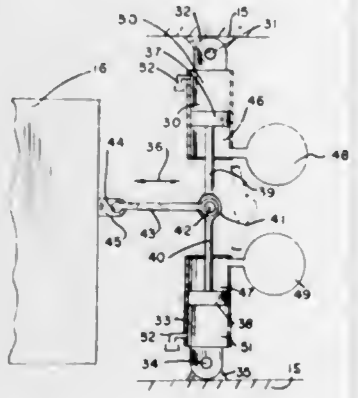
4,033,566
PNEUMATIC LINEAR SPRING DEVICE

Niel R. Petersen, Hopkins, Minn., assignor to MTS Systems Corporation, Eden Prairie, Minn.

Filed Apr. 26, 1976, Ser. No. 680,582

Int. Cl.² F16F *7/10, 9/00*

U.S. Cl. 267—126 **6 Claims**



1. A pneumatic linear spring for use under high loads and with substantial travel comprising first and second pneumatic motor means, accumulator means to provide fluid under pressure to said motor means, a first object, a second object mounted to be movable relative to said first object in a first direction and which movement is to be subjected to spring forces, means to mount said first and second motor means relative to a first of said objects, said motor means including link means connected between said first and second motor means and loaded in tension by both of said motor means and being urged to move to a rest position, said link means having a central pivot between said motor means and being mounted with respect to the motor means and the first object to permit folding movement of said link means in said first direction from the rest position to increase the fluid pressure acting upon both of said motor means to increase tension loading from both of said motor means tending to restore the link means to said rest position, and means to couple said second object to said link means to cause said link means to move to folded position in said first direction when said second object moves in said first direction relative to the first object.

4,033,567
CUSHIONING MATERIAL CONSTRUCTION

Donald Ernest Lipfert, Woolwich, Maine, assignor to Deres Development Corporation, Greenwich, Conn.

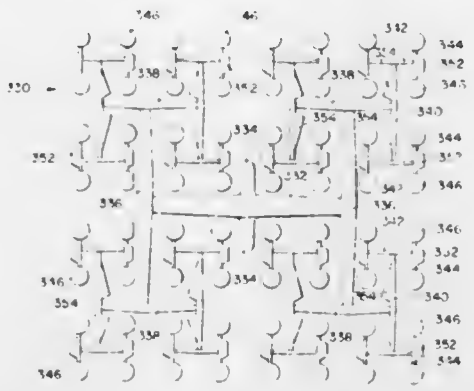
Continuation-in-part of Ser. No. 75,373, Sept. 25, 1970, Pat. No. 3,790,150. This application Apr. 2, 1973, Ser. No. 347,069

Claims priority, application United Kingdom, Oct. 4, 1969, 48860/69

The portion of the term of this patent subsequent to Feb. 5, 1991, has been disclaimed.

Int. Cl.² A47C *25/02*

U.S. Cl. 267—151 **43 Claims**



1. A cushioning material construction comprising a mechanical support system comprising at least one module comprising a plurality of displaceable bearing means, particular ones of said bearing means being interconnected to others of said bearing means by a first lever-type arrangement, so as to define a grouping of bearing means, said first lever-type arrangement being operative upon displacement of one of said load support means in a first direction to apply a force to another of said bearing means in an opposite direction, such that the displaceable bearing means will displace to conform to the shape of an imposed load and provide for distribution of load supporting forces; wherein selected groupings of interconnected bearing means are further interconnected to other groupings of interconnected bearing means by means comprising a second lever-type arrangement in combination with main support means comprising at least one module holder for holding and positioning at least one module in a selected position with relation to the main support means.

4,033,568
EDGE WORKING MACHINE WITH HOLD DOWN FOR SHEET METAL TO BE WORKED

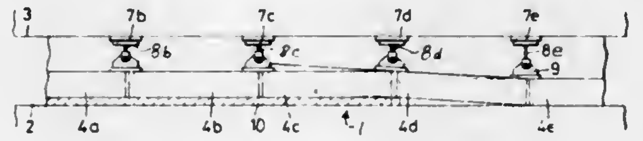
Hermann Josef Frentzen, Rheydt; Gerhard Hendrix, Stolberg; Manfred Huppertz, Monchengladbach; Hans Georg Ritter, Rheydt, and Fritz Wittek, Viersen, all of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Nov. 19, 1976, Ser. No. 743,237

Claims priority, application Germany, Dec. 5, 1975, 2555325

Int. Cl.² B23Q *3/08*

U.S. Cl. 269—26 **4 Claims**



1. In a machine for working the edges sheet metal, the improvement comprising:
a. a hold down device having a plurality of elements disposed in and along the direction of extension of the sheet metal edges to be worked, the elements being arranged in overlapping relation so that a first portion of each element at its side opposite the plate edge to be worked being disposed adjacent the preceding element, a second portion of each element at the side facing the plate edge to be worked being disposed adjacent the succeeding element;
b. a plurality of piston cylinder units, each for pressing down one of said elements against the sheet metal to be worked, the lateral surfaces of all elements facing the plate edge to be worked being in alignment with each other; and
c. means for pivotally securing the middle of each element to one of the units.

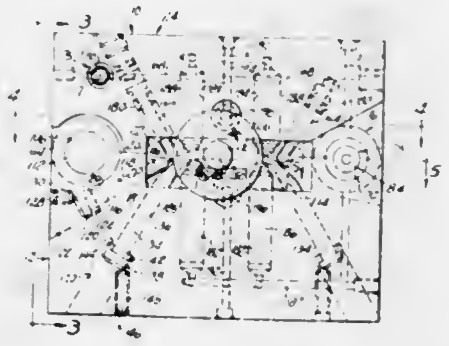
4,033,569
DEFORMATION-PREVENTING WORKPIECE-HOLDING FIXTURE FOR MACHINE TOOLS

Garf L. Dunn, 31720 Hunters Drive, Farmington Hills, Mich. 48018

Filed Oct. 15, 1976, Ser. No. 732,797

Int. Cl.² B24B *41/06*; **B25B** *1/20, 1/24*

U.S. Cl. 269—26 **15 Claims**



1. A deformation-preventing pressure-equalizing fixture for holding, in a machine tool during machining, a workpiece having a first end enlargement to be machined and having a thinner deformable portion adapted to be gripped by said fixture during such machining, said fixture comprising
a block structure having a cavity therein adapted to receive the thinner deformable portion of said workpiece and having an end opening adapted to expose the end enlargement of the workpiece externally of said opening for machining,
said block structure holding a base block and a cover block and a pivot element hingedly interconnecting said blocks and a locking device adapted to releasably lock said blocks together,
a plurality of longitudinally-spaced edge stops and an end stop disposed in one of said blocks and projecting into said cavity and adapted to engage an edge and an end respectively of the thinner deformable portion of said workpiece,
a plurality of workpiece support members disposed in spaced relationship to one another in said base block and projecting upward into said cavity and adapted to engage and support the bottom of the workpiece portion,
a plurality of workpiece clamping members disposed in spaced relationship to one another in said cover block and projecting downward into said cavity with their lower ends disposed substantially in alignment with the upper ends of said support members and adapted to engage the top of the thinner deformable workpiece portion and hold the same down against said workpiece support members,
means for urging said clamping members downward into such engagement with the thinner deformable workpiece portion,
lower and upper sets of lower and upper pressure-equalizing hydraulic plungers of each set disposed in longitudinally-spaced and laterally-spaced relationship and with the upper hydraulic plungers aligned with corresponding lower hydraulic plungers and adapted to engage aligned

locations on the top and bottom of the thinner deformable workpiece portion,

and a first hydraulic pressure fluid generator hydraulically connected to said pressure-equalizing plungers.

4,033,570
CORNER CLAMP

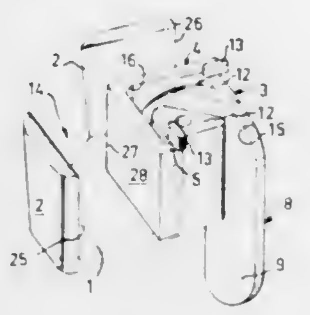
Rolf Lennart Curlow, Gustavsberg, Sweden, assignor to AB Gustavsbergs Fabriker, Gustavsberg, Sweden

Filed Apr. 8, 1976, Ser. No. 675,161

Claims priority, application Sweden, Apr. 17, 1975, 7504443

Int. Cl.² B25B *1/20*

U.S. Cl. 269—41 **5 Claims**



1. In a clamping device for such mutual fixing of constructional elements arranged at an angle to each other, each of which are substantially uniformly thick at least at the fixing area in question, so that a corner is formed between the elements.

which device comprises a base portion provided with at least two rigid, spaced abutments, a supporting means joined to the base portion, on said supporting means there being accommodated an angular pressure plate with a certain amount of freedom of movement, there also being movably attached to the supporting means a pressure-applying means by which the pressure plate can be moved towards the abutments into a clamping position in which the constructional elements inserted between the abutments and the pressure plate are cornerwise fixed adjacent each other,

the improved construction according to which the base portion comprises an abutment plate, the aforesaid abutments being formed integrally with this abutment plate and having the form of two projections extending upwardly from it and arranged at an angle to each other, the supporting means being connected to the abutment plate by means of an arm one end of which arm has a pin portion projecting from it, which pin portion is turnably mounted in a base portion of the supporting means and the other end of which arm has an engagement portion with a knurled surface structure, said knurled engagement portion extending through an aperture in a plug turnably mounted in the abutment plate, the arm being adapted to be held stationary in the aperture, when there is a certain angular displacement thereof, by engagement between the opening edges of the aperture and engagement portion of the arm.

4,033,571
POSITIONING ARRANGEMENT

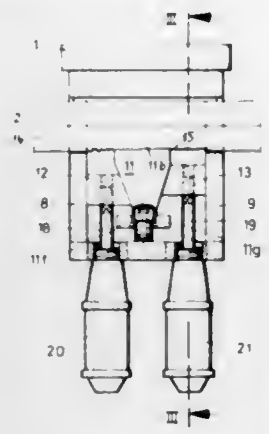
Joachim Wepner, Gevelsberg, Germany, assignor to Rolf Peddinghaus, Gevelsberg, Germany

Filed Dec. 16, 1975, Ser. No. 641,187

Claims priority, application Germany, Dec. 20, 1974, 2460615

Int. Cl.² B23Q *7/00*

U.S. Cl. 269—315 **13 Claims**



1. A positioning arrangement comprising, in combination, elongated guide means extending in a first direction: an element mounted on said guide means for movement in said first direction between an infinite number of positions; means for moving said element into any selected one of said positions thereof; means for arresting said element in said selected position, including a toothed portion rigid with and extending longitudinally of said guide means, an arresting member having a detent portion juxtaposed with said toothed portion and mounted on said element for displacement relative thereto in a second direction toward and away from said toothed portion and also in said first direction, means for displacing said arresting member relative to said element at least in said second direction into a respective one of a plurality of discrete positions of said arresting member in which said detent portion fully engages at least one of the teeth of said toothed portion, and means for locking said element with said arresting member in said selected and respective positions thereof for preventing relative movement between said element and said arresting member which is retained in said respective position thereof by the engagement of said detent portion with said toothed portion and thus arrests said element locked thereto in said selected position thereof; and means for releasing said arresting means.

4,033,572
SHEET-PLATE POSITIONING DEVICE FOR MACHINE TOOLS

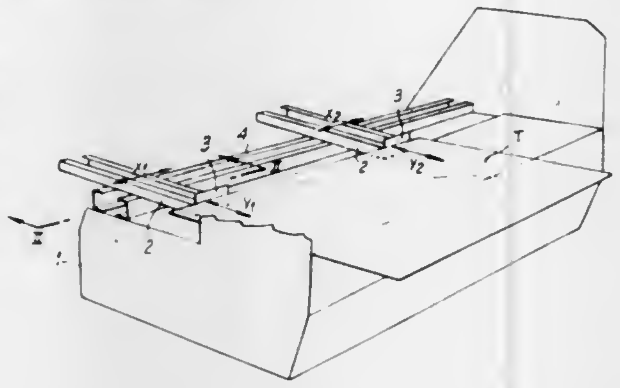
Paul Cailloux, Val de Marne, France, assignor to Promecam Sisson-Lehmann, Saint-Denis, France

Filed June 1, 1976, Ser. No. 691,408

Claims priority, application France, June 16, 1975, 75.18708

Int. Cl.² B23Q *3/00*

U.S. Cl. 269—320 **9 Claims**



1. An abutment device for the accurate positioning of a sheet-plate on the working bed of a machine tool such as a shear or bending press, which comprises a pair of parallel spaced abutment arms provided with stop members adapted to be engaged by the rear edge of the sheet-plate and movable depthwise for performing the desired adjustment, and a pair of separate carriages supporting said abutment arms and movable independently of each other on a transverse common supporting rail, wherein each carriage comprises two series of means adapted to drive the relevant carriage along said transverse rail and the corresponding abutment arm depthwise in relation to said carriage, and two series of braking means adapted to hold against motion said carriage in relation to said supporting rail and said abutment arm in relation to its carriage.

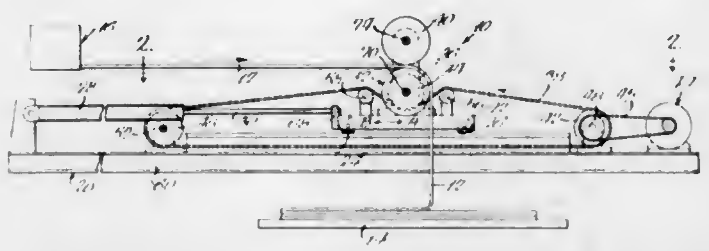
4,033,573
APPARATUS FOR CONVEYING MATERIAL AT A CONSTANT RATE TO A VARIABLE LOCATION

Harold Wortman, 5936 Monroe St., Morton Grove, Ill. 60053

Filed Sept. 29, 1975, Ser. No. 617,279

Int. Cl.² B65H *29/46*

U.S. Cl. 270—30 **8 Claims**



1. Apparatus for conveying material at a constant rate while supplying the material to a variable location on a material receiving means comprising: a main frame; endless driven belt means which is supported on said frame and has a predetermined speed; a carriage means which is movable on said frame; means for moving said carriage means back and forth relative to said frame; a material supply means operating at a constant speed; and a material drive means engaging said belt means, and supported for movement with said carriage to supply said material to a variable location on said material receiving means, whereby the speed of linear travel of said carriage means increases or decreases the peripheral speed of said material drive means relative to said frame to convey said material at a constant rate while supplying the material to a variable location.

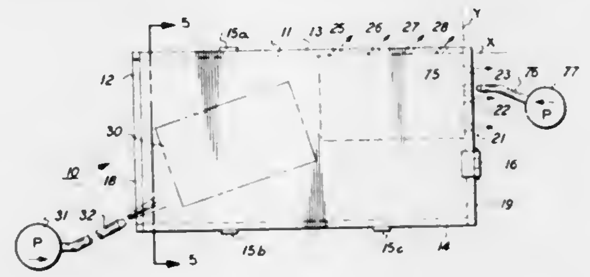
4,033,574
DOCUMENT HANDLING APPARATUS

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 28, 1975, Ser. No. 635,998

Int. Cl.² B65H *29/24*

U.S. Cl. 271—3 **12 Claims**



1. Apparatus for posing documents at a station, posed documents being registered with respect to an imaginary plane and an axis perpendicular thereto, comprising

a. means for feeding documents: b. fluidic means for receiving and registering said documents at the station, the fluidic means including: a sleeve for internally accommodating said documents, at least a plurality of points on an inner narrow wall of the sleeve being located on the imaginary plane, a stop having at least one point aligned with the axis, and means, including at least one port in said stop and at least one port in said narrow wall, for providing in the sleeve a first fluid stream having velocity components normal to the imaginary plane and axis; and

c. means for collecting discharged documents.

4,033,575
AUTOMATIC SHEET FEED AND DELIVERY APPARATUS

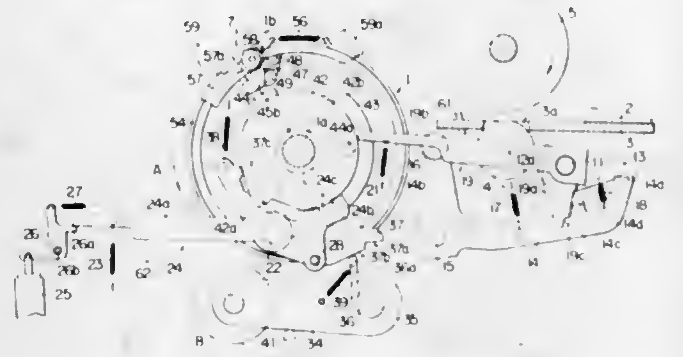
Sakae Fujimoto, Chofu, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 12, 1976, Ser. No. 731,423

Claims priority, application Japan, Oct. 9, 1975, 50-122309

Int. Cl.² B65H *5/12*

U.S. Cl. 271—3 **15 Claims**



1. An automatic sheet feed and delivery apparatus comprising:

a rotatable drum;

retaining claw means mounted on and rotatable with said drum for clamping the leading end of a sheet fed thereto to the surface of said drum;

retaining member means for clamping the trailing end of a sheet onto the drum, said retaining member means being rotatable with and rotatable relative to the drum along the peripheral surface thereof;

means for feeding a sheet to the drum;

means for detecting the presence of a sheet fed by the feeding means and for producing a signal indicative thereof;

a control lever means for initiating operation of said retaining claw means and said retaining member means;

means, responsive to a signal from the detecting means when a sheet is to be wrapped around the drum and also responsive to a sheet delivery signal when the sheet is to be removed from the drum, for actuating said control lever means;

cam disc means frictionally coupled for rotation with the drum and responsive to the operation of the control lever means to be prevented from rotation thereby;

means rotatable with the drum relative to the cam disc means when the latter is stopped from rotation and operable by the cam disc means for opening and then closing the retaining claw means to clamp the leading end of a sheet to the drum;

means for operating the sheet feed means as the retaining claw means, when opened by said opening and closing means, rotates together with the drum to a given position to feed the leading end of a sheet thereto;

release means for interrupting the operation of the sheet feed means after the leading end of the sheet fed onto the drum by said sheet feed means is clamped by the retaining claw means;

detent means for preventing rotation of the retaining member means with the drum just before the leading end of the sheet is clamped by the retaining claw means and while the drum is rotating through one revolution after the leading end of the sheet is clamped by the retaining claw means;

means for releasing the retaining member means from the detent means when the trailing end of the sheet has moved to a position opposite to the retaining member means after said one revolution of the drum whereby the retaining member means clamps the trailing end of the sheet onto the surface of the drum and rotates therewith; and

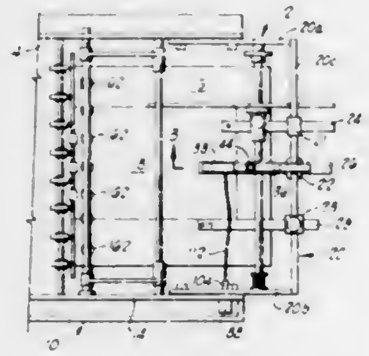
delivery means responsive to said control lever means after a sheet delivery signal for delivering the sheet from the drum.

4,033,576
PAPER FEEDING AND RECEIVING SYSTEMS FOR PRESSES AND DUPLICATORS
Jay E. Stanfield, Guymon, Okla., assignor to J.I.M. Corporation, Guymon, Okla.

Continuation-in-part of Ser. No. 474,975, May 31, 1974, Pat. No. 3,921,970. This application Nov. 11, 1975, Ser. No. 631,139

Int. Cl.² B65H *5/22*

U.S. Cl. 271—5 **28 Claims**



18. In a duplicating machine of the type having
a vertically reciprocable feed table;
means for picking up and feeding sheets of paper from said feed table to a printing mechanism;
means for incrementally elevating the feed table in the direction of said picking up means;
means for implacing indicia on said sheets of paper in individual sequence;
means for discharging sheets of paper in sequence after implacing the indicia thereon; and
reciprocating jogger mean adjacent said discharge means, the improvement which comprises:
- a housing;
- a pair of spaced belt-supporting rollers rotatably mounted in said housing;
- at least one endless belt extended around said rollers and extending under said discharging means;
- an oscillating needle drive structure supported in said housing and comprising:
  - a needle-carrying plate;
  - needles on said needle-carrying plate; and
  - guide element means secured to said housing and movably supporting said needle-carrying plate in a position adjacent said belt; and
- driving means mounted in said housing and including:
  - a drive rod having a portion projecting from said housing in alignment with said jogger means for cooperation with said jogger means; and
  - linkage means interconnecting said drive rod with said needle-carrying plate for reciprocating said needle-carrying plate, said linkage means cooperating with said guide element to oscillate said plate to periodically impale said needles in said belt, and alternately, release said needles from said belt.

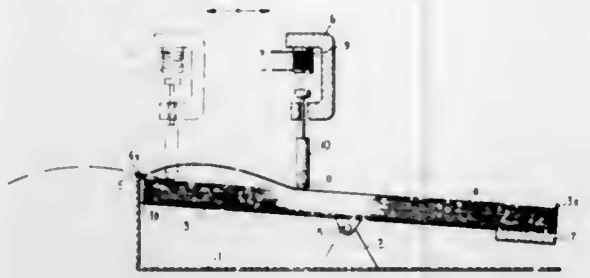
4,033,577
SHEET FEEDING DEVICES
Bernard Godard, Nueville les Dieppe, and Koger Gomitoli, Arques la Bataille, both of France, assignors to La Cellophane, Paris, France

Filed Sept. 12, 1975, Ser. No. 612,758

Claims priority, application France, Sept. 18, 1974, 74.31466

Int. Cl.² B65H *1/08, 3/02*

U.S. Cl. 271—128 **4 Claims**



1. A mechanism for feeding sheets of paper by advancing a top sheet from a stack of sheets, said mechanism comprising:
hopper means for carrying said paper, said hopper means having a closed end and an open end;
pivot means for supporting said hopper means to pivot about an axis aligned with the center of gravity of the hopper;
a load secured to the hopper on the same side of the axis as the closed end, said load creating a moment for urging said hopper to pivot in one direction about said axis;
stop means positioned adjacent the open end of said hopper means, wherein said hopper means moves relative to said stop means upon pivoting about said pivot, and wherein said stop means abuts the top sheet of paper to limit rotation of said hopper about said pivot in said one direction;
paper engaging means positioned above said hopper for engaging the top sheet of paper intermediate the ends thereof, wherein said paper engaging means is freely supported to rest on said top sheet and has a weight sufficient to effect frictional coupling between said top sheet and said paper engaging means, so that when said paper engaging means is advanced, said top sheet moves relative to the sheet upon which the top sheet rests, and wherein, the weight of the paper engaging means exerts a moment on said hopper which is opposite to, but less than, the moment created by said
means for operating said paper engaging means to cause the paper engaging means to push the top sheet of paper against said stop so as to buckle said sheet between the stop and paper engaging means to separate said top sheet from said stack and, upon further advancement, to feed said top sheet over said stop means, and
means for retracting the paper engaging means from the stack of paper, after the top sheet has been fed and for releasing the paper engaging means upon returning the paper engaging means to the starting point.

4,033,578
STACK ELEVATING APPARATUS
Thomas N. Taylor, Rochester, and Wayne F. Schoppe, Webster, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

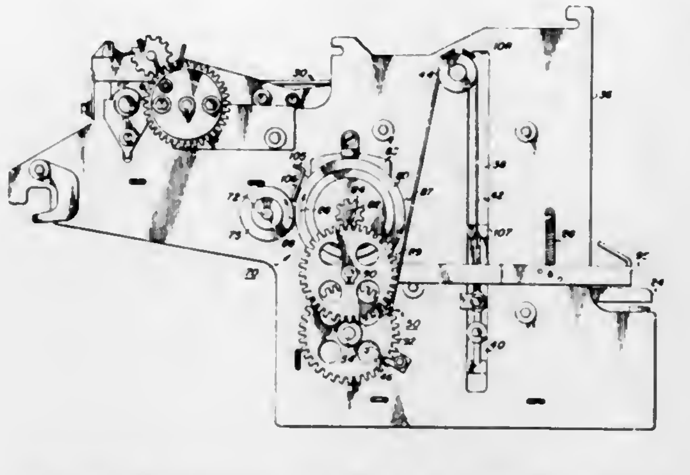
Filed Mar. 1, 1976, Ser. No. 662,383

Int. Cl.² B65H *1/30*

U.S. Cl. 271—157 **24 Claims**

1. A stack elevating apparatus for a sheet feeder comprising:
means for supporting a stack of sheets;
means for moving said stack support means between at least

one elevated position and a lowered position, said moving means including:
means for allowing said stack support means to descend by gravity to said lowered position; and friction drive means for raising said stack support means, said friction drive means comprising at least one friction roll;
means for providing an inertial force for controlling the rate of descent of said stack support means, said inertial force means including: at least one inertial member;



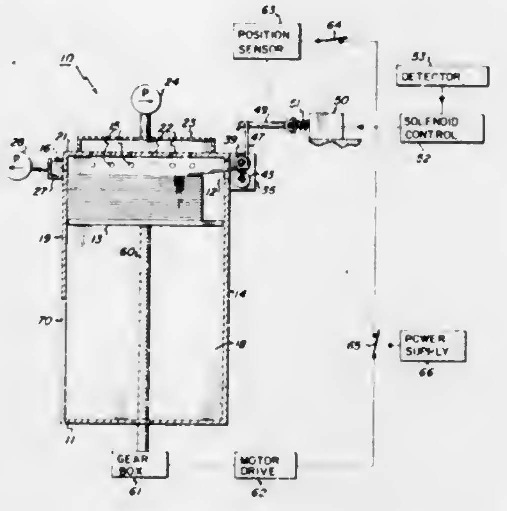
said inertial member comprising a wheel arranged as part of said friction drive means; means for rotating said inertial member in response to the descent of said stack support means; and means for allowing said member to continue to rotate after said stack support means has stopped at its lowered position;
said apparatus further including means for selectively and drivingly engaging said inertial member with said friction roll.

4,033,579
OFFSET STACKER
Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 11, 1976, Ser. No. 665,827

Int. Cl.² B65H *31/10*

U.S. Cl. 271—195 **6 Claims**



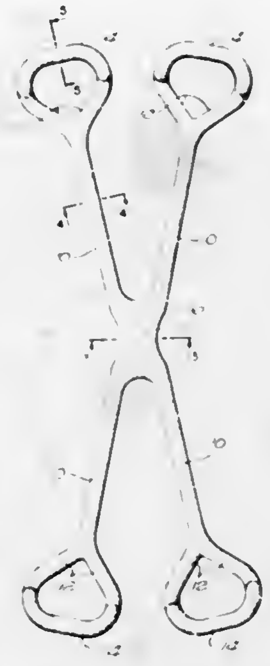
1. Apparatus for stacking supplied sheets comprising:
a. a rectangular housing having a first wall with an orifice, a second wall opposite the first wall, a third wall orthogonally related to the second wall, and a fourth wall orthogonally related to the second wall;
b. fluidic means for selectively moving sheets fed through the orifice against the third or fourth wall of the housing and the second wall; and
c. means for vertically supporting sheets fed through the orifice, including a platform to maintain the top-most sheet supported thereby at a predetermined location and means for moving the platform to maintain the top-most sheet on the platform at a predetermined location.

4,033,580
ELASTIC TYPE EXERCISING
Irwin S. Paris. 28 Seacove Drive, Rancho Palos Verdes, Calif. 90274

Filed Jan. 15, 1976, Ser. No. 649,372

Int. Cl.² A63B *21/02, 21/10*

U.S. Cl. 272—137 **9 Claims**



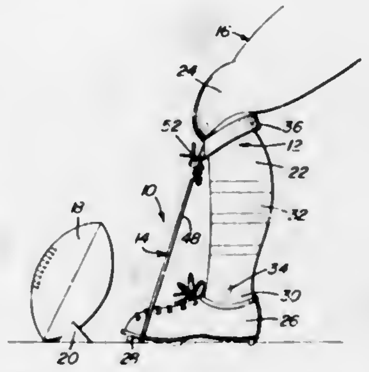
6. A resistive exercise device comprising:
a plurality of at least four resilient handle means adapted to be held by a hand or foot of the exerciser;
a plurality of elastic strap means joining said handles, each of said straps being integrally joined together and forming one uninterrupted structure, said strap being joined approximately midway between said handles, whereby different ones of said handles when aligned in an unstretched condition may be held alone or together to vary the resistive force produced in stretching various straps.

4,033,581
FOOTBALL KICKER'S STRAP
Jay W. Sheppard, 1426 Sandra Drive, Fort Myers, Fla. 33901

Filed Dec. 15, 1975, Ser. No. 640,930

Int. Cl.² A63B *67/00*

U.S. Cl. 273—55 B **8 Claims**



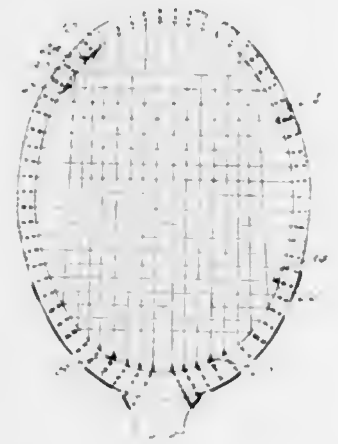
3. For use by a kicker when kicking a football placed in a generally upright, inclined position in which the toe of the kicker and football shoe must be slightly elevated for proper ball impact, a kicker's strap comprising a leg strap encircling the leg of the kicker immediately below the knee at the upper calf portion of the leg and a shoe strap connected to the leg

strap and extending diagonally downwardly and looping under the football kicking shoe adjacent to but spaced rearwardly from the toe portion thereof to enable impact of the toe portion of the shoe with the football without inteference from the shoe strap, means adjustably connecting said shoe strap to the leg strap immediately below and forwardly of the knee for maintaining the foot and leg in substantially perpendicular relation with the length of the foot and leg up to the leg strap forming elongated sides of a right triangle and the football kicker's strap defining the hypotenuse of the right triangle with the distance between the leg strap adjacent the knee and the ankle defining the longest possible lever arm acting on the torque in the ankle thereby enabling greater accuracy and distance for the kicked football resulting from transmission of leg power through a substantially rigid ankle joint to the foot.

4,033,582

METHOD OF STRINGING RACKETS

Gaylord C. Linden, 7583 El Arco, Cucamonga, Calif. 91730
Continuation of Ser. No. 446,780, Feb. 28, 1974, abandoned. This application June 16, 1975, Ser. No. 587,141
Int. Cl.² A63B *51/00*
U.S. Cl. 273—73 D **18 Claims**



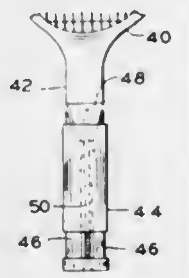
11. A method of stringing a tennis racket or the like comprising the steps of:
- providing a racket frame having a plurality of string holes distributed in a predetermined pattern around its head, a first piece of string of suitable length to form a peripheral section of mesh within the area enclosed by said head, surrounding a central portion of that area, a second length of string of suitable length to form a working main string section consisting of a plurality of main strings passing through said central portion in the longitudinal direction and a third piece of string of suitable length to form a working cross string section consisting of a plurality of cross strings passing through said central portion in the transverse direction; and
- stringing each piece of string separately through appropriate holes in the head of said racket to form the peripheral, working main string and working cross string sections of said head, said sections being adapted to cooperate to form a complete string mesh for the racket;
- the stringing of the three pieces of string including the steps of securing each piece near each end in a way to firmly anchor each string section in position in the racket frame under suitable tension for efficient use of the racket, this being accomplished by tying off each piece of string near each end to a tightened strand of the string section formed from that piece of string at a point adjacent the inner periphery of said head to form a suitable knot at that point.

17. A tennis racket or the like comprising a racket frame with a head, said frame having three separate pieces of string affixed to its head under tension so as to form a peripheral section surrounding a central portion of the area within the head, a working main string section consisting of a plurality of main strings passing through said central portion in the longitudinal direction and a working cross string section consisting of a plurality of cross strings passing through said central portion in the transverse direction, the piece of string comprising each section being secured at each end by being tied off onto a strand of the section formed thereby adjacent the inner periphery of the head of said racket frame so as to maintain that section properly tensioned and positioned for use in the racket frame.

4,033,583

TENNIS RACKET

Wendell A. Ehrhart, 160 Schoolhouse Lane, Hellam, Pa. 17406
Filed Mar. 16, 1976, Ser. No. 667,286
Int. Cl.² A63B *49/08*
U.S. Cl. 273—73 R **5 Claims**

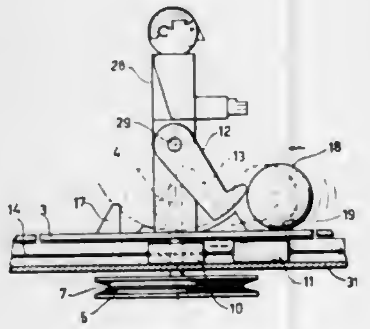


1. A racket comprising:
- a. a head portion having an open frame and strings positioned within the open frame,
- b. a handle portion attached to said head portion,
  1. said handle portion being formed of two parts with a friction clutch means therebetween, said friction clutch means being adjustable to vary the frictional contact between the two parts and permitting a variable degree of rotation of one part relative the other part to absorb shock action,
  2. one part of the handle portion being connected to said head portion,
  3. the second part of the handle portion being adapted to be grasped by the user of the racket, and
  4. said friction clutch means being between said two handle parts, said clutch means being constructed and arranged to permit the head portion of the racket to rotate about the axis of the handle portion when a ball strikes the side of the racket head.

4,033,584

GAME SYSTEM

Robert A. Smith, Maarland 58 N.Z., Brielle, Netherlands
Filed Mar. 17, 1975, Ser. No. 558,732
Int. Cl.² A63F *7/06*
U.S. Cl. 273—85 A **1 Claim**

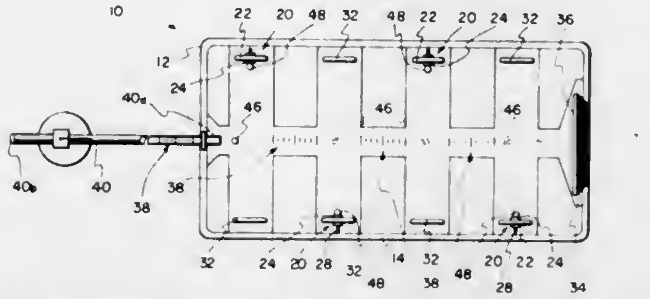


1. In a game apparatus having a planar playing field, at least one player element; a horizontally rotatable disc member communicating with said player element; at least one pivotable element on said player element defining a leg; magnetic means for said leg for contributorily activating and horizontally moving said leg; first means below said disc for complimentary magnetic communication with the magnetic means of said leg; the first means below said disc being planarly slidable thereunder to selectively cause movement of said leg; second means below and communicating with the said disc for selective rotation of said disc and said player elements; first line means for engagement with said first means below said disc to move said first means in forward and rearward directions; second line means for engagement with said second means below said disc; a selectively activatable component for movement of said first and second line means; a ball element movable along the playing field; stop means for arresting backward movement of said leg defining pivotal element; said first means comprising, in tandem alignment, a forwardmost magnetic means and a rearwardmost magnetic means, said leg magentic means being attracted to said rearwardmost magnetic means and repelled by said forwardmost magnetic means, such that as said first line means moves said first means in a rearward direction, said leg magnetic means is attracted to said rearwardmost magnetic means and said leg is pivoted rearwardly until it is arrested by said stop means, and as said first means continues in a rearward direction, said forward most magnetic means repels said leg magnetic means causing said leg to forcefully pivot forwardly to simulate a kicking of said ball element.

4,033,585

AMUSEMENT GAME

Larry W. Foreman, 115 W. Burnette Ave., Enfield, N.C. 27823
Filed Oct. 8, 1975, Ser. No. 620,636
Int. Cl.² A63F *7/02, 7/10*
U.S. Cl. 273—120 R **8 Claims**

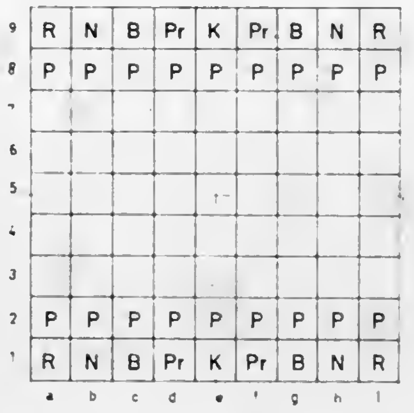


1. An amusement game comprising: a gameboard having a generally flat plane surface; means for directing a rolling target projectile across said gameboard such that said target projectile moves across said gameboard in a generally straight line path when not interfered with; a plurality of shooting stations disposed on said gameboard playing surface in longitudinal spaced apart relationship relative to the normal straight line path of said target projectile and with each shooting station spaced laterally from said normal straight line path of said target projectile, wherein during play respective players at each shooting station are provided with intercepting rolling projectiles that are propelled by the respective players across said playing board and towards the normal straight line path of said target projectile while the same moves across said playing board with the object being to hit or intercept the target projectile with the intercepting projectile whose movement across said playing board is initiated by a respective player; and retaining means formed on said gameboard about said playing surface to retain said target and intercepting projectile thereon and to prevent the same from generally rolling off said playing surface.

4,033,586

CHESS GAME APPARATUS

Michael J. Corinthios, 4031 Grey Avenue, Montreal, Quebec, Canada
Filed Aug. 13, 1975, Ser. No. 604,340
Int. Cl.² A63F *3/02*
U.S. Cl. 273—131 K **1 Claim**



9	R	N	B	Pr	K	Pr	B	N	R
8	P	P	P	P	P	P	P	P	P
7									
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5									
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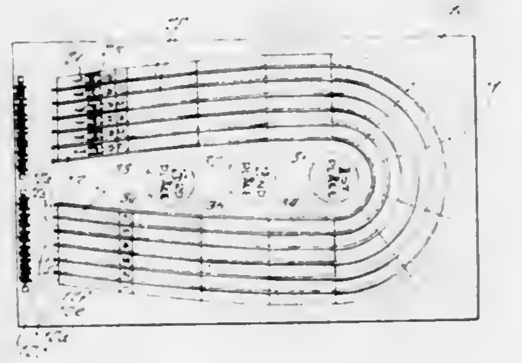
3									
2	P	P	P	P	P	P	P	P	P
1	R	N	B	Pr	K	Pr	B	N	R
	a	b	c	d	e	f	g	h	i

1. A chess type game for two players comprising a square board, said board being uniformly divided into eighty-one squares, each side of said board being nine squares long, and wherein the chessmen of each player consist of a king, nine pawns and eight major pieces, namely, two princes, two bishops, two knights and two rooks, each of said kings, pawns, bishops, knights and rooks having the same moves and strengths as the corresponding pieces in conventional chess, each of said princes having the same moves and strengths as the queens in conventional chess, the pieces of one player being disposed, at the beginning of each game, with the king of the player in the central square of the first row of one end of the board, the major pieces being disposed on said first row in symmetrical arrangement about said king, and the pawns being disposed in the second row at said end of said board, the pieces of the other player being disposed, in similar arrangement, at the end of the board opposing said end.

4,033,587

HORSE RACE BOARD GAME APPARATUS

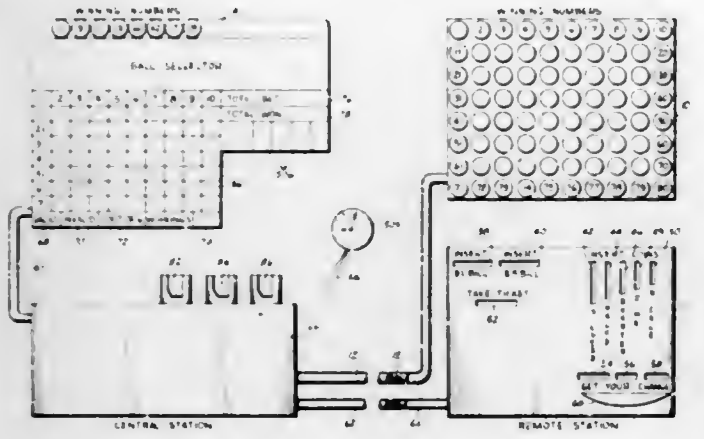
Willie R. Oliver, 164 S. Portland Ave., Brooklyn, N.Y. 11217
Filed June 22, 1976, Ser. No. 698,768
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 CH **8 Claims**



1. A game apparatus comprising in combination playing cards, scoring means and a game board, said game board having outlined thereon a horseshoe racetrack divided into a plurality of adjacent lanes, each lane being divided into a plurality of spaces and having guide means for guiding a marker along the lane, and means on which said marker is removably supported, said means comprising a marker support member coupled to said guide means and first and second pulling means coupled to said member and to each other for alternatively pulling said marker along said track in opposite directions.

4,033,588
AUTOMATIC KENO GAME

James P. Watts, 6930 E. Pinchot Ave., Scottsdale, Ariz. 85251
Filed June 16, 1975, Ser. No. 587,101
Int. Cl.² A63F *3/06;* A06K *3/00*
U.S. Cl. 273—138 A **6 Claims**

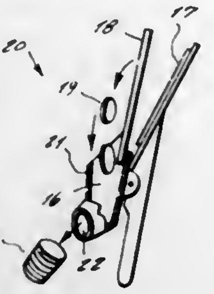


1. In an automated Keno game system,
- a. at least one remote station having a player operated console for repeated player actuation comprising,
  - I. means to select numbers by a player from a group of eighty on which a player wishes to bet,
  - II. means to indicate the amount of money to be bet on the numbers selected,
  - III. a device to accept money in the form of bills and change to cover the amount bet,
  - IV. means to return change when the amount of money deposited for acceptance is in excess of the amount of the bet,
  - V. a supply of tickets,
  - VI. mechanism to impress on a ticket the numbers selected for a bet; the amount of the bet, the date on which the bet is made and the number of the game of that date for which the bet is made on final player actuation at the console of a bet button, and
  - VII. means for issuing said ticket which is so impressed; and
- b. a central station having an overall game operator's console connected to said remote station, including,
  - I. means for making a record of the numbers selected at a remote station, the amount bet on the numbers selected by the player, the date and time of selecting the numbers and the number of the ticket that is issued at said remote station,
  - II. a ticket validator for comparing a ticket issued at said remote station when inserted into said operator's console with recording mechanism to determine that said ticket was issued by said ticket-issuing means,
  - III. a winning numbers selecting machine in which a predetermined number of numbers from said group of eighty are determined by chance for a particular game;
  - IV. means for printing on a validated winning ticket the amount of money won as determined by the number of numbers of the group selected which come out in the operation of the winning numbers selecting machine, and a predetermined table of odds, and
  - V. a cashier's station at which a bettor receives the amount of money won by his play of a winning ticket for a particular game.

4,033,589
BINGO INSTRUMENT

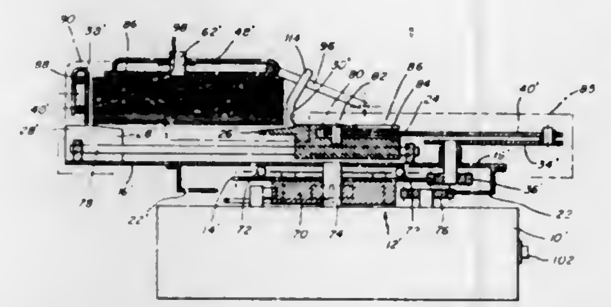
John F. Fernandez, 2-106th Ave., Elmont, N.Y. 11003
Filed Jan. 9, 1976, Ser. No. 638,781
Int. Cl.² A63F *9/00*
U.S. Cl. 273—148 R **1 Claim**

1. A bingo instrument comprising in combination a pair of levers made preferably of rigid plastic material, said levers being pivotally attached together at their intermediate longitudinal portions about a common fulcrum, one end of said levers forming handles which can be squeezed together when held in a person's hand, and the opposite end of said levers incorporating means for quickly releasing said chips thereafter, said means comprising one of said levers having a magnet plate secured thereto and the other of said levers having a cardboard plate secured thereto, said plates being parallel and adjacent to each other when said handles are released, said handle having said cardboard plate secured thereto incorporating a hopper into which said chips drop.



4,033,590
APPARATUS FOR DISTRIBUTING PLAYING CARDS AUTOMATICALLY

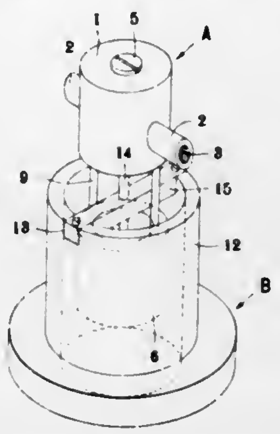
Francoise Pic, Allee Beau-Rivage l-Alba, Bergerac (Dordogne), France
Continuation-in-part of Ser. No. 500,299, Aug. 26, 1974, abandoned. This application Jan. 22, 1976, Ser. No. 651,231
Int. Cl.² A63F *1/14*
U.S. Cl. 273—149 R **19 Claims**



1. A device for distributing playing cards comprising:
a fixed base;
a table rotatably mounted on the base;
drive means for rotating the table, said drive means being normally inoperative to drive said table;
means responsive to partial preliminary rotation of the table for switching the drive means into an operative condition to drive the table;
means for supporting a deck of cards on the table for rotation therewith;
ejection means carried by the table and operative in response to rotation of the table, said ejection means being constructed and arranged to engage the bottom card in the deck and eject the bottom card for each operation of the ejection means, the ejection means being constructed and arranged as to effect a predetermined number of complete cycles thereof for each complete rotation of the table; and
means responsive to ejection of the last card in the deck for disabling the drive means thereby automatically stopping the device.

4,033,591
PICK-UP ARM ROTARY PIVOT BEARING STRUCTURE

Yoshitomo Ichikawa, Tokyo, Japan, assignor to Ichikawa Hoseki Kabushiki Kaisha, Tokyo, Japan
Filed Jan. 28, 1976, Ser. No. 653,200
Claims priority, application Japan, Jan. 31, 1975, 50-15157[U]
Int. Cl.² G11B *3/10*
U.S. Cl. 274—23 R **1 Claim**

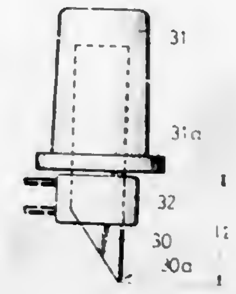


1. A rotary pivot bearing structure for a pick-up arm comprising:
- a. a cylindrical base (12) with an upper portion;
- b. a crosswisely extending support beam (15) extending diagonally across said upper portion;
- c. an upstanding vertical pivot shaft (14) with upper and lower ends centrally secured on said support beam (15), end bearing means on said upper and lower ends;
- d. substantially identical upper and lower cup-like cylinders (1, 6) each cup-like cylinder having a cup disc end closed portion, an open front end, and a cylindrical wall, said open front end of each cup being disposed astride said support beam (15) facing the front end of the other cup, said cylindrical walls being coupled to each other by stems (9);
- e. upper and lower bearing elements (5, 8) threaded through the centers of said disc end portions opposed to the upper and lower ends of said vertical pivot shaft (14) and engaging the end bearing means on said upper and lower ends;
- f. a pair of opposed radial, substantially identical horizontally outward extending arms (2) coupled onto the outer periphery of the cylindrical wall of the upper cylinder, each arm having a distal end with a central portion, first and second bearing elements (3) disposed on each of said distal end central portions; and,
- g. bracket means (10) diagonally positioned around the periphery of the upper cylinder (1) and extending outward of said pair of arms (2), said bracket means (10) having inner threaded bearing supports (11) engaging said first and second bearing elements (3), said bracket means (10) serving to hold a cartridge mounting pick-up arm and a balance weight.

4,033,592
RECORD DISC CUTTING STYLUS

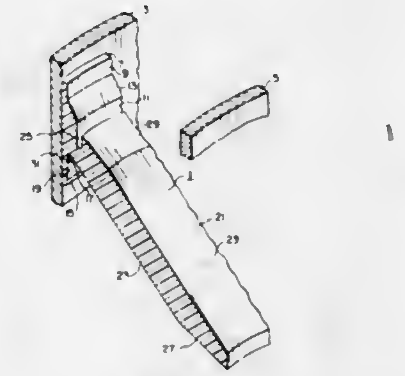
Kaoru Totuka; Isao Ohwaki, both of Tokyo; Masahiro Ohba, Yokohama, and Shinji Nakamura, Tokyo, all of Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan
Filed Oct. 30, 1975, Ser. No. 627,195
Claims priority, application Japan, Nov. 1, 1974, 49-126281
Int. Cl.² G11B *3/44*
U.S. Cl. 274—38 **1 Claim**

1. A cutting stylus for recording multiplexed signals on a record disc, said signals comprising a direct wave signal and an angle modulated signal, said stylus comprising a cutting stylus body having a stylus tip portion for cutting a groove on the record disc and a shank holding the upper part of the stylus body, said stylus tip portion having a mirror surface at the front part thereof which faces in the direction in which cutting advances relative to the record disc, a burnishing angle in the range of approximately 25° to 40°, a relief surface in the range of approximately 30° to 40° at the rear part of said tip portion, and a burnishing facet having a width in the range approximately 0.5 μm to 3.0 μm between the mirror surface and the relief surface, the distance l from the lower end face of the shank to the extreme tip end of the stylus tip being within a range from approximately 2.0 mm to a lower limit which is determined by factors of fabrication, the stylus operating at a maximum signal level which decreases with a slope of --6dB/octave with increasing frequency.



4,033,593
SEAL FOR LARGE ANNULAR OPENINGS

Albert J. Molnar, Trafford; George E. Rudd, Murrysville, and Joseph F. Meier, Export, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 28, 1976, Ser. No. 700,234
Int. Cl.² F16J *15/32*
U.S. Cl. 277—212 F **7 Claims**



1. An annular seal for sealing a large annular space between a tubular member and a cylindrical member, said annular seal comprising an annular band forming a base, a low pressure side and a high pressure side, said base band being formed to generally engage the inner surface of the tubular member and to increase in thickness as it extends from its low pressure side toward its high pressure side, a generally frustoconical-shaped portion made integral with the base and so disposed that the apex would be on the high pressure side of the seal and an annular groove disposed on the low pressure side of the seal between said base and said frustoconical-shaped portion, whereby said annular seal will deflect easily when inserting the cylindrical member from the low pressure side and will withstand high differential pressures without blowing through.

4,033,594

DEFLECTION DEVICE FOR SAFETY BELTS FOR VEHICLES PROVIDED WITH BAND COLLECTING MEANS

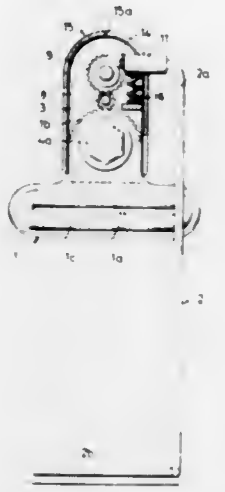
Oskar Lennart Lindblad, Hedasgatan 16, 440 20 Vargarda, Sweden

Filed Jan. 8, 1976, Ser. No. 647,519

Claims priority, application Sweden, Jan. 10, 1975, 7500246

Int. Cl.² A47B *35/00*

U.S. Cl. 297—389 **5 Claims**



1. A deflection device for a safety belt in a vehicle, comprising: support means for connection to a portion of the vehicle, deflection means pivotably mounted relative to said support means and to be engaged by the safety belt, a holder for the safety belt, and means for supporting said holder in spaced relationship to said deflection means, said holder supporting means comprising an arm, means for pivotally mounting said arm adjacent said deflection means, and means pivotally interconnecting said arm and said deflection means so that upon pivoting of said arm said deflection means pivots in the same direction as said arm.

4,033,595

HAND TRUCK

Floyd Mauch, 8245 Kirkwood Drive, Los Angeles, Calif. 90046

Filed May 5, 1976, Ser. No. 683,428

Int. Cl.² B62B *5/02*

U.S. Cl. 280—5.22 **10 Claims**

1. A hand truck comprising:

a frame having wheels mounted on the bottom sides thereof, said frame having lower rear side support members extending angularly outwardly from the bottom thereof, each said side support members having rollers on the upper and lower ends thereof to provide a track,

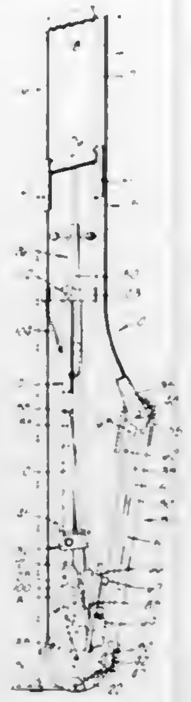
an endless belt on each of the tracks provided by said support members,

a pair of handles slidably mounted on the sides of said frame,

belt grippers on the endless belts, and

connecting means for respectively connecting said pair of slidable handles to said pair of belt grippers,

whereby when said frame is tilted about its wheels such that the rear portion of the endless belts on said support members make contact with a corner of a step and said slidable handles are pulled upwardly the belt grippers grip and pull up on the front portions of the endless belts to cause the lower rollers to operate as single movable pulleys to lift the truck up the step with a mechanical advantage of two.



4,033,596

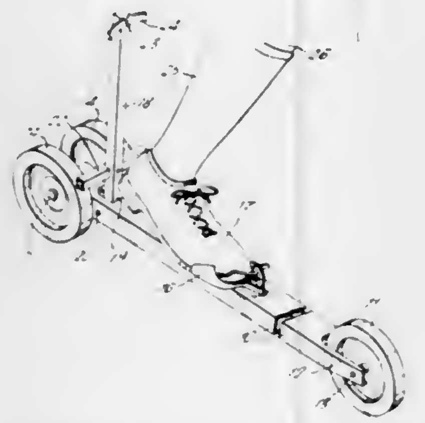
ROLLER SKI HAVING LEG OPERATED BRAKING MEANS

John Peter Andorsen, Dalgardstien 5, 7000 Trondheim; Helge Revhaug, Saupstadringen 43A, 7078 Saupstad, and Ole Nyberg, Osloveien 30, 7000 Trondheim, all of Norway

Filed Aug. 25, 1975, Ser. No. 607,671

Int. Cl.² A63C *17/14*

U.S. Cl. 280—11.2 **5 Claims**



1. Roller ski which comprises a web; axles mounted in parallel on said web adjacent front and rear ends of the latter; two sets of wheels mounted for rotation each on a respective one of said axles of which at least the rearmost set has two wheels, the distance between said axles being a multiple of the diameter of the wheels; a binding for the foot of the skier mounted on said web between said sets of wheels enabling the sole of the foot to be positioned approximately at the level of said axles; a main U-shaped member comprising two arms joined by a bight at their upper ends while their lower free ends are pivotably mounted on said web permitting said member, when not in use, to be swung forwards from a substantially upstanding position in the direction of motion of said ski and downwards against said web with an arm disposed on each longitudinal side of the latter and, when in use, to be swung from said substantially upstanding position in the opposite direction as a result of the pressure exerted by the leg of the skier on being moved rearwardly into abutment with said bight; and brake means comprising an auxiliary U-shaped member comprising two arms joined by a bight at their upper ends while their lower, free ends are pivotably mounted on said web adjacent said rearmost set of wheels, said member being spring-loadedly urged forwardly and away from said wheels and positioned in the rearward path of movement of the main U-shaped member so as to be abuttably swingable rearwardly thereby against the spring loading to make braking contact with said rearmost set of wheels.

4,033,597

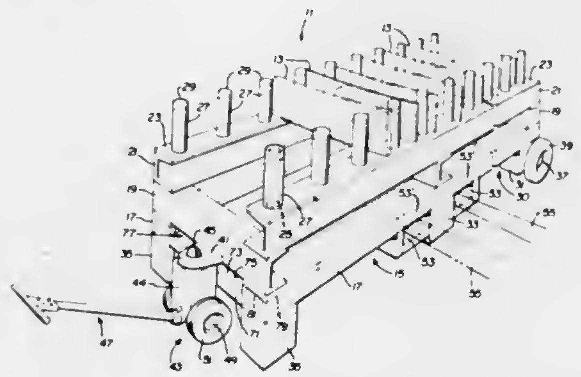
APPARATUS FOR CARRYING GLASS PANELS

Ambroise O. Boyer, 2345 Randolph, Windsor, Ontario, Canada

Filed Dec. 22, 1975, Ser. No. 642,905

Int. Cl.² B62B *1/08*

U.S. Cl. 280—46 **7 Claims**



1. An apparatus for carrying, holding and storing glass windshields so that such windshields may be transported without damage thereto comprising:

a frame having first and second longitudinal frame members of generally the same length, said frame members being arranged parallel and in laterally spaced apart relation, said frame members having upper surfaces which are flat, with said upper surfaces of said frame members laying in a horizontal plane;

elongated pads of resilient material secured to the upper surfaces of said first and second longitudinal frame members, each pad extending the entire length of the corresponding frame member, being adapted to support first portion of a glass windshield placed thereon and prevent slippage of the windshield in either a longitudinal direction or in a lateral direction;

a first row of upright stationary dowels of generally cylindrical configuration fixedly secured to and positioned at predetermined spaced locations along the length of said first longitudinal frame member;

a second row of upright stationary dowels of generally cylindrical configuration fixedly secured to and positioned at corresponding predetermined spaced locations along the length of said second longitudinal frame member;

said dowels extending from said frame members through openings provided in said pads;

the spacing between said dowels of said first and second rows being at least sufficient to supportively receive the largest of said windshields likely to be encountered;

each of said dowels of said first and second rows being provided with a stationary elongated tubular resilient member of generally cylindrical configuration which is sleeved over the dowel, each tubular member having upper and lower annular surfaces, with the lower annular surface of each tubular member abutting one of the pads of resilient material, each of the elongated tubular resilient members being adapted to support a second portion of the windshield and prevent the scratching or breaking thereof, each tubular resilient member having a length less than the length of the corresponding dowel;

a stationary end cap of resilient material for each dowel sleeved over the upper portion thereof and having upper and lower surfaces, the lower surface of each end cap abutting the upper annular surface of the corresponding tubular resilient member, the upper surface of each resilient end cap lying in a horizontally extending plane to prevent breaking or scratching of the windshields during loading and unloading operations;

said elongated tubular resilient member and the corresponding resilient end cap for each dowel completely enclosing and covering same; and

means associated with said frame for enabling the apparatus to be transported from place to place.

4,033,598

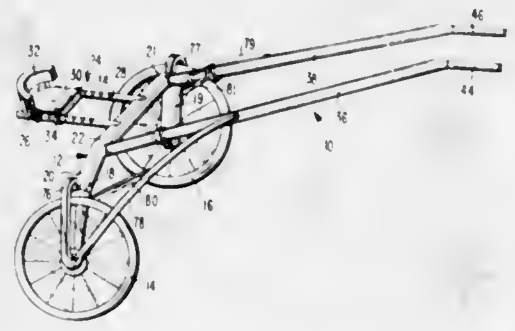
ARCH AXLE SULKY

Joseph H. King, 930 John Anderson Drive, Ormond Beach, Fla. 32074

Filed July 26, 1976, Ser. No. 708,523

Int. Cl.² B62D *27/04*

U.S. Cl. 280—63 **7 Claims**



1. A sulky for use in harness horse racing, including an arch axle frame having an elastic axis and having first and second ends, wheel means including an axle and a wheel secured to each of said first and second ends of said arch axle frame, the rotational axes of said wheel means being placed aft of the elastic axis of said arch axle frame to produce a drag-reducing castering action in said wheel means, and an adjustable seat secured to an extending aft of said arch axle frame, the improvement comprising:

a pair of spaced upwardly and forwardly extending, flexible shafts secured to said arch axle on either side of said seat, said shafts being angled inwardly toward each other and having a tear drop-shaped, streamlined cross section with one longitudinal edge being rounded and the opposite longitudinal edge being tapered, the shafts being canted so that the cross-sectional axes of said shafts diverge downwardly and outwardly at an angle parallel to the direction of air flow about a horse harnessed to said sulky.

4,033,599

FOLDABLE MUDFLAP ASSEMBLY

Anthony F. Fusco, 2248 Charlotte Ave., Concord, Calif. 94518

Filed Feb. 17, 1976, Ser. No. 658,514

Int. Cl.² B62D *25/16*

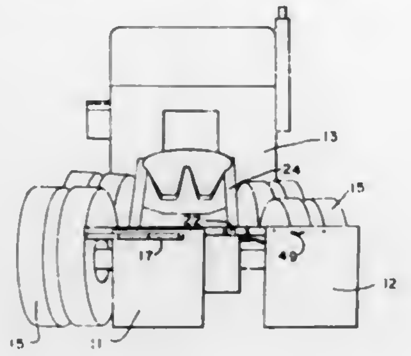
U.S. Cl. 280—154.5 R **4 Claims**

1. A foldable mudflap support assembly for retractably disposing mudflaps behind the wheels of a mudflap carrying vehicle comprising

an elongated hollow support member adapted to be attached to said vehicle between and proximate the rear portion of said wheels,

two elongated extension members each having a support end which is shaped and of a size to slide within the ends of said hollow support member, and each having means to attach a mudflap thereto such that said mudflap will hang substantially vertically therefrom,

- a guide plug slidably disposed in each end of said support member,
- a link member interconnecting the support end of each extension member to one of said guide plugs so as to provide a doubly pivotal interconnection therebetween whereby each of said extension members can be secured in an extended operative position by aligning the support end thereof with the guide plug and sliding the support end into the end of said hollow support member until said interconnecting link member is captured thereby, or



whereby each of the extension members can be folded back to a fully retracted position against said support member by sliding the extension member and guide plug outwardly until the pivotally interconnecting link member is positioned just outside of its capturing hollow support member,

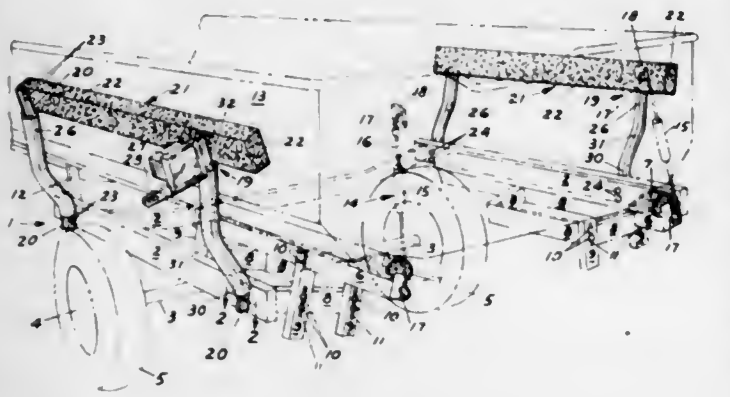
- means for releasably locking said extension members into said extended operative position, and
- means for releasably locking said extension members into said retracted position.

4,033,600
BOAT GUIDE
Harry W. Watson, P.O. Box 9092, Shreveport, La. 71109

Filed Oct. 1, 1975, Ser. No. 618,375

Int. Cl.² B60P *3/10*

U.S. Cl. 280—414 R **8 Claims**



1. A boat guide for boat trailers comprising:

a. An essentially horizontally disposed guide means; and

b. A pair of essentially vertically disposed, downwardly extending legs attached to said guide means at one end of each of said legs, and each of said legs having a first bend proximate said one end of said legs in a direction away from a vertical plane through the longitudinal center of said guide means; a second bend proximate the opposite end of said legs from said one end, for forming an end portion of said legs substantially parallel to said vertical plane; and a third bend between said first bend and said second bend in a direction toward said vertical plane to conform to the shape of the bottom and side portions of a boat; and

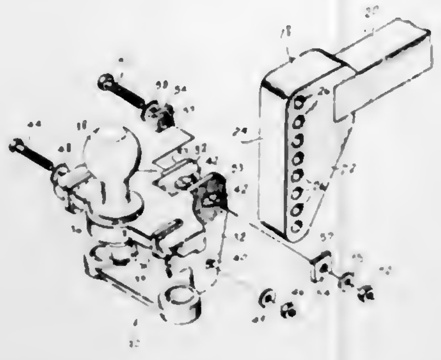
c. Means for securing said one end of each of said legs to said guide means.

4,033,601
ADJUSTABLE HITCH BALL MOUNT FOR A TRAILER HITCH
Robert F. Lindahl, and Donald F. Morgan, both of Elkhart, Ind., assignors to Masco Corporation of Indiana, Elkhart, Ind.

Filed Jan. 19, 1976, Ser. No. 650,566

Int. Cl.² B60D *1/06*

U.S. Cl. 280—490 R **5 Claims**



1. An adjustable hitch ball mount for use in conjunction with a coupler connected to a trailer, said hitch ball mount comprising a support part, said support part including opposite side faces terminating in an end edge, means for attaching said support part to a towing vehicle with said support part side faces being generally vertically oriented and in general alignment with the direction of travel of the towing vehicle, said support part having a plurality of spaced parallel generally vertically aligned openings extending therethrough from one said side face to the other, a bracket including a hitch ball and a U-shaped channel part defined by spaced flanges, a first pair of aligned openings in said flanges, a second pair of aligned openings in said flanges, each second pair opening being elongated with opposite ends and located spacedly from a said first pair opening, said bracket fitted over said support part end edge and having each flange thereof overlying a side face of the support part, said first and second pairs of openings being aligned with a pair of said openings in the support part, a first bolt member extending through one of said support part pair of openings and said first pair of bracket openings, a second bolt member extending through the order of said support part pair of openings and said second pair of bracket openings, said bolt members fitting complementally within said support part pair of openings, said first bolt member constituting pivot means about which said bracket may shift relative to the support part, said second bolt member being shiftable laterally between the ends of said second pair of bracket openings to pivot said bracket about said first bolt member and to vary the angular relationship of said bracket relative to said support part whereby said hitch ball is shiftable between multiple positions, and means carried by said second bolt member and compressed against said bracket for securing said bracket in a selected angular position.

4,033,602
SKI BRAKE
Robert Spieldiener; Reinhold Spieldiener, both of Zurich, and Alphons Saiko, Oberrieden, all of Switzerland, assignors to Intamin AG, Zurich, Switzerland

Filed May 24, 1976, Ser. No. 689,346

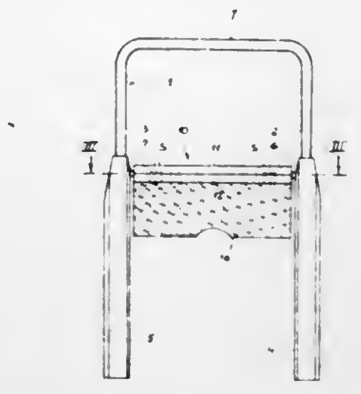
Claims priority, application Austria, May 22, 1975, 3879/75

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **5 Claims**

1. A ski brake for a ski comprising:

- a stirrup adapted to straddle the ski and having a bight extending across the width of the ski and a pair of shanks displaceable from an inoperative position wherein said bight is held against the surface of said ski and said shanks extend generally along the longitudinal edges thereof, into an operative position wherein said shanks extend transversely to said ski;
- respective brake elements on said shanks and extending therealong engageable with the snow in said operative position of said stirrup to brake free flight of the ski;
- a pair of torsion rods each secured at one end to a respective one of said shanks with a coil surrounding same; and



mounting means comprising at least one plate receiving said torsion rods and retaining the other end of each of said torsion rods against rotation, said torsion rods forming the sole pivots enabling displacement of said stirrup from said inoperative position to said operative position.

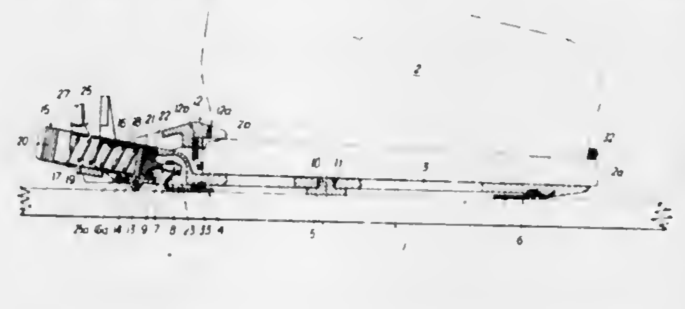
4,033,603
SAFETY SKI BINDING
Hans Horn, Bern, Switzerland, assignor to Gertsch AG, Baar, Zug, Switzerland

Filed July 16, 1975, Ser. No. 596,265

Claims priority, application Austria, July 26, 1974, 66182/74; Oct. 30, 1974, 8711/74

Int. Cl.² A63C *9/08*

U.S. Cl. 280—618 **13 Claims**



1. A releasable binding for a ski boot, comprising:

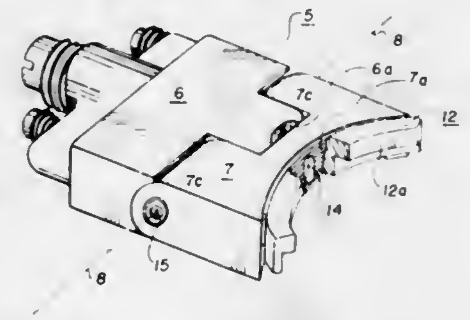
- a sole plate;
- means centrally located relative to said sole plate for pivotally securing said sole plate to a ski;
- spaced holder means for releasably holding said ski boot onto said sole plate;
- resilient means adjacent one end of said sole plate for resiliently maintaining the longitudinal axis of said sole plate in alignment with the longitudinal axis of said ski and for permitting a pivotal movement of said sole plate relative to said ski between predefined limits without effecting a release of said ski boot from the holding engagement by said spaced holder means, said resilient means including a holding element secured to said ski, a locking element mounted on said sole plate and a spring for urging said locking element into engagement with said holding element and permitting said relative pivotal movement between said sole plate and said ski against the urging of said spring; and
- support means adjacent the other end of said sole plate for supporting said sole plate on said ski throughout the range of pivotal movement of said sole plate, said resilient means and said support means maintaining said pivotal securement of said sole plate to said ski throughout positions of pivotal movement thereof, said spaced holder means including release means responsive to a relative pivotal movement between said sole plate and said ski which exceeds said predefined limits for releasing said ski boot therefrom, said spring effecting a return of said sole plate to an aligned position on said ski immediately following said release of said ski boot.

4,033,604
RELEASE ASSEMBLY FOR SKI BINDING
John F. Cirino, 40 Allen Farm Lane, Concord, Mass. 01742

Filed Aug. 21, 1975, Ser. No. 606,665

Int. Cl.² A63C *9/08*

U.S. Cl. 280—628 **13 Claims**



1. In ski binding apparatus of the type for releasably securing a boot and ski, a release assembly comprising:

a. a main housing mounted with said ski to rotate about a vertical axis between a first position in longitudinal alignment with said ski and a second position out of such longitudinal alignment, said main housing being pivotally coupled to vertically extending shaft means rigidly secured to said ski,

b. clamp support body means mounted with said main housing to respectively pivot about a horizontal axis toward and away from clamping engagement with said boot,

c. first means for applying a controlled amount of pressure to said main housing to determine the ease by which said main housing can rotate between said first and second position, said first means comprising pressure plate means resiliently urged against said shaft means and first adjustment means for adjusting the extent of resilient pressure of said pressure plate means against said shaft means,

d. second means for applying a controlled amount of pressure against said clamp support body means, thereby to determine the ease by which said clamp support body means can pivot toward and away from said clamping engagement, said second means comprising pressure cylinder means resiliently urged against said clamp support body means at the locus of pivotal intersection of said support body and said main housing, and second adjustment means for adjusting the extent of resilient pressure by which said pressure cylinder means is urged against said clamp support body, and

e. clamp means secured to said clamp support body for engaging said boot,

f. said main housing including a pair of channels longitudinally extending between opposed end walls of said main housing and terminating in enlarged openings at said locus of pivotal intersection,

g. said second means comprising a pair of cylindrical rollers respectively disposed within said enlarged openings, a pair of springs respectively disposed within said channels for urging said rollers into engagement with said clamp support body, and adjustment screws threadably received within said channels at one of said opposed end walls for determining the extent said springs urge said rollers against said clamp support body.

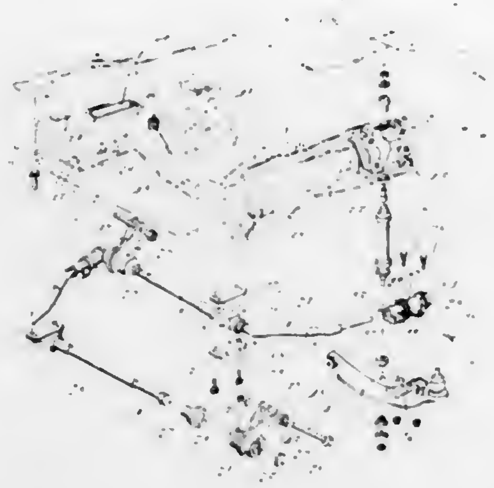
4,033,605
INTEGRAL TORSION BAR — STRUT FRONT SUSPENSION SYSTEM

Robert H. Smith, Rochester, and Howard L. Benford, Bloomfield Hills, both of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Filed Nov. 7, 1975, Ser. No. 630,130

Int. Cl.² B60G *11/18*

U.S. Cl. 280—664 **19 Claims**



19. Suspension apparatus for the front wheels of an automotive vehicle having a frame, said apparatus comprising control arm means for supporting the wheels at opposite sides of said frame, and spring members connected at one end to said control arm means and at the other end to said frame, said spring members extending across said vehicle and adapted to be torsionally deflected upon movement of said wheels in a generally vertical direction, each of said spring members comprising a generally L-shaped arm having one of the portions thereof extending from an elbow rearwardly toward said control arm means, and the other portion thereof extending from said elbow across said vehicle, each of said portions becoming progressively smaller from said elbow to the end thereof and adjustable means connecting the end of said other portion of each of said spring members to said frame at the side thereof opposite the control arm means to which said one portion of the respective spring member is connected said adjustable means being adapted to rotate the ends of the spring members to which they are attached for adjusting the height of the frame relative to the surface on which the vehicle is located.

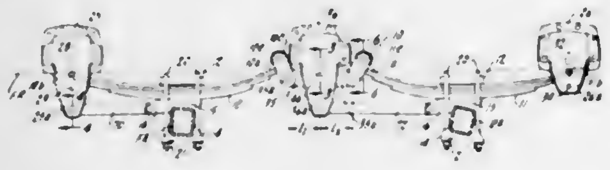
4,033,606
VEHICLE TANDEM SUSPENSIONS

James C. Ward, Springfield, and Robert Wayne Davis, Ozark, both of Mo., assignors to Reyco Industries, Inc., Springfield, Mo.

Filed Aug. 6, 1975, Ser. No. 602,218

Int. Cl.² B60G *11/10*

U.S. Cl. 280—682 **11 Claims**



1. In a suspension for a vehicle having forward and rearward axles in tandem relation beneath the frame thereof, first and second elongated semi-elliptic compound leaf springs mounted in tandem one behind the other on each side of the vehicle and independent of one another, means coupling the medial portions of each of the said springs to the axles so that the springs at each side of the vehicle have inner ends disposed adjacent to one another and outer ends spaced remotely from one another; means slidably supporting the outer ends of the respective springs on the frame of the vehicle to react against the frame of the vehicle in the event a corresponding spring is flexed upwardly by an upwardly applied force encountered by the corresponding axle; an equalizer support member secured to the frame of the vehicle between the adjacent ends of the first and second spring, an equalizer beam pivotally mounted on said equalizer support member; a first shackle assembly pivotally attached to the forward end of said equalizer and pivotally attached to the inner end of said first spring; a second shackle assembly pivotally attached to the rearward end of said equalizer and pivotally attached to the inner end of said second spring, so that an encountered force exerted on one axle deflecting the associated spring is transmitted directly through its associated shackle to the equalizer beam, in turn, through the second shackle which imposes a portion of the encountered force on the spring associated therewith; and front and rear torque rods beneath the related springs and each having a rear end connected to the related axle with the opposite front end connected to a part secured to the frame of the vehicle, said opposite ends of the torque rod being so connected to be positioned at points lying below a line joining the slidable supports for the springs.

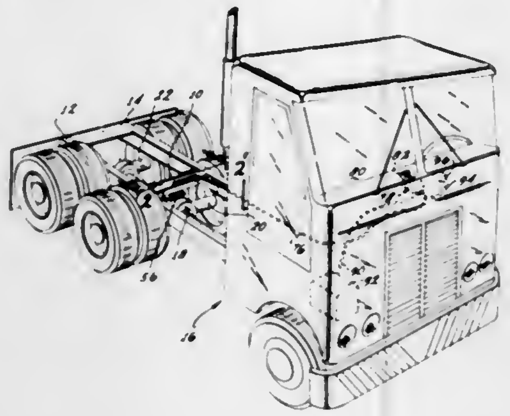
4,033,607
MEANS FOR ATTENUATING THE JARRING AND VIBRATION OF A TRUCK-TRACTOR

John Stratton Cameron, La Mirada, Calif., assignor to Jeffries Truck Parts & Equipment, Inc., Bell, Calif.

Filed Oct. 30, 1975, Ser. No. 627,050

Int. Cl.² B60G *11/26*

U.S. Cl. 280—711 **8 Claims**



1. Means for attenuating the jarring and vibration of a truck tractor designed to carry one end of, and pull a trailer, when said tractor is travelling on a road, without any trailer, said tractor including a horizontally disposed rectangular support frame, motor means supported on said frame, a pair of steerable wheels disposed below and supporting through a suspension system the front end of said frame, and a cab therefor, at least one differential axle operatively connected to said motor means, said axle having a housing and wheels at its opposite ends disposed below and supporting through another spring suspension system, the after end of said frame said first mentioned attenuating means comprising:

- i. a rigid elongated mounting member, said mounting member being securable transversely of, and to the side of elements forming said rectangular frame, for disposition directly above, and parallel to said differential axle;
- ii. an air bellows, said air bellows being expandable downwardly, when provided with air under pressure, to press against said axle housing at a point intermediate the axle, and thereby attenuate road induced vibrations of said support frame through its said suspension system;
- iii. a source of air under pressure carried by the truck;
- iv. manual valve control means, the last said means being conveniently accessible to the operator of said truck; and
- v. air conduit means, said air conduit means being connected to said source of air under pressure and also to said air bellows via said manual valve control means;

whereby, when said tractor is being operated without a trailer load, the truck operator, by operating said manual valve control means, may cause said bellows to be inflated to a desired extent and expanded downwardly against said axle housing to provide thereby an air cushion between said axle and, through said support member, said horizontal frame in opposition to the spring suspension system by which said frame is supported on said differential axle.

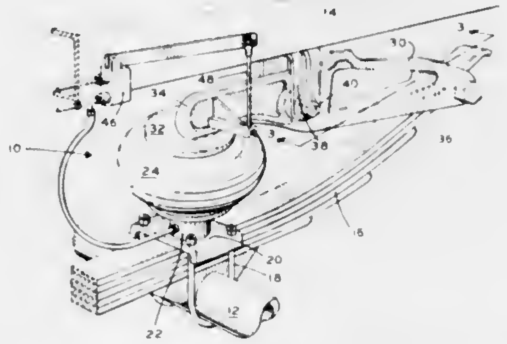
4,033,608
AIR SPRING UNIT

Philip J. Sweet; Buck C. Hamlet, and David L. Sweet, all of Fresno, Calif., assignors to American Carrier Equipment, Fresno, Calif.

Filed Dec. 10, 1975, Ser. No. 639,290

Int. Cl.² B60G *17/00*

U.S. Cl. 280—711 **2 Claims**



1. In combination with a suspension system for the frame of a wheeled vehicle characterized by a load supporting axle and a cantilevered leaf spring assembly mounted on the axle, an improved air spring unit comprising:

- A. a pressurizable air bag disposed in substantial vertical alignment with the axle;
- B. a pivotal rocker arm having one end vertically supported by said air bag and one end vertically supported by a projected end portion of said cantilevered support assembly;
- C. means for connecting said rocker arm in supporting relation with said frame including a bracket affixed to said frame and depending therefrom, and a horizontally oriented pin pivotally connecting the rocker arm to the bracket; and
- D. means including a pneumatic circuit connected with said air bag, including a leveling valve connected with said rocker arm, for variably pressuriing said air bag as pivotal motion is imparted to the arm.

4,033,609
TRAILED VEHICLE SUSPENSIONS

George David Malcolm, 5 James Street, Mangere East, Auckland, New Zealand

Filed Aug. 14, 1975, Ser. No. 604,691

Claims priority, application Australia, Aug. 16, 1974, 8553/74

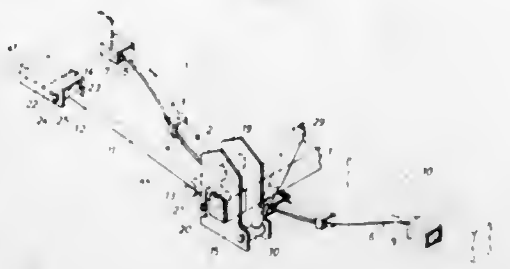
Int. Cl.² B60G *11/04*

U.S. Cl. 280—718 **11 Claims**

1. A suspension, for a trailed vehicle, comprisng:

- i. a beam axle
- ii. respective spring means positioned adjacent each end of said beam axle
- iii. respective axle mounting means securing said spring means to said beam axle
- iv. respective means for mounting said spring means to a trailed vehicle and adapted to permit limited movement of the spring means longitudinally of the trailed vehicle
- v. a respective leading radius arm positioned adjacent each end of the beam axle, said radius arm being pivotably attachable at one of its ends to the trailed vehicle and pivotably coupled at least indirectly at its other end to said beam axle, the arrangement being such that, when the suspension is mounted on the trailed vehicle, the first end of the radius arm is at a position higher than said second end of the radius arm for all conditions of loading of the spring means,

whereby as the beam axle moves upwardly at an end in response to bump conditions it is also caused by the respective radius arm to move in the forward direction of movement of the trailed vehicle and thereby undergo a steering effect tending to oppose the effects on the trailed vehicle of the displacing force.



4,033,610
ELECTRICAL IGNITION CIRCUIT FOR GAS GENERATOR

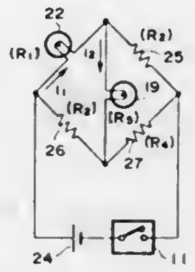
Iichi Shingu; Yutaka Kondo, and Shuho Nishina, all of Aichi, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Japan

Filed May 19, 1975, Ser. No. 578,866

Claims priority, application Japan, Sept. 19, 1974, 49-107936

Int. Cl.² B60R *21/08*

U.S. Cl. 280—737 **11 Claims**



1. An electrically-activated ignition circuit system for a gas generator for inflating a gas bag in a motor vehicle, said gas generator including a high pressure gas bomb having a first ignition filament for exploding a detonator to break a seal therein and an enclosure containing gas-producing substances having a second ignition filament for burning said gas-producing substances, comprising:

a collision sensor,

a voltage source connected in series with said collision sensor to form a series circuit, and

a bridge circuit having first, second, third and fourth arms, the junction of said first and second arms being connected to one end of said series circuit and the junction of said third and fourth arms being connected to the other end of said series circuit, the first arm of said bridge circuit comprising said first ignition filament, said second and third arms being resistors, and said second ignition filament being connected between the junction of said first and third arms and the junction of said second and fourth arms, the resistive values of said arms and said first and second ignition filaments being such that, upon actuation of said collision sensor, the current through said first ignition filament exceeds a first value required to explode said detonator and destroy said first ignition filament and the current through said second ignition filament is less than a second value required to effectively heat said second ignition filament, destruction of said first ignition filament causing the current through said second ignition filament to immediately increase above said first value thereby being heated sufficiently to burn said gas-producing substances.

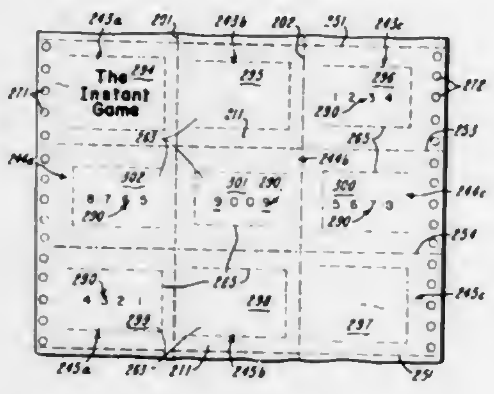
4,033,611
MULTI-PLY LOTTERY TICKETS OR LIKE ARTICLES, CONTINUOUS BUSINESS FORM AND METHOD FOR PRODUCING SAME

Edward L. Johnsen, 12 Fox Meadow Lane, Wayland, Mass. 01778

Division of Ser. No. 433,461, Jan. 15, 1974, Pat. No. 3,940,124. This application July 14, 1975, Ser. No. 595,733

Int. Cl.² B42D *15/00*

U.S. Cl. 283—6 **8 Claims**



1. A multi-ply lottery ticket comprising:

a single elongate sheet of material having a pair of foldlines extending transversely thereacross to define three contiguous end edge connected panels, said sheet being accordian folded with said panels being disposed in a zig-zag relationship to define a concealed area having opposed first and second interior faces and an exterior face on a common side of said sheet;

a plurality of elongate original indicia located in the concealed area on said second interior face;

an elongate outer hinged tear strip for providing access to the interior of said folded sheet, said strip being defined in said exterior face to be longitudinally disposed on said exterior face and having a hinge located adjcaent a first one of said foldlines, said exterior face having original directly applied indicia positioned thereon;

a plurality of elongate interior hinged tear strips for providing access to the original indicia on said second interior face, said interior tear strips each being defined in the panel including said first interior face to have the longitudinal axis thereof oriented transversely of said outer tear strip and hinged to open outwardly through said exterior face after said outer hinged tear strip has been opened, said interior tear strips having outer faces which are exposed when said outer tear strip is opened,

each of the original indicia on said second interior face being longitudinally aligned with a corresponding one of said interior tear strips and being located to be exposed when said corresponding interior tear strip is opened so that said elongate indicia can be viewed from outside the ticket with both said outer and interior tear strips are open, said original applied indicia directly applied to said exterior face and said second interior face in a single printing run;

initially inactive adhesive applied to peripheral portions of the surfaces of said panels which are in abutting contact when said panels are accordion folded for forming a permanent seal between said abutting surfaces to permanently bond to one another those portions of said abutting surfaces bordering said outer tear strip, said interior hinged tear strips and the indicia in the concealed area on said second interior face so that said bonded panels must be mutilated to separate same when said adhesive is activated.

4,033,612
ARMORED FLEXIBLE PIPE EQUIPPED WITH A RIGID COUPLING

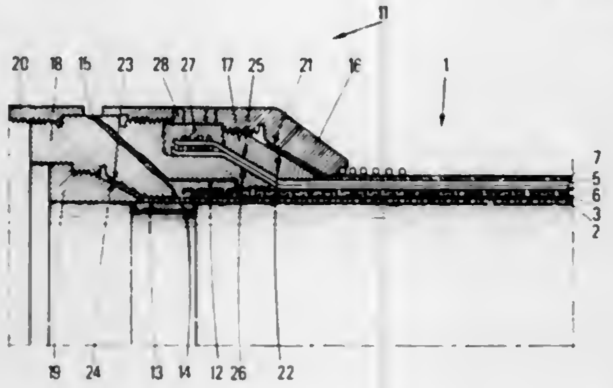
André Chevalier, Pantin, France, assignor to Institut Francais du Petrole, des Carburants et Lubrifiants, France

Division of Ser. No. 414,103, Nov. 8, 1973, Pat. No. 3,874,064. This application Jan. 23, 1975, Ser. No. 543,307

Claims priority, application France, Nov. 21, 1972, 72.41397

Int. Cl.² F16L *39/02*

U.S. Cl. 285—149 **6 Claims**



1. A flexible armoured pipe having a rigid coupling comprising

at least one flexible tubular core,

at least one first armouring surrounding said core, said first armouring including an elongated member helically wound with a short pitch around said core,

coupling means having a rigid body member positioned at the end of the tubular core and said first armouring, said coupling means including first clamping means for clamping said tubular core and means for anchoring said armouring, wherein said means for anchoring includes at least one bore means within said rigid body member for housing an end of said armouring and channel means through said rigid body member for introducing solidifiable material into said bore means such that said end of said armouring is anchored in said coupling means,

at least one second armouring provided around said at least one first armouring, said second armouring including two layers of wires helically wound in opposite directions with a large pitch over said first armouring,

second clamping means for clamping said two layers and securing said second armouring to said coupling means,

second bore means for housing ends of said two layers of said second armouring, said solidifiable material being introduced into said second bore means for anchoring said ends of said two layers,

an outer tubular covering arranged over said first and second armourings, and

third clamping means for securing said outer covering to said coupling means.

4,033,613
LOCKED JOINT BETWEEN TWO PIPE ELEMENTS CAPABLE OF HAVING AN ANGULAR DEVIATION WITH RESPECT TO EACH OTHER

Georges Eugene Bram, Pont-a-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France

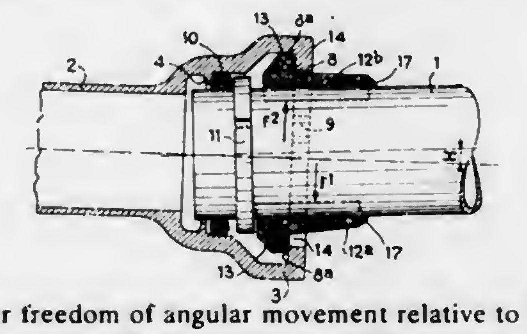
Filed June 19, 1975, Ser. No. 588,457

Claims priority, application France, July 5, 1974, 74.23526

Int. Cl.² F16L *21/00*

U.S. Cl. 285—184 **10 Claims**

1. A locking device for locking a joint between two pipe elements against forces tending to separate the pipe elements, in which joint one pipe element is capable of having its axis angularly deviating from a coaxial position with respect to the other pipe element, there being provided a smooth tubular end portion on a first of the pipe elements and a socket on a second of the pipe elements, the socket having a cavity for an annular sealing element and a free outer end which has on the periphery of the outer end a radial abutment wall defining a first abutment face extending radially inwardly and facing axially inwardly of the socket, the locking device comprising in combination a notch defined by the abutment wall, at least one locking member which is separate from the pipe elements before locking the joint and initially unfixed therefrom and has the general shape of a sector of a cylindrical ring and is capable of passing axially through said notch subsequent to the engagement of the smooth end portion in the socket and defines a radially inner wall for placing adjacent the tubular end portion and has a radially outer projecting portion defining a second abutment face extending radially outwardly for abutment against said first abutment face, said second abutment face facing axially outwardly of the socket in the assembled state of the joint, whereby the locking member has an engagement with the abutment wall which allows the locking member freedom of angular movement relative to the axis of the second pipe element when assembling the two pipe elements, the locking member having an elongated extension portion which extends from said abutment face outside the socket in a direction parallel to the axis of the first pipe element between the abutment wall and the tubular end portion with sufficient radial clearance between the abutment wall and the extension portion to allow the first pipe element to be assembled with the second pipe element with said angular deviation, the locking member having a circumferential extent allowing the utilization of a plurality of said locking members between the socket and the tubular end portion by insertion thereof in succession by way of the notch subsequent to the engagement of the smooth end portion in the socket, and means independent of the socket for axially locking the extension portion with the first pipe element for precluding movement of the locking member, axially relative to the first pipe element toward the end of the first pipe element in the socket, subsequent to the positioning of the projecting portion of the locking member axially against said abutment face.



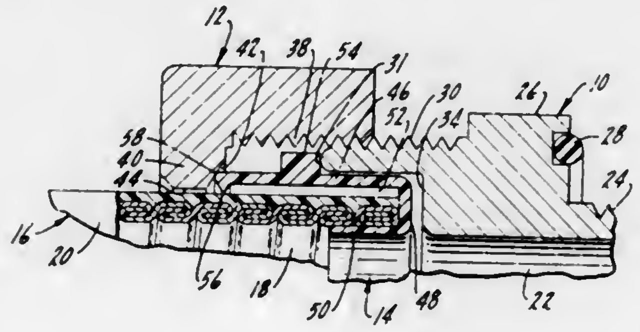
4,033,614
CONDUIT FITTING

Ronald P. Hanson, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Filed Mar. 1, 1976, Ser. No. 662,463

Int. Cl.² F16L *33/20*

U.S. Cl. 285—248 **3 Claims**



1. A connector assembly for joining flexible metallic conduit to a terminus, including a fitting and nut threaded together for relative rotation and defining an annular compression chamber between them, a plastic ferrule in the compression chamber having a generally cylindrical main body adapted to be mounted on the end of the conduit, an outstanding circumferential shoulder on the main body of the ferrule intermediate the ends thereof to receive an axial thrust from the compression chamber upon closing thereof, an inwardly directed peripherally continuous tooth on one end of the main body arranged to be compressed inwardly into liquid-tight sealing relation with the outside of the conduit upon closing of the compression chamber, a transversely disposed inwardly directed annular end wall on the other end of the main body of the ferrule, a double-backed generally cylindrical pilot on the inner circumference of the end wall in spaced relationship to the main body and forming a socket therewith and dimensioned for free reception of the end of the flexible metallic conduit, an annular taper in the compression chamber on the nut opposite and effective against the one end of the main body of the ferrule with the circumferential tooth to cause deflection of the tooth peripherally inwardly into tight sealing relation with the outside of the conduit, the double-backed pilot having smooth cylindrical inner and outer surface with diameters that effect a sliding relation with the inside and outside of the conduit, the dimensioning of the ferrule being such that it will freely slide into the end of the conduit with the inside diameter of the main body of the ferrule being slightly larger than the outside diameter of the conduit, the axial spacing between the shoulder and the tooth and the radial thickness of the main body of the ferrule in between, on the one hand, and the axial spacing between the annular taper on the nut and the fitting, on the other hand, being such that the tooth will flex inwardly into liquid-tight sealing relation with the outside of the conduit upon axial closing of the compression chamber without effecting excessive resistance to such closing and will lock up with the tooth still inside of the compression chamber without the annular end wall of the ferrule engaging the fitting, the portion of the ferrule in between the tooth and the shoulder being flexed under the axial loading applied between the shoulder, on the one hand, and the tooth, on the other, and without permanent deformation.

4,033,615
PORT THREAD

Raymond A. Miller, Jr., Madison Heights, and Douglas M. Thornton, Rochester, both of Mich., assignors to Ross Operating Valve Company, Detroit, Mich.

Filed June 16, 1975, Ser. No. 587,121

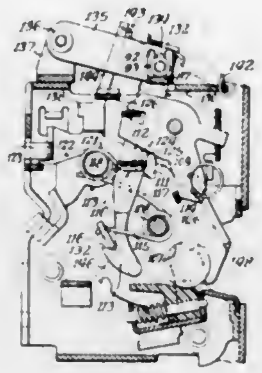
Int. Cl.² F16L *15/00*

U.S. Cl. 285—333 **2 Claims**

1. A threaded port in a valve body for the reception of hardware having NPT, BSP Tr. or BSP Pl. external threads with nominal tube bores at least between ¼ and 1 inch, comprising threads having a pitch midway between the NPT and BSP pitches for the nominal tube bore and an included angle between thread sides of 57½°.

4,033,616
AUTOMOTIVE VEHICLE DOOR RETARDING AND CLOSING MECHANISM

Jay R. Sheesley, Glencoe, Ill., assignor to Keystone Industries, Inc., Rolling Meadows, Ill.
Division of Ser. No. 284,230, Aug. 28, 1972, Pat. No. 3,989,287. This application June 1, 1976, Ser. No. 691,600
Int. Cl.² E05C *3/26*
U.S. Cl. 292—216 **6 Claims**



1. A device for effecting complete closure of the door of an automotive vehicle or the like after the door has moved to a predetermined, partially closed position, comprising a frame adapted to be mounted on one of said vehicle door and body, a latch movably mounted in said frame and having an opening therein for receiving a striker, said striker being adapted to be mounted on the other of said door and body, said latch being operable when in one position to permit said striker to move into or out of said opening and being operable during movement to another position to engage said striker and effect relative movement thereof to a position corresponding to the closed position of said door, first spring means biasing said latch to said one position, a pawl movable between a first position engaging and preventing movement of said latch and a second position spaced from and permitting movement of said latch, said pawl being adapted to be moved to said second position by manually actuated means mounted on the door of said vehicle, and an operating lever movably carried by said frame and having a portion directly engageable with said latch, said operating lever being movable to a first position permitting movement of said latch relative thereto and to a second position causing movement of said latch to its other position, whereby said operating lever is effective when moved from the first to the second position thereof to cause the door of said vehicle to move to a fully closed position.

4,033,617
PROCESS FOR THE PURIFICATION OF ETHYLENE OXIDE

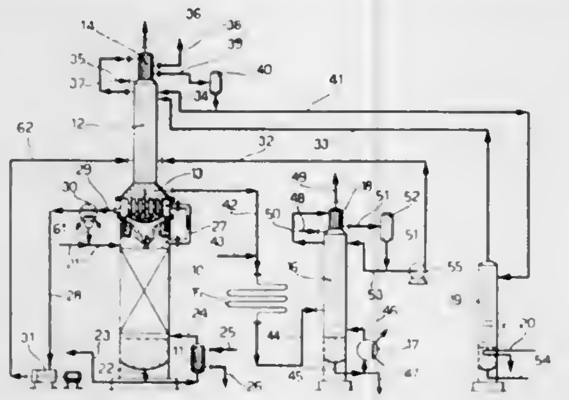
Gioacchino Cocuzza, Catania; Gianni Torreggiani, Busto Arsizio (Varese), and Michele Sfregola, Bergamo, all of Italy, assignors to Societa' Italiana Resine S.I.R. S.p.A., Milan, Italy
Filed July 8, 1976, Ser. No. 703,342
Claims priority, application Italy, July 8, 1975, 25177/75
Int. Cl.² B01D *3/14;* **C07D** *303/04*
U.S. Cl. 203—27 **7 Claims**

1. A method for the purification of the crude ethylene oxide present in the dilute aqueous solution resulting from the extraction with an aqueous solvent of ethylene oxide from the gaseous stream obtained by catalytic oxidation of ethylene, which comprises the steps of:

a. desorbing said crude ethylene oxide in a desorption column provided with a dephlegmator, thereby to condense in the latter water vapor issuing together with the desorbed crude ethylene oxide from the top of the desorption column;

b. liquefying by compression said desorbed crude ethylene oxide and delivering said liquefied crude ethylene oxide to a fractionating column provided with a reflux condenser, at a point intermediate the top and the bottom, said fractionating column being coupled with said desorption column thereby to use the vapor condensing in said dephlegmator as heating means for said fractionating column and being operated at a temperature of from 50° to 100° C at the bottom, at a pressure of from 4 to 15 Atmospheres and with a reflux ratio of from 0.5:1 to 6:1, discharging a gaseous stream containing non-condensable gases at the top of said reflux condenser, a liquid stream of ethylene oxide containing absorbed non-condensable gases and practically free from acetaldehyde at the bottom of said reflux condenser and a liquid stream of ethylene oxide rich in acetaldehyde at the bottom of said fractionating column;

c. treating said liquid stream discharged at the bottom of the fractionating column of (b) to convert at least 50% of the acetaldehyde present therein into high boiling products;

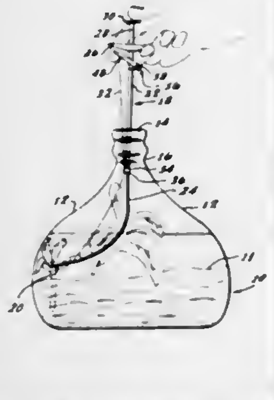


d. delivering said treated liquid stream of (c) to a distillation column provided with a reflux condenser, at a point intermediate the top and the bottom, operating said distillation column at a pressure of from 2 to 6 atmospheres and at a temperature of from 120° to 180° C at the bottom and discharging from said distillation column said conversion products of acetaldehyde and the substances having a higher boiling point than ethylene oxide, at the bottom, and a liquid stream containing ethylene oxide and the acetaldehyde unconverted at step (c), at the bottom of the reflux condenser, said liquid stream of (d) being recycled to the fractionating column of (b) at a point intermediate the top and the bottom; and

e. removing said non-condensable gases absorbed in said liquid stream discharged at the bottom of said reflux condenser of the fractionating column of (b) in a desorption column and recovering from the latter pure ethylene oxide practically free from acetaldehyde.

4,033,618
TERRARIUM PLANTING IMPLEMENT

Gerald P. Lamb, 2648 Hartford St., San Diego, Calif. 92110
Filed June 7, 1976, Ser. No. 693,530
Int. Cl.² A01G *3/00;* **B25B** *7/14*
U.S. Cl. 294—19 R **9 Claims**



1. A terrarium planting implement comprising:

an elongated body member having a rigid and a flexible portion, the portions being substantially co-axial;

a handle member fixedly attached to said rigid portion;

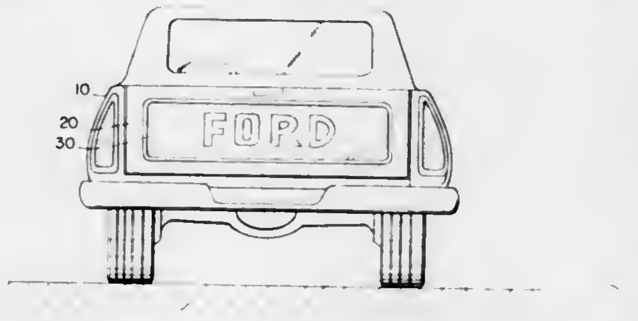
a holding means attached to said flexible portion;

a first actuating means positioned remote from said flexible portion and moveable relative to said portions for selectively releasing said holding means; and

a second actuating means attached to said rigid portion for moving said holding means selectively between a position of substantially co-axial relationship with said rigid portion and a position of non-co-axial relationship with said rigid portion, said second actuating means comprising a lever member pivotally attached at one end to said rigid portion, an elongated actuating member pivotally attached at one end to said lever member intermediate the ends thereof and pivotally attached to said flexible portion at its other end, said elongated actuating member passing through a guide member attached to said rigid portion.

4,033,619
TRANSPARENT TAILGATE FOR STATIONWAGONS AND PICKUP TRUCKS

Diane M. Cox, Depew, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.
Filed July 21, 1975, Ser. No. 597,702
Int. Cl.² D60R *13/00*
U.S. Cl. 296—21 **1 Claim**



1. A tailgate for station wagons and pickup trucks, comprising:

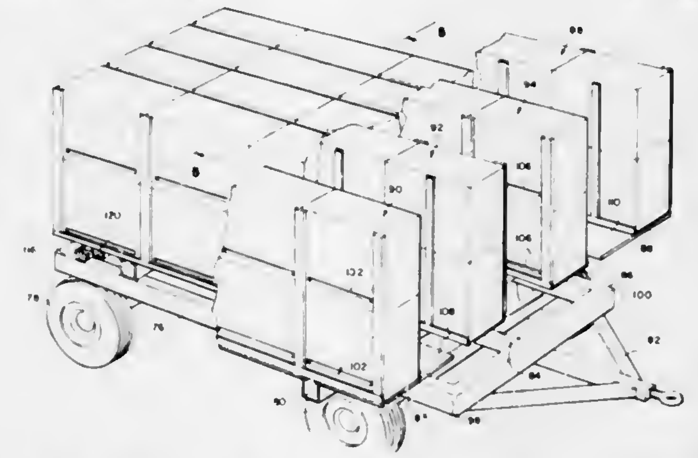
a tailgate having recessed central aperture,

a transparent panel mounted within said recessed central aperture, and

indicia embedded in said transparent panel, wherein said transparent panel is formed of a one-way glass, thereby being transparent from inside the cabin of the station wagon or pickup truck only.

4,033,620
BEE HIVE CARRIER AND TRANSPORT MEANS

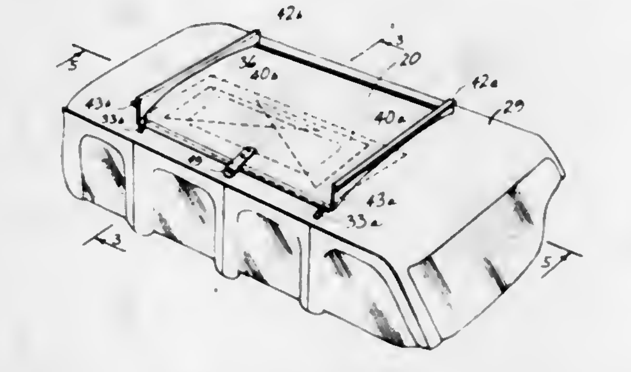
Robert L. Blake, and James David Blake, both of 1821 N. 28th St., Phoenix, Ark. 85008
Filed Sept. 4, 1975, Ser. No. 610,144
Int. Cl.² B62D *33/04*
U.S. Cl. 296—24 C **20 Claims**



1. A bee hive carrier and transport means comprising a frame; a plurality of closely adjacent bee hive supports on said frame; each support adapted to carry a plurality of bee hives; some of said supports being moveable supports moveably mounted on said frame so as to permit transport and storage of said hives on said frame in close compact relation to each other and whereby some of said bee hive supports may be moved on said frame to positions wherein bee hives, carried thereon, are displaced and spaced from bee hives carried on the remaining ones of said supports and thereby allowing space around said bee hives for the bees to work and for manual servicing of said bee hives said frame is located in a suitable area for the bees to work.

4,033,621
ORIGINAL CONFIGURATION RETENTION EXTENDIBLE ROOF SECTIONS BY MEANS OF UNIVERSAL INSERTS

Garry W. C. Rogers, 402 Kirkfield St., Winnipeg, Manitoba, Canada (R3K 1E6)
Filed Nov. 17, 1975, Ser. No. 632,476
Int. Cl.² B60J *7/18*
U.S. Cl. 296—137 B **3 Claims**



1. In a vehicle roof structure having therein a generally rectangular opening defining a first, second, third and fourth edge, a reliable top of a shape conforming to that of the roof opening, a first edge of said raisable top being hingedly connected to said first edge of said opening, means for locking said raisable top in a closed position; a weatherproof seal comprising a pair of generally vertically disposed plates, each of said plates being fastened to said third and fourth edge in a weather proof fashion, said plates extending beyond the uppermost portion and the lowermost portion of the roof structure, each of said plates having an upwardly opening channel means formed along the upper portion thereof, a pair of generally rectangular members each fastened to a third and fourth edge of said raisable top, a bend formed in the upper portion of each of said members, said bend having a portion extending outwardly and downwardly defining a downwardly opening channel adapted to engage over the upper portion of corresponding one of said plates when said raisable top is in said closed position, a pair of generally triangular rigid filler members, each received between corresponding ones of said upwardly opening channels and said downwardly opening channels when said raisable top is in said raised position to seal off undesirable elements, a side filler member of a generally rectangular shape which lower edge is hingedly connected to said second edge of said opening, the upper edge of said side filler member being adapted to supportively engage a second edge of said raisable top when said raisable top is in said raised position to seal off undesirable elements, and each of two side edges of said side filler member engaging corresponding one of remaining edges of said triangular filler members in a weatherproof fashion when said raisable top is in said raised position.

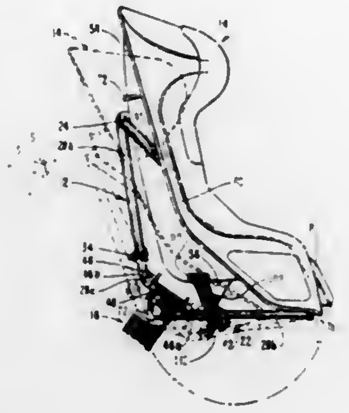
4,033,622
INFANT'S CAR SEAT

Robert J. Boudreau, Bedford, Pa., assignor to Hedstrom Co., Bedford, Pa.

Filed June 29, 1976, Ser. No. 700,913

Int. Cl.² A47D *1/10*

U.S. Cl. 297—250 **8 Claims**



1. An infant's car seat comprising
- A. a truss formed of frame members, said truss having a generally triangular shape in side elevation, and a generally rectangular shape in rear elevation, said truss comprising
  1. a generally rectangular frame member,
  2. a first frame section having first and second portions formed at right angles to one another, said frame section having third and fourth portions integral with the free ends of the first and second portions, said third and fourth portions being oriented at right angles to the first and second portions,
  3. means for connecting the third and fourth portions of the first frame section to the upper and lower edges of the frame member at one side thereof,
  4. a second frame section, said second frame section being a mirror image of the first frame section, and
  5. means for securing the third and fourth portions of the second frame section to the upper and lower edges of the frame member at the opposite side thereof from the first frame section,
- B. a rigid, molded plastic shell interfitting with the hypotenuse of said truss, said shell including a seating platform adjacent the base leg of said truss, a back wall adjacent the rear leg of said truss and spaced apart side walls projecting upwardly from the side edges of the seating platform and back wall, each said side wall being composed of spaced-apart webs which form a rigid beam extending from the top of the shell to the bottom thereof, the spaces between each set of said webs being adapted to receive the members forming the hypotenuse of said truss, and
- C. means for securing the shell to members of the truss.

4,033,623
CHILD'S SAFETY RESTRAINT FOR USE IN A VEHICLE

Christian Thary, Lure; Armand R. Bernard, Etampes; Jean Francois Labadie, Etampes, and Olivier P. De La Taille, Etampes, all of France, assignors to Etablissements Bertrand Faure, Le Chesnay, France

Filed June 10, 1975, Ser. No. 585,598

Claims priority, application France, June 14, 1974, 74.20792

Int. Cl.² B60R *21/02*

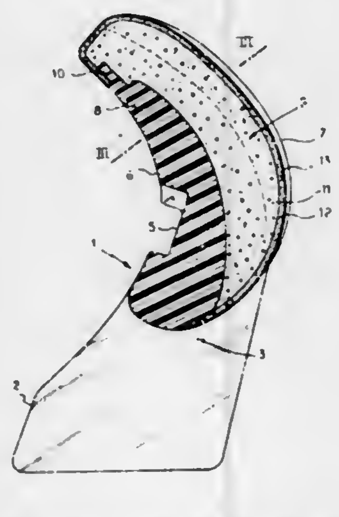
U.S. Cl. 297—390 **5 Claims**

1. A child's safety restraint for use in a motor vehicle comprising:

a retaining member adapted to be held in front of a child on one of the vehicle seats and so shaped that in the event of a sudden deceleration of the vehicle, the chest and head of the child will come to rest against a rearmost face of said member,

wherein said member includes a lower part within which there is defined an opening through which the legs of the child can pass, and an upper part which includes a rigid part on the front face thereof and a squab on the rearmost face thereof,

the upper part of said member having a predetermined thickness profile throughout its height while the rigid part of the retaining member is of progressively reduced thickness from the lowermost portion thereof of the uppermost end thereof, said rigid part having a thickness approximately equal to two-thirds the thickness of said retaining member within the lower, torso-engaging region thereof and approximately equal to one-third of the thickness of said retaining member within the upper head engaging region thereof, and the squab is of increased thickness from the lowermost portion thereof to the uppermost end thereof disposed above and forwardly of said rigid part uppermost end, said squab having a thickness approximately equal to one-third of the thickness of said member within the lower region thereof and approximately equal to two-thirds the thickness of said member within the upper region thereof, said rigid and squab portions of said member therefore having reversely complementary thickened portions so as to define said upper part of said member of said predetermined thickness profile.



4,033,624
INVALID WHEEL-CHAIR

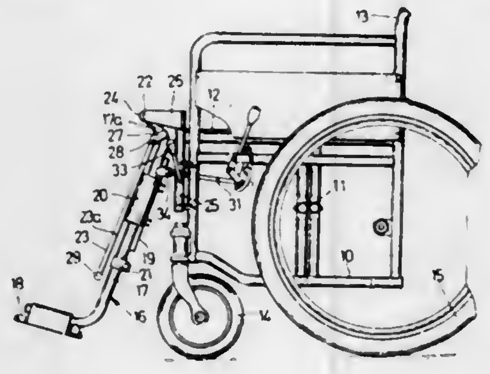
Wilhelm Meyer Jun, Kirchstrasse 7, 4973 Vlotho, Weser, Germany

Filed June 2, 1976, Ser. No. 692,214

Claims priority, application Germany, Apr. 2, 1976, 7610263[U]

Int. Cl.² A47C *7/50*

U.S. Cl. 297—434 **10 Claims**



1. A wheeled invalid-chair comprising a frame, and leg-supports, said leg-supports each having a carrier-spar with upper and lower ends, pivot means connecting said upper end of said carrier-spar to said frame to pivot relative thereto about a horizontal axis, a foot rest plate carried by said carrier-spar at said lower end thereof, an actuating lever and hinge means connecting said lever to said carrier-spar at a position spaced from said horizontal axis, said frame having abutment means engageable by said lever for pivoting said leg support about said axis to adjust the position thereof relative to said frame.

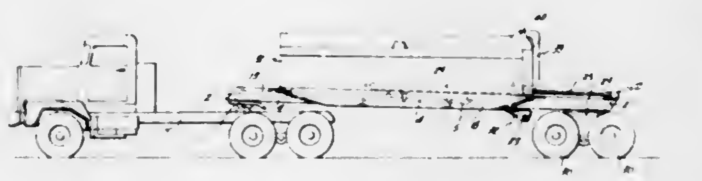
4,033,625
ADJUSTABLE-LENGTH SEMITRAILER CHASSIS AND METHOD OF SEMITRAILER MANEUVERING

Tyman H. Fikse, 4263 S. 172, Seattle, Wash. 98188

Filed Mar. 28, 1975, Ser. No. 563,195

Int. Cl.² B60P *1/18*

U.S. Cl. 298—22 R **24 Claims**



1. A semitrailer comprising load-carrying means, and a chassis supporting said load-carrying means and including front tractor-connecting means, rear wheeled supporting means, powered forward shifting means for moving said load-carrying means forward and rearward relative to said tractor-connecting means and powered rear shifting means for moving said wheeled supporting means forward and rearward relative to said load-carrying means and thereby altering the spacing between locations on the ground to which load carried by said load-carrying means is applied.

4,033,626
METHOD AND APPARATUS FOR CONTROLLING A TUNNELING MACHINE

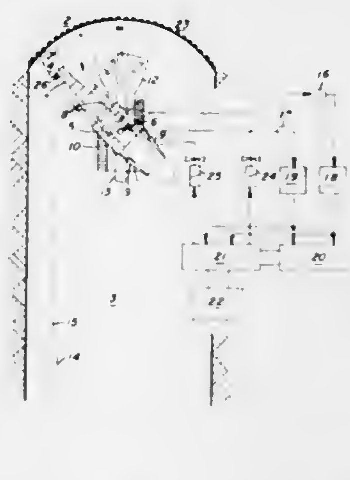
Anton Dinkelbach, Gelsenkirchen, Germany, assignor to Gebr. Eickhoff, Maschinenfabrik und Eisengiesserei m.b.H., Bochum, Germany

Filed July 12, 1976, Ser. No. 704,311

Claims priority, application Germany, July 16, 1975, 2531759

Int. Cl.² E21D *9/10*

U.S. Cl. 299—1 **9 Claims**



1. A method for controlling the displacement of a cutting tool by a pivot arm supported for universal movement upon a tunneling machine, said tunneling machine including means for displacing said cutting tool along a course of travel to form a tunnel having a desired profile by releasing material from the tunnel heading face, said method including the steps of:

projecting a laser beam in a direction parallel with the desired tunnel heading toward the heading face of the tunnel,

moving the tunneling machine into a set-point position adjacent the heading face of the tunnel,

displacing said pivot arm to move a lser detector supported thereby into a position for impingement by the laser beam while the tunneling machine remains at said set-point position,

generating a first set of signals corresponding to a measured set of pivot angles representing the pivoted position of the pivot arm with respect to said set-point position of the tunneling machine,

effecting a plunge cut by said cutting tool into the heading face of the tunnel,

thereafter again displacing said pivot arm to move said laser detector into a position for impingement by the laser beam,

generating a second set of signals corresponding to a second measured set of pivot angles of said pivot arm after effecting said plunge cut.

generating control signals corresponding to set-point values of a desired tunnel profile,

comparing said first set of signals with said second set of signals to obtain deviation signals corresponding to a position change by the tunneling machine from said set-point position, and

modifying said control signals with said deviation signals for controlling displacement of said cutting tool within a course of travel while releasing material from the heading face of the tunnel.

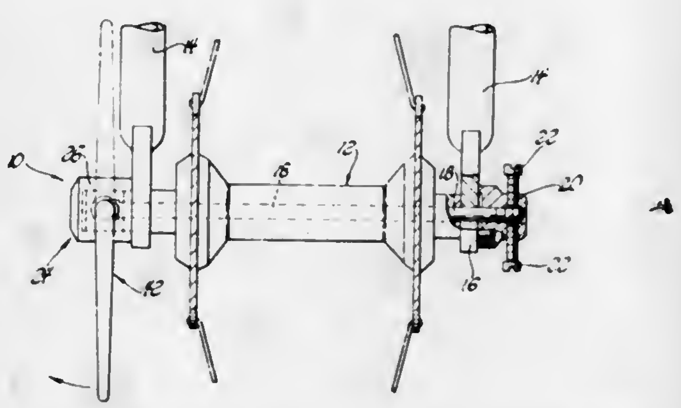
4,033,627
QUICK RELEASE DEVICE

Pino D. Morroni, Warren, Mich., assignor to Pino International Ltd., Warren, Mich.

Filed Sept. 8, 1975, Ser. No. 611,176

Int. Cl.² B62K *25/02*

U.S. Cl. 301—111 **15 Claims**



1. A quick release assembly for supporting a bicycle wheel hub on a bicycle frame comprising: an elongated rod having first and second ends; abutment means disposed on said first end of said rod for engaging a bicycle frame; and clamping means disposed on said second end of said rod for movement longitudinally of said rod between a clamping position to clamp a wheel hub on a bicycle frame by placing said rod in tension and a release position to release said rod from said tension for releasing the wheel hub from the bicycle frame, said clamping means including a clamping head for engaging a bicycle frame, a reaction member separate from said clamping head and separate from said rod, connecting means connecting said reaction member to said second end of said rod for placing said rod in tension, and actuation means operatively interconnecting said clamping head and said reaction member for effecting relative movement between said clamping head and said reaction member in a direction longitudinally of said rod between said clamping and release positions, said actuation means including a cam member rotatably supported by

said clamping head for rotation about a rotational axis which extends transversely of said rod, said cam member having an eccentric cam engaging said reaction member for effecting said relative movement between said clamping head and said reaction member, said second end of said rod including stop means engaging said eccentric cam for preventing rotation of said rod relative to said cam member and said clamping head, said eccentric cam being circular in cross section about an eccentric axis which is laterally displaced from said rotational axis, said stop means including an arcuate recess in said second end of said rod and concentric with said eccentric cam.

4,033,628

PARTICULATE MATERIAL CONVEYING ARRANGEMENT

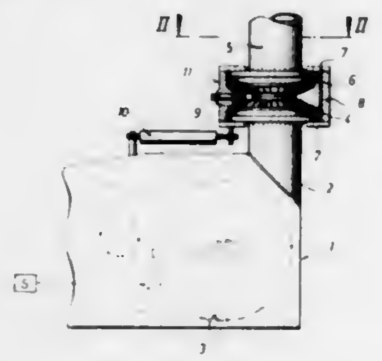
Karl Moosbrucker, Saulgau, Wurttemburg, Germany, assignor to Josef Bautz GmbH, Saulgau, Wurttemberg, Germany

Filed Oct. 14, 1975, Ser. No. 621,659

Claims priority, application Germany, Oct. 16, 1974, 2449152

Int. Cl.^{2} B65G *53/40*

U.S. Cl. 302—34 **9 Claims**



1. A device for conveying particulate material entrained in a stream of a gaseous medium, particularly in an agricultural ejector, a combination comprising a housing having an interior; an elongated tubular conveying element having one end portion having a longitudinal axis and another end portion spaced from said one end portion and facing in a lateral direction relative to said axis; means for mounting said conveying element on said housing for angular displacement about said axis to thereby select said direction and including a planetary gear transmission including a first gear stationarily mounted on said housing, a second gear connected to said one end portion of said conveying element for sharing said angular displacement thereof, and at least one third gear meshing with said first and second gears and orbiting about said axis, said gear transmission being interposed between said housing and said conveying element; drive means for actuating said transmission; and means for advancing the gaseous medium with the particulate material entrained therein from said interior of said housing through said conveying element and out of said other end portion thereof in a selected direction.

4,033,629

AUTOMATIC FREIGHT CAR BRAKE APPARATUS WITH SPRING-APPLIED FLUID-PRESSURE-RELEASED HAND BRAKE

Williard P. Spalding, Penn Hills, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed June 9, 1976, Ser. No. 694,146

Int. Cl.^{2} B60T *13/04*

U.S. Cl. 303—2 **21 Claims**

1. In a vehicle combined fluid pressure and hand brake apparatus including a normally charged brake pipe, an auxiliary reservoir, an emergency reservoir and a fluid pressure operated brake control valve device operable responsively to variations of pressure in the brake pipe to effect fluid pressure brake applications and brake releases, said brake apparatus comprising:

a. fluid pressure operated means for effecting a brake application on the vehicle and a subsequent brake release responsive to operation of the brake control valve device to effect the supply of fluid under pressure from one or both of said reservoirs to said fluid pressure operated means and the release of fluid under pressure therefrom,

wherein the improvement comprises;

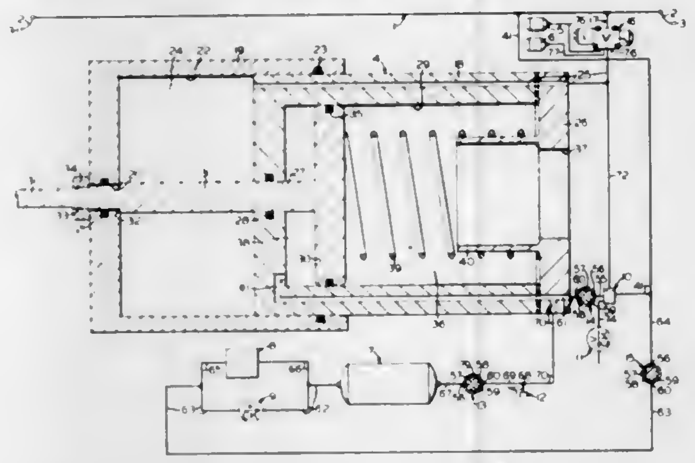
b. a brake release reservoir,

c. means for effecting charging of said brake release reservoir to a pressure higher than that in the normally charged brake pipe,

d. spring means for causing a brake application on the vehicle independently of the operation of the brake control valve device,

e. fluid motor means operable in response to the supply of fluid under pressure thereto to render said spring means ineffective to cause a brake application on the vehicle, and

f. means whereby fluid under pressure may be supplied to said fluid motor means from any one of a plurality of sources of fluid under pressure.



4,033,630

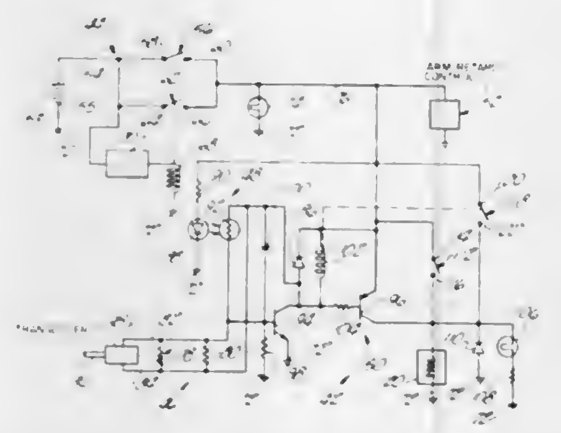
REMOTE CONTROL CIRCUIT FOR ELECTRIC TRAILER BRAKES

Harold C. Hubbard, Lansing, Mich., assignor to Motor Wheel Corporation, Lansing, Mich.

Filed Sept. 22, 1975, Ser. No. 615,234

Int. Cl.^{2} B60T *13/68, 13/74*

U.S. Cl. 303—7 **11 Claims**



1. In a tractor/trailer combination having a source of electrical energy wherein said tractor is equipped with a hydraulic brake system and said trailer is equipped with an electric brake system of the type in which brake torque is a function of electric current through an electromagnetic brake coil, a circuit for controlling said coil current comprising a hydraulic transducer operatively connected to said hydraulic brake system to provide an electronic first signal which varies as a function of hydraulic brake fluid pressure, amplifier means having an input and an output to apply said current from said energy source to said brake coils in proportion to said first signal, said input being operatively connected to said hydraulic transducer to receive said electronic first signal and said output being connected to said brake coils, current responsive means operatively connected between said source of electrical energy and said input of said amplifier means for electronically comparing said first signal to a first minimum threshold to provide a second signal when said first signal exceeds said first threshold, and means responsive to said second signal to provide a direct connection between said energy source and said brake coils independently of said amplifier means.

4,033,631

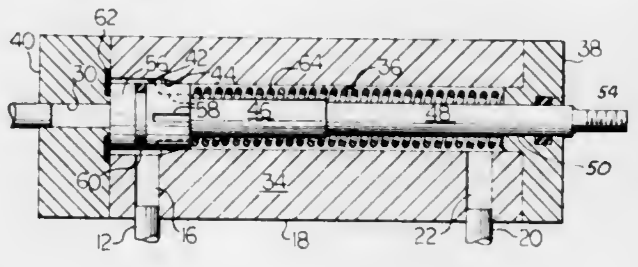
BRAKE CONTROL MECHANISM

David John Balzer, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 24, 1975, Ser. No. 634,951

Int. Cl.^{2} B60T *15/04*

U.S. Cl. 303—50 **7 Claims**



1. In a vehicle having a pressurized hydraulic system including a sump and a normally applied brake releasable by hydraulic pressure, a brake release mechanism comprising,

a valve

conduit means for communicating hydraulic fluid from a pressure source in the vehicle hydraulic system to said valve,

brake conduit means for communicating fluid from the valve to the vehicle brake,

exhaust conduit means for communicating fluid in the valve with the vehicle hydraulic system sump, and

a single control means for selectively operating the valve from a remote location on the vehicle,

wherein the valve comprises a valve body, a main bore provided in the valve body, an enlarged bore provided in the valve body at one end of the main bore, caps closing the ends of the main bore and the enlarged bore respectively, a spool slidably disposed within the main and enlarged bores having a stem portion extending through the cap closing the main bore and engaged by the control means, and a land portion disposed within the enlarged bore and adapted to abut the cap closing said enlarged bore, an exhaust port provided in said cap, seal means for sealing the exhaust port upon abutment of said cap by the land portion, spring means biasing the valve spool land portion against the seal means of the exhaust port so that it normally closes the exhaust port, an inlet port communicating with the enlarged bore, and an outlet port communicating the main bore and with the brake conduit means and slot means for communicating the enlarged bore and inlet port with the main bore and outlet port while the valve spool closed the exhaust port,

whereby the valve is operable by said control means to selectively communicate the pressure conduit means with the brake conduit means to release the vehicle brake, or with the exhaust conduit means to allow application of the normally applied brake, or to pressurize fluid in the valve and brake conduit in response to said control means to release the brake when pressurized hydraulic fluid is not available in the pressure conduit means.

4,033,632

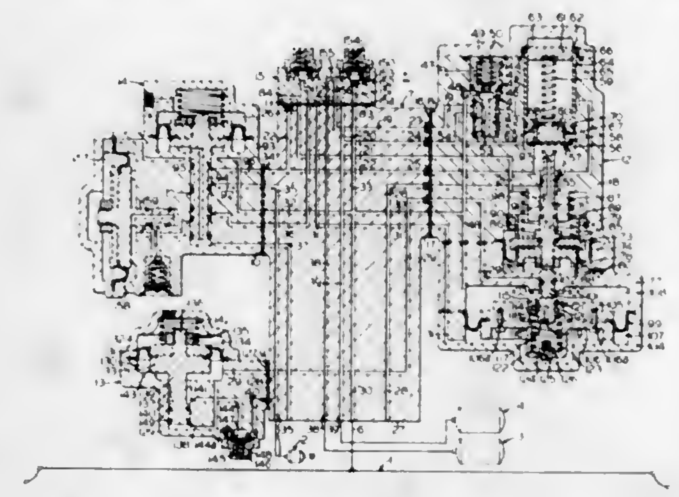
CONTROL VALVE DEVICE WITH CHANGE-OVER MEANS FOR DIRECT OR GRADUATED RELEASE OPERATION

Richard L. Wilson, Monroeville, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.

Filed Oct. 21, 1976, Ser. No. 734,393

Int. Cl.^{2} B60T *15/52*

U.S. Cl. 303—74 **12 Claims**



1. A fluid pressure controlled vehicle brake apparatus comprising, in combination:

a. a normally charged brake pipe, variations of the fluid pressure in which are effective to control brake applications and brake releases on the vehicle,

b. an auxiliary reservoir normally charged to the pressure carried in said brake pipe,

c. a second reservoir normally charged to the pressure carried in said brake pipe,

d. fluid pressure operated braking means for effecting a brake application on the vehicle,

e. a fluid pressure operated brake control service valve device comprising:

  i. valve means operable to effect the supply of fluid under pressure from said auxiliary reservoir to said fluid pressure operated braking means and the release of fluid under pressure from said fluid pressure operated braking means to atmosphere,

  ii. a stem coaxially arranged with respct to said valve means for effecting the operation thereof,

  iii. a first movable abutment subject on one side to the pressure of fluid in said brake pipe and subject on the opposite side to the pressure in one of said reservoirs, said first movable abutment being operatively connected to said stem to effect its movement in one direction in response to a reduction in brake pipe pressure on said one side relative to the pressure in one of said reservoirs on said opposite side to cause one end of said stem to operate said valve means to effect the supply of fluid under pressure from said auxiliary reservoir to said braking means to cause a brake application on the vehicle,

  iv. reservoir charging valve means carried on and so operable by said first movable abutment in response to said reduction in brake pipe pressure as to cut off charging of one of said reservoirs and in response to an increase in the pressure in said brake pipe to the pressure in one of said reservoirs to enable charging of one of said reservoirs,

  v. a second movable abutment that may be selectively subject on one side to the fluid under pressure supplied by said valve means to said braking means or to atmospheric pressure and subject constantly on the opposite side to atmospheric pressure, said second movable abutment being so connected to said valve stem as to, when subject on said one side to fluid under pressure supplied to said braking means, effect movement of said stem in a direction opposite said one direction in response to the force of fluid under pressure acting on said second abutment in said opposite direction slightly exceeding the fluid pressure force acting in said one direction on said first movable abutment to cause operation of said valve means to cut off flow of fluid under pressure from said auxiliary reservoir to said braking means without causing operation of said charging valve means to effect charging of one of said reservoirs, said first movable abutment being responsive to a subsequent increase in brake pipe pressure on said one side thereof to effect further movement of said stem in said opposite direction to cause said valve means to establish a venting communication whereby the fluid under pressure supplied to said braking means is released to atmosphere, and operation of said reservoir charging valve means to enable charging of one of said reservoirs, wherein the improvement comprises:

f. selectively positionable means that, while in one of two positions, enables said opposite side of said first movable abutment to be subject to the pressure in said auxiliary reservoir, and said one side of said second movable abutment to be subject to atmospheric pressure, thereby to enable said first abutment, in response to variations of brake pipe pressure on said one side thereof, to operate said brake control service valve device in the manner of a direct release control valve device, and, while in the other of its two positions, enables said opposite side of said first movable abutment to be subject to the pressure in said second reservoir, and said one side of said second movable abutment to be subject to the pressure in said fluid pressure operated braking means, thereby to enable said first and second abutments, in response to variations of brake pipe pressure on said one side of said first abutment, to operate said brake control service valve device in the manner of a graduated release control valve device.

4,033,633
FREQUENCY CONTROL, AND SENSING CIRCUIT

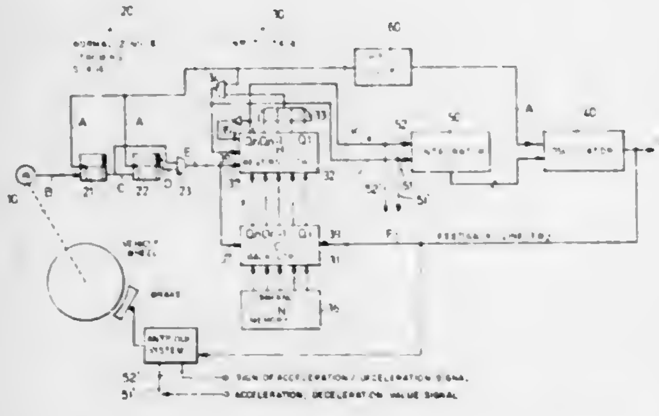
Norbert Miller, Stuttgart; Peter Jurgen Schmidt, and Bernd Przybyla, both of Schwieberdingen, all of Germany, assignors to Robert Bosch GmbH, Stuttgart, Germany

Filed Mar. 18, 1976, Ser. No. 668,296

Claims priority, application Germany, Mar. 22, 1975, 2512738

Int. Cl.^{2} B60T *8/08*

U.S. Cl. 303—97 **20 Claims**


10
21
22
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E
A
A
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60
40
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33
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N
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51'
52'
BRAKE
SIGN OF ACCELERATION / DECELERATION SIGNAL
ACCELERATION, DECELERATION VALUE SIGNAL

1. Frequency control circuit having an input signal (E) signal generating means (10, 20),
- means (36) providing a reference signal representative of a reference number (N),
- an input stage (30) having the input signal and the reference signal applied thereto,
- an oscillator (40) and an integrator (50) connected to and controlling the oscillation frequency of the ocillator. the output from the oscillator providing an output signal being fed back to the input stage (30) to provide, cyclically, an error signal to the integrator (50) by comparison in the input stage of said output signal with the reference signal and the input signal,

wherein the input stage comprises
- means (31) connected to and controlled by the oscillator (40) determining the number of oscillations of the output signal from the oscillator (40) within a predetermined time period (T), said oscillation number determining means being further connected to and controlled by said reference means (36) and determining the difference (Z1, Z2) between said number of oscillations within the predetermined time period (T) and the reference number (N), and providing said error signal (J, K) representative of said difference upon elapse of said time period.

4,033,634
ANTISKID CONTROL DEVICE FOR VEHICLES

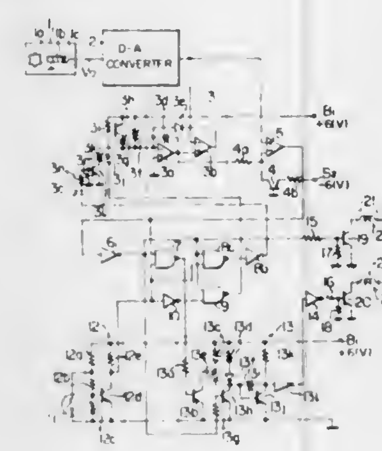
Hiroshi Arai, Toyota; Takahiro Nogami, Susono; Akio Sugiura, Nagoya; Atutoshi Okamoto, Toyohashi, and Koichi Toyama, Kariya, all of Japan, assignors to Nippondenso Co., Ltd, Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed June 18, 1975, Ser. No. 588,173

Claims priority, application Japan, June 28, 1974, 49-74661

Int. Cl.^{2} B60T *8/02*

U.S. Cl. 303—103 **8 Claims**



3. An antiskid control device for vehicles comprising:
- means for detecting the locking condition of a wheel upon braking to generate a release signal,
- a timer circuit for generating a timing signal having a predetermined time duration in synchronism with the extinction of the release signal from said detecting means,
- braking pressure modulating means decreasing the braking pressure on the wheel in response to the release signal from said detecting means, and rapidly increasing the pressure reapplication rate of the braking pressure at the initial stage of the pressure reapplication in response to the timing signal emitted from said timer circuit upon extinction of the release signal, and
- correcting means including sensor means for detecting a vehicle body deceleration upon braking and acting on said braking pressure modulating means to increase the pressure reapplication of the braking pressure when the vehicle body deceleration has a large value.

4,033,635
ELECTRONIC CONTROL DEVICES APPLICABLE TO ANTI-SKID EQUIPMENT IN AUTOMOBILE VEHICLES

Jose Maria Tarrafeta Montoya, Madrid. Spain, assignor to Fabrica Espanola Magnetos, S.A., Madrid, Spain

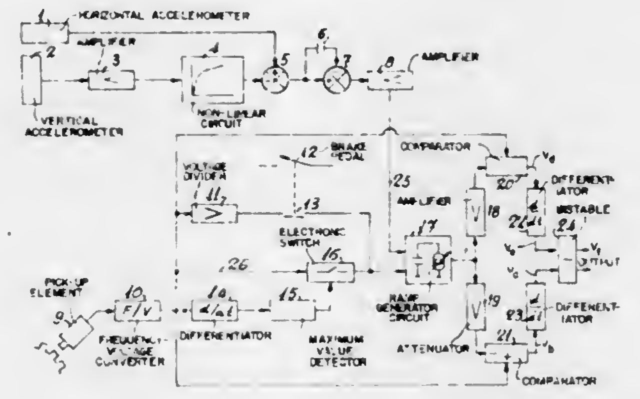
Continuation of Ser. No. 515,496, Oct. 17, 1974, abandoned.

This application Apr. 1, 1976, Ser. No. 672,774

Claims priority, application Spain, Mar. 13, 1974, 424230

Int. Cl.^{2} B60T *8/10*

U.S. Cl. 303—109 **1 Claim**



1. An electronic control device applicable to anti-skid equipment in automobile vehicles, said device comprising;
- elements for maintaining each wheel of a vehicle at an optimum value of slip for which road surface to wheel adherence is at a maximum level, a velocity corresponding to said slip value being obtained from a first unit generating a signal corresponding to an acceleration of the vehicle and a second unit generating a signal corresponding to the velocity of the wheel at an instant in which the acceleration of the wheel is at a maximum value with its brake released;
- means for generating a signal corresponding to a deceleration of the vehicle comprising a longitudinal accelerometer and a corrector circuit for eliminating any errors due to road slope;
- means for generating a signal corresponding to the velocity of the wheel;
- means for generating a comparison signal representative of the velocity corresponding to the optimum value of slip from the deceleration of the vehicle, said comparison signal being corrected to a value of the optimum slip level in each reacceleration of the wheel by means of a differentiator and a detector of maximums;
- means for comparing the velocity of each wheel with a comparison signal, and according to a result thereof, applying and releasing the brake pressure of said wheel as required; and
- means for changing the comparison signal depending upon the response of the brake actuator of the vehicle.

4,033,636
VEHICLE ANTI-SKID BRAKING APPARATUS

Anthony P. R. Rolt, Stratford-on-Avon, and Frederick J. Walker, Banbury, both of England, assignors to Harry Ferguson Limited, England

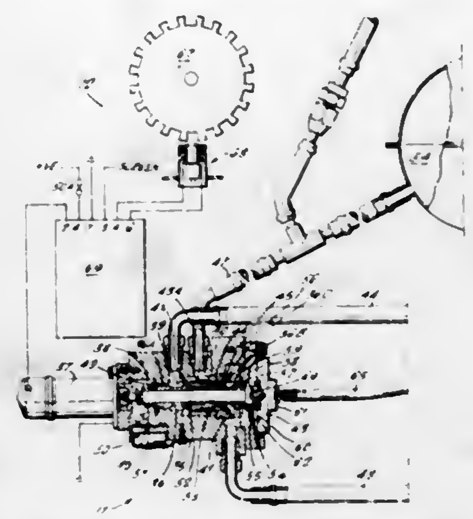
Filed Aug. 7, 1975, Ser. No. 602,920

Claims priority, application United Kingdom, Aug. 22, 1974, 36861/74

Int. Cl.^{2} B60T *8/08*

U.S. Cl. 303—114 **3 Claims**

1. An anti-skid braking apparatus for a vehicle, the apparatus comprising a booster including a first actuator element operable in one direction to provide a brake-assisting force to assist a driver's braking effort and a second actuator element operable in an opposite direction to provide a brake-opposing force to oppose a driver's braking effort, switching means for actuating the second actuator element, an anti-skid sensor device for actuating the switching means and wherein the second actuator element includes means for causing the maximum brake-opposing force to always be greater than the maximum brake-assisting force.



4,033,637
ANTI-LOCK REGULATING SYSTEM

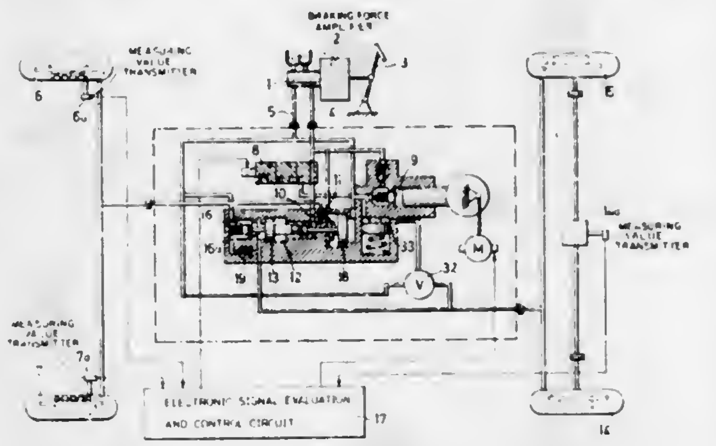
Heinz Leiber, Leimen, Germany, assignor to Teldix GmbH, Heidelberg, Germany

Filed Dec. 17, 1975, Ser. No. 641,758

Claims priority, application Germany, Dec. 18, 1974, 2459775

Int. Cl.^{2} B60T *8/06*

U.S. Cl. 303—115 **13 Claims**


BRAKING FORCE AMPLIFIER
2
3
1
5
6
6a
7a
8
9
10
12
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14
15
16
17
18
19
32
33
V
M
MEASURING VALUE TRANSMITTER
MEASURING VALUE TRANSMITTER
MEASURING VALUE TRANSMITTER
ELECTRONIC SIGNAL EVALUATION AND CONTROL CIRCUIT

1. In an anti-lock regulating system for brakes associated with wheels, having a first brake circuit including the brake of at least one wheel; a braking pressure regulating device for regulating the braking pressure when the wheels have a tendency to lock; a hydraulic braking pressure generator means coupled to the first brake circuit through the braking pressure regulating device; the improvement comprising
- a. a second brake circuit including the brake of at least one other wheel;
- b. a hydraulic control valve connecting said second brake circuit with said hydraulic braking pressure generator means; said hydraulic control valve having a normally open position and a closed position;
- c. a control piston having opposite first and second faces;
- d. means for exposing said first face of said control piston to a pressure P_R' which is dependent from the braking pressure P_R prevailing in said second brake circuit;
- e. means defining a control chamber bounded by said second face of said control piston;
- f. a throttle means connecting said braking pressure regulating device with said control chamber;
- g. means for exposing said second face of said control piston to a pressure P_{St}' which is dependent, through said throt-

tle means, from the pressure P_{St} as set by said braking pressure regulating device;

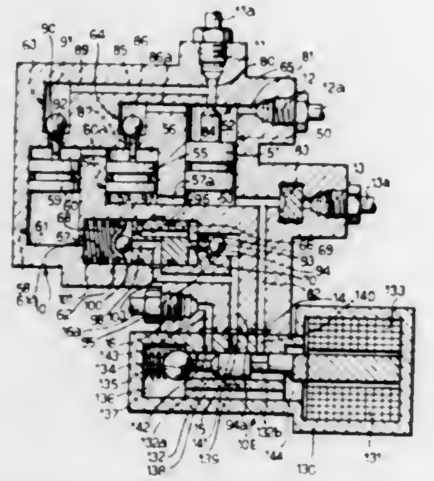
h. means connecting said control piston with said hydraulic control valve; said control piston, in response to a predetermined ratio P_R'/P_{St}' on said faces, being displaced for first closing said control valve and subsequently, as a result of a continuing displacement, effecting an increase in the volume accommodating hydraulic fluid between said hydraulic control valve and the wheel brake of said second brake circuit;

i. a bypass conduit connecting the hydraulic braking pressure generator means with said second brake circuit with the circumvention of said hydraulic control valve;

j. a bypass valve in said bypass conduit for controlling the same; and

k. means for normally maintaining open said bypass valve and for closing said bypass valve for duration of braking pressure regulation, whereby a more rapid pressure buildup in said second brake circuit is effected when said bypass valve is open.

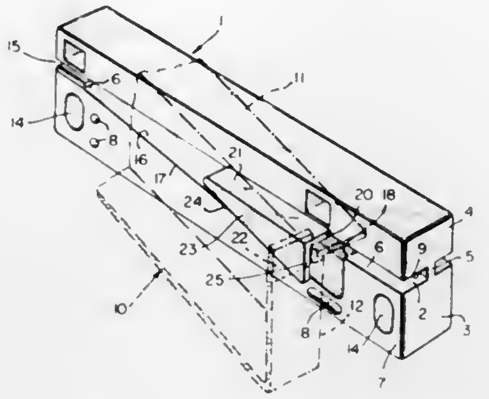
4,033,638
HYDRO-DYNAMIC ANTI-SKID BRAKING SYSTEMS
Antonino Bertone, Sant'Antonino (Vercelli); Enrico Rivetti, and Maurizio Cattaneo, both of Turin, all of Italy, assignors to Fiat Societa per Azioni, Turin, Italy
Filed Oct. 28, 1976, Ser. No. 736,637
Claims priority, application Italy, Nov. 7, 1975, 69751/75
Int. Cl.² B60T *8/10*
U.S. Cl. 303—116 **7 Claims**



1. In a hydro-dynamic anti-skid braking system, for motor vehicles, of the type comprising:
a master cylinder,
a brake pedal controlling said master cylinder,
a plurality of brake actuators at least one for each wheel of the vehicle,
a reservoir of brake fluid,
a modulating valve controlled by said brake pedal,
a volumetric pump operating to circulate brake fluid from said brake fluid reservoir through said modulating valve controlled by said brake pedal and back to said reservoir,
at least one hydraulic distributor having a solenoid valve and first, second, third and fourth ports,
means connecting said first port to said master cylinder,
means connecting said second port to said brake actuators of at least some of the wheels of said vehicle,
means connecting said third port to the output side of said volumetric pump, and
means connecting said fourth port to said reservoir,
sensor means associated with each of said wheels of said vehicle, operating to detect the speed of said wheels and producing respective output signals,
a processing circuit,
means feeding said output signals from said sensor means to said processing circuit which produces an output signal whenever any of the said wheels of said vehicle is in a skid or incipient skid state,
means feeding said output signal to said solenoid valve of said hydraulic distributor whereby to energise said solenoid valve whenever one of said wheels of said vehicle is in a skid or incipient skid state, whereby to control said distributor to release the brakes when a skid or incipient skid is detected,
the improvement wherein,
said hydraulic distributor comprises a body having first, second and third transfer ports communicating with said solenoid valve which acts to connect said first and second transfer ports together when de-energised and to connect said second and third transfer ports together when energised, said hydraulic distributor body also having:
a first cavity, a first piston in said first cavity separating it into a first chamber communicating with said first and second ports and a second chamber communicating with said third port and with said first transfer port,
a second cavity,
a second piston in said second cavity separating it into first and second chambers,
a first control valve connecting said first chamber of said second cavity with said first chamber of said first cavity, said second chamber of said second cavity communicating with said second chamber of said first cavity,
a third cavity,
a second control valve,
control means,
a third piston in said third cavity separating it into first and second chambers the first communicating with both said first chamber of said second cavity and, via said second control valve with said first port, and the second communicating with said second transfer port via said control means which permit a controlled flow of fluid from said second chamber of said third cavity through said second and third transfer ports to said fourth port when said solenoid valve is energised,
a projection on said first piston serving as a shutter to close communication between said first port and said first chamber of said first cavity when the pressure in said first chamber of said first cavity is lower than the pressure in said second chamber of said first cavity, said first and second control valves acting to prevent the flow of fluid into said first chambers of said second and third cavities respectively when the pressure in these is higher then the pressure in said second chambers of said second and third cavities respectively.

4,033,639
DRAWER SLIDE
Roland A. Benoit, and Richard H. Duprey, both of Danielson, Conn., assignors to Interroyal Corporation, New York, N.Y.
Filed Oct. 20, 1975, Ser. No. 624,200
Int. Cl.² F16C *21/00*
U.S. Cl. 308—3.6 **15 Claims**

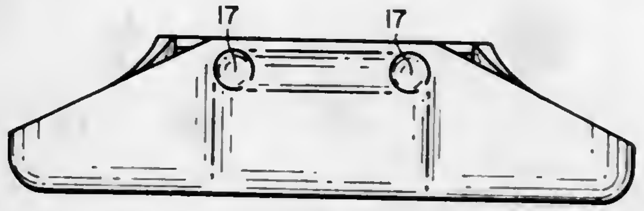
1. Drawer slide for holding a draw against unintentional removal comprising:
a track for guiding the drawer during inward and outward movement,
said track being interrupted in the vicinity of its outward end by a depressed track section having a downwardly inclined track portion in the direction of inward drawer movement, and
a cooperating offset drawer stop operatively positioned out of the path of the track and extending into the path of the drawer and situated at a level sufficiently above the depressed track section to permit the drawer upon inward and outward movement to be intentionally correspondingly downwardly tilted at said depressed track section to clear said stop yet hold the drawer upon normal outward movement against unintentional removal by otherwise abutment with said stop.



4,033,640
SEAL BEARING APPARATUS
Juan A. Garcia, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Division of Ser. No. 562,691, March 27, 1975. This application July 20, 1976, Ser. No. 707,132
Int. Cl.² F16C *17/00*
U.S. Cl. 308—4 A **6 Claims**

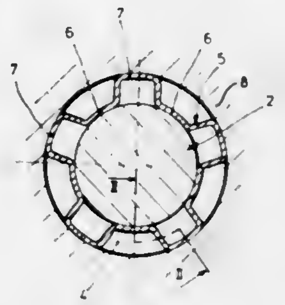
1. A balanced pressure, sealed bearing apparatus, comprising:
a. a plurality of balls;
b. an upper hard metallic race;
c. a lower hard metallic race;
d. an upper shoulder abutting said upper race fabricated of a metal which is softer than said upper race;
e. a lower shoulder abutting said lower race fabricated of a metal which is softer than said lower race;
f. a seal sleeve closing off and defining a space for sealing lubricant about the interior of said bearing, and
g. a lower seal assembly having a plurality of movable seals which are pressure responsive to balance internal bearing pressure with the ambient external pressure.

4,033,641
FLANGE MOUNT
Earl S. Cain, Portola Valley; Jerome A. Carlson, Woodside, and George E. Goodrich, San Carlos, all of Calif., assignors to Tribotech, Redwood City, Calif.
Filed Mar. 5, 1976, Ser. No. 664,164
Int. Cl.² F16C *13/00, 35/00, 39/00*
U.S. Cl. 308—15 **8 Claims**



1. A flange mount including a flange plate, a bearing receiving flange extending outwardly from one face thereof and adapted to receive and hold a bearing therein, the other face of said flange plate defining a mounting surface substantially perpendicular to the axis of said bearing receiving flange for mounting the flange on a supporting surface, the edges of said flange plate being bent in the same direction as the bearing receiving flange to stiffen the mounting plate with portions of said bent edges extending to and engaging the end of the bearing receiving flange.

4,033,642
SHAFT MOUNTING APPARATUS
Ulrich Sorgatz, Wolfsburg, and Hans-Jurgen Kogge, Fallersleben, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Germany
Filed Feb. 18, 1976, Ser. No. 659,114
Claims priority, application Germany, Feb. 20, 1975, 2507253
Int. Cl.² F16C *27/00*
U.S. Cl. 308—26 **8 Claims**

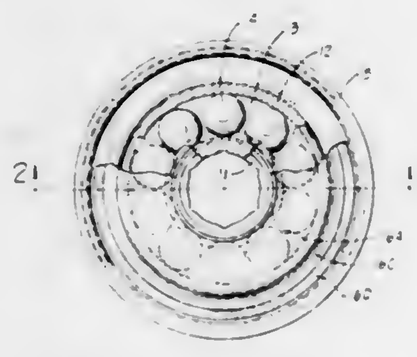


1. An apparatus for mounting an extended shaft, having a selected range of operating frequencies and a natural resonant vibrational frequency, to a support structure, comprising:
at least one bearing supporting said shaft arranged between said structure and said shaft, and having bearing play;
a support collar, on said structure, having an interior surface concentric to said shaft;
and means, permanently resilient in all radial directions, mounted between said shaft and said surface, for shifting the resonant frequency of said shaft to a frequency above said operating frequency range.

4,033,643
BALL BEARING ASSEMBLY WITH DUST SHIELD
Donald A. Miller, Sterling, Ill., and William O. Setele, Independence, Ohio, assignors to Kendale Industries, Inc., Valley View, Ohio
Filed June 25, 1976, Ser. No. 700,016
Int. Cl.² F16C *33/80*
U.S. Cl. 308—187.2 **5 Claims**

1. In a bearing assembly for a roller conveyor, the assembly including an outer housing adapted to engage in the open end

portion of a conveyor tube for providing bearing support for the tube, an outer race member mounted to and within the said housing concentrically thereof, an inner race member concentrically in spaced relationship to said outer race member, said inner race member having an annular groove formed in its outer circumferential surface thereof adjacent a first axial end thereof away from said outer race member, and a plurality of ball bearings arranged in a circle between the inner and outer race members to provide bearing interengagement therebetween, the improvement of a cup-shaped dust shield of material having the strength and rigidity to be self-sustaining in mounted position and having a degree of flexible yieldability required for mounting to the assembly in the position herein claimed, said material being selected from the group consisting of polyethylene, nylon and Teflon, said dust shield having an outer portion disposed adjacent said first axial end of the assembly, said outer portion having an inner edge portion disposed in said annular groove in the inner race member and firmly held therein to support the shield in position, said shield having an axially and radially portion extending at an angle from said outer portion and spaced radially outward of said outer race member to clear the same, said shield having a circumferential outer edge portion adjoining the innermost portion of the said shield extending away from said outer race member and spaced from said housing to clear the same, whereby said shield is fixed to said inner race member and free of frictional contact with said outer race member sand housing, said shield being sufficiently rigid to be self sustaining for support in the described position and being sufficiently resiliently yieldable to permit the shield to be pressed upon said inner race member and for said inner edge portion of the shield to clear the inner race member and to enter said annular groove.



4,033,644
METHOD FOR PRELOADING BEARING

Josef Reneerkens, Bensberg-Refarth, Germany, assignor to Ford Motor Company, Dearborn, Mich.

Filed July 19, 1976, Ser. No. 706,335

Claims priority, application Germany, July 19, 1975, 2532370

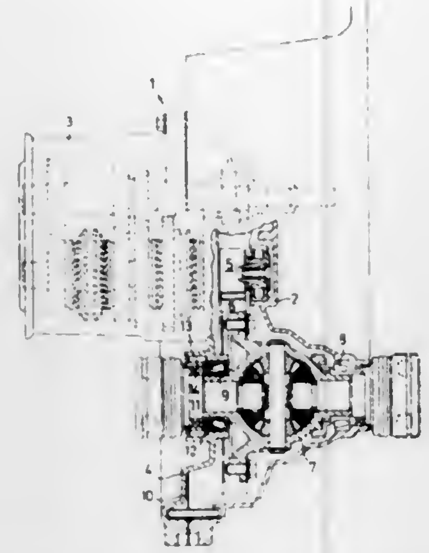
Int. Cl.² F16C *25/00*

U.S. Cl. 308—207 A **8 Claims**

1. A preloaded bearing construction comprising a housing, a member rotatable relative to said housing and a bearing interposed between said member and said housing;

a spring engaging a portion of said bearing and exerting a preload force upon said bearing:

an elastomeric plastic material disposed about a portion of said spring constructed to limit deflection of said spring in the direction opposite to the direction in which it exerts its preload force.



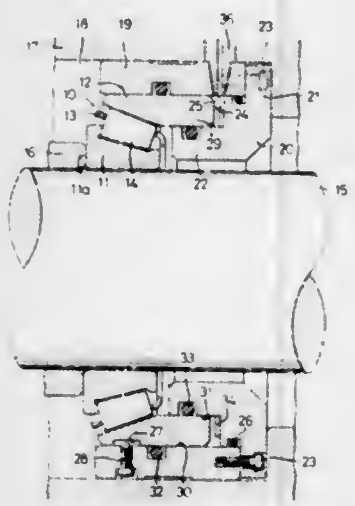
4,033,645
BEARING DEVICE

Tomio Yamada, Nara, Japan, assignor to Koyo Seiko Company, Limited, Osaka, Japan

Filed Apr. 26, 1976, Ser. No. 680,504

Int. Cl.² F16C *35/06*

U.S. Cl. 308—207 A **5 Claims**



1. A device including a preload-adjustable roller bearing adapted to carry a radial load and a thrust load at the same time, the device comprising:

a sleeve-like outer member to be fixedly fitted in a bore of a housing,

an annular inner member of L-shaped section having a flange secured to one end of the outer member, the inner member providing an annular pressure chamber between the outside peripheral surface of its cylindrical portion and the inside surface of the outer member for receiving a pressure fluid,

an outer ring constituting the bearing and fitted in the outer member in contact with the inside surface thereof slidably only in an axial direction thereof, the outer ring having a cylindrical portion axially integrally extending from its one end having a smaller inside diameter, the outer ring having its cylindrical portion slidably fitted in the pressure chamber so as to be subjected directly to the pressure of the fluid,

sealing means oiltightly sealing a clearance between the outside surface of the outer ring and the inside surface of the outer member in sliding fitting contact with each other,

sealing means oiltightly sealing a clearance between the inside surface of the cylindrical portion of the outer ring and the outside surface of the cylindrical portion of the inner member in sliding fitting contact with each other, and

guide means for permitting sliding movement of the outer ring only in the axial direction thereof.

4,033,646
ROLLER BEARING WITH ROTATABLE GUIDE CAGE

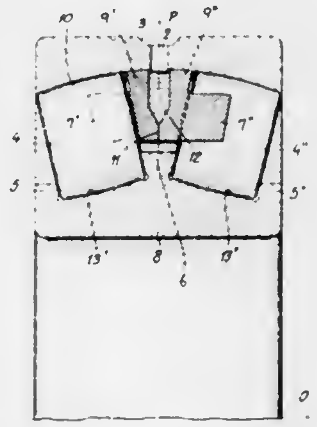
Franz Lang, Stadtlauringen, and Erwin Dees, Kutzberg, both of Germany, assignors to Kugelfischer Georg Schafer & Co., Schweinfurt, Germany

Filed Mar. 21, 1975, Ser. No. 560,704

Claims priority, application Germany, Mar. 21, 1974, 2413612

Int. Cl.² F16C *19/00*

U.S. Cl. 308—218 **8 Claims**



1. A journal bearing comprising:

an inner race with an outer peripheral surface and an outer race with an inner peripheral surface centered on a common axis, said races being symmetrical about a midplane transverse to said axis;

two sets of bearing rollers symmetrically disposed on opposite sides of said midplane in contact with said peripheral surfaces; and

an annular cage bisected by said midplane and rotatably guided on said inner peripheral surface, said cage being provided with lateral projections interleaved with the rollers of both said sets, said outer race being provided at said midplane with a radial inlet bore for lubricant, said cage having an outwardly open peripheral groove wider than said bore and in continuous communication therewith, said peripheral groove registering with an end of said bore opening onto said inner peripheral surface.

4,033,647
TANDEM THRUST BEARING

John Andrew Beavers, Tulsa, Okla., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Mar. 4, 1976, Ser. No. 663,650

Int. Cl.² F16C *19/04*

U.S. Cl. 308—227 **6 Claims**

1. A tandem thrust bearing arrangement comprising:

a housing means;

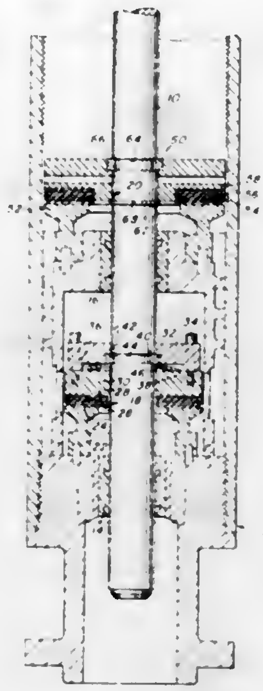
a substantially vertical shaft journaled for rotation in said housing means and having a load imposed thereon;

independently mounted lower and upper thrust bearing means operatively associated with said shaft;

said lower thrust bearing means being so constructed and arranged to carry a first part of said imposed load;

said upper thrust bearing means being so constructed and arranged to carry imposed load in excess of said first part thereof;

said lower and upper thrust bearing means permitting full loading of said shaft in a limited spacial relationship.



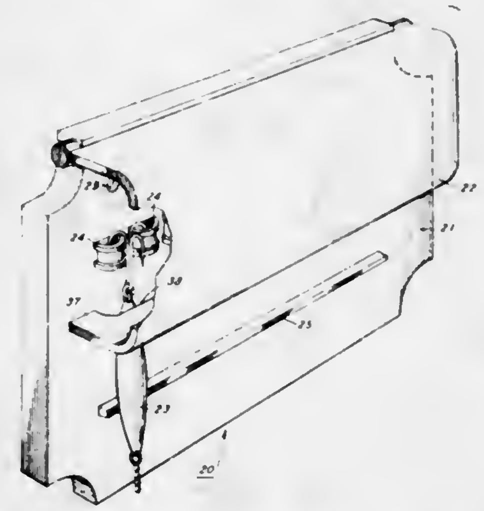
4,033,648
FISHING LURE RACK

Oscar E. Lopez-Cepero, 1700 Broadridge Ave., Stratford, Conn. 06497

Filed Jan. 26, 1976, Ser. No. 652,481

Int. Cl.² A47B *67/02*; **A47F** *5/08*

U.S. Cl. 312—100 **2 Claims**



1. A fishing lure storage-display and holding rack for visibly mounting a plurality of lures on a supporting wall, comprising:

A. a wall-plate member incorporating mounting means for removably mounting said wall-plate member to a suitable securing wall;

B. a plurality of retaining members mounted to said plate in at least one aligned row for securely retaining portions of fishing lures, with the remainder of the lure depending vertically therefrom, with the fishing lures fully displayable;

C. a spacer bar mounted to said rack below said retaining rings and substantially parallel thereto, for maintaining the vertically depending fishing lures spaced away from said plate for easy removal therefrom; and

D. a cover member:

   a. pivotably secured to said rack and movable from a first open position, exposing the retaining rings for lure removal therefrom, to a second closed position surrounding and substantially completely enclosing the barb portions of any fishing lures mounted on said plate with the decorative portion of the fishing lure non-enclosed and fully viewable, and

b. incorporating a lower edge having
  1. a lure contact portion positioned for co-operation with the spacer bar for maintaining stored fishing lures gripped between the spacer bar and the contact portion, retained on the rack in a secured position, and
  2. a rack abutting portion positioned for contact with the front surface of the wall-plate member and spaced away from the lure contact portion for assuring optimum positioning of the lure contact portion for secure tension without injuring the fishing lure decorative surfaces;

whereby said fishing lures are fully displayable and securely retained on said fishing lure display storage and holding rack for both esthetics and accessability.

4,033,649
ELECTRICALLY-OPERATED SHIFTABLE ARTICLE STORAGE DEVICE

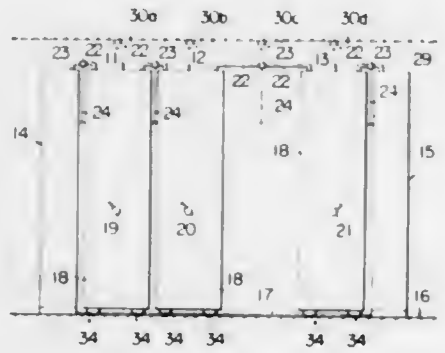
Hanichiro Naito, and Tsuneo Yamaguchi, both of Tokyo, Japan, assignors to Elecompack Company Limited, Tokyo, Japan

Filed Mar. 31, 1975, Ser. No. 563,838

Claims priority, application Japan, Apr. 2, 1974, 49-37174; Dec. 27, 1974, 50-148665

Int. Cl.² A47B *53/00;* **B65G** *47/00*

U.S. Cl. 312—201 **15 Claims**



1. An electrically-operated article storage device comprising

a plurality of shiftable article storage units, each of said units having a face disposed opposite to a face of an adjacent unit and being movable relative to an adjacent unit to form an individual article handling aisle therebetween;

a reversible drive motor mounted on each said article storage unit for moving said respective unit in a direction normal to said face thereof;

a control switch means disposed on each said article storage unit and interconnected to said drive motor on said respective unit for selectively rotating said drive motor in a normal direction and a reverse direction;

a regulating means disposed on each said article storage unit forming an aisle between an article storage face thereof and an article storage face of an adjacent unit facing each other on opposite sides of said aisle, each respective regulating means being operable to detect shifting movement of one of said storage units forming said aisle toward and away from the adjacent unit and being interconnected to a respective drive motor on said one unit to deactivate said drive motor in response to a movement of said one unit proximate the adjacent unit; and

confirmation switch means disposed for each said article handling aisle at a position at which the state of said article handling aisle can be readily confirmed, each said confirmation switch means being interconnected with a respective drive motor to permit activation of said motor in response to activation of said confirmation switch means, whereby shifting movement of one or more of said article storage units to form a new article handling aisle is permitted only when said confirmation switch means associated with an already existing article handling aisle is actuated.

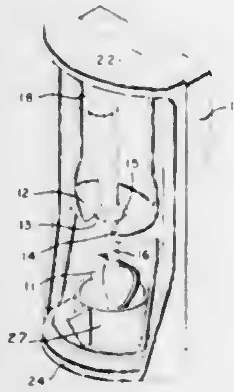
4,033,650
SANITARY BRUSH ASSEMBLY

Tacko D. Alissandratos, P.O. Box 606, Tarpon Springs, Fla. 33589

Continuation-in-part of Ser. No. 363,580, May 24, 1973, abandoned. This application Feb. 5, 1976, Ser. No. 655,568

Int. Cl.² A46B *17/00*

U.S. Cl. 312—206 **5 Claims**



1. A wall-mounted enclosure device for a sanitary brush useable in cleaning toilet bowls and the like, which comprises:

a recessed receptacle having top and bottom walls closing the ends of the receptacle;

a recessed door arranged for limited vertical movement and rotatably supported by and connected to the ends of the receptacle by an upper and a lower pivotal mounting therebetween, said door being pivotable between an open position wherein the door recess faces in the same direction as the receptacle recess, and a closed position wherein the door recess is opposed to the receptacle recess;

a single shelf rigid with said door and extending across the recess therein substantially medially thereof, said shelf defining a slot extending inwardly thereof from an outer edge of the shelf, in which the brush handle may be seated to suspend the brush from the shelf into a lower portion of the door recess;

closing spring means;

means cooperative with said receptacle for retaining the door in its open position against a closing force exerted on the door by the closing spring means, which include

an arcuate channel defined by the bottom wall of the receptacle, facing a bottom surface of the door, and concentric with the lower pivotal mounting of the door, said bottom wall also defining a raised protrusion in the channel adjacent one end of the channel,

a slide member attached to the bottom surface of the door, arranged to slide in the arcuate channel as the door is rotated about its pivotal mountings, so that the slide member is disposed at one end of the channel when the door is open, and at the other end of the channel when the door is closed, the door being displaced upward as the slide member traverses the raised protrusion in the channel, and the raised protrusion acting on the slide member to hold the door in its open position against the force of the closing spring means until the door is manually rotated toward its closed position and the slide member again traverses the raised protrusion, whereupon the closing spring means returns the door to its closed position.

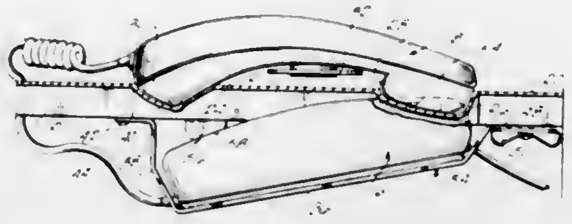
4,033,651
DESK MOUNTING FOR TELEPHONE

Albert O. England, Jr., 5225 Gould Ave., La Canada, Calif. 91011

Filed Mar. 29, 1976, Ser. No. 671,330

Int. Cl.² A47B *83/00;* **A04M** *1/02*

U.S. Cl. 312—237 **2 Claims**



1. Apparatus for providing a desk-top mounting of a phone of the type having a cradle and handset removably resting on the cradle when not in use, the handset having a dial between the pickup and earpiece ends of the handset, the cradle having a shutoff button projecting therefrom in a position to be engaged and depressed by the handset when placed on top of the cradle, comprising a flat supporting panel adapted to be mounted flush with the desk top, the panel having an elongated opening therein, a thin plastic sheet overlying the top surface of the panel and the elongated opening, the sheet having a pair of integrally formed spaced depressions formed therein extending into said opening, the depressions being adapted to receive the pickup and earphone ends respectively of the handset, one of said depressions having a small opening through the sheet for receiving the shutoff button of the cradle, a bracket detachably secured to the underside of the panel for supporting the cradle of the phone, the bracket holding the cradle at an acute angle to the panel with the portion having the shutoff button extending up into said opening in the panel adjacent one end of the elongated opening and with only the shutoff button projecting up through the opening in the plastic sheet, whereby the handset, when positioned in said depressions, engages the shutoff button, and a positioning bar secured to the under side of said panel and extending across the elongated opening adjacent the other end, the bar having a surface engaging the top of the cradle to clamp the cradle between the supporting bracket and the bar.

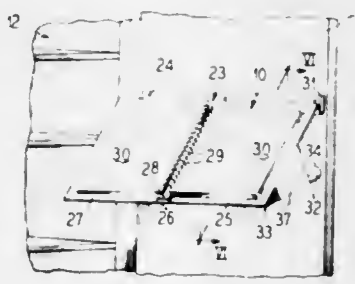
4,033,652
BOOK DESK

John F. O'Brien, Downers Grove, Ill., assignor to The Mercy Hospital and Mercy Orphan Asylum of Chicago, Chicago, Ill.

Filed Dec. 8, 1975, Ser. No. 638,296

Int. Cl.² A47B *63/00*

U.S. Cl. 312—245 **4 Claims**



1. In a patient's supply cabinet for a hospital bedroom having doors opening to a corridor outside the room and to the interior of the room with shelves between the doors, the improvements of a patient's record book adapted to be stored on one of said shelves, said book having a side backing, front and back covers hinged to said side backing, and pages removably mounted on said side backing between said covers adapted to receive writing on both the front and back sides thereof, an elongated horizontal upwardly opening channel strip mounted on the inner face of at least one of the doors of said cabinet, a cooperating downwardly opening channel strip on both covers of the book interfitting with said upwardly opening channel strip to suspend the book from the door in an open position with the covers of the book in a flat plane for selectively supporting the front and back sides of the pages, a prop flap hinged to a cover of the book for underlying said cover and having a free end edge for engaging the door from which the book is suspended to project the book from the door in a flat planar open position for comfortable writing on both sides of the pages.

4,033,653
UNIVERSAL SPEAKER STAND

Lawrence C. Doring, and Robert E. Williams, Jr., both of Memphis, Tenn., assignors to Support Systems, Inc., Memphis, Tenn.

Filed Aug. 29, 1975, Ser. No. 609,084

Int. Cl.² A47B *91/00;* **F16M** *11/38*

U.S. Cl. 312—253 **10 Claims**

1. A stand adaptable for elevating any one of a variety of different size speaker cabinets to an optimum height above a planar supporting surface, said stand comprising a plurality of upright uniform legs having predetermined lengths commensurate with the optimum height in which the speaker cabinet is intended to be elevated above the planar supporting surface, each of said legs including a horizontally extending arm member fixedly attached thereto, said plurality of legs being arranged with said arm members thereof reaching inwardly toward one another, a horizontally disposed member engaging said arm members, each of said legs including a horizontally disposed means to establish an acme resting surface defining the upwardly directed surface of said leg for restingly engaging in a conterminous portion of the lowermost horizontal surface of the speaker cabinet, and adjustable attachment means for attaching each of said arm members to said horizontally disposed member at any one of several different locations, said adjustable attachment means including means for selectively positioning each of said legs inwardly generally towards the other of said legs and outwardly generally away from the other of said legs and for selectively positioning each of said legs in one of a plurality of positions with each of said horizontally extending arm members extending outward of said horizontally disposed member at the same angle relative to the other arm member in each of the plurality of positions and with the distance between any adjacent pair of legs being variable independently of the distance between any other adjacent pair of legs for placement of said legs in at least several positions to enable said plurality of legs to restingly support any one of a variety of speaker cabinets of different widths and legths of said lowermost horizontal surface thereof.

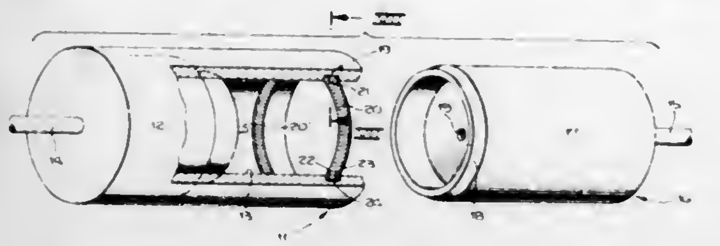
4,033,654
ELECTRICAL CONNECTOR

Harold B. Ross, Canoga Park, Calif., assignor to Automation Industries, Inc., Century City, Calif.

Filed July 29, 1976, Ser. No. 709,584

Int. Cl.² H01R *13/34*

U.S: Cl. 339—143 R **2 Claims**



1. In an electrical connector including a first connector member adapted to mate with a second connector member, the combination of:

said first connector member having a cylindrical wall including internal cylindrical surfaces,

a radially inwardly facing groove in said internal cylindrical surface,

said groove having a bottom wall of selected diameter and side walls spaced apart a selected distance;

said second connector member having an external cylindrical surface having an outer diameter to provide a close sliding fit with said internal cylindrical surfaces and having a beveled leading edge;

and a continuous helical spring formed in a closed circular loop, retained in said groove, and held against movement in axial and radially outward directions by said walls of said groove;

the outer circumference of said circular loop being seated against said bottom wall of said groove,

the inner circumference of said circular loop being less than the outer circumference of the external cylindrical surface on said second connector member,

said continuous helical spring having helical coils each having an outer diameter to closely fit within said groove with sliding contact with said side walls and bottom wall,

said continuous helical spring loop being non-compressible in an axial direction and being subject to forces in a radial outward direction when said second connector member is mated with said first connector member,

whereby said helical coils are displaced in a circumferential direction into a greater slant relation with the outer circumference of the circular loop during such mating of the connector members to close space between adjacent helical coils to provide an effective shield against RFI and EMI transmission,

and whereby the radial outward forces acting on said helical coils during relative sliding movement of the connector members causes wiping contact of the coils with side walls and bottom wall of the group and with said external cylindrical surface of said second connector member.

4,033,655
GROUNDABLE LAMP RECEPTACLE

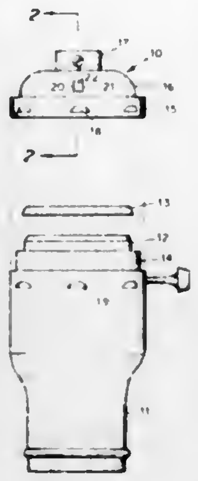
William Sewell, 205 Outer Drive, Oak Ridge, Tenn. 37830

Filed Aug. 30, 1976, Ser. No. 719,067

Int. Cl.² H01R *3/06*

U.S. Cl. 339—14 R **5 Claims**

1. An improved lamp receptacle of the type wherein a thin metallic shell and base substantially surround a socket for receiving an end of a lamp, the base being provided with a flange for releasible engagement with the shell and a domed cap terminating in a central hub attached to the flange, the improvement comprising a crimpable inwardly deformed connector within the cap for receiving a ground wire, the connector being formed from a part of the cap.



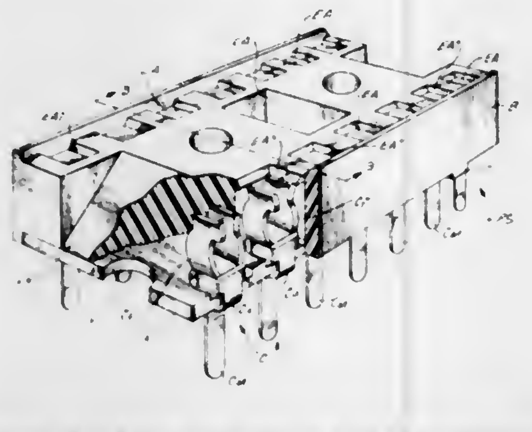
4,033,656
LOW PROFILE INTEGRATED CIRCUIT SOCKET

Eugene G. Freehauf, Ontario; Gene C. Hollingsworth, Cerritos, and David Edward Welsh, Fullerton, all of Calif., assignors to Zero Manufacturing Company, Burbank, Calif.

Filed Sept. 2, 1975, Ser. No. 609,702

Int. Cl.² H05K *1/16*

U.S. Cl. 339—17 CF **22 Claims**



1. An integrated circuit package socket comprising

an insulative body having a plurality of spaced apart electrical contact entry apertures extending therethrough, the entry apertures being arranged adjacent opposite edges of the body for receiving an integrated circuit package with the package leads mounted in the entry apertures,

a planar insulative base member having a plurality of spaced apart contact mounting positions defined thereon and arranged adjacent opposite edges of the base member for receiving and securing an electrical contact from an adjacent side position onto each mounting position in a non-tilting relationship, and

a plurality of electrical contacts constructed and defined to be mounted on said base member from an adjacent side position onto preselected ones of said mounting positions on the opposite edges of the base member to receive the integrated circuit package leads inserted into the entry apertures at one end of each electrical contact in an electrical conducting relationship, each of the electrical contacts having a female receptacle at said one end for receiving the integrated circuit package leads and extending from one side of the said base member and a terminal portion dependent from the female receptacle and extending from the opposite side of said base member from the female receptacle and being spaced therefrom by a solid portion of the base member,

the base member mounting the electrical contacts being secured to the insulative body with only the terminal portions of the contacts extending outwardly from the secured base member and the insulative body in an exposed relationship to allow an electrical conductor to be secured thereto.

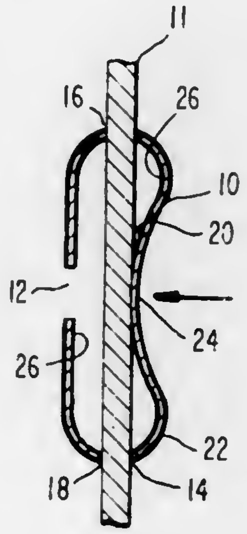
4,033,657
BUSS BARR

David C. Kemper, Mount Ephraim, N.J., assignor to The Burdette Company, Mount Ephraim, N.J.

Filed Feb. 11, 1976, Ser. No. 656,998

Int. Cl.² H01R *11/22*

U.S. Cl. 339—19 **12 Claims**



1. For use with a plurality of electrical terminal posts, a buss bar comprising:

a. an elongated generally tubular body of electrically conducting material, said body defining a slot extending laterally along a side thereof;

b. said body defining a plurality of pairs of apertures, each pair of apertures including an upper hole positioned in the upper portion of said body and a lower hole position in the lower portion of said body, each of said pairs of apertures being adapted to receive therethrough an electrical terminal post to provide electrical communication between posts positioned within each pair of apertures; and

c. a pressure surface on said body extending toward the center of said body to be in abutment with the terminal posts positioned extending through the pairs of said upper and lower holes, said pressure surface adapted to laterally bias the terminal posts into full electrical contact with edges of said upper and lower holes and with said pressure surface.

4,033,658
CONNECTOR ASSEMBLY ACCEPTING DIFFERENT SIZE POST CONTACTS THEREIN

John Carl Asick, Harrisburg, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Feb. 27, 1976, Ser. No. 661,887

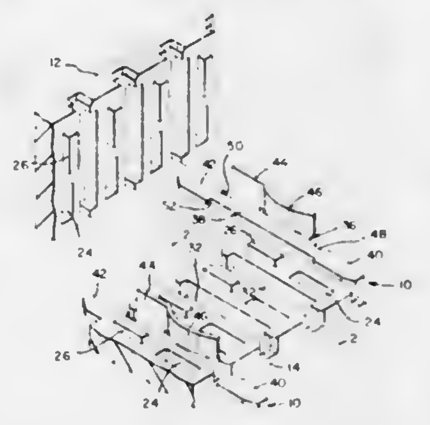
Int. Cl.² H01R *13/26, 13/46*

U.S. Cl. 339—32 R **1 Claim**

1. An electrical connector receptacle assembly capable of mating with a terminal pin having round, square, or rectangular section, with substantially uniform contact force being applied to said terminal pin regardless of its section, said connector assembly comprising:

a housing comprising a pair of identical mating housing members together defining therebetween a plurality of contact receiving cavities with a terminal pin receiving bore passing through each said cavity, each said bore having inwardly directed flanges at opposite ends thereof defining entrances with stepped profiles of lesser dimensions than the respective bore, a projection and a recess between each said cavity and bore mating with like projections and recesses in the opposite housing member with each projection bonded into a corresponding recess to permanently bond said housing members together; and

a contact received in each said cavity, each said contact having an elongated body portion lying within said cavity, neck means at each end of said body engaging said entrance flanges for lockingly holding said contact in said cavity, a conductor engaging solder tab portion integral with each end of said body portion and extending from each end of said bore, said solder tab being at least as wide as said body portion, and a terminal pin engaging blade portion having one end integral with and extending normal to said body portion and lying aligned with the broadest portion of said stepped profile for engagement with terminal pins inserted therein, said blade having an initial cantilever position in which it first engages a terminal pin and a second double beam position in which its free end engages and is supported by said housing to apply uniform pressure to the pin terminal regardless of the sectional configuration thereof.



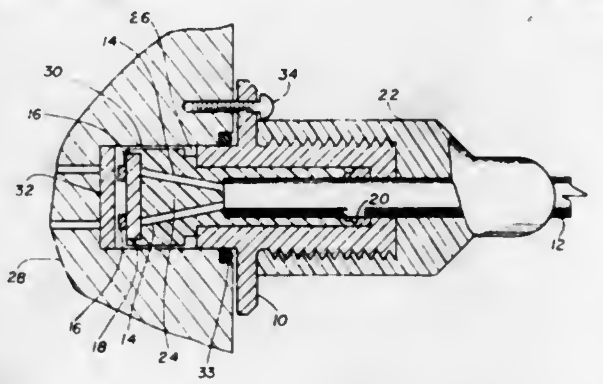
4,033,659
UNDERWATER CONNECTOR

Louis Alpert, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 26, 1976, Ser. No. 708,505

Int. Cl.² H01R *13/52*

U.S. Cl. 339—60 R **6 Claims**



1. An underwater connector for an electrical cable having at least one conductor comprising;

a hollow housing having an open end and a closed end;

said closed end having a bore hole therethrough;

a flange extending around the outer circumference of said hollow body near the open end thereof;

said flange acting to limit the penatration of said hollow body into said receptacle and also act as a retaining device to maintain said hollow body in place within the receptacle;

said cable entering said housing through said bore hole and substantially extending the length of said housing;

said at least one conductor extending through and beyond the open end of said housing;

means in physical engagement with said cable and abutting the inner surface of said closed end of said housing for securing the cable in said housing;

a plug of deformable insulating material filling the interior of said hollow housing and extending a distance beyond the open end of said housing;

the exterior dimensions of the plug extending beyond said open end of the housing being substantially equal to the interior dimensions of said receptacle;

a circumferential slot extending around said portion of said plug extending beyond the open end of the housing and immediately adjacent the housing at the open end thereof;

said plug surrounding the one end of said cable providing insulation between and around said at least one conductor and said housing and said receptacle;

the length of said plug being such that when said plug is secured in said receptacle said plug is always compressed;

contact means at the end of said receptacle adapted to be contacted by said at least one conductor;

a plug board inset flush with the end of said plug which is external to said hollow housing;

means associated with said flange for connecting said underwater connector in said receptacle;

said compression of said plug acting to insure that there will be sufficient pressure between the plug board and receptacle contact means to maintain a positive electrical contact there between.

4,033,660

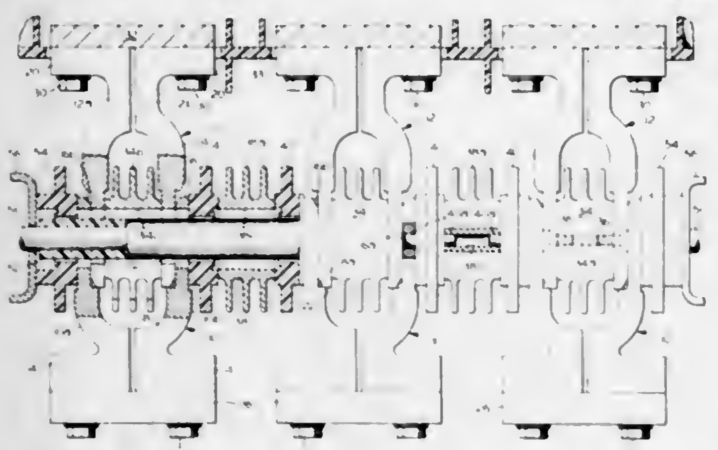
HIGH CURRENT ELECTRICAL JOINT APPARATUS

Eric A. Ericson, Plainville, and Frederick D. Kaufhold, Forestville, both of Conn., assignors to General Electric Company, New York, N.Y.

Filed Aug. 16, 1976, Ser. No. 714,524

Int. Cl.² H01R *13/54*

U.S. Cl. 339—75 M **15 Claims**



9. Electrical joint apparatus comprising, in combination:

A. an array of first electrical connectors commonly mounted in spaced relation, each said first connector mounting a pair of contact elements in parallel spaced relation;

B. an array of second electrical connectors commonly mounted independently of said first connector array, each said second connector associated with a different one of said first connectors and mounting a pair of contact elements arranged in parallel spaced relation, the separation between the paired contact elements of each said first connector being greater than the separation between the paired contact elements of its associated second connector, whereby said contact elements of each said first connector are arranged for juxtaposition in individual lapped relation with the outer surfaces of respective contact elements of the associated second connector;

C. a heat sink mounted between said paired contact elements of each said second connector; and

D. a joint clamping mechanism coupled with said first connector array and, upon movement of one of said connector array into juxtaposition with the other, operative to exert clamping forces effective to clamp each said contact element of each said first connector in secure electrical interconnection with the contact element of the associated second connector in lapped relation therewith.

4,033,661

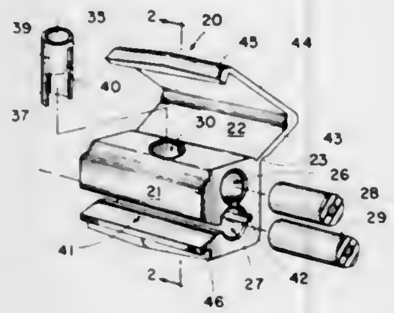
SOLDERLESS CONNECTOR FOR INSULATED WIRES

Roy A. Moody, Flossmoor, and John J. Bulanda, New Lenox, both of Ill., assignors to Panduit Corporation, Tinley Park, Ill.

Continuation of Ser. No. 481,566, June 20, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,072

Int. Cl.² H01R *13/38*

U.S. Cl. 339—98 **20 Claims**



1. A self-stripping wire connector adapted for making positive electrical connection to a pair of wires comprising an insulating body having a base portion and a cover portion, one of said portions being provided with a pair of elongate wire receiving channels, each of said channels being adapted to receive an insulated wire, said one of said portions having a wall or walls defining an elongate aperture therein with its longitudinal axis intersecting each of said channels, said channels being stacked in the direction of elongation of said aperture, the wall or walls of said one of said portions define a guiding surface, and a contact element positioned in said aperture and adapted to engage each of said pair of wires for making electrical and mechanical engagement therewith, said contact element comprising first and second surfaces having an edge surface therebetween, said first surface defining an outer boundary disposed adjacent said guiding surface at points spaced on said boundary lying in non-parallel planes.

4,033,662

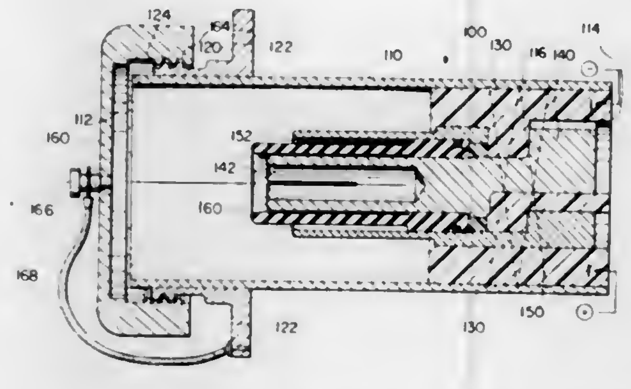
ELECTRICAL CONNECTOR

James W. Swiger, 1015 Heatherwood Road, Bluefield, W. Va. 24701

Filed Apr. 30, 1976, Ser. No. 681,823

Int. Cl.² H01R *3/00*

U.S. Cl. 339—113 R **5 Claims**



1. Electrical connector adapted to secure corresponding conduits of opposite polarity, comprising:

A. an elongated plug, said plug comprising an outer case wherein respective electrical contacts are housed;

A1. a cylindrical plug positive contact, set axially of the casing, said positive contact having open and closed ends;

A2. a plug negative probe contact set within the housing interiorly of the positive contact;

B. bores at adjacent closed ends of the respective contacts and means engageable with said bores and said conduits to secure conduit sections thereto,

B1. an elongated receptacle, said receptacle comprising an outer case wherein respective receptacle contacts are housed;

B2. a cylindrical plug positive contact, set axially of the casing, said plug positive contact having open and closed ends;

B3. a receptacle negative contact, disposed generally axially of the receptacle positive contact, said negative contact having at an open end thereof an axial cavity;

C. insulating means interposed between the respective receptacle negative and positive contacts;

D. transparent potting means securing the respective receptacle and plug contacts within the respective casings and

E. polarity indicia set within the respective said receptacle and plugs, adjacent the corresponding positive and negative contacts thereof.

4,033,663

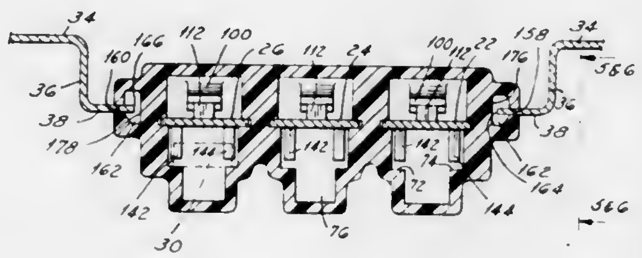
CONNECTOR BLOCK AND TERMINAL ASSEMBLY

Willard B. McCardell, Royal Oak, Mich., assignor to Altair Tool & Engineering Inc., Mount Clemens, Mich.

Division of Ser. No. 628,073, Nov. 3, 1975. This application June 4, 1976, Ser. No. 692,634

Int. Cl.² H01R *21/00*

U.S. Cl. 339—128 **7 Claims**



1. A connector block and support assembly comprising, in combination:

a support having a pair of co-planar spaced apart confronting marginal edges defining a connector block receiving space therebetween,

a connector block having means thereon for receiving and supporting an electrical terminal,

said block having opposite sides shaped to provide opposed longitudinally extending outwardly opening substantially parallel channels for slidable reception in one direction of said confronting marginal edges of the support,

and said block having locking tang means for engaging said support adjacent at least one confronting marginal edge and holding the block against reverse slidable removal on said confronting marginal edges.

4,033,664

BATTERY TERMINAL CONNECTOR

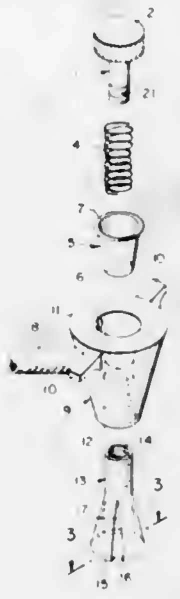
Virgil Y. Norman, P.O. Box 164, Courtland, Calif. 95615

Filed Jan. 19, 1976, Ser. No. 650,049

Int. Cl.² H01R *11/26*

U.S. Cl. 339—236 **9 Claims**

1. A battery terminal connector comprising a housing adapted to electrically contact a conductor, said housing adapted with a longitudinal opening therethrough, a spring retainer cup adapted to coaxially engage the interior of said housing at one end of said longitudinal opening, said cup having an opening therein, said spring retainer cup having a flange extending radially outwardly at one end of said opening and a lip extending radially inwardly at the other end thereof, a helical spring having an outside diameter smaller than said opening and larger than a port formed by the interior edges of said lip, a push button having one end of a longitudinal shaft fixedly secured normally thereto, the other end of said longitudinal shaft adapted with external threads thereupon, said opening having upper and lower tapered portions and an intermediate cylindrical portion, a battery terminal gripping element having a first portion of the length thereof adapted with a coaxial threaded hole within a cylindrically shaped external surface, said external threads adapted to threadingly



engage within said threaded hole, a second portion of the length of said battery terminal gripping element adjacent said first portion having an outside diameter at the free end thereof greater than the outside diameter of said battery terminal gripping element at the intersection of said first and said second portions of the lengths thereof, a battery terminal opening within said second portion of the length of said battery terminal gripping element formed by the walls thereof adapted with a plurality of notches extending longitudinally from said free end thereof, said battery terminal gripping element fabricated from a conducting material and adapted to electrically connect to said housing and said conductor.

4,033,665

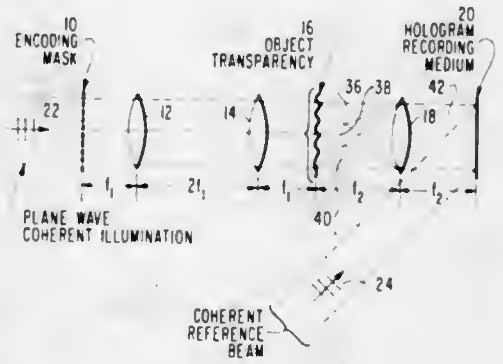
SYSTEM FOR RECORDING REDUNDANT FOURIER-TRANSFORM HOLOGRAM

Arthur Herbert Firester, Skillman, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 582,427, May 30, 1975, abandoned, which is a continuation of Ser. No. 490,501, July 22, 1974, abandoned. This application May 27, 1976, Ser. No. 690,653

Int. Cl.² G03H *1/28, 1/16*

U.S. Cl. 350—3.5 **3 Claims**



1. A system for recording a redundant Fourier-transform hologram of a two-dimensional object that exhibits a gray scale, said hologram being recorded on a given area of a

recording medium with mutually coherent reference and information beams of wave energy of a given wavelength, said system comprising:

a. illuminating means including an encoding mask positioned to simultaneously illuminate each one of respective sampled portions of said object with a corresponding one of divergent sampling components of coherent wave energy of said given wavelength,

b. Fourier-transform means including a lens having at least a given diameter and a given focal length, said lens having said object in its front focal plane and said recording medium in its back focal plane for illuminating substantially all of said given area with said information beam in response to substantially the area of said lens defined by said given diameter being simultaneously illuminated by all said divergent sampling components, and

c. wherein said encoding mask includes an amplitude mask in association with a phase plate, said amplitude mask comprising a substantially regular array of apertures for deriving from each aperture a separate one of said divergent sampling components, each aperture having a predetermined shape of a predetermined size with respect to said given wavelength which is sufficiently small to diffract coherent wave energy incident thereon so that the zero diffraction order of the wave energy passing therethrough exhibits a preselected angle of divergence which subtends said given diameter at the principal plane of said lens, whereby substantially said entire lens area defined by said given diameter is simultaneously illuminated by the zero diffraction order divergent sampling component emerging from each respective aperture of said array, and wherein said phase plate includes sampling area individually corresponding to said apertures of said array to provide a uniform phase shift for any single sampling component which bears a random phase relationship with the uniform phase shift provided for any other sampling component so that for the aperture corresponding to each sampling component there exists another randomly-located aperture corresponding to a sampling component substantially 180° out of phase therewith, whereby the average amplitude transmittance of the entire encoding mask is substantially zero.

4,033,666

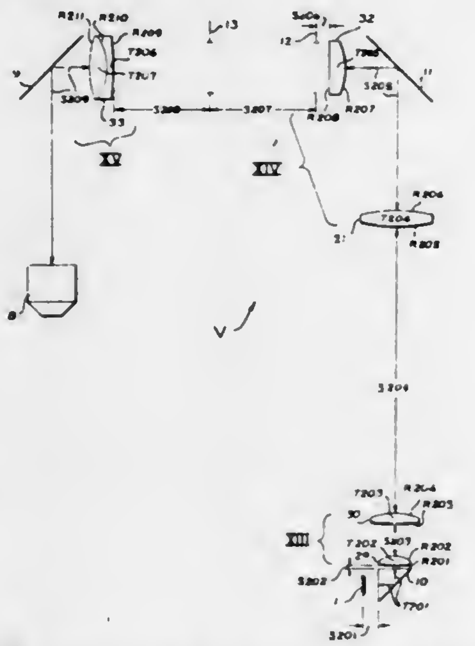
MICROSCOPE VERTICAL ILLUMINATOR

Arthur H. Shoemaker, East Aurora, N.Y., assignor to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 607,842, Aug. 25, 1975. This application June 28, 1976, Ser. No. 700,268

Int. Cl.² G02B *21/06*

U.S. Cl. 350—91 **2 Claims**



1. An illumination system for vertical microscopy comprising, in alignment and sequence along an optical axis, a light source, a collector lens system, having two plano-convex positive singlets (**29**) and (**30**), a relay lens system having a double convex singlet (**31**), and a convex-plano singlet (**32**), an aperture diaphram, an iris diaphram, a double convex positive doublet (**33**) collimating lens and a beam splitter to direct light from said source into the rear of a microscope objective and permit light coming from said objective to pass through said beam splitter to an eyepiece, said system having the following parameters:

Lens	Radius (R)	Thickness (T)	Spacing (S)	Index of Refraction (ND)	Abbe No. (ν)
			S_{201}= 0.5688Q		
	Prism	T_{201}= 1.2410Q		ND_{201}= 1.69963	ν_{201}= 34.67
			S_{202}= 0.0000Q		
	R_{201}= ∞				
29		T_{202}= 0.2585Q		ND_{202}= 1.58904	ν_{202}= 61.23
	R_{202}= −1.3005Q				
			S_{203}= 1 2410 Q		
	R_{203}= ∞				
30	R_{204}= −3.3739Q	T_{203}= 0.2585Q		ND_{203}= 1.58904	ν_{203}= 61.23
			S_{204}= 14.5605Q		
31	R_{205}= 11.2289Q R_{206}= −11.2289Q	T_{204}= 0.5171Q		ND_{204}= 1.52300	ν_{204}= 58.60
			S_{205}= 9.7248Q		
32	R_{207}= 4.0384Q R_{208}= ∞	T_{205}= 0.3619Q		ND_{205}= 1.52300	ν_{205}= 58.60
			S_{206}= 0.5336Q		
	Diaphragm Spacings		S_{207}= 5.5843Q		
			S_{208}= 4.7053Q		
33	R_{209}= 7.8243Q R_{210}= 4.0384Q R_{211}= −4.0384Q	T_{206}= 0.2585Q T_{207}= 0.5171Q		ND_{206}= 1.78600 ND_{207}= 1.58904	ν_{206}= 25.52 ν_{207}= 61.23
			S_{209}= 9.2036Q		

wherein Q is equal to 9mm to 15mm.

4,033,667

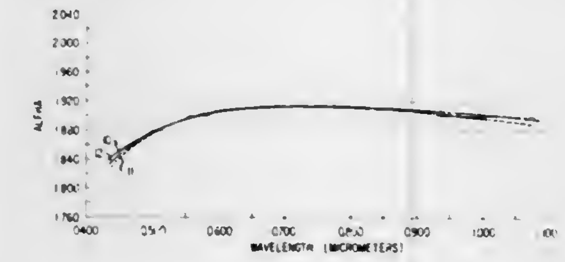
MULTIMODE OPTICAL FIBER

James William Fleming, Jr., Fanwood, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Sept. 12, 1975, Ser. No. 612,626

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 WG **4 Claims**



1. Glass transmission line for the transmission of electromagnetic radiation centering about a wavelength within the range of from 0.5 to 2.0 μm, said line comprising a core member manifesting a radially decreasing refractive index for

said radiation from the axial core composition to the peripheral core composition, together with a cladding about said core, in which the said core consists essentially of SiO_2 and at least two refractive index modifying ingredients, in which the gradient within the said core is due at least in part to a radially increasing concentration of boron oxide, B_2O_3, to an ultimate peripheral core composition which is essentially borosilicate containing from 10 mole percent B_2O_3 to 20 mole percent B_2O_3, the said gradient approximating the form:

$$n = n_1\left[1 - 2\Delta\left(\frac{r}{a}\right)^{\alpha}\right]^{1/2}.$$

in which the n_1, is the index maximum, r is the distance from the fiber axis, a is the core radius, Δ is the relative index difference between core center and cladding and α is a power law exponent which characterizes the profile, characterized in that the said gradient is due, at least in part, to a radially decreasing concentration of phosphorous pentoxide, P_2O_5, from an axial core composition containing from 10 mole percent P_2O_5 to 15 mole percent.

4,033,668

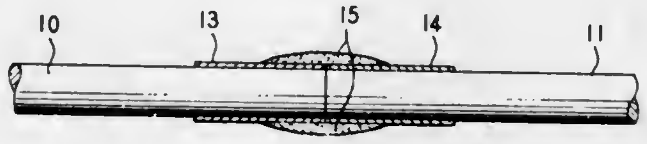
SOLDERABLE GLASS SPLICES, TERMINATIONS AND HERMETIC SEALS

Herman Melvin Presby, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 8, 1976, Ser. No. 674,857

Int. Cl.² G02B *5/14*; C03C *27/02*; B23K *1/02*

U.S. Cl. 350—96 C **10 Claims**



1. A method of splicing optical fibers comprising the steps of

a. forming a first thin metallic layer having a melting point above that of solder circumferentially on the peripheral surface of a first optical fiber at least in the area immediately adjacent the end thereof to be spliced;

b. forming a second thin metallic layer having a melting point above that of solder circumferentially on the peripheral surface of a second optical fiber at least in the area immediately adjacent the end thereof to be spliced;

c. axially aligning and abutting the exposed ends of the first and second optical fibers to be spliced; and

d. applying a continuous bead of solder circumferentially around the first and second optical fiber along the joint between the first and second thin metallic layers to complete the splice.

4,033,669

PRECISION OPTICAL FIBER SWITCH

Delon C. Hanson, Los Altos, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 11, 1976, Ser. No. 665,974

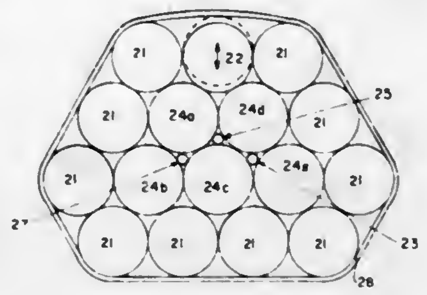
Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C **4 Claims**

1. An optical fiber switch having at least two positions for end-to-end coupling of optical fibers, said switch comprising:

a wiper assembly having at least three rods of substantially the same diameter and in substantially contiguous parallel relationship for retaining and aligning an optical fiber in the interspace therebetween;

a housing assembly having at least five retaining rods of substantially the same diameter and in substantially contiguous parallel relationship for retaining and aligning at least two optical fibers in the interspace therebetween, and at least ten fixed rods of substantially the same diameter and in substantially contiguous parallel relationship for retaining and aligning the retaining rods and wiper assembly;



a detent assembly including at least one rod and means for movably mounting same on the housing assembly to move in response and orthogonally to the movement of the wiper assembly as it moves from one position to another;

said wiper, housing said detent rods being substantially the same diameter.

4,033,670

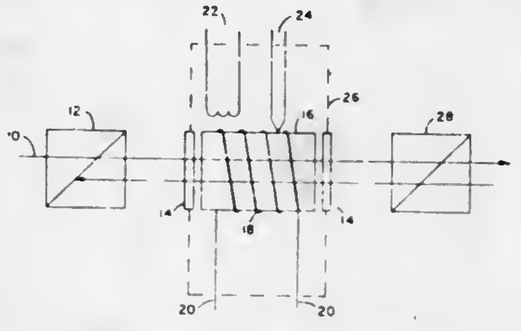
ZEEMAN EFFECT OPTICAL ISOLATOR

George A. Tanton, and James L. Smith, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 3, 1976, Ser. No. 663,410

Int. Cl.² G02F *1/09*

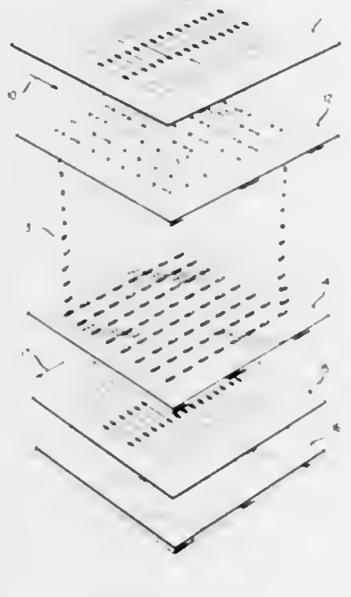
U.S. Cl. 350—151 **6 Claims**



1. An optical isolator for use in a laser system having an output in the 10.6 micron or infrared range to protect the system from damage due to unwanted scattered light energy comprising: a housing having windows at each end there for propagation of a laser beam therethrough; an optical rotator disposed between said windows for passing said laser beam between said windows, said rotator containing a material having a large dipole moment; polarizing means disposed for polarization of said beam prior to and following passage of said beam through said optical rotator, means disposed adjacent said rotator to cause an absorption line around 10.6 microns in said rotator to be split into two components wherein the light from said laser passes between said two components, said rotator material having a large dipole moment selected from the group consisting of CH_3Br; CH_3F; CH_3Cl; CH_3I and CH_2CF_2, said rotator material exhibiting a high rotation and a small absorption between said two components said absorption line splitting means being a solenoid coil circumferentially surrounding said rotator whereby a magnetic field is produced in said rotator when said coil is energized and a control heater and a thermocouple to maintain frequency stability and tuning of said rotator.

4,033,671
LIQUID CRYSTAL TWIST CELLS

Dwight Winton Berreman, Westfield, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Sept. 26, 1975, Ser. No. 617,073
Int. Cl.² G02F *1/16*
U.S. Cl. 350—160 LC **6 Claims**

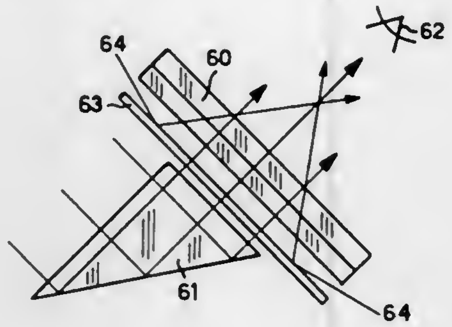


1. A liquid crystal twist cell device with improved interference and optical bounce properties capable of operating at a wavelength λ_r comprising:
- a first surface capable of transmitting optical radiation of wavelength λ_r, and capable of inducing alignment of the liquid crystal molecules in contact with the said surface;
- a layer of liquid crystal material of positive dielectric anisotropy;
- a second surface capable of transmitting optical radiation of wavelength λ_r, and capable of inducing alignment of liquid crystal molecules in contact with the said second surface, the two said surfaces bounding the liquid crystal, said second surface aligned parallel to said first surface but oriented so as to align the said molecules in contact with it at an angle of approximately 90° relative to the molecules in contact with said first surface, but in a plane parallel to said molecules in contact with said first surface;
- a polarization analyzer adjacent and approximately parallel to one of said surfaces;
- means to align the liquid crystal molecules perpendicular to the plane of said surfaces;
- the invention characterized in that
- the relationship between the thickness T of the liquid crystal layer its ordinary index of refraction n_o and its extraordinary index of refraction n_e and the wavelength of the incident light λ_r is given by

$$\frac{1}{4} \leq \frac{T}{\lambda_e}\left|\frac{n_o^2}{\sqrt{n_o^2-1}}-\frac{n_e^2}{\sqrt{n_e^2-1}}\right| \leq 1.$$

4,033,672
LIQUID CRYSTAL DEVICES

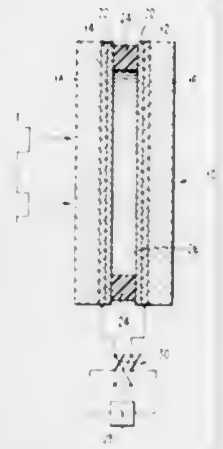
Claudio Dalmasso, Ivrea, Turin, Italy, assignor to Ing. C. Olivetti & C., S.p.A. Ufficio Brevetti, Ivrea (Turin), Italy
Division of Ser. No. 527,005, Nov. 25, 1974, Pat. No. 3,938,879, which is a continuation of Ser. No. 272,524, July 17, 1972, abandoned. This application Sept. 18, 1975, Ser. No. 614,573
Claims priority, application Italy, Nov. 24, 1971, 70842/71
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **4 Claims**



1. A liquid crystal display arrangement having a light transmissive liquid crystal display device having a front surface and a rear surface and further including:
- means disposed opposite said rear surface for redirecting ambient light rays from a first direction to a second direction passing from the rear surface toward the front surface, which is opposite an observer, to illuminate said front surface from the rear surface; and
- a one-way mirror disposed between said redirecting means and said rear surface and positioned to pass therethrough redirected light from said redirecting means traveling in said second direction and wherein said mirror is spaced apart from said rear surface to receive ambient light to additionally reflect same into said rear surface to further illuminate said front surface.

4,033,673
ERASABLE VISUAL IMAGE DISPLAY DEVICE

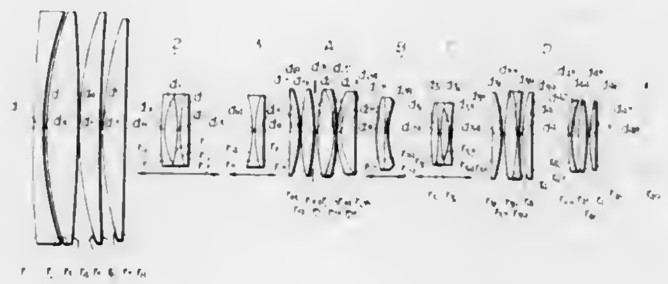
Hajime Seki, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed May 17, 1976, Ser. No. 686,974
Int. Cl.² G02F *1/36*
U.S. Cl. 350—160 R **9 Claims**



1. A visual image display device comprising:
- a first and a second conductive electrode in spaced-relationship;
- a cation permselective membrane on said first electrode,
- an anion permselective membrane on said second electrode,
- a voltage source and means for selectively applying this voltage between the electrodes to produce an electric field; and
- a normally light transmitting recording medium occupying the space between said electrodes, said medium having the properties of being both photo-ionizable and capable of electrochemically producing colored species.

4,033,674
ZOOM LENS HAVING A WIDE MAGNIFICATION VARIATION RANGE

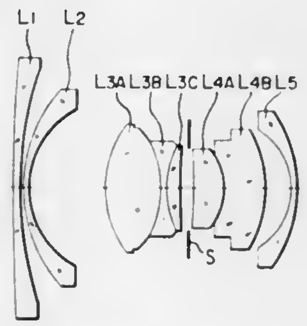
Takeshi Sekiguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 21, 1974, Ser. No. 453,507
Claims priority, application Japan, Mar. 23, 1973, 48-33311
Int. Cl.² G02B *15/18*
U.S. Cl. 350—184 **9 Claims**



1. A zoom lens having wide variation range, which comprises a front zoom part containing a focusing lens group, a variator lens groups and a compensator lens group said variator lens group and said compensator lens group being displaced simultaneously with as well as independently of each other, and a rear zoom part positioned behind said front zoom part and containing a fixed lens group, at least two divergent movable lens groups and a fixed relay lens group, said divergent movable lens groups being displaced simultaneously with as well as independently of each other, wherein the movable lens group of said two divergent movable lens groups placed at a position closer to the image plane is a lens group to vary the focal length while the movable lens group closer to an object is a lens group for compensation for the shifting of the image plane in the direction of optical axis.

4,033,675
WIDE ANGLE LENS

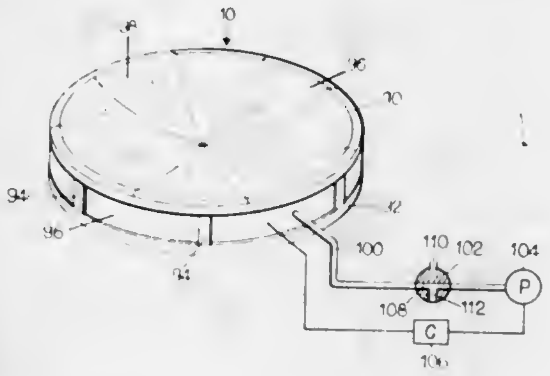
Hidenori Terasawa, and Ikuo Mori, both of Kawasaki, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Apr. 23, 1976, Ser. No. 679,687
Claims priority, application Japan, May 2, 1975, 50-52540
Int. Cl.² G02B *9/60*
U.S. Cl. 350—216 **10 Claims**



1. A wide angle lens system comprising, in succession from the object side toward the image side:
- a divergent first lens group having its surface of smaller curvature facing the object side;
- a divergent, meniscus, second lens group having its convex surface facing the object side;
- said first and second lens groups defining therebetween a divergent meniscus-shaped air chamber having its convex surface facing the object side;
- a convergent, meniscus, third lens group consisting of a plurality of lenses;
- a convergent, meniscus, fourth lens group consisting of a plurality of lenses; and
- a divergent, meniscus, fifth lens group having its convex surface facing the image side.

4,033,676
PRESSURE-SHAPED REFLECTOR APPARATUS

Lott W. Brantley, Jr., Rte. 2, Box 315A, Union Grove, Ala. 35175, and Robert W. Rood, 6510 Greenmeadow Road, Huntsville, Ala. 35810
Filed Jan. 21, 1976, Ser. No. 651,008
Int. Cl.² G02B *5/10*
U.S. Cl. 350—295 **12 Claims**



1. A lightweight pressure-shaped reflector apparatus for use in collecting and concentrating electromagnetic radiation waves and the like to provide a concentrated source of energy comprising:
- a. a hollow cylindrical frame member having an open top and an open bottom end;
- b. a resilient deformable enclosure carried between said open top and bottom having an enclosed interior space;
- c. said enclosure having an upper reflective surface co-extensive with said open top and a lower surface co-extensive with said open bottom end;
- d. means for evacuating air from the interior space of said enclosure creating a partial vacuum therein deforming said upper reflective surface inwardly to form a highly reflective surface of spherical curvature; and
- e. said enclosure including a side wall surface connecting said upper lower surfaces to define said interior space whereby said partial vacuum created therein causes all of said surfaces to deform inwardly.

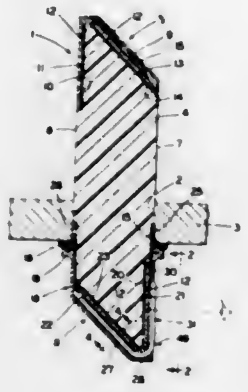
4,033,677
PERISCOPE BLACKOUT BLIND CONSTRUCTION

Gerald Tausch, Salem, Ohio, assignor to Miller-Holzwarth, Inc., Salem, Ohio
Filed May 6, 1976, Ser. No. 683,741
Int. Cl.² G02B *5/08*
U.S. Cl. 350—301 **12 Claims**

1. A periscope construction including:
- a. a transparent block having eyepiece and object viewing sections located at generally opposite ends of said block, said eyepiece section having a viewing surface and a reflective surface forming an included acute angle therebetween;
- b. a protective housing enclosing portions of the eyepiece viewing section, said housing having an opening aligned with the viewing surface and an angled rear wall spaced

from and extending generally parallel with the reflective surface;

c. guide means mounted between the housing and the transparent block, said guide means having a pair of spaced parallel channels with a first straight leg portion extending along edges of the housing opening, a second straight leg portion extending between the housing rear wall and the reflective surface of the block, and a curved portion integrally connecting said first and second straight leg portions and extending about the exterior of the angle formed by the viewing and reflective surfaces of the block; and



d. flexible opaque sheet means slidingly mounted on and extending between the space channels, said sheet means being movable in the first straight leg portion across the housing opening between open and closed positions for exposing and covering the eyepiece viewing surface of the transparent block, and movable through the curved portion between the first and second straight leg portions.

4,033,678

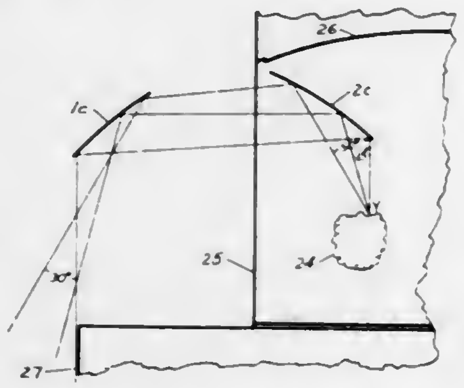
TWO-MIRROR SYSTEMS FOR PERISCOPIC REARWARD VIEWING

Milo O. Rudd, 2119 NE. 15 Terrace, Fort Lauderdale, Fla. 33305

Filed May 21, 1975, Ser. No. 579,365

Int. Cl.^{2} G02B *5/10*

U.S. Cl. 350—302 **19 Claims**



1. A periscope providing an erect and unreversed view at an intended viewing position of an extended object field and comprised of a first cylindrically concave mirror, a second cylindrically concave mirror, and means supporting and positioning said mirrors so that the cylindrical axes of both mirrors are substantially parallel and said first mirror reflects light from said object field to said second mirror and said mirror reflects light from said object field and said first mirror to said intended viewing position, wherein the distortion and astigmatism in the image of said object field as formed by reflection from said first mirror only are largely removed in said view at the intended viewing position by the reflection of said image by said second mirror.

4,033,679

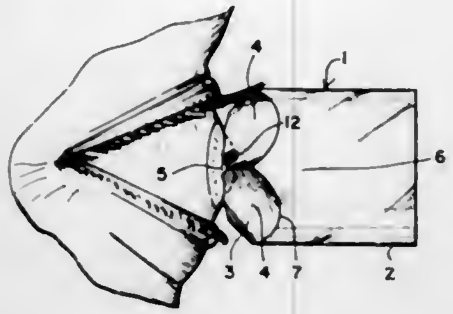
GONIOSCOPE

Walter Sussman, 2260 Merrick Road, Merrick, N.Y. 11566

Filed Dec. 10, 1975, Ser. No. 639,532

Int. Cl.^{2} A61B *3/10*

U.S. Cl. 351—16 **10 Claims**



1. A gonioscope for viewing the angle of the trabeculum of the drainage angle comprising:

a lens having a cylindrical surface and being formed at its front end with four inclined facets narrowing toward the front free end thereof,

said facets being inclined substantially between 20° and 45° relative to said longitudinal axis, and having a front surface substantially perpendicular to the longitudinal axis of said cylindrical surface having therein a concave inwardly directed recess,

said facets constituting total internal reflection surfaces.

4,033,680

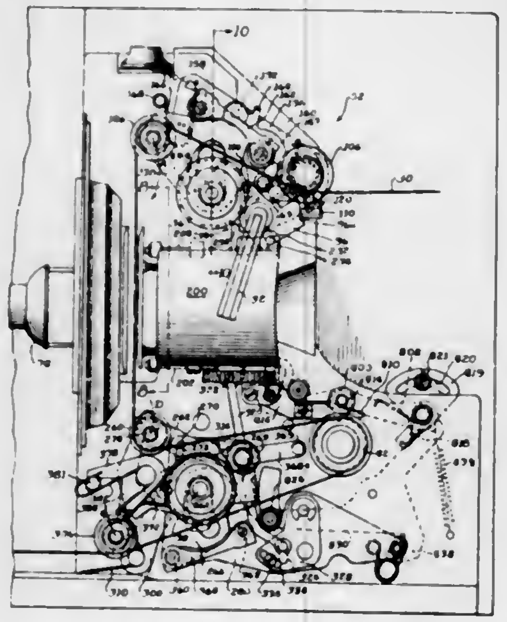
RAPID FILM REWIND MECHANISM

Vincent S. Pasturczak, Chicago, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Dec. 17, 1975, Ser. No. 641,682

Int. Cl.^{2} G03B *23/00*

U.S. Cl. 352—124 **11 Claims**



1. In a motion picture projector having a selectively operable reversible drive means, a supply reel drive, and a takeup reel drive; a rapid film rewind system for returning a projected reel of film from the takeup reel back to the supply reel, comprising:

a frame;

a takeup reel mounting arm pivoted on the frame for independent pivotal movement between a project position and a rewind position;

a rapid rewind drive means engageable between the reversible drive means and the supply reel drive to rotate the supply reel and rewind the film thereon at a substantially faster rate than during projection by the drive means; and

an actuator connected to said rapid rewind drive means and said takeup reel mounting arm to engage the rapid rewind drive means with the supply reel drive and including stop means to maintain the reversible drive means out of engagement therewith in response to manual movement of the takeup reel mounting arm from its project position to its rewind position.

4,033,681

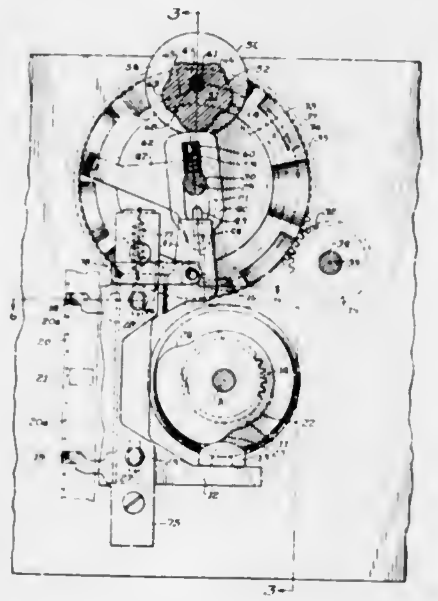
FORWARD-REVERSE MULTI SPEED FILM TRANSPORT MECHANISM

Raymond W. H. Kim, Cook County, Ill., assignor to Bell & Howell Company, Chicago, Ill.

Filed Sept. 2, 1975, Ser. No. 609.851

Int. Cl.^{2} G03B *1/00*

U.S. Cl. 352—173 **15 Claims**



1. In a motion picture projector of the type which includes a film frame aperture, a forward-reverse film transport mechanism comprising:

a drive shaft rotatable in a single angular direction;

a first cam mounted on said drive shaft and having a peripheral cam surface;

a film shuttle having at least one tooth for engaging perforations of the film;

a first follower coupled to said shuttle and communicating with said peripheral cam surface, said peripheral cam surface having a first portion for acting upon said first follower to cause said shuttle tooth to travel in a forward direction through a predetermined stroke and a second portion for acting upon said first follower to cause said shuttle tooth to travel in a reverse direction through a predetermined stroke;

a second cam rotatable about a fixed axis of rotation and having a dwelled face cam track surface comprising a plurality of concentric dwelled cam tracks, each said track including a different number of dwelled portions;

means for rotating said second cam responsive to rotation of said drive shaft; and

an elongated member slideably and rotatably movable about said fixed axis and having a second follower mounted thereon for changing both the direction and speed of film transportation, said second follower communicating with said shuttle and said dwelled cam face surface for causing said shuttle tooth to engage and disengage the film perforations as said second cam rotates, said second follower being arcuately displaceable about said fixed axis of rotation between a first position and a second position in response to rotation of said elongated member such that when said second follower is in said first position said shuttle tooth is caused to engage the film perforations during said forward stroke and to disengage the film perforations during said reverse stroke and when said second follower is in said second position said shuttle tooth is caused to engage the film perforations during said reverse stroke and to disengage the film perforations during said forward stroke to thereby render the direction of film transportation selectable, said second follower also being radially displaceable about said fixed axis in response to sliding movement of said elongated member for engaging selected ones of said tracks to thereby render the frequency of shuttle tooth engagement with the perforations and thus the speed of film transportation selectable, whereby both the speed and direction of film transportation is controlled by the movement of the second follower about the fixed axis of rotation of said second cam.

4,033,682

EXPOSURE QUANTITY CONTROL CIRCUIT

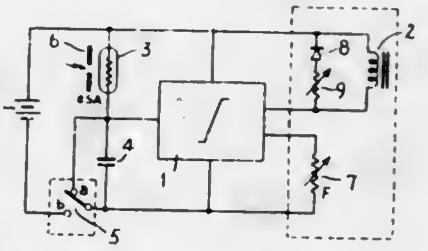
Yukio Nakamura, Yotsukaido; Shougo Kato, Chiba, and Shinji Nagaoka, Yotsukaido, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed July 15, 1975, Ser. No. 596,018

Claims priority, application Japan, July 15, 1974, 49-83556; July 15, 1974, 49-83557

Int. Cl.^{2} G03B *9/08*

U.S. Cl. 352—235 **1 Claim**



1. In a camera having an electric shutter operable from an initial closed state to an open state and then to a final closed state to effect an exposure: an electromagnet operable when deenergized to initiate closing of the shutter; a switching circuit connected to said electromagnet for controlling the energization of said electromagnet in accordance with preselected exposure information; and means including an adjustable exposure control circuit coacting with said switching circuit for adjustably controlling the time at which said electromagnet is deenergized such that the time period it takes said shutter from the moment of deenergization of said electromagnet to move from its open state to its final closed state substantially equals the time period it takes said shutter to move from its initial closed state to its open state, said adjustable exposure control circuit comprising a series connection of a diode and a variable resistor connected in parallel with said electromagnet to adjustably control the current flow through said electromagnet and effect deenergization of said electromagnet when the current falls below a predetermined value.

4,033,683

IMAGE VIEWING APPARATUS

Henry J. Tancredi, 9 Lamplighter Lane, Gwynedd, Pa. 19436

Filed July 14, 1976, Ser. No. 705,069

Int. Cl.^{2} G03B *35/20, 21/56;* **G02B** *27/22;* **G03B** *21/28*

U.S. Cl. 353—7 **17 Claims**

1. Apparatus for viewing an enlarged image comprising:

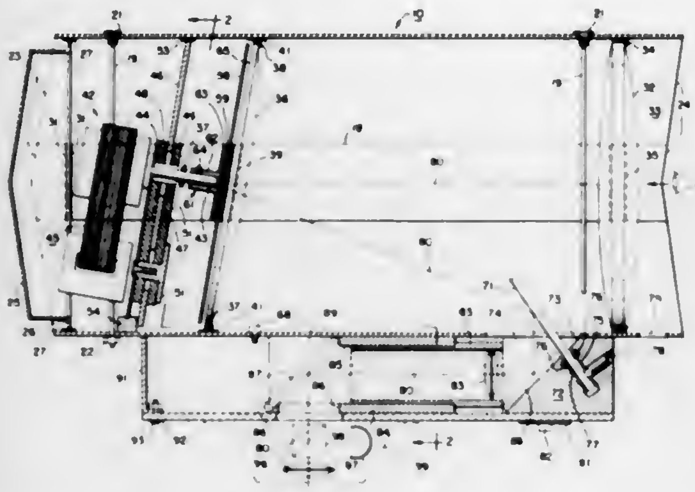
a housing.

projection lens means mounted in said housing and providing an enlarged projected image of an object to be viewed and for projecting said image along an optical path proceeding from said projection lens means,

reflective surface means mounted in said housing in said optical path proceeding from said projection means,

field lens means mounted in said housing having a front surface in said optical path proceeding from said reflective surface means and having a rear surface opposite said front surface,

moving screen means mounted for rotary movement in said housing juxtaposed said rear surface of said field lens means providing a substantially flat surface having optical embossments thereon in said optical path proceeding from said rear surface of said field lens means,



said moving screen means comprising a light weight flexible plastic disc having a highly reflective surface thereon,

moving screen mounting means having a shaft adapter and a disc shaped moving screen mounting portion,

means for attaching said moving screen mounting portion to a center portion of said moving screen means,

motor means mounted in said housing and having a rotatable shaft fixed in said shaft adapter of said moving screen mounting means, and

viewing lens means positioned in said optical path proceeding from said screen means and said field lens means for viewing an enlarged image on said moving screen means from the front of said field lens means.

4,033,684
MICROFICHE READER MEANS

Shiro Toriumi, Machida; Hiroshi Endo, Fuchu; Nobuo Ueda, Sagamihara, and Seiichi Yamagishi, Tokyo, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Oct. 6, 1975, Ser. No. 620,198

Claims priority, application Japan, Oct. 11, 1974, 49-117525

Int. Cl.² G03B *23/08*

U.S. Cl. 353—27 A **5 Claims**

1. A microfiche reader apparatus which comprises:

a frame location means including a slidable support table movable in a first direction and a carrier table movably mounted on said slidable support table and movable in a second direction which is orthagonal to said first direction;

a first pulse motor, first drive transmission means coupled between said first pulse motor and said slidable support table for moving said slidable support table in said first direction, a second pulse motor, a second drive transmission means coupled between said second pulse motor and said carrier table for moving said carrier table in said second direction;

means for inserting a microfiche having a plurality of frames in a rectangular array, said inserting means being positioned adjacent said frame location means and including a pair of microfiche detecting means in a path through which the microfiche is inserted and a transporting means for transporting the microfiche in said path and onto said carrier table, said transporting means being coupled to said detecting means and being operable to transport the microfiche only when both of said pair of detecting means are actuated by the leading end of the microfiche, said frame locating means being brought to an inserting position immediately behind said transporting means for taking in the microfiche onto the carrier table upon insertion of the microfiche;

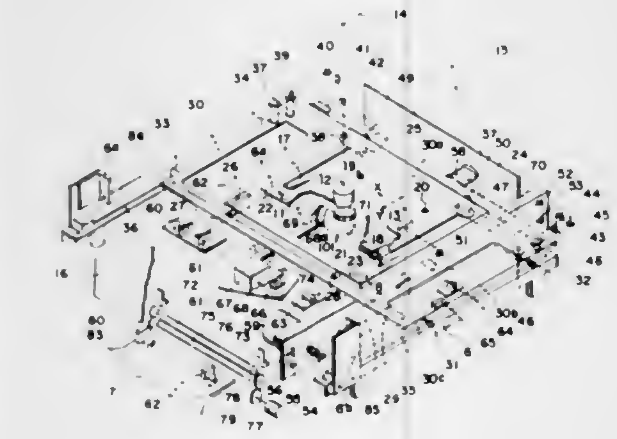
a projection means adjacent said frame location means for projecting a specific frame of the microfiche onto a screen;

a key means for specifying a specific frame of the microfiche;

control means coupled with said key means and said pulse motors for controlling the movements of said frame locating means and including decoder means for converting values specified by said key means into values corresponding to coordinates of said first and second directions, respectively;

a pair of subcontrol means coupled with said control means for controlling the movements of said frame locating means in said first and second directions, respectively;

each of said subcontrol means respectively including a first register means for memorizing one of said values corresponding to said first or second direction converted by said decoder means, a second register means for memorizing corresponding coordinate values for a previously selected frame, a subtraction circuit coupled to said first and second register means for subtracting said coordinate values stored in said first and second register for establishing a rotational direction of said first and second pulse motors, respectively, comparator means coupled to said subtraction circuit for receiving the absolute value obtained by said subtraction circuit, counter means connected to said comparator pulse emitter for emitting pulses and coupled to said counter means and to said first and second pulse motors, initiating means coupled to said pulse emitter for initiating operation of said pulse emitters for emitting pulses to said pulse motors and for initiating counting by said counter means, whereby said frame location means are moved in said first and second directions, respectively, by said pulse motors, and means coupled between said pulse emitter and said first and second pulse motors and coupld to said comparator for discontinuing the pulses to said motors when said counter means counts up to a number equal to said absolute value stored in said comparator means, whereby said frame location means is brought to rest with the specified frame at a position for projection onto the screen.



4,033,685
FILM READER

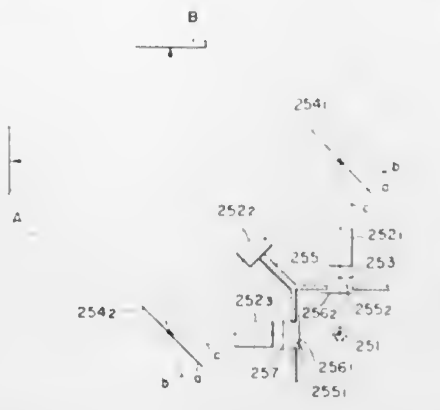
Keiichi Uno, Tokyo, and Mutsuhiro Inoue, Sagamihara, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 31, 1974, Ser. No. 537,642

Claims priority, application Japan, Jan. 12, 1974, 49-6894; Jan. 12, 1974, 49-6895; Jan. 12, 1974, 49-6893; Aug. 21, 1974, 49-95828; Aug. 30, 1974, 49-99683

Int. Cl.² G03B *23/08*

U.S. Cl. 353—82 **12 Claims**



1. A film reader for observing an image recorded on film, comprising:

a screen;

a recording member having a photoconductive member and a material whose electromagnetic ray absorbing characteristics change in accordance with a voltage applied thereto;

first projection means for selectively projecting an image of the film onto either said screen or said recording member;

means for applying a voltage to said recording member to record the image of the film on the recording member; and

second projection means for projecting an image of the recording member onto said screen.

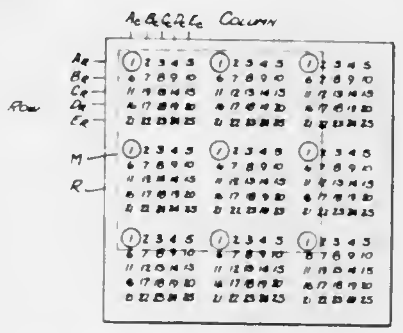
4,033,686
MICRO-IMAGE RECORDS

Adnan Waly, Stamford, Conn., assignor to Personal Communications, Inc., Stamford, Conn.

Division of Ser. No. 135,996, April 21, 1971, Pat. No. 3,704,068. This application Sept. 25, 1972, Ser. No. 291,589

Int. Cl.² G03B *23/02, 21/26*

U.S. Cl. 353—120 **2 Claims**



1. A microrecord comprising a record medium and a plurality of data sets formed on said medium, each data set representing a distinct page having alphanumeric and other information printed thereon and being dissected into a multiplicity of at least one thousand data sub-sets all of which are generated within a very narrow field angle along optical axes which are parallel to each other and are normal to the medium, each sub-set including at least one data bit formed by a minute portion of the information printed on said page, the sub-sets which together form a data set being dispersed on said medium according to a predetermined pattern, the dispersed sub-sets forming the plurality of data sets being interlaced with each other whereby the multiplicity of data sub-sets constituting each data set occupies a distinct position on said medium and may be optically read out therefrom along said parallel optical axes by a like multiplicity of lensettes, each having a very narrow field angle, said sub-sets being interlaced in the X- direction only.

4,033,687
CATHODE RAY TUBE PICKUP DEVICE

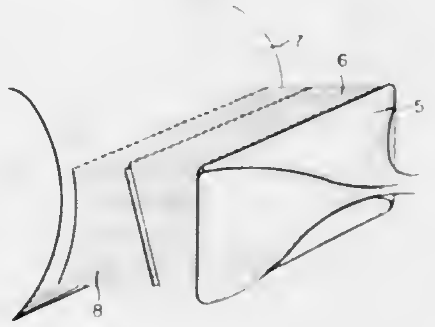
Kazuhiro Hirayama, Hachioji; Syusei Tsukada, Tokyo, and Takahiro Inoue, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 476,210, June 4, 1974, abandoned. This application Mar. 3, 1976, Ser. No. 663,476

Claims priority, application Japan, June 11, 1973, 48-65617

Int. Cl.² G03B *27/00*

U.S. Cl. 355—1 **2 Claims**



1. A cathode ray tube pickup device comprising:

a photosensitive medium having a dielectric layer, a photoconductive layer and a conductive layer;

means for uniformly charging the surface of said photosensitive medium;

means for uniformly discharging the charged surface of said photosensitive medium;

an optical fiber tube disposed closely adjacent to the surface of said photosensitive medium to apply a light image to the previously charged and discharged surface thereof to form a latent image upon said surface; and

means for developing the latent image on the surface of said photosensitive medium with a liquid developer including a toner having a charge polarity for developing that portion of the latent image corresponding to the light portion of the light image, wherein the developed image is a negative of the light image.

4,033,688
COLOR COPYING APPARATUS

Jürgen Orthmann, Munich, Germany, assignor to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 10, 1976, Ser. No. 656,949

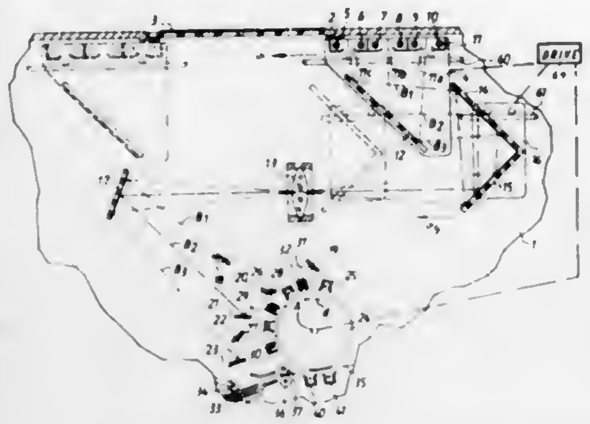
Claims priority, application Germany, Feb. 14, 1975, 2506366

Int. Cl.² G03G *15/01*

U.S. Cl. 355—4 **9 Claims**

1. A copying apparatus comprising: a housing fixedly supporting an image bearing master; a carriage on said housing displaceable at a scanning speed past said master and carrying a plurality of relatively fixed slot shutters spaced apart in the direction of displacement of said carriage; scanning means on said carriage at each of said shutters for directing therethrough a respective beam of a respective color component of the image on said master; a rotatable image drum on said housing; means for rotating said drum in a predetermined rotational sense at a peripheral velocity substantially equal to said scanning speed; a set of mirrors having an even number of mirrors aligned with each of said shutters for reflecting the respective beam along a respective path originating at said master and terminating at a respective location on said drum, the distance on said drum between said locations being equal

to the distance on said master between the corresponding path origins, each path defining at its origin with the master an angle that is substantially equal to the angle it defines at its terminus with the respective location on said drum; means for displacing one of said mirrors of each of said sets synchronously with said carriage so that said paths maintain constant length between their origins on said master and their termini on said drum during displacement of said carriage; at least one lens in said paths equidistant between the origins and termini thereof; means for charging said drum immediately upstream of each of said locations and for applying an image former thereto immediately downstream of the respective location; and means for applying a copy sheet to said drum downstream of the respective location and for transferring the image defined on said drum by said formers to said sheet.



4,033,689
COMPACT OPTICAL SYSTEM FOR AN ELECTROSTATIC PHOTOGRAPHIC COPYING APPARATUS

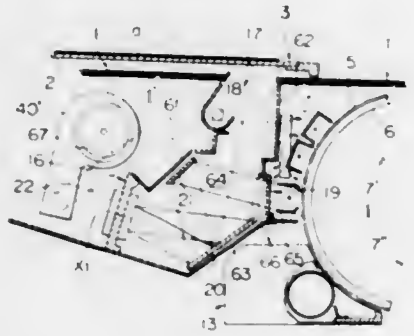
Takaji Washio, Toyonaka; Koichi Sasaki, and Tatsuo Aizawa, both of Osaka, all of Japan, assignors to Mita Industrial Company, Ltd., Osaka, Japan

Division of Ser. No. 399,516, Sept. 21, 1973, Pat. No. 3,923,391. This application Apr. 22, 1975, Ser. No. 570,426

Claims priority, application Japan, Sept. 24, 1972, 47-95460

Int. Cl.² G03G *15/28;* **G03B** *27/70*

U.S. Cl. 355—8 **6 Claims**



1. An electrostatic photographic copying apparatus comprising:

a frame member having a reciprocating transparent plate on which to place an original to be copied;

a rotatable photosensitive drum having an electrostatic photographic material on the periphery thereof;

a stationary optical system for projecting an image of the original placed on said transparent plate onto the surface of the photographic material as the transparent plate and photosensitive drum move relative to the optical system;

an image-forming zone disposed exteriorly of, and alongside, the periphery of said sensitive drum for forming on said sensitive material an electrostatic latent image corresponding to the image of the original or a developed image corresponding to the latent image;

a transfer zone for transferring said elctrostatic latent image or developed image to a transfer paper; and

a transfer paper forwarding system for feeding the transfer paper to said transfer zone and for forwarding the transfer paper on which said electrostatic latent image or developed image has been transferred to a discharge end through a desired treating zone from said transfer zone;

wherein the improvement resides in the optical system which includes;

an optical opening for exposure to the original;

an optical opening for exposure of the surface of the sensitive material;

first and second reflex mirrors;

one mirror lens;

an optical chamber which is substantially optically closed except for said optical openings, and

a light source for illuminating the original to be copied;

said two optical openings, first and second reflex mirrors and mirror lens being disposed so that the light reflected from the original to be copied follows a first path to said first reflex mirror through said optical opening for exposure of the original, is reflected by said first reflex mirror and follows a second path to said mirror lens, is reflected by the mirror lens and follows a third path back again to the first reflex mirror, is again reflected by the first reflex mirror and follows a fourth path across the second path to the second reflex mirror, is reflected by the second reflex mirror along a final path crossing said first path wherein the final path passes through the optical opening for exposure of the photosensitive material, thereby forming on the surface of the photosensitive material a four-fold reverse image of the desired size corresponding to the original to be copied.

4,033,690
PROCESS FOR THE PRODUCTION OR ERASURE OF DEFORMATION IMAGES AND APPARATUS FOR THE PERFORMANCE OF THE PROCESS

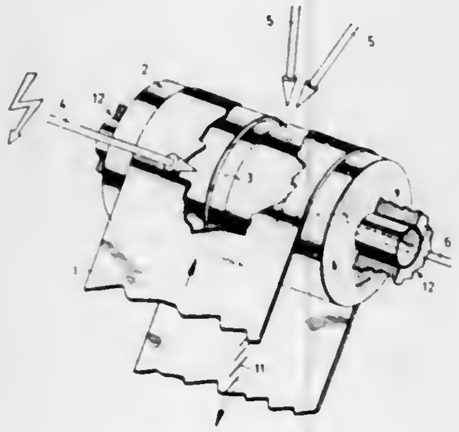
Roland Moraw, Naurod, uber Wiesbaden, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Mar. 11, 1975, Ser. No. 557,342

Claims priority, application Germany, Mar. 16, 1974, 2412771

Int. Cl.² G03G *15/00;* **G01D** *15/02;* **G11C** *11/44*

U.S. Cl. 355—9 **10 Claims**



1. In an apparatus for recording or erasing an electrostatic image by deforming a photoconductive thermoplastic layer of a recording material by heating, including support means for said recording material, charging means for charging the recording material, exposure means for exposing said material, and heating means for developing or erasing said material,

the improvement comprising groove means in said support means, above which said recording material is adapted to be continuously conveyed in a self-supporting manner and is adapted to be deformed above said groove means during the recording or erasing.

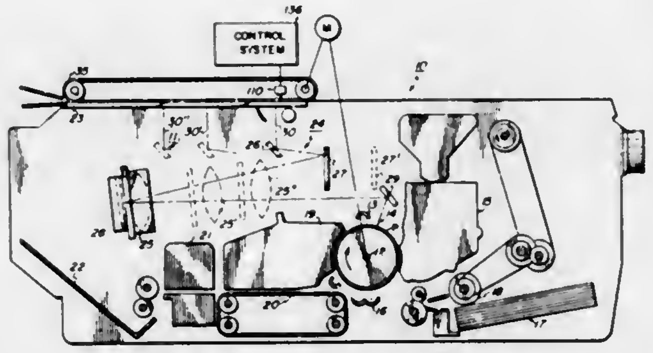
4,033,691
VARIABLE MAGNIFICATION REPRODUCING APPARATUS

David P. Bierworth, Thiensville, Wis., and Thomas Lynch, Fairport, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1975, Ser. No. 627,432

Int. Cl.² G03G *15/00*

U.S. Cl. 355—11 **10 Claims**



1. In a reproducing apparatus for producing copies of a document selectively at one of a plurality of copy image magnifications comprising: a photosensitive surface arranged for movement at a given velocity; the improvement wherein said apparatus further includes:

a plurality of document viewing positions arranged along a path of travel of said document, each of said positions corresponding to a different desired copy image magnification;

means for feeding said document along said path past said viewing positions at a desired velocity corresponding to said desired copy image magnification and proportionally synchronised to the velocity of said surface;

optical means, associated with said viewing positions, for stripwise viewing said document fed by said feeding means, selectively at any desired one of said viewing positions and for projecting an image thereof onto said surface selectively at one of said plurality of magnifications corresponding to said one viewing position, said optical means comprising at least one optical element.

4,033,692
MULTI-MODE REPRODUCING MACHINE

Richard P. O'Connell, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Oct. 30, 1975, Ser. No. 627,433

Int. Cl.² G03G *15/00*

U.S. Cl. 355—14 **10 Claims**

1. In an apparatus for producing copies of a document selectively at one of a plurality of copy image magnifications comprising:

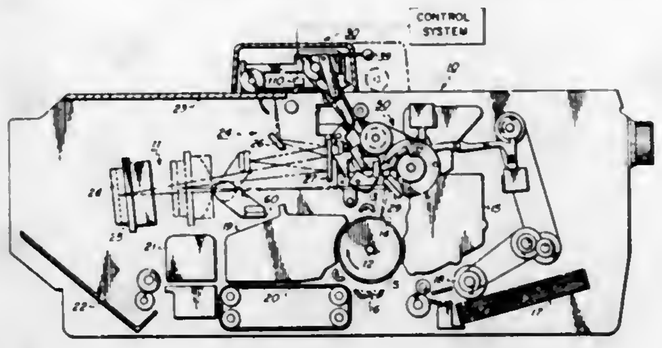
an imaging surface arranged for movement at a given velocity;

means for viewing a moving document and for projecting an image thereof onto said imaging surface selectively at one of a plurality of copy image magnifications;

feeding means for advancing said document along a path along a path past said viewing means selectively at one of a plurality of velocities corresponding to said copy image magnifications and synchronised with the movement of said imaging surface; the improvement wherein said apparatus further includes:

means arranged at a given position along said path for sensing an edge of said document at a desired position along said path, as it is advanced by said feeding means;

circuit means responsive to said sensing means sensing said edge of said document at said given position for initiating exposure of said document by said viewing means selectively after expiration of one of a plurality of time intervals following the sensing of said edge at said position, said time intervals corresponding to said copy image magnifications and said velocities of document advancement.



4,033,693
LIGHT INTERRUPTER

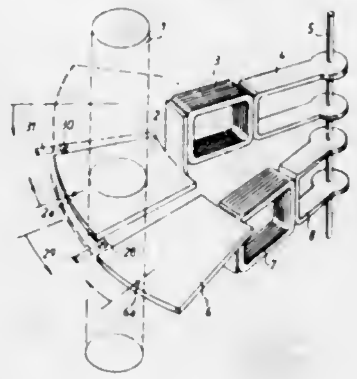
Bernd Payrhammer, Munich; Siegfried Bartel, Gauting, and Geert Besigk, Munich, all of Germany, assignors to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 21, 1975, Ser. No. 542,771

Claims priority, application Germany, Jan. 24, 1974, 2403315

Int. Cl.² G03B *27/76, 9/20*

U.S. Cl. 355—71 **18 Claims**



1. In an optical apparatus, particularly a photographic printer, copier, or the like, of the type in which a beam of light is caused to travel along a predetermined path in a predetermined direction, a light interrupter comprising, in combination, a light-interrupting component; a driving coil connected to said light-interrupting component; mounting means mounting said light-interrupting component and said driving coil for pivotal movement about an axis substantially parallel to the beam direction, with said light-interrupting component moving between a light blocking position and an unblocking position; a control circuit connected to said driving coil for effecting energization of said coil; and magnet means arranged to establish a magnetic field through which said driving coil moves when said driving coil pivots about said axis, with said magnetic field being oriented substantially perpendicular to the direction of movement of said driving coil.

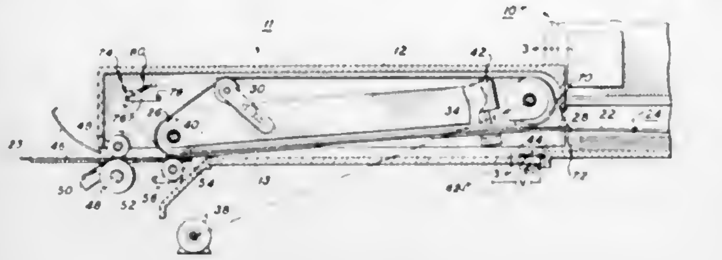
4,033,694
COPIER DOCUMENT EJECTOR

Patrick T. Ferrari, Walworth, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 17, 1975, Ser. No. 632,426

Int. Cl.² G03B *27/64*

U.S. Cl. 355—76 **13 Claims**



1. In a copying apparatus with a light-transmitting document copying platen and optical imaging means for copying documents through said platen, and with a document handling system for ejecting documents off from one side of said platen, wherein said document handling system comprises vacuum belt means overlying said platen for providing a document retaining air flow for transporting documents on said belt toward said one side of said platen; the improvement in said document handling system comprising:

stripping means for stripping said documents from said vacuum belt means adjacent said one side of said platen,

air jet means adjacent said one side of said platen for applying an air flow against said documents being stripped by said stripping means from said vacuum belt for counteracting said air flow from said vacuum belt means, and

including means for lifting one end of said vacuum belt means adjacent said one side of said platen for assisting the ejection of a document thereon.

4,033,695
PROCESS AND APPARATUS FOR COPYING ON PRINTING PLATES

George Sader, Bechthelm, and Dieter Osswald, Wiesbaden-Sonnenberg, both of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Filed May 27, 1975, Ser. No. 581,159

Claims priority, application Germany, May 29, 1974, 2426216

Int. Cl.² G03B *27/20*

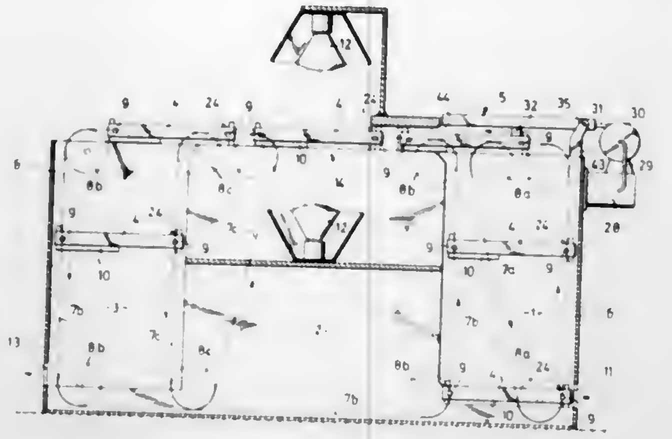
U.S. Cl. 355—87 **22 Claims**

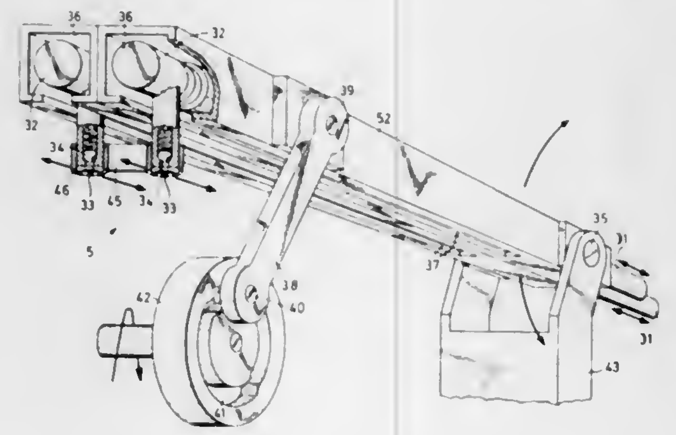
8. Apparatus for exposing light-sensitive printing plates through an original to be copied, comprising a light means for exposing said printing plate;

vacuum frame means, including an elastic blanket and a light-permeable plate adapted to be engaged with one another about the periphery thereof and form a cavity therebetween adapted to receive said printing plate and said original superimposed upon one another, with said original adjacent said light-permeable plate and light-sensitive side of said printing plate adjacent said original, to form a unitary assembly, of said vacuum frame, said printing plate and said original, separate from said light means,

means permitting the formation of a vacuum in said cavity to improve the contact between said printing plate and said original,

and support means which includes a conveyor for moving said unitary assembly into an operative position relative to said light means to expose said printing plate to light from said light means through said light-permeable plate and said original.





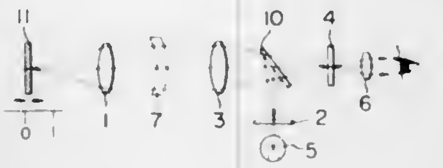
4,033,696
LENS METER

Masao Nohda, Kawasaki, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Feb. 3, 1975, Ser. No. 546,750

Int. Cl.² G01B *9/00*

U.S. Cl. 356—126 **5 Claims**



1. A lens meter comprising:

a collimator lens system in which the lens to be detected is located;

a beam splitter for dividing the optical axis of said lens system into two optical axes;

a target disposed on one of said two axes and at the focal plane of said lens system;

an indicating member on the other of said two axes and at the focal plane of said lens system; and

a reflecting member disposed on the opposite side of said lens system from said target to reflect the light beam passed through the lens system from said target toward said lens system, said reflecting member being movable along the optical axis of said lens system to enable said lens system to focus the reflected light beam on said indicating member and being provided with a marking on its reflecting surface; whereby, the light beam from said marking passes through said collimator lens system and the lens to be detected once only and then reaches said indicating member, and movement of the lens to be detected in the direction perpendicular to the axis of said collimator lens system causes the image of said marking on said indicating member to be moved thereby to permit detection of th apex of the lens to be detected.

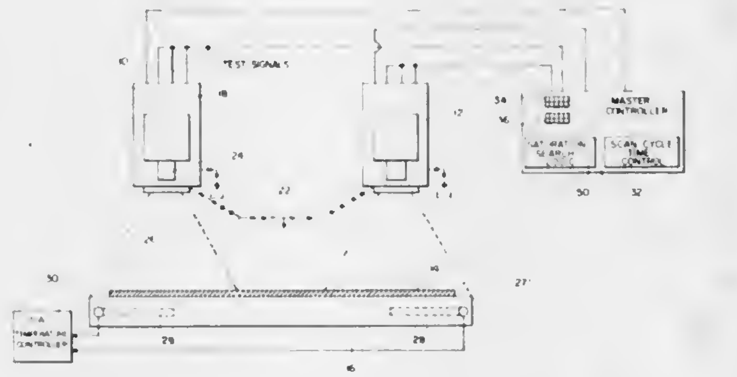
4,033,697
AUTOMATIC EXPOSURE CONTROL FOR A LUMINOUS OBJECT MONITOR SYSTEM

Ray W. Pfoutz, Sunnyvale; Karl H. Mauritz, Santa Clara, and John P. Skurla, Los Gatos, all of Calif., assignors to Reticon Corporation, Sunnyvale, Calif.

Filed May 17, 1976, Ser. No. 686,697

Int. Cl.² G01J *1/20;* **G01B** *11/00, 11/04*

U.S. Cl. 356—160 **14 Claims**



1. Apparatus for monitoring a light emitting workpiece by sensing the intensity of lumination given off by the workpiece, the apparatus comprising electronically scanned photo detection means for sensing the level of lumination emitted over a predetermined area of the workpiece and for producing a video output signal representative thereof, the photo detection means having a predetermined dynamic exposure range which is electronically variable as a function of the time duration to complete one scanning cycle, means responsive to a predetermined parameter of the video signal for determining if the intensity of the lumination of the workpiece extends outside of the range of the photo detection means and for producing an exposure control signal, and scan control responsive to the exposure control signal for varying the time required to complete one scanning cycle of the photo detection means to shift the dynamic exposure range of the photo detection means to include the level of intensity of the lumination from the workpiece.

4,033,698
APPARATUS FOR TEXTILE COLOR ANALYSIS

Herbert M. Demsky, Wappingers Falls; Einar S. Mathisen, Poughkeepsie; Paul A. Schumann, Jr., Wappingers Falls, and Alvin H. Tong, Poughkeepsie, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Oct. 10, 1975, Ser. No. 621,335

Int. Cl.² G01J *3/46*

U.S. Cl. 356—173 **5 Claims**

1. In apparatus for analyzing the color of a textile sample, the combination comprising:

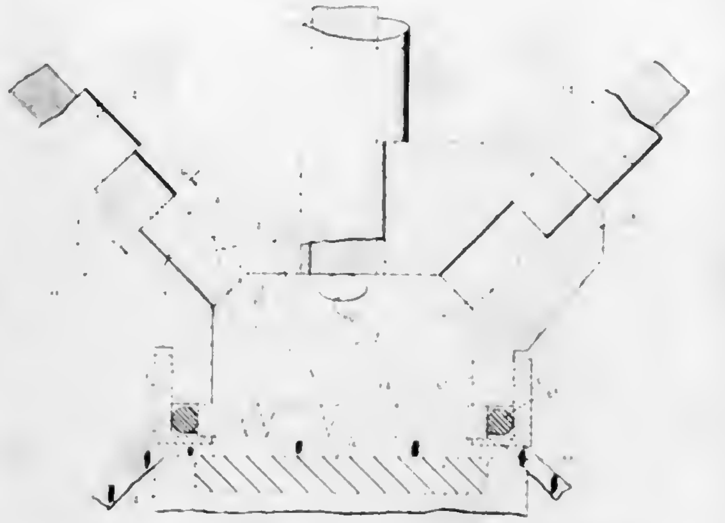
a housing of opaque material having a flat side, a cylindrical chamber therein opening through said flat side, a first cylindrical bore intercepting said chamber at a point opposite to said opening and extending substantially perpendicular to said opening, and a plurality of second cylindrical bores intersecting said chamber along the walls thereof, said second bores having axes that converge substantially to a point coincident with an extension to the axis of said first bore, the walls of said chamber and said first and second bores being blackened to minimize reflectance therefrom;

a first fiber optic bundle having one end mounted in said first bore, the other end being operative to receive light for directly illuminating a test sample positioned against said housing at said opening;

a plurality of second fiber optic bundles each having one end mounted in a different one of said second bores for receiving primarily diffuse light reflected from said sample, said ends of said second bundles being recessed in said second bores and located relative to said opening so that the only direct specular rays received by such ends are rays that have been reflected at least twice from said housing;

a transparent glass plate mounted in said housing and covering said opening and providing a reference surface located a fixed distance from said ends of said fiber optic bundles;

and support means adapted to press said test sample against said glass plate with a pressure in a range wherein the reflectance of said sample remains substantially constant with limited changes in pressure.



4,033,699
VAPOR CONCENTRATION MONITOR

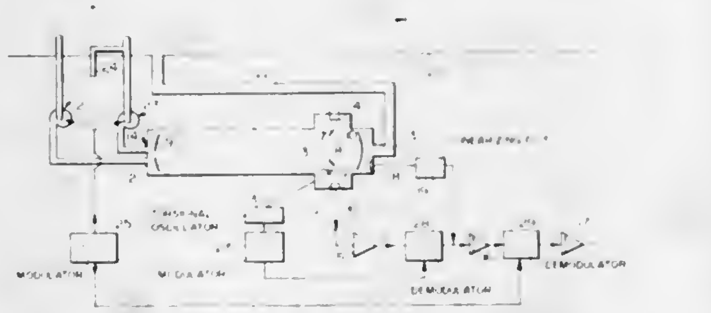
John G. Bayly, and Ronald J. Booth, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed May 30, 1975, Ser. No. 582,183

Claims priority, application Canada, Aug. 1, 1974, 206124

Int. Cl.² G01N *21/26*

U.S. Cl. 356—205 **8 Claims**



1. An apparatus for monitoring air from a predetermined area to determine the concentration of HDO in excess of normally occurring HDO concentration in air, comprising:

chamber means having an air inlet means and an air outlet means;

means for alternately driving the predetermined area air and the normal air into the chamber means through the air inlet means, at a first frequency;

means for producing a beam of radiation along a predetermined path in the chamber means, the radiation beam bandwidth alternating between a bandwidth coincident with at least one narrow absorption bandwidth of HDO and a bandwidth non-coincident with an absorption bandwidth of HDO at a second frequency greater than the first frequency;

detector means located on said predetermined path for detecting the intensity of said beam; and

indicating means connected to said detector means for providing an indication of the excess concentration of HDO as a function of radiation absorption.

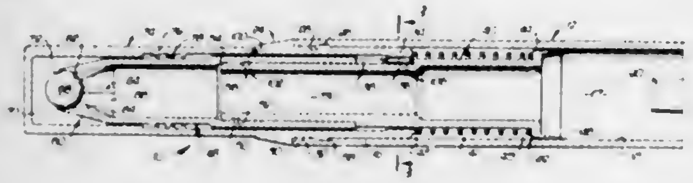
4,033,700
DISPENSER FOR FLUENT MATERIAL

Walter B. Spatz, Pacific Palisades, Calif., assignor to Spatz Corporation, Venice, Calif.

Filed Feb. 2, 1976, Ser. No. 654,034

Int. Cl.² B43K *5/06*

U.S. Cl. 401—180 **22 Claims**



1. A dispenser for fluent material comprising:

a container for storing fluent material to be dispensed;

a dispenser member slidably disposed in said container, said dispenser member having a discharge outlet;

follower means in said container movable in a forward direction toward said discharge outlet;

resilient means engaging and normally urging said dispenser member rearwardly in said container to pressurize fluent material in said container between said follower means and said discharge outlet, and means for shifting said dispenser member forwardly in said container to energize said resilient means.

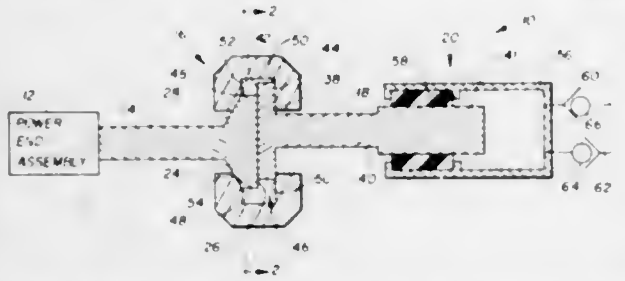
4,033,701
CLAMP — SELF ALIGNING

Harold S. Labyer, and James C. Dodson, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Apr. 8, 1976, Ser. No. 674,693

Int. Cl.² B25G *3/00*

U.S. Cl. 403—13 **2 Claims**



1. An adjustable self centering clamp for positive self-aligning coupling of adjacent end portions of two reciprocative rods in parallel alignment with the axes thereof laterally displaced, said clamp comprising:

an outwardly tapered shoulder, on said adjacent end portion of one of said rods and facing away from an adjacent end thereof;

a first flat transverse end surface means, on said adjacent end portion of said one of said rods, for allowing lateral movement of the rods relative to one another while maintaining a positive coupling force on the rods;

a second flat transverse end surface means, on said adjacent end portion of the other of said rods, disposed in laterally slidable abutment with said first flat transverse end surface means;

a flat radial shoulder perpendicular to the axes of said other of said rods on said adjacent end portion of said other of said rods and facing away from an adjacent end thereof;

at least two ring sectors each having a radially inward facing recess having first and second walls and a bottom, said first wall having a tapered portion conforming to said tapered shoulder and said second wall having a radial surface conforming to said radial shoulder; and

connector means positioning said ring sectors about said end portions with said second wall slidably abutting said radial shoulder and for thereafter adjustably forcing said first wall to slide inwardly along said tapered shoulder whereby said radial shoulder is forcibly held in non-slidable contact which said second wall;

said two ring sectors being operable, when engaged with said end portions of said two reciprocative rods and with said first and second transverse end surfaces slideably engaged to cooperate with said end portions to permit unitary reciprocative movement of said two rods,

with the axes of said two rods undergoing mutual displacement in response to said reciprocating movement while remaining in mutually, generally parallel relation, and

with said end portions of said two reciprocative rods remaining in generally axially abutting relation;

said two ring sectors being operable to undergo joint reciprocating movement with said two rods, while said axes of said two rods are mutually displaced,

with said tapered portion and tapered shoulder cooperating to wedgingly urge said end portions of said two reciprocative rods into a relatively mutually immobilized condition with said axes thereof being mutually displaced;

said first flat transverse end surface and said second flat transverse end surface being alternately subjected to pushing and pulling forces during said reciprocating movement and being mutually displaceable, generally transversely of said reciprocating movement and in response thereto, to effect said mutual displacement of said axes of said two rods during, and in response to, said reciprocating movement; and

said two ring sectors remaining substantially centered in relation to said one of said rods and said outwardly tapered shoulder thereof during said mutual displacement of rod axes, while said other of said rods and said flat radial shoulder thereof are laterally displaced relative to said two ring sectors during and in response to said reciprocating movement as permitted by relatively reduced frictional engagement between said first and second flat transverse end surface means existing while said end surface means are slidably engaged prior to said relative immobilizing of said axes of said rods.

4,033,702
ASSEMBLIES FOR SEALING ROADWAY CURB GAPS AND METHOD OF SEALING SAME

John C. Moerk, Jr., Buffalo Grove, Ill., assignor to Felt Products Mfg. Co., Skokie, Ill.

Filed Aug. 7, 1975, Ser. No. 602,684

Int. Cl.² E01C *11/02*

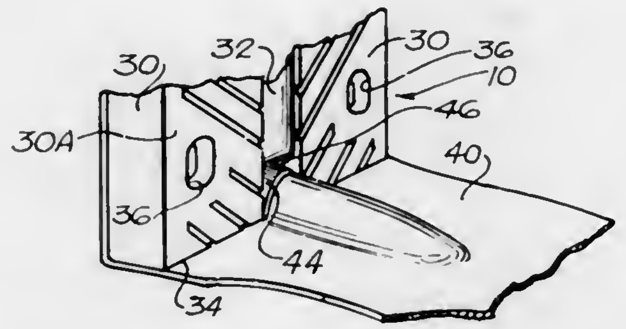
U.S. Cl. 404—69 **16 Claims**

1. An assembly for sealing the intersection of curb and gutter portions of adjacent roadway slabs comprising elongate parallel, spaced-apart side pads having front and rear surfaces and first and second ends, an elongate flexible joint membrane having a pre-formed, self-sustaining, upstanding arched configuration and sealingly joining said side pads, and having front and rear surfaces, and an expansive flexible sealing flap sealingly secured to said side pads and to said joint membrane for sealing a gap between curb and gutter portions of adjacent roadway slabs and for promoting controlled folding of the

sealing flap at the region where angular transition from the plane of the curb to the plane of the gutter occurs, and

said joint membrane terminating a distance from said first ends of said side pads equal at least to about the thickness of said side pads,

said flexible sealing flap extending away from said side pads and being substantially more flexible than is said joint membrane, said sealing flap comprising a main body portion which is relatively limp and a rigidified portion providing a self-sustaining, upstanding arched control zone, which control zone is substantially more rigid than the relatively limp main body portion of said sealing flap, said control zone commencing at about said first ends of said side pads and extending away from said first ends a distance equal to at least about the thickness of said side pads,



said control zone, when said side pads and flap are generally coplanar, extending in line with said joint membrane,

said joint membrane being connected to said control zone by an intermediate relatively limp flexible portion of said main body which is substantially more flexible and less rigid than is said control zone and than is said joint membrane,

whereby when said side pads and joint membrane are folded upwardly out of the plane of said sealing flap and relative to said sealing flap to position the upwardly extending portion of the joint membrane over said control zone, said control zone promotes controlled folding of said intermediate portion neatly between said joint membrane and said control zone and said control zone becomes disposed in the area between said side pads and beneath said joint membrane, and without bunching and wrinkling of said intermediate portion.

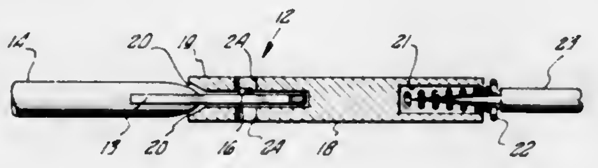
4,033,703
DRILL BIT FOR COUPLING TO A WIRE FISHING ADAPTER

Don Slater, 2542 Balfour, Fullerton, Calif. 92631

Filed Dec. 5, 1974, Ser. No. 529,627

Int. Cl.² B23B *51/08*

U.S. Cl. 408—211 **6 Claims**



1. A device for boring a passageway through a wall, or the like, and for fishing a wire through said passageway, comprising:

a. A drill having a blade-type drill bit;

b. At least one pin fixedly secured to and protruding from one of the two relatively broad faces of said blade-type drill bit;

c. A rod having an axially-disposed passageway in one end and a pair of axially-extending fingers in the other end, said fingers being spaced-apart a distance slightly greater than the thickness of the edge of said blade-type drill bit and having a journal in at least one of said fingers for pivotally capturing said pin; and

d. Wire coupling means disposed in said rod passageway and anchored to said rod for removably coupling said wire to said rod.

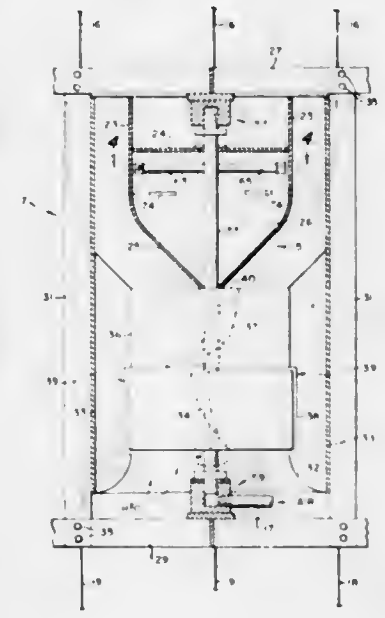
4,033,704
DESTRATIFICATION DEVICE

James C. Wadge, Golden; Henry T. Falvey, Conifer, and Perry L. Johnson, Lakewood, all of Colo., assignors to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Nov. 11, 1976, Ser. No. 741,075

Int. Cl.² F04B *17/00, 37/10*

U.S. Cl. 415—80 **12 Claims**



1. A destratification device for controlling water quality parameters in a body of water, which device comprises, in combination:

an elongated hollow open ended outer housing;

an elongate shroud having a smooth outer surface and an interior, mounted in the housing plenum;

means for supporting the housing and shroud in a substantially vertical position within the body of water with their lower ends spaced from the bottom thereof;

a rotatable drive shaft having a hollow portion disposed coaxially within the center of the shroud and in fluid communication with its plenum;

reactive propulsion arm means mounted on said shaft and operable by pressurized fluid flowing through the hollow portion of the shaft; for rotating said shaft;

impeller means carried by the shaft for moving water axially around the exterior of the shroud when the shaft is rotated; and

a source of pressurized fluid for supplying fluid to said propulsion means through said shaft.

4,033,705
BLADE RETAINER ASSEMBLY

George W. Luebering, Cincinnati, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Apr. 26, 1976, Ser. No. 680,067

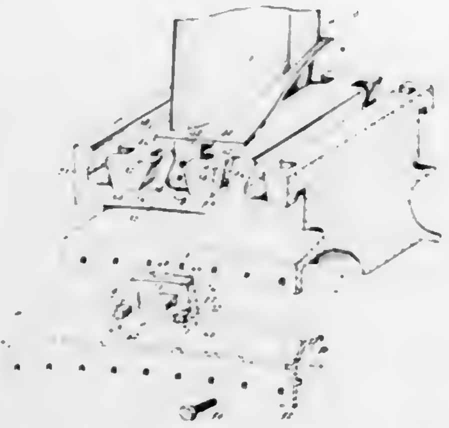
Int. Cl.² F01D *5/32*

U.S. Cl. 416—220 R **8 Claims**

1. A blade retaining assembly for locking radially extending blades in a rotor disc associated with a gas turbine engine,

each blade having a dovetail tang at its radially inward end and the rotor disc having dovetail slots extending axially across its periphery, each dovetail tang being received in one of said slots, said assembly comprising:

a pair of lugs axially extending from one side of said disc and disposed adjacent said slot and circumferentially spaced apart from each other to form an access gap for insertion of said blade tang into said dovetail slot, said pair of lugs having at least one radially inwardly facing abutment surface;



a pair of axially aligned opposed inwardly facing recesses, one of said pair of recesses disposed in one of said pair of lugs and opening into said gap and the other of said pair of recesses disposed in the other of said pair of lugs and opening into said gap;

a retaining member residing in said pair of recesses and extending across said gap so as to preclude egress of said blade tang from said dovetail slot, said retaining member including at least one axially extending protrusion adapted to radially overlap and abuttingly engage said radially inwardly facing abutment surface on said pair of lugs.

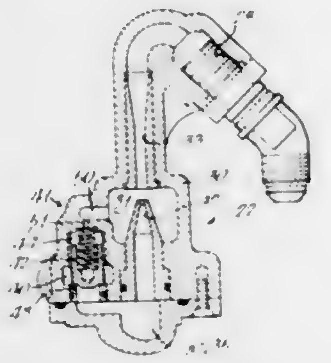
4,033,706
FLUID DELIVERY SYSTEM WITH A JET PUMP BOOSTER AND MEANS TO MAINTAIN A CONSTANT RATE OF FLOW THROUGH THE JET NOZZLE

John G. Schaefer, and Terry L. Whitesel, both of Rockford, Ill., assignors to Sundstrand Corporation, Rockford, Ill.

Filed Aug. 6, 1975, Ser. No. 602,240

Int. Cl.^{2} F04B *23/04;* **F04F** *5/48*

U.S. Cl. 417—79 **18 Claims**



1. A fluid delivery system for delivering fluid from a tank including a positive displacement pump having an outlet connected to a discharge line, fluid flow control means in said discharge line for varying the rate of fluid delivered by the system, an ejector pump upstream of the positive displacment pump for delivering fluid to an inlet of the latter pump from the tank and having a nozzle, means including a fluid line connected between said discharge line and said nozzle for directing a part of the fluid delivered by the positive displacement pump to said nozzle, and a valve separate from said fluid flow control means and having an inlet connected to said fluid line and operable to maintain a uniform rate of fluid flow through said fluid line to said nozzle, and said valve including means responsive to the rate of flow through said nozzle for control of valve operation to maintain said uniform rate of fluid flow.

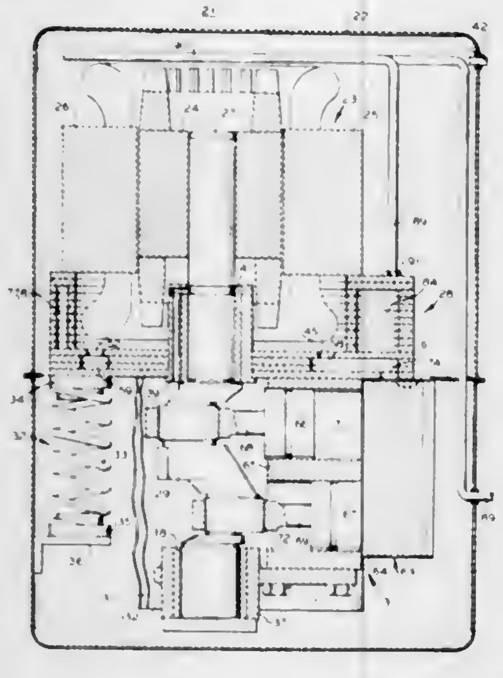
4,033,707
REFRIGERATION COMPRESSOR STRUCTURES AND THEIR METHODS OF CONSTRUCTION

Howard A. Stutzman, Fort Worth, Tex., assignor to Atlas Industries, Inc., Woodville, Ohio

Division of Ser. No. 347,847, April 4, 1973, abandoned. This application Aug. 18, 1975, Ser. No. 605,463

Int. Cl.^{2} F04B *21/00*

U.S. Cl. 417—312 **24 Claims**



1. In an integral motor and compressor comprising a base suporting a motor stator, a motor rotor, a compressor head, a valve assembly, a compressor block and a compressor crankshaft the improvement which comprises:

said base being constructed from at least three planar laminations in stacked, face-to-face relation;

a first of said laminations having an aperture formed therein the margins of which define a side wall of a cavity in said base for accommodating one end of said stator windings and rotor;

a second and a third of said laminations comprising an end wall for said cavity;

a low-pressure gas inlet passage integral with the end wall of said cavity and in circumferential alignment with said stator and rotor;

an array of low-pressure gas inlet ports through the end wall of said cavity and in communication with said inlet passage;

a low-pressure outlet port in communication with said inlet passage and through the end wall of said base abutting said compressor head; and

an intake manifold passage in said compressor head connected between said valve assembly and said low-pressure gas outlet port.

4,033,708
ROTARY COMPRESSOR

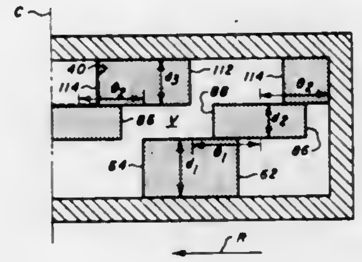
Roger C. Weatherston, Williamsville, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.

Continuation-in-part of Ser. No. 501,034, Aug. 28, 1974, Pat. No. 3,941,521. This application Jan. 30, 1976, Ser. No. 654,138

The portion of the term of this patent subsequent to Mar. 2, 1993, has been disclaimed.

Int. Cl.^{2} F04C *13/00, 17/10*

U.S. Cl. 418—9 **33 Claims**



2. A rotary compressor, comprising:

a. a housing defining two working chambers,

b. mating impellers rotatably mounted about an axis in each of said working chambers for rotation in opposite directions,

c. each impeller having at least two profiles each of constant cross-section in planes perpendicular to said axis,

d. each of said profiles comprised of at least one lobe and at least one well, each well and each lobe being joined by a transition surface,

e. an outlet communicating with said housing,

f. means for supplying fluid at inlet pressure to the wells of each profile during portions of the rotation cycle of each impeller, whereby in one rotational position of said impellers at least one well of each profile on each impeller contains trapped fluid at inlet pressure,

g. at least one of said profiles being out of the plane of said outlet and at least one of said profiles being adjacent said outlet and

h. the lobes and wells of any one profile being angularly displaced from those of the profiles immediately adjacent thereto thereby defining in said one rotational position a common volume of trapped fluid extending from said profile adjacent said outlet to the profile most remote therefrom whereby as said impellers continue to rotate from said one rotational position said common volume is sequentially reduced by the transfer of trapped fluid from the wells of said most remote profile to said adjacent profile with the wells of said most remote profile being substantially exhausted of fluid as the wells of said adjacent profile are exposed to said outlet.

4,033,709
MOLDING APPARATUS FOR RIBBED PRODUCT

Karl Kristian Kobs Kroyer, Copenhagen, Denmark, assignor to Karl Kroyer St. Anne's Limited, Bristol, England

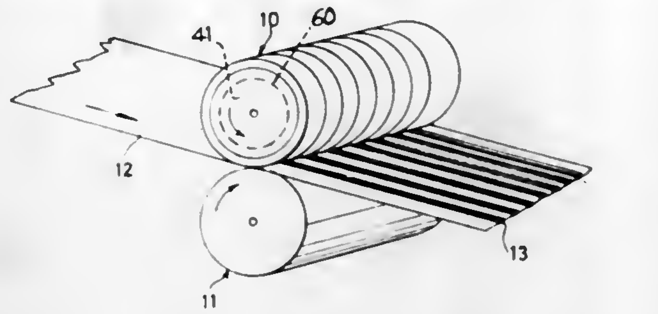
Filed July 7, 1975, Ser. No. 593,189

Claims priority, application United Kingdom, July 4, 1974, 29652/74; July 27, 1974, 33263/74

Int. Cl.^{2} B29C *15/00*

U.S. Cl. 425—224 **15 Claims**

1. Apparatus for moulding ribs, ridges, studs and other upstanding projections on a mouldable material comprising a mould having an endless shaping surface and having a plurality of flexible protrusions defining therebetween at least one moulding cavity defined by the adjacent faces of the protrusions, the adjacent faces being movable when the protrusions are deformed by pressure for reducing the size of the cavity and for compacting any mouldable material therein.



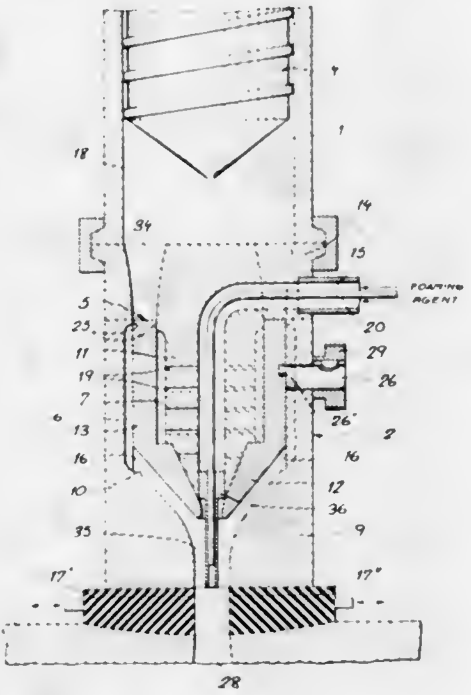
4,033,710
APPARATUS FOR MAKING THERMOPLASTIC ARTICLES WITH POROUS CORES AND LESS POROUS OR NONPOROUS SKINS

Robert Hanning, Via Tagliaferri 15, Campione d'Italia, Italy

Filed July 25, 1975, Ser. No. 599,055

Int. Cl.^{2} B29D *27/00*

U.S. Cl. 425—543 **9 Claims**



1. An apparatus for making thermoplastic articles with a highly porous part integrally adjoining a part of low to zero porosity, comprising:

a mold having a cavity provided with a gate;

a nozzle having a sprue communicating with said gate and an entrance port remote from said sprue, said nozzle being provided with a ring space between said port and said sprue and and entrance port remote from said sprue;

injection means connected to said port for introducing a flowable thermoplastic material through said sprue and gate into said cavity;

flow-dividing means in said nozzle forming a first and a second path between said port and said sprue, thereby splitting said material into a first stream and a second stream merging with each other in said gate, said flow-dividing means comprising an annular member axially movable in said ring space and defining therewith an outer clearance forming part of said first flow path and an inner clearance forming part of said second flow path, said ring space being bounded by walls coacting with confronting surfaces of said annular member for adjustably obstructing the flow of said material through said clearances, said annular member being provided with externally operable actuating means for axially displacing same; and

inlet means forming a passage open to said second flow path but separated from said first flow path for admixing a foaming agent with said second stream only.

4,033,711

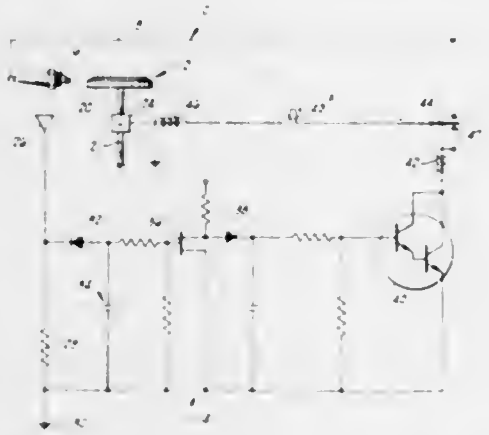
SPARK IGNITION GAS FLOW CONTROL SYSTEM

Joseph C. Christian, Norman, Okla., and Arthur J. Steele, Menlo Park, Calif., assignors to Metrodata, Inc., Norman, Okla.

Filed Feb. 25, 1976, Ser. No. 661,297

Int. Cl.² F23Q *3/00*

U.S. Cl. 431—66 **7 Claims**



1. A spark ignition fuel flow system which comprises:

spark-generating means;

means for detecting a spark generated by said spark-generating means and providing a signal in response to said detection;

means connected to said detection means for amplifying a signal produced by said detection means, said amplifying means comprising:

an N-channel field effect transistor connected to said detecting means and normally electrically biased to a state of conduction when no signal is produced by said detecting means;

a Darlington pair transistor having the coil of said relay in the collector circuit thereof; and

a diode connected between said N-channel field effect transistor and said Darlington pair transistor to pass positive going direct current to said Darlington pair transistor when said field effect transistor is in the nonconducting state;

a fuel burner adjacent said spark-generating means for delivering combustible fuel to a situs for ignition by a spark generated by said spark-generating means; and

fuel flow control means connected to said amplifying means for permitting fuel to flow to said burner in response to an amplified signal developed by said amplifying means.

4,033,712

FUEL SUPPLY SYSTEMS

Scott A. Morton, Laramie, Wyo., assignor to Edmund D. Hollon, Douglas, Wyo., a part interest

Filed Feb. 26, 1976, Ser. No. 661,629

Int. Cl.² F23H *3/00*

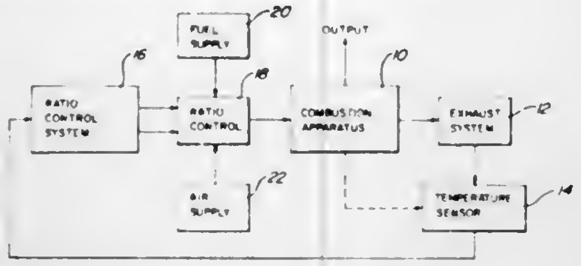
U.S. Cl. 431—90 **12 Claims**

1. In a combustion apparatus having an exhaust system, a fuel supply system and an air supply system, the improvement comprising:

varying means responsive to control information for adjusting in either direction the ratio of fuel to air supplied to said apparatus;

detecting means responsive to the atmosphere within the combustion system for sensing the temperature of the combustion resultant and developing a temperature signal having a value proportional to said temperature;

means for successively comparing a first sample of said temperature signal developed during a first time interval with a second sample of said temperature signal developed during a later time interval to produce said control information and thereby enable said varying means in the direction seeking a maximum of combustion-produced temperature.



4,033,713

SAFETY DEVICE FOR BUTTERFLY DAMPERS

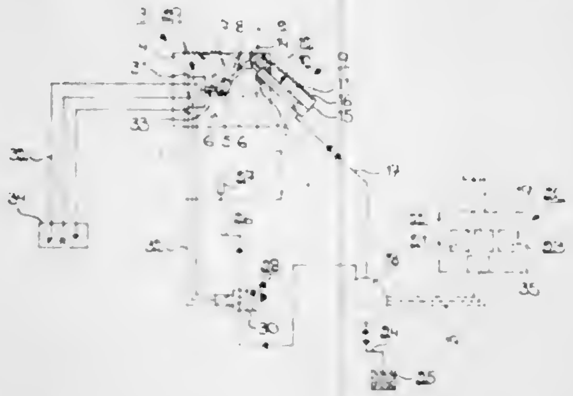
Sven Arne Nilsson, Hassle 12, S-240 36 Stehag, Sweden

Filed Aug. 21, 1975, Ser. No. 606,527

Claims priority, application Sweden, Apr. 24, 1975, 7504738

Int. Cl.² F23N *3/00*

U.S. Cl. 431—153 **2 Claims**



1. A safety device for an oil fired central heater having a butterfly damper mounted in the flue duct of the heater, said heater including burner means, pump means for pumping oil to said burner means, and control means for actuating said pump means, said safety device comprising:

hydraulic means connected with said butterfly damper for operating the same, said hydraulic means being arranged to open said damper when operating fluid under pressure is supplied thereto, and to close said damper when the pressure of said operating fluid is relieved;

first conduit means connecting said pump means with said hydraulic means, whereby oil is transmitted to said hydraulic means under pressure when said pump means is actuated, said oil serving as the operating fluid for said hydraulic means;

second conduit means connecting said pump means with said burner means, and including a normally closed magnetic flow control valve;

position indicator means carried by said butterfly damper;

normally open switch means arranged to be closed by said position indicator means when said butterfly damper is open, and to open when said damper moves from said open position; and

an electrical circuit connecting said normally open switch means with said normally closed magnetic flow control valve, and arranged to supply electric current to said magnetic valve for opening the same to allow oil to flow to said burner means, only when said butterfly damper is open whereby said position indicator means is effective to close said normally open switch means.

4,033,714

GASEOUS FUEL BURNERS

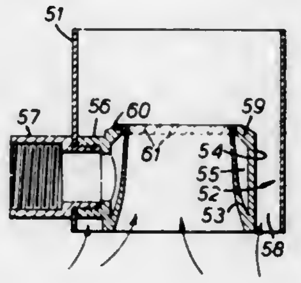
Alfred Longworth, Wembley, England, assignor to Radiation Limited, London, England

Division of Ser. No. 350,780, April 13, 1973, Pat. No. 3,897,198. This application May 5, 1975, Ser. No. 574,523

Claims priority, application United Kingdom, Apr. 17, 1972, 17691/72; Oct. 18, 1972, 47926/72

Int. Cl.² F23D *13/40*

U.S. Cl. 431—354 **19 Claims**



1. A mixer device for mixing first and second fluids, the device comprising a hollow vessel having two open ends and a longitudinal axis and comprising in combination first and second tubular members nested together to form the vessel, one of said members having a surface with a plurality of grooves each of which lies in a direction that is both tangential to a cylinder drawn about said axis and inclined towards one end of said vessel, the other of said members having a surface that coacts with said grooved surface to form a plurality of inlets into said cylinder for said first fluid whereby said first fluid is directed into said vessel with a helical motion about said axis and directed towards said one end of said vessel whereby a low pressure zone is created within the helix to draw said second fluid into said vessel via the other end thereof.

4,033,715

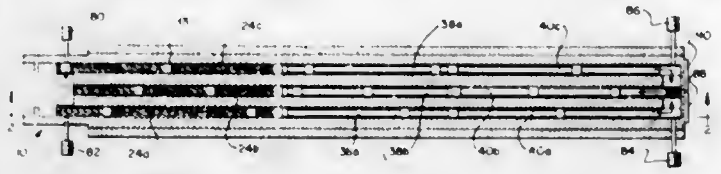
HEAT PROCESSING SYSTEM

Jacob Howard Beck, Waban, Mass., assignor to BTU Engineering Corporation, North Billerica, Mass.

Filed Jan. 12, 1976, Ser. No. 648,538

Int. Cl.² F27D *3/06*

U.S. Cl. 432—4 **4 Claims**



1. For use in a furnace having a high heat section to which exposure of a product must be limited, a lower temperature section contiguous with said high heat section for passage of a product along a common axis through said high heat section and said lower temperature section, first conveyor apparatus in said high heat section for transporting a product in a forward direction therethrough, second conveyor apparatus in said high heat section for transporting product carriers in a reverse direction therethrough, third conveyor apparatus in said lower temperature section for transporting a product in a forward direction through the lower temperature section and fourth conveyor apparatus in the lower temperature section for transporting product carriers in a reverse direction through the lower temperature section, and means for transferring the product carriers on the third conveyor apparatus at the end of the lower temperature section to the associated end of the fourth conveyor apparatus of the lower temperature section, a method for safely storing a product in a furnace during an emergency condition comprising the steps of:

moving a product on the third conveyor apparatus of the lower temperature section to the fourth conveyor apparatus of the lower temperature section;

moving the product on the first conveyor apparatus of the high heat section to the third conveyor apparatus of the lower temperature section; and

stopping said conveyor apparatus to retain said product in the furnace only within the lower temperature section.

CHEMICAL

4,033,716

TRANSFER PRINTING PROCESS FOR HYDROPHILIC FIBROUS MATERIAL

Raymond Défago, Riehen; Visvanathan Ramanathan, Basel, both of Switzerland, and Gerhard Back, Lorrach, Germany, assignors to Ciba-Geigy AG, Basel, Switzerland

Filed Oct. 15, 1974, Ser. No. 515,104

Claims priority, application Switzerland, Nov. 2, 1973, 15456

Int. Cl.² D06P *1/10, 1/12*

U.S. Cl. 8—2.5 A **16 Claims**

1. In a transfer printing process for the dyeing or printing of hydrophilic fibrous material which comprises (A) bringing the surface of a hydrophilic fibrous material into contact with the treated surface of a carrier, said carrier sheet having been treated with a printing ink containing at least one transferable, metallizable dye or color former, (B) subjecting the carrier and hydrophilic fibrous material to heat treatment for a time and at a temperature sufficient to achieve transfer of the dye or color former to the hydrophilic fibrous material, (C) separating the hydrophilic fibrous material from the carrier sheet, and (D) subjecting the hydrophilic fibrous material to after-treatment,

the improvement according to which the hydrophilic fibrous material is, prior to contact with the carrier sheet, impregnated with an aqueous solution comprising

- a. an organic solvent which
  - 1. has a boiling point higher than 120° C
  - 2. has a solubility in water of at least 25 g/l at 25° C directly or with the aid of an auxiliary solvent, and
  - 3. is sparingly volatile but fluid under the heat treatment conditions of (B), and
- b. at least one compound which yields a metal which forms a complex with the dye or color former of the printing ink, and

following impregnation, said hydrophilic fibrous material is dried at a temperature up to about 100° C.

4,033,717

METHOD OF PRODUCING MULTICOLORED YARN, AND YARN AND CARPET MADE THEREBY

Ralph Whitaker, Bala Cynwyd, Pa., assignor to Fred Whitaker Company, Bala-Cynwyd, Pa.

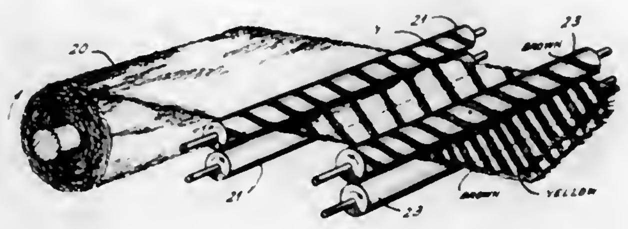
Filed Oct. 6, 1975, Ser. No. 619,631

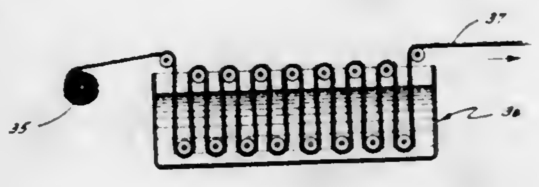
Int. Cl.² D06P *5/00, 7/00*

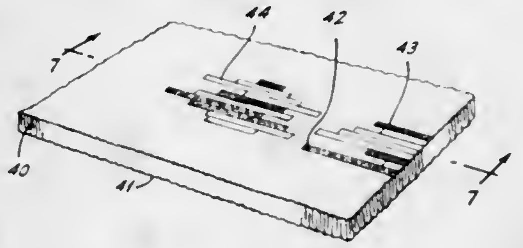
U.S. Cl. 8—14 **29 Claims**

1. In a method of making a fabric from a drawn but undyed synthetic yarn, the steps which comprise:

- a. forming a prefabric (a) of said drawn but undyed yarn,
- b. dyeing selected portions of said prefabric (a) while leaving other selected portions of said prefabric (a) free of any dye,
- c. raveling the resulting partially dyed prefabric (a) to produce a partially dyed yarn (c),
- d. forming said partially dyed yarn (c) into a partially dyed prefabric (d), and
- e. substantially completely over-dyeing the entire surface of said partially dyed prefabric (d) so that at least two different colors are intermittently and randomly arranged along the yarn length.







4,033,718

PHOTOACTIVATED BLEACHING PROCESS

Thomas Charles Holcombe, and Robert Howard Schultz, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 419,320, Nov. 27, 1973, abandoned. This application Sept. 8, 1975, Ser. No. 611,588

Int. Cl.² D06L *3/02, 3/04*

U.S. Cl. 8—103 **8 Claims**

1. A process for removing stains from textiles which comprises treating the textiles, in the presence of visible light and oxygen, with an aqueous solution containing:

- a. a concentration of from 78 milligrams per liter to 1,440 milligrams per liter of an anionic surfactant;
- b. a concentration of from 215 milligrams per liter to 2,140 milligrams per liter of an alkaline builder salt; and
- c. a concentration of from 0.25 milligrams per liter to 125 milligrams per liter of a bleach photoactivator which is a mixture of sulfonated zinc phthalocyanine species in which the relative densitometer values (RDV's) of the various sulfonated zinc phthalocyanine species in the mixture are:

Specie	RDV
unsulfonated	0
monosulfonated	0
disulfonated	0–15
trisulfonated plus tetrasulfonated	(100)-(RDV for disulfonated).

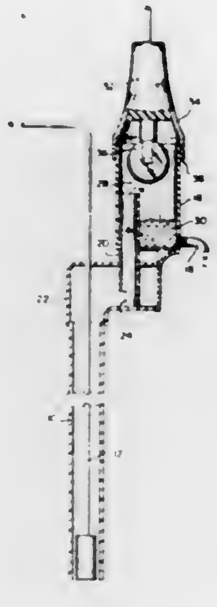
4,033,719
ULTRAVIOLET STERILIZER

Arnold Conn, 253 West End Ave., Brooklyn, N.Y. 11207, and Harvey K. Cohen, 79 Skyline Drive, Coram, N.Y. 11727

Continuation-in-part of Ser. Nos. 397,637, Sept. 17, 1973, Pat. No. 3,965,007, and Ser. No. 586,186, June 12, 1975. This application Dec. 22, 1975, Ser. No. 643,149

Int. Cl.^{2} A01K *64/02;* **A61L** *3/00*

U.S. Cl. 21—102 R **6 Claims**



1. An aquarium comprising a recirculating water flow filter system including an air stone for mixing air with the recirculating water, a diffuser connected in said recirculating water flow system, said diffuser comprising a container, baffle and conduit means for carrying the air-water mixture from said recirculating water flow system to said container and thereby thinning the flow sheet of said air-water mixture passing from said conduit means to said container, an ultraviolet sterilizer comprising a source of ultraviolet light, a housing for holding said source of ultraviolet light and means for attaching said housing to said diffuser and locating said source of ultraviolet light proximate to said sheet of air-water mixture flowing out of said conduit means for irradiating said thinned out air-water mixture.

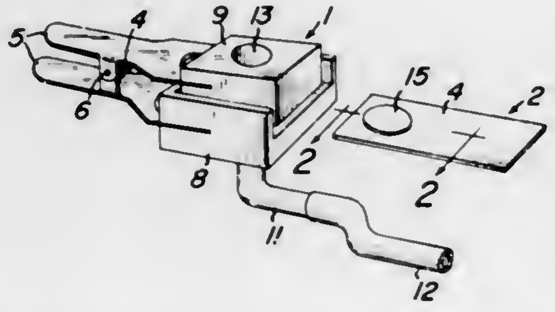
4,033,720
UNITARY SAMPLING AND ANALYSIS STRIP AND PROCESS

Achille Silvestri, Bel Air, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed May 31, 1974, Ser. No. 475,079

Int. Cl.^{2} G01N *31/22*

U.S. Cl. 23—230 R **1 Claim**



1. A method of detecting contaminants in fluids comprising the steps of: providing a unitary contaminant sampling and chromatographic analysis strip having a filter portion which is fluid porous with pores smaller than contaminants and a chromatographic portion disposed longitudinally therefrom: collecting a contaminant sample upon the said filter portion by traversely passing a contaminant containing fluid through the pores of the filter portion without engaging the said chromatographic portion and thereby leaving a contaminant sample upon said filter portion; chromatographing said sample with the application of a solvent to the sample and said strip; and then analyzing the resultant chromatographic portion.

4,033,721
ANALYSIS OF GENTIAN VIOLET RESIDUE IN TISSUE

Gregg W. Taylor, Murrayville, Ga., assignor to A.H.P., Inc., Gainesville, Ga.

Continuation-in-part of Ser. No. 342,290, March 16, 1973, Pat. No. 3,916,027, Continuation-in-part of Ser. No. 454,000, March 22, 1974, Pat. No. 3,915,637, Continuation-in-part of Ser. No. 595,876, July 14, 1975, Continuation-in-part of Ser. No. 625,873, Oct. 24, 1975, Continuation-in-part of Ser. No. 658,760, Feb. 17, 1976, Pat. No. 3,975,158. This application Aug. 16, 1976, Ser. No. 714,895

Int. Cl.^{2} G01N *33/16*

U.S. Cl. 23—230 B **24 Claims**

1. A process for the analysis of gentain violet in a material which comprises:

a. finely particulating a known amount of material containing gentian violet, unless such material is already in a finely divided state;
b. admixing a known amount of acidified ethanol with said finely particulated material and letting the resultant admixture stand, said acidified ethanol removing said gentian violet from said material;
c. separating said acidified ethanol (b) from said admixture (b) by centrifugation;
d. removing any spectrophotometrical interfering substance from said acidified ethanol (c) by passing said acidified ethanol (c) through a chromatograph column, containing a basic sorbent, the acid in said acidified ethanol (c) being neutralized;
e. concentrating said neutralized ethanol (d) so that the concentration of said gentian violet therein is increased;
f. determining the amount of getian violet in said neutralized ethanol (e) and the background measurement of said neutralized ethanol (e) by spectrophotometrical means;
g. quenching said gentian violet in said neutralized ethanol (e) by adding to said neutralized ethanol (e) a chemical substance which selectively renders said gentian violet non-detectable by spectrophotometric means without disturbing the spectrophotometric background of said neutralized ethanol;
h. determining the background measurement of said neutralized ethanol (e) by spectrophotometrical means; and
i. calculating the quantitative amount of gentian violet in said material using the spectrophotometrical measurements of steps (f) and (h).

4,033,722
ASSAY FOR MYASTHENIA GRAVIS

Jon M. Lindstrom, Del Mar, Calif., assignor to The Salk Institute for Biological Studies, San Diego, Calif.

Filed Aug. 8, 1975, Ser. No. 603,243

Int. Cl.^{2} G01N *33/16;* **A61K** *43/00*

U.S. Cl. 23—230.3 **8 Claims**

5. A diagnostic test for determination of myasthenia gravis comprising the steps of preparing a complex of acetylcholine receptor protein derived from human muscle, toxin and a radioactive isotope, incubating said complex with a serum sample from a patient so as to join antibodies engendered by myasthenia gravis to receptor in said complex, precipitating said antibody-complex with anti-immunoglobulin and measuring the radioactivity of said precipitate.

4,033,723
PREGNANCY TEST DEVICE

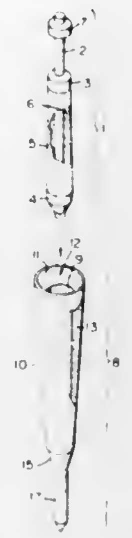
Morris Lincoln Givner, Pierefonds, and Guenther Schilling, Westmount, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,860

Claims priority, application Canada, Dec. 17, 1975, 242214

Int. Cl.^{2} B01D *31/00;* **G01N** *21/04, 33/16*

U.S. Cl. 23—253 R **10 Claims**



1. A pregnancy test device suitable for the detection of human chorionic gonadotropin or its β-subunit thereof in urine or serum, which comprises:

a. chamber means including a ultrafiltration membrane for concentration of the urine or serum and means for collecting the concentrate;
b. means for transferring the collected concentrate to a detection receptacle means;
c. detection receptacle means for the detection of human chorionic gonadotropin or its β-subunit thereof in the concentrate by immunological means; and
d. wherein said chamber means including an ultrafiltration membrane has been prewashed with a solution of protein.

4,033,724
OXYGENATOR HAVING A VARIABLE CAPACITY OXYGENATING TUBE

Tatsuo Tamiya, Chiba, Japan, assignor to Senko Medical Instrument Mfg. Co. Ltd., Tokyo, Japan

Filed June 10, 1975, Ser. No. 585,633

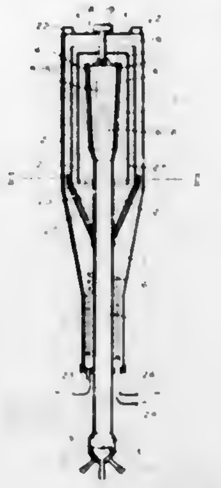
Claims priority, application Japan, May 15, 1975, 50-64506[U]; June 2, 1975, 50-74528[U]

Int. Cl.^{2} A61M *1/03*

U.S. Cl. 23—258.5 BH **4 Claims**

1. An oxygenator comprising:

a blood storage tube of a cylindrical shape;
an oxygenating tube longitudinally inserted in said blood storage tube in coaxial relation thereto;
at least one blood inlet port provided at a lower end of said oxygenating tube;
an oxygen disperser, provided within a central portion of the lower end of said oxygenating tube, including an injection plane composed of a perforated plate of a concave section, having a downwardly recessed surface;
a debubbling chamber provided within the annulus formed by said blood storage tube and said oxygenating tube and disposed at the upper portions thereof
a blood storage chamber defined by a substantially lower portion of said blood storage tube;
a heat exchanger wound around said oxygenating tube in said blood storage tube;
a blood capacity control means including an uppermost blood outlet at the top of said oxygenating tube and at least one outer side opening provided in a side wall of the substantially upper portion of said oxygenating tube and at least one corresponding inner side opening provided in a side wall of an internal cylindrical member rotatably longitudinally inserted in said substantially upper portion of said oxygenating tube, wherein, by rotating the internal cylindrical member, each pair of said outer and inner side openings are brought into alignment with each other thereby creating a lower blood outlet or deviated from their aligned positions thereby providing for the flow of blood through said uppermost outlet whereby the blood capacity of said oxygenating tube is controlled.



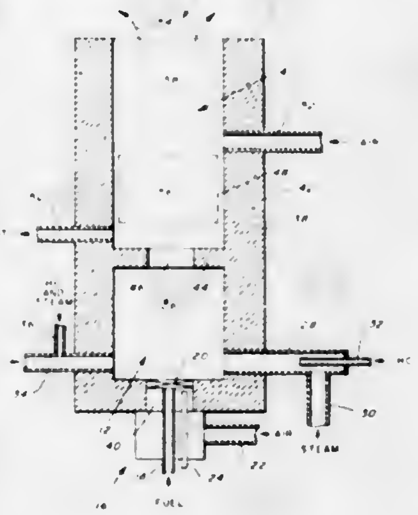
4,033,725
APPARATUS FOR NO_x CONTROL USING STEAM-HYDROCARBON INJECTION

Robert D. Reed, and Eugene C. McGill, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Division of Ser. No. 228,823, Feb. 24, 1972, Pat. No. 3,911,083. This application July 30, 1975, Ser. No. 600,386

Int. Cl.^{2} B01D *53/34;* **F23G** *7/06*

U.S. Cl. 23—277 C **2 Claims**



1. A furnace system for the reduction of nitrogen oxides, comprising:

a. a refractory lined furnace having a first and second chamber of substantially the same diameter; the first end of said first chamber being a plane surface;
b. first axial means for introducing gaseous fuel and stoichiometric air for burning said fuel into said first chamber

at said first end, and including ignition means for igniting said fuel;

c. second means to radially inject combustible hydrocarbon and steam at a plane close to said first end of said first chamber to create a reducing atmosphere in said first chamber;

d. third means for radially introducing nitrogen oxide containing gases into the reducing atmosphere in said first chamber at the first end of said first chamber whereby said nitrogen oxides will be reduced;

e. passage means of diameter less than said chamber diameter at the second end of said first chamber leading to the first end of said second chamber for the flow of gases from said first chamber to said second chamber, said passage means having transverse parallel walls;

f. fourth means for radially introducing cooling means into said second chamber at its said first end to reduce the temperature of the gases to within the range of 1250° to 2000° F. entering from said first chamber to a temperature low enough to prevent thermal regeneration of nitrogen oxides; and

g. fifth means downstream of said fourth means near the second end of said second chamber for radially introducing air into said second chamber for burning combustibles remaining in the gases in said second chamber.

4,033,726

SPENT CATALYST REGENERATION APPARATUS WITH INTERNAL AND EXTERNAL REGENERATED-CATALYST RECYCLE MEANS

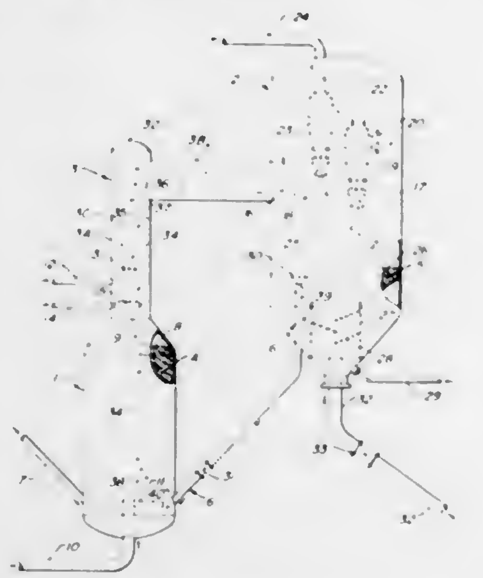
Richard P. Pulak, Palatine, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Continuation-in-part of Ser. No. 429,422, Dec. 28, 1973, Pat. No. 3,953,175. This application Dec. 16, 1974, Ser. No. 533,052

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.² B01J *8/08, 8/18, 37/14*

U.S. Cl. 23—288 B **8 Claims**



1. An apparatus for oxidizing coke on spent catalyst which comprises in combination:

a. a spent-catalyst receiving chamber for containing a dense-phase fluidized bed of catalyst having a spent-catalyst inlet means and a fresh-regeneration-gas inlet means connected thereto to allow passage of spent catalyst and fresh regeneration gas respectively into said chamber and having a regenerated-catalyst/regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and regeneration gas from said chamber;

b. a transfer conduit having a substantially vertical portion and a substantially horizontal portion, said vertical portion having an inlet connected to the regenerated-catalyst/regeneration-gas outlet means and said horizontal portion extending into the side of a hereinafter described regenerated-catalyst receiving chamber and having an outlet within said chamber whereby regenerated catalyst and regeneration gas are carried from said spent-catalyst receiving chamber in admixture to said regenerated-catalyst receiving chamber, said transfer conduit having a combustible fluid inlet means to allow passage of combustible fluid to said transfer conduit and a fresh regeneration gas inlet means to allow passage of fresh regeneration gas into said conduit;

c. an internal regenerated-catalyst recycle means, having an inlet means in the transfer conduit and an outlet means in the spent-catalyst receiving chamber, to allow passage of a portion of regenerated catalyst from the transfer conduit to the spent-catalyst receiving chamber;

d. a regenerated-catalyst receiving chamber for containing a dense-phase bed of regenerated catalyst, said chamber having a regenerated-catalyst outlet means and a spent-regeneration-gas outlet means connected thereto to allow passage of regenerated catalyst and spent regeneration gas from said chamber and said chamber being positioned adjacent to and at an elevation with respect to said spent-catalyst receiving chamber to maintain at least a portion of said dense-phase bed of regenerated catalyst above said dense-phase fluidized bed of catalyst in said spent-catalyst receiving chamber; and,

e. an external regenerated-catalyst recycle means, having an inlet means in the regenerated-catalyst receiving chamber and an outlet means in the spent-catalyst receiving chamber, to allow passage of a portion of regenerated catalyst from the regenerated-catalyst receiving chamber to the spent-catalyst receiving chamber.

4,033,727

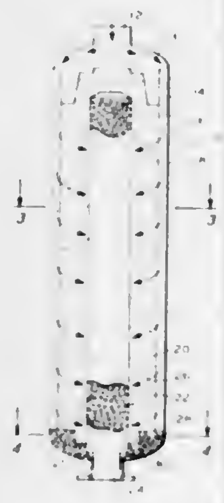
SEPARATOR RING IN FIXED BED RADIAL FLOW CATALYTIC REACTOR

Lucien H. Vautrain, Sweeny, Tex., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 6, 1976, Ser. No. 703,027

Int. Cl.² B01J *8/02;* **C10G** *35/04*

U.S. Cl. 23—288 R **6 Claims**



1. In a vertically disposed reactor comprising:

side walls, a top wall and a bottom wall;

an inlet opening at an upper end thereof;

an annulus communicating with said inlet opening, said annulus being formed by said side walls and a preforated means spaced inwardly from said side walls;

a centrally disposed apertured withdrawal conduit having an outlet opening at a lower end thereof;

the improvement comprising an annular separator ring extending upwardly from said bottom wall of said reactor between said side wall and said central apertured withdrawal conduit to a level within the range of 0 to 3 inches below a lowermost row of apertures in said central apertured withdrawal conduit, an annular space defined by said separator ring and said side wall being filled with catalyst support to a level essentially coextensive with a top of said separator ring and an annular space defined by said separator ring and said central apertured withdrawal conduit being partially filled with catalyst support, catalyst being present between said centrally disposed withdrawal conduit and said perforated means.

4,033,728

SYNTHETIC CAKING COAL AND METHOD FOR PRODUCTION THEREOF

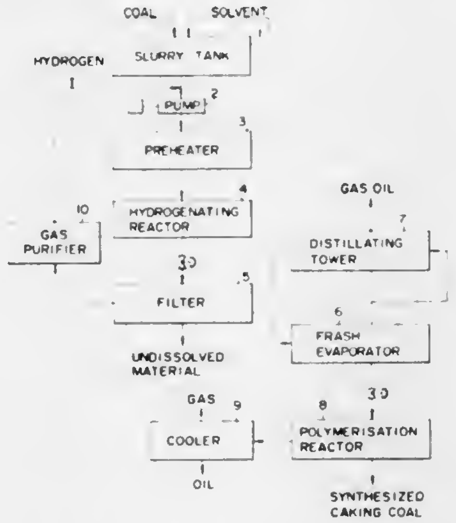
Yutaka Aoki, Tokyo; Akira Hase, Kawasaki, and Jiro Ito, Kamakura, all of Japan, assignors to Nissho-Iwai Co., Ltd., Japan

Filed Nov. 6, 1975, Ser. No. 629,536

Claims priority, application Japan, Nov. 11, 1974, 49-129799

Int. Cl.² C10L *9/10;* **C10G** *1/06*

U.S. Cl. 44—1 R **8 Claims**



5. Process for producing synthetic caking coal which comprises the following steps (1) adding finely pulverized weakly or non-caking coal to a solvent to form a slurry, hydrogenating the slurry in the presence or absence of hydrogenating catalyst under a high pressure hydrogen gas atmosphere, separating coal hydrogenated product, and then (2) heat-polymerizing the hydrogenated product in the presence or absence of a polymerizing catalyst at an elevated temperature preferably under an inert atmosphere, discharging and cooling the reaction product.

6. Process for producing synthetic caking coal according to claim 5 wherein the hydrogenation is carried out at a temperature of about 300° C to 500° C under a hydrogen pressure of about 70 to about 150 atm.

4,033,729

METHOD OF SEPARATING INORGANIC MATERIAL FROM COAL

Charles E. Capes; René J. Germain; Allan E. McIlhinney; Ira E. Puddington, and Aurelio F. Sirianni, all of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Apr. 26, 1976, Ser. No. 680,592

Claims priority, application Canada, June 20, 1975, 229763

Int. Cl.² C10L *9/00, 10/00, 9/10*

U.S. Cl. 44—1 A **4 Claims**

1. A method of separating inorganic materials from coal, comprising:

a. providing the coal, containing the inorganic materials, in particulate form as a suspension with a liquid hydrocarbon oil.

b. mixing an aqueous agglomerating liquid comprising water, which is immiscible with the liquid hydrocarbon oil, with the suspension,

c. mixing a particulate material having a hydrophilic surface that is readily wetted by liquid water with the suspension,

d. agitating the suspension, with the aqueous agglomerating liquid and particulate material having a hydrophilic surface mixed therewith, to agglomerate inorganic particulate materials in the suspension with the aid of the said particulate material having a hydrophilic surface, while leaving at least a major portion of the particulate coal dispersed in the liquid hydrocarbon oil, and then

e. separating the agglomerated inorganic material from at least a major portion of the liquid hydrocarbon oil and pulverized coal.

3. A method according to claim 1, wherein the particulate material having a hydrophilic surface is a material selected from the group consisting of ash, agglomerated silica flour, coarse silica chips, limestone and peat moss.

4,033,730

PROCESS AND APPARATUS FOR FEEDING PARTICULATE SOLIDS INTO A PRESSURE REACTOR

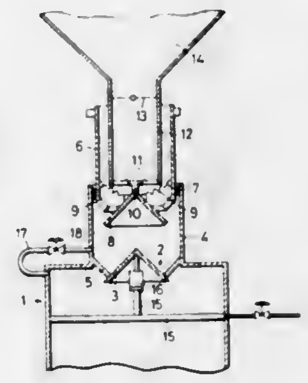
Gerhard Baron, Hofheim; Carl Hafke, Frankfurt am Main; Dietrich Engler, Hofheim; Rainer Reimert, Oberhochstadt, and Eberhard Blaum, Frankfurt am Main, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed June 4, 1976, Ser. No. 693,043

Claims priority, application Germany, Feb. 5, 1976, 2604383

Int. Cl.² C10J *3/30*

U.S. Cl. 48—86 R **10 Claims**



1. Feeder for feeding particulate coal into a coal gasification reactor having a reactor inlet, the feeder comprising: a guide cylinder fixed to the reactor and surrounding the reactor inlet, a first movable valve member, means mounting the first movable valve member to controllably open and close the reactor inlet, a cylindrical container having an outlet in the bottom thereof and gas-tightly mounted for longitudinal movement in the guide cylinder, a stationary feed conduit directed towards the container, means for controllably moving the container between a first position wherein the outlet is adjacent said reactor inlet and a second position wherein the outlet is spaced apart from the reactor inlet, a second movable valve member for opening and closing the container outlet and a first means coactive with said second valve member and responsive to the movement of the container from the first position towards the second position for effecting opening of the outlet and a second means responsive to the movement of the container from the second position towards the first position for effecting closing of the outlet.

4,033,731

PARTIALLY CROSSLINKED SILALACTONE POLYMERS, THEIR PREPARATION AND THEIR USE

Michel Bargain, and Zeno Pasquini, both of Lyon, France, assignors to Rhone Poulenc S.A., Paris, France

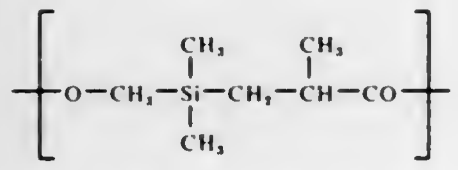
Division of Ser. No. 478,604, June 12, 1974, Pat. No. 3,948,864. This application July 29, 1975, Ser. No. 600,045

Claims priority, application France, June 13, 1973, 73.21494

Int. Cl.² B01D *59/14*

U.S. Cl. 55—16 **3 Claims**

1. A method of separating at least one gas component from a gaseous mixture of at least two of oxygen, nitrogen and carbon dioxide which comprises bringing the gaseous mixture into contact with one side of a membrane having selective permeability to gases comprising a 3,5,5,-trimethyl-1-oxa-5-sila-cyclohexan-2-one polymer having repeat units of Formula I:



$$\left[-O-CH_2-\overset{\overset{\displaystyle CH_3}{|}}{\underset{\underset{\displaystyle CH_3}{|}}{Si}}-CH_2-\overset{\overset{\displaystyle CH_3}{|}}{CH}-CO- \right] \qquad I$$

at least some of the units being cross-linked to one another and recovering from the other side of the membrane a gaseous mixture enriched in at least one gas component.

4,033,732

METHOD AND APPARATUS FOR CLEANING FABRIC FILTERS OF BAG TYPE OR THE LIKE

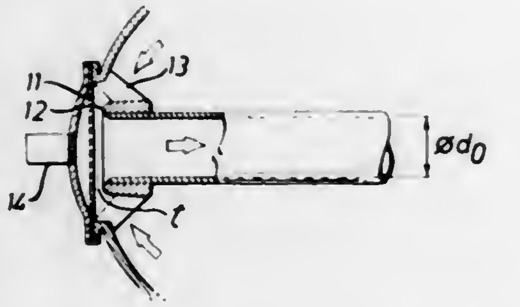
Birger Axelsson, and Sven-Olof Rosby, both of Vaxjo, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Stockholm, Sweden

Filed Apr. 29, 1975, Ser. No. 572,925

Claims priority, application Sweden, May 2, 1974, 7405903

Int. Cl.² B01D *46/04*

U.S. Cl. 55—96 **11 Claims**



1. A method of cleaning fabric filters of bag type comprising exposing the surface of the filter material opposite the surface having dust particles collected thereon to a high gaseous pressure pulse passed to said surface opposite the dust-collecting surface from a pressure tank so as to cause flow of gas through the filter to remove particles from the dust-collecting surface, establishing said pressure pulse at a rate between 0.4 MPa/s and 1.2 MPa/s while keeping the numerical relation between said pressure increasing rate and the initial air pressure above the atmospheric in said pressure tank between 3 and 5, said initial air pressure being kept between 0.11 MPa and 0.25 MPa, said pressure pulse reaching its maximum within a time interval less than 30 milliseconds.

4,033,733

AIR FILTER GAUGE

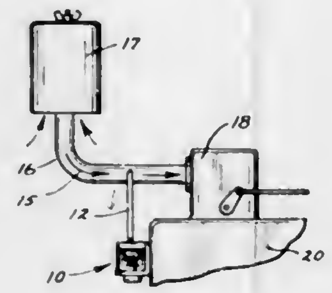
Richard D. Nelson, Decorah, Iowa, assignor to Joseph N. Nelson, Waterloo, Iowa

Filed Feb. 23, 1976, Ser. No. 660,658

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.² B01D *46/00*

U.S. Cl. 55—274 **3 Claims**



1. An air filter restriction indicating device, having in combination

a housing having a top and bottom wall and having in upstream connection therewith an air filter having an air stream passing to the air intake of an engine,

an inverted cup shaped diaphragm disposed within said housing having an upwardly extended end wall and means securing the open end portion of said diaphragm to the housing thereabout,

a cup shaped indicating member tapered downwardly having its bottom wall secured to said end wall of said diaphragm, the bottom wall of said indicating member having a substantially lesser width than that of the underlying wall portion of said diaphragm,

a passage through said housing at one end thereof connected downstream of the air filter providing communication with said indicating member and said air stream,

a passage through said housing at the other end thereof providing communication between said diaphragm and the atmosphere,

spring means disposed within said housing bearing against said indicating member and said housing holding the same in nested position within said diaphragm with said diaphragm in infolded position and with said air filter in a clean operating position, said spring means having a compressive force such as to represent the differential between the atmospheric pressure upon said diaphragm at one side of said housing and the partial vacuum drawn by said air stream upon said indicating member at said other side of said housing,

said housing having a transparent wall portion and an annular non-transparent portion at one end of said transparent wall portion,

said indicating member having a rim portion visible through said transparent wall portion and having linear movement to show the progressive condition of restriction of said air filter,

said non-transparent annular wall portion being positioned to have said rim portion in register therewith and to shield the same to indicate a full restriction of said air filter, and

said spring means moving said indicating member in a restriction indicating position only with an air stream passing to the air intake of an engine.

4,033,734

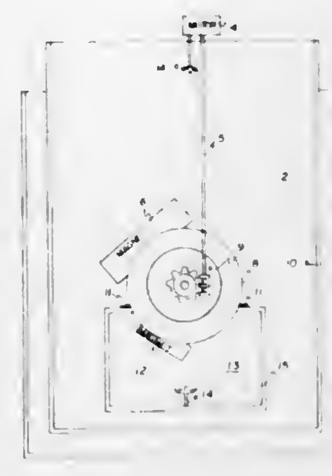
CONTINUOUS, NONCYCLIC MAGNETIC REFRIGERATOR AND METHOD

William A. Steyert, Jr., 1442 - 47th St., and Stephen S. Rosenblum, 641-A - 43rd St., both of Los Alamos, N. Mex. 87544

Filed Sept. 17, 1976, Ser. No. 724,404

Int. Cl.² F25B *21/02*

U.S. Cl. 62—3 **8 Claims**



1. A continuous, noncyclic magnetic refrigerator consisting of a liquid nitrogen cryostat having a motor-driven wheel with a pressed, porous rare earth compound as a rim that rotates through two thermally separated inner reservoirs of liquid cryogen, the first reservoir being at an elevated temperature relative to the second reservoir, two superconducting magnets of different field strengths, the larger of which is situate in the first reservoir and is adjacent to the said rim while the smaller magnet is positioned in the second reservoir adjacent to the said rim.

4,033,735

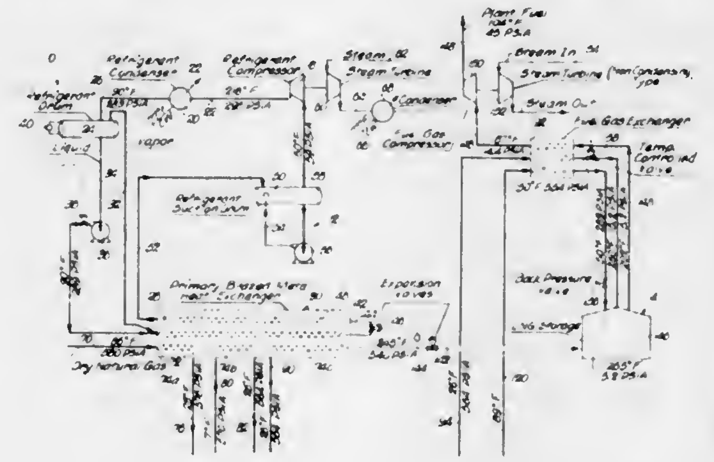
SINGLE MIXED REFRIGERANT, CLOSED LOOP PROCESS FOR LIQUEFYING NATURAL GAS

Leonard K. Swenson, Kansas City, Mo., assignor to J. F. Pritchard and Company, Kansas City, Mo.

Continuation of Ser. No. 612,183, Sept. 10, 1975, abandoned, which is a continuation of Ser. No. 106,524, Jan. 14, 1971, abandoned. This application Nov. 8, 1976, Ser. No. 739,793

Int. Cl.² F25J *1/00*

U.S. Cl. 62—9 **11 Claims**



1. A process for cooling a fluid feed material from an initial temperature to a level from over 200° Farenheit to over 300° Farenheit therebelow and consisting essentially of the steps of:

providing a single mixed refrigerant composition capable of said material and containing a number of refrigerant constituents having a wide range of successively lower boiling points;

passing said refrigerant composition through a single closed loop refrigeration cycle consisting essentially of compression, partial condensation, multiple path heat exchange and expansion zones;

maintaining the flowing constituents of the refrigerant composition and the relative proportions thereof indentical throughout said compression, partial condensation, multiple path heat exchange and expansion zones of the single closed loop cycle,

the total mixed refrigerant composition being successively directed

1. from the compression zone to the partial condensation zone for partial condensation of the refrigerant by an external cooling medium to produce a vapor phase and a liquid phase,
2. the vapor phase and the liquid phase from the condensation zone are combined,
3. the combined phases are directed to the heat exchange zone for flow without change in composition along
   - a. a first path therethrough, next
   - b. to the expansion zone, and then
   - c. back to the heat exchange zone for flow along a second path therethrough in countercurrent, thermal interchange relationship to refrigerant flow along said first path, and
4. the refrigerant composition is then returned to the compression zone;

directing the fluid feed material through said heat exchange zone along a third path in concurrent flow thermal interchange relationship to the refrigerant flowing along said first path and countercurrent to the refrigerant flow along said second path to effect the required cooling of the fluid feed material in said heat exchange zone by only the refrigerant composition of said single closed loop cycle,

at least one of the refrigerant constituents having a boiling point in the second path lower than the temperature level to which the fluid feed material is lowered in said heat exchange zone,

the constituents of the refrigerant composition in admixture having freezing points below said temperature level to which the feed material is lowered, and

said refrigerant composition being characterized by the properties of

1. at least a portion thereof being vaporizable across said expansion zone,
2. substantially all of the refrigerant becoming liquid along said first path through the heat exchange zone, and
3. substantially all of the composition undergoing vaporization along said second path through the heat exchange zone at the respective temperatures and pressures of the refrigerant existing along said first and second paths; providing a total of at least five refrigerant constituents in said refrigerant composition in

1. relative quantities of
2. respective relative boiling points and
3. circulating the refrigerant composition in said closed loop cycle at a sufficiently higher rate than the flow of feed material along said third path through the heat exchange zone, to
   - a. lower the temperature level of said fluid feed material in the heat exchange zone as it flows therethrough from more than 200° Fahrenheit to over 300° Fahrenheit below its initial temperature as directed to the heat exchange zone, while
   - b. maintaining a minimal temperature difference between the fluid feed material and the refrigerant composition in thermal interchangeable relationship thereto throughout the length of the heat exchange zone, and at the same time to
   - c. cause the combined cooling curve of the fluid feed material flowing along said third path and the refrigerant flowing along said first path and the heating curve of the refrigerant flowing along said second path to both be of relatively straight, closely adjacent, generally matched configuration throughout the respective

flow paths of the refrigerant and said feed material through the heat exchange zone; and

passing a cooling medium in heat exchange relationship with the refrigerant composition flowing through said partial condensation zone,

said cooling medium being at a temperature from more than 200° Fahrenheit to over 300° Fahrenheit above the temperature of the fluid feed material exiting from said heat exchange zone,

at least one other of the refrigerant constituents having a boiling point to cause only partial condensation of the refrigerant in said partial condensation zone at the temperature and pressure of the refrigerant composition as it flows through said partial condensation zone from the compression zone to the heat exchange zone.

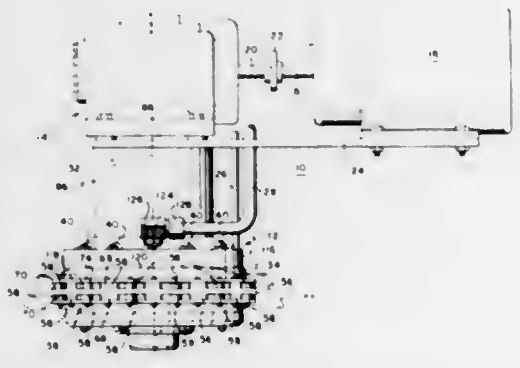
4,033,736
CONTINUOUS METHOD FOR MAKING ROD-LIKE SOLID CARBON DIOXIDE EXTRUSIONS

Lyle L. Cann, Peotone, Ill., assignor to Chemetron Corporation, Chicago, Ill.

Continuation of Ser. No. 515,650, Oct. 17, 1974, abandoned, which is a continuation of Ser. No. 389,255, Aug. 17, 1973, abandoned, which is a continuation of Ser. No. 284,264, Aug. 28, 1972, Pat. No. 3,786,645. This application Apr. 5, 1976, Ser. No. 673,772

Int. Cl.² F25J *1/00*

U.S. Cl. 62—10 4 Claims



1. A method of continuously forming rodlike extrusions of solid phase carbon dioxide from liquid carbon dioxide, comprising the steps of:

a. Flashing liquid carbon dioxide in an expansion zone to form solid and gaseous carbon dioxide, said solid carbon dioxide being collected in an extrusion chamber which communicates with an outlet of said expansion zone and an inlet of an extrusion passage,

b. Filtering said gaseous carbon dioxide from within said extrusion chamber and said extrusion passage through filter means communicating with said extrusion chamber,

c. Forcing said solid carbon dioxide into said extrusion passage by a rotary forcing means, against a constant back pressure produced by a spring means which spans the outlet of said extrusion passage, and

d. Extruding a rod-like extrusion of solid carbon dioxide past said spring means in response to force produced by said forcing means.

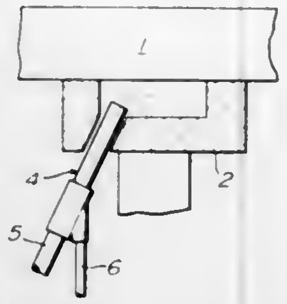
4,033,737
METHOD OF COOLING A STEEL MATERIAL WITHOUT DEFORMATION

Kazuo Kunioka, Yokohama; Kiwami Kurihara, Musashino; Koji Sakasegawa, Hiroshima; Atushi Ohsumi, Hiroshima; Akio Watanabe, Hiroshima, and Kenichi Sakai, Okayama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 341,063, March 14, 1973, abandoned. This application Apr. 1, 1975, Ser. No. 564,191

Int. Cl.² F25D *17/02*

U.S. Cl. 62—64 6 Claims



1. A method of cooling a steel body which comprises the steps of:

i. providing a skid having a base and peripheral upstanding walls defining a central cavity,

ii. placing said steel body on the upper edges of the peripheral upstanding wall and positioned above the central cavity,

iii. directing a liquid coolant, admixed with gas to form a two-phase jet flow, into the central cavity to cool the undersurface of the steel body overlying the central cavity and,

iv. directing the liquid coolant onto a remaining area of the steel body,

whereby the difference in temperature between the skid-contacting area of the steel body and the remaining area is minimized thereby to cool the steel without deformation.

4,033,738
HEAT PUMP SYSTEM WITH MULTI-STAGE CENTRIFUGAL COMPRESSORS

Carl R. Merola, Monroeville Borough; William F. Evans, Penn Township, Westmoreland County, and Raymond E. Shaffer, Hempfield Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 12, 1976, Ser. No. 666,277

Int. Cl.² G05D *23/32*

U.S. Cl. 62—158 8 Claims

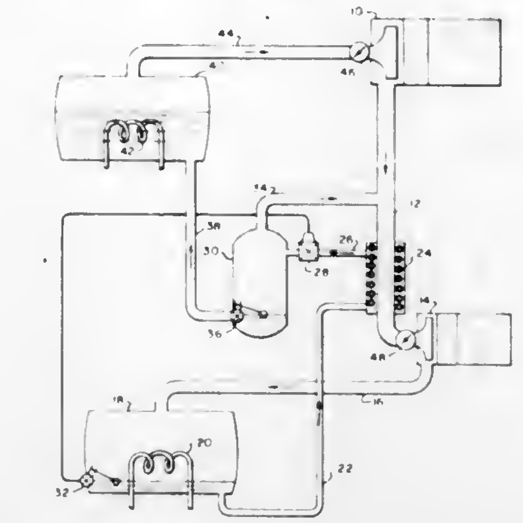
1. A heat pump system comprising:

a first and a second refrigerant compressor arranged for series refrigerant flow;

a pair of parallel control circuits;

the first of said circuits including a first main control relay required to be energized to start said first compressor, and the second of said circuits including a second main control relay required to be energized to start said second compressor;

means electrically interconnecting said circuits to make the energization of said second control relay dependent upon the energization first of said first control relay and the elapse of a short time period following the energization of said first control relay, and to make the continued energization of said first control relay beyond a time period slightly longer than said short time period following initial energization of said first control relay dependent upon the energization of said second control relay before the elapse of said slightly longer time period.



4,033,739
REFRIGERATION UNIT

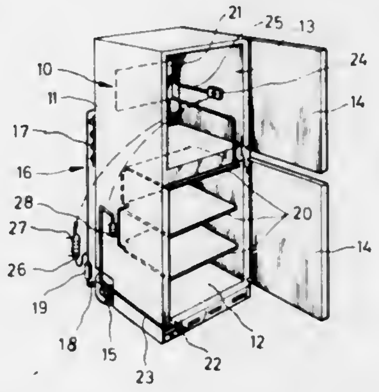
Jürgen Ballarin, Giengen, Germany, assignor to Bosch-Siemens Hausgerate GmbH, Stuttgart, Germany

Filed Feb. 6, 1976, Ser. No. 655,695

Claims priority, application Germany, Feb. 22, 1975, 2507706

Int. Cl.² G05D *23/30*

U.S. Cl. 62—202 5 Claims



1. A refrigeration unit, particularly a dual temperature refrigerator, with a refrigeration machine driven by a single compressor energized by an electric current flowing through an electric circuit, having a refrigeration cycle with coolant flowing in a coolant circuit through a condenser, a refrigerant metering capillary device and refrigerant transfer lines with at least two evaporator sections disposed in series in the flow path of the refrigerant, the first of said two evaporator sections associated with a colder compartment and the second of said two evaporator sections associated with a warmer compartment, two separate, intermittently activated, control elements, one of said control elements associated with the warmer compartment depending on the temperature therein, switches the current of a first heating element of a refrigerant collector attached to said coolant circuit before said metering capillary and from which latter liquid refrigerant is discharged when said heating element is switched on, thereby filling said second evaporator section, said second control element associated with said colder compartment being disposed in said electric circuit of said compressor, a sensor in said colder compartment for activating said second control element, a second heating element adjacent said sensor for heating said sensor, said second heating element being connected in series with said first control element whereby said first control element indirectly activates said compressor by means of said second heating element which heats said sensor which in turn triggers switching of said second control element and activation of said compressor.

4,033,740
COMBINED ENVIRONMENTAL CONTROL AND FIRE PROTECTION SYSTEM

Gershon Meckler, Bethesda, Md., assignor to Gershon Meckler Associates, Washington, D.C.

Filed Feb. 23, 1976, Ser. No. 660,623

Int. Cl.² F25D *23/12, 15/00, 23/12;* **A62C** *37/06*

U.S. Cl. 62—259 5 Claims

1. An improved circulating system for a building comprising a plurality of energy absorbing units located within the building, cooling means for cooling a heat transfer fluid, supply line means for circulating cooled heat transfer fluid from said cooling means to said energy absorbing units, return line means for circulating such heat transfer fluid from the energy absorbing units to said cooling means, open valve means located between said return line means and said cooling means, a plurality of check valves, means mounting said check valves between said energy absorbing units and said return line means, said check valves being oriented to prevent a fluid flow from said return line means to said energy absorbing units while being ineffective to prevent a fluid flow in a reverse direction, a plurality of sprinkler heads each including means responsive to a predetermined high temperature for activating such sprinkler heads, means connecting said sprinkler heads to said return line means, means for sensing a flow of heat transfer fluid from any of said sprinkler heads, means responsive to said sensing means sensing a fluid flow from any sprinkler head for closing said open valve means, means responsive to said sensing means sensing a fluid flow from any sprinkler head for supplying water under pressure to said return line means, and wherein said cooling means includes first and second closed circuit evaporative cooling means for transferring heat from the circulated heat transfer fluid to air circulated through said evaporative cooling means, means for circulating the heat transfer fluid sequentially from said return line means through said open valve means and said first and second evaporative cooling means to said supply line means, means for circulating fresh outside air through said first evaporative cooling means and means for exhausting air from the building through said second evaporative cooling means to the atmosphere, whereby the circulated heat transfer fluid is cooled to a temperature above the dew point of air in the building.

4,033,741

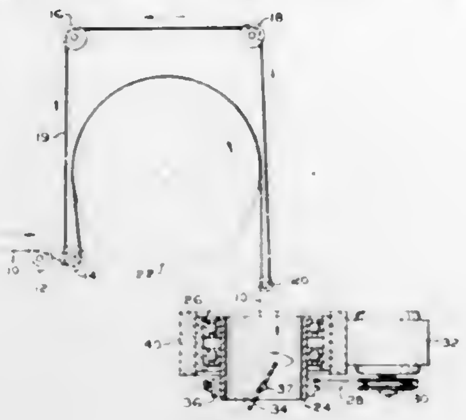
METHOD AND APPARATUS FOR FORMING CONTAINERIZED GLASS STRAND PACKAGE

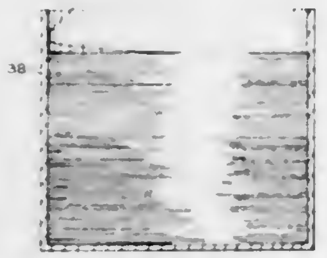
Warren W. Drummond, Allison Park, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Jan. 19, 1976, Ser. No. 650,329

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **13 Claims**





1. In the method of collecting glass fiber strands in a container, the improvement comprising pulling said strands at a high rate of speed in a controlled direction, ejecting said strand into a zone where said strand is impinged on a surface angled from the direction of travel of said strand and rotating said surface around said strand, swirling said strand from said surface to form a plurality of coils of said strand without said strand becoming fluffed by said impingement on said surface and collecting said coils of said strand in a container.

4,033,742

METHOD FOR PRODUCING GLASS FIBERS

Claude R. Nichols, Glendora, and Keith A. Helberg, Covina, both of Calif., assignors to Kaiser Glass Fiber Corporation, Oakland, Calif.

Filed Feb. 13, 1976, Ser. No. 658,122

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **6 Claims**

1. The method of establishing the running mode of a glass fiber producing orifice plate having orifice plate heating means and closely spaced orifices comprising:

a. permitting molten glass to flood the underside of the orifice plate;

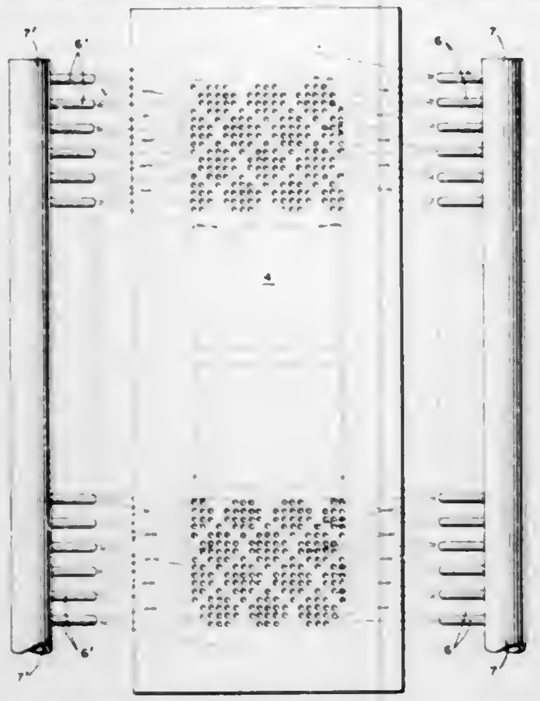
b. establishing the temperature of the orifice plate to provide a glass viscosity at the orifices of more than about 1000 poises;

c. forming a matrix of glass on the underside of the orifice plate;

d. directing cooling gas to the underside of said orifice plate from a plurality of nozzles located along each of at least two sides of the orifice area, said nozzles being at an angle of from about 30° to about 60° to said orifice plate, being in generally opposed relationship, being closely adjacent said orifice area, and being directed generally to the center of the plate, said cooling gas flow having a total cross-section at the orifice plate at least as large as the area occupied by orifices;

e. slowly with drawing said matrix of glass from said orifice plate while increasing the temperature of said orifice plate and regulating the flow of said cooling gas to form fiber-forming cones under at least some of the orifices in said orifice plate; and

f. periodically slowly decreasing and increasing the flow of cooling gas over the entire orifice area, said decreases in gas flow being sufficient to permit isolated flooded areas to flow to adjacent fiber forming cones and said increases in gas flow being sufficient to increase the viscosity of the glass to cause flooded areas to fiberize as fibers are drawn from adjacent fiber forming cones to progressively clear additional portions of the orifice area with each variation.



4,033,743

CHEMICALLY POLISHED POLYCRYSTALLINE ALUMINA MATERIAL

Garland E. Scott, Jr., Willoughby, and Michael K. Levenson, Cleveland Hts. both of Ohio, assignors to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 453,962, March 22, 1974, Pat. No. 3,935,495. This application June 25, 1975, Ser. No. 590,360

Int. Cl.² C03L *15/00*

U.S. Cl. 65—30 R **7 Claims**

1. A method of increasing the in-line optical transmission of an unpolished light transmissive body of sintered polycrystalline alumina by physically contacting the major surfaces of said alumina body with a molten inorganic flux selected from the group consisting of alkali metal salts and binary oxide systems having an alkali metal oxide constituent that dissolves alumina at elevated temperatures for a time period sufficient to reduce the high spots on the individual exterior alumina crystals without materially etching grain boundaries.

4,033,744

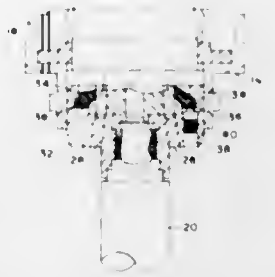
PLUNGER ASSEMBLY FOR A GLASS FORMING MACHINE

Robert Earl Davis, Muncie, Ind., assignor to Ball Corporation, Muncie, Ind.

Filed Sept. 18, 1975, Ser. No. 614,735

Int. Cl.² C03B *11/12, 11/10*

U.S. Cl. 65—362 **9 Claims**



1. A plunger assembly for use in a glass forming machine, said plunger assembly comprising:

an unitary plunger and

an unitary plunger head,

said plunger head having a central bore containing an engaging means within an annular wall, said engaging means comprising a base of a shape to engage a surface of said plunger and spring biased alignment means extending from said base to disengageably secure said plunger head in a mating relationship, and a plurality of flanges spaced about the periphery of said annular wall, said flanges being disposed on said wall and protruding inwardly,

said plunger being a cylindrical member having a reduced annular section about the periphery thereof at a first end of said member and of a diameter to fit within said annular wall and further comprising a plurality of ears radiating outwardly from said reduced annular section and having a spacing sufficient to pass between said flanges and having a width to lie between said alignment means said ears and said flanges being arranged so as to permit said plunger and said plunger head to fixedly engage in said mating relationship.

4,033,745

NON-BURNING STORABLE LIQUID FERTILIZER

William Percy Moore, Hopewell, Va., assignor to Slo Release, Inc., Kingston, Ohio

Filed June 3, 1976, Ser. No. 692,433

Int. Cl.² C05C *9/00*

U.S. Cl. 71—28 **2 Claims**

1. A non-burning, storable, liquid suspension grass turf fertilizer composition with improved stability and turf growth stimulation, comprising: 40 to 45% water; 12 to 16% nitrogen from urea formaldehyde polymers having a urea to formaldehyde mol ratio of 1.6/1 to 2/1 with no free urea of formalehyde, with 60 to 80% of the nitrogen present in the water insoluble form, and the water insoluble nitrogen having an activity index of 25 to 0.20% by weight insoluble nitrogen having an activity index of 25 to 35; 0.05 to 0.20% by weight methyl alcohol; and 3 to 6% by weight of water soluble sugars in the form of 75 to 96 Brix cane or beet molasses.

4,033,746

FOREST FERTILIZATION

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Dec. 22, 1975, Ser. No. 643,340

Int. Cl.² C05C *9/00, 1/00*

U.S. Cl. 71—30 **5 Claims**

1. The method of fertilizing conifer forests with nitrogen containing compounds by direct aerial application to the conifer foliage of an aqueous solution of said compounds containing at least about 15 weight percent determined as elemental nitrogen of a dissolved water soluble nitrogen source selected from the group consisting of urea, ammonia, nitrates of ammonium, calcium and potassium; ammonium phosphates and sulfates; and combinations thereof, at a dosage level of at least about 100 pounds of elemental nitrogen per acre corresponding to at least about 0.8 pounds of elemental nitrogen per 1000 square meters of specific foliage area, at a temperature of at least about 70° F., above the saturation temperature of said solution, and above the prevailing ambient temperature, and said ambient temperature is at least about 10° F. below the saturation temperature of said solution.

4,033,747

SILVICULTURAL FERTILIZATION

Donald C. Young, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Continuation-in-part of Ser. Nos. 494,613, Aug. 5, 1974, abandoned, Ser. No. 378,550, July 2, 1973, abandoned, Ser. No. 259,231, June 2, 1972, abandoned, and Ser. No. 57,810, July 23, 1970, abandoned. This application Feb. 4, 1976, Ser. No. 654,997

Int. Cl.² C05C *9/00, 1/00*

U.S. Cl. 71—30 **9 Claims**

1. The method of fertilizing conifer forests wherein said conifers are fertilized with nitrogen-containing compounds by direct application of an aqueous nitrogenous fertilizer to the foliage thereof which comprises spraying the exposed specific surface of said foliage with an aqueous solution containing about 15 to about 32 weight percent determined as elemental nitrogen of a water-soluble nitrogen source selected from the group consisting of urea; ammonia, nitrates of ammonia, calcium and potassium; ammonium phosphates and sulfates; and combinations thereof, and said solution is sprayed on said foliage (1) at a dosage level corresponding to about 15 to about 350 pounds of elemental nitrogen per acre of said conifer forest and (2) corresponding to about 0.8 to about 12 pounds of elemental nitrogen per 1000 square meters of exposed specific foliage area.

4,033,748

DIBICYCLO[3.1.1] AND [2.2.1] HEPTYL AND DIBICYCLO [3.1.1] AND [2.2.1] HEPTENYL POLYAMINES HAVING A PIPERIDINE MOIETY

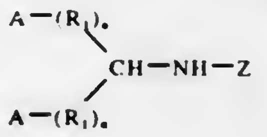
Nathaniel Grier, Englewood, N.J.; Richard A. Dybas, Center Square, Pa., and Robert A. Strelitz, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed July 2, 1976, Ser. No. 702,318

Int. Cl.² C07D *211/26*

U.S. Cl. 71—67 **19 Claims**

19. A composition for controlling the growth of microbes and algae comprising a compound of the formula:

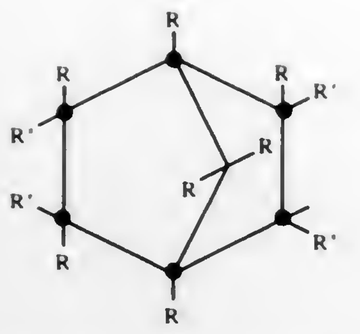


$$\begin{matrix} \mathrm{A-(R_1)_n} & & \\ & \diagdown & \\ & & \mathrm{CH-NH-Z} \\ & \diagup & \\ \mathrm{A-(R_1)_n} & & \end{matrix}$$

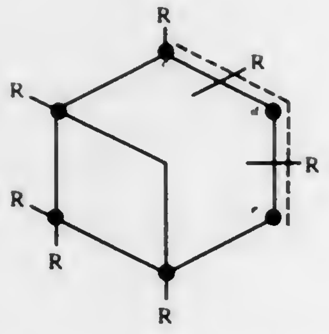
where:

each A is alike or different and is a [2.2.1] bicyclic group of the formula:

a.

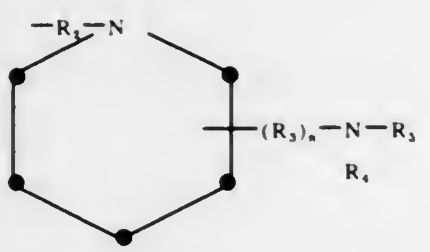


or a [3.1.1] bicyclic group of the formula:
b.

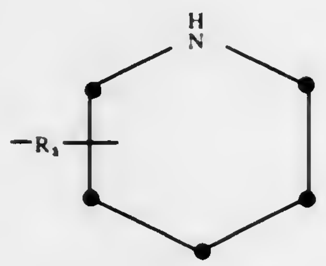


where R is alike or different and is hydrogen or C_1 to C_4 alkyl, R' is alike or different and is hydrogen or C_1 to C_4 alkyl or R' on adjacent carbon atoms taken together comprise an olefinic bond, and the dashed line indicates either saturation or c-, d- or d-, e- unsaturation;

each R_1 is alike or different and is C_1 to C_4 alkylene;
each *n* is alike or different and is the integer 0 to 1;
Z is



or



where
- R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;
- R_3 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;
- R_4 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, or C_2 to C_4 dihydroxyalkyl; and
- R_5 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl, and acid addition salts thereof.

4,033,749
ALKOXYCARBONYLPHOSPHONIC ACID DERIVATIVE BRUSH CONTROL AGENTS

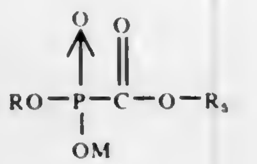
Colin Leslie McIntosh, Newark, Del., assignor to E. I, Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 474,536, May 30, 1974, Pat. No. 3,943,201, which is a continuation-in-part of Ser. No. 397,723, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 381,620, July 23, 1973, abandoned. This application Sept. 25, 1975, Ser. No. 616,837

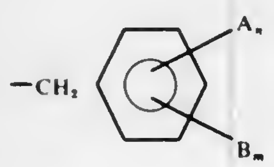
Int. Cl.² A01N *9/36*

U.S. Cl. 71—86 **9 Claims**

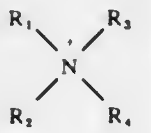
1. A method of retarding plant growth consisting essentially of applying to the plant an effective amount of



wherein
- R is M; alkyl of 1 to 8 carbon atoms, optionally substituted with a chlorine, bromine, fluorine, or iodine; alkenyl of 3 to 8 carbon atoms; or



wherein
- *A* is chlorine or methyl,
- *B* is chlorine or methyl,
- *n* is 0 or 1, and
- *m* is 0 or 1;
- R_5 is alkyl of 1 to 6 carbon atoms, alkenyl of 3 to 4 carbon atoms, or benzyl;
- M is hydrogen, sodium, lithium, potassium, calcium, magnesium, zinc, manganese, barium, or



wherein
- R_1 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;
- R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms;
- R_3 is hydrogen, alkyl of 1 to 4 carbon atoms, or hydroxyalkyl of 2 to 4 carbon atoms; and
- R_4 is hydrogen or alkyl of 1 to 12 carbon atoms, provided that the total number of carbon atoms in R_1, R_2, R_3, and R_4 is less than 16.

4,033,750
HERBICIDAL COMPOSITION

Hideo Hosaka, and Hiromi Yoneda, both of Oiso, Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,113

Claims priority, application Japan, Jan. 16, 1975, 50-6426; Sept. 14, 1974, 49-106538

Int. Cl.² A01N *9/22*

U.S. Cl. 71—90 **2 Claims**

1. A herbicidal composition comprising an inert carrier, and a herbicidally effective amount of a mixture of 1,3-dimethyl-3-(5-t-butylbenzothiazole-2-yl) urea and S-ethyl hexahydro-1H-azepine-1-carbothioate in a urea-carbothioate ratio of 1:1 to 1:2 parts by weight.

4,033,751
2-(SUBSTITUTED-PHENYL)-HEXAHYDRO- AND TETRAHYDRO-3-(2H)-CINNOLINONES AS HERBICIDES

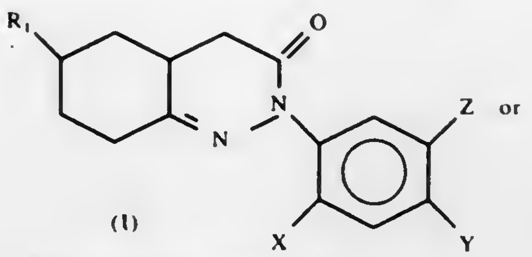
James Volney Hay, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Apr. 20, 1976, Ser. No. 678,707

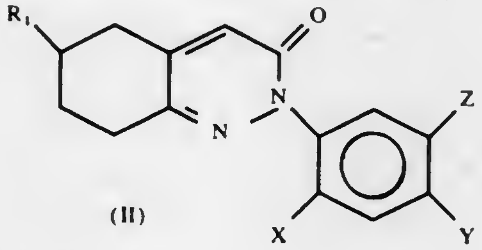
Int. Cl.² A01N *9/22*; **C07D** *237/28*

U.S. Cl. 71—92 **21 Claims**

1. A compound of the formulae:



(I) or



(II)

wherein:
- *X* is chlorine, fluorine, methyl, or trifluoromethyl:
- *Y* is chlorine, fluorine, or bromine:
- *Z* is hydrogen, chlorine, fluorine, or O—R_2;
- R_1 is hydrogen or methyl; and
- R_2 is alkyl of 1–3 carbon atoms.

4,033,752
PYRIDYLTRIAZINONE COMPOUNDS

Shunichi Hashimoto, Takarazuka, and Osamu Kirino, Ashiya, both of Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

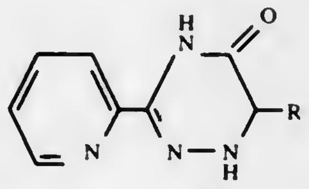
Filed Jan. 15, 1976, Ser. No. 649,319

Claims priority, application Japan, Jan. 21, 1975, 50-9543

Int. Cl.² C07D *253/06*; **A01N** *9/22*

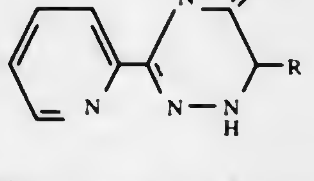
U.S. Cl. 71—93 **8 Claims**

1. A herbicidal or fungicidal composition which comprises as an active ingredient a pyridyltriazinone compound of the formula:



wherein R is a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxycarbonylmethyl group wherein the alkoxy has 1 to 3 carbon atoms or a phenyl group.

7. A pyridyltriazinone compound of the formula:



wherein R is a hydrogen atom, an alkyl group having 1 to 5 carbon atoms, an alkoxycarbonylmethyl group wherein the alkoxy has 1 to 3 carbon atoms or a phenyl group.

4,033,753
1-THIADIAZOLYL-5-PYRIDYLCARBONYLOXYIMIDAZOLIDINONES

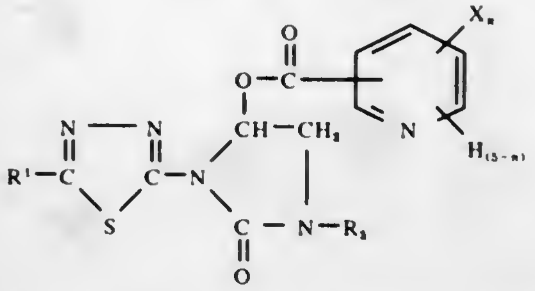
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Apr. 5, 1976, Ser. No. 673,776

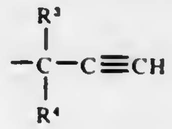
Int. Cl.² A01N *9/22*; **C07D** *417/14*

U.S. Cl. 71—94 **10 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower haloalkyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and



wherein R^3 and R^4 are each selected from the group consisting of hydrogen and alkyl of up to 3 carbon atoms; X is selected from the group consisting of lower alkyl, chlorine and bromine; and *n* is an integer from 0 to 3.

10. A method of controlling weeds which comprises contacting said weeds with a herbicidal composition comprising an inert carrier and, as an essential active ingredient, in a quantity toxic to weeds, a compound of claim 1.

4,033,754
SUBSTITUTED CYCLOHEXENE ESTERS

Miklo Sawaki, Takaoka; Isao Iwataki, Odawara; Yoshihiko Hirono, Hiratsuka, and Hisao Ishikawa, Odawara, all of Japan, assignors to Nippon Soda Company Limited, Tokyo, Japan

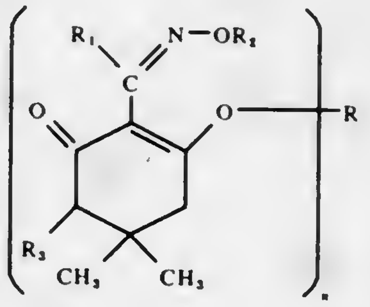
Continuation-in-part of Ser. No. 531,810, Dec. 11, 1974, Pat. No. 3,989,737. This application Jan. 19, 1976, Ser. No. 650,140

Claims priority, application Japan, Jan. 22, 1975, 50-8687; Mar. 31, 1975, 50-37884

Int. Cl.² A01N *9/20*; **C07C** *69/76*, *69/82*, *69/83*

U.S. Cl. 71—112 **24 Claims**

1. A compound of the general formula



wherein

R_1 is lower alkyl having six or less carbon atoms,

R_2 is selected from the group consisting of lower alkyl having six or less carbon atoms and lower alkenyl having six or less carbon atoms,

R_3 is selected from the group consisting of hydrogen and lower alkoxycarbonyl having six or less carbon atoms,

R is the residue of a benzene di- or tricarboxylic acid which may be substituted by alkyl or halogen, and

n is 2 or 3.

9. A herbicidal composition comprising an inert carrier and a herbicidally effective amount of a compound of claim 1.

17. A method for the control of weeds comprising applying a compound of claim 1 in an amount sufficient to exert herbicidal action to a locus to be protected.

4,033,755
RIPENING OF SUGARCANE BY USE OF AMMONIUM ISOBUTYRATE

Louis G. Nickell, Ellicott City, Md., assignor to W. R. Grace & Co., New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,790
Int. Cl.^{2} A01N *9/24*

U.S. Cl. 71—113 **5 Claims**

1. A process for increasing the sugar yield of grown sugarcane which comprises applying an effective amount of ammonium isobutyrate as a sugarcane ripening agent to the cane at a time at least about 2 and up to about 10 weeks prior to harvest.

4,033,756
DICHLOROACETAMIDE TREATED RICE SEEDS

Otto L. Hoffmann, Shawnee, Kans., assignor to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Sept. 17, 1971, Ser. No. 181,580
Int. Cl.^{2} A01N *9/20*

U.S. Cl. 71—118 **1 Claim**

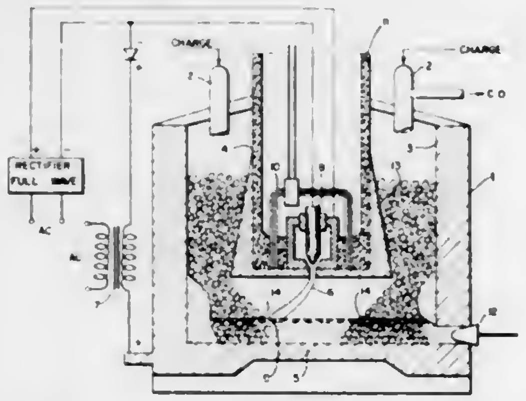
1. The method of protecting rice seed comprising applying thereon a coating of an effective but substantially non-phytotoxic quantity of an amide of dichloroacetic acid sufficient to improve resistance of the rice to a pre-emergent thiolcarbamate herbicide.

4,033,757
CARBOTHERMIC REDUCTION PROCESS

Robert Milton Kibby, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Sept. 5, 1975, Ser. No. 610,684
Int. Cl.^{2} C22B *21/02*

U.S. Cl. 75—10 R **4 Claims**



1. A carbothermic process for the production of aluminum from an aluminum oxide which comprises

A. striking an open electrical arc to a portion of the surface of a charge comprising an aluminum oxide and at least one material selected from the group consisting of carbon, aluminum compounds containing carbon, and mixtures thereof so as to form liquid aluminum and volatile products, with the proviso that only a small portion of the charge in the reaction zone is heated to reaction temperature while the majority of the charge in the reaction zone and the majority of the aluminum metal product is below reaction temperature at any given time;

B. causing said volatile products which are produced to pass through the charge and to further react and form liquid aluminum or compounds capable of forming said liquid aluminum at reaction temperature, and;

C. causing the liquid aluminum formed under the reaction conditions to flow away from the arc and over the non-reacted portions of the charge to be collected, said liquid aluminum containing no more than about 10 weight percent of aluminum carbide.

4,033,758
PROCESS FOR PRODUCING MAGNESIUM UTILIZING ALUMINUM-SILICON ALLOY REDUCTANT

James D. Johnston; Robert N. Sanders, and James M. Wood, Jr., all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sept. 4, 1975, Ser. No. 610,464
Int. Cl.^{2} C22B *45/00*

U.S. Cl. 75—67 R **16 Claims**

1. A process for the production of magnesium in a reaction-condensation system having a reducing furnace zone and a condensation zone, comprising; reacting an aluminum-silicon alloy comprising by weight percent 15 – 75 aluminum and 20 – 80 silicon with a calcium magnesium aluminum silicate slag or magnesium oxide in the presence of said slag in the reducing furnace zone or reaction zone at a temperature of about 1400° – 1650° C and a pressure of about 25 – 500 millimeters of mercury, the amount of magnesium oxide fed into the reaction zone being at least 101 percent of the amount theoretically required to react with the aluminum-silicon alloy fed into the reaction zone, maintaining the composition of the slag in amounts by weight percent of 42 – 65 calcium oxide, 1 – 11 magnesium oxide, 11 – 38 aluminum oxide and 5 – 19 silicon dioxide, evolving magnesium vapor from the reducing furnace zone or reaction zone to the condensation zone, and condensing and recovering the magnesium as a product.

4,033,759
PROCESS FOR PRODUCING MAGNESIUM UTILIZING ALUMINUM METAL REDUCTANT

James D. Johnston; Robert N. Sanders, and James M. Wood, Jr., all of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

Filed Sept. 4, 1975, Ser. No. 610,430
Int. Cl.^{2} C22B *45/00*

U.S. Cl. 75—67 R **18 Claims**

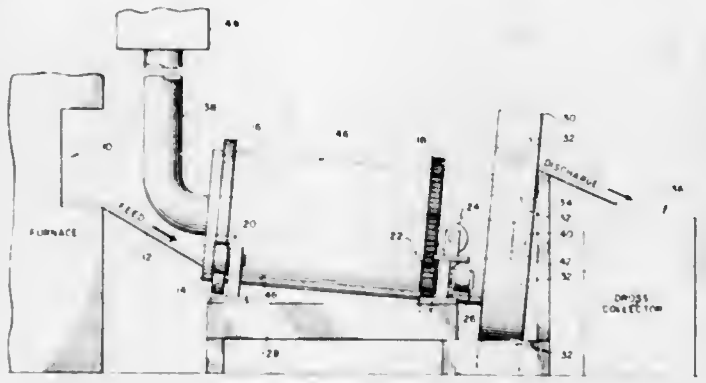
1. A process for production of magnesium in a reaction-condensation system having a reducing furnace zone and a condensation zone, comprising reacting in the reducing furnace zone aluminum metal containing at least 80 weight percent aluminum and a calcium magnesium aluminate slag or magnesium oxide in the presence of said slag containing not more than five weight percent silicon dioxide, the amount of magnesium oxide being fed into the reducing furnace zone being at least 110 percent of the amount required to react with the aluminum metal fed into the reaction zone and slag removed therefrom contain about 6 – 13 weight percent magnesium oxide, carrying out the reaction at a temperature of about 1350°–1700° C at a pressure of about 0.5 – 2.0 atmospheres, maintaining the silicon dioxide content and the magnesium oxide content of the molten oxide slag in the reaction zone at least as low as five weight percent and about 6 – 13 weight percent, respectively, evolving magnesium vapor from the reaction zone to the condensation zone, and condensing and recovering the magnesium as a product.

4,033,760
ALUMINUM DROSS RECOVERY METHOD

Richard T. Lance, and Pandelis N. Papafingos, both of Riverside, Calif., assignors to Alumax Mill Products, Inc., Riverside, Calif.

Filed Oct. 23, 1975, Ser. No. 625,286
Int. Cl.^{2} C21B *3/04*

U.S. Cl. 75—68 R **1 Claim**



1. In a dry process for recovering active metal from dross wherein the dross is removed from melting furnace and treated to separate metallic constituents from oxides, nitrides and other non-metallic dross constituents, the improvement comprising carrying out the following steps before treating the dross to separate metallic constituents from non-metallic constituents:

transferring the dross directly from the melting furnace to dry cooling means without substantial cooling enroute;

rotating the dross in the cooling means without water-dross contact in rolling contact with a cold cylindrical surface by lifting the dross from the lowermost point of said surface in contact with said surface and tumbling the dross back onto said surface; and

conveying the dross longitudinally along the length of said surface while carrying out the preceding step;

the combined action of the two preceding steps cooling the dross rapidly within no more than three minutes to less than 400° F., breaking the larger chunks of dross into smaller dross and preventing the formation of large chunks of dross by exothermic fusion, all without separation of substantial amounts of metallic constituent from the dross.

4,033,761
PROCESS FOR THE SEPARATION OF COPPER SULFIDE FROM METALLIC LEAD ENTRAINED IN A DROSS

Carl Richard DiMartini, Piscataway; William Lafayette Scott, Lebanon, and Leo James Bulvanoski, Fords, all of N.J., assignors to Asarco Incorporated, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,802
Int. Cl.^{2} C22B *13/02*

U.S. Cl. 75—77 **10 Claims**

1. A process for the separation of copper sulfide and, when present, metallic copper, from metallic lead entrained in a dross which comprises introducing the dross comprising copper sulfide and, when present, metallic copper, and metallic lead entrained therein into a vessel, introducing an alkali metal sulfide into said vessel, heating the resulting admixture of dross and alkali metal sulfide therein at an elevated temperature and for a time sufficient to melt together the dross and alkali metal sulfide, the molten dross releasing the entrained molten metallic lead, and molten copper sulfide of the molten dross and the molten alkali metal sulfide forming a low melting copper sulfide-alkali metal sulfide matte layer on the surface of a pool of the released molten lead, and separating the matte from the molten lead pool.

4,033,762
METHOD FOR PREVENTING OXIDATION OF MELTED METAL

Kozo Sato, No. 7-12, Minami 3-chome, Yamamato-cho, Yao, Osaka, Japan

Filed June 3, 1976, Ser. No. 692,578
Int. Cl.^{2} C22B *9/00*

U.S. Cl. 75—96 **5 Claims**

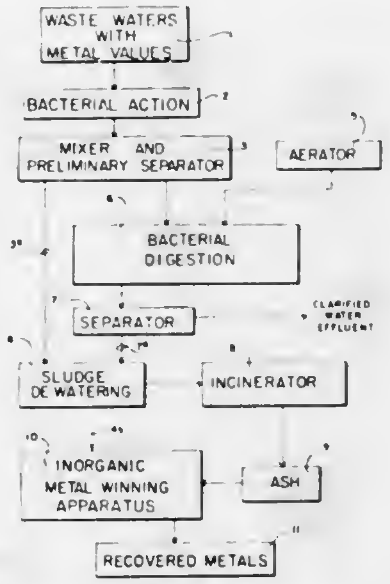
1. A method for preventing the oxidation of molten metal in a bath comprising the steps of (1) preparing a granular composition consisting of a mixture of relatively coarse, medium and fine globules ranging from about 0.5 mm to about 0.05 mm in size, whereby said coarse, medium and fine globules are present in substantially equal amounts, each of said globules consisting of a core made up of powdered glass, diatom and aluminum oxide coated with a material selected from the group consisting of aluminum and iron oxides and (2) depositing said composition on the molten metal to form partitioning layers thereover to separate the molten metal from the atmosphere.

4,033,763
PROCESS FOR RECOVERY OF SELECTED METAL VALUES FROM WASTE WATERS

Michael Markels, Jr., Springfield, Va., assignor to World Resources Company, McLean, Va.

Continuation-in-part of Ser. No. 622,783, Oct. 15, 1975, abandoned. This application Nov. 22, 1976, Ser. No. 743,745
Int. Cl.^{2} C22B *15/00, 11/08*

U.S. Cl. 75—97 R **16 Claims**



1. The process of recovering selected metal values from waste waters in which said selected metal values appear in low concentrations on the order of 0.1–500 PPB, comprising the steps of:

a. mixing natural surface water, industrial waste water and organic waste together to form said waste waters;

b. capturing metal values from said waste waters by bacterial imbibing of said values to immobilize and concentrate the values into organic matter;

c. coagulating and de-watering said organic matter, thereby separating said organic matter as a sludge from the waste waters;

d. burning off the de-watered sludge to eliminate organic matters and form an ash comprising metal values and residual contaminants;

e. separating certain ones of said metal values including said selected values by dissolving them and removing them from said ash while leaving undissolved others of said metal values and said contaminants; and

f. purifying said dissolved metal values to isolate and recover the selected metal values from said certain separated values.

4,033,764
RECOVERY OF METALS

Terence Dudley Colegate, Copthorne; Christopher Robert Farnworth, Thornton Heath, and Eric Joseph Davis, Birmingham, all of England, assignors to Laporte Industries Limited, London, England

Filed May 20, 1975, Ser. No. 579,295

Claims priority, application United Kingdom, May 21, 1974, 22640/74

Int. Cl.^{2} C22B *43/00, 15/00, 26/00*

U.S. Cl. 423—24 **16 Claims**

1. A process for removing, from solution, ions of metals capable of forming coordination complexes comprising contacting the solution with a complexing agent comprising an inorganic substrate and covalent organic molecules of an onium compound chemically bonded to the substrate, the covalent organic molecules containing free coordinating groups, said inorganic substrate comprising a clay mineral of the smectite group and having a layered anionic lattice based on layers of linked SiO$_4$ tetrahedra.

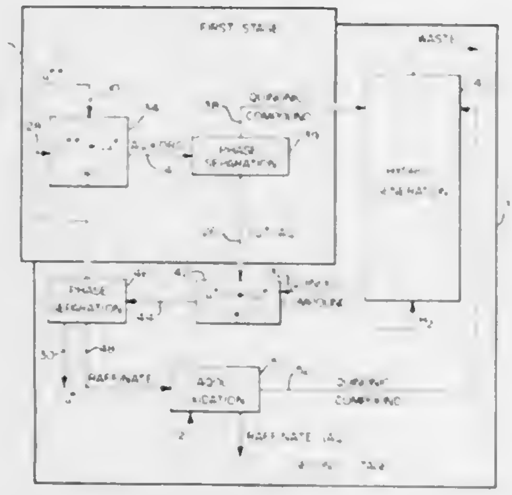
4,033,765
EXTRACTIONS OF COPPER FROM SOLUTIONS BY REDUCTION WITH ANTHRAQUINOLS

John N. Gerlach, Burlington, Mass., assignor to Kennecott Copper Corporation, New York, N.Y.

Filed Sept. 3, 1976, Ser. No. 720,414

Int. Cl.^{2} C22B *15/12*

U.S. Cl. 75—108 **14 Claims**



1. A processs for producing copper metal from an aqueous ammoniacal cupric ion containing solution, said process being characterized by the steps of:

1. mixing a stoichiometric excess of a quinolic compound and an aqueous ammoniacal solution of cuprous ions in a first reactor to precipitate copper metal and to oxidize part of said quinolic compound to a quinonic compound, the remaining quinolic compound and the produced quinonic compound being dissolved in a substantially water immiscible solvent;
2. separating said water immiscible solvent from the copper metal and the aqueous solution;
3. mixing the immiscible solvent containing the remaining quinolic compound which is separated in step 2 with an ammoniacal solution of cupric ions in a second reactor to enable said quinolic compound to reduce said cupric ions to cuprous ions and to produce further quinonic compound;
4. separating the immiscible solvent from the solution of cuprous ions produced in step 3; and
5. adding the solution of cuprous ions separated in step 4 to said first reactor and repeating step (1).

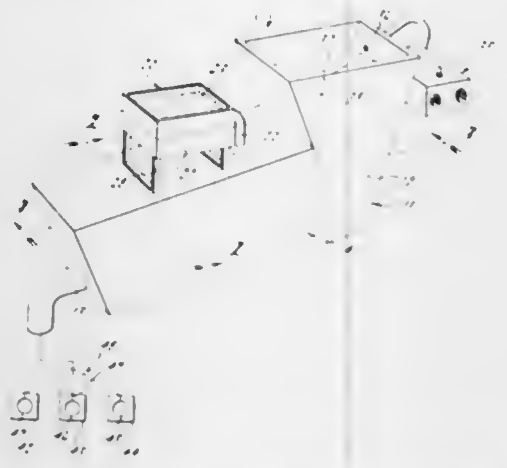
4,033,766
CONTINUOUS STREAM TREATMENT OF DUCTILE IRON

Gerald S. Cole, Dearborn; Bela V. Kovacs; Robert A. Sensoli, both of Dearborn Heights, and Herschel B. Smartt, Plymouth, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Division of Ser. No. 569,029, April 17, 1975. This application Feb. 2, 1976, Ser. No. 654,663

Int. Cl.^{2} C22C *33/00*

U.S. Cl. 75—123 CB **1 Claim**



1. A nodularized cast iron article consisting essentially of 3.5 carbon, 2–2.5% silicon, the carbon/silicon ratio being about 7:5, about 0.6 manganese, sulfur being no greater than 0.015%, 0.04–055% magnesium, the remainder being essentially iron, said composition being particularly characterized by the absence of carbides and dross, at least 90% of graphite nodules are spherical in shape, and has a graphite nodule count of at least 400 per square millimeter in a ½ inch section.

4,033,767
DUCTILE CORROSION RESISTANT ALLOY

Thomas E. Johnson, Sullivan, Wis., assignor to Chas. S. Lewis & Co., Inc., Afton, Mo.

Filed Sept. 19, 1975, Ser. No. 614,871

Int. Cl.^{2} C22C *19/03*

U.S. Cl. 75—170 **16 Claims**

1. In a corrosion resistant nickel base austenitic alloy, having improved malleability and ductility, the improvement consisting essentially of a silicon content of up to about 4%, a molybdenum content of up to about 4% and wherein the sum of the molybdenum and silicon content is less than about 4%, the combination producing improved malleability and hot ductility.

4,033,768
METHOD FOR THE PREPARATION OF AN ELECTROSTATOGRAPHIC PHOTOSENSITIVE DEVICE

Francis J. Wieloch, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Apr. 14, 1976, Ser. No. 676,841

Int. Cl.^{2} G03G *5/04*

U.S. Cl. 96—1.5 **12 Claims**

1. A method for the preparation of a seamless belt useful as the photosensitive element in an electrostatographic copying device which comprises:

a. applying a film of soluble material over a mandrel;
b. applying a photoconductive layer over the soluble film and heat treating the photoconductive layer;
c. applying a layer of conductive material over the photosensitive layer;
d. applying a seamless shrink film of a thermoplastic resin over the layer of conductive material to form a layered, endless belt;
e. removing the layered belt from the mandrel;

f. contacting the belt with a solvent for the soluble film to thereby dissolve the film; and
g. turning the belt inside out to provide a belt having layers from the bottom up of the polymeric film, the conductive material and the photoconductive layer.

4,033,769
PERSISTENT PHOTOCONDUCTIVE COMPOSITIONS

David J. Williams, Fairport, N.Y.; Marcel A. Lardon, Trubach, SG, Switzerland; Martin A. Abkowitz, and Gustav Pfister, both of Webster, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 316,152, Dec. 18, 1972, Pat. No. 3,879,201. This application Oct. 30, 1974, Ser. No. 519,329

Int. Cl.^{2} G03G *5/00*

U.S. Cl. 96—1.5 **18 Claims**

1. A photoconductive composition comprising an organic photoconductive electron donor material, an activator capable of formation of a charge transfer complex with said photoconductive material and a protonic acid having an aqueous dissociation constant of at least 10^{-4}, said acid being present in sufficient concentration in relation to the activator to enhance the stability of a complex formed during illumination between the anion radical form of the activator and a proton and thus extend the elevated level of conductivity of the composition in these light struck areas subsequent to illumination.

4,033,770
PRODUCTION OF ADHESIVE TRANSFERS BY DIFFUSION TRANSFER

Louis Maria De Haes, Edegem; Leon Louis Vermeulen, Broechem; Hugo Karel Gevers, Edegem, and Walter Frans De Winter, Gravenwezel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Apr. 4, 1975, Ser. No. 565,249

Claims priority, application United Kingdom, Apr. 11, 1974, 16212/74

Int. Cl.^{2} G03C *11/12, 5/54, 7/00;* **B44C** *3/00*

U.S. Cl. 96—28 **23 Claims**

1. A process for the production of transfer images comprising the steps of:

1. photographically exposing a photographic material carrying a light-sensitive silver halide emulsion layer;
2. contacting the emulsion layer side of the exposed photographic material with a supported image-receiving layer of an image-receiving material, said image-receiving layer containing developing or precipitating nuclei, in the presence of a developing liquid for the exposed silver halide and a silver halide solvent to diffuse developed silver halide image-wise from the photographic material into the receiving layer to form therein a visible silver image;
3. separating the exposed and developed photographic material from the receiving layer carrying said visible silver image;
4. pressing said receiving layer carrying said visible image at least partly into contact with a receptor material, said image-receiving layer comprising a mixture of a hydrophilic colloid, a thermoplastic latex, and at least one of a plasticizer or a tackifying resin, and being adapted to undergo an increase in sticking power upon the application of pressure and optionally with heat and/or solvents sufficient to make the pressure-receiving regions of said image-receiving layer remain adhered on the receptor material upon separation of the image-receiving material from the receptor material; and
5. separating said image-receiving material from the receptor material to leave at least a portion of the pressure-receiving regions of said image-receiving layer upon said receptor material.

4,033,771
STABILIZED BLEACH-FIXING BATHS

Gary L. Borton, Penfield; Cobb S. Goff, Rochester, and Richard J. Malloy, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 16, 1973, Ser. No. 389,063

Int. Cl.^{2} G03C *5/32*

U.S. Cl. 96—60 BF **27 Claims**

1. A bleach-fix composition for use in photographic processing, comprising

1. a bleaching agent which is an iron or cobalt complex of a polycarboxylic acid,
2. a thiosulfate fixing agent, and
3. an amount sufficient to retard sulfurization of said bleach-fix composition of a carbonyl bisulfite adduct comprising at least two carbon atoms.

4,033,772
AMPHOTERIC MALEIC ANHYDRIDE COPOLYMERS AND PHOTOGRAPHIC EMULSIONS EMPLOYING THE SAME

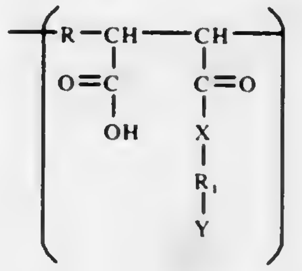
Joseph A. Sprung, Binghamton; Theodore Panasik, Vestal, and James J. Holmes, Endicott, all of N.Y., assignors to GAF Corporation, New York, N.Y.

Filed Dec. 9, 1975, Ser. No. 639,075

Int. Cl.^{2} G03C *1/72, 1/02*

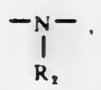
U.S. Cl. 96—114 **42 Claims**

1. A photographic silver halide emulsion, wherein the emulsion binder comprises a water-soluble, film-forming amphoteric copolymer having in its molecule repeating units of the general formula:



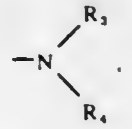
where

n is a positive integer;
R is the residue of an ethylenically unsaturated organic monomer;
X is

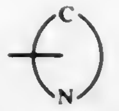
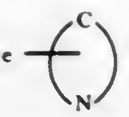


$$-\underset{\substack{|\\R_2}}{N}-,$$

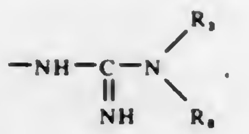
—S— or —O—, where R$_2$ is hydrogen or lower alkyl;
R$_1$ is lower alkylene, lower alkylene substituted by halogen, alkoxy or carboxy, cycloalkylene of 3 to 8 carbon atoms, or phenylene; and
Y is



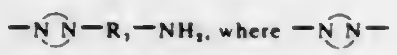
where R$_3$ and R$_4$ are each hydrogen, lower alkyl or lower alkyl substituted by amino, or R$_3$ and R$_4$ together with the nitrogen atom to which they are attached form a 3- 8-membered saturated or unsaturated heterocyclic ring containing the nitrogen atom as the sole hetero atom or containing a second hetero atom selected from nitrogen, oxygen or sulfur,


, where


represents a 3-to 8-membered saturated or unsaturated heterocyclic ring containing the nitrogen atom in the ring as the sole hetero atom or containing a second hetero atom selected from nitrogen, oxygen or sulfur,

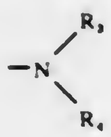

$$-NH-\underset{\underset{NH}{\|}}{C}-N\begin{matrix}R_5\\R_6\end{matrix}$$

where R_5 and R_6 are each hydrogen or lower alkyl,



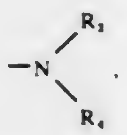
represents a 3- to 8-membered saturated or unsaturated heterocyclic ring containing the two nitrogen atoms as the sole heteroatoms and R_7 is lower alkylene, or -SR_8, where R_8 is hydrogen or lower alkyl;

or, when X is as defined above and Y is


$$-N\begin{matrix}R_5\\R_6\end{matrix}$$

or —SR_8, R_1 represents the atoms necessary to form a 3- to 8-membered heterocyclic ring with X and Y containing X and Y as the sole hetero atoms;

and the quaternary ammonium salts thereof when Y is


$$-N\begin{matrix}R_5\\R_6\end{matrix}$$

where R_5 and R_6 are lower alkyl or the ternary sulfonium salts thereof when Y is —S—R_8, where R_8 is lower alkyl.

4,033,773
RADIATION PRODUCED COLORED PHOTOPOLYMER SYSTEMS

James Marvin Lewis, Aurora, and Raymond Willis Newycar, Willoughby, both of Ohio, assignors to Horizons Incorporated, a division of Horizons Research Incorporated, Cleveland, Ohio

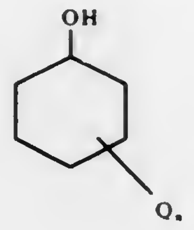
Division of Ser. No. 500,931, Aug. 27, 1974, Pat. No. 3,954,468. This application Feb. 9, 1976, Ser. No. 656,260

Int. Cl.^{2} G03C *1/68*

U.S. Cl. 96—115 P **7 Claims**

1. A colored photosensitive composition suitable for use in the production of colored images, consisting essentially of:

1. at least one N-vinyl monomer
2. an iodine containing activator selected from the group consisting of alkyl iodides, sulfenyl iodides and sulfonyl iodides;
3. a phenolic compound represented by the formula



where *n* is an integer up to 5 and Q represents monovalent radicals selected from the group consisting of hydroxyl, amino, alkyl and allyl;

4. at least one acid leachable dye selected from the group consisting of
   - a. substituted anthraquinones
   - b. binuclear merocyanines
   - c. complex merocyanines
   - d. cyanines
   - e. 9-phenyl-fluoren-9-ols; and
5. and alcohol soluble, acid insoluble resin binder;

each of the above constitutents being dispersed or disolved in said resin binder, the amount of leachable dye being sufficient to impart a distinct color to the photosensitive composition and the above constitutents being present in the following relative proportions, by weight:

N-vinyl monomer: 100 to 300

iodine containing activator: 15 to 300

phenolic compound: up to 100

acid leachable dye: 0.005 to 5.

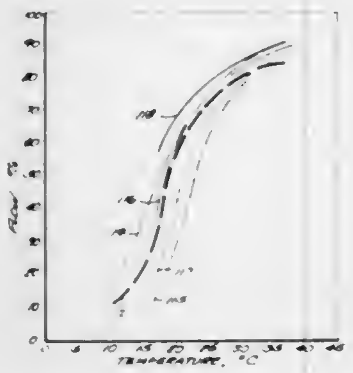
4,033,774
DENTAL IMPRESSION COMPOUND

Paul A. Johnson, 14040 N. Birchwood Lane, Mequon, Wis. 53092, and Hamilton A. Pinkalla, 7656 W. Forest Home Ave., Milwaukee, Wis. 53220

Filed Apr. 8, 1976, Ser. No. 675,047

Int. Cl.^{2} C08L *93/04*; C09K *3/00*

U.S. Cl. 106—35 **4 Claims**



1. A dental impression composition consisting essentially of a mixture by weight of hydrogenated wood rosin 65.5 to 91.0 percent; white petrolatum 4.0 to 9.5 percent; talc 0 to 20 percent; aluminum powder 5 to 25 percent; total talc and aluminum 5 to 25 percent.

4,033,775
PROCESS FOR PRODUCING ALUMINOUS KEATITE CERAMICS

David G. Grossman, Corning, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,985

Int. Cl.^{2} C03C *3/22, 21/00, 3/04*

U.S. Cl. 106—39.7 **4 Claims**

1. In a process for the manufacture of an aluminous keatite-containing ceramic article wherein a ceramic article selected for treatment, comprising a principal crystal phase composed of beta-spodumene solid solution, is first contacted with a strong acid to replace at least some of the lithium ions therein with hydrogen, and thereafter heated to provide aluminous keatite through the removal of at least some of the water of crystallization therefrom, the improvement which comprises selecting as the ceramic article for treatment an article wherein the mole ratio of Al_2O_3 to modifying oxides selected from the group consisting of Li_2O, Na_2O, K_2O, ZnO, MgO, CaO, BaO and SrO does not exceed about 1:1.

4,033,776
COMPOSITION OF CERAMIC MATERIAL

William R. Golya, and John Doornwaard, both of Gibsonia, Pa., assignors to Saxonburg Ceramics, Inc., Saxonburg, Pa.

Filed Aug. 18, 1975, Ser. No. 605,349

Int. Cl.^{2} C04B *33/26*

U.S. Cl. 106—46 **2 Claims**

1. A ceramic composition for forming an expanded glass-like seal upon heating, comprising about 26% kaolin, about 25% silica, about 16% zircon, about 29% of frit, about 4% of borate, by weight of the whole, the chemical composition of said components being as shown in the following table, in percentages by weight:

	Kaolin	Silica	Zircon	Frit	Borate
SiO_2	52.40	99.89		31.49	
Al_2O_3	44.65	.08	.30	13.20	
Fe_2O_3	.44	.02	.04		
TiO_2	1.81	.01	.20		
CaO	.09			15.80	38.22
MgO	.19				
Na_2O	.33			7.96	9.83
K_2O	.09				
B_2O_3				31.55	51.94
$ZrSiO_4$			99.46		

4,033,777
SODIUM SPECIFIC GLASS COMPOSITIONS AND ELECTRODES

Chung Chang Young, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 511,720, Oct. 3, 1974, Pat. No. 3,988,237. This application May 24, 1976, Ser. No. 689,310

Int. Cl.^{2} C03C *3/04, 3/30*

U.S. Cl. 106—52 **20 Claims**

1. A glass composition for use in ion selective glass electrodes consisting essentially of:

Component	Mole %
Na_2O	5–25%
Al_2O_3	0–20%
Ta_2O_5	1–10%
SiO_2	60–82%
wherein $\frac{Ta_2O_5 + Al_2O_3}{Na_2O}$	$\geq$ 0.2

4,033,778
PROCESS FOR MAKING MAGNESIA

William Cecil Gilpin, Welbeck Woodhouse, near Worksop; Noel Heasman, The Grove, near Hartlepool, and John Williamson, Hart, near Hartlepool, all of England, assignors to Steetley Limited, England

Continuation of Ser. No. 308,603, Nov. 21, 1972, abandoned. This application May 9, 1975, Ser. No. 576,208

Claims priority, application United Kingdom, Dec. 1, 1971, 55820/71; Apr. 4, 1972, 15482/72

Int. Cl.^{2} C04B *35/04*

U.S. Cl. 106—58 **13 Claims**

1. In a process for producing a refractory material in which an aqueous suspension of magnesium hydroxide is dewatered and the dewatered solid thus obtained is calcined to form the desired refractory, the improvement which comprises dewatering the aqueous suspension of the magnesium hydroxide at a pressure which is greater than 400 lbs per square inch to give a cake of magnesium hydroxide containing at least 67.5% by weight of solids and having a green bulk density of at least 1.15 grams/cc.

4,033,779
NON-EQUILIBRIUM CORDIERITE-ALUMINA

Ernel R. Winkler, Scottsdale, Ariz., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 23, 1976, Ser. No. 669,689

Int. Cl.^{2} C04B *35/18, 35/20*; C03C *3/22*

U.S. Cl. 106—62 **3 Claims**

1. A non-equilibrium sintered ceramic composition consisting essentially of a fine-grained matrix of crystalline cordierite and an effective amount up to about 70%, by weight based on the matrix weight of undissolved, 25–149 micron diameter alumina particles with an average particle size of between about 40 and 60 microns, for increasing the temporary use temperature of the matrix without increasing the coefficients of thermal expansion of the composition proportionally to the added alumina.

4,033,780
METHOD OF ENHANCING THE REFRACTORINESS OF HIGH PURITY FUSED SILICA

Charles E. Baumgartner, and Peter P. Bihuniak, both of Corning, N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,459

Int. Cl.^{2} C04B *35/14*

U.S. Cl. 106—69 **6 Claims**

1. In a method of producing a high purity fused silica product, wherein a liquid containing silica is dried to form solid silica bodies which are then thermally vitrified, the improvement, whereby the refractoriness of the fused silica is enhanced, which comprises doping a liquid flowable form of silica slurry or sol with 200 to 2500 parts per million by weight, as based on the fused silica, of elemental silicon.

4,033,781
FIBER REINFORCED STRUCTURAL MATERIAL

Karl V. Hauser, Ann Arbor, Mich., and Edwin W. Ronsaville, Jr., Annapolis, Md., assignors to Amtech, Inc., Odenton, Md. and Edward C. Levy Company, Detroit, Mich., part interest to each

Filed Jan. 9, 1976, Ser. No. 647,883

Int. Cl.^{2} C04B *7/35*

U.S. Cl. 106—90 **6 Claims**

1. A structural material comprising a hardenable hydraulic-setting matrix and a plurality of randomly arranged elongated elements admixed in said matrix, said elements being fabricated of a non-metallic substance, the elements as a group extending in all directions in the formed and set matrix, each element having a cross section with a central area and a plurality of arms extending outwardly from said area, each element cross section being further provided with lobes on the outer ends of said arms.

4,033,782
CALCIUM ALUMINATE CEMENT COMPOSITIONS AND MIXES AND METHOD FOR PREPARING THEM

James Allen Ray, Mantua, and Thomas Joseph Lazlo, Solon, both of Ohio, assignors to Martin Marietta Corporation, Bethesda, Md.

Filed Mar. 23, 1976, Ser. No. 669,734

Int. Cl.^{2} C04B *7/02, 13/20*

U.S. Cl. 106—104 **37 Claims**

1. A hydraulic cement composition comprising: calcium aluminate cement, aggregate material in amount within the range of to about 85% by weight based on the total weight of the dry cement and aggregate material, and additive material comprising calcium formate in at least an amount (a) which accelerates the rate of gain of compressive strength of the hydrated product, formed within the first six hours after water for hydraulic setting of the cement is added to said composition, materially over the rate of gain of compressive strength of the hydrated product formed from a similar composition without calcium formate and (b) which provides, when in-

cluded in a Standard Cement Mortar Mix containing said cement, a final setting time of about 7 to about 35 minutes after inclusion of water prescribed for said Standard Cement Mortar Mix as determined at about 70° F. by the appropriate Designated Test Method for mortars.

4,033,783

METHOD FOR MAKING LIME-SILICA INSULATION FROM PERLITE

Franz J. Brodmann, and Richard D. Varker, both of Philadelphia, Pa., assignors to General Refractories Company, Bala Cynwyd, Pa.

Filed June 23, 1975, Ser. No. 589,571
Int. Cl.^{2} C04B *1/00*

U.S. Cl. 106—120 **13 Claims**

1. A method of making lime-silica bonded structural materials suitable for use for insulation purposes comprising the steps of:

a. mixing particles of expanded perlite surface activated to accelerate gel formation with an aqueous slurry comprising lime and reinforcement fibers to form an aqueous lime-silica reaction mixture, the relative proportion by weight of perlite and lime being adjusted to provide a C/S ratio greater than about 0.70 and less than about 0.80;
b. heat treating the aqueous lime-silica reaction mixture to form a lime-silica gel;
c. shaping the lime-silica gel to form a lime-silica shaped article;
d. curing the lime-silica shaped article by treating the article in steam; and
e. drying the cured lime-silica shaped article to remove excess moisture.

4,033,784

METHOD FOR DISSOLVING ASPHALTIC MATERIAL

Michael B. Lawson, and Kenneth J. Snyder, both of Duncan, Okla., assignors to Halliburton Company, Duncan, Okla.

Filed Aug. 25, 1975, Ser. No. 607,653
Int. Cl.^{2} B08B *3/08*

U.S. Cl. 134—20 **12 Claims**

1. A method for dissolving asphaltic material comprising:

establishing contact between said asphaltic material and a composition comprising a liquid aromatic solvent and an additive material soluble in said liquid aromatic solvent, and

maintaining said contact for a time sufficient to dissolve said asphaltic material;

wherein said liquid aromatic solvent has a flash point of at least about 160° F and is a mixture of aromatic compounds selected from alkyl substituted benzene compounds having 1 to 10 carbon atoms per alkyl substituent, naphthalene, and alkyl substituted naphthalene having 1 to 10 carbon atoms per alkyl substituent; and

wherein said additive material is benzotriazole and is, present in said composition in the range of from about 0.1 to about 50 percent by weight of said liquid aromatic solvent.

4,033,785

AIR WIPE

Charles D. Gibbs, 1406 Greenville Highway, Hendersonville, N.C. 28739

Filed Mar. 4, 1976, Ser. No. 663,657
Int. Cl.^{2} B08B *1/02*

U.S. Cl. 134—15 **14 Claims**

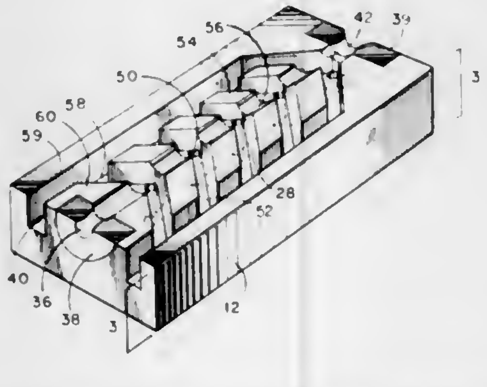
1. An air wipe to remove adhering particulate matter from a linearly drawn passing article of indefinite length having article entrance and exit orifices and opposing tandem jet stream orifices, within mating housing halves, directing impinging pressurized jet streams upon said article passing through an annular central housing passage comprising:

a plurality of transverse extrusion channels defined by corresponding V-shaped swept baffle means, swept obliquely with respect to the direction of article travel, each extrusion channel having opposing tandem jet stream orifices, to divert particulate laden dispersed jet streams at a lateral acute angle, with respect to said passing article, in a direction opposing the direction of movement of said article;

longitudinal exhaust channels coaxial with said central article passage communicating and merging with said extrusion channels and terminating in exhaust ports adjacent to, but displaced from, said article entrance orifice to divert said particulate laden dispersed jet streams away from said entering linearly drawn article;

said jet streams impinging upon said article at an angle less than 90° **and said opposing tandem jet stream orifices placed** 180° **apart;**

said swept baffle means having a machined annular groove, for passage of said wire, at the apex of said baffle means, the convergence of the arms of said baffle means being said apex, with said linear article forming an acute angle with respect to said baffle means swept arms.



14. A method for the incremental removal and diversion of adhering particulate matter from a continuously running linearly drawn wire whereby high velocity jet streams impinge upon said passing wire, the method comprising:

impinging said passing wire with a plurality of high velocity paired opposing concentrated jet streams, said pairs being linearly displaced along the line of wire travel and impinging upon said wire at an acute angle, to the line of wire travel;

diverting particulate laden dispersed jet streams laterally through angular transverse extrusion channels, said channels being symmetrical on either side of the line of said passing wire; and

exhausting said particulate laden dispersed jet stream away from said wire through longitudinal exhaust channels coaxial with the line of wire travel in a direction opposing the line of wire travel.

4,033,786

TEMPERATURE GRADIENT ZONE MELTING UTILIZING SELECTIVE RADIATION COATINGS

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

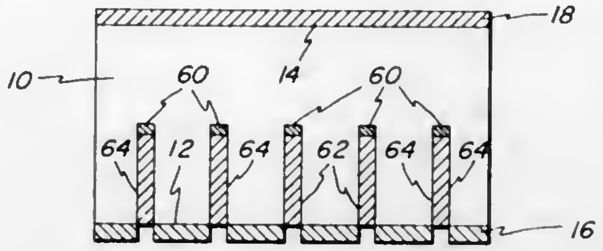
Filed Aug. 30, 1976, Ser. No. 718,975
Int. Cl.^{2} H01L *21/225*

U.S. Cl. 148—1.5 **17 Claims**

1. An improvement in the processing of a body of semiconductor material by thermal gradient zone melting comprising the steps of:

a. selecting a body of semiconductor material having a preferred crystal structure, a preferred type of conductivity, a preferred level of resistivity, two major opposed surfaces being, respectively, the top and bottom surfaces of the body, at least one of the major surfaces having a preferred planar crystal orientation, and a vertical axis substantially aligned with a first preferred crystal axis of the material of the body;

b. forming a layer of a material suitable for absorbing a predetermined range of wavelength of the radiation spectrum impinging thereupon on at least one of the two major opposed surfaces, the layer having a predetermined thickness, t, expressed by the following general equation:



$$t = \frac{(2n-1)\lambda}{4N}$$

wherein

n = any positive integer greater than zero
λ = the wavelength of the most intense portion of radiation spectrum impinging upon the material in vacuum and
N = the index of refraction of the material;

c. exposing the processed body to a source of radiant energy;
d. absorbing the predetermined range of wavelength of the most intense portion of the spectrum in the layer of material, and
e. increasing the heat flow lines through the material of the body to enhance the migration of a melt of metal-rich semiconductor through the body by thermal gradient zone melting.

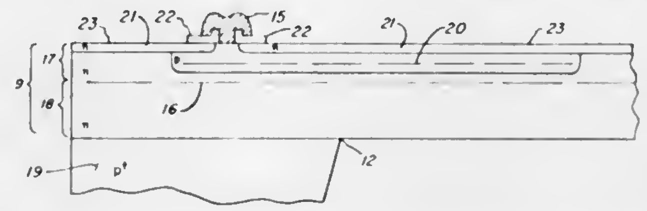
4,033,787

FABRICATION OF SEMICONDUCTOR DEVICES UTILIZING ION IMPLANTATION

James F. Marshall, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Continuation of Ser. No. 619,866, Oct. 6, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,564
Int. Cl.^{2} H01L *21/265, 27/20*

U.S. Cl. 148—1.5 **30 Claims**



1. A method for providing semiconductor material stress sensor having structural portions including substantially a diaphragm and a constraint for constraining said diaphragm at peripheral portions thereof, said method comprising:

providing a layer of semiconductor material initially of a first conductivity type; and

implanting ions of a first kind in said layer through a first surface portion thereof to form, after annealing, a first region of a second conductivity type located at least in part in a portion of said layer which will be included in said diaphragm to serve as a piezoresistor, said part of said first region as located being confined to interior portions of said layer with respect to said first surface portion such that a first semiconductor junction separates said part of said first region from remaining portions of said layer with said part of said first region having therein what, before annealing, is a region of maximum concentration of said first kind ions spaced apart from at least a first portion of said first semiconductor junction where said first portion of said first semiconductor junction occurs between said first surface portion and said region of maximum first kind ion concentration.

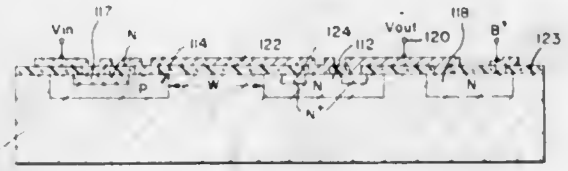
4,033,788

ION IMPLANTED GALLIUM ARSENIDE SEMICONDUCTOR DEVICES FABRICATED IN SEMI-INSULATING GALLIUM ARSENIDE SUBSTRATES

Robert G. Hunsperger, Malibu, and Nathan Hirsch, Santa Monica, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Division of Ser. No. 423,325, Dec. 10, 1973, Pat. No. 3,914,784. This application Aug. 22, 1975, Ser. No. 607,071
Int. Cl.^{2} H01L *21/26*

U.S. Cl. 148—1.5 **11 Claims**



1. A process for fabricating an electrically active component within an electrically isolating substrate which includes the steps of:

a. providing a GaAs semi-insulating substrate having a bulk resistivity in the range of 10^6–10^8 ohm.centimeters and having a dominant electrically active impurity of chromium present in at least about 0.01 parts per million,
b. forming an ion implantation mask having an opening therein on the surface of said substrate,
c. projecting N-type ions through said opening in said mask to form an ion implanted region in said substrate,
d. forming an insulating coating over the surface area of said substrate through which said N-type ions were projected,
e. annealing the structure in (d) above at a predetermined elevated temperature and time sufficient to electrically activate said N-type ions implanted in said substrate and to raise the carrier mobilities therein to at least about 3000 cm^2/volt·second, and
f. forming ohmic contacts at speed-apart areas of said implanted region, whereby an implanted resistor region is fabricated and electrically isolated in a single semi-insulating substrate material.

4,033,789

METHOD OF PRODUCING A HIGH STRENGTH STEEL HAVING UNIFORM ELONGATION

Emil G. Hamburg, Pittsburgh; Robert L. Cryderman, McMurray, and John F. Butler, Bethel Park, all of Pa., assignors to Jones & Laughlin Steel Corporation, Pittsburgh, Pa.

Filed Mar. 19, 1976, Ser. No. 668,374
Int. Cl.^{2} C21D *6/00, 7/14*

U.S. Cl. 148—12 F **7 Claims**

1. A method of heat treating steel to produce a high strength product having high tensile uniform elongation, comprising:

a. heating a steel product having a composition consisting essentially of from 0.04 to 0.17% carbon, 0.8 to 2.0% manganese, up to 1.0% silicon, up to 0.12% vanadium, up to 0.1% columbium, up to an effective amount of titanium to form titanium carbo-nitrides, 0.001 to 0.025% nitrogen, balance iron to a temperature above the Ac$_3$ temperature of the steel for a time sufficient to austenitize said steel product;
b. cooling said austenitized steel product at a rate of no more than about 70° to about 850° F; and
c. cooling said steel product at a rate of more than about 10° from 850° F to obtain a high-treated steel product having a minimum ultimate tensile strength of 80,000 p.s.i., a minimum tensile uniform elongation of 16%, and a micro-

structure of from about 10% to 35% MLB, balance essentially proeutectoid ferrite.

4,033,790
SOLID DIFFUSION DOPANTS FOR SEMICONDUCTORS AND METHOD OF MAKING THE SAME
Koreaki Gunjigake, Machida; Masashi Hasegawa; Hiroshi Oizumi, both of Sagamihara, and Yoshio Ogata, Machida, all of Japan, assignors to Denki Kagaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 29, 1976, Ser. No. 709,815

Int. Cl.² C04B *35/40;* **H01L** *21/223*

U.S. Cl. 148—22 **13 Claims**

1. A solid phosphorus dopant source for semiconductors, comprising a substance composed of at least one kind of compound R_2O_3 selected from the group consisting of Y_2O_3, La_2O_3 and Ce_2o_3 and P_2O_5 and containing mainly a compound with a chemical formula $R_2O_3 \cdot 5P_2O_5$.

4,033,791
MAGNETOSTRICTIVE ALLOY
Zbigniew Kaczkowski, Warsaw, Poland, assignor to Polska Akademia Nauk, Instytut Fizyki, Warsaw, Poland

Filed Jan. 6, 1976, Ser. No. 646,932

Claims priority, application Poland, Jan. 22, 1975, 177485

Int. Cl.² C04B *35/00;* **C22C** *38/06*

U.S. Cl. 148—31.55 **6 Claims**

1. A processed alloy having magnetostrictive properties and suitable for the production of magnetostrictive cores for magnetostrictive ultrasonic transducers,

said alloy consisting essentially of iron as a major ingredient and 5 to 15% aluminum and 0.5 to 10% cobalt as additive ingredients,

said alloy being further characterized by having a value of k_m between 0.32 and 0.38.

4,033,792
COMPOSITE SINGLE CRYSTAL ARTICLE
Anthony F. Giamei, Middletown, and Bernard H. Kear, Madison, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Division of Ser. No. 536,043, Dec. 23, 1974, Pat. No. 3,967,355. This application Apr. 7, 1976, Ser. No. 674,694

Int. Cl.² B23K *28/00*

U.S. Cl. 148—32 **3 Claims**

1. A metallic composite blade for use in gas turbine engines, for applications where at least a portion of the blade is exposed to a corrosive environment, including

a. a high strength single crystal core element

b. at least one oxidation resistant single crystal element bonded to the core element so as to protect the core from the corrosive environment

c. a base element bonded to the core element

wherein the following relationship is maintained between all bonded adjacent single crystal elements

a. the crystal structure types are substantially identical

b. the lattice parameters are substantially identical

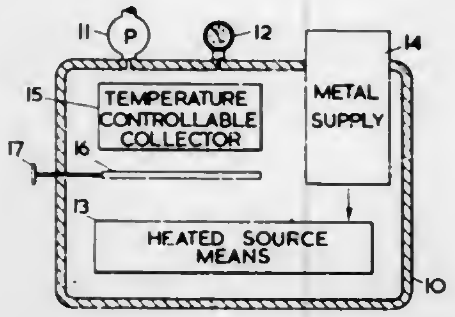
c. the orientations are substantially identical so that there are no mobile high angle grain boundaries between the bonded single crystal elements.

4,033,793
ALUMINIUM ALLOYS
Robert Lewis Bickerdike, Alton; Douglas Clark, Camberley; John Norman Eastabrook, Basingstoke; Garyth Hughes; William Norman Mair, both of Farnham; Peter George Partridge, Camberley, and Harry Christopher Ranson, Farnborough, all of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Sept. 15, 1975, Ser. No. 613,498

Int. Cl.² C22C *21/00*

U.S. Cl. 148—32 **10 Claims**



1. an evaporation-condensation aluminum alloy which consists of 2 to 12% by weight of chromium, 0.2 to 3.0% by weight of iron, the balance being aluminum apart from minor proportions of impurities and incidental elements wherein most of the chromium is present as a metastable solution in the aluminum lattice in the form of grains having one dimension of 5 μm or less, said grains containing a precipitate phase of iron-rich zones the major proportion of which have dimensions of 200A or less, the presence of large intermetallic particles, particularly at grain boundaries, being at a minimum.

4,033,794
ALUMINIUM BASE ALLOYS
Michael James Stowell, Saffron Walden; Brian Michael Watts, Haverhill; Edward Frederick Emley, Chalfont St. Giles, and Roger Grimes, Amersham, all of England, assignors to The British Aluminum Company, Limited, London and T. I. (Group Services) Limited, Birmingham, both of, England

Continuation of Ser. No. 433,618, Jan. 15, 1974, abandoned. This application Apr. 14, 1975, Ser. No. 567,505

Claims priority, application United Kingdom, Jan. 19, 1973, 2846/73

Int. Cl.² C22C *21/00*

U.S. Cl. 148—32 **14 Claims**

1. A superplastically deformable wrought aluminium-base alloy consisting of

1. non-heat treatable aluminium-base alloy selected from the group consisting of

1a. aluminium of normal commercial purity together with 0.4% to 2% iron and 0.4% to 2% silicon as dynamic recrystallization modifying additives to achieve fine structure during deformation,

1b. aluminium and 0.75% to 2.5% manganese together with 0.4% to 1% iron as dynamic recrystallization additive to achieve fine structure during deformation,

1c. aluminium and 0.25% to 0.75% manganese, and

1d. aluminium and 1% to 4% magnesium together with 0.25 to 0.75% manganese as dynamic recrystallization additive to achieve fine structure during deformation, and

2. zirconium in an amount of 0.3% to 1.0% in total content of which at least 0.3% is present in solid solution;

3. the remainder of said superplastically deformable alloy being normal impurities and incidental elements known to be incorporated in said aluminium-base alloys.

4,033,795
METHOD FOR INDUCING UNIAXIAL MAGNETIC ANISOTROPY IN AN AMORPHOUS FERROMAGNETIC ALLOY
Brian S. Berry, Ossining, and Walter C. Pritchet, Mahopac, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 214,127, Dec. 30, 1971, Pat. No. 3,820,040. This application June 4, 1974, Ser. No. 476,641

The portion of the term of this patent subsequent to June 25, 1991, has been disclaimed.

Int. Cl.² C21D *1/04;* **H03B** *5/30*

U.S. Cl. 148—108 **6 Claims**

1. Method for inducing uniaxial magnetic anisotropy in an amorphous ferromagnetic alloy, comprising the steps of:

providing an amorphous ferromagnetic alloy with substantially amorphous structure such as that producible by the method of splat cooling, and

magnetically annealing said alloy for times and temperatures confined to values which do not produce substantial crystallization therein, said magnetic annealing comprising the steps of

applying an approximately saturating magnetic field to said alloy along a direction in which the easy axis of said uniaxial anisotropy is to be induced, with an accompanying

heating of said alloy to temperatures no higher than that at which said amorphous alloy exceeds its Curie point for a time period sufficient to induce said anisotropy in said alloy, and

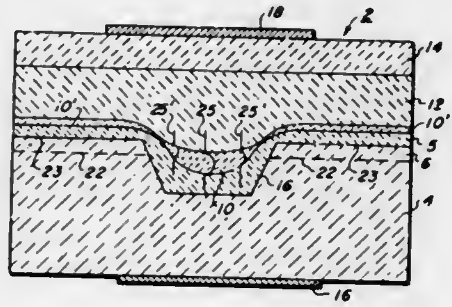
cooling said alloy with said induced uniaxial magnetic anisotropy therein to room temperature, at a rate to yield a substantially amorphous structure.

4,033,796
METHOD OF MAKING BURIED-HETEROSTRUCTURE DIODE INJECTION LASER
Robert D. Burnham, and Donald R. Scifres, both of Los Altos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed June 23, 1975, Ser. No. 589,277

Int. Cl.² H01L *21/20, 21/74;* **H01S** *3/06*

U.S. Cl. 148—175 **20 Claims**



1. A method of making a heterojunction diode laser comprising the steps of:

forming in a semiconductor single crystal material substrate of one conductivity type a surface layer of the second conductivity type to form a current blocking p-n junction when a bias is applied to the heterojunction hereinafter formed.

removing both a portion of said surface layer and an additional part of said substrate material adjacent thereto to provide an elongated groove in said substrate, said groove dividing said surface layer into distinct parts,

forming on the entire surface of said grooved surface of said substrate a first single crystal epitaxial layer of semiconductor material of said one conductivity type, with

formation of said first layer being concluded while the portion of the exposed surface of said first layer in said groove is concave,

forming on said first layer a second layer of a semiconductor material of higher index of refraction than that of said material of said first layer of either conductivity type, with formation of said second layer being concluded when the exposed surface of said second layer directly over the concave surface of said first layer is substantially flat to form a current carrying p-n junction when said junction in the groove is forward biased and the conductivity of said second layer is of a second conductivity type,

forming on said second layer a third layer of semiconductor material of lower index of refraction that that of said second layer and of a second conductivity type than that of said first layer to form a p-n junction when said second layer is of a conductivity type which is the same as said first layer, and

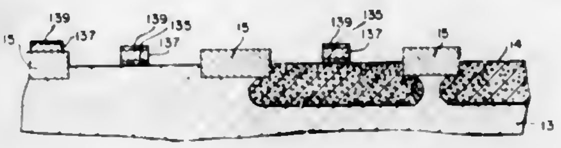
providing means for applying a bias voltage across the p-n junction formed in the groove such that the junction is forward biased when said bias voltage is applied and said rectifying junctions between said distinct parts of said surface layer and said first layer are reverse biased when said bias voltage is applied.

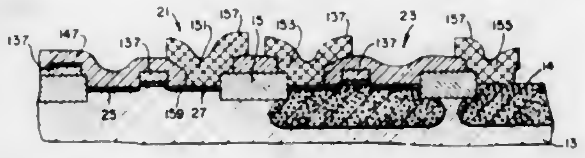
4,033,797
METHOD OF MANUFACTURING A COMPLEMENTARY METAL-INSULATION-SEMICONDUCTOR CIRCUIT
Hans G. Dill, Costa Mesa, and Thomas N. Toombs, Irvine, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Continuation of Ser. No. 362,025, May 21, 1973, abandoned, which is a continuation of Ser. No. 147,093, May 26, 1971, abandoned. This application Apr. 23, 1975, Ser. No. 570,687

Int. Cl.² H01L *21/22, 21/283, 29/78*

U.S. Cl. 148—187 **2 Claims**





1. In the process of producing an SIS circuit having at least one N-channel and one P-channel device with interconnected gates in a surface of a semiconductor substrate of a given type of conductivity, the steps of:

a. forming an insulating layer on said surface, said layer having an opening therein for each of said devices;

b. forming a complementary substrate under one of said openings for one of said devices;

c. disposing a gate insulator of electrically insulating material on a portion of said substrate within each of said openings;

d. forming on said layer of insulating material a multi-layered strip comprising an integral strip of electrically conductive polycrystalline silicon doped to have a given type of conductivity to serve as interconnected gates for said devices and a dopant-impervious insulating layer covering said polycrystalline silicon strip; and

e. with said multi-layered strip and said insulating layer as a mask, successively doping selected spaced-apart areas within respective ones of said openings with mutually opposite conductivity type determining impurities to convert them into source and drain regions of opposite conductivity from the substrate immediately surrounding them, without changing the conductivity type of said silicon strip.

4,033,798

COMPLEX OF NITROCELLULOSE AS PROPELLANT

Bruce W. Brodman, Cornwells Heights; Michael P. Devine, Churchville, and Stuart Schwartz, Philadelphia, all of Pa., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Mar. 29, 1976, Ser. No. 671,475

Int. Cl.² C06B *25/34*

U.S. Cl. 149—92 **7 Claims**

1. A chemical complex comprising nitrocellulose hydrogen-bonded to a member selected from the group of hexahydro-1,3,5-trinitro-s-triazine, octahydro-1,3,5,7-tetranitro-s-tetrazine, and mixtures thereof.

4,033,799

IONIC HYDROGENOLYSIS OF BINOR-S FOR USE AS A HIGH ENERGY FUEL

Abraham Schneider, Overbrook Hills, and Edward J. Janoski, Havertown, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Filed May 16, 1975, Ser. No. 578,070

Int. Cl.² C06B *23/00;* **B01J** *35/00;* **C07C** *1/00*

U.S. Cl. 149—120 **15 Claims**

1. A method for the ionic hydrogenolysis of Binor-S comprising:

contacting Binor-S with hydrogen in the presence of a promoting amount of a promoter selected from the group consisting of hydrogen halide and an organic halide and an effective amount of a catalyst selected from the following group: palladium-on-carbon, palladium-on-alumina and Raney nickel; said contacting occurring at a temperature of about 50°-200° C. and at a pressure of about 100-10,000 p.s.i.g.,

whereby the low melting point of the last crystalline material in the resulting mixture enables said mixture to be used as a high energy fuel at a low temperature.

4,033,800

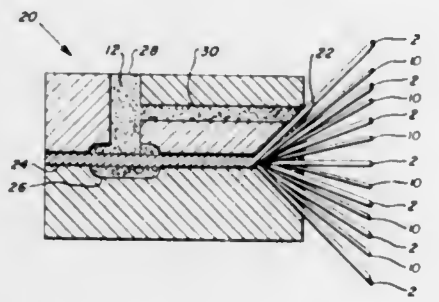
METHOD OF MAKING AN ELECTRIC CABLE

George E. Ollis, Worcester, Mass., assignor to United States Steel Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 109,287, Jan. 25, 1971, abandoned, which is a continuation-in-part of Ser. No. 784, Jan. 5, 1970, Pat. No. 3,602,632, which is a continuation-in-part of Ser. No. 691,459, Dec. 18, 1967, abandoned. This application Dec. 29, 1972, Ser. No. 319,564

Int. Cl.² H01B *13/14*

U.S. Cl. 156—48 **3 Claims**



1. The method of making a stranded electric cable having a plastic composition in continuous and intimate contact with the individual conductors throughout the length of the cable which comprises twisting the conductors together and passing the conductors through a stranding die, said stranding die having a long narrow passageway sized for the desired dimension of plastic composition surrounding the stranded conductors, a chamber located intermediate the ends of the passageway and a funnel shaped entrance, while simultaneously applying a plastic under high pressure through a transverse opening in the die into the chamber and at the same time through part of the transverse opening to the surface of the funnel shaped entrance through a branch opening connecting the transverse opening and the funnel shaped entrance.

4,033,801

MANUFACTURE OF ARTICLES OF A SUBSTANTIALLY SACK-LIKE OR TUBULAR STRUCTURE

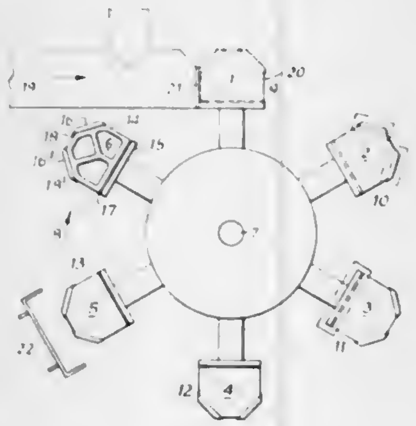
Eugene Gros, 9 Harman Drive, London NW. 2, England

Division of Ser. No. 575,075, May 6, 1975, Pat. No. 3,966,527, which is a division of Ser. No. 358,953, May 10, 1973, abandoned, which is a continuation of Ser. No. 149,319, June 2, 1971, abandoned. This application Apr. 8, 1976, Ser. No. 674,988

Claims priority, application United Kingdom, June 4, 1970, 26997/70

Int. Cl.² B32B *3/00;* **B29C** *19/04*

U.S. Cl. 156—70 **5 Claims**



1. A method of producing a tubular article having at least one elasticized opening therein which comprises advancing a plurality of generally flattened article supporting forms stepwise in a cycle around an endless path, applying to said form in a first stage of said cycle an article blank doubled over along its bottom side with its two opposite side edges sealed together in proximity to the opposite sides of said form and its fourth edge open around said form, advancing said blank-carrying form to at least one subsequent stage in said cycle and applying an elasticized band around at least one opening in said blank, then advancing said blank-carrying form to a subsequent stage in said cycle and stripping said elasticized blank from said form by engaging the margins of said open fourth side of said blank and peeling the tubular blank axially over said form.

4,033,802

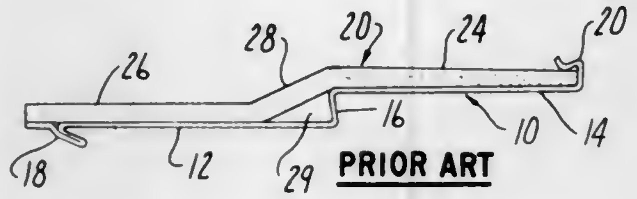
SIDING PANEL BACKERBOARD AND METHOD OF MANUFACTURING SAME

Bertram C. Culpepper, Jr., Linden, and Richard C. Wilson, Troy, both of Mich., assignors to Culpepper & Associates, Inc., Fenton, Mich.

Filed Feb. 11, 1976, Ser. No. 657,190

Int. Cl.² E04D *1/00;* **B32B** *31/12*

U.S. Cl. 156—71 **6 Claims**



1. A method for assembling a prefabricated backerboard to the exterior wall surfacing of a building, said backerboard comprising a siding panel of the type having longitudinally disposed first and second walls connected by a longitudinal step wherein the siding panel being adapted to said building exterior wall, with the said backerboard being adapted to be disposed between the inner surface of the siding panel walls and the exterior surface of the building, said method comprising the steps of cutting a first sheet of insulating material such that the one surface thereof and one edge thereof, respectively, have a contour that is complementary to the inner wall surfaces of the siding panel and longitudinal step within which it is adapted to be utilized; cutting a second sheet of insulating material such that the one surface thereof has a contour which is complementary to the wall surface of the panel member which said second sheet is adapted to abut and a width which is greater than said last mentioned wall surface such that the excess portion of said second sheet overlaps said first sheet; overlapping said excess portion of said second sheet with a portion of said first sheet; and bonding the overlapping surfaces of said sheets to each other, and thereafter assembling said prefabricated backerboard in position on the exterior wall of said building.

4,033,803

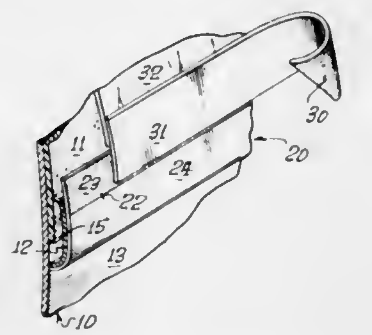
DOUBLE ADHESIVE MASKING TAPE

Glen L. Coder, 942 Millburg, La Puente, Calif. 90602

Filed Nov. 2, 1976, Ser. No. 738,097

Int. Cl.² B32B *7/10*

U.S. Cl. 156—71 **5 Claims**



1. An improved method for masking a portion of a surface in preparation for painting the unmasked portion thereof, the method being of the type utilizing a protective sheet of paper having an adhesive strip adhered along an edge thereof, wherein the improvement comprises:

adhering a strip of masking tape having a first principal side completely coated with a pressure sensitive adhesive and having its second principal side having a longitudinal area coated with a pressure sensitive adhesive and the remainder of this second side being free of adhesive, said adhering step being carried out so that the first side of the strip covers the edge of the area to be masked and the second side of the tape is positioned toward the area to be painted; and

adhering a combined protective paper and adhesive strip assembly to said masking tape by contacting the pressure sensitive portion of the adhesive tape to the portion of the masking tape which is coated with the pressure sensitive adhesive

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4,033,804

RECLAIMING WASTE PLASTICS

Eugene P. Baldyga, Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed July 7, 1975, Ser. No. 593,545

Int. Cl.² B29C *29/00;* **B32B** *35/00*

U.S. Cl. 156—84 **11 Claims**

1. In a process for delabeling molecularly oriented thermoplastic articles having labels adhesively bonded to surface portions thereof, the step of relieving orientation stresses beneath the labels to the extent of reducing the surface area of such portions by at least about five percent, thereby causing the thermoplastic material and labels to separate.

4,033,805

METHOD FOR MANUFACTURING AN INSULATED ELECTRIC COIL

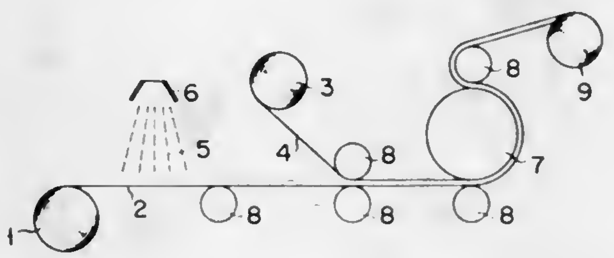
Hisayasu Mitsui; Jun-ichi Kamiuchi; Ryozi Kumazawa; Kimikazu Umemoto; Toshimitsu Yamada; Katsuhiko Yoshida, and Taichi Takechi, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation of Ser. No. 443,472, Feb. 19, 1974, abandoned. This application Feb. 24, 1976, Ser. No. 660,776

Claims priority, application Japan, May 30, 1973, 48-60705

Int. Cl.² B32B *19/04, 31/12;* **H01B** *13/08*

U.S. Cl. 156—185 **20 Claims**



1. A method of manufacturing an insulated electrical coil comprising the steps of:

a. bonding a mica sheet to a lining material to produce a compound mica sheet by
   1. depositing a mixture of powdered epoxy resin and a curing agent onto the surface of a mica sheet to produce a coated mica sheet,
   2. contacting the lining material with the coated mica sheet, and
   3. subjecting the coated mica sheet and lining material together to a temperature and pressure sufficient to thermally fuse the powdered epoxy resin and bond the lining material to the mica sheet,

b. mechanically winding said compound mica sheet into an electrical coil;

c. impregnating the coil wound with the compound mica sheet with a thermosetting resin; and

d. curing said impregnated coil.

4,033,806

METHOD OF MAKING REFRIGERATION APPARATUS ENCLOSURE STRUCTURE

Robert E. Lindenschmidt, Evansville, Ind., assignor to Whirlpool Corporation, Benton Harbor, Mich.

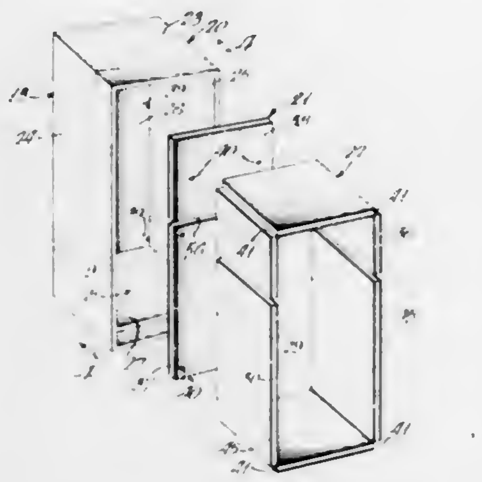
Division of Ser. No. 433,070, Jan. 14, 1974, Pat. No. 3,910,658. This application Aug. 4, 1975, Ser. No. 601,635

Int. Cl.² B32B *31/18;* **B65D** *11/20;* **F25D** *11/00*

U.S. Cl. 156—211 **10 Claims**

1. A method of constructing a refrigeration apparatus en-

closure comprising the steps of: fabricating a front opening outer cabinet having a back wall, top, bottom and side walls and defining a plurality of one-piece continuous corners; providing a flat laminate of sheet liner and insulation; cutting first wall means from said laminate; positioning said first wall means against said back wall with the sheet liner disposed interiorly; cutting second wall means from said laminate; slitting said second wall means insulation along lines corresponding to the corners of said outer cabinet; folding said



second wall means sheet liner at the slits with the sheet liner disposed interiorly to define one-piece continuous corners and outer voids; fitting the folded second wall means within said outer cabinet with the insulation confronting the inner surface of the cabinet along at least two of said top, bottom and side walls and with continuous corners of said liner being inwardly respectively aligned with said cabinet continuous corners spaced therefrom by said voids; and securing said second wall means to said outer cabinet.

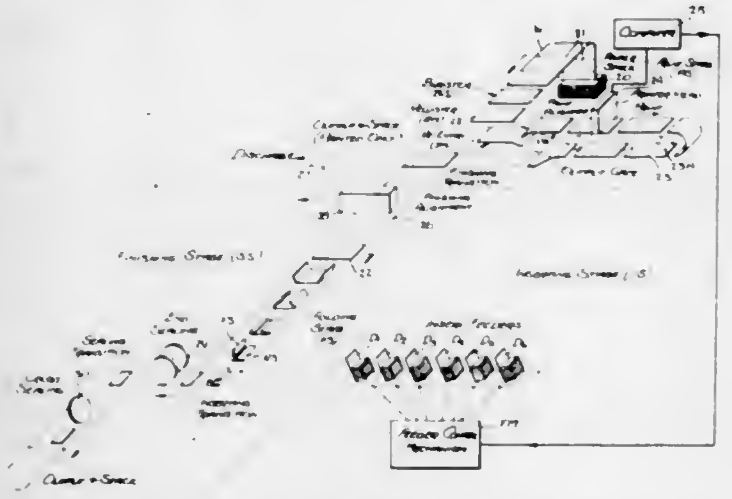
4,033,807
SYSTEM FOR PRODUCING TWO-WAY MAILER

Jimmie Neill, Hatboro, Pa., and Lester V. Wise, Old Westbury, N.Y., assignors to Federal Business Products, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 620,323, Oct. 7, 1975, Pat. No. 3,977,597. This application Jan. 5, 1976, Ser. No. 646,857

Int. Cl.² B41L ***47/42***

U.S. Cl. 156—384 **10 Claims**



1. In a system for printing fresh blanks on both faces thereof with a single printing head capable of imprinting blanks which lie below the head, the combination comprising:

A. a conveyor loop for transporting the blanks to be printed and having an input and an output, whereby each fresh blank admitted to the input of the loop is advanced thereby past the printing head at a position therebelow for imprinting on the obverse face of the blank, after which it is turned over and advanced toward the output thereof;

B. means periodically to feed fresh blanks to the input of the loop with an interval between each fresh blank admitted to the input and the succeeding fresh blank; and

C. selective means coupled to the output of the loop to transfer each turned-over blank already printed on one face thereof back to the input of the loop in the interval between the admission thereto of fresh blanks, each of said transferred blanks being advanced past the printing head for printing on the other face thereof, said selective means functioning to discharge from the loop only those turned-over blanks printed on both faces thereof.

4.033,808
APPARATUS FOR THE PRODUCTION OF HOLLOW BODIES, ESPECIALLY LARGE-DIAMETER DUCTS FROM THERMOPLASTIC SYNTHETIC RESIN

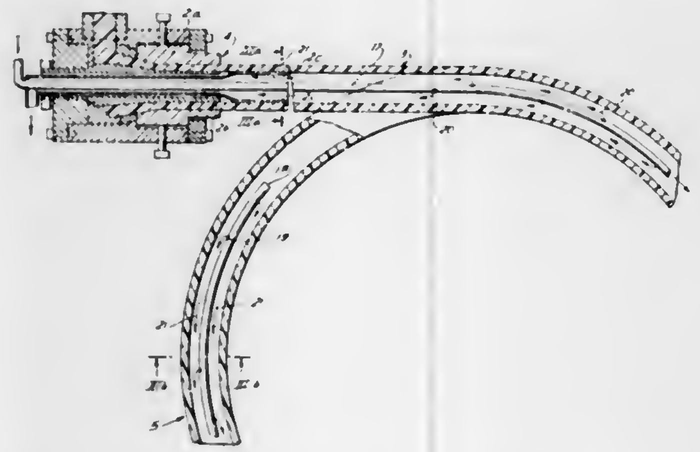
Aristovoulos George Petzetakis, Thessaloniki and Chandri Street, Moschaton, Piraeus, Greece

Division of Ser. No. 371,559, June 19, 1973, Pat. No. 3,917,500. This application Jan. 30, 1975, Ser. No. 545,748

Claims priority, application Greece, June 21, 1972, 48609

Int. Cl.² B31C ***13/00;*** **B29F** ***3/00***

U.S. Cl. 156—425 **3 Claims**



1. An apparatus for making a duct comprising:

an extruder having an extrusion die shaped to produce a continuous hollow profile thermoplastic strip in a thermoplastic state with a rectangular outer cross-section and a round inner cross-section;

a coil-forming machine downstream of said extruder and comprising a coiling drum formed by a plurality of angularly equispaced coiling rollers, and means for synchronously driving said rollers in the same sense of rotation, said strip passing on to said rollers at one end and forming a helix around said rollers advancing axially toward the other end with said helix rotating in said sense of rotation;

means for axially pressing said strip against a coil previously formed on said rollers to bond successive turns together to form the duct with the material of the axially pressed strip blending into the material of a previous turn, said coil-forming machine and said means for axially pressing said strip against a previously produced length of duct being constructed and arranged to axially advance said duct at a speed v_1 and apply said strip such that the axial pressure applied to bond each turn to the previously formed turn results in an axial rate of increase in the length of said duct of v_2, v_1 being smaller than v_2 and the difference (v_2-v_1) representing the compaction of the strip upon the application to the previously formed duct and the axial pressure applied to said strip in bonding same to the previously formed turns; and

means including a duct extending through said die for passing a cooling liquid through said strip from said extruder through at least one turn of the duct formed on said coiling rollers, said coiling rollers being formed with smooth low friction peripheries at their respective one end and with braking sheaths of high friction at their other ends.

4,033,809
APPARATUS FOR HANDLING COVERSLIPS

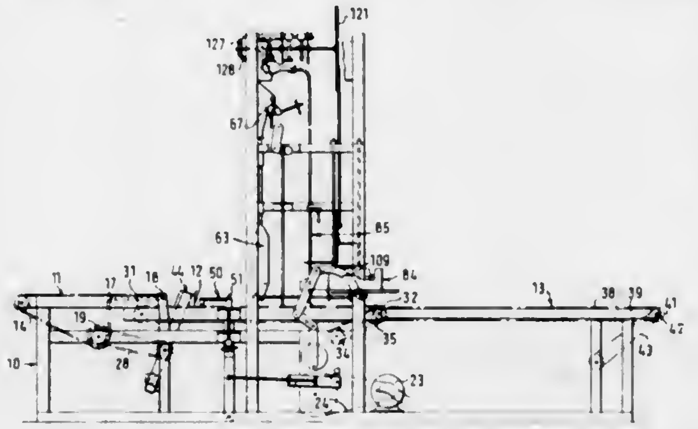
Peter William Tipton, Caversham Reading, England, assignor to John Wyeth & Brother Limited, Maidenhead, England

Continuation-in-part of Ser. No. 493,592, Aug. 1, 1974, Pat. No. 3,972,423. This application May 12, 1976, Ser. No. 685,581

Claims priority, application United Kingdom, Aug. 16, 1973, 38702/73

Int. Cl.² B65C ***9/08;*** **A01N** ***1/00***

U.S. Cl. 156—572 **3 Claims**



1. In an apparatus for preparing specimen containing slides for viewing under a microscope by placing a mounting medium over the specimen and a coverslip over the mounting medium the improvement for placement of the coverslip comprising:

A. Coverslip separator means to select a single coverslip from a stack of coverslips further comprising:
  1. An open bottom hopper having a rectangular central portion adapted to contain a stack of horizontally oriented coverslips, said hopper having;
    a. First and second side pieces having their bottom edges in a plane;
    b. First and second cross pieces having their bottom edges in substantially the same plane as the bottom edges of said side pieces;
  2. A base plate having
    a. An upper surface slidably engaging the bottom edges of said first and second side pieces;
    b. A depression defined in said upper surface and having a depth substantially equal to the thickness of a single coverslip;
  3. Restraining means holding said hopper stationary;
  4. First reciprocating means to move said base plate between a first position where said depression is under said hopper central portion and a second position where said depression is remote from said hopper central position;

B. Means to transfer said coverslip from said base plate to the mounting medium on a slide further comprising:
  1. A rigid supporting frame;
  2. A compressible bulb fixedly connected to said frame;
  3. Flexible tubing connected to said bulb;
  4. A rigid pipe connected to said tubing;
  5. A suction pad connected to said pipe;
  6. Second reciprocating means to raise and lower said pipe and said suction pad in a linear path from a first position in contact with said coverslip to a second position in contact with said slide;
  7. First compression means supported from said frame and adapted to compress said bulb just prior to contact of said suction pad and said coverslip, and to remove compression while said suction pad and said coverslip are engaged thereby retaining said coverslip in contact with said suction pad; and

C. Means to deposit said coverslip on the mounting medium further comprising:
  1. Second compression means supported from said frame and adapted to compress said bulb after said coverslip is in contact with the mounting medium on the slide, thereby desengaging said coverslip from said suction pad.

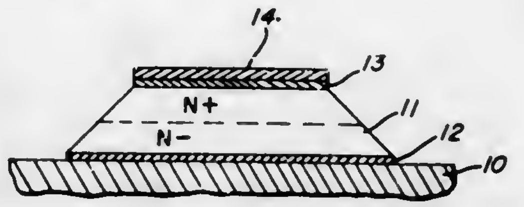
4,033,810
METHOD FOR MAKING AVALANCHE SEMICONDUCTOR AMPLIFIER

Chung Kyu Kim, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Continuation of Ser. No. 490,143, July 19, 1974, abandoned, which is a division of Ser. No. 447,620, March 4, 1974, abandoned, which is a continuation of Ser. No. 291,966, Sept. 22, 1972, abandoned, which is a continuation of Ser. No. 291,483, Sept. 22, 1972, abandoned, which is a continuation of Ser. No. 133,642, April 13, 1971, abandoned. This application Apr. 29, 1976, Ser. No. 681,629

Int. Cl.² H01L ***21/312***

U.S. Cl. 156—656 **7 Claims**



1. The method of forming a microwave semiconductor device comprising:

forming a body comprising a semiconductor region and a Schottky barrier junction with at least one side of said junction comprising said semiconductor region and the other side of said junction comprising a metal;

forming a metallic heat sink on said body in close thermal contact with said conjunction; and

removing portions of said semiconductor material in regions adjacent said heat sink to produce a device in which said semiconductor material is left in first and second series of elongated regions, said elongated regions of said first and second series intersecting each other in mutually orthogonal directions, all of said elongated regions being electrically coupled in parallel, each of said elongated regions extending parallel to said junction for a distance substantially greater than ten times the thickness and width of each of said elongated regions.

4,033,811
METHOD AND APPARATUS FOR FILLING OF FIBER MATERIAL AND LIQUID TO STEAM PHASE IN TREATMENT VESSEL

Stig Torleif Gloersen, Karlstad, Sweden, assignor to Stig Gloersen, Karlstad, Sweden

Filed June 9, 1975, Ser. No. 584,903

Int. Cl.² D21C ***1/02, 7/06***

U.S. Cl. 162—17 **13 Claims**

1. A method of filling a pressure treatment vessel having a steam phase and operatively connected to a pretreatment vessel with a chips-liquid mixture utilizing apparatus having a pocket of given dimensions, said method comprising the steps of sequentially and continuously

establishing a flow of chips-liquid mixture from the pretreatment vessel along a first path into the liquid-filled pocket,

depositing a chips-liquid mixture of given volume into the pocket while displacing liquid already in the pocket and removing it therefrom;

admitting gas under pressure to the pocket to expell at least a portion of the liquid therefrom while maintaining the chips in the pocket, so that a desired volume of liquid to be admitted with chips into the pessure treatment vessel is provided in the pocket,

discharging the chips-liquid mixture in the pocket into the steam phase of the pressure treatment vessel by displacing the chips-liquid mixture from the pocket with gas,

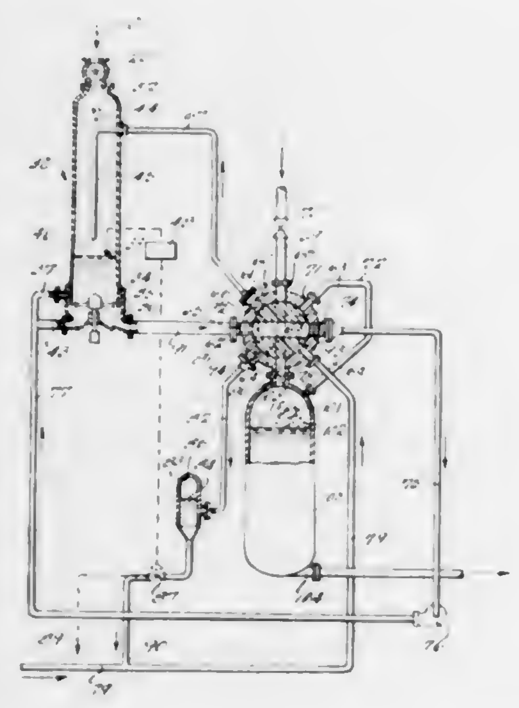
discharging the gas from the pocket into the pretreatment vessel and simultaneously filling the pocket with liquid so that the pocket is filled with liquid when another chips-liquid mixture is deposited therein, and

sequentially continuously repeating all the above steps.

9. Apparatus for filling a pressure treatment vessel having a steam phase operatively connected to a pretreatment vessel with a chips-liquid mixture, said apparatus comprising

a rotary valve member having member having four noncommunicating pockets extending therethrough each for providing communication between an inlet and an outlet,

means for depositing a chips-liquid mixture into one of said pockets while displacing liquid in the pocket from the pocket at a first position of said valve member, said means including a first inlet and a first outlet,



means for admitting gas under pressure to one of said pockets to expell at least a portion of the liquid therefrom while maintaining the chips in the pocket at a second position of said valve member, so that the desire volume of liquid to be admitted with chips into the pressure treatment vessel is provided in the pocket, said means including a second inlet and a second outlet,

means for discharging the chips-liquid mixture from one of said pockets into the steam phase of said pressure treatment vessel at a third position of said valve member by displacing the chips-liquid mixture from the pocket with gas, said means including a third inlet and a third outlet,

means for discharging the gas from one of said pockets into said pretreatment vessel and simultaneously filling the pocket with liquid at a fourth position of said valve member so that the pocket is filled with liquid when another chips-liquid mixture is deposited therein, said means including a fourth inlet and a fourth outlet, and

means for continuously sequentially rotating said valve member about an axis of rotation from said first to said second to said third to said fourth and back to said first position.

4,033,812

DEWATERING SYSTEMS FOR PAPER MACHINES

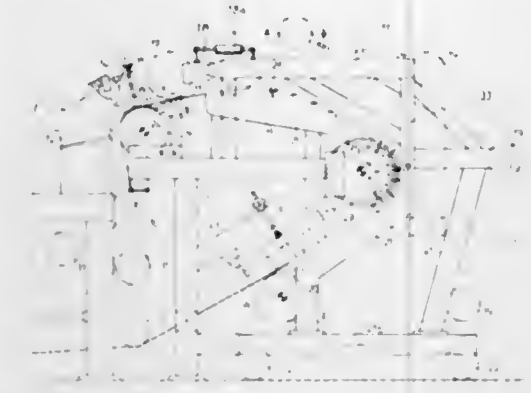
Kalevi Riihinen, Tampere, Finland, assignor to Valmet Oy, Finland

Filed Oct. 24, 1975, Ser. No. 625,670

Claims priority, application Finland, Oct. 25, 1974, 3138/74

Int. Cl.² D21F *1/00*

U.S. Cl. 162—273 **2 Claims**



1. In a machine for manufacturing paper such as tissue paper, a pair of elongated, flexible, endless, liquie-pervious means one of which is a web-carrying means and the other of which is a web-pressing means for coacting with said web-carrying means to compress a web, during formation thereof, between said pair of means, and guide means cooperating with said pair of means for guiding them for movement together along a predetermined common path of travel having a starting location at an early phase of web formation and an ending location where the web is in a condition, while compressed between and engaging both of said pair of means, to be detached from said web-pressing means while remaining in engagement with said web-carrying means and carried by said web-carring means beyond said web-pressing means with the web being compressed between said pair of means while travelling along said common path from said starting location to said ending location, said guide means cooperating with said pair of means for respectively guiding them for movement along separate paths respectively leading to said starting location and respectively travelling away from said ending location, said guide means including a breast roll cooperating with said web-carrying means and situated in advance of but adjacent to said starting location for guiding said web-carrying means toward said starting location, and said guide means cooperating with at least one of said pair of means for providing along said common path of travel through a substantial portion thereof beginning at said starting location a compressive pressure, acting on a web between said pair of means, which has progressively greater magnitudes at locations along said common path which are progressively more distant from said starting location, and headbox means situated at least in part over said breast roll and the part of said web-carrying means guided thereby for depositing on said web-carrying means at the region of said breast roll stock from which the web is formed so that the stock delivered from said headbox means is initially carried only by said web-carrying means from said breast roll toward said starting location without being compressed between said pair of means, and said guide means providing at the region of said starting location a compressive pressure greater than any dewatering pressure acting on the stock as it is carried by said web-carrying means from said breast roll to said starting location, whereby from said breast roll through said substantial portion of said common path beginning at said starting location the pressure acting to dewater the web during formation thereof increases as the extent of dewatering increases, said guide means including along said common path of travel, between and at a substantial distance from said starting and ending locations, a reversing roll for reversing the direction of trael of said pair of means, the distance of said breast roll to said starting location

of said common path of travel being substantially less than one half the distance from said starting location along said common path of travel to said reversing roll, a stationary frame means carrying that part of said guide means which guides said web-carrying means with said reversing roll being situated at one end of said stationary frame means, and movable frame means carrying that part of said guide means which guides said web-pressing means, said movable frame means having a substantially U-shaped portion for receiving said reversing roll while situating said web-pressing means against said web-carrying means at said reversing roll as well as along portions of said web-carrying means extending from said reversing roll, said movable frame means having a pair of web-pressing reversing rolls respectively situated at said starting and ending locations of said common path for reversing the travel of said web-pressing means at said starting and ending locations, said movable frame means including a carriage means for displacing said movable frame means and all of the structure carried thereby in its entirety away from said stationary frame means.

4,033,813

METHOD OF DETECTING LEAKAGE OF REACTOR CORE COMPONENTS OF LIQUID METAL COOLED FAST REACTORS

Fred E. Holt; Robert J. Cash, and Robert E. Schenter, all of Richland, Wash., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Oct. 22, 1975, Ser. No. 624,804

Int. Cl.² G21C *17/04*

U.S. Cl. 176—19 LD **2 Claims**

1. In the operation of a liquid-metal-cooled fast neutron reactor, having an inert cover gas, the method of detecting failure of a sealed, non-fueled reactor core component and of detecting the location of said failed component consisting essentially of incorporating a tag gas in said sealed non-fueled component comprising different ratios of at least two isotopes selected from the group consisting of Krypton-78, Krypton-80, Krypton-82, Xenon-126, Xenon-128 and Xenon-129 to identify the location of failure of a said component and further incorporating in said tag gas Xenon-124 to identify the failure of said component, and radiochemically analyzing said cover gas for gamma radiation-energy level of 188 Kev for the presence of Xenon-125 until said Xenon-125 is detected, and subsequently analyzing said cover gas by mass spectrographic analysis for said tag gas ratios of said at least two isotopes to identify the location of said failed, non-fueled reactor core component.

4,033,814

THERMOGENIC SWIMMING-POOL TYPE NUCLEAR REACTOR

Louis Bregeon, Savigny-sur-Orge; Gérard Dupuy, Paris; Bernard Lerouge, Saint-Germain-en-Laye, and Jean-Pierre Schwartz, Paris, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

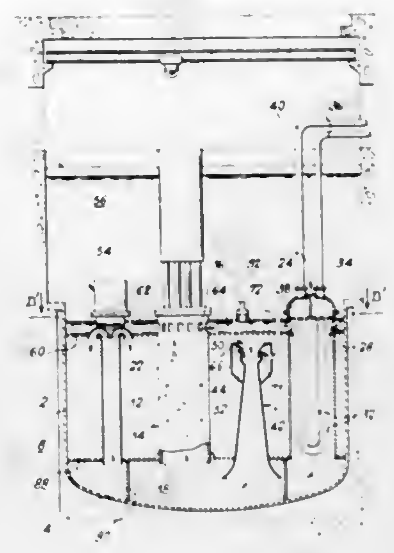
Filed Aug. 29, 1975, Ser. No. 608,990

Claims priority, application France, Aug. 30, 1974, 74.29646

Int. Cl.² G21C *15/24*

U.S. Cl. 176—63 **10 Claims**

1. A thermogenic swimming-pool type nuclear reactor, characterized in that it comprises a vertical-axis enclosure of a general cylindrical shape filled with a cooling liquid and open at the top, the said enclosure being divided into a top and a bottom zone respectively by a horizontal wall, the bottom zone containing a reactor core having a core inlet and a core outlet, at least one heat exchanger, at least one venturi each venturi being provided with a wall and an outlet and an inlet and a neck and at least one aperture formed in the wall of the venturi at the neck of the venturi, and pump means for circulating some of the cooling liquid between the core outlet and the core inlet through the exchanger and the venturi, the reactor further comprising at least one conduit extending through said horizontal wall and opening at a top end into the top zone and, at a bottom end, into the aperture formed in the wall of the venturi.



4,033,815

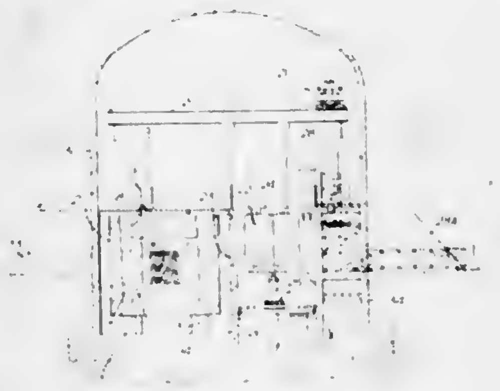
NUCLEAR REACTORS

John William Robert Webber, Ashby Parva, near Lutterworth, and Anthony Charles Roberts, Blaby, both of England, assignors to Nuclear Power Company (Whetstone) Limited, Whetstone and Taylor Woodrow Construction Limited, Southall, both of, England

Filed May 7, 1975, Ser. No. 575,360

Int. Cl.² G21C *13/00*

U.S. Cl. 176—87 **8 Claims**



1. A nuclear reactor installation comprising a fluid-cooled nuclear heat source, a primary pressure vessel containing the heat source, and an outer envelope surrounding the primary pressure vessel and providing external-missile protection therefor, wherein there are provided a floor, dividing the outer envelope internally into upper and lower sections, and an internal wall, dividing the lower section into respectively a first part containing the primary pressure vessel and a second part, the said internal wall and that part of the floor disposed over the said second part of the section below the floor being joined in pressure-tight manner to each other and to the outer envelope and constituting therewith a pressure-tight secondary containing means of the installation which secondary containment means encompasses the said upper section and the said first part of the said lower section but excludes the said second part of the section below the floor, the said second part containing shielded facilities including a new fuel store and a spent fuel store, and there being provided in the said upper section handling means for transporting reactor components, including nuclear fuel, between the interior of the primary pressure vessel and the said shielded facilities through normally-closed access apertures in the primary pressure vessel and in the said floor.

4,033,816

PROCESS FOR INHIBITING PLATELET AGGREGATION

Neel C. Sekhar, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

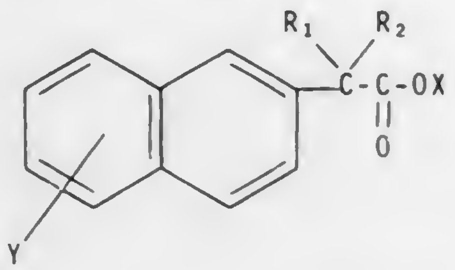
Continuation of Ser. No. 370,990, June 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 276,714, July 3, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,839

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 2, 1976

Int. Cl.² C12B *3/00, 9/00*

U.S. Cl. 195—1.8 **3 Claims**

1. A process for inhibiting platelet aggregation in vitro comprising the addition of an effective amount for inhibiting platelet aggregation of a compound of the formula:



wherein Y is lower alkyl of 1 to 8 carbon atoms, cyclopropyl, ethinyl, $-CF_3$, $-F$, $-Cl$, $-OCH_3$, $-OCHF_2$, $-OCH_2OCH_3$, $-SCH_3$, $-SCHF_2$, $-SCH_2OCH_3$, acetyl; R_1 and R_2 are H, CH_3, CHF_2, or taken together are $=CH_2$ or $=CF_2$; and X is hydrogen, or a pharmacologically acceptable cation, to whole blood or platelet-rich concentrates.

4,033,817

PRESSURE-DRIVEN ENZYME-COUPLED MEMBRANES

Harry P. Gregor, 150 Lakeview Ave., Leonia, N.J. 07605

Filed Nov. 7, 1975, Ser. No. 629,941

Int. Cl.² C07G *7/02;* **C12B** *1/00*

U.S. Cl. 195—2 **8 Claims**

1. A process for effecting an enzymatic reaction comprising forcing a solution of an activating agent through a homoporous ultrafiltration membrane under a pressure equivalent to at least about 30 psig, thereby to form activated sites, the membrane having pores of about 15 to 200 Angstroms in diameter, forcing a solution of an enzyme through said membrane under a pressure equivalent to at least about 10 psig, the activated sites being chemically reactive with said enzyme thereby chemically to couple said enzyme to said membrane, and forcing a substrate solution through said membrane under a pressure equivalent to at least about 5 psig, said substrate solution containing a material which is capable of being converted by said enzyme, whereby said enzyme-coupled membrane effects said enzymatic conversion of said material.

4,033,818

PROCESS FOR THE PREPARATION OF A COMPLETE EXTRACT OF PILEWORT ROOTS

Henri Pourrat, and Aimée Pourrat nee Gaillard, both of Clermont Ferrand Cedex, France, assignors to Centre Europeen de Recherches Mauvernay C.E.R.M., Riom, France

Filed July 15, 1976, Ser. No. 705.460

Claims priority, application France, July 18, 1975, 75.22527

Int. Cl.² C12D *1/00*

U.S. Cl. 195—7 **5 Claims**

1. A process for the extraction of the active substances from tuberised pilewort roots, said process comprising the following stages:

a. macerating the pilewort roots, which have previously been dried and ground to a powder, in 35°–45° C petroleum ether, extracting them with this solvent, so as to remove all the substances soluble therein, separating the resulting solid residue from the solvent and drying it;

b. macerating the dried residue in an aqueous lower alcohol and extracting it with a supplementary amount of this aqueous alcohol;

c. subjecting the resulting alcoholic extract to two successive concentrations in each of which the quantity of alcohol is approximately halved, allowing the extract to cool after each concentration, and removing precipitated impurities by filtration;

d. treating the filtrate with papaine and concentrating it to a solids content of 40 to 50%;

e. adding an equal volume of an aqueous lower alcohol to the viscous solution thus obtained, allowing the mixture to stand in the cold, and removing the insoluble products by decantation, filtration or centrifugation; and

f. distilling off the alcohol so as to give an aqueous extract.

4,033,819

DERIVATIVES OF DIPHTHERIA TOXIN, PROCESS FOR PREPARING THEM AND AGENTS CONTAINING THEM

Torsten Bertil Helting, Marbach-Marburg an der Lahn, Germany, assignor to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed Oct. 9, 1975, Ser. No. 621,238

Claims priority, application Germany, Oct. 11, 1974, 2448530

Int. Cl.² C12D *7/00;* **C12K** *5/00*

U.S. Cl. 195—29 **8 Claims**

1. A method for preparing a derivative of fragment B of diphtheria toxin, which method comprises treating an aqueous solution of diphtheria toxin with an aliphatic mono-or di-aldehyde having 1 to 6 carbon atoms at an aldehyde concentration from 0.0015 M to 0.035 M, at 1° C to 20° C, for 5 minutes to 50 hours, reacting the toxin, before or after the aldehyde treatment, with a proteolytic enzyme in the presence of a compound splitting disulfide bridges, recovering the so-obtained derivative of fragment B from the solution by protein-chemical isolation processes in the presence of a denaturing agent, and separating said derivative from the denaturing agent.

4,033,820

STARCH SPONGE COLUMN APPARATUS AND PROCESS FOR IMMOBILIZED ENZYME REACTIONS

Robert Ernest Brouillard, Cedar Rapids, Iowa, assignor to Penick & Ford, Limited, Cedar Rapids, Iowa

Filed Aug. 23, 1976, Ser. No. 716,518

Int. Cl.² C12D *13/02;* **C12B** *1/00;* **C07G** *7/02*

U.S. Cl. 195—31 R **14 Claims**

6. The process for reacting a water-soluble enzyme-convertible substance with an enzyme in which a water solution of the substance is passed through a porous bed of material containing immobilized therein at least one enzyme for the reaction, wherein the improvement comprises employing as said bed starch in sponge form which has been chemically modified to incorporate an effective amount of enzyme-immobilizing groups, said starch sponge bed having a flow direction length of at least 2 feet, and passing said water solution through said bed at a rate of over 0.5 gallon of solution per minute per square foot of bed cross-section.

4,033,821

PROCESS FOR PRODUCING YEAST CELLS

Teizi Urakami, and Reiko Michimi, both of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Continuation-in-part of Ser. No. 539,603, Jan. 8, 1975, abandoned. This application Apr. 9, 1976, Ser. No. 675,551

Claims priority, application Japan, Jan. 14, 1974, 49-7387

Int. Cl.² C12C *11/08;* **C12B** *1/00*

U.S. Cl. 195--49 **6 Claims**

1. A process for producing yeast cells which comprises culturing aerobically a yeast belonging to *Pichia aganobii* in a culture liquor containing methanol and/or ethanol as a carbon source, nitrogen sources, inorganic salts and other nutrient sources, and recovering yeast cells therefrom.

4,033,822

ENZYME-COUPLED ULTRAFILTRATION MEMBRANES

Harry P. Gregor, 150 Lakeview Ave., Leonia, N.J. 07605

Filed Nov. 7, 1975, Ser. No. 629,940

Int. Cl.² C07G *7/02*

U.S. Cl. 195—68 **4 Claims**

1. A process for producing an enzyme-coupled ultrafiltration membrane comprising forcing a solution of cyanogen bromide under a pressure equivalent to at least about 30 psig through a homoporous cellulosic ultrafiltration membrane having pores of about 15 to 200 Angstroms in diameter thereby to form activated sites within such membrane, washing away excess cyanogen bromide and forcing a solution of chymotrypsin or beta-galactosidase through said membrane under a pressure equivalent to at least about 10 psig, the activated sites being reactive with said enzyme thereby to couple said enzyme to said membrane.

4,033,823

PROCESS TO PRODUCE LYSOCELLIN

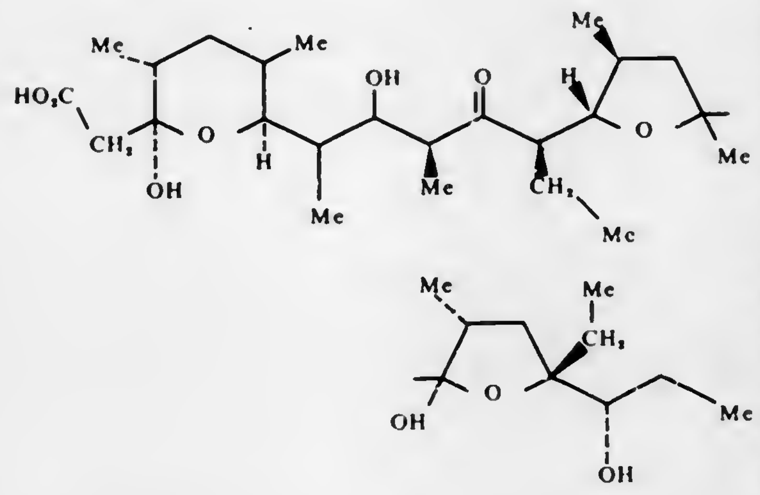
Chao-Min Liu, Cedar Grove; Norberto Palleroni, North Caldwell; Theron Hermann, Bloomfield, and Barbara Prosser, Newark, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Aug. 12, 1976, Ser. No. 713,754

Int. Cl. C12D *9/14*

U.S. Cl. 195—80 R **1 Claim**

1. A process for the production of the antibiotic lysocellin having the following formula



which comprises cultivating a strain of *Streptomyces longwoodensis* ATCC 29251 in an aqueous carbohydrate solution containing a nitrogenous nutrient under submerged aerobic conditions and thereafter isolating the lysocellin from said solution.

4,033,824

PROCESS FOR THE DETERMINATION OF PLASMINOGEN

Hermann Erich Karges; Norbert Heimburger, both of Marburg-Marbach, and Eckart Jacobi, Erkrath, all of Germany, assignors to Behringwerke Aktiengesellschaft, Marburg an der Lahn, Germany

Filed July 24, 1975, Ser. No. 598,626

Claims priority, application Germany, July 26, 1974, 2435988

Int. Cl.² G01N *33/00, 31/14*

U.S. Cl. 195—99 **7 Claims**

1. A method for the analytical determination of human plasminogen, which comprises mixing a liquid containing diluted human plasminogen with

a. streptokinase,

b. fibrinogen,

c. the plasminogen of a ruminant, and

d. thrombin,

and then determining the coagulation time of the mixture.

4,033,825

CELL CULTURE SYSTEM

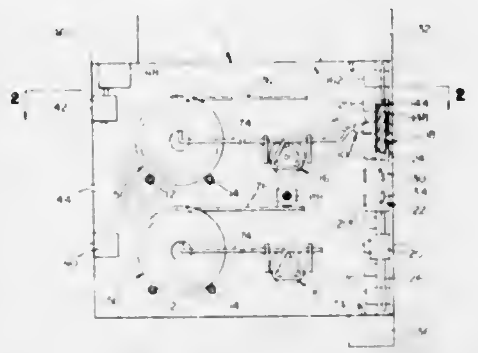
Ihsan A. Haddad, Bedford, and Alvin R. Arsenault, Burlington, both of Mass., assignors to Instrumentation Laboratory, Inc., Lexington, Mass.

Continuation of Ser. No. 365,535, May 31, 1973, Pat. No. 3,887,436. This application Feb. 6, 1975, Ser. No. 547,703

The portion of the term of this patent subsequent to June 3, 1992, has been disclaimed.

Int. Cl.² C12K *9/00*

U.S. Cl. 195—127 **12 Claims**



1. A cell culture system comprising a housing, a cell culture chamber support assembly in said housing and removable from said housing, a cell culture chamber on said support assembly, said cell culture chamber being a replaceable, sterilizable elongated tubular member of gas permeable, liquid impermeable material and having an inner surface to which cells are attachable and an outer surface exposed to the gaseous environment in said housing, said tubular member being disposed in a plurality of layers in spiral relation, spacer structure between adjacent layers of said spiral chamber maintaining said adjacent layers spaced from one another to permit gas to contact external surfaces of said spiral chamber over substantially its entire length, circulation path structure on said support assembly including supply and return conduits connected to said cell culture chamber so that an elongated spiral flow path between said supply and return conduits is provided by said chamber, pump means on said support assembly for circulating nutrient media along said circulation path and across said inner surface of said cell culture chamber, a detachable drive coupling on said support assembly for connecting said pump means to an external power source, a valve and a pH sensor in said circulation path, a carbon dioxide sensor in said housing, a first control responsive to said pH sensor for controlling the introduction of carbon dioxide to said housing, and a second control responsive to said carbon dioxide sensor for operating said valve to discard at least a portion of the

nutrient media circulating in said circulation path and replace such discarded portion with fresh nutrient media.

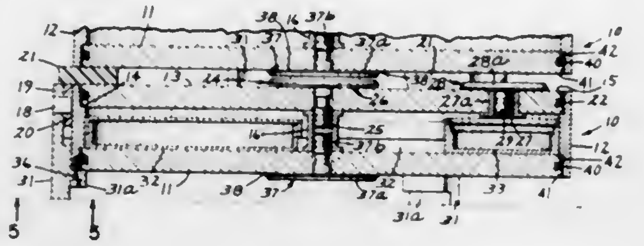
4,033,826
ANAEROBIC SYSTEM CONTAINER

Otis M. Larsen; Richard D. Larsen, both of 4036 Reservoir Blvd., Minneapolis, Minn. 55421; Gerald P. Tjernagel, 620 Page, N. Mankato, Minn. 56001, and Steven L. Marine, 220 Aurora Lane, Circle Pines, Minn. 55014

Filed Nov. 20, 1975, Ser. No. 633,827

Int. Cl.² C12B *1/10*

U.S. Cl. 195—139 4 Claims



1. A culture system, comprising:

1. a generally cylindrical tray, having a transparent bottom portion and an upstanding circular wall, said upstanding circular wall being sized such that the effective interior height of said containers is slightly greater than the height of typical culture dish, said wall having a circumferential inner seal seat formed about the interior thereof at least one culture dish in a non-stacking arrangement positioned within said tray.
2. a top plate, generally transparent, fitting securely within said cylindrical tray on said inner seal seat, said top plate including a seal engaging said seal seat;
3. means for releasably securing said top plate to said cylindrical tray; and
4. means for facilitating removal of said top plate from said tray.

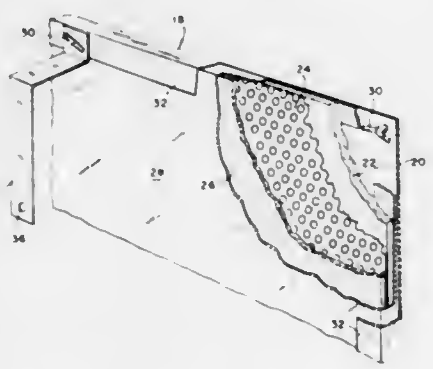
4,033,827
APPARATUS FOR SEALING A COKING CHAMBER

Herbert A. White, Jr., 2516 Collins Road, Pittsburgh, Pa. 15235

Filed Feb. 2, 1976, Ser. No. 654,516

Int. Cl.² C10B *1/06, 25/16*

U.S. Cl. 202—248 11 Claims



1. In a coke oven having a heating chamber, a door opening at one end of said chamber, a door jamb surrounding the door opening and having a flat sealing surface extending over its periphery, a door having a peripheral sealing edge at the end of a metal member generally normal to said sealing surface and adapted to engage said contacting sealing surface, and a detachable high temperature resistant, deformable and compressible sealing member adapted to be received between said sealing surface and said sealing edge, said sealing member including a plurality of layers one of which being a high temperature resistant compressible insulating material; the improvement wherein said sealing member includes an outer layer of steel foil adjacent one side of said layer of high temperature resistant compressible insulating material, and perforated steel strip means adjacent the other side of said layer of insulating material for spreading and equalizing the compressive load transmitted through the sealing edge to the sealing member.

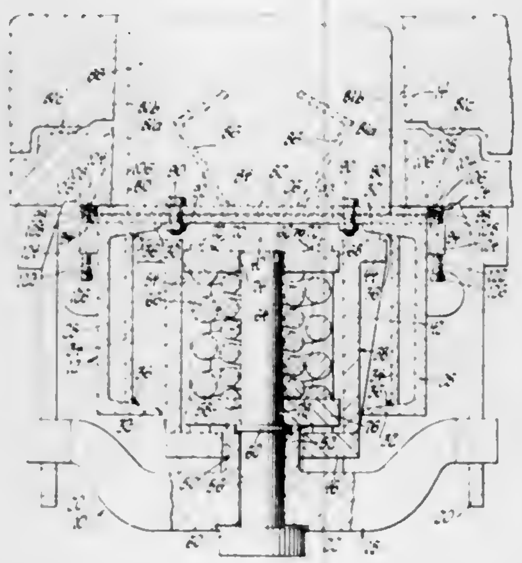
4,033,828
COKE OVEN DOOR SEAL

William K. Morrow, 3722 Forge, and Walter B. Peterman, Jr., 2673 Renshaw, both of Troy, Mich. 48084

Filed July 6, 1976, Ser. No. 702,553

Int. Cl.² C10B *25/06*

U.S. Cl. 202—248 12 Claims



1. In an elongated rectangular coke oven door for closing a vertically extending door opening of a coke oven, a seal comprising: a metallic diaphragm plate of a vertically elongated rectangular shape secured to the door and including an inner side that faces toward the oven in a closed position of the door as well as an outer side that faces toward the environment in the door closed position; said diaphragm plate including relatively short upper and lower edge portions as well as relatively long side edge portions; each of said edge portions extending outwardly beyond the periphery of the door opening in the door closed position; elongated metallic seal members associated with the edge portions of the diaphragm plate and having long and short lengths corresponding to the lengths of the associated edge portions; each seal member having a channel shape including a base engaged with the associated edge portion of the diaphragm plate and a pair of spaced projections extending from the base; slidable connections mounting the bases of the long seal members on the side edge portions of the diaphragm plate at the inner side thereof so as to permit relative movement therebetween along the lengths of the seal members in a manner that accommodates for thermal expansion thereof with respect to the plate; the short seal members extending along the upper and lower edge portions of the plate having ends that terminate short of the side edge portions of the plate; the long seal members extending along the side edge portions of the plate having ends that extend into alignment with the short seal members so as to be engaged by the ends thereof from the side in a manner that seals therebetween without interfering with thermal expansion of the long seal members along the side edge portions of the plate; each of said seal members being relatively flexible in a direction perpendicular to the plane of the diaphragm plate; the projections of the seal members engaging the oven about the periphery of the door opening in the door closed position to provide sealing thereof; and means for adjusting the position of the diaphragm plate edge portions inward and outward with respect to the oven along the lengths thereof so as to flex the seal members to ensure engagement of the seal members with the oven in the door closed position and consequent sealing of the door opening.

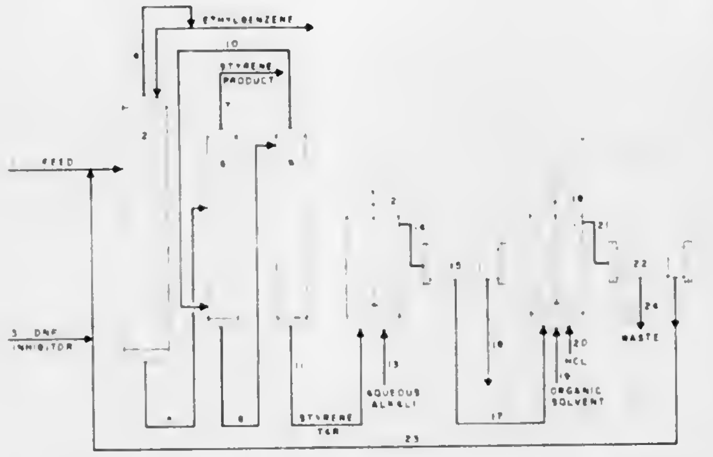
4,033,829
PROCESS FOR INHIBITING POLYMERIZATION OF STYRENE DURING DISTILLATION

Thomas D. Higgins, Jr., Texas City, and Raymond A. Newsom, Dickinson, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 536,271, Dec. 26, 1974, Pat. No. 3,959,395. This application Dec. 15, 1975, Ser. No. 640,360

Int. Cl.² B01D *3/32;* **C07C** *15/10*

U.S. Cl. 203—9 1 Claim



1. The method for inhibiting the polymerization of styrene during separation and recovery thereof from a mixture consisting substantially of ethylbenzene, styrene and styrene tar in a plurality of distillation stages to recover ethylbenzene, styrene and styrene tar, respectively, which comprises introducing into the first of said distillation stages in an amount sufficient to inhibit polymerization of styrene, a solution of a dinitrophenol, said dinitrophenol having no substituents on the benzene ring other than the hydroxy group and the nitro groups, obtained by intimately contacting styrene tar containing such a dinitrophenol inhibitor with an aqueous solution of the hydroxide of an alkali metal or ammonia at a temperature between about 70° and about 95° C while controlling the pH of the aqueous phase between about 5 and 10, separating the resulting liquid phases, intimately contacting the separated aqueous phase simultaneously with hydrochloric acid and an organic solvent selected from the group consisting of ethylbenzene and ethylbenzene in admixture with sytrene, benzene and toluene while controlling the pH of the aqueous phase below 3 and recovering the organic phase containing substantially all the dinitrophenol dissolved therein from said acid-solvent contacting.

4,033,830
ON-LINE AMPEROMETRIC ANALYSIS SYSTEM AND METHOD INCORPORATING AUTOMATIC FLOW COMPENSATION

Kenneth S. Fletcher, III, Norfolk, Mass., assignor to The Foxboro Company, Foxboro, Mass.

Filed Mar. 17, 1976, Ser. No. 667,969

Int. Cl.² G01N *27/54*

U.S. Cl. 204—1 T 10 Claims

1. A system for flow compensated amperometric analysis of a flowing stream comprising:

conduit means for enabling flow of the stream therethrough;

electrode means to contact the stream flowing through said conduit means; said electrode means comprising means capable of serving as magnetic flow meter electrodes and as test and counter electrodes of an amperometric analysis system;

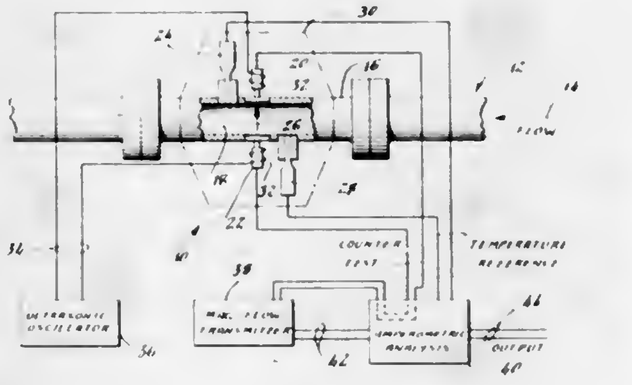
a reference electrode positioned to contact the stream for printing a potentiostat with said electrode means serving as counter and test electrodes for amperometric measurement of the stream;

means coupled to said electrodes to produce an amperometric measurement signal representing the current flow through said test electrode required to produce a predetermined potential difference between said reference and test electrodes;

means coupled to said electrode means to develop magnetic flow metering signal representing the flow rate of said stream; and

means for combining said magnetic flow metering signal with said amperometric measurement signal to obtain an amperometric analysis of the stream that is flow compensated.

6. A method for directly analyzing the concentration of unknown chemical species of a flowing stream by amperometric measurement comprising the steps of:



flowing the stream through an amperometric cell containing electrode means comprising a test and a counter electrode and a reference electrode, said reference electrode having a potential relative to the test electrode;

causing a current to flow between the test electrode and the counter electrode;

developing an output signal related to said current to provide an amperometric measurement of the stream;

applying a magnetic field to the flowing stream to develop from said electrode means a potential output signal related to stream flow rate through the cell; and

combining the flow rate output signal and the amperometric output signal to obtain a final amperometric output signal relating to concentration of unknown chemical species in the-stream that is flow compensated.

4,033,831
METHOD OF MAKING A BI-METAL SCREEN FOR THICK FILM FABRICATION

Joseph J. Bakewell, Boxford, Mass., assignor to Dynamics Research Corporation, Wilmington, Mass.

Continuation of Ser. No. 321,461, Jan. 5, 1973, abandoned. This application Sept. 23, 1974, Ser. No. 508,554

Int. Cl.² C25D *1/08, 7/00*

U.S. Cl. 204—11 3 Claims

1. A method for fabricating a bi-metallic screen for printing precisely dimensional thick film elements of printed electronic circuits comprising the steps of:

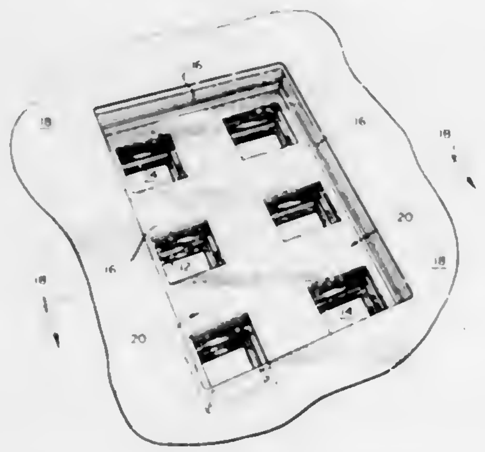
applying a thick film element edge defining layer of a first metal to a spacing sheet formed of a second metal having a different etching characteristic from that of the edge defining layer;

said edge defining layer having a thickness substantially less than the thickness of the spacing sheet;

removing portions of said edge defining layer in a plurality of defined areas by etching of said edge defining layer substantially without undercutting thereof to expose areas of said spacing sheet through said edge defining layer;

etching first cavities into said spacing sheet through the

areas exposed by the removed portions of said edge defining layer;
the first cavities being etched to a depth which is a predetermined portion of the thickness of the spacing sheet;
producing a row and column matrix of unconnected insulator regions over the surface of said spacing sheet opposite to the surface having said edge defining layer;
the dimensions of said insulator regions being substantially smaller than the dimensions of the removed areas of said edge defining layer;
electrodepositing a metal on the portions of the opposite side of the spacing sheet surrounding said insulator regions to provide a support mesh;
the metal of said support mesh having a different etching characteristic from that of said spacing sheet;



the electrodepositing step providing a support mesh extending outwardly from said spacing sheet and contacting said spacing sheet substantially only at areas around said insulator regions;
said first cavities being etched with respect to the matrix of said insulator regions to provide at least one edge of said cavities parallel to at least one of the rows and columns of said matrix;
removing the insulator regions; and
etching a matrix of second cavities into the spacing sheet through the openings of the support mesh exposed by the removal of the insulator regions, the etching of said second cavities being to a depth to communicate with said first cavities.

4,033,832
METHOD FOR SELECTIVE PLATING

Henley F. Sterling, Great Dunmow, and Miles P. Drake, Harlow, both of England, assignors to International Standard Electric Corporation, New York, N.Y.

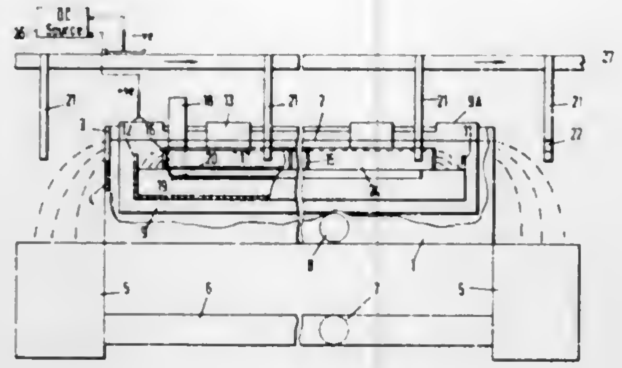
Filed June 14, 1976, Ser. No. 695,736

Claims priority, application United Kingdom, June 16, 1975, 25584/75

Int. Cl.² C25D *5/02, 5/08, 17/28*

U.S. Cl. 204—15 **4 Claims**

1. A process for selectively electro-plating a plurality of workpieces comprising the steps of:
providing a tank having slots in the opposite end walls thereof opening to the tops of said walls;
floating in said tank an electrolytic plating solution layer over a denser, underlying, inert fluid which is immiscible with said plating solution;
maintaining the interface of said plating solution and said underlying fluid in said tank at a predetermined level above the bottoms of said slots;
conveying said workpieces through said tank via said slots at such a level that said workpieces are immersed in said plating solution, and extend through said interface to a predetermined depth into said underlying fluid, said inert solution operating to mask that portion of the workpieces extending therein to produce a plating stripe on said workpieces having a dimension equal to the depth of said plating solution layer; and



electrically energizing said plating solution, with said workpieces being cathode poled, while conveying said workpieces through said tank.

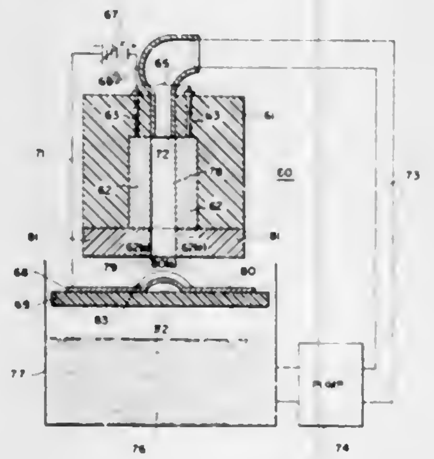
4,033,833
METHOD OF SELECTIVELY ELECTROPLATING AN AREA OF A SURFACE

John Louis Bestel, Montgomery Township, Somerset County; Richard Haynes, East Windsor Township, Mercer County, both of N.J., and Venkataraman Srinivasan, Attleboro, Mass., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 627,317, Oct. 30, 1975, abandoned. This application July 8, 1976, Ser. No. 703,326

Int. Cl.² C25D *5/02, 5/08*

U.S. Cl. 204—15 **8 Claims**



1. A method of selectively electroplating an area of a surface, which comprises:
a. cathodically charging the surface and initially maintaining said charged surface out of contact with an electroplating electrolyte;
b. contact masking a charged anode, spaced from said maintained charged surface, with a dielectric member which is maintained between said anode and the surface, along their corresponding opposed surface areas, out of contact with the surface;
c. contacting said masked anode with a stream of electroplating electrolyte; and
d. distributing said electrolyte stream over at least a portion of the surface, said portion including the area to be electroplated, to freely flow a stream of electrolyte thereover, to selectively electroplate the area.

4,033,834
METHOD FOR PLATING

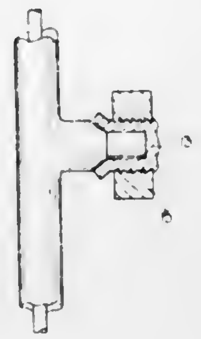
Norman Harrison, Sabden, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Division of Ser. No. 621,141, Oct. 9, 1975. This application July 28, 1976, Ser. No. 709,520

Claims priority, application United Kingdom, Oct. 16, 1975, 44790/75

Int. Cl.² C25D *5/02, 7/04*

U.S. Cl. 204—15 **1 Claim**



1. A method of externally plating a hollow component, including making an electrical connection between the component and a plating jig by inserting into the bore of the component, as a push fit, a contact piece of the jig, the contact piece closing the bore to prevent ingress of electrolyte in use and being formed from a non-conducting resiliently compressible matrix containing conductive particles such that a conductive path is established through the matrix wherever this is compressed, the contact piece being arranged to be compressed by contact with the interior of the component and so establish an electrical connection between the conductive frame of the jig and the component.

4,033,835
TIN-NICKEL PLATING BATH

Lewis Brian Lerner, Linglestown, and Thomas Francis Davis, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Oct. 14, 1975, Ser. No. 621,997

Int. Cl.² C25D *3/56, 3/60*

U.S. Cl. 204—43 S **9 Claims**

8. An aqueous electrolyte suitable for electrodeposition of tin-nickel alloys from said electrolyte, said aqueous electrolyte comprising nickel as nickel chloride, based on the metal, in an amount from 7.5 to 30 grams per liter, tin as tin chloride ($SnCl_2 \cdot 2H_2O$) based on the metal from 7.5 to 30 grams per liter, thiourea from 10 to 100 grams per liter, sodium hypophosphite from 10 to 100 grams per liter, hydrochloric acid from 30 to 100 milliliters per liter as a concentrated acid of 36 percent to 38 percent acid and ammonium chloride an in amount from 40 to 200 grams per liter and wherein the pH of said solution is from 0.7 up to 1.5.

4,033,836
ELECTROLYTIC REDUCTION CELL

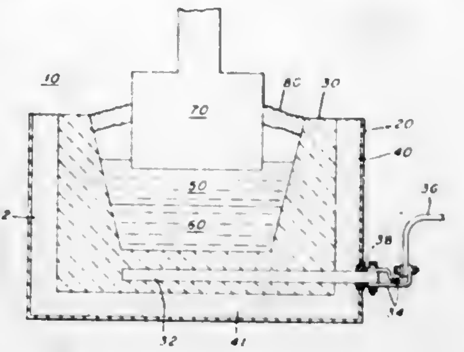
G. Thomas Holmes, Badin, N.C., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Oct. 21, 1976, Ser. No. 734,612

Int. Cl.² C25C *3/06, 3/08*

U.S. Cl. 204—67 **5 Claims**

1. An improved reduction cell comprising a metal shell, a layer of carbonaceous material for containing electrolyte, the carbonaceous material permeable by sodium, an insulative layer of aluminum fluoride disposed intermediate the metal shell and the layer of carbonaceous material, said aluminum fluoride being reactive with sodium permeating said carbonaceous layer thereby preventing substantial corrosive attack by the sodium of the shell.



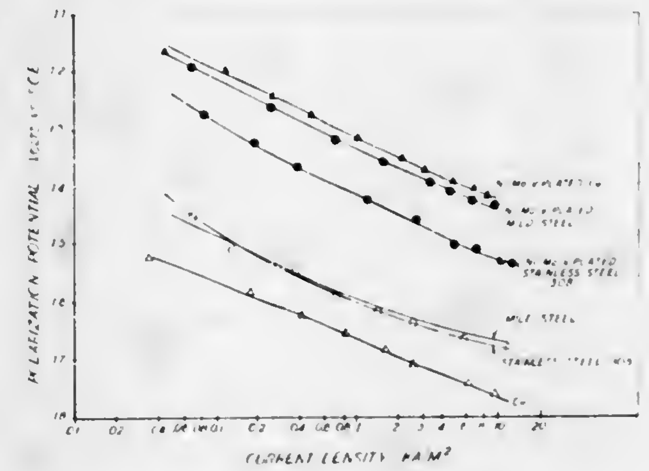
4,033,837
PLATED METALLIC CATHODE

Han C. Kuo; Ronald L. Dotson, and Kenneth E. Woodard, Jr., all of Cleveland, Tenn., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 24, 1976, Ser. No. 660,847

Int. Cl.² C25B *1/34, 11/04*

U.S. Cl. 204—98 **6 Claims**



1. A cathode for use in electrolytic cells comprising a copper substrate and a plating on said copper substrate, said plating being an alloy of nickel, vanadium, and molybdenum.

6. The cathode of claim 1 used in electrolytic cells for the electrolysis of alkali metal chloride solutions.

4,033,838
RECOVERY OF COPPER FROM WASTE NITRATE LIQUORS BY ELECTROLYSIS

Isadore Mockrin, Plymouth Meeting, and Martin A. Hobin, Allentown, both of Pa., assignors to Kawecki Berylco Industries, Inc., Reading, Pa.

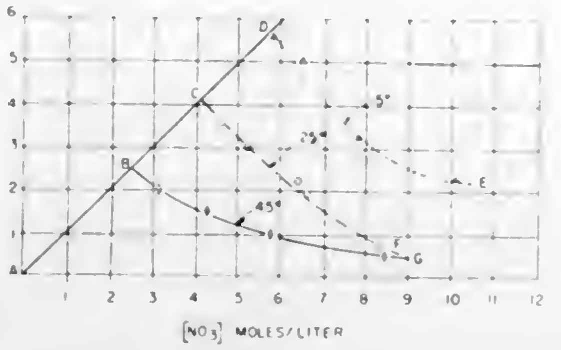
Filed May 19, 1976, Ser. No. 687,885

Int. Cl.² C25B *1/22;* **C25C** *1/12*

U.S. Cl. 204—103 **11 Claims**

1. A process for recovering copper and regenerating nitric acid from waste liquors containing nitrate ion or nitrate ion plus unused nitric acid, said process comprising adjusting the nitrate and hydronium ion concentrations in the liquor to

between about 2 to 12 moles per liter and between about 0.5 to 6 moles per liter, respectively, and subjecting the liquor to electrolysis at a temperature of between about 0° to 55° C. using anodes resistant to oxidation.



4,033,839

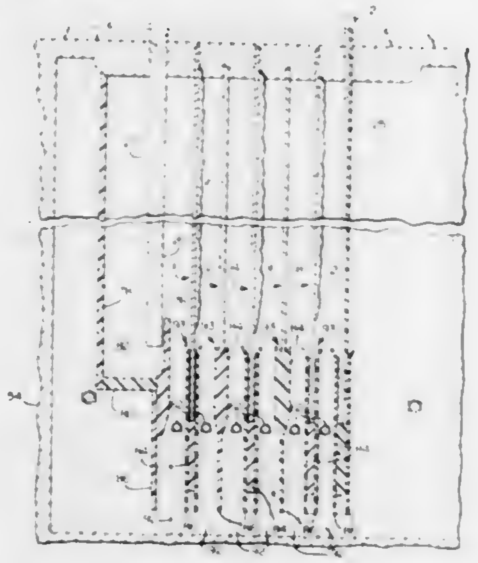
METHOD FOR SERIES ELECTROWINNING AND ELECTROREFINING OF METALS

Walter W. Harvey, Bedford; Myron R. Randlett, Burlington, and Karlis I. Bangerskis, Walpole, all of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Division of Ser. No. 553,139, Feb. 26, 1975, Pat. No. 3,979,275, which is a continuation-in-part of Ser. No. 445,435, Feb. 25, 1974, Pat. No. 3,875,041. This application Apr. 14, 1976, Ser. No. 676,685

Int. Cl.² C25C *1/12*

U.S. Cl. 204—108 **9 Claims**



1. A process of performing series electrodeposition of metals at a high current density while reducing bypass current comprising:

a. providing a conveyable rack formed of a non-conductive material and including a pair of sidewalls having slots on the bottom extending through the sidewalls to allow fluid flow through the sidewalls, the conveyable rack also being provided with non-conductive bottom support members extending between and secured to each sidewall between the slots, the conveyable rack also being provided with nonconductive electrode guides on the side of the rack in line with the bottom support members, the length of the nonconductive electrode guides being sufficient to extend the entire submerged length of a bipolar electrode is placed in the rack with the rack in a tank containing an electrolyte, said rack also being provided with a means for shielding an anode to prevent current from passing along the side, bottom and back of the anode toward the cathode when an anode and cathode are in the rack during electrodeposition;

b. positioning within the conveyable rack, at a location remote from an electrolytic tank,

1. an anode so that it is within the means for shielding the anode so that current cannot pass along the sides, bottom or back of the anode toward the cathode during electrodeposition,
2. a cathode, and
3. a series of bipolar electrode between the anode and the cathode so that the bottom of each bipolar electrode is supported by a nonconductive bottom support member and each side of each bipolar electrode is within a nonconductive electrode guide;

c. conveying the conveyable rack which has been loaded in step (b) with an anode, a cathode and bipolar electrodes to an electrodeposition tank containing an electrolyte to form an electrodeposition cell; and,

d. electrodepositing metal on the cathodic faces of the bipolar electrodes and the cathode while generating sheets of ascending bubbles of gas from bubble tubes positioned between and below the bipolar electrode to continuously circulate electrolyte over the top of the rack, down the side of the rack and through the slots, the bottom support members and electrode guides forming compartments within the cell which minimize lateral spreading and contraction of the sheet of bubbles and reduce the possibility of bypass current.

4,033,840

THERMOSETTING ACRYLOYLOXY-TERMINATE BUTADIENE POLYMERS

Yoshio Fujiwara; Keiichi Naito; Yoshinobu Fujimnto, all of Utsunomiya; Tooru Odashima, Kanuma, and Tomohiko Sada, Tokyo, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 389,213, Aug. 17, 1973, abandoned. This application Feb. 6, 1975, Ser. No. 547,701

Claims priority, application Japan, Aug. 21, 1972, 47-82789

Int. Cl.² C08F *8/00;* **C08L** *9/00, 31/02*

U.S. Cl. 204—159.17 **6 Claims**

1. A thermosetting resin composition consisting essentially of

a. a butadiene-containing resin having an average molecular weight of 1000 to 5000 and being selected from the group consisting of acryloyloxyl- and methacryloyloxyl-terminated butadiene homopolymers and copolymers of butadiene with acrylonitrile or styrene which contain at least 70 weight percent of butadiene, said butadiene-containing resin having from 1.5 to 3.0 terminating acryloyloxyl or methacryloyloxyl groups per molecule of said butadiene-containing resin;

b. at least one ethylenically unsaturated monomer which is capable of copolymerizing with said terminating groups of said butadiene-containing resin and which is present in an amount between 50 and 200 weight percent based on said butadiene-containing resin; and

c. at least one unreacted ethylenically unsaturated acid anhydride selected from the group consisting of maleic anhydride, itaconic anhydride, dodecenyl succinic anhydride, methyl-endo-methylene-tetrahydrophthalic anhydride, tetrahydrophthalic tetrahydrophthalic anhydride and methyltetrahydrophthalic anhydride, and being present in an amount between 5 and 20 weight percent based on said butadiene-containing resin.

4,033,841

LIQUID REMOVING METHOD AND APPARATUS

James T. Candor, 5440 Cynthia Lane, Dayton, Ohio 45429

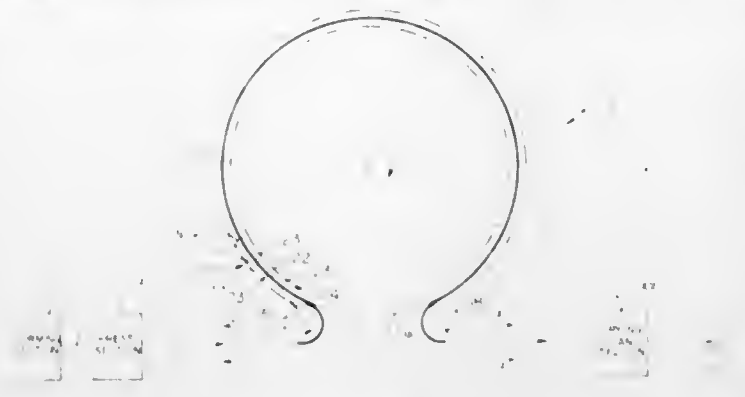
Continuation-in-part of Ser. No. 569,815, April 21, 1975, Pat. No. 3,966,575. This application June 11, 1976, Ser. No. 695,068

The portion of the term of this patent subsequent to Nov. 19, 1991, has been disclaimed.

Int. Cl.² B01D *13/02*

U.S. Cl. 204—180 R **7 Claims**

1. In a method of removing retained liquid from web-like bearing material of the liquid absorbing type as said material is being substantially continuously moved, the improvement comprising the steps of creating a plurality of non-uniform electrostatic fields with each field having the higher intensity portion thereof substantially oppositely located relative to the higher intensity portion of an adjacent non-uniform field, and passing said continuously moving web-like material through said fields so that said fields at least partially extend through said material to act on at least part of the retained liquid thereof to move at least part of said retained liquid relative to said material.



4,033,842

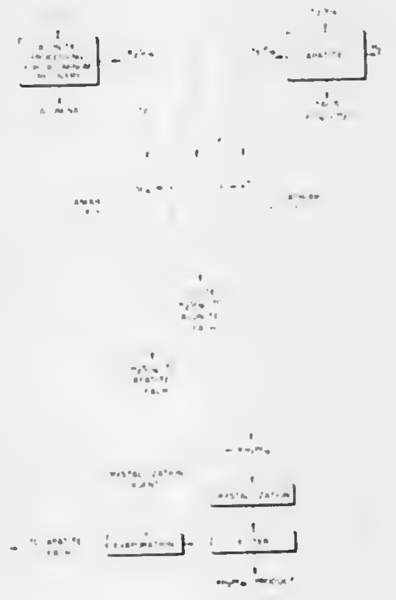
PRODUCTION OF MONOBASIC POTASSIUM PHOSPHATE BY ELECTRODIALYSIS

Kent W. Loest, Broomfield, and John T. Schaefer, Boulder, both of Colo., assignors to Southwire Company, Carrollton, Ga.; National Steel Corporation, Pittsburgh, Pa. and Earth Sciences, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 608,628, Aug. 28, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,333

Int. Cl.² B01D *13/02;* **C01B** *15/16, 25/26*

U.S. Cl. 204—180 P **34 Claims**



1. In the combined process for producing phosphoric acid by treating apatite with sulfuric acid, and aluminum from alunite ore with the production of by-product potassium sulfate, the improvement which comprises converting the phosphoric acid and potassium sulfate to monobasic potassium phosphate by electrodialysis.

4,033,843

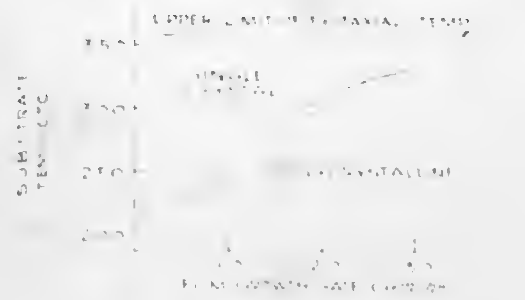
SIMPLE METHOD OF PREPARING STRUCTURALLY HIGH QUALITY PBSNTE FILMS

Esther Krikorian, Claremont, and Richard J. Sneed, Upland, both of Calif., assignors to General Dynamics Corporation, Pomona, Calif.

Filed May 27, 1976, Ser. No. 690,705

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 P **13 Claims**



1. A method of predictably preparing high structural quality, single-crystal $Pb_{1-x}Sn_xTe$ films having infrared sensing properties, said method comprising:

sputtering from a single $Pb_{1-x}Sn_xTe$ target a single crystal $Pb_{1-x}Sn_xTe$ film on a selected single crystal substrate in a selected inert gas atmosphere in a reaction zone at pressures below 10μm after first having evacuated said reaction zone to at least about 10^{-7} torr, said sputtering employing control of substrate temperature and film growth rate where substrate temperature is selected from a range from about 220° to about 350° C and the film growth rate is selected from a range from about 0.1 to about 3.0μm/hr., with the higher of said growth rates typically used with the higher of said temperatures and the lower of said growth rates typically used with the lower of said temperatures.

4,033,844

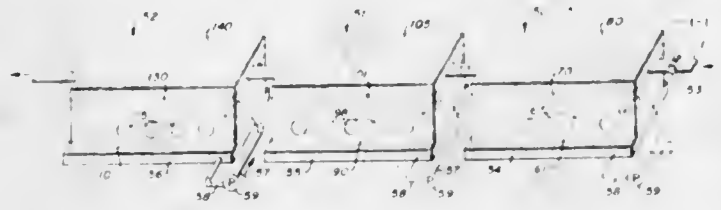
APPARATUS FOR SELECTIVELY PLATING LEAD FRAMES

Gene N. Pantiga, San Jose, and Robert M. Allen, Mill Valley, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Nov. 3, 1975, Ser. No. 628,541

Int. Cl.² C25D *5/02, 5/10, 7/06*

U.S. Cl. 204—224 R **2 Claims**



1. An apparatus for selectively plating a lead frame strip, said strip including a plurality of lead frames, each of said frames including a plurality of leads, each of said leads having a tip, and a die-attach pad, comprising:

means for providing a first plating on each of said lead frames, said first plating being a plating directly on and restricted to the surface of a predetermined portion of said tip of each of said leads and said die-attach pad, said first plating means comprising masking means for masking the surface of each of said lead frames about said tip of each of said leads;

means for providing a second plating on each of said lead frames, said second plating being a plating directly on said first plating and which is restricted to the area of said die-attach pad, said second plating means comprising a masking means for masking the surface of each of said lead frames about said die-attach pad; and

means for providing a third plating on each of said lead frames, said third plating being a plating directly on said first plating which is restricted to the area of said tip portion of each of said leads said third plating means comprising a first means for masking the surface of said lead frames about said tip of each of said leads and a second means for masking said die-attach pad,

each of said plating means further comprising means for jetting a plating fluid against each of said lead frames and means for providing an electric field in said fluid between said fluid and said lead frames,

said jetting means in said third plating means further comprising a plurality of input fluid chambers and a plurality of corresponding output fluid chambers and;

a wall member separating each of said input fluid chambers from its corresponding output fluid chamber,

a predetermined number of fluid passageways being associated with each of said input fluid chambers and being adapted to carry fluid into said input fluid chamber;

said second masking means for masking said die-attach pad comprising a pedestal means supported on said wall member and a fluid sealing member supported on said pedestal means for sealing against said die-attach pad.

4,033,845
[2-(4-OXO-4H-1-BENZOPYRAN-2-YL)ETHENYL]BENZONITRILES AND BENZOIC ACIDS

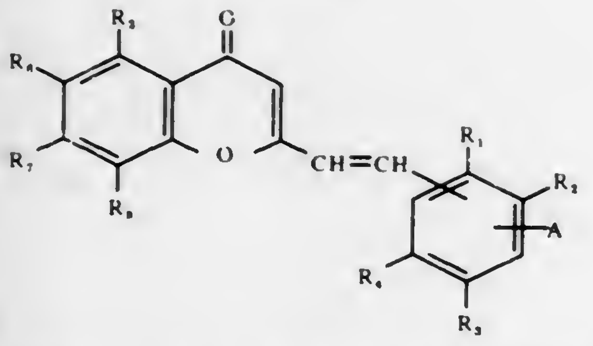
Marvin P. Cohen, New Milford; John Shavel, Jr., Mendham, and Max von Strandtmann, Rockaway Township, Morris County, all of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Nov. 20, 1975, Ser. No. 633,761

Int. Cl.^{2} C07D *311/22*

U.S. Cl. 260—240 D **11 Claims**

1. A compound of the formula:



I

wherein R_1, R_2, R_3, R_4, R_5, R_6, R_7, R_8 are hydrogen, lower alkyl, halogen or lower alkoxy and A is COOH or CN.

4,033,846
APPARATUS FOR GAS COLLECTION IN ALUMINUM SMELTING FURNACES

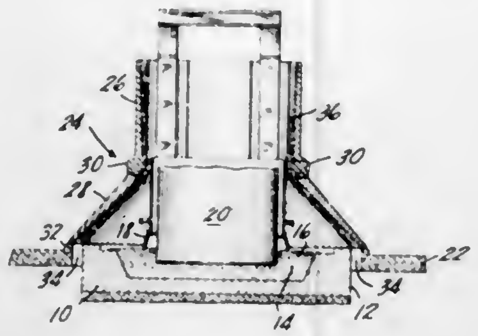
Arne Engesland, Mosjoen, Norway, assignor to Lista Og Mosjoen Aluminiumverk, Elkem Aluminum A/S & Co., Oslo, Norway

Filed Sept. 16, 1975, Ser. No. 613,900

Int. Cl.^{2} C25C *3/08, 3/22*

U.S. Cl. 204—247 **4 Claims**

1. In an electric smelting furnace for the melt electrolytic production of aluminum including a furnace post having an annular outer side wall and generally cylindrical anode section disposed above the furnace pot and being of lesser diameter than the diameter of the furnace pot the improvement comprising an annular gas collecting hood, said gas collecting hood comprising upper and lower portions each of which comprises a plurality of sections and each plurality of sections in combination forming an annular shape and each said section of each plurality of sections being movable with respect to any other section independently of the other to permit access to said furnace pot, each of said sections in the lower portion having a slope upwardly towards the anode section and the lower end of the lower portion being of greater diameter than the diameter of the outer wall of the furnace pot and being spaced radially outward from the outer wall of the furnace pot to permit entry of air, the upper portion being disposed at least in part radially outward from the anode section and being spaced along its length from the anode section to permit upward egress of gases evolved from the smelting process.



4,033,847.
METAL ANODE ASSEMBLY

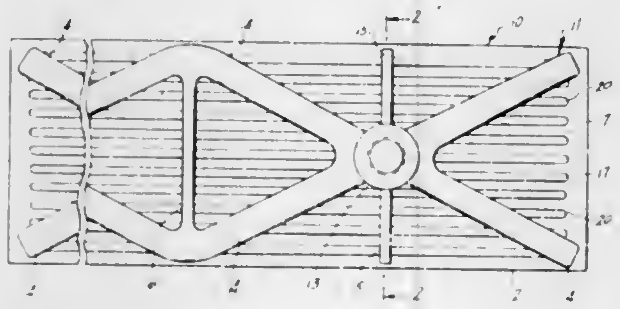
Joseph E. Baker, Clearwater, Fla., assignor to Olin Corporation, New Haven, Conn.

Division of Ser. No. 412,936, Nov. 5, 1973, Pat. No. 3,953,316. This application Dec. 23, 1975, Ser. No. 643,725

The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.^{2} C25B *11/02, 11/04*

U.S. Cl. 204—250 **6 Claims**



1. An electrolytic mercury cell for the electrolysis of flowing brine, said cell comprising

- a. a mercury cathode and
- b. a metal anode assembly spaced from cathode, said metal anode assembly comprising
  - 1. a distributor,
  - 2. at least one anode support receiver positioned in the top of said distributor,
  - 3. means forming an anodic surface in electrical contact with and positioned below said distributor, and
  - 4 said anodic surface being activated by applying a coating of an oxide of at least one platinum group metal, the improvement which comprises
  - i. employing as said distributor a spider-like distributor having a plurality of support ribs
  - ii. employing as said metal anode assembly an integral titanium casting comprised of
    - a. said distributor
    - b. said anodic surface
    - c. said anode support receiver
  - iii. said anodic surface having a first set of two opposite sides longer than the remaining set of two opposite sides,
  - iv. said anodic surface being formed of a series of spaced-apart bars parallel to said first set of opposite sides, and
  - v. said metal anode assembly being positioned in said mercury cell with said spaced-apart bars extending parallel to the direction of flow of said brine.

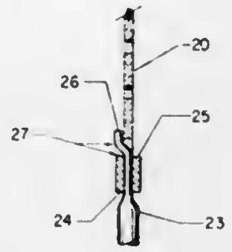
4,033,848
WAFER ELECTRODE FOR AN ELECTROLYTIC CELL

Thomas G. Strempel, Madison, and Charles J. Hora, Willoughby Hills, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed Oct. 15, 1975, Ser. No. 622,702

Int. Cl.^{2} C25B *11/00*

U.S. Cl. 204—284 **4 Claims**



1. A wafer electrode comprising: two annular flanges having an inner circumferential edge and connected by a sealing engagement at an outer peripheral edge thereof; sandwiched between said annular flanges, a foraminous electrode plate retained between said annular flanges by weldment at the outer peripheral edge of said annular flanges; at least one access tube extending substantially in the same plane as said electrode plate from said outer peripheral edge to said inner circumferential edge through said annular flanges so as to define a passageway therebetween; and means for connecting an electrical supply source to said electrode plate.

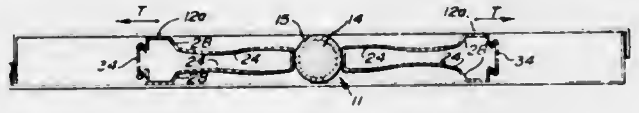
4,033,849
ELECTRODE AND APPARATUS FOR FORMING THE SAME

Gerald R. Pohto, Mentor, and Richard O. Olson, Parma, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Filed May 9, 1975, Ser. No. 576,014

Int. Cl.^{2} C25B *11/02*

U.S. Cl. 204—286 **4 Claims**



1. An electrode assembly for use in an electrolytic cell comprising: an electrode riser for conducting electrical energy to the ctive portions of the electrode assembly and to act as active support member therefore; two opposed parallel electrode surfaces defined by two continuous generally planar electrically conductive expanded metal sheet members such that said electrode riser resides therebetween; at least two electrically conductive V-shaped connectors for mechanically connecting said electrode surfaces at distant points thereon to diametrically opposite sides of said electrode riser at points 90° removed from the points of tangetial contact of said electrode surfaces to said electrode riser if compressed together; said connectors having two leaf portions at an angle of approximately 6° relative to a plane parallel to that of said electrode surfaces and bisecting said electrode riser when said electrode surfaces are in their nonstressed condition; and at the outer ends of each of said leaf portions, a short leg extending at nearly a right angle toward said electrode surfaces, so that upon compression, said leaf portions cause an outward tension upon said electrode surfaces to maintain their planar configuration and said short legs cause a binding moment within said leaf portions in a slightly S-shaped configuration to produce said outward tension and take up the excess length of said leaf portions.

4,033,850
ELECTRODIALYSIS DEVICE

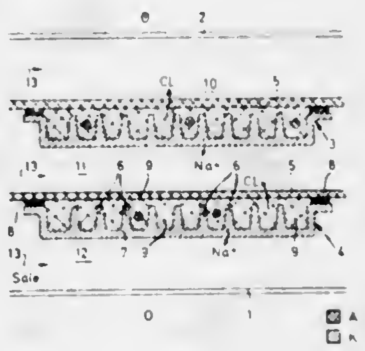
Ora Kedem, and Abraham Kedem, both of Rehovot, Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Filed Nov. 17, 1975, Ser. No. 632,801

Claims priority, application Switzerland, Nov. 29, 1974, 15888/74

Int. Cl.^{2} B01D *13/02*

U.S. Cl. 204—301 **12 Claims**



1. An electrodialysis device comprising a plurality of adjacent compartments through which there flow dialysate and brine, respectively, each dialysate compartment being separated from the adjoining two compartments by an anion-selective and by a cation-selective membrane, respectively, the two terminal compartments being provided with an anode and a cathode, connected to a current source, wherein in the dialysate space between the membranes there are provided two continuous ion-conductive elements in contact with each other, said elements consisting of two different ion exchange materials. the anion-exchange material being in contact with the anion selective membrane, the cation-exchange material being in contact with the cation selective membrane, the electric resistance of said elements being lower than that of the dialysate, said elements providing a continuous path for the different ions across more than half of the distance between the membranes.

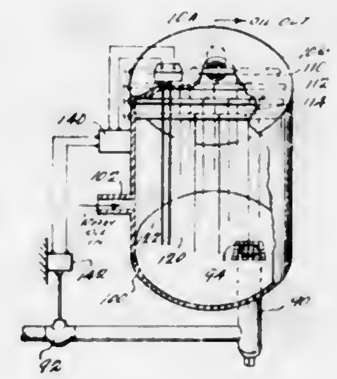
4,033,851
A.C. HYDROELECTROSTATIC PRECIPITATOR

Richard G. Oros, Grand Rapids, Mich., assignor to C&O Railroad Company, Cleveland, Ohio and B&O Railroad Company, Baltimore, Md.

Continuation of Ser. No. 450,215, March 11, 1974, abandoned. This application June 25, 1976, Ser. No. 699,969

Int. Cl.^{2} C10G *33/02*

U.S. Cl. 204—302 **7 Claims**



1. Apparatus for separating oil from water in a raw mixture comprising:

- a separator tank having an oil outlet disposed near the top thereof, a water outlet disposed near the bottom thereof and a raw mixture inlet disposed between said water outlet and oil outlet,
- a plurality of electrodes disposed in said tank between said raw mixture inlet and said oil outlet for applying an electrical potential to separate said oil from said water, comprising first and second bars extending across said tank near the top thereof, a plurality of first wires suspended therefrom, third and fourth bars extending across said tank near the top thereof and separated from said first and second bars, a plurality of second wires having a length greater than said first wires suspended therefrom,
- means for applying a first AC voltage between the first wires suspended from said first bar and from said second bar and applying a second AC voltage between said second wires suspended from said third bar and from said fourth bar, said first AC voltage being higher than said second AC voltage,
- means for sensing the conductivity of the liquid at a location adjacent the bottom of said tank,
- an outlet pipe connected to said water outlet,
- valve means in said outlet pipe for controlling flow through said outlet pipe, and
- means connected to said valve means and said sensing means for opening said valve means when the sensed conductivity is greater than a given value and closing said valve means when the sensed conductivity is less than said value.

4,033,852
PROCESS FOR TREATING COAL AND PRODUCTS PRODUCED THEREBY

Carl Horowitz, and Michael Dichter, both of Brooklyn, N.Y., assignors to Polygulf Associates, New York, N.Y.

Filed June 26, 1975, Ser. No. 590,696

Int. Cl.² C10G *1/04*

U.S. Cl. 208—8 **12 Claims**

8. A process for grafting polymeric side chains onto natural coal which comprises dispersing natural coal, 0.5 to 10 wt.% based on said coal of an olefinically unsaturated monomer and a catalyst system selected from the group consisting of a free radical catalyst system comprising a source of silver ions and a peroxide polymerization initiator and an ionic catalyst system comprising a sodium naphthalene charge transfer complex in a fluid medium, heating the aforesaid material at a temperature of 25° to 150° C. to produce coal radicals and to react said coal radicals with said monomer to produce a grafted coal product.

9. The process of claim 8, wherein said fluid medium is a solvent for said grafted coal product and the grafted coal product is extracted from the reacted mixture of ingredients upon completion of the heating step to produce a liquified coal product.

4,033,853
PROCESS AND APPARATUS FOR HEATING AND DEAERATING RAW BITUMINOUS FROTH

Thomas C. A. Hann, Fort McMurray, Canada, assignor to Great Canadian Oil Sands Limited, Toronto, Canada

Filed Jan. 16, 1976, Ser. No. 649,608

Int. Cl.² C10G *1/04*

U.S. Cl. 208—11 LE **3 Claims**

1. In a method for heating and deaerating bituminous froth containing up to 70 volume percent occluded air, said method comprising collecting the froth in a collection zone and subsequently deaerating the froth in a deaeration zone, the improvement which comprises transferring the froth from the collection zone to the deaeration zone through a conduit wherein the froth is contacted with stream directionally provided to cause the froth to flow from the collection zone to the deaeration zone, said steam concurrently heating the froth to cause formation of gas pockets therein, thereby effecting improved deaeration in said deaeration zone.

4,033,854
ELECTRICAL INSULATING OILS

Tadashi Ohmori, Yokohama, and Tokuo Fujisou, Kawasaki, both of Japan, assignors to Nippon Oil Company, Ltd., Tokyo, Japan

Filed Dec. 1, 1975, Ser. No. 636,391

Claims priority, application Japan, Dec. 2, 1974, 49-136983; Sept. 26, 1975, 50-115682

Int. Cl.² C10G *39/00*; H01B *3/22*

U.S. Cl. 208—14 **21 Claims**

1. An electrical insulating oil consisting essentially of (I) 100 parts by weight of a mineral oil (A) having a sulphur content of not higher than 0.5 wt. %, a pour point of from −10° to −25° C. and a nitrogen content of not more than 100 p.p.m., the mineral oil (A) being prepared by subjecting at at least to hydrofining and solvent dewaxing a fraction containing a distillate having a boiling range of 280° - 400° C. at atmospheric pressure, the fraction being obtained by the distillation of a paraffin base crude oil or a mixed base crude oil and (II) 5 - 100 parts by weight of a highly aromatic hydrocarbon oil (B) prepared by hydrofining a fraction having a boiling range of 250° - 400° C. at atmospheric pressure, the fraction being produced as a by-product of subjecting naphtha hydrocarbons to reforming reaction at temperatures of 400° - 600° C. in the presence of a catalyst selected from the group consisting of the Platinum Group metals and combinations of each of the Platinum Group metals with at least one of Ge, Sn, Re, Fe, Ni, Pb and halogens.

4,033,855
MINERAL OIL DEWAXING PROCESS WITH DEHYDRATION OF FEED AND SOLVENT

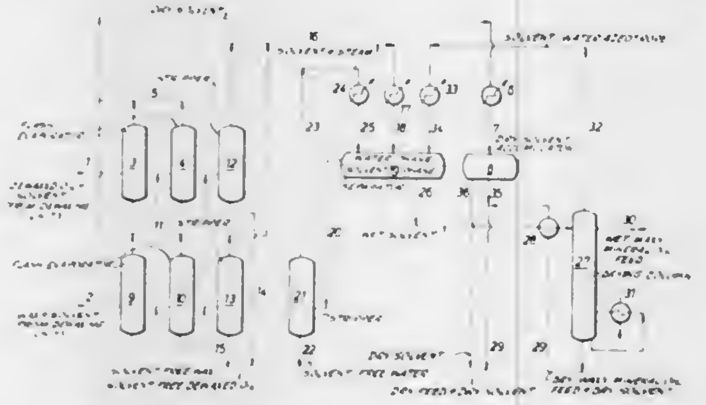
Joachim E. Pütz, Offenthal, Germany, assignor to Edeleanu Gesellschaft mbH, Frankfurt, Germany

Filed Nov. 24, 1975, Ser. No. 634,960

Claims priority, application Germany, Nov. 26, 1974, 2455785

Int. Cl.² C10G *43/04*, *43/08*

U.S. Cl. 208—25 **10 Claims**



1. In a mineral oil dewaxing process wherein an oil solvent is admixed with a waxy mineral oil feed, and a dewaxed mineral oil filtrate is separated from the wax producing a wax product containing a portion of said oil solvent and a dewaxed mineral oil filtrate containing a second portion of said oil solvent, said oil solvent forming an azeotrope with water, the improvement for dehydrating wet waxy mineral oil feed and wet oil solvent which comprises:

- a. flash vaporizing the wax product containing the first portion of said oil solvent thereby producing a first oil solvent flash vapor and a flashed wax bottoms containing some oil solvent,
- b. steam stripping the remaining oil solvent from the flashed bottoms thereby producing a first vaporous water-oil solvent mixture and oil solvent-free wax as a product stream,

- c. flash vaporizing the dewaxing mineral oil filtrate containing the second portion of said oil solvent thereby producing a second oil solvent flash vapor and a flashed dewaxed mineral oil filtrate bottoms containing some oil solvent,
- d. steam stripping the remaining oil solvent from the flashed dewaxed mineral oil filtrate bottoms thereby producing a second vaporous water-oil solvent mixture and a solvent-free mineral oil filtrate as a product stream,
- e. condensing the first oil solvent flash vapor of step (a) and the second oil solvent flash vapor of step (c) thereby producing a condensed oil solvent,
- f. condensing the first vaporous water-oil solvent mixture of step (b), the second vaporous water-oil solvent mixture of step (d), and the vaporous oil solvent-water azeotrope, hereinafter described in step (h), thereby producing a condensed mixture of oil solvent and water,
- g. separating said condensed mixture of oil solvent and water from step (f) into an aqueous phase of oil solvent and water an an organic phase of wet oil solvent,
- h. distilling the wet oil solvent of step (g) and the wet waxy mineral oil feed to produce an oil solvent-water azeotrope as an overhead product and a mixture of a water free-mineral oil feed and water free-oil solvent as a bottoms product, and
- i. passing said bottoms product together with condensed oil solvent from step (e) to the mineral oil dewaxing process as the feed stream thereto.

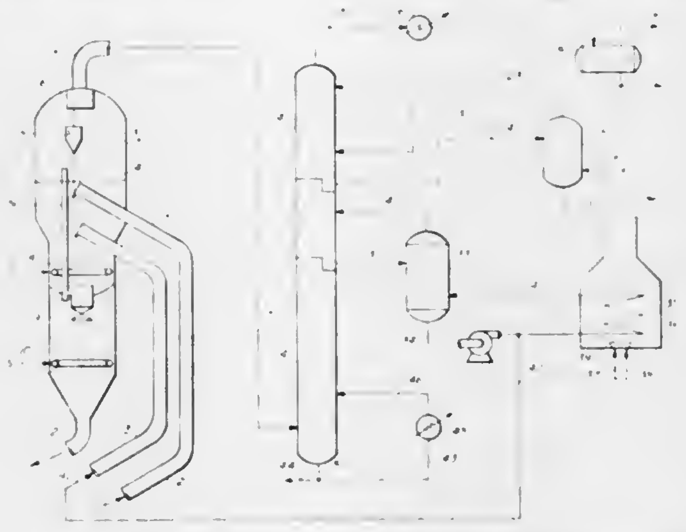
4,033,856
FLUIDIZED CATALYTIC CRACKING PROCESS WITH IMPROVED INTERMEDIATE CYCLE GAS OIL STRIPPING

James H. Colvert; Frederick C. Jahnke, and Dale Williams, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,870

Int. Cl.² C10G *7/00*, *37/00*

U.S. Cl. 208—102 **5 Claims**



1. In a fluidized catalytic cracking process wherein a fresh feed hydrocarbon is contacted with regenerated catalyst in a cracking zone under cracking conditions, wherein cracked hydrocarbons vapors are separated from spent catalyst in a reaction vessel forming a hydrocarbon vapor phase and a dense phase fluidized catalyst bed, wherein the spent catalyst from said fluidized bed is returned to a regeneration zone for regeneration and subsequent contact with additional hydrocarbon charge, wherein cracked hydrocarbon vapors removed overhead from said reaction vessel are charged to a product fractionation column for separation into fractions including a wet gas fraction, a naphtha fraction, a light cycle gas oil fraction, an intermediate cycle gas oil fraction, and a heavy cycle gas oil fraction, wherein said light cycle gas oil fraction is stripped in a first stripping zone for separation of naphtha boiling range components therefrom and for production of a light cycle product boiling in the range of about 400°-650° F. wherein said intermediate cycle fraction is stripped in a second stripping zone for separation of light cycle gas oil boiling range hydrocarbons and for production of a stripped intermediate gas oil stream boiling in the range of about 575°-750° F., wherein a portion of said stripped intermediate cycle gas oil stream is contacted with regenerated catalyst in a fluidized catalytic cracking zone under cracking conditions and wherein cracked intermediate cycle gas oil vapors are separated from spent catalyst in said reaction vessel, such that said cracked intermediate cycle gas oil vapors enters the hydrocarbon vapor phase and the spent catalyst enters the dense phase fluidized catalyst bed; the improvement which comprises:

- a. charging said intermediate cycle gas oil fraction, containing light cycle gas oil boiling range hydrocarbons from said product fractionation column to the upper portion of said second stripping zone for contact with reboiled intermediate cycle gas oil vapors,
- b. reboiling, in a second direct fired reboiling zone, a first stripped intermediate cycle gas oil stream withdrawn from the bottom of said second stripping zone, at a temperature of about 700° to 800° F. and a pressure of about atmospheric to 45 psig;
- c. charging said reboiled intermediate cycle gas oil to the lower portion of said second stripping zone for stripping light cycle gas oil boiling range components from said intermediate cycle gas oil fraction; and
- d. recycling a portion of stripped intermediate cycle gas oil from the bottom of said second stripping zone to said fluidized catalytic cracking zone at a temperature of from about 600° F. to about 750° F.

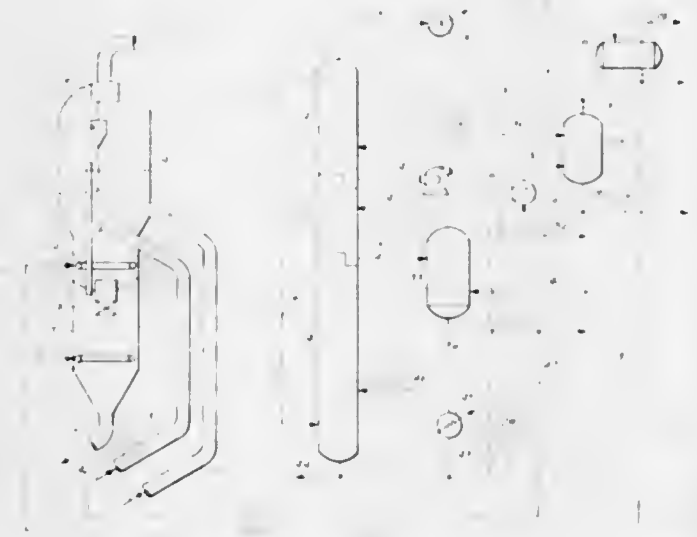
4,033,857
FLUIDIZED CATALYTIC CRACKING PROCESS WITH IMPROVED LIGHT CYCLE GAS OIL STRIPPING

Dale Williams; James H. Colvert, and Frederick C. Jahnke, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 643,050

Int. Cl.² C10G *7/00*, *37/00*

U.S. Cl. 208—102 **3 Claims**



1. In a fluidized catalytic cracking process wherein a fresh feed hydrocarbon is contacted with regenerated catlayst in a cracking zone under cracking conditions, wherein cracked hydrocarbon vapors and spent catalyst from the cracking zone are separated in a reaction vessel to form a dense phase fluidized catalyst bed and a hydrocarbon vapor dilute phase, wherein hydrocarbon vapors from said recation vessel are fractionated, in a product fractionation column into a plurality of fractions including a light cycle gas oil fraction boiling in the range of from about 400° F to about 650° F, wherein said light cycle gas oil fraction is contacted with stripping vapors in a light cycle gas oil stripping vessel forming a vapor phase comprising heavy naphtha components and liquid stripped

light cycle gas oil; the improvement which comprises:

- a. recovering, from the bottom of said product fractionation column, a non-distillate heavy cycle gas oil fraction, at a temperature of about 600°–700° F;
- b. charging said light cycle gas oil fraction from said product fractionation column to said light gas oil stripping vessel at a temperature in the range of about 400°–550° F;
- c. reboiling, in a light cycle gas-oil reboiler, a first portion of said stripped light cycle gas oil, in an amount equivalent to about 1/10 to about 8/10 the weight of light cycle gas oil fraction charged to said stripping vessel, by indirect heat exchange with said non-distillate heavy cycle gas oil fraction for producing stripping vapors;
- d. charging said reboiled light cycle gas oil to the lower portion of said light cycle gas oil stripping vessel for stripping heavy naphtha components from said light cycle gas oil fraction and
- e. recovering from said light cycle gas oil stripping vessel a heavy naphtha vapor stream and stripped light cycle gas oil stream.

4,033,858
CRACKING HYDROCARBONS OVER LAMINAR HEAVY METAL ALUMINOSILICATES

William T. Granquist, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Division of Ser. No. 508,339, Sept. 23, 1974, Pat. No. 3,976,744, which is a continuation-in-part of Ser. No. 291,252, Sept. 22, 1972, Pat. No. 3,852,405. This application June 17, 1976, Ser. No. 697,231

Int. Cl.² C10G *11/08;* B01J *27/12*

U.S. Cl. 208—115 **5 Claims**

1. The process of cracking hydrocarbons which comprises contacting a hydrocarbon feedstock at a temperature high enough to bring about cracking with a catalyst consisting essentially of a synthetic laminar 2:1 layer-lattice aluminosilicate mineral possessing an inherent negative charge balanced bu cations exterior to said lattice and corresponding to the followig formula for a given embodiment:

$$[(G^{3}_{4-w}Y^{2}_{3w})^{VI}(Q^{4}_{8}-xR^{3}_{x})^{IV}O_{20}(OH)_{4-f}F_{f}].[dC^{y}]$$

where

$2<e<3$

$0<w<2$

$0<w<4$

$0<(e-2)w<1/3$

$0.05<x<2$

$f<4$

$0.05<dy<2$

wherein said first bracket represents the average unit cell formulation of said layer lattice and said second bracket represents said charge balancing cations; and wherein

- G is selected from the class consisting of trivalent cations having an ionic radius not to exceed 0.75 A and mixtures thereof, provided that G is less than 100 mole percent A1 when w=o;
- Y is selected from the class consisting of divalent cations having an ionic radius not to exceed 0.75 A and mixtures thereof; provided that Y is less than 100 mole percent Mg when $w=2$;
- Q is at least 95 mole percent silicon ions, the remainder consisting of tetravalent cations having an ionic radius not to exceed 0.64 A;
- R is selected from the group consisting of trivalent cations having an ionic radius not to exceed 0.64 A and mixtures thereof; and
- C is at least one charge balancing cations, with y being its valence and d being the number of such cations C where:

$$dy = x + 3(e-2)w$$

and thereafter recovering the products resulting from said cracking.

4,033,859
THERMAL TREATMENT OF USED PETROLEUM OILS

Donald Douglas Davidson, Pasadena, and Bjorn I. Engesvik, Bakersfield, both of Calif., assignors to Witco Chemical Corporation, New York, N.Y.

Filed Apr. 24, 1975, Ser. No. 571,114

Int. Cl.² C10M *11/00*

U.S. Cl. 208—179 **5 Claims**

1. An improved process in the recycling of used automotive crankcase oil comprising heating said oil in an essentially liquid state at a temperature of between about 400°–800° F under a pressure of about 500–3500 p.s.i.g. and thereafter separating the formed sludge from the substantially ashless oil product.

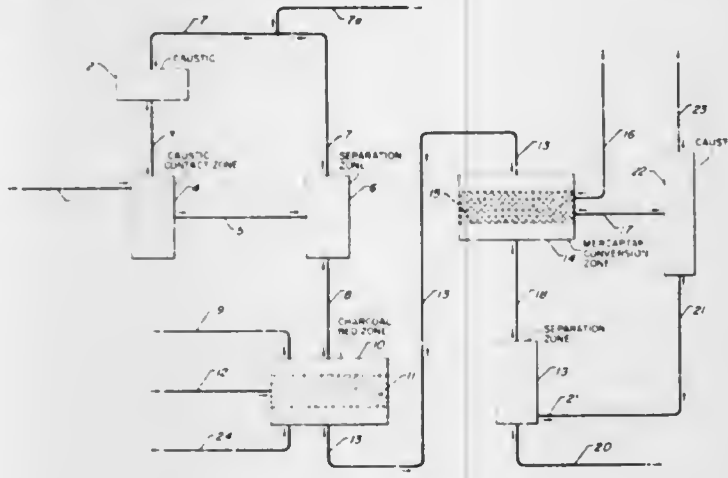
4,033,860
MERCAPTAN CONVERSION PROCESS

David H. J. Carlson, Park Ridge, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 10, 1975, Ser. No. 612,618

Int. Cl.² C10G *19/00*

U.S. Cl. 208—206 **17 Claims**



1. In a process for the reduction of mercaptan compounds in a petroleum distillate which comprises contacting said petroleum distillate with a caustic possessing a pH of from about 8 to a pH of about 10 to extract naphthenic acids at a temperature of about 10° C to about 100° C and a pressure of from about 1 atmosphere to about 100 atmospheres and catalytically treating said petroleum distillate with an oxygen-containing gas atmosphere in the presence of a catalyst consisting essentially of a metal phthalocyanine compound dispersed on a solid catalytic support in a caustic medium possessing a pH of from about 9 to a pH of about 14 at a temperature of from about 10° C to about 100° C, a pressure of from about 1 atmosphere to about 100 atmospheres and a liquid hourly space velocity of from about 0.5 to about 10 to substantially reduce mercaptan content of said petroleum distillate the improvement which consists of passing said petroleum distillate subsequent to contacting with said caustic and before catalytic treatment thereof through an unimpregnated charcoal bed selected from the group consisting of a charcoal derived from lignite coal, bituminous coal, vegetable sources, peat, petroleum black extrusions and bone char to remove catalyst-toxin precursors from said distillate at a temperature of from about 10° C to about 100° C, a pressure of from about 1 atmosphere to about 10 atmospheres and a liquid hourly space velocity of from about 0.5 to about 10.

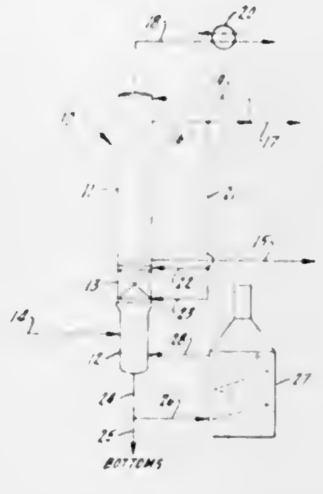
4,033,861
REDUCED NITROGEN CONTENT OF HYDROCARBON FRACTION BY CATALYTIC POLYMERIZATION

Richard L. Holloway, Country Club Hills; Robert R. Edison, Olympia Fields, and Stephen J. Wachtel, Homewood, all of Ill., assignors to Atlantic Richfield Company, Philadelphia, Pa.

Filed May 19, 1975, Ser. No. 578,790

Int. Cl.² C10G *23/02, 29/04*

U.S. Cl. 208—211 **18 Claims**



1. A method for producing a hydrocarbon fraction having a reduced nitrogen content from a nitrogen-containing hydrocarbon feedstock boiling primarily in the range from about 200° F. to about 1000° F. and containing at least about 1000 ppm. of nitrogen comprising:

1. contacting said feedstock in the presence of a catalyst effective to promote the polymerization of the nitrogen-containing compounds in said feedstock at conditions sufficient to polymerize at least a portion of said nitrogen-containing compounds and form a reaction effluent, said catalyst comprises at least one metal selected from the group consisting of Group IB metals, Group IIB metals, Group III metals, Group IV metals Group VI metals, Group VIII metals, the rare earth metals and mixtures thereof; and
2. separating from said effluent a fraction enriched in said polymerized nitrogen-containing compounds and said hydrocarbon fraction having a reduced nitrogen content relative to said feedstock.

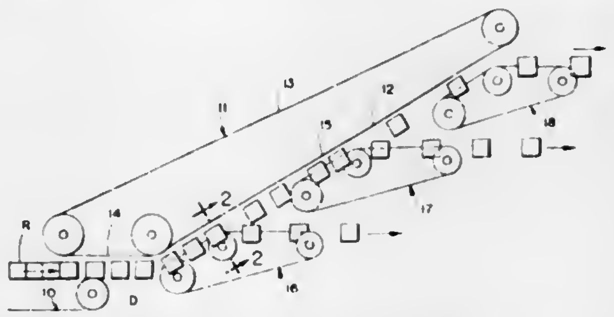
4,033,862
APPARATUS FOR HANDLING WOUND ROLLS

Harvey J. Spencer, Green Bay, Wis., assignor to Paper Converting Machine Company, Green Bay, Wis.

Filed Jan. 21, 1976, Ser. No. 651,200

Int. Cl.² B07C *9/00;* B65G *47/52*

U.S. Cl. 209—73 **10 Claims**



1. Apparatus for handling wound rolls comprising

a source conveyor adapted to deliver a series of individual wound rolls along a first path,

an endless takeaway conveyor arranged with a portion of its lower run traveling along a path at an upwardly inclined angle to said first conveyor path and equipped with spaced apart depending grippers adapted to grip each roll delivered by said source conveyor, and

a plurality of endless diverter conveyors located at spaced distances along said inclined path, with each diverter conveyor having its upper run disposed parallel to said first conveyor path,

each diverter conveyor being equipped with spaced apart upstanding grippers, and

means associated with each diverter conveyor and said takeaway conveyor for selectively operating the grippers thereof whereby a selected roll from said takeaway conveyor can be selectively diverted into any of said diverter conveyors and each succeeding roll selectively diverted into any of said diverter conveyors.

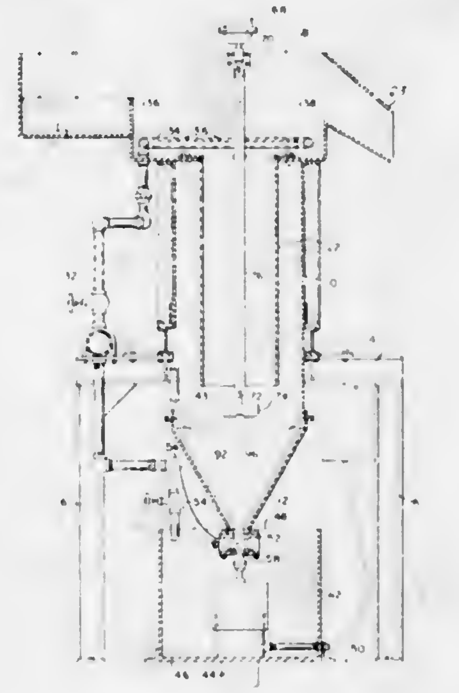
4,033,863
APPARATUS FOR SEPARATING HIGH GRAVITY FROM LOW GRAVITY FRACTIONS OF A COAL OR AN ORE

Spencer A. Stone, Fort Wayne, Ind., assignor to Deister Concentrator Company Inc., Fort Wayne, Ind.

Filed Dec. 19, 1975, Ser. No. 642,453

Int. Cl.² B03B *5/66*

U.S. Cl. 209—159 **10 Claims**



1. In a mineral separation apparatus having a hydraulic classifier provided with an exterior wall, an open bottom sorting column within said exterior wall, means for introducing a swirl of hydraulic medium in the sorting column, said exterior wall providing a quiescent zone below the bottom of said sorting column for collecting a bed of refuse material, and a spigot connected to said quiescent zone for discharging said refuse material therethrough, the improvement which comprises

- a. a launder section above said exterior wall and sorting column and in communication therewith, said launder section having spaced, upstanding sides, and means for introducing supplemental hydraulic medium,
- b. first and second weir means in said launder section on opposite sides, respectively, of said exterior wall, said first weir means being higher than said second weir means to provide a hydraulic flow gradient therebetween, feed box means in said launder section separated from said exterior wall by said first weir means whereby hydraulic medium introduced into said feed box means overflows and said first weir means into said sorting column and toward said second weir means,
- c. a discharge spout on said launder section in communication with said second weir means and the top of said sorting column on the side opposite said first weir means

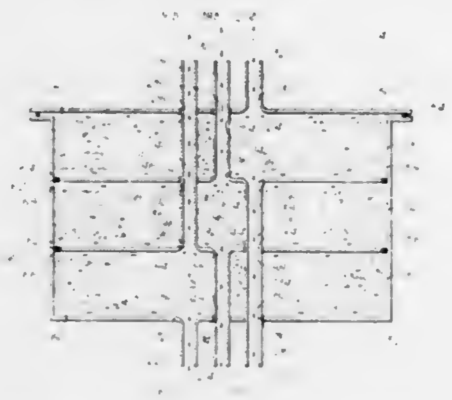
to receive overflow of hydraulic medium from said sorting column and said second weir means,

d. the sides of said launder section being of a height to confine flow of the hydraulic medium to and across said sorting column, said weir means and out of said spout,

e. valve means operatively associated with said spigot for maintaining the bed level in said quiescent zone,

whereby the feed pulp entering said feed box means, overflowing said first and second weir means and also entering said sorting column undergoes conjoint stream and hydraulic classification before being discharged from said discharge spout.

4,033,864
INLET AND OUTLET APPARATUS FOR MULTIPLE MATRIX ASSEMBLY FOR MAGNETIC SEPARATOR AND MODULAR MATRIX AND MATRIX UNIT
John J. Nolan, Cambridge, and Peter G. Marston, Gloucester, both of Mass., assignors to Sala Magnetics, Inc., Cambridge, Mass.
Filed July 16, 1975, Ser. No. 596,167
Int. Cl.^{2} B03C *1/02*
U.S. Cl. 209—223 R **8 Claims**



1. A multiple matrix assembly for a magnetic separator comprising:

a plurality, M, of magnetic matrices arranged in a longitudinal stacked array, each matrix being fed by a number, *p*, of inlets and having its product collected by a number *p* of outlets;

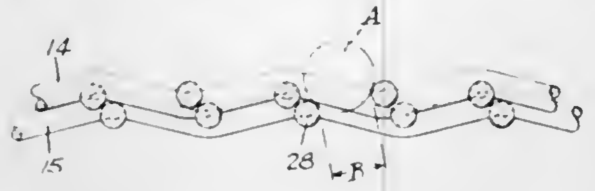
at least one partition means including a transverse member between each adjacent pair of said matrices;

a container for receiving said matrices and said partition means;

each said partition means and the longitudinal ends of said container including a number of ports P equal to *p* × M, arranged in M sectors with *p* ports per sector, the pattern of ports being the same in each sector;

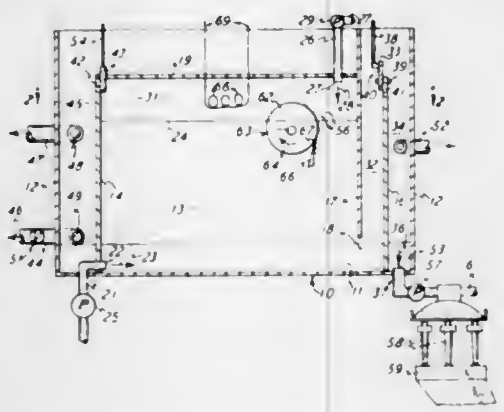
each said matrix having on each longitudinal end, *p* sections of approximately equal area and P port positions corresponding to said P ports in said partition means, each of *p* of said P port positions being located at approximately the center of each of said p sections, respectively, and being defined as through-put positions and the remaining P − *p* port positions being through-holes penetrating said matrix; each of said *p* through-put positions in any particular sector having associated with it M−1 through holes at a corresponding location one in each of the other M−1 sectors.

4,033,865
NON-CLOGGING SCREEN APPARATUS
H. William Derrick, Jr., Williamsville, N.Y., assignor to Derrick Manufacturing Corporation, Buffalo, N.Y.
Continuation of Ser. No. 531,175, Dec. 9, 1974, abandoned. This application Feb. 23, 1976, Ser. No. 660,490
Int. Cl.^{2} B07B *1/28*
U.S. Cl. 209—275 **4 Claims**



1. In a vibratory screening apparatus for finely divided material, a pair of screen cloths in close face to face abutment for receiving material to be screened thereon, the upper screen cloth being of approximately 20 mesh or finer and the openings in the screen cloths being at least twice as wide as the wire diameters thereof, a frame for supporting said screen cloths, the lower screen cloth having openings therein at least as large as the openings in the upper screen cloth but not in excess of 50 percent larger than the openings in the upper screen cloth and with the majority of the openings in the upper screen cloth intersected by the wires of the lower abutting screen cloth, said frame including a transverse series of spaced parallel longitudinally extending stringers whose upper edges define a transverse arch for supporting said screen cloths in upwardly arched formation, whereby the longitudinal wires of one screen are held securely against the transverse wires of the other screen and vice versa to lock the wires of one screen into the wires of the other in such manner that the plane defining the upper surfaces of the lower screen is above the plane defining the lower surfaces of the upper screen whereby the strands of said lower screen effectively prevents a generally spheroidal particle from becoming lodged in an opening of said upper screen, said convex surfaces further serving to effectively prevent relative vertical movement of said screen cloths during vibration thereof.

4,033,866
METHOD FOR SEPARATING FOREIGN SOLID PARTICLES FROM A LIQUID
Sigmund Johann Enzmann, 4534 Leslie Ann Lane, Racine, Wis. 53403
Division of Ser. No. 603,634, Aug. 11, 1975. This application Oct. 1, 1976, Ser. No. 728,548
Int. Cl.^{2} B01D *37/04*, *12/00*
U.S. Cl. 210—42 S **6 Claims**



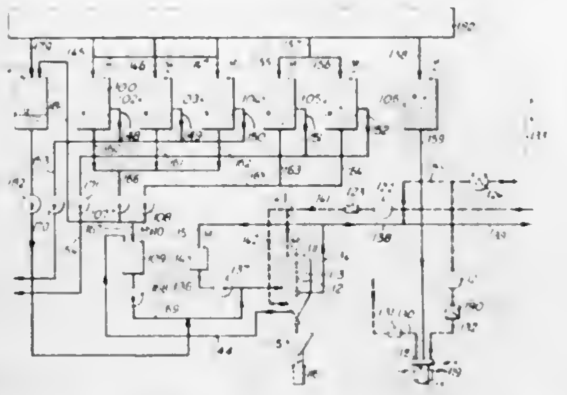
1. A method for separating foreign solid particles from a contaminated liquid, comprising the steps of pumping into an enclosed tank having a cover a vehicle liquid of a specific gravity greater than that of the contaminated liquid having the particles, pumping into said tank and on top of the vehicle liquid the contaminated liquid and thereby floating the contaminated liquid on the vehicle liquid to present a layer of the contaminated liquid and allow the foreign solid particles to sink into the vehicle liquid, filling said tank up to said cover with both said liquids to create a pressure in said liquids in said tank, removing the originally contaminated liquid from said tank and controlling the rate of removal by use of a valve while continuously pumping additional contaminated liquid with solid particles into said tank and thereby control the height of the layer of the contaminated liquid in said tank, all of said contaminated liquid is introduced and removed relative to said tank at spaced-apart locations adjacent respective opposite sides of said tank and said layer and adjacent the upper surface of said layer, for flow of the contaminated liquid across said tank and optimum sinking of the particles from the contaminated liquid while in said tank, pumping said vehicle liquid into said tank and removing said vehicle liquid from said tank at spaced-apart locations adjacent respective opposite sides of said tank and opposite from the locations of the introduction and removal of the contaminated liquid relative to said tank, to establish a cross-flow between the two liquids, and consequently flushing the vehicle liquid and the solid particles from said tank while continuously pumping the vehicle liquid into said tank.

4,033,867
CHROMATE REDUCTION IN AQUEOUS MEDIUM
Donald F. Jacques, Cornwells Heights, and K. Robert Lange, Huntingdon Valley, both of Pa., assignors to Betz Laboratories, Inc., Trevose, Pa.
Continuation of Ser. No. 489,962, July 19, 1974, abandoned. This application Oct. 31, 1975, Ser. No. 627,629
Int. Cl.^{2} C02C *5/02*
U.S. Cl. 210—28 **6 Claims**

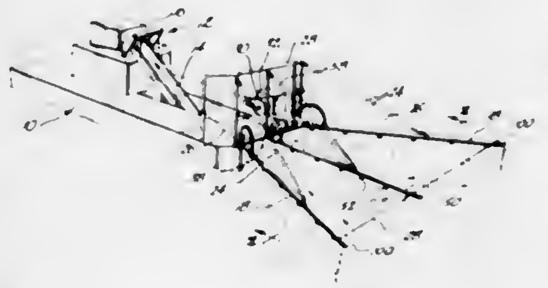
4. A method for removing chromium from an aqueous medium, said chromium largely being present in said medium in the chromate form as CrO_4^{-2}, which comprises sequentially: (*a*) reducing the chromium from the chromate form to the chromic form as Cr^{+3} by controlling the pH of the medium at near zero to about 2.8, and then contacting said medium at said pH with hydrogen in the presence of a hydrogenation catalytic material on a charcoal substrate, said material being selected from the group consisting of platinum and palladium; (*b*) adjusting the pH of the medium containing the reduced chromic form to about 3.5 to about 4.0; and (*c*) contacting the medium at said pH with a cationic exchange resin in the calcium form so as to remove most of the reduced chromic form from the medium onto the resin.

4,033,868
METHOD AND APPARATUS FOR PROCESSING CONTAMINATED WASH WATER
Othmar Meichsner, Raunheim, and Horst Queiser, Hochstadt, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany
Continuation-in-part of Ser. No. 353,114, April 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 119,339, Feb. 26, 1971, Pat. No. 3,773,177. This application Oct. 29, 1974, Ser. No. 519,020
Claims priority, application Germany, Mar. 27, 1974, 2414728; Mar. 27, 1974, 7410691[U]
Int. Cl.^{2} B01D *37/02*
U.S. Cl. 210—38 C **27 Claims**

1. A method for processing contaminated waste wash waters developed in a nuclear plant and containing radioactive solid substances and radioactive ionically bound dissolved substances, said nuclear plant having a resin-bead ion exchange filter, an evaporator concentrator, a powdered resin ion exchange filter which forms used ion exchange powder resin which can no longer be used in a straight-through operation and which is not completely exhausted as yet, and a wash-water column for the contaminated waste wash waters, said nuclear plant forming radioactive concentrate from which liquid is removed, the concentrate comprising (a) radioactive concentrate from the resin-bead ion exchange filter, (b) radioactive concentrate from the evaporation concentrator and (c) radioactive concentrate having particles of a size smaller than that of resin beads in the resin-bead ion exchange filter and having a salt content less than that of (b), and wherein a mixture of concentrate (a) and concentrate (c) is dewatered by filtering in a filter-cake-producing filter and dried, the improvement comprising mixing the contaminated wash waters with said used ion exchange powder resin in a mixing vessel to form a suspension and remove ionically bound radioactive substances dissolved in the wash water and then feeding the resulting suspension into the filter-cake-producing filter to remove radioactive solid substances from the suspension.



4,033,869
OIL SPILL CONFINING AND DIRECTING APPARATUS AND METHOD USING WATER SPRAY BOOMS
Jay L. McGrew, Littleton, Colo., assignor to Marine Construction & Design Co., Seattle, Wash.
Filed June 5, 1974, Ser. No. 476,420
Int. Cl.^{2} B01D *37/00*
U.S. Cl. 210—65 **15 Claims**

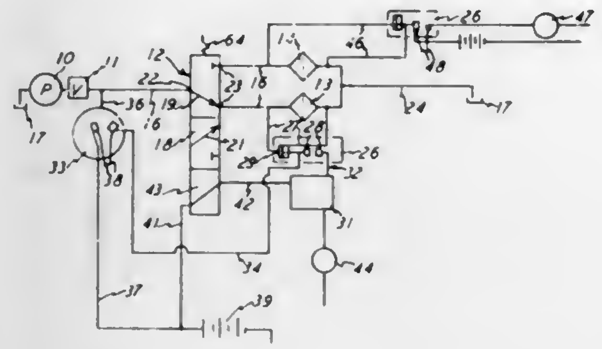


1. The method of sweeping or confining an oil spill on open water in relation to a selected surface area, comprising forming a curtain of water spray directed downwardly from a selected height above, and at an incline toward, said surface area so as to impact the water's surface along an edge of said area, the volumetric flow rate per unit of surface area impacted by the spray, together with the spray velocity, being sufficient when combined with air entrained by the spray, to move the oil ahead of the spray into the said area, the spray discharge comprising discrete droplets of such limited size and discharge velocity as to avoid substantially breaking up and dispersing the oil by such impact.

4,033,870
DUAL OIL FILTER AUTOMATIC SWITCHING SYSTEM
Donald James Parquet, and Carl Oluf Pedersen, both of Burlington, Iowa, assignors to J. I. Case Company, Racine, Wis.
Filed July 1, 1976, Ser. No. 701,903
Int. Cl.^{2} B01D *29/36*
U.S. Cl. 210—90 **8 Claims**

1. A dual oil filter automatic switching system comprising

two oil filters, an oil valve having an oil inlet and two oil outlets and having an electrically operative movable valve closure with a plurality of oil passageways for selective fluid-flow communication of said inlet with said two outlets, fluid lines separately interconnected between said two filters and each of said two outlets for diverting the flow of oil to said filters, an oil pump in fluid-flow communication with said oil valve for supplying oil under pressure to said inlet, a differential fluid pressure electric switch, additional fluid lines separately connected to said switch and the respective oil flow inlet and outlet sides of one of said filters for transmitting oil pressure to said switch for actuation of said switch in accordance with oil pressure at said one filter, and electric connections between said switch and said electrically operative closure for moving said closure and its said passageways relative to said two outlets to thereby direct the flow of oil relative to said two filters.



4,033,871

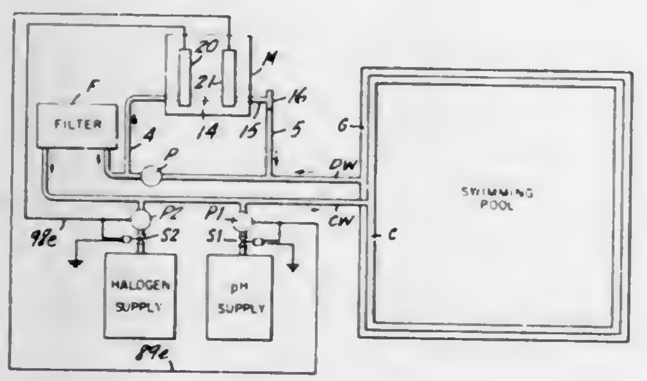
INTEGRATED MONITOR AND CONTROL SYSTEM FOR CONTINUOUSLY MONITORING AND CONTROLLING pH AND FREE HALOGEN IN SWIMMING POOL WATER

Frederick Wall, Elnora, N.Y., assignor to Paddock of California, Inc., Rock Hill, S.C.

Filed Nov. 13, 1975, Ser. No. 631,544

Int. Cl.² G05D *11/08*

U.S. Cl. 210—96 R **20 Claims**



1. A swimming pool system having pool water monitored for independent and concomitant control of halogen concentration and pH, comprising, in combination, a swimming pool; an integrated monitor and control system for continuously monitoring and independently controlling pH and free halogen in swimming pool water; and line connections for circulating swimming pool water flow therebetween; the monitor and control system comprising, in combination, a first electrochemical flow cell having two electrodes and through which swimming pool water flows, giving rise to an electric potential between the electrodes in proportion to hydrogen/hydroxyl ion concentration in the pool water; means for measuring the electric potential across the electrodes in a manner correlated with pH of the pool water; a second electrochemical flow cell having two electrodes and through which swimming pool water flows giving rise to an electric potential between the two electrodes in proportion to the oxidation/reduction potential of the pool water; means for measuring the electric potential across the electrodes in a manner correlated with halogen concentration in the pool water; a first operational amplifier in electric connection with the first cell and arranged to respond to a pH outside a predetermined range and give a first signal; a first means responsive to the first signal to adjust alkali or acid content of the pool water to restore pH to within the predetermined range; a second operational amplifier in electric connection with the second cell and arranged to respond to a halogen concentration outside a predetermined range and give a second signal; second means responsive to the second signal to adjust halogen concentration in the pool water to restore halogen concentration to within the predetermined range; and means for circulating pool water to, through and from each electrochemical cell and to and from a swimming pool water supply.

4,033,872

RESERVOIR TANK

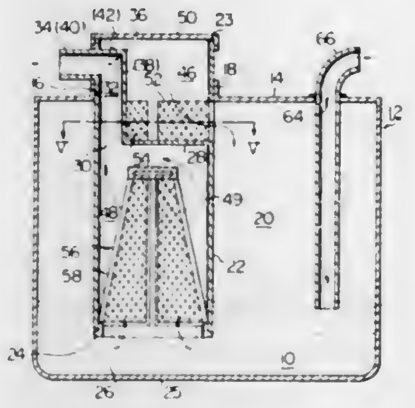
Yoshiro Mori, Sagamihara, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Nov. 7, 1975, Ser. No. 630,079

Claims priority, application Japan, Nov. 8, 1974, 49-134453[U]

Int. Cl.² B65D *25/00*

U.S. Cl. 210—168 **7 Claims**



1. A reservoir tank for use in a hydraulic system, comprising a tank top formed therethrough with a first aperture, a hollow member vertically extending from the outside of said tank thereinto through said first aperture and having therein a filling chamber, an outlet chamber located below said filling chamber, and an outlet passage located laterally of said filling chamber and above said outlet chamber and communicating with said outlet chamber, said hollow member having a bottom end which submerges into and communicates with hydraulic fluid in said tank, a horizontal partition member horizontally located in said hollow member and separating said filling chamber and said outlet chamber from each other, a vertical partition member fixedly connected to said horizontal partition member and vertically extending upwardly from said horizontal partition member and separating said filling chamber and said outlet passage from each other, said filling chamber communicating with the outside of said tank for delivery of hydraulic fluid thereinto, said hollow member being formed therethrough below said tank top with a second aperture opening from said filling chamber into said tank for admission of said hydraulic fluid in said filling chamber thereinto, said hollow member being formed therethrough above said tank top with a third aperture opening from said outlet passage into the outside of said tank.

4,033,873

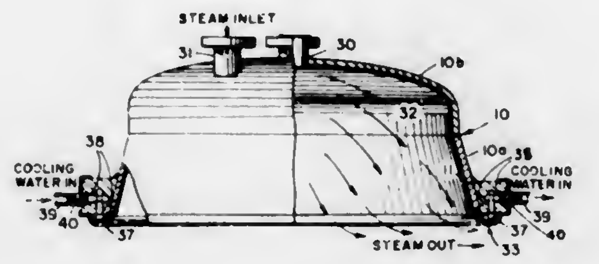
FILTRATION APPARATUS AND PRESSURE SEAL

Donald A. Stoltenberg, Park Ridge, Ill., assignor to Pureco Systems, Inc., Rosemont, Ill.

Continuation-in-part of Ser. No. 332,596, Feb. 15, 1973, Pat. No. 3,870,585. This application May 14, 1973, Ser. No. 359,646

Int. Cl.² B01D *35/18*

U.S. Cl. 210—186 **2 Claims**



1. Pressure filtration apparatus for removing solids from a saturated water solution thereof, including receiver vessel means for collection of the solids during pressure filtering, said vessel having an open bottom through which the solids are discharged, liquid-passing solids-retaining filter means cooperating with said open bottom to close it during filtration and open it for discharge of the collected solids, said filter means having gasket means around the periphery thereof, and sealing rim means extending around said open bottom for engagement with said gasket means during filtration, wherein the improvement comprises: the gasket engaging surface of said sealing rim means being formed of metal and said sealing rim means being provided internally with passage means in heat transfer relation with the inside of said metal gasket engaging surface, means for circulating cooling fluid through said passage means for cooling by heat transfer said external gasket engaging surface to a steam condensing temperature, means for providing a flow of steam over said external gasket engaging surface while said surface is disengaged from said gasket means and is being cooled by said circulating cooling fluid to condense water on said surface for preventing the drying of said saturated solution thereon, whereby effective sealing engagement between said sealing rim means and said gasket means can be maintained during pressure filtration.

4,033,874

APPARATUS FOR THE TREATMENT OF LIQUIDS

Kurt Marquardt, Holzgerlingen, and Reinhard Buchholz, Wendlingen, both of Germany, assignors to Hager & Elsaesser, Stuttgart, Germany

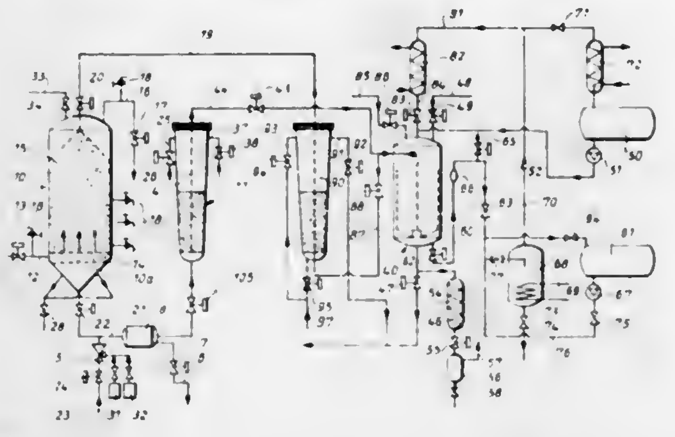
Continuation of Ser. No. 362,953, May 23, 1973, abandoned. This application Apr. 22, 1975, Ser. No. 570,926

Claims priority, application Germany, May 26, 1972, 2225682; Sept. 23, 1972, 2246792

Int. Cl.² B01D *33/30*

U.S. Cl. 210—189 **1 Claim**

1. Apparatus for separating solid substances from liquids comprising a treatment column containing a bed of treatment material, a solvent extraction column, a washing column, means for intermittently removing successive volumes of said material from the lower end of the treatment column and conveying said material into said solvent extraction column, means for removing portions of said material from said solvent extraction column and conveying said portions to the lower end of said washing column, means for intermittently removing successive volumes of said materials from said washing column and conveying said material to the upper end of said treatment column, means for supplying untreated liquid to the lower end of the treatment column, means for removing purified liquid from the upper end of the treatment column, means for supplying washing liquid to the lower end of the washing column, means for removing used washing liquid from the upper end of said washing column, said treatment column, solvent extraction column and said washing column and all said means being connected to form a closed system for said treatment material and means for supplying solvent to the solvent extraction column, means for removing used solvent from the solvent extraction column, volume-adjustment devices which comprise pipes protruding respectively into the treatment and washing columns and adjustable depthwise therein for adjusting both said volumes removed from the treatment column and from the washing column, said volume adjustment devices being formed as telescopically guided pipe and pipe connection devices provided on the treatment and washing columns coupled to each pipe, said volume-adjustment device of the treatment column being formed as a hollow annular body located within the treatment column, said body openings therein and being in fluid connection with two pipes engaging the annular body at diametrically opposite positions, said pipes extending out of the treatment column and being adjustable as to height within the treatment column.



4,033,875

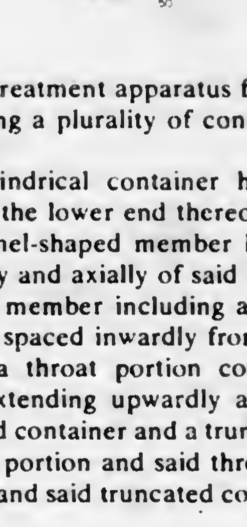
WASTE WATER TREATMENT APPARATUS

Ferdinand Besik, Mississauga, Canada, assignor to Ontario Research Foundation, Sheridan Park, Canada

Division of Ser. No. 542,716, Jan. 21, 1975. This application Nov. 8, 1976, Ser. No. 739,491

Int. Cl.² C02C *1/26*

U.S. Cl. 210—197 **3 Claims**



1. A waster water treatment apparatus for the treatment of waste water containing a plurality of contaminants comprising:

a substantially cylindrical container having a truncated conical shape at the lower end thereof,

a substantially funnel-shaped member located in inverted manner internally and axially of said container,

said funnel-shaped member including a skirt portion concentric with and spaced inwardly from the inner wall of said container, a throat portion concentric with said container and extending upwardly above the intended liquid level in said container and a truncated cone portion joining said skirt portion and said throat portion,

said throat portion and said truncated cone portion defining with the inner wall of said cylindrical container a first treatment zone,

an inlet pipe to said cylindrical container communicating with said first treatment zone adjacent the intended liquid level therein,

an outlet pipe from said cylindrical container communicating with said throat portion at the intended liquid level therein for discharge of treated waste water,

a riser tube extending centrally and axially of and through said container terminating at its lower end adjacent the lower end of said container for receipt therein of material located at said lower end terminating at its upper end in a cross arm member extending radially of said container,

outlet pipes integral with each end of said cross arm member, each of said outlet pipes including a downwardly extending portion and a horizontally extending portion for discharge of fluid tangentially a the intended liquid level in the first treatment zone, and

a gas feed tube communicating with gas feed means exteriorally of said container and extending from said gas feed means through said riser tube and terminating adjacent the lower end of said riser tube for discharge of gas therein.

4,033,876

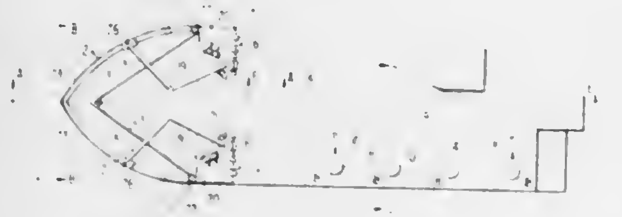
SPILLED OIL RETRIEVER AND ANTI-WATER POLLUTION WATER CRAFT

Diosdado L. Cocjin, Quezon City, and Artemio M. Masongsong, Manila, both of Philippines, assignors to Diosdado L. Cocjin, Quezon City, Philippines

Filed Feb. 6, 1976, Ser. No. 655,937

Int. Cl.² E02B *15/04*

U.S. Cl. 210—242 S **3 Claims**



1. A water craft capable of retrieving oil or chemicals lighter than and floating on the water surface, said craft comprising, in combination:

flat sidewalls terminating at their forward ends in a pointed bow;

said bow being recessed at its forward and upper portion to define a scoop lying beneath the water craft line, said scoop including a horizontal upper wall;

a pair of hollow gates, each of said gates conforming to the bow scoop and consistuting sidewall extensions of said water craft at said bow and having vertical forward and rear edges, the rear edges being hinged to the sides of said water craft hull for rotation about vertical axes and movable between closed and open positions wherein the forward vertical edges are closed to form the water craft pointed bow and are open so as to extend outwardly to the plane of the hull sidewalls to cause oil and water to converge onto the horizontal surface of the scoop;

means mounted on the hull and operatively coupled to the gates for opening and closing said gates;

a trough located amidship of the water craft and extending through its entire length including a forward, oblique portion which is in communication with the horizontal surface of said scoop and which extends upwardly and terminates above the water line such that a portion of said trough lies above the water line at the rear of said gates;

an oil and water separating tank within said hull;

an opening formed within the side of said trough above the water craft water line and open to said oil and water separating tank;

an oil storage tank within said hull and adjacent said oil and water separating tank, said oil and water separating tank being provided with an oil overflow outlet at an upper portion leading to said oil storage tank; and a submerged water outlet at a lower portion of said oil and water separating tank and beneath the water line of said water craft and being open to the water exterior of said water craft for permitting separated water flow out of said water craft; and

baffle means installed on the water craft and astride said trough to block water and oil flow and detour that flow through said opening within the side of said trough into said oil and water separating tank.

4,033,877

CYCLONE FOR REMOVING SOLID IMPURITIES FROM LIQUID IN A PUMP AND MOTOR UNIT

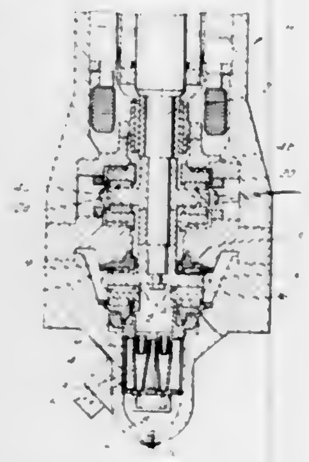
Christian Klepp; Günter Koll, and Heinz Bernd Matthias, all of Frankenthal, Germany, assignors to Klein, Schanzlin & Becker Aktiengesellschaft, Frankenthal, Pfalz, Germany

Filed July 22, 1975, Ser. No. 598,041

Claims priority, application Germany, July 22, 1974, 2435127

Int. Cl.² B01D *45/12*

U.S. Cl. 210—304 **7 Claims**



3. The improvement defined in claim 1 wherein said cover is formed with a sealable opening and is provided with a plug normally closing said opening, whereby access can be gained to said compartment through said opening after removal of said plug for removal of solids trapped by said cyclone separator.

4,033,878

SPIRAL WOUND MEMBRANE MODULE FOR DIRECT OSMOSIS SEPARATIONS

Gerald E. Foreman, San Diego, and Peter K. Worsley, Santa Barbara, both of Calif., assignors to Universal Oil Products Company, Des Plaines, Ill.

Filed May 12, 1975, Ser. No. 576,925

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 A **3 Claims**

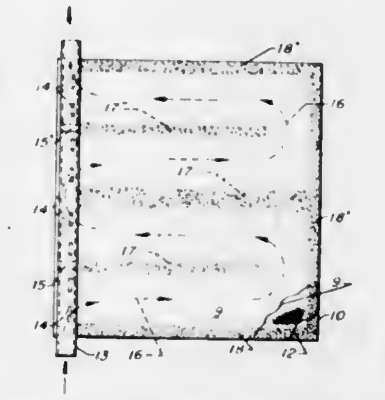
1. A spiral wound membrane separation module, which comprises in combination:

a. a hollow mandrel having at least one flow blocking means in the interior portion thereof and having longitudinally aligned passageway means on both sides of the flow blocking means extending through the wall portion of the mandrel;

b. a sheet-like layer of a first porous material provided in a spaced spiral wrapping around said mandrel and having one end in contact with the passageway means to the interior of said mandrel to permit fluid flow from one to the other;

c. said porous material further having elongated fluid flow blocking seal means incorporated within the interior portion thereof, with at least one such seal means in alignment with the flow blocking means in said mandrel and extending for a portion of the spiral wound length thereof in the manner of interior weir means, as well as fluid blocking means incorporated around the side and outer end portions thereof, whereby fluid flow will be caused to travel in at least one flow path that is from one mandrel portion out into the outer spiral wrapped length of the porous material and then back into another mandrel portion;

d. a pair of membrane sheets each positioned on an opposite side of said first porous material with outer edge portions sealed to the latter to provide an envelope arrangement therewith and such envelope spirally wrapped therewith around said mandrel along with a layer of a second porous material, hereinafter described and set forth, to provide resulting membrane layers between spiral wound porous material layers;



e. a sheet-like layer of a second porous material interposed between said envelope and between the membranes in the spirally wound arrangement therewith to be thus spaced from said first porous material layer by one of said membranes in a resulting spiral wound module; and,

f. said spiral wound membrane module being further characterized in that a plurality of flow blocking means are spaced longitudinally in said mandrel and a corresponding plurality of flow blocking seal means are provided in the first said porous material to provide more than one outward and inward flow paths for the fluid flow in the envelope arrangement.

4,033,879

CENTRIFUGE, ESPECIALLY SUGAR CENTRIFUGE

Peter Natt, Braunschweig, and Heinrich Kurland, Lucklum, both of Germany, assignors to Braunschweigische Maschinenbauanstalt, Braunschweig, Germany

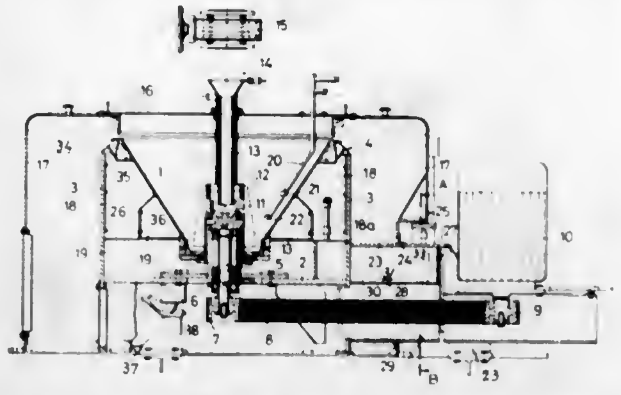
Filed July 15, 1975, Ser. No. 596,182

Claims priority, application Germany, July 26, 1974, 2436044

Int. Cl.² B01D *33/02*

U.S. Cl. 210—369 **10 Claims**

1. A centrifuge comprising a first unit and a second unit, said first unit comprising a base plate, spring support means for said base plate, drum means, means rotatably securing said drum means to said base plate while inhibiting nonrotational movement therebetween, said securing means including a drive shaft rotatably supported by and vertically extending through said base plate and rigidly secured to said drum, inner housing means supported by said base plate and surrounding said drum to form collecting chamber means around said drum for receiving liquid centrifuged from the drum, carrier means having an inner end rigidly secured to said inner housing and an outer end extending laterally away from said inner housing, motor means rigidly supported by said outer end of the carrier means, and means operatively connecting said motor means to said drive shaft for rotating said drive shaft, said spring support means operatively supporting said first unit independently of said second unit, said second unit comprising an outer housing separated from said inner housing, said outer housing being mounted to surround said inner housing to form an enclosed space around said inner housing to receive solid materials from said drum means, cover means for said outer housing, and material filling means extending through said cover means into said drum means, said carrier means extending through said outer housing.



4,033,880

FILTER DEVICE

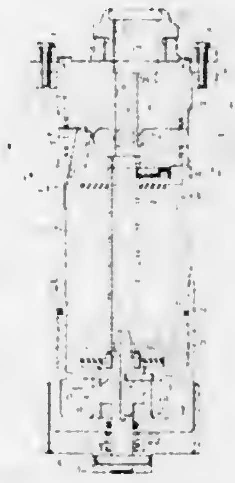
Göran Vilhelm Bengtsson, Pianogatan 84, S-421 44 Vastra Frolunda, Sweden

Filed Apr. 5, 1976, Ser. No. 673,778

Claims priority, application Sweden, Apr. 11, 1975, 7504194

Int. Cl.² B01D *29/42*

U.S. Cl. 210—424 **7 Claims**



1. A filter device, particularly a dry filter device for refrigerant in cooling systems, comprising a filter housing having a chamber containing a filter and a single inlet (2) into a chamber (10) and a single outlet (3) from said chamber (10), said chamber (10) having a sealable opening for allowing replacement of said filter in the chamber (10), and a valve means disposed between said inlet (2) and said outlet (3) and having a movable valve body (13), said valve body (13) having an operating position in which it establishes communication between said inlet (2) and said outlet (3) through the filter in said chamber (10), an evacuation position, in which it closes said inlet (2) and establishes communication between said chamber (10) and said outlet (3) only, and a service position, in which it establishes a communication between said inlet (2) and said outlet (3) by-passing said chamber (10) in order to maintain a flow of refrigerant from said inlet (2) to said outlet (3) during replacement of the filter.

4,033,881

MULTILAYER PAPER SHEET FILTER CARTRIDGES

David B. Pall, Roslyn Estates, N.Y., assignor to Pall Corporation, Glen Cove, N.Y.

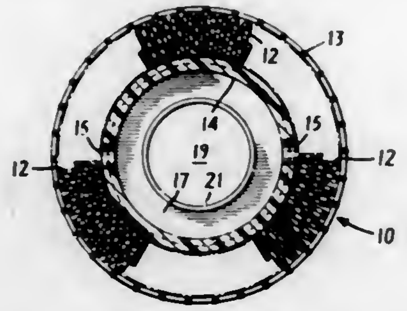
Continuation-in-part of Ser. No. 538,972, Jan. 6, 1975, abandoned. This application Jan. 12, 1976, Ser. No. 648,553

Int. Cl.² B01D *39/18*

U.S. Cl. 210—491 **8 Claims**

1. A tubular filter cartridge comprising a tube having open ends closed off by end caps, with at least one of the end caps

provided with at least one aperture for fluid flow therethrough into the interior of the tube, the tube comprising a plurality of separate unattached juxtaposed paper filter sheets of differing pore size, arranged in sequence of fluid flow therethrough according to decreasing pore size, and formed in a concentric corrugated tubular configuration, for fluid flow through the tube from one side to the other side, the separtate paper filter sheets comprising cellulose fibers exclusively, substantially free from binder, being from about 0.001 to about 0.02 inch thick, and having a density within the range from about 0.1 to about 0.75 g per cc, with at least one foraminous corrugated relatively rigid separate unattached support member in supporting juxtaposition to at least one of the outermost and innermost sheets of the tube.



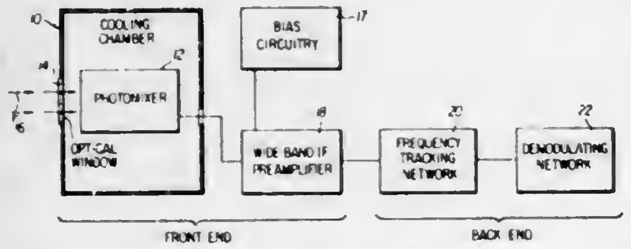
4,033,882
WIDEBAND HETERODYNE RECEIVER FOR LASER COMMUNICATION SYSTEM

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Theodore Flattau, Dix Hills, N.Y.; Ronald Albert Lange, Huntington, N.Y.; John Walter Mellars, Westbury, N.Y.; Bernard Joseph Peyton, Huntington Station, N.Y., and John Martin Wolczok, Farmingdale, N.Y.

Filed Mar. 18, 1976, Ser. No. 667,930

Int. Cl.² H03D *1/24*

U.S. Cl. 250—199 **9 Claims**



1. A wideband receiver for a laser communication system, comprising:

wideband optical transducer means for detecting modulated optical signals over a predetermined range of carrier frequencies and for converting said optical signals to electrical signals;

wideband preamplifier means coupled to said optical transducer means for amplifying the output thereof; and

narrow band signal processing and demodulating means coupled to said preamplifier means for processing and demodulating said electrical signals including;

heterodyne demodulating means for demodulating said electrical signals,

frequency tracking means coupled to said heterodyne demodulating means for adjusting said heterodyne demodulating means in accordance with changes in said carrier frequency of said detected signal,

first mixer means coupled to said preamplifier means for mixing a variable intermediate frequency with the output of said preamplifier means,

frequency tracking feedback loop means coupled to said first mixer means for varying said intermediate frequency in response to changes in said carrier frequency of said detected signals,

linear band pass filter means coupled to said first mixer means for filtering the output thereof, and

wherein said heterodyne demodulating means includes fourth mixer means coupled to said linear band pass filter means for demodulating the output thereof and binary decision circuit means coupled to said fourth mixer means for supplying binary logic levels to the output thereof.

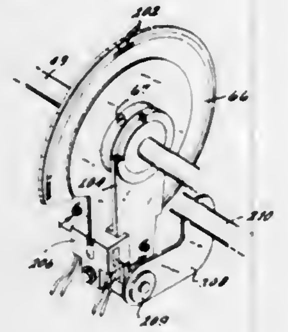
4,033,883
CONTROL AND DATA SYSTEM

Herbert G. Zinsmeyer; Rodney L. Johnson, both of Austin; Ralph H. Genz, Leander, and James E. Setliff, Austin, all of Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Division of Ser. No. 434,196, Jan. 17, 1974, which is a continuation-in-part of Ser. No. 398,987, Sept. 20, 1973, abandoned. This application Oct. 9, 1975, Ser. No. 621,259

Int. Cl.² G01D *5/34*

U.S. Cl. 250—231 SE **6 Claims**



1. In combination in a dispenser at a gasoline station for producing electrical signals representing the amount of energy fluid dispensed by the dispenser, a first shaft operably connected to the dispenser for rotation thereby in an amount correlated with the amount of fluid dispensed, a second stationary shaft displaced from the first shaft, brace means mounted at one end on the second stationary shaft, means defining a forked frame mounted at one end on the first shaft rotationally free of the first shaft, the forked frame means being attached to the brace means at a position removed from the first shaft and the second stationary shaft, a rotary disc supported on the first shaft between the fork legs of the frame means for rotation with the first shaft, the rotary disc having a plurality of uniformly spaced apertures provided in an annular path of orbit near its periphery, and photocell means disposed on the frame for scanning the apertures in the disc rotates to provide a plurality of electrical signals each representing a predetermined increment in the amount of energy fluid dispensed by the dispenser.

4,033,884
CALIBRATION SOURCE

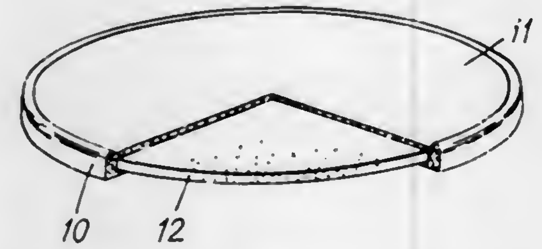
Edgar Adolf Lorch; Keith Ernest Fletcher, and David Page, all of Amersham, England, assignors to The Radiochemical Centre Limited, Amersham, England

Filed Jan. 24, 1975, Ser. No. 543,908

Claims priority, application United Kingdom, Jan. 28, 1974, 3951/74

Int. Cl.² G21F *5/02*

U.S. Cl. 250—496 **7 Claims**



1. A flood source for calibrating gamma-cameras, said source comprising:

a plastics sheet of uniform thickness containing the nuclide tellurium-123m uniformly dispersed therein.

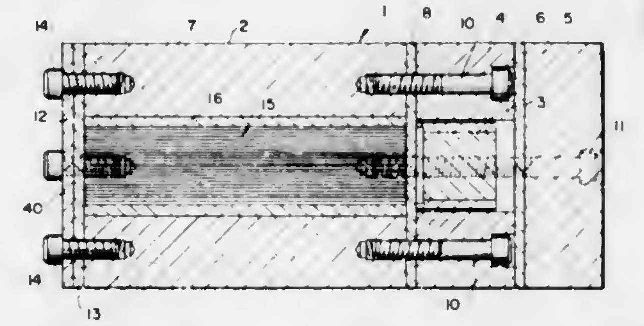
4,033,885
APPARATUS FOR COLLIMATION OF RADIATION SIGNALS FOR LONG DISTANCE TRANSMISSION AND METHOD OF CONSTRUCTION THEREFOR

Leonard R. Stone, South Euclid; Steven J. Aron, Jr., Parma, and Robert A. Kemmerling, Cleveland Heights, all of Ohio, assignors to Republic Steel Corporation, Cleveland, Ohio

Continuation of Ser. No. 381,671, July 23, 1973, abandoned. This application Dec. 30, 1974, Ser. No. 537,458

Int. Cl.² G21F *5/02*

U.S. Cl. 250—496 **3 Claims**



1. A source assembly for a radiation detector comprising:

a. a collimator shielding body;

b. an elongated collimator assembly comprising a series of radiation opaque elongate members defining a plurality of parallel elongated gamma transmitting passages;

c. said collimator assembly being axially received in said body;

d. a gamma outlet window secured to said collimator shielding body and overlying an outlet end of said collimator assembly;

e. gamma inlet window secured to said collimator body in spaced relationship with the outlet window and overlying an inlet end of said collimator assembly;

f. a tubular source shield secured to the collimator body and defining a source chamber adjacent the inlet window;

g. a radiation source in the chamber and having a radiation face near said inlet window and aligned with said collimator assembly to emit gamma radiation through said elongated passages; and,

h. a shielding cap removably secured to the shield body to permit facile replacement of the source while preventing emission of radiation rearwardly of the shielding body when the assembly is in use.

4,033,886
RECYCLEABLE METALWORKING LIQUID

George F. Felton, Jr., Chadds Ford, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Continuation-in-part of Ser. No. 545,845, Jan. 31, 1975, abandoned. This application Nov. 11, 1975, Ser. No. 630,823

Int. Cl.² C10M *1/32*

U.S. Cl. 252—34.7 **23 Claims**

1. A liquid suitable for the formulation of a recycleable metal working liquid comprising a major amount of an aqueous solution of a liquid block copolymer of ethylene oxide and propylene oxide, said copolymer having a molecular weight of about 1800–2900, and an amount of both an alkanolamine cinnamate and a boron amine complex effective to inhibit corrosion and which complex is the reaction complex between methyl borate or phenyl borate and one of the following: trimethylamine, ammonia, hydrazine and primary aliphatic hydrocarbyl amine.

12. In a method for metal working wherein relatively small amounts of metal are removed from an article and a metal working fluid is juxtaposed to contacting surfaces, the improvement comprises that the liquid comprises a major amount of an aqueous solution of a liquid block copolymer of ethylene oxide and propylene oxide, said copolymer having a molecular weight of about 1800–2900 and an effective amount of both an alkanolamine cinnamate and a boron amine complex to inhibit corrosion and which complex is the reaction complex between methyl borate or phenyl borate and one of the following: trimethylamine, ammonia, hydrazine and primary aliphatic hydrocarbyl amine.

4,033,887
PHOSPHORIC ACID ESTER BASED FUNCTIONAL FLUIDS

Alain J. G. De Roocker, Brussels, Belgium, assignor to Labofina S.A., Brussels, Belgium

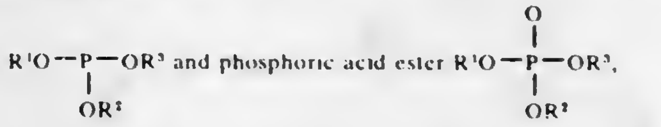
Continuation-in-part of Ser. No. 407,539, Oct. 18, 1973, abandoned. This application May 16, 1975, Ser. No. 578,075

Int. Cl.² C10M *1/10*

Claims priority, application Belgium, July 13, 1973, 802298

U.S. Cl. 252—49.8 **11 Claims**

1. A functional fluid comprising a mixture of a major amount of (A) an orthophosphoric acid ester of formula $O=P=(OR)_3$, wherein R is an alkyl radical, an aryl radical or an alkylaryl radical, and a viscosity improving amount of (B) a transesterification product between a dihydroxy aromatic compound selected from the group consisting of hydroquinone, resorcinol, pyrocatechol, 2,2'bis (4-hydroxy-phenyl)-propane and bis(4-hydroxyphenyl) methane and a phosphorous compound selected from the group consisting of the phosphorous acid ester



$$R^1O-\underset{\displaystyle OR^2}{\underset{|}{P}}-OR^3 \text{ and phosphoric acid ester } R^1O-\overset{\displaystyle O}{\overset{|}{\underset{\displaystyle OR^2}{\underset{|}{P}}}}-OR^3,$$

wherein R^1, R^2 and R^3, which may be the same or different, are alkyl radicals, aryl radicals or alkylaryl radicals, wherein said transesterification product contains not more than about 4 structural units and has a molecular weight of between about 500 and 2000.

4,033,888
DISPERSANT VI IMPROVER

Thomas E. Kiovsky, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1976, Ser. No. 733,574

Int. Cl.² C10M *1/24*

U.S. Cl. 252—56 D **8 Claims**

1. The oil-soluble product prepared by the process comprising:

a. reacting a selectively hydrogenated block copolymer having the general configuration A-B with maleic anhydride at a temperature of between about 180° C and 250° C and in the presence of a solvent wherein each polymer block A is a monoalkenylarene polymer having an average molecular weight of between about 25,000 and about 50,000 and each block B is a polymer of a C_{4-5} conjugated diene having an average molecular weight of between about 35,000 and about 100,000 wherein between about 80% and about 98% of the aliphatic unsaturation has been reduced by hydrogenation while less than about 20% of the aromatic unsaturation has been reduced; and

b. reacting the product of step (a) with an alkane polyol having at least two hydroxy groups at a temperature of between about 150° C and about 250° C.

4,033,889
TERPOLYMER DISPERSANT - VI IMPROVER

Thomas E. Kiovsky, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Oct. 18, 1976, Ser. No. 733,573

Int. Cl.² C10M *1/28, 3/22*

U.S. Cl. 252—56 D **10 Claims**

1. The oil-soluble product prepared by the process comprising:

- a. reacting a terpolymer with maleic anhydride at a temperature of between about 180° C and 250° C wherein the terpolymer has a molecular weight of between about 70,000 and 150,000 and comprises about 30 to 85 mole percent ethylene, about 15 to 70 mole percent of a C_3 to C_8 alpha monoolefin and about 1 to about 20 mole percent of a C_5 to C_{14} non-conjugated diene; and
- b. reacting the product of step (a) with an alkane polyol having at least two hydroxy groups at a temperature of between about 150° C and about 250° C.

4,033,890

LIQUID DEVELOPER FOR ELECTROPHOTOGRAPHY

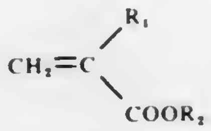
Yasuo Tamai, Odawara; Satoru Honjo, Asaka; Sadao Osawa, Asaka; Masato Satomura, Asaka; Chiaki Osada, Asaka; Wakio Nagashima, Kanagawa, and Naomitsu Takashina, Fujisawa, all of Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara and Mitsubishi Gas Chemical Company, Inc., Tokyo, both of, Japan

Filed Feb. 26, 1975, Ser. No. 553,202

Int. Cl.^{2} G03G *9/00*

U.S. Cl. 252—62.1 L **10 Claims**

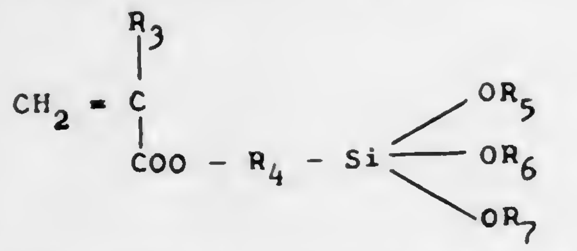
1. An electrophotographic liquid developer comprising an insulating carrier liquid having a high electric resistance and a low dielectric constant and a toner in a proportion of about 0.1 to about 20 parts by weight of said toner per 1,000 parts by weight of said carrier liquid, said toner comprising the graft-copolymer of (a) and addition-polmerizable monomer (A) represented by the formula.



$$CH_2{=}C(R_1)COOR_2$$

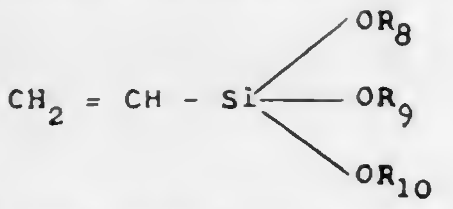
where R_1 represents a hydrogen atom or a methyl group and R_2 represents an alkyl group having 6 to 20 carbon atoms, and (b) an addition-polymerizable monomer (B) having an alkoxysilane group or a phenoxysilane group, and pigment particles selected from the group consisting of carbon black, aniline black, alkali blue, nigrosine, phthalocyanine blue and phthalocyanine green, with the proportion of addition polymerizable monomer (A) to addition polymerizable monomer (B) being 5 to 45 parts by weight of addition polymerizable monomer (A) per 1 part by weight of addition polymerizable monomer (B) and with the amount of addition polymerizable monomer (A) and addition polymerizable monomer (B) grafted to the pigment particles being sufficient to provide the pigment particles with an effective positive charge.

2. The developer of Claim 1 where said addition-polymerizable monomer (B) is represented by the formula:



$$CH_2{=}C(R_3)COO{-}R_4{-}Si(OR_5)(OR_6)(OR_7)$$

where R_3 is a hydrogen atom or a methyl group, R_4 is an alkylene group having 1 to 8 carbon atoms, and R_5, R_6 and R_7 each is an alkyl group having 1 to 4 carbon atoms or a phenyl group; or



$$CH_2{=}CH{-}Si(OR_8)(OR_9)(OR_{10})$$

where R_8, R_9 and R_{10} each is a phenyl group, an alkyl group having 1 to 4 carbon atoms or a $—CH_2—CH_2—OR_{11}$ group wherein R_{11} represents a phenyl group or an alkyl group having 1 to 4 carbon atoms.

4,033,891

MAGNETIC PARTICLE POWDER OF ACICULAR FERRIC OXIDE USED FOR MAGNETIC RECORDING MATERIAL AND A PROCESS FOR PRODUCING THE SAME

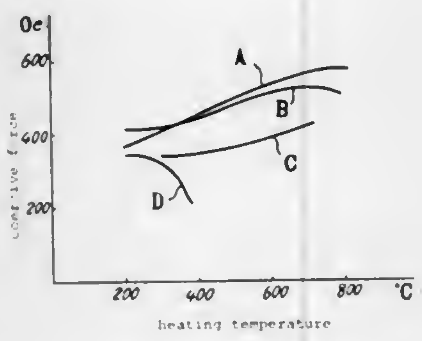
Goro Matsui; Koji Toda; Shigeki Shimizu; Nanao Horiishi, and Atushi Takedoi, all of Hiroshima, Japan, assignors to Toda Kogyo Corporation, Hiroshima, Japan

Filed Feb. 26, 1975, Ser. No. 553,325

Claims priority, application Japan, Mar. 1, 1974, 49-24519

Int. Cl.^{2} C01G *49/06*

U.S. Cl. 252—62.56 **6 Claims**



1. In the production of acicular gamma-ferromagnetic iron oxide from acicular goethite, wherein the acicular goethite is reduced to acicular magnetite and the resultant magnetite is oxidized to gamma-hematite retaining the particle shape of the starting material, the improvement for obtaining gamma-hematite having improved magnetic properties which comprises heating the acicular magnetite obtained from the reduction of the acicular goethite, prior to subjecting it to oxidation, at a constant temperature in the range of 200°–800° C in an inert gas atmosphere having a partial pressure of oxygen controlled at a constant value in the range of 0.001–1% by weight and for the time sufficient to make the partial pressure of the acicular magnetite reach the equilibrium value according to Gibb's phase rule under said conditions.

4,033,892

ELECTRIC FIELD RESPONSIVE FLUIDS

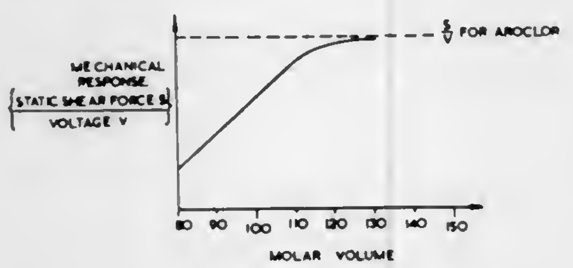
James Edward Stangroom, Castleton, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, Whitehall, London, England

Filed July 7, 1975, Ser. No. 593,494

Claims priority, application United Kingdom, July 9, 1974, 30456/74

Int. Cl.^{2} C10M *3/34, 3/18;* **C09K** *3/00*

U.S. Cl. 252—76 **21 Claims**



1. An electroviscous fluid which comprises at least one polyhydric alcohol in solid particulate form which polyhydric alcohol contains acid groups selected from the group consisting of carboxylic acid groups and sulphonic acid groups and has a structure in which water is adsorbed, and an electrically non-conducting oleaginous vehicle in which the solid particles are dispersed.

4,033,893

POTASSIUM-LIME AQUEOUS DRILLING FLUIDS AND METHOD OF PREPARING SAME

Thomas C. Mondshine, Houston, Tex., assignor to NL Industries, Inc., New York, N.Y.

Filed Nov. 20, 1975, Ser. No. 633,867

Int. Cl.^{2} C09K *7/00*

U.S. Cl. 252—8.5 A **16 Claims**

1. A drilling fluid consisting essentially of a suspension of clay, lime, and a lignitic material in an aqueous phase, said drilling fluid having a Pm in the range from 1 to 40 and a pH in the range from 12.4 to 13.5, said aqueous phase being saturated with lime and having a Pf in the range from 1 to 8, and a K^+ concentration of at least 8000 ppm., wherein Pm>Pf, and wherein said lignitic material is present in a concentration within the range from 10 to 35 ppb., and wherein said K^+ is obtained from said lignitic material, potassium hydroxide, and potassium chloride.

4,033,894

POWDER DETERGENT COMPOSITIONS

Robert L. McLaughlin, Wilmette, and Donald C. Wood, Des Plaines, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed June 5, 1975, Ser. No. 583,908

Int. Cl.^{2} C11D *7/18, 7/38*

U.S. Cl. 252—99 **18 Claims**

1. A powder detergent composition adapted for machine dish washing using hard water and which does not require the presence of phosphates consisting essentially of the following components by weight:

1. from 2–8% of low foaming nonionic surfactant useful for machine dish washing,
2. from 0.5–5% of a chlorine or oxygen-supplying bleaching agent,
3. from 15–85% of borax,
4. solid particulate organic or inorganic buffering agent which will not precipitate calcium or magnesium salts at use concentration, said buffering agent providing a pH in the range of pH 7.8 – pH 8.5 when the composition is placed in 1% water solution, and
5. any balance of said detergent consisting essentially of inert particulate filler which does not precipitate calcium or magnesium salts at use concentration.

4,033,895

NON-IRRITATING SHAMPOO COMPOSITIONS CONTAINING STEARYL AMINE OXIDE

Terry Gerstein, Merrick, N.Y., assignor to Revlon, Inc., New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,131

Int. Cl.^{2} C11D *1/14, 3/48, 1/84*

U.S. Cl. 252—106 **6 Claims**

1. An aqueous non-irritating shampoo consisting essentially in parts by weight of

sodium lauryl sulfate	4–18
zinc pyridinethione	0.1–4
stearyl dimethyl amine oxide	0.2–12
water q.s.	100

4,033,896

METHOD OF CORROSION INHIBITION AND COMPOSITIONS THEREFOR

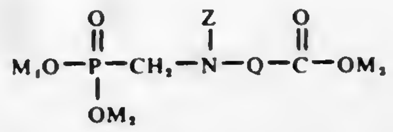
Robert S. Mitchell, Webster Groves, and Thomas M. King, Creve Coeur, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed June 18, 1976, Ser. No. 697,503

Int. Cl.^{2} C23F *11/16, 11/10*

U.S. Cl. 252—389 A **35 Claims**

1. A method of inhibiting the corrosion of metals in a water system comprising maintaining in the water of said system at least 1 part per million of phosphonomethyl amino carboxylate having the general formula



$$M_1O{-}P(=O)(OM_2){-}CH_2{-}N(Z){-}Q{-}C(=O){-}OM_3$$

wherein M_1, M_2 and M_3 are individually selected from the group consisting of hydrogen, metal ions, ammonium ions, and alkyl ammonium ions containing up to about 10 carbon atoms; Z is $—CH_2PO_3M_1M_2$, $C_{1\text{-}4}$ alkanol, $C_{1\text{-}4}$ alkyl carboxylic acid or $C_{1\text{-}10}$ alkaminomethylene phosphonic acid; and Q is selected from the group consisting of $C_{3\text{-}15}$ alkylene, $C_{3\text{-}15}$ alkenylene, and alkaryl radicals.

4,033,897

FLASH POINT DETERMINATION CALIBRATION STANDARDS

Alfred J. Barnard, Jr., and Russell C. Lance, Jr., both of Bethlehem, Pa., assignors to J. T. Baker Chemical Company, Phillipsburg, N.J.

Filed Apr. 19, 1976, Ser. No. 678,228

Int. Cl.^{2} C09K *3/00;* **G01N** *25/52*

U.S. Cl. 252—408 **5 Claims**

1. A flash point determination reference standard calibration mixture for a flash point calibration temperature of 73° F., said standard calibration mixture not exhibiting any substantial change in the flash point value on partial evaporation of the mixture and consisting essentially of a mixture of about 76% by weight ethylbenzene and about 24% by weight m-xylene.

4,033,898

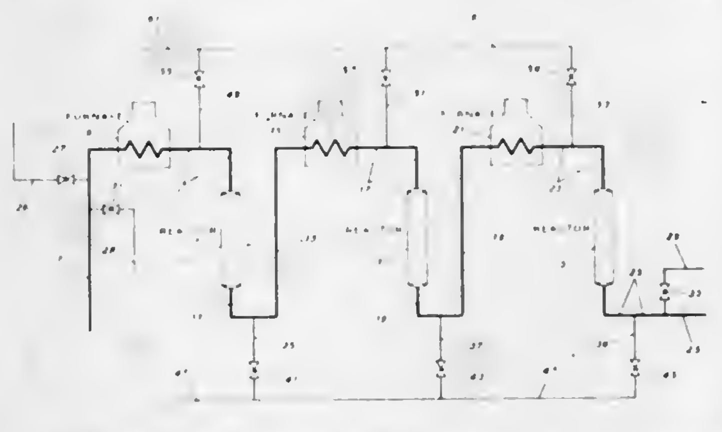
IN SITU HYDROCARBON CONVERSION CATALYST REGENERATION WITHOUT SULFUR CONTAMINATION OF VESSELS COMMUNICATING WITH CATALYST REACTOR

Robert L. Jacobson, Pinole, and Robert M. Ormiston, San Anselmo, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Dec. 22, 1975, Ser. No. 643,581

Int. Cl.^{2} B01J *21/20, 23/96;* **C10G** *35/08*

U.S. Cl. 252—416 **6 Claims**



1. A process for regenerating a catalyst contaminated with carbonaceous deposits in situ in a catalytic hydrocarbon conversion unit including a reactor vessel containing a bed of catalyst comprising a Group VIII metal on an alumina carrier and including a sulfur-contaminatable vessel communicating with said reactor by a conduit, wherein said catalyst has previously become at least partially deactivated by contact with a sulfur-containing hydrocarbon, a process for removing sulfur from said unit comprising the steps of:

- a. burning substantially all of the carbonaceous deposits on the catalyst and forming sulfur dioxide in said unit by passing an oxygen-containing gas stream through said reactor in contact with said bed of catalyst and through said sulfur-contaminatable vessel, at a temperature of about 500° F to about 1000° F, and removing the resulting gas from said unit;

b. forming a sulfur-containing gas in said reactor by contacting a hydrogen-containing gas with said bed of catalyst at a temperature of about 500° F to about 1000° F, passing the resulting sulfur-containing gas from said reactor into said conduit, and withdrawing said sulfur-containing gas from said unit through an opening in said conduit; and

c. continuously passing a stream of an inert gas through said sulfur-contaminatable vessel into said conduit and through said conduit toward said reactor at a rate sufficient to prevent substantially all said sulfur-containing gas from entering said sulfur-contaminatable vessel while carrying out step (b), and withdrawing said inert gas stream from said conduit in admixture with said sulfur-containing gas.

5. A process according to claim 1 wherein said vessel comprises a furnace.

6. A process according to claim 5 wherein said vessel further includes a second reactor containing a second bed of said catalyst, said second reactor communicating with said furnace.

4,033,899

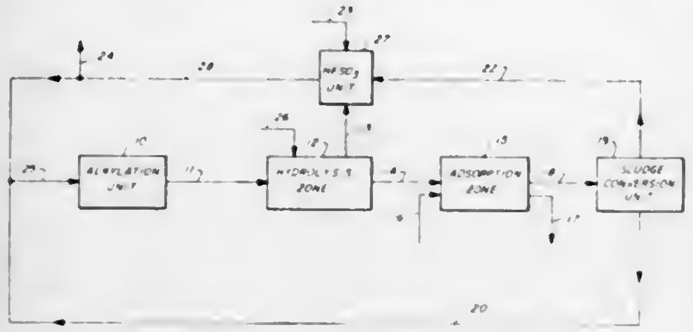
ALKYLATION FLUOSULFONIC-SULFURIC ACID CATALYST RECOVERY PROCESS WITH SILICA-ALUMINA REMOVAL OF FLUORIDE COMPOUNDS

Richard H. Bennett; Byron V. Klock, and James W. Brockington, all of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Continuation-in-part of Ser. No. 537,631, Dec. 30, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 641,804

Int. Cl.² B01J *37/00;* C01B *17/46;* C07C *3/54*

U.S. Cl. 252—420 5 Claims



1. A process for the removal of fluoro compounds from spent sulfuric acid-fluorosulfonic acid alkylation catalyst, wherein said fluoro compounds comprise about 15,000–30,000 ppmw, calculated as HF, of said spent catalyst; which process comprises:

a. reacting, in a hydrolysis zone, said spent catalyst, at sub-atmospheric pressure, at a temperature in the range of from about 50° to about 120° C in the presence of at least; about 3 weight percent water for a period in the range of about 1–8 hours, for production of a first vapor phase comprising mainly hydrogen fluoride and a first liquid phase comprising sulfuric acid, and containing about 800 ppm or less fluoro compounds;

b. contacting, in an adsorption zone, said first liquid phase with a fluidizable silica-alumina cracking catalyst in an amount equivalent to about 0.3–5 weight percent of said first liquid phase for a period of time in the range of about 1–8 hours, at a temperature in the range of about 50°–120° C for production of a second liquid phase comprising said cracking catalyst containing fluoro compounds; and

c. separating, in a solid-liquid separation zone, said second liquid phase from said first solid phase for production of an effluent acid containing the greater part of said sulfuric acid present in said spent catalyst and containing about 10 ppmw or less fluoride compounds.

4. A process for the regeneration of spent sulfuric acid-fluorosulfonic acid alkylation catalyst containing about 15,000–30,000 ppmw, calculated as HF, fluoro compounds, which process comprises:

a. reacting, in a hydrolysis zone, said spent alkylation catalyst, at subatmospheric pressure, at a temperature in the range of from about 80° to about 110° C in the presence of of about 3–15 weight percent water for a period in the range of about 4–8 hours, for production of a first vapor phase comprising mainly hydrogen fluoride and a first liquid phase comprising sulfuric acid and containing about **800** ppm or less residual fluoro compounds;

b. flowing said first vapor phase overhead from said hydrolysis zone into a fluorosulfonic acid generation zone;

c. treating said first vapor phase with sulfur trioxide to form regenerated fluorosulfonic acid from said hydrogen fluoride present in said first vapor fraction;

d. flowing said first liquid phase from said hydrolysis zone into an adsorption zone;

e. contacting, in said adsorption zone, said first liquid phase with a fluidizable silica-alumina cracking catalyst in an amount equivalent to about 0.3–5.0 weight percent of said first liquid phase for a period of time in the range of about 1–8 hours, at a temperature in the range of about 50°–120° C sufficient to react a major portion of said residual fluoro compounds with said cracking catalyst for production of a second liquid phase comprising sulfuric acid and containing **10** ppm or less fluoro compounds;

f. separating, in a solid-liquid separation zone, said second liquid phase from said cracking catalyst for production of an effluent acid free of cracking cataylst, comprising sulfuric acid and containing about 10 ppmw or less fluoro compounds;

g. combusting said effluent acid to convert said sulfuric acid to sulfur dioxide;

h. converting at least a portion of said sulfur dioxide to sulfur trioxide;

i. absorbing a portion of said sulfur trioxide from step (h) into a sulfuric acid solution for production of regenerated sulfuric acid;

j. flowing a portion of said sulfur trioxide from step (h) to said fluorosulfonic acid regeneration zone of step (c); and

k. combining said regenerated fluorosulfonic acid with said regenerated sulfuric acid acid in a weight ratio of from about 0.11/1 to about 0.32/1 respectively to produce fresh alkylation catalyst.

4,033,900

COMPOSITION USEFUL IN ANIONIC POLYMERIZATION

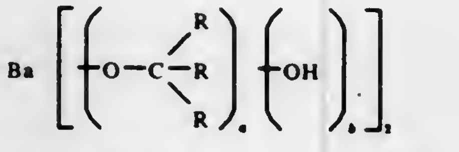
Ivan Glen Hargis, Tallmadge; Russell Anthony Livigni, and Sundar Lal Aggarwal, both of Akron, all of Ohio, assignors to The General Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 593,579, July 7, 1975, Pat. No. 3,992,561. This application Apr. 23, 1976, Ser. No. 679,634

Int. Cl.² C08F *4/48*

U.S. Cl. 252—431 L 12 Claims

1. A composition of matter useful in anionic polymerization and comprising a complex of (1)



$$Ba\left[\left(-O-C\begin{matrix}R\\R\\R\end{matrix}\right)_a\left(-OH\right)_b\right]_2$$

where at least one R is a methyl or cyclohexyl radical and where the remaining Rs are selected from the group consisting of alkyl and cycloalkyl radicals having from 1 to 6 carbon atoms which may be the same or different and where the mol ratio of *a* to *b* is from about 99.5:0.5 to 88:12 and (2) R'Li in which R' is selected from the group consisting of normal, secondary and tertiary alkyl and cycloalkyl radicals having from 2 to 20 carbon atoms, the mol ratio of (1) to (2), based on barium metal and lithium metal, being from about 0.30:1 to 0.75:1.

4,033,901

SHAPED, BONDED BORIDE CATALYSTS

Ernest P. Buinicky, Newburgh; Joseph A. Durkin, Fishkill, and John H. Estes, Wappingers Falls, all of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed Feb. 6, 1976, Ser. No. 656,048

Int. Cl.² B01J *21/02, 23/16;* C04B *35/58, 35/00*

U.S. Cl. 252—432 5 Claims

1. A shaped catalyst material having improved crush strength for catalyzing the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide to the corresponding oxirane, consisting essentially of 80 to 95 percent by weight of finely divided particles of tungsten boride intimately bonded by 5 to 20 percent by weight of preoxidized aluminum powder having an oxide coating constituting from 5 to 10 percent by volume of said powder.

4,033,902

COBALT-PLATINUM CATALYST

Guenther Fritz Lengnick, Adrian, Mich., assignor to SWS Silicones Corporation, Adrian, Mich.

Continuation-in-part of Ser. No. 471,750, April 20, 1974, abandoned, which is a continuation of Ser. No. 273,676, July 20, 1972, abandoned, which is a division of Ser. No. 214,445, Dec. 30, 1971, Pat. No. 3,714,212. This application July 21, 1975, Ser. No. 597,940

Int. Cl.² B01J *27/06, 27/20;* C01G *1/04;* C01B *9/00*

U.S. Cl. 252—441 4 Claims

1. A method for preparing a cobalt-platinum catalyst which will catalyze the addition of SiH containing compounds to unsaturated organic compounds which consists essentially of reacting platinum dichloride with dicobalt octacarbonyl in a 1:1 mol ratio in the presence of an ether solvent having a boiling point up to about 102° C and at a temperature up to about 52° C.

4,033,903

PROCESS FOR PREPARING MODIFIED SILVER CATALYSTS

Ian E. Maxwell, Haarlem, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 19, 1976, Ser. No. 678,106

Claims priority, application United Kingdom, Mar. 25, 1976, 12129/76

Int. Cl.² B01J *23/50*

U.S. Cl. 252—476 2 Claims

1. A process for preparing modified silver catalyst which comprises

(a) heating a catalyst comprising from about 1 to about 35 percent by weight of the total catalyst of silver on a porous refractory support to a temperature between about 150° C to about 900° C;

b. impregnating the catalyst of step (a) with a solution comprising a solvent and a salt of an alkali metal wherein the cation is selected from the group consisting of potassium, rubidium, cesium or mixtures thereof, and the anion is selected from the group consisting of hydroxides, chlorides, iodides, bromides, bicarbonates, carbonates, alkoxides, acetates, oxalates, tartrates and lactates, the amount of said salt being sufficient to deposit on said support from about 0.00004 to about 0.008 gram equivalent weight per kilogram of total catalyst of said alkali metal, and,

c. removing said solvent from the impregnated support.

4,033,904

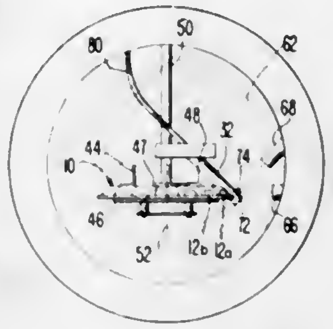
INTERCHANGEABLE SPECIMEN TRAYS AND APPARATUS FOR A VACUUM TYPE TESTING SYSTEM

Robert L. Gerlach, Los Altos, and George D. Rossini, Mountain View, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation of Ser. No. 453,749, March 22, 1974, abandoned. This application Dec. 24, 1975, Ser. No. 644,284

Int. Cl.² G21K *5/06*

U.S. Cl. 250—491 16 Claims



1. In apparatus for examining samples: vacuum envelope means defining a vacuum chamber, an axially elongated shaft rotatively mounted in the chamber, a radially extending sample holder support affixed to the shaft, a sample holder removably mounted on the support coaxially of the shaft and having a radially extending slot in which the shaft is received, said sample holder having a plurality of sample receiving zones spaced peripherally of the holder a predetermined distance from the center thereof, a sealable aperture in the envelope means permitting installation and removal of the sample holder, a test probe constrained for rotation with the sample holder support, said test probe being positioned in the slot and aligned with the sample zones, a radiation source for directing radiation to a stationary target zone at the periphery of the sample holder, means for rotating the shaft and support to rotate the sample holder and thereby selectively align the test probe or one of the sample zones with the target zone, and examining means responsive to the effect of radiation on a sample in the target zone.

4,033,905

METHOD FOR INCREASING THE CONDUCTIVITY OF ELECTRICALLY RESISTIVE ORGANIC MATERIALS

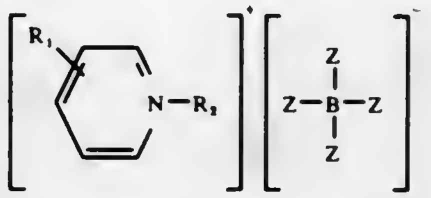
Allen Bloom, East Windsor, and Daniel Louis Ross, Princeton, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 5, 1975, Ser. No. 629,086

Int. Cl.² H01B *1/00*

U.S. Cl. 252—500 9 Claims

1. A method for increasing the conductivity of resistive organic material selected from the group consisting of silicone rubber, polyester thermoplastic resin and liquid crystals, which comprises adding to said organic material a resistivity-lowering compound of the formula:



wherein

R_1 is selected from the group consisting of hydrogen, C_1C_4 alkyl, and phenyl-substituted C_1-C_4 alkyl

R_2 is an alkyl group having 8–20 carbon atoms; and

Z is selected from the group consisting of phenyl, and C_1-C_4 alkyl-substituted phenyl.

4,033,906

CERAMICS HAVING NONLINEAR VOLTAGE CHARACTERISTICS AND METHOD FOR PRODUCING SAME

Ikuo Nagasawa, and Kazuo Mukae, both of Kawasaki, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Filed June 3, 1975, Ser. No. 583,358

Claims priority, application Japan, June 3, 1974, 49-62656; June 3, 1974, 49-62657

Int. Cl.² C04B *35/00;* **H01C** *7/10*

U.S. Cl. 252—519 **11 Claims**

1. A ceramic having non-linear voltage characteristics consisting essentially of the calcined product obtained on calcining in air a mixture of (a) zinc oxide as a principal component and (b) cobalt plus one of praseodymium or terbium, either in elemental form or as a compound thereof, as subcomponents, in an amount of from 0.1 to 8.0 atomic % for the cobalt, from 0.08 to 8.0 atomic % for the praseodymium and from 0.1 to 8.0 atomic % for the terbium, each calculated as cobalt, praseodymium and terbium.

4,033,907

RECLAIMING WASTE PLASTICS

William D. Wolf, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed July 7, 1975, Ser. No. 593,604

Int. Cl.² C08J *11/04*

U.S. Cl. 260—2.3 **9 Claims**

1. In a process for recycling non-cellular molecularly oriented thermoplastic material which includes the steps of:
  reducing the material to the form of platelets; and
  melt processing such material via a rotating screw during refabrication of articles therefrom;
  the improvement in said process comprising, in combination, the step of:
  heating the molecularly oriented platelets to within the molecular orientation temperature range of the thermoplastic material prior to such melt processing to relieve stresses in the platelets without causing substantial fusing of adjacent platelets whereby the surface area is decreased to improve the screw feeding characteristics.

4,033,908

POLYISOCYANURATE COMPOSITIONS AND FOAMS OF IMPROVED FRIABILITY AND PROCESS OF PREPARING SAME

Henry S. Hopkins, Jr., Ashland, Ohio, and Donald L. Vargo, Blama, Sierra Leone, assignors to General Latex and Chemical Corporation, Cambridge, Mass.

Filed Aug. 25, 1975, Ser. No. 607,201

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AW **19 Claims**

1. In a process of preparing a polyisocyanurate foam, which process comprises: reacting a polyisocyanate in the presence of a trimerization catalyst and an expanding amount of an inert blowing agent in a foamable composition to provide a polyisocyanurate foam, the improvement which comprises:
  carrying out the reaction in the presence of a plasticizing amount of a nonreactive liquid organic carbonate, thereby producing a polyisocyanurate foam having improved friability and dimensional stability properties.

4,033,909

STABLE PHENOLIC RESOLES

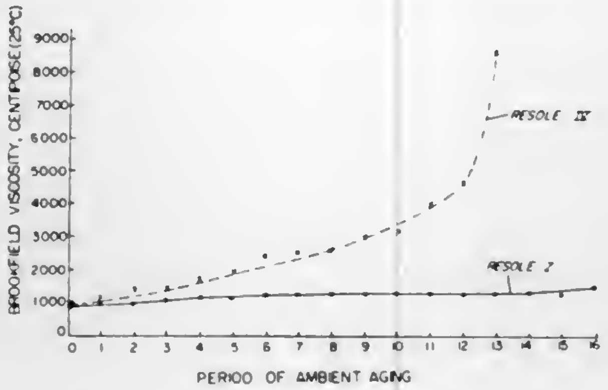
Anthony Joseph Papa, Saint Albans, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 497,072, Aug. 13, 1974, abandoned. This application July 14, 1975, Ser. No. 595,744

Int. Cl.² C08G *8/08, 8/10;* **C08J** *9/00*

U.S. Cl. 260—2.5 F **34 Claims**

1. Foamable phenolic resoles which are free of ionic species removable by the free acid form of a cation exchange resin and the hydroxyl form of a strongly basic anion exchange resin and having a water content of no more than about 10 weight percent.



4,033,910

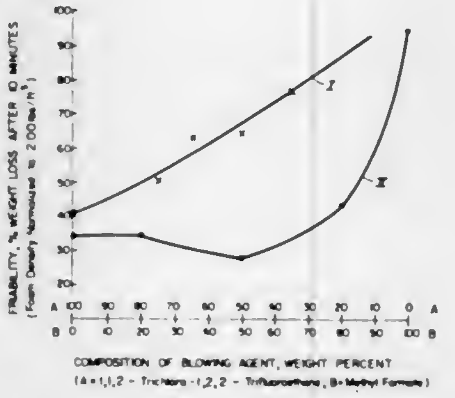
METHYL FORMATE AS AN ADJUVANT IN PHENOLIC FOAM FORMATION

Anthony Joseph Papa, Saint Albans, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,243

Int. Cl.² C08J *9/14*

U.S. Cl. 260—2.5 F **14 Claims**



1. A blend containing: (A) a phenolic resole, (B) methyl formate and (C) 1,1,2-trichloro-1,2,2-trifluoroethane, wherein the total combined weight of (B) and (C) is from about 2 to about 40 parts by weight per 100 parts by weight of (A) and, of the total combined weight of (B) and (C) contained in the blend, from about 5 to about 80 weight percent is methyl formate, provided the blend contains at least 0.4 and no more than about 20 parts by weight of methyl formate per 100 parts by weight of component (A).

4,033,911

PROCESS FOR CATALYZING POLYURETHANE FOAM FORMATION USING N,N-DIMETHYL-AMINOALKOXY-PROPIONITRILES

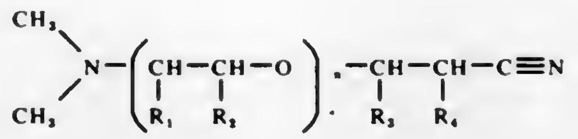
Michael Ray Sandner, Chappaqua, and Bela Prokai, Mahopac, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 24, 1976, Ser. No. 699,459

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AC **37 Claims**

1. A method for producing a cellular urethane polymer which comprises reacting and foaming a reaction mixture containing: (1) an organic polyol reactant comprising a polyether polyol having an average hydroxyl functionality of at least two; (2) an organic polyisocyanate reactant having an average isocyanate functionality of at least two; (3) a blowing agent; and (4) a catalytically effective amount of a catalyst system comprising an N,N-dimethylaminoalkoxypropionitrile having the formula,



$$(CH_3)_2N-\left(\underset{R_1}{CH}-\underset{R_2}{CH}-O\right)_n-\underset{R_3}{CH}-\underset{R_4}{CH}-C\equiv N$$

wherein:
  R_1 and R_2 each represents hydrogen, methyl or ethyl provided R_1 and R_2 cumulatively have no more than 2 carbon atoms;
  R_3 and R_4 each represents hydrogen, methyl or ethyl provided R_3 and R_4 cumulatively have no more than 2 carbon atoms; and
  n has an average value of at least 1 and no more than about 5.

4,033,912

PROCESS FOR MOLDING POLYURETHANE FOAMS

Helmut Kleimann, and Wulf von Bonin, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Nov. 6, 1974, Ser. No. 521,426

Claims priority, application Germany, Nov. 13, 1973, 2356692

Int. Cl.² C08G *18/14, 18/77;* **C08K** *5/54*

U.S. Cl. 260—2.5 AH **11 Claims**

1. In a process for making molded polyurethane foams wherein a foamable reaction mixture is foamed in a closed mold, the improvement which comprises including in the foamable reaction mixture as an internal mold release agent a reaction product of an organic monoisocyanate or polyisocyanate and a polysiloxane which contains 1 to 6 $—CH_2—N—H—(C_1$ to C_8 alkyl) or $—CH_2—NH—(C_3$ to C_8 cycloalkyl) groups in the molecule.

2. In a process for making molded polyurethane foams wherein a foamable reaction mixture is foamed in a closed mold, the improvement which comprises including in the foamable reaction mixture as an internal mold release agent a reaction product of an organic monoisocyanate or polyisocyanate and a polysiloxane represented by the general formula:

$$AR_2SiO—(R_2SiO)_nSiR_2A$$

in which
  n represents 3 to 300
  R represents i a methyl or phenyl groups, and
  A represents $—CH_2—OH$ or $—CH_2—NH—(C_1$ to C_8 alkyl) or $—CH_2—NH—(C_3$ to C_8 cycloalkyl).

4,033,913

CELLULOSE AND CELLULOSE PRODUCTS MODIFIED BY SILICIC ACID

Olof Sundén, 22 Snickarvagen, S 181 46 Lidingo, Sweden

Filed May 16, 1975, Ser. No. 578,043

Int. Cl.² C08L *1/10*

U.S. Cl. 260—17 R **15 Claims**

1. A composition comprising cellulose fibers, polysilicic acid, and a binder material, said cellulose fibers and polysilicic acid forming a cellulose polysilicic acid capillary structure having an internal capillarity corresponding to a BET-surface of 200-800 m²/g polysilicic acid by absorbing a water based solution of monomer and oligomer silicic acids having a pH of between 1 and 5 into said cellulose fibers and polycondensating said monomer and oligomer silicic acids, and said binder material being adhered to said capillary structure.

4,033,914

WATER RESISTANT CORRUGATING ADHESIVE CONTAINING AMINOHYDROXY COMPOUND

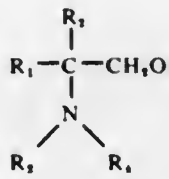
Edward M. Bovier, and John E. Voigt, both of St. Louis County, Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed Feb. 23, 1976, Ser. No. 660,171

Int. Cl.² C08L *3/02*

U.S. Cl. 260—17.2 **7 Claims**

1. A method of making a starch based adhesive comprising the steps of:
  a. preparing an aqueous alkaline starch carrier containing a portion of the total starch solids,
  b. mixing therein the remaining portion of the total starch solids, a resin selected from the group consisting of ketone-aldehyde, urea-formaldehyde, phenol-aldehyde, resorcinol-aldehyde, and mixtures thereof, and a primary, secondary or tertiary amine compound of the following formula:



$$R_1-\overset{R_3}{\underset{|}{C}}-CH_2OH \quad \text{with } N(R_2)(R_4) \text{ on } C$$

wherein R_1, R_2, R_3, and R_4 are the same or different and are hydrogen, alkyl groups of 1 to 3 carbon atoms, or hydroxyalkyl groups of 1 to 3 carbon atoms, wherein the pH of the adhesive is about 10 to about 12.5.

4,033,915

FLAME-EXTINGUISHING POLYOLEFIN COMPOSITIONS

Guido Bertelli; Pierpaolo Roma, both of Ferrara, and Paolo Longi, Milan, all of Italy, assignors to Montedison S.p.A., Milan, Italy

Filed July 22, 1975, Ser. No. 598,123

Claims priority, application Italy, Aug. 2, 1974, 25928/74

Int. Cl.² C08K *5/56, 5/00*

U.S. Cl. 260—28.5 A **6 Claims**

1. Self-extinguishing polyolefin compositions consisting of a mixture of:
  A. 100 parts by weight of a homopolymer of ethylene or of an alpha-olefin, or a copolymer of ethylene and an alpha-olefin;
  B. a flame-extinguishing agent which consists of the product obtained by reacting
    1. a compound having the general formula MR_mX_n, in which M is bismuth; R is selected from the group consisting of alkyl, cycloalkyl, aryl and alkaryl having up to 20 carbon atoms, and the group $—OR^1$ wherein R^1 has a molecular weight of up to 400 and is selected from the group consisting of hydrocarbon groups and hydrocarbon groups containing ether oxygen atoms; X is chlorine or bromine; *m* and *n* are zero or integers from 1 to 5, the sum *m* + *n* being equal to the valency of M, and
    2. a compound selected from:
      a. a saturated or unsaturated hydrocarbon polymer, or a saturated or unsaturated non-polymeric hydrocarbon having more than 6 carbon atoms; and
      b. a polymeric or non-polymeric, partially halogenated, thermally unstable compound that decomposes when subjected to heating, resulting in the formation of the corresponding hydrogen halide;
  said flame extinguishing agent being present in such amount as to provide a metal content in the polymer of (A) ranging from 0.5 to 5% by weight; and
  C. 0 to 10 parts by weight of a partially chlorinated or brominated compound, said compound being thermally unstable and being capable of decomposing when sub-

jected to heating, resulting in the formation of hydrochloric or hydrobromic acid.

6. Self-extinguishing polymeric compositions made up of a mixture of:

- A. predominantly isotatic polypropylene; and
- B. a flame extinguishing agent, consisting of the product obtained by reacting bisumuth trichloride with a chlorinated paraffin wax containing 40 to 75% by weight of chlorine, said flame extinguishing agent being present in such an amount as to provide a bismuth content in the polymer of A of between 0.5 and 5% by weight.

4,033,916
TERNARY FLAME-RETARDED COMPOSITIONS INCLUDING IRON OXIDE

William Paul Whelan, Jr., Woodbury, Conn., assignor to Uniroyal Inc., New York, N.Y.

Continuation-in-part of Ser. No. 515,799, Oct. 17, 1974, abandoned. This application Sept. 10, 1975, Ser. No. 612,147

Int. Cl.² C08K *3/22*

U.S. Cl. 260—28.5 A **13 Claims**

2. A composition comprising an organic polymer selected from the group consisting of acrylonitrile-butadiene rubber and a plastic terpolymer of acrylonitrile, butadiene and styrene, and: (a) from 1 to 110 parts by weight per 100 parts by weight of said organic polymer of a non-polymeric organic additive selected from the group consisting of chlorine-substituted and bromine-substituted aliphatic, aromatic and alicyclic hydrocarbyl compounds having a halogen content in the range of from 35 to 80 weight percent and optionally containing oxygen substituents in the form of hydroxyl or anhydride groups and which can alternatively be polymeric when said organic polymer is said plastic terpolymer and which are substantially non-volatile and stable at polymer processing temperatures, and mixtures thereof; and (b) from 0.1 to 50 parts by weight per 100 parts by weight of said organic polymer of an iron oxide selected from the group consisting of the anhydrous and hydrated forms of ferric oxide and ferrosoferric oxide and mixtures thereof.

9. The composition of claim 2 in which said organic additive is chlorine-containing paraffin wax.

4,033,917
ELECTRODEPOSITION OF AQUEOUS DISPERSIONS OF COPOLYMERS OF POLYETHYLENICALLY UNSATURATED EPOXY-AMINE ADDUCTS

Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed May 12, 1975, Ser. No. 576,714

Int. Cl.² G08K *3/18;* **C08L** *61/20*

U.S. Cl. 260—29.2 N **17 Claims**

1. A nongelled, amine-functional polymer dispersible in water with the aid of a solubilizing acid, said polymer being a copolymer of:

- A. an ethylenically unsaturated hydroxy functional amine adduct free of epoxy groups and containing from about 1.4 to about 2.0 ethylenically unsaturated amine groups per molecule, formed from a polyepoxide having a 1,2-epoxy equivalency of from about 1.4 to about 2.0 and at least a stoichiometric amount of an ethylenically unsaturated primary monoamine; and
- B. copolymerizable monoethylenically unsaturated monomers, a portion of which is amine-functional.

4,033,918
WATER REMOVABLE PRESSURE SENSITIVE ADHESIVE

Rüdiger Hauber, Hamburg, Germany, assignor to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Continuation of Ser. No. 344,309, March 23, 1973, abandoned. This application Nov. 17, 1975, Ser. No. 632,624

Claims priority, application Germany, Mar. 24, 1972, 2214293; July 26, 1972, 2236575

Int. Cl.² C08L *33/08, 33/02, 33/10*

U.S. Cl. 260—29.6 WB **7 Claims**

1. An adhesive composition which comprises an aqueous mixture containing, based on 100 parts weight of the total solids,

- a. 25 to 35 parts by weight of an acrylic acid ester copolymer in dispersed form, said copolymer being cross-linked through its carboxyl groups and containing from 80 to 90% by weight of an acrylic acid ester of an alcohol having 4–12 carbon atoms, and from 10 to 20% by weight of a compound selected from the group consisting of acrylic acid, methacrylic acid, acrylonitrile, vinyl acetate, 2-ethyl hexyl maleinate, diethyl maleinate and mixtures thereof;

  10 to 20 parts by weight of an uncross-linked acrylic acid ester copolymer in dispersed form, said copolymer contains from 80 to 90% by weight of an acrylic acid ester having in its alcohol residue 4–12 carbon atoms, and from 10 to 20% by weight of a compound selected from the group consisting of acrylic acid, methacrylic acid, acrylonitrile, vinyl acetate, 2-ethyl hexyl maleinate, diethyl maleinate and mixtures thereof;
- b. 10 to 20 parts by weight of polyvinylmethyl ether;
- c. 10 to 20 parts by weight of an alkali metal and/or ammonium salt of polyacrylic acid, polymethacrylic acid or of a copolymer of acrylic and methacrylic acids;
- d. 10 to 20 parts by weight of monomeric plasticizer, and
- e. 10 to 15 parts by weight of an emulsifying agent.

4,033,919
DESENSITIZING COMPOSITIONS FOR LITHOGRAPHIC PLATEMAKING AND PRINTING WHICH ARE AQUEOUS SOLUTIONS OF COPOLYMERS OF ACRYLAMIDE WITH A CARBOXYL CONTAINING MONOMER AND A DESENSITIZING ACIDIC ADDITIVE

Leslie Edward Lawson, Orpington, England, assignor to Vickers Limited, London, England

Filed Jan. 31, 1975, Ser. No. 546,098

Claims priority, application United Kingdom, Feb. 4, 1974, 5099/74

Int. Cl.² C08L *33/26*

U.S. Cl. 260—29.6 TA **9 Claims**

1. A desensitising composition for use in lithographic plate making and lithographic printing which composition is an aqueous solution comprising (i) a polymer of acrylamide containing from 1% by weight to 25% by weight of structural units containing carboxyl groups and (ii) acidic desensitising material in an amount such that the pH of the solution is less than 5.5.

4,033,920
PROCESS FOR PRODUCING UNSATURATED RESIN EMULSION

Osamu Isozaki; Tadashi Watanabe, and Masahiro Sakamoto, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed June 10, 1975, Ser. No. 585,770

Claims priority, application Japan, June 14, 1974, 49-67698; July 1, 1974, 49-75166

Int. Cl.² C08L *33/02*

U.S. Cl. 260—29.6 H **8 Claims**

1. A process for producing an aqueous emulsion of unsaturated resin which comprises the steps of: synthesizing polyvinyl resin having an acid value of 50 to 230 and a number average molecular weight of 10,000 to 200,000 by means of solution copolymerization of at least one acid monomer selected from the group consisting of acrylic acid, methacrylic acid, orthophosphoric acid monoacrylate ester and orthophosphoric acid monomethacrylate ester with at least one compound selected from the group consisting of styrene; methyl, ethyl, n-butyl, isobutyl, 2-ethylhexyl, 2-hydroxyethyl, 2-hyroxypropyl and lauryl ester of acrylic acid; methyl, ethyl, n-butyl, isobutyl, 2-ethylhexyl, 2-hydroxyethyl, 2-hydroxypropyl and lauryl ester of methacrylic acid; acrylonitrile; methacrylonitrile; acrylamide; methacrylamide; N-methylol acrylamide; N-methylol methacrylamide; diacetone acrylamide; and diacetone methacrylamide; adding at least one monomer having epoxy group and reactive unsaturated group selected from the group consisting of glycidyl acrylate, glycidyl methacrylate and allylglycidyl ether to said polyvinyl resin to produce unsaturated resin having an acid value of 20 to 60 and an unsaturation degree of 0.5 to 3.0, removing the polymerization solvent under reduced pressure, neutralizing residual acid groups with 0.4 to 1.2 equivalent of base and dispersing the neutralized product into water.

4,033,921
WATER-SOLUBLE HYDROXYALKYLATED AND ALKOXYALKYLATED COMPOSITIONS DERIVED FROM N-3-OXO-HYDROCARBON-SUBSTITUTED ACRYLAMIDES

Lester Earl Coleman, Willoughby Hills, Ohio, assignor to The Lubrizol Corporation, Cleveland, Ohio

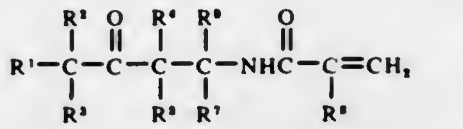
Division of Ser. No. 533,361, Dec. 16, 1974, Pat. No. 3,959,224, which is a continuation-in-part of Ser. No. 111,676, Dec. 1, 1971, abandoned, which is a continuation-in-part of Ser. No. 833,162, June 13, 1969, abandoned, which is a continuation-in-part of Ser. No. 751,715, Aug. 12, 1968, abandoned. This application Aug. 25, 1975, Ser. No. 607,847

Int. Cl.² C08L *29/12, 35/00*

U.S. Cl. 260—29.6 H **7 Claims**

1. An aqueous latex of an addition interpolymer of at least one polymerizable unsaturated monomer with a polymerizable water-soluble composition consisting essentially of:

- A. compounds of the formula



$$R^1-\underset{R^3}{\overset{R^2}{C}}-\overset{O}{\overset{\|}{C}}-\underset{R^5}{\overset{R^4}{C}}-\underset{R^7}{\overset{R^6}{C}}-NH\overset{O}{\overset{\|}{C}}-\underset{R^8}{C}=CH_2$$

  wherein each of R^1, R^2, R^3, R^4 and R^5 is hydrogen, a hydrocarbon or substituted hydrocarbon radical, a hydroxyalkyl radical having not more than 4 carbon atoms, or an alkoxy derivative of said hydroxyalkyl radical, at least one of R^1, R_2, R^3, R^4 and R^5 being a hydroxyalkyl radical or alkoxy derivative thereof; each of R^6 and R^7 is hydrogen or a hydrocarbon or substituted hydrocarbon radical; and R^8 is hydrogen, halogen or a lower alkyl radical; with the proviso that the substituents on said substituted radicals do not alter significantly the character or reactivity of said radicals; and
- B. condensation dimers and trimers of said compounds.

4,033,922
SYNTHETIC SIZES

Joseph J. Baron, Jr., Morris Plains, and Sherman Krefting, Teaneck, both of N.J., assignors to Diamond Shamrock Corporation, Cleveland, Ohio

Division of Ser. No. 481,214, June 20, 1974, Pat. No. 3,974,326. This application Mar. 30, 1976, Ser. No. 671,967

Int. Cl.² C08F *220/06*

U.S. Cl. 260—29.6 RW **3 Claims**

1. A synthetic size for use on yarn in a water jet loom comprising an aqueous solution of a copolymer comprising from about 97% to about 85% by weight of methacrylic acid and from about 3% to about 15% by weight of a comonomer selected from the group consisting of acrylic acid and vinylethoxytetraethylene glycol.

4,033,923
COLORING RESINS BY MIXING NAPHTHACENEQUINONES THEREWITH

Michihiro Tsujimoto, Tachikawa; Ryoichi Tsukahara, Yokohama; Tsutomu Nishizawa, Kamakura, and Ichiro Okubo, Hachioji, all of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

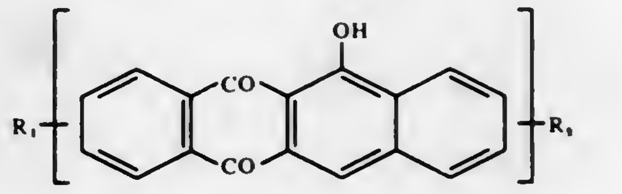
Division of Ser. No. 544,820, Jan. 28, 1975, Pat. No. 3,986,826. This application Feb. 4, 1976, Ser. No. 655,011

Claims priority, application Japan, Feb. 7, 1974, 49-14892

Int. Cl.² C08L *77/02, 61/20, 67/00*

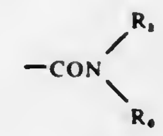
U.S. Cl. 260—37 N **10 Claims**

1. A method for coloring a synthetic or semisynthetic organic resin comprising mixing said resin with a naphthacenequinone derivative having the formula:



wherein R_1 is selected from the group consisting of hydrogen, chlorine, hydroxyl and amino; and R_2 is selected from the group consisting of

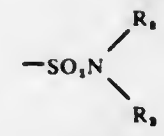
- i. -13 $COOR_4$ wherein R_4 is a member selected from the group consisting of hydrogen, alkyl, alkoxyalkyl, cyclohexyl, aralkyl and cations;
- ii.



$$-CON\begin{matrix}R_5\\R_6\end{matrix}$$

wherein R_5 and R_6 are members selected from the group consisting of hydrogen, alkyl and aryl;

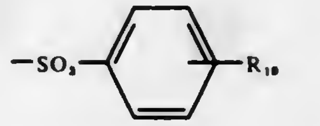
- iii. $-CONH-R_7$ wherein R_7 is amino;
- iv.



$$-SO_2N\begin{matrix}R_8\\R_9\end{matrix}$$

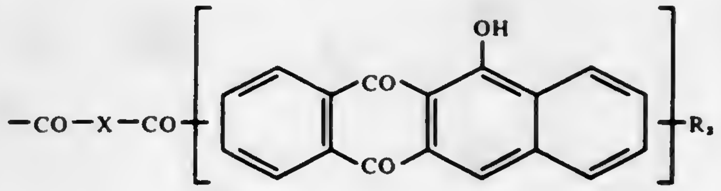
wherein R_8 and R_9 are hydrogen, alkyl, alkoxyalkyl, and aryl;

- v.



wherein R_{10} is a member selected from the group consisting of methyl or chlorine;

- vi. $-SO_3-R_{11}$ wherein R_{11} is a cation; and



substituted at an optional position and wherein X is hydrazo or aromatic diamino and R_3 is optionally positioned and is selected from the group consisting of hydrogen, chlorine, hydroxyl and amino.

4,033,924
HEAT CURABLE ORGANOPOLYSILOXANE COMPOSITIONS CONTAINING ADHESION ADDITIVES

Katsutoshi Mine, Ichihara; Minoru Nishio, Chiba, and Shinichi Sumimura, Ichihara, all of Japan, assignors to Toray Silicone Company, Ltd., Ichihara, Japan

Filed Oct. 26, 1976, Ser. No. 735,721

Claims priority, application Japan, Dec. 15, 1975, 50-148443

Int. Cl.² C08L *83/04*

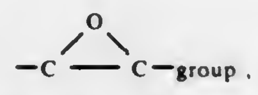
U.S. Cl. 260—37 SB **2 Claims**

1. A heat curable organopolysiloxane composition which consists of

1. 100 parts by weight of an organopolysiloxane having the general formula

$R_aSiO_{4-a/2}$

wherein R is a hydroxy group, an alkoxy radical containing 1–4 carbon atoms or a substituted or unsubstituted hydrocarbon radical containing 1–8 carbon atoms, *a* is 1–3 and at least 25 mol percent of the R groups are monovalent unsubstituted hydrocarbon groups,
2. 0–400 parts by weight of particulate of fibrous filler,
3. 0.01–10 part by weight of an organic peroxide catalyst and,
4. 0.01–20 parts by weight of an organosilicon compound having
   i. at least one $A(R'O)_2Si$— group attached thereto wherein A is a monovalent hydrocarbon group containing at least one



R′ is a low molecular weight alkyl group, and
   ii. at least one alkyl group containing 1–4 carbon atoms or
   iii. at least one low molecular weight alkenyl group or hydrogen atom bound to silicon.

4,033,925
MONOMERIC FURFURYL ALCOHOL-RESORCINOL FOUNDRY BINDERS

Hugh C. Anderson, Palatine, Ill., assignor to The Quaker Oats Company, Chicago, Ill.

Filed July 12, 1976, Ser. No. 704,329

Int. Cl.² C08K *3/36*

U.S. Cl. 260—42.53 **10 Claims**

1. The method of manufacturing foundry sand shapes for use as cores and molds comprising placing a sand mix in the shaping element and hardening the mix in the shaping element, the sand mix comprising sand, an acid catalyst, and a monomeric mixture of furfuryl alcohol and resorcinol, comprising 2–45 percent resorcinol.

4,033,926
FLAME RETARDANT EPOXY RESIN COMPOSITIONS

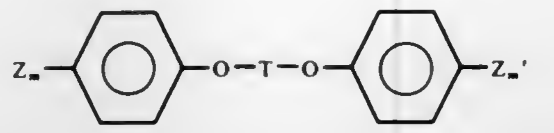
Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 330,843, Feb. 8, 1973. This application Apr. 29, 1976, Ser. No. 681,432

Int. Cl.² C08K *5/06*

U.S. Cl. 260—45.75 B **26 Claims**

1. A plastic composition comprising a three component system consisting of (1) an epoxy resin polymer, (2) a bis-phenoxy compound, which functions as a flame retardant for said composition, having the formula



wherein (a) Z is bromine; (b) *m* and *m′* are independent and are integers having a value of from 1 to 5 with the proviso that the bromine atom content is from 6 to 10 bromine atoms; and (c) T is a straight or branched chain carbon group having from one to four carbon atoms, and (3) a flame retardant enhancing agent.

4,033,927
FLAME RETARDANT POLYESTER RESIN COMPOSITIONS

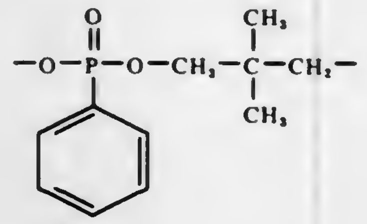
Willem F. H. Borman, Pittsfield, Mass., assignor to General Electric Company, Pittsfield, Mass.

Continuation of Ser. No. 194,519, Nov. 1, 1971, abandoned. This application Jan. 15, 1975, Ser. No. 541,344

Int. Cl.² C08K *5/53*

U.S. Cl. 260—45.7 P **1 Claim**

1. A flame retardant thermoplastic composition comprising:
a. a normally flammable high-molecular weight poly(1,4-butylene terephthalate) resin and;
b. as a flame retardant additive, the reaction product of neopentyl glycol and phenyl phosphonic dichloride, said reaction product being a single unit or being 2 to 50 repeating units of the formula;



4,033,928
STABILIZED EPOXY RESINS

Donald Richard Randell, Stockport; Barry Cook, Manchester, and Alexander Michael Chalmers, Cheadle, all of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

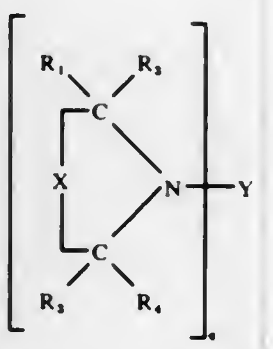
Filed Apr. 1, 1975, Ser. No. 564,185

Claims priority, application United Kingdom, Apr. 11, 1974, 16127/74

Int. Cl.² C08K *5/00*

U.S. Cl. 260—45.8 N **9 Claims**

1. A method of stabilizing an epoxy resin by incorporating therein as a stabilizer substantially only at least one sterically hindered cyclic amine of the formula



and salts thereof, wherein *q* is 1 or 2, *X* represents an organic grouping which complements the nitrogen-containing ring to give 5-membered, 6-membered or 7-membered ring, R_1 and

R_2 represent methyl or together represent —$(CH_2)_5$—, R_3 represents methyl, R_4 represents alkyl with 1-5 carbon atoms or together with R_3 represents the radicals —$(CH_2)_4$—, —$(CH_2)5$—, —CH_2—$C(CH_3)_2$—NH—$C(CH_3$-$)_2$—CH_2—or —CH_2—$C(CH_3)_2$—N(O·)—$C(CH_3)_2$—CH_2-—and, if *q* is 1, *Y* denotes hydrogen,—O·, hydroxyl, alkyl, substituted alkyl, alkenyl, alkynyl, aralkyl, substituted aralkyl or acyl or, if *q* is 2, *Y* denotes alkylene, alkenylene, alkynylene, cycloaklylene or aralkylene.

4,033,929
PLASTIC SKIN ENVELOPES FOR GLASS BOTTLES AND THE LIKE

Claude J. Stiles, Tuscola, and Daniel Tomo, Arthur, both of Ill., assignors to National Distillers and Chemical Corporation, New York, N.Y.

Filed Jan. 14, 1974, Ser. No. 433,169

Int. Cl.² B29C *27/20;* **B29D** *27/00;* **B65D** *11/16*

U.S. Cl. 264—45.9 **9 Claims**

1. A method of producing a seamless lightweight, strong, uniform, multi-ply, oriented foamed layer tubular laminate preform with good opacity adapted to be heat-shrunk onto a tubular substrate rapidly and uniformly, which comprises co-extruding through coaxial annular dies a first and second plastic material, said first plastic material comprising a low density polyethylene and said second plastic comprising an intimate mixture of an ethylene polymer and 0.1%–2% of a blowing agent having a decomposition range above the softening point of the ethylene polymer and below the decomposition temperature of the ethylene polymer, drawing down the resultant tubular foamed laminate at a speed of about 10–25 feet/minute; inflating said tubular foamed laminate wherein the blow-up ratio is about 1:1 to 3:1 such that shrinkage in the machine direction upon application of heat to the resulting laminate will be about 70%–90% and shrinkage in the transverse direction will be about 5%–15% ; cooling said foamed tubular laminate and cutting said laminate to length to form said tubular preform and wherein the non-foamed ply of said final laminated perform is about 10%–20% of the thickness thereof.

4,033,930
FLAME RETARDANT POLYCARBONATE COMPOSITION

Victor Mark, Evansville, Ind., assignor to General Electric Company, Pittsfield, Mass.

Continuation-in-part of Ser. No. 429,121, Dec. 28, 1973, Pat. No. 3,948,851. This application Mar. 26, 1976, Ser. No. 670,679

Int. Cl.² C08K *5/16*

U.S. Cl. 260—45.9 R **10 Claims**

1. A flame retardant aromatic carbonate polymer composition comprising in admixture an aromatic carbonate polymer and a minor amount of a metal salt of a mixture of a monomeric and polymeric aromatic sulfonesulfonate or a metal salt of a polymeric aromatic sulfonesulfonate wherein said metal salts are selected from the group consisting of the alkali metal salts and the alkaline earth metal salts and mixtures thereof.

4,033,931
PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

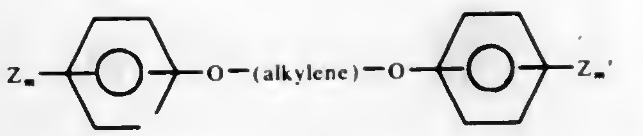
Filed Feb. 8, 1973, Ser. No. 330,841

The portion of the term of this patent subsequent to July 5, 1994, has been disclaimed.

Int. Cl.² C08L *69/00*

U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising a polycarbonate and a flame retardant, said flame retardant consisting of a compound having the formula



wherein (a) Z is bromine; (b) *m* and *m′* are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,033,932
PLASTIC COMPOSITIONS

Arnold L. Anderson, Antioch, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

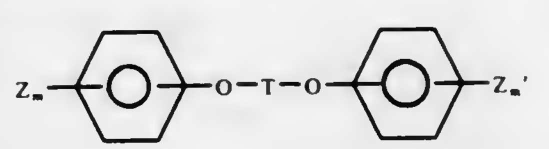
Continuation-in-part of Ser. No. 330,841, Feb. 8, 1973. This application Feb. 9, 1976, Ser. No. 656,224

The portion of the term of this patent subsequent to July 5, 1994, has been disclaimed.

Int. Cl.² C08K *5/06*

U.S. Cl. 260—45.75 B **29 Claims**

1. A plastic composition comprising a three component system consisting of (1) a polycarbonate, (2) a bis-phenoxy compound, which functions as a flame retardant for said composition, having the formula



wherein (*a*) Z is bromine; (*b*) *m* and *m′* are independent and are integers having a value of from 1 to 5 with the proviso that the bromine atom content is from 6 to 10 bromin atoms; and (*c*) T is a straight or branched chain carbon group having from one to four carbon atoms, and (3) a flame retardant enhancing agent.

4,033,933
RUBBER COMPOSITIONS AND METHODS FOR PRODUCTION THEREOF STABILIZED

Akira Shimizu; Manabu Kusano, and Takeshi Takami, all of Ibaragi, Japan, assignors to Kuraray Co., Ltd., Kurashiki, Japan

Filed Oct. 28, 1975, Ser. No. 626,603

Claims priority, application Japan, Oct. 31, 1974, 49-125793

Int. Cl.² C08K *5/17, 5/10, 5/06*

U.S. Cl. 260—45.85 R **10 Claims**

1. A rubber composition comprising (A) a synthetic cis-1,4-polyisoprene rubber stock and (B) from 0.005 to 5 parts by weight per 100 parts by weight of said rubber stock of a high molecular weight alkylene oxide selected from the group consisting of:

1. polyalkylene glycols and polyalkylene glycol monoalkyl ethers having the general formula:

$$RO(C_xH_{2x}O)_aH \qquad (I)$$

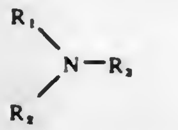
wherein R is hydrogen or an alkyl radical containing 1 to 20 carbon atoms; *x* and *a*, respectively, represent numbers of at least 2;

2. polyalkylene glycol monoesters having the general formula:

$$RCOO(C_xH_{2x}O)_aH \qquad (II)$$

wherein R is an alkyl radical containing 1 to 20 carbon atoms; *x* and *a*, respectively, represent numbers of at least 2;

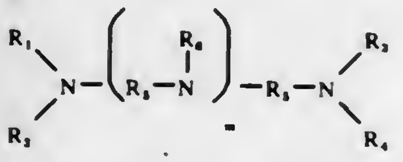
3. the ammonia- or amine-polyalkylene glycol adducts of the general formula:



(III)

wherein at least one of R_1, R_2 and R_3 is $(C_xH_{2x}O)_aH$, and the others can be hydrogen or an alkyl radical containing 1 to 20 carbon atoms; x and a, respectively, represent a number of at least 2; and

4. the alkylene polyamine-polyalkylene glycol adducts having the general formula:



(IV)

wherein at least one of R_1, R_2, R_3 and R_4 is $(C_xH_{2x}O)_aH$ and the others can be hydrogen or an alkyl radical containing 1 to 20 carbon atoms; R_5 is an alkylene radical containing 1 to 6 carbon atoms; R_6 is hydrogen, an alkyl radical containing 1 to 20 carbon atoms or $(C_xH_{2x}O)_aH$; x and a, respectively, represent a number of at least 2; and m is zero or a number of at least 1.

4,033,934

ALKENYL THIOALKYL SILICONES AND METHOD OF PREPARATION

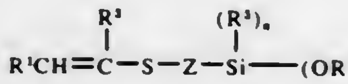
Abe Berger, Schenectady, N.Y., assignor to Abe Berger; Gerhard K. Adam, both of Schenectady, N.Y. and John Stonkus, Dover, N.J.

Filed Feb. 27, 1976, Ser. No. 662,149

Int. Cl.² C08G *77/04*

U.S. Cl. 260—46.5 G **20 Claims**

1. A silicone compound having alkylenethio functional groups and represented by the formula:



$$R^1CH{=}\overset{\displaystyle R^2}{\overset{|}{C}}{-}S{-}Z{-}\overset{\displaystyle (R^3)_n}{\overset{|}{Si}}{-\!\!-}(OR^4)_{3-n}$$

wherein R^1 and R^2 are lower alkyl, phenyl or hydrogen; R^3 is lower alkyl, phenyl or phenylalkyl; R^4 is alkyl containing up to 15 carbon atoms, phenyl or phenylalkyl; Z is a bivalent organic radical selected from the group consisting of alkylene having 1–18 carbon atoms, phenylene, a radical having the structure: $-R^5-Y-R^6-$ wherein Y is oxygen or sulfur, R^5 is lower alkylene or phenylene, R^6 is lower alkylene or phenylene and n is an integer having the value of 0–2.

4,033,935

PROCESS FOR THE PRODUCTION OF AMINO SILICATE COMPOUNDS AND THEIR CONDENSATION PRODUCTS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 559,313, March 17, 1975, Pat. No. 3,979,362, which is a continuation-in-part of Ser. No. 71,628, Sept. 11, 1970, abandoned. This application Jan. 26, 1976, Ser. No. 652,338

Int. Cl.² C08G *12/26;* **C08K** *3/34*

U.S. Cl. 260—67.6 R **12 Claims**

1. The process for the production of poly(aldehyde amino silicate) resinous condensation products by the following steps:

a. mixing about 10 parts by weight of silicic acid, weight calculated on the basic of dried silicic acid, and from about 5 to 20 parts by weight of an amino compound;

b. heating said mixture to a temperature of from about 70° C to above the melting point, but below the boiling point of the amino compound for at least 20 minutes; whereby an amino silicate compound is formed:

c. adding an aldehyde to said mixture in the ratio of 1 to 5 mols to each mol of said amino silicate, heating said mixture to a temperature of from about 70° to 150° C., while agitating, for at least about 20 minutes, whereby a poly(aldehyde amino silicate) resin is produced.

4,033,936

PROCESS FOR THE MANUFACTURE OF FLAME RETARDING LINEAR POLYESTERS

Ulrich Bollert, Hofheim, Taunus; Elmar Lohmar, Rodenkirchen, and Alexander Ohorodnik, Erfstadt, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

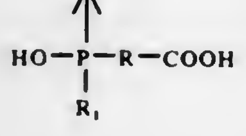
Filed Nov. 17, 1975, Ser. No. 632,782

Claims priority, application Germany, Nov. 15, 1974, 2454189

Int. Cl.² C08G *63/20, 63/68*

U.S. Cl. 260—75 P **4 Claims**

1. In a process for the manufacture os flame retarding linear polyesters by reaction of a dicarboxylic acid capable of forming high molecular weight linear polyesters or an ester of said dicarboxylic acid with a lower aliphatic alcohol, with a diol reactant and a phosphorus compound of the formula



$$HO-\underset{\displaystyle R_1}{\underset{|}{\overset{\displaystyle O}{\overset{\uparrow}{P}}}}-R-COOH$$

where

R is a saturated open-chain or cyclic alkylene, an arylene or an aralkylene radical and

R_1 is an alkyl radical having up to 6 carbon atoms, an aryl or aralkyl radical; and R as well as R_1 may contain one or more hetero atoms selected from the group consisting of F, Cl, Br, O, and S, the improvement which comprises employing a cyclic anhydride of the above phosphorus compounds, dissolving said anhydride at elevated temperature in a diol solvent suitable for the polyester manufacture to form a carboxy phosphinic acid semi-ester of said diol solvent and reacting said semi-ester with said dicarboxylic acid and said diol reactant to form said polyester.

4,033,937

POLYISOCYANURATE SALT EMULSIFYING AGENTS AND DERIVATIVES

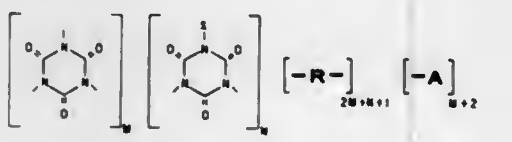
Perry A. Argabright, Larkspur; C. Travis Presley, Littleton, and Charles B. Wenger, Denver, all of Colo., assignors to Marathon Oil Company, Findlay, Ohio

Filed Feb. 9, 1972, Ser. No. 224,905

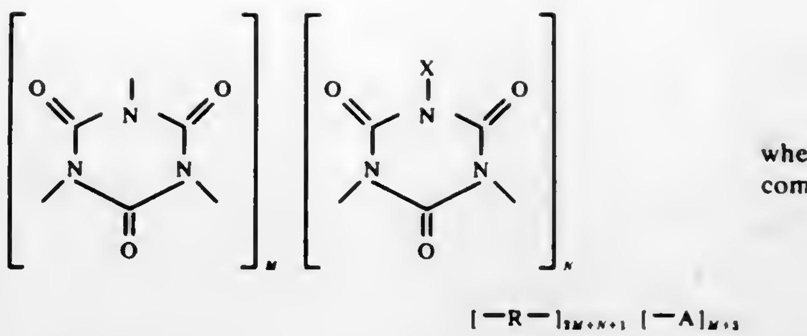
The portion of the term of this patent subsequent to Dec. 18, 1990, has been disclaimed.

Int. Cl.² C08G *18/00*

U.S. Cl. 260—77.5 NC **7 Claims**



1. A composition comprising a mixture of compounds containing in a single molecule isocyanurate and metal isocyanurate, and having the structure:



$$[-R-]_{2M+N+1}\ [-A]_{M+2}$$

wherein:

R = divalent hydrocarbon or substituted hydrocarbon radical, containing 2 to about 40 carbon atoms,

X is selected from the group consisting of metals, or quarternary ammonium radials,

A is a monovalent organic radical selected from the group consisting of $-NHCO_2R'$, $-NHCONHR'$, $-NH_2$, $-NHR'$, and $-NR'_2$ wherein R' is a monvalent radical or substituted hydrocarbon radical containing from 1 to about 40 carbon atoms,

M is the average number of trisubstituted isocyanurate rings per molecule and is a positive integer from zero to about 400

$2M+N+1$ = the average number of divalent R groups and is a positive integer from 2 to about 11,000, and wherein

$M+2$ is the average number of A groups and is a positive integer from 2 to about 2,000, and wherein there are no N—to—N bonds, no A—to—N bonds, no A—to—A bonds, and no R—to—R bonds,

N is the average number of isocyanurate salt groups and is a positive integer from 1 to about 10,000, are useful emulsifying agents.

4,033,938

POLYMERS OF UNSYMMETRICALLY SUBSTITUTED 1,4-DIOXANE-2,5-DIONES

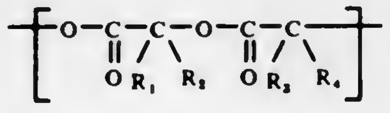
Thomas Anthony Augurt, Stamford, Conn.; Michael Norman Rosensaft, Monsey, and Vincent Anthony Perciaccante, Long Island, both of N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Division of Ser. No. 435,365, Jan. 21, 1974, abandoned. This application Mar. 14, 1975, Ser. No. 558,527

Int. Cl.² C08G *63/08*

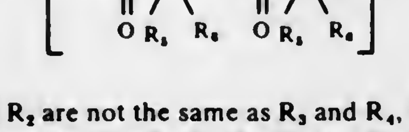
U.S. Cl. 260—78.3 R **5 Claims**

1. A method of forming a polymer containing more than 2% by weight of recurring units of the formula:



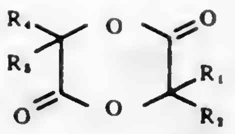
$$\left[-O-\underset{\displaystyle O}{\underset{\|}{C}}-\underset{\displaystyle R_1\ \ R_2}{\underset{/\ \backslash}{C}}-O-\underset{\displaystyle O}{\underset{\|}{C}}-\underset{\displaystyle R_3\ \ R_4}{\underset{/\ \backslash}{C}}-\right]$$

and the remaining units are

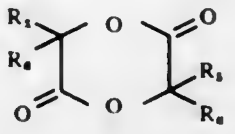


$$\left[-O-\underset{\displaystyle O}{\underset{\|}{C}}-\underset{\displaystyle R_5\ \ R_6}{\underset{/\ \backslash}{C}}-O-\underset{\displaystyle O}{\underset{\|}{C}}-\underset{\displaystyle R_5\ \ R_6}{\underset{/\ \backslash}{C}}-\right]$$

where R_1 and R_2 are not the same as R_3 and R_4, R_1 has at least one carbon atom, and R_1, R_2, R_3, R_4, R_5, and R_6, are separately selected from the group consisting of hydrogen and the radicals methyl, ethyl, propyl, isopropyl, butyl, isobutyl, cyclohexyl, and phenyl which comprises heating, in the presence of a catalyst, at least 2% by weight of an unsymmetrically substituted 1,4-dioxane-2,5-dione of the formula:



where R_1, R_2, R_3 and R_4 are defined as above and at least one compound of the formula:



where R_5 and R_6 are defined as above.

4,033,939

STRESS-CRACK RESISTANT ETHYLENE-PERHALOETHYLENE TERPOLYMERS

Stephen R. Schulze, Gillette, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 564,232, April 2, 1975. This application Jan. 19, 1976, Ser. No. 649,936

Int. Cl.² C08F *214/04, 214/26;* **C08L** *23/08*

U.S. Cl. 260—878 R **23 Claims**

1. Terpolymers of from about 40 to 60 mol percent ethylene, from about 60 to about 40 mol percent of a halogenated comonomer selected from the group consisting of tetrafluoroethylene, chlorotrifluoroethylene and mixtures thereof and about 0.1 to 10 mol percent of a termonomer selected from the group consisting of 3,3,3-trifluoro-2-trifluoromethyl propene, a vinyl monomer selected from the group consisting of fluorinated alpha-monoolefins, and monomers of the formula $R\ -CF{=}CF_2$; $ROCF{=}CF_2$; $CF_3(CF_2)_mCH_2OCF{=}CF_2$; $CH_3(CH_2)_nOCF{=}CF_2$; $R'CH_2(X){=}CH_2$ and $R_2OCH_2C(X){=}CH_2$, wherein R is an organic group containing 2 to 8 carbon atoms, R' is a perfluorinated or chlorofluoroalkyl group of 1 to 7 carbon atoms or a secondary or tertiary halo-alcohol group, R_2 is a perfluorinated or chlorofluoroalkyl of 1 to 7 carbon atoms, X is H or CH_3, m is an integer of 0 to 6 and n is an integer of 1 to 7, and mixtures thereof, and containing high and low molecular weight components of said terpolymers such that equations (1) and (2) are satisfied:

$$(1)\quad \sum_{i=1}^{\infty} X_i\bar{M}w_i = f \cdot \bar{M}w, \text{ and}$$

$$(2)\quad 0.02 \le \frac{\bar{M}w \sum_{i=1}^{\infty} X_i}{\sum_{i=1}^{\infty} X_i\bar{M}w_i} \le 0.6$$

wherein

X_i represents the weight fraction of each high molecular weight component,

$\bar{M}w$ represents the weight-average molecular weight of the terpolymer,

$\bar{M}w_i$ represents the weight-average molecular weight of each component i,

$$\bar{M}w = \sum_{i=1}^{\infty} X_i\bar{M}w_i + \sum_{j=1}^{\infty} X_j\bar{M}w_j,$$

wherein

X_j represents the weight fraction of each low molecular weight component,

$\bar{M}w_j$ represents the weight-average molecular weight of each component j, and

$0.1 \leq f \leq 0.95$, the high molecular components having a weight-average molecular weight, expressed in terms of melt index of from about 0.0001 to 1.0 and the low molecular weight components having a weight-average molecular weight, expressed in terms of melt index of from about 3 to 3000

and therefore wherein said terpolymers contain from 0.2 to 57 weight percent of said high molecular weight components and from 99.8 to 43 weight percent of said low molecular weight components.

4,033,940
CYCLIZATION OF PEPTIDES

John L. Hughes, Kankakee; Jay K. Seyler, Bourbonnais, and Robert C. Liu, Kankakee, all of Ill., assignors to Armour Pharmaceutical Company, Phoenix, Ariz.

Filed Nov. 12, 1975, Ser. No. 631,408

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 S **21 Claims**

1. In a process for preparing a peptide having a disulfide ring structure, the step of holding a peptide which contains an amino terminal cystine residue and a cysteine residue located in a position within the amino acid sequence in a solution substantially free of oxygen until rearrangement has taken place to yield a cyclic disulfide peptide.

4,033,941
PROCESS FOR PURIFYING GLUCAGON

John G. Stilz, and Richard L. Jackson, both of Indianapolis, Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Dec. 17, 1975, Ser. No. 641,419

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 R **12 Claims**

1. A process for purifying glucagon which comprises the steps of

A. swelling a gel having in the dry state a water regain of at least about 4 percent by weight and particle diameters smaller than about 100 microns;

B. packing a column with the swollen gel;

C. adding to the packed column an aqueous solution, having a pH of from about 9 to about 11, of glucagon having a purity of at least about 0.1 percent, wherein such glucagon solution contains at least about 0.01 miligrams of glucagon per mililiter of solution and less than about 10 percent, weight per volume, total protein solids, and the total amount of glucagon added to the column is sufficient to provide a column loading of from about 0.01 to about 5 g per liter of bed volume; and

D. eluting the glucagon from the column at a temperature from about 4 to about 40° C., with an aqueous eluant having a pH within same range as that of the glucagon solution.

4,033,942
CHROMIUM COMPLEX DYE, INCLUDING AZO AND AZO METHINE DYE COMPOUNDS

Fabio Beffa, Riehen, Switzerland; Gerhard Back, Lorrach, Germany, and Eginhard Steiner, Fullinsdorf, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

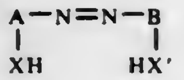
Filed Apr. 27, 1976, Ser. No. 680,640

Claims priority, application Switzerland, May 14, 1975, 6193/75

Int. Cl.^{2} C09B *45/26, 45/06*

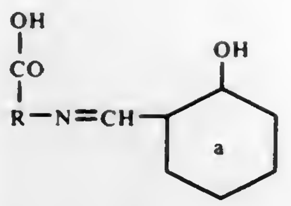
U.S. Cl. 260—145 A **21 Claims**

1. A 1:2 chromium complex dye containing one molecule of a non-heterocyclic azo compound of the formula



$$\underset{XH}{A}-N{=}N-\underset{HX'}{B}$$

and one molecule of a non-heterocyclic azomethine compound of the formula



complexed to a chromium atom, wherein

A is an ortho-phenylene or -naphthylene diazo component radical;

B is an ortho-phenylene or -naphthylene coupling component radical;

X is —O— or —CO—O—;

X' is —O—, —NH—, —N(lower alkyl)—, —N(aralkyl)— or —N(aryl)—;

R is a substituted or unsubstituted aliphatic radical;

the benzene ring *a* is unsubstituted or substituted by a fused benzene ring, halo, nitro, alkyl or alkoxy,

and wherein said compounds contain together 0 to 5 water-solubilizing groups, 0 to 1 group of the formula

$$-N{=}N-Ar-N{=}N-Ar'$$

and 0 to 2 groups of the formula —N=N—Ar''

wherein

Ar, Ar' and Ar'' each represent an aromatic or carbocyclic radical.

4,033,943
FIBER REACTIVE WATER SOLUBLE 2,4,6-TRIAMINO, 3-CYANO PYRIDINE-(5) AZO DYESTUFFS

Visvanathan Ramanathan; Angelo Della Casa, both of Basel; Rene de Montmollin, Riehen; Gert Hegar, Schonenbuch, and Hans Ulrich Schutz, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

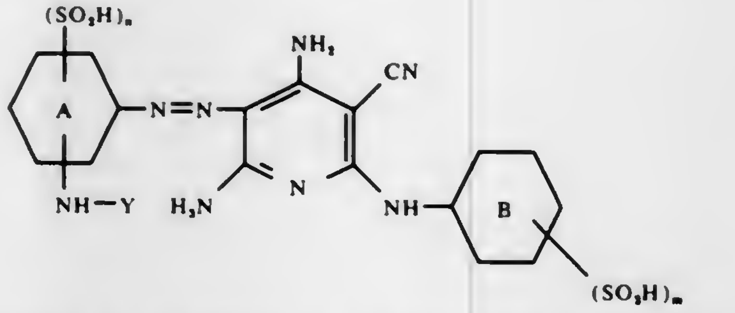
Filed Feb. 21, 1975, Ser. No. 551,794

Claims priority, application Switzerland, Feb. 26, 1974, 2689/74

Int. Cl.^{2} C09B *29/36, 43/12, 43/16*

U.S. Cl. 260—153 **7 Claims**

1. A water-soluble azo dye of the formula



wherein Y is an aliphatic acyl or heterocyclic fiber-reactive group capable of reacting with the hydroxy groups of cellulose or with the amino groups of polyamides to form a covalent chemical bond therewith; *n* is 1 or 2; *m* is 0, 1 or 2; the benzene ring A is further unsubstituted or substituted by halo, lower alkyl, lower alkoxy, nitro or carboxy; and the benzene ring B is further unsubstituted or substituted by lower alkyl, lower alkoxy, nitro, carboxy, or is -NHY wherein Y is independently as defined above.

4,033,944
FIBRE-REACTIVE HYDROXYCYCLOALKENYL-HALO TRIAZINYL CONTAINING DYESTUFFS

Rainer Begrich, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

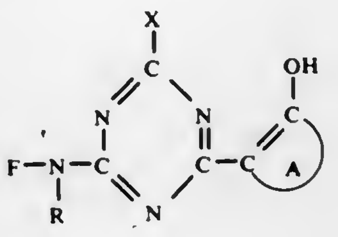
Filed Apr. 14, 1975, Ser. No. 567,796

Claims priority, application Switzerland, Apr. 18, 1974, 5359/74

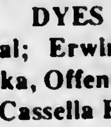
Int. Cl.^{2} C09B *29/36, 31/00, 43/12, 45/48*

U.S. Cl. 260—153 **5 Claims**

1. A fiber-reactive dyestuff of the formula



wherein



$$F-\underset{R}{N}-$$

is an amino substituted azo dyestuff radical;

R is hydrogen, lower alkyl, cyclohexyl or phenyl;

and the ring A is cyclopentenyl, cyclohexenyl or cycloheptenyl.

4,033,945
WATER-SOLUBLE TRISAZO 8-AMINO-NAPHTHOL-1 DYES

Wolfgang Bauer, Maintal; Erwin Krusche, Frankfurt am Main, and Joachim Ribka, Offenbach am Main-Burgel, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

Filed May 20, 1975, Ser. No. 579,156

Claims priority, application Germany, May 20, 1974, 2424462

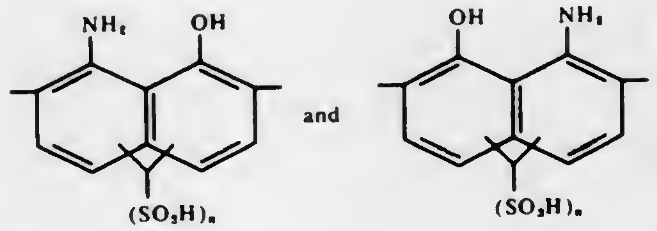
Int. Cl.^{2} C09B *31/16, 33/18, 35/36;* **D06P** *1/06*

U.S. Cl. 260—157 **20 Claims**

1. A water-soluble dye having the formula

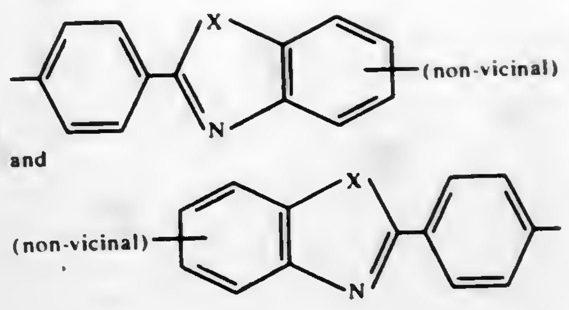
$$A\text{-}N{=}N\text{-}A^1\text{-}N{=}N\text{-}A^2\text{-}N{=}N\text{-}A^3$$

where A^1 is selected from the class consisting of

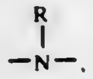


n being 1 or 2,

A^2 is selected from the class consisting of



X being



$$-\overset{R}{N}-,$$

—S—, or —O—and

R being hydrogen or lower hydrocarbyl free of non-aromatic unsaturation,

A is a radical of a diazo component, and

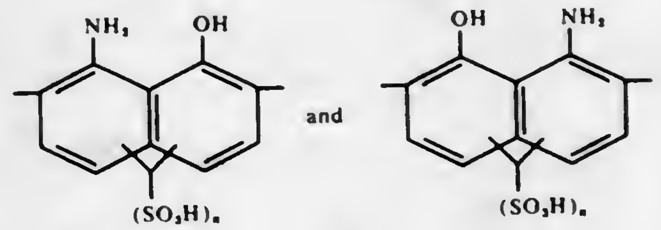
A^3 is a radical of a coupling component,

each of A and A^3 having a carbon-containing aromatic ring connected by such carbon to the azo linkages.

7. A water-soluble dye having the formula

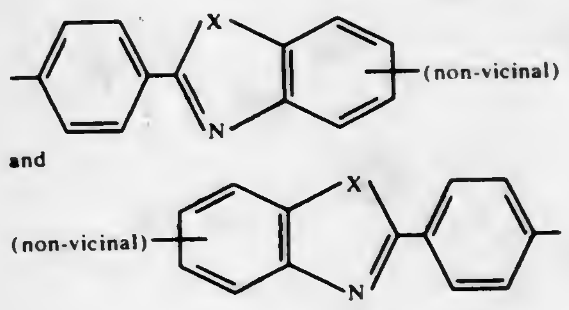
$$A\text{-}N{=}N\text{-}A^1\text{-}N{=}N\text{-}A^2\text{-}N{=}N\text{-}A^3$$

where A^1 is selected from the class consisting of



n being 1 or 2,

A^2 is selected from the class consisting of



X being

$$-\overset{R}{N}-$$

—S—, or —O—, and

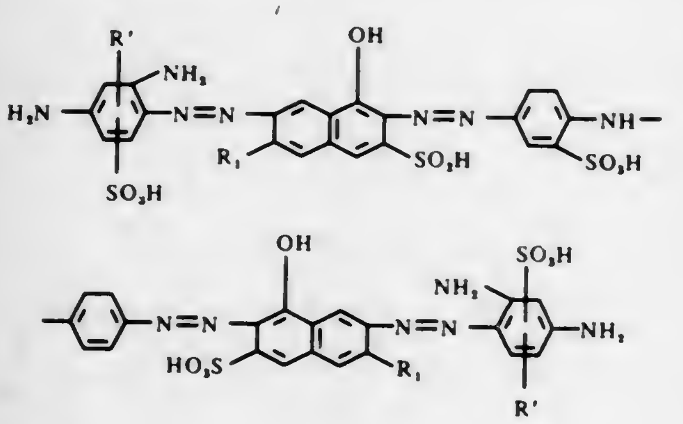
R being hydrogen or lower hydrocarbyl free of non-aromatic unsaturation,
A is selected from the class consisting of unsubstituted or substituted phenyl, naphthyl and dehydrothiotoluidinyl, the substitution being selected from the class consisting of:
alky having 1 to 4 carbon atoms,
alkoxy having 1 to 4 carbon atoms,
alkylthio having 1 to 4 carbon atoms,
hydroxy,
cyano,

nitro,
sulfo,
carboxy,
chloro,
bromo,
alkoxycarbonyl having 1 to 4 carbon atoms in the alkoxy radical,
alkylcarbonyl having 2 to 5 carbon atoms,
aminocarbonyl,
alkylaminocarbonyl having to 1 to 4 carbon atoms in the alkyl radical,
alkylamino having 1 to 4 carbon atoms in the alkyl radical,
arylamino having 6 to 12 carbon atoms,
alkylcarbonylamino having 2 to 5 carbon atoms,
aminosulfonyl, and
alkylaminosulfonyl having 1 to 4 carbon atoms in the alkyl radical, and
A^3 is acetoacetic acid arylamide.

4,033,946
TETRAKISAZO DYESTUFFS

Hermann Goebel, Leverkusen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany
Filed Aug. 14, 1972, Ser. No. 280,146
Claims priority, application Germany, Aug. 14, 1971, 2140867
Int. Cl.² C09B *35/36*
U.S. Cl. 260—166 **2 Claims**

1. The tetrakisazo dyestuff which in the acid form correspond to the general formula

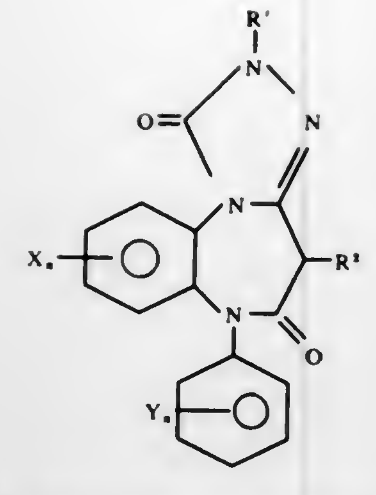


wherein
$R' = H, CH_3$, or Cl
$R_1 = H$ or SO_3H.

4,033,947
1H-S-TRIAZOLO[4,3-a][1,5]BENZODIAZEPIN-1,5(6H)-DIONES

B. Richard Vogt, Yardley, Pa., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.
Filed Oct. 5, 1973, Ser. No. 404,071
Int. Cl.² C07D *487/22*
U.S. Cl. 260—239.3 T **12 Claims**

1. A compound of the formula

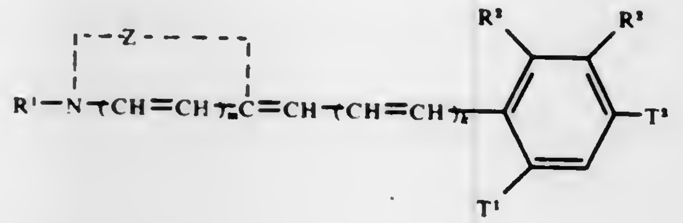


wherein R' is H; phenyl optionally substituted by a member selected from the group consisting of alkyl of 1–3 carbons or alkoxy of 1–3 carbons, halogen, trifluoromethyl or nitro; or alkyl of 1–3 carbons optionally substituted by a member selected from the group consisting of amino, mono-alkylamino of 1–3 carbons or di-alkylamino wherein each alkyl radical contains 1–3 carbons, or phenyl optionally substituted by alkyl of 1–3 carbons or alkoxy of 1–3 carbons, halogen, trifluoromethyl, or nitro;
R^2 is H, alkyl of 1–3 carbons, hydroxy or alkanoyloxy of 1–4 carbons;
X occupies the 8- and/or 9-positions and is selected from the group consisting of H, F, Cl, Br, trifluoromethyl, alkyl of 1–4 carbons or alkoxy of 1–4 carbons, nitro, cyano, amino, alkanoylamino of 1–4 carbons, alkylthio of 1–4 carbons, alkylsulfinyl of 1–4 carbons or alkyl sulfonyl of 1–4 carbons;
Y may be the same as or different from X and occupies one or two of the 2'-, 4'-, or 5'-positions and is selected from the group consisting of H, F, Cl, trifluoromethyl, alkyl of 1–4 carbons or alkoxy of 1–4 carbons, alkylthio of 1–4 carbons or alkyl sulfonyl of 1–4 carbons;
and *n* is 0, 1 or 2.

4,033,948
ACUTANCE AGENTS FOR USE IN THERMALLY-DEVELOPABLE PHOTOSENSITIVE COMPOSITIONS

Harvey A. Brown, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Filed May 17, 1976, Ser. No. 687,003
Int. Cl.² C07D *207/30, 215/00*
U.S. Cl. 260—240 A **3 Claims**

1. A methine arylidene dye base represented by the formula:



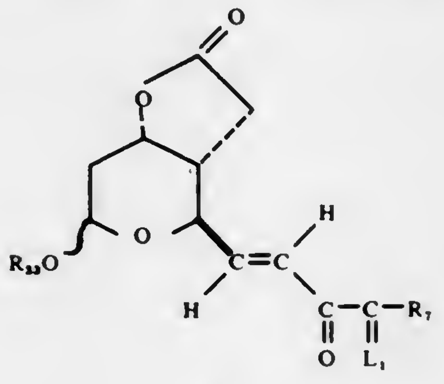
wherein:
Z represents the atom necessary to complete a mono- or polycyclic dihydroheterocyclic nucleus having 5 to 6 atoms in the ring including the N of the formula;
R^1 is an alkyl, substituted alkyl, alkenyl or aryl group;
$m = 0$ or 1;
$k = 0$, 1 or 2;
T^1 is an aprotic electron-withdrawing group having a σ_{para} value of 0.45 to 0.63 selected from CF_3 and CN;
T^2 is NO_2; and

R^2 and R^3 are hydrogen or together constitute a condensed carbocyclic aromatic ring.

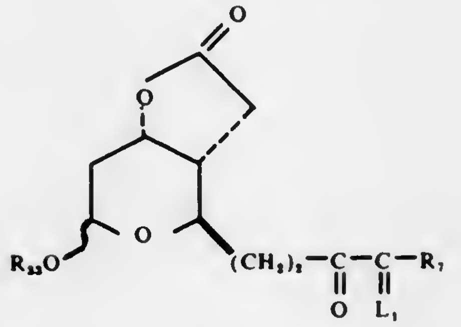
4,033,949
ANALOGS OF THROMBOXANE B₂ AND PROCESSES FOR THEIR SYNTHESIS

Robert C. Kelly, Kalamazoo, and Norman A. Nelson, Galesburg, both of Mich., assignors to The Upjohn Company, Kalamazoo, Mich.
Continuation-in-part of Ser. No. 676,890, April 14, 1976. This application Aug. 20, 1976, Ser. No. 716,450
Int. Cl.² C07D *493/04, 309/02, 309/16*
U.S. Cl. 260—240 R **41 Claims**

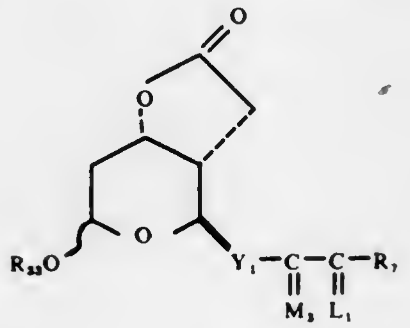
19. A thromboxane intermediate of the formula



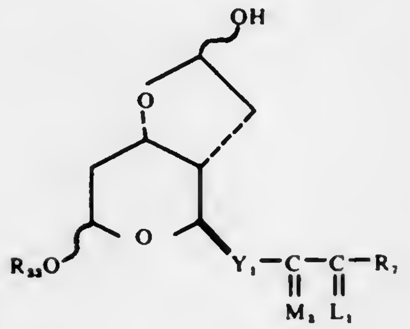
(a)



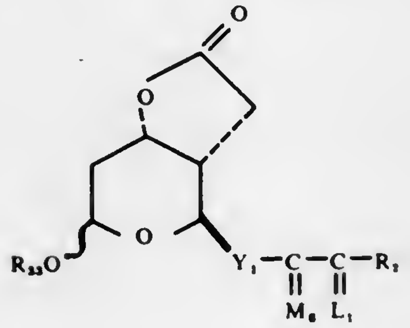
(b)



(c)



(d)



(e)

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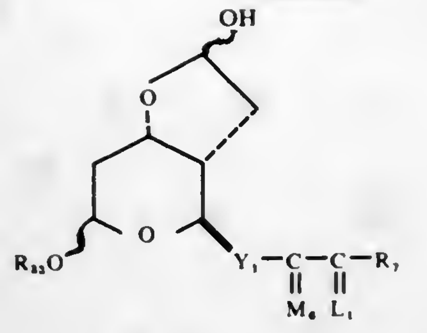
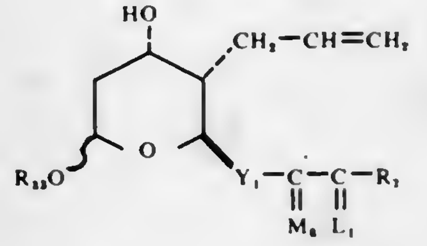
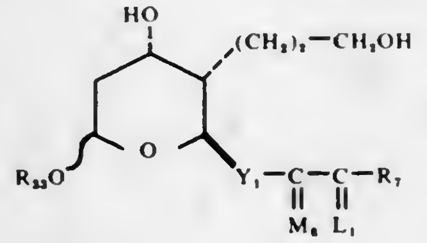


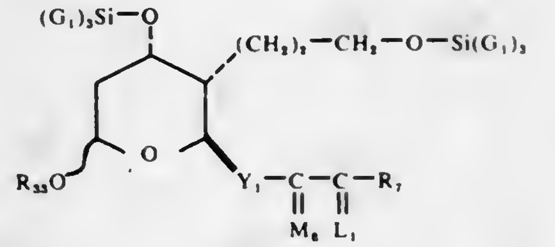
(f)



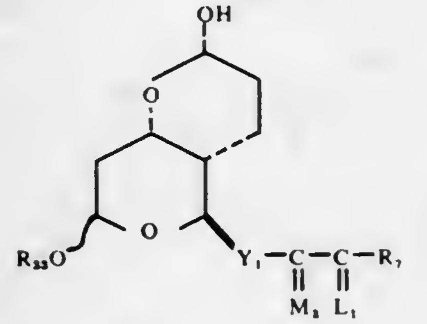
(g)



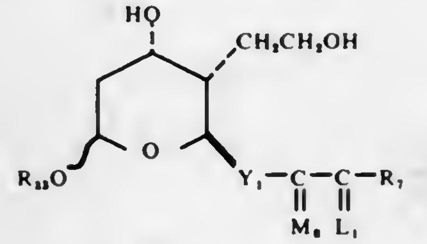
(h)



(i)

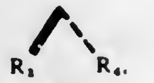


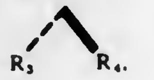
(j)



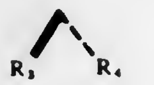
(k)

wherein R_{33} is alkyl of one to 4 carbon atoms, inclusive; wherein L_1 is

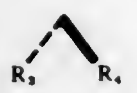




or a mixture of



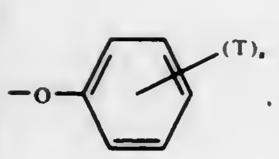
and



wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different with the proviso that one of R_3 and R_4 is methyl only when the other is hydrogen or methyl;
wherein R_7 is

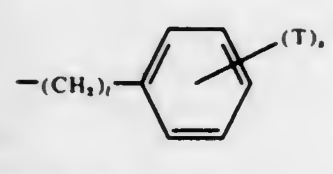
$-(CH_2)_m-CH_3$. (1)

(2)

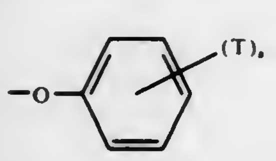


, or

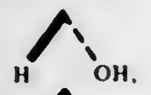
(3)

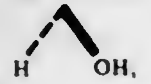


wherein l is 0, 1, 2, or 3.
wherein m is one to 5, inclusive, T is alkyl of 1 to 3 carbon atoms, inclusive, alkoxy of 1 to 3 carbon atoms, inclusive, chloro, fluoro, or trifluoromethyl, and s is 1, 2, or 3, the various T's being the same or different, with the proviso that not more than two T's are other than alkyl, with the further proviso that R_7 is

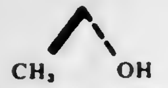


only when R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein M_5 is

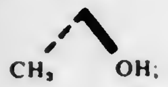




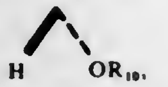
or a mixture of

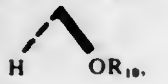


and

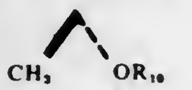


wherein Y_1 is trans—CH═CH— or $-CH_2CH_2-$;
wherein M_8 is





or a mixture of



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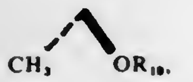


wherein R_{10} is a blocking group;
wherein G_1 is alkyl of 1 to 4 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, phenyl, or phenyl substituted with one or 2 fluoro, chloro, or alkyl of one to 4 carbon atoms, with the proviso that in the $-Si-(G_1)_3$ moiety the various G_1's are the same or different; and
wherein g is 1, 2, or 3 and n is 1 or 2.

4,033,950
3-HYDROXYMETHYL-7β-(2-ALKOXY-OR BENZYLOXYIMINO-2-ARYLACETAMIDO)CEPH-3-EM-4-CARBOXYLIC ACIDS AND SALTS THEREOF

Martin Christopher Cook; Gordon Ian Gregory, both of Chalfont St. Peter, and Janice Bradshaw, Harrow, all of England, assignors to Glaxo Laboratories Limited, Greenford, England

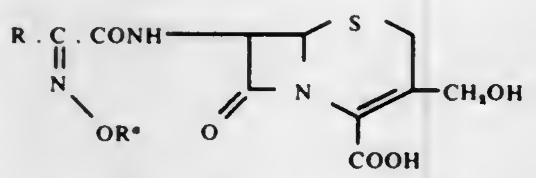
Division of Ser. No. 304,524, Nov. 7, 1972, Pat. No. 3,971,778, which is a continuation-in-part of Ser. No. 252,666, May 12, 1972, abandoned. This application Mar. 24, 1976, Ser. No. 669,818

Claims priority, application United Kingdom, May 14, 1971, 15082/71; Oct. 1, 1971, 45884/71

Int. Cl.² C07D *501/32, 501/34*

U.S. Cl. 260—243 C **3 Claims**

1. A compound selected from the group consisting of a cephalosporin antibiotic highly stable to β-lactamases having the formula



wherein R is phenyl, thienyl or furyl and R^a is C_1-C_8 alkyl or benzyl; and a physiologically acceptable salt thereof.

4,033,951
MORPHOLINE DERIVATIVE OF A 1,4-BENZOTHIAZIN-3-ONE

Roy Frederick Maisey, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

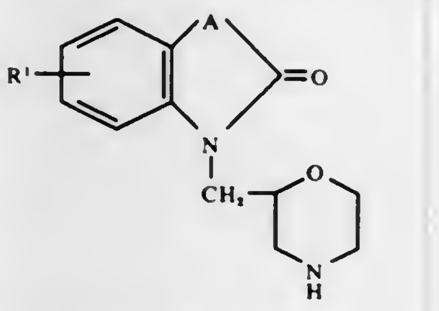
Division of Ser. No. 528,578, Nov. 29, 1974, Pat. No. 3,989,699. This application June 22, 1976, Ser. No. 698,780

Claims priority, application United Kingdom, Dec. 13, 1973, 57743/73

Int. Cl.² C07D *279/16*

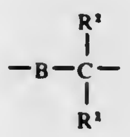
U.S. Cl. 260—243 R **3 Claims**

1. A morpholine derivative of the formula:



I

wherein R^1 is hydrogen or halogen, or alkyl or alkoxy of 1 to 3 carbons; A is a radical of the formula:



$$-B-\overset{\displaystyle R^2}{\underset{\displaystyle R^3}{\overset{|}{\underset{|}{C}}}}-$$

wherein R^2 and R^3, which may be the same or different, are hydrogen or alkyl of 1 to 3 carbons and B is sulphur, and the non-toxic, pharmaceutically-acceptable acid-addition salts thereof.

4,033,952
1,1,1-TRICHLORO-3-NITRO-3-(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)-2-PROPANONE

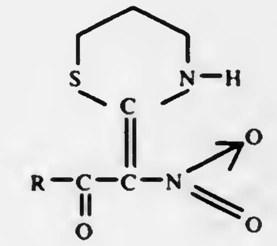
Charles H. Tieman, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

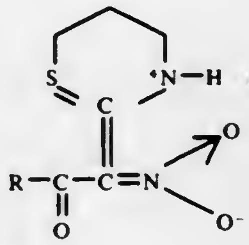
Filed July 19, 1976, Ser. No. 706,312

Int. Cl.² C07D *279/06*

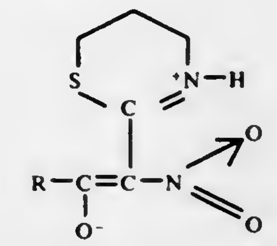
U.S. Cl. 260—243 R **1 Claim**

1. A resonance hybrid in which the significant forms which contribute thereto are represented by the formla

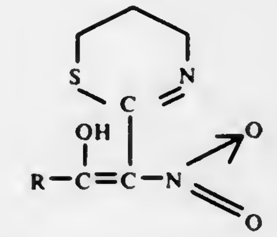




and



and including the enol form represented by the formula



wherein R is trichloromethyl.

4,033,953
3-(5,6-DIHYDRO-4H-1,3-THIAZIN-2-YL)-3-NITRO-2-PROPENOIC ACID

Charles H. Tieman, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 2, 1976, Ser. No. 710,937

Int. Cl.² C07D *279/06*

U.S. Cl. 260—243 R **1 Claim**

1. 3-(5,6-dihydro-4H-1,3-thiazin-2-yl)-3-nitro-2-propenoic acid.

4,033,954
3,4-DIHYDRO-7-HYDROXY-8-NITRO-2H-PYRROLO(2,1-B)-(1,3)THIAZIN-6(7H)-ONE

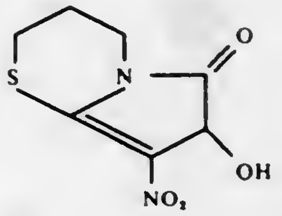
Charles H. Tieman, Modesto, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 5, 1976, Ser. No. 711,932

Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **1 Claim**

1. A compound of the formula



4,033,955
3,4-DIHYDRO-8-NITRO-2H-PYRROLO(2,1-B)(1,3)THIAZIN-7(6H)-ONE

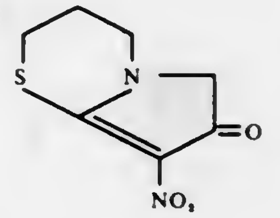
James E. Powell, Salida, Calif., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 10, 1976, Ser. No. 713,157

Int. Cl.² C07D *279/08*

U.S. Cl. 260—243 R **1 Claim**

1. A compound of the formula



4,033,956
7[α-AMINO-ω-(2,3-METHYLENEDIOXY-PHENYL-)ACYLAMIDO]CEPHALOSPORANIC ACID DERIVATIVES

Raymond C. Erickson, and Ronald E. Bambury, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

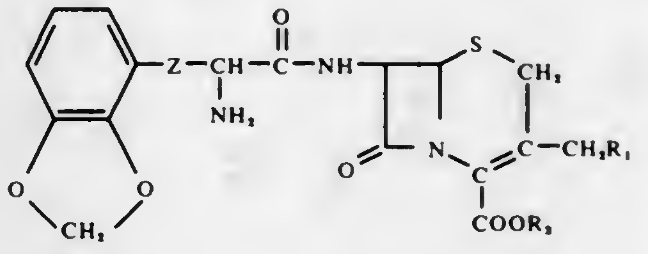
Filed July 22, 1975, Ser. No. 598,151

The portion of the term of this patent subsequent to Apr. 26, 1994, has been disclaimed.

Int. Cl.² C07D *501/20, 501/22, 501/36*

U.S. Cl. 260—243 C **8 Claims**

1. A 7-[α-amino-ω-(2,3-methylenedioxyphenyl) acylamido]cephalosporanic acid having the formula:



wherein
- Z is selected from the group consisting of a sigma bond, methylene and ethylene;
- R_1 is selected from the group consisting of hydrogen, hydroxy, acetoxy, pyridinium and $-S-R_2$;
- R_2 is a heterocycle selected from the group consisting of pyrazolyl, imidazolyl, triazolyl, tetrazolyl, thiazolyl, isothiazolyl, thiadiazolyl, oxazolyl, isoxazolyl, oxadizole,

pyrimidinyl, pyrazinyl, pyridazinyl and the mono or dimethyl and mono or diethyl derivatives thereof;

R_3 is selected from the group consisting of hydrogen, formyloxymethyl and alkanoyloxmethyl in which the alkanoyl group contains from 1 to 5 carbon atoms; and the pharmaceutically acceptable salts thereof.

4,033,957

TRIAZINE DERIVATIVES AS STABILIZERS FOR ORGANIC MATERIALS

Kurt Hofer, Munchenstein, and Guenther Tscheulin, Riehen, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

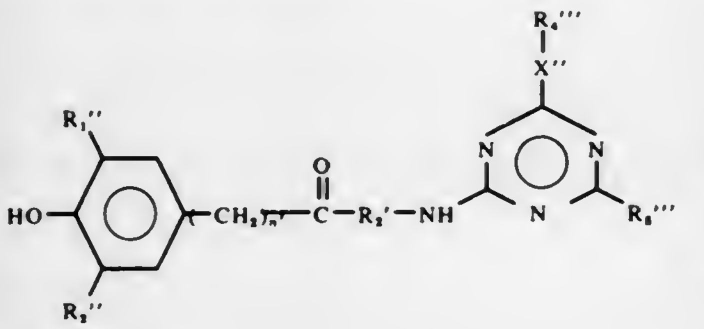
Filed Dec. 3, 1974, Ser. No. 529,024

Claims priority, application Switzerland, Dec. 10, 1973, 17269/73

Int. Cl.² C07D *401/14, 413/14, 251/04*

U.S. Cl. 260—246 B **10 Claims**

1. A compound of the formula



wherein

R_1'' and R_2'' are each a tertiary butyl radical,

n' is 0 or an integer 1 or 2,

R_3' is —NH— or $—O(CH_2)_{m'}$,

wherein *m'* is an integer 2 or 3,

X'' is —S— or $—NR_6'''—$,

wherein R_6''' is hydrogen, C_{1-18} alkyl, unsubstituted phenyl or phenyl monosubstituted by C_{1-4} alkyl,

R_4''' is, independently, one of the significances of R_6''', or R_4''', together with R_6''' and the common nitrogen atom, form a piperidine or morpholine ring, and

R_5''' is, independently, one of the significances of $—X'\lambda$ $'—R_4'''$.

4,033,958

4-MORPHOLINO DERIVATIVES OF PYRAZOLO[1,5-a]-QUINOXALINE-3-CARBOXYLIC ACIDS AND ESTERS

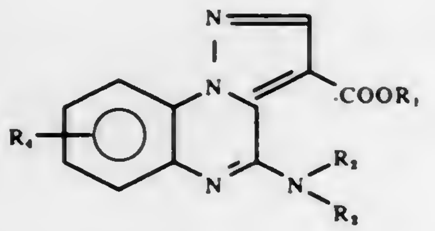
Uwe D. Treuner, Regensburg, Germany, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 628,277, Nov. 3, 1975, Pat. No. 3,994,893. This application Aug. 18, 1976, Ser. No. 715,600

Int. Cl.² C07D *487/04*

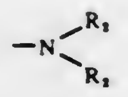
U.S. Cl. 260—247.2 B **3 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen or lower alkyl;



is morpholino;

R_4 is hydrogen, lower alkyl or halogen; and acid addition salts thereof.

4,033,959

PROCESS FOR PREPARING CHLOROISOCYANURATE COMPLEX COMPOUNDS

Ronald H. Carlson, Willingboro, N.J., assignor to FMC Corporation, Philadelphia, Pa.

Filed July 19, 1976, Ser. No. 706,274

Int. Cl.² C07D *251/36*

U.S. Cl. 260—248 C **8 Claims**

1. A process for preparing hydrated {(mono-trichloro,) tetra-(monopotassium dichloro,)} penta-isocyanurate, which comprises bringing together and reacting in a substantially dry state potassium dichloroisocyanurate monohydrate and dichloroisocyanuric acid monohydrate in amounts such that the molar ratio of said monohydrate to said acid is in the range of 1:1 to 3:1.

4,033,960

2-MERCAPTOQUINOXALINE-DI-N-OXIDE PRODUCTS AND A METHOD FOR THEIR PREPARATION

Florin Seng, Schildgen, and Kurt Ley, Odenthal-Gloebusch, both of Germany, assignors to Bayer Aktiengesellschaft, Germany

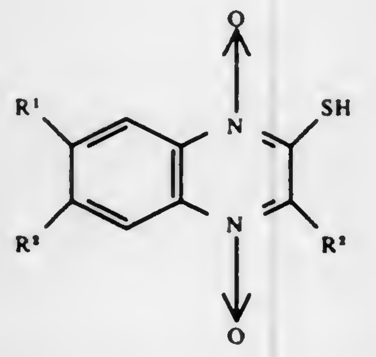
Division of Ser. No. 491,226, July 24, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,084

Claims priority, application Germany, July 31, 1973, 2334722

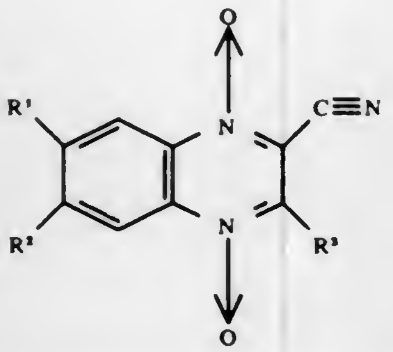
Int. Cl.² C07D *241/52*

U.S. Cl. 260—250 QN **20 Claims**

1. Process for the preparation of a mercapto compound of the formula:



wherein each of R^1 and R^2 is hydrogen, lower alkyl, lower alkoxy, trifluoromethyl or halo and R^3 is methyl, hydroxy or amino which comprises treating a nitrile of the formula:



with hydrogen sulfide or an alkali metal or alkaline earth metal salt thereof in a solvent and, when a salt of hydrogen sulfide is used, converting the resultant mercaptide salt into the corresponding free mercapto compound by acidification with a nonoxidizing and nonreducing organic or inorganic acid.

4,033,961

PYRIDO[2-1-b]QUINAZOLIN-ONES AND THEIR METHODS OF PREPARATION

Charles F. Schwender, Lebanon, and Brooks R. Sunday, Hackettstown, both of N.J., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed Oct. 7, 1975, Ser. No. 620,471

Int. Cl.² C07D *239/88*

U.S. Cl. 260—251 A **7 Claims**

1. 7-cyano-11-oxo-11H-pyrido[2,1-b]quinazoline.

7. 2-methoxy-11-oxo-11H-pyrido[2,1-b]quinazoline-8-carboxylic acid.

4,033,962

2,4-DIAMINO-PYRIMIDINE DERIVATIVES AND PROCESSES

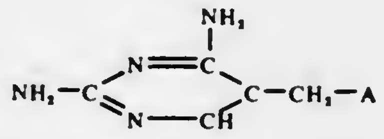
Perry Rosen, North Caldwell, N.J., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed June 26, 1975, Ser. No. 590,755

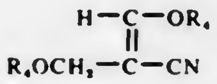
Int. Cl.² C07D *239/22*

U.S. Cl. 260—256.4 N **7 Claims**

1. A process for the preparation of a pyrimidine of the formula

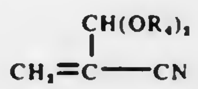


wherein A is aryl which comprises the steps of (a) reacting an aromatic benzene derivative with an acrylonitrile selected from the group consisting of a compound of the formula



$$\begin{matrix} H-C-OR_4 \\ \| \\ R_4OCH_2-C-CN \end{matrix} \qquad V$$

and a compound of the formula



$$\begin{matrix} CH(OR_4)_2 \\ | \\ CH_2=C-CN \end{matrix} \qquad VI$$

wherein R_4 is, independently, lower alkyl whereby the corresponding enol ether or a mixture thereof with its corresponding acetal is obtained, and subsequently, (b) treating the reaction mixture of step (a) with guanidine.

4,033,963

NAPHTHOQUINONE DERIVATIVES

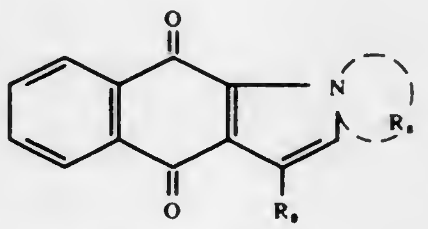
Bansi Lal Kaul, Basel, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

Division of Ser. No. 411,086, Oct. 30, 1973, Pat. No. 3,931,163. This application Sept. 15, 1975, Ser. No. 613,336

Int. Cl.² C07D *471/04*

U.S. Cl. 260—256.4 C **4 Claims**

1. A compound of formula Ia,

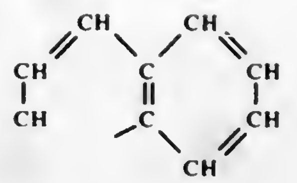


Ia

wherein R_8 is a radical of formula P

—CH=CH—CH=Ch— P

or a radical of formula Q



Q

which radicals are unsubstituted or mono-substituted by chloro, bromo, methyl, methoxy, aminocarbonyl, methylaminocarbonyl, ethylaminocarbonyl, dimethylaminocarbonyl, diethylaminocarbonyl, phenylaminocarbonyl, methoxycarbonyl or ethoxycarbonyl, and

R_9 is pyrimidyl or pyrimidyl substituted by up to three substituents selected from the group consisting of hydroxy, methoxy, ethoxy, amino, methylamino, ethylamino, dimethylamino, diethylamino, di-hydroxyethylamino, phenylamino, chloro, bromo and mono-chlorophenylamino.

4,033,964

IMIDAZOLYLACETIC ACID AMIDES, THEIR PRODUCTION, ANTIMYCOTIC COMPOSITIONS COMPRISING SAID COMPOUNDS AND THEIR USE AS ANTIMYCOTIC AGENTS

Jürgen Wenzelburger; Karl Heinz Büchel; Manfred Plempel, and Werner Meiser, all of Wuppertal, Germany, assignors to Bayer Aktiengesellschaft, Germany

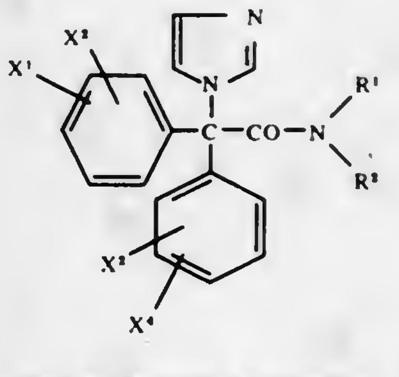
Division of Ser. No. 400,263, Sept. 24, 1973, Pat. No. 3,950,354. This application July 9, 1975, Ser. No. 594,569

Claims priority, application Germany, Sept. 26, 1972, 2247187

Int. Cl.² C07D *403/12*

U.S. Cl. 260—268 C **11 Claims**

1. An imidazolylacetice acid amide of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R^1 and R^2, together with the nitrogen atom to which they are attached form a saturated [5 to 7-] 6-membered heterocyclic ring having a —NY— moiety wherein Y is alkoxycarbonyl of 2 to 4 carbon atoms, dialkylaminocarbonyl of 1 to 4 carbon atoms in each alkyl moiety, phenyl or diphenylmethyl, and

X^1, X^2, X^3 and X^4 are the same or different and are each hydrogen or halogen.

4,033,965

NITRO ACRIDONE DYES

Kurt Burdeska, Basel, and Hansrudolf Schwander, Riehen;, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

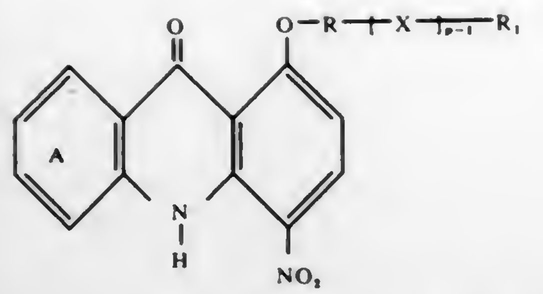
Filed Apr. 16, 1975, Ser. No. 568,767

Claims priority, application Switzerland, Apr. 17, 1974, 5287/74; Nov. 19, 1974, 15367/74

Int. Cl.² C09B *15/00;* **C07D** *219/08*

U.S. Cl. 260—279 R **10 Claims**

1. A disperse dye of the formula



wherein *p* is 1 or 2, R is a straight-chain alkylene of 2 to 4 carbon atoms which may be interrupted by sulphur or oxygen atoms or a branched alkylene of 2 to 4 carbon atoms which is unsubstituted or substituted by hydroxy, R_1 is phenyl or phenyl substituted by C_1–C_4-alkyl, C_1–C_2-alkoxy, halogen, phenyl, trifluoromethyl or lower carbalkoxy, X is oxygen or sulphur atom, the rings A and B can carry further non-ionic substituents selected from the group consisting of C_1–C_4-alkyl, C_1–C_2-alkoxy, halogen, alkylthio, nitro, cyano, trifluoromethyl, phenoxy, phenyl or acetamido, and the ring A can carry a further fused benzo ring.

4,033,966
NOVEL BERBINE DERIVATIVES

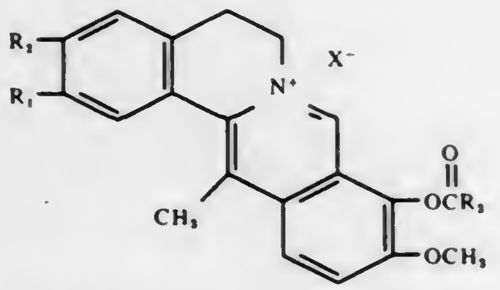
Yoshio Sawa, Nishinomiya, Japan, assignor to Kanebo, Ltd., Tokyo, Japan

Filed June 24, 1975, Ser. No. 589,920

Int. Cl.² C07D *215/20*

U.S. Cl. 260—286 Q **5 Claims**

1. A berbine derivative of the formula:



wherein R_1 and R_2 represent each methoxy or jointly methylenedioxy, R_3 represents a member selected from the group consisting of methyl, 4-methoxyphenyl and phenylvinyl, and X represents a pharmaceutically acceptable anion.

4,033,967
CYCLOPENTENO[1,2-H]QUINOL-4-ONE DERIVATIVES

Alfred Rhomberg, Mannheim-Neuostheim; Herbert Berger, Mannheim-Kafertal, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Germany; Werner Plattner, administrator, Linz, Austria; Wolfgang Voṁel, Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, both of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed Oct. 17, 1974, Ser. No. 515,790

Claims priority, application Germany, Nov. 27, 1973, 2358909

The portion of the term of this patent subsequent to Aug. 26, 1992, has been disclaimed.

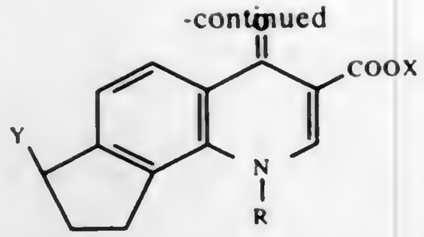
Int. Cl.² C07D *215/56*

U.S. Cl. 260—287 CF **6 Claims**

1. Cyclopenteno-quinolone compound of the formula

(1)

-continued



wherein

R is saturated or unsaturated aliphatic hydrocarbyl of up to 5 carbon atoms,

X is hydrogen or alkyl of up to 5 carbon atoms,

Y is halogen

and the pharmacologically compatible salts thereof.

4,033,968
DIAZATETRACYCLODODECANES

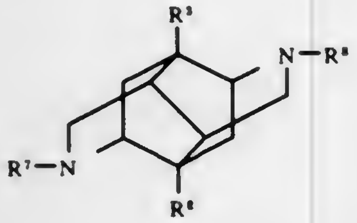
Jan ten Broeke, Somerset; Edward J. J. Grabowski, Westfield, both of N.J.; Lars M. Flataker, Lansdale, Pa.; Michael H. Fisher, Bridgewater, and Arthur A. Patchett, Cranford, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Apr. 14, 1976, Ser. No. 676,769

Int. Cl.² C07D *471/08*; A61K *31/435*

U.S. Cl. 260—288 CF **7 Claims**

1. A compound of structural formula:

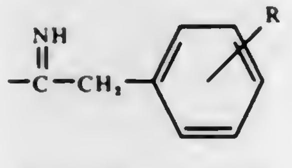


or pharmaceutically acceptable salt thereof, wherein

R^5 and R^8 are the same or different and each is

1. —CN,

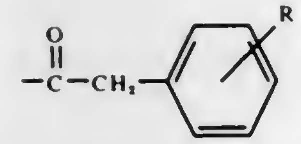
2.



R is hydrogen, lower alkoxy, fluoro, chloro, bromo, or hydroxy,

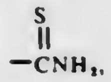
3. —COO (lower alkyl),
4. $—CONH_2$,
5. —CO (halo),
6. —COOH,
7. $—CH_2OH$,
8. —CHO,
9. $—CH_2$ (halo),

10.



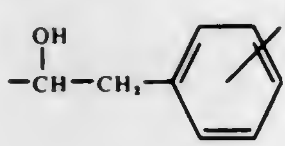
11. $—CH_2NH_2$.

12.



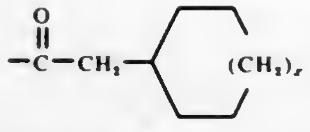
$$—\overset{S}{\overset{\|}{C}}NH_2,$$

13.



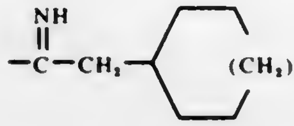
-continued

14.



wherein X = 0 or 1; or

15.

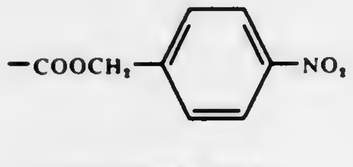


wherein X = 0 or 1, and

R^7 and R^8 are the same or different, and each is

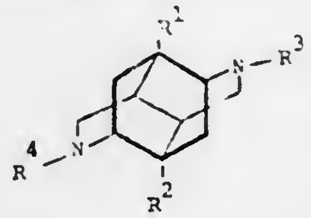
1. lower alkyl,
2. lower alkenyl,
3. phenyl-lower alkyl, wherein the phenyl group is unsubstituted or substituted with $C_{1\text{-}3}$-alkoxy or halo,
4. hydrogen,
5. —COOBz,

6.



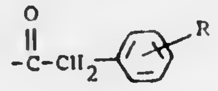
7. —COO (lower alkyl),
8. $—COOCH_2CCl_3$.

4. A compound of structural formula:



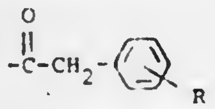
or pharmaceutically acceptable salt thereof, wherein:

R^1 is

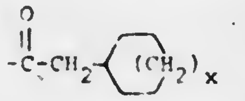


wherein R is hydrogen, fluoro, chloro, bromo, lower alkoxy or hydroxy;

R^2 is



or



,

wherein X is 0 or 1;

R^3 is hydrogen or $C_{1\text{-}2}$ alkyl; and

R^4 is $C_{1\text{-}2}$ alkyl.

4,033,969
VINCAMINE DERIVATIVES

Thierry Sevenet, Gif-sur-Yvette; Claude Thal, Malakoff; Pierre Potier, Bois d'Arcy, and Henri Philippe Husson, Chevreuse, all of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

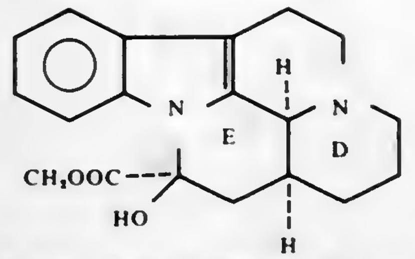
Continuation-in-part of Ser. No. 370,334, June 15, 1973, Pat. No. 3,937,709. This application Sept. 29, 1975, Ser. No. 617,695

Claims priority, application France, June 19, 1972, 72.220210

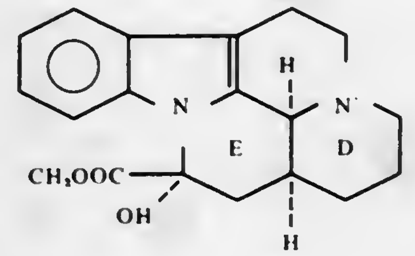
Int. Cl.² C07D *459/00*

U.S. Cl. 260—293.53 **1 Claim**

1. 20 -Deethyl-vincamine, under its racemic and optically active forms, having the formula:



and its stereoisomer, having the formula:



4,033,970
VARIOUS 1,5,10,11-TETRAHYDROBENZO
[4,5]-CYCLOHEPTA
[1,2-b]PYRAZOLO[4,3-e]PYRIDINE DERIVATIVES

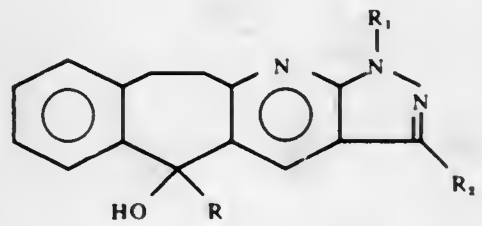
Hans Hoehn, Tegernheim, Germany; Jack Bernstein, New Brunswick, N.J., and Berthold Richard Vogt, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed June 23, 1976, Ser. No. 698,992

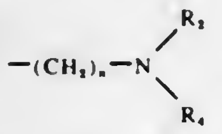
Int. Cl.² C07D *471/04*

U.S. Cl. 260—293.61 **12 Claims**

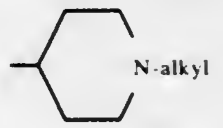
1. A compound of the formula:



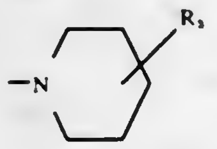
wherein R_1 is lower alkyl of 1 to 4 carbons, phenyl, benzyl or phenethyl; R_2 is hydrogen, lower alkyl of 1 to 4 carbons, or phenyl; R is



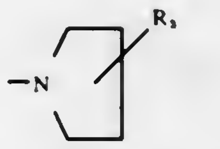
or



wherein alkyl is straight or branched chain of 1 to 4 carbons and R_3 and R_4 are the same or different and each is lower alkyl of 1 to 4 carbons or R_3 and R_4 taken together with the N-atom form a heterocyclic ring selected from the group consisting of



or



wherein R_5 is hydrogen, lower alkyl of 1 to 4 carbons, or lower alkoxy of 1 to 4 carbons; *n* is an integer from 3 to 6; and a pharmaceutically acceptable acid addition salt thereof.

4,033,971
CYCLOHEXANE TETROLS AND DERIVATIVES THEREOF

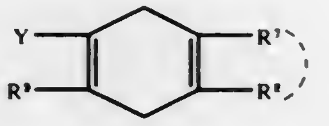
Frederic Peter Hauck, Somerville, N.J., and Joseph E. Sundeen, Yardley, Pa., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 383,642, July 30, 1973, Pat. No. 3,936,465. This application Nov. 18, 1975, Ser. No. 633,046

Int. Cl.² C07D *211/32*

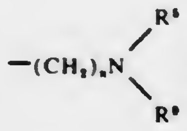
U.S. Cl. 260—293.72 **6 Claims**

1. A compound of the formula

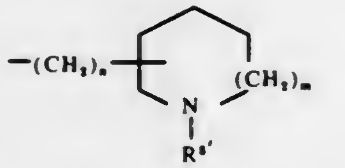


wherein

Y is a radical of the formula



or of the formula

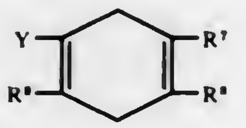


wherein *n* is 1–6, *m* is 0 or 1, R^5 is hydrogen, alkyl of 1 to 3 carbons, or phenylalkyl containing 1 to 3 carbons in the alkyl group, and R^5 and R^6 together with the nitrogen to which they are attached are pyrrolidino, or piperidino;

R^6 is H, or a straight or branched chain alkyl radical of 1–6 carbon atoms;

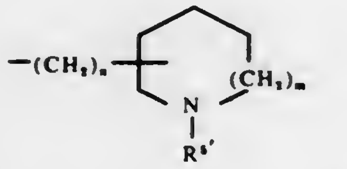
R^7 and R^8 are the same or different and may be hydrogen or alkyl, or R^7 and R^8 taken together with the carbon atoms to which they are attached form a cycloalkyl ring having from 5 to 7 carbons.

2. A compound of the formula



wherein

Y is a radical of the formula



wherein *n* is 1–6, *m* is 0 or 1, and R^5 is hydrogen, alkyl of 1 to 3 carbons, or phenylalkyl containing 1 to 3 carbons in the alkyl group;

R^6 is H or a straight or branched chain alkyl radical of 1–6 carbon atoms; and

R^7 and R^8 are the same or different and are hydrogen or alkyl of 1–4 carbon atoms.

3. A compound as defined in claim 2 having the name 4-(3,6-dihydro-2-methylbenzyl)-N-methylpiperidine.

4,033,972
3-PYRIDYLMETHYL-(N-SUBSTITUTED PHENYL)-CARBAMATE DERIVATIVES

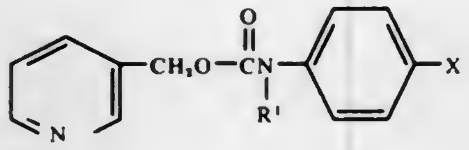
Edward E. Kilbourn, Chalfont, and Ernest D. Weiler, Ambler, both of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 497,542, Aug. 14, 1974, Pat. No. 3,925,397. This application Sept. 9, 1975, Ser. No. 611,759

Int. Cl.² C07D *417/12, 213/46*

U.S. Cl. 260—294.8 D **6 Claims**

1. A compound of the formula



where

X is cyano, methylthio, or nitro; and

R^1 is 2-thenyl when X is cyano or nitro; and when X is methylthio, R^1 is allyl, benzyl or 2-thenyl.

4,033,973
OXADIAZOL-5-YL-COUMARIN DERIVATIVES

Hansrudolf Schwander, Riehen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

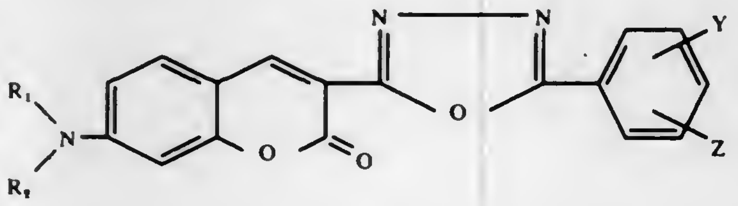
Continuation of Ser. No. 540,063, Jan. 10, 1975, abandoned, which is a continuation of Ser. No. 335,635, Feb. 26, 1973, abandoned. This application Mar. 25, 1976, Ser. No. 670,309

Claims priority, application Switzerland, Apr. 18, 1972, 5691/72

Int. Cl.² C07D *413/14, 413/04*

U.S. Cl. 260—295 F **5 Claims**

1. A dyestuff of the formula



wherein

R_1 and R_2 independently represent methyl, ethyl, propyl, butyl, pentyl, hexyl, heptyl, octyl, nonyl, decyl, β-chloroethyl, β-hydroxyethyl, β-cyanoethyl, γ-cyanopropyl, β-methoxyethyl, β-acetoxyethyl, β-butyryloxyethyl, methoxycarbonylethyl, ethoxycarbonylethyl, phenylethyl or benzyl; and

Y and Z independently represent lower alkyl, lower alkoxy, hydroxy, halo or hydrogen.

4,033,974
PYRIDYLMETHYL ESTERS OF N-(PHENOXYALKANOYL)PEPTIDE DERIVATIVES

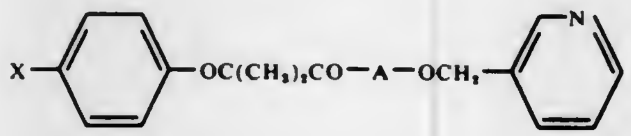
Jean-Marie Ferland, St. Laurent; Amedeo Failli, Montreal; Hans U. Immer, Mount Royal, and Manfred K. Gotz, Hudson, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 505,103, Sept. 11, 1974, Pat. No. 3,956,484. This application Feb. 11, 1976, Ser. No. 657,118

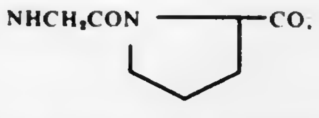
Int. Cl.² C07D *213/55*

U.S. Cl. 260—295.5 R **6 Claims**

1. A compound of the formula



in which X is selected from the group consisting of bromine, chlorine and lower alkyl and A is selected from the group consisting of $NHCH_2CO$, $NHCH_2CONHCH_2CO$ and



and acid addition salts thereof with pharmaceutically acceptable acids.

4,033,975
PROCESS FOR THE PRODUCTION OF 2-AMINO-3-HYDROXYPYRIDINE DERIVATIVES

Günter Mattern, Liestal, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

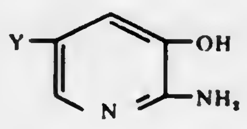
Filed May 10, 1976, Ser. No. 684,692

Claims priority, application Switzerland, May 13, 1975, 6158/75

Int. Cl.² C07D *213/61*

U.S. Cl. 260—296 R **8 Claims**

1. Process for the production of 2-amino-3-hydroxypyridine derivatives of formula I

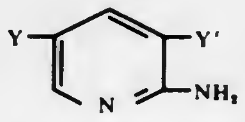


(I)

wherein

Y represents chlorine or bromine,

which process comprises reacting a 2-amino-3,5-dihalogenopyridine of formula II



(II),

in which the two symbols Y and Y′ can be identical or different and represent chlorine or bromine, at 140°–240° C in the presence of a base with water.

4,033,976
COPPER-OXAZOLINE COMPLEX

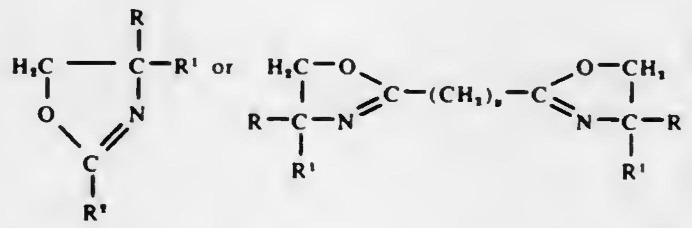
Juozas Briedis, Lemont, and Louis A. Jurisch, Marengo, both of Ill., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Filed Oct. 28, 1975, Ser. No. 626,607

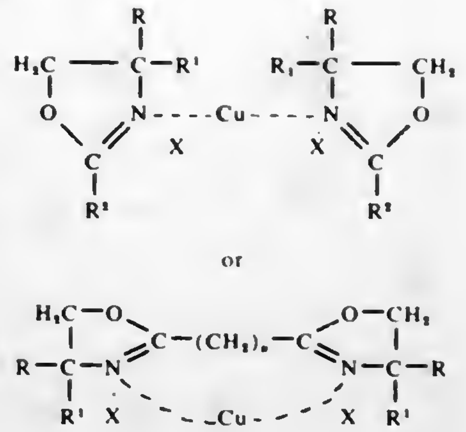
Int. Cl.² C07F *1/08*

U.S. Cl. 260—299 **14 Claims**

1. A complex of copper and an oxazoline represented by the formula



where R and R^1 are alkyl radicals of 1–3 carbon atoms, or hydroxymethyl and can be the same or different; R^2 is alkyl of from 1 to 4 carbon atoms or alkenyl of 2–4 carbon atoms; and *y* is an integer of 1 to 4, said complex being represented by the formula



where X is an acetate, chloride, bromide, nitrate, formate or sulfate ion.

4,033,977
4H-PYRANO[4,3-d]THIAZOLE DERIVATIVES AND PROCESS THEREFOR

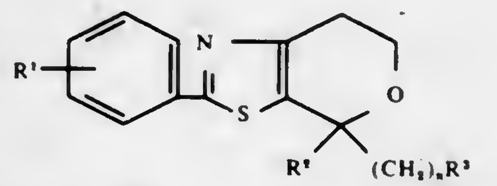
Adolf H. Philipp, St. Laurent, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,643

Int. Cl.² C07D *515/00*

U.S. Cl. 260—302 F **17 Claims**

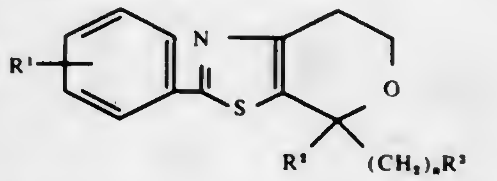
1. A compound of formula I



(I)

in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; R^2 is lower alkyl; R^3 is COOH or $CH_2NR^4R^5$ in which R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; and *n* is the integer one or two; or a pharmaceutically acceptable salt thereof.

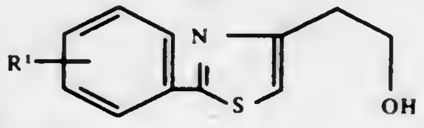
16. A process for preparing a compound of formula I



(I)

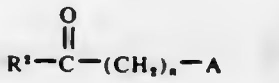
in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; R^2 is lower alkyl; R^3 is COOH and*n* is the integer1 or 2, which comprises:

a. condensing a compound of formula II



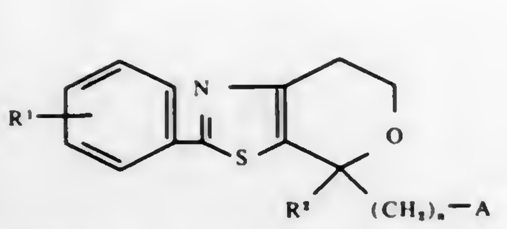
(II)

in which R^1 is as defined herein with a compound of formula



$$R^2-\overset{\overset{\displaystyle O}{\|}}{C}-(CH_2)_n-A$$

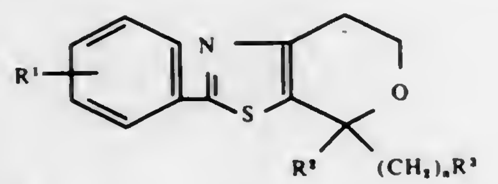
in which R^2 is lower alkyl, *n* is the integer 1 or 2 and A is $COOR^6$ in which R^6 is lower alkyl, in the presence of an acid catalyst, to obtain the corresponding compound of formula IV



(IV)

in which R^1 and R^2 are as defined herein and A is $COOR^6$ in which R^6 is lower alkyl, and subjecting the last-named compound to hydrolysis to obtain the corresponding compound of formula I in which R^3 is COOH.

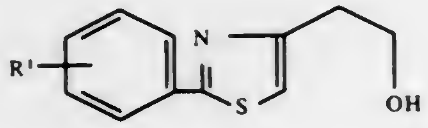
17. A process for preparing a compound formula I



(I)

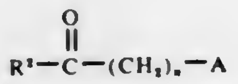
in which R^1 is hydrogen, halogen, lower alkyl, lower alkoxy or nitro; R^2 is lower alkyl; R^3 is $CH_2NR^4R^5$ in which R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl; and *n* is the integer 1 or 2, which comprises:

a. condensing a compound of formula II



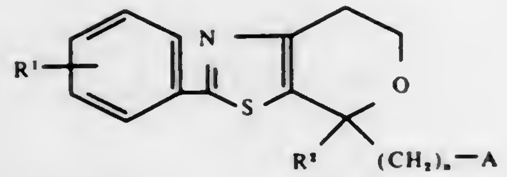
(II)

in which R^1 is as defined herein with a compound of formula



$$R^2-\overset{\overset{\displaystyle O}{\|}}{C}-(CH_2)_n-A$$

in which R^2 is lower alkyl, *n* is the integer 1 or 2 and A is $COOR^6$ in which R^6 is lower alkyl, in the presence of an acid catalyst, to obtain the corresponding compound formula IV



(IV)

in which R^1 and R^2 are as defined herein and A is $COOR^6$ in which R^6 is lower alkyl, and subjecting the last-named compound to hydrolysis to obtain the corresponding compound of formula IV in which A is COOH, subjecting the last-named product to amidation with an appropriate amine of formula NHR^4R^5 in which R^4 and R^5 are as defined herein to give the corresponding compound of formula IV in which A is $CONR^4R^5$, and reducing the last-named compound with a complex metal hydride to give the corresponding compound of formula I in which R^1 and R^2 are as defined herein and R^3 is $CH_2NR^4R^5$ as defined herein.

4,033,978

THIACYCL[2.2.2]AZINE CARBOXYLIC ACIDS

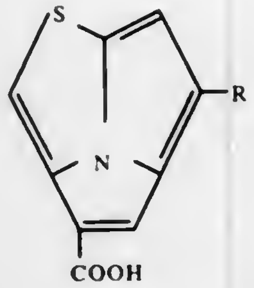
Karl G. Untch, Los Altos, and John O. Gardner, Palo Alto, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 499,713, Aug. 22, 1974, Pat. No. 3,920,672. This application Aug. 15, 1975, Ser. No. 604,983

Int. Cl.² C07D *513/16*

U.S. Cl. 260—306.7 R **6 Claims**

1. A compound represented by the formula



wherein R is phenyl or phenyl monosubstituted in the meta or para position with fluoro, chloro, lower alkyl of from 1 to 4 carbon atoms or lower alkoxy of from 1 to 4 carbon atoms, and the pharmaceutically acceptable salts thereof.

4,033,979

ORGANIC COMPOUNDS

Peter Hubert Bentley, Rudgwick, and John Peter Clayton, Horsham, both of England, assignors to Beecham Group Limited, England

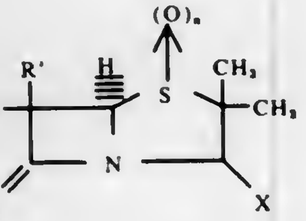
Division of Ser. No. 566,695, April 10, 1975, Pat. No. 3,996,235, which is a division of Ser. No. 443,724, Feb. 19, 1974, Pat. No. 3,936,446. This application Jan. 21, 1976, Ser. No. 650,958

Claims priority, application United Kingdom, Feb. 5, 1973, 5577/73; Feb. 5, 1973, 5578/73

Int. Cl.² C07D *499/42*

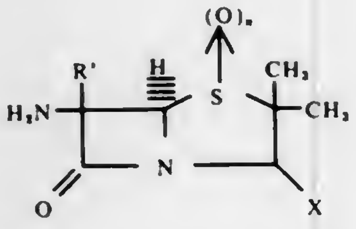
U.S. Cl. 260—306.7 C **8 Claims**

1. A process for the conversion of a compound of the formula:



(VII)

wherein *n* is zero or 1, X is COOH, a non-toxic salt thereof or a conventional penicillin ester, and hydroxyalkyl, alkoxycarbonylalkyl, aralkoxycarbonyl-alkyl, aralkyl or alkylthio into a compound of the formula:



(VIII)

which comprises reacting a compound of the formula (VII) with an acid capable of converting CN to NH_2 and which does not cleave the β-lactam ring of the penam.

4,033,980

PHTHALOCYANINE DYESTUFFS AND PROCESS FOR PREPARING THEM

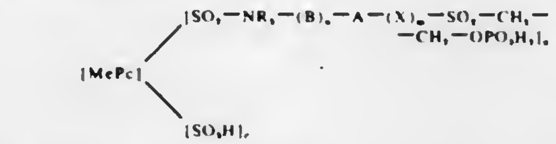
Fritz Meininger, Frankfurt am Main; Klaus Hunger, Kelkheim, Taunus, and Hartmut Springer, Frankfurt am Main, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 851,091, Aug. 18, 1969, abandoned. This application Aug. 18, 1972, Ser. No. 281,790

Int. Cl.² C09B *47/04*

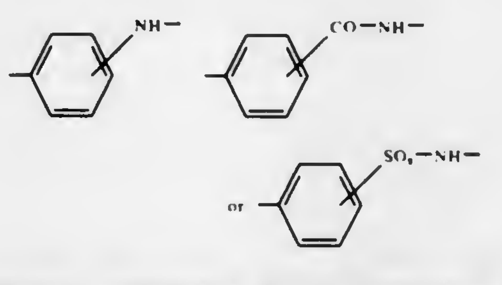
U.S. Cl. 260—314.5 **3 Claims**

1. A water-soluble phthalocyanine dyestuff of the formula



$$[MePc]\begin{cases}[SO_2-NR_3-(B)_n-A-(X)_m-SO_2-CH_2-CH_2-OPO_3H_2]_a\\ [SO_3H]_c\end{cases}$$

wherein MePc is copper phthalocyanine, nickel phthalocyanine or cobalt phthalocyanine and wherein the sulfonic acid and the sulfonamide groups are linked to the 3-position or the 4-position of the phthalocyanine benzene rings, *a* and *c* each is an integer or a fractional number in the range 1 to 3, the sum of *a* and *c* being at most 4, R_3 is hydrogen or methyl, B is $-CH_2-CH_2-$, $-CH_2-CH_2-NH-$,



A is phenylene, naphthylene, hydroxyphenylene, methoxyphenylene, methylphenylene, dimethoxyphenylene, methylmethoxyphenylene, sulfo-phenylene, carboxy-phenylene, bromo-phenylene, nitrophenylene or hydroxy-nitro-phenylene, X is $-CH_2-$ or $-N(CH_3)-$ and *n* and *m* each is 0 or 1, the sum of *m* and *n* being 0 or 1.

4,033,981

THIANTHRENE AND PHENOXATHIINE S-OXIMIDES

Peter Stoss, Wildtal, and Gerhard Satzinger, Denzlingen, both of Germany, assignors to Warner-Lambert Company, Morris Plains, N.J.

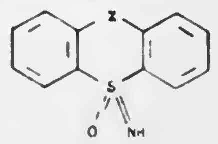
Division of Ser. No. 496,600, Aug. 12, 1974, Pat. No. 3,978,052. This application Mar. 3, 1976, Ser. No. 663,312

Claims priority, application Germany, Aug. 17, 1973, 2341653

Int. Cl.² C07D *339/08, 327/08*

U.S. Cl. 260—327 M **3 Claims**

1. Tricyclic sulphoximide of the general formula:



wherein X is oxygen, sulfur, or the pharmacologically compatible salts thereof.

4,033,982

3,4,5-TRITHIAPOLYCYCLO COMPOUNDS AND DERIVATIVES

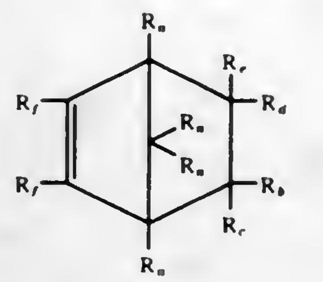
Allan Stuart Hay, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation-in-part of Ser. No. 515,349, Oct. 16, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 651,190

Int. Cl.² C07D *341/00*

U.S. Cl. 260—327 H **7 Claims**

1. A process for the preparation of a 3,4,5-trithiapolycyclo compound which comprises the reaction of sulfur with a bicyclo[2.2.1]hept-2-ene compound of the formula:



wherein each R_a, R_b, R_c, R_d and R_e when taken singly can be hydrogen, halogen, alkyl of from 1 to about 15 carbon atoms, aryl of from 6 to about 15 carbon atoms, and cycloalkyl of from 4 to about 10 carbon atoms; R_b and R_d when taken singly can be alkenyl of from 2 to about 10 carbon atoms, hydroxyl, hydroxyalkyl of from 1 to about 10 carbon atoms, dialkylamino of from 1 to about 10 carbon atoms, dialkylaminoalkyl of from 1 to about 4 carbon atoms per alkyl group, and alkoxy of from 1 to about 10 carbon atoms; R_f can be hydrogen or alkyl of from 1 to about 15 carbon atoms; R_b and R_c taken together and R_d and R_e taken together can be alkylidene of from 1 to about 6 carbon atoms; R_b and R_d taken together are the divalent $-CHYCH{=}CY-$ group in which Y is hydrogen or methyl, said reaction being carried out at a temperature within the range of from about 0° to about 200° C. in the presence of a phenol of the formula:

$$(R)_m\,[Ar](OH)_n$$

wherein Ar is an arene radical having a valence of at least one and having at least one —OH radical attached directly to an arene carbon atom, R is an alkyl, cycloalkyl, aryl, halide, hydroxy, alkoxy, alkanoate radical or a combination thereof, *m* is a positive integer at least equal to 0, and *n* is a positive integer at least equal to 1, and a base selected from the group consisting of elemental alkali and alkaline earth metals, alkali or alkaline earth metal hydroxides, and salts of strong bases and weak organic acids.

4,033,983

NONFLAMMABLE COATING MATERIAL

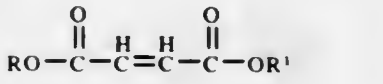
Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Dec. 17, 1975, Ser. No. 641,856

Int. Cl.² C08K *5/01*

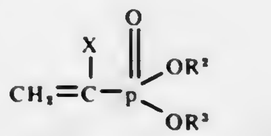
U.S. Cl. 260—33.6 UA **4 Claims**

1. An improved, nonflammable coating composition containing vinyl chloride, dialkyl maleates, and bis-2-chloro alkyl vinyl phosphonates, the improvement comprising forming a tertelomer using a free radical initiator in the presence of at least, based on one mole of vinyl chloride, 0.25 moles of xylene, and from about 0.01 to 1 moles vinyl phosphonate and 0.05 to 0.5 moles of dialkyl maleate, wherein the maleate is defined by:



$$RO-\overset{\overset{\displaystyle O}{\|}}{C}-\overset{H}{C}{=}\overset{H}{C}-\overset{\overset{\displaystyle O}{\|}}{C}-OR^1 \qquad (I)$$

and wherein the phosphonate is defined by:



$$CH_2{=}\overset{\overset{\displaystyle X}{|}}{C}-\overset{\overset{\displaystyle O}{\|}}{P}\begin{matrix}OR^2\\OR^3\end{matrix} \qquad (II)$$

wherein R and R^1 are the same or different alkyl radicals containing from 3 to 15 carbon atoms, R^2 and R^3 are the same or different alkyl radicals containing from 1 to 15 carbon atoms and *x* is selected from the group consisting of hydrogen, halogens, and alkyls, cyanoalkyls and haloalkyls containing from 1 to 18 carbon atoms.

4,033,984

PROCESS FOR THE MANUFACTURE OF PERFLUORALKOXY-PROPIONIC ACID FLUORIDE

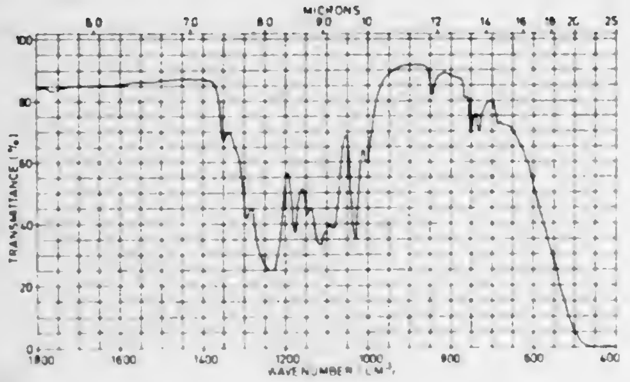
Thomas Martini, Neuenhain, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 18, 1975, Ser. No. 597,382

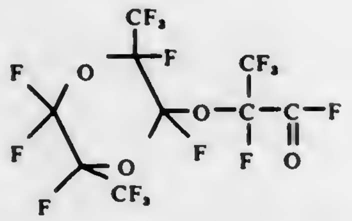
Claims priority, application Germany, June 20, 1974, 2434992

Int. Cl.² C07D *319/10*

U.S. Cl. 260—340.6 8 Claims

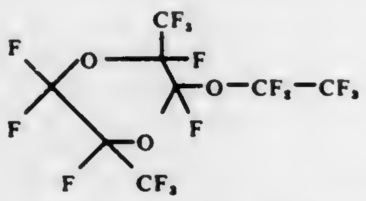


1. A perfluoro-α-[3,6-dimethyl-1,4-dioxanyl-2-oxy]-propionic acid fluoride of formula

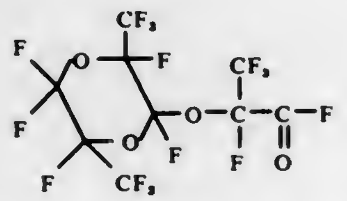


III

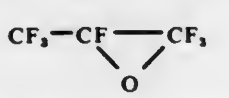
2. A perfluoro-2-ethoxy[3,6-dimethyl-1,4-dioxane] of the formula



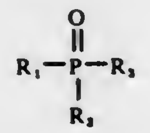
3. A process for the preparation of a perfluoralkoxypropionic acid fluoride of the formula



which comprises reacting hexafluoropropene oxide of the formula



with a phosphoric acid tris-(dialkyl amide) of the formula



$$R_1-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle R_3}{|}}{P}}-R_2$$

wherein R_1, R_2 and R_3 each represent a di-alkyl amine, the alkyl groups having from 1 to 4 carbon atoms, said reaction being carried out at a temperature of from −50° C to +10° C, and recovering said perfluoralkoxypropionic acid fluoride.

4,033,985

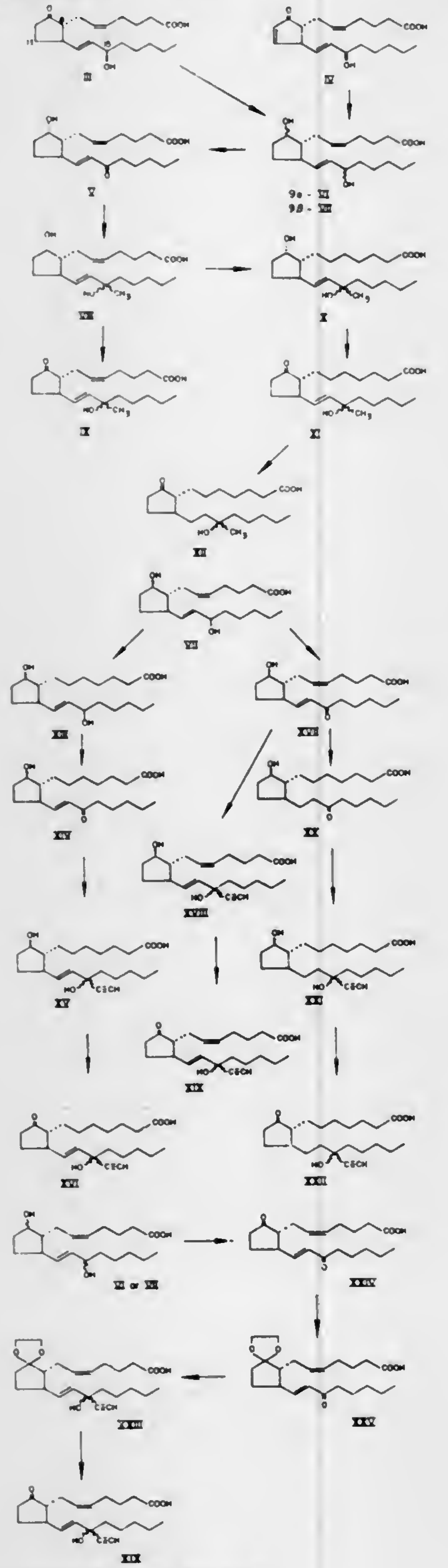
15-SUBSTITUTED PROSTANOIC ACID

Donald Peter Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

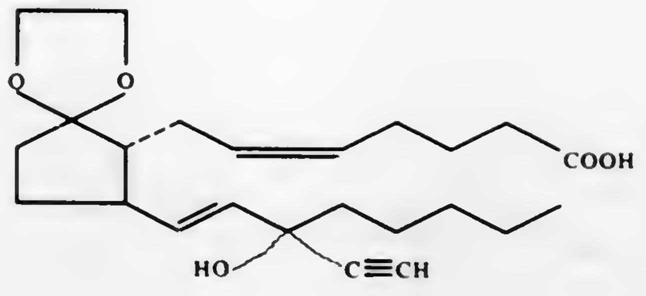
Division of Ser. No. 569,026, April 17, 1975, which is a division of Ser. No. 462,006, April 18, 1974, which is a continuation-in-part of Ser. No. 383,007, July 26, 1973, Pat. No. 3,922,802. This application Apr. 19, 1976, Ser. No. 678,290

Int. Cl.² C07D *317/10*

U.S. Cl. 260—340.9 1 Claim



1. A compound of the Formula:



4,033,986

PROCESS FOR THE PREPARATION OF 4-BROMO-1,8-NAPHTHALIC ACID ANHYDRIDE

Richard L. Castenson, Coventry; James R. Hazen, and Rex Y. Tien, both of Warwick, all of R.I., assignors to American Hoechst Corporation, Bridgewater, N.J.

Filed Feb. 11, 1976, Ser. No. 657,304

Int. Cl.² C07D *311/02*

U.S. Cl. 260—345.2 **8 Claims**

1. A process for the preparation of 4-bromo-1,8-naphthalic acid anhydride which comprises brominating a di-alkali metal salt of 1,8-naphthalic acid in an aqueous solution at a pH between 6.5 and 9.5 to the di-alkali metal salt of 4-bromo-1,8-naphthalic acid with a brominating agent comprising

1. an alkali metal bromide, or
2. molecular bromine,

in the presence of either

a. a hypochlorite, or
b. chlorine gas and alkali,

at a temperature between 0° and 30° C.

4,033,987

ISOLATING NAPHTHOQUINONE AND PHTHALIC ANHYDRIDE FROM NAPHTHALENE OXIDATION PRODUCT

Joachim Priemer, Odenthal; Norbert Schenk, Leverkusen; Jorg Krekel, Essen, and Wulf Schwerdtel, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 16, 1976, Ser. No. 706,093

Claims priority, application Germany, July 19, 1975, 2532388

Int. Cl.² C07D *307/89*; C07C *49/66*

U.S. Cl. 260—346.4 **15 Claims**

1. A process for isolating naphthoquinone and phthalic anhydride from the gases obtained from the oxidation of naphthalene, comprising passing the gases obtained from the oxidation of naphthalene at a temperature of about 250° to 500° C and under pressure into a quencher, passing into said quencher in counter-current to said gas a liquid which contains naphthalene, naphthoquinone and phthalic anhydride, taking off liquid at a temperature of less than about 200° C from the sump of the quencher, cooling part of this liquid and recycling it to the top of the quencher, cooling being effected with a liquid coolant which has a temperature at most about 70° C below that of the liquid to be cooled, at the top of the quencher removing a gas at a temperature of less than about 150° C, which gas still contains only small amounts of naphthalene, naphthoquinone and phthalic anhydride, scrubbing this gas with liquid naphthalene supplied to the top of a scrubber, from the bottom of the scrubber removing naphthalene containing small amounts of naphthoquinone and phthalic anhydride, feeding a minor proportion of the removed naphthalene to the quencher, cooling the major proportion of the removed naphthalene and recycling it for further scrubbing, and removing from the top of the scrubber a gas which is virtually free from naphthoquinone and phthalic anhydride.

4,033,988

DERIVATIVES OF 17α-HYDROXY, 19-NORPREGN-4-ENE-3,20-DIONE

Jean Marie Gastaud, 3 avenue du prince pierre, Monte Carlo, Monaco

Filed June 20, 1975, Ser. No. 588,959

Claims priority, application United Kingdom, June 28, 1974, 28882/74

Int. Cl.² C07J *1/00*

U.S. Cl. 260—397.4 1 Claim

1. 3,20-Diketo-7α-acetylthio-17α-acetoxy-19-norpregnene-4.

4,033,989

9-DEOXY-PGF₂ ANALOGS

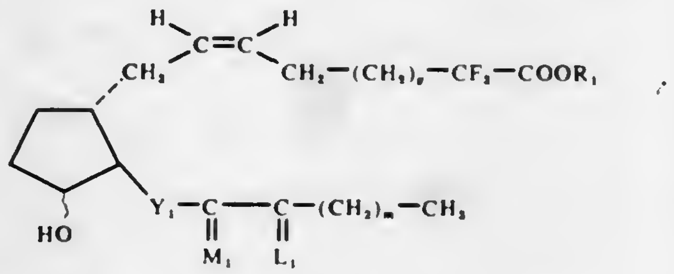
Gordon L. Bundy, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Sept. 17, 1975, Ser. No. 614,243

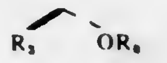
Int. Cl.² C07C *177/00*

U.S. Cl. 260—408 69 Claims

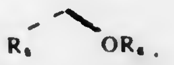
1. A prostaglandin analog of the formula



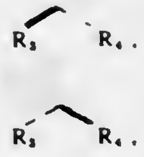
wherein Y_1 is cis—CH=CH— or trans —CH=CH—;
wherein g is one 2, or 3;
wherein M_1 is

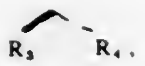


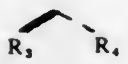
or



wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_1 is

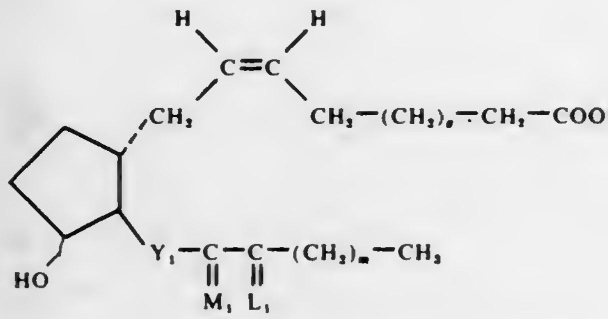




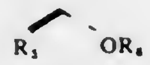


wherein R_3 and R_4 are hydrogen, methyl, or fluoro, being the same or different, with the proviso that one of R_3 and R_4 is fluoro only when the other is hydrogen or fluoro;
wherein *m* is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

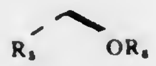
36. A prostaglandin analog of the formula



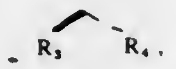
wherein Y_1 is cis—CH=CH— or trans—CH=CH—;
wherein *g* is one, 2, or 3;
wherein M_1 is

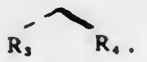


or

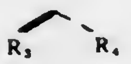


wherein R_5 and R_6 are hydrogen or methyl, with the proviso that one of R_5 and R_6 is methyl only when the other is hydrogen;
wherein L_2 is

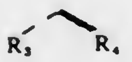




or a mixture of

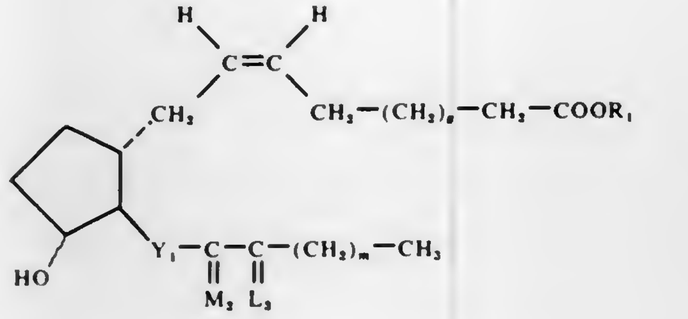


and

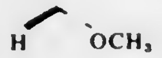


wherein R_3 and R_4 are hydrogen or fluoro, being the same or different, with the proviso that at least one of R_3 and R_4 is fluoro;
wherein *m* is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two, or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

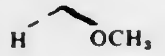
57. A prostaglandin analog of the formula



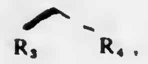
wherein Y_1 is cis—CH=CH— or trans—CH=CH—.
wherein *g* is one, 2, or 3;
wherein M_2 is

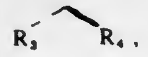


or

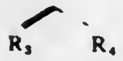


wherein L_3 is

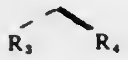




or a mixture of



and



wherein R_3 and R_4 are hydrogen or methyl, being the same or different;
wherein *m* is one to 5, inclusive; and
wherein R_1 is hydrogen, alkyl of one to 12 carbon atoms, inclusive, cycloalkyl of 3 to 10 carbon atoms, inclusive, aralkyl of 7 to 12 carbon atoms, inclusive, phenyl, phenyl substituted with one, two or three chloro or alkyl of one to 3 carbon atoms, inclusive, or a pharmacologically acceptable cation.

4,033,990

HYDROXYBICYCLOSILOXANE RIGID URETHANE FOAM STABILIZERS

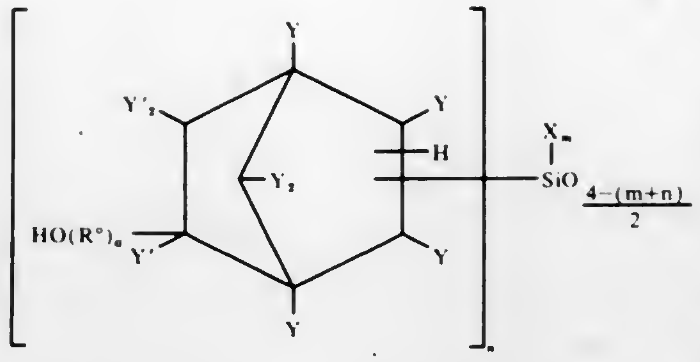
George M. Omietanski, Marietta, Ohio; Harold D. Furbee, Sistersville, W. Va., and Vincent T. Chuang, Marietta, Ohio, assignors to Union Carbide Corporation, New York, N.Y.

Filed Dec. 29, 1972, Ser. No. 319,788

Int. Cl.² C07F *7/08*

U.S. Cl. 260—448.2 B **9 Claims**

1. A hydroxybicyclosiloxane consisting essentially of: (A) at least one hydroxybicyclosiloxane unit having the formula:



wherein Y is hydrogen or an alkyl group containing from 1 to 4 carbon atoms inclusive, Y' is hydrogen or an alkyl group containing from 1 to 12 carbon atoms inclusive, R° is a divalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds, *a* has a value of 0 or 1, X is a monovalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds, *m* has a value of 0, 1 or 2, *n* has a value of 1 or 2, and (*m*+*n*) has a value of 1, 2 or 3, each hydroxybicyclosiloxane group has no more than 20 carbon atoms; and (B) at least hydrocarbylsiloxane units represented by the formula:

$$Z_pSiO_{\frac{4-p}{2}}$$

wherein *p* has a value of 1, 2 or 3 and Z is a monovalent hydrocarbon group free of aliphatic carbon to carbon multiple bonds, the molecular weight of the siloxane portion of the hydroxybicyclosiloxane being from about 250 to about 1300 inclusive, and, when dihydrocarbylsiloxane units (Z_2SiO units) are present, the ratio of hydroxybicyclosiloxane units to dihydrocarbylsiloxane units is at least 0.5 to 1.0.

4,033,991

METHOD FOR PREPARING ORGANOSILANES CONTAINING SILICON-BONDED OXIME GROUPS

Toshio Shinohara, and Masatoshi Arai, both of Annaka, Japan, assignors to Shin-Etsu Chemical Company, Limited, Tokyo, Japan

Filed Dec. 23, 1975, Ser. No. 643,812

Claims priority, application Japan, Dec. 26, 1974, 50-2933

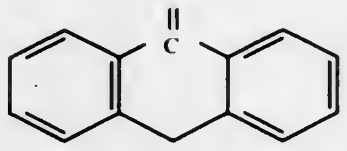
Int. Cl.² C07F *7/08, 7/10*

U.S. Cl. 260—448.2 E **11 Claims**

1. A method for preparing an organosilane represented by the general formula

$$R^1_aSi(ON{=}Y)_{4-a}$$

where R^1 is a monovalent hydrocarbon group selected from the class consisting of alkyl, alkenyl, aryl and aralkyl groups and halogen- or cyano-substituted groups thereof; Y is a group denoted by $R^2R^3C{=}$ or $R^4C{=}$, R^2 and R^3, which may be identical or different, having the same meaning as R^1 defined above and R^4 being a divalent group selected from alkylene groups, halogen-substituted groups thereof and a group represented by the formula



and *a* is 0, 1, 2 or 3, which comprises reacting a halogenosilane represented by the general formula

$$R^1_aSiX_{4-a}$$

where R^1 and *a* are as defined above and X is a halogen atom with a metal oxime represented by the general formula

$$Y{=}NOM$$

where Y is as defined above and M is an alkali metal.

4,033,992

NOVEL COMPOUNDS OF THE 11-DEOXYPROSTAGLANDIN E_3,$F_{3\alpha}$, AND $F_{3\beta}$ SERIES

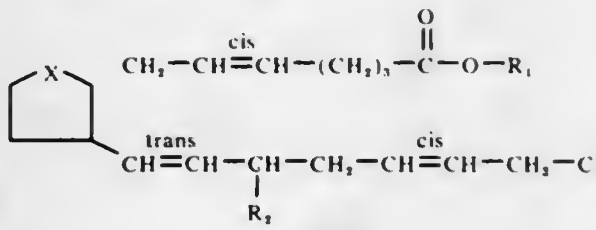
Charles Vincent Grudzinskas, 21 5th Ave., Nyack, N.Y. 10960, and Martin Joseph Weiss, 975 Phillis Lane, Oradell, N.J. 07649

Division of Ser. No. 526,772, Nov. 25, 1974, abandoned, which is a continuation-in-part of Ser. No. 300,011, Oct. 24, 1972, abandoned. This application Dec. 29, 1975, Ser. No. 645,066

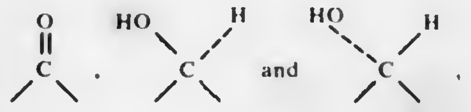
Int. Cl.² C07C *177/00*

U.S. Cl. 260—456 R **14 Claims**

1. A compound selected from the group embracing the 15(S) and 15(R) configurations and consisting of those of the formula:



wherein R_1 is selected from the group consisting of hydrogen and alkyl having up to 12 carbon atoms; R_2 is selected from the group consisting of hydroxy, formyloxy, alkanoyloxy having up to four carbon atoms and alkanesulfonyloxy having up to four carbon atoms; X is a divalent radical selected from the group consisting of those of the formulae:



and the pharmacologically acceptable cationic salts thereof when R_1 is hydrogen.

4,033,993

CYCLOALKYL CARBONATES

Klaus Bruns, Krefeld-Traar, and Peter Meins, Mettmann, both of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

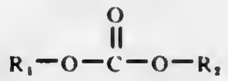
Filed Apr. 14, 1976, Ser. No. 676,932

Claims priority, application Germany, Apr. 25, 1975, 2518392

Int. Cl.² C07C *69/96;* **A61K** *7/46*

U.S. Cl. 260—463 **5 Claims**

1. A carbonic acid ester of the formula



$$R_1{-}O{-}\overset{\overset{\large O}{\|}}{C}{-}O{-}R_2$$

wherein R_1 is cycloalkyl having from 8 to 12 carbon atoms, and R_2 is a member selected from the group consisting of alkyl having from 1 to 5 carbon atoms, alkenyl having from 2 to 5 carbon atoms and alkynyl having from 2 to 5 carbon atoms.

4,033,994

SUBSTITUTED p-MENTHANES

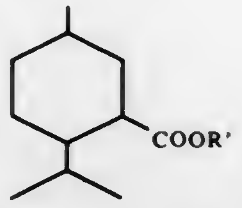
Hugh R. Watson, Wargrave; David G. Rowsell, Staines, and John H. D. Browning, Wokingham, all of England, assignors to Wilkinson Sword Limited, England

Continuation-in-part of Ser. No. 221,753, Jan. 28, 1972, abandoned. This application July 8, 1974, Ser. No. 486,652

Int. Cl.^{2} C07C *69/74*

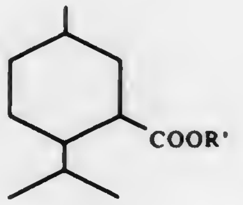
U.S. Cl. 260—468 R **6 Claims**

1. Compounds of the formula:



where R′ is an aliphatic radical of up to 10 carbon atoms selected from: mono- and poly-hydroxyalkyl and cycloalkyl radicals containing from 2 to 10 carbon atoms and having a hydroxyl group in one or more of the 2-, or 3-position and a hydrogen atom in the 1-position; (2,2-dimethyl-1,3-dioxolan-4-yl) methyl; an acylated derivative of a hydroxyalkyl radical of 2–9 carbon atoms with a lower alkanoic acid; an aryl hydrocarbon radical of up to 10 carbon atoms and containing a hydroxyl substituent in a 2- or 3-position relative to the ester grouping; carboxyalkyl radicals containing a carboxyl group in the 1-, 2- or 3-position; and alkali metal, alkaline earth metal, ammonium or substituted amonium salt of such a carboxyalkyl radical; and lower alkyl esters of such carboxyalkyl radicals.

6. Compounds of the formula:



wherein R′ is a radical containing up to 10 carbon atoms, said radical being an adduct of a hydroxyalkyl radical of at least 2 carbon atoms and having a hydroxyl group in the 2, or 3-position and a hydrogen atom in the 1-position, with from 1 to 3 moles of a lower alkylene oxide.

4,033,995

D-HOMO STEROIDS

Robert C. Nickolson; Ulrich Kerb, and Rudolf Wiechert, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

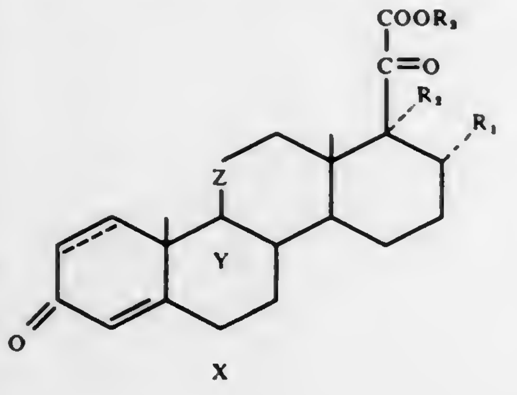
Filed Sept. 2, 1975, Ser. No. 609,707

Claims priority, application Germany, Sept. 4, 1974, 2442616

Int. Cl.^{2} C07J *63/00*

U.S. Cl. 260—468.5 **20 Claims**

1. A D-homo steroid of the formula



wherein is a single bond or a double bond; X is a hydrogen atom, a fluorine atom, or methylene; Y is a hydrogen atom, a fluorine atom, or a chlorine atom; Z is methylene, carbonyl, β-hydroxymethylene, a β-n-alkanoyloxymethylene of 1–4 carbon atoms in the alkanoyl group or when Y is a chlorine atom, also β-fluoromethylene or β-chloromethylene; R$_1$ is a hydrogen atom or methyl; R$_2$ is a hydrogen atom, hydroxy or n-alkanoyloxy of 1–4 carbon atoms; and R$_3$ is a hydrogen atom or a sodium, potassium or ammonium ion, alkyl of 1–12 carbon atoms, cycloalkyl of 3–12 rng carbon atoms or hydrocarbon mono or di-cyclic aryl or aralkyl of up too 12 carbon atoms.

4,033,996

8-AZA-9-OXO(AND DIOXO)-THIA-11,12-SECOPROSTAGLANDINS

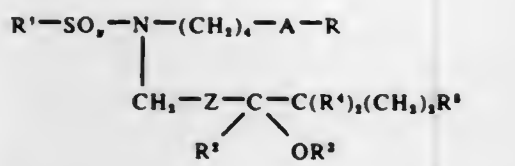
Edward J. Cragoe, Jr., Lansdale, and James H. Jones, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 580,497, May 23, 1975, abandoned, which is a continuation-in-part of Ser. No. 418,341, Nov. 23, 1973, abandoned, which is a continuation-in-part of Ser. No. 354,273, April 25, 1973, abandoned. This application Mar. 22, 1976, Ser. No. 669,123

Int. Cl.^{2} C07C *143/74, 143/75, 145/02*

U.S. Cl. 260—490 **26 Claims**

1. A compound of the formula:



$$\begin{array}{l} R^1-SO_2-N-(CH_2)_4-A-R \\ \qquad\qquad\;\; | \\ \qquad\quad CH_2-Z-\underset{R^2\;\;\;OR^3}{C}-C(R^4)_2(CH_2)_yR^5 \end{array}$$

wherein

- R is carboxy, a carboxy salt, said salt being formed from a pharmaceutically acceptable cation selected from the group of metals and amines or a derivatized carboxy having the formula —COOY, wherein; Y is alkyl having 1–10 carbon atoms;
- A is ethylene, trimethylene, α-methylethylene, β-methylethylene, α,α-dimethylethylene, or β,β-dimethylethylene;
- y is 1 or 2
- R^1 is methyl, ethyl, propyl, or isopropyl;
- Z is ethylene, vinylene, or ethynylene;
- R^3 is hydrogen or loweralkanoyl;
- R^2 is hydrogen, methyl, ethyl, or propyl;
- R^4 is independently hydrogen or methyl; and
- R^5 is selected from the group consisting of hydrogen, lower alkyl of 1–4 carbon atoms either straight or branched.

4,033,997

PREPARATION OF DOPAMINE DERIVATIVES

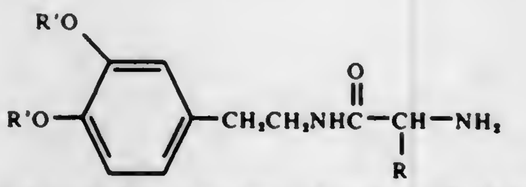
Robert Roteman, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Feb. 26, 1976, Ser. No. 661,470

Int. Cl.^{2} C07C *68/02, 69/96*

U.S. Cl. 260—463 **10 Claims**

1. The process for making a compound of the formula



I

where R is hydrogen or an inert radical and R′ is hydrogen or benzyloxycarbonyl, consisting essentially in reacting the N-carboxyanhydride of a natural aminoacid of the formula NH_2-CHR-COOH wherein R has the above meaning with dopamine or its dibenzyloxycarbonyl analog in an inert, liquid reaction medium at a pH of 8–12.5 and a temperature of −10° C to 5° C and recovering the formed acyldopamine derivative of said formula I.

4,033,998

VINYLBENZYL ESTER OF AN N-BOC AMINO ACID

Nicholas D. Harris, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Division of Ser. No. 659,967, Feb. 20, 1976. This application Oct. 28, 1976, Ser. No. 736,403

Int. Cl.^{2} C07C *125/06*

U.S. Cl. 260—471 C **1 Claim**

1. The vinylbenzyl ester of N-tertiarybutyloxy carbonyl-O-benzyl-L-tyrosine.

4,033,999

PROCESS FOR PREPARING A CARBOXYLIC ESTER

Takeru Onoda, and Keisuke Wada, both of Yokohama, Japan, assignors to Mitsubishi Chemical Industries Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 548,779, Feb. 10, 1976, abandoned. This application May 5, 1976, Ser. No. 683,529

Claims priority, application Japan, Feb. 12, 1974, 49-16922

Int. Cl.^{2} C07C *67/05*

U.S. Cl. 260—488 CD **14 Claims**

1. In a process for preparing a carboxylic ester of a substituted benzene compound having one or two hydroxymethyl groups on the benzene ring by reacting a benzene compound selected from the group consisting of toluene and xylene, a lower alkanoic acid, and molecular oxygen in the gaseous phase in the presence of a catalyst, the improvement which comprises:

reacting said reactants over a supported catalyst wherein the active constituents consist essentially of:

a. palladium metal,

2. and antimony component substantially as the oxide thereof, and

3. at least one carboxylic acid salt of an alkali metal, an alkaline earth metal, zinc, cadmium or lead or a carrier.

4,034,000

DIFUNCTIONAL POLYMERIC DIENES

Emanuel Schoenberg, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 310,910, Sept. 23, 1963, abandoned, which is a continuation-in-part of Ser. No. 9,161, Feb. 17, 1960, abandoned. This application July 1, 1970, Ser. No. 51,715

Int. Cl.^{2} C07C *154/00, 51/15, 20/00, 31/18*

U.S. Cl. 260—502.6 **3 Claims**

3. A process for producing relatively high molecular weight difunctional polydienes of at least 370 molecular weight consisting essentially of (A) reacting finely divided lithium metal with isoprene in a solvent to form a lithium metal polymeric diene adduct, the ratio of lithium to isoprene being in the range of 1 to 2 to about 1 to 26 at a temperature less than 30° C., (B) immediately after the formation of the lithium metal polymeric diene adduct reacting said adduct with a functionality imparting compound to form a lithium polymeric compound, (C) treating the lithium polymeric compound to replace lithium with hydrogen to yield a compound characterized by high reactivity with an organo diisocyanate to yield a polyurethane having a dilute solution viscosity of at least about 0.4, said solvent comprisng at least 60 percent by weight of an ether, said ether being selected from the class consisting of diethyl ether, tetrahydrofuran and dimethoxyethane, and said functionality imparting compound being selected from the class consisting of carbon dioxide, propylene oxide, alkanals of less than 5 carbon atoms, alkanones of less than 5 carbon atoms, and carbon disulfide.

4,034,001

BIS-AMIDOALKANESULFONIC ACIDS AND SALTS THEREOF

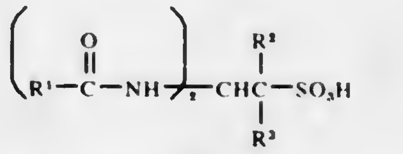
Leonard Edward Miller, Chagrin Falls, and Donald Leon Murfin, Mentor, both of Ohio, assignors to The Lubrizol Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 216,290, Jan. 7, 1972, abandoned, and a continuation-in-part of Ser. No. 889,806, Dec. 12, 1969, abandoned, which is a division of Ser. No. 619,923, March 2, 1967, Pat. No. 3,531,442. This application July 28, 1975, Ser. No. 599,613

Int. Cl.^{2} C07C *143/16*

U.S. Cl. 260—513 N **15 Claims**

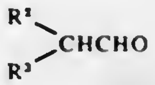
1. A compound having the formula



$$\left(R^1-\overset{\overset{O}{\|}}{C}-NH\right)_2 CH\underset{R^3}{\overset{R^2}{C}}-SO_3H$$

wherein R^1 is an alkenyl radical having no more than about 12 carbon atoms and each of R^2 and R^3 is hydrogen or an alkyl radical having up to about 18 carbon atoms.

7. A method for preparing a compound according to claim 1 which comprises reacting, at a temperature between about −30° and 250° C., an aldehyde of the formula



$$\begin{matrix} R^2 \\ R^3 \end{matrix}\!\!>CHCHO$$

with a nitrile of the formula R^{1}CN and a sulfonating agent comprising sulfuric acid, sulfur trioxide or fuming sulfuric acid, wherein R^1, R^2 and R^3 are as defined in claim 1.

4,034,002

PROSTAGLANDIN DERIVATIVES

Donald P. Strike, St. Davids, and Wen-Ling Kao, Devon, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

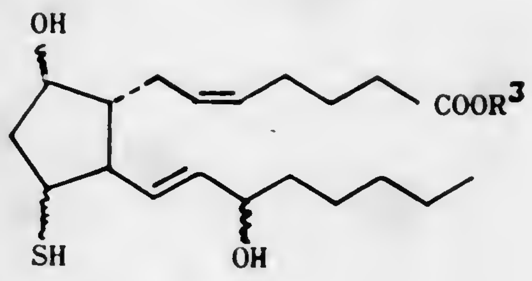
Division of Ser. No. 384,769, Aug. 1, 1973, Pat. No. 3,845,042. This application Aug. 2, 1974, Ser. No. 494,138

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.^{2} C07C *149/26*

U.S. Cl. 260—514 D **2 Claims**

1. A compound of the formula:



wherein R^3 is hydrogen or lower alkyl.

4,034,003
15-CYCLOALKYL-PROSTAGLANDINS

Masaki Hayashi; Seiji Kori, both of Takatsuki; Hajimu Miyake, Suita; Takashi Yamato, Takatsuki, and Hisashi Suga, Nishinomiya, all of Japan, assignors to Ono Pharmaceutical Co., Ltd., Osaka, Japan

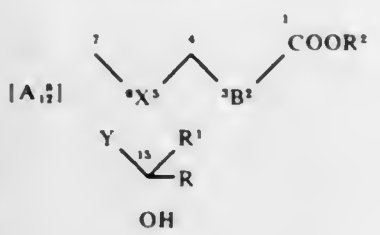
Filed Apr. 8, 1975, Ser. No. 566,147

Claims priority, application United Kingdom, Apr. 11, 1974, 16241/74; Nov. 8, 1974, 48535/74

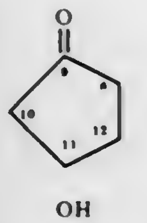
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—514 D 7 Claims

1. A compound of the formula:



wherein A represents a grouping of the formula:



X represents ethylene, Y represents trans-vinylene, B represents trans-vinylene, R represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 4 carbon atoms, R_1 represents cycloalkyl of 4–7 carbon atoms, and R_2 represents a hydrogen atom or a straight- or branched-chain alkyl group containing from 1 to 12 carbon atoms and cyclodextrin clathrates of such acids and esters and, when R_2 represents a hydrogn atom, non-toxic salts thereof.

4,034,004
PROCESS FOR THE PREPARATION OF CARBOXYLIC ACIDS FROM ORGANIC HALIDES

Luigi Cassar; Marco Foá, both of Novara, and Andrea Gardano, Trino Vercellese (Vercelli), all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

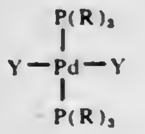
Filed June 10, 1975, Ser. No. 585,756

Claims priority, application Italy, June 11, 1974, 23849/74

Int. Cl.^{2} C07C *63/00*

U.S. Cl. 260—515 R **8 Claims**

1. A process for the preparation of carboxylic acid by reaction of carbon monoxide with an organic halide selected from the group consisting of aromatic and aliphatic halides, and catalyzed by a phosphine palladium complex selected from the group consisting of (a) a palladium complex of the formula $Pd[P(R)_3]_m$ wherein *m* is a whole number from 2 to 4, and $(R)_3$ represents a homogeneous or heterogeneous group consisting of phenyl and alkyl radicals; (b) a palladium complex of the formula $Pd[P(R)_2-(CH_2)_n-P(R_2)]_p$ wherein $(R)_2$ has the same meaning indicated above for $(R)_3$, *p* is a whole number from 1 to 2, and *m* is a whole number from 1 to 6; or (c) a palladium complex of the formula



wherein the groups $(R)_3$, equal to or different from each other have the same meaning as indicated above, and Y is a halogen atom and an aryl radical

and in the presence of a quaternary alkyl-ammonium salt having a total of at least 6 carbon atoms, characterized in that said process is conducted in a double liquid phase consisting of (a) said organic halide and said catalytic palladium complex or their solutions in a hydrocarbon solvent immiscible with H_2O, and (b) an aqueous sodium hydroxide or potassium hydroxide solution containing said quaternary alkyl-ammonium salt

at a temperature between about 50° and 150° C, the molar ratio of Pd/organic halide being between 0.1 and 0.0001 and the molar ratio of sodium or potassium hydroxide/organic halide being greater than equimolar, and

acidifying the resulting intermediate product to obtain said carboxylic acid.

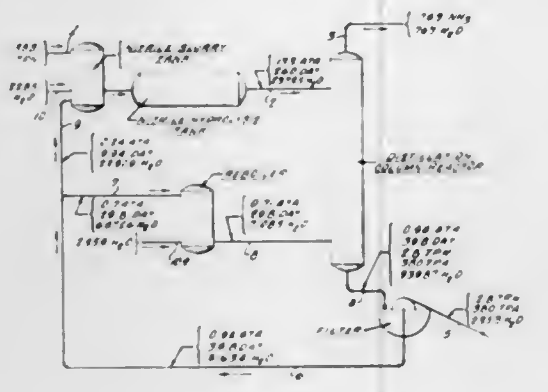
4,034,005
PROCESS FOR MAKING AROMATIC ACIDS

Allen W. Hancock, II, Media, and William D. Vanderwerff, West Chester, both of Pa., assignors to Sun Ventures, Inc., St. Davids, Pa.

Filed June 17, 1975, Ser. No. 587,756

Int. Cl.^{2} C07C *63/14, 63/06*

U.S. Cl. 260—515 P **12 Claims**



1. In the process for making an aromatic carboxylic acid of high purity by feeding an essentially equilibrium hydrolysis mixture of an aromatic nitrile to a reactive distillation column operated at a temperature of from about 200° C. to about 325° C. at autogenous pressure where the equilibrium mixture is subjected simultaneously to further hydrolysis and distillation of ammonia, removing water vapor and ammonia from the top of the column, subjecting remaining equilibrium hydrolysis mixture to further hydrolysis and distillation in a reboiler, returning vapor from the reboiler to the distillation column, removing an aqueous solution of product acid from the reboiler, cooling said separated solution, and separating aromatic acid product, the improvement of returning the aqueous filtrate from said separate aromatic acid product to a lower portion of said column whereby product purity is enhanced.

3. The process of claim 1 where the aromatic nitrile is a phthalonitrile.

4,034,006
PROCESS FOR THE MANUFACTURE OF ALKALI SALTS OF 3,5-DISUBSTITUTED 4-HYDROXYBENZOIC ACIDS AND THEIR FREE ACIDS

Hanns Lind, Liestal; Jean Rody, Basel, and Heimo Brunnetti, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 282,638, Aug. 21, 1972, abandoned. This application Feb. 24, 1975, Ser. No. 552,527

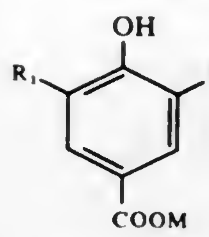
Claims priority, application Switzerland, Sept. 28, 1971, 14105/71

Int. Cl.^{2} C07C *51/15*

U.S. Cl. 260—521 C **6 Claims**

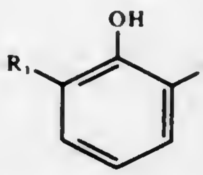
1. A process for the manufacture of compounds of the general formula I

-continued



(I)

wherein R_1 and R_2 are both tert.-butyl, sec.-butyl or cycloocytl, or R^1 is tert.-butyl and R_2 is methyl or R_1 is tert.-butyl and R_2 is cyclohexyl, and M is hydrogen or an alkali metal atom, in which process a phenol of the general formula II



(II)

wherein R_1 and R_2 have the meaning indicated under the formula I, is treated, in a mixture of water and a dipolar aprotic solvent, with an alkali metal hydroxide and the reaction product, after removal of the water, is reacted, without intermediate isolation and in the organic medium, at elevated temperature, with carbon dioxide under normal pressure and the acid is optionally liberated from the resulting alkali metal salt.

4,034,007
PROCESS FOR THE PRODUCTION OF HALOGENATED AROMATIC CARBOXYLIC ACIDS

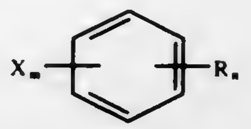
Roy Tully Gottesman, Glen Rock, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed Jan. 7, 1972, Ser. No. 216,279

Int. Cl.^{2} C07C *51/33*

U.S. Cl. 260—524 R **8 Claims**

1. In the process for the production of halogenated aromatic carboxylic acids which comprises contacting a halogenated alkylbenzene having the structural formula



wherein X represents a halogen atom; R represents an alkyl group having from 1 to 4 carbon atoms or a haloalkyl group having from 1 to 4 carbon atoms and from 1 to 4 halogen atoms; and *m* and *n* each represents a number in the range of 1 to 5, the sum of *m* and *n* being in the range of 2 to 6, with an oxygen-containing gas in the presence of about 0.01 percent to 5 percent, based on the weight of the halogenated alkylbenzene, of a heavy metal oxidation catalyst selected from the group consisting of cobalt, manganese, and vanadium salts of alkanoic acids having 1 to 8 carbon atoms, benzoic acid, and naphthenic acids at a temperature between about 130° C. and the boiling point of said halogenated alkylbenzene and at a pressure in the range of about 10 p.s.i. to 75 p.s.i., the improvement that comprises carrying out the oxidation in the presence of at least 0.001 mole per mole of halogenated alkylbenzene of epichlorohydrin.

4,034,008
PROCESS FOR PREPARING UNSATURATED ACIDS AND ALDEHYDES

Abraham Nathan Kurtz; Erlind Magnus Thorsteinson, and Harry Joe Decker, all of Charleston, W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 606,973

Int. Cl.^{2} C07C *51/32, 45/04*

U.S. Cl. 260—533 N **9 Claims**

1. A process for the production of C_3 to C_4 alpha-beta unsaturated aliphatic carboxylic acid and C_3 to C_4 alpha-beta unsaturated aliphatic aldehyde by vapor phase catalytic oxidation of the corresponding unsaturated C_3 to C_4 mono-alpha-olefin with molecular oxygen in the presence of steam which comprises contacting the reaction mixture with a calcined oxidation catalyst which is devoid of potassium and which contains the elements Mo, Bi, Fe, T, Si and X in the form of oxides and which contains the elements Mo, Bi, Fe, T, Si, X and Cl, prior to calcination, in the ratio

$$Mo_aBi_bFe_cT_dSi_eX_fCl_g$$

wherein

T is selected from the group consisting of Ni and Co,
X is selected from the group consisting of Ru and Sb,
a is 10,
b is 0.1 to 5.0,
c is d/3 to d/5,
d is 2.0 to 9.0,
e is 1 to 20,
f is 0.1 to 1.0, and
g is 0 to 5.

4,034,009
4-UREIDO-2-ACYL PHENOXYPROPANOLAMINE

Gerhard Zölss, Linz; Heribert Pittner, Gmund, and Helmo Stormann-Menninger-Lerchenthal, Linz, all of Austria, assignors to Chemie Linz Aktiengesellschaft, Austria

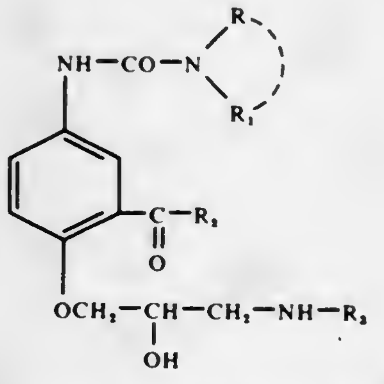
Filed Dec. 17, 1974, Ser. No. 533,688

Claims priority, application Austria, Dec. 20, 1973, 10666/73

Int. Cl.^{2} C07C *127/15, 127/19;* **A61K** *31/17*

U.S. Cl. 260—553 A 7 Claims

1. A phenoxypropylamine derivative selected from the group consisting of compounds of the formula



wherein R and R_1 which may be the same or different are an alkyl group containing 1 to 6 carbon atoms, R_2 is an alkyl group containing 1 to 5 carbon atoms and R_3 is tertiary butyl or isopropyl and pharmaceutically acceptable salts thereof.

4,034,010

BIS-(META-AMIDINOPHENOXY)-COMPOUNDS AND PHARMACOLOGICALLY ACCEPTABLE ACID ADDITION SALTS THEREOF

Sachiyuki Hamano, Tokyo; Tamotsu Kanazawa, Tokorozawa, and Shin-ichi Kitamura, Tokyo, all of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

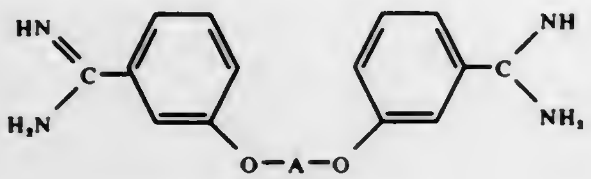
Filed Sept. 22, 1976, Ser. No. 725,673

Claims priority, application Japan, Jan. 13, 1976, 51-2458

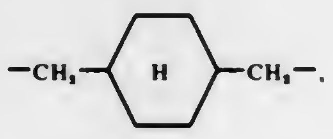
Int. Cl.² C07C *123/00*

U.S. Cl. 260—564 R **2 Claims**

1. Bis-(meta-amidinophenoxy)-compound having the general formula:



wherein A represents the chain residue



and its pharmacologically acceptable acid addition salts.

4,034,011

1,1-DIPHENYL-4-(SUBSTITUTED-AMINO)BUTANES

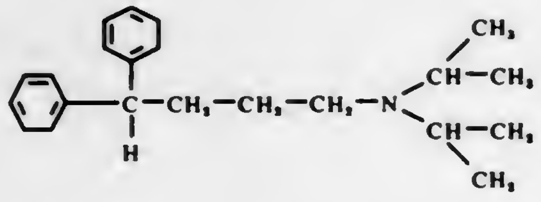
Bryan B. Molloy, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Continuation of Ser. No. 536,284, Dec. 24, 1974, abandoned. This application Mar. 12, 1976, Ser. No. 666,278

Int. Cl.² C07C *87/28*

U.S. Cl. 260—570 R **2 Claims**

1. The compound of the formula



and the physiologically tolerable salts thereof.

4,034,012

ACETONE-FORMALDEHYDE-RESORCINOL RESIN COMPOSITIONS AND ADHESIVES PREPARED THEREFROM

M. Frank Gillern, Seattle, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed Mar. 17, 1975, Ser. No. 559,083

Int. Cl.² C08L *61/00*

U.S. Cl. 260—828 **43 Claims**

1. A liquid, hydrophilic, 2-stage resin composition produced by reaction of (1) an aceton-formaldehyde resin, (2) free formaldehyde, and (3) resorcinol in an aqueous solution at a temperature of at least 50° C. at least until substantially all said free formaldehyde is consumed, the molar quantities of chemically combined acetone, A, and formaldehyde, F_c, in the acetone-formaldehyde resin and the molar quantities of free formaldehyde, F_f, and resorcinol, R, satisfying the equations $F_c/A = 1.5$ to 3.0, $F_f/R = 0.2$ to 1.2 and $R/A = 3.0$ to 5.0.

4,034,013

IMPACT AND MELT STRENGTH IMPROVEMENT OF POLY(ALKYLENE TEREPHTHALATE)

Constance A. Lane, Philadelphia, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed Nov. 13, 1975, Ser. No. 631,761

Int. Cl.² C08L *63/00*

U.S. Cl. 260—835 **14 Claims**

1. A method of improving the notched Izod impact strength and the melt strength of poly(alkylene terephthalate) comprising blending therewith a multiple stage polymer having a rubbery first stage and an epoxy group-containing hard final stage, and a minimum film forming temperature above about 50° C.

4,034,014

PRODUCTION OF POLYANHYDRIDE EPOXIDE PREPOLYMER COMPOSITIONS

Omer E. Curtis, Jr., Morristown; Harold W. Tuller, Long Valley; Charles T. O'Neill, Dover, and Ralph W. Nussbaum, West Orange, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 345,172, March 26, 1973, Pat. No. 3,929,738, which is a division of Ser. No. 81,616, Oct. 16, 1970, Pat. No. 3,732,332. This application Oct. 6, 1975, Ser. No. 619,733

Int. Cl.² C08L *63/00*

U.S. Cl. 260—837 R **18 Claims**

1. A low molecular weight polyanhydride epoxide prepolymer composition obtained by admixing an epoxy compound containing more than 1,2-epoxy group with a polyanhydride in an amount sufficient to provide from about 0.1 to about 1.3 equivalents of epoxy per anhydride equivalent weight, said polyanhydride having a molecular weight below about 1000 and a softening point within the range of about 111° C. to about 156° C. and being the reaction product of the mass polymerization process, in the absence of a polymerization catalyst, of a maleic monomer selected from the group consisting of maleic acid, maleic anhydride, anhydrides which rearrange to maleic anhydrides and the halo-, aryl-, aralkyl-, alkyl-, or cycloalkyl-substituted derivatives thereof and at least one alkyl-substituted styrene in molar proportions of said maleic monomer relative to said alkyl-substituted styrene of greater than 1:1, said polymerization process being effected by heating at least a major portion of the maleic monomer to a temperature of about 160° C. to about 200° C., adding the alkyl-substituted styrene to said maleic monomer, with agitation, at a rate which permits control of the heat of reaction and continuing the polymerization until essentially all of said maleic monomer and alkyl-substituted styrene have polymerized.

4,034,015

ESTER TERMINATED TERPOLYMERS

Ross M. Hedrick, Creve Coeur, and James D. Gabbert, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

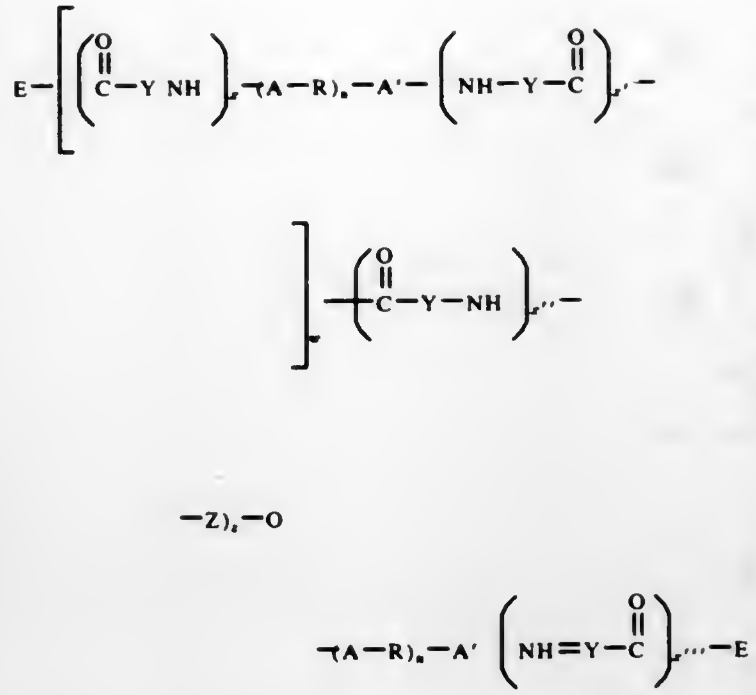
Continuation of Ser. No. 423,639, Dec. 10, 1973, abandoned. This application Oct. 22, 1974, Ser. No. 516,941

The portion of the term of this patent subsequent to Jan. 21, 1992, has been disclaimed.

Int. Cl.² C08L *77/02*

U.S. Cl. 260—857 PG **30 Claims**

1. A lactam-polyol-polyacyl lactam block terpolymer or a lactam-polyol-acyl polylactam block terpolymer having at least about 5% ester end group termination and the general formula:



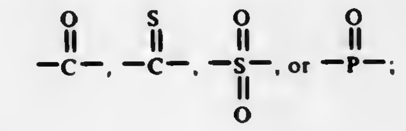
$$E-\left[\left(\overset{O}{\overset{\|}{C}}-Y\,NH\right)_{x}-(A-R)_{n}-A'-\left(NH-Y-\overset{O}{\overset{\|}{C}}\right)_{x'}-\right.$$

$$\left.\right]_{z}-\left(\overset{O}{\overset{\|}{C}}-Y-NH\right)_{x''}-$$

$$-Z)_{w}-O$$

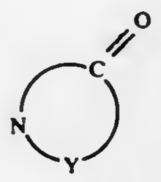
$$-(A-R)_{n}-A'\left(NH=Y-\overset{O}{\overset{\|}{C}}\right)_{x'''}-E$$

wherein $(O-Z)_w$ is a polymeric moiety and Z is a hydrocarbon or substituted hydrocarbon group said group being alkylene, arylene, alkylene carbonyl, arylene carbonyl, and mixtures thereof; A and A′ are acyl groups selected from



$$-\overset{O}{\overset{\|}{C}}-,\ -\overset{S}{\overset{\|}{C}}-,\ -\underset{\underset{O}{\|}}{\overset{O}{\overset{\|}{S}}}-,\ \text{or}\ -\overset{O}{\overset{\|}{P}}-;$$

R is a divalent hydrocarbon group;
n is an integer equal to zero or one;
E is an amide group of the formula



or an ester group of the formula —O—R′ where the —O—R′ is the residual of a monohydric functional alcohol; and

Y is an alkylene or substituted alkylene having from about 3 to about 14 carbon atoms;

R′ is an aliphatic or substituted aliphatic hydrocarbon wherein the ester group is attached to other than a cyclic or aromatic radical:

x, x', x'', and x''' are integers and the total number of x's is equal to $2w + 2$; and z and w are integers equal to one or more.

4,034,016

TERNARY POLYBLENDS PREPARED FROM POLYBUTYLENE TEREPHTHALATES, POLYURETHANES AND AROMATIC POLYCARBONATES

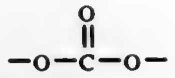
Arthur L. Baron, New Martinsville, W. Va., and John V. Bailey, Pittsburgh, Pa., assignors to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed July 15, 1976, Ser. No. 705,745

Int. Cl.² C08L *75/00*

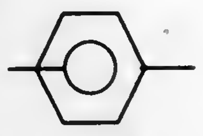
U.S. Cl. 260—858 **23 Claims**

1. A ternary polyblend consisting essentially of an intimate mixture of between about 10 and 40 parts by weight of an aromatic polycarbonate possessing the repetitive carbonate group

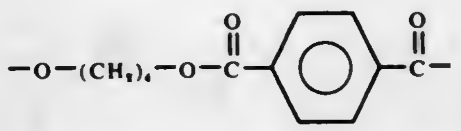


$$-O-\overset{O}{\overset{\|}{C}}-O-$$

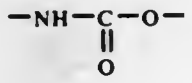
and having the



radical attached to the carbonate group; from about 35 to 60 parts by weight of polybutylene terephthalate composed of recurring structural units of the formula



and from about 20 to 40 parts by weight of a polyurethane that is a reaction product of a diisocyanate, a polyester or polyether and a chain extender characteristically containing the urethane structure



$$-NH-\underset{\underset{O}{\|}}{C}-O-$$

wherein more than about 20 parts by weight of polyurethane are used if more than about 55 parts of polybutylene terephthalate are used.

4,034,017

COMPOSITION USEFUL IN MAKING EXTENSIBLE FILMS

Wen-Hsuan Chang; J. Alden Erikson, and Roger L. Scriven, all of Gibsonia, Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 392,584, Aug. 29, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 567,022

Int. Cl.² C08L *75/04*

U.S. Cl. 260—859 R **13 Claims**

1. A method of producing a solvent-soluble coating composition which comprises reacting:

1. from about 1 to 30 percent by weight of a saturated aliphatic or aromatic polyisocyanate;
2. from about 4 to 50 percent by weight of a hydroxyl-containing material selected from the group consisting of saturated aliphatic or aromatic polymeric diols having glass transition temperatures less than 50° C., saturated aliphatic or aromatic low molecular weight diols and mixtures thereof;
3. from about 2 to 20 percent by weight of a hydroxyalkyl ester of an ethylenically unsaturated carboxylic acid;
4. from about 1 to 20 percent by weight of a monomer selected from the group consisting of alkoxymethyl-containing ethylenically unsaturated amides, and ethylenicaly unsaturated blocked isocyanates which are capable of curing said coating composition through hydroxyl functionality of said reaction product and the isocyanate groups of said blocked isocyanates or the N-alkoxymethyl groups of said amide;
5. from about 25 to 90 percent by weight of an ethylenically unsaturated monomer or mixture of monomers diffirent from (3) and (4); the equivalent ratio of isocyanate groups to hydroxyl groups in (1), (2) and (3) being between 1:1.1 and 1:9 so as to obtain an ungelled reaction product and introduce hydroxyl functionality into the reaction product; said coating composition being further

characterized as being essentially free of unreacted NCO groups and ethylenic unsaturaton and said coating compositon being curable through reacton of the N-alkoxymethyl groups or the blocked isocyanate groups at times and temperatures sufficient for these groups to react with the hydroxyl functionality of said reaction product, said reaction being conducted by any of the following steps:

A. reacting the hydroxyalkyl ester with the polyisocyanate and subsequently reacting this product either consecutively or simultaneously with the hydroxyl-containing material and the monomer component (4) and (5);

B. reacting the hydroxyalkyl ester, the hydroxyl-containing material and the polyisocyanate and subsequently reacting this product with the monomer component (4) and (5);

C. reacting all the components (1), (2), (3), (4) and (5) together simultaneously;

D. reacting the polyisocyanate and the hydroxyl-containing material to form an isocyanate-terminated prepolymer and the prepolymer reacted consecutively or simultaneously with the hydroxyalkyl ester and the monomer component (4) and (5).

4,034,018
LINEAR POLYESTERS BASED ON S-TRIAZINEDICARBOXYLIC ACIDS

Jurgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed July 21, 1975, Ser. No. 597,609

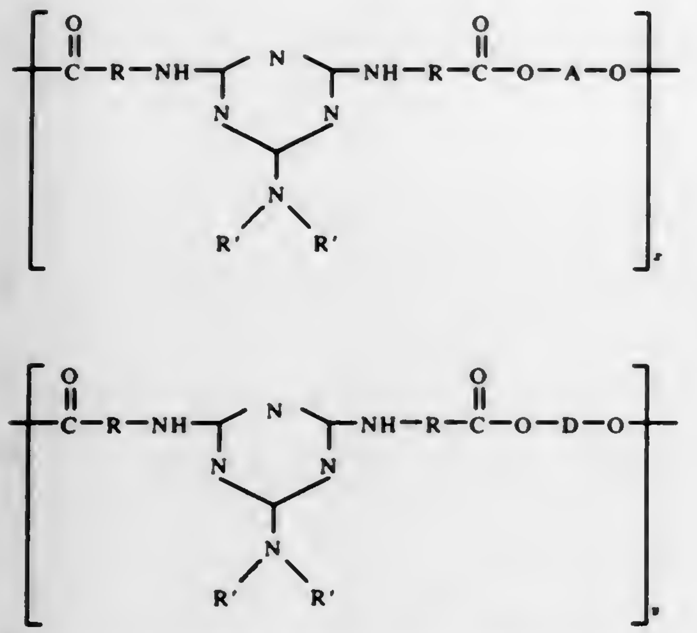
Claims priority, application Switzerland, July 30, 1974, 10477/74

The portion of the term of this patent subsequent to July 5, 1994, has been disclaimed.

Int. Cl.² C08L *67/02;* **C08G** *63/68*

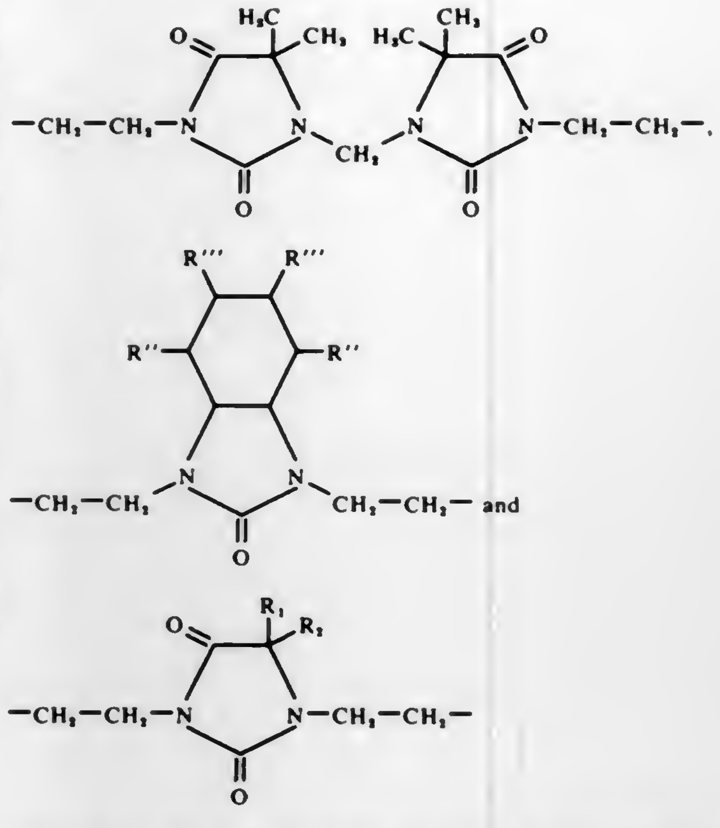
U.S. Cl. 260—860 **8 Claims**

1. A linear, thermoplastic polyester having a relative viscosity of 1.1 to 3.0, measured at 30° C. on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, characterised by the structural elements of the general formula I



(I)

wherein R denotes an aliphatic radical having 1 to 6 C atoms or the para-phenylene radical, R' represents methyl, ethyl, phenyl or cyclohexyl, A denotes a diradical selected from the group consisting of



wherein R'' and R''' represent H atoms, chlorine atoms or bromine atoms, or R'' represents a H atom and R''' represents a chlorine or bromine atom, and R_1 and R_2 represents methyl or ethyl, or conjointly represent pentamethylene, D denotes an aliphatic radical having 2 to 10 C atoms, and the mol fraction ($x/x+y$) formed from x and y has values of 0.1 to 1, and x and y each denote a number from 1 to 30, and y can also be 0.

4,034,019
LINEAR COPOLYESTERS BASED ON TEREPHTHALIC ACID AND/OR ISOPHTHALIC ACID

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciga-Geigy Corporation, Ardsley, N.Y.

Filed July 21, 1975, Ser. No. 597,610

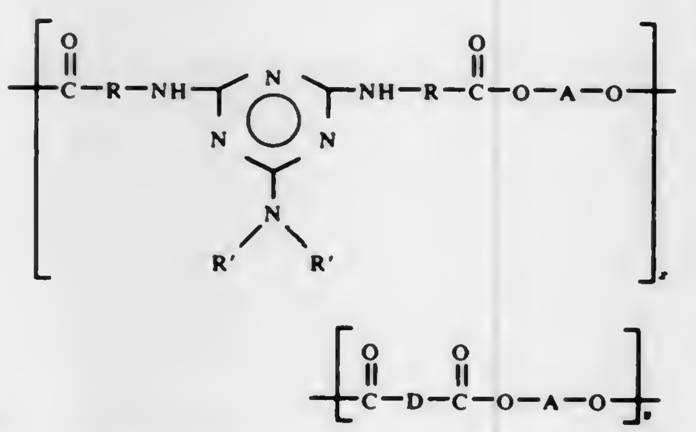
Claims priority, application Switzerland, July 30, 1974, 10476/74

The portion of the term of this patent subsequent to July 5, 1994, has been disclaimed.

Int. Cl.² C08L *67/02;* **C08G** *63/68*

U.S. Cl. 260—860 **7 Claims**

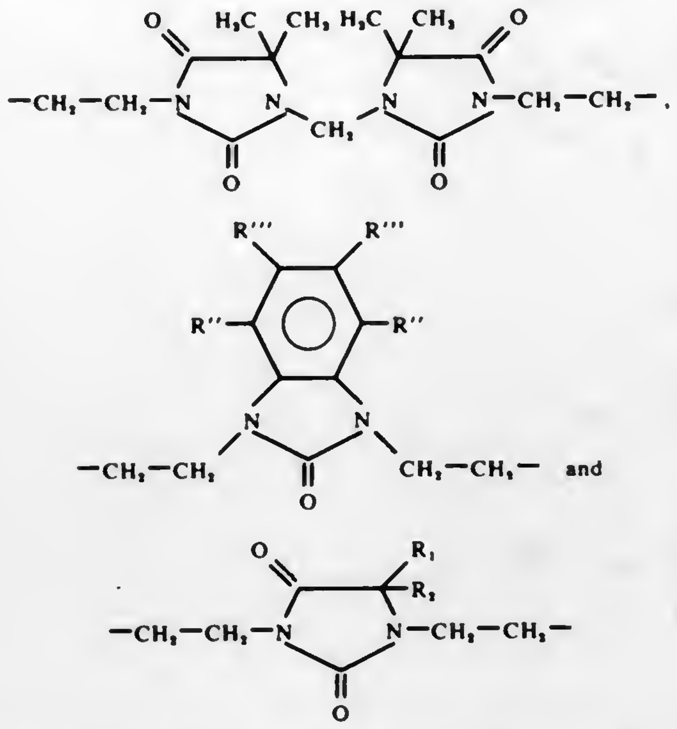
1. A linear, thermoplastic copolyester having a relative viscosity of 1.1 to 3.0, measured at 30° C on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, which are characterised by the structural elements of the general formula I



(I)

wherein R denotes an aliphatic radical having 1 to 6 C atoms or the para-phenylene radical, R' represents methyl, ethyl,

phenyl or cyclohexyl, A denotes a diradical selected from the group consisting of an aliphatic radical having 2 to 10 atoms, an N,N'-heterocyclic-aliphatic radical of the formula



wherein R'' and R''' represent H atoms, chlorine atoms or bromine atoms, or R'' represents an H atom and R''' represents a chlorine or bromine atom, and R_1 and R_2 represent methyl or ethyl or conjointly represent pentamethylene, D denotes the meta- or para-phenylene radical and the mol fraction

$$\frac{x}{x+y}$$

formed from x and y has values of 0.01 to 0.99, x and y each denoting a number from 1 to 30.

4,034,020
GRAFT COPOLYMER PREPARATION

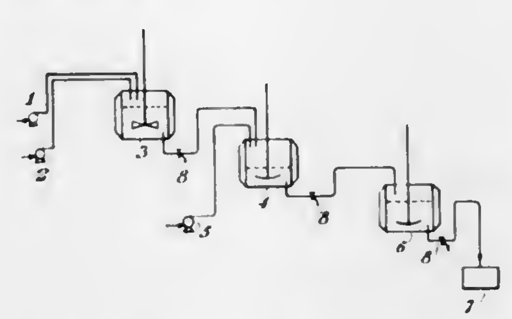
John David Moore, and Ian Robert Wheeler, both of Southampton, England, assignors to The International Synthetic Rubber Company, Limited, Southampton, England

Continuation of Ser. No. 269,022, July 5, 1972, abandoned. This application Feb. 12, 1976, Ser. No. 657,631

Claims priority, application United Kingdom, July 6, 1971, 31622/71

Int. Cl.² C08F *279/04*

U.S. Cl. 260—880 R **7 Claims**



1. A process for preparing a graft copolymer comprising admixing one or more vinyl aromatic monomers and one or more unsaturated nitrile monomers with a latex of a rubbery polymer selected from polybutadiene and butadiene-styrene copolymer, characterised by imbibing the mixture for a period of 30 to 50 minutes at a temperature of from 20° to 90° C under continuous flow conditions continuously supplying the imbibed mixture to a first stirred reactor, at a temperature (T1) of 70° to 90° C, initiating emulsion graft polymerisation in the presence of a free radical initiator in said first stirred reactor and continuing the polymerisation to effect conversion of 40 to 65% by weight of the monomers at a rate not more than 5% per minute, continuously removing the reaction mixture from said first stirred reactor and supplying it to a second stirred reactor, at a temperature equal to or above T1 but not over 100° C and further continuing the graft polymerisation in the second stirred reactor whereby to convert at least 80% by weight of the monomers to polymer.

4,034,021
COPOLYMERS OF PIVALOLACTONE AND ISOPRENE OR BUTADIENE

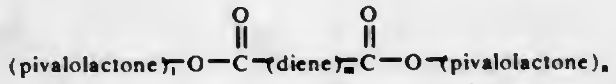
Robert Paul Foss, Hockessin, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 413,367, Nov. 6, 1973, Pat. No. 3,907,933, which is a division of Ser. No. 324,502, Jan. 17, 1973, Pat. No. 3,821,331, which is a continuation-in-part of Ser. No. 227,258, Feb. 17, 1972, abandoned. This application June 25, 1975, Ser. No. 590,371

Int. Cl.² C08L *9/00, 13/00*

U.S. Cl. 260—887 **9 Claims**

1. A copolymer derived from pivalolactone and a diene selected from the group consisting of isoprene and butadiene, said copolymer being of the formula



$$(\text{pivalolactone})_l\!-\!O-\overset{\overset{\large O}{\|}}{C}-(\text{diene})_m\!-\!\overset{\overset{\large O}{\|}}{C}-O-(\text{pivalolactone})_n \qquad (A)$$

wherein l and n are about 5 to 4,000 and m is about 25 to 25,000, and wherein the molecular weights of the polypivalolactone segments are about 500 to 400,000 and the molecualr weights of the polydiene segments are about 1300 to 1,700,000, said copolymer being further characterized by having a melt index of zero at 180° C and at least 2.0 at 250° C.

4,034,022
PHOSPHORIC ESTERS OF POLYFLUORINATED ALCOHOLS, AND THEIR PREPARATION

Michel Demarcq, and Joseph Slezlona, both of Lyon, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

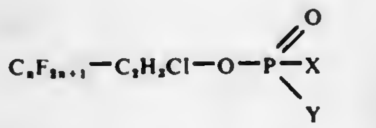
Filed Dec. 9, 1971, Ser. No. 206,512

Claims priority, application France, Dec. 9, 1970, 70.44290

Int. Cl.² C07F *9/09, 9/12, 9/14, 9/24*

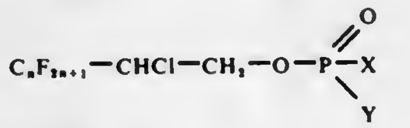
U.S. Cl. 260—955 **9 Claims**

1. Phosphoric esters of polyfluorinated alcohols consisting essentially of at least one isomer of phosphoric esters of polyfluorinated alcohols, said esters corresponding to the general formula:

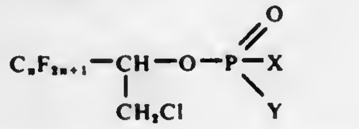


$$C_nF_{2n+1}-C_2H_3Cl-O-P(=O)(-X)(-Y) \qquad (I)$$

said two isomers corresponding to formulae (II) and (III):



$$C_nF_{2n+1}-CHCl-CH_2-O-P(=O)(-X)(-Y) \qquad (II)$$



$$C_nF_{2n+1}-\underset{\underset{CH_2Cl}{|}}{CH}-O-P(=O)(-X)(-Y) \qquad (III)$$

wherein C_nF_{2n+1} is a perfluorinated aliphatic chain, n is an integer from 2 to 18, X and Y are the same or different and are each a halogen atom; a hydroxyl radical; the group OM in which M is a metallic equivalent; an alkoxy, chloroalkoxy, hydroxypolyalkyleneoxy, or an aryloxy group; or the group —NZZ' in which Z and Z' are the same or different and are each a hydrogen atom or an alkyl, cycloalkyl, or aryl group.

4,034,023

PROCESS FOR PREPARING MIXED PHOSPHATE ESTER COMPOSITIONS

Donald Hardy, Sr., Yardley, and Edward Francis Orwoll, Langhorne, both of Pa., assignors to FMC Corporation, Philadelphia, Pa.

Filed May 5, 1975, Ser. No. 574,588

Int. Cl.² C07F *9/11, 9/12*

U.S. Cl. 260—973 **5 Claims**

1. A process for preparing a mixed phosphate ester composition consisting essentially of 10% to 19% tributyl phosphate, 62% to 80% dibutyl phenyl phosphate, and 10% to 19% butyl diphenyl phosphate, which comprises:

a. reacting phosphorus oxychloride with phenol in a molar ratio 1:0.8 to 1.0 at a temperature of about 40° to about 100° C until less than 1% unreacted phenol is present in the reaction mixture while moving liberated hydrogen chloride from the reaction mixture to prepare a first reaction product comprising crude phenyl phosphorodichloridate, diphenyl phosphorochloridate and unreacted phosphorus oxychloride;

b. reacting the first reaction product with at least two moles of n-butanol per replaceable chloride under agitation at a temperature below 35° C for a sufficient time to prepare a second reaction product comprising crude tributyl phosphate, dibutyl phenyl phosphate, and butyl diphenyl phosphate; and

c. purifying the second reactiomn product by removing acid esters, acidic impurities, salts unreacted n-butanol from the second reaction product thereby leaving a substantially pure mixed phosphate ester composition consisting essentially of 10% to 19% tributyl phosphate, 62% to 80% dibutyl phenyl phosphate, and 10% to 19% butyl diphenyl phosphate.

4,034,024

METHOD OF PREPARING TRIALKYL TETRATHIOPHOSPHATES

Arthur D. F. Toy, Stamford, Conn., and Eugene H. Uhing, Ridgewood, N.J., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 514,525, Oct. 15, 1974, abandoned. This application Jan. 19, 1976, Ser. No. 650,488

Int. Cl.² C07F *9/17, 9/177*

U.S. Cl. 260—981 **5 Claims**

1. A method of preparing compounds of the formula:

$$(R^1S)_x(R^2S)_yP(S) \qquad (I)$$

wherein $x + y = 3$; R^1 and R^2 are the same or different and are selected from the group consisting of $C_1$14 C_{18} straight-chain or branched alkyl and cycloalkyl of 5 to 6 carbons in the ring and the C_1-C_4 alkyl substituted derivatives thereof; comprising contacting under at least an autogenous pressure at a temperature of from about 150° C. to 300° C. a reactant selected from the group consisting of dialkyl sulfide reactants of the formula:

$$R^1SR^2 \text{ TM II}$$

wherein R^1 and R^2 are as defined above with a phosphorus pentasulfide reactant of the formula:

$$P_4S_{10}.$$

4,034,025

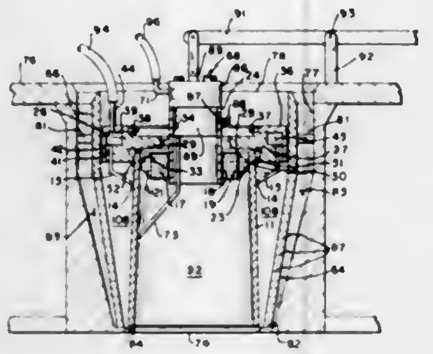
ULTRASONIC GAS STREAM LIQUID ENTRAINMENT APPARATUS

John G. Martner, 49 James Ave., Atherton, Calif. 94025

Filed Feb. 9, 1976, Ser. No. 656,532

Int. Cl.² F02M *27/08*

U.S. Cl. 261—18 A **9 Claims**



1. Apparatus for entraining liquid particles in a gas stream, comprising an outer framework, said outer framework having a throat therethrough with first and second ends and throat walls extending therebetween, said throat operating to conduct the gas stream therethrough from said first to said second ends, a resonator disposed in said throat spaced from said throat walls and having resonator surfaces thereon, means for driving said resonator to assume a resonant vibratory condition, a clamp engaging one end of said resonator for positioning thereof in said throat, means for delivering a liquid to contact a surface on said resonator, and a diffuser disposed in spaced relations with said resonator surface and forming boundaries of a chamber therewith, said diffuser operating to direct the gas stream into said chamber toward said surface at a first velocity, said resonator operating to atomize the liquid and urge it from said surface into said chamber at a second velocity which is lower than and substantially in opposition to said first velocity, so that the atomized liquid is prevented from passing through said diffuser and is mixed with the gas stream and entrained therein.

4,034,026

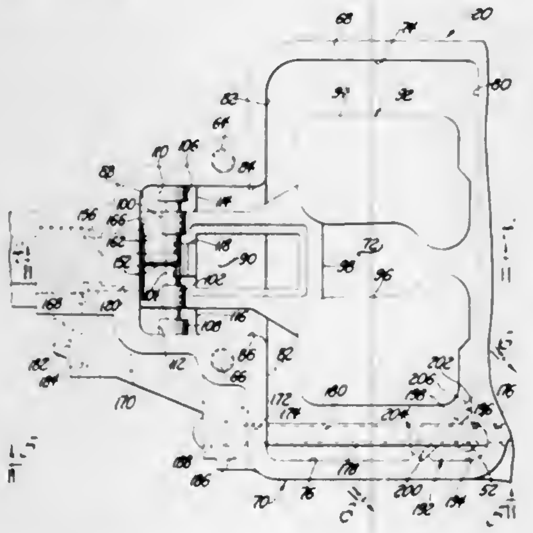
MULTI-FUNCTION FLUID INLET VALVING MEANS AND RESERVOIR MEANS

Robert J. Miller, Warren, Mich., assignor to Colt Industries Operating Corporation, New York, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,117

Int. Cl.² F02M *5/02*

U.S. Cl. 261—23 A **4 Claims**



1. A fuel supply system for a carburetor for an internal combustion engine having main combustion chamber means and precombustion chamber means, said fuel supply system comprising first fuel reservoir means effective for supplying fuel to said combustion chamber means, second fuel reservoir means effective for supplying fuel to said precombustion chamber means, float means situated in said first reservoir means and responsive to the level of the fuel within said first reservoir means and first and second series arranged fuel inlet valve means operatively connected to said float means and effective for admitting fuel from associated fuel source means to said first and second fuel reservoir means, said second fuel inlet valve means being effective during a first range of operating conditions to effectively divert at least a substantial portion of such fuel flow passing through said first fuel inlet valve means from said first fuel reservoir means and to said second fuel reservoir means, and said second fuel inlet valve means being effective during a second range of operating conditions to admit into said first fuel reservoir means at least a substantial portion of such fuel flow passing through said first fuel inlet valve means while still diverting a portion of such fuel flow to said second fuel reservoir means.

4,034,027

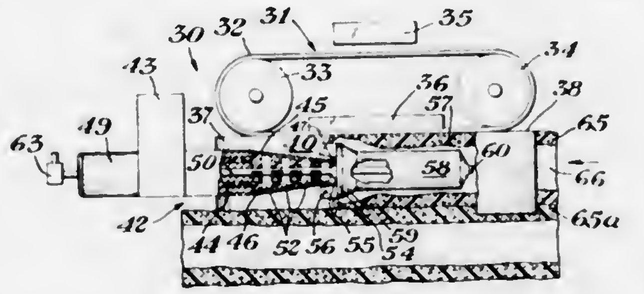
METHOD FOR SPIRAL DEPOSITION OF AN INTEGRALLY BONDED HOLLOW FOAMED SYNTHETIC RESIN STRIP

Hubert Stacy Smith, Jr., Bay City, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 487,073, July 10, 1974, abandoned, which is a continuation of Ser. No. 302,840, Nov. 1, 1972, abandoned. This application Nov. 24, 1975, Ser. No. 634,997

Int. Cl.² B29D *27/04*

U.S. Cl. 264—32 **2 Claims**



1. In a method for the deposition of a hollow strip of a hardened foamed synthetic resinous material from a foam depositing head moving relative to the deposited strip to prepare a walled structure, the method comprising depositing into a peripherally restraining configuration having a generally rectangular cross sectional configuration a foamable hardenable liquid synthetic resinous material which cures to form a foamed plastic body, the material being deposited in a generally radially outward direction from a centrally disposed depositing means, permitting the resinous material to foam and harden to form a hollow foam strip, disposed in a generally helical or spiral manner wherein adjacent portions of the strip are integrally bonded, the material being progressively deposited until a desired structure is achieved, the improvement which comprises

rotating a mandrel on said depositing means within the central region adjacent said deposited resinous material during at least the initial portion of the foaming, curing and hardening of said material, at least a portion of said material contacting the mandrel thereby providing a passageway of generally uniform cross section within the deposited strip.

4,034,028

VARIABLE VENTURI CARBURETOR

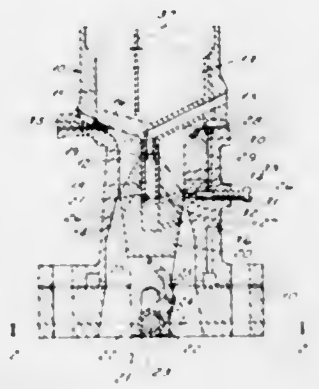
Thomas Tsoi-Hei Ma, Romford, England, assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 26, 1976, Ser. No. 652,487

Claims priority, application United Kingdom, Mar. 14, 1975, 10693/75

Int. Cl.² F02M *9/14*

U.S. Cl. 261—41 R **5 Claims**



1. A variable venturi carburetor having an induction passage communicating with ambient air at one end and adapted to be connected to an engine inlet manifold at the opposite end, the induction passage having a fixed area venturi defined by a fixed area choke, the passage converging upstream of the choke and diverging downstream of the choke, a main fuel passage extending into the induction passage and communicating with a fuel discharge tube which extends axially along the choke, an elongated throttle body supported at its upstream end by engagement with the fuel tube for a sliding movement in the induction passage, a throttle control device arranged for supporting the downstream end of the throttle body for a sliding movement and for displacing the throttle body between an idle speed position and a full throttle position downstream of the idle speed position, the throttle body having a divergent portion merging into a convergent portion, the throttle body in its idle speed position closely fitting the induction passage, displacement of the throttle body towards the full throttle position opening a variable throat between the widest part of the throttle body and the divergent portion of the induction passage, the throttle body having internal passages connecting the fuel tube to the widest part of the throttle body for discharge of fuel into the variable throat, the fuel tube being formed with a number of openings in its wall, the openings being just below the exit of the main fuel passage and communicating with the fixed choke flow area, the openings being sufficiently large that the pressure in the fixed choke flow area determines the flow of fuel in the main fuel passage.

4,034,029

METERING ROD CONTROL FOR AN AIR VALVE CARBURETOR

Larry J. Tipton, Florissant, Mo., assignor to ACF Industries, Incorporated, St. Louis, Mo.

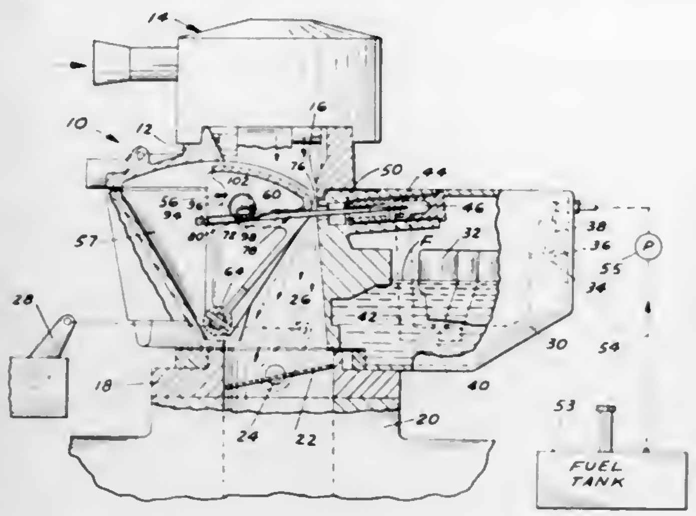
Filed July 19, 1976, Ser. No. 706,511

Int. Cl.² F02M *9/06*

U.S. Cl. 261—44 R **7 Claims**

1. In a carburetor having an air and fuel mixture conduit, a throttle valve within the conduit, an air valve mounted across the conduit above the throttle valve and pivoted adjacent its lower end for movement between open and closed positions relative to the mixture conduit, a metering rod carried by the air valve and extending generally in a horizontal direction, an orifice plate in an opening in the wall of the mixture conduit having a metering orifice therein receiving the extending end of the metering rod, and means on the air valve mounting the metering rod for limited pivoted movement;

the improvement comprising a torsion spring engaging the metering rod to urge the metering rod into contact with the side of the orifice, said torsion spring including two portions thereof which have different spring rates, one portion continuously urging the metering rod against the side of the orifice and the other portion urging the metering rod against the side of the orifice after the air valve has been at least partially opened.



4,034,030

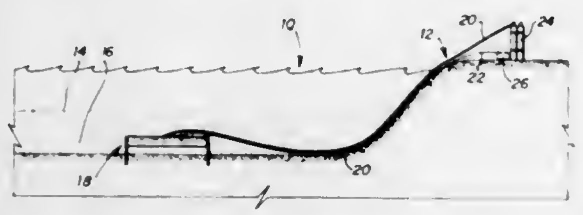
OXYGENATION IMPREGNATION APPARATUS

Jep T. Bracey, Shepherd, Tex., assignor to Martin L. Towler, Galveston, Tex.

Continuation of Ser. No. 420,214, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 385,056, Aug. 2, 1973, Pat. No. 3,903,636, which is a continuation of Ser. No. 202,839, Nov. 29, 1971, abandoned. This application Sept. 10, 1975, Ser. No. 611,907

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—64 D **2 Claims**



1. An apparatus for dissolving oxygen within a body of water comprising:

receptacle means immersed in said water for containing a volume of oxygen in quiescent surface contact with said water, said receptacle means comprises a top wall, a lip extending from the periphery of said wall, said lip extending downward, and transverse to said top wall to form an open bottom chamber,

means for introducing oxygen within a region of said receptacle means containing said volume of oxygen, said region bounded by said top wall, said lip extending downward from the periphery of said top wall, and the surface of said water underlying said volume of oxygen, thereby supplying oxygen directly to said volume of oxygen and maintaining the quiescent surface contact of said volume of oxygen with said water,

float valve means disposed subjacent said top wall for supplying oxygen to said receptacle means at a rate equal to the rate oxygen is absorbed by the water underlying the receptacle means and thereby maintaining a predetermined volume of oxygen in said receptacle means and in substantially quiescent surface contact with the underlying water,

said oxygen not exhausting from said receptacle means other than by absorption into the underlying water, and said top wall including a plurality of ribs equally spaced across said top wall for stiffening said wall.

4,034,031

METHOD OF MANUFACTURING GRID ELECTRODES FOR ELECTRON TUBES

Bernhard Lersmacher, Aachen; Horst Seifert, Hamburg, both of Germany, and Johannes Wilhelmus Antonius Krol, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 16, 1975, Ser. No. 622,999

Claims priority, application Germany, Oct. 23, 1974, 2450261

Int. Cl.^{2} B29C *17/08;* **B23K** *9/00*

U.S. Cl. 264—25 **8 Claims**

1. A method of manufacturing grid electrodes for electron tubes, in which pyrolytic graphite is deposited by thermal decomposition of carbon-containing gases on a mandril having a smooth surface and the resulting molded body is separated from the mandril and provided with grid-like apertures, characterized in that the molded body after the formation of the grid is covered again with a thin layer of pyrolytic graphite and that the steps of deposition on the mandril and the covering again of the molded body having grid-like apertures are carried out at a temperature of the carbon-containing gas that is higher than the temperature of the mandril and of the molded body, respectively.

4,034,032

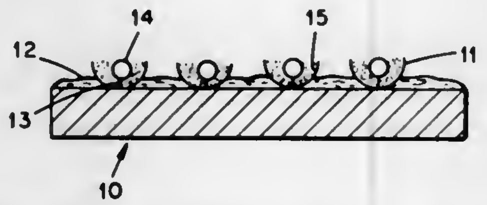
METHOD FOR FOAM ENCAPSULATING LASER TARGETS

Charles D. Hendricks, Livermore, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Sept. 2, 1975, Ser. No. 609,640

Int. Cl.^{2} B29D *27/04;* **C01B** *4/00*

U.S. Cl. 264—28 **7 Claims**



1. A method for encapsulating a quantity of fusion fuel in a foam having a density of about 0.065 to 0.6 × 10^3 kg/m^3, a thickness of about 10 to 100 μm, and a cell size of up to about 2 μm comprising the steps of: positioning a fusion fuel-containing member having a cross-section of about 40 to 100 μm in a mold cavity formed in a desired configuration, filling the mold cavity with a solution comprising cellulose acetate and at least a swelling agent, placing the thus filled mold cavity in a bath of water having a temperature of 0°–10° C causing the solution to gel, soaking the gel in a water bath to extract additives therefrom, freezing the thus soaked gel, freeze-drying the thus frozen gel such that water and solvents therein sublime and the gel structure solidifies into a low density microcellular foam containing the fusion fuel therein, and removing the thus formed fuel containing foam from the mold cavity.

4,034,033

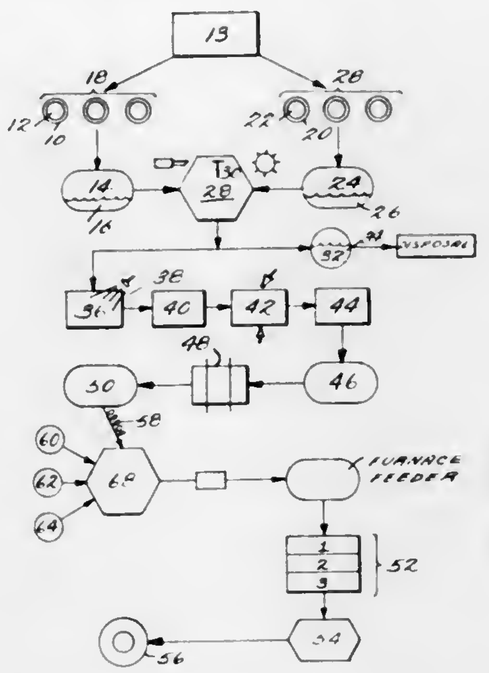
METHOD FOR RECOVERING MATERIAL FROM THE CENTERS OF PHONOGRAPH RECORDS

Ricardo Haro Carrere, Lima, Peru, assignor to Fredrick M. Kerr, Miami, Fla.

Filed Mar. 26, 1976, Ser. No. 670,903

Int. Cl.^{2} B29D *17/00*

U.S. Cl. 264—36 **17 Claims**



1. A method for recovering the center portions of phonograph records carrying paper labels comprising the steps of:

a. soaking a first batch of record center portions in a plastic dissolving liquid,
b. simultaneously introducing a second batch of record center portions into a container of plastic dissolving solution,
c. removing the record center portions from the container of plastic dissolving liquid,
d. removing the paper labels from the record center portions,
e. depositing the removed paper labels in a suitable depository,
f. repeating the steps (c-e) for the second batch of record center portions,
g. rinsing the record center portions and drying the same portions after rinsing,
h. crushing the record center portions into relatively small particles,
i. sieving the record center portions according to size, and
j. passing the sieved particles through an electromagnet.

4,034,034

PROCESS FOR MELT-SPINNING FILAMENTS FROM NOZZLES COATED WITH STABILIZED SILICONE OIL

Wiprecht Eberius, Kreuzau, and Herbert Lorenz, Laudenbach, both of Germany, assignors to Akzona Incorporated, Asheville, N.C.

Filed Oct. 15, 1974, Ser. No. 515,049

Claims priority, application Germany, Oct. 15, 1973, 2351668

Int. Cl.^{2} D01D *1/10*

U.S. Cl. 264—39 **5 Claims**

1. In a process for melt-spinning a synthetic linear fiber-forming polymer at temperatures of at least about 270° C. into filaments by extrusion through a nozzle treated on its discharge face with a thin layer silicone oil coating, the improvement of using a silicone oil coating stabilized with a small stabilizing amount of a cerium compound consisting essentially of the reaction product of cerium acetylacetonate and a polymethylsiloxane containing reactive hydrogen atoms.

4,034,035

METHOD OF PREPARING MULTI-TONED TABLETS

Joseph B. Schwartz, Hatfield, and Frederick A. Restaino, Hatboro, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed July 14, 1975, Ser. No. 595,645

Int. Cl.^{2} B29C *9/00*

U.S. Cl. 264—77 **3 Claims**

1. A process for preparing multi-toned compressed tablet dosage form which comprises:

a. blending to a uniform admixture a therapuetically effective quantity of an orally administerable medicament together with an excipient mixture of microcrystalline cellulose and modified corn starch having a cold water soluble content in excess of 10 percent to form a dry mass for granulation;
b. adding to said dry mass with continual mixing a granulation solution having dissolved therein a water soluble pharmaceutically acceptable dye until the thus wetted mass has achieved the proper consistency suitable for granulation and wherein the dye has been more strongly attracted to the starch excipient than to the cellulose excipient;
c. drying the wetted mass;
d. milling the dried mass so produced to obtain granules having a particle size between about 30 to about 325 mesh;
e. compressing the dried granules so obtained to the desired tablet shape and size to form multi-toned compressed tablet dosage forms.

4,034,036

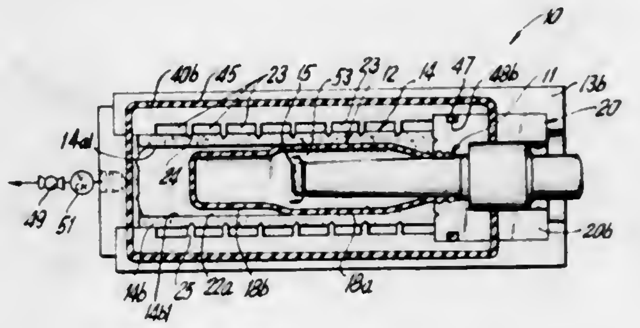
PARISON CONTROL IN LONGITUDINAL STRETCH

John Jerome Farrell, Greenbrook, N.J., assignor to Consupak, Inc., Morristown, N.J.

Filed Oct. 31, 1975, Ser. No. 627,602

Int. Cl.^{2} B29C *17/07*

U.S. Cl. 264—89 **7 Claims**



1. A method for controlling the thickness of a parison comprising: providing a fluid on the inside of the parison to expand the parison in the longitudinal direction while exerting a vacuum on a first portion of the outside of the parison to hold that first portion from further longitudinal extension and exerting a fluid cushion on another portion of the outside of the parison to permit longitudinal extension of that another portion so as to control the thickness of the parison as it undergoes longitudinal expansion prior to blow molding.

4,034,037

CARBOXYLATION METALLATION PROCESS

Robert Kenneth Jordan, The Carlton House, Suite 1431, 550 Grant St., Pittsburgh, Pa. 15219

Filed Jan. 14, 1974, Ser. No. 433,296

Int. Cl.^{2} C07F *3/08*

U.S. Cl. 260—429 R **22 Claims**

1. The compound of the formula $(R)(NR'CO_2)_cM_d$ where R is selected from alkylene containing 1 to 50 carbon atoms and arylene, R' is selected from the group consisting of hydrogen,

alkyl and aryl, M is a metal having a valence of 1,2 or 3, *c* is from 2 to 5 and *d* is from two-thirds to 5.

7. A process for the production of metal carboxylates comprising combining an ammonium salt of a carboxylic acid and a metal salt of an acid in an inert solvent in an equivalent ratio of from about 0.1:1 to about 10:1 at a temperature in the range of from about −80° C to about 400° C.

15. A process for the production of metal N-organic substituted carbamates comprising an ammonium salt of an N-organic substituted carbamic acid and a metal salt of an acid an an inert solvent in an equivalent ratio for from about 0.1:1 to about 10:1 at a temperature in the range of from about −80° C to about 400° C.

4,034,038
BORON-CONTAINING ESTERS

Paul W. Vogel, Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Continuation of Ser. No. 885,265, Dec. 15, 1969, abandoned, which is a continuation-in-part of Ser. No. 800,367, Feb. 12, 1969, abandoned, which is a continuation of Ser. No. 323,266, Nov. 13, 1963, abandoned. This application June 19, 1972, Ser. No. 264,094

Int. Cl.² C07F *5/04*

U.S. Cl. 260—462 R **11 Claims**

1. A process for the preparation of boron-containing esters of a polyhydroxy compound chracterized by the presence of ester radicals of both a succinic acid type and a boron acid type which comprises the esterification of one mole of a polyhydroxy compound having the formula $R(OH)_x$, wherein R represents a hydrocarbon radical and *x* is an integer having a value of from 2 to about 10, with

A. at least about 0.5 mole of a hydrocarbon-substituted succinic acid-producing compound selected from the group consisting of the acid, acid halides, esters, and acid anhydrides, wherein the hydrocarbon substituent has at least about fifty aliphatic carbon atoms; and

B. at least about one mole of a boron-containing reactant selected from the group consisting of boron oxide, boron halides, boron acids, ammonium salts of boron acids, esters of boron acids with volatile monohydric alcohols, wherein the alcohols have boiling points below about 150° C., and esters of boron acids with monohydric phenols;

wherein the total amount of the succinic acid-producing compound of (A) and the boron reactant of (B) to take part in the esterification reaction does not exceed *x* moles per mole of polyhydroxy compound.

6. A process for the preparation of boron-containing esters of a polyhydroxy compound characterized by the presence of ester radicals of both a succinic acid type and a boron acid type which comprises the steps of

1. the partial esterification at a reaction temperature above 100° C. of a polyhydroxy compound corresponding to the formula $R(OH)_x$, wherein R represents a hydrocarbon radical, and *x* is an integer having a value of from 2 to about 10, with

    A. at least about 0.5 mole of a hydrocarbon-substituted succinic acid-producing compound selected from the group consisting of the acid, acid halides, esters, and anhydrides, wherein the hydrocarbon substituent has at least about fifty carbon atoms;

and

2. the esterification of the intermediate product of step (1) at a temperature above about 100° C., with

    B. at least about one mole of a boron-containing reactant selected from the group consisting of boron oxide, boron halides, boron acids, ammonium salts of boron acids, esters of boron acids with volatile monohydric alcohols, wherein the alcohols have boiling points below about 150° C., and esters of boron acids with monohydric phenols;

wherein the total amount of the succinic acid-producing compound (A) and the boron-containing reactant (B) to take part in the esterification reaction does not exceed *x* moles per mole of polyhydroxy compound.

4,034,039
PURIFICATION OF METHYLENEDIANILINES

Kwok K. Sun, Hamden, Conn., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed May 28, 1976, Ser. No. 690,913

Int. Cl.² C07C *87/20*

U.S. Cl. 260—570 D **11 Claims**

1. A process for the separation of 4,4′-diaminodiphenylmethane in substantially pure form from admixtures thereof with the corresponding 2,4′-isomer and 2,2′-isomer, which process comprises:

heating said mixture of isomeric diamines at a temperature of 30° C to 150° C with a phenol selected from the class consisting of phenol, lower-alkyl substituted phenols, lower-alkoxy substituted phenols, catechol, orcinol, resorcinol and bis-lower-alkylidene phenols, said phenol being employed in an amount such that there is at least one phenolic hydroxyl for each amine group in said 4,4′-diaminodiphenylmethane;

separating the complex of 4,4′-diaminodiphenylmethane and said phenol so formed; and

regenerating substantially pure 4,4′-diaminodiphenylmethane from said complex.

4,034,040
XYLENE-DIAMINES AS ANTIVIRAL AGENTS

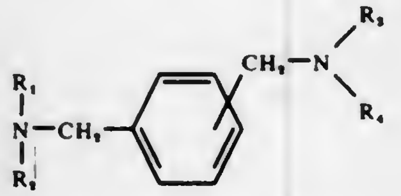
Timothy H. Cronin, Niantic; Hermann Faubl; William W. Hoffman, both of Mystic, and James J. Korst, Old Lyme, all of Conn., assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 541,240, Jan. 15, 1975, abandoned, which is a division of Ser. No. 330,042, Feb. 6, 1973, Pat. No. 3,872,171, which is a continuation-in-part of Ser. No. 146,548, May 24, 1971, abandoned, which is a continuation-in-part of Ser. No. 62,192, Aug. 7, 1970, abandoned. This application Mar. 14, 1975, Ser. No. 558,224

Int. Cl.² C07C *87/28*

U.S. Cl. 260—570.9 **17 Claims**

1. A compound of the structure



or a non-toxic acid addition salt thereof wherein

R_1 is alkyl of from 1 to 20 carbon atoms;

R_2 is alkyl of from 12 to 20 carbon atoms;

R_3 is selected from the group consisting of hydrogen and hydroxyalkyl of from 2 to 89 carbon atoms; and

R_4 is selected from the group consisting of hydrogen, alkyl of from 1 to 8 carbon atoms and hydroxyalkyl of from 2 to 8 carbon atoms.

4,034,041
1,3-BRIDGED AMINO TETRALINS

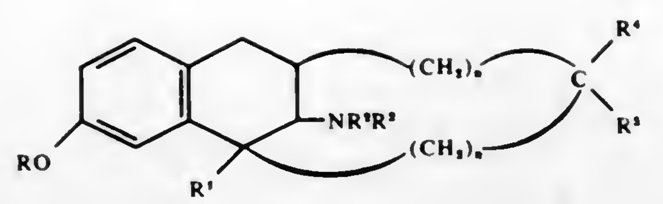
Meier E. Freed, Paoli, and John R. Potoski, Spring City, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Mar. 13, 1975, Ser. No. 558,021

Int. Cl.² C07C *87/64*

U.S. Cl. 260—571 **4 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, phen(lower)alkyl, or substituted phen(lower)alkyl, R¹ is lower alkyl of from 1 to 4 carbon atoms; R² and R³ are independently selected from hydrogen, or lower alkyl of from 1 to 4 carbon atoms; R⁴ and R⁵ are independently selected from the group lower alkyl, or R⁴ and R⁵ may be concatenated to form a 5 or 6 membered carbocyclic ring; and *n* is 1 or 2 and the pharmaceutically acceptable addition salts thereof.

4,034,042
PROCESS FOR THE PRODUCTION OF 4-NITROSO-DIPHENYLAMINE

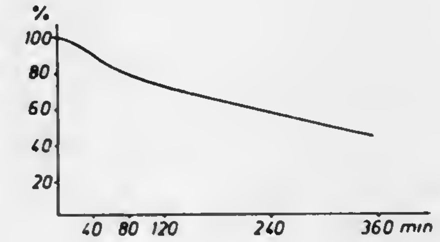
Karlfried Wedemeyer, and Rudolf Helm, both of Cologne, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Mar. 5, 1973, Ser. No. 338,219

Claims priority, application Germany, Mar. 9, 1972, 2211341

Int. Cl.² C07C *87/28*

U.S. Cl. 260—576 **6 Claims**



1. In the process of producing 4-nitrosodiphenylamine wherein N-nitrosodiphenylamine is subjected to rearrangement in an alcoholic hydrogen chloride solution and 4-nitrosodiphenylamine is recovered, the improved method of preventing spontaneous decomposition of 4-nitrosodiphenylamine hydrochloride which comprises regulating the ratio of hydrogen chloride to N-nitrosodiphenylamine in said solution, the rearrangement reaction temperature and the rearrangement reaction time in such a way that the resulting 4-nitrosodiphenylamine hydrochloride is prevented from crystallizing out and remains in solution during said rearrangement, and then neutralizing said 4-nitrosodiphenylamine hydrochloride and recovering resulting 4-nitrosodiphenylamine, there being up to 20 mols of hydrogen chloride used per mole of N-nitrosodiphenylamine reactant, said reaction temperature being in the range of from 0° to 65° C. and said reaction time being up to 4 hours.

4,034,043
ALCOHOLIC HYDROLYSIS OF 2-FORMYLAMINOCHLOROTOLUENE

Alfred Grieder, Muttenz, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 13, 1976, Ser. No. 648,847

Int. Cl.² C07C *87/50*

U.S. Cl. 260—578 **6 Claims**

1. Process for the production of 2-amino-5-chlorotoluene hydrochloride by chlorination of 2-formylaminotoluene, subsequent splitting-off of the formyl group of the formed 2-formylaminochlorotoluenes, and separation of 2-amino-5-chlorotoluene as hydrochloride, in which process the 2-formylamino-5-chlorotoluene, formed on chlorination of 2-formylaminotoluene in an inert organic solvent, in the reaction mixture obtained on chlorination is split by reaction with methanol into methyl formate and 2-amino-5-chlorotoluene; and the last-mentioned is separated as hydrochloride.

4,034,044
MENTHONE-8-THIOL, CARVOMENTHONE-8-THIOL AND PROCESS FOR PREPARING SAME

Erling Sundt, Pinchat-Geneva, and Günther Ohloff, Bernex, Geneva, both of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

Continuation of Ser. No. 13,755, Feb. 24, 1970, Pat. No. 3,598,643. This application Apr. 30, 1973, Ser. No. 355,470

Claims priority, application Switzerland, Feb. 27, 1969, 2928/69; Nov. 3, 1969, 16374/69

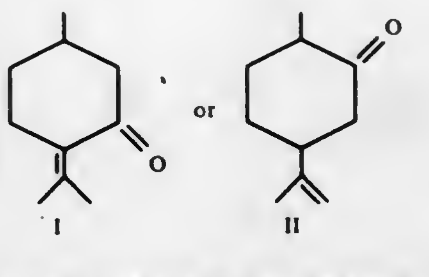
Int. Cl.² C07C *49/31, 45/00*

U.S. Cl. 260—586 R **4 Claims**

1. Substantially pure menthone-8-thiol having a b.p. of 57° C./0.01 Torr.

2. Carvomenthone-8-thiol.

3. A process for the preparation of menthone-8-thiol or carvomenthone-8-thiol respectively, which comprises condensing H_2S with a monoolefinic ketone of the formula



respectively, in which reaction the stoichiometric ratio of the formula I or II compound to the H_2S is such as to result in a reaction product substantially comprising menthone-8-thiol or carvomenthone-8-thiol, wherein the reaction is carried out at a temperature of from −80° C to room temperature.

4,034,045
2,4-DISUBSTITUTED-4b,5,6,7,8,8a,9,10-OCTAHYDRO-9-OXO-PHENANTHRENES

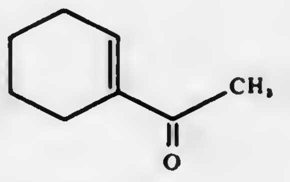
Sandor Barcza, West Orange, N.J., and James B. Hendrickson, Cambridge, Mass., assignors to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 566,759, April 10, 1975, abandoned, which is a continuation of Ser. No. 368,939, June 11, 1973, abandoned. This application Dec. 4, 1975, Ser. No. 637,718

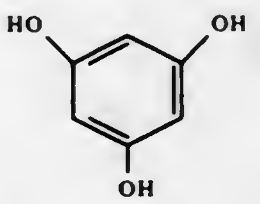
Int. Cl.² C07C *49/82*

U.S. Cl. 260—590 FB **3 Claims**

1. A process for preparing 2,4 dihydroxy 4*b*,5,6,7,8,8*a*,9,10-octahydro-9-oxo-phenanthrene which comprises treating a compound of the formula



with a compound of the formula



under an inert atmosphere in the presence of a strong base and alcoholic solvent at a temperature of between 50° and 150° C.

4,034,046

HYDROXYARYLDIALKYL SULFONIUM HALIDES

Vincent Lamberti, Upper Saddle River, and Mark D. Konort, Haworth, both of N.J., assignors to Lever Brothers Company, New York, N.Y.

Filed Feb. 9, 1971, Ser. No. 114,034

Int. Cl.^{2} C07C *149/46*

U.S. Cl. 260—607 B **5 Claims**

1. (4-hydroxyphenyl)n-dodecylmethyl sulfonium bromide.

4,034,047

PROCESS FOR CATALYTIC OXIDATION OF OLEFINS TO FORM HYDROPEROXIDES

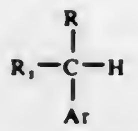
Howard P. Angstadt, Media, Pa., assignor to Suntech, Inc., St. Davids, Pa.

Division of Ser. No. 524,912, Nov. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 853,547, Aug. 27, 1969, abandoned. This application Feb. 17, 1976, Ser. No. 656,055

Int. Cl.^{2} C07C *29/00, 179/00*

U.S. Cl. 260—610 B **13 Claims**

1. In the process for the catalytic oxidation of aliphatic or alicyclic olefins having at least one hydrogen atom on the α-carbon atom, said olefins having 3 to 18 carbon atoms, or secondary or tertiary alkylaromatic hydrocarbons of the formula



$$R_1-\overset{\displaystyle R}{\underset{\displaystyle Ar}{\overset{|}{\underset{|}{C}}}}-H$$

wherein R is lower alkyl; R_1 is lower alkyl or hydrogen; and Ar is an aromatic nucleus selected from the group consisting of phenyl and naphthyl, in the presence of air or oxygen at a temperature of from about 80° to 200° C to form hydroperoxides, the decomposition products thereof, or mixtures of the same, the improvement wherein the catalyst is a polymeric complex formed from a thermally condensed polyacrylonitrile and a transition metal salt, wherein said transition metal is from Group IB, IIB, IIIB, IVB, VB, VIB, VIIB, VIIIB, or IIA of the Periodic Table and wherein the ratio of said catalyst to said olefin or alkylaromatic hydrocarbon is from about 0.01 to 5.0 parts by weight of catalyst per 100 parts by weight of olefin or alkylaromatic hydrocarbon.

4,034,048

TAR ACID PRODUCTS FROM SOLVENT NAPHTHA

Norman S. Boodman, Penn Hills Township, Allegheny County, and Richard C. Well, Monroeville Borough, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Nov. 15, 1971, Ser. No. 198,967

Int. Cl.^{2} C07C *37/32, 39/02*

U.S. Cl. 260—621 H **6 Claims**

1. A process for the preparation of tar acids from the solvent naphtha fraction having a boiling point in the range of about 160° - 200° C obtained from the carbonization of bituminous coal, said fraction containing coumarone as the major heterocyclic ingredient, comprising destructively hydrogenating the solvent naphtha fraction over a catalyst selected from the group consisting of alumina-supported cobalt molybdate and alumina-supported nickel molybdate wherein

a. the temperature is from about 300° C to about 500° C,
b. the hydrogen pressure is 1000 to 3000 psig, and
c. the catalyst comprises about 1 - 20 percent by weight of the solvent naphtha fraction.

4,034,049

MO CATALYZED CHLORINATION OF DICHLOROBUTENES

Billy J. Lovelace, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Nov. 19, 1975, Ser. No. 633,379

Int. Cl.^{2} C07C *17/02*

U.S. Cl. 260—658 R **22 Claims**

1. In a process for the production of meso-1,2,3,4-tetrachlorobutane by contacting in a reaction zone trans-1,4-dichlorobutene-2 in the liquid phase with chlorine at a temperature of from about 25° C. to about 150° C. in the substantial absence of oxygen, the improvement which comprises:

effecting said contacting of trans-1,4-dichlorobutene-2 and chlorine in the presence of a catalytic amount of molybdenum.

8. The process to claim 1 wherein nitric oxide is added to the reaction zone in an amount of from about 0.1 to about 20 mol precent based on trans-1,4-dichlorobutene-2.

4,034,050

PREPARATION OF 5-METHYL-2-NITROPHENOL

Mitsuru Sasaki, and Kunio Mukai, both of Nishinomiya, Japan, assignors to Sumitomo Chemical Company, Ltd., Osaka, Japan

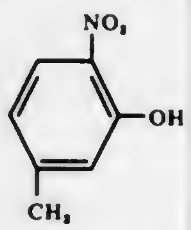
Continuation-in-part of Ser. No. 547,090, Feb. 4, 1975, abandoned. This application Dec. 17, 1975, Ser. No. 641,585

Claims priority, application United Kingdom, Jan. 31, 1975, 4428/75; Germany, Feb. 4, 1975, 2504592; France, Feb. 3, 1975, 75.03304; Belgium, Feb. 4, 1975, 153032; United Kingdom, Feb. 4, 1975, 01314/75; Canada, Feb. 4, 1975, 219387; Italy, Feb. 3, 1975, 67270/75; U.S.S.R., Feb. 3, 1975, 2103873; Switzerland, Feb. 3, 1975, 1240/75; Denmark, Feb. 3, 1975, 360/75; Czechoslovakia, Feb. 4, 1975, 725/75

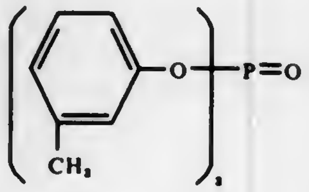
Int. Cl.^{2} C07C *79/24*

U.S. Cl. 260—622 R **7 Claims**

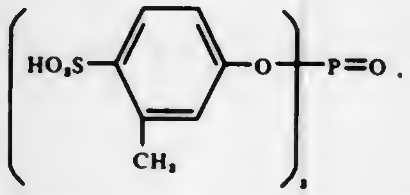
1. A process for preparing 5-methyl-2-nitrophenol of the formula



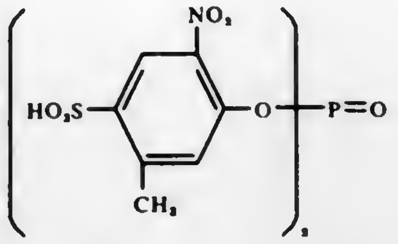
which comprises treating tri-m-cresyl phosphate of the formula



with a sulfonating agent selected from the group consisting of sulfuric acid and fuming sulfuric acid, at a temperature of 25° to 150° C., to form a sulfonated compound of the formula



nitrating the sulfonated compound with a nitrating agent selected from the group consisting of nitric acid, fuming nitric acid, a mixture of nitric acid and sulfuric acid and a mixture of acetic acid and nitric acid, at a temperature of −15° to 20° C., to form a nitrated compound of the formula



and hydrolyzing the nitrated compound at a temperature of 110° to 170° C. in the presence of an acid selected from the group consisting of sulfuric acid, phosphoric acid, concentrated hydrochloric acid and a mixture of at least two of said acids.

4,034,051

STABILIZATION OF PERCHLOROETHYLENE

Dominik Dempf, Mehring; Otto Fruhwirth, Burghausen, and Ludwig Schmidhammer, Haiming, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

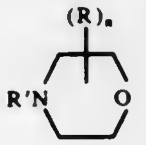
Filed Sept. 18, 1975, Ser. No. 614,547

Claims priority, application Germany, Oct. 18, 1974, 2449667

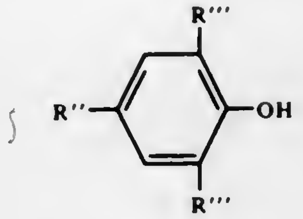
Int. Cl.^{2} C07C *17/40, 17/42*

U.S. Cl. 260—652.5 R **10 Claims**

1. A stable mixture of perchloroethylene containing a mixture of from 0.001% to 0.01% by weight of at least one N-alkylmorpholine having the formula



wherein R' is alkyl having from 1 to 5 carbon atoms, R is alkyl having from 1 to 5 carbon atoms and n is an integer from 0 to 3, and from about 0.001% to 0.01% by weight of at least one alkylphenol having the formula



wherein R'' and R''' are members selected from the group consisting of hydrogen and alkyl having from 1 to 18 carbon atoms, with the proviso that at least one of R'' and R''' is alkyl having from 1 to 18 carbon atoms.

4,034,052

ALKENYLATION CATALYSTS

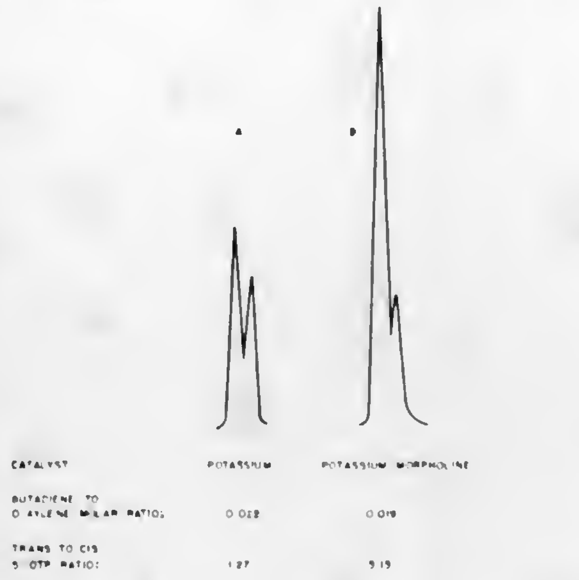
Imre Puskas, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sept. 29, 1975, Ser. No. 617,368

Int. Cl.^{2} C07C *3/00*

U.S. Cl. 260—671 C **19 Claims**

1. In a process for alkenylation of alkylaromatics having benzylic hydrogen with conjugated diolefins of 4–15 carbon atoms in the presence of an alkali metal selected from the group consisting of potassium, rubidium, cesium, and alloys of said metals with each other or with other alkali metals, the improvement comprising carrying out the process in the presence of a cocatalyst selected from the group consisting of unsaturated amines having 1–60 carbon atoms, primary and secondary saturated amines having 1–60 carbon atoms,



N,N,N',N'-tetramethylethylenediamine, N,N,N'N'-tetramethyl-1,3-propanediamine, and ammonia.

4,034,053

SELECTIVE PRODUCTION OF PARA-XYLENE

Warren W. Kaeding, Westfield, and Lewis B. Young, Kendall Park, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,861

Int. Cl.^{2} C07C *3/62, 15/08*

U.S. Cl. 260—672 T **7 Claims**

1. A process for the selective production of para-xylene which comprises contacting toluene, under disproportionation conditions, with a catalyst consisting essentially of a crystalline aluminosilicate zeolite having a silica to alumina ratio of at least about 12 and a constraint index within the approximate range of 1 to 12, said catalyst having combined therewith magnesium in an amount of at least about 0.5 percent by weight, as a result of contact of said zeolite with a magnesium compound in the liquid phase, cooling the resulting product and separating para-xylene therefrom.

4,034,054

PROCESS FOR THERMOFORMING HOLLOW ARTICLES

Donald G. Sauer, Harwinton, Conn., assignor to National Can Corporation, Chicago, Ill.

Filed Sept. 20, 1974, Ser. No. 507,788

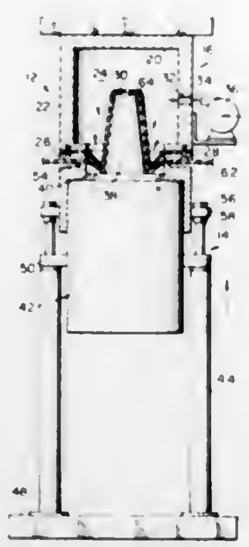
Int. Cl.^{2} B29C *17/04;* **B29F** *5/00*

U.S. Cl. 264—93 **1 Claim**

1. In a process for thermoforming a hollow plastic article from a sheet of heated thermoplastic material over a male mold contained to a desired internal shape of said article, wherein said sheet of thermoplastic material is firmly held between a pressure box assembly and a male mold assembly including said male mold, the improvement comprising:

a. closing an entrance to a chamber of said pressure box by disposing a resilient diaphragm of elastomeric material across said entrance, between said sheet and said entrance;
b. stretching and forming said sheet by moving and pressing said male mold against a side of said sheet opposite said diaphragm, said moving including passing said male mold through a plane originally occupied by said diaphragm so

that said resilient diaphragm causes said sheet to be drawn about said male mold, and maintaining chamber at a positive pressure with a compressible fluid during said stretching and forming.



4,034,055

TUBULAR FILM OF POLYETHYLENE TEREPHTHALATE AND PROCESS FOR THE PRODUCTION THEREOF

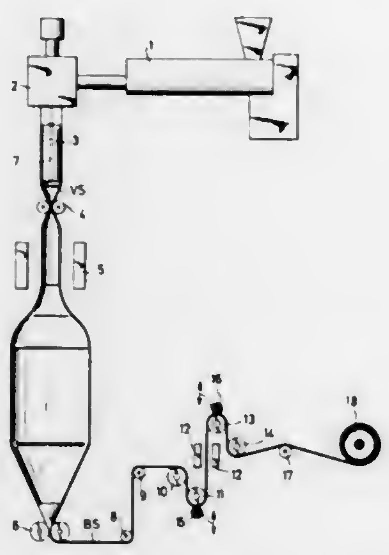
Hans Strutzel, Wiesbaden; Detlef Gneuss, Marktredwitz, and Ludwig Klenk, Hallgarten, all of Germany, assignors to Hoechst Aktiengesellschaft, Germany

Division of Ser. No. 501,628, Aug. 29, 1974. This application Mar. 18, 1975, Ser. No. 559,405

Claims priority, application Germany, Aug. 30, 1973, 2343698

Int. Cl.^{2} B29D *7/24;* **B29C** *17/02*

U.S. Cl. 264—95 **5 Claims**



1. In the process for the production of tubular films of polyethylene terephthalate by biaxial stretching in the range of the second order transition point of an extruded, amorphous tubular film, subsequent longitudinal stretching at temperatures between the second order transition point and the melting temperature range, and cooling,

the improvement comprising performing the biaxial stretching at a stretching ratio of 3.3 to 4.2 in the longitudinal direction and 4.0 to 4.7 in the transverse direction at a tube temperature of 84° to 86° C, collapsing the tube into a lay flat film without a gas cushion, and performing the longitudinal after-stretching at a stretching ratio of 1.05 to 2.5 and at a tube temperature of 148° to 152° C.

4,034,056

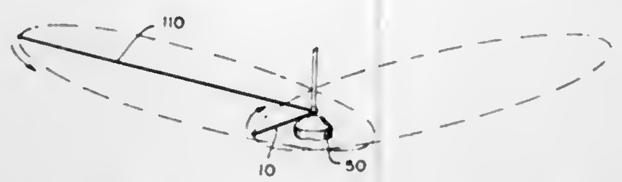
METHOD OF MAKING SLIDE FASTENER COILS

George B. Moertel, Conneautville, Pa., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 380,323, July 18, 1973, Pat. No. 3,906,595. This application July 16, 1975, Ser. No. 596,109

Int. Cl.^{2} B29D *5/00*

U.S. Cl. 264—281 **7 Claims**



1. A method of forming a pair of coils for a slide fastener device comprising the steps of

supplying a pair of continuous filaments having generally elliptical cross sections to a shaping station,

winding the filaments at the shaping station in opposite directions to form a pair of intermeshed coils,

shaping each convolution of each coil into four components including a bight element, first and second links extending from said bight element and a connector member extending from the first link of one convolution to the second link of an adjacent convolution, and

continuously changing the geometry of each convolution as it is being shaped by reorienting the major axis of its cross section whereby the first links are asymmetrically arranged relative to the second links.

4,034,057

METHOD OF SHAPING A BELL END ON THERMOPLASTIC PIPE

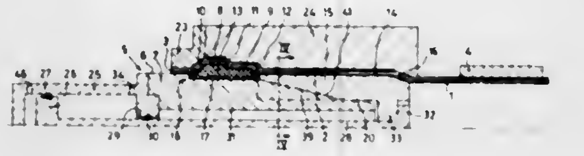
Petrus Marinus Acda, Enkhuizen, Netherlands, assignor to Polva-Nederland B.V., Enkhuizen, Netherlands

Division of Ser. No. 581,707, May 28, 1975, Pat. No. 3,998,578, which is a continuation of Ser. No. 408,562, Oct. 23, 1973, abandoned. This application Jan. 15, 1976, Ser. No. 649,480

Claims priority, application Netherlands, Apr. 5, 1973, 7304761

Int. Cl.^{2} B29C *1/12*

U.S. Cl. 264—297 **2 Claims**



1. A method of shaping a bell end on a pipe of thermoplastic material, the opening of the bell end having a diameter which is smaller than the maximum diameter of the inner surface of the bell end and substantially equal to the outer diameter of the pipe, by axially inserting a cylindrical shaping mandril into a pre-heated pipe end, said mandril comprising a base part having a diameter equal to the diameter of said opening, comprising the sequential steps of:

radially expanding an elastic shaping ring onto said base part from a relaxed state having an outside diameter at the most equal to said base part diameter to an operative position having a diameter equal to said maximum diameter;

restraining said shaping ring against axial movement with respect to said base part;

moving at least one of said mandril and said pipe axially with respect to each other so as to insert said mandril into an end of the pipe;

causing a bell end portion of the pipe to deform inwardly so as to form a bell end having an opening whose diameter is smaller than said maximum diameter;

cooling said pipe such that the shape formed about the mandril will be retained;

continuing said restraining step while said moving, causing and cooling steps are performed;

forming a space radially inward from said shaping ring so as to establish a clearance under the shaping ring;

allowing said shaping ring to contract elastically into said clearance; and

lastly moving at least one of said mandril and said pipe axially with respect to each other so as to remove said mandril from said end of the pipe.

4,034,058

METHOD FOR PRODUCING SYNTHETIC SODIUM ALUMINOSILICATE ION-EXCHANGE MATERIAL FROM CALCINED KAOLIN CLAY

M. Phillip Jameson, and Fred R. Huege, both of Somerville, N.J., assignors to Engelhard Minerals & Chemicals Corporation, Edison, N.J.

Filed June 29, 1976, Ser. No. 700,862

Int. Cl.^{2} C01B *33/28*

U.S. Cl. 423—118 **6 Claims**

2. In a process for producing finely divided particles of a synthetic crystalline sodium aluminosilicate zeolite by heating an aqueous alkaline reaction mixture consisting essentially of oxides of aluminum, silicon and sodium, the major portion of said aluminum and silicon oxides being provided by the inclusion in the reaction mixture of finely divided particles of metakaolin until finely divided zeolite crystals form, separating the zeolite crystals from the reaction liquid and washing the crystals, which process results in a zeolite product having a brightness substantially less than the brightness of the clay used to produce said metakaolin reactant, the improvement whereby the zeolite product will have a substantially higher brightness, which comprises removing iron-bearing impurities from the metakaolin by volatilizing the impurities with a chlorine-bearing gas at a temperature in the range of 600° to 980° C. before including the metakaolin in the aqueous alkaline reaction mixture used to produce the zeolite.

4,034,059

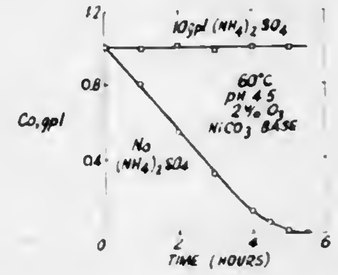
SEPARATION OF COBALT FROM NICKEL BY OZONATION IN THE PRESENCE OF AMMONIUM SALTS

Franklin F. Clark; Cvetko B. Nikolic, and Paul B. Queneau, all of Golden, Colo., assignors to Amax Inc., Greenwich, Conn.

Filed July 19, 1976, Ser. No. 706,817

Int. Cl.^{2} C01G *51/04*

U.S. Cl. 423—144 **7 Claims**



1. A method of separating cobalt from a nickel solution containing cobalt in the cobaltous state and at least about 0.1 grams/liter of ammonium ion, the nickel to cobalt ratio in solution being at least about 5:1, which comprises,

subjecting said solution to ozonation while controlling the pH thereof from about 4.5 to 6 by the addition of a base other than ammonium hydroxide, and continuing said ozonation in said pH range until said cobalt has been oxidized to the cobaltic state and precipitated as a cobaltic hydrate at a temperature of at least about 10° C.

4,034,060

EXHAUST GAS PURIFYING CATALYST AND PROCESS OF MAKING AND USING SAME

Edgar Koberstein, Alzenau, and Eduard Lakatos, Grossenhausen, both of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation of Ser. No. 567,776, April 14, 1975, abandoned, which is a division of Ser. No. 406,075, Oct. 12, 1973, Pat. No. 3,928,238. This application May 13, 1976, Ser. No. 685,958

Claims priority, application Germany, Oct. 13, 1972, 2250200

Int. Cl.^{2} C01B *21/20, 31/18*

U.S. Cl. 423—213.5 **15 Claims**

1. A process for purifying an exhaust gas comprising contacting said exhaust gas with a catalyst comprising at least one heavy metal oxide, alkali metal, alkaline earth metal and optionally noble metal or aluminum oxide, said catalyst comprising a shaped core of temperature-resistant support material having a coating of catalytically active material, at least 50% by weight of the active material being at least one heavy metal oxide or modified heavy metal oxide, wherein said heavy metal is selected from the group consisting of copper, chromium, nickel, titanium, vanadium, manganese, iron, cobalt, zinc, tin, molybdenum, tungsten and bismuth; said support material and catalytically active material being in a weight ratio of about 4 - 30 : 1 and being without substantial mutual permeation due to said core having been intensively mixed with a binding agent until the surface of said core is slightly glutinous and thereafter having been intensively mixed with a pulverulent catalytically active material or with a hydroxyl group-containing precursor of the catalytically active material and the resulting mass having been heated to remove the binding agent.

4,034,061

ALUMINUM BORATE CATALYST COMPOSITIONS AND USE THEREOF IN CHEMICAL CONVERSIONS

Dennis P. McArthur, Yorba Linda, Calif., assignor to Union Oil Company of California, Los Angeles, Calif.

Continuation of Ser. No. 307,031, Nov. 16, 1972, abandoned. This application June 30, 1975, Ser. No. 591,352

The portion of the term of this patent subsequent to Dec. 24, 1991, has been disclaimed.

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—213.5 **11 Claims**

11. A process as defined in claim 1 wherein said shaped aggregate is in the form of a membranous coating supported on an inert monolithic structure traversed by channels of about 1/32 -¼ inch in diameter.

4,034,062

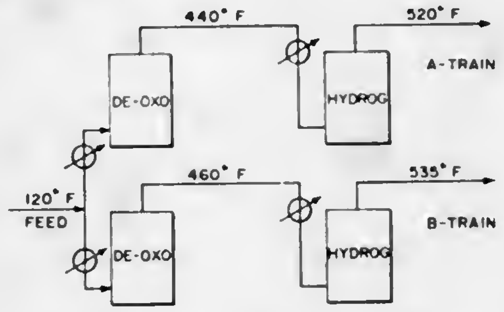
REMOVAL OF OXYGEN FROM GAS STREAM WITH COPPER CATALYST

Bruno O. Krueger, Columbus, Ohio, assignor to Borden, Inc., Columbus, Ohio

Filed Mar. 20, 1975, Ser. No. 560,551

Int. Cl.^{2} B01D *53/34*

U.S. Cl. 423—219 **10 Claims**



1. Process for the purification of a gas stream containing

primarily hydrogen and carbon monoxide as well as small quantities of oxygen, acetylene, and ethylene as impurities, comprising passing said gas stream at a temperature of 250° to 700° F through a bed of catalyst consisting essentially of a copper catalyst for removal of substantially all of acetylene and oxygen and at least about 60% ethylene.

4,034,063

PROCESS FOR CONTROL OF SO_x EMISSIONS FROM COPPER SMELTER OPERATIONS

Edward C. Rosar, Lakewood, Colo.; Jacques M. Dulin, Libertyville, Ill.; Joseph M. Genco, Gahanna, and Harvey S. Rosenberg, Columbus, both of Ohio, assignors to Industrial Resources, Inc., Chicago, Ill.

Filed Mar. 22, 1974, Ser. No. 453,582

The portion of the term of this patent subsequent to Apr. 8, 1992, has been disclaimed.

Int. Cl.^{2} C01B *17/00;* **B01J** *8/60;* **C01G** *3/00;* **C22B** *11/00*

U.S. Cl. 423—244 **10 Claims**

1. A process for control of SO_x off-gases from a copper smelter having copper ore in situ heap or dump leaching and cement copper operations requiring sulfuric acid-containing leach liquor, and said cement copper operation producing a barren, with respect to copper values, liquor rich in ferrous ions, comprising the steps of:

a. contacting a smelter off-gas with a sodium alkali sorbent to form a sodium sulfur oxide salt waste,
b. removing ferrous ions from said barren liquor by reacting said liquor with said sodium sulfur oxide salt waste,
c. maintaining said reaction at a temperature in the range of from about 50° to 300° F and a pH below about 5.5 a time sufficient to form: (19 a substantially water insoluble double salt selected from natrojarosite, sideronatrite, metasideronatrite, depegite, rosarite, iriite and mixtures thereof, and (2) an iron-stripped leach liquor having reduced levels of ferrous iron and being substantially free of said sulfur oxide salt waste, and
d. passing said iron-stripped leach liquor to said ore leaching operation for in situ leaching of copper values from said copper ore,

thereby controlling SO_x emissions, disposing of water-soluble SO_x emissions control wastes, and providing a leach liquor low in ferrous ion values which assists in reducing the amount of leach operation plugging contributed by leach liquor ferrous iron.

4,034,064

HYDROGEN PEROXIDE STABILIZATION WITH TRIAMIDES OF PHOSPHORUS

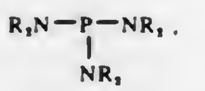
James A. Cook, Jr., Barberton, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Feb. 2, 1976, Ser. No. 654,312

Int. Cl.^{2} C01B *15/02*

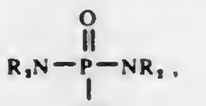
U.S. Cl. 423—272 **12 Claims**

1. A stabilized aqueous hydrogen peroxide solution having dissolved therein a minor stabilizing concentration, sufficient to retard decomposition of hydrogen peroxide induced by polyvalent metal cation contamination, of a phosphorus compound selected from the group consisting of compounds represented by the formula:



$$R_2N-\underset{\underset{\displaystyle NR_2}{|}}{P}-NR_2\,,$$

compounds represented by the formula

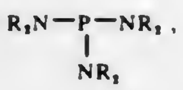


$$R_2N-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle NR_2}{|}}{P}}-NR_2\,,$$

and mixtures thereof, wherein (a) each R independently is an alkyl group having 1 to 6 carbons, (b) the two R on a particular nitrogen may be joined, optionally through an oxygen, to form a ring together with the nitrogen, and (c) the total number of carbons in all R is from 6 to 20.

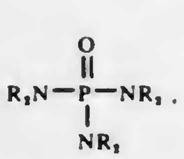
7. A method of stabilizing aqueous hydrogen peroxide, which comprises:

adding to aqueous hydrogen peroxide solution a minor stabilizing amount, sufficient to retard decomposition of hydrogen peroxide induced by polyvalent metal cation contamination, of a soluble phosphorus compound selected from the group consisting of compounds represented by the formula:



$$R_2N-\underset{\underset{\displaystyle NR_2}{|}}{P}-NR_2\,,$$

compounds represented by the formula



$$R_2N-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle NR_2}{|}}{P}}-NR_2\,,$$

and mixtures thereof, wherein (a) each R independently is an alkyl group having 1 to 6 carbons, (b) the two R on a particular nitrogen may be joined, optionally through an oxygen, to form a ring together with the nitrogen, and (c) the total number of carbons in all R is from 6 to 20.

4,034,065

PREPARATION OF CU+ ZEOLITES

Paul Haruo Kasai, White Plains; James Nelson Francis, Peekskill, and Roland Justin Bishop, Jr., Hauppauge, all of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 26, 1975, Ser. No. 617,083

Int. Cl.^{2} C01B *33/28*

U.S. Cl. 423—328 **3 Claims**

1. Process for preparing zeolites containing Cu^+ cations which comprises providing a crystalline zeolite having pore diameters of at least 4 Angstroms, having a framework SiO_2/Al_2O_3 molar ratio of from 15 to 200 and containing bivalent copper cations, contacting and reacting said zeolite as a reagent with water at a temperature of from 200° C. up to the crystal destruction temperature of the zeolite, said zeolite reagent containing insufficient water of hydration to stabilize the bivalent copper cations thereof against reaction with said water.

4,034,066

METHOD AND HIGH PRESSURE REACTION VESSEL FOR QUALITY CONTROL OF DIAMOND GROWTH ON DIAMOND SEED

Herbert M. Strong, Schenectady, and Roy E. Tuft, Guilderland Center, both of N.Y., assignors to General Electric Company, Columbus, Ohio

Filed Nov. 2, 1973, Ser. No. 412,425

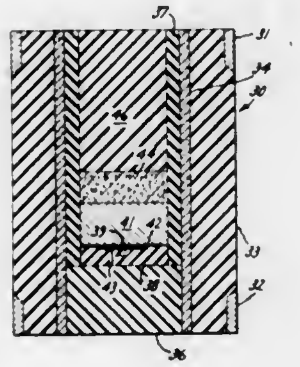
Int. Cl.^{2} C01B *31/06*

U.S. Cl. 423—446 **23 Claims**

1. In a diamond synthesis reaction vessel for introduction into the reaction volume of a high pressure, high temperature apparatus, said reaction vessel constituting an assembly of interfitting elements for enclosing diamond seed material and a source of substantially pure carbon, said diamond seed material and source of carbon being separated by a mass of metallic catalyst-solvent material for the diamond-making reaction disposed therebetween so as to provide a predetermined temperature gradient between said diamond seed material and said source of carbon under operating conditions of pressure and temperature in the diamond stable region of the phase diagram of carbon, said diamond seed material and said

source of carbon being located in separate regions of said reaction vessel such that under said operating conditions said diamond seed material will be heated to a temperature near the minimum value of temperature for said temperature gradient and simultaneously said source of carbon will be heated to a temperature near the maximum value of temperature for said temperature gradient, the combination with said interfitting elements of

a. metallic means for isolating said diamond seed material from contact with said catalyst- solvent material for a preselected period of time under operating conditions of pressure and temperature,
b. means for suppressing diamond nucleation,
c. said isolating means and said nucleation suppressing means being in separate layers; said isolating means, said nucleation suppressing means and said mass of catalyst-solvent material being of different materials in any given reaction vessel construction, said isolating means being made of a material having a melting point, when in contact with diamond, that is higher than the melting point of said catalyst-solvent material saturated with carbon dissolved therein, when in contact with diamond,
d. said isolating layer being in contact with said diamond seed material and being disposed between the said diamond seed material and said mass of catalyst-solvent material and
e. said nucleation suppressing layer being disposed in contact with the underside of said mass of catalyst-solvent material.



4,034,067

HYDROXYCHLORIDES OF ALUMINUM AND METHOD

Laurent Seigneurin, Salindres, and Michel Brunet, Rousson, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Continuation-in-part of Ser. No. 514,623, Oct. 15, 1974, abandoned. This application May 17, 1976, Ser. No. 687,019

Claims priority, application France, Oct. 16, 1973, 73.36846; June 26, 1974, 74.2201; July 2, 1974, 74.22968

Int. Cl.^{2} C01B *7/00*

U.S. Cl. 423—462 **7 Claims**

1. A method for preparing products consisting essentially of aluminum hydroxychlorides in homogeneous solution in which the aluminum hydroxychlorides have the general formula $Al_2(OH)_xCl_{6-x}$ in which X is a value of 3 to more than 5 but less than 6, comprising heating an aqueous solution of activated alumina to a temperature of 60° F to reflux temperature with vigorous agitation in the presence of a compound selected from the group consisting of aluminum chloride, hydrochloric acid and mixtures thereof for reaction to provide said aluminum hydroxychloride in homogeneous solution, the activated alumina consisting of the product of the partial dehydration of hydrates of alumina in a stream of hot gases to less than 2 moles combined water and a specific surface area of at least 200 m^2/g.

4,034,068

PROCESS FOR PREPARATION OF AMMONIUM TETRAFLUOROALUMINATE

Minoru Aramaki, and Etsuo Ushirogouchi, both of Ube, Japan, assignors to Central Glass Co., Ltd., Ube, Japan

Filed Oct. 24, 1975, Ser. No. 625,476

Claims priority, application Japan, Oct. 28, 1974, 49-123467

Int. Cl.^{2} C01F *7/50;* **C01C** *1/16, 1/18*

U.S. Cl. 423—465 **10 Claims**

1. A process for the preparation of ammonium tetrafluoroaluminate comprising the steps of:

a. preparing an aqueous slurry of ammonium hexafluoroaluminate and an aluminum compound selected from the group consisting of aluminum hydroxide and aluminum oxide, the molar ratio of said ammonium hexafluoroaluminate to said aluminum compound being about 1:1/2;
b. adding an inorganic acid selected from the group consisting of sulfuric acid, hydrochloric acid and nitric acid to said slurry in such an amount that the molar ratio of said ammonium hexafluoroaluminate to said inorganic acid in the resulting mixture is about 4:3 for sulfuric acid, and about 2:3 for hydrochloric acid and nitric acid, leaving an excess amount of the acid necessary to neutralize free ammonia which may be present in said slurry; the resultant reaction system being kept at a temperature between room temperature and about 100° C. at atmospheric pressure; and
c. recovering the ammonium tetrafluoroaluminate product from the reaction system in crystalline form by filtration.

4,034,069

METHOD OF PREPARING ARSENIC TRIFLUORIDE

M. David Curtis, Ann Arbor, MI, assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,044

Int. Cl.^{2} C01B *27/00*

U.S. Cl. 423—489 **9 Claims**

1. A process for the production of arsenic trifluoride which comprises reacting arsenic trichloride with at least one molten fluoride salt selected from the group consisting of alkali metal fluorides, alkaline earth metal fluorides and mixtures thereof in the presence of at least one molten chloride salt.

4,034,070

PROCESS FOR PREPARING ANHYDROUS METAL FLUORIDES

John A. Wojtowicz, and David F. Gavin, both of Cheshire, Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 597,546, July 21, 1975, abandoned. This application Sept. 22, 1976, Ser. No. 725,898

Int. Cl.^{2} C01B *7/08;* **C01F** *5/28;* **C01G** *1/06, 43/06*

U.S. Cl. 423—489 **10 Claims**

1. A process for preparing anhydrous metal fluoride which comprises reacting, in the presence of a nitrile having 2–4 carbon atoms, a metal with HF and halogen, both in substantially anhydrous form, said halogen being selected from the group consisting of chlorine, bromine, iodine and a mixture thereof, the reaction being carried out using, per every gram-equivalent of metal, about 0.1–50 gram-moles of HF and about 0.05–25 gram-moles of halogen.

4,034,071

IMMUNOASSAY PROCEDURES

Herbert S. Strickler, Pittsburgh, Pa., assignor to Allegheny General Hospital, Pittsburgh, Pa.

Filed Jan. 26, 1976, Ser. No. 652,302

Int. Cl.^{2} G01N *33/00;* **G21H** *5/02;* **B01J** *1/22*

U.S. Cl. 424—1 **14 Claims**

1. In an immunoassay procedure, including the step of separating within a mixture a bound untagged substance and a

bound tagged same substance from unbound substance and unbound tagged same substance by selectively absorbing the unbound portions, the improvement comprising subjecting said mixture to a clathrate compound having a host substance and an inclusion substance to carry out the separation, wherein a sorbent is the host substance.

9. In an automated system for performing immunoassays in which a bound untagged substance and a bound tagged same substance are separated from unbound substance and unbound tagged same substance within a mixture by selectively absorbing the unbound portions, the improvement comprising:

A. adding to the mixture to be separated a clathrate charcoal;
B. mixing the clatherated charcoal and the mixture; and
C. continuously filtering to obtain the bound untagged substance and bound tagged same substance as a filtrate.

4,034,072

SERUM HEPATITIS TEST

Shirley A. Mjos, Millis, and Roger N. Piasio, Medfield, both of Mass., assignors to Corning Glass Works, Corning, N.Y.

Filed July 21, 1975, Ser. No. 597,359

Int. Cl.^{2} G01N *33/00;* **A61K** *39/00;* **G21H** *5/02*

U.S. Cl. 424—1 **14 Claims**

1. A method of detecting the presence of hepatitis associated antigen in an unknown serum sample, the method comprising the steps of:

a. incubating the serum sample with a reagent comprising anti-hepatitis associated antigen antibodies covalently bonded via an intermediate silane coupling agent to a plurality of essentially siliceous particles having a surface area of at least about 1 m^2/g and, if porous, an average pore diameter of at least about 1000 A, the incubation being under conditions sufficient to allow complexation of any hepatitis associated antigen in the sample with the anti-hepatitis associated antigen antibodies of the reagent;
b. separating the reagent from the incubation medium of step (a);
c. incubation the separated reagent with a solution of radio labelled anti-hepatitis associated antigen antibodies under conditions sufficient to complex the labelled antibodies with any hepatitis associated antigen complexed to the antibodies of the reagent;
d. separating the reaction products of step (c) from the solution; and
e. measuring the radioactivity of the separated products or the remaining solution to determine whether hepatitis associated antigen was present in the serum sample.

4,034,073

COMPOSITE FOR BIASED SOLID PHASE RADIOIMMUNOASSAY OF TRIIODOTHYRONINE AND THYROXINE

Howard H. Weetall, Big Flats, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,102

Int. Cl.^{2} G01N *33/00, 33/16*

U.S. Cl. 424—1 **4 Claims**

1. A reagent useful for a solid phase radioimmunoassay of triiodothyronine comprising an aqueous suspension of an immunochemical composite consisting of a saturating amount of radioactively labelled triiodothyronine complexed to a sub-composite consisting of anti-triiodothyronine antibodies covalently coupled via an intermediate silane coupling agent to suspenable particles of porous glass.

4,034,074

UNIVERSAL REAGENT 2-SITE IMMUNORADIOMETRIC ASSAY USING LABELLED ANTI(IgG)

Laughton E. M. Miles, Stanford, Calif., assignor to The Board of Trustees of Leland Stanford Junior University, Stanford, Calif.

Filed Sept. 19, 1974, Ser. No. 507,347

Int. Cl.^{2} G01N *33/00;* **G21H** *5/02;* **A61B** *10/00*

U.S. Cl. 424—1 **3 Claims**

1. The process of making an immunoradiometric quantitative assay of an unknown quantity of a known antigen of a first animal species comprising the steps of:

a. preparing an antibody to the antigen of the first animal species in a second animal species,
b. causing said antibody to be bound to a reaction site,
c. reacting and binding said known antigen with said bound antibody,
d. preparing an antibody to said known antigen in a third animal species and reacting and binding the same with the bound known antigen of paragraph c,
e. preparing a purified, radioactive labeled antibody to the immunoglobulin of said third animal species in said second animal species and reacting and binding the same with the bound material of paragraph d,
f. removing unreacted material from said reaction site, and
g. measuring the radioactivity of the bound material to determine the quantity of the known antigen.

4,034,075

QUINALDIC ACID DERIVATIVES

David Edmund Bays; Mervyn Evan Peel; David Martin Waters, all of London, and Gwynn Pennant Ellis, Rhiwbina, all of England, assignors to Allen & Hanburys Limited, London, England

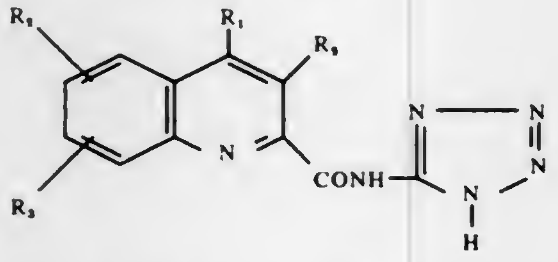
Division of Ser. No. 372,027, June 21, 1973, Pat. No. 3,932,416. This application Aug. 15, 1975, Ser. No. 605,036

Claims priority, application United Kingdom, July 3, 1972, 30990/72

Int. Cl.^{2} C07D *413/14;* **A61K** *31/47*

U.S. Cl. 424—45 **12 Claims**

1. A compound of the formula:



in which R_1, R_2 and R_3 independently represent a hydrogen atom, alkyl, nitro, a halogen atom or $-NR_4R_5$ or $-OR_4$; in which R_4 and R_5 may be the same or different and each represent a hydrogen atom, or an alkyl, alkenyl or cycloalkyl group which alkyl group may optionally be substituted by alkoxy, hydroxy, formyloxy, amino, alkylamino, dialkylamino; or R_4 and R_5 together with the nitrogen atom form morpholino, piperazinyl or N-methyl piperazinyl; and R_6 represents a hydrogen atom or alkyl; or a pharmaceutically acceptable salt thereof; any alkyl moiety being of 1 to 6 carbon atoms; any alkenyl moiety being of 2 to 6 carbon atoms, any cycloalkyl moiety being of 5 or 6 carbon atoms, R_2 and R_3 when both are vicinal and other than a hydrogen atom, said substituents are methyl; and at least one of R_1, R_2 and R_3 is $-NR_4R_5$ forming morpholino, piperazinyl or N-methyl piperazinyl.

9. A method of treating a condition due to the combination of extrinsic antigen with a reaginic antibody in which the condition is extrinsic asthma, hay fever, urticaria, eczema or atopic dermatitis which comprises administering by oral ingestion or inhalation an effective amount of a compound as claimed in claim 1.

4,034,076

PROCESS FOR MAKING TOOTHPASTE

James Coulson, Bracknell, England, and Malcolm Richard Nearn, Ingleburn, Australia, assignors to Lever Brothers Company, New York, N.Y.

Filed Mar. 3, 1975, Ser. No. 554,880

Claims priority, application United Kingdom, Mar. 7, 1974, 10303/74

Int. Cl.^{2} A61K *7/16*

U.S. Cl. 424—49 **4 Claims**

1. Process for inhibiting the swelling of aluminum toothpaste tubes containing a toothpaste composition comprising from about 20 percent to about 60 percent by weight of an alumina trihydrate having an average particle size of from about 3 to about 30 microns, in which process there is incorporated in the toothpaste composition a silica sol of which the silica particles are negatively charged in an amount of at least about 0.001 percent, calculated as silica by weight of the toothpaste, effective to stabilise the toothpaste against gassing of the aluminum tubes.

4,034,077

OINTMENTS AND POWDERS CONTAINING SEBACIC ACID

John Anthony Hill, New Brunswick; Irwin A. Katz, East Brunswick, and John H. Murphy, Toms River, all of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Jan. 2, 1973, Ser. No. 320,042

Int. Cl.^{2} A61K *7/035*

U.S. Cl. 424—69 **11 Claims**

1. A powder composition comprising in parts by weight from about 2 to about 30% sebacic acid, from about 45 to about 97% talc, and from about 0.1 to about 2% hydrophobic silicon dioxide.

4,034,078

PRODUCT AND METHOD FOR CONTROLLING ODORS

Earl Thomas Van Horn, Manchester, Mo., assignor to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 115,788, Feb. 16, 1971, abandoned. This application Sept. 22, 1975, Ser. No. 615,616

Int. Cl.^{2} A61K *37/48;* **A61L** *13/00*

U.S. Cl. 424—76 **7 Claims**

1. A method for the abatement of noxious odors emanating from an odoriferous substance comprising: treating said substance with an effective amount of a mixture which comprises a substantially proteolytic enzyme in an amount by weight of said mixture sufficient to yield an enzymatic activity of about 340,000 PVU/lb. and a ferrous salt, so that a synergistic deodorizing effect is achieved with said mixture thereby abating said odors.

4,034,079

SELF-SANITIZING PLASTIC

Marten Leonard Schoonman, 906 N. Elam Ave., Greensboro, N.C. 27408

Continuation of Ser. No. 441,775, Feb. 12, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,381

Int. Cl.^{2} A61K *31/745*

U.S. Cl. 424—83 **8 Claims**

1. A self-sanitizing plastic article consisting essentially of a moldable polyethylene resin and uniformly dispersed therethrough about 0.5 to 10 percent by weight of boric acid, about 0.5 to 10 percent by weight potassium or ammonium alum and about 0.5 to 3 percent by weight of a finely-divided inert particulate.

4,034,080

CHEMICAL ATTRACTANT FOR SMALLER EUROPEAN BARK BEETLE

Robert M. Silverstein; William E. Gore; Glenn T. Pearce, all of Syracuse, N.Y.; Roy A. Cuthbert, Delaware, Ohio; John B. Simeone; Gerald N. Lanier, both of Syracuse, N.Y., and John W. Peacock, Marion, Ohio, assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Jan. 14, 1976, Ser. No. 648,835

Int. Cl.^{2} A01N *17/14*

U.S. Cl. 424—84 **4 Claims**

2. An attractant composition for bark beetle *Scolytus multistriatus*, which comprises a mixture of the compounds 4-methyl-3-heptanol; 2,4-dimethyl-5-ethyl-6,8-dioxabicyclo (3.2.1) octane; and α-cubebene, wherein the proportions of the compounds are 1:1:2–10.

4,034,081

VACCINES AGAINST FELINE LEUKEMIA

William Fleming Hoggan Jarrett; James Oswald Jarrett, and Lindsay Joan Mackey, all of Glasgow, Scotland, assignors to University of Glasgow, Glasgow, Scotland

Division of Ser. No. 505,625, Sept. 13, 1974, Pat. No. 3,966,907. This application Mar. 18, 1976, Ser. No. 668,110

Claims priority, application United Kingdom, Sept. 18, 1973, 43642/73

Int. Cl.^{2} A61K *38/12*

U.S. Cl. 424—89 **5 Claims**

1. A vaccine for the prevention of disease caused by Feline leukemia virus which comprises in unit dosage form about 10^7–10^9 cells infected with live Feline leukemia virus, said cells having virus-associated antigens on their surface and wherein the cells and virus are inactivated by chemical or physical means without removing immunogenic properties from the cell surface.

4,034,082

METHOD TO PREVENT REPRODUCTION IN WARM-BLOODED FEMALE ANIMALS WITH NONAPEPTIDES

Edwin Samuel Johnson, Antioch, and Wilfrid Francis White, Arlington Heights, both of Ill., assignors to Abbott Laboratories, North Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,759

Int. Cl.^{2} A61K *37/02*

U.S. Cl. 424—177 **7 Claims**

1. A process for preventing reproduction consisting essentially in administering to a female, warm-blooded animal in or before reaching the reproductive age, an effective dose of the nonapeptide L-pGlu-L-His-L-Trp-L-Ser-L-Tyr-X-L-Leu-L-Arg-L-Pro-NH-C_2H_5 wherein X denotes the divalent, optically active D-form of tryptophane, tyrosine or phenylanine for at least one day in the period before said female produced one or more mature ova or after ovulation occurred.

4,034,083

COMPOSITIONS FOR INHIBITING ABSORPTION OF CHOLESTEROL

Fred Hugh Mattson, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Nov. 3, 1975, Ser. No. 628,265

Int. Cl.^{2} A61K *31/70, 31/22, 31/23*

U.S. Cl. 424—180 **23 Claims**

1. A composition of matter, comprising: a non-absorbable, non-digestible polyol fatty acid polyester having at least 4 fatty acid ester groups, wherein the polyol is selected from the group consisting of sugars and sugar alcohols containing from 4 to 8 hydroxyl groups and wherein each fatty acid group has from about 8 to about 22 carbon atoms; and sufficient fat-soluble vitamin selected from the group consisting of vitamin A, vitamin D, vitamin E and vitamin K, or mixtures thereof, to prevent abnormally low levels of any of said fat-soluble vitamins in animals ingesting said composition.

4,034,084
METHOD OF INHIBITING MICROBIAL ACTIVITY USING INSOLUBLE DIALDEHYDE POLYSACCHARIDES

Judith Ann Siragusa, Hopewell, N.J., assignor to Personal Products Company, Milltown, N.J.

Continuation-in-part of Ser. No. 513,678, Oct. 10, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,704

Int. Cl.^{2} A01N *9/00;* **A61K** *31/70;* **A61L** *13/00*

U.S. Cl. 424—180 **16 Claims**

1. A method for inhibiting bacterial growth in a locus susceptible to bacterial growth comprising applying to said locus a bactericidally effective amount of a water-insoluble dialdehyde polysaccharide selected from the group consisting of dialdehyde cellulose and dialdehyde starch wherein said water-insoluble dialdehyde polysaccharide has a degree of polymerization of at least about 50 repeating units per molecule.

4,034,085
O-[1-ALKOXYPHOSPHORYL-3-METHYL-PYRAZOL(-5)YL]-(THIONO)PHOSPHORIC ACID ESTERS AND ESTER AMIDES

Hellmut Hoffmann, Wuppertal, and Ingeborg Hammann, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

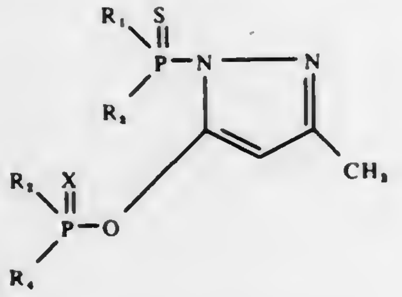
Filed Oct. 21, 1976, Ser. No. 734,180

Claims priority, application Germany, Oct. 28, 1975, 2548183

Int. Cl.^{2} A01N *9/36;* **C07F** *9/65*

U.S. Cl. 424—200 **10 Claims**

1. A diphosphorylated pyrazole of the formula



in which

R_1 is alkoxy with 1 to 4 **carbon atoms**,

R_2 and R_3 each independently is alkoxy or alkylthio with 1 to 6 carbon atoms,

R_4 is alkoxy, alkylthio, alkylamino or alkyl with 1 to 5 carbon atoms, provided that at least one of the radicals R_2, R_3 and R_4 is alkylthio, and

X is oxygen or sulfur.

9. A method of combating arthropods, which comprises applying to the arthropods, or to habitat thereof, an arthropodicidally effective amount of a compound according to claim 1.

4,034,086
PYRROLIDONE-5,5-DIPHOSPHONIC ACIDS

Walter Plöger, Hilden Rhineland; Manfred Schmidt-Dunker, Dusseldorf, and Christian Gloxhuber, Haan Rhineland, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

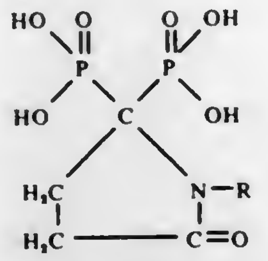
Division of Ser. No. 498,997, Aug. 20, 1974, Pat. No. 3,960,888. This application Feb. 20, 1976, Ser. No. 659,926

Claims priority, application Germany, Aug. 27, 1973, 2343147

Int. Cl.^{2} A61K *31/675*

U.S. Cl. 424—200 **7 Claims**

1. A method for alleviating conditions caused by the abnormal deposition or dissolution of difficulty soluble calcium salts in the body of warm-blooded animals having said condition, which consists in administering to said warm-blooded animals a safe but effective amount for said treatment of from 0.05 to 500 mg per kg. of body weight of at least one pharmacologically acceptable pyrrolidone-5,5-diphosphonic acid compound selected from the group consisting of (A) a compound of the formula:



wherein R represents hydrogen and alkyl having 1 to 6 carbon atoms, and (B) non-toxic, pharmaceutically acceptable salts thereof.

4,034,087
PHARMACEUTICAL COMPOSITION AND PROCESS OF TREATMENT

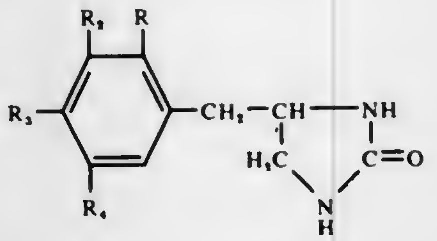
John J. Voorhees, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Continuation-in-part of Ser. No. 425,065, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 324,012, Jan. 16, 1973, abandoned. This application Jan. 5, 1976, Ser. No. 646,633

Int. Cl.^{2} A61K *31/56, 31/415*

U.S. Cl. 424—240 **8 Claims**

1. A process for treating a proliferative skin disease which comprises administering to the afflicted human or animal a composition containing as its active component at least one of the compounds selected from the group consisting of compounds characterized by the formula:



wherein R is halogen, hydrogen, lower alkyl and lower alkoxy; R_2, R_3 and R_4 taken independently of each other are hydrogen, lower alkoxy or hydroxy-lower alkoxy and provided that R_2, R_3 and R_4 taken independently of each other represent at least one oxygenated substituent; or R, R_2, R_3 and R_4 taken as a adjacent pair is methylenedioxy and the optical antipodes thereof, said compounds being in association with a pharmaceutical carrier and present in an amount in the range of about 0.1 to about 10% which is effective to alleviate a profiferative skin disease.

4,034,088
CEPHALOSPORIN DERIVATIVES, AND COMPOSITIONS CONTAINING THEM

Christian Berger, Le Plessis Robinson; Daniel Farge, Thiais; Georges Gros, Bourg-la-Reine; Mayer Naoum Messer, Bievres, and Claude Moutonnier, Le Plessis-Robinson, all of France, assignors to Rhone-Poulenc Industries, Paris, France

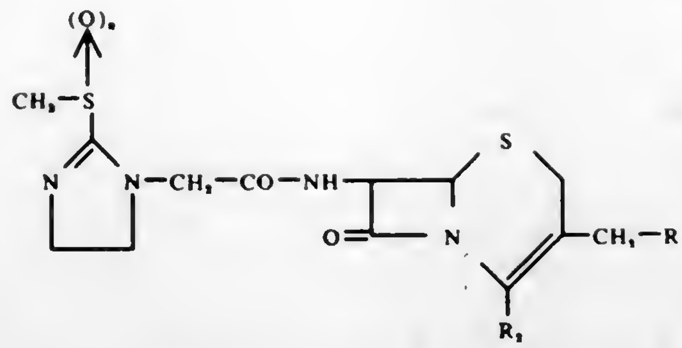
Filed Apr. 30, 1975, Ser. No. 573,110

Claims priority, application France, May 2, 1974, 74.15226; Mar. 26, 1975, 75.09517

Int. Cl.^{2} C07D *501/20;* **A61K** *31/545*

U.S. Cl. 424—246 **8 Claims**

1. A cephalosporin compound of the formula:



(I)

in which R_2 is carboxy or pivaloyloxymethoxycarbonyl and either *n* is 1 or 2 and R_1 is acetoxy, (5-methyl-1,3,4-thiadiazol-2-yl)-thio or (2-methyl-1,2,3,4-tetrazol-5-Yl)-thio, or *n* is 0 and R_1 is (5-methyl-1,3,4-thiadiazol-2-yl)-thio or (1-methyl-1,2,3,4-tetrazol-5-yl)-thio, or a pharmaceutically acceptable non-toxic metal salt thereof or an addition salt thereof with a pharmaceutically acceptable non-toxic nitrogen-containing base.

8. A cephalosporin compound as claimed in claim 1 in which R_2 is carboxy or a pharmaceutically acceptable non-toxic metal salt thereof or an addition salt thereof with a pharmaceutically acceptable non-toxic nitrogen-containing base.

4,034,089
AQUEOUS SUSPENSIONS OF 7-[D-α-AMINO-α-(p-HYDROXYPHENYL)-ACETAMIDO]-3-(1,2,3-TRIAZOL-5-YLTHIOMETHYL)-3-CEPHEM-4-CARBOXYLIC ACID 1,2-PROPYLENE GLYCOLATE

Murray Arthur Kaplan, Syracuse, and Alphonse Peter Granatek, Baldwinsville, both of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Division of Ser. No. 534,114, Dec. 18, 1974, Pat. No. 3,970,651, which is a continuation-in-part of Ser. No. 431,251, Jan. 7, 1974, abandoned. This application Mar. 5, 1976, Ser. No. 664,218

Int. Cl.^{2} A61K *31/545*

U.S. Cl. 424—246 **6 Claims**

1. A stable aqueous suspension useful for the treatment of bacterial infections in mammals comprising at least 30 mgm./ml. crystalline 7-[D-α-amino-α-(p-hydroxyphenyl-)acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid 1,2-propylene glycolate and having a pH in the range of 2.8 – 5.

4,034,090
CEPHALOSPORIN DERIVATIVES

Christian Berger, Le Plessis Robinson; Daniel Farge, Thiais; Georges Gros, Bourg-la-Reine; Mayer Naoum Messer, Bievres, and Claude Moutonnier, Le Plessis-Robinson, all of France, assignors to Rhone-Poulenc Industries, Paris, France

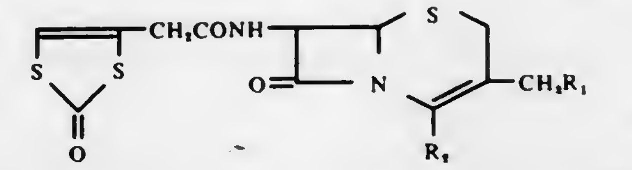
Filed June 30, 1975, Ser. No. 592,096

Claims priority, application France, July 1, 1974, 74.22867; May 22, 1975, 75.15937; May 22, 1975, 75.15938

Int. Cl.^{2} C07D *501/20;* **A61K** *31/545*

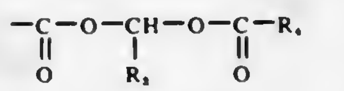
U.S. Cl. 424—246 **31 Claims**

1. A cephalosporin compound of the formula:



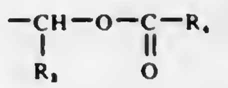
(I)

in which either (a) R_1 is hydrogen, acetoxy, azido, (1,2,3-thiadiazol-4-yl)-carbonylthio or heterocyclylthio selected from the class consisting of (1,3,4-thiadiazol-2-yl)-thio which is unsubstituted or substituted by straighrt or branched chain C_{1-4} alkyl or alkoxy, straight or branched chain C_{1-4} alkylthio, straight or branched chain C_{1-4} alkylsulphonyl, amino or acetylamino; (1,2,3,4-tetrazol-5-yl) thio which is unsubstituted or substituted in the 1-position by straight or branched chain C_{1-4} alkyl, hydroxy straight or branched chain C_{1-4} alkyl, phenyl or hydroxyphenyl, or in the 2-position by straight or branched chain C_{1-4} alkyl or hydroxy straight or branched chain C_{1-4} alkyl; (1,2,4-triazol-3-yl)-thio; (4-methyl-1,3-thiazol-2-yl)-thio; and (3-methyl-1,2,4-thiadiazol-5-yl)-thio; and R_2 is carboxy or a radical of the formula:



$$-\underset{\underset{O}{\|}}{C}-O-\underset{\underset{R_3}{|}}{CH}-O-\underset{\underset{O}{\|}}{C}-R_4 \qquad (II)$$

in which the radical:



$$-\underset{\underset{R_3}{|}}{CH}-O-\underset{\underset{O}{\|}}{C}-R_4 \qquad (III)$$

is a radical which can be easily removed enzymatically, and in which R_3 is hydrogen or straight or branched chain C_{1-4} alkyl and R_4 is straight or branched chain C_{1-4} alkyl or cyclohexyl; or (b) R_1 is the pyridinio ion and R_2 is the carboxylato ion; or, when R_2 represents carboxy, a pharmaceutically acceptable non-toxic metal salt thereof or addition salt thereof with a pharmaceutically acceptable non-toxic nitrogen-containing base.

30. A pharmaceutical antibacterial composition which comprises, as active ingredient, a cephalosporin compound as claimed in claim 1 together with a significant amount of a pharmaceutically acceptable carrier, diluent or adjuvant.

4,034,091
N-(ARYLSULFONYL)-2-NITRO-2-(TETRAHYDRO-2H-1,3-THIAZIN-2-YLIDENE)ACETAMIDES

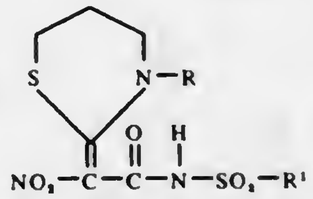
James E. Powell, Kent, England, assignor to Shell Oil Company, Houston, Tex.

Filed May 10, 1976, Ser. No. 684,830

Int. Cl.^{2} C07D *279/06;* **A61K** *31/54*

U.S. Cl. 424—246 **5 Claims**

1. A compound of the formula:



wherein R is hydrogen or middle halogen and R^1 is phenyl or phenyl substituted by from one to two of one or more of halogen, nitro, cyano, alkyl or alkoxy of from one to six carbon atoms or phenoxy.

4. An insecticidal composition comprising an insecticidal amount of a compound according to claim 1, together with a carrier, and optionally a surface-active agent.

4,034,092
7-ACYL-3-(CARBOXYALKYL AND CARBAMOYLALKYL SUBSTITUTED OXADIAZOLYLTHIOMETHYL) CEPHALOSPORINS

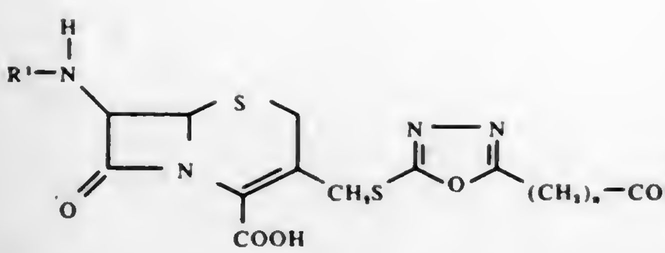
David A. Berges, Wayne, Pa., assignor to SmithKline Corporation, Philadelphia, Pa.

Filed May 3, 1976, Ser. No. 682,948

Int. Cl.^{2} C07D *501/20;* **A61K** *31/545*

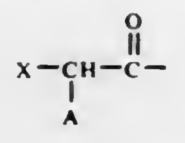
U.S. Cl. 424—246 **19 Claims**

1. A compound of the formula:



in which:

R^1 is an acyl group of the formula:



$$X-\underset{\displaystyle A}{\underset{|}{CH}}-\overset{\displaystyle O}{\overset{\|}{C}}-$$

where:

X is thienyl; dihydropheny; phenyl or phenyl monosubstituted with hydroxy, hydroxymethyl, formamido, ureido, or carboxymethylamino;

A is NH_2, OH, COOH or SO_3H; or formyloxy when X is phenyl;

n_2 is 1 to 5; and

R^2 is hydroxy, amino, lower alkylamino or di(lower)-alkylamino,

or a non-toxic pharmaceutically acceptable salt thereof.

14. A anti-bacterial pharmaceutical composition comprising a compound as claimed in claim 1 and a pharmaceutically acceptable carrier therefor.

4,034,093

4(1H)-PYRIMIDINONES

Kurt Klemm, Allensbach, and Erhard Langenscheld, Konstanz, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Konstanz, Germany

Filed Sept. 4, 1973, Ser. No. 393,814

Claims priority, application Luxembourg, Sept. 8, 1972, 66036; Sept. 8, 1972, 66037; Sept. 8, 1972, 66038

Int. Cl.^{2} C07D *239/22;* **A61K** *31/535*

U.S. Cl. 424—251 **23 Claims**

1. A compound which is characterized by physiological activity, pharmaceutical acceptability, xanthineoxidase-inhibitory utility and a structure which has a (1H)-pyrimidine nucleus that is (organic-acid-acyl)amino substituted in the 1-position, unsubstituted in the 2- and 6-positions, oxo substituted in the 4-position and cyano substituted in the 5-position; the organic acid of the organic-acid acyl being a diazinoheterocyclic-free carbonic or carboxylic acid, a carbon atom of which is directly bound to the amino nitrogen.

16. A medicament composition in dosage form which contains, as a pharmacologically-active component thereof, an effective amount of at least one compound according to claim 1 and pharmaceutical vehicle or diluent therefor.

4,034,094

8-ALKYL-5-OXO-5,8-DIHYDRO-PYRIDO(2,3-d)PYRIMIDINE-6-CARBOXYLIC ACIDS FOR TREATING URINARY TRACT INFECTIONS

Marcel Pesson, Paris, France, assignor to Laboratoire Roger Bellow, Neuilly-sur-Seine, France

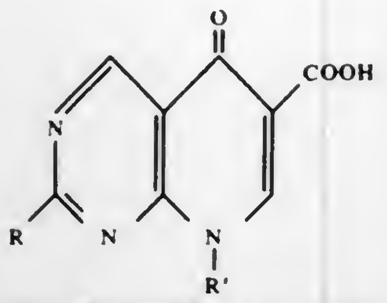
Division of Ser. No. 384,203, July 31, 1973, Pat. No. 3,950,338. This application Oct. 24, 1975, Ser. No. 625,767

Claims priority, application France, Aug. 2, 1972, 72.27876

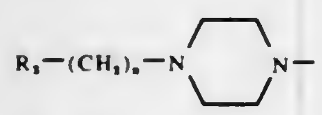
Int. Cl.^{2} A61K *31/505*

U.S. Cl. 424—251 **2 Claims**

1. A pharmaceutical composition for treating urinary tract infections induced by Gram negative micro-organisms comprising a non-toxic pharmaceutical carrier and, as an essential active ingredient, an antibacterially effective amount of an 8-alkyl-5-oxo-5,8 dihydropyrido (2,3-d)-pyrimidine-6-carboxylic acid of the formula:



in which R' is lower alkyl and R is a piperazino radical of the formula:



wherein *n* is a number from 0 to 3 and R_3 is selected from hydrogen, hydroxy, vinyl, phenyl, phenyl-substituted by halogen and lower alkoxy groups of from 1 to 5 carbon atoms.

4,034,095

BENZO[5,6]CYCLOHEPTA[1,2-c]PYRIDINES

Jean-Michel Bastian, Therwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

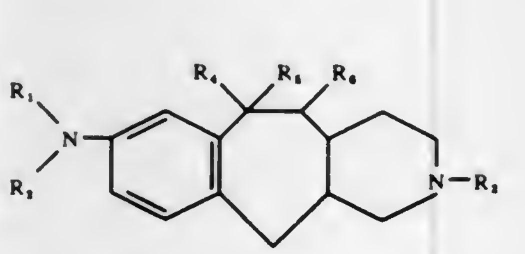
Filed Sept. 9, 1976, Ser. No. 721,835

Claims priority, application Switzerland, Sept. 15, 1975, 11930/75; Sept. 15, 1975, 11931/75; Sept. 15, 1975, 11932/75

Int. Cl.^{2} C07D *221/16*

U.S. Cl. 424—256 **29 Claims**

1. A compound of formula



I

wherein

R_1 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_2 is hydrogen or alkyl of 1 to 4 carbon atoms,

R_3 is hydrogen or alkyl of 1 to 4 carbon atoms, and

either

i. R_4, R_5 and R_6 each is hydrogen,

or

ii. R_4 and R_5 together are oxygen and R_6 is hydrogen,

or

iii. R_4 and R_6 together form a bond and R_5 is hydrogen,

or a pharmaceutically acceptable acid addition salt thereof.

27. A method of treating depression which comprises administering to an animal in need of such treatment an effective amount of a compound of claim 1.

28. A method of treating Parkinson's disease which comprises administering to an animal in need of such treatment an effective amount of a compound of claim 1.

29. A pharmaceutical composition for use in treating depression and parkinson's disease comprising a therapeutically effective amount of a compound of claim 1 in association with a pharmaceutical carrier of diluent.

4,034,096

NITROGEN CONTAINING DERIVATIVES OF CYCLOPENTENO-QUINOLONE COMPOUNDS AND BACTERIOSTATIC COMPOSITIONS

Alfred Rbomberg, Mannheim-Neuostheim; Herbert Berger, Mannheim-Kafertal, both of Germany; Kurt Stach, deceased, late of Mannheim-Waldhof, Germany; by Werner Plattner, administrator, Linz, Austria; Wolfgang Vömel, Mannheim, and Winfriede Sauer, Mannheim-Wallstadt, both of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

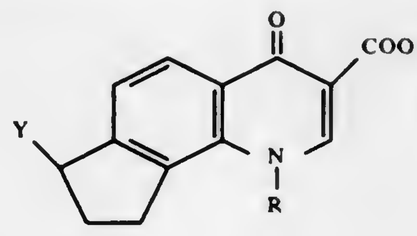
Division of Ser. No. 515,790, Oct. 17, 1974. This application July 14, 1975, Ser. No. 595,953

Claims priority, application Germany, Nov. 27, 1973, 2358909

Int. Cl.^{2} C07D *215/56*

U.S. Cl. 424—258 **17 Claims**

1. Cyclopenteno-quinolone compound of the formula



(I)

wherein

R is saturated or unsaturated aliphatic hydrocarbyl of up to 5 carbon atoms,

X is hydrogen or alkyl of up to 5 carbon atoms,

Y is azido, nitrile, amino, mono- or dialkylamino, mono- or dialkanoylamino, mono- or dialkylamino-methyleneamino, pyrrolidino or piperidino, of up to 5 carbon atoms per alkyl moiety,

and the pharmacologically compatible salts thereof.

14. Pharmaceutical composition having bacteriostatic activity comprising a pharmaceutically acceptable carrier and, in effective amounts, at least one cyclopenteno-quinolone compound as claimed in claim 1.

4,034,097

SYNERGISTIC BIOSTATIC COMPOSITION

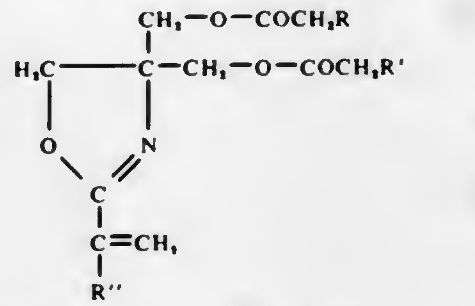
John S. Kuczkowski, Chicago, and William A. Konitz, Kankakee, both of Ill., assignors to Mortell Company, Kankakee, Ill.

Division of Ser. No. 401,402, Sept. 27, 1973, Pat. No. 3,947,576. This application Nov. 28, 1975, Ser. No. 636,154

Int. Cl.^{2} A01N *9/00, 9/22;* **C07D** *211/00, 213/00*

U.S. Cl. 424—263 **4 Claims**

1. A biocidal complex for contact sterilization prepared by mixing with high shear at room temperture or above about 25–55% of a vinyl oxozaline fatty or carboxylic acid ester of tris-(hydroxymethyl)-amino-methane of the formula:



where R, R' and R'' are the same or different alkyl groups each of 1 to 17 carbon atoms, and about 29–69% of the biocide 2,3,5,6-Tetrachloro-4-(methylsulfonyl)-pyridine and about 6–16% of the biocide 3,7-Dichlorodibenz-(be)-(1,4)-oxiodinium bisulfate for a total of 100%.

3. A biocidal composition with a pH of about 4–9 comprising a biocidally effective amount of the composition of claim 1 and a compatible carrier material comprising water.

4,034,098

SULPHONAMIDOPIPERIDYL DERIVATIVES

John Leheup Archibald, Windsor, and John Lambert Jackson, Royston, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

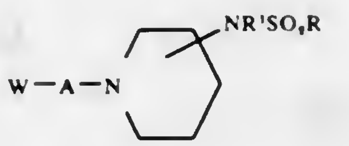
Filed Nov. 24, 1975, Ser. No. 634,567

Claims priority, application United Kingdom, Dec. 11, 1974, 53643/74

Int. Cl.^{2} C07D *211/56*

U.S. Cl. 424—267 **6 Claims**

1. A compound having the general formula



(Ia)

wherein W represents a phenyl radical, which may be unsubstituted or substituted by halogen, lower alkyl, lower alkoxy or hydroxy; A represents a lower alkylene radical, an oxo lower alkylene radical or a hydroxy lower alkylene radical; R represents a phenyl radical optionally substituted by halogen, lower alkyl, lower alkoxy or hydroxy, a cycloalkyl radical of 5 to 7 carbon atoms or a lower alkyl radical; R^1 represents hydrogen or a lower alkyl radical; or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof.

6. A hypotensive composition comprising a therapeutically effective amount of a compound as claimed in claim 1 or a pharmaceutically acceptable acid addition or quaternary ammonium salt thereof together with a pharmaceutically acceptable carrier.

4,034,099

COMPOSITIONS AND METHOD FOR TREATING MASTITIS IN MILK ANIMALS

Jack T. Bryan, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 456,030, March 29, 1974, abandoned. This application Sept. 2, 1975, Ser. No. 609,462

Int. Cl.^{2} A61K *31/43, 47/00*

U.S. Cl. 424—271 **51 Claims**

1. A method of treating mastitis in milk animals which comprises administering to the affected mammary region by intramammary infusion a composition which comprises an effective amount of an anti-mastitis medicament dispersed in a gelled vehicle for carrying said anti-mastitis medicament comprising a vegetable oil acceptable for intramammary infusion selected from the group consisting of non-drying, semi-drying, and drying oils and blends thereof; and from about 0.5% to 5.0% by weight of said oil of a fatty acid ester formed from a fatty acid selected from the group consisting of long chain saturated and unsaturated monocarboxylic acids having from twelve to twenty carbon atoms, inclusive, and a member selected from the group consisting of glycerin, propylene glycol, mono- and dihydric alcohols of from one to twelve carbon atoms, inclusive, and polyethylene glycols having a molecular weight of between about 200 and about 6000.

4,034,100

ANTIHYPERTENSIVE AGENTS

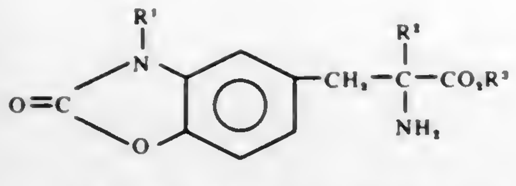
Patrick S. Callery, Cockeysville; Nicolas Zenker, Lutherville; Jeremy Wright, Baltimore, all of Md., and Clement A. Stone, Blue Bell, Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Feb. 13, 1976, Ser. No. 657,826

Int. Cl.^{2} C07D *263/58*

U.S. Cl. 424—272 **9 Claims**

1. A compound of the formula:



wherein each of R′, R^2 and R^3 is hydrogen or alkyl of from 1 to 3 carbon atoms, and the pharmaceutically acceptable acid-addition salts thereof.

8. A method for the treatment of hypertension in a mammalian species which comprises administering to a hypertensive subject an effective amount of a compound of claim 1.

4,034,101

N-OXY AND N-AMINO GUANIDINES

Graham John Durant; Charon Robin Ganellin, and Geoffrey Robert Owen, all of Welwyn Garden City, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

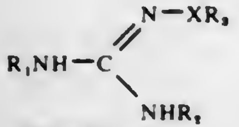
Filed June 11, 1975, Ser. No. 585,898

Claims priority, application United Kingdom, June 28, 1974, 28722/74

Int. Cl.² A61K *31/415;* C07D *233/64*

U.S. Cl. 424—273 **19 Claims**

1. A compound of the formula:



FORMULA I

wherein R_1 represents a grouping of the structure shown in the formula:

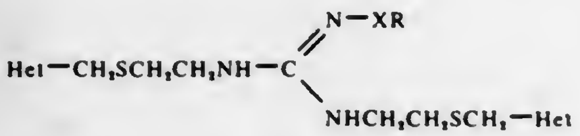
$$Het-(CH_2)_mZ(CH_2)_n$$

FORMULA II

wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl, chlorine or bromine; Z is sulphur or a methylene group; *m* is 0, 1 or 2 and *n* is 2 or 3 provided that the sum of *m* and *n* is 3 or 4; R_2 is hydrogen, lower alkyl or a grouping of the structure shown in Formula II wherein Het, *m*, *n* and Z are as defined above; X is oxygen and R_3 is hydrogen, lower alkyl, phenyl or benzyl, or a pharmaceutically acceptable acid addition salt thereof.

13. A method of blocking histamine H_2-receptors which comprises administering to an animal in need of blocking of histamine H_2-receptors in an effective amount to block histamine H_2-receptors a compound of claim 1.

15. A compound of the formula:



wherein Het is imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl, chlorine or bromine; X is oxygen or NH; and R is hydrogen, lower alkyl, phenyl or benzyl, or a pharmaceutically acceptable acid addition salt thereof.

18. A method of blocking histamine H_2-receptors which comprises administering to an animal in need of blocking of histamine H_2-receptors in an effective amount to block histamine H_2-receptors a compound of claim 15.

4,034,102

4-SUBSTITUTED-1,3-DITHIOLAN-2-YLIDENE MALONATES AND PHARMACEUTICAL COMPOSITIONS CONTAINING THE SAME

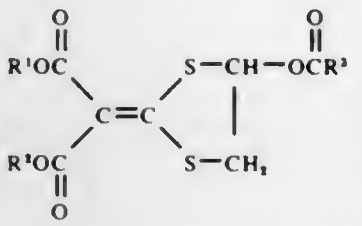
Kuniaki Taninaka, Ibaragi; Hitoshi Kurono, Amagasaki, and Tsutomu Kasai, Sakai, all of Japan, assignors to Nihon Nohyaku Co. Ltd., Tokyo, Japan

Filed June 6, 1975, Ser. No. 584,410

Int. Cl.² A61K *31/385;* C07D *339/06*

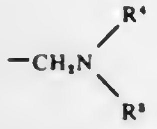
U.S. Cl. 424—277 **28 Claims**

1. A compound represented by the general formula

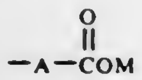


(I)

wherein R^1 and R^2, which may be same or different, represent individually a C_1–C_4 alkyl group; and R^3 represents a chloromethyl group, a phenyl group, a group of the formula



(where R^4 and R^5 represent individually a C_1–C_4 alkyl group, or a group of the formula



$$-A-\overset{\overset{O}{\|}}{C}OM$$

(where M represents a hydrogen atom or a pharmaceutically acceptable salt-forming residue; and A represents a lower alkylene group, a lower alkenylene group, a phenylene group or a cyclohexenylene group).

6. A pharmaceutical composition for preventing liver necrosis, fatty liver or hepatitis of animals including humans, which comprises an effective amount sufficient for said purpose of a compound having the general formula (I) defined in claim 1, and a pharmaceutically acceptable diluent.

4,034,103

ARALKYLAMINO SULFONES HAVING SPASMOLYTIC ACTIVITIES

Jan Hartog, and Johannes Maria Antonius Zwagemakers, both of Weesp, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

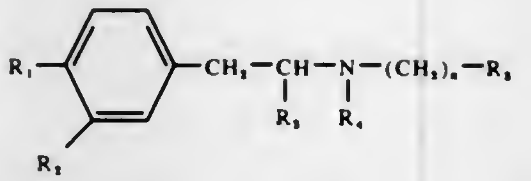
Filed Apr. 3, 1975, Ser. No. 564,789

Claims priority, application Netherlands, Apr. 8, 1974, 7404732

Int. Cl.² A61K *31/135;* C07C *87/28, 91/30*

U.S. Cl. 424—282 **5 Claims**

1. Compounds of the formula



wherein R_1 represents an alkyl group, an alkoxy group, an alkylthio group or a dialkylamino group, which groups have up to 2 carbon atoms, a hydroxy group, a hydrogen atom, a chlorine atom or a fluorine atom, R_2 represents a hydrogen atom or, if R_1 represents a hydrogen atom, one of the remaining groups recited for R_1, while R_1 and R_2 both may represent an alkoxy group having 1 or 2 carbon atoms or together a methylene dioxy group or ethylene dioxy group; R_3 is an alkyl group having 1 or 2 carbon atoms; R_4 is an alkyl group having 1 to 3 carbon atoms; *n* is an integer number from 3 to 20 and R_5 is a group SO_2R_8, wherein R_8 denotes an alkyl group having 1 to 3 carbon atoms and salts thereof formed with pharmaceutically acceptable acids.

4. A pharmaceutical composition comprising a compound of claim 1 in a spasmolytically effective amount and an inert pharmaceutically acceptable carrier therefor.

4,034,104

CARBAMIC ACID ESTERS OF GALLIC ACID, THEIR ESTERS, AND HEAVY METAL SALTS

Werner Daum, Krefeld; Wilhelm Brandes, Cologne, and Paul-Ernst Frohberger, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

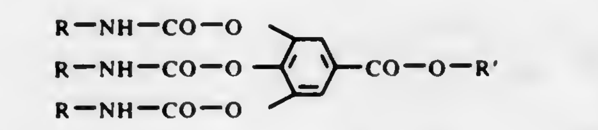
Filed June 10, 1976, Ser. No. 694,861

Claims priority, application Germany, July 3, 1975, 2529648

Int. Cl.² C07F *3/06;* A01N *9/20*

U.S. Cl. 424—289 **8 Claims**

1. A carbamic acid ester of gallic acid, its ester or heavy metal salt, of the formula

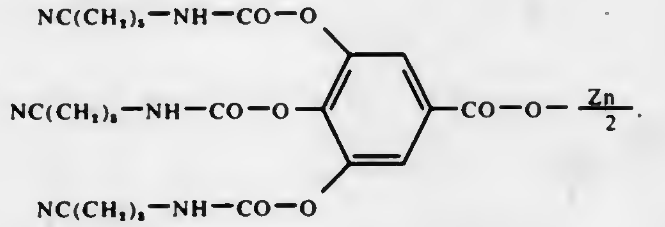


in which

R is alkyl with up to 8 carbon atoms optionally substituted by halogen or cyano, and

R′ is hydrogen, optionally halogen-substituted alkyl with up to 6 carbon atoms or one equivalent of a heavy metal atom.

4. The compound according to claim 1 wherein such compound is tris-(N-ω-cyanopentyl)-carbamoyl)-gallate of the formula



5. A fungicidal composition containing as active ingredient a fungicidally effective amount of a compound according to claim 1 in admixture with a solid or liquefied gaseous diluent or carrier or in admixture with a liquid diluent or carrier containing a surface-active agent.

4,034,105

NEMATOCIDAL N-CYANOFORMYL CARBAMATES AND N-CYANOFORMYL THIOLCARBAMATES

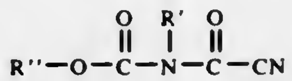
Malcolm S. Singer, Richmond, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 470,234, May 15, 1974, Pat. No. 3,956,364, which is a division of Ser. No. 280,608, Aug. 14, 1972, Pat. No. 3,845,091. This application Feb. 23, 1976, Ser. No. 660,597

Int. Cl.² A61K *31/27*

U.S. Cl. 424—300 **18 Claims**

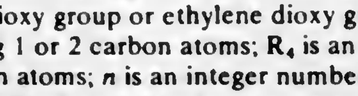
1. A method for control of nematodes which comprises contacting the nematodes with a nematocidally effective amount of a compound of the formula



$$R''-O-\overset{\overset{O}{\|}}{C}-\overset{\overset{R'}{|}}{N}-\overset{\overset{O}{\|}}{C}-CN$$

or

-continued



$$R'''-S-\overset{\overset{O}{\|}}{C}-\overset{\overset{R'}{|}}{N}-\overset{\overset{O}{\|}}{C}-CN$$

wherein R′ is alkyl of 1 to 6 carbon atoms, R″ is alkyl of 1 to 10 carbon atoms, alkenyl of 2 to 10 carbon atoms, cycloalkyl of 3 to 10 carbon atoms, biphenyl, phenyl, hydrocarbon aralkyl of 7 to 10 carbon atoms, or phenyl substituted with from 1 to 3 groups selected from fluorine, chlorine, bromine and alkyl of 1 to 6 carbon atoms, and R‴ is R″.

4,034,106

ALKANOLAMINE DERIVATIVES

Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 2, 1975, Ser. No. 582,883

Claims priority, application United Kingdom, June 5, 1974, 24837/74

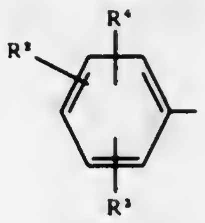
Int. Cl.² A61K *31/165, 31/17, 31/275;* C07C *121/80*

U.S. Cl. 424—304 **10 Claims**

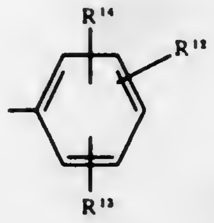
1. An alkanolamine derivative selected from a compound of the formula:

$$R\,OCH_2.CHOH.CH_2NH-A-NH-X-Y-R^1$$

wherein A is alkylene of from 2 to 12 carbon atoms; wherein X is carbonyl (—CO—); wherein Y is a direct link, or is alkylene or alkyleneoxy each of up to 6 carbon atoms, and wherein R is aryl of the formula:



and R^1 is aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, hydroxy, amino, nitro or cyano, or alkyl, hydroxyalkyl, cycloalkyl, alkenyl, alkynyl, alkoxy, alkylthio, cycloalkoxy, alkenyloxy, alkynyloxy or alkanoyl each of up to 6 carbon atoms or aryl, aryloxy or dialkylamino each of up to 12 carbon atoms; or wherein R^2 and R^3 together, and/or R^{12} and R^{13} together, form trimethylene, tetramethylene, 1-oxotetramethylene, propenylene, but-2-enylene or buta-1,3-dienylene such that together with two adjacent carbon atoms of the benzene ring they form respectively indanyl, 5,6,7,8-tetrahydronaphthyl, 5-oxo-5,6,7,8-tetrahydronaphthyl, indenyl, 5,8-dihydronaphthyl or naphthyl; wherein R^4 is hydrogen or amidic of the formula:

$R^{18}R^{19}N-CO-Q-$

$R^{18}R^{19}N-CO-NH-Q-$

$R^{18}R^{19}N-CO-Q^1-O-$

$R^{18}-X-NR^{19}-Q-$

or

wherein Q is a direct link or is alkylene or alkenylene each of up to 6 carbon atoms; wherein Q^1 is alkylene of up to 6 carbon atoms; wherein R^{15} is hydrogen or alkyl of up to 6 carbon atoms; wherein R^{16} is hydrogen or alkenyl, cycloalkyl, hydroxyalkyl or alkoxyalkyl each of up to 6 carbon atoms, or alkyl, aryl, aralkyl, or aralkenyl each of up to 10 carbon atoms; wherein X is carbonyl; and wherein R^{14} is amidic as defined above for R^4; and an acid-addition salt thereof.

9. A method for the treatment of prophylaxis of heart diseases and hypertension in a warm-blooded animal which comprises administering to said animal an effective amount of at least one compound claimed in claim 1.

10. A method for producing coronary β-adrenergic blockade in a warm-blooded animal in need of such blockade which comprises administering to said animal an effective amount of at least one compound claimed in claim 1.

4,034,107
SUBSTITUTED (ALKOXYCARBONYLTHIOUREIDO)-(ACYLAMINO)-BENZENE DERIVATIVES

Leslie George King, London; Glyn Evan Lee, Thorpe Bay; George Christopher James Martin, Brentwood, and David Conwil Jenkins, Barkingside, all of England, assignors to May and Baker Limited, Dagenham, England

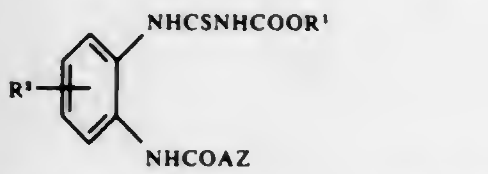
Filed Nov. 4, 1975, Ser. No. 628,669

Claims priority, application United Kingdom, Nov. 5, 1974, 47889/74

Int. Cl.² A61K *31/24*; **C07C** *149/40;* **A01N** *9/20*

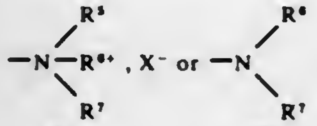
U.S. Cl. 424—309 **53 Claims**

1. A benzene derivative of the formula:



I

wherein R^1 represents alkyl of 1 to 4 carbon atoms, R^2 represents a group selected from $-SR^3$, $-SOR^3$, $-SO_2R^3$, $-OR^3$, $-SCONH_2$, and $-T(CH_2)_mT^1R^4$, wherein R^3 represents alkyl of 1 to 6 carbon atoms, cycloalkyl of 3 to 7 carbon atoms, alkenyl or alkynyl of 3 to 6 carbon atoms, aralkyl with 1 or 2 carbon atoms in the alkyl moiety, or R^3 represents an aryl group or an aryl group substituted by a halogen atom or an alkyl or alkoxy group of 1 to 3 carbon atoms, or represents cycloalkylalkyl in which the cycloalkyl moiety contains from 3 to 7 carbon atoms and the alkyl moiety contains 1 or 2 carbon atoms, R^4 represents hydrogen, alkyl of 1 to 4 carbon atoms, T and T^1 each represent oxygen, sulphur or sulphinyl, and m is an integer from 1 to 7 inclusive whose position on the benzene ring is either para to the group -NHCSNHCOOR¹ or para to the group —NHCOAZ, A represents a bivalent straight-chain aliphatic hydrocarbon radical of 1 to 4 carbon atoms or a said hydrocarbon radical substituted by at least one methyl group, and Z represents a group of the formula:



II III

wherein R^5 represents hydrogen, alkyl of 1 to 4 carbon atoms, R^6 represents hydrogen, alkyl of 1 to 4 carbon atoms, or phenylalkyl with 1 to 2 carbon atoms in the alkyl moiety, and R^7 represents hydrogen or alkyl of 1 to 4 carbon atoms, and X^- represents a pharmaceutically acceptable or agriculturally acceptable anion.

10. Method for the treatment of helminth infections in man and domestic animals which comprises administering to man or a domestic animal infected with helminths an anthelmintically effective amount of at least one benzene derivative as claimed in claim 1 or a pharmaceutically acceptable salt thereof.

19. Fungicidal compositions which comprise, as the active ingredient, at least one benzene compound as claimed in claim 1, any anion X^- present in the benzene compound being an agriculturally acceptable anion, in association with one or more diluents compatible with the benzene compound and suitable for use in agricultural fungicidal compositions, the amount of benzene compound present in the composition being between 0.005% and 95% by weight of the composition.

4,034,108
N-(1'-ALKOXYCARBONYL-ETHYL)-N-HALOACETYL-2,6-DIALKYLANILINES FOR THE CONTROL OF PHYTOPATHOGENIC FUNGI

Hans Moser, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

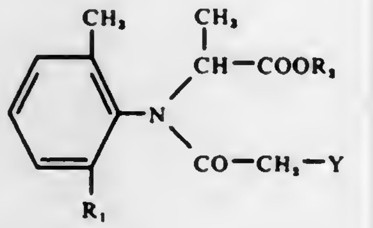
Continuation-in-part of Ser. No. 405,618, Oct. 11, 1973, abandoned. This application June 16, 1975, Ser. No. 587,589

Claims priority, application Switzerland, Aug. 29, 1973, 1237/73; Oct. 13, 1972, 15044/72

Int. Cl.² A01N *9/20, 9/24*

U.S. Cl. 424—309 **9 Claims**

1. A fungicidal composition comprising a fungicidally effective amount of the enantiomeric D-form of a compound of formula I



(I)

wherein R_1 and R_2 each independently are methyl or ethyl, and Y is fluorine, chlorine, bromine or iodine, together with a suitable inert carrier

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4,034,109
COMPOUNDS HAVING A PHYSIOLOGICAL COOLING EFFECT AND COMPOSITIONS CONTAINING THEM

David G. Rowsell, Staines, and Roger Hems, Maidenhead, both of England, assignors to Wilkinson Sword Limited, England

Filed July 20, 1973, Ser. No. 381,098

Claims priority, application United Kingdom, Jan. 18, 1973, 2686/73

Int. Cl.² A61K *31/22, 31/18*

U.S. Cl. 424—311 **1 Claim**

1. A method of stimulating the cold receptors of the nervous system of the surface tissues of the human body, which comprises bringing into contact with said tissues an effective amount of a cold receptor stimulating acyclic sulphonamide or sulphinamide of the formula:

$$RSO_xNR_1R_2$$

where

R is a secondary or tertiary alkyl group containing from 5–12 carbon atoms;

R_1 and R_2, when taken separately, are each hydrogen, C_1–C_{12} alkyl or C_1–C_{12} hydroxyalkyl, and together provide a total of no more than 12 carbon atoms, with the proviso that when R_1 is hydrogen R_2 may also be alkylcarboxyalkyl of up to 12 carbon atoms; and *x* is an integer of from 1–2 inclusive,

R, R_1 and R_2 together providing a total of from 6–18 carbon atoms.

4,034,110
ANTHELMINTICS EFFECTIVE AGAINST LIVER FLUKES

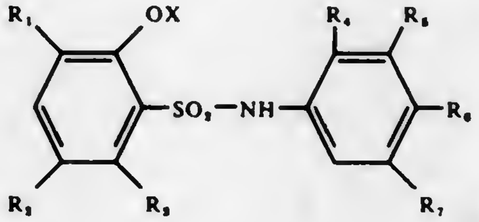
Milan Mitrovic, Nutley, and Terence James Hayes, Upper Montclair, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Sept. 20, 1976, Ser. No. 724,785

Int. Cl.² A61K *31/18, 31/22*

U.S. Cl. 424—311 **10 Claims**

1. A method for the treatment of *Fasciola hepatica* infections which comprises administering to an animal infected with *Fasciola hepatica* an anthelmintically effective amount of a composition comprising a non-toxic carrier material and an anthelmintic compound represented by the formula



wherein each of

R_1 and R_2 are independently chlorine or bromine,

R_3 is hydrogen or chlorine and each of

R_4 through R_7 is independently hydrogen, halogen or trifluoromethyl, with the proviso that at least 2 of R_3 through R_7 is other than hydrogen and X is hydrogen or lower alkanoyl.

4,034,111
COMPOSITIONS OF AND NEW USES FOR N-ACYLANILINOBUTYRIC ACIDS

Wolfgang Schoetensack, Hegne, and Richard Riedel, Constance, both of Germany, assignors to Byk Gulden Lomberg Chemische Fabrik GmbH, Constance, Germany

Filed Apr. 25, 1975, Ser. No. 571,501

Claims priority, application Germany, Oct. 25, 1974, 2450680; Luxembourg, Apr. 30, 1974, 69970

Int. Cl.² A61K *31/195*

U.S. Cl. 424—319 **16 Claims**

1. A process which comprises administering to a warm-blooded animal having a cardiovascular system insufficiency an amount of medicament composition sufficient to counteract the insufficiency; the medicament composition containing a plurality of ingredients and comprising from 1 to 95 percent by weight of at least one physiologically-active and pharmacologically-acceptable ingredient which is an N-acylanilinobutyric acid or an essentially non-toxic salt thereof.

4,034,112
ETHANOLAMINE DERIVATIVES HAVING β-ADRENERGIC BLOCKING ACTIVITY

Leslie Harold Smith, Macclesfield, England, assignor to Imperial Chemical Industries Limited, London, England

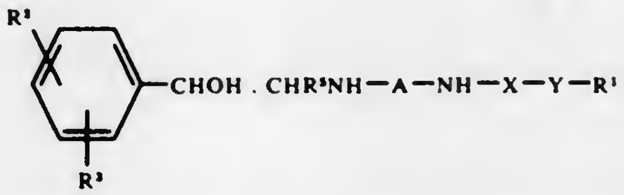
Division of Ser. No. 479,174, June 13, 1974, Pat. No. 3,944,611. This application Dec. 29, 1975, Ser. No. 645,300

Claims priority, application United Kingdom, June 22, 1973, 29679/73

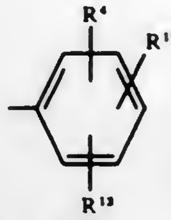
Int. Cl.² A61K *31/18*

U.S. Cl. 424—321 **11 Claims**

1. An ethanolamine derivative selected from the group consisting of a compound of the formula:



wherein A is alkylene of from 2 to 6 carbon atoms, wherein R^1 is hydrogen or alkyl, alkenyl, halogenoalkyl or cycloalkyl each of up to 6 carbon atoms, or aryl of the formula:



wherein R^2, R^3, R^{12} and R^{13}, which may be the same or different, each is hydrogen, halogen, nitro, amino or cyano, or alkyl alkenyl, alkoxy, alkenyloxy, hydroxyalkyl, alkanoyl, acylamino or alkanesulphonamido each of up to 6 carbon atoms, wherein R^4 is hydrogen, hydroxy or carbamoyl, wherein R^5 is hydrogen or alkyl of up to 6 carbon atoms, wherein X is sulphonyl and wherein Y is a direct link, or alkylene or alkylenoxy each of up to 6 carbon atoms, or imino (—NH—) or (except when R^1 is hydrogen) oxygen; and an acid-addition salt thereof.

9. A pharmaceutical composition having β-adrenergic blocking activity, comprising as active ingredient an effective amount of at least one alkanolamine derivative or an acid-addition salt thereof, claimed in claim 1, in association with a pharmaceutically-acceptable carrier therefor.

4,034,113
TREATMENT OF SENILE GERIATRIC PATIENTS TO RESTORE PERFORMANCE

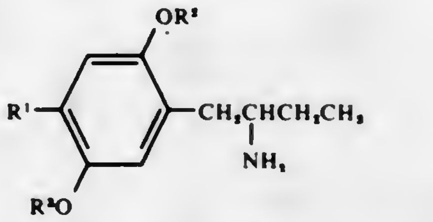
Alexander T. Shulgin, 1483 Shulgin Road, Lafayette, Calif. 94549

Division of Ser. No. 566,458, April 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 304,069, Nov. 6, 1972, abandoned. This application Apr. 15, 1976, Ser. No. 677,348

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **11 Claims**

1. A method of treating senile geriatric humans to restore performance which comprises administering to said human an effective amount of a compound of the formula



wherein R^1, R^2 and R^3 are alike or different and each is (lower)alkyl; or a pharmaceutically acceptable nontoxic salt thereof.

4,034,114
TREATMENT OF SKIN KERATOSES WITH RETINAL

Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128, and Eugene J. Van Scott, 1138 Sewell Lane, Rydal, Pa. 19046

Filed Sept. 15, 1976, Ser. No. 723,327

Int. Cl.² A61K *31/11*

U.S. Cl. 424—333 **8 Claims**

1. A method of treating actinic or nonactinic keratoses in humans having skin affected thereby without irritating the skin comprising:

administering topically to the affected skin a therapeutically effective amount of a composition comprising retinal in a pharmacologically acceptable vehicle, on a daily basis to eradicate actinic or nonactinic keratotic lesions.

4,034,115

MULTI-CURDLED MILK PRODUCT AND THE PROCESS FOR THE PREPARATION THEREOF

James Gordon Roberts, 161 Flamingo Drive, Clearwater, Fla. 33516

Filed July 29, 1975, Ser. No. 599,959

Int. Cl.² A23C *9/12*

U.S. Cl. 426—43 **7 Claims**

1. A method of producing a multi-curdled food product which comprises:

a. effecting a first fermentaion of milk, skim milk, or cream with a lactic type, acid-producing culture for a period of time sufficient to produce buttermilk;

b. effecting a second fermentation of the product resulting from step (a) with a yogurt culture wherein said culture is selected from the group consisting of *Lactobacillus bulgaricus*, *Lactobacillus helveticus*, *Lactobacillus lactic*, and *Streptococcus thermophilus* between a temperature range of 105°–114° F. until the curds start to separate;

c. adding small amounts of colostrum to the product resulting from step (b); and then

d. effecting a third fermentation of the product resulting from step (c) with a lactobacillus culture wherein said culture is selected from the group consisting of *L. acidophilus* and *L. bifidus* at a temperature of approximately 98° F. for a period of time sufficient to produce a symbiotic product high in lactase content.

4,034,116

PACKAGED ROASTED COFFEE PRODUCTS

Matthew Hamell, Orangeburg, N.Y.; Arthur Stefanucci, Clifton, N.J., and William W. Ward, White Plains, N.Y., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 545,264, Jan. 30, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,577

Int. Cl.² B65D *85/70, 25/14*

U.S. Cl. 426—131 **4 Claims**

1. A hermetically-sealed, vacuum-packed, roasted and ground coffee product comprising a rigid container containing an aroma solvent coating consisting essentially of a relatively odorless and tasteless aroma solvent over at least a portion of its interior surface, said solvent being selected from the group consisting of glycerides, waxes, paraffins, polyesters, polyethers, polysilicones and combinations thereof, wherein said container contains roasted and ground coffee and said coating is present at a level of 1 to 4 grams of aroma solvent per pound of roasted and ground coffee and wherein the coating exists as a solid below about 75° F.

4,034,117

PROCESS FOR PREPARING FORAGE CROP ANIMAL FEEDS

Elmer F. Glabe, Northbrook, Ill., assignor to Food Technology Products, Chicago, Ill.

Filed Nov. 6, 1975, Ser. No. 629,499

Int. Cl.² A23K *3/03*

U.S. Cl. 426—335 **5 Claims**

1. A process of treating hay and alfalfa forage crops which consists essentially in cutting and partially drying said crops in the field to a moisture content above 10% but not more than 65% by weight, intimately mixing the resultant forage crops with a quantity of sodium diacetate, and then consolidating the resultant product and storing it at ambient temperatures, the said temperature and moisture conditions being such that said crops when stored at ambient external temperatures in a baled or otherwise consolidated condition will reach an internal temperature of at least 120° F. at which they would normally have to be removed from storage to avoid spontaneous combustion, the quantity of sodium diacetate being sufficient to have a temperature depressing effect when the consolidated product is stored at ambient temperatures so that said internal temperature remains below 120° F.

4,034,118

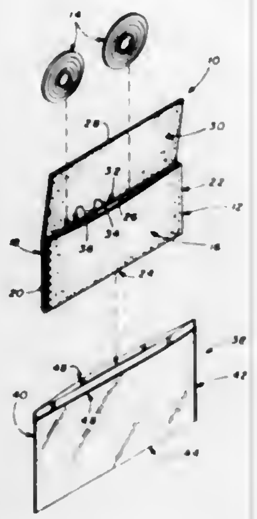
METHOD OF SWEETENING OR MELLOWING ONIONS

Fred A. Martin, 3840 Arborlawn Drive, Fort Worth, Tex. 76109

Filed Jan. 5, 1976, Ser. No. 646,564

Int. Cl.² A23L *1/212*

U.S. Cl. 426—431 **6 Claims**



1. A method of mellowing onions comprising:

peeling and slicing at least one onion to provide at least one onion slice having two major cut surfaces;

placing the resulting onion slice in a pouch comprising a liquid retaining material;

said pouch comprising opposed panel joined together along the bottom and opposite edges; the onion slice being positioned with at least one major surface of said onion slice engaging an adjacent surface of one of the panels of said pouch;

substantially moistening the pouch and the onion slice contained therein with a liquid selected from the group consisting of water, vinegar, and mixtures thereof; and

thereafter refrigerating the mositened pouch in contact with the onion slice contained therein at a temperature of about 40° F and for a period of time of between about 24 hours and about 72 hours.

4,034,119

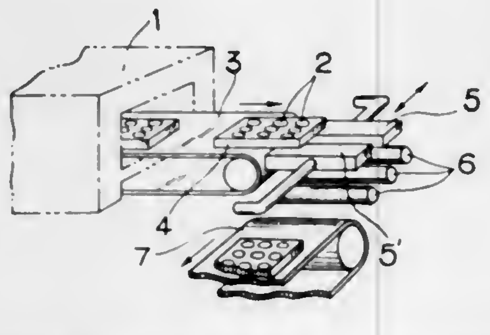
METHOD AND APPARATUS FOR PREVENTING CAVE-IN OF BAKED GOODS

Takao Kanbe, Chofu; Yoshio Kaneko, Urawa, and Satoshi Nomura, Tokyo, all of Japan, assignors to Nisshin Flour Milling Co., Ltd., Tokyo, Japan

Filed Jan. 27, 1976, Ser. No. 652,887

Int. Cl.² A21D *15/00;* **A21C** *15/00*

U.S. Cl. 426—497 **10 Claims**



1. A method for preparing baked goods comprising the steps of: baking an article; applying an impact force transferred at least to the interior of said baked article, said force being applied for preventing cave-in on the surface of said article after completing said baking step; said force being applied when the interior temperature of the baked article is substantially up to 5° C lower than the interior temperature prevailing when baking of said article has been completed; said force applied to said article having a value equivalent to at least the impact force which would be applied to said article if it were to fall under gravity onto a rigid surface from a height of at least 3 centimeters, said impact force being applied by shock or vibration.

4,034,120

PELLETING AID FOR AGRICULTURAL PRODUCTS

Joseph Sidney Wortham, Brownsville, and Ernest Carlisle Johnson, Memphis, both of Tenn., assignors to W. R. Grace & Co., Cambridge, Mass.

Filed Oct. 28, 1975, Ser. No. 626,569

Int. Cl.² A23K *1/175*

U.S. Cl. 426—531 **8 Claims**

1. A pelletizing aid for edible fibrous agricultural refuse material which consists essentially of an organic fatty material with an inorganic material selected from the group consisting of:

a. mixtures of (1) an organic fatty material selected from the group consisting of animal fat, vegetable oils, hydrogenated vegetable oils and mixtures thereof and an inorganic material selected from the group consisting of finely divided unexpanded vermiculite ore and mixtures of finely divided vermiculite ore with expanded vermiculite; and

b. mixtures of an animal fat with an inorganic material selected from the group consisting of expanded vermiculite, finely divided unexpanded vermiculite ore and mixtures thereof.

4,034,121

FOODS WITH MICROCRYSTALLINE CHITIN

Howard J. Dunn, Lomita, and M. Paul Farr, San Pedro, both of Calif., assignors to Ralston Purina Company, St. Louis, Mo.

Continuation of Ser. No. 178,457, Sept. 7, 1971, Pat. No. 3,847,897. This application Nov. 13, 1972, Ser. No. 306,341

Int. Cl.² A23L *1/325*

U.S. Cl. 426—565 **7 Claims**

1. A food composition having improved thickening properties, said product comprising food material and a uniform, stable aqueous dispersion of microcrystalline chitin, characterized by a multiplicity of randomly spaced ruptured glycosidic bonds, particle sizes substantially invisible at a microscopic magnification of 1600X and having a microcrystalline chitin particle concentration of from 0.5% to 25% by weight of the dispsersion whereby the food product has an improved viscosity and an improved resistance against syneresis.

4,034,122

NON-FAT DRIED WHIPPING COMPOSITION

Bernard A. Patterson, 4040 N. LeClaire Ave., Chicago, Ill. 60641

Filed June 1, 1976, Ser. No. 691,834

Int. Cl.² A23L *1/00*

U.S. Cl. 426—570 **4 Claims**

1. A substantially fat-free dried whipping composition capable of being reconstituted by whipping with water to a high yield topping, said composition comprising at least 75% by weight of a mixture of at least one maltodextrin and corn syrup solids, said mixture having a DE value in the range from 10 to 42, from 5 to 10% by weight of a polyoxyethylene sorbitan stearate containing from 15 to 25 ethylene oxide groups, from 0.2 to 1% of a food stabilizer, and the balance being essentially a glyceride ester in which at least 90% of the ester groups present are long chain monoester groups.

4,034,123

COMPRESSED, FREEZE-DRIED COTTAGE CHEESE AND METHOD OF MAKING

Myer Glickstein, and Justin M. Tuomy, both of Framingham, Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 13, 1976, Ser. No. 657,985

Int. Cl.² A23C *19/00*

U.S. Cl. 426—582 **4 Claims**

1. Method of making compacted, freeze-dried cottage cheese which is readily rehydratable to form an acceptable reconstituted cottage cheese food product having good curd identity which comprises the steps of:

a. freeze-drying dry curd cottage cheese having a large curd size and a milk fat content of less than 0.5 percent prior to freeze-drying,

b. freeze-drying creamed cottage cheese having a large curd size and a milk fat content of about 4 to 4.5 percent prior to freeze-drying,

c. blending substantially equal quantities by weight of said freeze-dried, dry curd cottage cheese and said freeze-dried, creamed cottage cheese, and

d. compressing said blend of freeze-dried, dry curd cottage cheese and freeze-dried, creamed cottage cheese at a pressure of from about 500 psi to about 1000 psi, using a dwell time of at least about 10 seconds, whereby a compacted, freeze-dried cottage cheese having good curd identity upon rehydration thereof is obtained.

4,034,124

EMULSIONS

Antonius Franciscus van Dam, Vlaardingen, Netherlands, assignor to Lever Brothers Company, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,336

Claims priority, application United Kingdom, Nov. 25, 1974, 50958/74

Int. Cl.² A23D *3/00, 5/00*

U.S. Cl. 426—602 **17 Claims**

1. A water and oil emulsion, which contains at least 0.05%, based on the quantity of oil, of a phospholipo-protein which has been modified by phospholipase A to a degree of conversion of at least 10%.

4,034,125

SOURDOUGH COMPOSITIONS

William H. Ziemke, San Jose, Calif., and Elmer F. Glabe, Northbrook, Ill., assignors to Food Technology Products, Chicago, Ill.

Filed Dec. 31, 1975, Ser. No. 645,537

Int. Cl.² A21D *2/08, 2/18*

U.S. Cl. 426—650 **8 Claims**

1. A baking ingredient for use in making sourdough bakery products, said baking ingredient being in the form of a flowable powder for the introduction of acetic acid and lactic acid into bread doughs and other bakery products comprising minor quantities of acetic acid and lactic acid absorbed on a major quantity of a finely divided solid edible absorbent which is a starch polysaccharide or an edible cellulosic material, such baking ingredient being stabilized against premature loss of acetic acid and lactic acid, by intimate dispersion with a minor quantity of a normally solid edible fatty glyceride material sufficient to hold said acids in the absorbent and reduce evaporation of said acids during oven baking of said sourdough bakery products, the quantity of acetic acid being within the range of 2% to 15% by weight and the quantity of lactic acid being within the range of 1% to 8% by weight, and the weight ratio of acetic acid to lactic acid being at least 1:1.

4,034,126

PROCESS FOR COATING GRANULAR MATERIALS

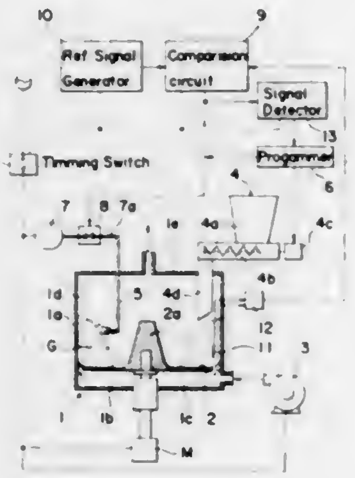
Yoshiro Funakoshi, Kyoto; Yoshihiko Matsumura, Kawanishi; Masaki Yamamoto, Suita, and Hiromu Komeda, Nara, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 419,964, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 213,608, Dec. 29, 1971, abandoned. This application Oct. 10, 1975, Ser. No. 621,621

Claims priority, application Japan, Dec. 29, 1970, 45-128947

Int. Cl.^{2} B05D *1/00*

U.S. Cl. 427—8 **9 Claims**



1. A process for coating granular material having granules with a particle size within the range of 100 to 1,000 microns in a coating apparatus of the type having a rotatable dish, which dish is mounted in a stationary vessel, said stationary vessel having a rising inner surface contiguous to the periphery of said dish and curved upwardly therefrom to define a steadily rising surface from said dish, which comprises charging said granular material into said vessel and onto said rotatable dish while said rotatable dish is rotated at a predetermined speed, intermittently supplying a binding solution to said vessel by measuring the specific electro-resistance of a mass of said granular material by means of a detector including at least one electrode which is spaced from a portion of the rising inner surface of the vessel, feeding a signal indicative of the detected specific electro-resistance to a comparision circuit, comparing said signal from said detector with a reference value fed from a reference signal generator, said comparision circuit generating a control pulse only when said detected specific electro-resistance exceeds the reference value and continuing the generation of such control pulse during a period in which said detected specific electro-resistance is in excess of said reference value, said binding solution spraying being effected under a predetermined pressure onto the fluidized mass of said granular material by means of an electromagnetic valve opened by said control pulse during the duration of said control pulse, the electromagnetic valve being closed to discontinue spraying when the detected specific electro-resistance is less than the reference value and no control pulse is generated from said comparision circuit, and feeding coating powder continuously throughout the coating operation onto the fluidized mass of said granular material within said vessel.

4,034,127

METHOD OF FORMING AND TREATING CADMIUM SELENIDE PHOTOCONDUCTIVE BODIES

Charles John Busanovich, Princeton, N.J., and Robert Milton Moore, Carmel, Ind., assignors to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,682

Int. Cl.^{2} H01L *21/363*

U.S. Cl. 427—76 **10 Claims**

1. A method for fabricating a photoconductive body on a surface of a substrate including the steps of:

a. vapor depositing within an evacuated chamber an overlayer of cadmium selenide on the surface of the substrate while maintaining the substrate at a temperature of from about 200° C. to about 500° C.; then

b. thermally treating the substrate including the cadmium selenide overlayer at a temperature of from about 450° C. to about 550° C. within a continuously renewed atmosphere substantially of an inert gas selected from the group consisting of argon, helium, and nitrogen, or mixtures thereof, for a period of time of at least 2 hours; and, thereafter

c. thermally treating the substrate including the cadmium selenide overlayer in air at a temperature of from about 250° C. to about 450° C. for a period of time from about 15 minutes to about 2 hours.

8. The method of claim 1, wherein the thermal treatment of step *c* is a temperature of about 400° C.

9. The method of claim 8, wherein the thermal treatment of step *c* is for a period of time of approximately 30 minutes.

4,034,128

PRODUCTION OF A COLOR DEVELOPING RECORD SHEET CONTAINING METAL-MODIFIED NOVOLAK RESIN PARTICLES

Russell D. Kelley, Waverly, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed May 5, 1975, Ser. No. 575,055

Int. Cl.^{2} B41M *5/12, 5/16*

U.S. Cl. 427—150 **15 Claims**

1. In a method of producing a color developing record sheet for pressure sensitive papers comprising the steps of grinding together an aqueous mixture of a metal-modified novolak resin and an anionic polymeric dispersing agent for said novolak resin to form an aqueous dispersion of finely divided metal-modified novolak resin particles, said aqueous dispersion containing up to about 58% of said metal-modified resin particles; preparing a coating composition by mixing together said aqueous mixture of said finely divided metal-modified novolak resin particles and a binder for said resin particles; applying said coating composition to a paper base: and drying said coated paper; the improvement comprising adding to said aqueous mixture at least 0.2% by weight of an organophosphorus compound based on the weight of said resin particles, said organo-phosphorus compound containing two or more phosphonic acid or alkali metal phosphonate groups per molecule prior to the grinding step, wherein said anionic polymeric dispersing agent is present in the amount of at least 1.5% by weight based on the weight of said resin particles.

4,034,129

METHOD FOR FORMING AN INORGANIC THERMAL RADIATION CONTROL

Paul A. Kittle, Gardenville, Pa., assignor to Rohm and Haas Company, Philadelphia, Pa.

Filed July 18, 1975, Ser. No. 597,117

Int. Cl.^{2} B05D *5/06*

U.S. Cl. 427—163 **3 Claims**

1. A method for producing a two-layer laminate water-based thermal radiation control coating upon a metallic or metallized substrate which comprises depositing upon the substrate a layer of a semiconductor pigment solution, drying said pigment layer, overcoating the pigment layer with a layer of an alkali metal silicate solution and heat-curing the silicate layer at above ambient temperature.

4,034,130

METHOD OF GROWING PYROLYTIC SILICON DIOXIDE LAYERS

Marian Briska, and Ewald Eisenbraun, both of Boblingen, Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 22, 1975, Ser. No. 615,258

Claims priority, application Germany, Oct. 3, 1974, 2447224

Int. Cl.^{2} C23C *11/00*

U.S. Cl. 427—248 C **7 Claims**

1. A method of growing pyrolytic silicon dioxide layers on a heated substrate wherein the resulting charge carrier numbers per cm^2 is less than about 10^{12} comprising mixing nitrosyl chloride and silane in a volume ratio between approximately 4:1 and approximately 50:1 in the presence of a carrier gas, and passing the gaseous mixture over said substrate while maintaining a predetermined substrate temperature.

4,034,131

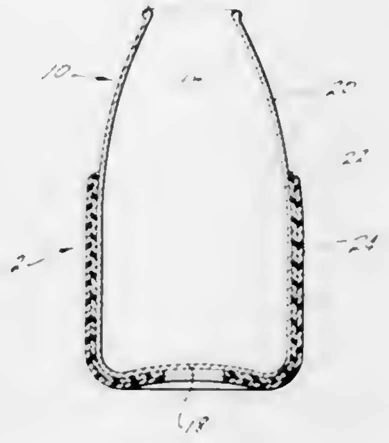
CONTAINER WITH IMPROVED HEAT SHRUNK CELLULAR SLEEVE

Roger R. Rhoads, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 504,111, Sept. 9, 1974. This application Oct. 2, 1975, Ser. No. 618,988

Int. Cl.^{2} B65D *1/02*

U.S. Cl. 428—35 **22 Claims**



1. In an article of manufacture comprising a container having a sidewall and further including a heat shrunk, polymeric seamed sleeve disposed circumferentially outwardly of said sidewall and in snug engagement therewith, the improvement wherein said polymeric sleeve is a composite structure of a closed cellular polyethylene layer and a non-cellular polyethylene layer in adhering contact with said cellular layer, said cellular layer being in engagement with said sidewall and said non-cellular layer being disposed outwardly of said cellular layer.

4,034,132

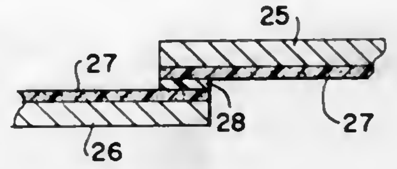
PROPYLENE POLYMER ADHERED TO ENAMEL COATED METAL SURFACE

Ernesto H. Manuel, Park Forest, Ill., assignor to The Continental Group, Inc., New York, N.Y.

Filed Sept. 25, 1975, Ser. No. 616,530

Int. Cl.^{2} B65D *25/14;* **C09J** *3/14*

U.S. Cl. 428—36 **11 Claims**



1. A method of bonding a propylene polymer to a metal surface which comprises:

a. applying to the metal surface an enamel coating containing a solids mixture of about 70 to about 90% by weight of an epoxy resin, about 5 to about 25% by weight of a urea formaldehyde resin and about 0.1 to 5% by weight of a carboxyl modified polypropylene resin which is the reaction product of polypropylene and an unsaturated dicarboxylic acid or anhydride containing about 0.1 to about 5.0% by weight carboxyl groups,

b. baking the enamel coating to cure and harden the coating,

c. heat sealing a propylene polymer layer to the hardened enamel coating metal surface and then,

d. cooling the heat sealed assembly to ambient temperature.

4,034,133

MAGNETIC RECORDING MEDIUM WITH LUBRICANT

Harry Ronald Fleck, Redwood City, and Charles Philip Mignosa, San Jose, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed May 14, 1973, Ser. No. 360,228

Int. Cl.^{2} H01F *10/00*

U.S. Cl. 428—64 **9 Claims**

1. In a magnetic recording element of the type including a base and a coating upon a surface of the base, the coating comprising magnetic particles dispersed in a polymeric binder and a lubricant, the improvement comprising a lubricant chosen from the group consisting of a trifluoride of Ce, La, Pr, Nd, and Sm, said lubricant being present in from 1½% to 50% by weight of the coating.

4,034,134

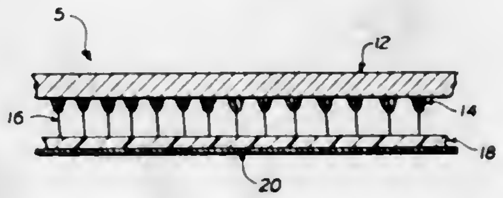
LAMINATES AND COATED SUBSTRATES

Razmic S. Gregorian, Aiken, S.C., and Hans R. Hoernle, Augusta, Ga., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Oct. 7, 1975, Ser. No. 620,280

Int. Cl.^{2} B05D *1/14, 1/16;* **B32B** *33/00*

U.S. Cl. 428—86 **28 Claims**



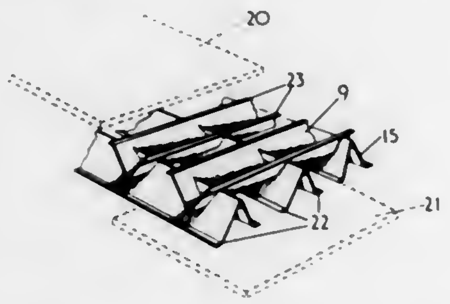
1. A laminate comprising:

a. an air permeable film facing layer; and

b. a substrate backing layer secured to the facing layer by a plurality of uniformly distributed, substantially upstanding flock fibers, one end of substantially all of the flock fibers being permanently embedded in the facing layer and the other end of substantially all of the flock fibers being secured to the substrate backing layer by a discontinuous layer of a flock adhesive and wherein substantially all of the flock adhesive is present at the tips of the flock fibers which are secured to the substrate backing layer, thereby imparting air permeability to the laminate.

4,034,135
RIGID STRUCTURE

Michael Edward Anthony Passmore, Mount Pleasant, Chiseldon, Wiltshire, England
Filed Nov. 20, 1975, Ser. No. 633,658
Int. Cl.^{2} B32B *3/10, 3/28*
U.S. Cl. 428—184 **10 Claims**



1. A rigid structure comprising a first layer of generally corrugated form and a second layer comprising a plurality of laminae arranged across the said corrugations of the first layer, slots being formed in one side of the corrugated form, the slots extending oppositely on opposite sides from crests of the form on the said one side of the first layer, similar slots formed in the laminae, the slots extending from a one edge of each laminae, the said slots in the laminae and the first layer being so disposed whereby the laminae can interengage with the first layer so as to enable the laminae to engage in the slots in the first layer to lock into the said slots of the corrugation form at an angle to the general plane of the structure.

4,034,136
FLAME-RETARDANT RESIN COMPOSITIONS

Carl Leonard Wright, Pasadena, and Harry Hoyt Beacham, Severna Park, both of Md., assignors to FMC Corporation, Philadelphia, Pa.
Division of Ser. No. 95,418, Dec. 4, 1970, Pat. No. 3,936,414, which is a continuation-in-part of Ser. No. 837,911, June 30, 1969, abandoned. This application May 8, 1975, Ser. No. 575,515
Int. Cl.^{2} B32B *15/14;* **C08L** *71/04*
U.S. Cl. 428—246 **16 Claims**

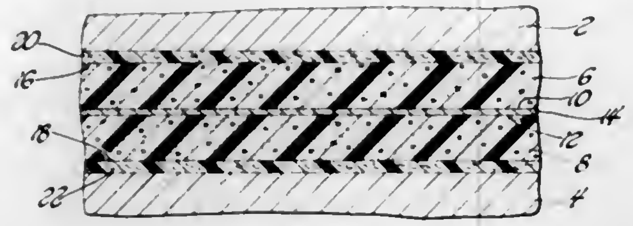
1. A copper clad laminate comprising (a) a copper sheet, coated with a thermosetting coating comprising:

1. 10 to 50 parts by weight of a polyunsaturated monomer,
2. 5 to 30 parts by weight of a polychlorinated or polybrominated aromatic hydrocarbon containing at least 50% by weight chlorine or bromine and having a molecular weight of at least 200,
3. 20 to 60 parts by weight of a polyphenylene ether polymer,
4. 0 to 30 parts by weight of a polyunsaturated polymer having carbon to carbon unsaturation,
5. 2 to 10 parts by weight per 100 parts of all of (1) plus (2) plus (3) plus (4) of a peroxide catalyst which has a ten hour half-life in benzene at a temperature in excess of 100° C

the said coated copper being heated for 2 to 30 minutes at 100° to 170° C prior to being laminated at a temperature of at least 130° C to (b) a base, whereby said thermosetting coating is converted to the thermoset state.

4,034,137
COMPOSITE SHEET STRUCTURE AND METHOD FOR MANUFACTURING SAME

Peter H. Hofer, Grosse Pointe Farms, Mich., assignor to John Z. Delorean Corporation, Bloomfield Hills, Mich.
Filed Dec. 6, 1976, Ser. No. 748,039
Int. Cl.^{2} B32B *3/26*
U.S. Cl. 428—308 **26 Claims**



1. A composite structure comprising two layers of initially liquid permeable material having opposed inner surfaces and having outer surfaces oriented in opposite directions, at least one of said layers being an initially resilient resin foam with open and connected cells, and a thermosetting resinous material which impregnates said layers and which has been cured while maintaining said layers under compression whereby the resinous material is disposed in said layers and therebetween as a continuous and rigid phase, said thermosetting resinous material containing fibrils having a length not in excess of about 1/16 inch.

5. A composite as set forth in claim 1 wherein said thermosetting resinous material also contains hollow glass beads having a diameter less than the length of said fibrils.

4,034,138
AROMATIC POLYAMIDE FIBERS COATED WITH A POLYURETHANE

Eduard P. Babayan, Huntington Beach, Calif., assignor to Hitco, Irvine, Calif.
Division of Ser. No. 429,220, Dec. 28, 1973, abandoned. This application Oct. 9, 1975, Ser. No. 621,005
Int. Cl.^{2} B32B *27/02, 27/34;* **D02G** *3/40;* **D07B** *5/00*
U.S. Cl. 428—378 **10 Claims**

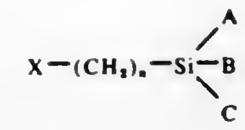
1. An article of manufacture comprising high modulus multifilaments of synthetic, aromatic polyamide fibers impregnated and coated with 5–95% by weight of a thermoplastic polyurethane resin comprising the reaction product of:

a liquid polytetramethylene ether glycol;
an aliphatic diisocyanate; and
an aliphatic diamine coupling-curing agent.

4,034,139
GRAFTED MINERAL CARRIERS FOR FIXING ENZYMES

Honore Mazarguil, Ramonville-St Agne; François Meiller, Palaiseau, and Pierre Monsan, Toulouse, all of France, assignors to Rhone-Poulenc Industries, Paris, France
Filed Apr. 16, 1975, Ser. No. 568,796
Claims priority, application France, Apr. 19, 1974, 74.13687
Int. Cl.^{2} B32B *27/14;* **B01J** *21/00*
U.S. Cl. 428—405 **8 Claims**

1. Grafted mineral carriers comprising oxides, hydroxides or other porous, insoluble mineral compounds having a grain size range of from 40 μ to 5 mm, a specific surface area of from 2 to 600 sq. m/g, a pore diameter of from 50 to 10,000 A and a pore volume of from 0.5 to 1.8 ml/g in which a mineral carrier having hydroxyl groups is grafted with a substituted or unsubstituted haloalkylsilane having the general formula



$$X-(CH_2)_n-Si(A)(B)(C)$$

in which:
X represents a chlorine, bromine or iodine atom;
n is an integer of from 3 to 11;
A, B and C, which are the same or different, are selected from the group consisting of a chlorine atom, a methoxy, ethoxy, methyl or ethyl group, in which at least one of the substituents A, B or C is reacted with an OH group of the carrier.

4,034,140
HEAT-CURABLE SILICONE ELASTOMERS HAVING UNPRIMED ADHESION

Richard L. Przybyla, Midland, Mich., assignor to Dow Corning Corporation, Midland, Mich.
Filed July 31, 1975, Ser. No. 600,692
Int. Cl.^{2} C08L *83/06;* **B05D** *3/02*
U.S. Cl. 428—447 **15 Claims**

1. A heat-curable composition obtained by mixing components comprising

a. 100 parts by weight of an organic-peroxide-curable organopolysiloxane composition, stable in the presence of moisture and curable with heat to an elastomeric solid, and
b. from 0.1 to 10.0 parts by weight of a room-temperature-curable organopolysiloxane composition having silicon-bonded acetoxy radicals, stable in the absence of moisture and curable in the presence of moisture to a coherent rubbery solid; said room-temperature-curable composition being the only source of silicon-bonded acetoxy radicals in the heat-curable composition, there being sufficient silicon-bonded acetoxy radicals in (b) to provide from 0.03 to 0.3 parts by weight of silicon-bonded acetoxy radicals in every 100 parts by weight of the heat-curable composition comprising (a) and (b), said heat-curable composition having better adhesion to an unprimed surface than does the organic-peroxide-curable organopolysiloxane composition.

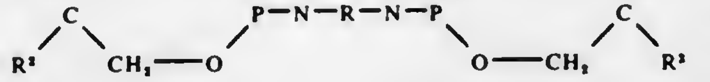
13. A method comprising

I. contacting the composition of claim 1 with at least a part of the surface of a substrate within a period of 1 week after said mixing, thereby forming an assembly, and
II. heating the assembly of (I) within a period of one week after said mixing to cure the heat-curable composition thereon and to adhere the heat-curable composition to the substrate, thereby producing an article having adhered to at least a part of the surface of the substrate the cured composition of claim 1.

4,034,141
BROMINATED PHOSPHORAMIDATES

James J. Duffy, Tonawanda; Richard D. Carlson, Grand Island, both of N.Y., and James C. Watson, Florence, S.C., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.
Division of Ser. No. 537,742, Dec. 31, 1974, Pat. No. 4,007,236. This application May 3, 1976, Ser. No. 682,557
Int. Cl.^{2} B32B *9/02, 9/04*
U.S. Cl. 428—473 **10 Claims**

1. A method of imparting fire retardant properties to a combustible material, which comprises treating said material with a fire retardant amount of a compound of the structure:



wherein
R^1 and R^2 are independently selected from the group consisting of hydrogen, chloro, bromo and chloro or bromo substituted alkyl of from 1 to 8 carbon atoms;
R^3 is selected from the group consisting of hydrogen, alkyl of from 1 to 8 carbon atoms, hydroxy substituted alkyl of from 1 to 8 carbon atoms and chloro or bromo substituted alkyl of from 1 to 8 carbon atoms, and
R is selected from the group consisting of alkylene of from 2 to 8 carbon atoms, phenylene, biphenylene and dicyclohexylene; provided that at least one of R^1 and R^2 contains a bromine atom.

4,034,142
SUPERALLOY BASE HAVING A COATING CONTAINING SILICON FOR CORROSION/OXIDATION PROTECTION

Ralph Julius Hecht, West Palm Beach, Fla., assignor to United Technologies Corporation, Hartford, Conn.
Filed Dec. 31, 1975, Ser. No. 645,763
Int. Cl.^{2} B32B *15/00*
U.S. Cl. 428—678 **15 Claims**

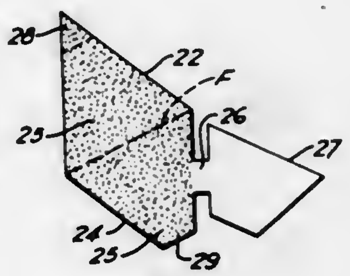
1. An article suitable for use at elevated temperature which comprises:

a. a superalloy base material
b. a coating on the superalloy base material having a composition of from about 10 to about 45% chromium, from about 6 to about 25% aluminum, from about .1 to about 0.7% of an oxygen active element selected from the group consisting of the Group III B elements, the lanthanides, the actinides, and mixtures thereof, from about 0.5 to about 7% silicon, balance selected from the group consisting of nickel, cobalt and iron and mixtures thereof, said silicon being present in elemental form in solid solution,

said coating tending to form an external continuous layer composed predominately of alumina.

4,034,143
THERMAL DEFERRED ACTION BATTERY WITH INTERCONNECTING, FOLDABLE ELECTRODES

Roger G. Sweet, New Canaan, Conn., assignor to Catalyst Research Corporation, Baltimore, Md.
Filed Feb. 24, 1960, Ser. No. 10,798
Int. Cl.^{2} H01M *6/36*
U.S. Cl. 429—112 **3 Claims**



1. A thermal cell electrode composed of a thin metal sheet in the form of two laterally spaced members integrally connected at adjacent edges by a strip, a first of said members being in the shape of a pair of isosceles triangles joined through their bases and in which the apex of the equal sides of one of said triangles is truncated, and the other of said members defining a truncated triangle smaller than the truncated portion of said first member.

4,034,144
SEPARATOR FOR SECONDARY ALKALINE BATTERIES

Roland F. Chireau, Quaker Hill, Conn., assignor to Yardney Electric Corporation, Pawcatuck, Conn.
Filed July 27, 1976, Ser. No. 709,136
Int. Cl.² H01M *2/16*
U.S. Cl. 429—144 **17 Claims**

1. In a rechargeable alkaline electrochemical cell comprising a positive electrode, a negative electrode, a main separator disposed between said positive and negative electrodes, and an alkaline electrolyte in contact with said electrodes and said main separator, the improvement which comprises:

- a negative interseparator disposed in said electrolyte between said main separator and said negative electrode and comprising
  - a. an inorganic fibrous titanate material, and
  - b. an inorganic fibrous matrix-forming material having a length and flexibility sufficient to form a matrix for said titanate material,

said titanate material being present in an amount between about 50% and about 95% by weight of the weight of said (a) and (b), and said matrix-forming material being present in an amount sufficient to make up 100% by weight of said (a) and (b).

4,034,145
ANAEROBICALLY HARDENING ADHESIVES AND SEALANTS CONTAINING AN ORGANIC PERCARBOXYLIC ACIDS

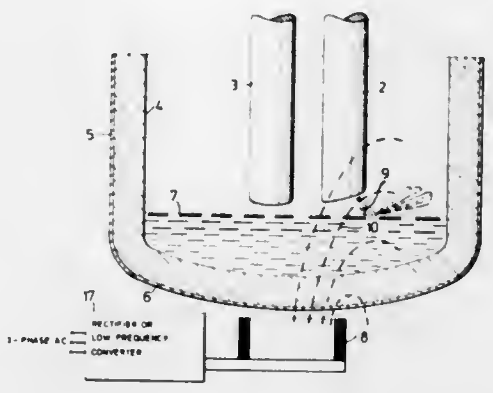
Werner Gruber, Dusseldorf-Gerresheim; Joachim Galinke, Dusseldorf-Holthausen, and Jürgen Keil, Monheim-Hitdorf, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf, Germany
Filed Aug. 25, 1975, Ser. No. 607,898
Claims priority, application Germany, Sept. 2, 1974, 2441943
Int. Cl.² C08F *120/12, 120/20*
U.S. Cl. 526—328 **10 Claims**

1. In an aerostable, anaerobically-setting adhesive composition comprising a polymerizable (meth) acrylate ester as principal latent adhesive component, a peroxide polymerization catalyst therefor and an organic polymerization accelerator: a small but effective uniformly distributed amount of a compound selected from the group consisting of the aliphatic and aromatic percarboxylic acids homogeneously dispersible in said composition as agent improving the storage stability of said composition in the presence of molecular oxygen.

ELECTRICAL

4,034,146
METHOD AND APPARATUS FOR EQUALIZING THE WALL LINING WEAR IN THREE PHASE ALTERNATING CURRENT ELECTRIC ARC FURNACES

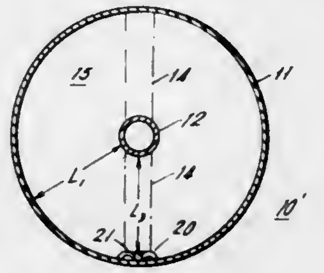
Sven-Einar Stenkvist, Ormbergssvangen 10, 724 62 Vasteras, Sweden
Filed Jan. 27, 1976, Ser. No. 652,660
Claims priority, application Sweden, Jan. 28, 1975, 7500812
Int. Cl.² H05B *7/20*
U.S. Cl. 13—11 **11 Claims**



5. An apparatus for equalizing the wear of the wall lining in a three-phase AC electric arc furnace, including means for creating a magnetic field arranged substantially symmetrically to the electrodes and intersecting the arcs in the furnace space above the charge, the apparatus comprising at least one electromagnetic coil mounted under the furnace bottom lining and means for supplying an electric current to said coil of a polarity which is unchanged during a period of time substantially exceeding the time period of one complete cycle of the electrode supply current.

4,034,147
CONTAMINATION CONTROL DEVICE

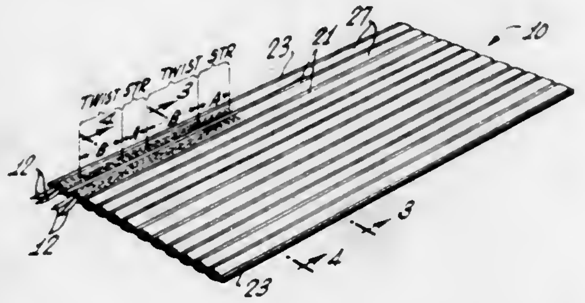
Robert M. Clark, Ligonier, and John C. Cronin, Greensburg, both of Pa., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Feb. 25, 1976, Ser. No. 661,122
Int. Cl.² H01B *9/04*
U.S. Cl. 174—14 R **19 Claims**



1. A contamination control device for trapping charged particles in an electrical transmission bus including an elongated center conductor coaxially mounted within a cylindrical conductive shell, said device comprising: an elongated conductive member electrically connected to said shell to maintain said member at a value of electrical potential essentially equal to an electrical potential on said shell, thereby to form a region having a low electrical field intensity within a volume bounded by said member and said shell; said member having a pair of longitudinally opposed ends; a pair of generally tapering side portions being formed at at least one of said pair of ends and generally converging toward the associated end, each of said tapering side portions forming an entranceway arranged at an angle to the axis of said center conductor to facilitate entry of said charge particles through one of said entranceways and into a portion of said region removed from said entranceways whereby said particles are trapped within said region.

4,034,148
TWISTED PAIR MULTI-CONDUCTOR RIBBON CABLE WITH INTERMITTENT STRAIGHT SECTIONS

Donald D. Lang, Garden Grove, Calif., assignor to Spectra-Strip Corporation, Garden Grove, Calif.
Filed Jan. 30, 1975, Ser. No. 545,582
Int. Cl.² H01B *7/08, 11/04*
U.S. Cl. 174—34 **11 Claims**

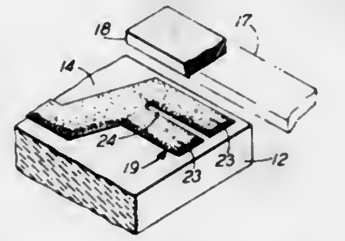


1. A laminated multi-conductor cable, which comprises:

- a plurality of laterally spaced, longitudinally extending, insulated wire conductor pairs, each of said longitudinally extending insulated conductor pairs having alternating twisted portions and straight portions;
- a first laminating plastic film completely underlying said spaced insulated conductor pairs; and
- a second laminating plastic film completely overlying said spaced insulated conductor pairs and being laminated to said first plastic film at least at nip areas extending laterally between said alternating twisted portions and straight portions of each of said spaced conductor insulated pairs, said first and second laminated films tightly surrounding each of said alternating twisted portions and straight portions of each of said spaced insulated conductor pairs and forming longitudinally extending encapsulating ducts for said alternating twisted portions and said straight portions of each of said spaced insulated conductor pairs to thereby precisely space each of said spaced conductor pairs along their entire lengths within said laminated cable.

4,034,149
SUBSTRATE TERMINAL AREAS FOR BONDED LEADS

Vincent Joseph Zaleckas, Union, N.J., assignor to Western Electric Company, Inc., New York, N.Y.
Filed Oct. 20, 1975, Ser. No. 624,136
Int. Cl.² H05K *1/10*
U.S. Cl. 174—68.5 **4 Claims**



1. An article comprising:
an insulating substrate having a conductive pattern thereon, the conductive pattern extending into at least one bond site on the surface of the substrate, the conductive pattern at the bond site including at least two conductive surface areas with at least one opening in the continuity

of the conductive surface areas located between said conductive surface areas; and

a lead having one of its ends bonded to the conductive pattern at the bond site in a thermo-compression bond, and lead being joined to each of the conductive surface areas with heat and metal-deforming pressures, the lead spanning the opening in the continuity of the conductive surface areas of the pattern to provide a plurality of distinct thermo-compression bonds between the lead and the substrate to enhance the pullout strength between the lead and the substrate.

4,034,150
ACCORDIAN FOLD CABLE WITH FLEXIBLE CLIPS OVER THE FOLDS

Jack W. Burnett, III, Mauldin, S.C., assignor to Southern Weaving Company, Greenville, S.C.

Filed Feb. 20, 1976, Ser. No. 659,775

Int. Cl.² H01B *7/06*

U.S. Cl. 174—69 9 Claims

1. In combination, an accordion-fold cable having a plurality of conductor wires, said cable being folded to define an open-loop configuration at each fold thereof, a flexible clip device carried over a fold comprising:

opposing inclined side portions convergently extended and terminating at a joint section;

remote ends of said opposing side portions being spaced apart and arranged over a fold of said accordion cable with an apex of said open loop of said fold being nested adjacently within said joint section;

fastening means securing and maintaining said apex of said fold in said nested position within said joint section reducing the tendency of said fold to remove from said clip member during an expansion of said cable; and

said opposing side portions being flexible inwardly and outwardly relative to each other so as to impart a retracting force to said cable following an expansion thereof;

whereby said cable may be maintained in its accordion fold configuration.

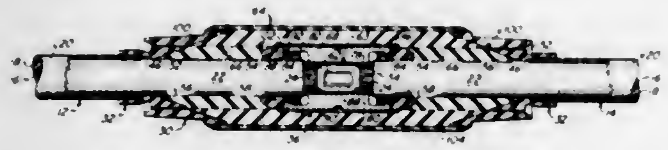
4,034,151
SPLICE CONNECTOR WITH INTERNAL HEAT TRANSFER JACKET

Frank A. Silva, Basking Ridge, and Robert W. Mayer, Hackettstown, both of N.J., assignors to Amerace Corporation, New York, N.Y.

Filed May 14, 1975, Ser. No. 577,558

Int. Cl.² H02G *15/08*

U.S. Cl. 174—73 R 20 Claims



1. In a splice connector for connecting high voltage cables, each cable having a conductor, insulation surrounding the conductor and a shield around the insulation, the connector including a pair of adaptor sleeves for placement of one sleeve at the terminus of each cable, means for connecting bared portions of the conductors together and a housing for placement over the adaptor sleeves and connecting means to engage the adaptor sleeves along an interface between each sleeve and the housing and to enclose the connection between the bared portions of the conductors, the improvement comprising:

a heat transfer jacket for placement over the connection between the bared portions of the conductors and having a longitudinal length sufficient to extend longitudinally between the adaptor sleeves, and a thickness sufficient to extend radially between the connection and the housing, said jacket being constructed of a material of relatively high thermal conductivity; and

complementary means on the heat transfer jacket and the adaptor sleeves for engaging the jacket with each adaptor sleeve to positively locate and preclude movement of the adaptor sleeves longitudinally to one another.

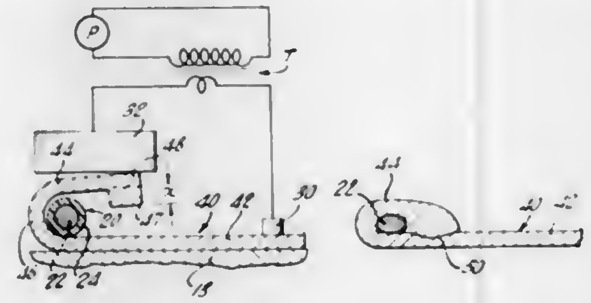
4,034,152
TERMINATION SYSTEM FOR FUSING ALUMINUM-TYPE LEAD WIRES

Allan S. Warner, 50 Haliday St., Clark, N.J. 07066

Continuation of Ser. No. 370,679, June 18, 1973, abandoned, which is a continuation of Ser. No. 220,939, Jan. 26, 1972, abandoned. This application Dec. 3, 1975, Ser. No. 637,253

Int. Cl.² H01R *43/02, 11/06;* **B23K** *11/18*

U.S. Cl. 174—94 R 2 Claims



1. A method of fusing conductor wire that includes aluminum or aluminum alloy to a tang type terminal having an interconnected body comprising positioning at a designated wire position within the tang insulated wire that includes aluminum or aluminum alloy; heating the tang, body and wire with a fusing electrode enough to soften the tang beyond its metallic memory and to burn away insulation on the wire to expose the surface thereof but not enough so that the tang reaches its plastic state and concurrently applying pressure to the tang to join the tang to the body and to join the wire thereto by a thermocompression surface adhesion contact; and controlling that portion of the pressure applied to the wire when softened so that the pressure applied to the wire is insufficient to sever or excessively reduce the cross-section of the wire; and wherein said step of controlling the pressure comprises positioning an enlarged mass of terminal material between the tang and body and opposite from the inter-connection relative to the designated wire position prior to said heating step and spacing said mass from one of said tang and body such that said mass engages both said tang and body during said pressure-applying step.

2. An article made by the method of claim 1.

4,034,153
ELECTRICAL CABLE FOR TRANSPORT VEHICLES AND SHIPS

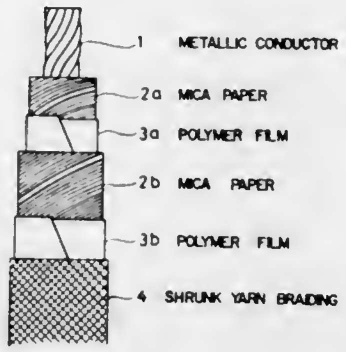
Werner Andres, Muttenz; Ernst Diehl, and Werner Marti, both of Breitenbach, all of Switzerland, assignors to Schweizerische Isola-Werke, Breitenbach, Switzerland

Filed Aug. 15, 1975, Ser. No. 604,938

Claims priority, application Switzerland, Nov. 18, 1974, 15325/74; Austria, Feb. 4, 1975, 816/75

Int. Cl.² H01B *7/00*

U.S. Cl. 174—120 SR 13 Claims



1. In a flexible electrical cable comprising a flexible conductor made from metal selected from the group consisting of aluminum, copper, nickel-plated copper and tin-plated copper, and a flexible insulation covering the conductor, the improvement wherein said flexible insulation comprises:

A. at least four alternately disposed layers, at least two of said layers being spirally wound layers of mica tape, said mica tape (a) being made from mica paper and a heat resistant fiber sheet which is stable to temperatures up to at least 300° C., and (b) being impregnated with an adhesive silicone resin which resin remains flexible after curing, and the other two of said alternating layers each being a layer of a heat-resistant plastic film wound in overlapping relation onto a corresponding one of said two spirally wound layers of mica tape, with the overlapping regions of said film adhering to one another, and

b. a cover-braiding of shrinkable yarn over the outermost layer of plastic film.

4,034,154
DEVICE FOR REDUCING THE RADIO AND AUDIBLE NOISE CAUSED BY CORONA ON HIGH VOLTAGE ELECTRICAL INSTALLATIONS

Albert Pierre Marie Lecat, Rixensart, Belgium, assignor to Laboratoire Belge de l'Industrie Electrique (LABORELEC), Linkebeek, Belgium

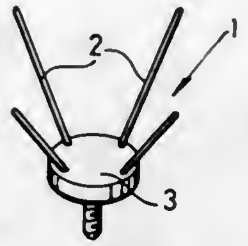
Continuation-in-part of Ser. No. 497,449, Aug. 14, 1974, abandoned, which is a continuation-in-part of Ser. No. 279,157, Aug. 9, 1972, abandoned. This application Dec. 11, 1975, Ser. No. 639,686

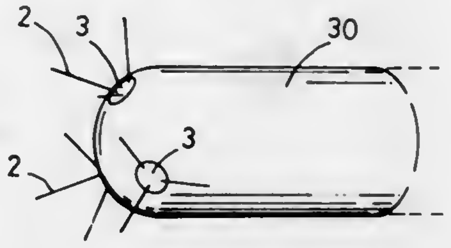
Claims priority, application Belgium, Aug. 17, 1971, 107129

Int. Cl.² H01B *5/00*

U.S. Cl. 174—127 4 Claims

1. In combination, a high voltage member and a device for reducing the radio and audible noise caused by corona, said device comprising an electrically conductive member in the form of a conductive flat nonperforate disc with a mounting means extending from one flat side thereof, said mounting means and said disc being in substantial electrical contact with the high voltage member, and a plurality of electrical projecting portions projecting from a second flat side of said disc in fan order with their ends remote from the mounting means and being substantially evenly spaced from each other and having radii of curvature that are small relative to their lengths, said projecting portions having lengths such that, during the use of the combination, the ends of the projecting portions remote from the mounting means are located in a well-defined zone of electrical field around said high voltage member where the local electric field has a magnitude such that the usual distrubing ionization mode of the surrounding air is replaced by a new ionization mode producing substantially no radio or audible noise and characterized by stable, small bright spherical glows which are observable in the dark at the ends of said projecting portions.





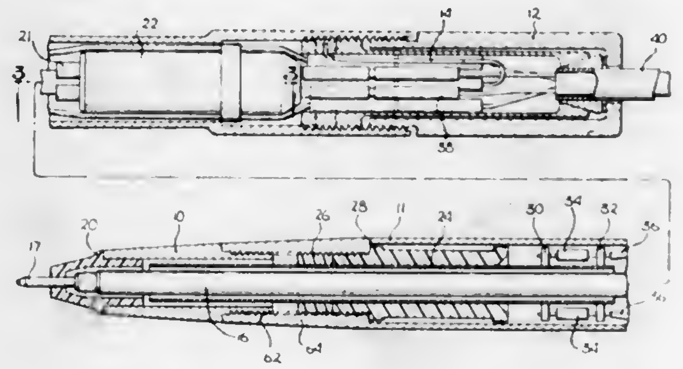
4,034,155
ELECTRICAL SENSING WRITING PEN

Alex Marcel Muller, and Joseph Leslie Tyrrell, both of Palos Verdes, Calif., assignors to Telautograph Corporation, Los Angeles, Calif.

Filed Apr. 19, 1976, Ser. No. 677,872

Int. Cl.² G08C *21/00;* **H04N** *1/00*

U.S. Cl. 178—19 14 Claims



11. A writing pen capable of sensing an electrostatic field near its writing tip comprising:

a. a writing tip for sensing said electrostatic field;

b. a cylindrical member electrically coupled to said writing tip for re-radiating the electrostatic field sensed by said writing tip, said member having an outer surface;

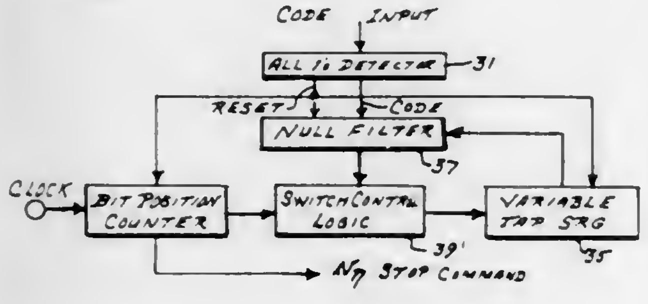
c. A tubular member coaxially surrounding said cylindrical member so as to capacitively couple the re-radiated electrostatic field from the tubular member to the cylindrical member;

d. electronic amplification means coupled adjacent said outer surface of said cylindrical member, said amplification means electrically coupled to said cylindrical member, and adapted to electronically amplify the signal induced by the coupled electrostatic field;

e. housing means operable for electrostatically shielding said cylindrical member, said tubular means and said amplification means and for exposing said writing tip to said electrostatic field.

f. switch means comprising a light emitting source and a light detecting means, said switch means disposed within said housing means such that some part of said cylindrical member will, upon inward axial displacement of said cylindrical member, obstruct the passage of light from said source to said detecting means and thereby provide electrical indication that said writing pen is operable, while upon outward axial displacement of said cylindrical member, light from said source will impinge upon said detecting means and thereby provide electrical indication that said writing pen is not operable.

4,034,156
APPARATUS FOR THE IDENTIFICATION OF FEEDBACK TAPES IN A SHIFT REGISTER GENERATOR
Robert R. Willmore, Millersville, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Continuation-in-part of Ser. No. 77,355, Oct. 1, 1970, abandoned. This application July 9, 1973, Ser. No. 377,170
Int. Cl.² G11C *19/00*; **H04K** *3/00*
U.S. Cl. 178—22 **4 Claims**

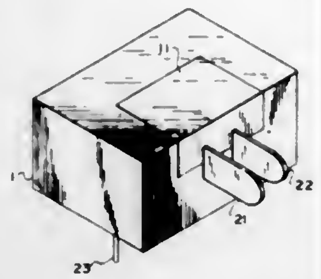


1. An apparatus for determining the feedback tap position of a transmitting binary code shift register generator, comprising:

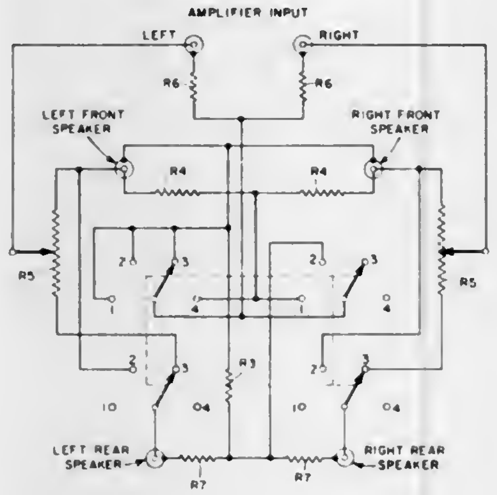
a. an internal shift register generator, each stage thereof having a controllable feedback tap to the first tap thereof;
b. a bit position counter;
c. means for comparing the codes from the transmitting shift register generator and the internal shift register;
d. register means for producing an output pulse upon the occurrence of the transmitting code having identical binary digits in all stages, said output pulse being the reset pulse for the bit position counter and the internal shift register generator and the enabling pulse for the comparing means; and
e. means for activating selected feedback taps of the internal shift register generator, the activating means being fed by the bit position counter and the comparing means.

4,034,157
TEST JACK FOR MOUNTING ON PRINTED CIRCUIT BOARDS
Eugene R. Hrdlicka, Schiller Park; George J. Vincolese, and John H. Szuberla, both of Elmhurst, all of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.
Filed Sept. 2, 1975, Ser. No. 609,279
Int. Cl.² H04M *3/26*
U.S. Cl. 179—1 PC **3 Claims**

1. A telephone test jack adapted for mounting on a printed circuit card and adapted to receive a male type test plug, said jack comprising: a base portion of insulating material including a shoulder portion extending upward from a portion of said base, a plurality of parallel spaced contact spring receiving slots included in the upper surface of said base portion and a plurality of openings in the bottom surface of said base, each of said openings connected to a different one of said slots; a plurality of electrically conductive contact springs each including a printed circuit card terminal and a test plug engaging end, and each mounted in a different one of said base portion slots with said printed circuit card terminal portion extending through a different one of said base portion surface openings; and a spring retaining portion of insulating material positioned on top of said base portion and within said shoulder portion, said retaining portion including a plurality of parallel spaced spring receiving slots in the bottom surface thereof; said spring retaining portion and said base portion in combination supporting each of said contact springs and insulating said springs from each other.



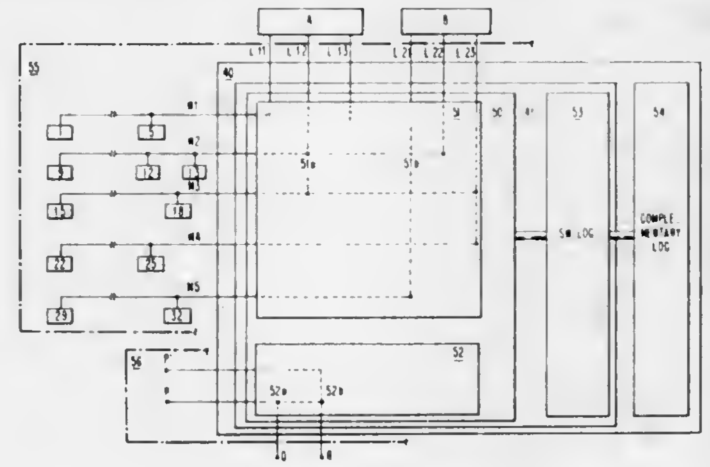
4,034,158
QUADRAPHONIC PASSIVE FOUR-CHANNEL DECODER
Berdette O. Britton, P.O. Box 18044, Dallas, Tex. 75218
Filed Dec. 5, 1972, Ser. No. 312,307
Int. Cl.² H04R *5/00*
U.S. Cl. 179—1 GQ **1 Claim**



1. A decoding network for use in a quadraphonic sound system connected between the left and right outputs of a stereophonic amplifier and at least four acoustic transducers, the respective left and right audio output signals of that amplifier each having signal components in phase with one another and also signal components out of phase with the corresponding signal components of the other, comprising

means for applying said left audio output signal from said left amplifier output to a left pair of said acoustic transducers,
means for applying said right audio output signal from said right amplifier output to a right pair of said acoustic transducers,
means connecting the first of said left pair and the first of said right pair of transducers in series with said left and right amplifier outputs so that said first transducer of each pair responds primarily to the mutually out-of-phase components of the respective applied audio signals,
means connecting the second of said left pair and the second of said right pair of transducers respectively across the respective said left and right amplifier outputs,
trap means comprising a pair of series connected resistors, said resistors, said resistor pair being center tapped, and said resistor pair being connected in series between the high sides of only said second left and right transducers, whereby the out-of-phase components of the left and right audio signals substantially cancel each other out and are not reproduced by said second transducers,
a differentiating network coupled between said transducer series connecting means and ground so that each one of said series connected first pair of acoustic transducers is responsive to its out-of-phase component and to a portion of its respective in-phase component of the audio signal applied thereto, and
a switch for selectively connecting said resistor center tap to ground, whereby, when the center tap is connected to ground, there is provided an in-phase amplifier load sufficient to permit application of only the out-of-phase signal component and only to said second transducers, without destructive oscillation of the amplifier, such that the presence or absence of such an out-of-phase signal component may be detected.

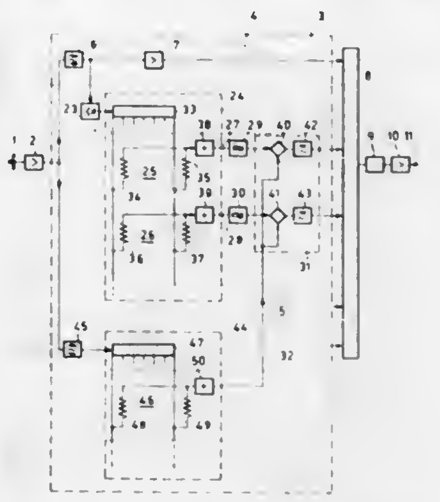
4,034,159
SWITCHING SYSTEM FOR MULTICHANNEL LINES
Rene Henri Buron, St. Paul, France, assignor to International Business Machines Corporation, Armonk, N.Y.
Filed July 19, 1974, Ser. No. 490,142
Claims priority, application France, July 20, 1973, 73.26959
Int. Cl.² H04Q *11/00*
U.S. Cl. 179—15 AT **2 Claims**



1. In a switching system providing space division interconnection of multiplex lines in independent groups wherein no line of any group formed by a specific interconnection participates in any other group,

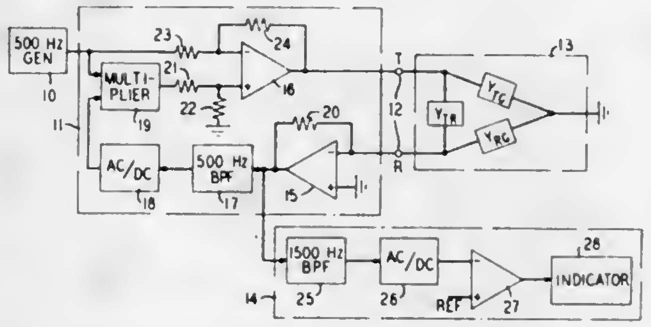
a first matrix comprising storage element arrays equal in number to the maximum number of independent groups, each array having storage elements corresponding to said lines for indicating the connected status of respective lines in said group,
an additional storage array having storage elements corresponding to said lines for indicating a proposed new connection of said lines,
and logic means for comparing, one array at a time, the arrays of said first matrix with said additional array,
a set of latches for recording, by first matrix array, coincidence between at least one element of corresponding first matrix arrays and said additional array,
a second matrix comprising storage element arrays corresponding to said latches, each said second matrix array having an ordered series of storage elements corresponding to multiplex channels of said lines for indicating use status of said channels,
and logic means responsive to said latches to compare said second matrix arrays, selectively according to the state of said latches, and to provide signals indicative of those orders wherein more than one channel is in use.

4,034,160
SYSTEM FOR THE TRANSMISSION OF SPEECH SIGNALS
Petrus Josephus Van Gerwen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 5, 1976, Ser. No. 664,409
Claims priority, application Netherlands, Mar. 18, 1975, 7503176
Int. Cl.² G10L *1/00*; **H04B** *1/66*
U.S. Cl. 179—15.55 R **24 Claims**



15. A receiver for band compressed speech signals comprising a band expander including a baseband channel, a plurality of a sub-band expander channels, means having an input coupled to said baseband channel and an output coupled to said expander channels for generating components in said subbands, a frequency analyzer coupled to said component generator and having for each sub-band first and second subbandpass filters with the same amplitude-frequency characteristics and differing phase frequency characteristics, and a modulator circuit having a first input means for receiving a constant amplitude signal from said component generator, a second input means for receiving reference phase and amplitude data, and an output means for supplying a portion of the original speech signal.

4,034,161
TELEPHONE RECEIVER-OFF-HOOK DETECTOR
Richard Scott Hoppough, Greensboro, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 28, 1976, Ser. No. 700,329
Int. Cl.² H04M *3/22*
U.S. Cl. 179—18 AB **3 Claims**

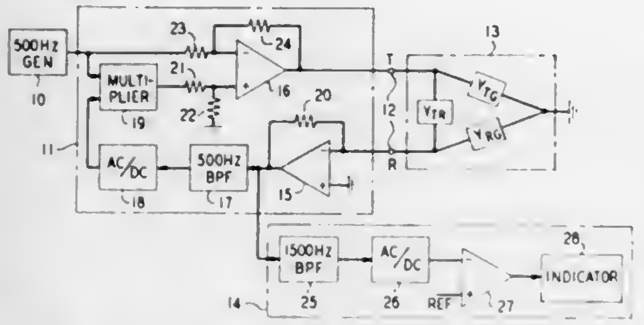


1. Apparatus for detecting a telephone receiver-off-hook condition from a location remote from the telephone but interconnected therewith by a transmission line, said apparatus comprising:

a source of alternating signals,
means for use at said location for applying to said transmission line said signals set to an amplitude level related to the loading effect of said transmission line, and
means for use at said location for producing an output when

a signal having a frequency harmonically related to the frequency of said alternating signal and exceeding a predetermined amplitude is present on said line.

4,034,162
TELEPHONE RECEIVER-OFF-HOOK DETECTOR
James Tyler Holt, Elon College, N.C., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 28, 1976, Ser. No. 700,330
Int. Cl.² H04M *3/22*
U.S. Cl. 179—18 AB 5 Claims

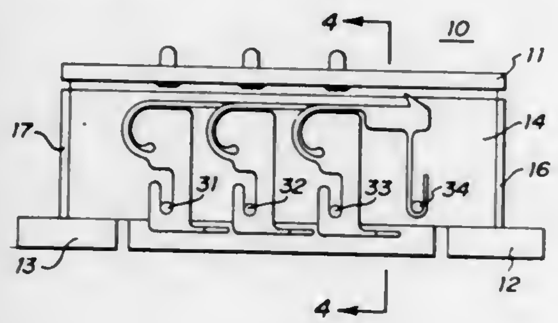


1. In apparatus for detecting a telephone receiver-off-hook condition from a location remote from the telephone but interconnected therewith by a transmission line where said apparatus comprises first means for use at said location for applying to said transmission line an amplitude-controlled test signal where the amplitude is related to the loading effect of said transmission line, and second means for use at said location for producing an output when a signal having a frequency harmonically related to the frequency of said test signal and exceeding a predetermined amplitude is present on said line, an improvement characterized in that:

said first means produces, for application to said transmission line, a second alternating signal having a frequency different from said test signal, and

said first means is responsive to current produced by said second signal to control the amplitude of said test signal.

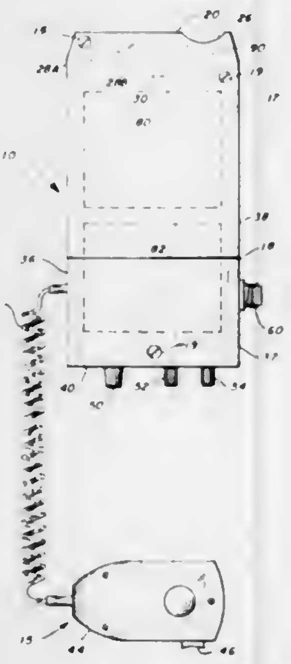
4,034,163
APPARATUS FOR MECHANICALLY OPERATING PUSH BUTTONS
Wilbur R. Youngs, Dallas, Tex., assignor to Zip-Call, Inc., Allen, Tex.
Filed Jan. 7, 1976, Ser. No. 647,218
Int. Cl.² H04M *1/48*
U.S. Cl. 179—90 CS 10 Claims



1. A device for selectively actuating keys in an array of columns and rows by use of a perforated card comprising:
- a. a frame adapted to overlay said keys,
- b. partition means in said frame defining slots in number equal to the number of said keys which slots extend normal to the plane of said array and parallel to the length of said rows, and
- c. actuators each having an upfacing upwardly urged hook mounted to operate such that there is one in each of said slots, each actuator being pivotally mounted and having a bottom foot to contact one of said keys,

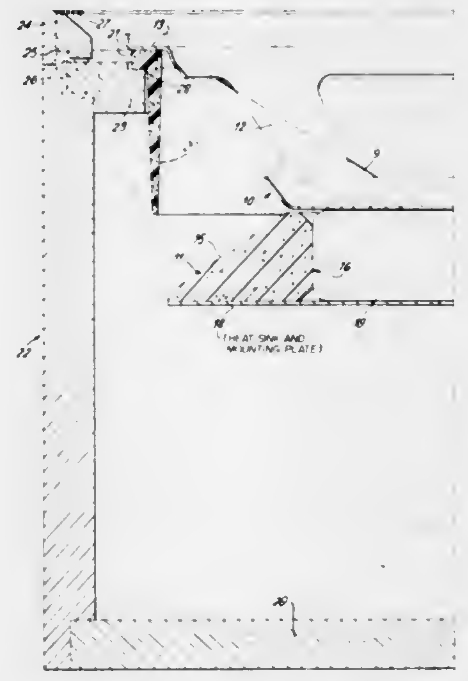
whereby a perforated card moved along the top of said frame in the direction of the length of said slots with perforations therein selectively engages and moves said hooks to rotate said actuators for depression of said keys.

4,034,164
CITIZENS BAND CARTRIDGE FOR TAPE DECKS
Randy C. Westmoland, Box 92, Skiatook, Okla. 74070
Filed Aug. 25, 1975, Ser. No. 607,184
Int. Cl.² G11B *31/00*
U.S. Cl. 179—100.11 8 Claims



1. In a communication system including a cartridge tape deck means including power supply and loud speakers, and including a radio transceiver cartridge means adapted for use in conjunction with said tape deck means utilizing said power supply and said loud speakers; and wherein said transceiver cartridge means comprises
- a. a housing including a first part of the shape and size of a conventional tape cartridge adapted to be inserted into said tape deck; and a second part of selected dimensions extending to the front of said tape desk;
- b. a plurality of openings in the end of said first part including:
  1. a first opening including therein two contacts adapted to contact the conventional two contacts inside said tape deck, whereby power can be drawn from said conventional two contacts to power said transceiver;
  2. a second opening including therein magnetic transducer means for transducing magnetic signals into the pickup magnetic head in said deck;
  3. A third opening to provide clearance for the tape drive wheel in said deck;
- c. radio transceiver means in said housing;
- d. control means for said transceiver means;
- e. microphone/loud speaker means connected to said transceiver cartridge means; and
- f. means to connect antenna means to said transceiver cartridge means, and including
- g. means in said cartridge tape deck means to apply power to said transceiver cartridge means, whereby when said radio transceiver cartridge means is inserted into said tape deck means and said antenna means is connected, said transceiver cartridge means receives power from said tape deck means and plays out through said loud speakers, and when said transceiver cartridge means is removed from said tape deck, and separate power is supplied, said transceiver cartridge means can be used independently of said tape deck means; and further including
- h. a transceiver cartridge receptacle means into which said transceiver cartridge means can be inserted; and including in said transceiver cartridge receptacle means:
  1. batteries; and
  2. extensible antenna means.

4,034,165
TRANSDUCER WITH REARWARDLY DISPOSED DAMPING ELEMENTS
Gert Wilhelm Haeder, Schmitten, Germany, assignor to The Rank Organisation Limited, London, England
Filed Jan. 12, 1976, Ser. No. 648,516
Claims priority, application United Kingdom, Jan. 22, 1975, 2765/75
Int. Cl.² H04R *1/02, 1/28, 9/02*
U.S. Cl. 179—115.5 R 13 Claims



1. In a loudspeaker of the type comprising:

a substantially conical diaphragm,

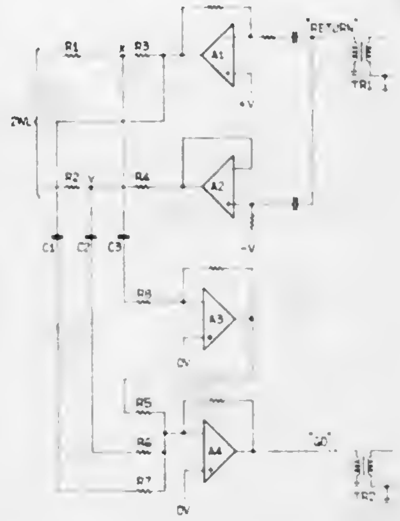
support means for said diaphragm, and

means for causing said diaphragm to vibrate in dependence on a varying electrical input signal fed to said loudspeaker, whereby said diaphragm radiates acoustic vibrations forwardly from one face and rearwardly from the other face,

the improvement wherein, there is provided a frusto-conical annular damping element of cellular material mounted on said support means of said loudspeaker in a position such as partly to absorb and partly to radially outwardly deflect acoustic vibrations directed rearwardly from said diaphragm.

4,034,166
TRANSMISSION NETWORKS FOR TELEPHONE SYSTEM
John Edward Hollis, High Wycombe, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland
Filed Nov. 25, 1975, Ser. No. 635,039
Claims priority, application United Kingdom, Nov. 27, 1974, 51306/74
Int. Cl.² H04B *1/58*
U.S. Cl. 179—170 NC 2 Claims

1. A terminating set of the kind providing for the coupling of go and return speech paths to a 2-wire speech circuit characterised in that,
- a. the return path includes a first and a second operational amplifier and the go path includes a third and a fourth operational amplifier, said third and fourth amplifiers have preselected gains,
- b. said first and second amplifiers extend return path balanced speech currents to said 2-wire speech circuit over a resistor network comprising first and second identical branches each having an identical internal tapping point,
- c. the tapping point of said first branch is connected over a first capacitor to the input path of said third amplifier,
- d. the tapping point of the second branch is connected over a second capacitor and a first input resistor to said fourth amplifier,



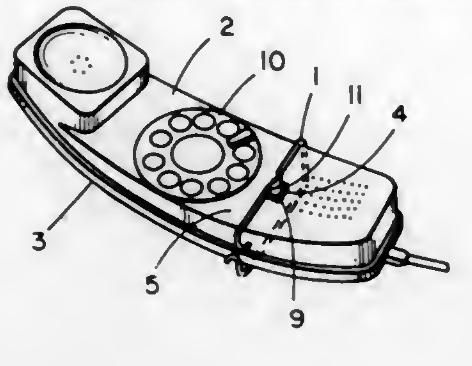
- e. the output path of said third amplifier is connected over a second input resistor to said fourth amplifier,
- f. the output path of the first amplifier is connected over a third capacitor and a third input resistor to said fourth amplifier, and wherein said preselected gains of the third and fourth amplifiers is such that balanced speech currents derived from the 2-wire line are extended to the go path whereas common-mode voltage conditions at said tapping points are substantially rejected and not applied to the go path.

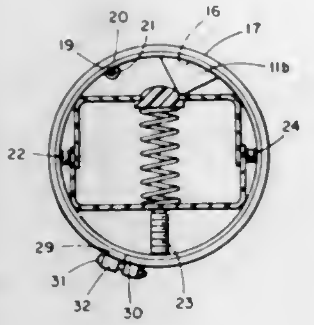
4,034,167
TELEPHONE SWITCH RETAINING DEVICE
Albert E. Boyd, 2417 Eastline Drive, Joliet, Ill. 60436
Filed May 24, 1976, Ser. No. 689,597
Int. Cl.² H01H *9/22*
U.S. Cl. 179—178 8 Claims

1. A switch retaining device for telephones comprising band means, said band means includes a wire frame member, said wire frame member being shaped to correspond with the cross-sectional shape and dimension of a portion of said telephone which carries a switch to be retained by said device, said wire frame member including detent means formed by a bend of said wire frame member inwardly of the area surrounded by said wire frame member, said wire frame member being stiffly resilient, said wire frame member including first and second ends, said first and second ends including fastening means, said first and second ends being manually moveable towards each other for fastening engagement in a first position, said first and second ends being movable away from each other by the bias of said stiffly resilient wire frame member to a second position when unfastened and released.

6. A switch retaining device for telephones comprising band means, said band means includes a first annular ring member including means to mount around a portion of said telephone which carries a switch to be retained by said device, a second annular ring member being mounted for rotation over and coaxially with said first annular ring member, detent means being carried by said second annular ring member and including a projecting member which projects inwardly toward the central axis of said coaxially mounted ring members, slot means in said first annular ring member to receive said projecting member carried by said second annular ring member

therethrough for movement between a first position and a second position, said second annular ring member being manually rotatable on said first annular ring member to move said projecting member between said first and second positions.





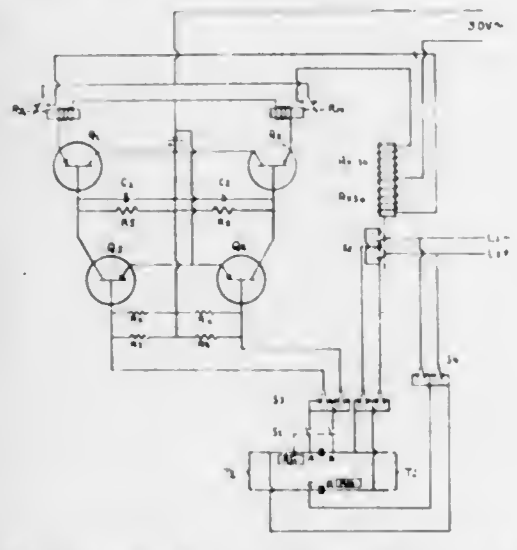
4,034,168
DEVICE TO DETECT AND AUTOMATICALLY CONTROL ELECTRICAL POTENTIAL POLARITIES

Robert Kenneth Brown, 147 Marine Drive, Apt. 5-D, Buffalo, N.Y. 14202

Filed Dec. 2, 1974, Ser. No. 528,777

Int. Cl.² B60L *9/04*

U.S. Cl. 191—2 **10 Claims**



1. An apparatus for detecting differences in polarity between a pair of separate conductors and changing the polarity of one such conductor so as to make both conductors of the same polarity which comprises means for selectively applying the same and different electrical polarities to the conductors, amplifying means and first relay means, means in contact with both such conductors and actuatable when they are of different polarities to impose a potential difference across said amplifying means, said amplifying means producing an amplified potential to operate said first relay means when said potential difference is impressed across it and means coupled to said first relay means for reversing the polarity of one of the conductors so as to make them both of the same polarity.

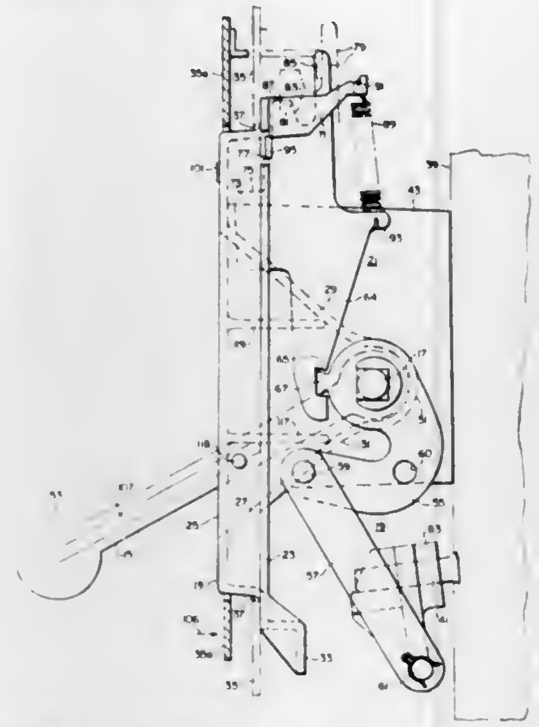
4,034,169
ELECTRIC SWITCHGEAR DEVICE WITH INTERLOCKING HANDLE MEANS

Donald D. Armstrong, Pittsburgh, Pa., and John R. Wilson, Darien, Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1975, Ser. No. 612,525

Int. Cl.² H01H *9/22*

U.S. Cl. 200—50 A **8 Claims**



1. A handle mechanism for use with a circuit interrupter located within a metal enclosed control center, comprising a cabinet providing a compartment, a circuit interrupter within the compartment and having an operator for actuating the interrupter between open and closed positions, an access door to the compartment on the cabinet and having an opening therein, a handle mounting member in the compartment having a recess therein and extending through said opening, a pivot shaft journally mounted in the compartment and extending through said recess, a handle fixedly mounted on the pivot shaft and operatively connected to the operator and comprising a lever and a link, the lever being fixedly mounted on the pivot shaft, and the link being attached to the lever and to the operator.

4,034,170
ELECTRICAL TRANSFER SWITCHING APPARATUS HAVING DOOR INTERLOCK AND PLURAL SWITCH INTERLOCK

Rodney Dean Raabe, and Ardie Reinhard Dittberner, both of Mankato, Minn., assignors to General Electric Company, New York, N.Y.

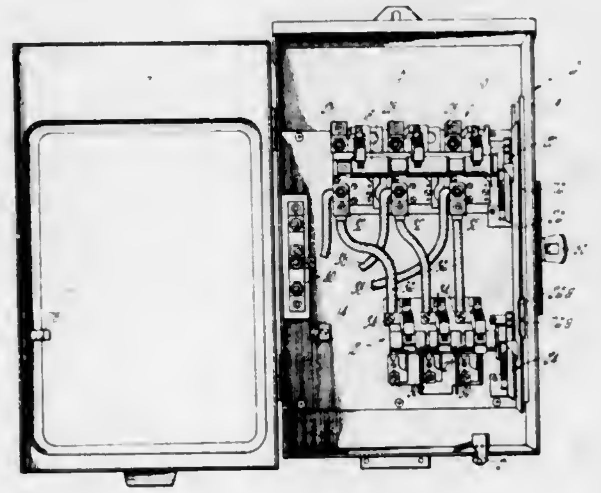
Filed Jan. 21, 1976, Ser. No. 651,044

Int. Cl.² H01H *9/20*

U.S. Cl. 200—50 A **7 Claims**

1. Transfer switching apparatus for switching an electrical load between alternative sources of electrical power, said transfer switching apparatus comprising, in combination:

A. an enclosure;
B. a first switch mounted within said enclosure and having a first rotary operating mechanism;
C. a first pin carried eccentrically by said first operating mechanism;
D. a second switch mounted within said enclosure and having a second rotary operating mechanism;
E. a second pin carried eccentrically by said second operating mechanism;
F. an elongated slide mounted within said enclosure for longitudinal reciprocating motion through an intermediate neutral position; and
G. means forming in said slide first and second L-shaped slots in which said first and second pins are respectively accommodated, each said slot including a longitudinally extending slot segment and a transversely elongated slot segment.
   1. with said slide in its neutral position, said first and second pins being located in said transverse slot segments of their associated first and second slots and said first and second switches being in their OFF conditions,
   2. upon movement of said slide from its neutral position in one direction, said first pin moves solely in its transverse slot segment causing rotation of said first rotary operating mechanism to convert said first switch to its ON condition, while said second pin moves out of its transverse slot segment and through its longitudinal slot segment to idle said second operating mechanism leaving said second switch in its OFF condtion, and



   3. upon movement of said slide from its neutral position in the opposite direction, said second pin moves solely in its transverse slot segment causing rotation of said second rotary operating mechanism to convert said second switch to its ON condition, while said first pin moves out of its transverse slot segment and through its longitudinal slot segment to idle said first operating mechanism leaving said first switch in its OFF condition.

3. The transfer switching apparatus defined in claim 1, which further includes:

A. a door for said enclosure;
B. a catch carried by said door; and
C. means carried by said slide engaging said catch to preclude opening said door while slide is in any position other than its neutral position.

4,034,171
MEANS FOR ENERGIZING A COLOR TELEVISION PICTURE TUBE DURING MANUFACTURE

Armando V. Marino, Chicago, and Albert Sora, River Forest, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

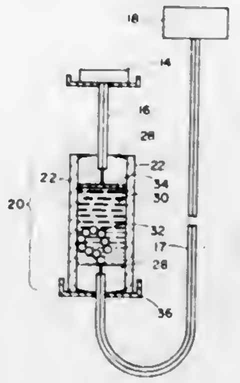
Filed Sept. 30, 1976, Ser. No. 728,333

Int. Cl.² H01H *35/02*

U.S. Cl. 200—51 R **1 Claim**

1. For use in the manufacture of a color television picture tube having an envelope containing an electron gun assembly and a base attached to a neck of said envelope, said base having electrically conductive pins connected to elements of said electron gun assembly wherein a first of said pins on said base carries a relatively high focus potential of many kilovolts and a second of said pins carries a substantially higher main focus lens potential, a means for energizing said tube during manufacture comprising:

a socket for coupling with said base on said tube wherein said socket has a lead attached to a source of high potential, said lead being characterized by having a switch comprising:
an electrically nonconductive casing filled with a dielectric fluid,
an electrically conductive contact plate within said electrically nonconductive casing, said contact plate being connected to said socket by a first wire, and
an electrically conductive chain within said electrically nonconductive casing, said chain having a first end connected to said high potential source by a second wire, said second end being free within said electrically nonconductive casing and said chain being sufficiently long to contact said contact plate, said chain contacting said contact plate when said casing is in a first position wherein said socket is coupled to said base, and
means for supporting said switch in an inverted position after said socket is decoupled from said base of said tube to cause said chain to fall away from said contact plate and thus de-energize said socket.



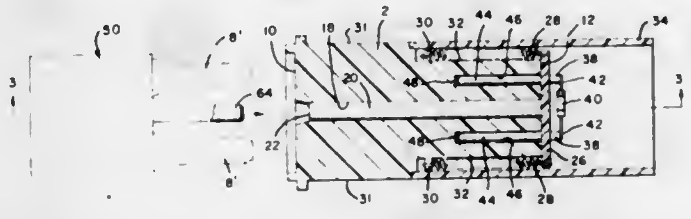
4,034,172
HIGH VOLTAGE CONNECTOR WITH CROW BAR

Douglas Wade Glover, Harrisburg; Jan Philip Askman, Carlisle, and Henry Otto Herrmann, Jr., Mount Joy, all of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Mar. 19, 1976, Ser. No. 668,356

Int. Cl.² H01R *33/30*

U.S. Cl. 200—51.1 **4 Claims**



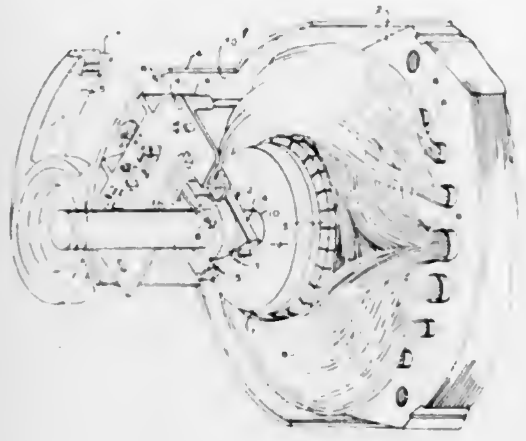
1. A connector for mixed voltage signals with an auxiliary positive disablement of dangerous high voltage, comprising:

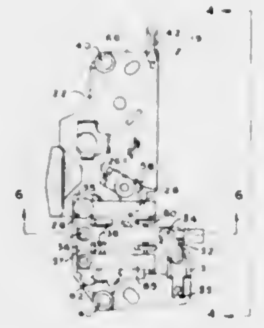
a first connector block having a plurality of electrical receptacles recessed within protruding insulative sleeves,
a second connector block having a plurality of cavities matingly receiving said insulation sleeves therein,
electrical conductors projecting into said cavities and secured to male electrical contacts for pluggable connection to said electrical receptacles,
said second electrical connector block having a dielectric piston slidably mounted in a piston chamber and having a pair of conductive shorting rods engaging two of said male electrical contacts thereby connecting them together electrically,
said first connector block having a projecting dielectric plunger insertable in said piston chamber for displacing said piston and disengaging said shorting rods from said corresponding male contacts prior to pluggable connection of said male contacts and said receptacle contacts but after receipt of said sleeves in said cavities.

4,034,173
CENTRIFUGAL ACTUATED ELECTRIC MOTOR SWITCH STRUCTURE

William D. Crow; Thomas V. Ottersbach, and Eugene F. Hildebrandt, all of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed June 18, 1975, Ser. No. 587,822
Int. Cl.² H01H *35/10, 1/28*
U.S. Cl. 200—80 R 15 Claims



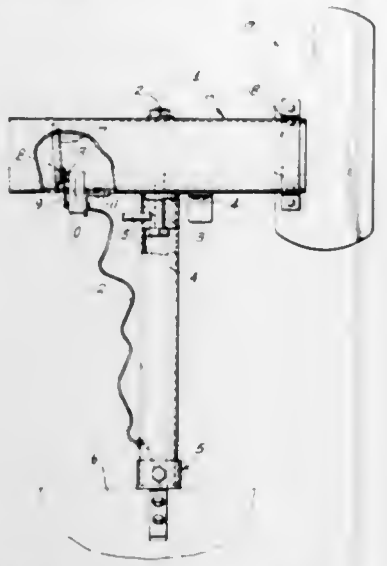


11. In an electric motor having a stator assembly and a rotor assembly, said rotor assembly including a shaft, said stator assembly including a plurality of windings, the selective energization of said windings being utilized to generate a force for rotating said rotor assembly, and a centrifugal actuator mounted to said shaft including at least a part movable relative to said shaft, the improvement which comprises a terminal board for electrically interconnecting said windings to a source of power, said terminal board having a switch assembly attached to it, said switch assembly adapted to interconnect respective ones of said windings to a source of power, said switch assembly comprising conductive means, said conductive means including a base portion, a first conductive member extending outwardly from said base portion, a second conductive member extending outwardly from said base portion, and means responsive to part movement of said centrifugal actuator for alternately engaging and releasing said conductive members, said engaging and releasing means comprising a switch arm having a first end and a second end, said second end being adapted to abut said actuator in at least one position of said switch assembly, said switch arm having a non-conductive body part including means for alternately engaging and releasing said conductive members, release of said conductive members causing electrical energization of the released conductive member, the force applied to said conductive member during energization being independent of any force applied by and to said engaging and releasing means.

4,034,174
WIND WARNING DEVICE

Talmadge W. McCord, Mountain Crest, Guntersville, Ala. 35976

Filed June 2, 1975, Ser. No. 582,697
Int. Cl.² H01H *35/40*
U.S. Cl. 200—81.9 R 10 Claims



1. A wind warning device comprising:

a. supporting means;

b. a wind tube rotatably mounted on said supporting means for the passage of wind therethrough;

c. means for directing said wind tube to receive wind of any direction;

d. means within said wind tube for responding to said wind;

e. means for resiliently biasing said responding means to a first position, and

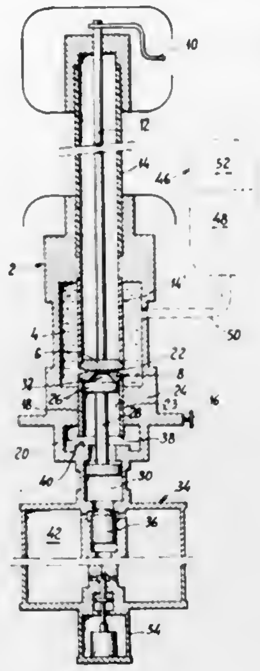
f. switching means connected to said responding means for changing a circuit condition in response to motion of said responding means away from said first position, whereby any wind providing sufficient force within said wind tube to displace said responding means by overcoming bias provided by said resilient biasing means causes said switching means to change said circuit condition.

4,034,175
PROTRACTED-BLAST ELECTRIC CIRCUIT-BREAKER FOR ALTERNATING CURRENTS

Jean Louis Gratzmuller, 66, Boulevard Maurice Barres, Neuilly-sur-Seine, France (92200)

Filed Aug. 18, 1975, Ser. No. 605,428
Claims priority, application France, Aug. 27, 1974, 74.29200; July 11, 1975, 75.21809
Int. Cl.² H01H *33/68*
U.S. Cl. 200—150 R 10 Claims

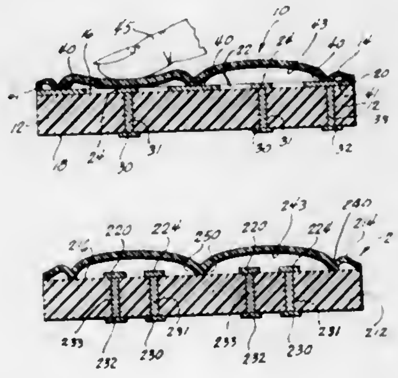
1. An electric circuit-breaker for alternating currents: in which the arc extinction chamber containing the fixed and moving contacts is filled with a liquid dielectric consisting of liquefied SF6 gas under pressure; in which, when the circuit-breaker is in the switched-in position, the moving contact bears against the fixed contact solely by axial pressure exerted by thrust-exerting actuating means; and in which said moving contact has an axial passage therethrough which forms a nozzle for centripetal blasting of the liquid dielectric having port adjacent to and between the contacts; said circuit-breaker being characterized in that the moving contact is supported by a first piston which cooperates with a second coaxial or blast piston, the two said pistons sliding one within the other and the assembly formed by said coaxial pistons being slidable within a bore formed through the end-face of the arc extinction chamber; in that each of the pistons has one face in contact with the dielectric under pressure contained in the arc extinction chamber; in that said assembly is controlled by said actuating means and in that stop means limit the travel of the first piston to less than the travel of the second piston; whereby the blast process is prolonged beyond the instant at which the moving contact supported by the first piston reaches its position of maximum spacing from the fixed contact.



4,034,176
MEMBRANE SWITCH APPARATUS

Willis August Larson, Mequon, Wis., assignor to Magic Dot, Inc., Minneapolis, Minn.

Filed June 11, 1975, Ser. No. 585,773
Int. Cl.² H01H *13/70*
U.S. Cl. 200—159 B 6 Claims



1. A membrane switch apparatus comprising:

a nonconductive substrate having a planar first surface and an opposite second surface;

first contact means supported on said first surface and comprising a conductive sheet supported on said first surface and having a plurality of apertures formed therein to expose portions of said first surface;

second contact means supported on said first surface laterally spaced from and electrically insulated from said first contact means and comprising at least one contact supported on said first surface within each of said apertures;

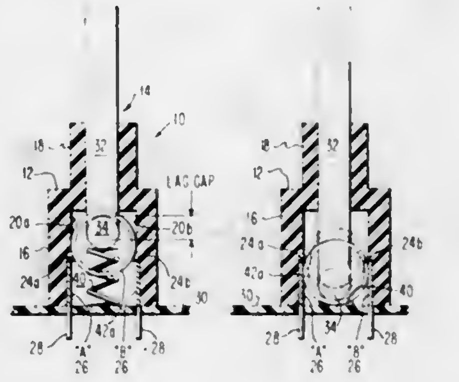
flexible membrane means comprising a substantially planar sheet having electrically conductive bridging means formed thereon for selectively providing an electrical connection between said first and second contact means upon deflection, said connductive mens extending adjacent said first and second contact means, said membrane means being supported from said first surface and having a plurality of discrete projections integrally formed therein for maintaining said membrane means in a normally spaced relation with at least one of said first or second contact means and supporting said membrane means on said first contact means and spaced from said second contact means, whereby portions of said membrane may be selectively depressed to electrically couple selected ones of said contact means with said first contact means; and

means for electrically coupling said first and second contact means to an electrical circuit.

4,034,177
PLUNGER-ACTUATED, LOST MOTION SWITCH WITH TACTILE FEEDBACK

Dewey M. Sims, Jr., Westland, Mich., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 19, 1976, Ser. No. 743,240
Int. Cl.² H01H *13/52*
U.S. Cl. 200—159 R 9 Claims



1. An electrical switch of the class suitable for use in keyboards or the like comprising:

a dielectric switch housing defined by a hollow integral body having first and second pairs of opposed interior walls formed therein and further having an external aperture in communication with the hollow portion of said integral body;

a dielectric base surface supporting said switch housing;

a dielectric plunger defined by a shaft disposed for reciprocal motion within said external aperture and an actuator arm formed integrally with one end of said shaft and disposed within the hollow portion to have its opposed ends adjacent said first pair of opposed interior walls;

terminal means disposed on each of said second pair of opposed interior walls proximate said base surface;

biasing means for urging said plunger toward a rest position distal from said base surface;

electrically conductive annular means, dimensioned and disposed to freely encircle the ends of said actuator arm and to frictionally bear against said second pair of opposed interior walls, for defining a conductive path between said terminal means, whereby the conductive path is effected when said actuator arm is caused to travel against said biasing means from its rest position to a lowermost position proximate said terminal means and the conductive path continues effected until said actuator arm has traversed an initial distance from its lowermost position toward its rest position through a lost motion relation between said plunger and said annular means; and

threshold means disposed on each of said second pair of opposed interior walls for interferring with the travel of said annular means to provide a force threshold for the passage of said actuator arm between its rest position and its lowermost position.

4,034,178

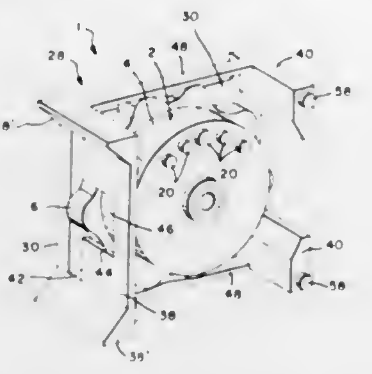
ROTARY SWITCH HOUSING HAVING INTEGRAL FLEXIBLE DETENTING WALLS AND ROTOR MOUNTING STRUCTURE

Gary Jay Koppenheffer, and William Henry Rose, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Continuation-in-part of Ser. No. 621,173, Oct. 9, 1975, abandoned. This application June 2, 1976, Ser. No. 692,174

Int. Cl.² H01H *9/02, 21/00, 19/00*

U.S. Cl. 200—293 3 Claims



1. In a rotary switch having moveable electrical contacts mounted on a rotor provided with radially projecting levers and a housing substantially enclosing the rotor and contacts, and the housing enclosing detent means engageable on said rotor, the improvement comprising:

said housing and said detent means being fabricated in one piece from a dielectric material,

said housing having a base wall rotatably supporting said rotor and a plurality of sidewall portions integral with and projecting outwardly of said base wall,

said detent means comprising a pair of elongated and relatively thin and resilient web portions each integrally joined at opposite ends to opposed ones of said sidewall portions,

said web portions extending between said opposite ones of said sidewall portions and resiliently engaging selected levers of said rotor which is disposed between said web portions,

said base wall having therein slots extending lengthwise of said web portions for formation of said web portions in spaced relationship from said base wall, and

axle means rotatably mounting said rotor on said base wall.

4,034,179

METHOD OF MULTIPLE ELECTRODE GAS SHIELDED ARC WELDING

Fusao Koshiga, Kawasaki; Jinkichi Tanaka, and Itaru Watanabe, both of Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

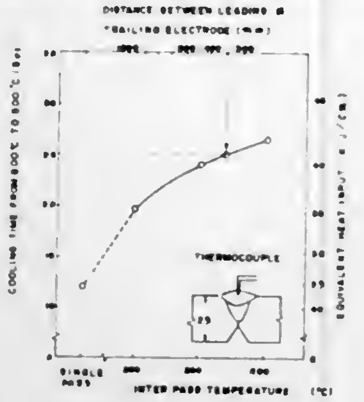
Filed Nov. 17, 1975, Ser. No. 633,020

Claims priority, application Japan, Nov. 26, 1974, 49-135181

Int. Cl.² B23K *9/16*

U.S. Cl. 219—74 9 Claims

1. A method of multiple electrode gas shielded arc welding comprising the steps of: mixing gases of at least one inert gas and at least one active gas as shielding gas, and selecting the active gas content of shielding gas fed to leading electrode means so as to differ from the active gas content of shielding gas fed to trailing electrode means.



4,034,180

METHOD OF CONTINUOUSLY SOLDERING SMALL ELEMENTS ARRANGED GENERALLY IN A LINE BY A CONCENTRATED RADIANT ENERGY SOURCE

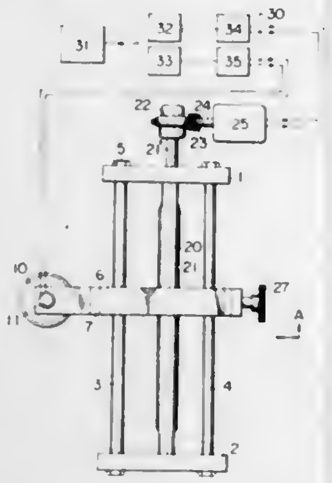
Toshihiko Kobayashi, Mitaka; Tetsusaburo Kanbayashi, Niiza; Satoshi Ichioka; Shinjiro Takeuchi, both of Toda, and Yukinori Matsushima, Tokyo, all of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Tokyo and Mishima Kosan Co., Ltd., both of, Japan

Continuation of Ser. No. 367,181, June 5, 1973, abandoned. This application May 28, 1975, Ser. No. 582,412

Claims priority, application Japan, June 10, 1972, 47-58077

Int. Cl.² B23K *3/04*

U.S. Cl. 219—85 BM 1 Claim



1. In a method of successively soldering small elements arranged generally in a line by means of a substantially circular concentrated radiant beam source by successive heating of a region having a length equal to that of the line and a narrow width, the improvement comprising the steps of:

intermittently moving said source along the line by predetermined increments;

operating said source only while movement of said source along said line is stopped to apply radiant energy to the elements in successive circular heating zones along said line;

interrupting operation of said source to interrupt application of said radiant energy to said elements while said source is moved along said line; and

controlling the movement of said source along said line, as a function of the length of time of operating said source to apply said radiant energy and of the current of said source, such that the length of each said predetermined increment of movement is less than the diameter of said circular heating zones, and thereby partially overlapping said circular heating zones along said line.

4,034,181

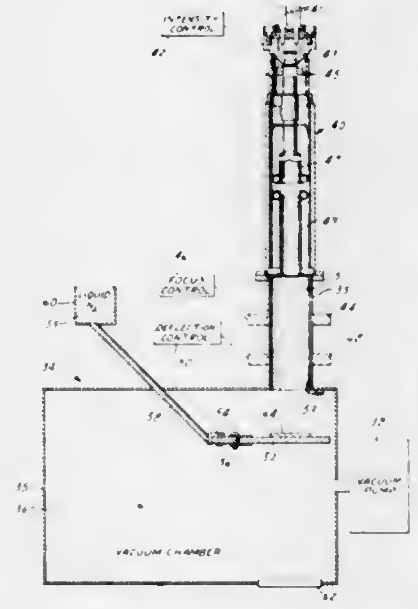
ADHESIVE-FREE PROCESS FOR BONDING A SEMICONDUCTOR CRYSTAL TO AN ELECTRICALLY INSULATING, THERMALLY CONDUCTIVE STRATUM

James R. Packard, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 281,969, Aug. 18, 1972, abandoned. This application Jan. 8, 1975, Ser. No. 539,503

Int. Cl.² B23K *15/00*

U.S. Cl. 219—121 EM 3 Claims



1. An adhesive-free process for forming a light resonant cavity and transparent heat sink suitable for use in an electron beam laser consisting of the following steps:

providing a crystal of a direct band-gap semiconductor having two major broad and plano-parallel faces and a thickness therebetween not greater than approximately 60 micrometers,

forming on a block of a thermally-conductive electrical insulator material selected of either quartz or sapphire a corresponding major broad and substantially planar surface,

positioning a major broad surface of the crystal in contact with the major broad surface of the insulator material,

bombarding the breadth of the opposite major broad surface of the crystal with a swept and pulsed electron beam for a total duration of approximately 15 minutes, said beam having an energy of approximately 40 keV, a beam current of approximately 4 ma and a beam diameter of approximately 50 μm, being swept at a rate of approximately 100 meters/sec over a raster containing approximately 125 lines and being pulsed at a rate of approximately one pulse every 5 microseconds, with each pulse lasting approximately 50 nanoseconds to allow heat produced at a given location in the crystal as the result of a given pulse to be dissipated into the crystal and insulating material during the period between pulses and during the period while the beam is scanned over the remainder of the crystal to avoid appreciable increases in the bulk temperature of the crystal and to ensure that the uniformity of laser characteristics of the crystal are not impaired, a uniform bond thereby being produced over substantially the entire area of the contacted surfaces of the crystal and insulator material without the application of external heat or pressure such that when the bonded crystal and insulator material are utilized in a said electron beam laser, heat generated as a result of electron bombardment during the laser emission is dissipated into the heat sink, enabling the lasing crystal to be in thermal equilibrium such that lasing threshold and wavelength of laser emission is the same over all portions of the crystal.

4,034,182

METHOD OF FABRICATING RINGS FROM SEPARATE SEGMENTS AND FIXTURE FOR USE THEREWITH

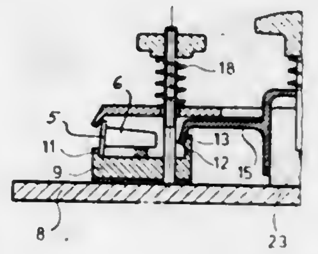
Werner Schlosser, Munich, and Horst Berger, Lochham, both of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Dec. 17, 1974, Ser. No. 533,587

Claims priority, application Germany, Dec. 21, 1973, 2363722

Int. Cl.² B23K *15/00*

U.S. Cl. 219—121 EM 7 Claims



1. A method of fabricating self-supporting rings of a particular diameter by welding together separate segments, comprising the steps of:

a. making segments of a size including an allowance for shrinkage so that when the segments are assembled they form a complete ring having a diameter larger than the particular diameter,

b. arranging the individual segments into the shape of a ring within a fixture and without first bonding together any of the segments, the successive segments of the ring being in abutting relationship and the ring being supported only by the fixture,

c. placing the ring and fixture into a vacuum chamber,

d. joining the segments to one another by welding their abutting surfaces together, using an electron beam, without removing the ring from the vacuum chamber until all the segments have been welded,

e. urging all the segments of the ring radially inwardly during the welding operation, and

f. separating the ring from the fixture.

4,034,183

PROCESS FOR THE PRODUCTION OF PLANOGRAPHIC PRINTING FORMS BY MEANS OF LASER BEAMS

Fritz Uhlig, Wiesbaden, Germany, assignor to Hoechst Aktiengesellschaft, Germany

Filed Oct. 8, 1975, Ser. No. 620,756

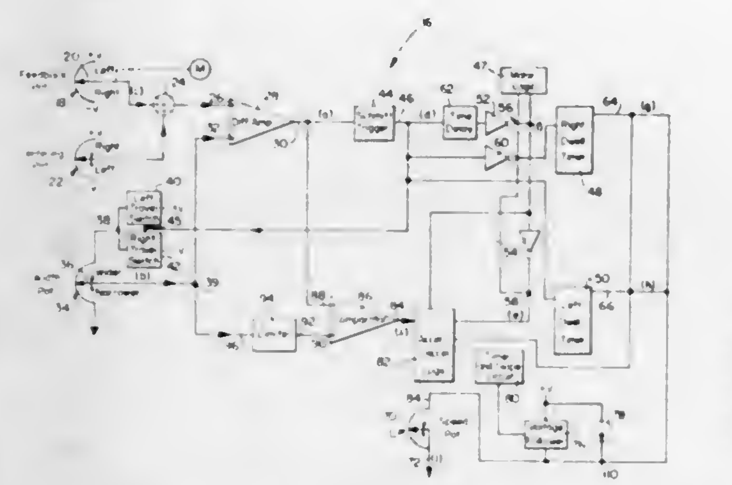
Claims priority, application Germany, Oct. 10, 1974, 2448325

Int. Cl.² B23K *9/00*

U.S. Cl. 219—122 LM 8 Claims

1. In the process for the production of a planographic printing form in which a carrier coated with a hydrophilic layer composed of a non-light-sensitive compound is imagewise exposed, the improvement comprising imagewise exposing the layer to laser radiation of an intensity and for a period such that the exposed areas are rendered hydrophobic and oleophilic, whereby the printing form obtained may be used for printing in a planographic printing machine without further treatment.

4,034,184
WELDING TORCH OSCILLATOR CONTROL SYSTEM
Robert C. Fernicola, Florence, S.C., assignor to Union Carbide Corporation, New York, N.Y.
Filed June 30, 1975, Ser. No. 592,098
Int. Cl.² B23K *9/10*
U.S. Cl. 219—124 **13 Claims**



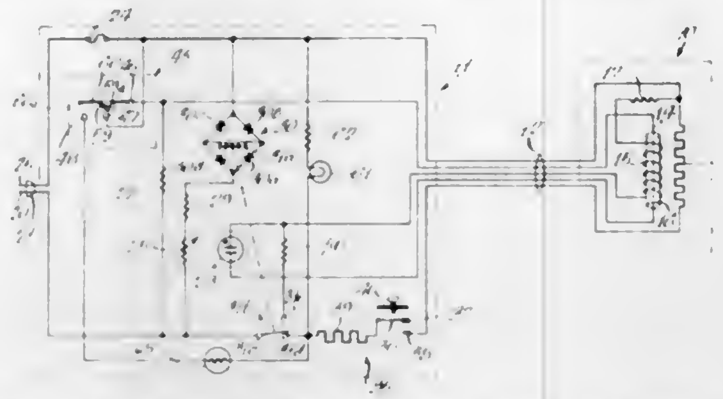
1. A welding torch oscillator control system including a drive motor, means for rectilinearly reciprocating said torch in response to rotation of said drive motor, and an oscillator circuit for alternately varying the direction of rotation of said drive motor, said oscillator circuit comprising:

- first means for providing a DC reference potential the polarity of which is representative of the direction of torch travel;
- second means responsive to the rotation of said motor for providing an output signal which varies from a predetermined DC potential of one polarity to another predetermined DC potential of opposite polarity;
- third means coupled to said first and second means for providing a control signal having a polarity responsive to the difference between said DC reference potential and said varying output signal;
- switching means coupled to said first and third means for reversing the polarity of said DC reference potential upon the occurrence of a change in polarity in said control signal;
- motor speed circuit means for controlling the speed of said drive motor;
- fourth means coupled to said first and third means for providing a speed adjustment signal in each stroke at a predetermined instant proportional to when said control signal equals said DC potential; and
- deceleration control means responsive to the occurrence of said speed adjustment signal for decreasing the current in said motor speed circuit means at a predetermined rate until substantially zero current flows in said circuit.

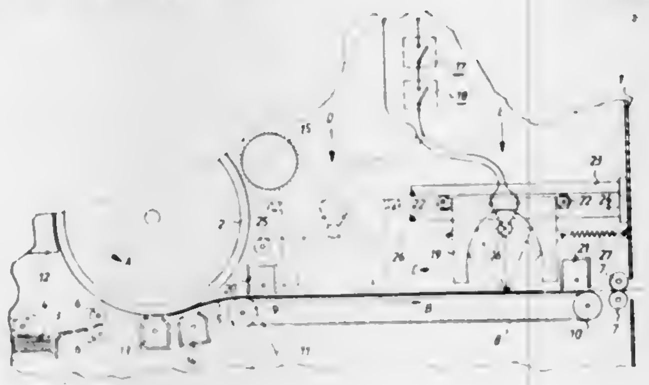
4,034,185
ELECTRIC BLANKET CONTROL CIRCUIT
George C. Crowley, Winnetka, Ill., assignor to Northern Electric Company, Chicago, Ill.
Filed Sept. 2, 1975, Ser. No. 609,243
Int. Cl.² H02H *1/02;* **H05B** *3/34*
U.S. Cl. 219—212 **15 Claims**

1. An overheat protection circuit for an electric blanket having a heating means and a sensing means to detect an overheat condition comprising switch means to electrically activate said heating means; said switch means having at least two mechanically stable positions; circuit means to electrically simulate an overheat condition; and said simulating circuit means activated each time said switch means is switched to one of its said stable positions.

12. An overheat protection circuit for an electric blanket having a heat means and a sensing means to detect an overheat condition comprising deactivation circuit means electrically connected to said sensing means and including switch means to deactivate said heating means when an overheat condition is detected; a fuse separate from said sensing means connected in circuit with said heating means; and testing means connecting said switch means and said fuse in series across the input voltage source whereby said fuse will break down if said switch means has malfunctioned to test for a malfunction in said deactivation circuit means.

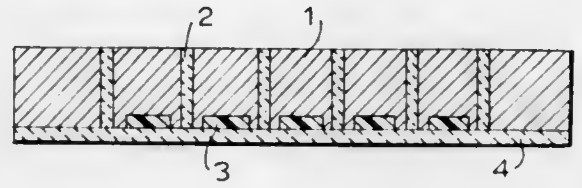


4,034,186
METHOD AND ARRANGEMENT FOR PREVENTING SHEETS FROM CHARRING IN COPYING MACHINES
Friedrich Bestenreiner, Grunwald, and Dieter Giglberger, Unterhaching, both of Germany, assignors to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Germany
Filed Mar. 10, 1976, Ser. No. 665,382
Claims priority, application Germany, Mar. 15, 1975, 2511424
Int. Cl.² H05B *1/00;* **G03G** *15/20*
U.S. Cl. 219—216 **12 Claims**



1. In an electro-photographic copier of the type wherein an image is formed on an image-carrying sheet and is thereafter fixed by subjecting the sheet at a fixing station to the influence of heat, a combination comprising heating means at said station for fixing an image on a sheet; and means for moving said heating means relative to a sheet located in said station at a predetermined speed sufficient to permit said heating means to fix the image on the sheet and also to prevent charring of the latter.

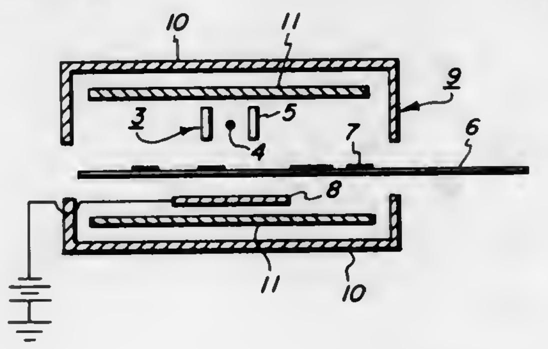
4,034,187
THERMAL PRINTING HEAD
Tatsuyuki Tomioka, Hirakata; Noboru Yukami, Kawanishi; Yoshi Hamaguchi, and Kiyoharu Yamashita, both of Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Filed Sept. 15, 1975, Ser. No. 613,463
Claims priority, application Japan, Sept. 18, 1974, 49-108240; Oct. 17, 1974, 49-120131
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **1 Claim**



1. A thermal printing head of the silicon planar type which comprises a silicon substrate having a generally flat substantially unbroken surface for being brought into contact with a thermosensitive paper;

- a plurality of heat-generating layer elements which are provided in the silicon substrate, each heat-generating layer having an electrical resistivity;
- heat-insulation portions of silicon dioxide extending through the thickness of the substrate around each heat-generating layer element whereby the domains surrounded by the heat-insulation portions constitute heat-generating elements, the heat-insulation portions preventing heat which is generated from the heat-generating elements; and
- a plurality of electrodes connected to the heat-generating elements for energizing them.

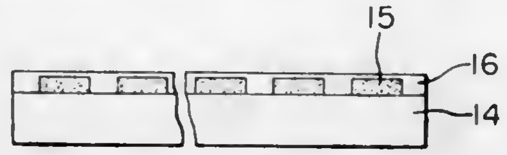
4,034,188
HEAT FIXING DEVICE FOR COPYING MACHINE
Koichi Takiguchi, Ebina, Japan, assignor to Rank Xerox, Ltd., London, England
Filed May 24, 1976, Ser. No. 689,294
Claims priority, application Japan, July 31, 1975, 50-092561
Int. Cl.² H01B *1/00;* **C03G** *15/20*
U.S. Cl. 219—216 **3 Claims**



1. Fuser apparatus for fixing toner images to support body, said apparatus comprising:

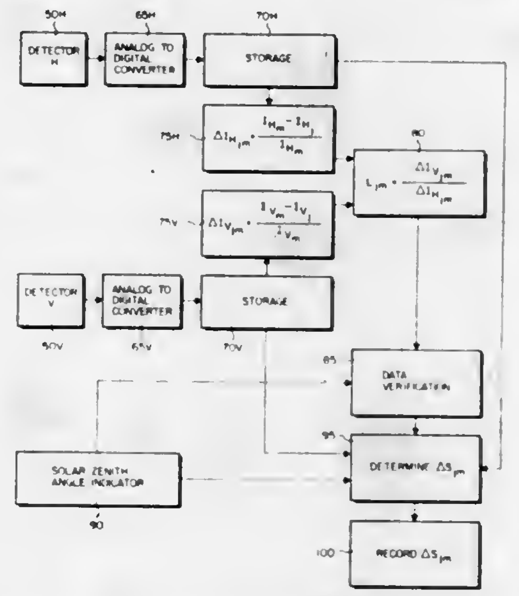
- a source of thermal energy for causing the toner forming said images to coalesce and become tacky; and
- means interposed between said source of thermal energy and said support body for improving the efficiency of heat transfer from said thermal energy source to said toner, said means for improving a heat transfer efficiency comprising: a corona discharge device.

4,034,189
DEVICE FOR HEAT FIXATION
Hisashi Sakamaki, Yokohama, and Toshiyuki Ohtani, Tokyo, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed May 30, 1975, Ser. No. 582,296
Claims priority, application Japan, June 4, 1974, 49-63217
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **4 Claims**



1. In a heat fixing device for fixing an electrophotographic image developed with a developer containing a toner composition onto a copy material comprising a heating member having a heat resistant insulating support and a heat generating member on said support, the improvement for protecting the heat generating member, preventing the buildup of developer and minimizing friction and abrasion between the heat fixing device and the copy material comprising a heat resistant, thin film coating having a film thickness up to about 30 microns for said heating member overlying said heat generating member.

4,034,190
METHOD AND APPARATUS FOR REMOTE SALINITY SENSING
Peter G. White, Palos Verdes Peninsula, Calif., assignor to TRW Inc., Redondo Beach, Calif.
Filed Mar. 15, 1974, Ser. No. 451,391
Int. Cl.² G01V *1/28*
U.S. Cl. 235—151.3 **21 Claims**


50H
DETECTOR H
65H
ANALOG TO DIGITAL CONVERTER
70H
STORAGE
75H
$\Delta I_{H_{jm}} = \frac{I_{H_m} - I_{H_j}}{I_{H_m}}$
80
$L_{jm} = \frac{\Delta I_{V_{jm}}}{\Delta I_{H_{jm}}}$
75V
$\Delta I_{V_{jm}} = \frac{I_{V_m} - I_{V_j}}{I_{V_m}}$
DETECTOR V
ANALOG TO DIGITAL CONVERTER
STORAGE
50V
65V
70V
85
DATA VERIFICATION
95
DETERMINE ΔS_{jm}
SOLAR ZENITH ANGLE INDICATOR
90
100
RECORD ΔS_{jm}

1. In a method of remotely determining the degree of salinity of water at a specified point at the surface of a body thereof, the steps of:

- a. electro-optically generating a first data signal representative of a first value, corresponding to the intensity of at least a finite wavelength band of the horizontally-polarized component of sunlight specularly reflected from a solar glitter pattern at the specified point;
- b. electro-optically generating a second data signal representative of a second value, corresponding to the intensity of at least a finite wavelength band of the horizontally-polarized component of sunlight specularly reflected from the solar glitter pattern at another point;
- c. electro-optically generating a third data signal represen-

tative of a third value, corresponding to the intensity of at least a finite wavelength band of the vertically polarized component of sunlight specularly reflected from the solar glitter pattern at the specified point;
d. electro-optically generating a fourth data signal representative of a fourth value, corresponding to the intensity of at least a finite wavelength band of the vertically polarized component of sunlight specularly reflected from the solar glitter pattern at the other point;
e. electronically operating on said first data signal and said second data signal to compute a first difference between the first value and the second value;
f. electronically operating on said third data signal and said fourth data signal to compute a second difference between the third value and the fourth value;
g. electronically computing a first ratio of said first difference to said first value;
h. electronically computing a second ratio of said second difference to said third value; and
i. electronically computing an empirical reference factor, defined as the ratio of said second ratio to said first ratio.

4,034,191

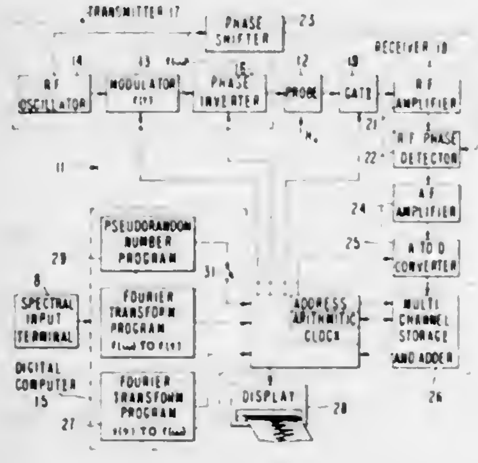
SPECTROMETER MEANS EMPLOYING LINEAR SYNTHESIZED RF EXCITATION

Barrett L. Tomlinson, Palo Alto, and Howard D. W. Hill, Cupertino, both of Calif., assignors to Varian Associates, Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 494,802, Aug. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 350,457, April 12, 1973, abandoned. This application June 19, 1975, Ser. No. 588,264

Int. Cl.² G01N *27/78;* **G01R** *33/08*

U.S. Cl. 235—151.3 **26 Claims**



1. A method of obtaining a RF resonance spectra of a sample of matter comprising the steps of irradiating said sample of matter with RF excitation to excite resonance of a spectrum of resonance line simultaneously within the sample, detecting said excited resonance lines and reading out said detected lines, wherein said irradiation step includes irradiating the sample with a spectrum of RF radiation of nonuniform spectral power density in or near the frequency region of the resonance line spectrum to be excited.

4,034,192

NUMERICAL CONTROL SYSTEM HAVING A SYMMETRICAL PATH GENERATION MEANS

Hajimu Kishi, and Fumio Onoda, both of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

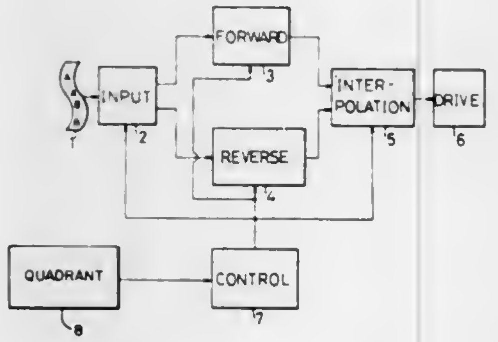
Filed Dec. 5, 1975, Ser. No. 637,971

Claims priority, application Japan, Dec. 13, 1974, 49-142472

Int. Cl.² G05B *19/24*

U.S. Cl. 235—151.11 **3 Claims**

1. A system generating symmetrical paths for numerical control, characterized in that the system comprises (1) an input medium for numerical control, said input medium carrying positional information convertible into increments in a device, and instruction information, said instruction information including sets of instruction blocks, each set of instruction blocks being adapted to continue the function of one instruction until another instruction interrupts the function of said one instruction, said instruction information being so edited as to apply one instruction to the first block and the last block of that set of instruction blocks, which set is to continue the function of said one instruction; (2) an input means reading the input medium both in the forward and reverse directions; (3) a circuit producing forward-interpolating-information from the input medium information for forwardly moving along a path as defined by each instruction block; (4) a circuit producing reverse-interpolating-information from the input medium information for reversely moving along a path as defined by each instruction block; (5) an interpolating circuit producing pulse series from the interpolating information; (6) a circuit driving various shafts of a machine tool in response to the pulse series; and (7) a symmetrical path control circuit which controls whether the input means reads the input medium forwardly or reversely, which one of the forward-interpolating-information producing circuit and the reverse-interpolating-information producing circuit should operate, and whether the interpolating circuit reverses the moving direction in each axis or not; whereby, in case of generating the path as defined by the input medium information, the input medium is read forwardly, forward-interpolating-information is produced, and the pulse series are produced without changing the moving direction in any axis; in case of generating a path which is axially symmetrical with the path as defined by the input medium information relative to a line parallel to one axis of coordinates, the input medium is reversely read, reverse-interpolating-information is produced, and the pulse series are produced while reversing the moving direction in the other axis of the coordinates; and in case of generating a path which is symmetrical with the path as defined by the input medium information relative to a point, the input medium is forwardly read, forward-interpolating-information is produced, and pulse series are produced while reversing the moving direction in each axis of the coordinates.



4,034,193

ELECTRONIC ACCESS CONTROL SYSTEM

James J. Jackson, Westbrook, Conn., assignor to Veeder Industries, Inc., Hartford, Conn.

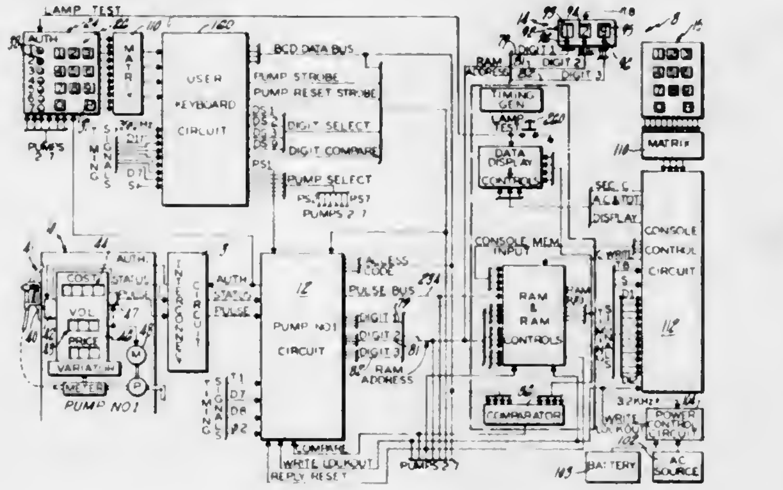
Filed Aug. 21, 1975, Ser. No. 606,416

Int. Cl.² G06F *15/24;* **B67D** *5/14*

U.S. Cl. 235—151.34 **32 Claims**

1. A multiple station access control and accounting system for activation and use, by a plurality of authorized users, of a plurality of separate operating stations, each adapted to be activated for predetermined use thereof and having means for generating a train of a plurality of pulses in accordance with the amount of use thereof; the users having different assigned multiple digit identifiers, each having a multiple digit memory block address code portion and a multiple digit security code portion, for activating the operating stations for use thereof;

the access control and accounting system comprising read/write memory means having an assigned multiple digit memory block for each user, corresponding to the user's assigned memory block address code, with a first multiple digit security code section for having written therein the user's assigned multiple digit security code and a second multiple digit accumulator section for accumulating a multiple digit count of the user's operating station usage; read/write memory control means selectively operable for selecting each user memory block and selectively operable for selectively reading the accumulated count of the accumulator section of the selected user memory block, for selectively incrementing the accumulated count of the selected user memory block, and for selectively writing an assigned multiple digit security code in the security code section of the selected user memory block; operating station control means for each operating station having a settable user memory block selector for operating the read/write memory control means for selecting a user memory block of the read/write memory means; controller entry means having a readout register and operable by a controller for operating the read/write memory control means for selecting each user memory block and selectively operable for operating the read/write memory control means for writing a selected multiple digit security code in the multiple digit security code section of the selected user memory block and for reading the accumulated count of the selected user memory block with the readout register; user entry means operable by each user to select an operating station and enter the user's multiple digit identifier into the access control and accounting system to set the user memory block selector of the selected operating station control means with the multiple digit memory block address code portion thereof for selecting the corresponding user memory block of the read/write memory means; and comparator means operable for comparing the security code portion of the entered user identifier with the security code stored in the selected user memory block; the selected operating station control means being operable by the comparator means to activate the corresponding operating station only if the stored and entered security codes are the same; the read/write memory control means being operable by the pulses of each operating station to increment the accumulated count in the multiple digit accumulator section of the corresponding selected user memory storage block in accordance with the number of such pulses.



4,034,194

METHOD AND APPARATUS FOR TESTING DATA PROCESSING MACHINES

David E. Thomas; Marion B. McCoy, and Michael J. Chaky, all of Seaford, Del., assignors to NCR Corporation, Dayton, Ohio

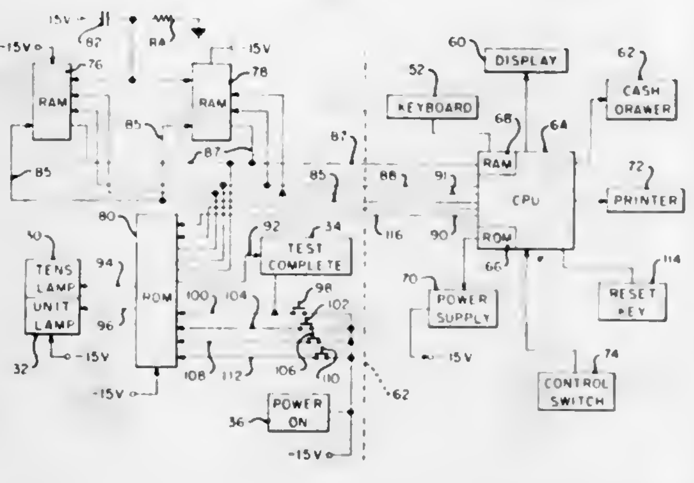
Filed Feb. 13, 1976, Ser. No. 658,135

Int. Cl.² G06F *11/04*

U.S. Cl. 235—153 AC **6 Claims**

1. A method of utilizing a test apparatus with a data processing apparatus having stored data therein, said data processing apparatus including means for recording on a record member the data stored in the apparatus, the method comprising the steps of:

a. generating a first record of the data stored in the data processing apparatus;
b. transferring the stored data from the data processing apparatus to the test apparatus;
c. conditioning the data processing apparatus for operation in a test mode;



d. transferring the stored data from the test apparatus to the data processing apparatus;
e. generating a second record of the data stored in the data processing apparatus;
f. and comparing the data on the said first and second records.

4,034,195

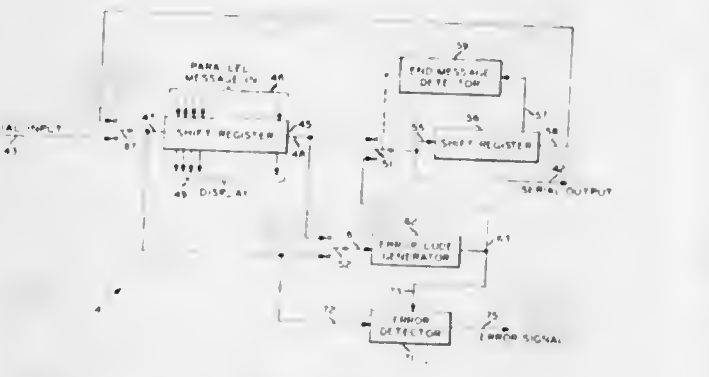
TEST APPARATUS AND METHOD

Danny E. Bates, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 22, 1975, Ser. No. 543,174

Int. Cl.² G06F *11/00;* **G08C** *25/00*

U.S. Cl. 235—153 AC **16 Claims**



1. Apparatus comprising:
a test input means for receiving serial binary data;
a test output means for transmitting serial binary data;
means for establishing a preselected binary test message representative of a computer command;
means for serially transmitting said test message from said test output means;
means for generating a first error code in response to transmission of said test message;
means for transmitting said first error code from said test output means;
means for receiving and storing a serial binary message response received by said test input means; and
means for displaying said message response.

4,034,196
DIGITAL SIGNAL PROCESSING DEVICE WITH QUANTIZER

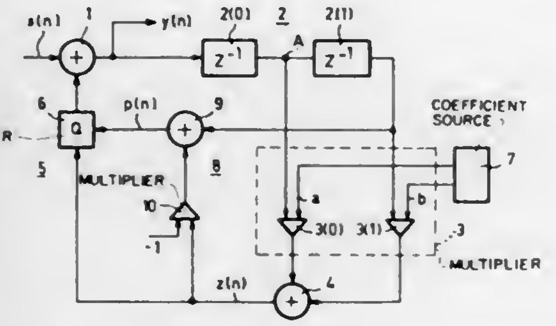
Hans-Jurgen Butterweck, Akert; Theodoor Antonius Carel Maria Claasen, Eindhoven; Wolfgang Friedrich Georg Mecklenbrauker, Eindhoven, and Johannes Bernhard Heinrich Peek, Eindhoven, all of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,183

Claims priority, application Netherlands, Nov. 14, 1974, 7414848

Int. Cl.² G06F ***7/38***

U.S. Cl. 235—156 **5 Claims**



1. A digital signal processing device comprising:

supply means for supplying a sequence of code word signals;

coefficient storage means for storing predetermined weighting coefficients;

multiplying means for multiplying ones of said code word signals by ones of said weighting coefficients and producing a sequence of output signals; and

first combination means for combining two sequences of signals from said multiplying means, and producing an output signal;

feedback means for feeding back a quantized representation of said output signals to said supply means, comprising a quantizer having a first and second input, and an output connected to said supply means, and

second combination means for combining said output signal of said digital multiplier with a sequence of code word signals from said supply means, and producing an output signal for controlling said quantizer.

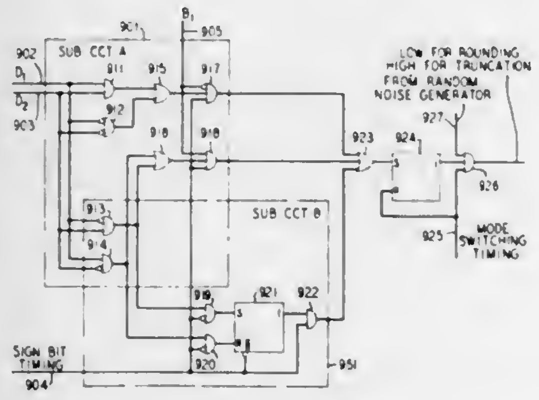
4,034,197
DIGITAL FILTER CIRCUIT

Victor Bernard Lawrence, Matawan, and Kent Vincent Mina, Colts Neck, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 30, 1976, Ser. No. 701,195

Int. Cl.² G06F ***15/34, 7/52***

U.S. Cl. 235—156 **29 Claims**



1. In a recursive digital filter including:

a. a forward path including an input terminal for receiving an input signal X(n) and an output terminal for supplying an output signal Y(n);

b. a first feedback loop including a first delay element and a first digital multiplier circuit, said first feedback loop being arranged to form a first signal given by the product $-B_1D_1(n)$, wherein

$-B_1$ = the multiplier coefficient of said first digital multiplier circuit,

$D_1(n) = Y(n-1)$,

n = the time at which a variable is sampled,

c. a second feedback loop including a second delay element and a second digital multiplier circuit, said first and second feedback loops together being arranged to form a second signal given by the product $-B_2D_2(n)$, wherein

$-B_2$ = the multiplier coefficient of said second digital multiplier circuit, and

$D_2(n) = Y(n-2) = D_1(n-1)$,

d. first means for summing said first and second signals and said input signal to form said output signal, said output signal being given by

$Y(n) = X(n) - B_1D_1(n) - B_2D_2(n)$, and

e. second means for randomly switching between rounding and truncating of at least one of said products, the improvement comprising:

f. third means operable to control said random switching means, said third means including

1. fourth means for determining the polarity relationship between $D_1(n)$ and $D_2(n)$ and the polarity of B_1,
2. fifth means for determining the magnitude relationship between $D_1(n)$ and $D_2(n)$, and
3. sixth means jointly responsive to said fourth and fifth means for selectively inhibiting said second means from truncating said at least one product.

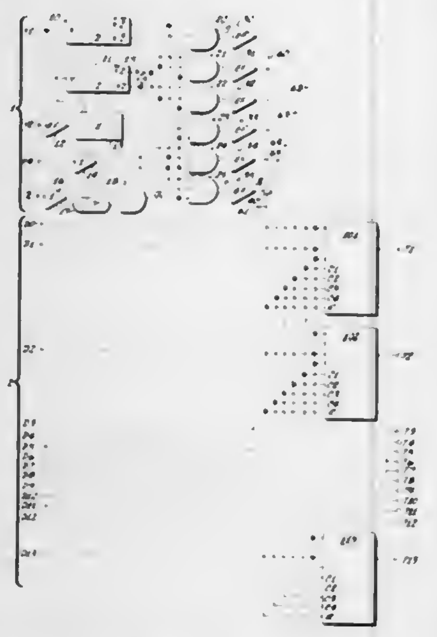
4,034,198
MULTIPLE GENERATING REGISTER

Jerry L. Kindell, Phoenix, Ariz., assignor to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Dec. 22, 1975, Ser. No. 642,845

Int. Cl.² G06F ***7/52***

U.S. Cl. 235—164 **5 Claims**



1. A multiple-generating register for generating multiples of a first binary number which is input thereto, said register comprising:

a control circuit responsive to a first control signal for generating a second control signal, said second control signal representing one of a plurality of possible multiple-generating commands; and

a plurality of logic circuits, one for each bit of said first binary number, each receiving as a first input a respective bit of sid first binary number and receiving as a second input the next lowest order bit of said first binary number, except that said logic circuit which receives as a first input the lowest order bit of said first binary number receives as a second input a zero-valued binary bit, said plurality of logic circuits generating a second binary number which is a multiple of said first binary number in response to said second control signal.

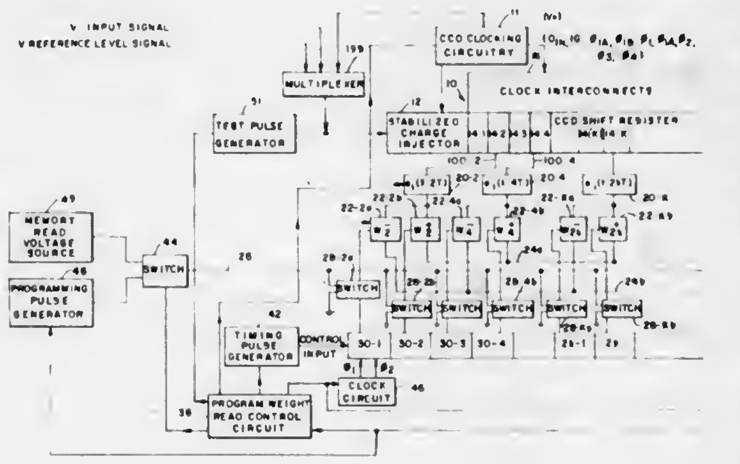
4,034,199
PROGRAMMABLE ANALOG TRANSVERSAL FILTER

Donald R. Lampe, Ellicott City; Marvin H. White, Laurel, and James H. Mims, Linthicum Heights, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 507,115, Sept. 17, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,569

Int. Cl.² G11C ***11/40;*** **H03K** ***5/159***

U.S. Cl. 235—193 **17 Claims**



5. A discrete analog signal processing system for processing an input signal in accordance with a pattern of weighting factors, said system comprising:

a. a matrix of memory elements disposed in rows and columns, each of said memory elements comprises an MNOS field effect transistor and capable of storing an analog weighting factor of the pattern and responsive to a portion of the input signal applied thereto for providing an element output indicative of the product of the stored weighting factor and the input signal portion, said matrix further comprising first sets of row and column conductors coupled to the corresponding memory elements of said matrix and means for isolating one row of said memory elements from the remaining rows thereof;

b. first converter means comprising a plurality of stages, each coupled to corresponding column conductors and responsive to the input signal for disposing sequentially a portion of the input signal at each of its stages, whereby a signal portion is applied through its corresponding column conductor to those memory elements of that column;

c. second converter means comprising a plurality of stages, each coupled to a row conductor of said matrix, for summing and storing the element outputs of those memory elements of that row and operative to sequentially read out the plurality of summed row signals; and

d. means for programming the pattern of weighting factors onto corresponding ones of said memory elements, said programming means including first generator means for applying programming signals to each of said row regions, a second set of column conductors coupled to the gate electrodes of said memory element of that column, and second generator means for applying programming signals to each of said column conductors of said second set.

4,034,200
ARTICLE OF FURNITURE

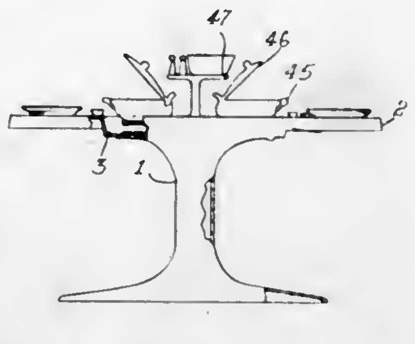
Gerhardus Johannes Cornelius Visagie, 9 Amatola Road, Verwoerdburg, South Africa

Filed Dec. 11, 1975, Ser. No. 639,976

Claims priority, application South Africa, Apr. 6, 1975, 75/3601; Dec. 12, 1974, 74/7931

Int. Cl.² H05B ***1/00***

U.S. Cl. 219—218 **11 Claims**



1. A rotatable heating unit for supporting food receptacles, which is convertible to a rotatable unheated unit, comprising a base, a circular support rotatably mounted on said base, having a depressed central surface, means for heating said depressed central surface and thereby heating food receptacles supported thereon, a removable cover which substantially fills the depressed central portion of said support and comprises a substantially level unheated surface for supporting food receptacles, and means for spacing said cover from said depressed central surface.

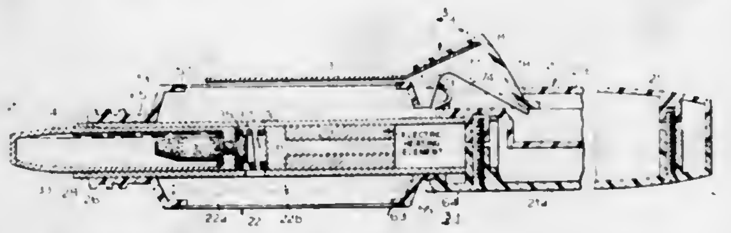
4,034,201
STEAM CURLING IRON HAVING INTERCHANGEABLE HAIR WINDING MANDRELS

Henry J. Walter, Wilton, and Raymond W. Kunz, Monroe, both of Conn., assignors to Clairol Incorporated, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,098

Int. Cl.² H05B ***1/00;*** **A45D** ***1/04, 2/36***

U.S. Cl. 219—222 **24 Claims**



1. A hair device comprising:

a tubular barrel having first and second ends and a predetermined cross-sectional configuration;

heat and vapor generating means within said barrel for heating said barrel and for producing vapor in said barrel;

a plurality of apertures through said barrel for conveying vapor out of said barrel, said apertures being located in spaced relation around said barrel;

a handle portion extending from the first end of the tubular barrel;

a mandrel for winding hair therearound, said mandrel cross sectional area exceeding that of the tubular barrel, wherein said mandrel is removably received over the barrel for replacement by a simularly constructed mandrel having a different hair engaging surface, and wherein said mandrel is generally tubular in configuration about a longitudinal axis, has first and second ends and inner and outer surfaces;

a plurality of passages through the mandrel; and

a plurality of resilient fins arranged in pairs to form ducts therebetween which register with the passages in the mandrel, wherein the fins extend from the inner surface of the mandrel toward the barrel and engage the barrel to hold the mandrel in spaced relation with the barrel, and wherein the fins engage the barrel adjacent the apertures of the barrel with the apertures aligned with the ducts so that the vapor in the barrel passes through the ducts and through the passages in the mandrel while the heat is conducted by the fins to the mandrel, whereby hair wound around the outer surface of mandrel is treated with heat and vapor

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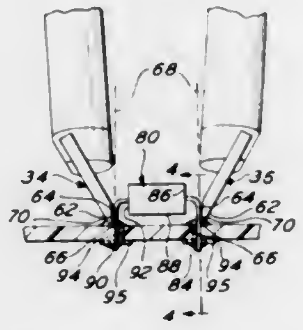
4,034,202
INTEGRATED CIRCUIT PACK EXTRACTOR

Harold F. Vandermark, Blue Bell, Pa., assignor to Nu-Concept Computer Systems, Inc., Colmar, Pa.

Filed May 23, 1975, Ser. No. 580,260

Int. Cl.² H05B *1/00;* **B23K** *3/00;* **B25B** *27/14*

U.S. Cl. 219—230 **8 Claims**



1. A tool for extracting electrical components having at least one pin from printed circuit boards to which said pin is soldered, comprising: a pair of tongs including first and second elongated arms, each arm being movable with respect to each other and including an electrically heated tip portion mounted thereon, each tip portion including a generally planar inside face extending at at least a half degree angle to a plane bisecting the space between said faces, each face terminating at a continuous linear bottom edge extending at an acute angle to the longitudinal axis of the arm upon which said tip is mounted so that when said tip is in contact with said pin, said arm extends at an acute angle to said board to provide visibility of said pack, said tips being arranged to be moved toward each other by the movement of said arms toward each other, whereupon the linear bottom edge of each tip clampingly engages and abuts said pin at portions immediately adjacent to the printed circuit board solder joint but with the remaining inside surface portions of each tip being remote from the remaining portions of the pin above the solder joint so that heat is applied to the pin at said joint, but not appreciably to the component, to effect the melting of the solder at said joint, said bottom edges clampingly engaging the pin therebetween, whereupon when said solder is melted the pack can be readily removed from said board by the movement of said tool away from said board.

4,034,203
ELECTRICALLY HEATED STEAM GENERATOR

Jerry D. Cooper, 1210 N. Texas, Odessa, Tex. 79761

Filed Aug. 19, 1974, Ser. No. 498,748

Int. Cl.² H05B *1/02;* **F22B** *1/28;* **B05B** *1/24;* **F24H** *11/104*

U.S. Cl. 219—272 **5 Claims**

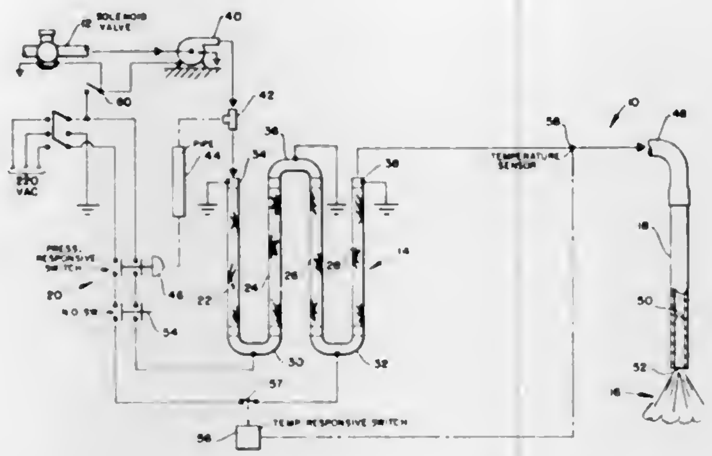
1. An electrical heating apparatus comprising:

an elongated non-conducting tubular element made of resilient, flexible, polymer reinforced fabric ply; said tubular element having a longitudinally extending axial passageway formed therethrough, through which liquid can flow; opposite ends of said tubular element being defined by an electrical conducting fluid inlet coupling and an electrical conducting fluid outlet coupling;

a source of water, means connecting said inlet coupling to said source of water, an elongated, flexible electrical resistance element located within and coextensively arranged respective to said axial passageway;

means electrically connecting the opposite free ends of said electrical resistance element, respectively, to said inlet and outlet coupling, respectively; means by which said inlet and outlet couplings are electrically grounded;

A plurality of electrical conducting intermediate fluid conducting members connected to intermediate portions of said tubular element; said electrical resistance element having intermediate portions; means by which said intermediate portions of said electrical resistance element are electrically connected to said intermediate fluid conducting members;



circuit means, including a source of current, connected to said intermediate fluid conducting members in such a manner that current flow occurs across said electrical resistance element to ground;

a thermostat having a sensor actuated switch, means connecting said sensor to measure the temperature downstream of said outlet coupling, circuit means connecting said switch to control current flow through part of said electrical resistance element;

so that liquid flowing through said tubular element is heated by said resistance element, thereby elevating the temperature of the liquid as it flows from said inlet coupling to said outlet coupling.

4,034,204
ELECTRIC HEATER FOR WARMING THE INTERIOR OF A CAR

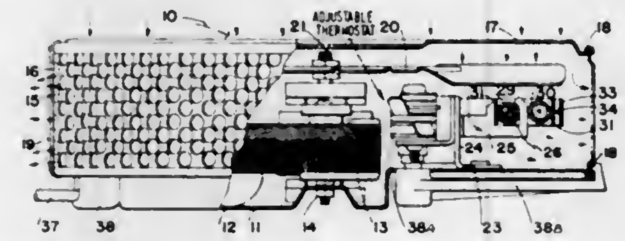
Lynne E. Windsor, and Lawrence Smorang, both of Winnipeg, Canada, assignors to James B. Carter Limited, Winnipeg, Canada

Filed June 13, 1975, Ser. No. 586,564

Claims priority, application Canada, June 28, 1974, 203699

Int. Cl.² H05B *1/00;* **F24H** *3/04;* **B60H** *1/02*

U.S. Cl. 219—368 **8 Claims**



1. A heater for the interior of cars, trucks and the like adapted to be operated from a source of electrical power; comprising in combination a substantially cylindrical casing which includes a base plate, an air intake end plate, and an air discharge circumferential wall between said base plate and said air intake end plate, thus maintaining the same in substantially spaced and parallel relationship one with the other, a fan motor centrally mounted within said casing and upon said base plate and connectable to said source of electrical power, a fan driven by said motor in a plane substantially parallel to said base plate, said fan being situated above said motor and adjacent said air intake end plate, a heating element within said casing also connectable to said source of electrical power, said heating element being formed in a single length counterangulated between the ends thereof to form outer and inner portions, said portions being arcuately curved and having a degree of curvature similar to the degree of curvature of said perimetrical wall but lying spaced inwardly therefrom, said inner and outer portions lying substantially spaced and parallel one from the other, means to support said heating element within said casing, said means comprising a combination air deflector and support bracket secured to said base plate, said bracket being formed from a shaped flat plate extending upwardly from said base plate and being situated between part of said heater element and said fan motor, the upper edge of said bracket terminating just below said fan, said bracket extending around approximately 180° of said cylindrical casing, lugs extending radially outwardly from said bracket, the inner and outer portions of said heating element being supported by said lugs intermediate said base plate and said air intake end plate, and a guard strip between said heating element and said circumferential wall.

4,034,205
APPARATUS HAVING MULTIPLE HEATING WIRES FOR HEATING OF A FLAT WORKPIECE

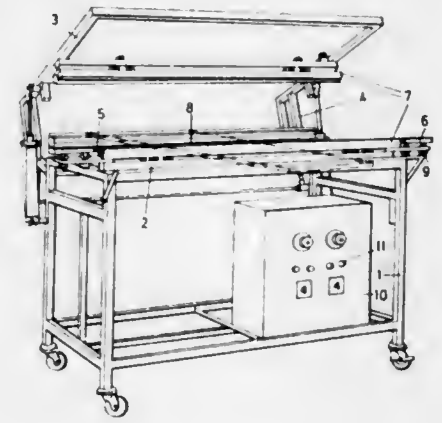
Wilfried Reichel, Muhle 1, 6501 Bubenheim, Germany

Filed Aug. 19, 1975, Ser. No. 605,916

Claims priority, application Germany, Aug. 28, 1974, 2441181

Int. Cl.² F27D *11/02*

U.S. Cl. 219—385 **7 Claims**



1. An apparatus for local rectilineal heating of a flat workpiece of thermoplastic material, so that the workpiece can be bent when it is heated, comprising a first frame-shaped support, a second frame-shaped support pivotally displaceably between a first position disposed opposite, parallel and adjacent to said first support and a second position swung upwardly from the first position away from said first support, a first pair of longitudinally extending bar displaceably mounted on said first support, a second pair of longitudinally extending bars displaceably mounted on said second support, said first pair of bars spaced from and aligned opposite said second pair of bars in the first position of said second support and forming a first space therebetween for gripping the workpiece between said first pair and said second pair of bars, the bars in each said pair spaced laterally apart to form a second space therebetween facing toward and open to the first space between said first and second pair of bars, at least one heating wire forming a heat source and positioned in the second space between at least one of said pairs of first and second bars for effecting contactless heating of the workpiece gripped in the first space, and means for variably spacing said heating wire within the second space with respect to the first space for varying the distance between said heating wire and the workpiece, the lateral spacing between the bars in the at least one of the said pairs of bars with said heating wire therebetween is variable for varying the spacing between said bars and said heating wire in accordance with the thickness and the bending requirements of the workpiece to be bent.

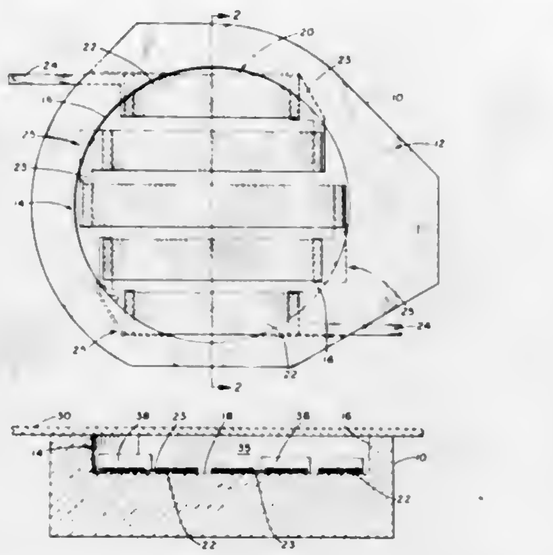
4,034,206
RANGE TOP ELEMENT

Glen H. Penrod, North Olmsted, Ohio, assignor to Gould Inc., Rolling Meadows, Ill.

Filed May 11, 1976, Ser. No. 685,331

Int. Cl.² H05B *3/68*

U.S. Cl. 219—464 **10 Claims**



1. A heating element assembly comprising a thermally conducting electrically insulating rigid ceramic sheet;

a block of thermally and electrically insulating material, a face of said block having a wall projecting therefrom to define a recess in said block, said block being positioned against said ceramic sheet such that said recess and said sheet define a chamber;

and a planar heating element of apertured foil-like electrical resistance material, said element being contained in said chamber and being spaced from and in noncontiguous relationship with said ceramic sheet, the periphery of said element defining a plane parallel to said ceramic sheet, said wall containing a plurality of cavities, said cavities each containing a peripheral portion of said element, said planar heating element of apertured foil-like electrical resistance material being in the form of an array of thin flat strips, said strips being equidistantly spaced from each other and electrically connected to each other.

4,034,207
POSITIVE TEMPERATURE COEFFICIENT SEMICONDUCTOR HEATING ELEMENT

Minoru Tamada; Takashi Shikama, and Toshikazu Nakamura, all of Yokaichi, Japan, assignors to Murata Manufacturing Co., Ltd., Kyoto, Japan

Filed Apr. 30, 1976, Ser. No. 682,161

Claims priority, application Japan, Jan. 23, 1976, 51-7123[U]; Jan. 23, 1976, 51-7124[U]; Jan. 29, 1976, 51-14640[U]; Jan. 29, 1976, 51-14642[U]; Jan. 29, 1976, 51-14645[U]; Jan. 29, 1976, 51-14647[U]

Int. Cl.² H05B *1/02*

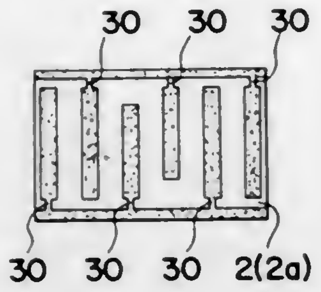
U.S. Cl. 219—517 **12 Claims**

1. A positive temperature coefficient semiconductor (PTCS) heating element comprising:

a. a PTCS body having two opposite flat and mutually parallel faces;

b. a first electrode having a plurality of strips of metal film electrically connected to each other at its one end and being separated from each other along their respective length with at least one of said strips being shorter than other strips and said first electrode being provided on an upper face of said two faces of said PTCS body;

c. a second electrode having a plurality of strips of metal film electrically connected to each other at its one end and being separated from each other along their respective length with at least one of said strips being shorter than other strips and said second electrode being provided on said upper face in such a manner that the strips of opposite electrodes are alternately disposed on said upper face so that neighboring strips of respective strips are members of opposite electrode;



d. a first terminal of a pair of terminals for applying predetermined voltage, said first terminal being electrically connected to said first electrode and provided on a bottom face of said two faces at such a position that said first terminal does not overlap, through the PTCS body, with any of the strips of said second electrode; and

e. a second terminal of said pair of terminals, said second terminal electrically connected to said second electrode and provided on said bottom face at such a position that said second terminal does not overlap, through the PTCS body, with any of the strips of said first electrode.

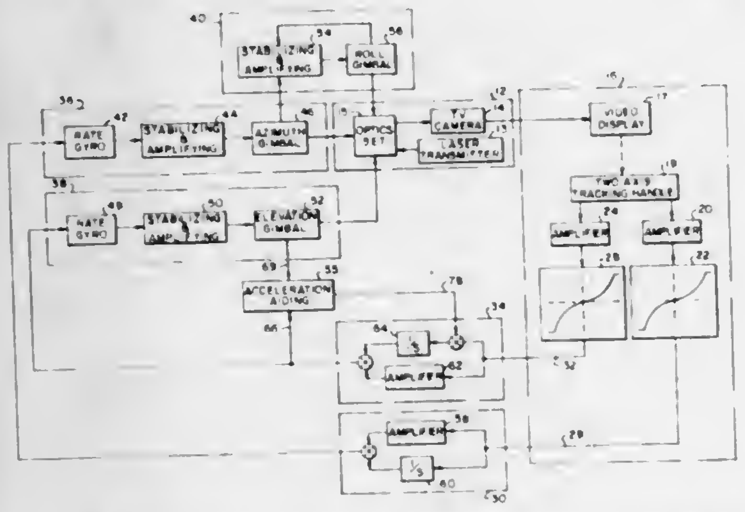
4,034,208
ACCELERATION AIDED TRACKING OF A DESIGNATED TARGET

James E. Vaeth, Baltimore, and Brewton O. Van Hook, Ellicott City, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,073

Int. Cl.² G06G *7/80;* **H04N** *5/14*

U.S. Cl. 235—61.5 S **10 Claims**



1. A system for tracking an object with respect to the position of a gimbaled sensor that is controlled in response to an azimuth angular rate command signal and in response to an elevation angular rate command signal said system comprising:

a tracking control means to generate azimuth and elevation error signals;

an azimuth control for generating the azimuth angular rate command signal to control the gimbaled sensor in response to the generated azimuth error signal;

an elevation control for generating the elevation angular rate command signal to control the gimbaled sensor in response to the generated elevation error signal and in response to an elevation angular acceleration aiding signal; and

means for generating the elevation angular acceleration aiding signal in response to the generated elevation angular rate command signal and in response to the elevation deflection angle of said gimbaled sensor to provide acceleration aiding for the elevation control.

4,034,209
RECORDING DEVICE

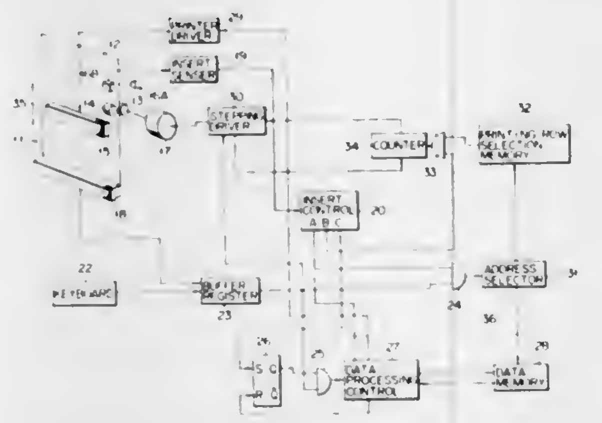
Toshio Kashio, Yamato, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 311,549, Dec. 4, 1972, abandoned. This application July 12, 1974, Ser. No. 488,027

Claims priority, application Japan, Dec. 8, 1971, 46-99217

Int. Cl.² G06K *1/18, 7/10;* **G01D** *9/04*

U.S. Cl. 235—61.9 R **6 Claims**



1. A recording device for recording a new data item on a recording paper adjacent an already printed row of data, and wherein said recording paper is removed from said recording device after said new data item is printed and then fed again into said recording device for recording another new data item, said recording device comprising:

paper driving means (13, 14, 17) for feeding to said recording device a recording paper (12) which carries a code distinguishing said recording paper from other recording papers;

means (18) for reading out the code carried by said recording paper (12);

storage means (28) having a plurality of addresses, each being assigned to an individual recording paper, for storing first data in, and reading data out from an address designated by said read out code, said first data corresponding to the data items already printed on said recording paper and the information indicating the printed row of said recording paper;

address designating means (31) coupled to said storage means (28) and to said read out means (18) for designating an address of said storage means (28) corresponding to said read out code;

means (32) coupled to said address designating means (31) for reading out from the address designated by said address designating means (31) said information indicating the printed row, so that the printed row can be read out when the recording paper is fed again into the recording device;

control means (30, 33, 34) coupled to said paper driving means (13, 14, 17) for controlling said paper driving means (13, 14, 17) in accordance with said information read out from said storage means (28) so as to set said recording paper (12) at a new printing position corresponding to a row in which said new data item is to be printed;

said storage means including means for reading out said first data from the address designated by said address designating means (31);

data input means (22, 23) for supplying input data items;

arithmetic operation means (27) coupled to said storage means and to said data input means for receiving an input data item and for obtaining second data which is the sum of said first data read out from said storage means (28) and an input data item;

means (29) coupled to said arithmetic operation means (27) for printing said second data obtained by said arithmetic operation means at said new printing position on said recording paper; and

means (27) for writing in the designated address of said storage means (28) said second data and the information indicating the row in which the second data is printed.

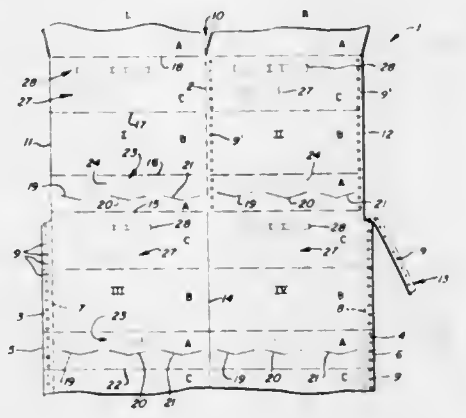
4,034,210
CREDIT CARD CARRIERS AND METHODS OF MANUFACTURE

James E. Hill, Prospect Heights; Baesley I. Dahlstrom, Des Plaines, and Robert D. Fisher, Melrose Park, all of Ill., assignors to Dynetics Engineering Corporation, Wheeling, Ill.

Filed Sept. 19, 1975, Ser. No. 615,112

Int. Cl.² G06K *19/00;* **B65B** *5/10*

U.S. Cl. 235—61.12 N **65 Claims**



1. Improved credit card carriers comprising:

a. a web of sheet material having a pair of substantially parallel side edges, a top edge and a bottom edge;

b. a plurality of foldable panels defined by fold lines disposed medially of, and substantially parallel to, said top and said bottom edges;

c. a plurality of means for receivingly engaging credit cards disposed in at least one of said panels;

d. said panels being adapted to wedge trap said cards when folded with said cards disposed between said panels.

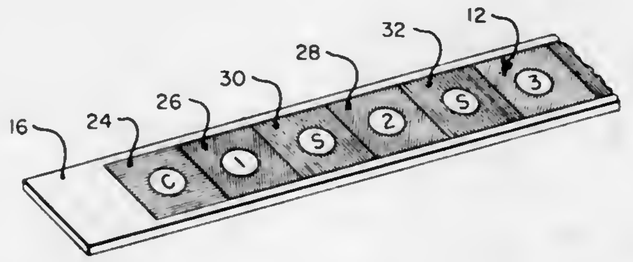
4,034,211
SYSTEM AND METHOD FOR PROVIDING A SECURITY CHECK ON A CREDIT CARD

William R. Horst, Dayton, and William J. Hale, Kettering, both of Ohio, assignors to NCR Corporation, Dayton, Ohio

Filed June 20, 1975, Ser. No. 588,937

Int. Cl.² G06K *19/06, 7/14;* **G02B** *5/18;* **G06K** *19/08*

U.S. Cl. 235—61.12 N **12 Claims**



1. A security system comprising:

a record medium having first data thereon in a first form and second data thereon in a second form;

first and second reading means for reading said first data and said second data respectively from said record medium;

said first data being in the form of diffraction gratings; an

comparison means for comparing selected portions of said first data read with selected portions of said second data read and for producing a signal which is indicative of the validity of said record medium;

said record medium comprising:

a generally planar body portion;

a first layer of deformable transparent material having a reflective layer, formed on one side thereof and positioned on said body portion and having said diffraction gratings formed in said one side with said reflective layer thereon and arranged thereon in a predetermined order to represent said first data; and

a second layer of protective transparent material covering said first layer of material and being sealed to said body portion to enable said diffraction gratings to be read by said first reading means and to seal said diffraction gratings in said record medium to make said gratings tamperproof.

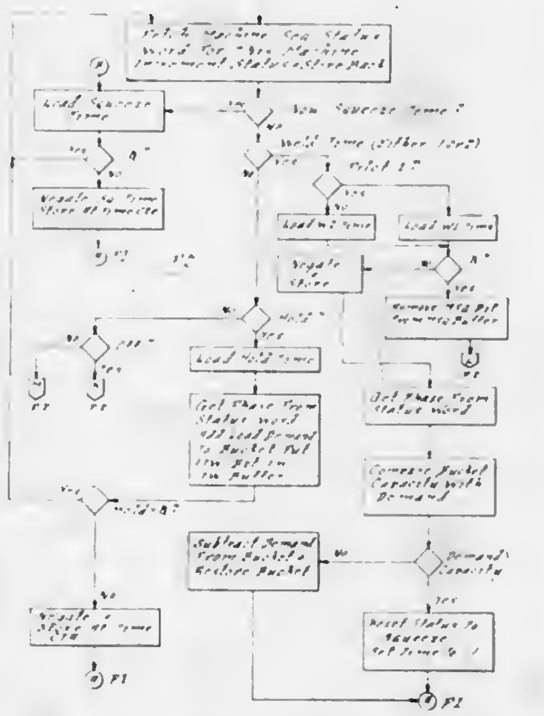
4,034,212
WELDING AND AUTOMATION CONTROL SYSTEM

Charles F. Paxton, Farmington, Mich., assignor to Weltronic Company, Southfield, Mich.

Continuation of Ser. No. 368,062, June 8, 1973, abandoned. This application Feb. 28, 1975, Ser. No. 553,918

Int. Cl.² B23K *9/12*

U.S. Cl. 235—151.1 **8 Claims**

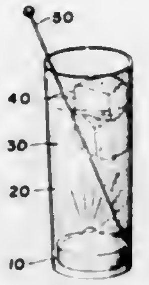


1. A welding control system for controlling the various portions of a welding cycle including the weld portion of the cycle, comprising a power supply, a plurality of welding heads connected to said power supply, and a general purpose computer programmed to control the welding cycle for all of said plurality of welding heads and to control the application of welding power from said power supply to said plurality of welding heads; said computer being programmed to postpone the application of welding power to one or more of said plurality of welding heads whenever the welding power demand of said one or more welding heads combined with the total amount of power currently being supplied to other welding heads in the weld portion of the welding cycle will exceed a preselected power level, until such time as said welding power demand can be supplied to said one or more welding heads without exceeding said preselected power level.

4,034,213
ILLUMINATING INSERT FOR A DRINKING GLASS

Frank John Norris, Ossining, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y.

Filed July 14, 1975, Ser. No. 595,386
Int. Cl.^{2} F21V *33/00*; F21L *11/00*
U.S. Cl. 240—6.4 G 3 Claims

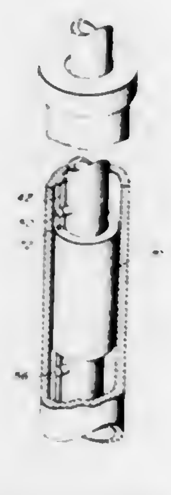


1. An illuminating insert for a drinking glass, comprising:
a terminal,
a first mercury battery connected to the terminal,
a second mercury battery connected in series to the first mercury battery,
the second battery connected to the terminal, whereby the electrical circuit can be completed,
the terminal, batteries and connections mounted in a molding plastic,
the molding plastic forming a slot, and
a light emitting diode cap physically and electrically connectable to the terminals.

4,034,214
MULTIPLE POSITION LAMP

Earle F. Chapman, Summer St., Marshfield, Mass. 02051, and Bernard J. Ruskin, 17 Sheldon Road, Marblehead, Mass. 01945

Filed Mar. 4, 1976, Ser. No. 663,972
Int. Cl.^{2} F21S *1/12, 3/10*
U.S. Cl. 240—70 11 Claims

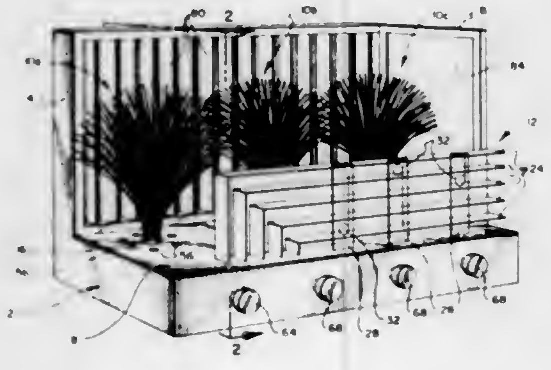


8. A multiple position lamp comprising:
a. a base;
b. a first tubular member, one end of said first tubular member mounted to said base, said first tubular member formed with a longitudinal rib projecting outwardly from an interior surface thereof;
c. a second tubular member having a pair of stops in spaced parallel alignment extending from an exterior surface thereof, said stops at one end of said second tubular member, said one end of said second tubular member received in said first tubular member, an annular chamber formed between said first and second tubular members;
d. a cylindrical guide formed with a longitudinal slot disposed in said chamber between said stops, said rib received in said slot;
e. said second tubular member vertically and rotatably adjustable in said first tubular member, said stops contacting said rib as said second tubular member is rotated in said first tubular member to limit said rotational movement to less than one revolution;
f. a cap mounted to the other end of said first tubular member, said cap formed with a concentric hole through which said second tubular member extends, upward vertical movement of said second tubular member relative to said first tubular member limited by one of said stops contacting said cap;
g. a receptacle adapted to receive at least one lamp; and
h. means for mounting said receptacle to the other end of said second tubular member.

4,034,215
DECORATIVE LIGHT DISPLAY

Hideo Hashimoto, 2618 Desert St., P.O. Box 1182, Rosamond, Calif. 93560

Filed Apr. 23, 1976, Ser. No. 679,802
Int. Cl.^{2} A63J *17/00*; F21P *1/02*
U.S. Cl. 240—10 L 9 Claims



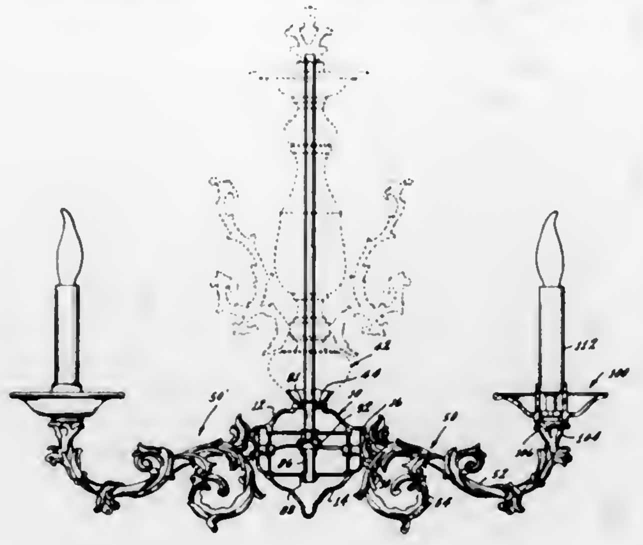
1. A decorative light display comprising
a chassis having a base housing and a back panel extending upwardly from a rear edge of the base housing
a plurality of fiber optic spray assemblies, each including a lamp and optical fibers, mounted on top of the base housing so that the optical fibers extend upwardly in front of the back panel,
means responsive to an audio input signal for supplying power to said lamps, said power varying with variations in the audio signal, and
a plurality of vertically oriented mirrored panels fixed in said back panel adjacent the spray assemblies, each mirrored panel being positioned at substantially a right angle with respect to immediately adjacent mirrored panels.

4,034,216
LIGHTING FIXTURE

Robert B. Webster, Huntington Beach, and Charles Gretz, Calabasas, both of Calif., assignors to Robert B. Webster, Huntington Beach, Calif.

Filed June 19, 1975, Ser. No. 588,369
Int. Cl.^{2} F21S *1/06*; H02B *1/10*
U.S. Cl. 240—78 F 6 Claims

1. An ornamental chandelier construction, comprising:
central box member adapted to contain electrical wiring; said central box member having openings therein for permitting electrical wiring to pass therethrough;
central, ornamental structure connected to and enclosing said central box member so as to cover said central box member and present an ornamental appearance; and
plurality of chandelier arms connected to said central box member and said central, ornamental structure;
each of said chandelier arms including an inner tubular member adapted to contain electrical wiring, and an ornamental design configuration molded on said tube;

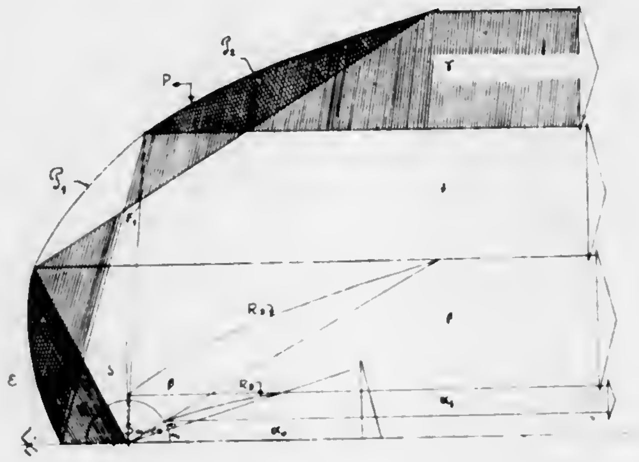


the interior of said tube of each of said chandelier arms communicating with the interior of said central box member via one of said openings in said central box member.

4,034,217
OPTICAL DEVICE FOR LIGHTING APPARATUS, WITH A PLURALITY OF COMBINED REFLECTORS

Roger Louis Dumont, 8, Rue de La Mesange, Thionville, Moselle, France

Filed June 20, 1975, Ser. No. 588,681
Claims priority, application France, June 21, 1974, 74.21695; Apr. 18, 1975, 75.12254
Int. Cl.^{2} F21V *7/00*
U.S. Cl. 240—103 R 11 Claims

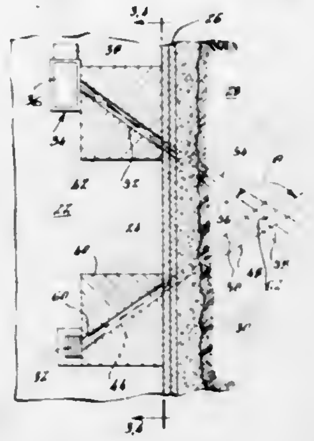


1. An optical device for a luminous source for producing a beam of light having an axis, said device comprising first, second and third reflecting surfaces, said first surface being described by an arc of an ellipse having a first focus coincident with said luminous source and a second focus, said second reflecting surface being described by an arc of a parabola having an axis parallel to the axis of the beam of light, the focus of said parabola being coincident with said second focus of said ellipse and said third reflecting surface described by an arc of a curve of second degree positioned between said second reflecting surface and said axis, the focus of said third surface coincident with said source.

4,034,218
FOCUSED DETECTION LOGGING TECHNIQUE

Ronald E. Turcotte, West Redding, Conn., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Oct. 9, 1975, Ser. No. 620,972
Int. Cl.^{2} G01V *5/00*
U.S. Cl. 250—269 7 Claims



1. A well logging method comprising the steps of:
a. emitting from a given location gamma radiation in at least one tightly collimated beam toward the media surrounding a borehole;
b. detecting at a predetermined distance from said location gamma radiation that is tightly collimated to a plurality of paths focused to a zone of intersection with and aligned to intersect with said emitted gamma radiation beam so that the radiation detected includes singly scattered gamma radiation produced by the intersection of emitted gamma radiation and the media at said zone of intersection;
c. misaligning the beam emitted from said location and the tightly collimated paths to prevent their intersection;
d. detecting at said predetermined distance, with the emitted beam and the tightly collimated paths misaligned, principally gamma radiation multiply scattered by the interaction of the emitted gamma radiation and the media; and
e. subtracting the gamma radiation detected during misalignment from the gamma radiation detected during alignment to obtain a measurement of said singly scattered gamma radiation which is related to a density characteristic of the media at the zone of intersection.

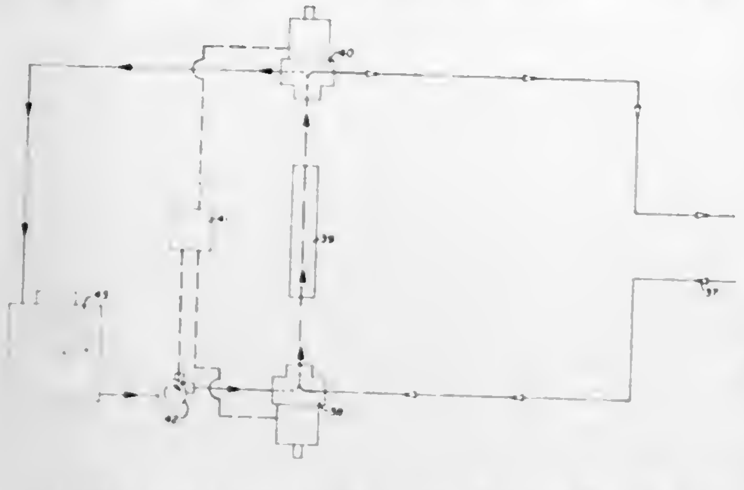
4,034,219
CLEANING SYSTEM FOR A CONTINUOUS SENSING OIL-IN-WATER MONITOR

Lester Richard Louden; Clement Auguston Blessington, and Jerry Lon Beatty, all of Houston, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Apr. 22, 1976, Ser. No. 679,297
Int. Cl.^{2} G01T *1/169*
U.S. Cl. 250—301 2 Claims

1. Apparatus for sensing oil in a water sample, comprising:
a sample tube;
light source means for directing light energy into said sample tube;
detector means for detecting light energy characteristic of oil emanating from said sample tube;
sample conduit means for channeling said water sample, said sample conduit means having a sample outlet end;
a source of cleaning solution;
cleaning solution conduit means connected to said source of cleaning solution, said cleaning solution conduit means having a cleaning solution outlet end; and
valve means for directing said water sample and said cleaning solution through said sample tube, said valve means having a first port connected to said sample outlet end of

said sample conduit, a second port connected to said cleaning solution end of said cleaning solution conduit, a third port in communication with said sample tube, and means for selectively blocking said second port and allowing said water sample to be directed thorugh said sample tube and selectively blocking said first port and allowing said cleaning solution to be directed through said sample tube.



4,034,220
PROCESS AND APPARATUS FOR THE ELEMENTARY AND CHEMICAL ANALYSIS OF A SAMPLE BY SPECTRUM ANALYSIS OF THE ENERGY OF THE SECONDARY ELECTRONS

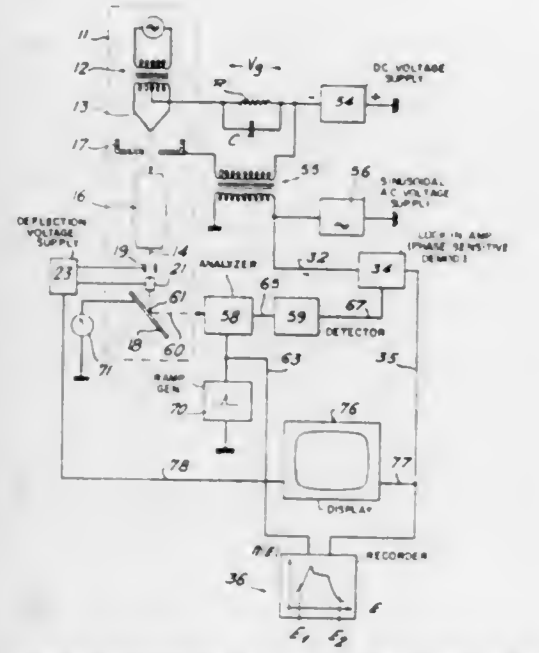
Claude le Gressus, Fontenay-le-Fleury; Daniel Massignon, Paris, and René Sopizet, Chevilly-Larue, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Dec. 16, 1975, Ser. No. 641,240

Claims priority, application France, Jan. 2, 1975, 75.00050; May 23, 1975, 75.16206

Int. Cl.² G01N *23/225*

U.S. Cl. 250—310 **17 Claims**



1. Process of elementary and chemical analysis of a sample by analysing energy spectra of secondary electrons emitted by the said sample when it is subjected to a beam of monoenergetic primary electrons concentrated on its surface, characterised in that:

the intensity of the beam of monoenergetic primary electrons emitted by an electron gun is modulated in accordance with a sinusoidal law at a frequency ω,

the beam of secondary electrons having an energy E is collected,

the intensity of the said collected beam is detected by generating an electrical detection signal proportional to the said intensity,

in the said detection signal there is measured the intensity of the component at the frequency ω which gives the number of secondary electrons, corresponding to the said energy,

the value of the energy of collection E is changed in order to scan an energy spectrum comprised between two limits E_1 E_2, which is done so that the spectrum $n(E)$ is obtained of the intensity of the secondary electron emission from the sample as a function of the energy E.

4,034,221
CHARGING DEVICE FOR AUTOMATIC COPYING APPARATUS

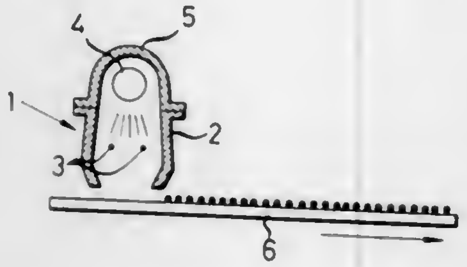
Tadashi Yamashita, Yokohama, Japan, assignor to Ricoh Co., Ltd., Japan

Filed Mar. 31, 1976, Ser. No. 672,236

Claims priority, application Japan, Apr. 7, 1975, 50-41185

Int. Cl.² G03G *15/00*

U.S. Cl. 250—324 **9 Claims**



1. A charging device for automatic copying apparatus comprising:

a. a charger case;
b. charging wires arranged in said charger case;
c. a charging circuit for supplying a charge voltage to said charging wires, said charging circuit impressing a charge voltage to said charging wires at all times while copying condition of the apparatus;
d. a plurality of lamps disposed in the rearward position of the charger case; and
e. a control circuit turning on and off said lamps so as to bring the charged zone of a photoconductor into agreement with the effective image region.

4,034,222
SYSTEM FOR MEASURING RADIATION DOSES IN RADIOTHERAPY APPARATUS

Guy Azam, and Rene Boux, both of Paris, France, assignors to C.G.R.-Mev., Paris, France

Filed Apr. 12, 1976, Ser. No. 675,903

Claims priority, application France, Apr. 16, 1975, 75.11759

Int. Cl.² G01J *1/42*

U.S. Cl. 250—355 **6 Claims**

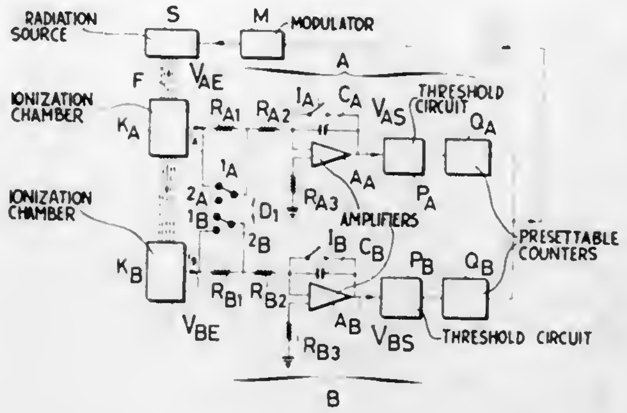
1. A system for measuring and controlling the amount of radiant energy emitted by a radiation source comprising:

radiation-sensing means in the path of a radiant beam originating at the radiation source to be controlled;

a pair of substantially identical metering networks connected to said radiation-sensing means for generating and accumulating respective electrical parameters proportional to the sensed radiation;

adjustable delay means in each of said networks for selectively retarding the accumulation of the generated electrical parameter in either of said networks whereby one of said networks operates as a controller normally reaching a predetermined limit for the accumulated electrical parameter earlier than the other of said networks;

disabling means connected to said networks for deactivating said source upon attainment of said predetermined limit by either of said networks, said other of said networks serving as a backup taking over the control of said disabling means in the event of a malfunction of said one of said networks; and



switchover means coupled with said adjustable delay means for selectively interchanging the roles of said networks as a controller and as a backup.

4,034,223
DEVICE FOR MEASURING RADIATION ABSORPTION

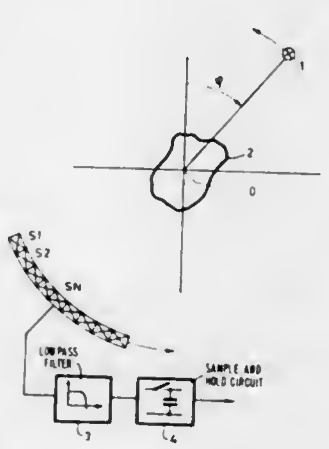
Gunter Kowalski, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jan. 28, 1976, Ser. No. 653,111

Claims priority, application Germany, Jan. 30, 1975, 2503789

Int. Cl.² G01T *1/20*

U.S. Cl. 250—369 **4 Claims**



1. In apparatus for measuring the absorption of radiation in a plane of a body of the type wherein a radiation source and a plurality of detectors are arranged in the same plane on opposite sides of the body and uniformly moved relative to the body at a constant speed, the improvement comprising, with respect to each detector:

means for removing from the output signal of the detector all absorption signal frequency components which are above a limit frequency; and

means for periodically sampling the frequency limited absorption signal of the detector, the limit frequency being approximately half of the sampling frequency to thereby avoid sampling errors.

4,034,224
PATIENT POSITIONING AND SUPPORTING ARRANGEMENT

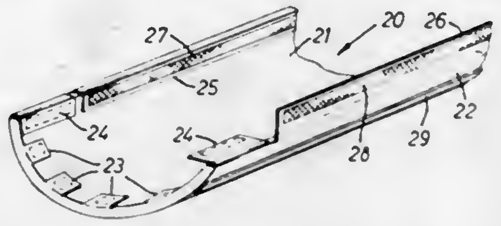
Michael Heavens, Hillingdon; Richard Charles James, Uxbridge, and Dennis Stanley Slinn, West Drayton, all of England, assignors to EMI Limited, Hayes, England

Filed Apr. 12, 1976, Ser. No. 676,056

Claims priority, application United Kingdom, Mar. 25, 1976, 11959/76

Int. Cl.² H01J *37/20*

U.S. Cl. 250—439 P **9 Claims**



1. An arrangement for positioning and locating the body of a patient in relation to an apparatus for irradiating the body with penetrating radiation, the arrangement comprising a curved platter upon which the patient can be disposed, a table having a curved groove to accommodate the platter, and means for driving the platter slidably along the groove; the platter comprising a substantially rigid platform shaped to conform to said curved groove.

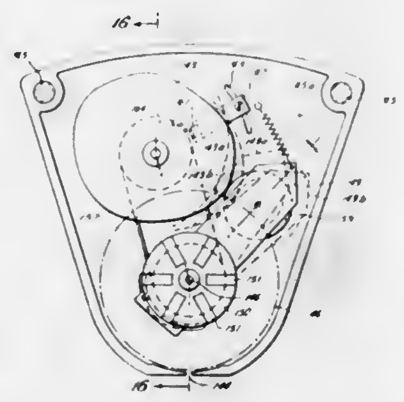
4,034,225
FILM DRIVE MECHANISM FOR PANORAMIC RADIOGRAPHIC APPARATUS

Donald C. Hudson; Charles R. Morris; Horst G. Fleck, and Karl A. Senghaas, all of San Antonio, Tex., assignors to Pennwalt Corporation, S.S. White Dental Products Division, Philadelphia, Pa.

Division of Ser. No. 429,482, Jan. 2, 1974, Pat. No. 3,908,126. This application Apr. 24, 1975, Ser. No. 571,265

Int. Cl.² G11B *1/00*

U.S. Cl. 250—471 **15 Claims**



1. A film drive mechanism for moving an x-ray film past an x-ray slit at a variable rate of speed as a function of the shape of a desired focal trough while the film drive mechanism including the x-ray film is being moved about an object to be x-rayed, comprising, in combination:

a film holder having an x-ray slit;

a movable film cassette for mounting in said film holder, said film cassette adapted to support and move an x-ray film past said slit;

motor means connected to drive said film cassette, said motor means including a rotatable shaft and a housing; and

means coupled between said shaft and housing to vary the speed of rotation of said shaft with respect to said housing by selectively rotating said housing with respect to said shaft as a function of the shape of a desired focal trough.

4,034,226

METHOD OF AND MEANS FOR PRODUCING RADIATION IN THE X-RAY REGION

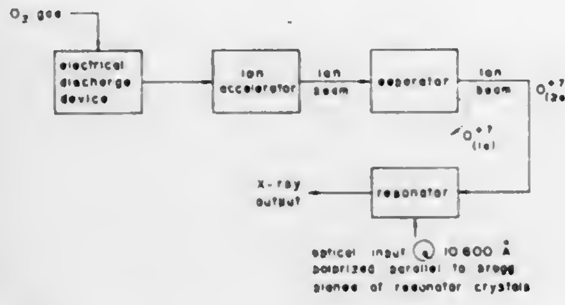
Isaac Freund, Petah Tiqva, Israel, assignor to Bar-Ilan University, Ramat-Gan, Israel

Filed May 29, 1974, Ser. No. 474,329

Claims priority, application Israel, May 30, 1973, 42398

Int. Cl.² H01S *4/00*

U.S. Cl. 250—493 **10 Claims**


O₂ gas
electrical discharge device
ion accelerator
ion beam
separator
ion beam
O⁺⁷ (2s)
O⁺⁷ (1s)
X-ray output
resonator
optical input 10 600 Å polarized parallel to bragg planes of resonator crystals

1. A method for producing emission of radiation in the X-ray region at a frequency ω_2 comprising the steps of: selecting as an active medium a system having the following properties; two energy levels separated by an energy difference ΔE corresponding to radiation of frequency ω_t in the X-ray region such that a transition from the upper to the lower of the two levels by one-photon emission is weakly allowed or strictly forbidden, one of the two levels having nearly degenerate partner level optically coupled thereto such that a transition therebetween by one-photon emission has a high probability; subjecting the active medium to radiation at a frequency ω_1 that is substantially equal to the frequency of the optical coupling between the nearly degenerate levels but much smaller than the frequency ω_t such that $\omega_2 = \omega_t \pm \omega_1$; and polarizing the radiation of frequency ω_1.

4,034,227

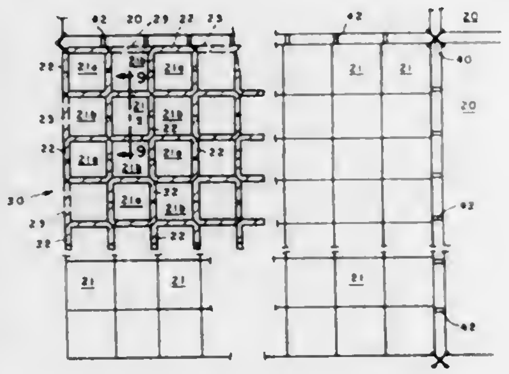
NUCLEAR FUEL STORAGE RACK

Olaf Soot, 9 Tomahawk Lane, Greenwich, Conn.

Filed Feb. 2, 1976, Ser. No. 654,475

Int. Cl.² G21F *5/00*

U.S. Cl. 250—507 **18 Claims**



1. Nuclear fuel storage rack comprising a plurality of elongated, corner-adjoining, parallel enclosures each of generally rectangular cross-section having interior slots for receiving fuel elements, and structural means permanently joining each of the fuel receiving enclosures directly to its neighboring enclosures along portions of their adjoining corners distributed along their length and in checkerboard fashion to form a rigid honeycomb structure wherein the walls of individual enclosures through their corner connections form a plurality of rigid shear walls extending in two directions across the rack and wherein the number of fuel-receiving slots present is approximately equal to twice the number of enclosures present.

4,034,228

TUBUS FOR DETERMINING THE BOUNDARIES OF A BEAM OF PENETRATING RAYS

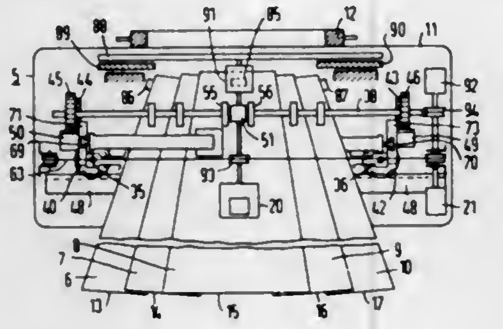
Alfred Arauner, Furth, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 29, 1975, Ser. No. 617,579

Claims priority, application Germany, Sept. 30, 1974, 2446680

Int. Cl.² G21F *5/04;* **G21K** *1/04*

U.S. Cl. 250—511 **7 Claims**



1. In a tubus for defining the boundaries of a beam of penetrating rays including a tubus housing, a plurality of mutually overlapping wall elements forming a tubus wall structure in parallel with the direction of edge radiation of a ray cone encompassed by the tubus, means for suspending the wall elements on the tubus housing for displacement perpendicular to the direction of edge radiation, the improvement comprising shaft means having a longitudinal axis for guiding and pivoting the wall elements of each tubus side for a suspension in the virtual focal point of a radiation source, the tubus having a symmetrical axis, said shaft means being supported on the tubus housing, displaceable at right angles to said longitudinal axis and extending in parallel with the tubus side associated therewith, and perpendicular to the symmetrical axis of the tubus; lever means for controlling the inclination of the wall elements with respect to the tubus symmetrical axis; and guide means for guiding said lever means.

4,034,229

OZONE GENERATING APPARATUS

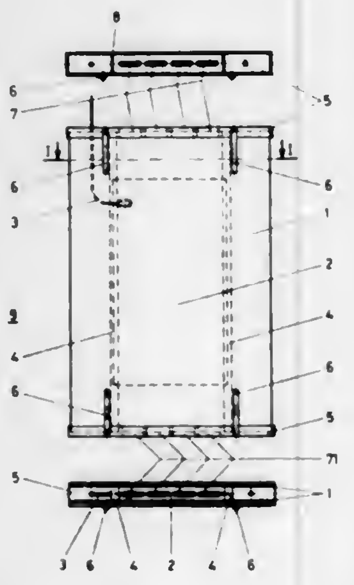
Walter Grossen, Riehen; André Gagnaux, Kaiseraugst, and Edgar Chariatte, Oberwil, all of Switzerland, assignors to Fr. Sauter AG., Fabrik elektr. Apparate, Basel, Switzerland

Filed Nov. 5, 1975, Ser. No. 628,929

Claims priority, application Switzerland, June 10, 1975, 7487/75

Int. Cl.² C01B *13/11*

U.S. Cl. 250—541 **12 Claims**



1. Apparatus for generating ozone by corona discharge, comprising first electrode means and second electrode means, said first electrode means comprising at least one assembly, said assembly comprising a first electrode consisting of an electrically conductive plate having a pair of oppositely directed face surfaces, a pair of side edges extending along the opposite sides of said face surfaces and a pair of end edges extending transversely of the side edges and along the opposite ends of said face surfaces, a pair of spacers formed of insulating material and extending in the same direction as said side edges, each said side edge fitted into a different one of said spacers, a pair of plates of dielectric material each located spaced outwardly from a different one of the face surfaces of said electrically conductive plate, each said dielectric material plate comprising a pair of side edges extending in the same direction as said side edges of said electrically conductive plate and a pair of end edges extending in the same direction as said end edges of said electrically conductive plate, said side edges and end edges of said dielectric material plates being longer than the corresponding side edges and end edges of said electrically conductive plate, said spacers having a length corresponding to the length of the side edges of said dielectric material plates, a pair of end portions disposed in spaced relation and extending in the same direction as said end edges of said dielectric material plates, each said end portion having one end edge of each said dielectric plate inserted therein, the opposite ends of said spacer being located within said end portions, each said spacer extending in the direction between the face surfaces of said electrically conductive plate between the facing surfaces of the pair of said dielectric material plates and said end portions, said spacers, and the facing surfaces of said dielectric material plates defining a discharge space containing said electrically conductive plate and within which ozone is generated, one of said end portions having at least one first opening therein for admitting gas to said discharge space, the other said end portion having at least one second opening therein for the outflow of ozone gas from the discharge space, a conduit for receiving ozone from said second opening, means for sealing said second opening to said conduit, said second electrode means comprising at least two said second electrodes associated with each said assembly and each said second electrode located adjacent a different one of said dielectric material plates, each said second electrode comprising an electrically conductive plate member, and means for contacting said plate member with the adjacent said dielectric material plate of said first electrode so that in use a corona discharge occurs in said discharge base, and means for cooling said second electrode means with a fluid medium.

4,034,230

ELECTRO-OPTICAL BAR-CODE SCANNING UNIT

Henry Brill, Flushing, and Peter Yee, East Northport, both of N.Y., assignors to Bulova Watch Company, Inc., New York, N.Y.

Filed Oct. 24, 1975, Ser. No. 625,687

Int. Cl.² G06K *7/10*

U.S. Cl. 250—568 **8 Claims**

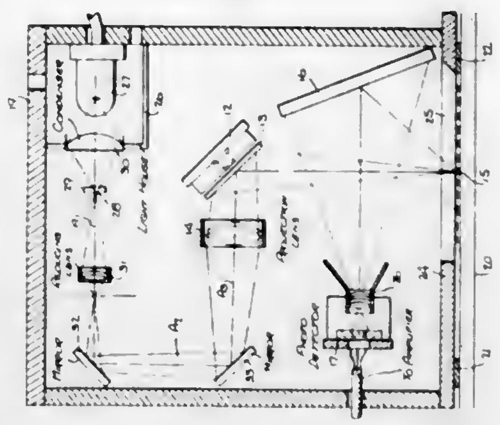
1. An electro-optical directional scanning unit adapted to sense a bar-code pattern printed on an article and to generate corresponding digital signals, said unit comprising:

A. an incandesent light source;

B. optical means coupled to said source to produce an illuminated slit and including a reducing lens to project a reduced scale image of said illuminated slit along an optical path to create a luminous line in a focal plane;

C. an optical scanner interposed in said optical path to cause said luminous line to sweep back and forth periodically within said focal plane;

D. means to confine said article at a position on which the bar-code printed thereon lies in said focal plane with its bars parallel to said luminous line whereby the light from said line is reflected to produce modulated light pulses, said confining means being constituted by a channel whose dimensions conform to that of the article and having a window therein to expose said bar code pattern; and



E. means to detect said light pulses to generate said digital signals.

4,034,231

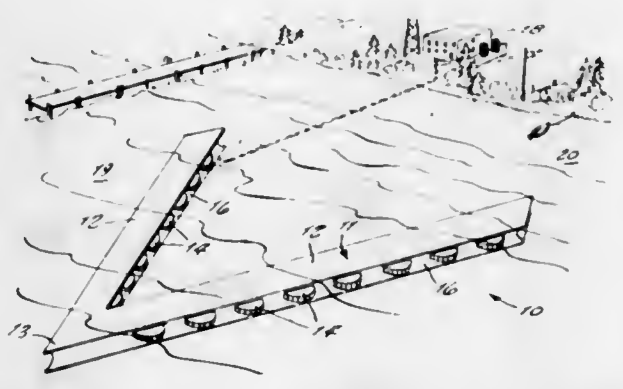
OCEAN TIDE AND WAVE ENERGY CONVERTER

John L. Conn, and George Spector, both of 3615 Woolworth Bldg., 233 Broadway, New York, N.Y. 10007

Filed Apr. 28, 1975, Ser. No. 541,051

Int. Cl.² F03B *13/10, 13/12*

U.S. Cl. 290—53 **1 Claim**



1. A machine for converting tidal and wave energy into electrical energy comprising a V-shaped frame emersed in water subjected to tidal and wave action said frame having an apex directed away from a shore line with integral legs diverging along linear axes towards said shoreline, said legs having aligned parallel upper and lower horizontal sides integral with transverse side walls, including means mounted movably in said legs, wherein said means include a vertical member intersecting the said linear axis of said legs at right angles thereto, in further combination with an electric generator and means for transmitting the motion of the first said means to drive the generator, in further combination with an electric cable connecting the generator to a power station for distribution of the generated electric energy wherein the first said means comprises a float secured to a vertically slidable shaft mounted on said frame, including toothed racks on said shaft engaging a pair of gears affixed on a pair of horizontal shafts journalled in said side walls symmetrically about said linear axis wherein said horizontal shafts are connected by slip clutches to a second pair of horizontal shafts which in turn are geared to drive said generator including means for causing one of said clutches to engage only upon vertical upward movement of the vertical shaft and the other of said clutches to engage only upon vertical downward movement of said vertical shaft.

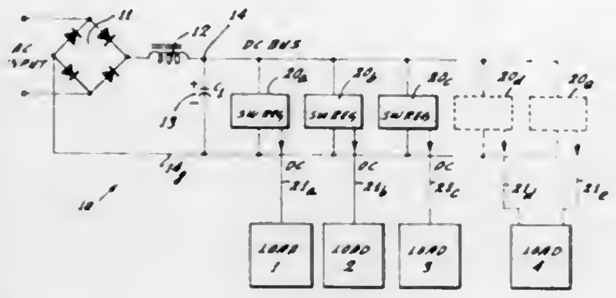
4,034,232
SYSTEM FOR SYNCHRONIZING AND PHASE SHIFTING SWITCHING REGULATORS

Orville W. LaVenture, Covina, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed June 1, 1976, Ser. No. 691,867

Int. Cl.² H02M *5/453*

U.S. Cl. 307—32 **4 Claims**



4. In a regulated power supply system for supplying a plurality of separate unregulated D.C. voltages to a plurality of loads, the combination comprising:

a. means for converting A.C. voltage to an unregulated D.C. voltage;

b. a plurality of switching regulator means for controlling said unregulated D.C. voltage to provide a plurality of constant D.C. outputs for delivery to a plurality of loads;

c. control means for determining a common frequency of switching for said plurality of switching regulator means and for determining the switch-on duration time of each cycle of each of said switching regulator means, said control means having individual subcontrol means responsive to the output voltage delivered to each of said loads in order to control the said switch-on duration time for each switching cycle of each of said switching regulators, wherein said control means includes:

common clock generation means;

phased signal generation means derived from said common clock means for generating a plurality of signals which are set to have a predetermined phase relationship, said plurality of signals being used to clock said plurality of switching regulator means;

and wherein said control means provides a subcontrol means for each switching regulator which subcontrol means includes:

c-1. an operational amplifier;

c-2. an integrator;

c-3. a signal proportional to the output voltage of the individual switching regulator at its load;

c-4. a reference voltage;

c-5. a plurality of gates;

said operational amplifier receiving signals from said integrator and said proportional output voltage,

said integrator being clocked by a preselected phase signal from said phased signal generation means,

said gates being controlled by combined signals from said operational amplifier and from said preselected phase signals of said phased signal generation means.

4,034,233
POWER MONITORING AND REGULATING CIRCUIT AND METHOD HAVING AN ANALOG INPUT REPRESENTING POWER RATE AND A DIGITAL OUTPUT FOR CONTROLLING THE ON/OFF STATES OF A PLURALITY OF LOADS

Warren L. Leyde, Seattle, Wash., assignor to Pacific Technology, Renton, Wash.

Filed July 22, 1976, Ser. No. 707,566

Int. Cl.² H02J *3/00*

U.S. Cl. 307—41 **9 Claims**

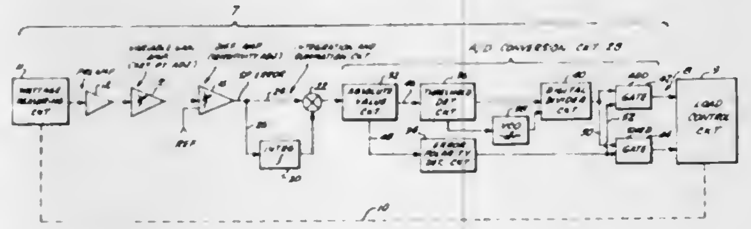
1. A closed loop power monitoring and load control system, comprising the combination of:

analog measuring means for measuring the rate of power delivered to a plurality of electrical loads, said analog measuring means having an output at which an analog signal is produced that has a predetermined relationship to said rate;

reference signal source means for producing a reference signal;

electrical difference taking means responsive to said analog measuring means and to said reference signal source means for producing an analog error signal that represents the difference between said analog signal and said reference signal, said analog error signal having a nominal level when the rate of power delivered to the electrical loads equals a desired rate and deviating from said nominal level in a first direction when such rate of power exceeds the desired rate and deviating from said nominal level in a second direction when such rate of power falls below the desired rate;

analog to digital conversion circuit means including a threshold detector means for detecting when said analog error signal deviates from said nominal level by a predetermined amount in either of said first or second directions;



said analog to digital conversion circuit means further including first and second digital outputs, said first digital output producing a digital shed signal commanding that a load be shed when said threshold detector means detects that said analog error signal has deviated from said nominal level by said predetermined amount in said first direction, and said second digital output producing a digital add signal commanding that a load be added when said threshold detector means detects that said analog error signal has deviated from said nominal level by said predetermined amount in said second direction; and

load control circuitry means having an input responsive to said first digital output of said analog to digital conversion circuit means for disconnecting one of a plurality of electrical loads in response to said digital shed signal, and having another input connected to said second digital output of said analog to digital conversion circuit means for connecting one of a plurality of electrical loads in response to said digital add signal.

4,034,234
SWITCHING MODULE FOR SOLID-STATE KEYBOARD

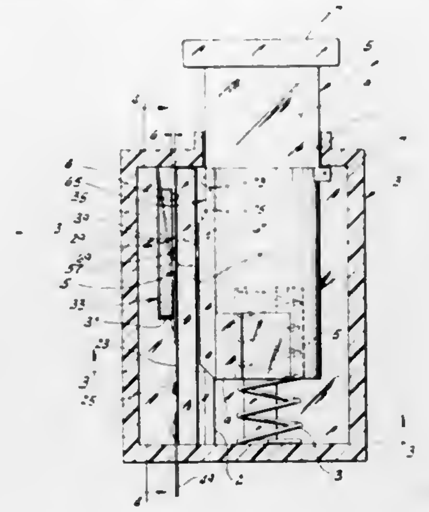
Brian C. Ehlers, Barrington, and Henry J. Boulanger, Cumberland, both of R.I., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Jan. 10, 1975, Ser. No. 535,893

Int. Cl.² H01H *35/00*

U.S. Cl. 307—116 **11 Claims**

1. A switching module for a solid-state keyboard or the like comprising an actuating key manually movable between a first and a second position, a variable capacitor comprising a rigid stationary electrode and another electrode movable toward and away from said stationary electrode between a first position in which said electrodes are separated by an air gap and a second position in which said air gap is substantially eliminated for effecting a change in capacitance in said variable capacitor, said movable electrode having a rigid dielectric material secured thereto on its side toward said stationary electrode, said dielectric member having a dielectric constant substantially greater than air, biasing means comprising a unitary member of resilient electrically conductive metal having a plate portion constituting said movable electrode and a frame surrounding said plate portion and being secured thereto at one locale but being free of said plate portion elsewhere therearound for permitting movement of said plate portion relative to said frame, the latter being secured to a substrate opposite said one locale, and said module further comprising means coupling said actuating key and said movable electrode for effecting movement of said movable electrode and said dielectric member between its said first and second position in response to movement of said actuating key between its first and second positions.



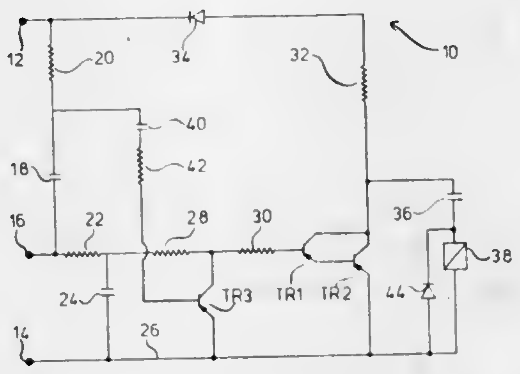
4,034,235
CIRCUITS

Kenneth Robinson Wade, Parbold, England, assignor to Product Automation and Control Limited, England

Filed Dec. 22, 1975, Ser. No. 643,058

Int. Cl.² H01H *47/26*

U.S. Cl. 307—117 **13 Claims**



1. A flame detection circuit comprising probe means connectible to a source of alternating signal and locatable in a combustion area of a flame to apply said alternating signal across the flame for rectification thereby; first semiconductor switch means connected to said probe means and triggerable by said alternating signal to convert the rectified signal into a pulsed signal; a capacitance connectible to a source of direct current signal to be charged thereby; relay means connected to said capacitance; and second switch means actuable by each pulse of said pulsed signal to discharge said capacitance through said relay means whereby to actuate said relay means.

4,034,236
DEVICE FOR FORMING A BIPOLAR SIGNAL OF 50% DUTY CYCLE

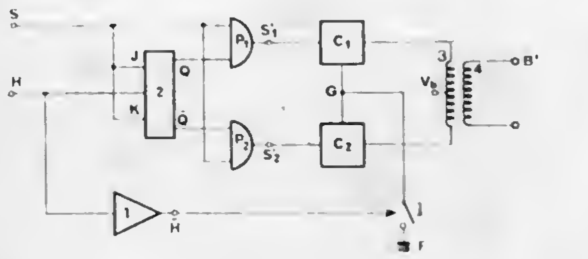
André A. Aveneau, Clamart, and Guy A. de Passoz, Lesigny, both of France, assignors to Societe Anonyme de Telecommunications, Paris, France

Filed Feb. 6, 1976, Ser. No. 655,681

Claims priority, application France, Feb. 14, 1975, 75.04644

Int. Cl.² H04J *3/00;* **H03K** *5/00;* **H04B** *3/00*

U.S. Cl. 307—261 **8 Claims**



1. Apparatus for forming a bipolar signal of alternating polarity, having a duty cycle of ½ when alternating polarity signal elements succeed each other with minimum interpulse intervals, in response to a binary signal in the form of a succession of binary elements 0 and 1 of duration T, comprising, in combination:

means for producing, at two respective outputs of said means, in response to said binary signals, two trains of pulses of duration T respectively corresponding to alternate signal elements 1 of duration T of said binary signals;

interruptible means, having a pair of inputs respectively connected to said outputs of said pulse train producing means, for applying said two trains of pulses respectively to a pair of oppositely poled inputs of a balanced-input output coupling device, said coupling device having a common return terminal for said inputs thereof, and

means interposed between said common return terminal and said interruptible means for interrupting the operability of said interruptible means for periods respectively corresponding to one half of the duration of each pulse of both of said trains of pulses and allowing said interruptible means to be operable for periods respectively corresponding to the other half of each of said pulses.

4,034,237
DRIVE CIRCUIT FOR ULTRASONIC LEVEL GAUGE

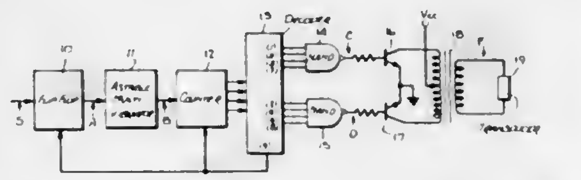
Hiroshi Minami, Kawasaki, Japan, assignor to Hokushin Electric Works, Ltd., Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 668,845

Claims priority, application Japan, Mar. 31, 1975, 50-43715[U]

Int. Cl.² H03K *5/01, 13/00*

U.S. Cl. 307—268 **6 Claims**



1. A drive circuit for supplying AC power having a sharp rise at the beginning of transmission and a sharp fall at the end thereof to excite an ultrasonic transducer transmitting an ultrasonic wave or the like, said circuit comprising:

A. a gate-controlled astable multivibrator producing during a gate period initiated by a start pulse a train of rectangular pulses of constant amplitude and constant frequency;

B. a counter coupled to the multivibrator to count the pulses produced thereby;

C. decoder means coupled to the counter to produce a first set of rectangular output pulses in response to oddnumbered counts and a second set of rectangular output pulses in response to even-numbered counts;
D. means alternately actuated by output pulses of the first and second sets to yield said AC power in the form of bipolar rectangular pulses whose frequency is one-half said constant frequency; and
E. means for terminating said gate period when said decoder means produces a reset pulse representing a predetermined maximum count.

4,034,238

FIELD EFFECT TRANSISTOR INFORMATION TRANSFER CIRCUIT FOR USE IN STORAGE REGISTER

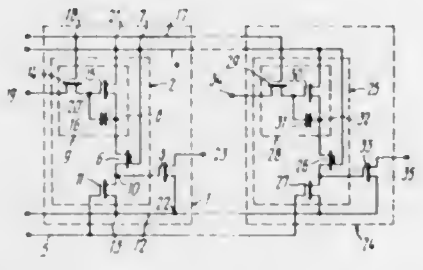
Jury Vasilievich Tayakin, ulitsa Scherbakova, 98v, kv. 109; Vladimir Pavlovich Sidorenko, ulitsa Scherbakova, 92v, kv. 29; Alexandr Yakovlevich Sirota, ulitsa Scherbakova, 74b, kv. 81; Jury Vladimirovich Prokofiev, ulitsa Scherbakova, 73, kv. 131, and Alexandr Maximovich Kopytov, ulitsa Karpinskogo, 3, all of Kiev, U.S.S.R.

Filed Nov. 24, 1975, Ser. No. 634,528

Claims priority, application U.S.S.R., Nov. 29, 1974, 2075539

Int. Cl.² G11C *19/28*

U.S. Cl. 307—221 C **1 Claim**



1. An output device of a metal-insulator-semiconductor transistor integrated circuit providing the transfer of information to the register involving time separation of character digits and comprising:
a. a penultimate stage and an output of said penultimate stage;
b. an output transistor, having a gate, a drain and a source, said gate of said output transistor being connected to said output of said penultimate stage, said drain of said output transistor being connected to the output of the output device;
c. a clock pulse line;
d. a separation pulse line;
e. a first transistor of said penultimate stage, provided to charge the gate capacitance of said output transistor, and having a gate, a drain and a source, said gate of said first transistor being connected to said clock pulse line; said source of said first transistor being connected to said output of said penultimate stage;
f. a second transistor of said penultimate stage provided to discharge the input capacitance of the gate of said output transistor and having a gate, a drain and a source, said gate of said second transistor being connected to said separation pulse line; said drain of said second transistor being connected to said output of the penultimate stage;
g. a follower of said penultimate stage; an input and an output of said follower; a terminal for gating information from said output of said follower; said input of said follower being an input of said output device of the metal-insulator-semiconductor transistor integrated circuit, said output of said follower being connected to said drain of said first transistor, said terminal for gating information from said output of said follower being connected to said clock pulse line; and
h. a common line; said source of said second transistor and said source of said output transistor being connected to said common line.

4,034,239

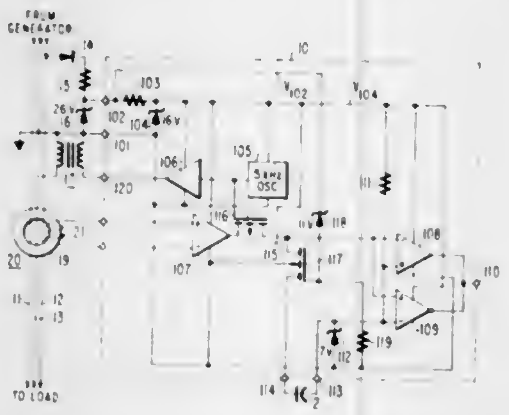
CAPACITANCE MEMORIES OPERATED WITH INTERMITTENTLY-ENERGIZED INTEGRATED CIRCUITS

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 6, 1976, Ser. No. 702,400

Int. Cl.² H03K *17/60;* G11C *11/34;* H01L *27/02*

U.S. Cl. 307—238 **4 Claims**



1. In a system including a memory capacitor together with a monolithic integrated circuit, said integrated circuit having a first point for connection to a point of reference potential and having a second point for making charge available for adding or subtracting to the charge on said memory capacitor, said monolithic integrated circuit being disposed on a substrate of semiconductor material of a first conductivity type having a surface covered by a layer of semiconductor material of a second conductivity type opposite to said first conductivity type, with means extending through said layer for dividing it into a plurality of isolation tubs and with means for defining the various circuit elements of said integrated circuit in separate ones of said isolation tubs, the improvement for substantially forestalling leakage of charge to or from said memory capacitor during intervals when energizing potential is not applied to portions of said monolithic integrated circuit connected to said first or second point, which improvement comprises:
an analog switch, having a control electrode and having a controlled conduction path for serial connection with said memory capacitor between the first and second points of said integrated circuit, and
means for responding to the presence and absence of said energizing potential for applying a control signal to the control electrode of said analog switch that will condition its controlled conduction path for non-conduction during said intervals when energizing potential is not applied to portions of said monolithic integrated circuit connected to said first or second point.

4,034,240

SINE-TO-SQUARE WAVE CONVERTER

Donald S. Foreman, Fridley, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

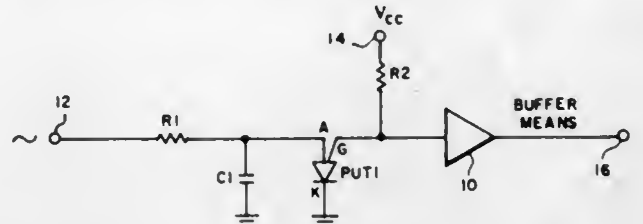
Filed Dec. 29, 1975, Ser. No. 645,068

Int. Cl.² H03K *17/00*

U.S. Cl. 307—252 F **10 Claims**

1. A circuit for producing a square wave output signal, the circuit comprising:
first terminal means adapted to receive an alternating current signal;
second terminal means adapted to receive a reference signal;

programmable unijunction transistor means having gate, anode, and cathode electrodes;
first impedance means connected to the anode and to the first terminal means for limiting current flow to the anode;



second impedance means connected to the gate and to the second terminal means;
capacitor means connected between the anode and the cathode; and
means for deriving an output signal from the gate.

4,034,241

VOLTAGE SENSITIVE TRIGGER CIRCUIT

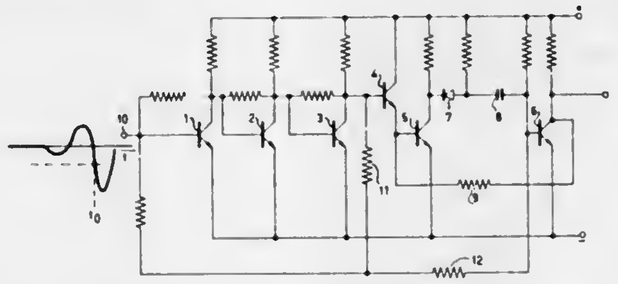
Cornelis Martinus van der Burgt, and Gerardus Andreas Van Maanen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 574,511, May 5, 1975, abandoned. This application May 17, 1976, Ser. No. 686,998

Claims priority, application Netherlands, May 21, 1974, 7406785

Int. Cl.² H03K *1/02, 1/14*

U.S. Cl. 307—264 **6 Claims**



1. A voltage sensitive trigger circuit which comprises a preamplifier and two cross-coupled alternately conducting trigger transistors biased to a quiescent state, the trigger circuit changing its conducting state when the input voltage exceeds a specific threshold level, means for deriving a first voltage from the base of that trigger transistor which conducts in the quiescent stage, means for deriving a second voltage at the output of the preamplifier, means for applying said first and second voltages to the input of said preamplifier in such a way that the quiescent voltage which is applied from the output of the preamplifier to the input of that trigger transistor which is non-conducting in the quiescent state experiences a threshold value which is compensated for temperature and supply voltage variations.

4,034,242

LOGIC CIRCUITS AND ON-CHIP FOUR PHASE FET CLOCK GENERATOR MADE THEREFROM

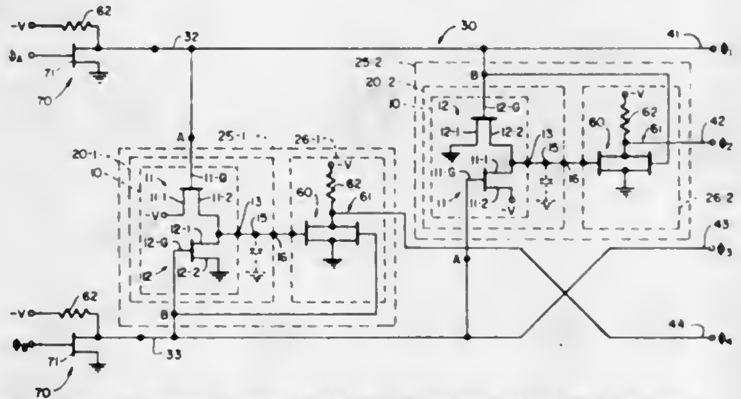
Richard H. Heeren, Palatine, Ill., assignor to Teletype Corporation, Skokie, Ill.

Filed Aug. 25, 1975, Ser. No. 607,408

Int. Cl.² H03K *5/13, 3/353, 19/08, 19/20*

U.S. Cl. 307—269 **16 Claims**

1. A timer having two inputs and a single output, and utilizing combinations of a first voltage and a second voltage on said inputs to impress a predetermined one or the other of said voltages on said output, wherein the improvement comprises:
a first FET, the gate of which is said one input, and, a first controlled terminal of which is connectible to a source of said first voltage;
a second FET, the gate of which is said other input, a first controlled terminal of which is connected to a source of said second voltage; and, a second controlled terminal of which is connected to a second controlled terminal of said first FET;
a capacitance effectively interposed between said second controlled terminals and a source of said second voltage;



a two input, single output logical element means for providing said first voltage on its output if and only if both of its inputs have said second voltage thereon, and for providing said second voltage on its output for all other states of its inputs;
means for connecting a first of said logical element means inputs to said second controlled terminals; and
means for connecting the second of said logical element means inputs to the gate of said second FET.

4,034,243

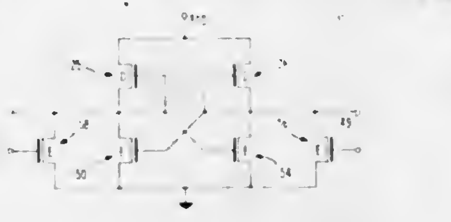
LOGIC ARRAY STRUCTURE FOR DEPLETION MODE-FET LOAD CIRCUIT TECHNOLOGIES

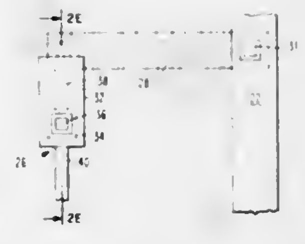
Robert D. Love, Burke; James W. Cullen, Fredericksburg, and Robert W. Kruppa, Manassas, all of Va., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,513

Int. Cl.² H03K *3/353, 19/34;* H01L *29/78, 23/48*

U.S. Cl. 307—304 **21 Claims**





1. In an FET logic function layout including a spaced parallel array of horizontal diffusion segments in the surface of a semiconductor substrate, an insulating layer deposited over the surface of the substrate, and a spaced parallel array of vertical metallized lines deposited over the insulation layer, wherein an improvement in the configuration of an FET depletion mode load device in a static logic array, comprises:
a first one of said horizontal diffusion segments, to serve as the drain diffusion of the FET static load device;
a second one of said horizontal diffusion segments spaced from said first horizontal diffusion, to serve as the source diffusion of the FET static load device;

said first horizontal diffusion juxtaposed with said second horizontal diffusion and defining a channel region therebetween in said substrate;

said insulating layer having a thinner portion over said channel region and a via-hole perforation over said second horizontal diffusion;

a vertical metallized line deposited over said first and second diffusion segments, forming an electrically conductive source contact with said second horizontal diffusion through said via hole, forming the gate electrode by its close proximity in said thinner portion of said insulator, to said channel region, and forming the output electrode for the device;

whereby the number of metallized lines and via holes necessary to the structure of said FET load device is reduced, thereby increasing the horizontal circuit packing density.

4,034,244
RESONANT CYLINDRICALLY SHAPED ULTRASONIC WAVE GENERATOR

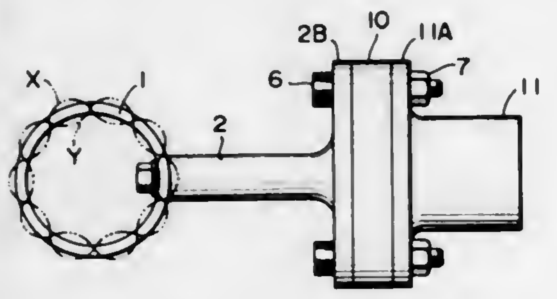
Kiyokazu Asai, and Akihiro Takeuchi, both of Nagoya, Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Nagoya, Japan

Continuation of Ser. No. 453,987, March 22, 1974, abandoned. This application Sept. 5, 1975, Ser. No. 610,799

Claims priority, application Japan, Mar. 30, 1973, 48-365.04

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.2 **8 Claims**



1. An ultrasonic wave generator comprising:

a hollow cylindrically shaped ultrasonic frequency vibratory member open at both ends which has a side circular wall having a predetermined length between ends of said hollow cylindrically shaped member and a constant wall thickness in the axial direction of said hollow cylindrically shaped member;

means for flexurally vibrating said vibratory member so that plural nodal lines extend generally parallel to the axis thereof with the inner and outer surfaces of said member spaced from said nodal lines vibrating radially and equally in a harmonic vibration pattern comprising:

an ultrasonic frequency oscillator;

an ultrasonic electromechanical transducer for transforming electric oscillations generated by said ultrasonic frequency oscillator into mechanical longitudinal vibrations; and

an amplifier member for amplification of ultrasonic vibrations integrally connected to the output of said ultrasonic electromechanical transducer, said amplifier member having its output end integrally connected to said hollow cylindrically shaped ultrasonic frequency vibratory member with the axis thereof being in perpendicular relation to the axis of said vibratory member whereby said amplified mechanical longitudinal vibrations are converted to ultrasonic vibrations of both the inner and outer surfaces of said vibratory member.

4,034,245
SYNCHRONOUS ELECTRICAL MACHINE HAVING A SUPERCONDUCTIVE FIELD WINDING

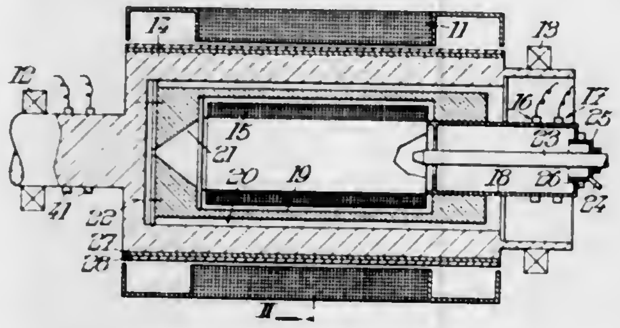
Alain Mailfert, Morsang-sur-Orge, and Michel Renard, Grenoble, both of France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), France

Continuation of Ser. No. 443,014, Feb. 15, 1974, abandoned. This application May 5, 1975, Ser. No. 574,342

Claims priority, application France, Feb. 21, 1973, 73.06118; Jan. 7, 1974, 74.00387

Int. Cl.² H02K *2/00*

U.S. Cl. 310—52 **13 Claims**



1. A polyphase synchronous electrical machine comprising a superconducting D.C. field winding for providing a rotating, at least bipolar magnetic field, stationary windings adapted to produce a field which rotates about the longitudinal axis of the machine when a polyphase alternating current flows through said windings; means for notatably supporting said field winding inside said stationary windings coaxially of a rotating torque transmission shaft carrying an auxiliary winding; and an exciting circuit for circulating in the auxiliary winding a field-producing D.C. current and for adjusting said D.C. current delivered by an external source in the auxiliary winding at a value so related to the power component of the current flowing through the stationary windings as to maintain synchronism between the field winding and the auxiliary winding.

4,034,246
VARIABLE VIBRATING MOTOR

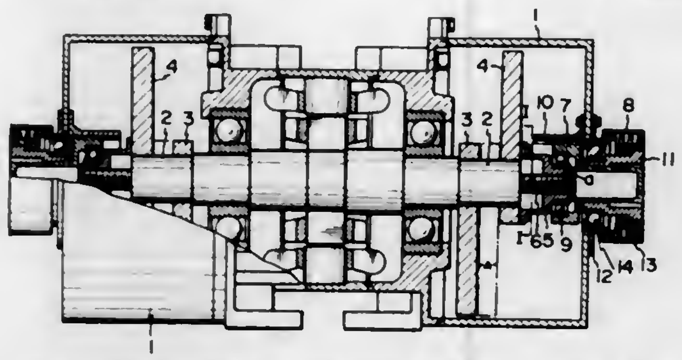
Akinobu Nakashima, 1592-365 Kamifu, Oaza-Shingu, Kasuya, Fukuoka, and Masanori Eshima, 1041-2, Oaza-Matsuzaki, Higashi, Fukuoka, both of Japan

Filed Sept. 25, 1975, Ser. No. 616,708

Claims priority, application Japan, Dec. 26, 1974, 50-990; July 2, 1975, 50-82104

Int. Cl.² H02K *7/06*

U.S. Cl. 310—81 **8 Claims**



1. In a vibration motor comprising a casing, a rotor having a rotor shaft rotatably mounted in said casing, a fixed weight fixedly mounted on said rotor shaft, a movable weight on said rotor shaft, adjustable means on said casing for adjusting said movable weight to various rotational positions about said rotor shaft, said adjustable means comprising a male threaded member extending coaxially from the longitudinal end of said rotor shaft, an urging sleeve threadedly engaging said threaded member, means connecting said urging sleeve to said movable weight, said movable weight being rotatably and slidably mounted on said rotor shaft, and manually operable means outside of said motor casing for adjusting said adjustable means, said manually operable means being operable to rotate said urging sleeve and thereby varying the rotational position of said movable weight when the motor is running.

4,034,247
STRUCTURE FOR SYNCHRONOUS MOTOR, ESPECIALLY STEPPER MOTOR

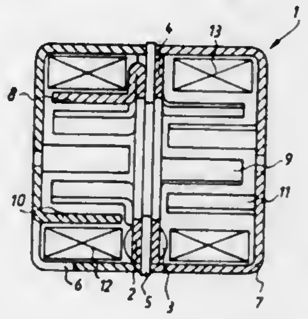
Eduard Wagensonner, Aschheim, and Herbert Wilsch, Unterhaching, both of Germany, assignors to AGFA-Gevaert, Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 28, 1975, Ser. No. 626,208

Claims priority, application Germany, Oct. 31, 1974, 2451876

Int. Cl.² H02K *19/00*

U.S. Cl. 310—164 **10 Claims**



1. In a synchronous motor, comprising, a pair of stators surrounding an armature space each stator being provided with a respective stator winding, each stator being comprised of a first pole teeth plate, a stator housing and a second pole teeth plate with the teeth of the first plate of each stator being interdigitated with the teeth of the second plate of the same stator but not with the teeth of the other stator and extending generally in axial direction of the motor radially outwardly of the armature space but radially inwardly of the respective stator winding, the angular spacing between a point on a pole tooth of the first plate of one stator and the corresponding point on the neighboring pole tooth of the second plate of the same stator constituting one pole pitch, the stators being arranged coaxially but angularly offset relative to each other by half the pole pitch, the first plates being identical to each other and arranged back-to-back with the second plates being separated from each other by the two first plates, each first plate having at its outer periphery a first engaging portion, each stator housing having a complementary second engaging portion, the first engaging portion of each first plate cooperating with the complementary second engaging portion of the housing of the same stator to establish the angular relationship between such first plate and such stator housing, each first engaging portion on a first plate being angularly offset relative to the neighboring tooth of the same first plate by half the pole pitch, each second engaging portion on a stator housing being angularly offset relative to the neighboring tooth of the second plate of the same stator by half the pole pitch, each first plate having at least two third engaging portions, on each first plate the first engaging portion and the neighboring tooth of the same plate together defining an angle which is bisected by a line relative to which the third engaging portions of the same plate are symmetrically disposed, the third engaging portions of one first plate congruently registering with the third engaging portions of the other first plate, with the first engaging portion of one first plate being angularly offset relative to the first engaging portion of the other first plate by half the pole pitch.

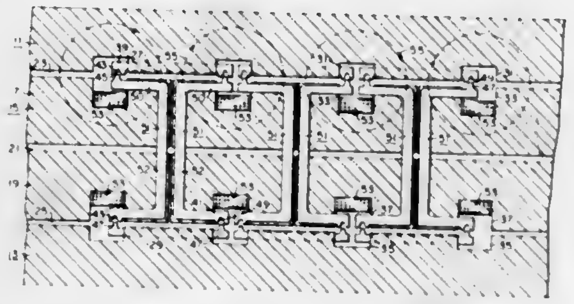
4,034,248
SEGMENTED MAGNET HOMOPOLAR TORQUE CONVERTER

Cecil J. Mole, Monroeville, and William C. Brenner, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 346,534, March 30, 1973, now Defensive Publication No. T921,004. This application Aug. 22, 1975, Ser. No. 607,009

Int. Cl.² H02K *31/00*

U.S. Cl. 310—178 **7 Claims**



1. A torque converter comprising:

first and second rotating members;

a plurality of electrically conductive lengths carried by said rotating members;

a stationary structure positioned between said rotating members;

magnetic flux producing means mounted in said stationary structure producing lines of flux through which said conductive lengths pass;

current collecting means to convey current from said conductive lengths carried by said rotating members to said stationary structure;

stationary interconnecting means passing through said stationary structure to provide a closed loop through said conductive lengths carried by said first rotating member, said current collector means, and said conductive lengths carried by said second rotating member;

adjacent ones of said conductive lengths being electrically connected to form continuous conductors carried by said rotating members;

said first and second rotating members being inner and outer, respectively, generally cylindrical members concentric with one another;

said current collecting means comprising projeting rings on said inner rotating member and the outer portion of said stationary structure between said conductive lengths, grooves formed in said stationary structure and in said outer rotating member to mate with said projecting rings on said inner rotating member and said stationary member, respectively, and liquid metal in said grooves to provide an electrically conductive path between said projecting rings and said grooves.

4,034,249
COMMUTATOR ROUNDING BRUSH

Ralph W. Avery, Erie, Pa., assignor to General Electric Company, Erie, Pa.

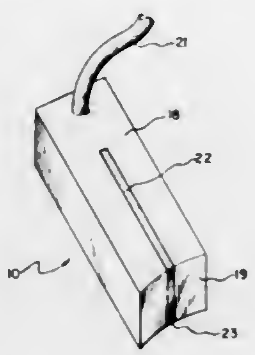
Filed Aug. 5, 1976, Ser. No. 711,941

Int. Cl.² H02K *13/00;* **H01R** *39/56*

U.S. Cl. 310—253 **19 Claims**

1. An improved electrically conductive brush of the type used in dynamoelectric machinery including a rotated part, such as a commutator or a slip ring, said part comprising electroconductive material such as copper, having an exposed convex surface and said machinery further including means for holding the brush and for biasing a contact surface thereof toward said exposed surface to provide an electric current conducting, sliding contact between the brush and the rotated part, wherein the improvement comprises an abrasive element longitudinally interposed in said brush, said element having

one end extending across and forming a central portion of said contact surface, which portion has a relatively small area and is disposed generally parallel to and midway between leading and trailing edges of said brush, said contact surface being so arranged that with said brush continuously in contact with said rotated part the central portion of said contact surface will frictionally engage high spots of said exposed surface where the exposed surface has a radius of curvature less than its average radius of curvature but will not engage low spots of said exposed surface where the radius of curvature is greater than average, said element having such dimensions and abrasive content that in operation it removes electroconductive material from said exposed surface of the rotated part at a rate faster than the rate of electrical erosion of said material, whereby the improved brush when utilized in said machinery will cause selective abrasive wear of any high spots on said exposed surface and thus restore and maintain a substantially round profile on said rotated part.



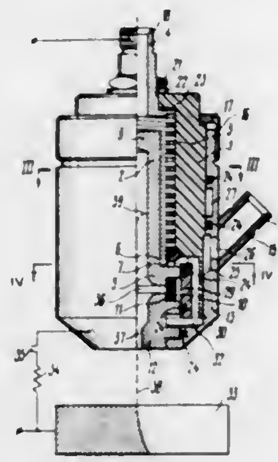
4,034,250
PLASMATRON

Jury Yakovlevich Kiselev, ulitsa Chernomorskaya, 3, kv. 53; Alexandr Mikhailovich Merkher, ulitsa Tolbukhina, 34, kv. 34, both of Kishinev, and Stanislav Antonovich Sokolovsky, ulitsa Entuziastov, 27, kv. 85, Kiev, all of U.S.S.R.

Filed Aug. 16, 1976, Ser. No. 714,604

Int. Cl.² H01J *1/50, 7/24;* **H05H** *1/02*

U.S. Cl. 313—32 **4 Claims**



1. A plasmatron comprising:
a casing having a first butt and a second butt;
a power lead-in positioned in the first butt of said casing;
a cylindrical hollow electrode positioned in said casing at a certain distance from said lead-in and having a bottom facing said lead-in and a butt end;
a lead-in coil having a first end and a second end and enveloping said cylindrical hollow electrode and positioned with a clearance between said electrode and said coil, the first end of said coil being connected to said lead-in and the second end being connected to said butt of said cylindrical hollow electrode;
an annular vortex generator made of insulating material positioned in said casing along its periphery and having a first butt and a second butt and at least one passage tangential to the inner annular surface of said vortex generator, the first butt being in contact with said butt of said electrode;
a nozzle positioned in the second butt of said casing and being in contact with the second butt of said annular vortex generator;
a means of supplying cooling water into said clearance between said electrode and said coil, to said nozzle and of removing said water therefrom;
a means of supplying air through said passage of said vortex generator into the space of said electrode;
a means of supplying said electrode and said nozzle with electricity.

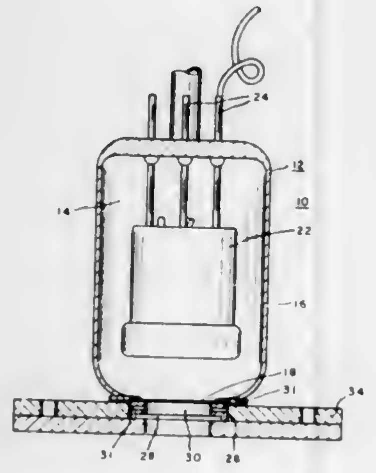
4,034,251
TRANSMISSION X-RAY TUBE

David J. Haas, Stamford, Conn., assignor to North American Philips Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,698

Int. Cl.² H01J *35/00*

U.S. Cl. 313—59 **6 Claims**



1. A transmission x-ray tube, comprising:
a. an envelope comprising a wall structure;
b. means for generating a charged particle beam;
c. x-ray permeable window means disposed at said wall structure;
d. means for directing said particle beam to said window means to produce x-rays;
e. structural means for providing a space at said window means, and comprising wall means and an x-ray permeable window element disposed opposite said window means;
f. means for transferring a heat transfer fluid through said space; and
g. a flange structure for mounting said tube on an external support, said structural means and said flange structure comprising a unitary element.

4,034,252
CERAMIC LAMP SEAL AND CONTROL OF SEALING FRIT DISTRIBUTION

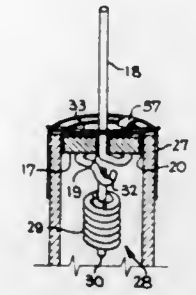
Charles I. McVey, Shaker Heights, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Dec. 15, 1975, Ser. No. 640,804

Int. Cl.² H01J *17/04, 17/16*

U.S. Cl. 313—217 **6 Claims**

1. A high pressure vapor discharge lamp comprising:
a tubular light-transmitting ceramic envelope having an end closures and thermionic electrodes sealed into its ends and containing an ionizable filling;
a closure assembly at one end of said envelope comprising a ceramic plug having a perforation and a ceramic-matching metal inlead conductor sealed therethrough, said plug being sealed to said envelope and said inlead being sealed to said plug by sealing frit;
and a crosspiece attached to said inlead immediately next to the plug and extending transversely across the end of said envelope, and a ridge of sealing frit on the surface of said plug reaching up to said crosspiece and extending from the inlead-plug seal at the perforation to the plug-envelope seal on each side.



4,034,253
GLASS COVER PLATE FOR A FLAT DISPLAY PANEL HAVING MARGINAL PROJECTIONS

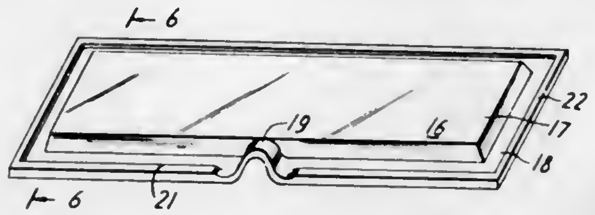
Takashi Yamauchi, Tokyo, Japan, assignor to Yamato Denshi Co., Ltd., Tokyo and Nippon Electric Kagoshima, Limited, Izumi, both of, Japan

Filed Mar. 25, 1976, Ser. No. 670,532

Claims priority, application Japan, Mar. 26, 1975, 50-40259

Int. Cl.² H01J *19/54, 61/30*

U.S. Cl. 313—317 **18 Claims**



1. In a glass cover plate for a flat display panel comprising a substantially planar substrate made of an electrically insulating material and having a plurality of electrodes attached thereto, said cover plate being of a shape of a substantial rectangle in outline and comprising an outwardly protruding central portion for covering said electrodes and a peripheral flange having a substantially planar surface to be sealed to said planar substrate, the improvement wherein said cover plate is provided with a projection along margins of said flange at least at each corner portion of said rectangle, said projection protruding away from said planar surface substantially in the direction in which said central portion protrudes.

4,034,254
COLOR TUBE HAVING CONCENTRIC PHOSPHOR RING PATTERN AND ELECTRON MULTIPLIER CHANNEL PLATE

Hewson Nicholas Graham King, Redhill; John Revere Mansell, East Grinstead, and Pamela May Stubberfield, Wantage, all of England, assignors to U.S. Philips Corporation, New York, N.Y.

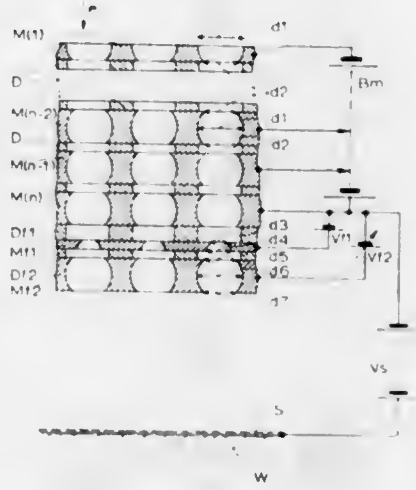
Filed Apr. 24, 1975, Ser. No. 571,402

Claims priority, application United Kingdom, May 7, 1974, 20020/74

Int. Cl.² H01J *43/24, 43/22*

U.S. Cl. 313—400 **4 Claims**

1. A color cathode ray tube comprising an electron gun to generate an input electron beam, an electron multiplying, dynode channel plate structure having an input face opposite said gun and an output face emitting the outgoing electrons in hollow beams, a viewing screen arranged parallel to said output face; a focusing control electrode between said structure and said screen which electrode has apertures aligned with the channels of said structure and is provided to vary the overall width of said outgoing beams when varying focus potentials are applied thereto; said screen including an array of phosphor patterns arranged in concentric areas having different color responses to electron bombardment and each of said patterns being aligned with an aperture of the focusing control electrode in such manner that said varying focusing potentials can control the outgoing electron beams so as to cause them to land on differing selected areas of said patterns; and an additional focusing electrode provided between the final dynode of the channel plate structure and said focusing control electrode, said additional electrode being thinner than said focusing control electrode and said additional electrode having apertures aligned with and smaller in cross-section than the channels of said structure to apply a degree of a constant focusing action to the hollow beams of individual channels while control of the diameter of said outgoing beams is performed by said focusing control electrode.



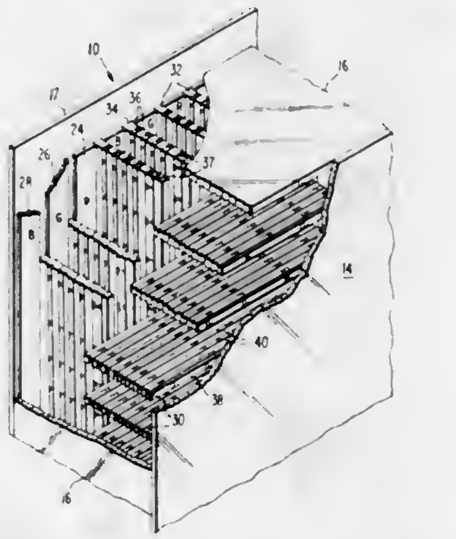
4,034,255
VANE STRUCTURE FOR A FLAT IMAGE DISPLAY DEVICE

Carmen Anthony Catanese, Rocky Hill; John Guiry Endriz, Plainsboro, and Jan Aleksander Rajchman, Princeton, all of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,095

Int. Cl.² G01J *31/48;* **H01J** *43/20, 29/70*

U.S. Cl. 313—400 **10 Claims**



1. A structure for an image display device comprising, an evacuated envelope including a transparent front panel

and a back panel spaced from said front panel, said front panel having a cathodoluminescent screen thereon,

a plurality of first vanes substantially perpendicular to and contacting and back panel, said first vanes being spaced from and parallel to each other,

a plurality of second vanes, substantially perpendicular to and contacting said front panel, said second vanes being spaced from and parallel to each other and transverse to said first vanes, said first and second vanes being mutually supporting, and

said first and second vanes having electroding thereon for controlling operation of said device.

4,034,256

ELECTRON GUN FOR HEATING, FUSING AND VAPORIZING

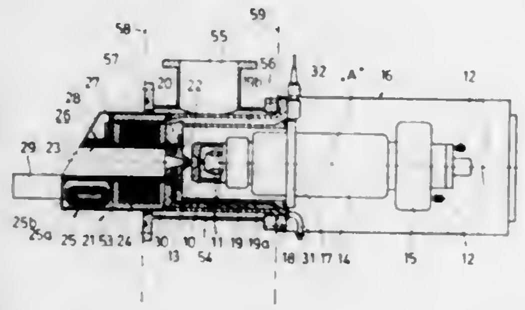
Peter Sommerkamp, Hanau am Main, and Walter Heil, Neuberg, both of Germany, assignors to Leybold-Heraeus GmbH & Co., Cologne, Germany

Filed May 27, 1976, Ser. No. 691,041

Claims priority, application Germany, June 24, 1975, 2528032

Int. Cl.² H01J *7/24, 29/76*

U.S. Cl. 313—440 **3 Claims**



1. Electron gun for heating, fusing and vaporizing having a high voltage portion, electron emitting cathode means, at least one beam forming electrode means associated with the cathode means, accelerating anode means, beam guiding tube means extending in the direction of the beam path and surrounded by jacket tube means, electromagnetic lens means and one or more deflection systems positioned in the space formed between the beam guiding tube means and the jacket tube means, said beam guiding tube means, jacket tube means, electromagnetic lens means and the deflection systems being contained in a single, replaceable unit which is joined by a plurality of hollow post means parallel to the gun axis of the high voltage portion of the gun and disposed between two flange ring means having distribution passages for coolant disposed therein one of which is connected to said replaceable unit and the other to said high voltage portion and wherein the space for the electromagnetic lens means and the deflection systems communicates with the atmosphere through at least one of the hollow posts means.

4,034,257

MERCURY VAPOR LAMP UTILIZING A COMBINATION OF PHOSPHOR MATERIALS

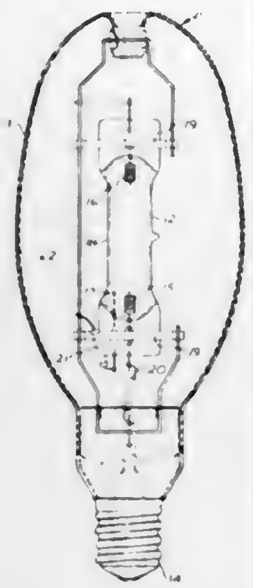
Mary V. Hoffman, South Euclid, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed June 5, 1975, Ser. No. 583,959

Int. Cl.² H01J *1/62*

U.S. Cl. 313—487 **16 Claims**

1. In a high-pressure mercury vapor lamp comprising an inner discharge assembly including an arc tube containing a filling of mercury, a transparent outer envelope surrounding said discharge assembly and spaced therefrom, and a phosphor coating deposited on the inner surface of said outer envelope, the improvement which comprises using a phosphor blend of a red-emitting phosphor selected from the group consisting of europium-activated yttrium vanadate and europium-activated yttrium vanadate phosphate with up to about 30 weight percent in said phosphor blend of cerium-activated yttrium aluminate phosphor so as to absorb at least part of the 436 nanometer emission generated by the mercury arc discharge.



4,034,258

DEVICE FOR ATTENUATING VERY SHORT PARASITIC WAVES IN ELECTRONIC TUBES

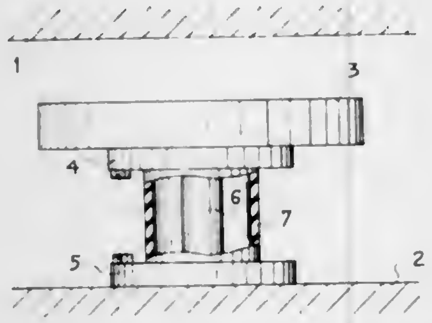
Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris Cedex, France

Filed June 24, 1975, Ser. No. 589,888

Claims priority, application France, June 28, 1974, 74.22688

Int. Cl.² H01J *7/46, 19/80*

U.S. Cl. 315—39 **9 Claims**



1. A device for attenuating very short parasitic waves occurring between two conductive walls of a high frequency electronic tube, comprising a resistive element connected between two conducting components, one of said two conducting components being connected to one of said two conductive walls and the other of said conducting components is located opposite the other of said conductive walls spaced therefrom and forms a capacitor in association therewith, said attenuator device being disposed between said two conductive walls in a region of said tube devoided of useful waves.

4,034,259

SPARE LAMP CONTROL CIRCUIT FOR A LIGHT PROJECTION SYSTEM

David K. Schoch, Downers Grove, Ill., assignor to Audio Visual Innovators Corporation, Darien, Ill.

Filed Apr. 14, 1976, Ser. No. 676,747

Int. Cl.² H05B *37/04*

U.S. Cl. 315—93 **9 Claims**

1. A control circuit for a light projection system for operation from an alternating-current voltage source, said circuit comprising:

a pair of input lines for applying said alternating current voltage source to said circuit;

a main lamp;

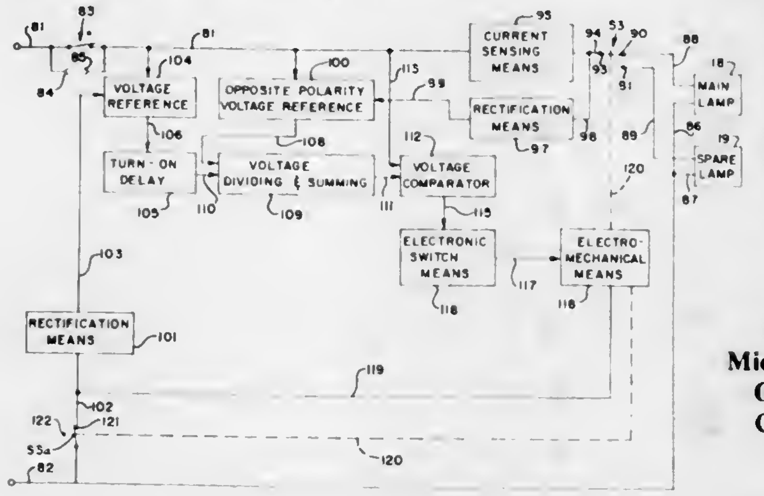
a spare lamp substantially in parallel connection with said main lamp;

switch means in series connection with said main lamp and said spare lamp for selectively energizing said main lamp or said spare lamp across said pair of input lines;

current sensing means in series connection with said switch means for sensing current through said main lamp and for dropping a portion of the voltage source thereacross;

rectification means;

a voltage reference established by said rectification means rectifying said portion of the voltage source dropped across said current sensing means;



voltage comparator means for comparing the voltage difference between a pair of inputs, one of said inputs referenced to one of said input lines, another of said inputs for monitoring said voltage reference, said voltage comparator means having an output responsive to said pair of inputs and adapted to control said switch means, whereby failure of said main lamp causes said portion of the voltage source dropped across said current sensing means to be removed therefrom, causing said voltage reference to collapse and said voltage comparator means to change said output, said switch means responding to the changed output to said voltage comparator means to energize said spare lamp.

4,034,260

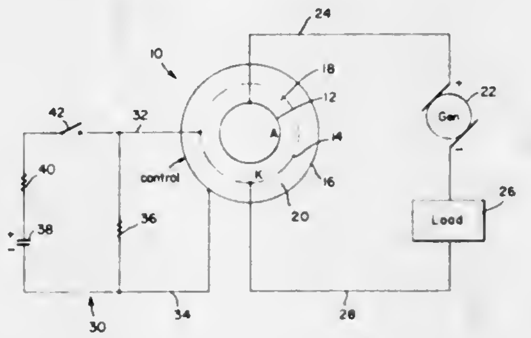
GRIDDED CROSSED-FIELD TUBE AND IGNITION METHOD

Michael A. Lutz, Livermore, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 19, 1976, Ser. No. 659,604

Int. Cl.² H01J *17/14, 17/32*

U.S. Cl. 315—344 **8 Claims**



1. A crossed-field switch device comprising:

a tubular anode electrode and a tubular cathode electrode spaced from said anode electrode, said electrodes having active areas that face to form a continuous closed main discharge gap therebetween and means for making electrical connections to said anode and said cathode electrodes and means for providing a gas at sub-atmospheric pressure in said main discharge gap and a magnetic field above the critical value in said main discharge gap so that a glow mode plasma discharge can take place between said anode and said cathode electrodes for conduction of said switch device, the improvement comprising:

a tubular control electrode postioned adjacent to one of said anode and cathode electrodes to form a continuous closed ignition discharge gap adjacent to, over the whole area of and in communication with said main discharge gap; and

means for electrically pulsing said control electrode with respect to its adjacent electrode on the other side of said ignition discharge gap for bringing conditions in said ignition discharge gap into conductive conditions so that glow mode plasma discharge begins in said ignition discharge gap and enters into the entire area of said main discharge gap to cause conductive condition of said main discharge gap over all of its area so that said crossed-field switch device can be turned on with voltage applied thereto without magnetic field pulsing and with uniform wear of said anode and cathode electrodes over their entire active areas.

4,034,261

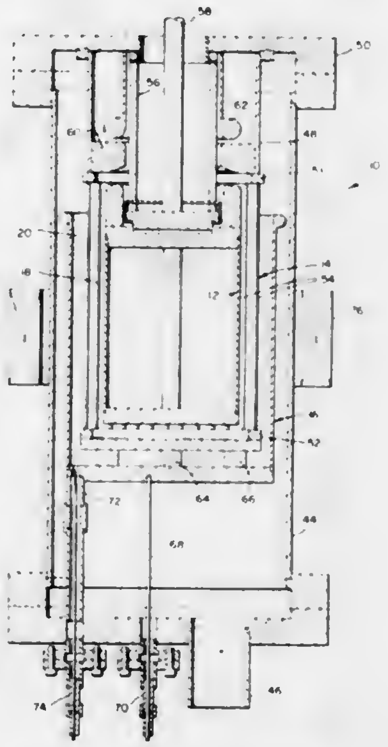
GRIDDED CROSSED-FIELD TUBE

Michael A. Lutz, Livermore, and Robin J. Harvey, Thousand Oaks, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Feb. 19, 1976, Ser. No. 659,605

Int. Cl.² H01J *17/14, 17/32*

U.S. Cl. 315—344 **11 Claims**



1. A crossed-field switch device comprising:

a tubular anode electrode and a tubular cathode electrode spaced from said anode electrode the active areas thereof defining and facing a main discharge gap having therebetween a continuous closed path and means for making electrical connections to said anode and said cathode electrodes and means for providing a gas at sub-atmospheric pressure in said main discharge gap and a magnetic field above the critical value in said main discharge gap so that a glow mode plasma discharge can take place between said anode and said cathode electrodes for conduction of said switch device, the improvement comprising:

a tubular control electrode positioned adjacent to one of said anode and cathode electrodes to form a continuous closed path ignition discharge gap adjacent to, substantially over the whole active area of and in communication with said main discharge gap, the electrode between said main gap and said ignition discharge gap being an intermediate electrode, said intermediate electrode having openings therethrough so that there is a line of sight between said main gap and said ignition gap so that plasma can pass from said ignition gap to said main gap; and

means for electrically pulsing said control electrode with respect to its adjacent electrode on the other side of said ignition discharge gap for bringing conditions in said ignition discharge gap into conductive conditions so that glow mode plasma discharge begins in said ignition discharge gap and enters into substantially the entire active area of said main discharge gap through said intermediate electrode to cause conductive condition of said main discharge gap so that said crossed-field switch device can be turned on with voltage applied thereto without magnetic field pulsing and with uniform wear of said anode and cathode electrodes over their entire active areas.

4,034,262

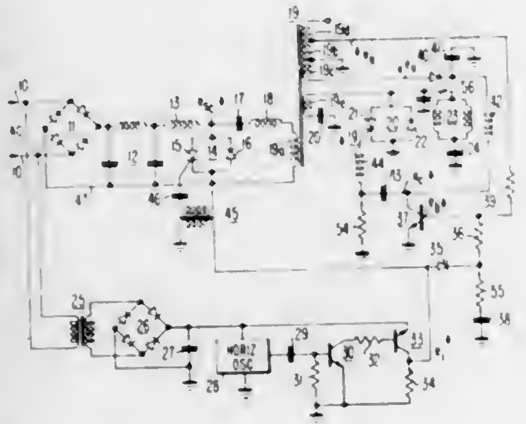
GATE DRIVE CIRCUIT FOR SCR DEFLECTION SYSTEM

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 8, 1975, Ser. No. 638,848

Int. Cl.² H01J *29/70, 29/76*

U.S. Cl. 315—408 **4 Claims**



1. A gate drive circuit for a thyristor deflection system in which a second thyristor switch couples a deflection winding to an energy storage source during a trace interval and a first thyristor switch couples energy to said source during a commutating interval, comprising:

a source of first pulses timed for enabling said first switch for conduction;

said second switch requiring second enabling pulses offset in time from said first pulses;

a source of retrace pulses in said deflection system;

means coupled to said sources of first and retrace pulses for delaying said first pulses and for combining said delayed first pulses with said retrace pulses for forming said second pulses; and

means coupling said second pulses to said second switch for enabling conduction thereof.

4,034,263

GATE DRIVE CIRCUIT FOR THYRISTOR DEFLECTION SYSTEM

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,733

Int. Cl.² H01J *29/70, 29/76*

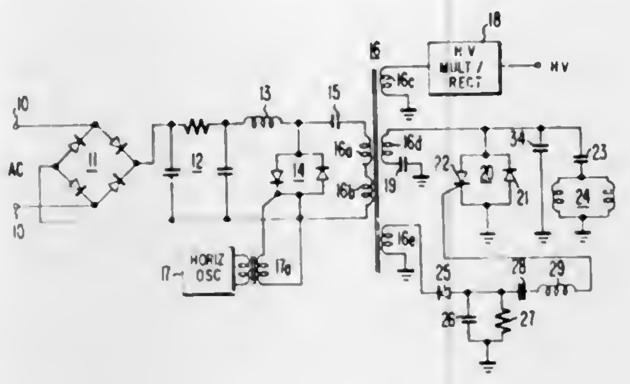
U.S. Cl. 315—408 **8 Claims**

1. A gat drive circuit for a thyristor deflection system, comprising:

a commutating circuit including a periodically controlled first switch for producing alternating current in said commutating circuit;

a trace circuit including a periodically controlled second switch coupled to said commutating circuit for storing energy in a deflection winding during a retrace interval of every deflection cycle; and

a gate drive circuit including a unidirectional current conducting device coupled to receive alternating current signals from said commutating circuit, a capacitor coupled to be charged by unidirectional current from said device, said capacitor being coupled to control the conduction state of said second switch, and means for controlling the discharge time of said capacitor for rendering it unresponsive to polarity changes in said alternating current signals within each of said deflection cycles.



4,034,264

ARRANGEMENT FOR DETECTING A DEFICIENT OPERATIONAL CAPABILITY OF A VACUUM SWITCHING VESSEL

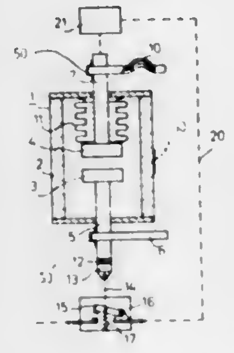
Kurt Muller; Hans-Jurgen Lendt, and Manfred Rimmrott, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Apr. 2, 1975, Ser. No. 564,377

Claims priority, application Germany, Apr. 2, 1974, 2416318

Int. Cl.² H02H *7/22*

U.S. Cl. 361—2 **8 Claims**



1. In a vacuum switching vessel equipped with contacts and with a member which undergoes a change in temperature when the operation of the switching vessel becomes deficient, the improvement comprising: detection means mounted in heat-conductive contact with the member of the switching vessel, said member having a low temperature time constant and undergoing a temperature change when the vacuum in said vessel is insufficient to extinguish the arc between said contacts when opened, and said detection means having a physical characteristic changeable in response to a limited change in temperature; interrupting means for interrupting the flow of current through the vacuum switching vessel; and, transducer means for translating said change in physical characteristic into a signal for actuating said interrupting means whereby the current through the vacuum switching vessel is interrupted.

4,034,265

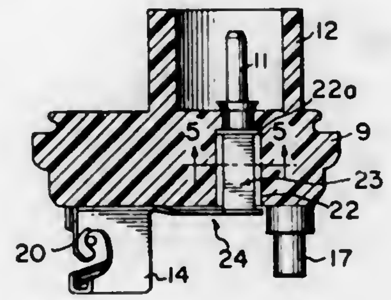
ELECTRIC MOTOR PROTECTOR

Gideon A. DuRocher, and Daniel J. DuRocher, both of Mount Clemens, Mich., assignors to Essex International, Inc., Fort Wayne, Ind.

Continuation-in-part of Ser. No. 371,247, June 18, 1973, abandoned. This application Feb. 24, 1975, Ser. No. 552,171

Int. Cl.² H02H *7/085, 3/08*

U.S. Cl. 361—25 **12 Claims**



1. Apparatus for protecting an electric motor having a winding and electrically conductive components for connecting said winding in an electrical circuit, said apparatus comprising a compressible and expansible device constituting one of said components and constantly in bridging engagement with others of said components, said device comprising a plurality of electrically conductive particles contained in a thermally sensitive, elastomeric, non-conductive material which is expansible and contractile in response to an increase and decrease, respectively, in its temperature; and resilient, thermally sensitive force applying means acting on said device and normally applying on the latter a compressive force of such magnitude as to effect engagement of said conductive particles with one another and establish a conductive path through said material, the force applied by said force applying means on said device varying inversely with the temperature of said force applying means, said force applying means being of such resilience as to yield in response to expansion of said material due to an increase in its temperature and in an amount sufficient to enable disengagement of said conductive particles and thereby break the conducitve path through said material.

4,034,266

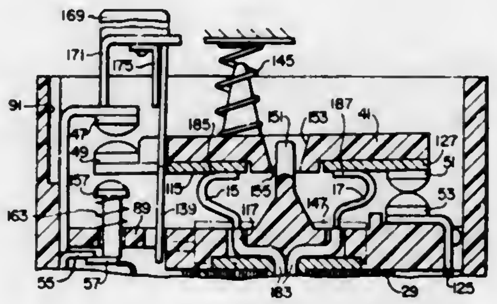
ELECTRIC WALL RECEPTACLE WITH GROUND FAULT PROTECTION

Gopal J. Virani, Bridgeport, and John J. Misencik, Shelton, both of Conn., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Aug. 29, 1975, Ser. No. 609,135

Int. Cl.² H02H *3/28*

U.S. Cl. 361—42 **6 Claims**



1. An electric receptacle for mounting in a wall outlet for connecting electrical appliances to the conductors of a power source, comprising an insulating housing adapted to fit in a wall outlet box, receptacle components and electronic components within the housing; the receptacle components comprising socket means for receiving the plug of an electrical appliance first and second pairs of contacts operable between open and closed positions for interruptably connecting the socket means to a power source, the stationary contacts of each pair of contacts being operatively mounted on the housing, a contact mounting arm carrying the movable contacts of each pair of contacts at spaced locations on the arm and aligned with the corresponding stationary contacts, a latch member releasably holding the contact arm in closed contact positions of said contacts, bias means for biasing the arm to a contact open position when the latch member is released and located between the movable contacts to effect pivotal movement of the arm upon the first pair of contacts during the initial pivotal movement when the latch member is released to effect opening of the second pair of contacts, a pivot point for the arm between the first pair of contacts and the bias means for final pivotal movement of the arm to effect opening of the first pair of contacts subsequent to opening of the second pair of contacts, operating means for moving the contacts to their open position in response to a fault signal; the electronic components comprising ground fault responsive means for monitoring the flow of current in the conductors and delivering a fault signal to the operating means in response to a current imbalance in the conductors, and said responsive means comprising a toroidal coil through which the conductors extend.

4,034,267

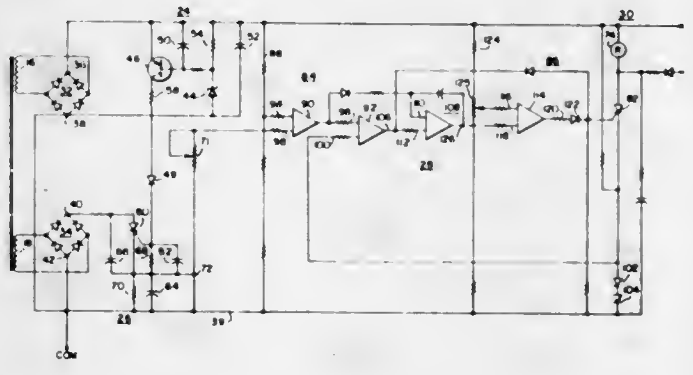
INDICATING APPARATUS

John T. Wilson, Beaver, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1975, Ser. No. 640,301

Int. Cl.² H02H *3/28*

U.S. Cl. 361—44 **17 Claims**



1. Apparatus for indicating the existence of a fault in a multi-conductor electrical distribution system wherein the fault may occur in any of a plurality of adjacent electric conductors comprising:

a closed loop core structure current transformer having a power output winding and a control output winding, providing a power output and a central output respectively, said closed loop core forming a window therebetween, said plurality of electric conductors extending throught said window and causing a current flow in said transformer only when a fault exists in at least one of said conductors;

control signal translation means connected to said transformer control output for translating said transformer control output into a control signal;

starting means connected to said power output and said control signal translation means for initiating operation of said control signal translation means, said starting means being driven by said power output and initiating operation of said control signal translation means only when said power output reaches a predetermined power magnitude;

means for indicating the existence of a fault connected to and driven by said power output, said fault indicating means including means for preventing the operation of said fault indicating means, said prevention means being responsive to said control signal such that said prevention means allow the operation of said fault indicating means only when said control signal activates said prevention means; and

transmission means connected to said control signal translation means and said prevention means for transmitting said control signal from said control signal translation means to said prevention means.

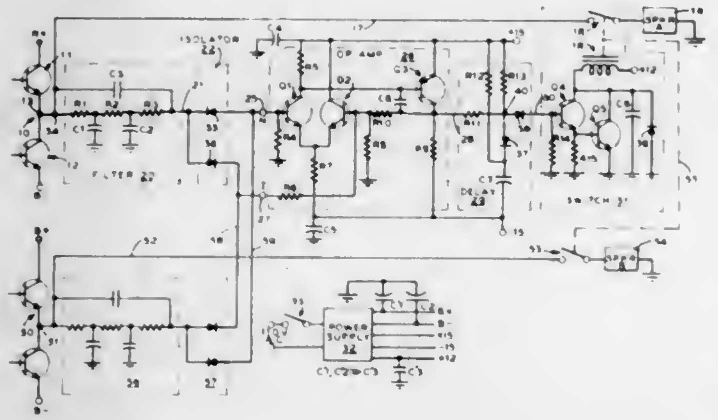
4,034,268
SPEAKER PROTECTION CIRCUIT

David E. Klauck, St. Joseph, Mich., assignor to Heath Company, Benton Harbor, Mich.

Filed Nov. 10, 1975, Ser. No. 630,598

Int. Cl.² H02H *3/00*

U.S. Cl. 361—111 **26 Claims**



1. In a system including an audio amplifier with an output, a power supply for powering the audio amplifier, the power supply including means to turn the power supply on or off, and a speaker, a protection circuit to prevent connection of the speaker to the amplifier output whenever turn-on or turn-off transients or signals outside the normal audio band are present at the amplifier output comprising, in combination:

a filter network connected to the amplifier output, said filter network being operative to block signals within the normal audio band and pass signals both above and below the normal audio frequency band;

an isolation circuit responsive to the signals passed by said filter network for separating the passed signals into a positive and a negative component;

detector means responsive to both said positive and said negative component for producing a control signal whenever the magnitude of either said positive or said negative component is below a given magnitude;

delay circuit means powered by the power supply for passing said control signal following a delay time after the power supply is turned on; and

a switching circuit powered by the power supply and responsive to said passed control signal from said delay circuit for connecting the speaker to the amplifier output, said switching circuit and power supply, in combination, being operative to disconnect the speaker from the amplifier output before turn off transients appear at the amplifier output when the power supply is turned off.

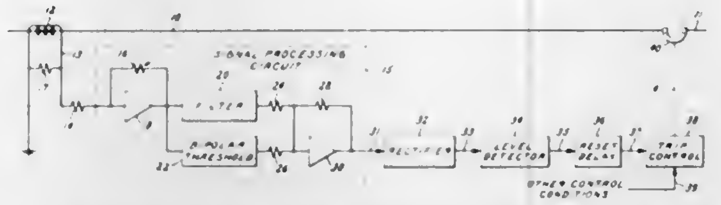
4,034,269
PROTECTIVE RELAY CIRCUITS

Stanley B. Wilkinson, Havertown, Pa., assignor to General Electric Company, Philadelphia, Pa.

Filed Dec. 12, 1975, Ser. No. 640,308

Int. Cl.² H02H *7/00*

U.S. Cl. 361—79 **49 Claims**



1. A circuit for generating a signal for controlling the trip coil of a circuit breaker protecting an a-c power system comprising:

a. a sensor adapted to be coupled to one a-c power line for generating a sensor signal proportional to an electrical quantity in the power system that is subject to variations;

b. a filter responsive to the sensor signal for filtering the transient component from the sensor signal;

c. first circuit means responsive to the sensor signal for generating a signal having a first output level when the sensor signal is less than a predetermined level and having a second output level when the sensor signal exceeds said predetermined level, said second output level being a function of the sensor signal level;

d. second circuit means for combining the first generated signal and the filtered signal; and

e. third circuit means responsive to the combined signal for generating said trip coil control signal when the combined signal exceeds a fixed level.

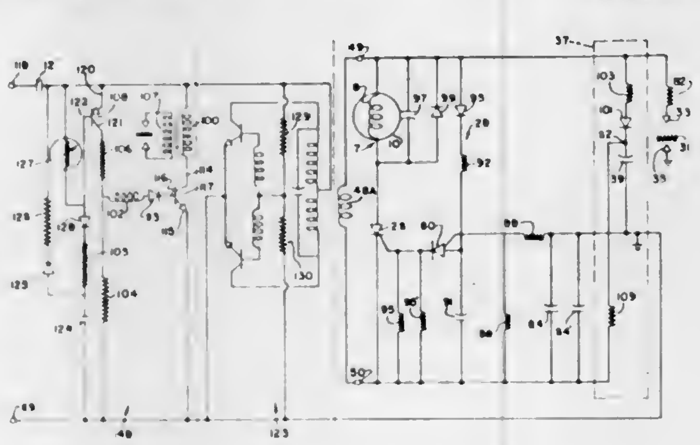
4,034,270
SELF-INHIBITING SPARK GENERATING ARRANGEMENT

Russell B. Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Division of Ser. No. 422,692, Dec. 7, 1973, Pat. No. 3,938,937. This application Apr. 7, 1975, Ser. No. 565,626

Int. Cl.² F23Q *3/00*

U.S. Cl. 361—256 **8 Claims**



1. A spark generating arrangement for producing sparks to ignite gaseous fuel, comprising electrode means, oscillator means operable when energized for activating said electrode means to produce sparks, said oscillator means having a feedback control path, timing means including resistance means and capacitance means, switching means operable when enabled to couple a source of direct current power to said feedback control path for energizing said oscillator means and to connect said resistance means and said capacitance means to said source of power to permit said capacitance means to charge over said switching means and said resistance means for a predetermined interval of time for causing said switching means to be maintained enabled during said time interval and to be disabled when said capacitance means has charged to a given value whereby said switching means uncouples said source of power from said feedback control path of said oscillator means thereby deenergizing said oscillator means after said interval of time.

4,034,271
ELECTRICAL DISTRIBUTION SYSTEMS FOR MOTOR VEHICLES

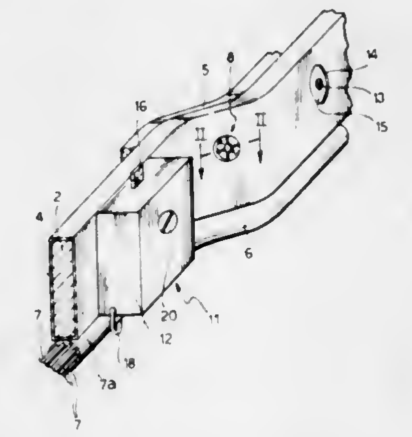
Mario Palazzetti, Avigliana (Turin), and Franco Grisotto, Turin, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy

Filed Feb. 12, 1976, Ser. No. 657,553

Claims priority, application Italy, Feb. 27, 1975, 67492/75

Int. Cl.² H02B *1/04, 1/20*

U.S. Cl. 361—332 **5 Claims**



1. In a motor vehicle electrical distribution system of the type operating selectively to distribute electrical power to one or more electrical devices of the vehicle, and comprising:

an electric current conductor,

a control cable, and

a plurality of actuators operating to interconnect said electric current conductor and a selected one of said electrical devices or a selected group of said electrical devices in dependence on signals received along said control cable, the improvement wherein:

said electric current conductor is in the form of a metal strip, and

said actuators are each directly mounted on said metal strip.

4,034,272
MOVING SCREEN ARRANGEMENT

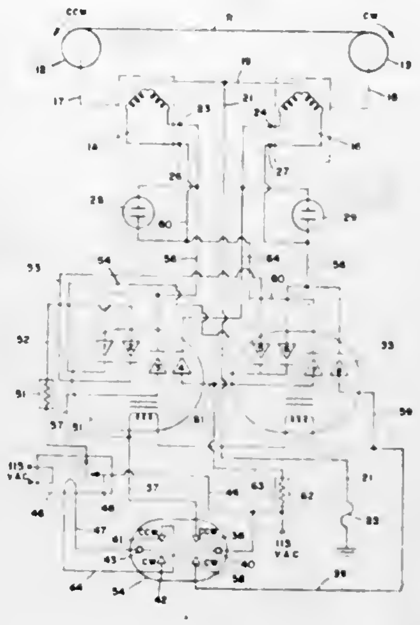
John M. Steward, Grizzly Flat Road, Somerset, Calif. 95684

Filed July 7, 1975, Ser. No. 593,870

Int. Cl.² B65H *77/00*

U.S. Cl. 318—7 **2 Claims**

1. A web transport system comprising a pair of reels for supporting, storing and displaying a web therebetween, a pair of reversible electric motors each operatively connected to one of said reels, relay means including a pair of relays for applying a first voltage to one of said motors to drive said one motor in a first rotational direction, and for applying a second, reduced voltage to the other of said motors to torque bias said other motor in said first rotational direction, and stopping means for applying a third, reduced voltage to said one motor to drive said one motor in said first direction while applying said first voltage in reverse fashion to said other motor to drive said other motor counter to said first direction and stop said reels, said stopping means including a manual switch and a time delay relay, said manual switch including a neutral, non-actuating position, a first position for actuating said relay means to apply said first and second voltages to said motors,



and a second position for actuating said time delay relay and said relay means to apply said third voltage to said motors.

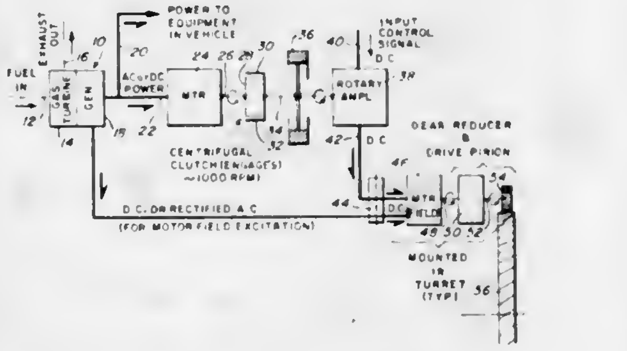
4,034,273
TURBO-ELECTRIC TURRET DRIVE SYSTEM FOR MOBILE VEHICLES

James M. Meek, Silver Spring, and Benjamin E. Dunmore, Lanham, both of Md., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 4, 1975, Ser. No. 546,973

Int. Cl.² B60K *41/02, 41/04*

U.S. Cl. 318—149 **13 Claims**


EXHAUST OUT
FUEL IN
GAS TURBINE
GEN
POWER TO EQUIPMENT IN VEHICLE
AC or DC POWER
MTR
CENTRIFUGAL CLUTCH (ENGAGES) ~1000 RPM
INPUT CONTROL SIGNAL
D C
ROTARY AMPL
GEAR REDUCER & DRIVE PINION
D.C. OR RECTIFIED A.C (FOR MOTOR FIELD EXCITATION)
MTR FIELD
MOUNTED IN TURRET (TYP)

1. A turret-drive system for mobile vehicles comprising:

a rotary amplifier having a substantial overload factor;

a first electric motor connected to the driveshaft of a rotary amplifier for driving the rotary amplifier;

a flywheel mounted to the driveshaft for storing kinetic energy during normal rotation of the shaft;

means for impressing a control signal at the input of the rotary amplifier thus generating a related DC output;

a second electric motor having a substantial overload factor connected to the DC output for driving first gear means at a rate determined by the control signal, said first gear means being connected to a rotatable turret of a mobile vehicle;

second gear means relatively stationarily positioned for meshing engagement with said first gear means;

a turbo-generator having the generator output thereof connected to the first electric motor thereby energizing the latter;

said flywheel having a size such that rotation of the rotary-amplifier driveshaft remains fairly constant during momentary peak demands on the rotary amplifier, due to relatively limited energy transfer from the flywheel, the peak damands being met by operation of the rotary amplifier and second electric motor in their overload range;

whereby the turret-drive system is capable of driving a turret to track high-speed aerial targets while having a size and weight suitable for use in mobile land vehicles.

4,034,274

SPEED CONTROL DEVICE FOR DIRECT CURRENT MOTORS

Hideaki Akima, Koshigaya, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 416,742, Nov. 19, 1973,- which is a continuation of Ser. No. 257,272, May 26, 1972, abandoned. This application Aug. 1, 1974, Ser. No. 493,837

Claims priority, application Japan, May 28, 1971, 46-36802

Int. Cl.² H02P *5/16*

U.S. Cl. 318—334 **20 Claims**

1. A speed control system for a direct current motor, comprising a DC tacho-generator for generating a speed indicating signal normally proportional to the speed of the motor, signal level adjusting means for producing an output proportional to the signal generated by said DC tacho-generator, reference means for forming a reference signal, differential amplifier means having a first input terminal connected to the output from said adjusting means and a second input terminal connected to the signal from said reference means producing an error signal that corresponds to a difference between the output of said adjusting means and the signal from said reference means, waveform-producing means for producing a varying signal of a predetermined wave shape, comparison means responsive to said waveform-producing means and the error signal from error signal-producing means for comparing the error signal with the wave shape of said waveform-producing means for producing pulses which last as long as the relationship between the wave shape and the error signal is in one range and outside another, switching means coupled to said comparison means and responsive to the pulses therefrom for producing driving pulses having pulse widths determined by said comparison means, the speed indicating signal departing from normal proportionality to the motor speed in response to changes in temperature, said reference means having a constant voltage circuit including a constant voltage circuit including series-connected diodes which departs from a constant value at a rate corresponding to the rate at which the speed indicating signal departs from proportionality to the motor speed.

4,034,275

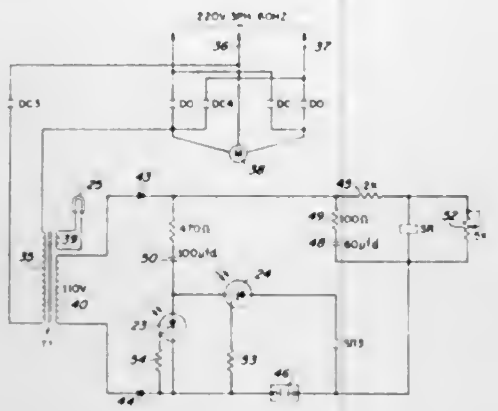
OPTICAL CONTROL SYSTEM FOR ELEVATORS

Karl Mangel, 4709 B Church St., Skokie, Ill. 60076

Filed Dec. 29, 1975, Ser. No. 644,589

Int. Cl.² H02H *7/093*

U.S. Cl. 318—461 **6 Claims**



1. In an elevator control system, a circuit for sensing a reduction in the speed of a movable member, comprising

a relay having a solenoid,

a half-wave rectifier adapted to be connected to a source of A C voltage,

a first light activated silicon controlled rectifier,

a first capacitor,

said silicon controlled rectifier and said capacitor being connected in series across the output of said half-wave rectifier,

a second light activated silicon controlled rectifier connected in series with said capacitor across said solenoid,

a second capacitor connected across said solenoid, and means responsive to the speed of movement of said movable member for selectively and alternately applying light to said silicon controlled rectifiers at a rate proportional to the speed of said movable member,

whereby said relay is dropped out if said silicon controlled rectifiers are not sequentially activated at more than a predetermined rate.

4,034,276

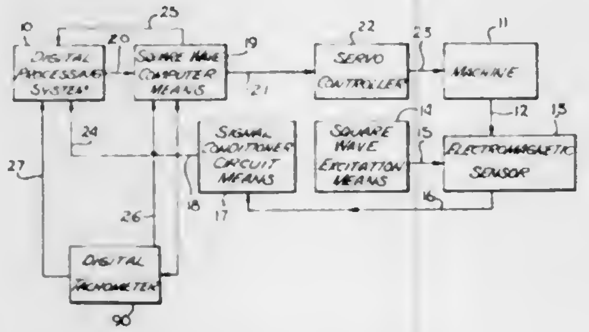
DIGITAL SIGNAL PROCESSOR FOR SERVO VELOCITY CONTROL

Gilbert P. Hyatt, P.O. Box 4584, Anaheim, Calif. 92803

Division of Ser. No. 135,040, April 19, 1971, which is a continuation-in-part of Ser. No. 101,881, Dec. 28, 1970. This application Mar. 9, 1973, Ser. No. 339,817

Int. Cl.² G05B *1/02*

U.S. Cl. 318—608 **19 Claims**


10
DIGITAL PROCESSING SYSTEM
20
25
SQUARE WAVE COMPUTER MEANS
19
21
22
SERVO CONTROLLER
23
11
MACHINE
12
24
SIGNAL CONDITIONER CIRCUIT MEANS
14
SQUARE WAVE EXCITATION MEANS
15
13
ELECTROMAGNETIC SENSOR
27
18
17
16
26
DIGITAL TACHOMETER
90

1. A signal processing system comprising:

servo means for controlling a physical system, said servo means including feedback means for generating a feedback signal wherein said feedback signal is related to control of said physical system and

processor means for generating an output signal related to a frequency of the feedback signal, said processor means including

a. detector means for generating a detector signal in response to a repetitive condition of the feedback signal;

b. reference means for generating a reference signal in response to the detector signal; and

c. output means for generating the output signal in response to the feedback signal and the reference signal.

4,034,277

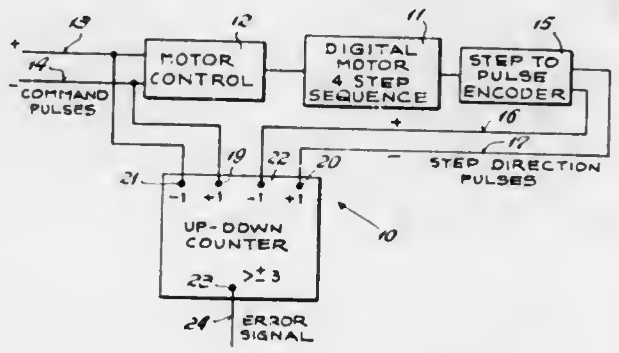
PULSE TO STEP ERROR SENSING CIRCUIT

Albert C. Leenhouts, Harwinton, Conn., assignor to The Superior Electric Company, Bristol, Conn.

Filed Aug. 13, 1975, Ser. No. 604,318

Int. Cl.² G05B *19/40*

U.S. Cl. 318—685 **6 Claims**



1. An error sensing system for use in a digital motor system that accepts command pulses and is to produce a step for each pulse comprising a digital motor of the type that is to produce a step for each change of energization with the changes occurring in a repeatable sequence with each sequence having the same set plural number and pattern of changes, means for changing the energization of the motor to produce a step for each command pulse received, means for sensing that the motor has produced a step, means for maintaining a count of the instantaneous difference between the number of command pulses and the number of steps and means for providing an error signal only when the count of the instantaneous difference has a value from which the motor is incapable of overcoming which is when the instantaneous count difference is greater than one less than the set number of changes in a sequence.

4,034,278

CHARGING CIRCUIT FOR A FLASH CAPACITOR

Egon Gahler, Hattersheim; Hans Eberhard Heintke, Wachtersbach, and Rolf Dietrich, Hofheim, all of Germany, assignors to Braun Aktiengesellschaft, Frankfurt, Germany

Filed Oct. 2, 1975, Ser. No. 618,997

Claims priority, application Germany, Oct. 2, 1974, 2446960

Int. Cl.² H02M *9/04;* **G05F** *3/14*

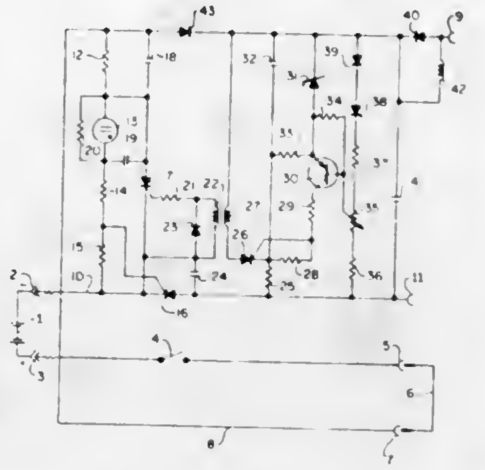
U.S. Cl. 320—1 **10 Claims**

1. A circuit for charging a flash capacitor from a DC voltage source which provides a voltage larger than that for which the flash capacitor is designed comprising:

a first thyristor having a control electrode electrically connected in series between the DC voltage source and the flash capacitor;

circuit means electrically connected to the flash capacitor and said control electrode of said first thyristor for monitoring the voltage of the flash capacitor and for providing a control signal through said control electrode of said first thyristor for rendering said thyristor non-conducting when the designed voltage of the flash capacitor is exceeded, said circuit means including means for maintaining said control electrode of said first thyristor at a voltage proportional to the voltage of the DC voltage source sufficient to render said first thyristor conductive before the designed voltage of the flash capacitor is reached, said circuit means also including a variable resistance means electrically connected in parallel to the flash capacitor for rendering said first thyristor non-conducting when a predetermined voltage across the variable resistance means develops, said predetermined voltage being proportional to the voltage across the flash capacitor, said circuit means further including a transistor electrically connected between said variable resistance means and said first thyristor, said predetermined voltage rendering said transistor conductive; and

a Zener diode electrically connected to the emitter of said transistor for providing a reference voltage at the designated voltage of the flash capacitor.



4,034,279

METHOD AND A DEVICE FOR DETERMINING GAS GENERATION WITH ELECTRODES IN CONTACT WITH ELECTROLYTES

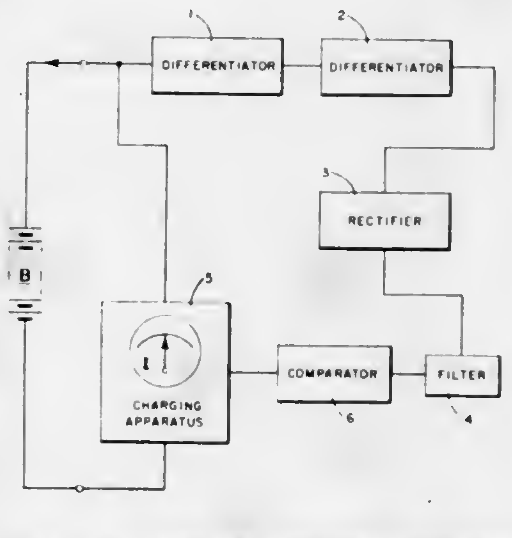
Bruno Yngve Nilsson, Boliden, Sweden, assignor to Boliden Aktiebolag, Stockholm, Sweden

Continuation of Ser. No. 486,591, July 8, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 643,162

Claims priority, application Sweden, July 13, 1973, 7309890

Int. Cl.² H02J *7/04*

U.S. Cl. 320—20 **2 Claims**



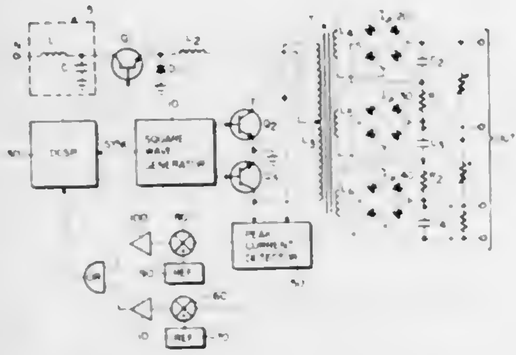
1. A method for controlling the charging condition of an electric accumulator, characterized by the steps of determining the resistance fluctuations at an electrolyte-electrode interface due to the gas generation by time differentiating the terminal voltage, rectifying and filtering the differentiated voltage to obtain a D.C. voltage, the level of which being a measure of the intensity of the gas generation process, sensing

said level and governing the value of the charging current in response to the sensed level.

4,034,280
MULTIPLE HIGH VOLTAGE OUTPUT DC-TO-DC POWER CONVERTER

Donald L. Cronin, Anaheim; Bertrand F. Farber, Hermosa Beach; Hartmut K. Gehm, and Daniel S. Goldin, both of Los Angeles, all of Calif., assignors to TRW Inc., Redondo Beach, Calif.

Filed June 9, 1975, Ser. No. 585,429
Int. Cl.² H02M *3/335*
U.S. Cl. 363—25 **3 Claims**



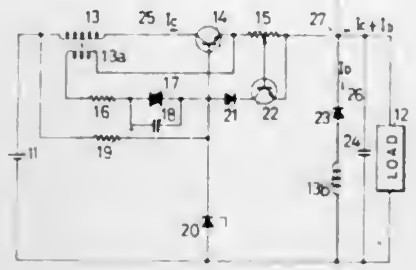
1. A DC to Dc power converter comprising:
- a. a transformer having a primary winding and a plurality of secondary windings;
- b. input circuit means coupled to said primary winding to cause an AC power to flow therethrough;
- c. said input circuit means including means to accept DC power at a first voltage and transistor means to convert said DC power to AC power at a first relatively low voltage for transmission through said primary winding, said transformer being such that the alternating voltage on each of said secondary windings is higher than that at said primary winding;
- d. output circuit means associated with each of said secondary windings to reconvert AC power induced in the associated secondary winding to DC power at a higher voltage;
- e. a capacitor effectively directly connected across each of said secondary windings, the capacitance of each of said capacitors being reflected across said primary winding to provide an input current source; and
- f. a peak current detector having an input coupled across said primary winding and having an output coupled across said input circuit means, thereby to protect said transistor means against over voltage due to a short in any one of said output circuits.

4,034,281
DIRECT CURRENT POWER SUPPLY WITH A TRANSISTOR CHOPPER

Kouichi Morita; Hirohito Sekine, and Takao Ubukata, all of Niiza, Japan, assignors to Sanken Electric Company Limited, Niiza, Japan

Filed Mar. 17, 1975, Ser. No. 559,216
Claims priority, application Japan, July 25, 1974, 49-85761
Int. Cl.² G05F *1/58*
U.S. Cl. 323—17 **1 Claim**

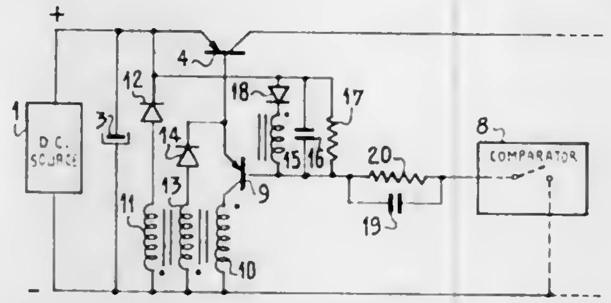
1. A direct current power supply for supplying substantially stabilized direct current power to an electrical load comprising, in combination:
- a source of direct current having opposite polarity terminals across which said load is connected;
- a transistor connected between said source and said load;
- a reactor comprising:
  - a primary winding connected between said source and said load; and
  - a secondary winding magnetically coupled to said primary reactor winding and adapted to apply a biasing voltage across a base and emitter of said transistor;
- energy release circuit means through which the electrical energy stored in said reactor is released;
- starting circuit means connected to the base of said transistor for supplying a starting current thereto;
- base control circuit means also connected to the base of said transistor for controlling a base current thereof; and
- a voltage-dependent nonlinear resistance element connected between the base of said transistor and said secondary reactor winding; and
- a capacitor connected in parallel with said voltage dependent nonlinear resistance element;
- whereby said transistor functions as a chopper to supply substantially stabilized direct current power to said load.



4,034,282
CHOPPER-STABILIZED POWER SUPPLY

Yves Renard, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Oct. 20, 1975, Ser. No. 624,408
Claims priority, application France, Oct. 22, 1974, 74.35446
Int. Cl.² G05F *1/56*
U.S. Cl. 323—17 **4 Claims**

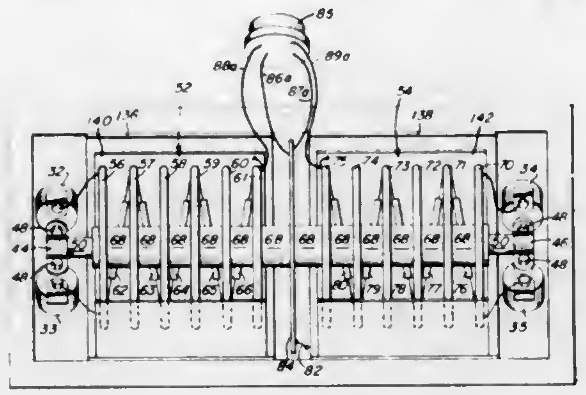


1. A chopper-stabilized power supply comprising a switching transistor and an integrating filter connected between a source of unstabilized d.c. energy and a load circuit, a voltage comparator for comparing the output voltage of the power supply to a reference voltage and for delivering rectangular signals of variable width and constant repetition frequency or constant width and variable repetition frequency, a control transistor connected by its base to said voltage comparator for furnishing a control current to the base of said switching transistor, the emitter-collector circuit of said control transistor being connected in series with an inductor which is connected to one terminal of said source and which is constituted by the primary winding of a transformer, said transformer including a secondary winding connected to said one terminal and in series with a diode to the base of said switching transistor for neutralizing the charge carriers present in the junction of said switching transistor at each cut-off of the current of the control transistor and said transformer further including an additional secondary winding connected to said one terminal and in series with a further diode to the base of said control transistor.

4,034,283
COMPENSATED VOLTAGE DIVIDER

Anthony Pellegrino, Brewster, N.Y., assignor to The Machlett Laboratories, Incorporated, Stamford, Conn.

Filed Aug. 28, 1975, Ser. No. 608,495
Int. Cl.² G01T *1/26*
U.S. Cl. 323—74 **10 Claims**

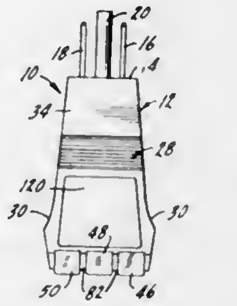


1. Voltage monitoring apparatus comprising:
- capacitance means including a coaxial array of capacitive plates having respective adjacent surfaces disposed in predetermined spaced relationship for providing electrostatic fields therebetween; and
- resistance means attached electrically to the capacitive plates for providing voltage drops therebetween, the resistance means including at least one resistive element disposed entirely between respective adjacent surfaces of the capacitive plates and in direct electrical contact therewith.

4,034,284
HAND-HELD WALL RECEPTACLE WIRING TESTER WITH OPPOSITELY DISPOSED PUSH/PULL SURFACES FOR INSERTION AND REMOVAL OF THE TESTER

Marvin J. Peplow, and Peter M. Wells, Jr., both of Sycamore, Ill., assignors to Ideal Industries, Inc., Sycamore, Ill.

Filed Aug. 8, 1975, Ser. No. 603,036
Int. Cl.² G01R *31/02;* **H01R** *13/62, 33/06*
U.S. Cl. 324—51 **6 Claims**

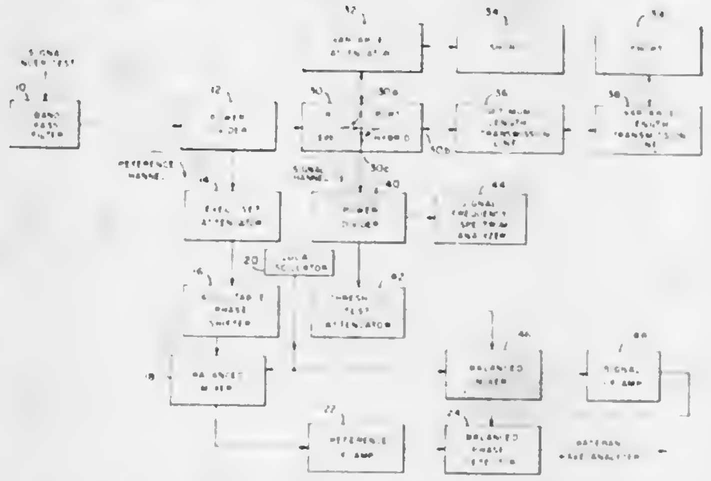


1. In a hand-held receptacle wiring tester, a housing, two generally parallel flat blades and a ground blade mounted within the housing and protruding from the wall at one end thereof in fixed positional relationship for insertion into a wall receptacle, said flat blades each having a first shoulder adapted to abut against said wall of the housing from within to prevent the blade from being pulled out of the housing, and a second shoulder spaced longitudinally from the first shoulder and adapted to abut against an internal retaining wall of the housing to prevent the blade from being pushed into the housing, a plurality of indicator lamps at the other end of the housing and contained within the housing, electrical connections between the lamps and the blades so that the lighting of the lamp and various combinations of lamps indicates respective predetermined wiring conditions of a wall receptacle into which the terminal blades are inserted, the housing having first laterally opposed surfaces on the exterior thereof which spread increasingly apart toward the said one end of the tester and second laterally opposed surfaces which spread increasingly apart toward the other end of the tester, thereby to provide bearing surfaces for respectively pushing the tester manually into a receptacle and pulling it out therefrom, each of the first and second surfaces comprising a pair of surfaces which are generally symmetrically situated with respect to a longitudinal center line through the housing, the first and second pairs of surfaces being on different sides of the housing and limited thereto, the first laterally opposed surfaces being longitudinally positioned closer to said one end of the tester than the second laterally opposed surfaces with the first and second laterally opposed surfaces being an axial nonoverlapping relationship to each other.

4,034,285
SUPERHETERODYNE NOISE MEASURING DISCRIMINATORS

James R. Ashley, Colorado Springs, Colo.; Thomas A. Barley, and Gustaf J. Rast, Jr., both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 30, 1976, Ser. No. 718,691
Int. Cl.² G01R *27/00*
U.S. Cl. 324—57 R **7 Claims**

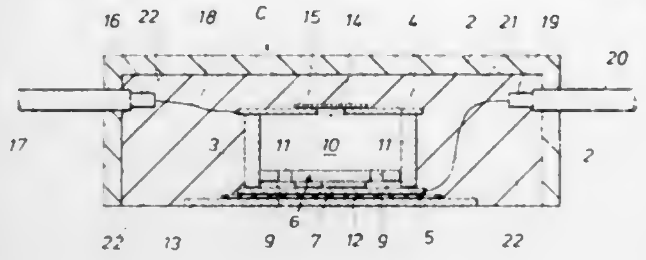


1. A superheterodyne noise measuring discriminator for measuring input frequency modulation noise on a carrier signal comprising:
- a bandpass filter having an input and an output, the input being disposed to receive said carrier with modulation noise signal;
- a first and second power divider means, each having an input and first and second outputs, the input of said first power divider being coupled to the output of said filter to receive said carrier with modulation noise signal;
- signal coupling and routing means having an input port coupled to the first output of said first divider and having a first output port; said output port being coupled to the input of said second power divider;
- quadrature detection means having first and second inputs and an output, said first input being coupled to the first output of said second power divider and said second input being coupled to the second output of said first power divider, the output of said detection means being disposed for coupling output measurement signals therefrom;
- a signal level attenuator, a phase shifter, a first balanced mixer and a first intermediate frequency amplifier connected in series between the second output of said first divider and the second input of said quadrature detection means; and a threshold test attenuator, a second balanced mixer, and a second intermediate frequency amplifier connected in series between the first output of said first divider and the first input of said quadrature detection means, said threshold test attenuator providing means for determining and correcting for discriminator internal noise.

4,034,286
DEVICE FOR DETECTING A FAILURE IN AN INSULATION SYSTEM

Yaacov Lev, Liverpool, England, and Frederick R. Pritchard, Caergwrle, nr. Wrexham, Wales, assignors to Shell Internationale Research Maatschappij B.V., Netherlands

Filed Nov. 3, 1975, Ser. No. 628,059
Int. Cl.² G01N *27/00*
U.S. Cl. 324—71 R **4 Claims**

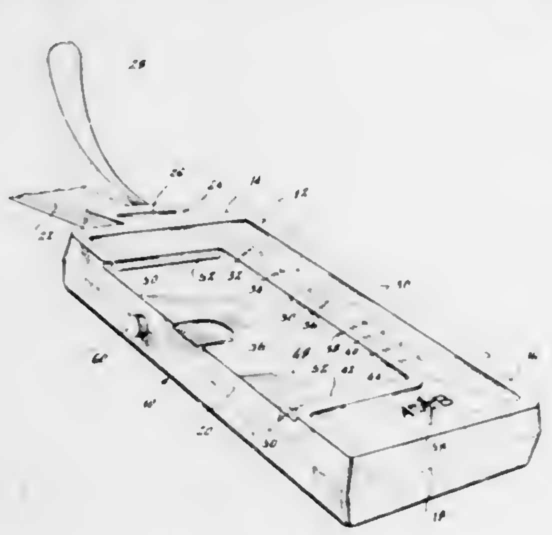


1. A sensing device for detecting a failure in an insulation system of cryogenic tank comprising:
- a closed housing;
- a pair of spaced electrodes mounted within said housing;
- a pair of electrical leads, one of said leads being attached to each of said electrodes;
- said housing being filled with an ion-conducting material that solidifies when subjected to the temperature produced by a leak in the insulation, said ion-conducting material changing conduction upon solidifying; and
- said housing having a transverse wall disposed to divide the interior of the housing into two reservoirs of unequal volumes, said reservoirs being in fluid communication, and said electrodes being disposed on opposite sides of said transverse wall.

4,034,287
GENERAL PURPOSE DIGITAL LOGIC MONITOR

Flavio M. Manduley, Seymour, and Daniel F. Dlugos, Huntington, both of Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.

Filed Dec. 15, 1975, Ser. No. 640,487
Int. Cl.² G01R *15/12;* **G11C** *11/02*
U.S. Cl. 324—73 R **29 Claims**

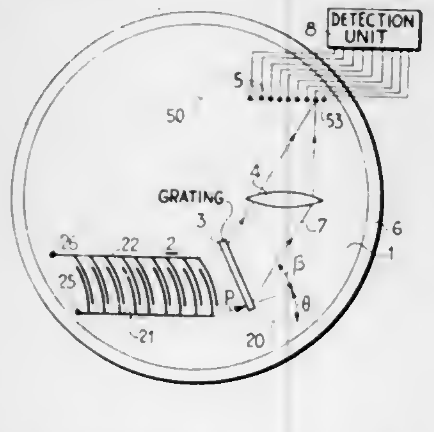


1. A general purpose electronic monitor for use in servicing digital logic circuits within a system having a clock, comprising
- a display for providing a visual read-out of the status of a digital logic circuit;
- connection means adapted to be connected to a selected digital logic circuit for carrying digital signals between the selected circuit and said display;
- an auxiliary clock for permitting an operator to introduce clock pulses to the selected digital logic circuit to step the circuit through its operating sequence at an operator-selected rate as an alternative to having the circuit driven by the system clock; and
- means for latching said display to permit an operator to freeze inputted signals on the display without interrupting continued digital logic circuit operation.

4,034,288
SYSTEM FOR MEASURING THE FREQUENCY OF AN ELECTRICAL SIGNAL

Pierre Hartemann, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 13, 1975, Ser. No. 586,750
Claims priority, application France, June 18, 1974, 74.21123
Int. Cl.² G01R *23/00*
U.S. Cl. 324—80 **11 Claims**

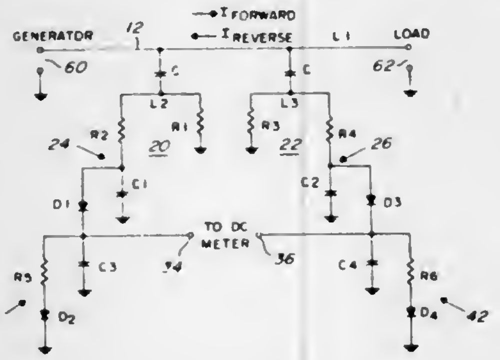


1. A system for measuring the frequency of an electrical signal, said system comprising: a substrate of piezo-electric material having a face for propagating vibratory energy in the form of surface elastic waves, and a transducer array of radiator elements positioned on said face for launching in response to said electrical signal a frequency steerable narrow beam of said vibratory energy; said narrow beam having in said face N distinctly orientated transmission paths respectively corresponding to N distinct values of said frequency; said system further comprising a set of N elementary detection means respectively located on said face along said N distinct transmission paths for supplying an indication relative to any one of said N distinct values; N being an integer at least equal to two.

4,034,289
RF POWER MONITOR UTILIZING BI-DIRECTIONAL COUPLER

Edward Francis Rozylowicz, Villa Park, and Steven Glen Twiselton, Lake Zurich, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 5, 1976, Ser. No. 646,456
Int. Cl.² G01R *21/04;* **H01P** *5/14*
U.S. Cl. 324—95 **12 Claims**

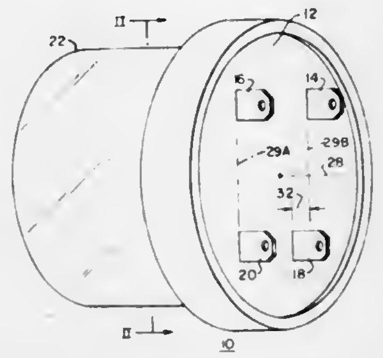


1. In a means for monitoring an RF power line and producing a signal representative of the power flow thereon, apparatus comprising:
- reactance coupling means, electrically coupled to the power line in a low power loss configuration, and producing a signal whose magnitude is dependent on the magnitude of power flow on the power line, said reactance coupling means produced signal magnitude also being dependent on the frequency of the RF power line flow;
- frequency compensating means for processing the reactance coupling means produced signal and predeterminedly compensating the magnitude thereof in response to the frequency of the RF power flow, such that the magnitude of the frequency compensating means processed signal is substantially independent of the frequency of the RF power line flow over a given frequency range,
- rectifier means for rectifying and filtering the processed signal to produce a DC signal having a magnitude representative of the magnitude of the RF power flow, said rectifier means including one or more elements which display thermal drift characteristics; and
- diode means for compensating said DC produced signal against thermal drift.

4,034,290
ELECTRICAL METER ASSEMBLY HAVING DISPLACED METER AND SOCKET TERMINALS

Robert A. Warren, deceased, late of Raleigh, N.C. (by Dorothy L. Warren, executrix), assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Jan. 28, 1976, Ser. No. 653,046
Int. Cl.² G01R *11/24, 1/04;* **H01R** *13/64*
U.S. Cl. 324—110 **6 Claims**

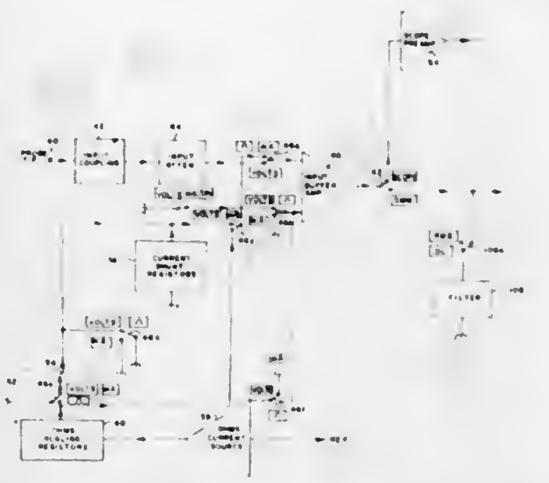


1. An electric meter assembly, comprising:
- a meter socket including plural line and load terminals disposed on symmetrical terminal axes thereof such that said load terminals are aligned with said line terminals along common symmetrical axes which are parallel;
- a meter including plural terminals for plug-in attachment to said meter socket terminals, said meter terminals being disposed relative to symmetrical terminal axes thereof such that one of the meter terminals is offset from one of the meter terminal axes, and said meter terminal axes being alignable with the socket terminal axes so that the one meter terminal is offset from one of the socket terminals when said meter is positioned for mounting in said meter socket; and
- an electrically conductive terminal adaptor including a first portion attachable to said one socket terminal wherein said first portion has a blocking part for preventing insertion of a meter terminal into said one socket terminal, and said adaptor further including a second portion defining an auxiliary socket terminal being offset from said one socket terminal so that said one socket terminal is modified for mounting said meter in said meter socket in only one predetermined orientation.

4,034,291
ELECTRONIC MEASURING INSTRUMENT COMBINING AN OSCILLOSCOPE AND A DIGITAL MULTIMETER

David William Allen, Beaverton, and Marshall Bond Borchert, Aloha, both of Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Filed Apr. 14, 1975, Ser. No. 567,798
Int. Cl.² G01R *13/20, 15/08*
U.S. Cl. 324—121 R **8 Claims**

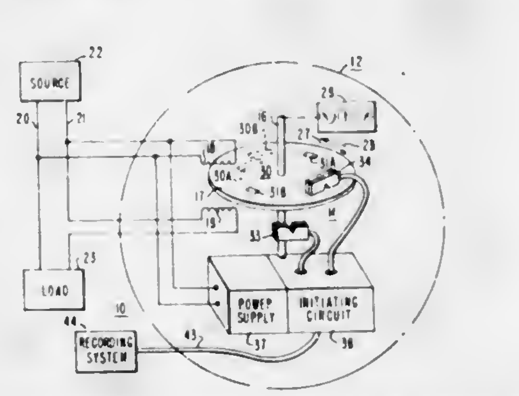


1. A portable electronic measuring instrument, comprising:
- input circuit means including preprocessing means for converting a plurality of input signals of different measurement quantities to voltage signals;
- analog processing means for receiving said voltage signals and producing an analog waveform signal therefrom;
- digital processing means for receiving said voltage signals and producing numerical values thereof, said digital processing means including a Gm conversion unit, an RMS conversion circuit, and an A-D converter; and
- display means for selectively displaying said analog waveforms and said numerical values.

4,034,292
DIRECTION SENSITIVE OPTO-ELECTRONIC PULSE INITIATOR FOR ELECTRICAL METERS

Theodore M. McClelland, III, Raleigh, N.C., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Feb. 18, 1976, Ser. No. 658,951
Int. Cl.² G01R *11/36, 13/38;* **G01D** *5/36;* **G08C** *19/16*
U.S. Cl. 324—157 **6 Claims**



1. A direction sensitive pulse initiator for an electrical meter having an electro-responsive meter movement including a rotating member which rotates in opposite directions and at a rate corresponding to the direction and amount of an electric power quantity to be measured by the electrical meter, said pulse initiator comprising:
- a light reflecting pattern including first and second circularly arcuate surfaces disposed on the rotating member, said first of the reflecting surfaces extending along a first circular axis between first and second ends thereof, and

said second of the reflecting surfaces extending along a second circular axis between first and second ends which are arcuately staggered relative to said first and second ends of said first surface and being positioned along a second arc, said second circular axis being concentric with said firstcircular axis and having a radius which is greater than the radius of the first circular axis;

first and second optical sensors mounted on said meter in alignment with said first and second circular axes, respectively, so as to separately detect the respective first and second reflecting surfaces when positioned adjacent the sensors, said first and second sensors being activated by the adjacent positioning of said first and second surfaces to produce first and second impulses;

said first and second sensors and said first and second relfecting surfaces being arranged with respect to each other such that rotation of the rotating member in one direction causes at least a portion of the first surface to pass adjacent the first sensor before any portion of the second surface passes adjacent the second sensor, and further such that rotation of the rotating member in the opposite direction causes at least a portion of the second surface to pass adjacent the second sensor before any portion of the first surface passes adjacent the first sensor;

a bistable circuit including first and second inputs connected to receive said first and second impulses from the sensors when the reflecting surfaces pass adjacent the sensors, said circuit being connected to establish opposite output states corresponding to said one and opposite directions of rotation and maintaining the associated output state when the direction of rotation remains the same; and

output circuit means for producing output pulses at a rate corresponding to the rate of rotation of said rotating member, said output circuit means including an input connected to the bistable circuit so as to be responsive to the opposite output states, and further including first and second output channels selectively producing said output pulses in accordance with the opposite states of said bistable circuit, said first output channel providing the output pulses corresponding to the power quantity when occurring in one direction, and said second channel providing the output pulses corresponding to the power quantity when occurring in the opposite direction.

4,034,293

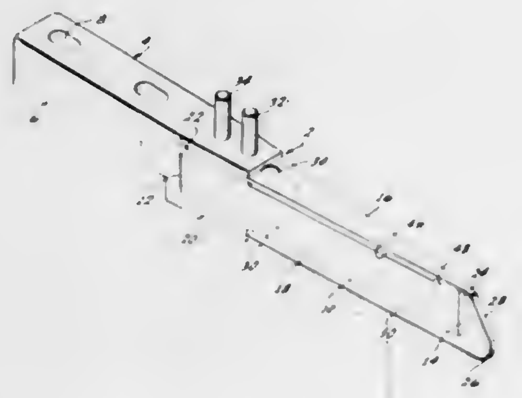
MICRO-CIRCUIT TEST PROBE

Jacques Leon Roch, San Jose, Calif., assignor to Electroglas, Inc., Santa Clara, Calif.

Continuation of Ser. No. 447,865, March 4, 1974, which is a continuation-in-part of Ser. No. 436,844, Jan. 28, 1974, Pat. No. 3,939,414. This application May 8, 1975, Ser. No. 575,970

Int. Cl.^{2} G01R *1/06, 31/02*

U.S. Cl. 324—158 P **19 Claims**



1. A probe for testing integrated micro-circuits comprising:

a dielectric support body;

conductive spring arms supported by said body;

said arms including a longer arm and a shorter arm;

said shorter arm being positioned above said longer arm and in spaced relation to said longer arm;

said arms each having outer ends;

a conductive probe tip connected to said outer ends and said probe tip including a downwardly positioned point for contact with a surface having an integrated circuit defined thereon;

contact means cooperating with said arms and said tip to transmit an electrical signal to or from said tip;

each of said arms having inner ends joined directly to said body with said arms having a substantial length to width ratio to permit said arms to bend with respect to said support body during upward movement of said probe tip with said point in contact with a surface having an integrated circuit defined thereon;

the outer ends of said shorter arm and said longer arm each undergoing movement in separate arcuate paths when said arms are bent as said probe tip is moved upwardly, and

the outer end of said shorter arm undergoing an inward horizontal movement which is greater than the inward horizontal movement of said longer arm during bending of said arms with upward movement of said probe tip,

whereby the angle of said probe tip is decreased with respect to the surface having an integrated circuit defined thereon during upward movement of said probe tip to provide an outward horizontal movement to said point which tends to compensate for inward horizontal movement of said tip so as to prevent arcing of a surface contacted by said point by maintaining the position of said point relatively constant with respect to the surface contacted by the point.

4,034,294

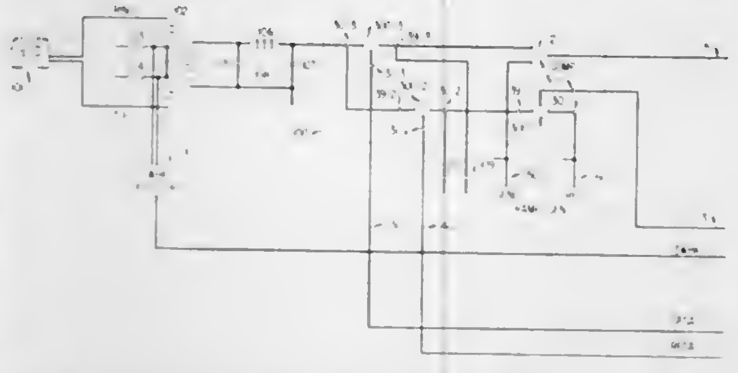
OVERLAP PCM CODER/DECODER WITH REACTION TIME COMPENSATION

James Edwin Dalley, Denver, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 19, 1976, Ser. No. 687,624

Int. Cl.^{2} H04B *1/00*

U.S. Cl. 325—38 R **11 Claims**



1. An arrangement for compensating both

a. for the time between the time of attainment of a predetermined count by a counter commencing to count clock pulses at an initial count determined by a received binary code pattern and the time a ramp signal is decoupled from a first analog signal storage device, and

b. for the time between the time said ramp signal equals the amplitude of a signal on a second analog signal storage device and the time said counter is disconnected from said clock pulses, comprising:

means defining a sequence of successive field intervals during a first of which said ramp signal is connected and disconnected from said second analog signal storage device and during the second of which said clock pulses are coupled and decoupled from said counter; and

means operative intermediate successive ones of said field intervals for augmenting by a predetermined amount, the count corresponding to said received code pattern.

4,034,295

RADIO COMMUNICATION SYSTEM FOR SIMULTANEOUS TELECOMMUNICATION BETWEEN RADIO STATIONS

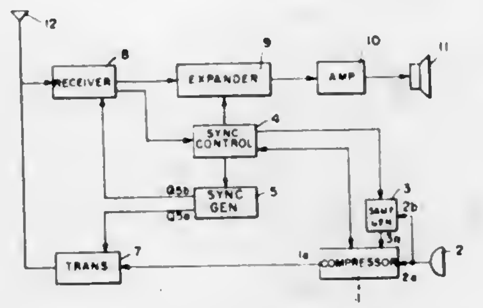
Katsutaka Kotezawa; Toshimi Onodera; Setsuo Hayashi, and Fujio Shimanuki, all of Funabashi, Japan, assignors to Chiba Communications Industries, Inc., Funabashi, Japan

Filed Jan. 28, 1976, Ser. No. 653,249

Claims priority, application Japan, Feb. 5, 1975, 50-14378; Feb. 12, 1975, 50-16811

Int. Cl.^{2} H04B *1/00*

U.S. Cl. 325—39 **4 Claims**



1. A radio communication system for simultaneous telecommunication betweeen a calling station and a called station comprising:

a transmitter;

a receiver;

a sampling pulse generator for generating sampling pulses for dividing an aural signal at a suitable time division rate;

a compressor for suitably compressing said sampled aural signal with respect to the time axis including memory means in which said sampled aural signal is written to be read out at a reading speed higher than the writing speed;

a synchronizing signal generator for generating a synchronizing signal synchronous with said aural signal compressed by said compressor for alternately turning on and off said transmitter and said receiver;

an expander connected to said receiver for expanding the time-divided and compressed aural signals received by said receiver,

and a zero cross synchronizing circuit comprising first circuit means for generating a first trigger pulse corresponding to each of the zero cross points of said compressed aural signal in response to the application of said compressed aural signal from said compressor, second circuit means for generating a second trigger pulse corresponding to the first zero cross point of said compressed aural signal appearing after said synchronizing signal, third circuit means for generating a third trigger pulse corresponding to the zero cross point of said compressed aural signal appearing immediately before the inversion of said synchronizing signal, and fourth circuit means for applying to said transmitter the aural signal portion appearing between the time at which said second trigger pulse generated by said second circuit means is applied thereto and the time at which said third trigger pulse generated by said third circuit means is applied thereto.

4,034,296

OMNI-FREQUENCY PILOT SYSTEM

Walter Louis Berenson, Palatine, and Ronald Wayne Taylor, Arlington Heights, both of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1975, Ser. No. 644,797

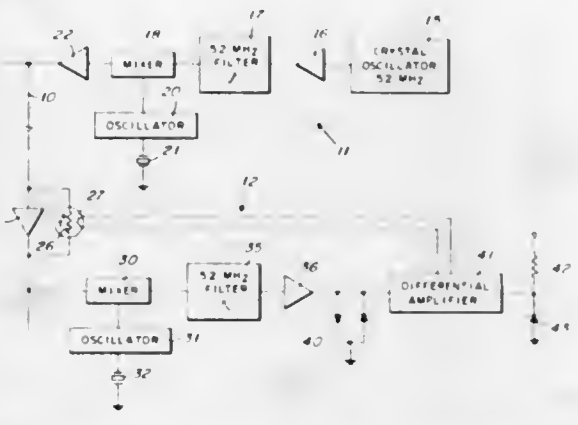
Int. Cl.^{2} H04B *1/62*

U.S. Cl. 325—62 **5 Claims**

1. Omni-frequency pilot means for use in a suppressed carrier communications system including a communications link, said pilot means comprising:

a. a pilot signal generator including first crystal controlled oscillator means having an output, a second crystal controlled oscillator with a plug-in crystal and an output, a mixer having a first input connected to the output of said first crystal controlled oscillator means, a second input connected to the output of said second crystal controlled oscillator and an output, and level control means connected between the output of said mixer and the communications link for controlling the level of the pilot applied to the communications link; and

b. a pilot signal receiver including variable gain amplifier means connected into the communications link and having a regulating input for receiving a regulating signal thereon, a mixer having a first input coupled to the communications link for receiving a pilot signal from said pilot generator and further having a second input and an output, a crystal controlled oscillator having a plug-in crystal connected thereto for controlling the frequency thereof and further having an output connected to the second input of said receiver mixer, a bandpass filter tuned to pass a predetermined frequency, said filter being coupled between the output of said receiver mixer and the regulating input of said variable gain amplifier means, and the plug-in crystal of said receiver oscillator controlling the frequency thereof to convert the frequency of the received pilot signal in said receiver mixer to the predetermined frequency of said bandpass filter.



4,034,297

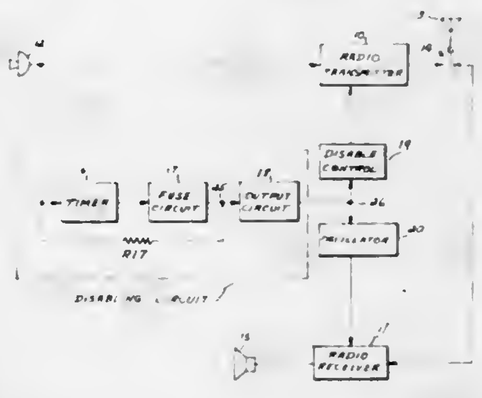
CIRCUIT FOR DISABLING A RADIO TRANSMITTER WHICH IS CONTINUOUSLY OPERATED LONGER THAN A PREDETERMINED TIME

Robert A. Giorgi, and James E. Loyd, III, both of Lynchburg, Va., assignors to General Electric Company, Lynchburg, Va.

Filed Jan. 13, 1976, Ser. No. 648,788

Int. Cl.^{2} H04B *1/04*

U.S. Cl. 325—166 **9 Claims**



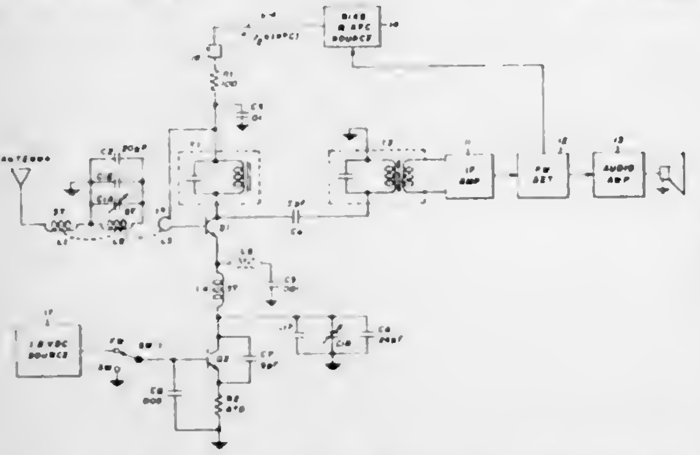
1. An arrangement for preventing a person from keying a radio transmitter for more than a predetermined continuous time period by operation of a microphone, said arrangement comprising:

a. an input circuit for receiving a signal indicative of the operation of said microphone for said radio transmitter;

b. a timing circuit connected to said input circuit for producing a timing signal in response to said microphone operation signal exceeding a predetermined continuous time period;
c. a fuse circuit connected to said timing circuit for blowing a fuse in response to said timing signal;
d. an output circuit connected to said fuse circuit and to said input circuit for producing an output signal in response to said fuse being blown and in response to said microphone operation signal;
e. and means for connecting said output circuit to said radio transmitter for preventing operation of said radio transmitter in response to said output signal.

4,034,298
CASCODE FM TUNER FOR A RADIO RECEIVER
Robert J. McFadyen, Syracuse, and William Peil, North Syracuse, both of N.Y., assignors to General Electric Company, Syracuse, N.Y.

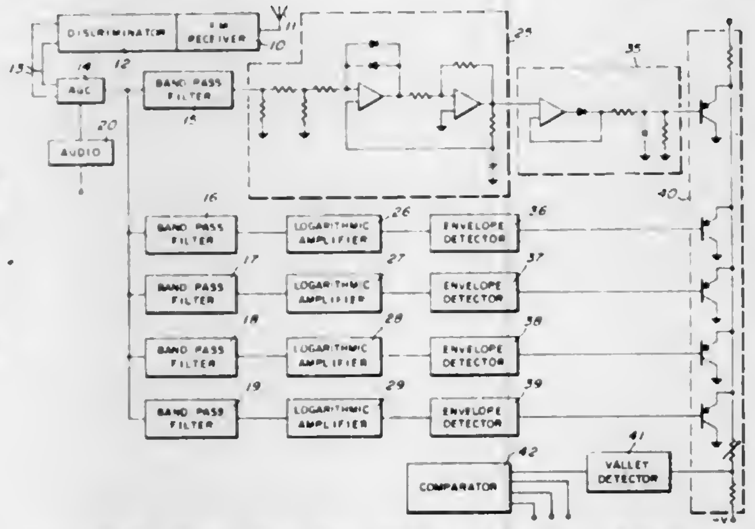
Filed Oct. 17, 1975, Ser. No. 623,372
Int. Cl.^{2} H04B *1/16*
U.S. Cl. 325—318 **9 Claims**



1. In a tuner for converting radio frequency signals to a fixed intermediate frequency and designed for automatic frequency control, the combination comprising:
1. a first source of variable potentials for effecting automatic frequency control,
2. a mixer including:
   a. a first transistor having base, emitter and collector electrodes,
   b. an input circuit for said mixer comprising an r.f. transformer having a first winding tuned to resonance and coupled to a source of r.f. signals; and an untuned, secondary winding connected to said base electrode for coupling signals thereto, and connecting said base electrode to said first source in a path of low d.c. impedance,
   c. a mixer output circuit connected to said collector electrode and tuned to said fixed intermediate frequency for deriving signals at the intermediate frequency,
3. an oscillator comprising:
   a. a second transistor connected in circuit with said first transistor having base, emitter and coilector electrodes,
   b. a bypass capacitor for grounding the base of said second transistor at the oscillator frequency,
   c. a second source of d.c. potentials connected between the base electrode of said second transistor and ground,
   d. a tuned resonant circuit for said oscillator providing a single path of low d.c. impedance between the emitter of said first transistor and the collector of said second transistor to equalize the currents between said transistors to transfer the voltage variations in said first source less the voltage drop in the input junction of said first transistor to the collector of said second transistor, and to provide oscillator injection into said mixer, and
   e. a resistance connected between the emitter of said second transistor and ground for setting the desire current levels in both said transistors.

4,034,299
AUDIO SIGNAL QUALITY INDICATOR
Susumu Cho, Elk Grove Village; Paul Milton Erickson, Oak Park, and Gary Raymond Reynolds, Streamwood, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Dec. 29, 1975, Ser. No. 645,002
Int. Cl.^{2} H04B *1/16, 17/00*
U.S. Cl. 325—363 **4 Claims**

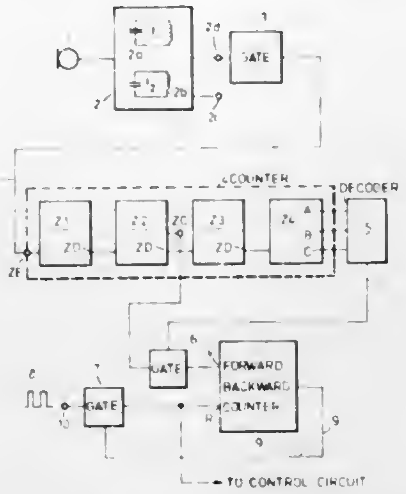


1. Signal quality indicator means for a radio receiver designed to pass a predetermined band and having a discriminator with an output of audio signals, said indicator means comprising:
a. a plurality of bandpass filters each having a bandpass substantially smaller and lying substantially within the predetermined band of audio signals, said bandpass filters being coupled to the output of the discriminator, and each of said bandpass filters passing a portion of the predetermined band of audio signals which is spaced from the portion passed by each of the other bandpass filters; and
b. means connected to said bandpass filters for selecting the bandpass filter with the lowest amplitude output and providing an output signal indicative of the amplitude thereof.

4,034,300
CIRCUIT ARRANGEMENT FOR EVALUATING RECEIVED OSCILLATIONS OF A PREDETERMINED FREQUENCY
Wulf-Christian Streckenbach, Hemmingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

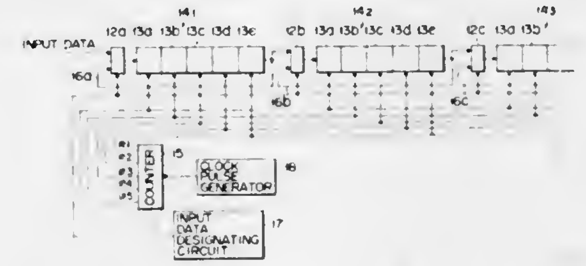
Filed Nov. 26, 1975, Ser. No. 636,222
Claims priority, application Germany, Nov. 27, 1974, 2455991
Int. Cl.^{2} H04B *1/06*
U.S. Cl. 325—390 **10 Claims**

1. In a circuit arrangement for evaluating a received control signal of the type including a first signal of a first predetermined frequency and of a time duration which represents information, and a second signal which immediately follows the first signal in time and has a second predetermined frequency different than said first frequency, said circuit arrangement including first means for receiving the control signal and second means, connected to said first means, for determining the time duration of said first signal by counting the oscillations of the first signal and for supplying an output signal representative of the number of oscillations, and hence of said information, to a control circuit which responds to said information, the improvement wherein said second means includes a memory to which the oscillations of said first signal are fed and which stores a count representative of a number of received oscillations of said first signal, and further means responsive to the receipt of said second signal for serially discharging the contents of said memory and for supplying said contents in series, as said output signal, to an output terminal connected to the control circuit.



4,034,301
MEMORY DEVICE WITH SHIFT REGISTER USABLE AS DYNAMIC OR STATIC SHIFT REGISTER
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

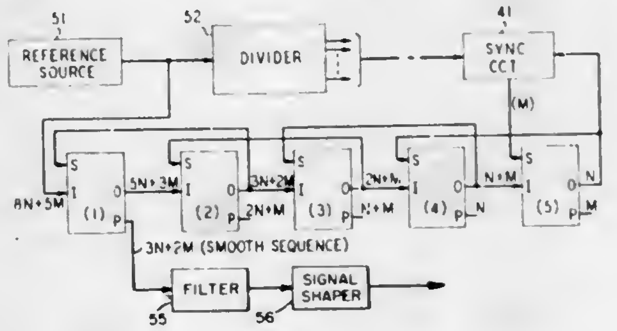
Filed Dec. 23, 1975, Ser. No. 643,801
Claims priority, application Japan, Dec. 23, 1974, 49-146841; Dec. 27, 1974, 50-529
Int. Cl.^{2} G11C *19/28, 11/40*
U.S. Cl. 328—37 **2 Claims**



1. An information memory device for storing a pluarl bit data character, comprising:
a shift register which includes a plurality of cascade connected register units, each register unit having a number N of sequentially arranged memory elements capable of storing digital information, and a number N of sequentially arranged transfer elements respectively coupled to said N memory elements, each of said memory elements and transfer elements being responsive to a supplied shift pulse for transferring digital information stored in a memory element to another memory element via transfer element, N being larger by one than the number of bits in one data character;
shift pulse generating means for supplying a shift pulse of the same phase to the transfer elements occupying the same sequential position in the respective register units and a number N of shift pulses having different phases to the transfer elements of each register unit from the transfer element disposed on the output side of said register unit;
shift circulation means coupled to said register units for causing an output delivered from the output terminal of each register unit to circulate through the output terminal of said register unit; and
input information changeover means including gating means coupled to the input terminal of each register unit for either supplying fresh information to the shift register in order to cause said shift register to act as a dynamic type shift register or circulating information already supplied through said shift circulation means to cause said shift register to act as a static type shift register.

4,034,302
SMOOTH SEQUENCE GENERATOR FOR FRACTIONAL DIVISION PURPOSES
Carl Jerome May, Jr., Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

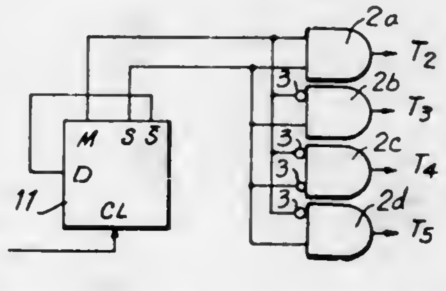
Filed May 26, 1976, Ser. No. 690,100
Int. Cl.^{2} H03K *21/00, 23/06*
U.S. Cl. 328—39 **6 Claims**



1. A smooth sequence generator capable of dividing a uniform pulse sequence from a reference source which is delivered to its input in accordance with a predetermined rational fraction comprising a plurality of routing circuit means coupled in tandem, each routing means having an input, a first and a second output and a control terminal that serves to route a pulse presented to the input of the routing means to said first or second output, the first output of each routing means connected to the next tandem-coupled routing means, a feedback connection from the first output of each routing means to the control terminal of the preceding routing means to control the routing of a pulse presented to the input of the latter, and synchronization means coupled to the source of the uniform pulse sequence and the first output of the last tandem-coupled routing means, said synchronization means providing an output signal to the control terminal of said last routing means to constrain the frequency or phase of the smooth sequence generator output to a synchronization signal derived from the uniform pulse sequence.

4,034,303
ELECTRONIC PULSE GENERATING CIRCUIT FOR ELIMINATING SPIKE PULSES
Mitsuharu Kodaira, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 26, 1975, Ser. No. 635,473
Claims priority, application Japan, Nov. 27, 1974, 49-136455
Int. Cl.^{2} H03K *3/04, 1/17*
U.S. Cl. 328—62 **6 Claims**



1. An electronic pulse generating circuit comprising in combination divider stage means for receiving a time standard signal having a predetermined frequency and pulse width, said divider stage means including a first divider stage having master and slave flip-flops, said master flip-flop producing a first output signal having a frequency less than or equal to

one-half said predetermined frequency of said time standard frequency signal in response to said time standard signal being applied thereto, said slave flip-flop being coupled to said master flip-flop for producing a second output signal having the same frequency as said first output signal in response to said time standard signal being applied thereto, said second output signal being time delayed with respect to said first output signal by a time interval equal to the time interval of the predetermined pulse width of the time standard clock signal, and logic means for receiving said first and second output signals and in response to detecting coincident predetermined states thereof, producing a timing pulse signal having a frequency less than or equal to one-half the predetermined frequency of the time standard signal and having a pulse width equal to the pulse width of said time standard signal.

4,034,304

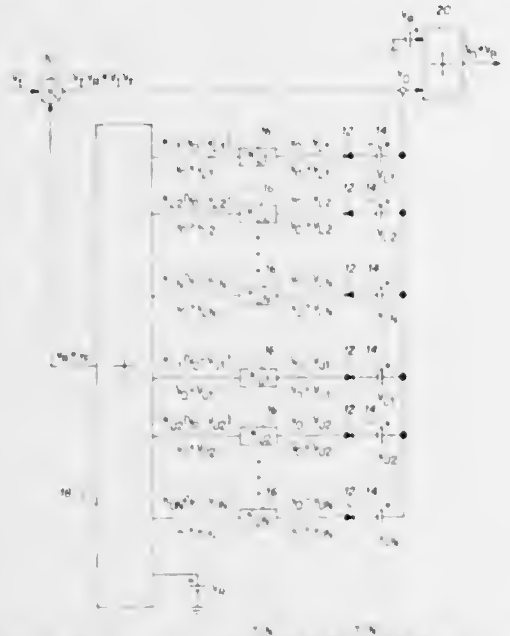
METHOD AND APPARATUS FOR GENERATING A NON-LINEAR SIGNAL

David B. Hallock, Marion, Iowa, assignor to Rockwell International Corporation, El Segundo, Calif.

Filed June 8, 1976, Ser. No. 694,009

Int. Cl.² G06G *7/12*

U.S. Cl. 328—142 **9 Claims**



1. Apparatus for generating an output signal which is a non-linear function of an input signal, comprising:

- multiplier circuit means for receiving the input signal and multiplying it by a feedback signal applied thereto to provide the non-linear ouput signal;
- threshold circuit means for establishing a signal threshold level to provide a signal at its output which is equal to the difference between the non-linear output signal from said multiplier circuit means and said signal threshold level whenever the non-linear output signal is in one region with respect to said signal threshold level and zero whenever the non-linear output signal is in the other region, and
- feedback circuit means for generating and applying to said multiplier circuit means said feedback signal as a direct function of the signal output of said threshold circuit means.

4,034,305

DEMODULATOR FOR SIGNALS HYBRID MODULATED BY MORE AND LESS SIGNIFICANT DIGIT SIGNALS IN SUCCESSION IN EACH CLOCK INTERVAL

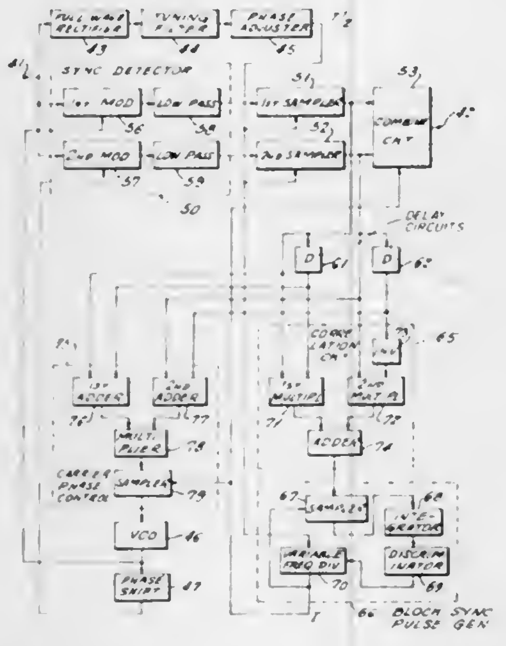
Yoichi Sato, Tokyo, Japan, assignor to Nippon Electric Company, Ltd., Tokyo, Japan

Division of Ser. No. 500,905, Aug. 27, 1974, Pat. No. 3,980,971. This application Apr. 5, 1976, Ser. No. 673,910

Claims priority, application Japan, Sept. 5, 1973, 48-99933

Int. Cl.² H03D *1/00*

U.S. Cl. 329—50 **4 Claims**



1. A demodulator for demodulating a received quadrature amplitude modulated signal supplied from a modulator and having a predetermined clock interval wherein the signal being transmitted is separated into a most significant portion and at least significant portion respectively modulating an in phase carrier during first and second halves of a clock period and wherein a quantization error value and its complement respectively modulate a quadrature phase carrier during the first and second halves of the same clock period, said demodulator comprising;

- a local carrier generator for generating a local carrier signal;
- a synchronous detector responsive to said local carrier signal for deriving in phase and quadrature phase base band components from said received signal;
- means responsive to said received signal for deriving timing pulses of a repetition period equal to one half of said clock interval;
- a first sampler responsive to said timing pulses for producing samples of said in phase base band component;
- a second sampler responsive to said timing pulses for producing samples of said quadrature phase base band components;
- first delay means for delaying the in phase component samples by said repetition period;
- second delay means for delaying the quadrature phase component samples by said repetition period;
- a correlation circuit means coupled to the outputs of said first and second delay means and said first and second samplers and responsive to the undelayed and delayed in phase and quadrature phase component samples for producing an output signal representative of the sums of the correlation between the delayed and undelayed in phase component samples of adjacent clock intervals and the correlation between the delayed and undelayed quadrature phase component samples of adjacent clock intervals;
- a synchronizing pulse generator means responsive to said timing pulses and said correlation circuit output signal for producing synchronizing pulses appearing in synchronism with and at the same repetition rate as the clock intervals of said received signal; and
- a phase control circuit means responsive to said synchronizing pulses and said undelayed and delayed in phase and quadrature phase, component samples for producing a control signal, said control signal being supplied to said local carrier generator to adjust the phase of said local carrier signal relative to the received signal.

4,034,306

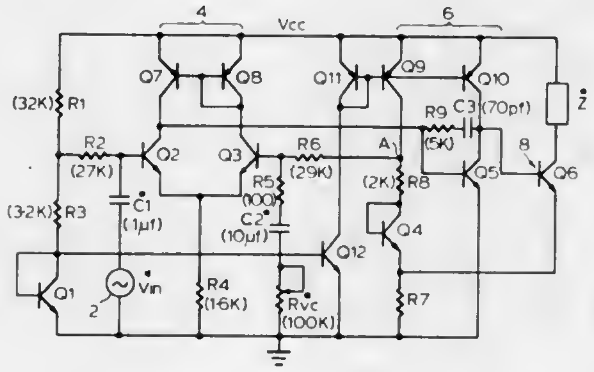
D.C. AMPLIFIER FOR USE WITH LOW SUPPLY VOLTAGE

Herbert Douglas Barber, Dundas, and Gary Curtis Salter, Burlington, both of Canada, assignors to Linear Technology Inc., Burlington, Canada

Filed Apr. 16, 1976, Ser. No. 677,632

Int. Cl.² H03F *3/45*

U.S. Cl. 330—30 D **7 Claims**



1. An integrated circuit direct coupled amplifier adapted to operate from a single battery cell and having no more than a single base-emitter junction in series across said cell, said amplifier comprising:

- a. a first connection adapted to be connected to one side of said cell and a second connection adapted to be connected to the other side of said cell,
- b. a differential stage having first and second NPN transistors, each having a base, an emitter and a collector, the emitters of said first and second transistors being connected together,
- c. an amplifying stage comprising a third NPN transistor having a base, an emitter and a collector,
- d. an output stage comprising a fourth NPN transistor having a base, an emitter and a collector,
- e. an input bias circuit for said first transistor, said input bias circuit comprising a first resistance having one side connected to said base of said first transistor and having a second side, a second resistance connected between said second side of said first resistance and said first connection, a fifth NPN transistor having a base, an emitter and a collector, a third resistance, said third resistance and the emitter and collector of said fifth transistor being connected in series between said second side of said first resistance and said second connection, the base and collector of said fifth transistor being connected together,
- f. means connected to said base of said first transistor for receiving a signal to be amplified,
- g. current conducting means connecting the emitters of said first and second transistors to said second connection,
- h. a first current source load connected to said output means of said first transistor, said first current source load being a sixth PNP transistor having a base, an emitter and a collector, the emitter of said sixth transistor being connected to said first connection and the collector of said sixth transistor being connected to the collector of said first transistor,
- i. first bias means biasing said sixth transistor, said first bias means being a seventh PNP transistor having a base, an emitter and a collector, the emitter of said seventh transistor being connected to said first connection and the collector of said seventh transistor being connected to the collector of said second transistor, the base and collector of said seventh transistor being connected together,
- j. said collector of said first transistor being connected to said base of said third transistor,
- k. a second current source load, separate from said first current source load, connected to said collector of said third transistor and operative when power is supplied from said battery cell to said first and second connections,
- l. said collector of said third transistor being connected to said base of said fourth transistor,
- m. negative feedback means for feeding back a portion of the signal from the emitter of said fourth transistor to said base of said second transistor, said negative feedback means comprising:
  - i. a series connection comprising: an eighth NPN transistor having a base, an emitter and a collector, the base and collector of said eighth transistor being connected together, and a fourth resistance connected in series with said eighth transistor,
  - ii. one side of said series connection being connected to the emitter of said fourth transistor,
  - iii. a fifth resistance connected between said one side of said series connection and said second connection for shifting the d.c. level of the feedback signal,
  - iv. a third current source load, separate from said first current source load, having one side connected to said first connection and having a second side connected to the other side of said series connection,
  - v. and a sixth resistance connected between the base of said second transistor and said second side of said third current source load, said third current source load being operative when power is supplied from said battery cell to said first and second connections,
- n. frequency compensation means connected to the base of said third transistor, to stablize said amplifier, said compensation means comprising a series resistance and capacitance,
- o. the base of said second transistor being substantially isolated from direct AC connection with the base of said first transistor,

and feedback attenuation means, including a second capacitance and a feedback attenuation resistance, connected in series between the base of said second transistor and said second connection.

4,034,307

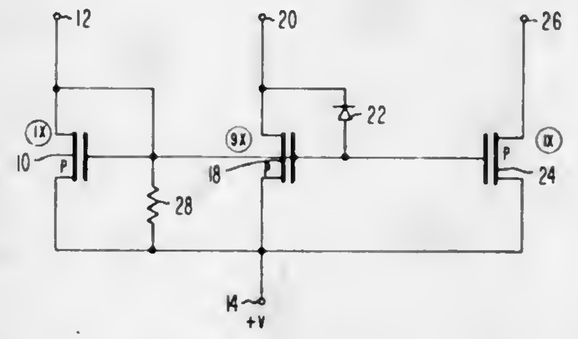
CURRENT AMPLIFIER

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 4, 1976, Ser. No. 655,163

Int. Cl.² H03F *3/16*

U.S. Cl. 330—35 **34 Claims**



11. In a current mirror amplifier of the type having a plurality of input circuits and an output circuit, said input circuits having characteristic transconductances and being adapted for respective currents to flow therethrough, the improvement wherein:

at least one of said input circuits includes switching means, responsive to the relative magnitudes of the currents flowing through said input circuits, for switching said one input circuit into a first operational state in which the transconductance of said one input circuit affects the gain of said mirror when any of the respective ratios of the current flowing through said one input circuit to the respective currents flowing through the other input circuits is in excess of predetermined ratios in accordance with the respective ratios of the transconductance of said one input circuit to said other input circuits, and for switching said one input circuit to a second operational state wherein the transconductance of said one input circuit does not affect the gain of said mirror when all of said ratios of currents do not exceed said predetermined ratios.

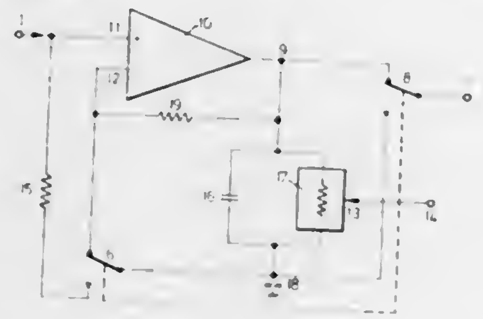
4,034,308
AMPLIFIER WITH CONTROLLABLE TRANSMISSION FACTOR AND SWITCHABLE CONTROL CHARACTERISTIC

Jürgen Wermuth, Stederdorf; Gerhard Dickopp, and Ernst Schröder, both of Hannover, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed July 6, 1976, Ser. No. 703,119

Int. Cl.² H03F *1/36*

U.S. Cl. 330—86 **4 Claims**



1. In a circuit including a differential amplifier having a noninverting input and an inverting input, the circuit being arranged to cause the amplifier to have a transmission factor which is a function of the value of a control voltage, and being switchable between first and second operating states in which the amplifier has mutually complementary control characteristics, the circuit including voltage-controllable first impedance means having a control input connected to receive the control voltage and arranged to assume an impedance value which is a function of the value of the control voltage, the first impedance means being connected in a feedback path of the amplifier when the circuit is in its first operating state, the improvement wherein said circuit further comprises:

second impedance means;

connection means connecting said first and second impedance means to one another at a point of connection and connecting said first and second impedance means in series between the output of said amplifier and a point at the circuit reference potential;

third impedance means connected between the output and inverting input of said amplifier;

fourth impedance means having an impedance value equal to that of said third impedance means and having one side connected to the noninverting input of said amplifier; and

switching means connected for switching said circuit between its said operating states, said switching means having a first switching state corresponding to said first operating state, in which the point of connection between said first and second impedance means is connected to said amplifier inverting input and the voltage at the output of said amplifier constitutes the output voltage of said circuit, and a second switching state corresponding to said second operating state, in which the point of connection between said first and second impedance means is connected to the other side of said fourth impedance means and the voltage at that connection point constitutes the output voltage of said circuit.

4,034,309
APPARATUS AND METHOD FOR PHASE SYNCHRONIZATION

Julian Edgar Vaughn, Campbell, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,714

Int. Cl.² H03B *3/04*

U.S. Cl. 331—1 A **7 Claims**

1. A phase locking oscillator system for synchronizing an output signal of a voltage controlled oscillator, having predetermined periodic characteristics of nominal frequency, with repetitive predetermined characteristics of an input signal applied to the system, comprising:

control voltage storage means including at least one capacitor for storing a control voltage;

a voltage controlled oscillator connected to receive said control voltage and whose frequency of operation is controlled by said control voltage;

a reference signal generating means adapted to receive said input signal and responsive to individual occurrences of said repetitive predetermined characteristic of said input signal to generate a reference signal indicating the lapse, since each said occurrence of said predetermined characteristic, of a reference interval exceeding one nominal period of said voltage controlled oscillator output signal by a predetermined time;

a positive constant current source;

a negative constant current source of equal magnitude;

a switching means, connected to said current sources for causing application of current from either of said current sources to said control voltage storage means;

and a logic means connected to said switching means and responsive to at least said individual occurrences of said predetermined characteristic of said input signal to cause said switching means simultaneously to apply current from both said current sources to said control voltage storage means, said logic means being further responsive to said reference signal indication to cause said switching means to remove current from one of said current sources from said control voltage storage means and further responsive to the occurrence of at least two successive predetermined periodic characteristics of said oscillator output signal, subsequent to each said occurrence of said predetermined characteristic of said input signal, to cause said switching means to remove current from the other of said current sources from said control voltage storage means, whereby a minimum time between switchings of current from the same current source is established which is at least equal to said predetermined time by which said reference interval exceeds one period of said oscillator output signal.

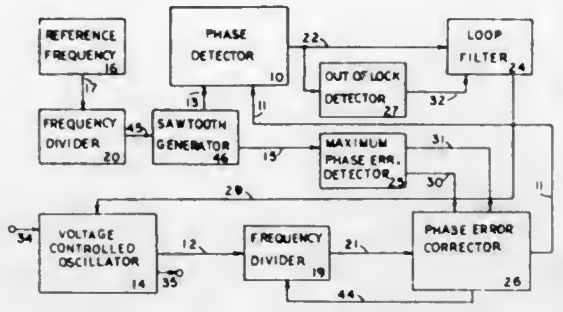
4,034,310
PHASE-LOCKED LOOP OSCILLATOR

Thomas F. Coe, 3173-39 Bancroft Drive, Spring Valley, Calif. 92077

Filed Jan. 5, 1977, Ser. No. 757,112

Int. Cl.² H03B *3/04*

U.S. Cl. 331—11 **6 Claims**



1. In a phase-locked circuit where the frequency of a first signal is automatically and continuously adjusted in response to the output of a phase detector which measures the phase error between the first signal and a second reference signal, a device for improving the operation of the circuit which comprises:

means for detecting when said phase error exceeds at least one predetermined limit; and

means, responsive to said means for detecting, for shifting the phase of one of the signals in relation to its source by an amount sufficient to return said phase error within said limit before applying it to the phase detector.

4,034,311
SEMICONDUCTOR LASER

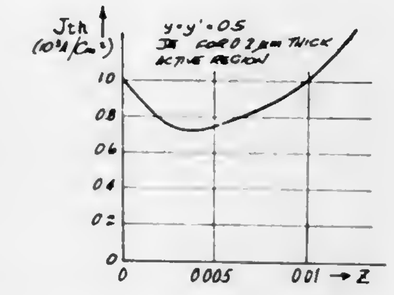
Kunio Itoh, and Morio Inoue, both of Takatsuki, Japan, assignors to Matsushita Electronics Corporation, Kadoma, Japan

Continuation of Ser. No. 445,895, Feb. 26, 1974, abandoned. This application Mar. 30, 1976, Ser. No. 671,948

Claims priority, application Japan, Feb. 26, 1973, 48-22867; Feb. 26, 1973, 48-22868

Int. Cl.² H01S *3/00*

U.S. Cl. 331—94.5 H **4 Claims**



1. A double heterostructure laser comprising:

an n-type GaAs substrate,

a first region of n-type $Ga_{1-y}Al_yAs$ ($1 \geqq y > 0$) epitaxially grown on one principal face of said substrate,

a second and active region of $Ga_{1-z}In_zAs$ epitaxially grown on said first region, the value of z being greater than zero and is selected to minimize the current threshold of the laser, by being less than the theoretical value that makes the lattice constant of said active region coincide with those of the neighboring regions,

a third region of p-type $Ga_{1-y'}Al_{y'}As$ ($1 \geqq y' > 0$) epitaxially grown on said second region,

and

a fourth region of p-type GaAs epitaxially grown on said third region.

4,034,312
MICROWAVE OSCILLATOR USING A TRANSIT TIME TRANSISTOR

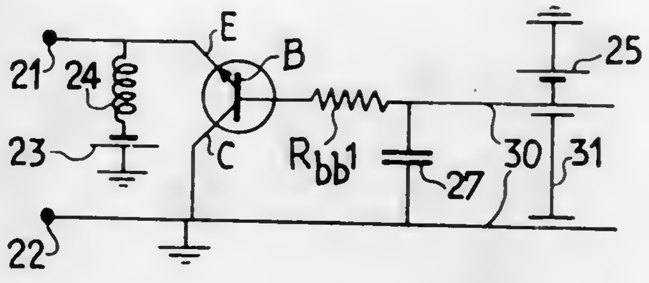
Marc Armand, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 26, 1976, Ser. No. 670,757

Claims priority, application France, Mar. 28, 1975, 75.09920

Int. Cl.² H03B *5/18, 9/12;* **H03F** *3/55, 3/60*

U.S. Cl. 331—96 **10 Claims**



1. A device utilizing transit time effects, comprising:

a semiconductor structure of the transistor type with emitter, base and collector terminals, able to generate a high frequency oscillation at a predetermined frequency, by applying of a direct current voltage across emitter and collector terminals;

a transmission line of adjustable length having its input across said base and collector terminals and its output short-circuited at high frequency said adjustable length being able to vary on both sides of a value equal to a quarter of wavelength at said predetermined frequency.

4,034,313
MICROSTRIP GUNN OSCILLATOR WITH VARACTOR TUNING

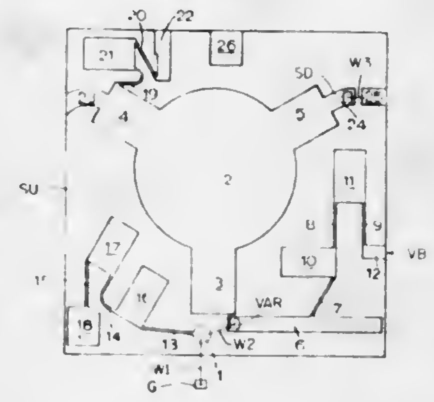
Stewart Barry Jones, and Keith Rushworth Williams, both of Stockport, England, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 14, 1975, Ser. No. 577,315

Claims priority, application United Kingdom, May 20, 1974, 22477/74

Int. Cl.² H03B *7/14, 9/12*

U.S. Cl. 331—96 **20 Claims**



1. A microwave oscillator arrangement comprising a dielectric substrate, a microstrip resonator formed on a portion of the substrate, a negative-resistance oscillator device external to the resonator, and means for coupling the negative-resistance oscillator device to the resonator, whereby substantially all the R.F. power produced by the negative-resistance oscillator device is fed into the resonator, means for coupling R.F. power out of the resonator into a load, and a variable reactance connected in series between the negative-resistance oscillator device and the resonator whereby to adjust the operating frequency of the oscillator arrangement.

4,034,314

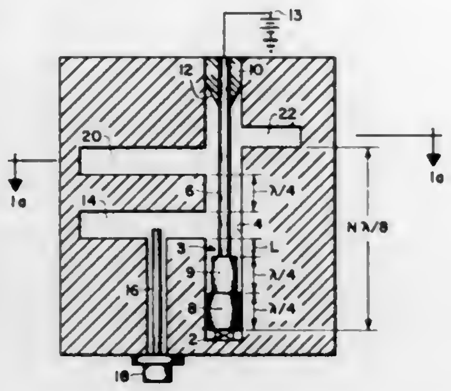
MICROWAVE DIODE COAXIAL CIRCUIT OSCILLATOR IMPROVEMENT

Michael Dydyk, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Filed June 24, 1976, Ser. No. 699,722

Int. Cl.² H03B *7/14*

U.S. Cl. 331—101 **6 Claims**



1. In a coaxial microwave oscillator circuit having at least one negative resistance semiconductor diode, and at least one matched terminating load wherein the at least one diode and the at least one load are positioned at opposite ends of at least one coaxial circuit and an output signal is coupled from a point intermediate the diode and the load, the improvement comprising:

an unloaded cavity of resonant frequency, f_0, coupled to the at least one coaxial circuit at a point one-quarter wavelength at frequency f_0 from the output signal coupling points.

4,034,315

WAVEGUIDE DIRECTIONAL COUPLER

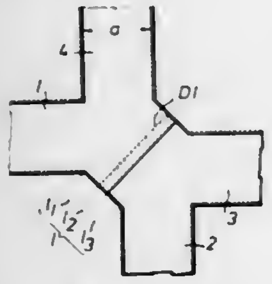
Udo Unrau, Lagesbuttel, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

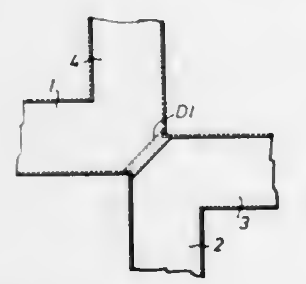
Filed Feb. 27, 1976, Ser. No. 662,088

Claims priority, application Germany, Mar. 8, 1975, 2510212

Int. Cl.² H01P *5/18*

U.S. Cl. 333—10 **10 Claims**





1. In a waveguide junction composed of two pairs of rectangular waveguide branches arranged in the manner of the arms of a cross with at least one partially radiation-reflecting obstacle disposed in the junction diagonally of the arms to produce a directional coupler, the improvement wherein said junction comprises two waveguide sections each disposed at a respective side of said obstacle and interposed between said obstacle and a respective pair of waveguide branches, said waveguide sections constituting means for matching the impedance at the surface of the obstacle to the values required at the regions of connection between each pair of branches to permit the coupler to operate in a frequency range in which the useful waveguide mode can propagate while spurious modes excited in the coupler are evanescent.

4,034,316

CIRCUIT ARRANGEMENT IN STRIP LINE TECHNIQUE FOR A WIDE BAND BALANCING ELEMENT

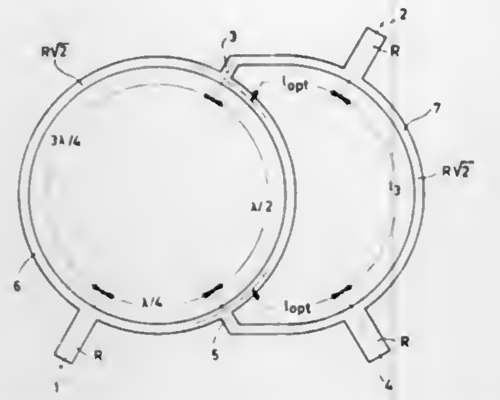
Hans Bex, Aachen, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed. Oct. 7, 1975, Ser. No. 620,299

Claims priority, application Germany, Oct. 22, 1974, 2449999

Int. Cl.² H01P *5/22*

U.S. Cl. 333—11 **2 Claims**



1. A circuit arrangement in strip line technique for a wide-band balancing element operating at a mid-band wave length λ, comprising: a hybrid ring, whose conductors are arranged on a base plate and which comprises an input gate, a first output gate which is moved over 3λ/4 in one direction with respect to this input gate, a second output gate which is moved over λ/4 in the opposite direction with respect to the input gate, the two output gates of the hybrid ring being interconnected by a partial ring conductor having a length of $2 \times l_{opt} + l_3$ where $l_{opt} \approx \lambda/60$, and including additional output gates each arranged at a distance of the length l_{opt} from said first and second output gates and spaced apart at a distance of the length l_3, said partial ring being the only other path between said two output gates.

4,034,317

ULTRASONIC DELAY LINES AND METHOD OF MAKING THE SAME

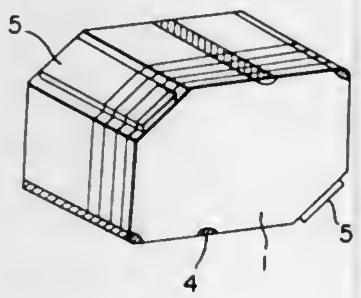
Michihiko Uemura; Tohru Kanbara, both of Yokohama, and Yutaka Igarashi, Kawasaki, all of Japan, assignors to Asahi Glass Co., Ltd., Tokyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,703

Claims priority, application Japan, Mar. 13, 1975, 50-29468

Int. Cl.² H03H *9/30, 9/26, 9/32;* **H01L** *41/04*

U.S. Cl. 333—30 R **8 Claims**



1. In a multiple reflection type solid ultrasonic delay line comprising a solid ultrasonic delay medium in the form of a thin flat plate having input and output transducers and reflection elements formed on the periphery thereof, the improvement comprising:

at least one arc shaped groove formed in a side surface of said plate having elements from which the reflection of ultrasonic vibration is undesirable; and,

a low melting point metallic material provided in said groove for vibration absorption.

4,034,318

ELASTIC SURFACE WAVE FILTER

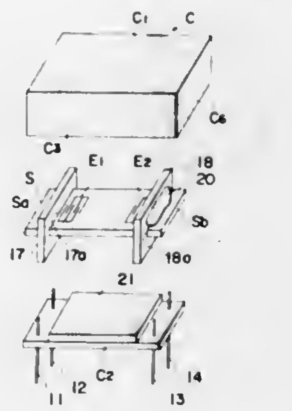
Hideki Ishiyama; Atushi Inoue, and Hideharu Ieki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 12, 1976, Ser. No. 666,304

Claims priority, application Japan, Mar. 12, 1975, 50-34112[U]; Mar. 19, 1975, 50-37826[U]

Int. Cl.² H03H *9/10, 9/26, 9/06*

U.S. Cl. 333—72 **4 Claims**



1. An elastic surface wave filter device which comprises:

a casing of substantially cubic body having top and bottom wall portions opposed to each other, a pair of opposed side wall portions and a pair of opposed end wall portions, all connected together to provide an interior chamber therein;

a substrate of piezoelectric material housed within said interior chamber and extending in substantially parallel relation to any of said top and bottom wall portions, said substrate including interleaved comb-type input and output transducing systems rigidly mounted on one of the opposed surfaces of said substrate which faces said top wall portion, said input and output transducing systems being respectively located adjacent the opposed ends of said substrate in spaced, but piezoelectrically coupled, relation to each other;

first and second elastic support means, made of rubber material, for steadily supportion said substrate within said interior chamber, said first and second elastic support means serving as substantial cushioning elements for absorbing an external impact being imposed on said filter device and for concurrently suppressing that portion of elastic surface waves which, during energization of said transducing systems and after having been propagated along the substrate from the input transducing system towards the output transducing system, may be reflected back towards such an area as substantially defined between said input and output transducing systems, said first and second electric support means being so positioned between the input transducing system and one of the opposed end wall portions adjacent said input transducing system and between the output transducing system and the other of said opposed end wall portions adjacent said output transducing system, respectively, facing the direction of propagation of the reflected surface waves towards said area on said substrate; and

a third elastic support means secured in position between the other of the opposed surfaces of said substrate and said bottom wall portion;

wherein each of said first and second elastic support means comprises a support member of substantially inverted L-shape having an upright portion and an overhang integral with said upright portion, and said third elastic support means is constituted by a support member of substantially plate-like configuration having opposed ends integral with said upright portions, said substrate being supported in such a manner that, while said other of said opposed surfaces of said substrate is held flat against said support member, the opposed end portions of said substrate are substantially clamped into betweeen said overhang portions and said opposed ends of said support member, respectively.

4,034,319

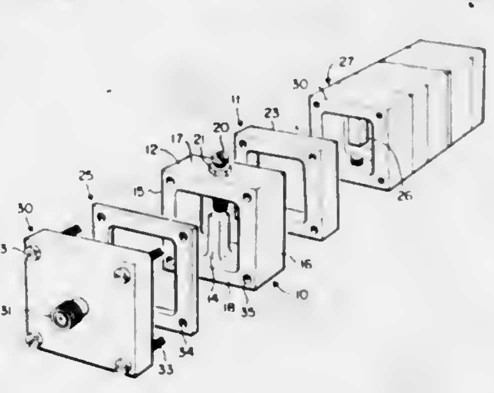
COUPLED BAR MICROWAVE BANDPASS FILTER

David L. Olsson, Manhattan Beach, Calif., assignor to TRW Inc., Redondo Beach, Calif.

Filed May 10, 1976, Ser. No. 684,804

Int. Cl.² H01P *1/20*

U.S. Cl. 333—73 R **6 Claims**



1. A microwave bandpass filter of the coupled bar type comprising:

- a. a plurality of resonator sections, each consisting of a single unitary metallic structure having four connected walls forming a hollow member of substantially rectangular cross-section providing two ground planes and a resonating bar integral with said structure and extending from one of the walls parallel to the ground planes;
- b. a plurality of spacer sections each matching the dimensions of the walls of a member and having a substantially rectangular cross-section; and
- c. means for connecting alternate resonator sections and spacer sections for forming a filter of predetermined properties.

4,034,320

HIGH POWER COAXIAL CAVITY RESONATOR TUNABLE OVER A BROAD BAND OF FREQUENCIES

LeRoy Francis Heckman, Jr., New Holland, Pa., and James Bruce Pickard, Quincy, Ill., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 26, 1976, Ser. No. 680,076

Int. Cl.² H01P *7/04;* **H03F** *3/60*

U.S. Cl. 333—82 B **6 Claims**

1. A coaxial cavity resonator for an active device tunable over a given broad band of frequencies comprising:

a first conductor for coupling to one terminal of said active device,

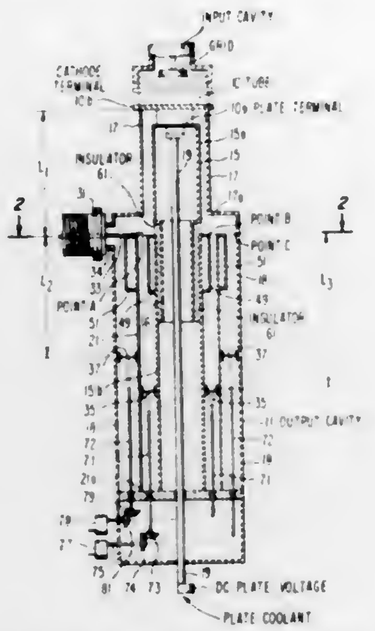
a second tubular conductor concentric with and spaced about said first conductor for coupling to a second terminal of said active device,

a third intermediate tubular conductor coaxially spaced between said first and second conductor, said third intermediate tubular conductor beginning at a given distance along said cavity from said active device and extending to that end of said cavity remote from said active device,

a fixed position output coupler having a given impedance with a first terminal directly connected to said third conductor at said given distance from said active device and a second terminal connected to said second conductor,

said first and second conductors being dimensioned to present over said given band of frequencies an inductive impedance across said first and second conductors at said given distance from said active device,

a pair of concentric shorting stubs with a first stub positioned between said third conductor and said first conductor to present a first capacitive reactance at said given distance from said active device and a second stub positioned between said third conductor and said second conductor to present a second capacitive reactance at said given distance from said active device in series with said first capacitive reactance and in shunt with said coupler, said stubs being adjustable for resonating the inductive reactance therewith to tune said cavity over said broad band of frequencies.



4,034,321

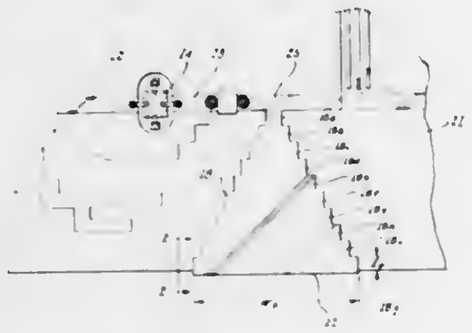
METHOD AND APPARATUS FOR MICROSTRIP TERMINATION

James H. Ward, Jr., and Max W. Medley, Jr., both of Largo, Fla., assignors to E-Systems, Inc., Dallas, Tex.

Filed Apr. 15, 1976, Ser. No. 677,343

Int. Cl.² H01P *1/24*

U.S. Cl. 333—84 M **12 Claims**



1. A transmission system comprising:

a transmission line formed on an insulating substrate;

a conductive layer terminating stub connected to said transmission line for terminating said transmission line and having a predetermined width at a point of connection to said transmission line, said stub having a progressively and incrementally increasing width as the distance from said transmission line increases,

a ground plane also formed on the insulating substrate, and

a conductive layer shunt connected to said stub and to said ground plane to terminate said transmission line in a d.c. short circuit ground.

4,034,322

DEVICE FOR PROTECTION AGAINST CURRENT OVERCHARGES

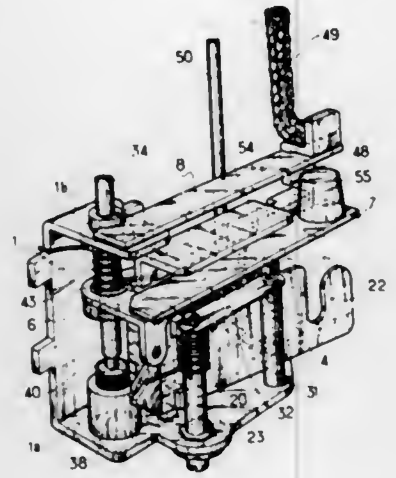
Paul Canonne, Barentin, France, assignor to Societe d'Apparetillage Electrique Saparfi, Saint-Marcellin, France

Filed Nov. 11, 1975, Ser. No. 631,155

Claims priority, application France, Nov. 15, 1974, 74.37703

Int. Cl.² H01H *77/06*

U.S. Cl. 335—42 **7 Claims**



1. A device for protection against overcharges of current, comprising a thermal protection device and a magnetic protection device fixed on a mounting plate (1), the thermal protection device comprising an active bimetal (8), a compensating bimetal (7) parallel to the active bimetal and a shield (54) situated between the active bimetal and the compensating bimetal, the magnetic protection device being constituted by a relay comprising, on a magnetic circuit (2) and insulated therefrom, a winding (5) and a movable armature (4), characterized in that the said mounting plate comprises two tabs (1*a*, 1*b*) in that the magnetic protection device is fixed on one (1*a*) of the said tabs, in that the active bimetal (8) is fixed by one end on another tab (1*b*) of the mounting plate, in that the compensation bimetal (7) is fixed by one end to a striker (6) integral with a pivot (34) installed between a tab (1*b*) by an insulating bearing (44) and another tab (1*a*) of the mounting plate, in that the said striker is fixed against a shoulder (35), in that a striker spring (43) is wound around one end of the said pivot between the said bearing (44) and the said striker, the said striker spring having one insulated end (46) fixed to the mounting plate and one end (47) fixed to the striker and exerting a pivoting force on the said striker and in that the compensating bimetal (7) comprises, at one free end, a compensator stop (55), having a given height, in contact, under the action of the said striker spring and over a length at most equal to its height, with a bimetal stop (48) fixed to one end of the active bimetal opposite to that by which it is fixed onto the mounting plate.

4,034,323

MAGNETIC RELAY

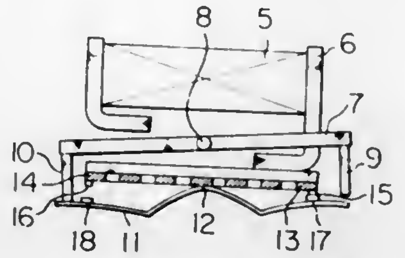
Rokuro Homma, Tokyo, Japan, assignor to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed Mar. 24, 1975, Ser. No. 561,379

Int. Cl.² H01H *67/02*

U.S. Cl. 335—129 **5 Claims**

1. A magnetic relay comprising a core, a coil wound on said core, an armature positioned movably near said core by magnetic force, and a plurality of pairs of contact points, each pair of which being arranged so as to be able to open and close according to the movement of said armature, characterized in that said relay further comprises a contact spring the center of which is fixed, and the side portions of which extend from said center and are each provided at their respective ends with some of said contact points, a pair of dielectric card means, one of which means is affixed to one end of said armature and in response to a magnetic force on said one end forcibly engages one of said side portions to open a contact on the end thereof, and the other end of which means is affixed to the other end of said armature and in response to a force on said armature forcibly engages the other of said side portions to open a contact on the end thereof, and a dielectric support plate having a support surface for supporting one of the contacts of each of said contact pairs whose other contact is provided on said contact spring.



4,034,324

DEFLECTION DEVICE FOR USE IN COLOR TELEVISION RECEIVER

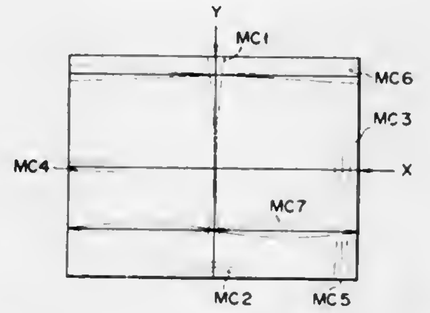
Shunichi Sano, Zama, and Youji Ogawa, Yokohama, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Sept. 16, 1975, Ser. No. 613,957

Claims priority, application Japan, Sept. 20, 1974, 49-109417

Int. Cl.² H01F *1/00*

U.S. Cl. 335—212 **5 Claims**



1. In a deflection device for use in a color television receiver, which is fitted to a neck portion of a color picture tube having electron guns emitting three electron beams, said electron guns being arranged in a horizontal plane and which comprises a deflection yoke for horizontally and vertically deflecting said three electron beams on a screen and at least a soft magnetic material piece fitted on said deflection yoke, the improvement which comprises a deflection yoke which is so designed as to eliminate mis-convergences MC_1, MC_2, MC_3, MC_4 and MC_7, in the mis-convergence MC_1 the three electron beams being horizontally displaced from each other at both the upper and lower end portions of the vertical or Y axis, in the mis-convergence MC_2, the three electron beams being vertically displaced from each other at both the upper and lower end portions of the Y axis, in the mis-convergence MC_3, the three electron beams being horizontally displaced from each other at both the right and left end portions of the horizontal or X axis, in the mis-convergence MC_4 three electron beams being vertically displaced from each other at both the right and left end portions of the X axis, and in the misconvergence MC_7 scanning lines of the three electron beams being vertically displaced at intermediate portions between the Y axis and each of said right and left ends of the screen; and at least a soft magnetic material piece fitted to an end portion of said deflection yoke nearer to the screen of the color picture tube so as only to eliminate a mis-convergence MC_5 wherein the three electron beams are horizontally displaced from each other at the diagonal end portions of the screen and a mis-convergence MC_6 wherein the three electron beams are vertically displaced from each other at the diagonal end portions of the screen.

4,034,325

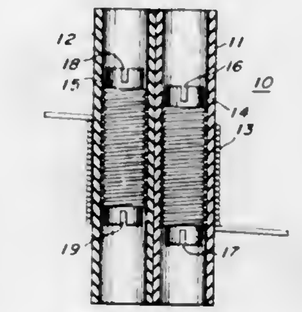
COARSE AND FINE ADJUSTMENT WARP COIL

Sviatoslav Zarkov, River Forest, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 26, 1976, Ser. No. 661,665

Int. Cl.² H01F *21/06*

U.S. Cl. 336—75 **6 Claims**



1. A two-terminal, single-winding adjustable inductor for connection into a circuit for adjusting the frequency thereof comprising only one winding of a predetermined number of turns and a predetermined interior dimension, two insulating tubes disposed side by side inside of said winding, and two cores of predetermined permeability, one each of said cores being disposed in one each of said insulating tubes, both of said cores being disposed within the interior of said winding for decreasing the coil inductance per unit turn, each of said cores being moveable relative to the other one for course adjustments and one for fine adjustments.

4,034,326

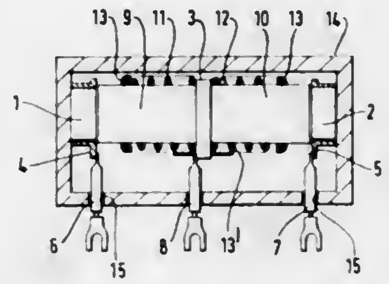
TEMPERATURE SENSITIVE TRIP DEVICE

John Hill, Bickley, and Henryk Turczanski, Beckenham, both of England, assignors to Comtelco (U.K.) Limited, Tonbridge, England

Filed Apr. 17, 1975, Ser. No. 569,013

Int. Cl.² H01H *37/04*; H02H *1/04*

U.S. Cl. 337—34 **4 Claims**



1. A temperature sensitive trip device comprising:

an elongated, cylindrical, electrically insulative support;

at least first and second electrical terminals affixed to said support and spaced axially along the length thereof;

a resilient, cylindrical coil spring mounted about said support and axially extending therealong between said at least first and second terminals and electrically connected to one of said terminals;

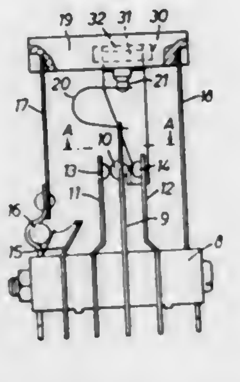
said coil spring being capable of assuming a first condition in which a connection is formed between said first and second terminals and a second condition in which said spring is resiliently biased out of connection between said first and second terminals;

a rigid, solidified, fusible material disposed along the length of said coil spring and joining together each coil of said

spring to retain said spring in said second condition in a compressed state against the resilient bias thereof;
said fusible material, upon melting by heat from said support, causing release of said coil spring into a biased axial movement to said first condition.

4,034,327
TIMING PULSE GENERATING SWITCH

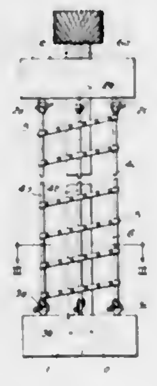
Holger Nicolaisen; Finn Schnoor Andersen, both of Nordborg, and Leif Borge Tandrup, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark
Filed Oct. 22, 1975, Ser. No. 624,846
Claims priority, application Germany, Oct. 28, 1974, 2451090
Int. Cl.² H01H *61/00, 71/16*
U.S. Cl. 337—41 **4 Claims**



1. A timing pulse generating switch assembly comprising housing and slide members in spaced apart relation, bimetallic spring means connecting said members to provide relative movement therebetween with said slide member having an at rest position and an operative position, three contact arms carrying contacts attached to said housing, a snap spring between the center one of said arms and said slide member, a blocking member carried by said slide member which is actuatable relative to said slide member from an inoperative nonblocking position to an operative blocking position, said blocking position being selectively between said center one of said arms and a selected one of said other two arms to selectively block the initial movement of said center arm or the return movement of said center arm, and means for actuating said blocking member.

4,034,328
ELECTRIC FUSE

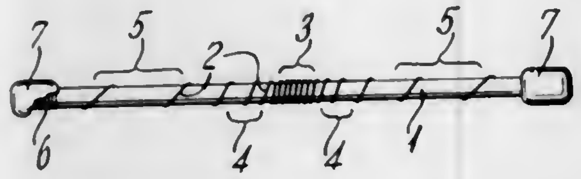
Erwin Salzer, P.O. Box 45, Waban, Mass. 02168
Filed June 28, 1976, Ser. No. 687,741
Int. Cl.² H01H *33/02*
U.S. Cl. 337—159 **9 Claims**



1. An electric fuse including
a. a tubular casing of electric insulating material;
b. a pair of terminal elements closing the ends of said casing;
c. a granular arc-quenching filler inside said casing;
d. a plurality of spaced flexible cords of glass fibers having ends affixed to said terminal elements and stressed in a direction longitudinally thereof so as to form a relatively stiff system defining the lateral edges of a prism; and
e. fusible element means inside said casing, embedded in said filler, conductively interconnecting said pair of terminal elements and supported by said stiff system of spaced bundles of glass fibers.

4,034,329
MINIATURE TIME-DELAY FUSE

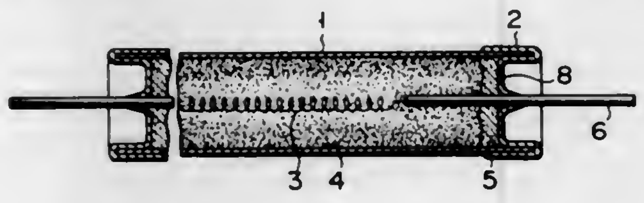
Hiroo Arikawa, 1-14-9, Oyamadai, Setagaya, Tokyo, and Masaya Maruo, 1-29-14, Shinkoyasu, Kanagawa, Yokohoma, both of Japan
Filed Apr. 30, 1976, Ser. No. 682,129
Claims priority, application Japan, May 2, 1975, 50-052563
Int. Cl.² H01H *85/04, 85/08*
U.S. Cl. 337—163 **16 Claims**



1. An electrical component for use in a time-delay fuse comprising an elongated generally cylindrical core member of low heat conductivity defined by a middle region, two intermediate regions and two ends, and a fusible metallic wire element of high melting point wound on said core member, said fusible wire element being densely wound at said middle region, thence sparsely wound toward the ends of said core member and again densely wound at said ends, and wherein said fusible wire element is soldered at said ends with a high melting solder element.

4,034,330
SHEATH HEATER

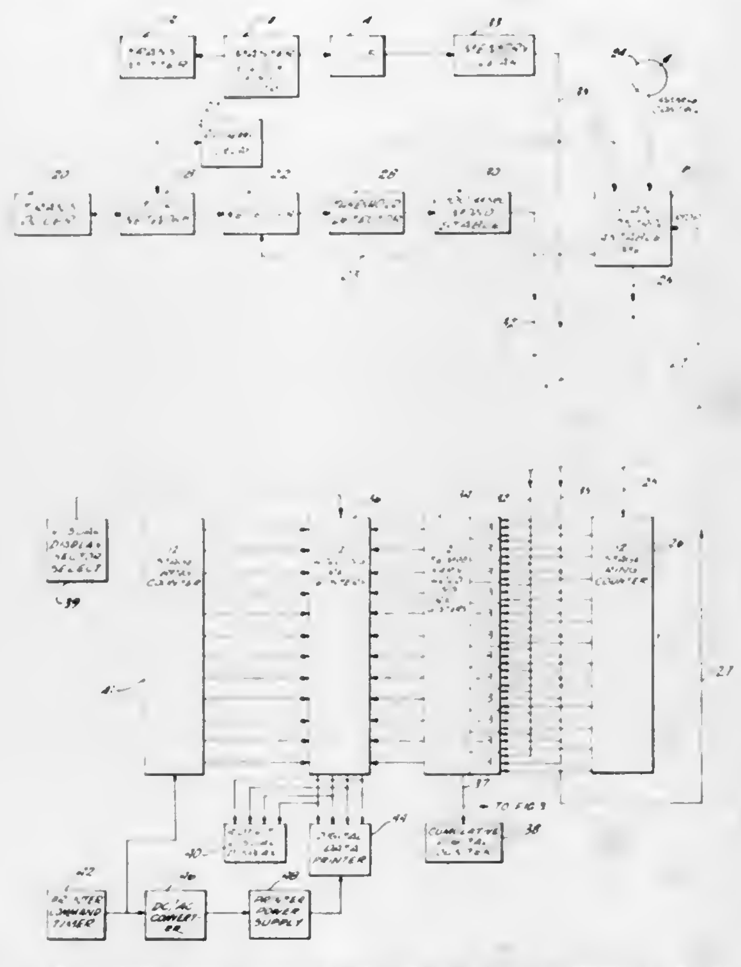
Eizo Goto, Chigasaki, Japan, assignor to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan
Filed Sept. 17, 1975, Ser. No. 613,974
Claims priority, application Japan, Sept. 19, 1974, 49-107965; Sept. 19, 1974, 49-112854
Int. Cl.² H01C *1/03*
U.S. Cl. 338—238 **7 Claims**



1. A sheath heater comprising a pipe having at least one open end, an electrically heat radiant body provided inside the pipe, an electrical terminal connected to the heat radiant body, a region of electrically insulating powder having a high melting point and loaded inside the pipe to fix the heat radiant body, a sealing member for said open end having a glass compound layer formed by a molten glass permeating into the insulating powder region at said open end, and a glass layer formed on the outer surface of the glass compound layer being thinner than the glass compound layer.

4,034,331
FISH COUNTER

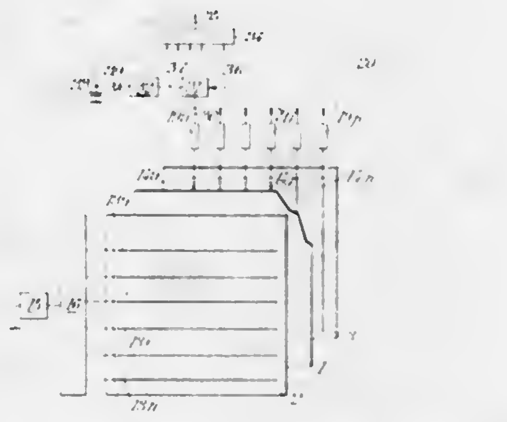
Albert S. Menin, Sylmar, and Robert M. Bridges, Northridge, both of Calif., assignors to The Bendix Corporation, North Hollywood, Calif.
Filed Dec. 29, 1975, Ser. No. 644,483
Int. Cl.² G01S *9/70*
U.S. Cl. 340—3 R **9 Claims**



1. A system for counting migrating fish swimming in a stream comprising:
a mechanical support structure adapted to be positioned on the bottom of said stream near the shore thereof extending a substantial distance into said stream essentially perpendicularly with respect to the direction of stream flow, said structure comprising a lightweight elongated tubular frame;
webbing means suspended from the downstream side of said structure to prevent fish of substantial size from passing under said support structure;
an acoustic transducer having a narrow beam width positioned adjacent the shore end of said structure and directed to insonify a volume of water in said stream immediately above said structure, and to receive echo return signals therefrom;
and electrical means connected to said transducer including a source of electrical power,
a master clock connected to said source for emitting pulses at regular intervals,
a transmitter responsive to said clock pulses for providing echo ranging pulse signals to said transducer,
a delay circuit responsive to said transmitted pulses,
a receiver and threshold detector means connected to said receiver,
multivibrator means responsive to signals passed by said threshold detector for providing pulse signals of essentially uniform magnitude representing fish returns,
a multistage ring counter providing a plurality of successive output pulses;
a scan control multivibrator responsive to said delay circuit for enabling said receiver and for enabling said ring counter,
a first holding register having a plurality of stages corresponding to the number of stages of said ring counter including a divider circuit at the input to each stage and connections from each stage of said ring counter to a corresponding one of said divider circuits to thereby provide pulse signals to each stage of said holding register representing one sector along the length of said mechanical support structure;
means connecting said multivibrator means to each of said divider circuits;
divider circuit means connected to said master clock, and means responsive to said divider circuit means output for providing a clearing or reset signal to each of said divider circuits;
a second holding register having a number of stages corresponding to the number of stages of said ring counter and said first named holding register and means interconnecting corresponding stages of said holding registers;
display means connected to said second holding register including timer means,
and second ring counter means responsive to said timer means and connected to said second holding register for causing the accumulated counts in said second holding register to be displayed on said display means.

4,034,332
ULTRASONIC TRANSMITTING AND RECEIVING DEVICES USING DIELECTRIC TRANSDUCERS

Pierre M. Alais, Dampierre, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Courbevoie, France
Continuation of Ser. No. 240,993, April 4, 1972, abandoned. This application Oct. 15, 1974, Ser. No. 514,930
Int. Cl.² H04R *19/04*
U.S. Cl. 340—9 **7 Claims**



1. A device for ultrasonic scanning of transmitted or received ultrasonic wave pulses, comprising: a transducer having a thin sheet of dielectric material tightly packed over its whole active surface in contact with and between the surfaces of an insulating backing plate and a thin insulating protective plate which separates the dielectric sheet from an ultrasonic transmission medium, part at least of the surfaces of both plates in contact with said dielectric material being electrically conductive for constituting separate electrodes, the electrode carried by said backing plate at least being fractioned to constitute at least one array of several conductive areas; and an electric circuit for D.C. electrical biasing of said areas according to a predetermined time sequence, the shape and arrangement of the areas and said time sequence providing a predetermined transmission or reception wave pattern.

4,034,333

METHOD OF REDUCING MONOCHROMATIC INTERFERENCE IN CONTINUOUS WAVE SEISMIC PROSPECTING

Allen B. Cunningham, Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.

Filed Sept. 29, 1975, Ser. No. 617,762

Int. Cl.² G01V *1/02, 1/36*

U.S. Cl. 340—15.5 TA **26 Claims**

1. In a continuous wave method of seismic prospecting wherein a seismic signal is transmitted into the earth from a first location and reflections of the signal from the subsurface are thereafter detected at a second location and cross-correlated with the transmitted signal, the method of reducing the effect of a monochromatic interference signal on the signal resulting from the cross-correlation which comprises:

transmitting a seismic signal having a power spectrum containing a substantially null component therein at a frequency nearer to the interference signal frequency than either of the frequencies of the components in said power spectrum adjacent said substantially null component are to said interference signal frequency.

4,034,334

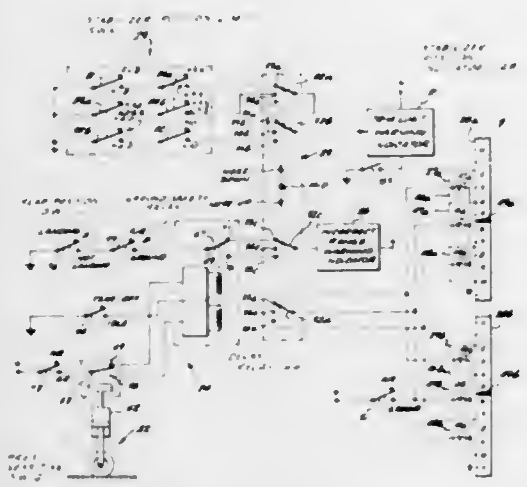
AIRFOIL POSITION RANGE SELECTING, INDICATING AND WARNING SYSTEM FOR AN AIRCRAFT

Donald Cooper Allyn, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed July 14, 1975, Ser. No. 595,505

Int. Cl.² G08G *5/00*

U.S. Cl. 340—27 R **11 Claims**



1. A position range selection and warning apparatus for a positionable airfoil of an aircraft comprising:

airfoil position indicator means for displaying the position of an airfoil;

range indicator means associated with said position indicator means and having first and second indicating states defining different, predetermined ranges of airfoil positions;

selector switch means connected to said range indicator means and having first and second positions, said range indicator means being responsive to said switch means to alternatively assume said first and second indicating states when said switch means is in said first and second positions respectively;

load sensing means associated with a landing gear that is located adjacent one end of the aircraft fuselage for producing a signal indicative of a load supported by such landing gear; and

warning indicator means connected to said load sensing means and to said selector switch means and being responsive to a predetermined relationship between said signal produced by said sensing means and the positions of said switch means to produce a warning indication.

4,034,335

AUTOMATIC SAFETY AND ALARMING APPARATUS FOR CONSTRUCTION EQUIPMENTS

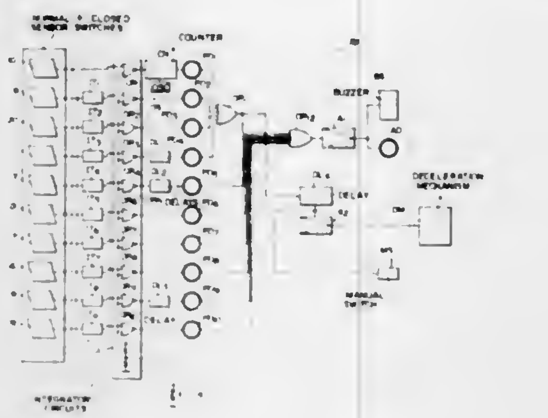
Yoshiaki Harazoe; Shigeru Kurakami, both of Hirakata; Michio Okamoto, Ayase, and Ichiro Hasegawa, Tokyo, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Aug. 27, 1975, Ser. No. 608,261

Claims priority, application Japan, Aug. 30, 1974, 49-98855

Int. Cl.² B60Q *5/00,* **G08B** *19/00*

U.S. Cl. 340—52 F **3 Claims**



1. An automatic safety and alarm apparatus for construction equipment comprising a plurality of sensors provided for an engine and various auxiliary devices which are mounted on said equipment for detecting the abnormal condition of said engine and said auxiliary devices, a plurality of abnormal condition display circuits respectively connected to receive the abnormal signals produced by respective sensors for independently displaying said abnormal conditions, a logical sum circuit connected to receive abnormal signals from the abnormal condition display circuit, an abnormal condition alarming circuit including an audible alarm and a visible alarm and connected to receive the output from said logical sum circuit for alarming and displaying any one of said abnormal conditions, a delay circuit connected to receive the output of a sensor provided for the engine, and a deceleration mechanism operated by the output from said delay circuit for decreasing the speed of the engine or stopping the same when an abnormal condition occurs in the engine, said deceleration mechanism comprising an electromagnetic solenoid energized by the output from said delay circuit, a first cam interlocked with an acceleration pedal, a second cam interlocked with a throttle lever of said engine, and a means responsive to the energization of said electromagnetic solenoid for coupling and decoupling said first and second cams from each other.

4,034,336

ELECTRONIC MONITOR SYSTEM FOR AUTOMOBILES

Hiroshi Arai, Aichi, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha and Nippon Denso Co., Ltd., both of Aichi, Japan

Filed Aug. 4, 1975, Ser. No. 601,801

Claims priority, application Japan, Aug. 13, 1974, 49-92627

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **12 Claims**

1. An electronic monitor system for automobiles, which comprises:

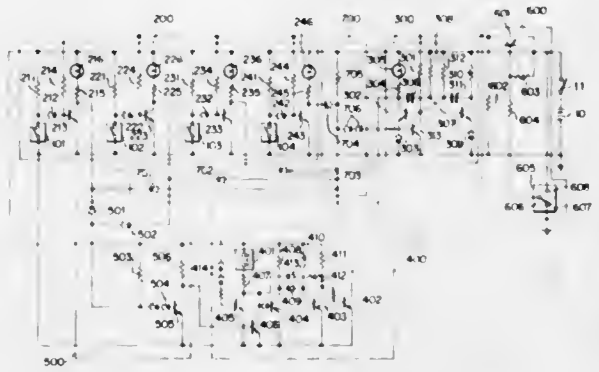
a plurality of defect sensing means located at different locations within said automobile for sensing a defect in various functions throughout the automobile, and for producing a signal whenever there is a defect in a sensed function;

a plurality of indicating circuit means for indicating a defect in one of said sensed functions, each of said indicating circuit means being responsive to one of said signals produced by said plurality of defect sensing means, said indicating circuit means comprising:

a plurality of indicator lights connected to said plurality of defect sensing means; and

transistor circuit means for controlling the supply of electric current to said plurality of indicator lights in response to said signal from said plurality of defect sensing means for turning on one of said plurality of indicator lights which indicates the location of the sensed defect;

a control circuit means including a manually-operated triggerable switch means for generating a control signal when said switch means is manually triggered;



a warning circuit means including a warning element for producing a warning whenever one or more of said defect sensing means senses a defect in a sensed function and for producing a less bothersome warning whenever one or more of said defect sensing means senses a defect in a sensed function and a control signal is generated by said control circuit; and

discriminating circuit means responsive to predetermined ones of said plurality of defect sensing means for preventing said control circuit means from producing a control signal by which said warning element is made to provide a less bothersome warning whenever one of said predetermined defect sensing means senses a defect.

4,034,337

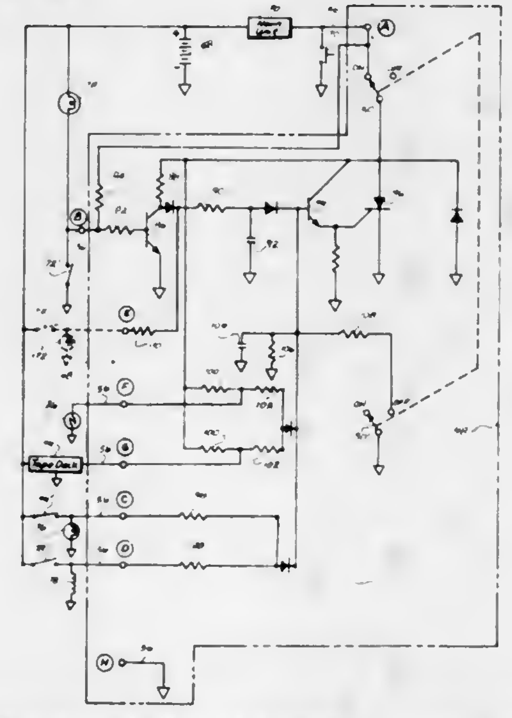
VEHICLE ALARM APPARATUS

Don E. Haddock, deceased, late of North Augusta, S.C. (by Joan L. Haddock, administratrix), assignor to Electronic Devices, Inc., Augusta, Ga.

Filed Sept. 9, 1975, Ser. No. 611,667

Int. Cl.² B60R *25/10;* **H01H** *53/06*

U.S. Cl. 340—63 **3 Claims**



1. For use in a vehicle having a battery connected in circuit with a horn means operated by a normally open horn switch, with a first vehicle accessory component connected by a first existing vehicle circuit directly to ground and having a normally open operating switch connected between said first component and a terminal post of said battery, with a second vehicle accessory component connected by a second existing vehicle circuit directly to said battery terminal and having a normally open operating switch connected between said second component and ground, and with a third vehicle accessory component having a casing thereof connected by a third existing vehicle circuit to ground; the improvement comprising an alarm device having a plurality of connecting points, and a plurality of lead lines formed with selectively attachable means connected, respectively, to said horn means circuit, to said first existing vehicle circuit at a point between said first accessory component and said operating switch therefor, to said second existing vehicle circuit at a point between said second accessory component and said operating switch therefor, and to said third existing vehicle circuit at a point between said third electrical component and grounds, said alarm device including control circuit means operable to close an operating circuit between said battery and said horn in response to a first full voltage circuit condition when said operating switch for said first component is closed, in response to a grounded circuit condition when said operating switch for said second component is closed, or in response to an open circuit condition when said circuit between said third electrical component and ground is broken.

4,034,338

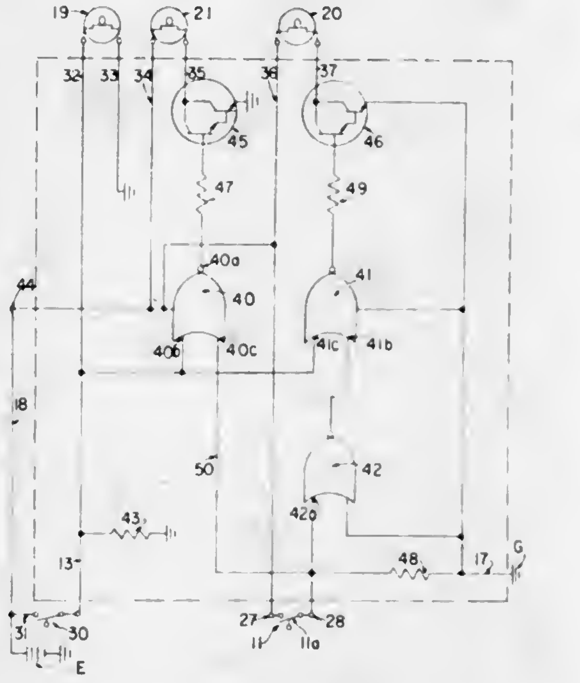
OPERATING CONDITION SIGNAL LIGHT FOR AN AUTOMOTIVE VEHICLE

Leno L. Bevilacqua, 1132 Upland Drive, Columbus, Ohio 43220

Filed Nov. 4, 1975, Ser. No. 628,756

Int. Cl.² B60Q *1/26*

U.S. Cl. 340—66 **5 Claims**



1. An automotive vehicle signal light system comprising:

A. a plurality of visually distinguishable electric lamps positionable on a vehicle for observation from a position relatively rearward of the vehicle, and

B. a control circuit having an output connected with said electric lamps and operable for energization of a selected one of said electric lamps in accordance with predetermined vehicle operating conditions, said control circuit including;

  1. a first input connectable with an electrical power source suitable for energization of said lamps,
  2. a second input connectable with the vehicle's brake system and responding to actuation thereof in provid-

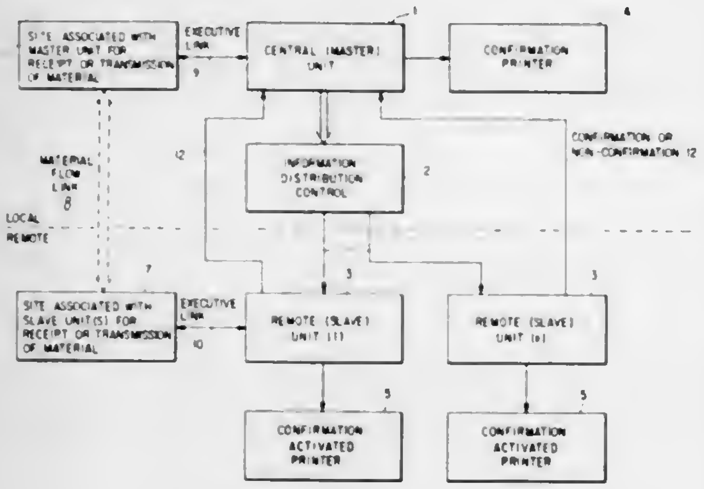
ing a signal to the control circuit resulting in energization of a first one of said lamps,

3. a pressure responsive electrical switch connected in the control circuit for effecting energization of a second one of said lamps in response to application of a pre-determined compressive force to said switch and effecting energization of a third one of said lamps when said pre-determined compressive force is not applied to said switch, said switch adapted for mounting on a surface of the vehicle's accelerator pedal in fixed relationship thereto and responding to application of a pre-determined compressive force by the vehicle operator in actuating the accelerator, and
4. interlock circuit means preventing energization of either said second or third lamps when actuation of the brake system has energized said first lamp and preventing energization of said third lamp when said second lamp is energized.

4,034,339
SYSTEM FOR COORDINATION AND DOCUMENTATION OF MATERIAL HANDLING

John Marshall Free, Montclair, and Charles William Jeunelot, Wayne, both of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Apr. 28, 1976, Ser. No. 681,109
Int. Cl.² G06F *3/02*
U.S. Cl. 340—146.1 C **11 Claims**


SITE ASSOCIATED WITH MASTER UNIT FOR RECEIPT OR TRANSMISSION OF MATERIAL
EXECUTIVE LINK
CENTRAL (MASTER) UNIT
CONFIRMATION PRINTER
MATERIAL FLOW LINK
8
INFORMATION DISTRIBUTION CONTROL
CONFIRMATION OR NON-CONFIRMATION 12
LOCAL
REMOTE
SITE ASSOCIATED WITH SLAVE UNIT(S) FOR RECEIPT OR TRANSMISSION OF MATERIAL
REMOTE (SLAVE) UNIT (1)
REMOTE (SLAVE) UNIT (n)
CONFIRMATION ACTIVATED PRINTER
CONFIRMATION ACTIVATED PRINTER
1
2
3
4
5
6
7
9
10
12

1. System for coordinating and documenting the handling of material between a first site and at least a second site remote therefrom, comprising:

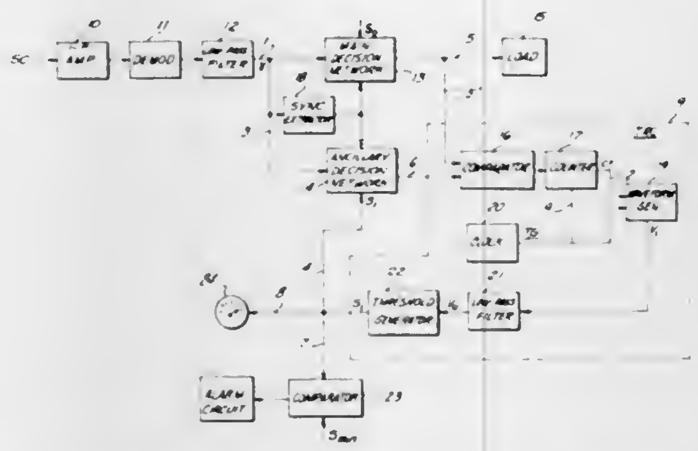
a. a master data communicating unit associated with the first site, said master unit including data entry means, memory means for storing entered data and display means for indicating system status and displaying the data entered in said memory means; and
b. a slave unit associated with the second site, said slave unit being operatively connected to said master unit and including means for displaying data entered into said master unit, means for indicating confirmation/non-confirmation of the data displayed by said slave unit display means and means for effecting a permanent record of the data displayed by said slave unit display means and also the output of said confirmation/non-confirmation indicating means,

whereby data entered in the master unit is simultaneously displayed by the respective display means of said master and slave units and confirmation/non-confirmation of said entered data is displayed by both units.

4,034,340
SYSTEM FOR DETERMINING THE QUALITY OF TRANSMISSION OF INCOMING DIGITAL MESSAGE SIGNALS

Marcello Sant'Agostino, Gattinara (VC), Italy, assignor to CSELT - Centro Studi e Laboratori Telecomunicazioni SpA, Turin, Italy

Filed June 8, 1976, Ser. No. 693,869
Claims priority, application Italy, June 10, 1975, 68487/75
Int. Cl.² H03K *13/32*
U.S. Cl. 340—146.1 R **8 Claims**



1. A system for determining, at a receiver for digital message signals, the quality of transmission of said signals, comprising:

input means for obtaining incoming message signals from a transmission channel;
a first and a second decision network connected in parallel to said input means, said first network having a fixed threshold of relatively low absolute value for discriminating between different signal levels in a predetermined range, said second network having a variable threshold of relatively high absolute value for discriminating between signal levels in the same range;
a utilization circuit connected to the output of said first network;
comparison means connected to the outputs of said first and second networks for emitting a pseudo-error pulse in response to any discrepancy between said outputs;
evaluation means connected to said comparison means for producing a control voltage representative of the average rate of pseudo-error pulses emanating therefrom, said second network being connected to said evaluation means for adjusting said variable threshold thereof in response to said control voltage and in inverse relationship with said average rate to maintain the latter substantially constant; and
monitoring means connected to said evaluation means for ascertaining significant changes in said control voltage.

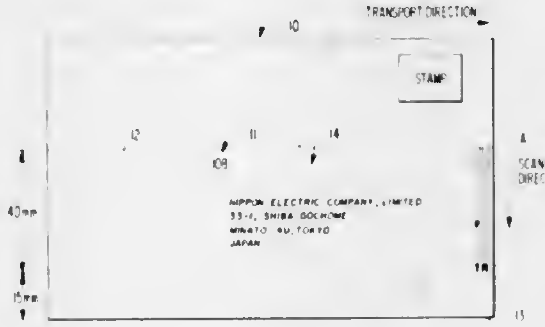
4,034,341
AUTOMATIC POSTAL-CODE-NUMBER READING SYSTEM

Tomoyuki Isono, and Toshio Nakada, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan
Continuation-in-part of Ser. No. 533,559, Dec. 17, 1974, abandoned. This application Apr. 22, 1976, Ser. No. 679,405
Claims priority, application Japan, Dec. 17, 1973, 48-142240

Int. Cl.² G06K *9/04*
U.S. Cl. 340—146.3 H **7 Claims**

1. In a mail sorting system of the type which automatically sorts mail based upon a machine recognizable postal code positioned on mail items within a specified field of characters grouped in words, the improvement comprising a pre-scanning means for detecting the word end positions of words in said field and distinguishing which of said word end positions constitute the positions of said postal code, said pre-scanning means comprising

a. optical scanner means for scanning said field and developing video bits corresponding to presence of characters instantaneously scanned,
b. shift register means, receiving said video bits, for storing said video bits temporarily in the order received,
c. word end masking means, responsive to the condition of video bits in selected stages of said shift register means, for generating a word end signal when the said condition of video bits satisfies preset criteria indicative of a word end being scanned,
d. height masking means, responsive to the condition of video bits in several selected combinations of stages of said shift register means, for generating height detection signals indicative of the height of a character scanned and stored in said shift register means,



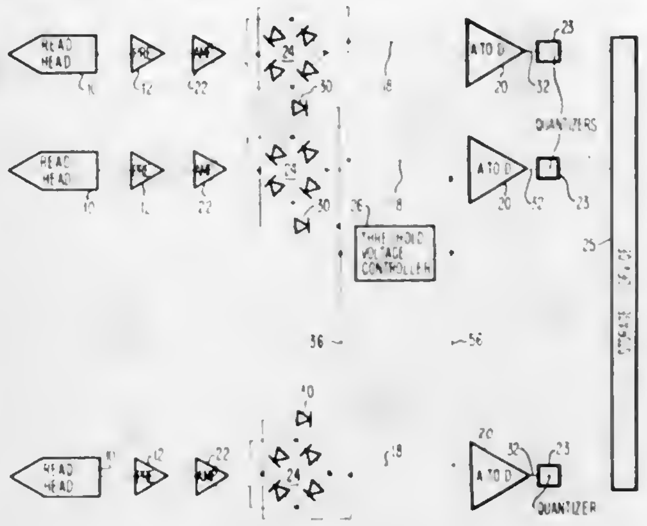
e. mask signal generating means responsive to said word end signal and said height detection signals for providing a mask signal indicative of the detection of the front or rear end of a word and the height of the character at the detected end of said word,
f. scan position determining means for continuously developing signals representing the coordinate position of said scan within said field, said scan position determining means being responsive to said mask signal for outputting the coordinate position signals of said detected word end, and
g. position determining means, connected to receive all mask signals and coordinate position signals developed during the scan of a field, for selecting the coordinate position signals satisfying a set of predetermined conditions as the coordinate position signals of said postal code.

4,034,342
MAGNETIC CHARACTER RECOGNITION SYSTEM EMPLOYING A DYNAMIC THRESHOLD VOLTAGE DETERMINATION SYSTEM

Karlis Kruklitis, Plymouth, Mich., assignor to Burroughs Corporation, Detroit, Mich.
Continuation of Ser. No. 535,361, Dec. 23, 1974, abandoned, which is a continuation-in-part of Ser. No. 394,293, Sept. 4, 1973, abandoned. This application Oct. 7, 1976, Ser. No. 730,431
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 AG **3 Claims**

1. A dynamic threshold voltage determination system of a character recognition system comprising:

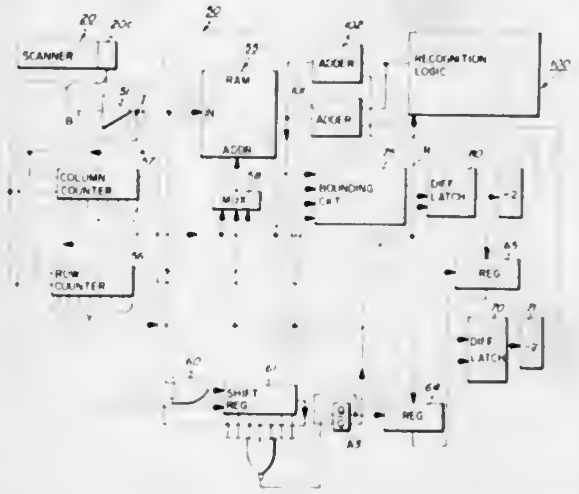
amplifying means for amplifying a dynamic information signal, the signal having an information signal range from greater than 150% to less than 25% of a nominal information signal;
a threshold voltage controller responsive to the amplified dynamic information signal for dynamically establishing a threshold voltage signal proportionate to the amplified dynamic information signal, the threshold voltage signal being established for a substantially uniform duration within the information signal range;
said voltage controller including:
a current control device responsive to a predetermined amount of the amplified dynamic information signal; and
linear operating means for allowing the linear operation of said current control device within the information signal range; and



first comparator means for comparing the voltage level of the amplified dynamic information signal with the voltage level of the threshold voltage signal, said first comparator means producing output pulses of substantially uniform width throughout said information signal range in response to the threshold voltage signal of substantially uniform duration.

4,034,343
OPTICAL CHARACTER RECOGNITION SYSTEM

Michael E. Wilmer, Portola Valley, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 1, 1976, Ser. No. 728,666
Int. Cl.² G06K *9/12*
U.S. Cl. 340—146.3 MA **12 Claims**



1. A character recognition system adapted for use with a facsimile scanner for sampling the reflectivity of a document medium comprising:

memory means connected to said scanner for storing at corresponding address locations thereof the corresponding sampled reflectivity signals of said document medium;
isolation means operatively connected to said scanner for isolating in the output thereof the coordinates of a character on said document medium; and
pattern generating means connected to compare selected ones of said reflectivity signals in said memory means

against a predetermined set of character patterns transposed by said character coordinates of said isolating means, said generating means including selected test points in said set of patterns combined in a logical OR to accommodate statistical variations in said isolated character.

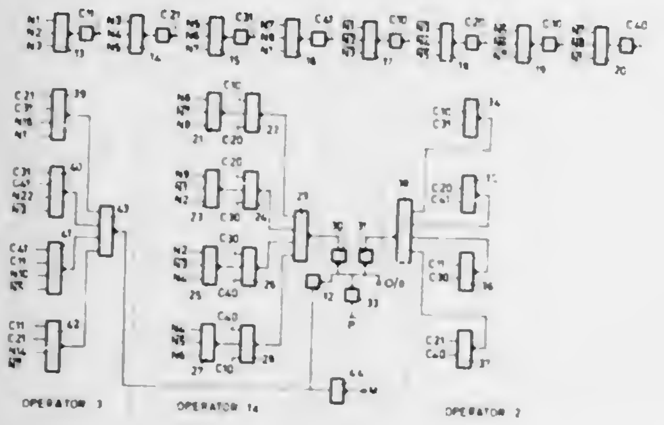
4,034,344
CHARACTER THINNING APPARATUS

Peter Saraga, Salfords, England, and Pieter Reijnierse, Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,089

Int. Cl.² G06K *9/12*

U.S. Cl. 340—146.3 H **4 Claims**



1. Character rewriting apparatus for use in recognizing binarized characters made up of points on a matrix of regular rows and columns, comprising:

machine means for applying a compound operator in predetermined cycles to each point of the binarized character on a first matrix, said compound operator having an operative center surrounded by a sub-matrix of points defining an operative area fitting said first matrix; and

machine means for rewriting, in each one of said predetermined cycles to each of said character points to which said compound operator is applied into corresponding positions on a second matrix in accordance with a predetermined compound test criterion applied by said compound operator, said compound operator comprising a set of operators, each operator of said set being applied to all of the four orientations in which said operator fits said first matrix, each operator being adapted to apply, in each of said four orientations, a predetermined binary logic function, for each one of said operators, to the binary values of the character points found in coincidence with the sub-matrix points,

said compound test criterion being defined so that a character point at the operative center is omitted by said machine means on second matrix if any one of the binary logic functions so applied is satisfied, wherein a binary logic function being satisfied is defined as when those points in the operator defined herein as black or as white are all in coincidence with character points or background points respectively;

each operator of said set of operators having sides of three operator points parallel to said rows and columns, said compound operator comprising:

a. all operators of a first kind having at least two but not more than five black points forming a chain of adjacent black points occupying not more than two adjacent sides of the operator, and

b. all operators of a second kind having at least five but not more than seven black points forming a chain of adjacent black points occupying three sides of the operator, all remaining points in the operators of both kinds being white, and the operators of the second kind having an additional external adjacent black point when applied in at least two of the adjacent orientations in which said operator sub-matrix fits said matrix points, said additional black point being located on the center of the side remote from the side having a central white point.

4,034,345
MICROPROGRAMMABLE COMPUTER DATA TRANSFER ARCHITECTURE

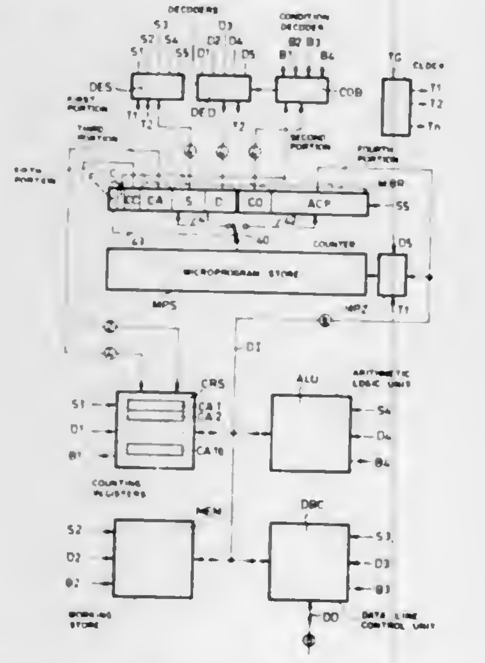
August Deis, Eiserfeld, Sieg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Aug. 20, 1975, Ser. No. 606,162

Claims priority, application Germany, Aug. 23, 1974, 2440390

Int. Cl.² G06F *9/00*

U.S. Cl. 364—200 **9 Claims**



1. A microprogrammable computer comprising

a microprogram store for storing micro-instructions;

a micro-instruction register connected to said microprogram store, having first, second, third, fourth, and fifth portions;

means for serially transferring information from said microprogram store to said micro-instruction register;

a microprogram counter connected to said microprogram store;

a clock pulse generator having an output connected to said microprogram counter;

an internal data line connected to said fourth portion of said micro-instruction register;

a working store for storing data comprising a data source and a data sink connected to said internal data line;

an arithmetic/logic unit connected to said internal data line for performing arithmetic/logic operations on data supplied by said data source;

a counting register group comprising a plurality of addressable registers connected to said internal data line, having an input connected to said third portion of said micro-instruction register for addressing one of said plurality of registers;

a first decoder having a first input connected to said first portion of said micro-instruction register for controlling said data source, a second input connected to said clock pulse generator, and an inhibit input;

a second decoder having a first input connected to said first portion of said micro-instruction register for controlling said data sink, and a second input connected to said clock pulse generator; and

a third decoder having a first input connected to said third portion of said micro-instruction register, a second input connected to a single bit location of said micro-instruction register, condition inputs, and an output connected to said inhibit input of said first decoder for generating an inhibit signal for inhibiting data transfer from said data source to said data sink.

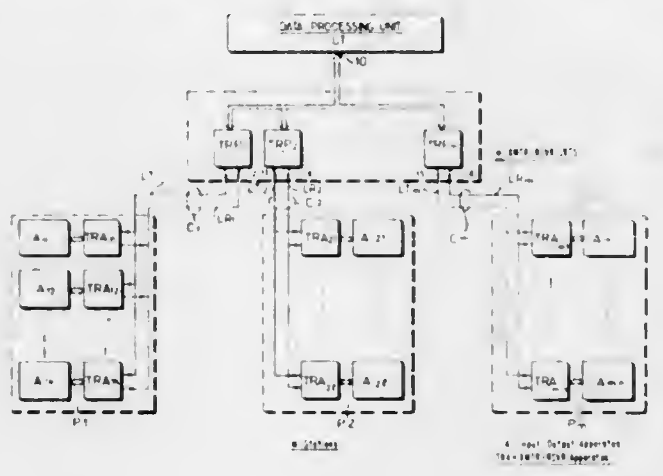
4,034,346
INTERFACE FOR ESTABLISHING COMMUNICATIONS BETWEEN A DATA-PROCESSING UNIT AND A PLURALITY OF STATIONS

Claude Hostein, Avrille, France, assignor to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Oct. 15, 1975, Ser. No. 622,466

Int. Cl.² G06F *3/00*

U.S. Cl. 364—900 **19 Claims**



1. An interface for connecting a data-processing unit to a group of *m* working stations formed by items of data emitting and receiving apparatus, the unit and each of the items of apparatus transmitting and receiving binary data in parallel characters in response to control signals which are generated in the unit, said characters being transmitted and received in series, comprising *m* transmitter/receiver circuits associated with the *m* stations and a transmitter/receiver circuit associated with each item of apparatus, each transmitter/receiver circuit including means for:

a. converting a parallel, input character supplied to it into a sequence of bits forming a series output character, and

b. converting sequential input bits forming a series-character into a parallel output character, means for selectively supplying a parallel output character from the unit as a parallel input character to each of the station transmitter/receiver circuits, means for selectively supplying a parallel output character at each station transmitter/-receiver circuit associated with a particular station as a parallel input character to the unit, each transmitter/-receiver circuit including two terminals adapted to be connected to first and second transmission lines forming a channel associated with each station, one of said terminals coupling a series output character from the transmitter/receiver circuit to the first transmission line, the other terminal coupling a series input character from the second transmission line to the transmitter/receiver circuit, means for supplying a parallel output character of each apparatus transmitter/receiver circuit associated with a particular item of apparatus as a parallel input character to the item of apparatus associated with the apparatus transmitter/receiver circuit, means for supplying a parallel output character of the particular item of apparatus associated with each apparatus transmitter/receiver circuit as a parallel input character to the apparatus transmitter/receiver circuit associated with the particular item of apparatus, said first and second transmission lines respectively coupling a series output character terminal from the circuit associated with a particular station to a series input character terminal of each apparatus transmitter/receiver circuit at that station and a series output character terminal of each apparatus transmitter/receiver circuit at a station to a series input character terminal of the circuit associated with that staton.

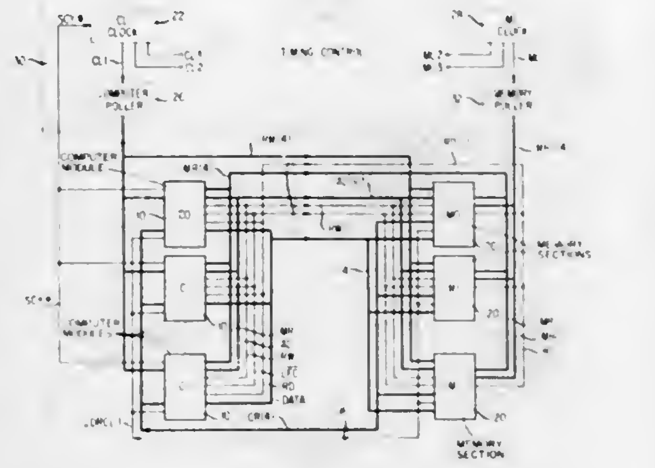
4,034,347
METHOD AND APPARATUS FOR CONTROLLING A MULTIPROCESSOR SYSTEM

Geoffrey Probert, Jr., Broomfield, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 8, 1975, Ser. No. 603,178

Int. Cl.² G06F *13/00, 15/16*

U.S. Cl. 364—200 **27 Claims**



1. A multiprocessing system comprising:

a plurality of computers,

a plurality of memory sections,

a time multiplexed bus system interconnecting said computers with said memory sections,

computer polling means for repetitively and sequentially polling said computers to determine whether any one of said polled computers currently, requires access to any one of said memory sections,

computer gating means responsive to a determination that a polled computer currently requires said access for connecting said polled computer over said bus system to said one memory section for a time interval controlled by said computer polling means,

means in said polled computer for transmitting service request information to said one memory section over said bus system during said time interval,

memory polling means for repetitively and sequentially polling said memory sections to determine whether any one of said polled memory sections currently requires access to any one of said computers, said memory polling means being asynchronously operated with respect to said computer polling means,

memory gating means responsive to a determination that a polled memory section currently requires access to one of said computers for connecting said polled memory section over said bus system to said one computer for a time interval controlled by said memory polling means, and

means for transmitting information over said bus system between said polled memory section and said one computer during said last named time interval.

4,034,348
APPARATUS, INCLUDING DELAY MEANS, FOR SAMPLING AND RECOVERING DATA RECORDED BY THE DOUBLE TRANSITION RECORDING TECHNIQUE

Donald J. Rathbun, Andover, Mass., assignor to Honeywell Information Systems, Inc., Waltham, Mass.

Filed June 28, 1976, Ser. No. 700,276

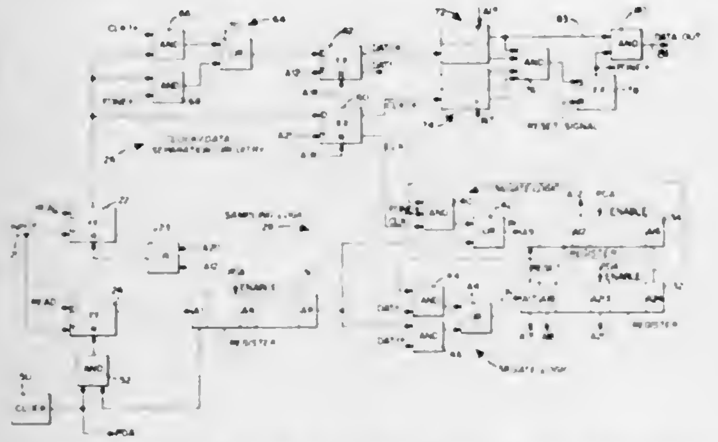
Int. Cl.² G06F *7/28;* **H03K** *5/00*

U.S. Cl. 364—200 **19 Claims**

1. Apparatus for sampling data from an information stream

of clock and data bits, said information stream having a first frequency, said apparatus comprising:

- A. a first delay element;
- B. a second delay element;
- C. wherein both said first and second delay elements have an input and an output;
- D. means for coupling the output of said first element to the input of said second element;
- E. means for receiving said stream of bits at the input of said first element;
- F. means for generating a stream of system clock signals having a frequency which is greater than said first frequency;



- G. means, included in said first and second delay elements and responsive to said clock signals, for enabling said clock and data bits of said information stream to be passed through said first and second elements;
- H. wherein said frequency of said clock signals is set so that no more than one bit, regardless of kind, is passing through either of said first or second elements at any given time;
- I. means, included in said second element, for indicating that one of said bits is substantially midway in its passing through said second element; and
- J. means, responsive to said means for indicating, for sampling whether another one of said bits has been received by said first element.

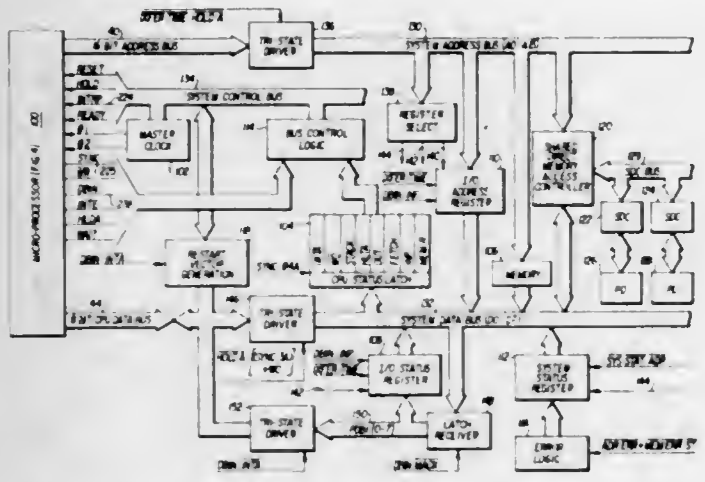
4,034,349
APPARATUS FOR PROCESSING INTERRUPTS IN MICROPROCESSING SYSTEMS

Robert F. Monaco, Jeffersonville, and Nicholas Derchak, Hatfield, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,409

Int. Cl.² G06F *3/04, 9/18*

U.S. Cl. 364—200 **11 Claims**



1. A data processor system comprising:
a central processor including means for executing a sequence of instructions;
memory means for storing instructions and data;
a peripheral device including means for generating a peripheral device interrupt signal when communication between said central processor and said peripheral device is desired;
a common system bus connected to said central processor and said memory means;
control means connected to said common system bus for controlling said peripheral device;
said control means including means responsive to a peripheral device interrupt signal for placing an interrupt request signal on said common system bus, and means responsive to a bus grant signal on said common system bus for simultaneously placing the status and address of the peripheral device requesting an interrupt on said common system bus;
first means connected to said common system bus for generating a bus grant signal on said common system bus in response to an interrupt request signal thereon;
second means responsive to an interrupt request signal on said common system bus for generating a central processor interrupt signal;
an address register and a status register connected to said common system bus; and,
means responsive to said central processor interrupt signal for enabling said address and status registers to thereby load said address and status registers with the address and status of the peripheral device requesting the interrupt.

4,034,350
INFORMATION-TRANSMITTING APPARATUS

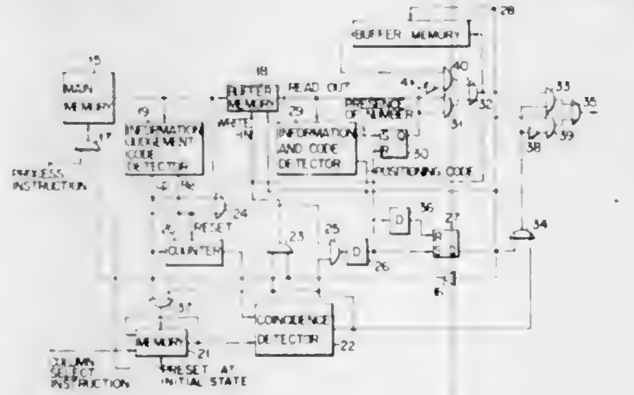
Toshio Kashio, Tokyo, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Nov. 14, 1975, Ser. No. 631,915

Claims priority, application Japan, Nov. 15, 1974, 49-131643

Int. Cl.² G06F *7/34*

U.S. Cl. 364—900 **5 Claims**



1. An information-transmitting apparatus comprising:
a source of a series of data records separated from each other by record positioning codes, each record including a plurality of data words separated from each other by word positioning codes, each word including a plurality of digits;
first memory means coupled to said source for successively storing the words of a series of records one after another;
coincidence detection means coupled to said first memory means for comparing respective digits of a given word included in a given record stored in said first memory means with the respective digits occupying corresponding data positions of a word arranged in the same sequential position in another succeeding record; and
control means coupled to said coincidence detection means for controlling the data transmission, said control means having an output and including means for stopping the delivery to said output of those of said digits of said succeeding record occupying the respective compared positions in words of said succeeding record having the same sequential position in the given record which indicate coincidence as the result of the comparison carried out by said coincidence detection means, and for delivering to said output only:

- i. those of the digits of said succeeding record which do not coincide with corresponding digits of said given record;
- ii. any other digits of said word of said succeeding record following said noncoincidence digits regardless of whether or not coincidence is detected as the result of comparison; and
- iii. all of said record positioning and word positioning codes.

4,034,351
METHOD AND APPARATUS FOR TRANSMITTING COMMON INFORMATION IN THE INFORMATION PROCESSING SYSTEM

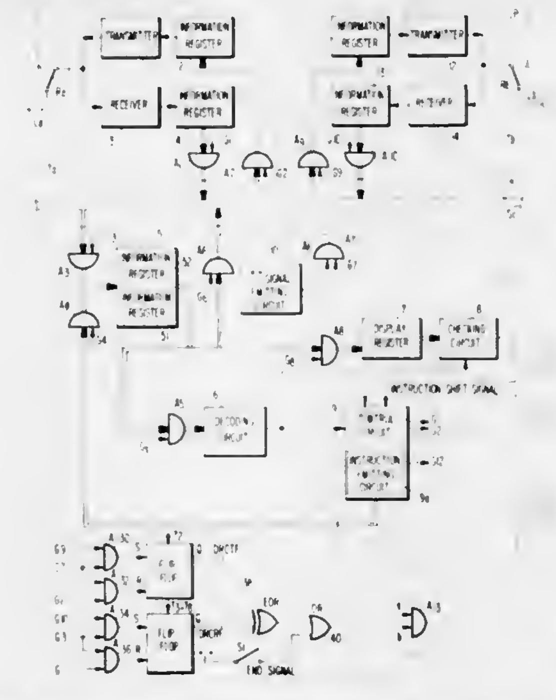
Fumihiko Takezoe, Kawasaki, Japan, assignor to Fuji Electric Company Ltd., Kawasaki, Japan

Filed Feb. 12, 1976, Ser. No. 657,662

Claims priority, application Japan, Feb. 12, 1975, 50-17628

Int. Cl.² G06F *3/04, 7/10, 9/19;* **G08B** *11/00*

U.S. Cl. 364—200 **8 Claims**



1. In an information processing system of the type having a plurality of widely dispersed stations connected in cascade via a communications link, a method of collecting and disseminating common data, said method comprising,

- a. dispatching from an optional one of said stations an information word containing at least an instruction part and a data part, said instruction part containing a search instruction, said information word being dispatched in a manner to travel to said stations consecutively via said communications link and return to said dispatching station,
- b. receiving said information word with said search instruction at each said station in operating condition, and inserting common data existing at said station into the data part of said information whereby the data part becomes loaded with common data from said operating stations including said dispatching station, and
- c. altering the instruction portion of said information word after it has its data part loaded with common data from all said operating stations including said dispatching station and sending said altered information word to said stations via said link for registration of said common data, and
- d. at each said station, receiving said information word with said altered instruction portion, detecting said altered instruction portion and registering the common data contained in said information word.

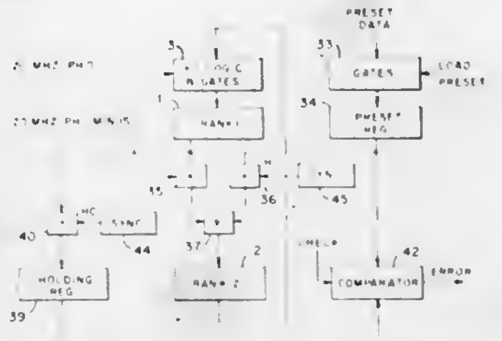
4,034,352
PHASE CONTROL OF CLOCK AND SYNC PULSER

LaVerne C. Hotchkiss, Greensboro, N.C., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 20, 1976, Ser. No. 659,885

Int. Cl.² G06F *1/00*

U.S. Cl. 364—200 **3 Claims**



1. In a system having gating circuitry which is to feed information from two different sources each having its own independent timing clocks into a processing device; the improvement comprising sync means connected to the gating circuitry so as to cause both sources to enter processing means at the same time; an additional gate device having an input connected to one of said sources and an output; comparator means having two inputs and an output; one input of said comparator being connected to the output of said additional gate device and the other input being connected to the other one of said sources; said sync means being fed to said additional gate device so as to time the receipt of the information to said comparator in accordance with the sync timing; said comparator producing an error output when its two inputs are not synchronized; and sync correcting means having a control input connected to the output of said comparator.

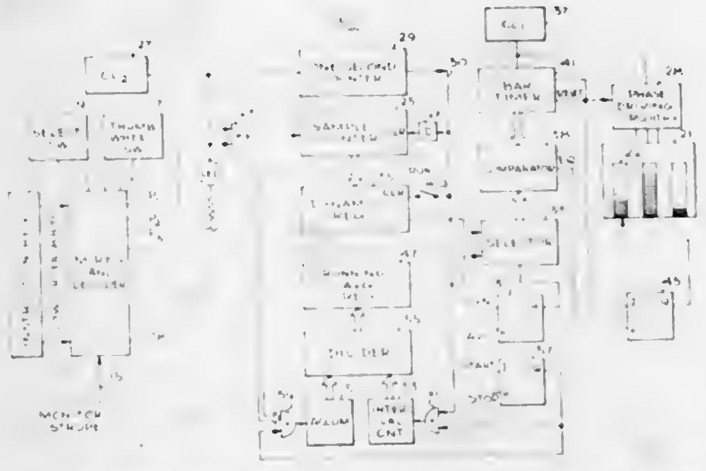
4,034,353
COMPUTER SYSTEM PERFORMANCE INDICATOR

William Michael Denny, Santa Barbara; Russell Louis Hagen, Goleta, and Steve Ka-Lai Leung, Santa Barbara, all of Calif., assignors to Burroughs Corporation, Detroit, Mich.

Continuation-in-part of Ser. No. 613,326, Sept. 15, 1975, Pat. No. 4,001,699. This application Oct. 29, 1975, Ser. No. 626,963

Int. Cl.² G06F *11/00*

U.S. Cl. 364—200 **15 Claims**



12. A computer performance indicator for use in conjunction with a computer having a monitor instruction capability comprising:

detecting means for detecting occurrence of an initial monitor instruction and a terminal monitor instruction in the computer program and for providng a representation of at least a predetermined portion of each such detected instruction at the output thereof;

decoding means coupled to the output of said detecting means for decoding said initial monitor instruction to produce a display activation signal, and for decoding said terminal monitor instruction to remove said display activation signal, said display activation signal representing a time-related parameter indicative of the performance of a predetermined operation of said computer occurring between said initial and terminal monitor instructions;

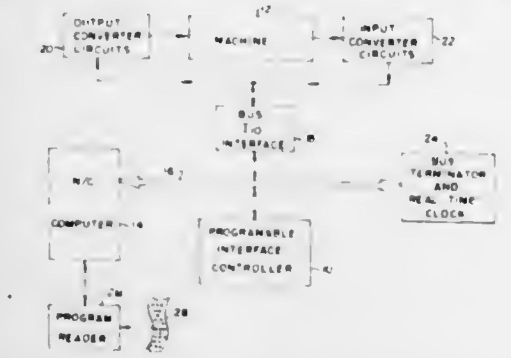
means coupled to the output of said decoding means for developing an electrical indication representing the state of said activation signal over a selected time interval occurring between said initial and terminal monitor; and

means responsive to said electrical indication for providing a humanly readable display representative of said indication.

4,034,354
PROGRAMMABLE INTERFACE CONTROLLER FOR NUMERICAL MACHINE SYSTEMS

Richard W. Simmons, Ann Arbor, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed Nov. 21, 1975, Ser. No. 634,299
Int. Cl.² G05F *19/18, 11/18;* G06F *3/04*
U.S. Cl. 364—900 18 Claims


OUTPUT CONVERTER CIRCUITS
20
12
MACHINE
INPUT CONVERTER CIRCUITS
22
BUS I/O INTERFACE
24
BUS TERMINATOR AND REAL TIME CLOCK
N/C COMPUTER
PROGRAMMABLE INTERFACE CONTROLLER
PROGRAM READER
28

1. In combination with a numerical control machine system operative to perform a series of instructions in accordance with a prepared program, said numerical control machine system comprising, a machine for performing the program instructions in response to control signals, sensors detecting the status of selected operational parameters of the machine for generating status data indicative of the present state of the selected operational parameters, a program reader for converting the prepared program into instruction data, a numerical control computer having storage means storing data including said instruction data and said status data and computation means for generating control signals controlling the operation of the machine and the data flow in said numerical control machine system in response to said stored data, and a bi-directional bus transmitting said control signals and status data back and forth between said numerical control computer, said sensors and said machine, an improved programmable interface controller interfacing the numerical control computer through the bi-directional bus to perform many of the routine arithmetic computation and logic functions normally performed by the numerical control computer and other auxiliary processors comprising:

data memory means having a plurality of discrete storage locations for temporarily storing data in said storage locations, each of said storage locations having an identifying multi-bit address field;

instruction generator means for generating series of instruction words in a predetermined sequence in response to a start signal, each of said instruction words comprising an operation code specifying one of a plurality of data manipulation operations to be performed and a address field specifying a specific storage location in said memory means;

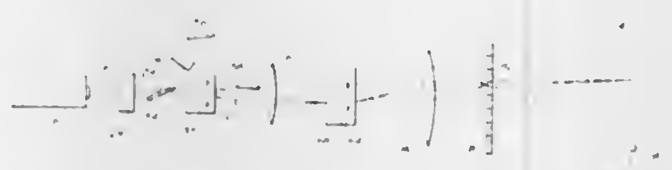
instruction processor means for performing said plurality of data manipulation operations in response to said series of instruction words, said instruction processor means sequentially performing arithmetic logic in response to said operational code with the data received from the storage location specified by said companion address field to generate processed data and transferring said processed data back to said data memory means where it is stored in the storage location specified by said companion address field; and

master control means interfacing said bi-directional bus for controlling the transfer of data from storage locations in the numerical computer's storage means to storage locations in said data memory means in response to a first control signal generated by the numerical computer, and generating said start signal each time new data transfer has been completed, and for transferring said processor data from said data memory means to said computers storage means in response to a second control signal after all the instructed operations to be performed by the instruction processor have been completed.

4,034,355
HOLOGRAPHIC DIGITAL DATA PROCESSING SYSTEM WITH SEQUENTIAL DATA STORAGE AND RETRIEVAL

W. John Carlsen, Natick, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation-in-part of Ser. No. 432,912, Jan. 14, 1974, Pat. No. 3,891,976. This application May 5, 1975, Ser. No. 574,479
Int. Cl.² G11C *13/04;* G02B *27/38*
U.S. Cl. 340—173 LM 15 Claims



1. A holographic digital data processing system in which data may be stored and retrieved in a sequential manner comprising

a source of a beam of coherent energy,

a beam divider for dividing the beam of coherent energy into a reference beam and a data beam,

a modulator for impressing a bit of digital data on at least one of the beams of coherent energy,

a first beam deflector which deflects the data beam by a first preselected angle selected from a first matrix array of angles,

means for by-passing the first beam deflector with the reference beam to establish a unique spatial relationship between the data beam and the reference beam,

a second beam deflector which deflects both the data beam and the reference beam by a second preselected angle selected from a second matrix array of angles,

a recording medium in which a hologram may be formed,

means for focussing the data beam and the reference beam into the recording medium so that the data beam and the reference beam interfere and form a hologram of the bit of digital data in the recording medium, the second preselected angle determining the position of the hologram in the recording medium and the first preselected angle determining the angle of intersection of the data beam and the reference beam at the recording medium whereby the hologram of the bit of digital data has a unique address within the recording medium and may be stored in the recording medium in a sequential manner,

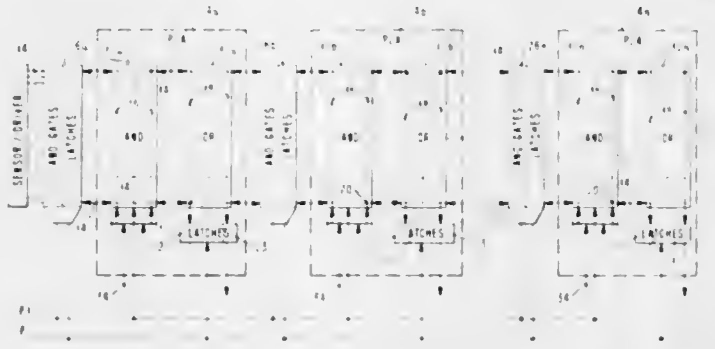
means for selectively occluding the reference beam before reaching the recording medium so that only the data beam is directed onto the recording medium at the hologram of the bit of digital data thereby forming an image of the single bit of digital data beyond the recording medium at a fixed location defined by the reference beam when the hologram is recorded, and

a photodetector located at the image of the bit of digital data so that the image bit of digital data located at a particular address in the recording medium may be retrieved individually in a sequential manner.

4,034,356
RECONFIGURABLE LOGIC ARRAY

Frank E. Howley, Poughkeepsie, N.Y.; John W. Jones, Winchester, England, and Joseph C. Logue, Poughkeepsie, N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Dec. 3, 1975, Ser. No. 637,261
Int. Cl.² G11C *11/36*
U.S. Cl. 340—173 R 2 Claims



1. A reconfigurable logic array comprising:

a plurality of programmable logic arrays made up of latches and sets of AND and OR arrays having common addressing lines that extend through all sets of arrays with inputs supplied to the AND arrays on lines transverse to said common addressing lines and the latches coupled to the outputs of the OR arrays on lines transverse to said common addressing lines;

gating means along the common address lines between the sets for controlling the passage of signals between sets;

latching means on said addressing lines between the sets for storing bits of data transmitted along said addressing line; and

clocking means for opening and closing said gating means at different time periods whereby the sets of AND and OR arrays can be connected and disconnected as necessary to perform logic functions.

4,034,357
PATTERNS FOR USE IN THE FIELD ACCESS PROPAGATION OF A BUBBLE LATTICE

Kay Beharat Mehta, and Otto Voegeli, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Aug. 15, 1975, Ser. No. 604,978
Int. Cl.² G11C *11/02*
U.S. Cl. 340—174 TF 11 Claims

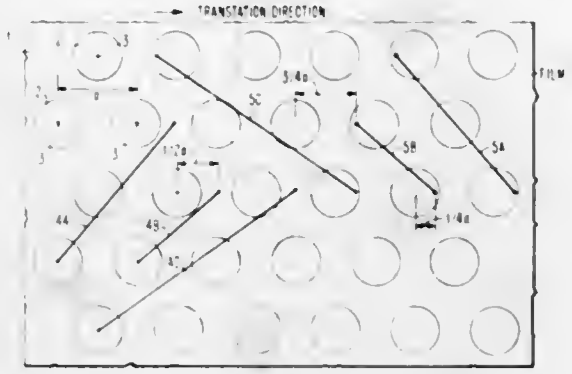
1. The combination of a bubble lattice and a rotating field access pattern suitable for the translation of bubbles, said pattern comprising:

a. a first set of substantially parallel oblong magnetizable elements having a first end positioned on a lattice point and a second end positioned a distance of about 0.5 lattice constant in the direction of translation from a different lattice point, and

b. a second set of substantially parallel oblong magnetizable elements being oriented substantially perpendicular to said elements of said first set,

said elements of said second set having a first end positioned a distance of about 0.25 lattice constant in the direction of translation from a lattice point and a second end positioned a distance of about 0.75 lattice constant in the direction of translation from a different lattice point,

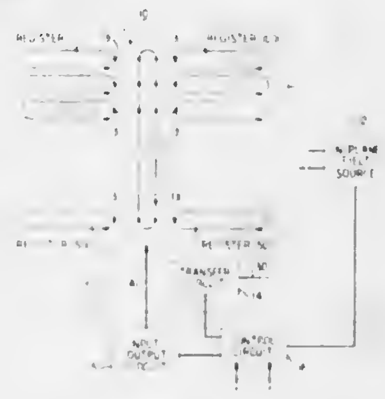
said elements of said first and second sets being distributed over the translation area of said bubble lattice wherein the forces from said elements generated by the application of a rotating in-plane magnetic field will combine with the magnetostatic bubble-bubble interaction forces in the lattice to move the bubble lattice system.



4,034,358
MAGNETIC BUBBLE DEVICES WITH CONTROLLED TEMPERATURE CHARACTERISTICS

Stuart Lawrence Blank, Madison, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Aug. 25, 1975, Ser. No. 607,378
Int. Cl.² G11C *11/02*
U.S. Cl. 340—174 TF 2 Claims



1. A magnetic bubble device comprising (a) a substrate supporting at least a first layer of an iron containing garnet possessing a uniaxial magnetic anisotropy perpendicular to the layer, which layer is capable of supporting magnetic bubbles which are stable and of a characteristic diameter in a temperature varying bias field over a temperature range, which anisotropy is predominantly a growth induced anisotropy produced by dodecahedral site substitution, which bias field is produced by a magnet adapted for maintaining the layer in the bias field throughout the temperature range, which bias field is less than a bubble collapse field at each temperature within the temperature range, and which bias field varies throughout the temperature range at an average variation rate (b) generating means for generating the bubbles; and (c) propagating means for moving the bubbles in order to produce information processing characterized in that the iron garnet is of a composition represented by the atomic formula: $R_{3-a}(Ca,Sr)_aGe_aFe_{5-a}O_{12}$, where R is at least one member of the group consisting of yttrium and the rare earth elements between numbers 57 and 71 of the Periodic Table of the Elements, wherein the Ge occupies octahedral sites in a relative molar concentration of from 0.01 to 0.1 per formula unit such that the bubble collapse field of the garnet varies with temperature at approximately the said average variation rate.

4,034,359

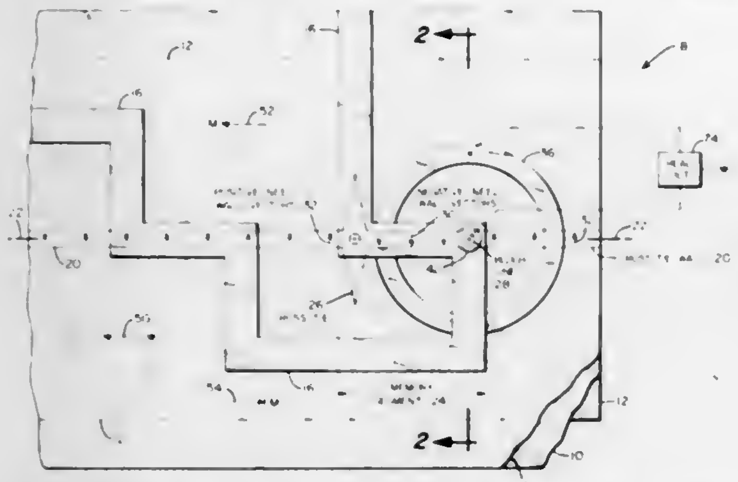
MAGNETO-RESISTIVE READOUT OF A CROSS-TIE WALL MEMORY SYSTEM USING A PILLAR AND CONCENTRIC RING PROBE

Ernest J. Torok, St. Paul; Alan D. Kaske, Minneapolis; John A. Krawczak, Hopkins, and Maynard C. Paul, Bloomington, all of Minn., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Aug. 28, 1975, Ser. No. 608,437

Int. Cl.² G11C *11/44*

U.S. Cl. 340—174 TF **4 Claims**



1. In a cross-tie wall memory system in which bits of binary data are stored as inverted Neel wall sections, which inverted Neel wall sections are bounded by a cross-tie on one end and by a Bloch-line on the other end, in a cross-tie wall in a magnetizable layer having magneto-resistive properties and an easy axis and in which said binary data are serially propagated along said cross-tie wall by the intersecting fields provided by associated drive lines, which drive lines have memory segments that are associated with associated memory cells in said magnetizable layer in which associated ones of said bits of binary data are stored as inverted Neel wall sections, a method of magneto-resistively reading out said bits of stored binary data comprising:

- conductively coupling a conductive pillar to the Bloch-line position in a memory segment of the cross-tie wall in said magnetizable layer;
- conductively coupling, concentric to and separated from said conductive pillar, a conductive ring to said magnetizable layer;
- coupling an electrical signal across said conductive pillar and said conductive ring;
- determining the resistance in said magnetizable layer between the opposing concentric edges of said conductive pillar and said conductive ring as an indication of whether or not a Bloch-line is stored in said memory segment.

4,034,360

SYSTEM FOR DISABLING THE RESET CIRCUIT OF FAULT INDICATING MEANS

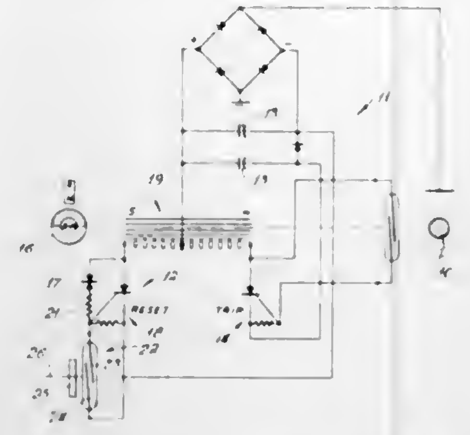
Edmund O. Schweitzer, Jr., 1002 Dundee Road, Northbrook, Ill. 60062

Filed Aug. 6, 1976, Ser. No. 712,281

Int. Cl.² G08B *21/00*

U.S. Cl. 340—253 A **8 Claims**

1. Fault indicating means responsive to flow of fault current in an electrical distribution system comprising: indicator means movable from one position to another position on flow of fault current in said system, a trip circuit responsive to flow of fault current in said system to shift said indicator means from said one position to said other position, a reset circuit to shift said indicator means automatically back to said one position on restoration of said system to normal operating condition; and manually operable means for disabling said reset circuit to maintain said indicator means in said one position.



4,034,361

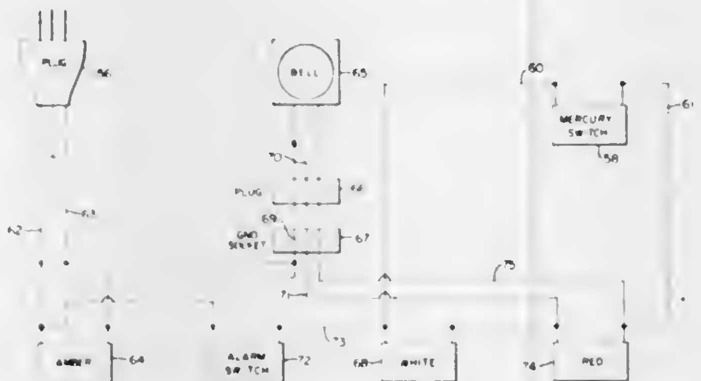
METHOD AND APPARATUS FOR STORING BIOLOGICAL MATTER

Thomas L. Mortensen, 5742 Falk Court, Arvada, Colo. 80002

Filed July 28, 1975, Ser. No. 599,648

Int. Cl.² G08B *21/00*

U.S. Cl. 340—272 **10 Claims**



1. In apparatus for sensing weight loss of a cryogenic fluid employed as a coolant in a biological storage container wherein there is provided a balance assembly including a fixed frame, a balance beam pivotally mounted on said fixed frame and movable between a first location on one side of a reference plane and a second location on an opposite side of said reference plane, the combination therewith of:

- means including a receiving platform responsive to the weight of the container and its contents to urge said beam into said first location when the weight of the container and its contents is at or above a predetermined level and counterweight means for urging said beam into said second location in response to a predetermined weight loss of the container and its contents such that the total weight is reduced below the predetermined level,
- an electric alarm circuit which is connectable to an electric power source, including terminal means for electrically connecting a remote alarm into said alarm circuit and alarm monitoring means for monitoring effective electrical connection of a remote alarm into said alarm circuit, and
- sensing means in said alarm circuit responsive to movement of said beam to said second location indicating a weight reduction of the container and its contents below the predetermined level for energizing said alarm circuit.

4,034,362

DEVICE FOR AUTOMATIC PROCESSING OF SIGNALS RECORDED ON AN OSCILLOSCOPE SCREEN

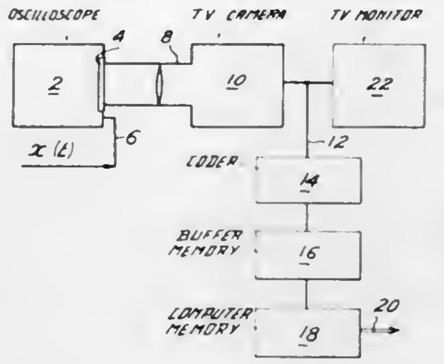
Charles Balanca, Corbreuse, and Gilbert Charles, Chatillon-sous-Bagneux, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Feb. 6, 1976, Ser. No. 655,958

Claims priority, application France, Feb. 18, 1975, 75.05021

Int. Cl.² G06F *3/00*

U.S. Cl. 340—347 AD **5 Claims**



1. A device for automatic processing of signals recorded on an oscilloscope screen, wherein said device comprises:

- an oscilloscope screen scanned by the signal $x(t)$ to be recorded as a function of the time interval t,
- a camera which is optically adjusted so as to produce the image of the oscilloscope screen on a storage target,
- a unit for electron scanning of said storage target in which the scan consists of a series of lines which are parallel to each other and perpendicular to the time axis of the image $x'(t)$ of the signal $x(t)$ on said storage target, said lines being such as to correspond to the scanning of the point of impact of an electron beam on said target, and for producing for each line a signal $y(\tau)$ containing a profile of the intersection of the electron beam with the image $x'(t)$ of the signal $x(t)$ on the storage target, the parameter τ being such as to vary between 0 and its maximum value in the case of each line,
- electronic means for associating with each line, in a line address counter, a line address n which varies from 1 to N,
- a coder responsive to said line address counter and to said signals $y(\tau)$ for associating with each line address n in a word-address counter a raw word address m which varies between 1 and M at each instant of appearance of said respective signals $y(\tau)$ from which at least one final word address m is to be obtained for recording in paired association with the line address n, said coder including also electronic means for comparing the signal $y(\tau)$ with a series of threshold values having increasing amplitudes S_1, $S_2 \ldots S_i \ldots S_k$, means responsive to said comparing means for generating signals of constant amplitude $M_i(\tau) = AY[y(\tau) - S_i]$ where Y is the step function having an amplitude equal to 1 when and only when:

$$y(\tau) - S_i \geq 1$$

A being a coefficient of proportionality which is independent of the parameter, means responsive to said signals $M_i(\tau)$ for selecting the nonzero signal $M_i(\tau)$ which corresponds in the case of each signal $y(\tau)$ to the maximum threshold value of S_i and means for calculating in response to each said selected signal $M_i(\tau)$ the final word address m by reference to the value of the time parameter τ corresponding to the half-sum of the values of τ which are associated with the leading edge and with the trailing edge of the selected signal $M_i(\tau)$, and

- means for recording sequentially the pairs of addresses (n, m) on a digital memory.

4,034,363

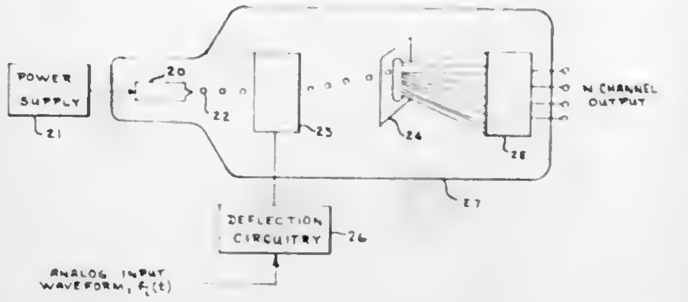
REAL TIME DATA RATE QUANTIZER AND ANALOG-TO-DIGITAL CONVERTER SYSTEM

Paul Van Etten, Clinton, and John V. McNamara, Rome, both of N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 14, 1976, Ser. No. 649,106

Int. Cl.² H03K *13/00*

U.S. Cl. 340—347 P **3 Claims**



1. A real time large data rate quantizer and analog-to-digital converter for an input analog wave form being comprised of an electron gun providing an electron beam of high constant energy, a mosaic target of electron beam sensitive detectors arranged in annular rings, said mosaic target having a preselected number of sectors, each sector being in the form of a wedge shaped piece, each sector including a preselected number of segments, each segment being a separate electron beam sensitive device, each sector corresponding to a specific time interval of said input analog signal and each segment corresponding to a finite range in amplitude of said input analog waveform, vertical and horizontal deflection circuitry means connected to said vertical and horizontal deflection structure, respectively, and operating in combination therewith to provide a rotating beam impinging in the form of a spot of preselected size on said mosaic target in a circular pattern, said vertical and horizontal circuitry means receiving said input analog waveform to provide an increasing diameter of said circular pattern in accordance with an increasing magnitude of said input analog waveform, said vertical and horizontal circuitry means including a power splitter receiving said input analog waveform and providing first and second split signals, a deflection oscillator, a quadrature coupler connected to said deflection oscillator and providing first and second oscillator deflection signals therefrom, first and second amplitude modulators, said first amplitude modulator receiving said first split signal and said first oscillator deflection signal, said second amplitude modulator receiving said second split signal and said second oscillator deflection signal, said first and second amplitude modulators providing first and second deflection signals to said vertical and horizontal deflection plates, respectively, and a vacuum envelope for said electron gun, said vertical and horizontal deflection structure and said mosaic target.

4,034,364

ANALOG-DIGITAL CONVERTER

Takeo Fukuda, Yokohama, and Isao Tashiro, Kawasaki, both of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Japan

Filed Nov. 12, 1975, Ser. No. 631,051

Claims priority, application Japan, Dec. 10, 1974, 49-141178

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 NT **8 Claims**

1. An analog-digital converter comprising:

- a D.C. amplifier;
- a first voltage-current converter connected to an input terminal of the D.C. amplifier,
- a feed-back capacitor connected between the input terminal of the D.C. amplifier and an output terminal of the D.C. amplifier,

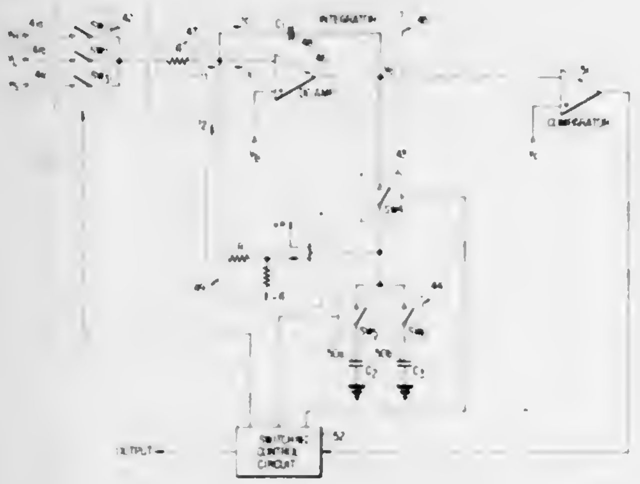
a first switching circuit for supplying an unknown analog voltage to be converted and first and second analog reference voltages having the same polarity as that of the converted voltage to the first voltage-current converter,

a serial connection circuit of a second switching circuit and a second voltage-current converter connected between the output terminal of the D.C. amplifier and the input terminal of the D.C. amplifier,

a third switchng circuit having two switches with one of the switches being connected to an inter-connecting point of the serial connection circuit;

a first capacitor connected between one of the two switches in the third switching circuit and ground to maintain a first voltage corresponding to an output voltage of the D.C. amplifier in the period when only the first reference voltage is supplied to the D.C. amplifier,

a second capacitor connected between one of the switches in the third switching circuit and ground to maintain a second voltage corresponding to an output voltage of the D.C. amplifier during the period when only the second reference voltage is supplied to the D.C. amplifier,



a comparator for producing an output signal when the levels of the output voltage of the D.C. amplifier are equal to the level of a reference voltage and

a switch control circuit for controlling the first, second and third switching circuits to maintain the first and second voltages corresponding to the output voltages of the D.C. amplifier respectively in the first and second capacitors, to supply a first combined voltage of the second voltage corresponding to the output voltage of the D.C. amplifier and the unknown analog voltage to be converted to the D.C. amplifier for a predetermined period, to supply a second combined voltage of the first voltage corresponding to the output voltage of the D.C. amplifier and the second reference voltage to the D.C. amplifier and to obtain a digital quantity of the unknown analog voltage to be converted by measuring the period in which the second combined voltage is supplied to the D.C. amplifier.

4,034,365
MOST RESTRICTIVE DIGITAL TO ANALOG CONVERTER

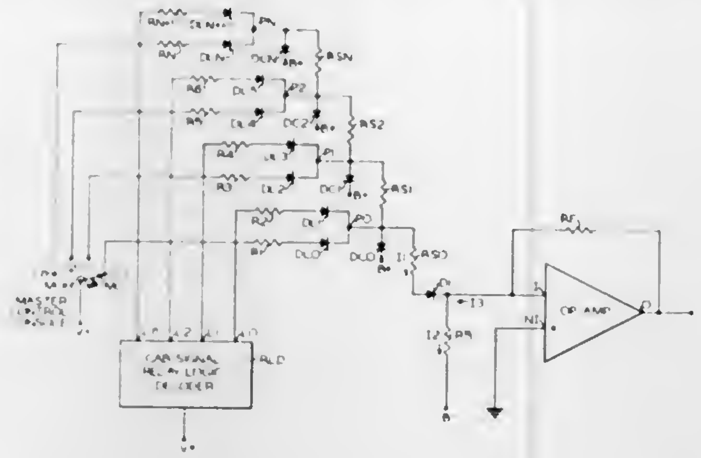
Reed H. Grundy, Murrysville, Pa., assignor to Westinghouse Air Brake Company, Swissvale, Pa.

Filed May 27, 1975, Ser. No. 581,222

Int. Cl.² H03K *13/00*

U.S. Cl. 340—347 DA **4 Claims**

1. A most restrictive digital to analog converter comprising, an integrated circuit operational amplifier having a first and a second input signal and an output, a degenerative feedback path coupled between said output and said first input, said second input coupled to a reference potential, said first input is also connected to a source of biasing voltage and is coupled to a series of current-limiting resistors by series diode, each of said series current-limiting resistors connected to a separate one of a first bank of series resistors and diodes and also connected to a separate one of a second bank of series resistors and diodes, a separate clamping diode connected between each one of said current-limiting resistors and the common point of said separate ones of said series resistors and diodes of said first and said second banks, each of said series resistors and diodes of said first bank selectively connected to a first digital input means, and each of said series of resistors and diodes of said second bank selectively connected to a second digital input means so that said integrated circuit operational amplifier produces an output signal in accordance with which one of the first or second digital input means is the most restrictive.



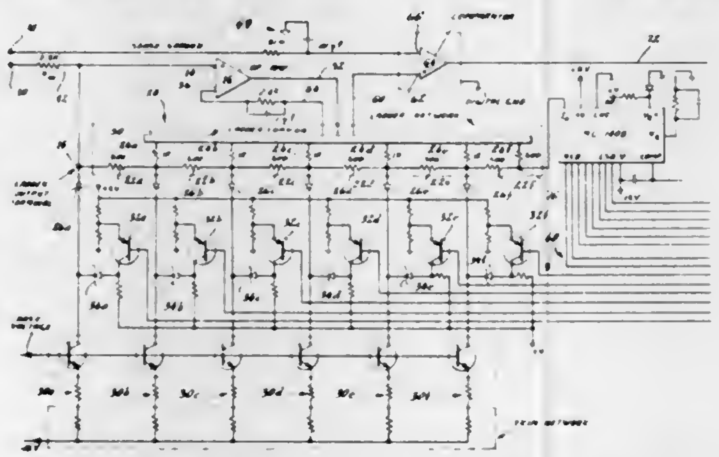
4,034,366
ANALOG-TO-DIGITAL CONVERTER WITH CONTROLLED LADDER NETWORK

John Memishian, Jr., Arlington, Mass., assignor to Analog Devices, Inc., Norwood, Mass.

Filed Jan. 28, 1976, Ser. No. 653,235

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **16 Claims**



1. In a digital-to-analog converter including a current-dividing resistor network comprising a plurality of interconnected resistors with an output terminal and a common terminal; a set of switchable current sources connected to respective junction points of said resistor network in such manner that the network serves to divide the currents of the switched-on sources between said output terminal and said common terminal to produce at said output terminal a network output signal signifying which current sources are on;

the improvement in such converter which comprises:

an operational amplifier having two input terminals;

means connecting the output of said operational amplifier to said network common terminal; and

negative feedback means connecting said network common terminal to an input terminal of said operational amplifier, said amplifier output supplying current to said common terminal to drive its potential to the potential of the other input terminal independently of which of said current sources is switched on.

4,034,367
ANALOG-TO-DIGITAL CONVERTER UTILIZING A RANDOM NOISE SOURCE

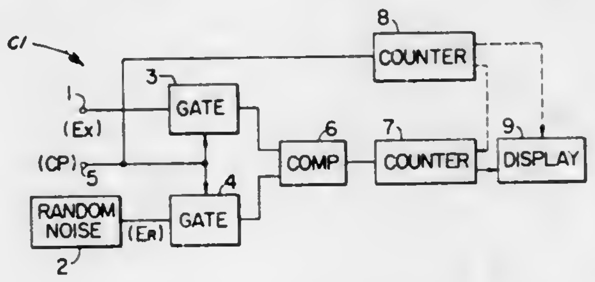
Takashi Sugiyama, and Takashi Tsuda, both of Musashino, Japan, assignors to Yokogawa Electric Works, Ltd., Tokyo, Japan

Filed Feb. 20, 1975, Ser. No. 551,283

Claims priority, application Japan, Feb. 28, 1974, 49-23900; Feb. 28, 1974, 49-23903

Int. Cl.² H03K *13/02*

U.S. Cl. 340—347 AD **9 Claims**



1. An analog-to-digital converter for converting an input analog signal into an output digital signal, comprising:

reference random noise source means for generating random noise signals at a rate of uniform occurrence probability density in a given range;

means for generating a triangular wave signal having an amplitude greater than the minimum amplitude increment of said random noise signal;

a feed wire and return wire across which the analog signal to be converted is applied;

amplitude comparator means for repeatedly comparing the amplitude of said random noise signal with that of the signal appearing on said feed wire and for supplying first output pulses in accordance with the comparisons, and for repeatedly comparing the amplitude of said random noise signal with that of the signal appearing on said return wire and for supplying second output pulses in accordance with the comparisons, the triangular wave signal being effectively superposed on one of the signals to be compared prior to the comparisons, and

means responsive to the difference between the numbers of the first and second output pulses obtained from said amplitude comparator means to provide a digital output corresponding to the value of said analog signal to be converted.

4,034,368
NUMERICAL DISPLAY ELEMENT

Jun Shimomura, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

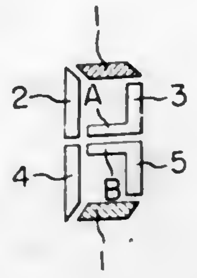
Filed Jan. 20, 1976, Ser. No. 650,786

Claims priority, application Japan, Jan. 27, 1975, 50-12167[U]

Int. Cl.² G09F *9/32*

U.S. Cl. 340—378 R **2 Claims**

1. In a numerical display comprising seven segments, the improvement resides in that the horizontally extending central segment of said seven segments is divided into two parallel upper and lower segments connected to upper and lower right hand segments respectively to provide two substantially L-shaped segments, whereby said numerical display is formed by six segments.



4,034,369
CHECK CIRCUIT FOR CHECKING VEHICLE WARNING SYSTEM

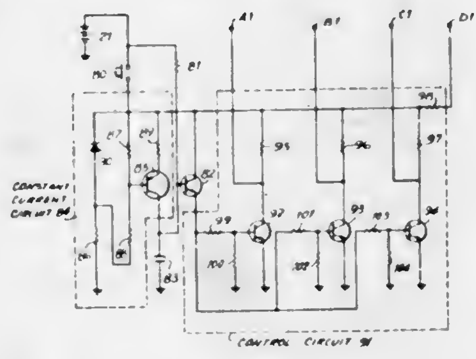
Kou Tanigawa; Kenzo Hashikawa, both of Kobe, and Jun Ota, Toyota, all of Japan, assignors to Fujitsu Ten Ltd., Kobe and Toyota Jidosha Kogyo Kabushiki Kaisha, both of, Japan

Filed Nov. 24, 1976, Ser. No. 744,612

Claims priority, application Japan, Nov. 28, 1975, 50-143105

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **6 Claims**

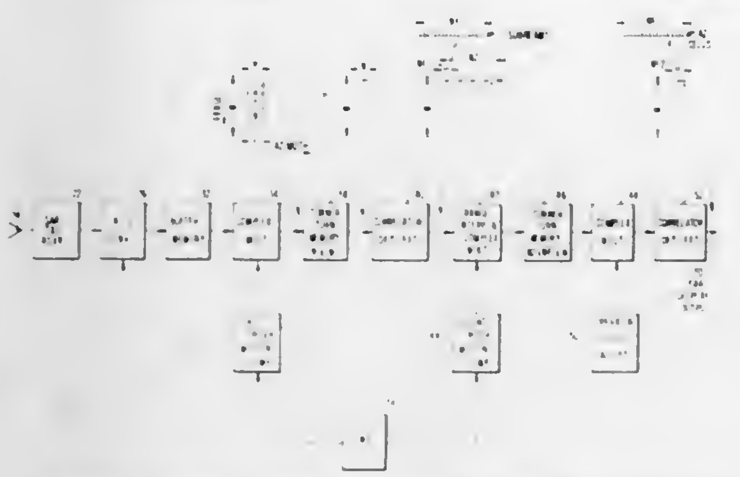


1. A check circuit for checking a vehicle warning system, said vehicle warning system having a plurality of sensors each positioned at a corresponding one of a plurality of operating elements of a vehicle, the integrity of which elements is to be supervised, a plurality of warning devices each provided for a corresponding one of the sensors and controlled in operation by an abnormality detection signal from the corresponding one of the sensors, and a priority sequence judging circuit connected between the sensors and the warning devices for determining the degree of importance of detection signals from the sensors and preferentially providing an output to the warning devices in accordance with the priority of greatest importance, said check circuit comprising

simulating circuit means for artificially creating the same condition as that obtained when the sensors detect abnormalities to actuate all the warning devices; and

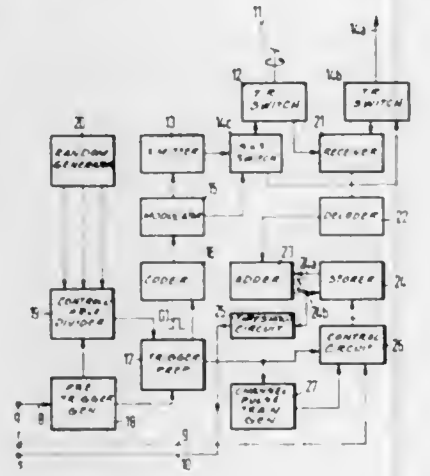
delay circuit means connected to the simulating circuit means and coupled to the warning devices for releasing said condition in accordance with a predetermined sequence at predetermined time delays whereby the integrity of the warning devices is checkable, item by item, in accordance with said sequence.

4,034,370
SECOND ORDER MOTION COMPENSATOR FOR HIGH RESOLUTION RADAR
James H. Mims, Linthicum, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 283,263, Aug. 23, 1972, abandoned. This application Apr. 6, 1976, Ser. No. 674,181
Int. Cl.² G01S *9/02*
U.S. Cl. 343—5 CM **12 Claims**



6. Apparatus for digitally providing motion compensation for vehicle maneuverability in a synthetic aperture radar coupled to the navigational system of said vehicle and including a transmitter and receiver section which respectively transmit and receive a sequence of N radar pulses during a predetermined coherent integration time period and converts the return pulses into a respective number of I&Q analog video signals, the combination comprised of:
- means coupled to said receiver section for converting each of said I&Q analog video signals into M complex digital range samples;
- first order motion compensation means, coupled to and receiving information from said navigational system, connected to said converting means and including means for applying a selective time translation and phase shift to each of said M digital samples;
- a first digital data memory coupled to said converting means for storing M data blocks of digital samples where each data block includes time samples covering a selected number of N' of interpulse periods during said coherent integration time;
- a digital processor adapter to perform a time-frequency decimation on a digital data block coupled to said memory, being operable to sequentially receive each of said M data blocks and resolve each data block into a plurality of frequency bands which corresponds to NF1 synthetic subbeams;
- second order motion compensation means, coupled to and receiving information from said navigational system, connected to said digital processor and including means for applying another selected time translation and phase shift to each frequency band;
- a second digital data memory coupled to said second order motion compensation means for storing digital data samples for M × NF1 synthetic subbeams for a selected number N2 time intervals and feed out sequential data blocks of M × N2 into data samples; and
- a second digital processor adapted to perform a time-frequency decimation process on a data block coupled to said second memory, being operable to sequentially receive each data block therefrom and resolve each said data block into a plurality of frequency bands in the azimuth direction which correspond to motion compensated range cells adaptable for utilization by a synthetic aperture radar display unit.

4,034,371
APPARATUS AND METHODS FOR DIFFERENTIATING BETWEEN SYNCHRONOUS AND ASYNCHRONOUS RESPONSE SIGNALS IN SECONDARY RADAR DEVICES
Bruno Maier, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Continuation-in-part of Ser. No. 461,741, April 17, 1974, abandoned. This application Apr. 28, 1975, Ser. No. 572,519
Claims priority, application Germany, May 21, 1973, 2325617
Int. Cl.² G01S *9/56*
U.S. Cl. 343—6 R **5 Claims**

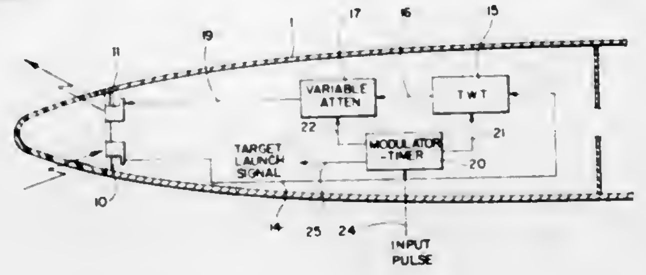


1. A secondary radar device in which the interrogation pulse repetition rate is derived from the pulse repetition rate of a primary radar device comprising a variable controllable frequency divider a pulse generator supplying pulse repetition rate pulses to said primary radar and to said variable frequency divider, a random generator also connected to said variable frequency divider, a trigger preparation device connected to the output of said variable frequency divider so that the interrogation pulse repetition frequency of the secondary radar for the interrogation signal changes continuously with the divider ratio, a memory control circuit, said trigger preparation circuit connected to key said secondary radar transmitter and emitting an indicator impulse to said memory control when an interrogation signal is transmitted, a storer connected to said memory control and storing information, an adder connected to said storer, a decoder connected to the receiver of said secondary radar and supplying to said adder the decoded answer signals, said storer under the control of said memory control and storing decoded answer signals from said adder in synchronism with the timing of the interrogation signals triggered by the trigger preparation circuit so that nonsynchronous answer signals are suppressed and that synchronous ones are admitted, and a threshold circuit connected to said storer, a presentation means connected to said threshold circuit and receiving an output signal from said storer only when a threshold value is exceeded by the stored answer signals.

4,034,372
VELOCITY GATE HAND-OFF SYSTEM
Donald Lee Margerum, Woodland Hills, Calif., assignor to Northrop Corporation, Los Angeles, Calif.
Filed July 12, 1976, Ser. No. 704,645
Int. Cl.² G01S *9/56, 7/36*
U.S. Cl. 343—6.8 R **10 Claims**

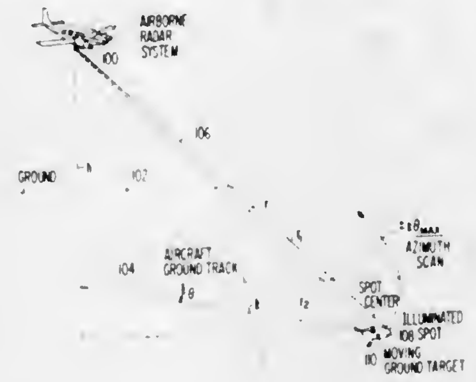
1. In a vehicle carrying a target to be launched therefrom for firing upon by a doppler radar guided missile; means for modifying the radar return signal from the carrier vehicle comprising:
- a. receiving antenna means in said carrier for receiving the radar signals of the missile radar system;

- b. signal amplifying means for amplifying said received radar signals;
- c. transmitting antenna means in said carrier for transmitting radar return signals;
- d. means for feeding said radar signals from said amplifying means to said transmitting antenna means;
- e. means for launching said target from said carrier vehicle; and



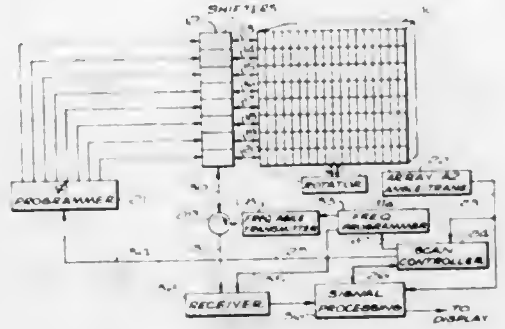
- f. modulator-timer means responsive to an input command to launch said target, said modulator-timer means comprising first ramp function means for increasing the frequency of said radar return for a first predetermined time period and second ramp function means for attenuating the amplitude of said radar return signal for a second predetermined time period, said time periods overlapping so that said frequency is high when said amplitude is low.

4,034,373
AIRBORNE MOVING-TARGET INDICATING RADAR SYSTEM
Richard de Pierre, W-Boxford; Gilbert Jerome Forgays, Lowell; Hans Heinrich Behling, Bedford, and William Childs Curtis, Lexington, all of Mass., assignors to RCA Corporation, New York, N.Y.
Filed Nov. 8, 1973, Ser. No. 413,808
Int. Cl.² G01S *9/42*
U.S. Cl. 343—7.7 **16 Claims**



1. In a radar system located on a first body moving at a relatively high velocity with respect to a second body which is spaced a distance from said first body, said radar system including transmitting, antenna and receiving means for illuminating a spot of said second body having a first size with a transmitted beam of exploratory pulses of wave energy and receiving reflected wave energy therefrom; the improvement therein in which said receiving means includes means for detecting moving targets located on said second body within said illuminated spot which targets include those having a radar cross section size many orders of magnitude smaller than said first size and moving with respect to said second body at a velocity which is more than an order of magnitude smaller than said relatively high velocity.

4,034,374
SEQUENTIAL LOBING TRACK-WHILE-SCAN RADAR
Bradford E. Kruger, Woodland Hills, Calif., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Nov. 10, 1975, Ser. No. 630,151
Int. Cl.² G01S *9/02*
U.S. Cl. 343—16 R **10 Claims**



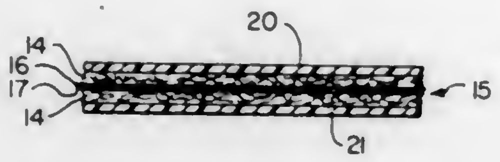
1. An angle tracking system for a track-while scan pulsed radar, comprising:
- a pencil-beam-forming array capable of providing inertialess scan in at least a first scanning coordinate as a function of the frequency of RF energy applied thereto;
- first means for mechanically rotating said array to scan said beam in said first coordinate, including angle transducer means for continuously providing a mechanical scan angle identifying signal;
- second means including a pulsed, frequency-agile transmitter, a receiver and duplexing means for energizing said array with RF pulses and for receiving corresponding target echoes, the variations of frequency of said RF pulses providing a superimposed scan in said first scanning coordinate;
- third means responsive to a first control signal for generating a pulsed frequency program to control said second means to transmit a sequential lobing pattern of N pulses at a first radio frequency and N pulses at a second radio frequency on a time shared basis within each of N successive transmitter pulses, said first and second frequencies corresponding to first and second beam positions overlapping by a first predetermined angle in said first coordinate;
- fourth means responsive to said angle indentifying signal for generating said first control signal and for programming said first control signal to effect repetition of the lobe sequencing provided by said third means to provide third and fourth beam positions overlapping by a second predetermined angle in said first coordinate, said fourth means also being operative to program said first control signal to produce a quiescent transmitter period between the end of said N transmitted pulses from said second means corresponding to said first and second beam positions and the beginning of N transmissions corresponding to said third and fourth beam positions;
- and fifth means responsive to the relative amplitudes of received signals at each of said beam positions and to said angle identifying signal for generating a value corresponding to the estimated angular position of a given target.

4,034,375
LAMINATED CAMOUFLAGE MATERIAL
Erik W. Wallin, Gamleby, Sweden, assignor to Barracudaverken Aktiebolag, Djursholm, Sweden
Filed May 23, 1975, Ser. No. 580,403
Int. Cl.² G01V *1/40;* B32B *5/12*
U.S. Cl. 343—18 A **5 Claims**

1. A flexible web having radar defeating characteristics for use in camouflage material comprising: a first non-woven,

flexible layer of electrically nonconductive polymeric material; a second non-woven, flexible material of electrically non-conductive polymeric material; and a third layer lying between said first and second layers for imparting partial radar reflective characteristics to said web, said third layer comprising

- a first plurality of strands containing electrically conductive fibers in generally discontinuous relationship, said strands arranged in parallel irregularly spaced relationship with each other and lying in a plane parallel to said first and second layers,

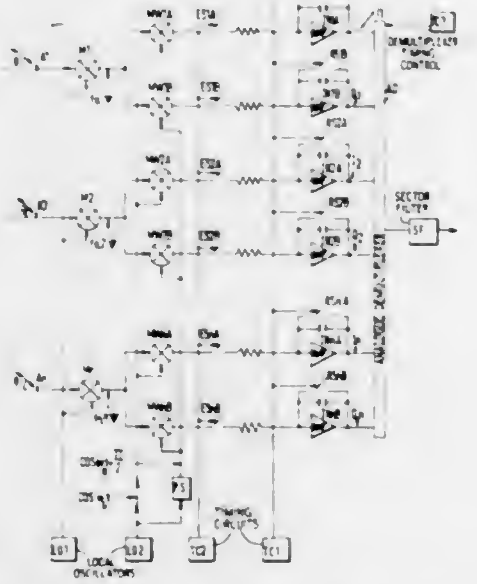


- a second plurality of strands identical to said first strands arranged in parallel irregularly spaced relationship with each other and lying in a plane parallel to said first and second layers, said sets of strands in said third layer being disposed to form a plurality of parallelogram-shaped openings;

said first and second layers being bonded to said third layer and to each other through said openings.

4,034,376
RADIO DIRECTION FINDER WITH ARRAY ELEMENT SIGNAL PROCESSING

Paul Barton, Bishops Stortford, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed July 22, 1976, Ser. No. 707,844
Claims priority, application United Kingdom, July 24, 1975, 30975/75
Int. Cl.² G01S *3/02*
U.S. Cl. 343—112 R **10 Claims**

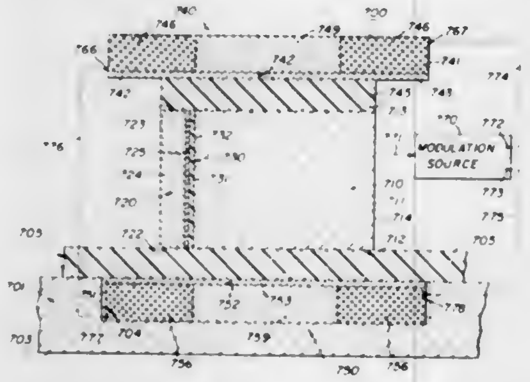


1. Radio direction finding equipment for deriving information respecting the angular position of a mobile craft with respect to said equipment from radio frequency pulses signals emanting from said craft, comprising:

- antenna means having *n* elements responsive to said emanating pulses to produce a series of *n* contemporaneons pulse signals to equal frequency and with phase difference ψ between successive signals of said series determined by the angle of arrival of said pulses from said mobile craft;
- a first mixing network including *n* first mixers each responsive to a corresponding one of said antenna elements and to a first phase of a local oscillaton providing a local oscillaton signal at substantially the same frequency as that of said emanating pulse signals;
- a second mixing network including *n* second mixers each responsive to a corresponding one of said antenna elements and to a second phase of said local oscillaton, said second phase being substantially at $\pi/2$ radians with respect to said first oscillaton phase;
- zero response means providing *n* pairs outputs and being responsive to the outputs of said first and second mixing networks to provide predetermined output corresponding to the occurrance of zero frequency output from each mixer of said first and second mixer networks, said predetermined output being characterized by I_j and Q_j, where I_j is proportional to $\cos j\psi$ and Q_j is proportional to $\sin j\psi$, j representing the position of said zero frequency output;
- sampling means responsive to said *n* pairs of outputs of said zero response means to derive from each of said pairs outputs in the form $I_j\, Q_j - I_j - Q_j$,
- and signal processing means for processing the *n* output pairs of said sampling means to determine therefrom the value of said ψ which is the phase difference of said emanating signal between successive elements of said antenna means and characterizes said angle of arrival of said pulses from said mobile craft.

4,034,377
FERRITE CIRCULATORS AND ISOLATORS AND CIRCUITS INCORPORATING THE SAME

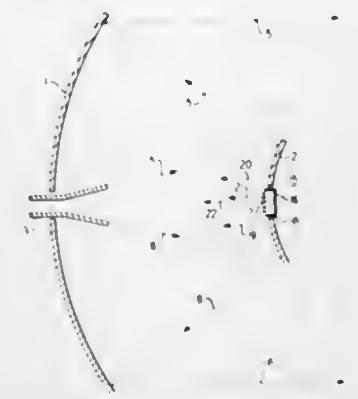
Robert M. Knox, La Grange, and Peter P. Toulios, Westchester, both of Ill., assignors to Epsilon Lambda Electronics Corporation, Batavia, Ill.
Filed Feb. 17, 1976, Ser. No. 658,412
Int. Cl.² H04L *5/14;* **H04B** *1/48;* **H01P** *1/36, 1/38*
U.S. Cl. 343—180 **43 Claims**



1. A circulator for use in the frequency range from about 1 GHz to about 1,000 GHz comprising a conductive image plane, three elongated high permittivity dielectric waveguides of finite cross section adjacent to said conductive image plane, a thin film of synthetic organic plastic resin disposed between and secured to both said image plane and said waveguides, said thin film being low loss in character having a low permittivity compared with that of said dielectric waveguide, the ratio between the thickness of said thin film and the square root of the cross-sectional area of said dielectric waveguides being in the range from about 0.02 to about 1.0, said waveguides being arranged in an equiangular Y-shape and integrally connected at a common junction and each including a port, a ferrite cylinder in said waveguide junction and having the axis of said ferrite cylinder disposed essentially normal to said image plane, and means for establishing a magnetic field in said ferrite cylinder extending essentially normal to said image plane, whereby microwave energy in said frequency range inserted in a first port is essentially all transmitted with little attenuation to a second part and essentially none transmitted to the third port.

4,034,378
ANTENNA WITH ECHO CANCELLING ELEMENTS

Edward Allen Ohm, Holmdel, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed July 21, 1975, Ser. No. 597,366
Int. Cl.² H01Q *19/12*
U.S. Cl. 343—781 CA **8 Claims**

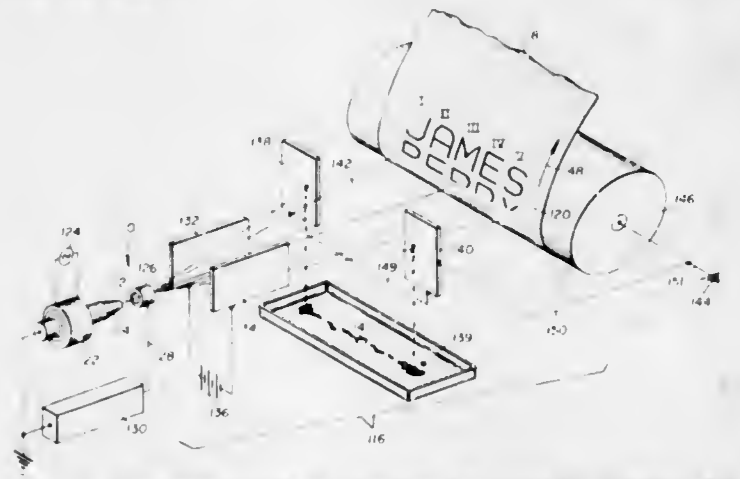


1. An antenna having a main reflector, a subreflector and a feed system so arranged that radiation from said feed system is successively reflected from said subreflector and said main reflector, said antenna further having an essentially flat plate mounted near said subreflector so as to reflect some of said radiation back toward said feed system,

- wherein the improvement comprises frequency sensitive reflector means comprising a grid of intersecting conductors located between said feed system and said plate near said plate and operating so that a first component of said radiation is reflected from said plate and a second component of said radiation is reflected by said frequency sensitive reflector means, said frequency sensitive reflector means and said plate presenting approximately equal areas to said radiation,
- whereby radiation from said feed system reflected back to said feed system by said subreflector is substantially cancelled in a first and a second frequency range by said first and second reflected components combined.

4,034,379
INK JET WRITING PROCESS AND APPARATUS

James M. Berry, Deerfield, Ill., assignor to Teletype Corporation, Skokie, Ill.
Filed Nov. 13, 1972, Ser. No. 306,104
Int. Cl.² G01D *15/18*
U.S. Cl. 346—1 **28 Claims**

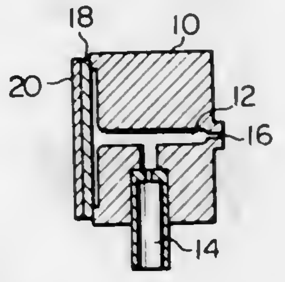


1. In a writing process wherein electrically charged elements from a stream are deflected electrostatically in a span between an issuing member and a carrier for records for producing thereon a pattern, the steps in producing a line on the carrier comprising:

- directing the charged elements in a first succession to a plurality of positions, respectively, at each of a succession of stations on said carrier, each station spaced from and aligned with the others; and
- directing the charged elements, respectively, in a second succession to a plurality of sites at said stations, respectively, and in the same sequence as corresponding drops in the first succession, each site spaced from and in alignment with the others and located at a place different from the position at its station.

4,034,380
INK EJECTION APPARATUS FOR PRINTER

Takuro Isayama, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan
Filed Apr. 6, 1976, Ser. No. 674,187
Claims priority, application Japan, Apr. 8, 1975, 50-42620
Int. Cl.² G01D *15/18;* **H01V** *7/00*
U.S. Cl. 346—140 R **8 Claims**

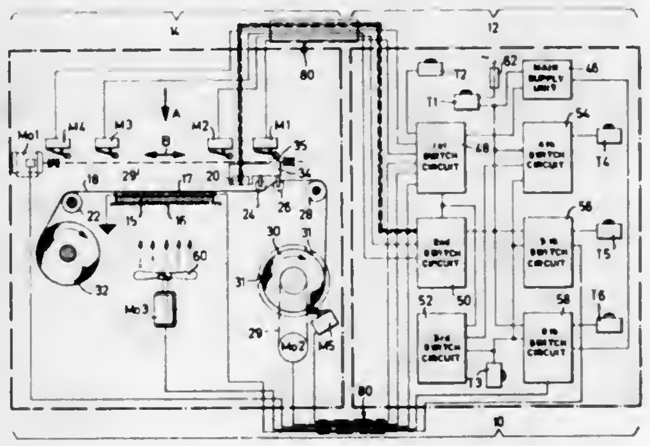


1. Ink ejection apparatus, comprising:

- an ink ejection head defining an ink chamber and an ejection orifice communicating with the ink chamber;
- an electrostrictive member defining part of the ink chamber;
- a pulse generator to feed a pulse to the electrostrictive member to cause reduction of a volume of the ink chamber; and
- sensor means to detect oscillation of the electrostrictive member during a duration of the pulse and produce an electrical signal in response thereto that indicates whether there is sufficient ink in the ink chamber.

4,034,381
THERMOPLASTIC RECORDING APPARATUS

Roland Moraw, and Günther Schädlich, both of Naurod, Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Sept. 24, 1975, Ser. No. 616,760
Claims priority, application Germany, Sept. 27, 1974, 2446208
Int. Cl.² G03G *16/00;* **G01D** *15/10*
U.S. Cl. 346—151 **32 Claims**



1. A recording apparatus for recording information on a

photoconductive thermoplastic recording medium comprising:

- transporting means for feeding said recording medium to and removing it from an exposure station for image-wise exposure of said information onto said recording medium,
- an exposure station including a heatable rostrum means,
- means for supporting said recording medium at said exposure station,
- means for charging said recording medium,
- carriage means for transporting said charging means across said recording medium thereby charging said recording medium,
- heating means for the control of the time of heating of said rostrum means,
- means for moving said carriage means, and
- means for delaying exposure at said exposure station by a delay time interval to permit vibrations in said apparatus from said transported carriage to substantially diminish.

4,034,382

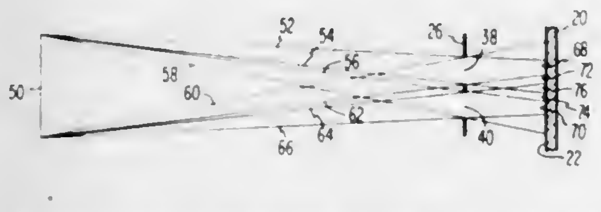
APPARATUS FOR FORMING A COLOR TELEVISION PICTURE TUBE SCREEN

Harold Bell Law, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 217,885, Jan. 14, 1972. This application Aug. 25, 1975, Ser. No. 607,488

Int. Cl.² G03B *41/00*

U.S. Cl. 354—1 **6 Claims**



1. A light exposure apparatus for the formation of a striped phosphor screen on the panel portion of a color picture tube including a striped color selective electrode having a plurality of slits comprising:

- a light source assembly including a light emitter, a reflector and a collimating member;
- a base for supporting the panel portion of a color picture tube and the striped color selective electrode with the plurality of slits in a predetermined positional relationship with respect to said light source assembly; and
- a correction lens disposed between said light source assembly and said base for causing paths of light from said light source assembly to approximate paths of electron beams in the color picture tube, said collimating member having a light emitting portion facing said base and said correction lens; said light emitting portion of said collimatng member being shaped substantially in a linear form as viewed from said base so that said light source assembly serves as a linear light source, and being oriented such that the length of said linear light emitting portion is in the direction of the length of the slits in the striped color selective electrode.

4,034,383

EXPOSURE CONTROL DEVICE

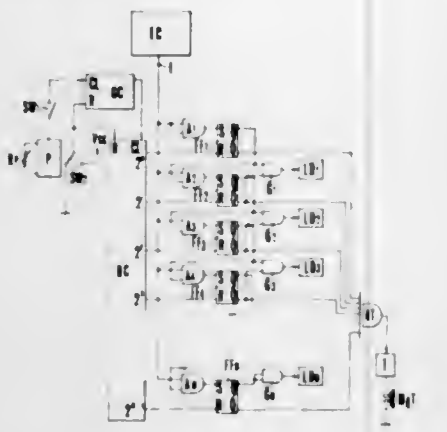
Yukio Mashimo, Tokyo; Tadashi Ito, Yokohama; Nobuhiko Shinoda, Tokyo; Nobuaki Sakurada, and Fumio Ito, both of Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 22, 1975, Ser. No. 570,503

Claims priority, application Japan, Apr. 23, 1974, 49-45814; Apr. 23, 1974, 49-45815

Int. Cl.² G03B *9/62*

U.S. Cl. 354—23 D **16 Claims**



1. An exposure control circuit comprising:

a. a shutter screen containing a shutter front screen and a shutter rear screen;

b. a shutter time control circuit, containing:

  1. a pulse forming circuit to form pulses with prescribed constant cycle,
  2. a computation circuit to compute pulses from said pulse forming circuit, and
  3. a shutter control means to control the running of the shutter front screen and the shutter rear screen based on the computed value of said computation circuit;

c. a compensation circuit coupled to said computation circuit, wherein said compensation circuit is for reducing the number of pulses provided by said pulse forming circuit so as to transmit the same to said computation circuit; and

d. an insertion means to insert the amount of pulse reduction corresponding to the amount of overlapping of shutter screens into said compensation circuit as an analog electrical amount;

whereby the number of pulses are reduced based on the amount of overlapping of shutter screens and are transmitted to the computation circuit, and accordingly, shutter time is adjusted.

4,034,384

EXPOSURE METER CIRCUIT OF CAMERA WITH MATCHING NETWORK FOR FLASH DEVICE

Tokuichi Tsunekawa, Yokohama; Soichi Nakamoto, Machida, and Tetsuya Taguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Division of Ser. No. 434,448, Jan. 18, 1974, abandoned. This application June 9, 1975, Ser. No. 584,831

Claims priority, application Japan, Jan. 24, 1973, 48-10014; Feb. 28, 1973, 48-23938

Int. Cl.² G03B *7/16*

U.S. Cl. 354—33 **4 Claims**

1. A camera system comprising:

a. a storage capacitor;

b. a flash tube coupled to said storage capacitor for illuminating an object with a light energy corresponding to electric energy stored in the storage capacitor;

c. a transistorized detecting circuit coupled to the storage capacitor for producing a control signal corresponding to the level of stored electric energy, said transistorized detecting circuit having a control signal terminal for transferring the control signal and a pair of driving voltage receiving terminals, a driving voltage receiving positive terminal of the transistorized detecting circuit being grounded through a switching means;

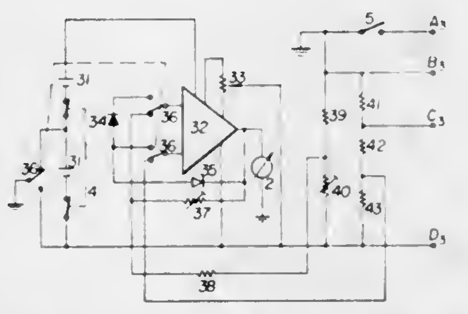
d. light sensitive means for producing a first electrical signal corresponding to the amount of light incident from the object to be photographed;

e. series-connected batteries, each having positive and negative electrodes, said connection of batteries having a connection point and outer negative and positive terminals;

f. amplifier means having power source terminals connected to the outer terminals of said series-connected batteries and also having input and output terminals;

g. an exposure meter coupled to the output terminal of said amplifier means for indicating an exposure value corresponding to the first electrical signal;

h. first change-over means connected with an input terminal of said amplifier means for coupling the light sensitive means with the input terminal of said amplifier means upon the selection of the daylight photography mode and for coupling the control signal terminal of said detecting circuit with the input terminal of said amplifier means upon the selection of the flash photography mode;



i. a second change-over means connected to ground, the second change-over means being connected to said connection point of the series-connected batteries when the flash photography is selected and being connected to the outer negative terminal of the series-connected batteries when the daylight photography is selected; and

j. driving voltage supplying means having a pair of driving voltage supplying terminals, one of said pair of driving voltage supplying terminals being connected to the ground, and being connected to one of the pair of driving voltage receiving terminals, which terminal is connected to the driving voltage receiving positive terminal of the transistorized detecting circuit, while one of said pair of driving voltage supplying terminals is connected to the other of the pair of driving voltage receiving terminals and being connected to the outer negative terminal of the series-connected batteries.

4,034,385

CAMERA WITH A SINGLE AUTOMATICALLY OR MANUALLY OPERABLE MEMORY SWITCH

Akihiro Arai, Tokyo, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan

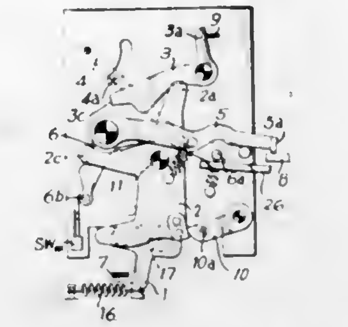
Filed May 3, 1976, Ser. No. 682,389

Claims priority, application Japan, May 15, 1975, 50-63715[U]

Int. Cl.² G03B *7/08, 19/12*

U.S. Cl. 354—38 **11 Claims**

1. In a single lens reflex camera having a mirror movable between a viewing position extending across an optical axis of the camera and an exposure position displaced beyond the optical axis, light-responsive circuit means for providing an electrical quantity corresponding at least in part to lighting conditions, capacitor means for storing said electrical quantity, a single switch connected between said light-responsive circuit means and said capacitor means for transmitting said quantity from said light-responsive circuit means to said capacitor means when said switch is in a closed position and for placing said capacitor means in a condition storing said electrical quantity when said switch is in an open position, switch-control means cooperating with said switch for controlling the latter to have one or the other of said positions, and a pair of operating means cooperating with said switch-control means for operating the latter to have the switch in its open position before the mirror moves from its viewing to its exposure position, one of said operating means being an automatic operating means for automatically operating said switch control means to determine the position of said switch automatically and the other of said operating means being a manual operating means accessible to the operator of the camera for manipulation for manually determining the position of said switch.



4,034,386

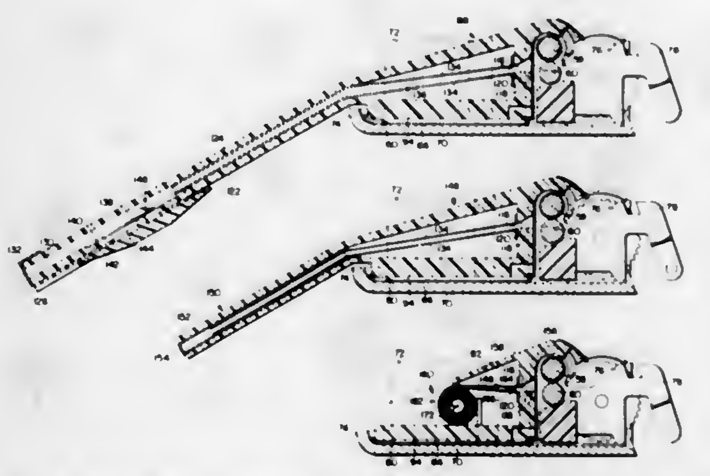
IMBIBITION CHAMBER ADAPTER FOR SELF-DEVELOPING CAMERA

Nicholas Gold, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Apr. 21, 1976, Ser. No. 679,048

Int. Cl.² G03B *17/50*

U.S. Cl. 354—86 **9 Claims**



1. An adapter for providing a lighttight imbibition chamber on a self-developing camera of the type including pressure applying means between which a self-developing film unit is adapted to be advanced to distribute a fluid processing composition within the film unit, a housing section extending forwardly of the pressure applying means, a baffle plate mounted on the housing section forwardly of the pressure applying means of a bottom wall of the housing section and extending laterally between side walls thereof and being mounted for movement between an inoperative position in overlying relation to the bottom wall and a normal operative position wherein the baffle plate is inclined with respect to the bottom wall and extends rearwardly towards the pressure applying means so as to extend into the normal path of travel of a film unit emerging from the pressure applying means for deflecting the film unit from its path of travel to improve the uniformity of fluid distribution within the film unit and for guiding the film unit to a film exit slot in the bottom wall of the housing section, said adapter comprising:

- a hollow base section configured to be operatively located in the camera housing section and including a bottom wall for engaging and depressing the baffle plate from its operative position to its inoperative position and a trailing end wall adapted to be located in alignment with and adjacent to the pressure applying means;

means defining a film entry slot in said trailing end wall through which a film unit emerging from the pressure applying means enters said base section;

means adjacent said film entry slot and extending into the normal path of travel of the film unit for deflecting the film unit from its normal path to improve the uniformity of fluid distribution therein;

means on said base section for defining lighttight chamber for receiving and completely enclosing a film unit that has advanced into said base section and has become disengaged from the pressure applying means;

means defining a film exit slot in said lighttight chamber; and

means on said base section fro releasably coupling said adapter to the camera housing section;

4,034,387

APPARATUS FOR TAKING PHOTOGRAPHS OF AN OBJECT IN CLOSE PROXIMITY BY MEANS OF FLASH

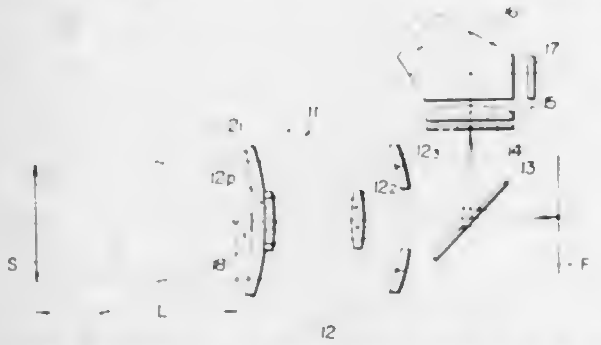
Shohei Ohtaki, Machida; Susumu Kozuki, Kawasaki, and Zenzo Nakamura, Urawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 390,712, Aug. 23, 1973, abandoned. This application Apr. 16, 1974, Ser. No. 461,420

Claims priority, application Japan, Aug. 28, 1972, 47-86064

Int. Cl.² G03B *15/02*

U.S. Cl. 354—126 **14 Claims**



1. Flash equipment for illuminating objects for a camera having an objective lens with an optical axis, comprising:

a. flash means for illuminating an object with flash light having a direction coincident with a central optical axis of the objective lens, said flash means being mounted along said axes;

b. circuit means connected to said flash means for energizing said flash means; and

c. control means for regulating flash duration of said flash means in correspondence to photographic magnification.

4,034,388

FILM TRANSPORT DRIVING AND BRAKING APPARATUS FOR A PHOTOGRAPHIC CAMERA

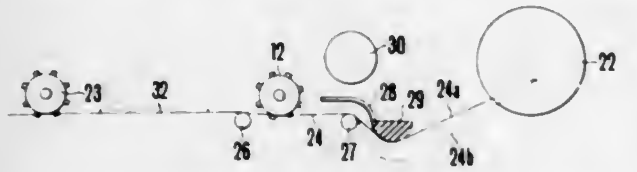
Tomonori Iwashita, Chofu, and Susumu Kozuki, Yokahama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed June 5, 1975, Ser. No. 583,971

Claims priority, application Japan, June 7, 1974, 49-64708

Int. Cl.² G02B *1/24*

U.S. Cl. 354—173 **5 Claims**



1. In a roll film camera including a camera body, an aperture plate having an exposure aperture therein located in said camera body, a long length film magazine including a magazine chamber removably combined with said camera body, wherein the improvement comprises a, transport driving and braking apparatus comprising, in combination:

a. a film supply shaft including shaft including a supply spool and a take up spool drive shaft including a take up spool each rotatable in the chamber of said magazine and positioned on the opposite sides of said exposure aperture for transporting film past said exposure aperture from the supply spool to the take up spool;

b. first driving means positioned in said magazine and connected to said take up spool drive shaft;

c. film advancing means positioned in said camera body for intermittently advancing said film past said exposure aperture, said film advancing means including a film advancing sprocket;

d. a take up spool located in said camera body between said film advancing sprocket and said take up spool in said magazine chamber, said take up spool in said camera body spaced from the path of the film between said film advancing sprocket and said take up spool in said magazine chamber;

e. second driving means positioned in said camera and operatively connected to said film advancing means; and

f. film guiding and braking means having a film guiding portion arranged between said take up spool in said camera body and the path of said film between said film advancing sprocket and said take up spool in said magazine chamber and having a frictional resilient portion arranged between said take up spool in said magazine chamber and said advancing sprocket, so that when said film advancing means is stopped while said first driving means is driving said take up spool drive shaft, said film is brought into frictional engagement with said frictional portion, whereby said film is braked so as not to impart any residual movement to the film behind said exposure aperture during exposure operation of said camera.

4,034,389

APPARATUS FOR DEVELOPING A TRAVELLING PHOTOGRAPHIC EMULSION CARRIER

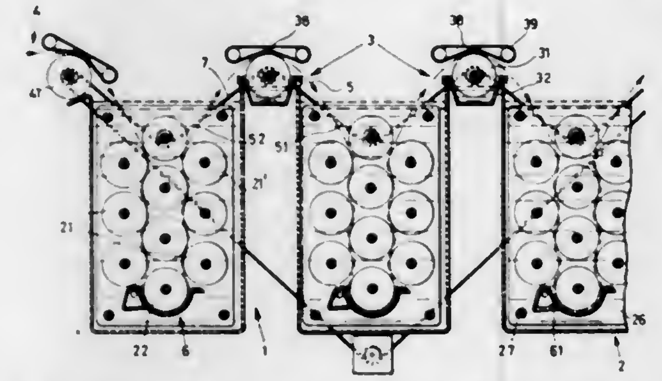
Heinrich Huss, Liebigstr. 1, 6051 Weiskirchen, Germany

Filed Sept. 22, 1975, Ser. No. 615,794

Claims priority, application Germany, Sept. 24, 1974, 2445503

Int. Cl.² G03D *3/08*

U.S. Cl. 354—322 **7 Claims**



1. An apparatus for developing a travelling photographic emulsion carrier, comprising at least two laterally spaced apart containers having upper edges and being adapted to accommodate baths of treating liquid, emulsion carrier guide means in the respective containers and each comprising a plurality of guide rollers for guiding the carrier in a loop-shaped path having a bight, and a deflecting roller for deflecting the carrier in said bight, all of said rollers being located downwardly of the respective upper edges so as to be at least partially immersed in the respective bath, said guide rollers and deflecting roller in each of said containers being of identical diameters and being arranged in three rows in the respective container; a receptacle located intermediate said containers for accommodating a body of fresh water; and carrier transfer roller means at least partly immersed in the body of water and operative for engaging and transferring the carrier from one to the other of said containers.

4,034,390

MAGNET WARNING DEVICE FOR FOCAL PLANE ELECTRIC SHUTTER CAMERA

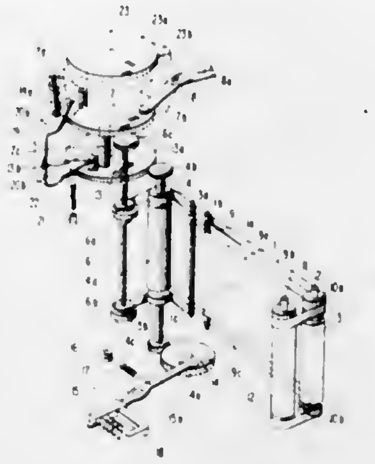
Fumio Urano, Omiya, and Tetsuji Shono, Ranzan, both of Japan, assignors to Asahi Kogaku Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1976, Ser. No. 680,568

Claims priority, application Japan, May 2, 1975, 50-53985

Int. Cl.² G03B *9/34*

U.S. Cl. 354—244 **6 Claims**



1. In a camera of the type having a focal plane electric shutter comprising a front blind which runs from a blocking to an unblocking position to start exposure, a rear blind which runs from an unblocking position to a blocking position to end the exposure, and an electromagnet for retaining and releasing said rear blind to hold said rear blind in said blocking position and to permit said rear blind to run to its unblocking position, respectively, the improvement comprising mechanical means, responsive to the start of movement of said rear blind from an unblocking to a blocking position simultaneously with the start of movement of said front blind from a blocking to an unblocking position, for stopping the movement of said rear and front blinds before they move to the blocking and unblocking positions respectively.

4,034,391

EXPOSURE CONTROL APPARATUS HAVING TWO EXPOSURE TIME SETTING POSITIONS

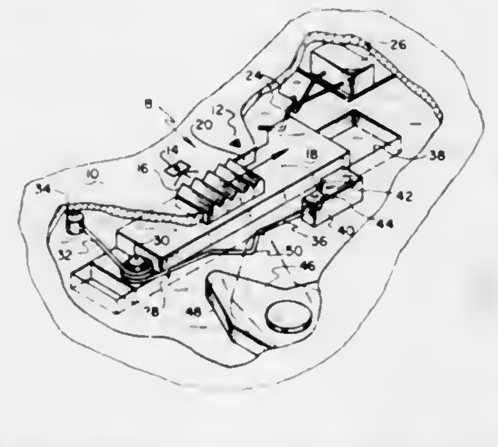
Heinz G. Bethmann, Fellbach; Heinz Kilguss, Kornwestheim, and Horst Simon, Fellbach, all of Germany, assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Feb. 6, 1976, Ser. No. 655,926

Claims priority, application Germany, Feb. 21, 1975, 2507432

Int. Cl.² G03B *7/00*

U.S. Cl. 354—289 **6 Claims**



6. In a photographic camera having a camera housing and an adjustable exposure control system, means for adjusting the exposure control system comprising:

a. a setting member for setting the exposure control system, movable between a first position and a second position;

b. latch means attached to said setting member and engageable with the camera housing for releasably holding said setting member in said second position;

c. spring means for:

  1. urging said latch means into latching engagement with the camera body, and
  2. applying a restoring force to said setting member to urge said setting member towards said first position;

d. release means, effective when actuated, to apply a force to said latch means against the force of said spring means to:

  1. release said latch means from engagement with the camera body, and
  2. increase the tension on said spring means, thereby increasing the restoring force exerted by said spring means on said setting member.

4,034,392

EXPOSURE INDICATOR DEVICE IN A SINGLE LENS REFLEX CAMERA WITH A TTL EXPOSURE METER CONTAINED THEREIN

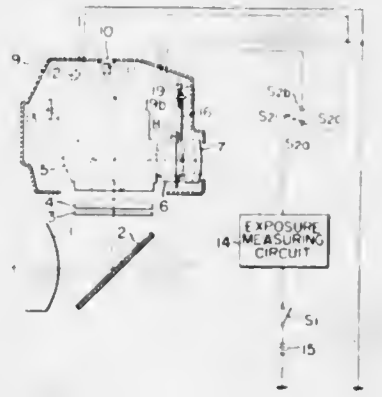
Sunao Ishizaka, and Yasuhito Kawahara, both of Tokyo, Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed June 22, 1976, Ser. No. 698,682

Claims priority, application Japan, June 27, 1975, 50-89959[U]

Int. Cl.² G03B *17/00*

U.S. Cl. 354—289 **6 Claims**



1. An exposure indicator device in a single lens reflex camera with a TTL exposure meter contained therein, comprising:

shutter means extraneously operable for displacement between a position in which it closes a finder optical system at the eyepiece portion thereof to intercept light passed through the finder eyepiece portion into the interior of the finder and a position in which it is retracted from said first-named position;

first indicator means for effecting exposure indication within the view field of the finder; and

second indicator means for effecting exposure indication outside the view field of the finder;

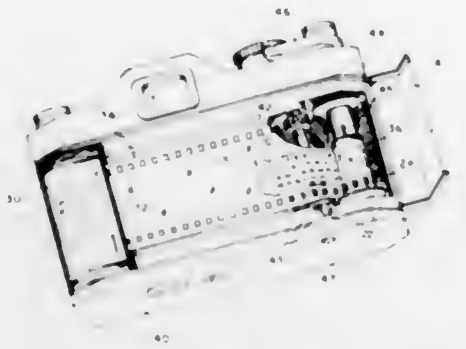
the improvement comprising:

change-over means operatively associated with said shutter means to cause only said first indicator means to effect the exposure indication when said shutter means is in said retracted position and to cause only said second indicator means to effect the exposure indication when said shutter means is in said light-intercepting position.

4,034,393
FILM REGISTRATION DEVICE

Howard K. Goldmacher, 136 Worthen Road, Lexington, Mass. 02173

Filed Feb. 24, 1976, Ser. No. 660,842
Int. Cl.^{2} G03B *19/00*
U.S. Cl. 354—354 **9 Claims**



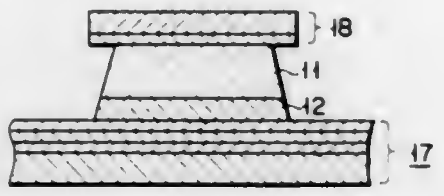
1. A device to enable a film strip packaged in a cassette to be installed in a camera, less than the total number of frames to be exposed, the film strip to be rewound into the cassette without rewinding the tongue end of the film into the cassette, the cassette to be removed from the camera, the cassette to be subsequently reinstalled into the camera, and the film strip to be advanced to the first remaining unexposed frame with correct registration with respect to the camera exposure counter and the exposed frame, comprising:

a projection disposed near the tongue end of the film strip forming a mechanical stop and arranged to contact the light trap of the film cassette during a rewind operation, thus alerting the user to cease rewinding thereby preventing rewinding of the film end into the cassette, said projection having associated index means alignable with selected teeth of the camera film drive sprocket.

4,034,394
SCHOTTKY SEMICONDUCTOR DEVICE

Hisao Kamo, Yokohama; Masahiro Kuroda, Tokyo, and Susumu Okano, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed Apr. 13, 1976, Ser. No. 676,493
Claims priority, application Japan, Apr. 16, 1975, 50-45168
Int. Cl.^{2} H01L *29/48, 29/06, 29/161, 23/48*
U.S. Cl. 357—15 **4 Claims**

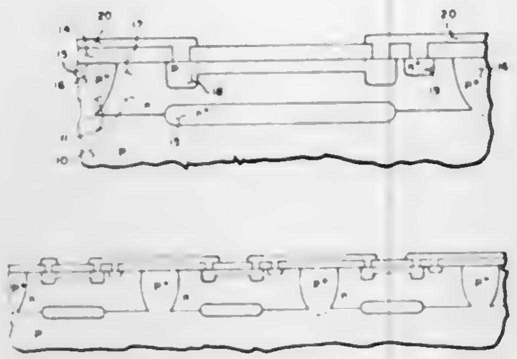


1. A Schottky semiconductor device which comprises a GaAs single crystal body, said GaAs single crystal body being of a mesa shape; a first metal layer formed of at least one selected from the group consisting of niobium, tantalum and vanadium and mounted on one side of the GaAs single crystal body to provide a Schottky junction between said first metal layer and GaAs single crystal body, a second metal layer prepared from at least one selected from the group consisting of platinum and palladium and deposited on said first metal layer; and a third metal layer formed of gold and provided on said second metal layer.

4,034,395
MONOLITHIC INTEGRATED CIRCUIT HAVING A PLURALITY OF RESISTOR REGIONS ELECTRICALLY CONNECTED IN SERIES

Mona M. Abdelrahman, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sept. 29, 1976, Ser. No. 727,743
Int. Cl.^{2} H01L *23/56, 29/66, 27/02, 27/04*
U.S. Cl. 357—28 **6 Claims**



1. A monolithic integrated circuit resistor provided in a semiconductor material having a voltage coefficient of resistance which is less than a selected value, said resistor comprising:

a set of *n* isolated regions in said semiconductor material, each of a first conductivity type;

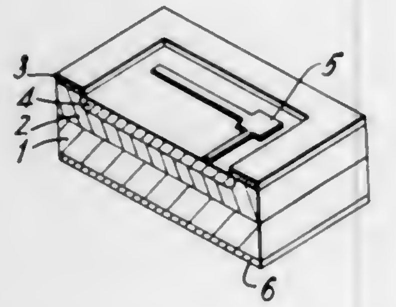
a set of *n* resistor regions, each of a second conductivity type and each being located in a corresponding one of said isolated regions, there being a semiconductor junction occurring between each said resistor region and its corresponding isolated region, each of said resistor regions having a first end and a second end; and

an interconnection network means electrically connecting each of said resistor regions in series with one another at said first and second ends in a resistor string and further adapted to electrically connect said resistor string into a circuit, said interconnection network means directly electrically connecting said first end of each said resistor region to its corresponding isolated region, a value for *n* being selected of two or more to be sufficiently large to reduce said voltage coefficient of resistance to being less than said selected value.

4,034,396
LIGHT SENSOR HAVING GOOD SENSITIVITY TO VISIBLE LIGHT

Tetsuro Nakamura, and Hideaki Suzuki, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed May 22, 1975, Ser. No. 579,848
Claims priority, application Japan, May 24, 1974, 49-59178
Int. Cl.^{2} H01L *27/14*
U.S. Cl. 357—30 **4 Claims**



1. A radiation sensing device for sensing visible light including

a semiconductor substrate of one conductivity type having an energy gap, said energy gap being between 1.80 eV and 2.0 eV and said semiconductor substrate being formed of Ga As_{1-x} P_x in which x has a value between 0.32 and 0.52;

a region of an opposite conductivity type which is formed in one surface of said substrate and extends to a depth of between 0.1 micron and 1.0 micron beneath said one surface;

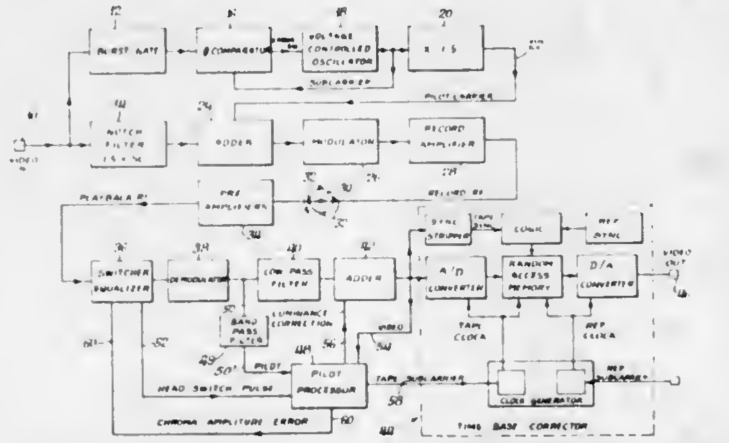
a first electrode which is electrically connected to said region; and

a second electrode which is electrically connected to said substrate whereby an electric current flows between said first and second electrodes when said region is exposed to said visible light.

4,034,397
PILOT SIGNAL LUMINANCE CORRECTION MEANS FOR VIDEO RECORDING APPARATUS

Allen J. Trost, Cupertino, Calif., assignor to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,660
Int. Cl.^{2} H04N *5/78, 5/795*
U.S. Cl. 358—8 **16 Claims**



16. In video recording and reproducing apparatus of the type which has at least one transducing head which cooperates to record on and reproduce from a recording medium and utilizes frequency modulation of a carrier signal with a video signal, said video signal having a pilot signal of predetermined frequency included therein prior to recording, a system for providing luminance error correcting signals during reproducing for combining with the video signal, comprising:

means for recovering said pilot signal from the video signal following demodulation;

discriminating means associated with said recovering means for generating a voltage output that varies in proportion to the frequency deviation of said pilot frequency caused by velocity errors;

means operatively connected to said discriminating means for adding the output thereof to the demodulated video signal to correct for luminance errors which result from said velocity errors.

4,034,398
OPTICAL AND MECHANICAL IMPROVEMENTS FOR TELEVISION PROJECTION SYSTEM

Charles Peter Hedley Sheldrake, and Timothy Gunton Blake, both of St. Peter Port, Guernsey, Channel Islands, assignors to Electro-Optiek, N.V., Curacao, Netherlands Antilles

Filed Sept. 15, 1975, Ser. No. 613,089
Claims priority, application United Kingdom, Aug. 27, 1975, 35428/75
Int. Cl.^{2} H04N *5/74, 9/31;* **H01J** *29/18, 31/10*
U.S. Cl. 358—60 **16 Claims**

1. A television projector comprising a plurality of color separation assemblages, each including, along an optic axis:

a. forwardly directed electron source means;

b. rearwardly directed phosphor target means;

c. forwardly directed converging mirror means having an aperture;

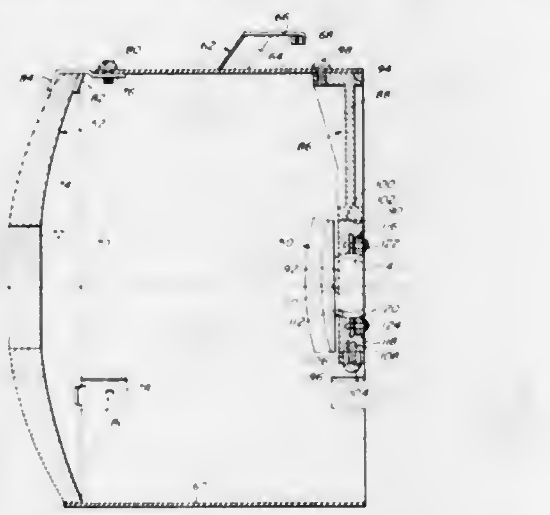
d. forwardly positioned corrector means;

e. evacuated envelope means;

f. said electron source means, said mirror means and said target means being disposed in said envelope means;

g. said electron source means, said mirror means, said target means and said corrector means being disposed along an optic axis;

h. first mounting means including only a single post portion extending radially toward said optic axis and a bearing portion having an inner cylindrical bearing surface with an axis coinciding with the optic axis;



i. second mounting means having an outer cylindrical bearing surface and an inner spherical bearing surface, said outer cylindrical bearing surface being slidable within said inner cylindrical bearing surface;

j. third mounting means having an outer spherical bearing surface being pivotally seated in said inner spherical bearing surface, said third mounting means carrying said target means;

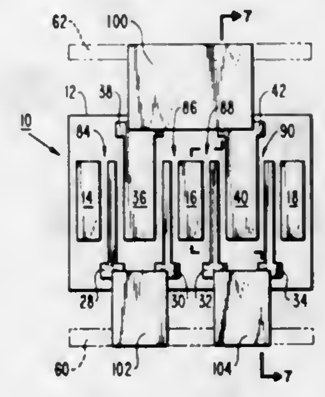
k. first screw means for locking said second mounting means with respect to said first mounting means; and

l. second screw means for locking said third mounting means with respect to said second mounting means.

4,034,399
INTERCONNECTION MEANS FOR AN ARRAY OF MAJORITY CARRIER MICROWAVE DEVICES

Ira Drukier, New York, N.Y., and Edward Mykletyn, Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 27, 1976, Ser. No. 662,001
Int. Cl.^{2} H01L *23/48, 23/02, 39/02, 27/02*
U.S. Cl. 357—68 **10 Claims**



1. In a majority carrier transistor array comprising a plurality of integrated field effect transistors situated on a substrate wherein each transistor comprises a source and a drain separated by a channel, a source contact connected to the source, a drain pad connected to the drain, and a gate pad connected

to the channel, and wherein each of the gate pads is situated adjacent a common edge of the substrate and each of the drain pads is situated adjacent another common edge, the array further comprising means for connecting each of the gate pads to a first conductive member and means for connecting each of the drain pads to a second conductive member, the improvement wherein the means for connecting each of the gate pads comprises at least ONE bilaterally symmetric first quadrangular conductive member SYMMETRICALLY interconnecting a PLURALITY of gate pads to the first conductive member, each of the gate pads being connected adjacent a COMMON EDGE of the first member, and the improvement wherein the means for connecting each of the drain pads comprises at least ONE second bilaterally symmetric conductive quadrangular member SYMMETRICALLY connecting a plurality of drain pads to the second conductive member, each of the drain pads being connected adjacent a COMMON edge of the second member.

4,034,400

APPARATUS FOR REPRODUCING GRAPHIC MATERIAL

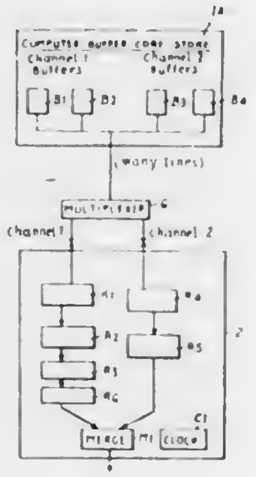
David Gregory Owen; John Vernon Ashworth, and Paul Anthony Beaufort Radcliffe, all of London, England, assignors to International Publishing Corporation Ltd., London, England

Continuation of Ser. No. 179,959, Sept. 13, 1971, abandoned. This application Dec. 26, 1973, Ser. No. 428,047

Claims priority, application United Kingdom, Sept. 23, 1970, 45398/70

Int. Cl.² H04N *1/04*

U.S. Cl. 358—75 18 Claims



1. A photo composing scanning system having an apparatus for scanning graphic material to produce an electrical output signal which is employed to reproduce the graphic information, comprising:

cathode ray tube means for producing a spot of light,

graphic-material bearing means,

a plurality of discrete items of graphic material mounted on the bearing means for sequentially illuminating elements of the items by the spot of light,

random access step-by-step scanning means connected to the cathode ray tube and operating in a random access mode for causing the spot of light to scan sequentially in step-by-step increments individual selected portions of selected items of graphic material on the bearing means,

random access starting means connected to the scanning means for beginning scanning of the spot at precisely selected predetermined orthogonal coordinates of a starting point for each selected portion,

scan length control means connected to the first means and operating in a random access mode for controlling lengths of scan lines on which the spot of light is caused to scan the selected items whereby amount of the graphic-material bearing means covered by any scan line is controlled,

step size control means connected to the scanning means and operating in a random access mode for controlling size of step-by-step increments in which the spot is advanced along the scan line, thereby controlling time intervals covered by one scan in the electrical output signal and controlling resulting magnification scale between scanned items and reproductions of said items,

spot size control means connected to the cathode ray tube means for controlling spot size, and

photosensitive detector means connected to the cathode ray tube means responsive to light which has scanned the graphic material for producing said electrical output signal modulated according to the graphic material.

4,034,401

OBSERVER-IDENTIFICATION OF A TARGET OR OTHER POINT OF INTEREST IN A VIEWING FIELD

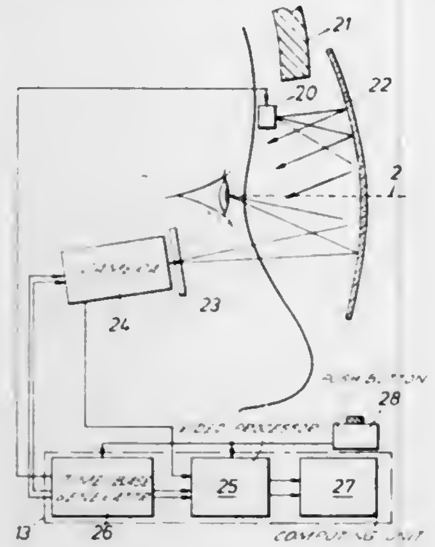
George Mann, Winchcombe, England, assignor to Smiths Industries Limited, London, England

Filed Apr. 21, 1976, Ser. No. 678,795

Claims priority, application United Kingdom, Apr. 22, 1975, 16701/75

Int. Cl.² H04N *3/00, 7/18*

U.S. Cl. 358—93 14 Claims



1. A system for providing identification of a point of interest in a field of view of an observer comprising means operable to provide a measure of eye position of the observer when the observer is looking at said point, means to define a reference point relative to said field of view, means operable to provide a measure of eye position of the observer when the observer is looking at said reference point, and means responsive to the two said measures of eye position to provide a representation identifying said point of interest relative to said reference point.

4,034,402

VIDEO SCRAMBLING SYSTEM

Jack Brian, Torrance, Calif., assignor to Hughes Aircraft Company, Culver City, Calif.

Filed July 1, 1974, Ser. No. 484,536

Int. Cl.² H04N *1/44*

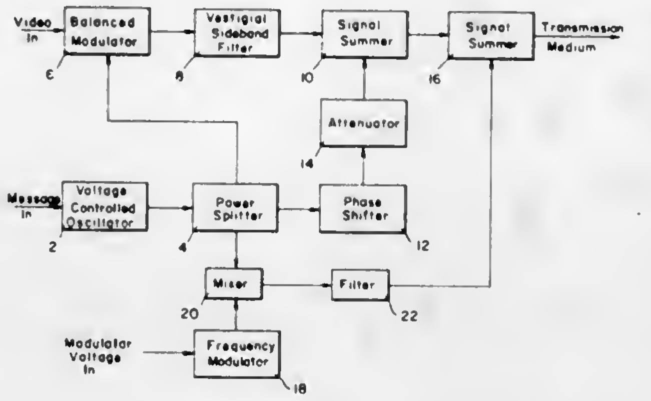
U.S. Cl. 358—114 6 Claims

1. A system for producing a scrambled television signal, comprising:

a variable frequency source of radio frequency carrier wave energy for receiving a time varying signal and producing a frequency-modulated radio frequency carrier;

balanced modulator means for amplitude modulating video information upon said frequency-modulated radio frequency carrier to produce a frequency and video amplitude modulated, suppressed carrier television signal;

phase shift means responsive to said frequency-modulated radio frequency carrier for producing a phase-shifted, frequency-modulated, radio frequency carrier; and



means for combining said suppressed carrier television signal with said phase-shifted, frequency-modulated radio frequency carrier to produce a scrambled television signal having a phase-shifted radio frequency carrier which is frequency and video amplitude modulated.

4,034,403

APPARATUS FOR POSITIONAL CONTROL OF A READING HEAD IN A DEVICE FOR REPRODUCING OPTICALLY CODED VIDEO DISK RECORDINGS

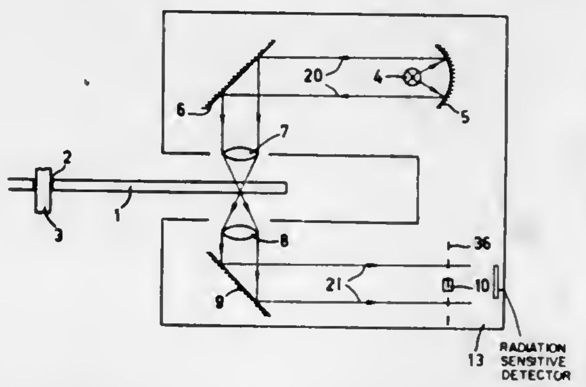
Klaas Compaan, and Gijsbertus Bouwhuis, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 229,291, Feb. 25, 1972, Pat. No. 3,833,769. This application Aug. 29, 1974, Ser. No. 501,676

Claims priority, application Netherlands, Mar. 11, 1971, 7103234

Int. Cl.² G11B *7/12, 7/16, 7/24*

U.S. Cl. 358—128 10 Claims



1. Apparatus for reading, by means of a beam of radiation, a disk-shaped information carrier which contains spirally arranged information signals coded in optical form, which apparatus comprises a source of radiation, a radiation-sensitive signal detector cell, the information carrier being disposed in the radiation path between this source and this radiation-sensitive signal detector cell, a periodic grating which consists of radiation-transmitting and radiation-absorbing stripes, optical means in the path of the radiation emanating from the carrier for imaging on the grating part of the grating-shaped structure of the carrier information track in the vicinity of the portion of this track to be read as a plurality of stripes substantially parallel to the grating stripes, and a further radiation-sensitive detection system in the path of the radiation emanating from the grating, wherein the detection system produces a focus control signal for said optical means.

4,034,404

SIGNAL COMBINING SYSTEM FOR BINARY PULSE SIGNALS

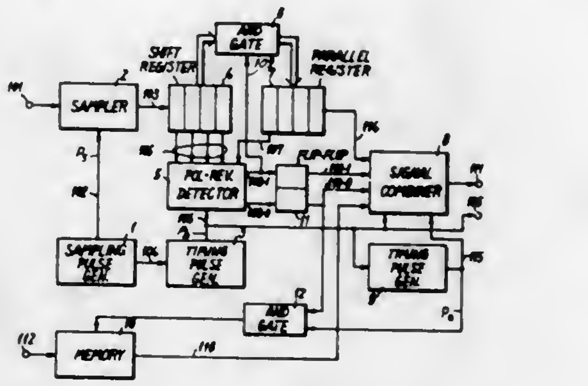
Yukio Nakagome, Yokohama, and Yasuo Fukata, Mitaka, both of Japan, assignors to Kokusai Denshin Denwa Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 459,719, April 10, 1974, abandoned. This application June 13, 1975, Ser. No. 586,722

Claims priority, application Japan, Apr. 12, 1973, 48-40832

Int. Cl.² H04J *3/16*

U.S. Cl. 358—142 3 Claims



1. A signal combining system comprising:

sampling means for successively sampling a main input signal from a main input communication circuit to obtain a binary pulse train;

first temporary storage means connected to said sampling means for temporarily and successively storing therein pulses of the binary pulse train in the form of blocks each corresponding to a certain number of bits;

polarity reversal detecting means connected to said first temporary storage means for deriving therefrom a first output and a second output depending on whether or not polarity reversal is present in the bit block stored in the first temporary storage means in comparison with the last bit in a bit block immediately preceding the same;

at least one second temporary storage means for temporarily storing therein secondary input information from at least one secondary input communication circuit; and

signal combining means connected to said first temporary storage means, and secondary temporary storage means and said polarity reversal detecting means for combining, as a converted output, the contents of said first temporary storage means in response to the first output of said polarity reversal detecting means and the contents of said second temporary storage means in response to the second output of said polarity reversal detecting means, respectively, together with a sign bit appended to each of the combined blocks of bits for indicating in which of said first and second temporary storage means the respective combined blocks of bits were stored.

4,034,405

TELEVISION FACSIMILE TRANSMISSION SYSTEM

Peter Johannes Hubertus Janssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,098

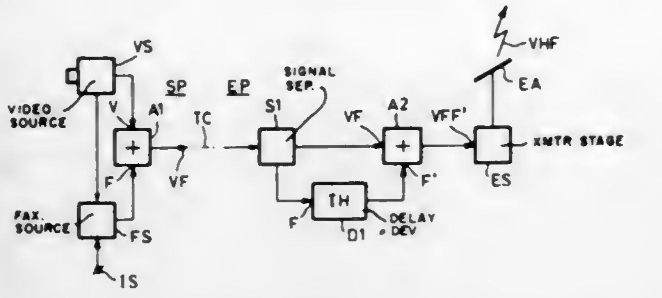
Claims priority, application Netherlands, Nov. 20, 1974, 7415098

Int. Cl.² H04N *7/08*

U.S. Cl. 358—147 5 Claims

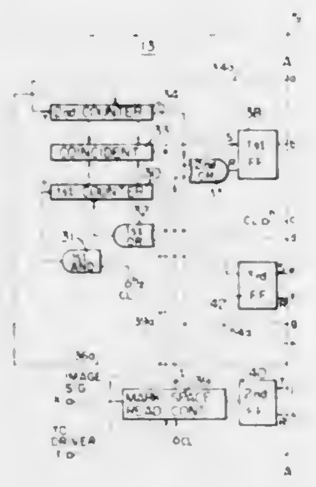
3. Television facsimile transmitter comprising, first means for transmitting facsimile information in the form of code words which occur in at least one line period in a television

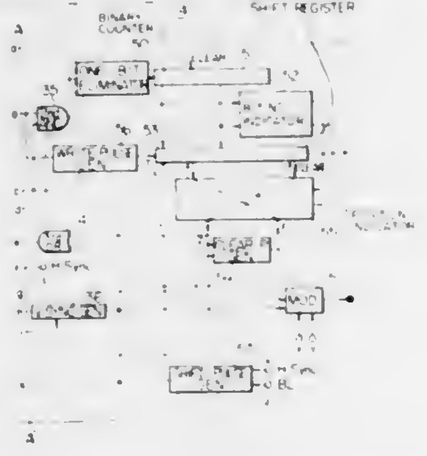
field blanking interval, and second means coupled to said first transmitting means for transmitting in at least one more successive line period in the field blanking interval the same facsimile information per line period.



4,034,406
FACSIMILE SIGNAL TRANSMISSION SYSTEM

Hiroyoshi Tsuchiya; Yukifumi Tsuda; Heijiro Hayami, and Hiroaki Kotera, all of Kawasaki, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan
Continuation of Ser. No. 310,540, Nov. 29, 1972, abandoned. This application Nov. 20, 1974, Ser. No. 525,659
Claims priority, application Japan, Nov. 29, 1971, 46-96488
Int. Cl.² H04N *1/04, 1/32, 1/38*
U.S. Cl. 358—260 8 Claims

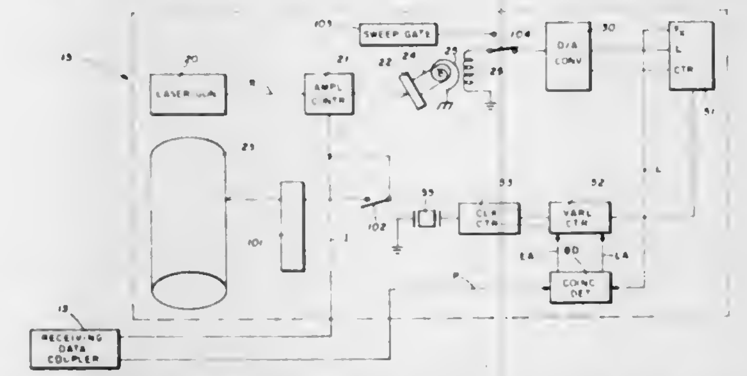




1. In a facsimile communication system for transmitting signals representative of the light levels of a two-valued object, comprising, at a transmitter station, line scanning means, means for causing said scanning means to repeatedly scan each of a plurality of line paths in said object at a predetermined rate, means for developing an image signal related to the light levels of each of said line paths, means for generating, during a portion of an individual scan of a single line path, a run length representative of a portion of said image signal, means for generating a vertical synchronization pulse, means for encoding said run length into a series of binary coded pulses, means for transmitting each said coded pulses at said predetermined rate and said vertical synchronization pulse to a receiver station, and vertical deflecting means for sequentially shifting said line paths and, at said receiver station, means for decoding said binary coded pulses to recover said run length, means operable with said recovered run length to determine one of two discrete signal levels related to said light levels, line scanning means, means for causing said line scanning means to repeatedly scan each of a plurality of line paths to successively reproduce said portion of said image signal at said predetermined rate, and vertical deflecting means actuated by said vertical synchronization pulse for sequentially shifting said line paths, the improvement wherein said vertical synchronization pulse is generated at said transmitter station at the instant the binary coded pulses representative of (n-1)th run length have been transmitted wherein "*n*" represents the maximum number of run lengths within said image signal, and means is provided at said receiver station to delay the actuation of said vertical deflecting means for a period sufficient to reconstruct *n*th run length.

4,034,407
SCAN INTERLOCK SYSTEM

Roy W. Rivers, Farmington, N.Y., assignor to Xerox Corporation, Stamford, Conn.
Filed Feb. 17, 1976, Ser. No. 658,442
Int. Cl.² H04N *1/36*
U.S. Cl. 358—267 9 Claims



1. A scan interlock system adapted to control the scan rate of a receiver with that of a transmitter, comprising:

a fixed length counter disposed in said receiver for controlling the scan deflection therein according to the bit output thereof;

timing signal generating means disposed in said transmitter for providing a timing pulse concurrent with each scan;

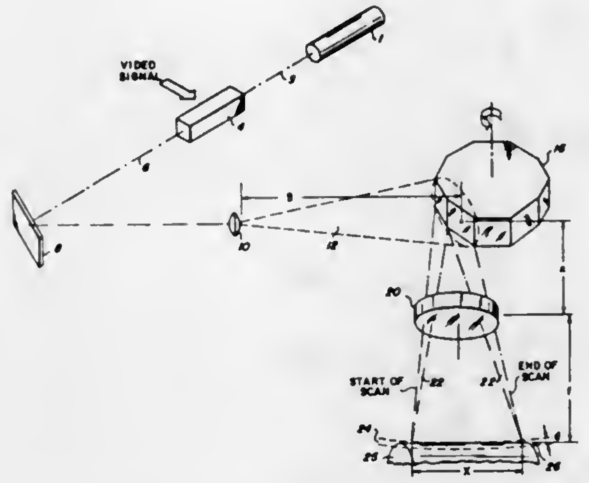
coincidence detecting means disposed in said receiver connected to receive a selected one of said bit outputs in said fixed length counter and said timing pulse for alternatively producing a first and second control signal corresponding to the lead or lag relationship between said selected one bit and said timing pulse;

a clock disposed in said receiver for generating a clock signal; and

a variable length counter disposed in said receiver and connected to receive said first and second control signals and said clock signal for producing a count signal to said fixed length counter at a first or second factor of said clock signal corresponding to the presence of said first or second control signals.

4,034,408
FLYING SPOT SCANNER

Gary K. Starkweather, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.
Continuation of Ser. No. 488,332, July 15, 1974, abandoned, and Ser. No. 519,378, Oct. 30, 1974, abandoned, which is a continuation-in-part of Ser. No. 488,332, , which is a continuation of Ser. No. 309,859, Nov. 27, 1972, abandoned. This application July 7, 1975, Ser. No. 593,891
Int. Cl.² H04N *1/10*
U.S. Cl. 358—293 6 Claims



1. An apparatus for recording the information content of an electrical signal on the surface of a light sensitive medium by means of a plurality of scan traces across said medium comprising:

means for providing a light beam of high intensity,

means for modulating said light beam of high intensity to provide a light beam modulated in accordance with the information content of an electrical signal supplied to said modulator means,

reflector means having a plurality of contiguous reflective facets rotatable about a central axis,

means for rotating said reflector means about said central axis, and

lens means disposed in the path of said modulated light beam for both (1) expanding the cross-sectional area of said modulated light beam such that said expanded beam illuminates more tha two contiguous facets of said reflector means at any given instant of time during each scan trace to provide a high duty cycle and (2) imaging said expanded beam to a substantially focused spot at the surface of said light sensitive medium, said lens means being disposed relative to said reflector means such that said modulated light beam travels in a plane substantially orthogonal to said central axis during the expansion thereof and during the imaging thereof to said focused spot.

4,034,409
METHOD AND APPARATUS FOR MAGNETICALLY RECORDING GRAPHIC INFORMATION

Sidney Levy, 145 W. Cuthbert Blvd., Oaklyn, N.J. 08107
Filed Apr. 16, 1975, Ser. No. 568,705
Int. Cl.² H04N *1/22*
U.S. Cl. 358—301 27 Claims

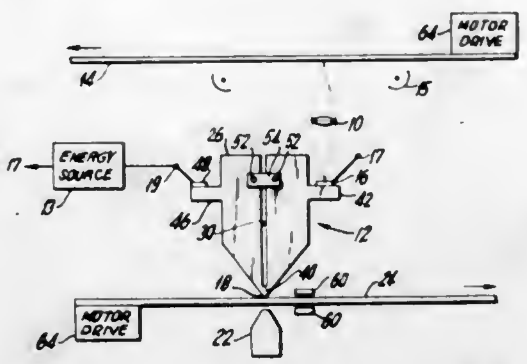
1. An imaging apparatus for line by line recording of graphic information from an original onto a receiving surface, comprising:

a. means for providing a magnetic field;

b. means for shaping the magnetic field to a substantially linear configuration;

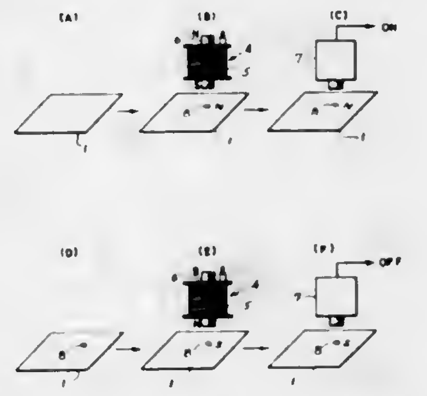
c. electrical means for simultaneously varying the intensity of the linear magnetic field along the length of said line in accordance with the variations of light and shade information contained in the full width of a corresponding line of the original graphic information, and

d. toner supply means positioned in juxtaposition to said shaping means and in magnetically attractable relation to said field for causing transfer of a full line of toner material from said toner supply means to the receiving surface in quantities along said line corresponding to the variations of the magnetic filed intensity along said line.



4,034,410
MAGNETIC RECORDING MEDIUM

Kazuo Suzuki, and Shinichiro Akuta, both of Ohtsu, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Apr. 10, 1975, Ser. No. 566,720
Claims priority, application Japan, Apr. 10, 1974, 49-41303
Int. Cl.² G11B *5/62, 5/00*
U.S. Cl. 360—55 2 Claims



1. A magnetic recording system comprising a magnetic sheet of domain sized particles of at least one member selected from the group consisting of barium ferrite, strontium ferrite and lead ferrite, uniformly dispersed in an organic binder, and a ferromagnetic plate bonded to one surface of said sheet, the other surface of said sheet being magnetizable at selected locations, means comprising an electromagnet having a substantially rod shaped core for magnetizing said particles at said selected locations in said other surface in a direction substantially perpendicular to said other surface, thereby to store information in the orientation of magnetic flux in perpendicular magnetic particles, means for detecting only one type of magnetic pole at said selected locations, and means comprising an electromagnet having a substantially rod shaped core for erasing the information stored in said perpendicularly oriented magnetic particles at all locations by changing the type of magnetic pole to be non-detectable by said means for detecting.

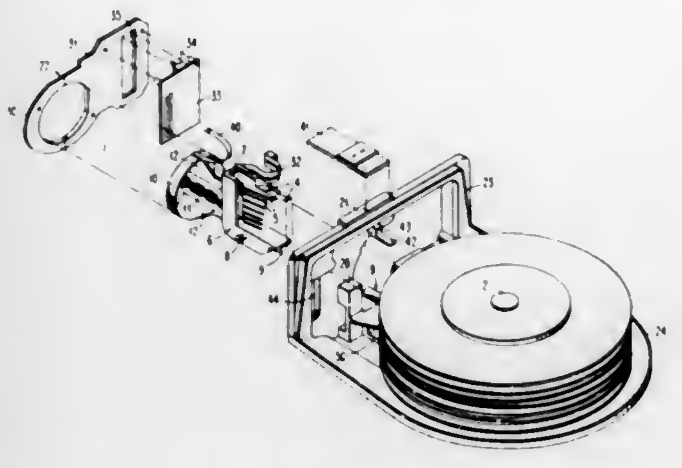
4,034,411
MAGNETIC DISK INFORMATION STORAGE APPARATUS

Edward Joseph Kraemer, and Tulsidas Ramlal Patel, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed July 11, 1975, Ser. No. 595,251

Int. Cl.² G11B *5/012, 23/02, 21/08*

U.S. Cl. 360—98 **35 Claims**



1. A housing assembly comprising part of a magnetic disk information storage apparatus and adapted to receive therein a removable head/disk subassembly comprising a rigid support structure, spindle means rotatably mounted in said support structure, magnetic disk means mounted on said spindle means for concentric rotation therewith, magnetic head means in transducing relation with said disk means, carriage means supporting said head means and being mounted on said support structure for movement alone a linear path whereby to carry said head means to different positions relative to said means, hollow rigid electrically conductive coil means supported on said carriage means, and means for electrically connecting said coil means to said housing assembly;

said housing assembly comprising registration and guide means adapted to guide such a head/disk assembly parallel to the carriage means linear path during mounting of the head/disk assembly in said housing assembly and to define an operative position of the subassembly therein,

means for supplying electric current to such a head/disk assembly by way of the connecting means thereof,

drive means for providing rotary drive to the spindle means of such a head/disk assembly when mounted in its operative position in said housing assembly, and

a magnetizable structure including a pair of magnetic pole means defining an open ended magnetic flux gap, extending parallel to said registration and guide means and adapted to receive the coil means therein when such a head/disk assembly is guided into its operative position in said housing assembly, so as to constitute a linear electromagnetic actuator for moving said carriage along its linear path in response to current from said supply means.

4,034,412
MAGNETIC TRANSDUCER APPARATUS WITH DAMPED SPRING ACTION

Curtiss A. Smith, El Cajon, Calif., assignor to Davis-Smith Corporation, San Diego, Calif.

Filed Jan. 19, 1971, Ser. No. 107,797

Int. Cl.² G11B *5/60, 17/34*

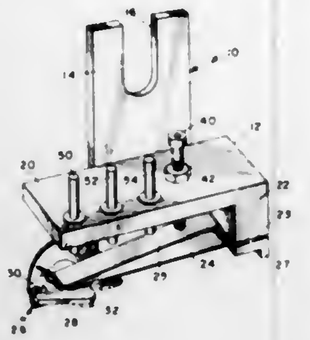
U.S. Cl. 360—103 **13 Claims**

1. In a magnetic transducer unit having a frame, and a magnetic recording head unit mounted for limited movement relative to said frame, wherein said head unit is to be supported a minimal distance away from a moving magnetic recording surface by the air carried along with said surface, said spacing to be substantially maintained despite irregularities in the movement of said surface that would otherwise tend to induce oscillation in said head unit, wherein the improvement comprises:

bias means including a loading spring,

a supporting spring which cooperates with said bias means for supporting said head unit at said minimal distance,

damping means for damping said oscillations of said head induced by said moving magnetic recording surface,



said damping means comprising a substantial area of contact maintained during relative movement of substantially parallel surfaces on said loading spring and said head unit,

whereby progressively increasing oscillations are eliminated to produce a head unit that closely follows said moving magnetic recording surface at a minimal spacing therefrom.

4,034,413
MAGNETIC HEAD LIFTING DEVICE

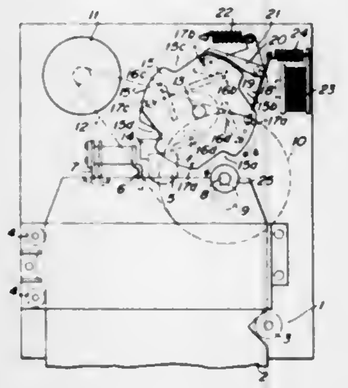
Kumeo Tahara, Iwaki, Japan, assignor to Motorola, Inc., Schaumburg, Ill.

Filed Aug. 29, 1975, Ser. No. 608,854

Claims priority, application Japan, Sept. 5, 1974, 49-106992[U]

Int. Cl.² G11B *21/08, 5/55*

U.S. Cl. 360—106 **10 Claims**



1. A magnetic head lifting device adaptable for use in a multi-track tape player, comprising:

a rotary body having a peripheral edge with indented portions therein;

ring means rotatable in association with a capstan shaft and positioned for rotating said rotary body by engaging the peripheral edge of said rotary body and disengaging said edge at said indented portions thereof,

urge member means for selectively urging said rotary body in a predetermined direction of rotation;

stopper means for selectively engaging said rotary body and preventing the rotation of said rotary body by said urge member means;

actuation means for disengaging said stopper means from said rotary body and permitting the rotation of said rotary body by said urge means, the rotation of said rotary body thereby causing said ring means to engage the peripheral edge of said rotary body;

anti-excessive rotation means including a member having its position controlled by said actuation means for selectively engaging said rotary body and positively preventing an excessive rotation of said rotary body by said ring means, and

stepped surface cam means integrally associated with the rotation of said rotary body for moving the position of the magnetic head.

4,034,414
MAGNETIC HEAD

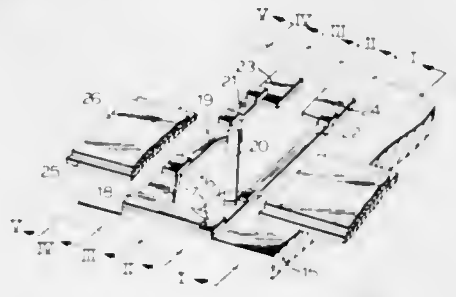
Nobuyuki Kaminaka, Moriguchi; Kenji Kanai, Neyagawa; Norimoto Nouchi, Katano, and Noboru Nomura, Kyoto, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 3, 1975, Ser. No. 637,478

Claims priority, application Japan, Dec. 4, 1974, 49-139785; Dec. 4, 1974, 49-139786; Dec. 4, 1974, 49-139787; Dec. 4, 1974, 49-139788; Dec. 4, 1974, 49-139789; Dec. 4, 1974, 49-139790; Dec. 4, 1974, 49-139793; Dec. 4, 1974, 49-139791

Int. Cl.² G11B *5/12, 5/30*

U.S. Cl. 360—113 **8 Claims**



1. A magnetic head which comprises: a non-magnetic substrate, a first thin ferromagnetic plate member on said non-magnetic substrate; a non-magnetic layer on said first thin ferromagnetic plate member; a second thin ferromagnetic plate member on said non-magnetic layer, the plate members, the non-magnetic layer and the substrate having edges aligned and the non-magnetic layer separating the plate members in a direction perpendicular to said substrate for defining a gap between said plate members for facing a recording medium; the ferromagnetic plate members having end portions extending away from said aligned edges on said substrate and having signal output means coupled to said end portions, the end portion of one of said plate members being spaced along said substrate from the end portion of said other plate member; a magnetoresistance effect element connected between the end portions of said plate members remote from said aligned edges for magnetically linking the ferromagnetic plate members; and bias plate means overlying said plate members and said magnetoresistance effect element and parallel to the surface of the non-magnetic substrate.

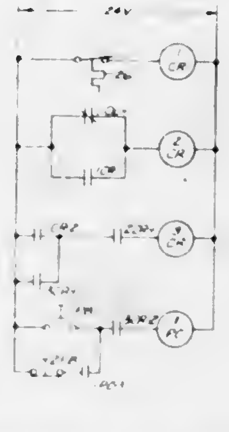
4,034,415
THERMAL PROTECTION FOR D.C. MOTORS

James David Suer, Cincinnati, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Mar. 15, 1976, Ser. No. 666,923

Int. Cl.² H02H *7/085*

U.S. Cl. 361—24 **1 Claim**



1. A control apparatus for a direct current motor including a casing and an armature, the casing being susceptible to heating from the armature, the motor having a substantial thermal inertia and adapted for use alternatively in intermittent and continuous duty cycles, the control apparatus comprising in combination:

a. an overload heater operable in response to motor current and having a thermal inertia less than that of the motor;

b. a temperature sensor mounted on and sensitive to the temperature of the casing for operation;

c. a power relay operable one way and the other for connecting electrical energy to the motor;

d. a control relay having contacts in circuit to control the condition of operation of the power relay;

e. a circuit having a pair of parallel paths to the control relay for energization thereof;

f. means in one of the parallel paths operated by the heater, and

g. means in the other of the parallel paths operated by the sensor whereby electrical energy is disconnected from the motor in response to both said heater and said sensor at the same time.

DESIGN PATENTS

GRANTED JULY 5, 1977

ERRATA

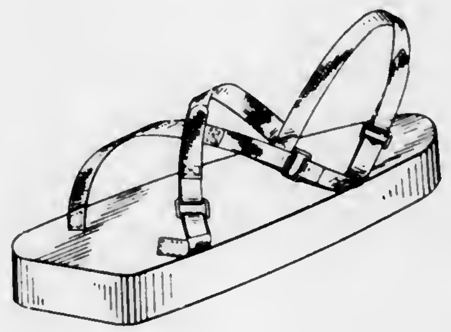
For CLASS	See PATENT NO.
015-112	244,929
014-010	244,943
013-024	244,944
024-021	244,945
014-005	244,961
014-075	244,962
014-070	244,963

DESIGNS

JULY 5, 1977

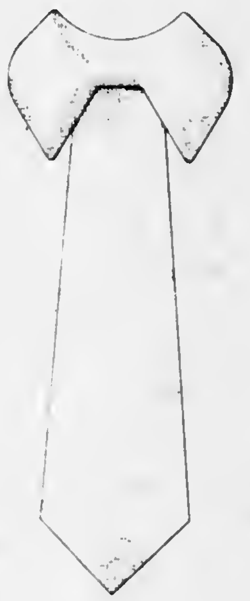
244,886
SHOE SUPPORT
Donald A. Perser, Northbrook, and Michael Franz Helmut Cook, Chicago, both of Ill., assignors to Ballert Orthopedic Corporation, Chicago, Ill.
Filed Sept. 15, 1975, Ser. No. 613,277
Term of patent 14 years
Int. Cl. D2—*04*

U.S. Cl. D2—264



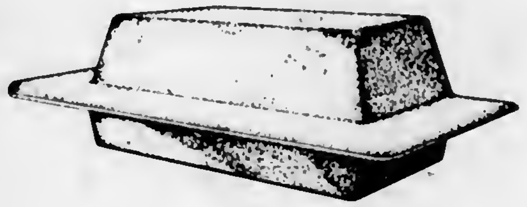
244,887
NECKWEAR
Walter W. Haines, Sr., 1511 Oakdale St., Philadelphia, Pa. 19132
Filed Jan. 20, 1975, Ser. No. 542,569
Term of patent 14 years
Int. Cl. D2—*05*

U.S. Cl. D2—351



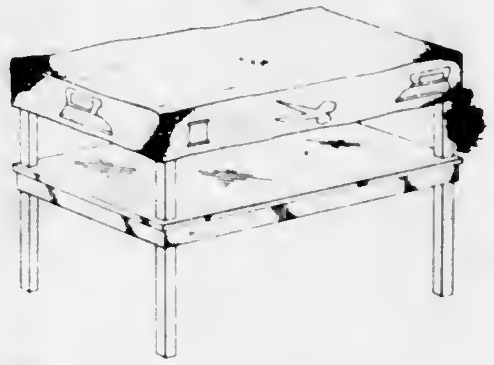
244,888
COMBINED TRAFFIC CONTROL CABINET AND PUBLIC TRANSPORTATION BENCH
Gregory Shafer, 9847 W. 75th Way, Arvada, Colo. 80005, and Joseph P. Serafini, 737 Zinnia, Golden, Colo. 80401
Filed Sept. 10, 1975, Ser. No. 611,899
Term of patent 14 years
Int. Cl. D6—*06*

U.S. Cl. D6—4



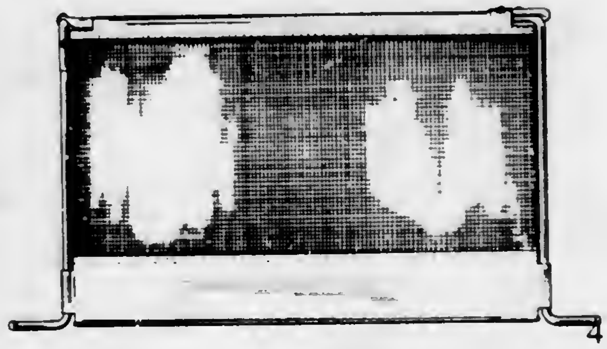
244,889
COMBINED SEWING TABLE AND COVER THEREFOR
Louise I. Neuschwander, 3021 SE. Francis St., Portland, Oreg. 97221
Filed Jan. 9, 1976, Ser. No. 647,742
Term of patent 14 years
Int. Cl. D6—*03*

U.S. Cl. D6—4



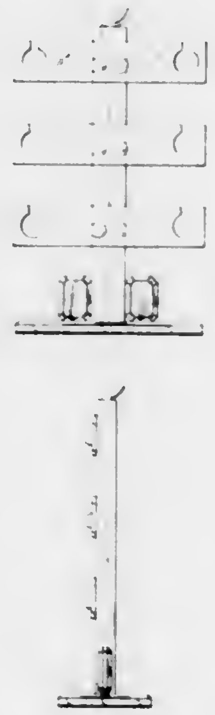
244,890
PLAYPEN
Ruey C. Adams, Columbus, Ind., assignor to Cosco, Inc., Columbus, Ind.
Filed Feb. 5, 1976, Ser. No. 655,470
Term of patent 14 years
Int. Cl. D6—*01*

U.S. Cl. D6—13



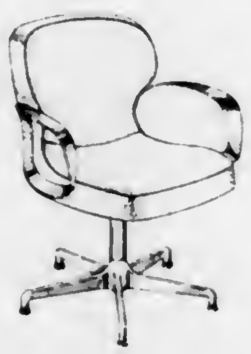
244,891
DISPLAY RECEPTACLE FOR EYEGLASSES OR THE LIKE

Stefan Engelmann, 61-38 164 St., Flushing, N.Y. 11365
Filed Aug. 14, 1975, Ser. No. 604,706
Term of patent 14 years
Int. Cl. D20—*02*
U.S. Cl. D6—24



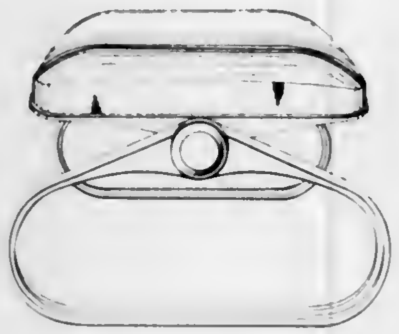
244,892
SWIVEL CHAIR

Earl H. Koepke, Sturgis, Mich., assignor to Harter Corporation, Sturgis, Mich.
Filed Feb. 26, 1976, Ser. No. 661,704
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—31



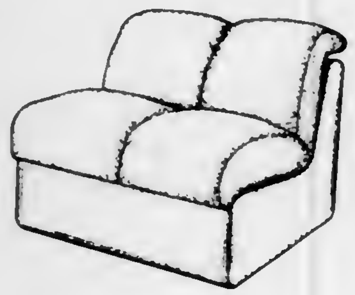
244,893
OTTOMAN

Hans Diehl, Haus Haufroos 6, 5452 Oberrohrdorf, Switzerland
Filed Feb. 5, 1976, Ser. No. 655,543
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—36



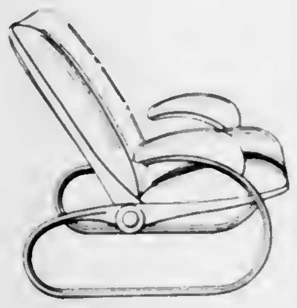
244,894
SETTEE

Robert Tillberg, Viken, Sweden, assignor to Overman AB, Tranas, Sweden
Filed Oct. 15, 1975, Ser. No. 622,470
Claims priority, application Sweden, May 6, 1975, 75973
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—47



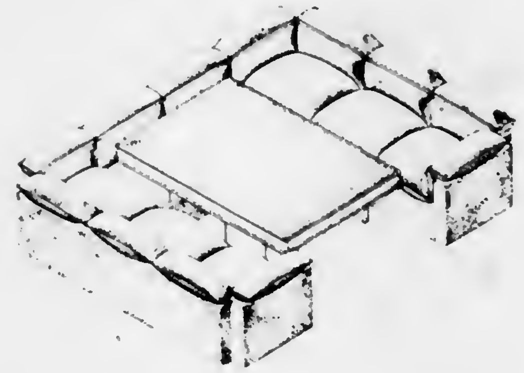
244,895
CHAIR

Hans Diehl, Haus Haufroos 6, 5452 Oberrohrdorf, Switzerland
Filed Feb. 5, 1976, Ser. No. 655,544
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—56



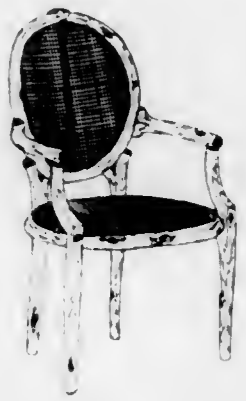
244,896
SOFA BED

Erich Grachten, Detmold, Germany, assignor to Burris Industries, Incorporated, Lincolnton, N.C.
Filed Oct. 22, 1975, Ser. No. 624,528
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—63



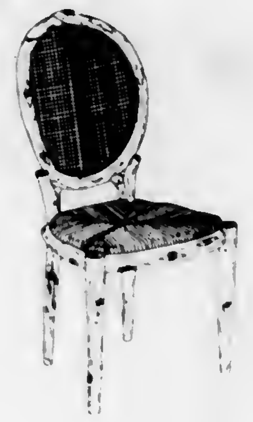
244,897
CHAIR

Peter A. Rocchia, San Francisco, Calif., assignor to The Wicker Works
Filed Mar. 3, 1976, Ser. No. 663,284
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—67



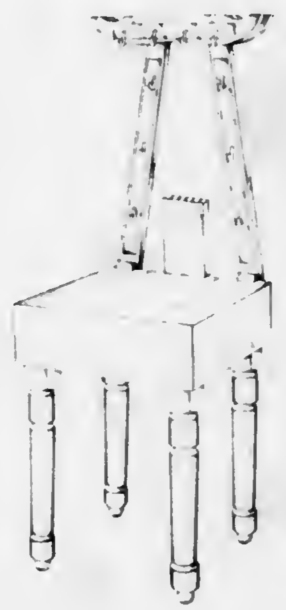
244,898
CHAIR

Peter A. Rocchia, San Francisco, Calif., assignor to The Wicker Works
Filed Mar. 30, 1976, Ser. No. 671,848
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—74



244,899
COMBINED CARVING BLOCK AND CUTLERY RACK

Carl Brandenfels, Scappoose, Oreg., assignor to HT Products, Inc., Scappoose, Oreg.
Filed Feb. 2, 1976, Ser. No. 654,362
Term of patent 14 years
Int. Cl. D6—*03*
U.S. Cl. D6—157



244,900
TABLE

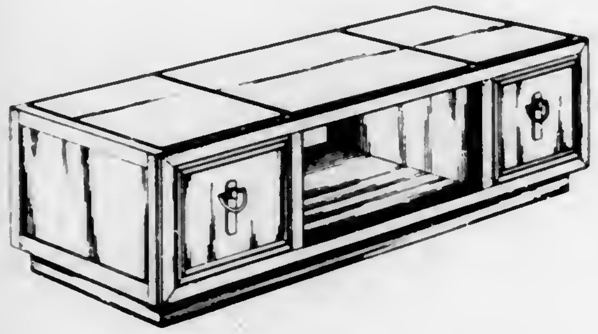
Leon E. Waxman, 11489 Laurelcrest Drive, Studio City, Calif. 91604

Filed Oct. 20, 1975, Ser. No. 623,824

Term of patent 3½ years

Int. Cl. D6—*03*

U.S. Cl. D6—179



244,901
HANGER BODY

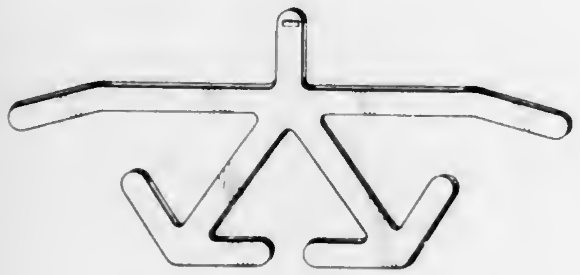
Yutaka Matsumoto, No. 21-1, 1-chome, Higashisugano, Ichikawa, Chiba, Japan

Filed Sept. 10, 1975, Ser. No. 611,990

Term of patent 14 years

Int. Cl. D6—*08*

U.S. Cl. D6—257



244,902
SALAD SERVER

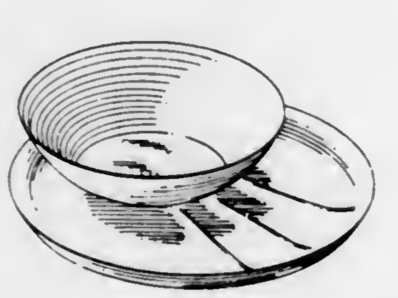
Gary C. Vonder Haar, Rte. 4, Box 50C, Little Falls, Minn. 56345

Filed Oct. 6, 1975, Ser. No. 620,214

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—3



244,903
FRANKFURTER ROASTING STICK

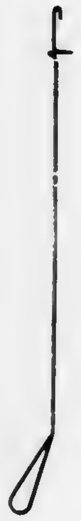
Oliver W. Hildebrand, Florissant, Mo., assignor to Wirecraft Manufacturing Company, St. Louis, Mo.

Filed Nov. 20, 1975, Ser. No. 633,941

Term of patent 14 years

Int. Cl. D7—*04*

U.S. Cl. D7—106



244,904
DEVICE FOR SEVERING HYPODERMIC NEEDLES AND THE LIKE

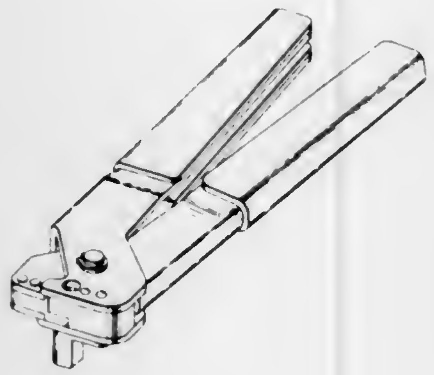
Richard Roy Brunner, Hershey, and Gabriel Boenzli, Newport, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 10, 1976, Ser. No. 694,518

Term of patent 14 years

Int. Cl. D8—*03*

U.S. Cl. D8—58



244,905
SUPPORT FOR AN EGG OR THE LIKE

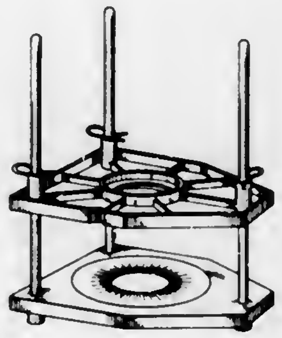
Karl Wach, 4271 Dewey Ave., Rochester, N.Y. 14616

Filed Mar. 28, 1975, Ser. No. 563,074

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—72



244,906
CONSOLE DESIGN

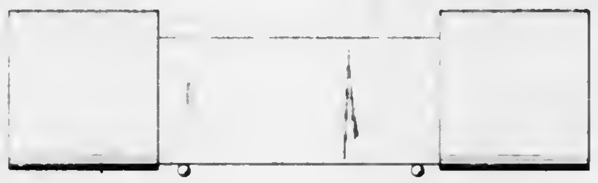
Antony Richard Gibbs, 27 Lyme Farm Road, Lee Green, London SE. 12, England

Filed Apr. 3, 1975, Ser. No. 564,862

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—181



244,907
SKI CLAMP

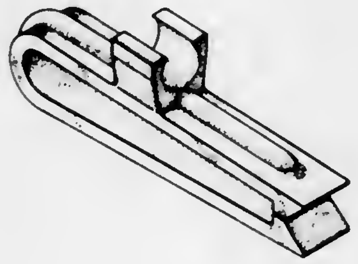
Reinhold G. Link, 8510 Dog Leg Road, Dayton, Ohio 45414

Filed June 11, 1975, Ser. No. 585,977

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—395



244,908
NUT

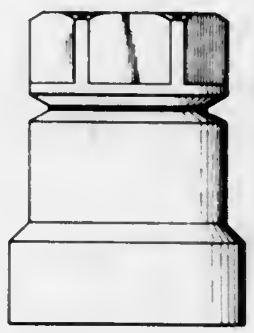
Edwin E. Hatter, Torrance, and Bartrom W. Pierce, San Pedro, both of Calif., assignors to Hi-Shear Corporation, Torrance, Calif.

Filed Sept. 8, 1975, Ser. No. 611,074

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—397



244,909
NUT

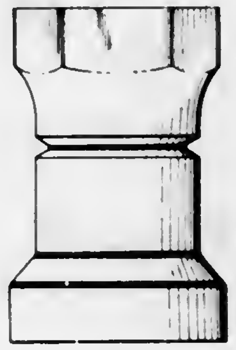
Frank L. Gill, Palos Verdes Peninsula, Calif., assignor to Hi-Shear Corporation, Torrance, Calif.

Filed Sept. 8, 1975, Ser. No. 611,075

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—397



244,910
HOOK

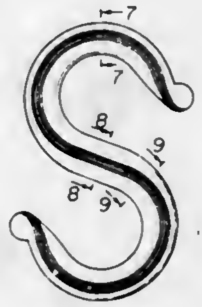
Lee Richard Chasen, Port Chester, and Ruediger Einhorn, Katonah, both of N.Y., assignors to Coats & Clark, Inc., Stamford, Conn.

Filed Jan. 14, 1976, Ser. No. 648,963

Term of patent 14 years

Int. Cl. D8—*08*

U.S. Cl. D8—367



244,911

BATTERY WATER DISPENSER

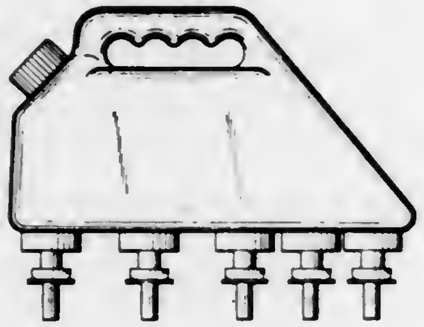
Clarence A. Herbst, Sr., Park Ridge, and Harvey I. Kling, Clarendon Hills, both of Ill., assignors to Efficiency Dispensers Corporation, Skokie, Ill.

Filed Mar. 5, 1976, Ser. No. 664,351

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—53



244,912

BOTTLE

Diego Zamora Conesa, Avda. Colon 146, San Antonio Abad (Cartagena-Murcia), Spain

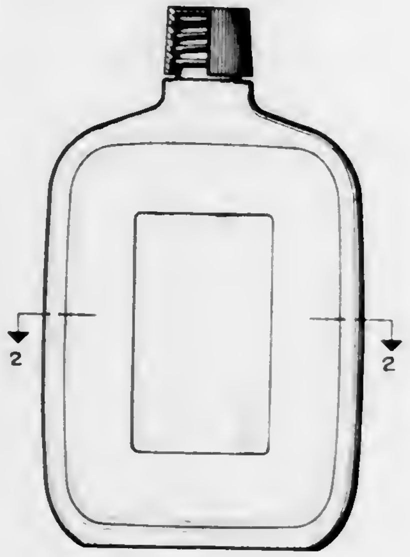
Filed Oct. 15, 1971, Ser. No. 189,807

The portion of the term of this patent subsequent to Jan. 30, 1980, has been disclaimed.

Term of patent 14 years

Int. Cl. D9—*01*

U.S. Cl. D9—167



244,913

MOBILE KITCHEN TABLE

Carl Brandenfels, Scappoose, Oreg., assignor to H. T. Products, Inc., Scappoose, Oreg.

Filed Feb. 4, 1976, Ser. No. 655,112

Term of patent 14 years

Int. Cl. D6—*03*

U.S. Cl. D6—179

244,914

BAG

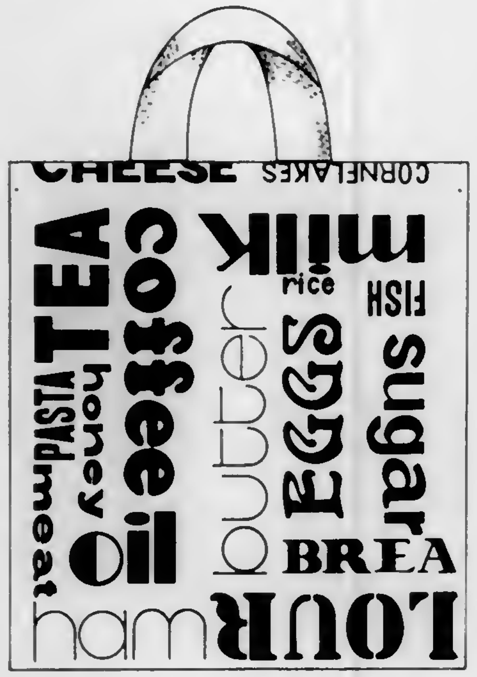
Douglas John Nicol, 175 Kirkdale, Sydenham, London SE26 4AH, England

Filed Mar. 31, 1975, Ser. No. 563,355

Term of patent 14 years

Int. Cl. D9—*05*

U.S. Cl. D9—249



244,915

END CLOSURE FOR A CONTAINER

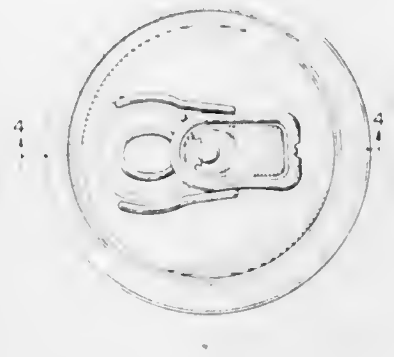
Daniel F. Cudzik, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.

Filed Aug. 20, 1975, Ser. No. 606,310

Term of patent 14 years

Int. Cl. D9—*07*

U.S. Cl. D9—255



244,916

DIGITAL WRISTWATCH

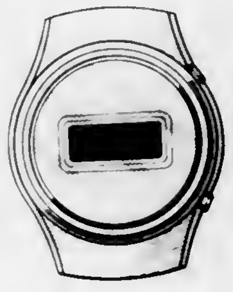
Naohiro Ueno, Tokyo, Japan, assignor to Bear Co., Ltd., Tokyo, Japan

Filed Sept. 3, 1975, Ser. No. 610,507

Term of patent 14 years

Int. Cl. D10—*02*

U.S. Cl. D10—38



244,917

AUTOMOBILE ACTUATED WALL PROXIMITY INDICATOR

David E. Lewis, 509 Olympia Way, Orange, Calif. 92669

Filed Jan. 28, 1976, Ser. No. 653,273

Term of patent 14 years

Int. Cl. D10—*06*

U.S. Cl. D10—109

244,918

SAFETY REFLECTOR FOR BICYCLES OR THE LIKE

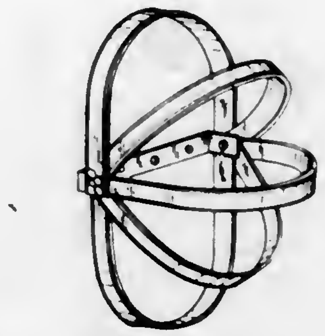
John V. Kitrell, 1830 N. 49th, Lincoln, Nebr. 68504

Filed Oct. 7, 1976, Ser. No. 730,694

Term of patent 14 years

Int. Cl. D10—*111*

U.S. Cl. D10—111



244,919

DIAMOND RING

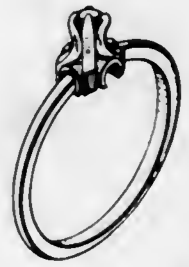
Erwin Kaluschny, Wayne, N.J., assignor to Jabel Incorporated, Irvington, N.J.

Filed Apr. 16, 1976, Ser. No. 677,659

Term of patent 14 years

Int. Cl. D11—*01*

U.S. Cl. D11—36



244,920

EARRING

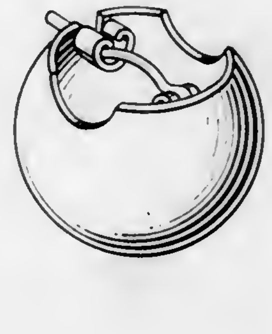
Pepi G. Kelman, 19264 Pacific Coast Highway, Malibu, Calif. 90265

Division of Ser. No. 637,852, Dec. 5, 1975, Pat. No. D242,573. This application Aug. 16, 1976, Ser. No. 714,376

Term of patent 14 years

Int. Cl. D11—*01*

U.S. Cl. D11—75



244,921
COMBINED ARMORED VEHICLE BODY AND GUN-TURRET

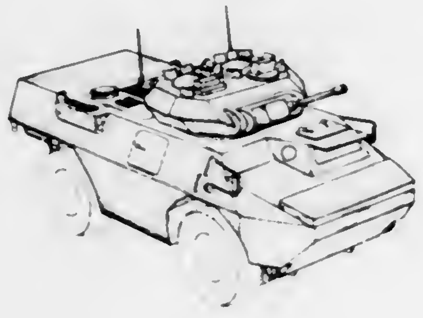
Jacques Longeau, Suresnes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem, Suresnes, France

Filed Oct. 8, 1975, Ser. No. 620,780

Claims priority, application France, Apr. 10, 1975, 75.73782

Term of patent 14 years
Int. Cl. D12—*13*

U.S. Cl. D12—12



244,922
COMBINED ARMOURED VEHICLE BODY AND GUN-TURRET

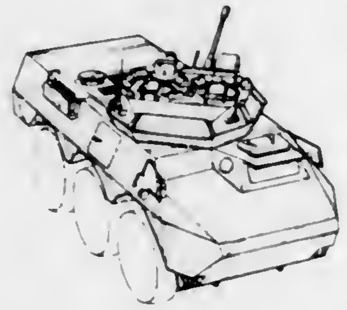
Jacques Longeau, Suresnes, France, assignor to Societe Anonyme de Vehicules Industries et d'Equipements Mecaniques Saviem, Suresnes, France

Filed Oct. 8, 1975, Ser. No. 620,781

Claims priority, application France, Apr. 10, 1975, 75.73783

Term of patent 14 years
Int. Cl. D12—*13*

U.S. Cl. D12—12



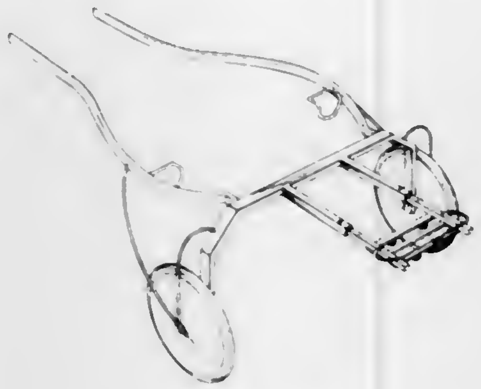
244,923
SULKY

George Ernest Jones, Toronto; Antonio Tangreda, Weston, and Gerardino Tangreda, Etobicoke, all of Canada, assignors to Olympic Metal Products Limited, Toronto, Canada

Filed Apr. 20, 1976, Ser. No. 678,639

Term of patent 14 years
Int. Cl. D12—*01*

U.S. Cl. D12—19



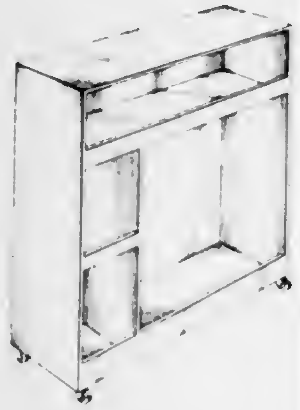
244,924
STORAGE CART FOR ATHLETIC EQUIPMENT

Helen E. Scheibner, 5401 NE. 46th St., Vancouver, Wash. 98661

Filed Aug. 13, 1975, Ser. No. 604,179

Term of patent 14 years
Int. Cl. D12—*02*

U.S. Cl. D12—29



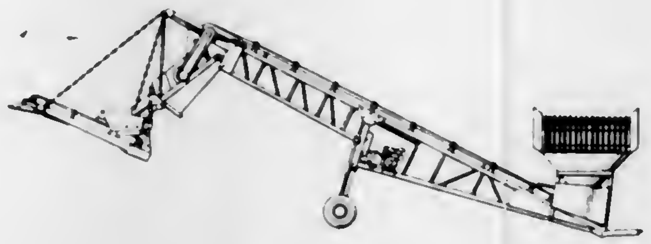
244,925
SCREENING APPARATUS FOR QUARRYING

Patrick O'Neill; Patrick Joseph Douglas, and Michael Lee Mallaghan, all of Dungannon, Ireland, assignors to Powerscreen International Limited

Filed Nov. 11, 1975, Ser. No. 630,774

Term of patent 14 years
Int. Cl. D12—*05*

U.S. Cl. D12—58



244,926
TIRE FOR A VEHICLE WHEEL

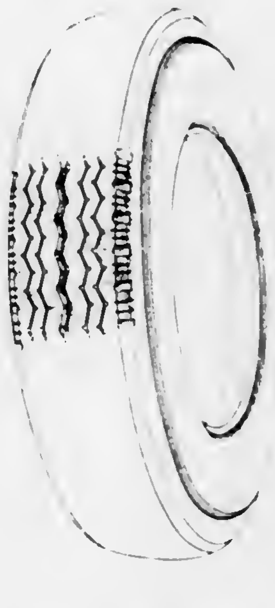
George McIntyre Robertson, Sutton Coldfield, England, assignor to Dunlop Limited, London, England

Filed May 4, 1976, Ser. No. 683,051

Claims priority, application United Kingdom, Dec. 12, 1975, 973626/75

Term of patent 14 years
Int. Cl. D12—*15*

U.S. Cl. D12—143



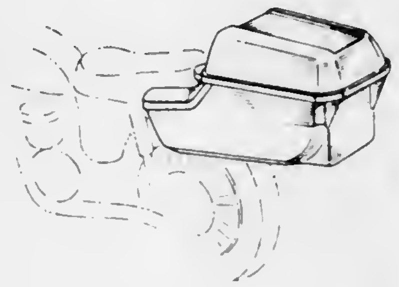
244,927
MOTORCYCLE UTILITY BOX

Edmund H. Anthon, III, 1385 Greenwich, San Francisco, Calif. 94109

Filed Dec. 24, 1975, Ser. No. 644,107

Term of patent 14 years
Int. Cl. D12—*11*

U.S. Cl. D12—158



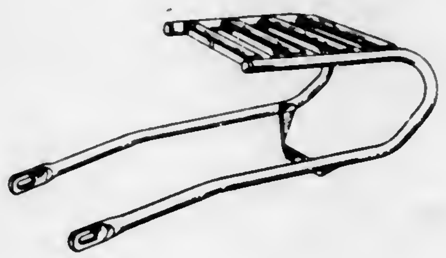
244,928
MOTORCYCLE LUGGAGE RACK

James P. Oakes, Los Angeles, Calif., assignor to Circle Industries, Inc., City of Industry, Calif.

Filed Feb. 19, 1976, Ser. No. 659,347

Term of patent 14 years
Int. Cl. D12—*11*

U.S. Cl. D12—158



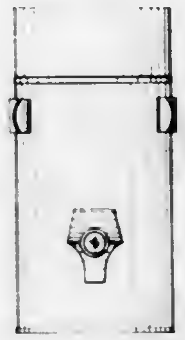
244,929
COMBINED LIQUID DISPENSER AND MOUNTING BRACKET

Robert H. Armstrong, 1507 Coburg Road, Eugene, Oreg. 97401

Filed Feb. 9, 1976, Ser. No. 656,139

Term of patent 14 years
Int. Cl. D15—*08*

U.S. Cl. D15—112



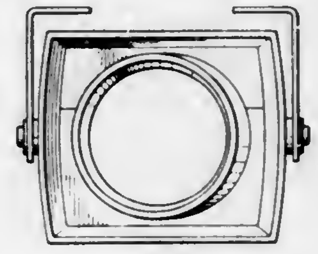
244,930
INSTRUMENT DISPLAY HOUSING OR SIMILAR ARTICLE

John R. Patterson, 4915 Glenwood Drive, Williamsville, N.Y. 14221

Filed Sept. 22, 1975, Ser. No. 615,673

Term of patent 14 years
Int. Cl. D12—*16*

U.S. Cl. D12—192



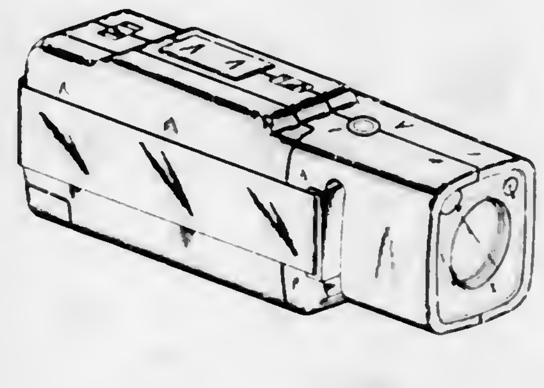
244,931
MOTION PICTURE CAMERA

Paul D. Miller, New York, N.Y., and Dale Caldwell, Evanston, Ill., assignors to GAF Corporation, New York, N.Y.

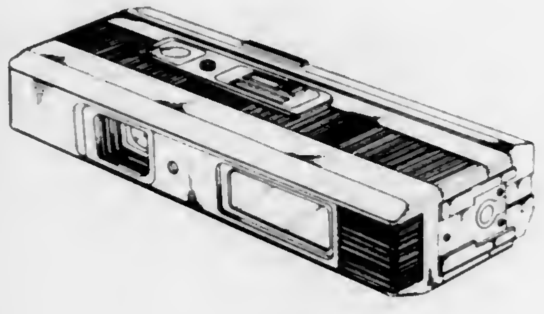
Filed Dec. 18, 1975, Ser. No. 642,156

Term of patent 14 years
Int. Cl. D16—*01*

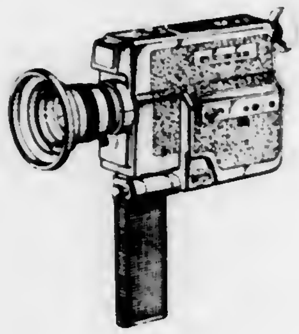
U.S. Cl. D16—3



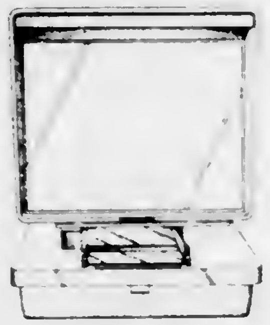
244,932
CAMERA
Hiroshi Fukuda, Tokyo, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan
Filed May 3, 1976, Ser. No. 682,535
Claims priority, application Japan, Feb. 4, 1976, 51-3294
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—06



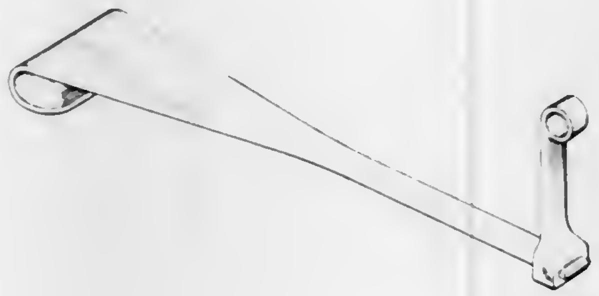
244,933
MOTION PICTURE CAMERA
Toru Yatabe; Yoshio Komine, both of Yokohama, and Ichiro Shimizu, Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Dec. 10, 1975, Ser. No. 639,467
Claims priority, application Japan, June 10, 1975, 50-23170
Term of patent 14 years
Int. Cl. D16—*01*
U.S. Cl. D16—04



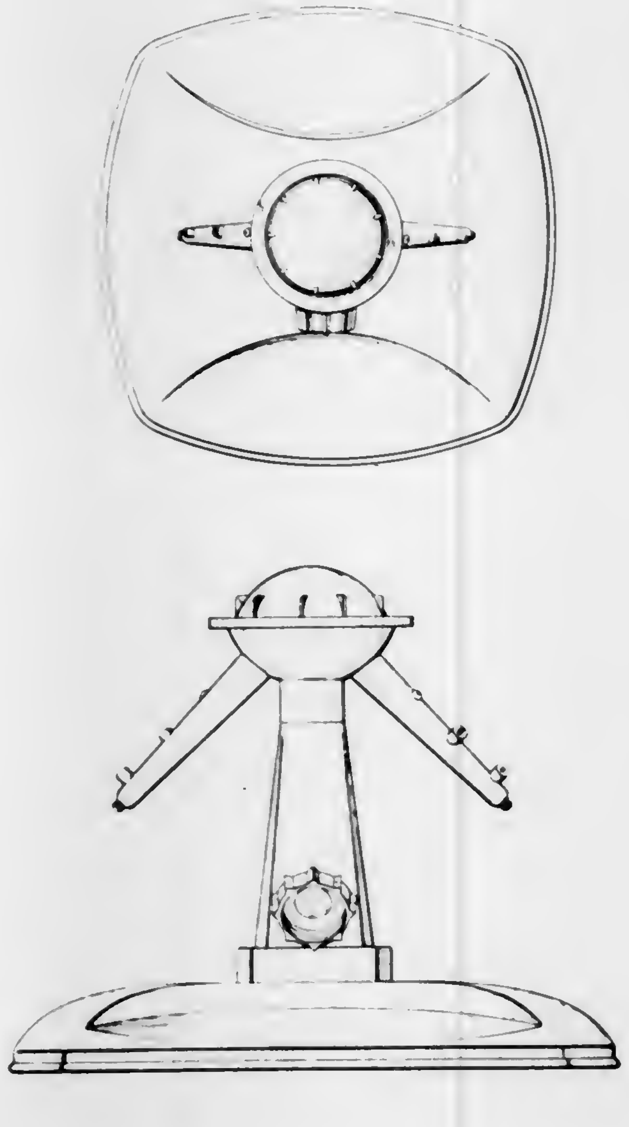
244,934
MICROFILM READER
Stephen G. Hauser, Tarzana; Keith S. Keith, Topanga Canyon; Ralph M. Bergo, Thousands Oaks, and Robert T. DiSorbo, Mountain View, all of Calif., assignors to Stromberg Datagraphix, Inc.
Filed Sept. 25, 1975, Ser. No. 616,627
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D16—14



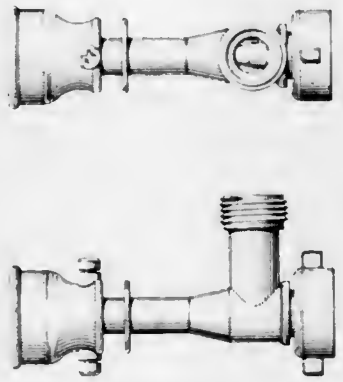
244,935
PAGE ALIGNER FOR AN OPEN BOOK OR THE LIKE
Loren C. Wheeler, 6182 Jellison Way, Arvada, Colo. 80004
Filed Oct. 14, 1975, Ser. No. 622,211
Term of patent 14 years
Int. Cl. D19—*99*
U.S. Cl. D19—99



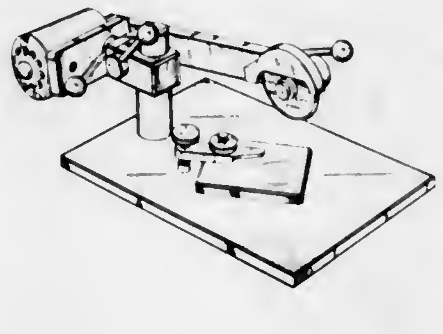
244,936
SPRINKLER
Ho Chow, River Edge, N.J., assignor to Beatrice Goods Co.
Filed Mar. 3, 1976, Ser. No. 663,465
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—7



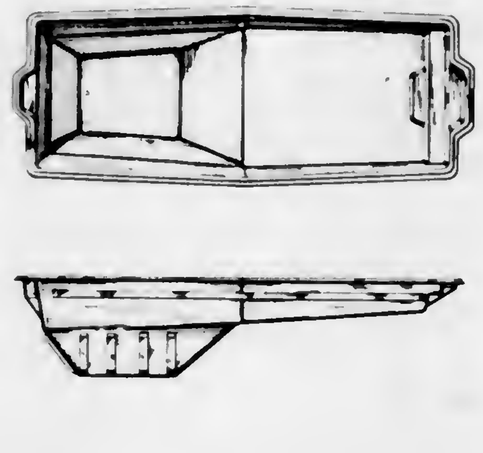
244,937
SYPHON
Le Roy M. Houk, Garden Grove, Calif., assignor to Wasco Products, Inc., Anaheim, Calif.
Filed Dec. 8, 1975, Ser. No. 638,738
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



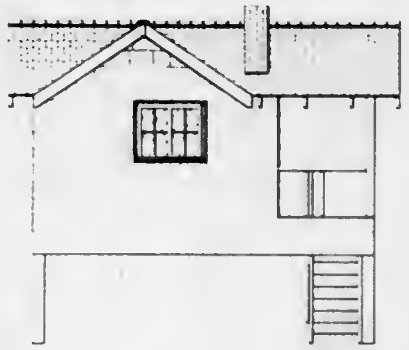
244,938
DENTAL SAW
Alfred A. Viazzoli, 14917 Rayen St., Panorama City, Calif. 91402
Filed Jan. 12, 1976, Ser. No. 648,497
Term of patent 7 years
Int. Cl. D24—*01*; D15—*09*
U.S. Cl. D24—8



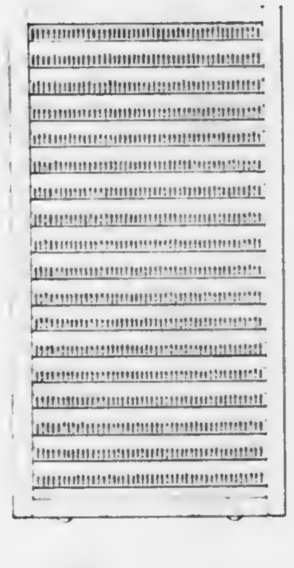
244,939
SWIMMING POOL LINER OR SIMILAR ARTICLE
Edgar G. Harman, 13875 W. 30th Place, Golden, Colo. 80401
Filed Oct. 3, 1975, Ser. No. 619,393
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—2



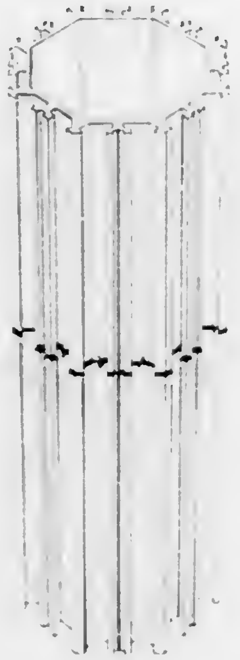
244,940
BUILDING
Thomas J. Brune, 6919 Pinehurst Drive, Evansville, Ind. 47711
Filed Feb. 11, 1976, Ser. No. 657,177
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—17



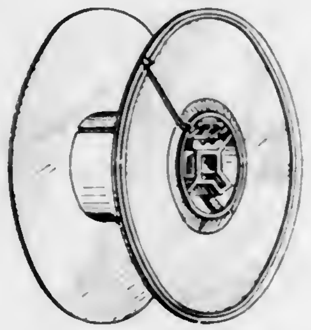
244,941
VENETIAN SHUTTER
Takeo Hashiba, 74-31, Shirahatanishi, Kanagawa, Yokohama, Kanagawa, Japan
Division of Ser. No. 241,864, April 6, 1972, Pat. No. D233,230. This application Aug. 7, 1974, Ser. No. 495,518
Term of patent 14 years
Int. Cl. D25—*02*
U.S. Cl. D25—47



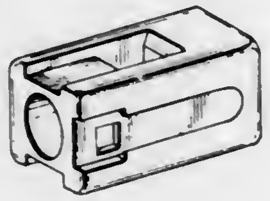
244,942
EIGHT-SIDED TUBULAR POST
Bertalan Tamas Bobrovniczky, Don Mills, Canada, assignor to Beautiline Systems Limited
Filed Jan. 7, 1976, Ser. No. 647,166
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—75



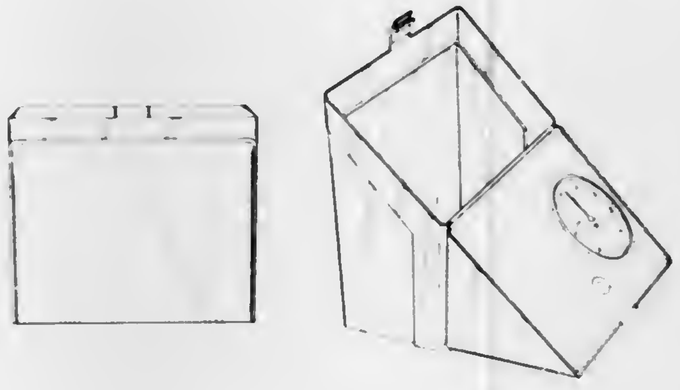
244,943
FILM REEL
James G. Balmer, Jr., Bloomfield Hills, Mich., assignor to Xerox Corporation, Stamford, Conn.
Filed Oct. 28, 1975, Ser. No. 626,390
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D14—10



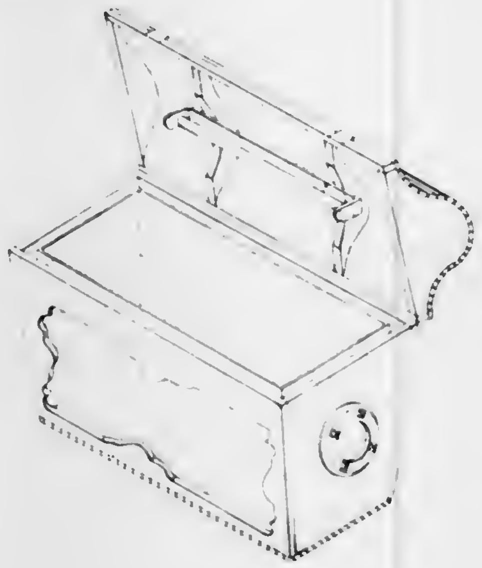
244,944
MOUNTING ADAPTOR FOR ELECTRICAL CONNECTOR
Dean Roosevelt Hooper, Jr., Middletown, Pa., assignor to AMP Incorporated, Harrisburg, Pa.
Filed Feb. 3, 1976, Ser. No. 654,685
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



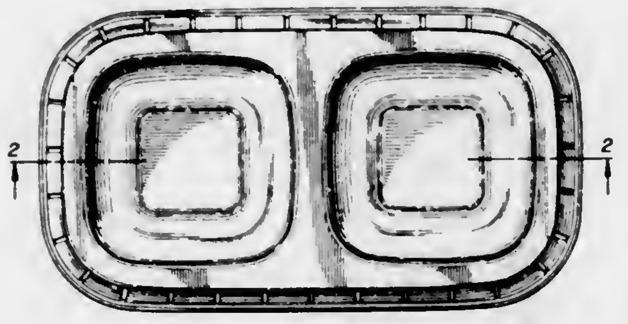
244,945
BLOOD PRESSURE TESTING KIT
John Cuccio, Westport, Conn., assignor to Sybron Corporation, Rochester, N.Y.
Filed Aug. 27, 1975, Ser. No. 608,087
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—21

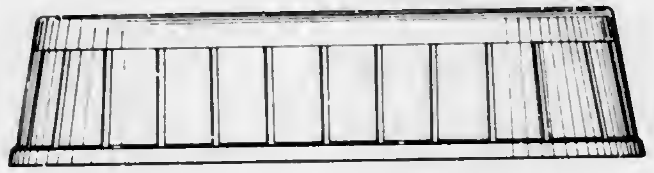


244,946
AQUARIUM
Wiley Kit Kaywood, 445 Sunset Parkway, Novato, Calif. 94947
Continuation of Ser. No. 300,701, Oct. 25, 1972, abandoned. This application Jan. 27, 1975, Ser. No. 551,516
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—6

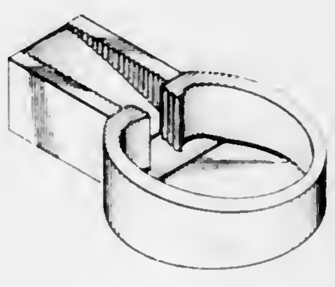


244,947
DUAL COMPARTMENT PET FEEDING DISH
William C. Gerber, 2867 Armstrong Drive, Wooster, Ohio 44691
Filed July 25, 1975, Ser. No. 599,125
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16

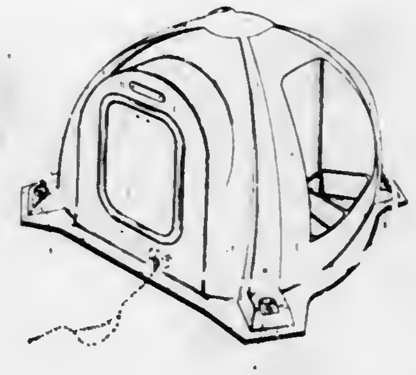




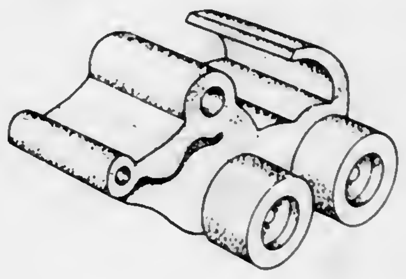
244,948
SELF-FEEDING PET FOOD BOWL
Robert D. Foley, Northridge, and Glynn C. Morris, Playa Del Rey, both of Calif., assignors to Carnation Company, Los Angeles, Calif.
Filed Feb. 19, 1976, Ser. No. 659,244
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—16



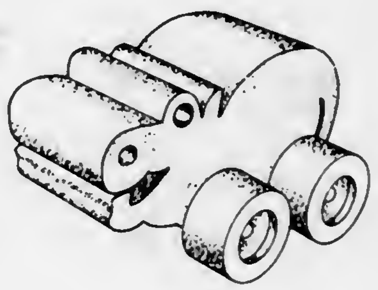
244,949
SHELTER
Scott D. Welker, 1359 Winnette, Toledo, Ohio 43614
Filed Aug. 4, 1976, Ser. No. 711,532
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



244,950
TOY WHEELED FIGURE
John F. McMahon, Boxford, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Jan. 2, 1976, Ser. No. 646,204
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



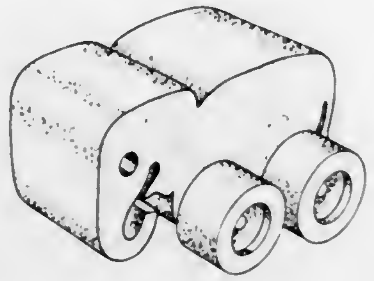
244,951
TOY WHEELED FIGURE
John F. McMahon, Boxford, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Jan. 2, 1976, Ser. No. 646,205
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



244,952
TOY WHEELED FIGURE

John F. McMahon, Boxford, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

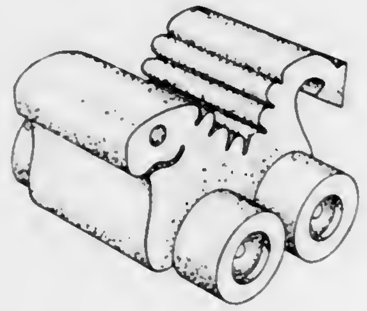
Filed Jan. 2, 1976, Ser. No. 646,206
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



244,953
TOY WHEELED FIGURE

John F. McMahon, Boxford, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

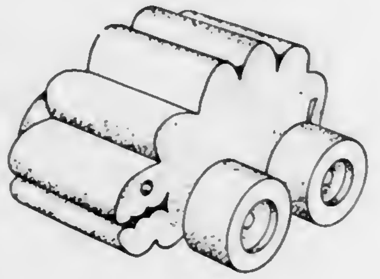
Filed Jan. 2, 1976, Ser. No. 646,207
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



244,954
TOY WHEELED FIGURE

John F. McMahon, Boxford, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

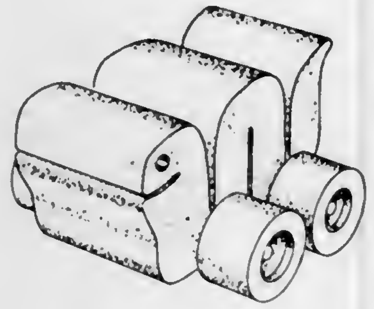
Filed Jan. 2, 1976, Ser. No. 646,208
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



244,955
TOY WHEELED FIGURE

John F. McMahon, Boxford, Mass., assignor to General Mills Fun Group, Inc., Minneapolis, Minn.

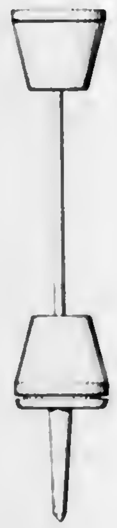
Filed Jan. 2, 1976, Ser. No. 646,209
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—2 R



244,956
HOLE MARKING AND SCORING PIN FOR MINIATURE GOLF GAME

Erik Behrentz Kristiansen, 29, Rungsvej, DK-9200 Skalborg, Denmark

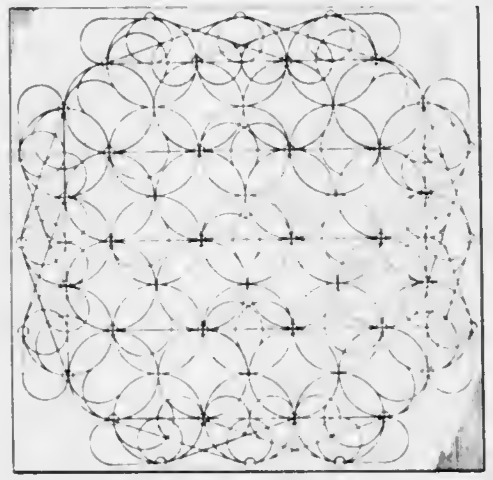
Filed Aug. 18, 1975, Ser. No. 605,336
Term of patent 3½ years
Int. Cl. D21—*01*
U.S. Cl. D34—5 NN



244,957
GAME BOARD

Marley A. Smith, 439 S. Main St., Miamisburg, Ohio 45342

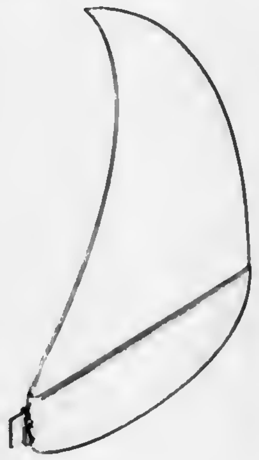
Filed Dec. 29, 1975, Ser. No. 644,435
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5.55



244,958
POOL TOY

Richard K. Bleser, Syosset, N.Y., assignor to Overman AB, Tranas, Sweden

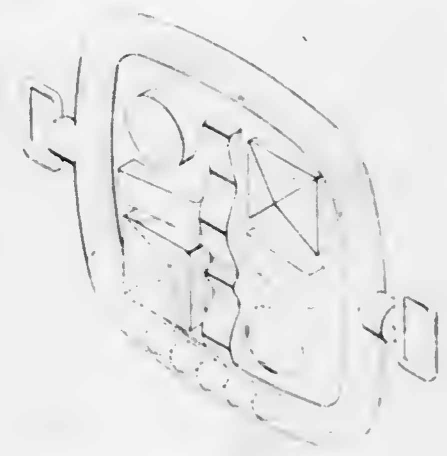
Filed Oct. 30, 1975, Ser. No. 627,112
Term of patent 7 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 JJ



244,959
CRIB TOY

Matthew A. Moustakas, Mercerville, and Per O. Hoel, Plainsboro, both of N.J., assignors to CBS Inc., New York, N.Y.

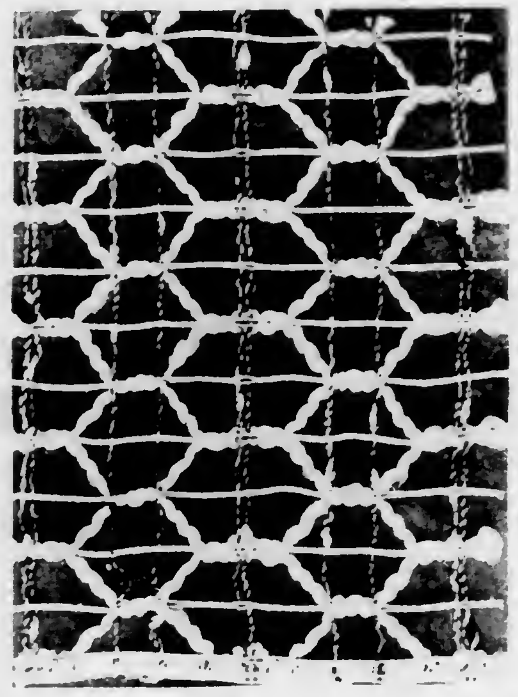
Filed Mar. 25, 1976, Ser. No. 670,354
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 J



244,960
CURTAIN MATERIAL 587

Peter E. Schroeder, Am Falter 8, CH-8966 Oberwil, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,674
Claims priority, application Germany, May 13, 1975, URA 289/75
Term of patent 14 years
Int. Cl. D5—*05*
U.S. Cl. D47—6 R

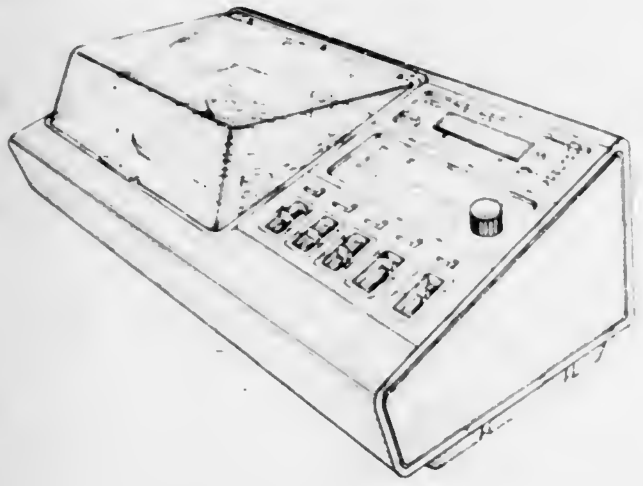


244,961
COMBINED PHONOGRAPH AND STEREO RECEIVER

Melvin H. Boldt, Glenview; David P. Chuboff, North Barrington, and Wayne Franek, Palatine, all of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Oct. 14, 1975, Ser. No. 621,908
Term of patent 14 years
Int. Cl. D14—*01*

U.S. Cl. D14—5

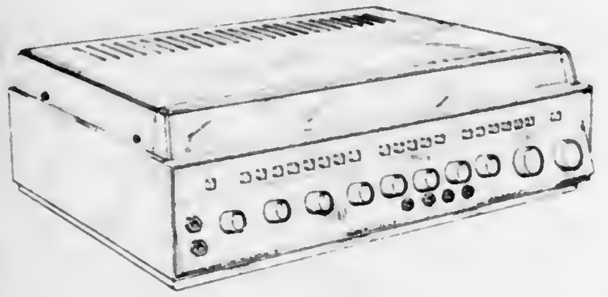


244,962
TUNER

Stuart Walter Sizer, Harbert, Mich., assignor to Heath Company, Benton Harbor, Mich.

Filed Oct. 28, 1975, Ser. No. 626,583
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D14—75

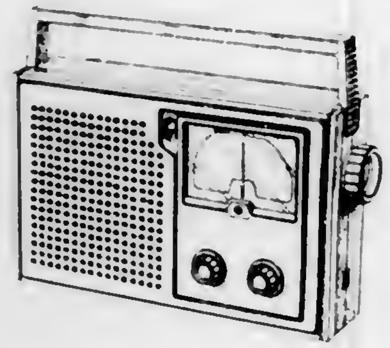


244,963
PORTABLE RADIO

Kunio Hoshino, Kadoma, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 17, 1975, Ser. No. 641,476
Claims priority, application Japan, June 20, 1975, 50-25267
Term of patent 14 years
Int. Cl. D14—*03*

U.S. Cl. D14—70

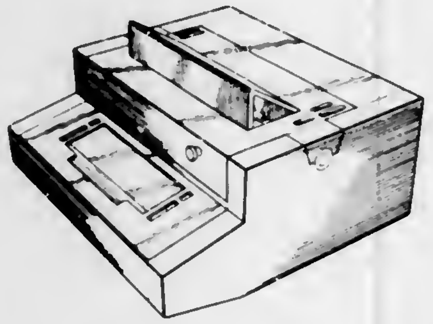


244,964
HOUSING FOR TYPEWRITER OR TELEPRINTER

Berndt Ebbe Frick, Herrgardsvagen 9, 135 00 Tyreso, Sweden

Filed July 3, 1975, Ser. No. 592,720
Claims priority, application Sweden, Jan. 16, 1975, 75100
Term of patent 14 years
Int. Cl. D14—*02*

U.S. Cl. D64—11 R

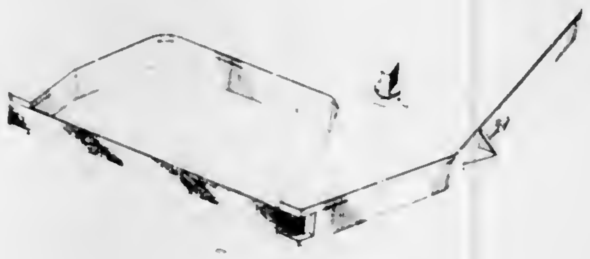


244,965
RIBBON CARTRIDGE

Richard D. Trezise, and James G. Savage, both of Newark, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Aug. 22, 1975, Ser. No. 606,993
Term of patent 14 years
Int. Cl. D18—*01*

U.S. Cl. D64—11 A



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF JULY, 1977

Note—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice)

A.H.P., Inc., *See*—
  Taylor, Gregg W., 4,033,721, Cl. 23-230.00B

AB Bofors. *See*—
  Eklund, John Folke; and Svensson, Sven-Hakan, 4,033,227, Cl. 89-34.000.

Ab Fi-Wes Maskinservice: *See*—
  Wennerstrom, Karl Filip, 4,033,428, Cl. 181-36.00C.

AB Gustavsbergs Fabriker: *See*—
  Curlow, Rolf Lennart, 4,033,570, Cl. 269-41.000.

Abbott Laboratories: *See*—
  Johnson, Edwin Samuel; and White, Wilfrid Francis, 4,034,082, Cl. 424-177.000.
  Roteman, Robert, 4,033,997, Cl. 260-463.000.

Abdelrahman, Mona M., to Honeywell Inc. Monolithic integrated circuit having a plurality of resistor regions electrically connected in series. 4,034,395, Cl. 357-28.000.

Abe, Isamu; and Sugioka, Takami, to Teijin Limited, and Teijin Seiki Co., Ltd. Method and apparatus for automatically changing bobbins and winding yarn continuously. 4,033,519, Cl. 242-18.00A.

Abkowitz, Martin A.: *See*—
  Williams, David J.; Lardon, Marcel A.; Abkowitz, Martin A.; and Pfister, Gustav, 4,033,769, Cl. 96-1.500.

Acda, Petrus Marinus, to Polva-Nederland B.V. Method of shaping a bell end on thermoplastic pipe. 4,034,057, Cl. 264-297.000.

ACF Industries, Incorporated. *See*—
  Tipton, Larry J., 4,034,029, Cl. 261-44.00R.

Acme Manufacturing Company: *See*—
  Przygocki, Witold C., 4,033,497, Cl. 226-194.000.

Acra-Plant, Inc.: *See*—
  Williams, Donald E.; and Robertson, Forrest E., 4,033,271, Cl. 111-7.000.

Adam, Gerhard K.: *See*—
  Berger, Abe, 4,033,934, Cl. 260-46.50G.

Affa, Steve: *See*—
  Newman, Ray; and Affa, Steve, 4,033,381, Cl. 138-113.000.

Agence Nationale de Valorisation de la Recherche (ANVAR): *See*—
  Alais, Pierre M., 4,034,332, Cl. 340-9.000.
  Mailfert, Alain; and Renard, Michel, 4,034,245, Cl. 310-52.000.
  Sevenet, Thierry; Thal, Claude; Potier, Pierre; and Husson, Henri Philippe, 4,033,969, Cl. 260-293.530.

AGFA-Gevaert, Aktiengesellschaft: *See*—
  Bestenreiner, Friedrich; and Giglberger, Dieter, 4,034,186, Cl. 219-216.000.
  Orthmann, Jurgen, 4,033,688, Cl. 355-4.000.
  Payrhammer, Bernd; Bartel, Siegfried; and Besigk, Geert, 4,033,693, Cl. 355-71.000.
  Wagensonner, Eduard; and Wilsch, Herbert, 4,034,247, Cl. 310-164.000.

AGFA-GEVAERT N.V.: *See*—
  De Haes, Louis Maria; Vermeulen, Leon Louis; Gevers, Hugo Karel; and De Winter, Walter Frans, 4,033,770, Cl. 96-28.000.

Aggarwal, Sundar Lal. *See*—
  Hargis, Ivan Glen; Livigni, Russell Anthony; and Aggarwal, Sundar Lal, 4,033,900, Cl. 252-431.00L.

Ahlen, Karl Gustav; and Fabricius-Hansen, Rolf Leonard, to S.R.M Hydromekanik Aktiebolag. Speed responsive electronic controls for transmissions. 4,033,202, Cl. 74-866.000.

Ahrweiler, Karl-Heinz; and Leifeld, Ferdinand, to Kustes, Eduard. Apparatus for producing patterns on advancing strips. 4,033,153, Cl. 68-205.00R.

Aichinger, Dietmar, to Albert Obrist AG. Closure for containers. 4,033,472, Cl. 215-256.000.

Air Products and Chemicals, Inc.: *See*—
  Klee, David J.; and Godtfring, Jack H., 4,033,140, Cl. 62-223 000.

Aisin Seiki Kabushiki Kaisha: *See*—
  Hirosawa, Koichiro, Ishikawa, Kazuo; Ogasawara, Tsunehiko; and Murakami, Noboru, 4,033,203, Cl. 74-869.000.
  Inada, Masami; Kawabata, Yasuhiro; and Sato, Katsujiro, 4,033,125, Cl. 60-290.000.
  Murakami, Noboru; and Ogasahara, Tsunehiko, 4,033,368, Cl. 137-54.000.

Aizawa, Tatsuo: *See*—
  Washio, Takaji, Sasaki, Koichi; and Aizawa, Tatsuo, 4,033,689, Cl. 355-8.000.

Akatsuka, Minoru: *See*—
  Naito, Makoto; Kawachi, Masaru; Sekiwa, Tetuo, Akatsuka, Minoru; Kasami, Akinobu; and Toyama, Masaharu, 4,033,291, Cl. 118-412.000.

Akima, Hideaki, to Canon Kabushiki Kaisha. Speed control device for direct current motors. 4,034,274, Cl. 318-334.000.

Aktiebolaget Svenska Flaktfabriken. *See*—
  Axelsson, Birger; and Rosby, Sven-Olof, 4,033,732, Cl. 55-96.000.

Akuta, Shinichiro *See*—
  Suzuki, Kazuo, and Akuta, Shinichiro, 4,034,410, Cl. 360-55.000

Akzona Incorporated. *See*—
  Eberius, Wiprecht, and Lorenz, Herbert, 4,034,034, Cl 264-39.000.
  Vukoje, Tatjana, 4,033,103, Cl 57-34 0HS

Alais, Pierre M., to Agence Nationale de Valorisation de la Recherche (ANVAR). Ultrasonic transmitting and receiving devices using dielectric transducers. 4 034,332, Cl. 340-9.000.

Albert Obrist AG: *See*—
  Aichinger, Dietmar, 4,033,472, Cl 215-256.000.

Alhrecht, Gerhard *See*—
  Soffge, Friedhelm, Piper, Ortwin; and Alhrecht, Gerhard, 4,033,006, Cl. 14-75.000.

Albright, Henry J *See*—
  Wirstlin, Arthur N., and Albright, Henry J., 4,033,442, Cl 194-17.000.

Aldenhoven, Ghislanus Matheus Antonius Maria, to U.S. Philips Corporation. Tape recorder mechanism responsive to tape stoppage 4,033,491, Cl. 226-11.000.

Alexander, Frank Bernard, Jr.; Capio, Cesar Deduyo, Hauser, Victor Emerald, Jr.; Levinstein, Hyman Joseph; Mogab, Cyril Joseph; Sinha, Ashok Kumar; and Wagner, Richard Siegfried, to Bell Telephone Laboratories, Incorporated. Radial flow reactor including glow discharge limiting shield. 4,033,287, Cl. 118-49.10R.

Alexandre, Arthur E. Holder for skis, ski poles and ski boots. 4,033,460, Cl. 211-60.0SK.

Alfa-Laval AB. *See*—
  Soderlund, Leif Ake, 4,033,295, Cl 119-14 440.

Alissandratos, Tacko D. Sanitary brush assembly. 4,033,650, Cl 312-206.000

Allegheny General Hospital *See*—
  Strickler, Herbert S., 4,034,071, Cl 424-1 000.

Allen, Clifford H. Flexible coupling. 4,033,144, Cl. 64-12.000.

Allen, David William; and Borchert, Marshall Bond, to Tektronix, Inc. Electronic measuring instrument combining an oscilloscope and a digital multimeter. 4,034,291, Cl 324-121 00R.

Allen & Hanburys Limited *See*—
  Bays, David Edmund, Peel, Mervyn Evan, Waters, David Martin, and Ellis, Gwynn Pennant, 4,034,075, Cl. 424-45.000.

Allen, Robert M.. *See*—
  Pantiga, Gene N.; and Allen, Robert M., 4,033,844, Cl. 204-224.00R.

Allied Chemical Corporation *See*—
  Curtis, Omer E., Jr., Tuller, Harold W.; O'Neill, Charles T., and Nussbaum, Ralph W., 4,034,014, Cl. 260-837.00R.
  Long, E. David, 4,033,513, Cl. 239-585.000.
  Pennington, James R., 4,033,419, Cl. 173-34 000
  Schulze, Stephen R., 4,033,939, Cl. 260-878.00R

Allums, John Henry Steel line measure guide 4,033,041, Cl 33-137.00R.

Allyn, Donald Cooper, to Boeing Company, The. Airfoil position range selecting, indicating and warning system for an aircraft 4,034,334, Cl. 340-27.00R.

Almqvist, Sven-Olof; Enzell, Curt R., Hjern, Lasse O., Artho, Antoine, and Koch, Robert, to Svenska Tobaks AB, and F.J Burrus & Cie. Filter for tobacco smoke. 4,033,362, Cl. 131-264.000

Alpert, Louis, to United States of America, Navy. Underwater connector. 4,033,659, Cl. 339-60.00R.

Altair Tool & Engineering Inc.: *See*—
  McCardell, Willard B., 4,033,663, Cl. 339-128.000.

Aluma Building Systems Incorporated: *See*—
  Johnston, Ronald J., 4,033,544, Cl. 249-40.000.

Alumax Mill Products, Inc. *See*—
  Lance, Richard T.; and Papafingos, Pandelis N., 4,033,760, Cl. 75-68.00R.

Aluminum Company of America: *See*—
  Holmes, G. Thomas, 4,033,836, Cl. 204-67.000.
  Pataki, William V., 4,033,441, Cl 193-38.000

Amax Inc.. *See*—
  Clark, Franklin F.; Nikolic, Cvetko B.; and Queneau, Paul B., 4,034,059, Cl. 423-144.000.

Ambrose, Peter C., Jr., and Knapp, Ronald F., to United Technologies Corporation. Friction welding machine. 4,033,501, Cl. 228-2.000.

Amerace Corporation. *See*—
  Silva, Frank A.; and Mayer, Robert W., 4,034,151, Cl. 174-73.00R.

American Bank Note Company *See*—
  Hutton, Robert Gordon, and Merry, Trevor, 4,033,059, Cl. 40-137.000.

American Can Company: *See*—
  Beese, Ronald E., 4,033,274, Cl. 113-120.00A.

- Radtke, Charles S., 4,033,275, Cl. 113-121.00C.
- Rentmeester, Kenneth Richard, 4,033,474, Cl. 220-75.000
- American Carrier Equipment *See*—
  - Sweet, Philip J.; Hamlet, Buck C.; and Sweet, David L., 4,033,608, Cl. 280-711.000.
- American Cyanamid Company. *See*—
  - Augurt, Thomas Anthony, Rosensaft, Michael Norman; and Perciaccante, Vincent Anthony, 4,033,938, Cl. 260-78.30R.
- American Hoechst Corporation: *See*—
  - Castenson, Richard L., Hazen, James R., and Tien, Rex Y., 4,033,986, Cl. 260-345.200.
- American Home Products Corporation *See*—
  - Ferland, Jean-Marie, Failli, Amedeo, Immer, Hans U., and Gotz, Manfred K., 4,033,974, Cl. 260-295.50R
  - Freed, Meier E., and Potoski, John R., 4,034,041, Cl. 260-571.000
  - Givner, Morris Lincoln, and Schilling, Guenther, 4,033,723, Cl. 23-253.00R
  - Philipp, Adolf H., and Humber, Leslie G., 4,033,977, Cl. 260-302.00F
  - Strike, Donald P., and Kao, Wen-Ling, 4,034,002, Cl. 260-514.00D.
  - Strike, Donald Peter, 4,033,985, Cl. 260-340.900
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  - DeRees, Delbert D., 4,033,245, Cl. 98-2.120.
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  - Shoemaker, Arthur H., 4,033,666, Cl. 350-91.000.
- AMP Incorporated. *See*—
  - Asick, John Carl, 4,033,658, Cl. 339-32.00R
  - Glover, Douglas Wade, Askman, Jan Philip, and Herrmann, Henry Otto, Jr., 4,034,172, Cl. 200-51.100
  - Koppenheffer, Gary Jay, and Rose, William Henry, 4,034,178, Cl. 200-293.000.
  - Lerner, Lewis Brian, and Davis, Thomas Francis, 4,033,835, Cl. 204-43.00S.
  - Wion, Donald Andrew, and Brown, Christopher Kingsley, 4,033,456, Cl. 206-347.000.
- Ampex Corporation *See*—
  - Trost, Allen J., 4,034,397, Cl. 358-8.000.
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- Amstutz, Paul G. *See*—
  - Amstutz, Jacob, and Amstutz, Paul G., 4,033,127, Cl. 60-455.000.
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  - Hauser, Karl V., and Ronsaville, Edwin W., Jr., 4,033,781, Cl. 106-90.000.
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  - Memishian, John, Jr., 4,034,366, Cl. 340-347.0AD
- Anders, Dietmar, to Hermann Berstorff Maschinenbau GmbH. End thrust bearing arrangements for screw extruders. 4,033,556, Cl. 259-191.000
- Andersen, Finn Schnoor *See*—
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- Anderson, Arnold L., to Velsicol Chemical Corporation. Flame retardant epoxy resin compositions. 4,033,926, Cl. 260-45.75B
- Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,033,931, Cl. 260-45.75R.
- Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,033,932, Cl. 260-45.75B
- Anderson, Hugh C., to Quaker Oats Company, The. Monomeric furfuryl alcohol-resorcinol foundry binders. 4,033,925, Cl. 260-42.530.
- Anderson, John Dale: *See*—
  - Fritz, David Paul, Anderson, John Dale, Pruitt, Martin Eugene, Mahagan, Deroy Ernest, and Buller, Richard James, 4,033,101, Cl. 56-344.000.
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- Angstadt, Howard P., to Suntech, Inc. Process for catalytic oxidation of olefins to form hydroperoxides. 4,034,047, Cl. 260-610.00B.
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  - Bovier, Edward M.; and Voigt, John E., 4,033,914, Cl. 260-17.200
- Annino, Raymond *See*—
  - Karas, Edwin L.; Annino, Raymond, and Kalinoski, Richard W., 4,033,171, Cl. 73-23.100
- Anonima Castelli S.p.A.. *See*—
  - Ponzellini, Giulio, 4,033,543, Cl. 248-412.000.
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  - Hayashi, Yoshimasa, Nakajima, Yasuo, Sugihara, Kunihiko, and Aoyama, Syunichi, 4,033,308, Cl. 123-119.00A.
- Apex Glove Co., Inc.. *See*—
  - Mandlman, Mayar Richard, 4,032,990, Cl. 2-161.00R.
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  - Kramer, Friedhelm; Wolfertz, Gunter; Klaus, Harald, Stanik, Raimund; Appelt, Horst Gustav, and Ramspott, Walter, 4,033,012, Cl. 24-90.00D.
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- Arai, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha; and Nippon Denso Co., Ltd. Electronic monitor system for automobiles. 4,034,336, Cl. 340-52.00F.
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  - Shinohara, Toshio, and Arai, Masatoshi, 4,033,991, Cl. 260-448.20E.
- Arai, Sakuji. *See*—
  - Asaka, Urataro, Yamazaki, Shuichi; Niitsu, Mitsugi, and Arai, Sakuji, 4,033,124, Cl. 60-290.000.
- Aramaki, Minoru; and Ushirogouchi, Etsuo, to Central Glass Co., Ltd. Process for preparation of ammonium tetrafluoroaluminate. 4,034,068, Cl. 423-465.000.
- Arauner, Alfred, to Siemens Aktiengesellschaft. Tubus for determining the boundaries of a beam of penetrating rays. 4,034,228, Cl. 250-511.000.
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- Archibald, John Leheup, and Jackson, John Lambert, to John Wyeth & Brother Limited. Sulphonamidopiperidyl derivatives. 4,034,098, Cl. 424-267.000.
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  - Hamblin, Richard David, 4,033,540, Cl. 248-246.000.
- Argabright, Perry A., Presley, C. Travis; and Wenger, Charles B., to Marathon Oil Company. Polyisocyanurate salt emulsifying agents and derivatives. 4,033,937, Cl. 260-77.5NC.
- Arikawa, Hiroo; and Maruo, Masaya. Miniature time-delay fuse. 4,034,329, Cl. 337-163.000.
- Arimura, Toru, and Fujita, Fumio, to Nippon Kokan Kabushiki Kaisha. Apparatus for controlling flatness of metal sheet during rolling. 4,033,165, Cl. 72-205.000.
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- Armaturenfabrik Wallisellen AG.: *See*—
  - Egli, Werner, 4,033,370, Cl. 137-100.000.
- Armour Pharmaceutical Company: *See*—
  - Hughes, John L.; Seyler, Jay K.; and Liu, Robert C., 4,033,940, Cl. 260-112.50S.
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  - Fritz, Thomas W., Gilbo, Charles F.; and Johnson, Norman A., 4,033,083, Cl. 52-484.000.
  - Gross, William G., 4,033,284, Cl. 118-3.000.
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  - Stone, Leonard R.; Aron, Steven J., Jr.; and Kemmerling, Robert A., 4,033,885, Cl. 250-496.000.
- Arova Rorschach AG. *See*—
  - Schiffmann, Anton, 4,033,094, Cl. 53-242.000.
- Arsenault, Alvin R.: *See*—
  - Haddad, Ihsan A.; and Arsenault, Alvin R., 4,033,825, Cl. 195-127.000.
- Artek Industries, Inc.. *See*—
  - Hicks, Prentiss C.; and Turrentine, Fred C., 4,033,481, Cl. 222-134.000
- Artho, Antoine *See*—
  - Almqvist, Sven-Olof; Enzell, Curt R.; Hjern, Lasse O.; Artho, Antoine, and Koch, Robert, 4,033,362, Cl. 131-264.000.
- Arzola, Rurico. Melody bird instrument. 4,033,069, Cl. 46-52.000.
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  - Uemura, Michihiko, Kanbara, Tohru; and Igarashi, Yutaka, 4,034,317, Cl. 333-30.00R.
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  - Arai, Akihiro, 4,034,385, Cl. 354-38.000.
  - Urano, Fumio, and Shono, Tetsuji, 4,034,390, Cl. 354-244.000.
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  - DiMartini, Carl Richard, Scott, William Lafayette; and Bulvanoski, Leo James, 4,033,761, Cl. 75-77.000
- Asazuma, Masayuki. *See*—
  - Takagi, Izumi, and Asazuma, Masayuki, 4,033,195, Cl. 74-230.17M

- ASEA Aktiebolag. *See*—
  - Collin, Per Harald, 4,033,562, Cl. 266-216.000
- Ashley, James R., Barley, Thomas A.; and Rast, Gustaf J., Jr., to United States of America, Army. Superheterodyne noise measuring discriminators. 4,034,285, Cl. 324-57.00R.
- Ashworth, John Vernon: *See*—
  - Owen, David Gregory; Ashworth, John Vernon; and Radcliffe, Paul Anthony Beaufort, 4,034,400, Cl. 358-75.000.
- Asick, John Carl, to AMP Incorporated. Connector assembly accepting different size post contacts therein. 4,033,658, Cl. 339-32.00R.
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  - Glover, Douglas Wade, Askman, Jan Philip; and Herrmann, Henry Otto, Jr., 4,034,172, Cl. 200-51.100.
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  - Aspin, Frank Metcalf, 4,033,317, Cl. 123-190.00D.
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  - Holloway, Richard L.; Edison, Robert R.; and Wachtel, Stephen J., 4,033,861, Cl. 208-211.000.
- Atlas Copco Aktiebolag. *See*—
  - Bergquist, Arne Erik; and Westerberg, Sven Peter Jonas, 4,033,532, Cl. 248-17.000.
- Atlas Industries, Inc.: *See*—
  - Stutzman, Howard A., 4,033,707, Cl. 417-312.000.
- Atomic Energy of Canada Limited *See*—
  - Bayly, John G.; and Booth, Ronald J., 4,033,699, Cl. 356-205.000.
- Audio Visual Innovators Corporation: *See*—
  - Schoch, David K., 4,034,259, Cl. 315-93.000.
- Augat, Inc.: *See*—
  - Ballew, George L., 4,033,031, Cl. 29-626.000.
- Augurt, Thomas Anthony; Rosensaft, Michael Norman; and Perciaccante, Vincent Anthony, to American Cyanamid Company. Polymers of unsymmetrically substituted 1,4-dioxane-2,5-diones. 4,033,938, Cl. 260-78.30R.
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  - Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; and Castillo, Adolfo, 4,033,025, Cl. 29-417.000.
- Automation Industries, Inc.: *See*—
  - Case, Dan Frank, 4,033,177, Cl. 73-67.900.
  - Ross, Harold B., 4,033,654, Cl. 339-143.00R.
- Avalle, Angel C., to Raymond Lee Organization, Inc., The, a part interest. Latch closer in combination with a closed latch detector. 4,033,149, Cl. 66-111.000.
- Aveneau, Andre A.; and de Passoz, Guy A., to Societe Anonyme de Telecommunications. Device for forming a bipolar signal of 50% duty cycle. 4,034,236, Cl. 307-261.000.
- Avery, Ralph W., to General Electric Company. Commutator rounding brush. 4,034,249, Cl. 310-253.000.
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- Azam, Guy; and Boux, Rene, to C.G.R.-Mev. System for measuring radiation doses in radiotherapy apparatus. 4,034,222, Cl. 250-355.000.
- B&O Railroad Company: *See*—
  - Oros, Richard G., 4,033,851, Cl. 204-302.000.
- Babayan, Eduard P., to Hitco. Aromatic polyamide fibers coated with a polyurethane. 4,034,138, Cl. 428-378.000.
- Babcock & Wilcox Company, The: *See*—
  - Holt, Amos E.; and Roseveare, Ronald N., 4,033,178, Cl. 73-71.5US.
  - Pinkstaff, Carlos Dean, 4,033,250, Cl. 100-53.000.
- Back, Gerhard: *See*—
  - Beffa, Fabio; Back, Gerhard; and Steiner, Eginhard, 4,033,942, Cl. 260-145.00A.
  - Defago, Raymond; Ramanathan, Visvanathan; and Back, Gerhard, 4,033,716, Cl. 8-2.50A.
- Baehr, Edward F., to United States of America, National Aeronautics and Space Administration. Corneal seal device. 4,033,349, Cl. 128-303.00R.
- Bailey, John V.: *See*—
  - Baron, Arthur L.; and Bailey, John V., 4,034,016, Cl. 260-858.000.
- Baits, Stephen S., to Sundstrand Corporation. Emergency hydraulic power system (start bottle). 4,033,115, Cl. 60-39.09R.
- Baker, Cyril Walter, to Cincinnati Milacron, Inc. Presses. 4,033,252, Cl. 100-99.000.
- Baker, Jack H.: *See*—
  - List, Harold A., Baker, Jack H., and Joyce, Jack, 4,033,183, Cl. 73-88.50R.
- Baker, Joseph E., to Olin Corporation. Metal anode assembly. 4,033,847, Cl. 204-250.000.
- Bakewell, Joseph J., to Dynamics Research Corporation. Method of making a bi-metal screen for thick film fabrication. 4,033,831, Cl. 204-11.000.
- Balanca, Charles; and Charles, Gilbert, to Commissariat a l'Energie Atomique. Device for automatic processing of signals recorded on an oscilloscope screen. 4,034,362, Cl. 340-347.0AD.
- Baldyga, Eugene P., to Monsanto Company. Reclaiming waste plastics. 4,033,804, Cl. 156-84.000.
- Ball Corporation: *See*—
  - Davis, Robert Earl, 4,033,744, Cl. 65-362.000.
- Ballarin, Jurgen, to Bosch-Siemens Hausgerate GmbH. Refrigeration unit. 4,033,739, Cl. 62-202.000.
- Ballew, George L., to Augat, Inc. Method and machine for inserting electrical contacts into electrical interconnection boards. 4,033,031, Cl. 29-626.000.
- Balz, Werner. *See*—
  - Woellhaf, Josef, Balz, Werner; Falk, Roland; Scheffel, Dieter, Richter, Volker; and Willmann, Paul, 4,033,288, Cl. 118-52.000.
- Balzer, David John, to Caterpillar Tractor Co. Brake control mechanism. 4,033,631, Cl. 303-50.000
- Bambury, Ronald E.: *See*—
  - Erickson, Raymond C.; and Bambury, Ronald E., 4,033,956, Cl. 260-243.00C
- Bangerskis, Karlis I. *See*—
  - Harvey, Walter W.; Randlett, Myron R., and Bangerskis, Karlis I., 4,033,839, Cl. 204-108.000
- Bank of America National Trust & Savings Association *See*—
  - Carlson, Alvin R., 4,033,090, Cl. 53-78.000
- Bar-Ilan University *See*—
  - Freund, Isaac, 4,034,226, Cl. 250-493.000
- Barash, David: *See*—
  - Schorsch, John B., Graul, William E.; and Barash, David, 4,033,142, Cl. 62-381.000.
- Barber, Herbert Douglas, and Salter, Gary Curtis, to Linear Technology Inc. D.C. amplifier for use with low supply voltage. 4,034,306, Cl. 330-30.00D.
- Barcell, Ernest A.; and Pusch, James L., to Easy Engineering Corporation. Method and apparatus for reducing hammermill slugging for livestock feed grinders and the like. 4,033,515, Cl. 241-27.000
- Barcza, Sandor; and Hendrickson, James B., to Sandoz, Inc. 2,4-Disubstituted-4b,5,6,7,8,8a,9,10-octahydro-9-oxo-phenanthrenes. 4,034,045, Cl. 260-590.0FB
- Bardocz, Arpad. Optical rail system. 4,033,539, Cl. 248-228.000
- Bareth, Erich, and Loge, Hans, to Kaltenbach & Voigt. Clamping device for dental tools. 4,033,040, Cl. 32-27.000.
- Bargain, Michel; and Pasquini, Zeno, to Rhone Poulenc S.A. Partially crosslinked silalactone polymers, their preparation and their use. 4,033,731, Cl. 55-16.000
- Barker, Alfred Walter. *See*—
  - Priest, Anthony Victor Norton, and Schorr, Murray Arnold, 4,033,132, Cl. 60-572.000.
- Barley, Thomas A.: *See*—
  - Ashley, James R., Barley, Thomas A., and Rast, Gustaf J., Jr., 4,034,285, Cl. 324-57.00R.
- Barnard, Alfred J., Jr.; and Lance, Russell C., Jr., to J. T. Baker Chemical Company. Flash point determination calibration standards. 4,033,897, Cl. 252-408.000.
- Baron, Arthur L.; and Bailey, John V., to Mobay Chemical Corporation. Ternary polyblends prepared from polybutylene terephthalates, polyurethanes and aromatic polycarbonates. 4,034,016, Cl. 260-858.000.
- Baron, Gerhard; Hafke, Carl; Engler, Dietrich; Reimert, Rainer, and Blaum, Eberhard, to Metallgesellschaft Aktiengesellschaft. Process and apparatus for feeding particulate solids into a pressure reactor. 4,033,730, Cl. 48-86.00R.
- Baron, Joseph J., Jr.; and Krefting, Sherman, to Diamond Shamrock Corporation. Synthetic sizes. 4,033,922, Cl. 260-29.6RW.
- Barr, Douglas, to Engineered Safety Products, Inc. Support for life ring and associated retrieval line. 4,033,276, Cl. 114-190.000
- Barracudaverken Aktiebolag: *See*—
  - Wallin, Erik W., 4,034,375, Cl. 343-18.00A.
- Barrett, George M. Fluid carrier recovery system and method. 4,033,412, Cl. 166-267.000.
- Bartel, Siegfried. *See*—
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- Barton, Paul, to International Standard Electric Corporation. Radio direction finder with array element signal processing. 4,034,376, Cl. 343-112.00R.
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  - Woellhaf, Josef; Balz, Werner; Falk, Roland, Scheffel, Dieter, Richter, Volker, and Willmann, Paul, 4,033,288, Cl. 118-52.000.
- Basiulis, Algred, to Hughes Aircraft Company. Heat exchanger utilizing heat pipes. 4,033,406, Cl. 165-32.000.
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- Bates, Danny E., to Phillips Petroleum Company. Test apparatus and method. 4,034,195, Cl. 235-153.0AC.
- Bauer, Wolfgang; Krusche, Erwin; and Ribka, Joachim, to Cassella Farbwerke Mainkur Aktiengesellschaft. Water-soluble trisazo 8-amino-naphthol-1 dyes. 4,033,945, Cl. 260-157.000.
- Baumgartner, Charles E.; and Bihuniak, Peter P., to Corning Glass Works. Method of enhancing the refractoriness of high purity fused silica. 4,033,780, Cl. 106-69.000.
- Baumgartner, Friedrich: *See*—
  - Weiss, Franz; Baumgartner, Friedrich; and Zach, Werner, 4,033,514, Cl. 239-662.000
- Bayer Aktiengesellschaft: *See*—
  - Daum, Werner; Brandes, Wilhelm, and Frohberger, Paul-Ernst, 4,034,104, Cl. 424-289.000.
  - Goebel, Hermann, 4,033,946, Cl. 260-166.000.
  - Hoffmann, Hellmut; and Hammann, Ingeborg, 4,034,085, Cl. 424-200.000.
  - Kleimann, Helmut; and von Bonin, Wulf, 4,033,912, Cl. 260-2.5AH.
  - Priemer, Joachim, Schenk, Norbert; Krekel, Jorg; and Schwerdtel, Wulf, 4,033,987, Cl. 260-346.400

Seng, Florin; and Ley, Kurt, 4,033,960, Cl. 260-250.0QN.

Wedemeyer, Karlfried; and Helm, Rudolf, 4,034,042, Cl. 260-576.000.

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Bayly, John G.; and Booth, Ronald J., to Atomic Energy of Canada Limited. Vapor concentration monitor. 4,033,699, Cl. 356-205.000.

Bays, David Edmund; Peel, Mervyn Evan, Waters, David Martin, and Ellis, Gwynn Pennant, to Allen & Hanburys Limited Quinaldic acid derivatives. 4,034,075, Cl. 424-45.000.

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Zaugg, Paul, 4,033,114, Cl. 60-39.020.

Beacham, Harry Hoyt: *See—*

Wright, Carl Leonard, and Beacham, Harry Hoyt, 4,034,136, Cl 428-246.000

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Louden, Lester Richard, Blessington, Clement Auguston, and Beatty, Jerry Lon, 4,034,219, Cl. 250-301.000.

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Beck, Jacob Howard, to BTU Engineering Corporation Heat processing system. 4,033,715, Cl 432-4.000.

Beck, Louis. Nozzle assemblies for atomizing and mixing different fluids and combining the mixture with solids and the like. 4,033,512, Cl. 239-423.000

Bedi, Ram D., to Eaton Corporation. Self-locking fastener. 4,033,393, Cl 151-14.500.

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Bentley, Peter Hubert, and Clayton, John Peter, 4,033,979, Cl 260-306.70C.

Beery, Jack, to Burroughs Corporation System for extending the life of a pin printer using pin shifting 4,033,444, Cl 197-1.00R

Beese, Ronald E., to American Can Company. Containers. 4,033,274, Cl 113-120.00A

Beffa, Fabio, Back, Gerhard, and Steiner, Eginhard, to Ciba-Geigy AG. Chromium complex dye, including azo and azo methine dye compounds 4,033,942, Cl. 260-145.00A.

Begrich, Rainer, to Ciba-Geigy Corporation. Fibre-reactive hydroxycycloalkenyl-halo triazinyl containing dyestuffs. 4,033,944, Cl. 260-153.000.

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de Pierre, Richard, Forgays, Gilbert Jerome, Behling, Hans Heinrich, and Curtis, William Childs, 4,034,373, Cl 343-7.700.

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Helting, Torsten Bertil, 4,033,819, Cl. 195-29.000

Karges, Hermann Erich; Heimburger, Norbert, and Jacobi, Eckart, 4,033,824, Cl. 195-99.000

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Hauber, Rudiger, 4,033,918, Cl. 260-29.6WB.

Belaco International Ltd *See—*

Nevai, Bela B., 4,033,461, Cl. 211-86.000.

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Kim, Raymond W. H., 4,033,681, Cl 352-173.000.

Pasturczak, Vincent S., 4,033,680, Cl 352-124.000.

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Alexander, Frank Bernard, Jr., Capio, Cesar Deduyo; Hauser, Victor Emerald, Jr.; Levinstein, Hyman Joseph; Mogab, Cyril Joseph, Sinha, Ashok Kumar; and Wagner, Richard Siegfried, 4,033,287, Cl. 118-49.10R.

Berreman, Dwight Winton, 4,033,671, Cl. 350-160.0LC.

Blank, Stuart Lawrence, 4,034,358, Cl 340-174.0TF.

Dalley, James Edwin, 4,034,294, Cl. 325-38.00R.

Fair, Richard Barton; Hayes, John Sayler; and Rosser, William Morgan, 4,033,027, Cl. 29-583.000.

Fleming, James William, Jr., 4,033,667, Cl 350-96.0WG.

Holt, James Tyler, 4,034,162, Cl. 179-18.0AB.

Hoppough, Richard Scott, 4,034,161, Cl. 179-18.0AB.

Lawrence, Victor Bernard; and Mina, Kent Vincent, 4,034,197, Cl. 235-156.000.

May, Carl Jerome, Jr., 4,034,302, Cl 328-39.000.

Ohm, Edward Allen, 4,034,378, Cl. 343-781.0CA.

Presby, Herman Melvin, 4,033,668, Cl. 350-96.00C.

Probert, Geoffrey, Jr., 4,034,347, Cl. 364-200.000.

Bendix Corporation, The: *See—*

Gardner, Delbert J., 4,033,131, Cl. 60-553.000.

Henrich, Robert Samuel, 4,033,272, Cl. 123-117.00R.

Menin, Albert S.; and Bridges, Robert M., 4,034,331, Cl. 340-3.00R.

Schuster, Robert W., 4,033,112, Cl. 60-39.28R.

Simmons, Richard W., 4,034,354, Cl. 364-900.000.

Benesh, Peter: *See—*

Gregory, Ralph R.; and Benesh, Peter, 4,033,329, Cl. 128-2.00S.

Benford, Howard L.: *See—*

Smith, Robert H.; and Benford, Howard L., 4,033,605, Cl. 280-664.000.

Bengtsson, Goran Vilhelm. Filter device. 4,033,880, Cl. 210-424.000.

Benjamin, Benjamin C.; and Schautz, Glenn A., to Schmelzer Corporation. Charge forming device. 4,033,232, Cl. 91-47.000.

Bennett, Bruce A., to Creative Innovations. Motorcycle lock. 4,033,159, Cl. 70-233.000.

Bennett, Richard H., Klock, Byron V.; and Brockington, James W., to Texaco Inc. Alkylation fluosulfonic-sulfuric acid catalyst recovery process with silica-alumina removal of fluoride compounds. 4,033,899, Cl. 252-420.000.

Bennett, William O., and Sagarino, Robert F., to Bulova Watch Company, Inc Automatic cut-off setting system for LED display in a solid-state watch. 4,033,108, Cl. 58-50.00R.

Benning, Vernon A., to M. L. Aviation Company Limited. Apparatus for manoeuvring aircraft. 4,033,422, Cl. 180-14.00C.

Benoit, Roland A., and Duprey, Richard H., to Interroyal Corporation Drawer slide. 4,033,639, Cl. 308-3.600.

Benson, William. Aerodynamic flow body. 4,033,526, Cl. 244-15.000

Bentley, Arthur P. Heat engine. 4,033,134, Cl. 60-641.000.

Bentley, Peter Hubert, and Clayton, John Peter, to Beecham Group Limited. Organic compounds. 4,033,979, Cl. 260-306.70C.

Bently, Donald E., to Bently Nevada Corporation. Shaft alignment apparatus and method. 4,033,042, Cl. 33-181.00R.

Bently Nevada Corporation: *See—*

Bently, Donald E., 4,033,042, Cl. 33-181.00R.

Berenson, Walter Louis, and Taylor, Ronald Wayne, to Motorola, Inc. Omni-frequency pilot system. 4,034,296, Cl. 325-62.000.

Berg, Daniel T.: *See—*

Berg, Winfred M.; and Berg, Daniel T., 4,033,395, Cl. 152-323.000.

Berg, Lawrance F., to Caterpillar Tractor Co Fluid operated ram 4,033,235, Cl. 91-396.000

Berg, Winfred M., and Berg, Daniel T. Continuous plastic tire body and tire. 4,033,395, Cl 152-323.000.

Berger, Abe, to Berger, Abe, Adam, Gerhard K., and Stonkus, John Alkenyl thioalkyl silicones and method of preparation. 4,033,934, Cl. 260-46.50G.

Berger, Christian, Farge, Daniel; Gros, Georges, Messer, Mayer Naoum, and Moutonnier, Claude, to Rhone-Poulenc Industries. Cephalosporin derivatives, and compositions containing them. 4,034,088, Cl. 424-246.000

Berger, Christian; Farge, Daniel; Gros, Georges; Messer, Mayer Naoum, and Moutonnier, Claude, to Rhone-Poulenc Industries. Cephalosporin derivatives. 4,034,090, Cl. 424-246.000.

Berger, Herbert: *See—*

Rhomberg, Alfred, Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, administrator; Vomel, Wolfgang; and Sauer, Winfriede, 4,033,967, Cl. 260-287.0CF.

Rhomberg, Alfred; Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, administrator; Vomel, Wolfgang; and Sauer, Winfriede, 4,034,096, Cl. 424-258.000.

Berger, Horst: *See—*

Schlosser, Werner; and Berger, Horst, 4,034,182, Cl. 219-121.0EM.

Berges, David A., to SmithKline Corporation. 7-Acyl-3-(carboxyalkyl and carbamoylalkyl substituted oxadiazolylthiomethyl) cephalosporins. 4,034,092, Cl. 424-246.000.

Bergkvist, Hakan Georg Frithiof. Positioning device for tubes to be embedded in surrounding cast material. 4,033,534, Cl. 248-49.000.

Bergquist, Arne Erik; and Westerberg, Sven Peter Jonas, to Atlas Copco Aktiebolag. Power tool support. 4,033,532, Cl. 248-17.000.

Bernard, Armand R.: *See—*

Thary, Christian; Bernard, Armand R.; Labadie, Jean Francois; and De La Taille, Olivier P., 4,033,623, Cl. 297-390.000.

Bernstein, Bertram J. Crankcase oil drainage and containment apparatus 4,033,432, Cl. 184-1.500.

Bernstein, Jack: *See—*

Hoehn, Hans; Bernstein, Jack; and Vogt, Berthold Richard, 4,033,970, Cl. 260-293.610.

Berreman, Dwight Winton, to Bell Telephone Laboratories, Incorporated. Liquid crystal twist cells. 4,033,671, Cl. 350-160.0LC.

Berry, Brian S.; and Pritchet, Walter C., to International Business Machines Corporation. Method for inducing uniaxial magnetic anisotropy in an amorphous ferromagnetic alloy. 4,033,795, Cl. 148-108.000.

Berry, James M., to Teletype Corporation. Ink jet writing process and apparatus. 4,034,379, Cl. 346-1.000.

Bertelli, Guido; Roma, Pierpaolo; and Longi, Paolo, to Montedison Fibre S.p.A. Flame-extinguishing polyolefin compositions. 4,033,915, Cl. 260-28.50A.

Bertone, Antonino; Rivetti, Enrico; and Cattaneo, Maurizio, to Fiat Societa per Azioni. Hydro-dynamic anti-skid braking systems. 4,033,638, Cl. 303-116.000.

Besigk, Geert. *See—*

Payrhammer, Bernd, Bartel, Siegfried; and Besigk, Geert, 4,033,693, Cl. 355-71.000.

Besik, Ferdinand, to Ontario Research Foundation. Waste water treatment apparatus. 4,033,875, Cl. 210-197.000.

Bestel, John Louis; Haynes, Richard, and Srinivasan, Venkataraman, to Western Electric Company, Inc. Method of selectively electroplating an area of a surface. 4,033,833, Cl. 204-15.000.

Bestenreiner, Friedrich, and Giglberger, Dieter, to AGFA-Gevaert, Aktiengesellschaft. Method and arrangement for preventing sheets from charring in copying machines. 4,034,186, Cl. 219-216.000.

Bethlehem Steel Corporation. *See—*

List, Harold A.; Baker, Jack H.; and Joyce, Jack, 4,033,183, Cl. 73-88.50R

Bethmann, Heinz G., Kilguss, Heinz; and Simon, Horst, to Eastman Kodak Company. Exposure control apparatus having two exposure time setting positions. 4,034,391, Cl. 354-289.000.

Bettencourt, Thomas S.. *See—*

Friedel, William C., Jr., Bettencourt, Thomas S.; and Freeman, Daniel L., 4,033,099, Cl. 56-327.00R.

Betts, Robert E.; Thorn, Lawrence B., and Maykut, Albert R., to United States of America, Army. Noise controllable nozzle closure. 4,033,121, Cl. 60-271.000.

Betz Laboratories, Inc.. *See—*

Jacques, Donald F.; and Lange, K. Robert, 4,033,867, Cl 210-28.000

Bevilacqua, Leno L. Operating condition signal light for an automotive vehicle. 4,034,338, Cl 340-66.000

Bewley, William L.; and Wilkinson, Herbert F., deceased (by Wilkinson, Alice E., executrix), to Union Oil Company of California. Dual cylinder rotating solids feeder and method. 4,033,467, Cl 214-23.000.

Bex, Hans, to U.S. Philips Corporation. Circuit arrangement in strip line technique for a wide band balancing element. 4,034,316, Cl. 333-11.000

Bezzerides, Paul A.; Bezzerides, Robert A., and Vradenburg, Dave W. Agricultural soil chemical incorporator. 4,033,270, Cl. 111-6.000

Bezzerides, Robert A.: *See—*

Bezzerides, Paul A., Bezzerides, Robert A.; and Vradenburg, Dave W., 4,033,270, Cl. 111-6.000.

Bichler, Peter: *See—*

Tybus, Gerd; Ebner, Ludwig, Waldhoer, Rudolf, Bichler, Peter; Bier, Wilhelm; Happe, Peter; and Weis, Frowald, 4,033,021, Cl. 29-157.00C.

Bickerdike, Robert Lewis; Clark, Douglas, Eastabrook, John Norman, Hughes, Garyth; Mair, William Norman, Partridge, Peter George, and Ranson, Harry Christopher, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Aluminium alloys. 4,033,793, Cl. 148-32.000.

Bieniosek, Chester E.; Kachik, Robert H.; and Pignocco, Arthur J., to United States Steel Corporation. Method for cladding copper and copper alloys to steel substrates. 4,033,399, Cl. 164-54.000.

Bier, Wilhelm. *See—*

Tybus, Gerd; Ebner, Ludwig; Waldhoer, Rudolf; Bichler, Peter; Bier, Wilhelm; Happe, Peter; and Weis, Frowald, 4,033,021, Cl. 29-157.00C.

Bierworth, David P.; and Lynch, Thomas, to Xerox Corporation. Variable magnification reproducing apparatus. 4,033,691, Cl. 355-11.000.

Bihuniak, Peter P.: *See—*

Baumgartner, Charles E.; and Bihuniak, Peter P., 4,033,780, Cl. 106-69.000.

Biller, Horst; and Huls, Friedrich, to Mannesmannrohren-Werke AG. Method for rolling tubes. 4,033,164, Cl. 72-205.000.

Birchenough, Arthur G., to United States of America, National Aeronautics and Space Administration. Sustained arc ignition system. 4,033,316, Cl. 123-148.00E.

Bishop, Roland Justin, Jr.: *See—*

Kasai, Paul Haruo; Francis, James Nelson; and Bishop, Roland Justin, Jr., 4,034,065, Cl. 423-328.000.

Black and Decker Manufacturing Company, The: *See—*

Chester, Nelson Sherwood; Laughon, Thomas Cecil; and Sindelar, William Frank, 4,033,077, Cl. 51-170.00T.

Blackwell Burner Company: *See—*

Lohman, John H.; and Brooke, Richard C., 4,033,328, Cl. 126-343.50A.

Blake, James David. *See—*

Blake, Robert L.; and Blake, James David, 4,033,620, Cl. 296-24.00C.

Blake, Robert L.; and Blake, James David. Bee hive carrier and transport means. 4,033,620, Cl. 296-24.00C.

Blake, Timothy Gunton: *See—*

Sheldrake, Charles Peter Hedley; and Blake, Timothy Gunton, 4,034,398, Cl. 358-60.000.

Blank, Stuart Lawrence, to Bell Telephone Laboratories, Incorporated. Magnetic bubble devices with controlled temperature characteristics. 4,034,358, Cl. 340-174.0TF.

Blaum, Eberhard: *See—*

Baron, Gerhard, Hafke, Carl; Engler, Dietrich; Reimert, Rainer; and Blaum, Eberhard, 4,033,730, Cl. 48-86.00R.

Blessington, Clement Auguston: *See—*

Louden, Lester Richard; Blessington, Clement Auguston; and Beatty, Jerry Lon, 4,034,219, Cl. 250-301.000.

Bloink, Harry William, to Illinois Tool Works Inc. Indexable milling cutter. 4,033,018, Cl. 29-105.00A.

Bloom, Allen; and Ross, Daniel Louis, to RCA Corporation. Method for increasing the conductivity of electrically resistive organic materials. 4,033,905, Cl. 252-500.000.

Blount, David H. Process for the production of amino silicate compounds and their condensation products. 4,033,935, Cl. 260-67.60R.

Boehringer Mannheim G.m.b.H.. *See—*

Rhomberg, Alfred, Berger, Herbert; Stach, Kurt, deceased; Plattner, Werner, administrator; Vomel, Wolfgang; and Sauer, Winfriede, 4,033,967, Cl. 260-287.0CF.

Rhomberg, Alfred, Berger, Herbert, Stach, Kurt, deceased; Plattner, Werner, administrator, Vomel, Wolfgang; and Sauer, Winfriede, 4,034,096, Cl. 424-258.000.

Boeing Company, The. *See—*

Allyn, Donald Cooper, 4,034,334, Cl 340-27.00R.

Bogan, Robert T. Shutter, grille or the like. 4,033,073, Cl 49-38.000.

Bolden, Edward J., to Raymond Lee Organization, Inc., The, a part interest. Speaker enclosure. 4,033,430, Cl 181-144.000.

Boliden Aktiebolag. *See—*

Nilsson, Bruno Yngve, 4,034,279, Cl. 320-20.000.

Bollert, Ulrich; Lohmar, Elmar; and Ohorodnik, Alexander, to Hoechst Aktiengesellschaft. Process for the manufacture of flame retarding linear polyesters. 4,033,936, Cl. 260-75.00P.

Bolza, Frederick, Sadek, Lubos Vojtech; and Fox, Richard, to ICI Australia Limited. Explosive cartridge. 4,033,264, Cl. 102-24.00R.

Bonifay, Andre. Functional stretcher shell device. 4,033,000, Cl 5-82.00R.

Boodman, Norman S.; and Weil, Richard C., to United States Steel Corporation Tar acid products from solvent naphtha. 4,034,048, Cl 260-621.00H.

Booth, Ronald J.: *See—*

Bayly, John G.; and Booth, Ronald J., 4,033,699, Cl. 356-205.000.

Borchert, Marshall Bond. *See—*

Allen, David William; and Borchert, Marshall Bond, 4,034,291, Cl 324-121.00R

Borden, Inc.: *See—*

Krueger, Bruno O., 4,034,062, Cl. 423-219.000

Borg-Warner Corporation. *See—*

Beavers, John Andrew, 4,033,647, Cl. 308-227.000.

Warner, John C., 4,033,145, Cl. 64-21.000.

Borman, Willem F. H., to General Electric Company. Flame retardant polyester resin compositions. 4,033,927, Cl. 260-45.70P.

Borthwick, James; and Morman, James Forrester, to Imperial Chemical Industries Limited. Smoking mixture 4,033,359, Cl. 131-17.0AC.

Borton, Gary L., Goff, Cobb S., and Malloy, Richard J., to Eastman Kodak Company. Stabilized bleach-fixing baths. 4,033,771, Cl 96-60.0BF.

Bos Kalis Westminster Group N.V.. *See—*

Demmers, Arie Adolf, 4,033,056, Cl. 37-73.000

Bosch-Siemens Hausgerate GmbH *See—*

Ballarin, Jurgen, 4,033,739, Cl. 62-202.000

Bouder, Paul C., to Etablissements Poutrait-Morin. Toe clip for pedals. 4,033,199, Cl. 74-594.600.

Boudreau, Robert J., to Hedstrom Co. Infant's car seat. 4,033,622, Cl 297-250.000

Boulanger, Henry J.: *See—*

Ehlers, Brian C., and Boulanger, Henry J., 4,034,234, Cl 307-116.000

Bourgeois, Armand E., to Sanders Associates, Inc Drogue release apparatus. 4,033,529, Cl. 244-151.00B

Bouwhuis, Gijsbertus. *See—*

Compaan, Klaas; and Bouwhuis, Gijsbertus, 4,034,403, Cl 358-128.000

Boux, Rene. *See—*

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Bovier, Edward M.; and Voigt, John E., to Anheuser-Busch, Incorporated. Water resistant corrugating adhesive containing aminohydroxy compound 4,033,914, Cl 260-17.200.

Bowman, Harold M. Fire hydrant locking device. 4,033,372, Cl 137-296.000

Boyd, Albert E. Telephone switch retaining device. 4,034,167, Cl. 179-178.000

Boyer, Ambroise O. Apparatus for carrying glass panels. 4,033,597, Cl. 280-46.000.

Bracey, Jep T., to Towler, Martin L. Oxygenation impregnation apparatus. 4,034,030, Cl 261-64.00D.

Bradshaw, Janice: *See —*

Cook, Martin Christopher; Gregory, Gordon Ian, and Bradshaw, Janice, 4,033,950, Cl. 260-243.00C.

Brady, John F.: *See—*

Czernik, Daniel E.; and Brady, John F., 4,033,005, Cl. 14-16.100

Bram, Georges Eugene, to Pont-A-Mousson S.A. Locked joint between two pipe elements capable of having an angular deviation with respect to each other. 4,033,613, Cl. 285-184.000.

Brammer, Hartmut G.. *See—*

Kroger, Uwe; Jaki, Friedrich, Brammer, Hartmut G., Ehrmann, Karl; Magdefrau, Herbert; Brand, Gunter, Kalippke, Harald, and Rink, Rolf, 4,033,315, Cl 123-146.50A

Brand, Gunter *See—*

Kroger, Uwe; Jaki, Friedrich, Brammer, Hartmut G., Ehrmann, Karl, Magdefrau, Herbert, Brand, Gunter, Kalippke, Harald, and Rink, Rolf, 4,033,315, Cl. 123-146.50A.

Brander, James Edward, to International Combustion Australia Limited. Vibratory drive unit. 4,033,193, Cl. 74-61.000

Brandes, Wilhelm *See—*

Daum, Werner, Brandes, Wilhelm, and Frohberger, Paul-Ernst, 4,034,104, Cl 424-289.000

Brantley, Lott W., Jr., and Rood, Robert W. Pressure-shaped reflector apparatus. 4,033,676, Cl. 350-295.000.

Braun Aktiengesellschaft. *See—*

Gahler, Egon, Heintke, Hans Eberhard, and Dietrich, Rolf, 4,034,278, Cl. 320-1.000.

Braun, Anton. *See—*

Lohn, Gerd, and Braun, Anton, 4,033,039, Cl. 32-26.000

Braun, Franz Electrostatic coating guns. 4,033,506, Cl. 239-15.000.

Braunschweigische Maschinenbauanstalt. *See—*

Natt, Peter, and Kurland, Heinrich, 4,033,879, Cl. 210-369.000.

Bregeon, Louis, Dupuy, Gerard; Lerouge, Bernard, and Schwartz, Jean-Pierre, to Commissariat a l'Energie Atomique. Thermogenic swimming-pool type nuclear reactor. 4,033,814, Cl. 176-63.000.

Brenner, William C.: *See—*

Mole, Cecil J.; and Brenner, William C., 4,034,248, Cl. 310-178.000.

Bresie, Don. Method and apparatus for down hole pressure and temperature measurement 4,033,186, Cl. 73-154.000.

Brewer, Robert A. Harness article carrier. 4,033,488, Cl. 224-5.00V.

Brian, Jack, to Hughes Aircraft Company. Video scrambling system. 4,034,402, Cl. 358-114.000.

Brice, Marilyn J., executrix: *See—*

Brice, Neil M., deceased, and Brice, Marilyn J., executrix, 4,033,524, Cl. 244-158.000.

Brice, Neil M., deceased, and by Brice, Marilyn J., executrix. Method and apparatus for controlling earth orbiting satellites and vehicles inter alia. 4,033,524, Cl. 244-158.000.

Bridges, Robert M.: *See—*

Menin, Albert S., and Bridges, Robert M., 4,034,331, Cl. 340-3.00R

Briedis, Juozas, and Jurisch, Louis A., to IMC Chemical Group, Inc. Copper-oxazoline complex. 4,033,976, Cl. 260-299.000.

Briles Manufacturing: *See—*

Marroquin, Emilio R., 4,033,003, Cl. 10-10.00R

Brill, Henry; and Yee, Peter, to Bulova Watch Company, Inc. Electro-optical bar-code scanning unit. 4,034,230, Cl. 250-568.000.

Briska, Marian; and Eisenbraun, Ewald, to International Business Machines Corporation. Method of growing pyrolytic silicon dioxide layers. 4,034,130, Cl. 427-248.00C.

Bristol-Myers Company: *See—*

Kaplan, Murray Arthur, and Granatek, Alphonse Peter, 4,034,089, Cl. 424-246.000.

British Aluminum Company, Limited, The: *See—*

Stowell, Michael James, Watts, Brian Michael, Emley, Edward Frederick, and Grimes, Roger, 4,033,794, Cl. 148-32.000.

Britton, Berdette O. Quadraphonic passive four-channel decoder. 4,034,158, Cl. 179-1.0GQ

Brock, James Donald: *See—*

Chazen, Julius L., and Brock, James Donald, 4,033,458, Cl. 209-11.000

Brockington, James W.: *See—*

Bennett, Richard H., Klock, Byron V., and Brockington, James W., 4,033,899, Cl. 252-420.000

Brodman, Bruce W., Devine, Michael P., and Schwartz, Stuart, to United States of America, Army. Complex of nitrocellulose as propellant. 4,033,798, Cl. 149-92.000

Brodmann, Franz J., and Varker, Richard D., to General Refractories Company. Method for making lime-silica insulation from perlite. 4,033,783, Cl. 106-120.000

Brodsky, Larry: *See—*

Jureit, John Calvin, Leutwyler, Roy, Brodsky, Larry; Kushner, Benjamin, and Castillo, Adolfo, 4,033,025, Cl. 29-417.000

Brolund, Theodore F., and Helgert, James F., to W. A. Whitney Corporation. Duplicating punch press with stylus control. 4,033,216, Cl. 83-413.000.

Brooke, Richard C.: *See—*

Lohman, John H., and Brooke, Richard C., 4,033,328, Cl. 126-343.50A

Brookline Instrument Company, Inc.: *See—*

De Masters, James J., 4,033,420, Cl. 177-126.000.

Brouillard, Robert Ernest, to Penick & Ford, Limited. Starch sponge column apparatus and process for immobilized enzyme reactions. 4,033,820, Cl. 195-31.00R

Brown, Christopher Kingsley: *See—*

Wion, Donald Andrew, and Brown, Christopher Kingsley, 4,033,456, Cl. 206-347.000.

Brown, Harvey A., to Minnesota Mining and Manufacturing Company. Acutance agents for use in thermally-developable photosensitive compositions. 4,033,948, Cl. 260-240.00A.

Brown, Robert Kenneth. Device to detect and automatically control electrical potential polarities. 4,034,168, Cl. 191-2.000

Brown, Wilburn Kelly, to Pettibone Corporation. Hydraulic boom-lift system with selective speeds. 4,033,468, Cl. 214-130.00R.

Brown & Williamson Tobacco Corporation: *See—*

Horsewell, Henry George, and Harris, Ian Richard, 4,033,361, Cl. 131-262.00A.

Rusk, Thomas P., 4,033,283, Cl. 118-1.000.

Browning, John H. D.: *See—*

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Brubaker, Hiram A.: *See—*

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Brunet, Michel: *See—*

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Brunnetti, Heimo: *See—*

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Bruns, Klaus, and Meins, Peter, to Henkel & Cie G.m.b.H. Cycloalkyl carbonates. 4,033,993, Cl. 260-463.000.

Bryan, Jack T., to Upjohn Company, The. Compositions and method for treating mastitis in milk animals. 4,034,099, Cl. 424-271.000.

BTU Engineering Corporation: *See—*

Beck, Jacob Howard, 4,033,715, Cl. 432-4.000.

Buchel, Karl Heinz: *See—*

Wenzelburger, Jurgen, Buchel, Karl Heinz, Plempel, Manfred, and Meiser, Werner, 4,033,964, Cl. 260-268.00C.

Buchholz, Reinhard: *See—*

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Buinicky, Ernest P., Durkin, Joseph A., and Estes, John H., to Texaco Inc. Shaped, bonded boride catalysts. 4,033,901, Cl. 252-432.000.

Bulanda, John J.: *See—*

Moody, Roy A., and Bulanda, John J., 4,033,661, Cl. 339-98.000

Buller, Richard James: *See—*

Fritz, David Paul; Anderson, John Dale; Pruitt, Martin Eugene, Mahagan, Deroy Ernest, and Buller, Richard James, 4,033,101, Cl. 56-344.000

Bulova Watch Company, Inc.: *See—*

Bennett, William O., and Sagarino, Robert F., 4,033,108, Cl. 58-50.00R.

Brill, Henry, and Yee, Peter, 4,034,230, Cl. 250-568.000

Sagarino, Robert F., 4,033,110, Cl. 58-88.00R.

Bulvanoski, Leo James: *See—*

DiMartini, Carl Richard, Scott, William Lafayette; and Bulvanoski, Leo James, 4,033,761, Cl. 75-77.000.

Bundy, Gordon L., to Upjohn Company, The. 9-Deoxy-PGF$_2$ Analogs. 4,033,989, Cl. 260-408.000.

Bunge, Ernst, Rothgordt, Ulf, Ehlers, Bernd, and Piotrowski, Herbert, to U.S. Philips Corporation. Logic circuit for grey-tone printer. 4,033,443, Cl. 197-1.00R

Burdeska, Kurt, and Schwander, Hansrudolf, to Ciba-Geigy Corporation. Nitro acridone dyes. 4,033,965, Cl. 260-279.00R.

Burdette Company, The: *See—*

Kemper, David C., 4,033,657, Cl. 339-19.000.

Burgat, Georges, and Guillemaut, Bernard, to Thimmonier S.A. Apparatus for opening bags. 4,033,096, Cl. 53-386.000.

Burger, Friedhelm: *See—*

Junghanns, Paul, and Burger, Friedhelm, 4,033,564, Cl. 266-242.000.

Burnett, Jack W., III, to Southern Weaving Company. Accordian fold cable with flexible clips over the folds. 4,034,150, Cl. 174-69.000.

Burnham, Robert D.; and Scifres, Donald R., to Xerox Corporation. Method of making buried-heterostructure diode injection laser. 4,033,796, Cl. 148-175.000

Buron, Rene Henri, to International Business Machines Corporation. Switching system for multichannel lines. 4,034,159, Cl. 179-15.0AT.

Burris Company: *See—*

Burris, Donald J., 4,033,046, Cl. 33-297.000.

Burris, Donald J., to Burris Company. Riflescope reticle. 4,033,046, Cl. 33-297.000.

Burroughs Corporation: *See—*

Beery, Jack, 4,033,444, Cl. 197-1.00R.

Denny, William Michael; Hagen, Russell Louis; and Leung, Steve Ka-Lai, 4,034,353, Cl. 364-200.000.

Kruklitis, Karlis, 4,034,342, Cl. 340-146.3AG.

LaVenture, Orville W., 4,034,232, Cl. 307-32.000.

Romania, Samuel Richard; and Sprenkle, George Joseph, 4,033,032, Cl. 29-764.000.

Sims, Dewey M., Jr., 4,034,177, Cl. 200-159.00R.

Burson, Bob O., to R. E. Phelon Company, Inc. Ignition system with hazardous-start inhibiting interlock. 4,033,311, Cl. 123-179.00K.

Busanovich, Charles John; and Moore, Robert Milton, to RCA Corporation. Method of forming and treating cadmium selenide photoconductive bodies. 4,034,127, Cl. 427-76.000.

Butler, David J. Fastener applicators. 4,033,499, Cl. 227-120.000.

Butler, John F.: *See—*

Hamburg, Emil G., Cryderman, Robert L.; and Butler, John F., 4,033,789, Cl. 148-12.00F

Butterweck, Hans-Jurgen; Claasen, Theodoor Antonius Carel Maria; Mecklenbrauker, Wolfgang Friedrich Georg; and Peek, Johannes Bernhard Heinrich, to U.S. Philips Corporation. Digital signal processing device with quantizer. 4,034,196, Cl. 235-156.000.

Buxton, Incorporated: *See—*

Fontana, Giampiero, 4,033,162, Cl. 70-456.00B.

Byk Gulden Lomberg Chemische Fabrik GmbH: *See—*

Klemm, Kurt, and Langenscheid, Erhard, 4,034,093, Cl. 424-251.000.

Schoetensack, Wolfgang, and Riedel, Richard, 4,034,111, Cl. 424-319.000.

Byland, Henry Lowell. Package wrapping method and apparatus. 4,033,089, Cl. 53-33.000.

C A V Limited: *See—*

Nicolls, Wilfrid Edward Walter, 4,033,310, Cl. 123-139.0AP.

C & D Distributors, Inc.: *See—*

Piontkowski, Carl, 4,033,390, Cl. 144-193.00D

C G R.-Mev.: *See—*

Azam, Guy, and Boux, Rene, 4,034,222, Cl. 250-355.000.

C&O Railroad Company: *See—*

Oros, Richard G., 4,033,851, Cl. 204-302.000.

Cailloux, Paul, to Promecam Sisson-Lehmann. Sheet-plate positioning device for machine tools. 4,033,572, Cl. 269-320.000.

Cain, Earl S., Carlson, Jerome A.; and Goodrich, George E., to Tribotech. Flange mount. 4,033,641, Cl. 308-15.000.

California Institute of Technology: *See—*

Chern, Shy-Shiun; and Maserjian, Joseph, 4,033,286, Cl. 118-49.000

Houseman, John, and Cerini, Donald J., 4,033,133, Cl. 60-606.000.

Callery, Patrick S., Zenker, Nicolas; Wright, Jeremy; and Stone, Clement A., to Merck & Co., Inc. Antihypertensive agents. 4,034,100, Cl. 424-272.000

Calligaro, Daniel: *See—*

Chesnut, W. Richard, and Calligaro, Daniel, 4,033,522, Cl. 242-75.400.

Calspan Corporation: *See—*

Weatherston, Roger C., 4,033,708, Cl. 418-9.000

Cameron, John Stratton, to Jeffries Truck Parts & Equipment, Inc. Means for attenuating the jarring and vibration of a truck-tractor. 4,033,607, Cl. 280-711.000

Campbell, Steven J.: *See—*

Fleming, Phillip F.; and Campbell, Steven J., 4,033,518, Cl. 241-47.000.

Canadian Business Machines Ltd.: *See—*

Williams, John, 4,033,157, Cl. 70-85.000.

Canadian Instrumentation and Research Limited: *See—*

Failes, Michael, 4,033,052, Cl. 35-19.00B.

Canadian Marine Drilling Ltd.: *See—*

Schaper, Manfred, 4,033,277, Cl. 114-230.000.

Canadian Patents and Development Limited: *See—*

Capes, Charles E.; Germain, Rene J.; McIlhinney, Allan E.; Puddington, Ira E., and Sirianni, Aurelio F., 4,033,729, Cl. 44-1.00A.

Kentfield, John A. C., 4,033,120, Cl. 60-249.000.

Candor, James T. Liquid removing method and apparatus. 4,033,841, Cl. 204-180.00R.

Cann, Lyle L., to Chemetron Corporation. Continuous method for making rod-like solid carbon dioxide extrusions. 4,033,736, Cl. 62-10.000.

Canon Kabushiki Kaisha: *See—*

Akima, Hideaki, 4,034,274, Cl. 318-334.000.

Hirayama, Kazuhiro; Tsukada, Syusei; and Inoue, Takahiro, 4,033,687, Cl. 355-1.000.

Iwashita, Tomonori; and Kozuki, Susumu, 4,034,388, Cl. 354-173.000.

Mashimo, Yukio; Ito, Tadashi; Shinoda, Nobuhiko; Sakurada, Nobuaki; and Ito, Fumio, 4,034,383, Cl. 354-23.00D.

Ohtaki, Shohei; Kozuki, Susumu; and Nakamura, Zenzo, 4,034,387, Cl. 354-126.000.

Sakamaki, Hisashi; and Ohtani, Toshiyuki, 4,034,189, Cl. 219-216.000.

Sekiguchi, Takeshi, 4,033,674, Cl. 350-184.000.

Tsunekawa, Tokuichi; Nakamoto, Soichi; and Taguchi, Tetsuya, 4,034,384, Cl. 354-33.000.

Uno, Keiichi; and Inoue, Mutsuhiro, 4,033,685, Cl. 353-82.000.

Canonne, Paul, to Societe d'Apparetillage Electrique Saparfi. Device for protection against current overcharges. 4,034,322, Cl. 335-42.000.

Capes, Charles E.; Germain, Rene J.; McIlhinney, Allan E.; Puddington, Ira E.; and Sirianni, Aurelio F., to Canadian Patents and Development Limited. Method of separating inorganic material from coal. 4,033,729, Cl. 44-1.00A.

Capio, Cesar Deduyo: *See—*

Alexander, Frank Bernard, Jr.; Capio, Cesar Deduyo; Hauser, Victor Emerald, Jr.; Levinstein, Hyman Joseph; Mogab, Cyril Joseph; Sinha, Ashok Kumar; and Wagner, Richard Siegfried, 4,033,287, Cl. 118-49.10R.

Capuano, Terry D., to Veeder Industries, Inc. Clamping split lock nut. 4,033,394, Cl. 151-21.00C.

Cardiac Pacemakers, Inc.: *See—*

Amundson, David Charles, 4,033,355, Cl. 128-404.000.

Carlsen, W. John, to GTE Laboratories Incorporated. Holographic digital data processing system with sequential data storage and retrieval. 4,034,355, Cl. 340-173.0LM.

Carlson, Alvin R., to Bank of America National Trust & Savings Association. Machine for packaging rolls of coins. 4,033,090, Cl. 53-78.000.

Carlson, David H. J., to UOP Inc. Mercaptan conversion process. 4,033,860, Cl. 208-206.000.

Carlson, Jerome A.: *See—*

Cain, Earl S.; Carlson, Jerome A.; and Goodrich, George E., 4,033,641, Cl. 308-15.000.

Carlson, Richard D.: *See—*

Duffy, James J.; Carlson, Richard D.; and Watson, James C., 4,034,141, Cl. 428-473.000.

Carlson, Ronald H., to FMC Corporation. Process for preparing chloroisocyanurate complex compounds. 4,033,959, Cl. 260-248.00C.

Carnaud Total Interplastic: *See—*

Flamand, Guy, 4,033,172, Cl. 73-37.000.

Carr, Richard Wallace, to Diamond Power Specialty Corporation. Clip for reflective insulation. 4,033,464, Cl. 214-10.50R.

Carrere, Ricardo Haro, to Fredrick M. Kerr. Method for recovering material from the centers of phonograph records. 4,034,033, Cl. 264-36.000.

Carrier Corporation: *See—*

Duffey, James R.; and Smith, Joseph W., 4,033,163, Cl. 72-121.000.

Case, Dan Frank, to Automation Industries, Inc. Dual trace display for ultrasonic testing apparatus. 4,033,177, Cl. 73-67.900.

Cash, Robert J.: *See—*

Holt, Fred E.; Cash, Robert J.; and Schenter, Robert E., 4,033,813, Cl. 176-19.0LD.

Casio Computer Co., Ltd.: *See—*

Kashio, Toshio, 4,034,209, Cl. 235-61.90R.

Kashio, Toshio, 4,034,301, Cl. 328-37.000.

Kashio, Toshio, 4,034,350, Cl. 364-900.000.

Cassano, James R.: *See—*

Stange, Klaus K.; Smith, Richard E., Hamlin, Thomas J.; and Cassano, James R., 4,033,574, Cl. 271-3.000.

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,033,579, Cl. 271-195.000.

Cassar, Luigi; Foa, Marco; and Gardano, Andrea, to Montedison Fibre S.p.A. Process for the preparation of carboxylic acids from organic halides. 4,034,004, Cl. 260-515.00R.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*

Bauer, Wolfgang, Krusche, Erwin; and Ribka, Joachim, 4,033,945, Cl. 260-157.000.

Castenson, Richard L.; Hazen, James R.; and Tien, Rex Y., to American Hoechst Corporation. Process for the preparation of 4-bromo-1,8-naphthalic acid anhydride. 4,033,986, Cl. 260-345.200.

Castillo, Adolfo: *See—*

Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry; Kushner, Benjamin; and Castillo, Adolfo, 4,033,025, Cl. 29-417.000.

Catalyst Research Corporation: *See—*

Sweet, Roger G., 4,034,143, Cl. 429-112.000.

Catanese, Carmen Anthony; Endriz, John Guiry; and Rajchman, Jan Aleksander, to RCA Corporation. Vane structure for a flat image display device. 4,034,255, Cl. 313-400.000.

Caterpillar Tractor Co.: *See—*

Balzer, David John, 4,033,631, Cl. 303-50.000.

Berg, Lawrance F., 4,033,235, Cl. 91-396.000.

Chamberlain, Richard W.; and Moore, Michael E., 4,033,158, Cl. 70-202.000.

Goloff, Alexander; and Brubaker, Hiram A., 4,033,231, Cl. 90-24.300.

Johnson, Howard L.; and Junck, John A., 4,033,236, Cl. 91-463.000.

Nichting, Robert P., 4,033,439, Cl. 192-85.0AA.

Cattaneo, Maurizio: *See—*

Bertone, Antonino; Rivetti, Enrico; and Cattaneo, Maurizio, 4,033,638, Cl. 303-116.000.

Cavitron Corporation: *See—*

Hardway, Edward V., Jr.; and Holtman, William H., 4,033,332, Cl. 128-2.00S.

Celanese Corporation: *See—*

Mims, Herman D.; Willes, John A.; and Gibson, Baylor D., 4,033,520, Cl. 242-43.00R.

Central Glass Co., Ltd.: *See—*

Aramaki, Minoru, and Ushirogouchi, Etsuo, 4,034,068, Cl. 423-465.000.

Centre Europeen de Recherches Mauvernay C.E.R.M.: *See—*

Pourrat, Henri; and Pourat nee Gaillard, Aimee, 4,033,818, Cl. 195-7.000.

Centre Technique Industriel dit: Institut Textile de France: *See—*

Vanhelle, Michel E., 4,033,102, Cl. 57-12.000.

Cepuritis, Talivaldis, to Johnson & Johnson. Disposable diaper having a tab fastener with a bifurcated fixed end. 4,033,348, Cl. 128-287.000.

Cerini, Donald J.: *See—*

Houseman, John; and Cerini, Donald J., 4,033,133, Cl. 60-606.000.

Cervin, Gunnar, to Cervinter AB. Work-facilitating apparatus for lining converters, metallurgical furnaces, holding vessels and like equipment. 4,033,463, Cl. 214-1.00H.

Cervinter AB: *See—*

Cervin, Gunnar, 4,033,463, Cl. 214-1.00H.

Chaky, Michael J.: *See—*

Thomas, David E.; McCoy, Marion B., and Chaky, Michael J., 4,034,194, Cl. 235-153.0AC.

Chalmers, Alexander Michael: *See—*

Randell, Donald Richard; Cook, Barry; and Chalmers, Alexander Michael, 4,033,928, Cl. 260-45.80N.

Chamberlain, Richard W., and Moore, Michael E., to Caterpillar Tractor Co. Adjustable steering wheel and transmission lock arrangement. 4,033,158, Cl. 70-202.000.

Chamberlin, Edward B. Portable atomizer apparatus. 4,033,511, Cl. 239-346.000.

Chang, Wen-Hsuan, Erikson, J. Alden, and Scriven, Roger L., to PPG Industries, Inc. Composition useful in making extensible films. 4,034,017, Cl. 260-859.00R.

Chapman, Earle F.; and Ruskin, Bernard J. Multiple position lamp. 4,034,214, Cl. 240-70.000.

Chariatte, Edgar: *See—*

Grossen, Walter; Gagnaux, Andre; and Chariatte, Edgar, 4,034,229, Cl. 250-541.000

Charland, Terrence D.; and Klett, Stanley D., to Xerox Corporation. Developer mixing and transporting auger for magnetic brush developing apparatus. 4,033,294, Cl. 118-658.000.

Charles, Gilbert: *See—*

Balanca, Charles; and Charles, Gilbert, 4,034,362, Cl. 340-347.0AD.

Chas. S. Lewis & Co., Inc.: *See—*

Johnson, Thomas E., 4,033,767, Cl. 75-170.000.

Charlton, David, deceased: *See—*

Venus, James; Charlton, David, deceased; and Charlton, Martha, administratrix, 4,033,470, Cl. 214-152.000.

Charlton, Martha, administratrix: *See—*

Venus, James; Charlton, David, deceased, and Charlton, Martha, administratrix, 4,033,470, Cl. 214-152.000.

Chazen, Julius L.; and Brock, James Donald. Method and apparatus for cleaning shredded scrap. 4,033,458, Cl. 209-11.000.

Chemetron Corporation: *See—*

Cann, Lyle L., 4,033,736, Cl. 62-10.000.

Chemie Linz Aktiengesellschaft: *See—*

Zolss, Gerhard; Pittner, Heribert; and Stormann-Menninger-Lerchenthal, Heimo, 4,034,009, Cl. 260-553.00A.

Chern, Shy-Shiun; and Maserjian, Joseph, to California Institute of Technology. Chemical vapor deposition reactor. 4,033,286, Cl. 118-49.000.

Chesnut, W. Richard; and Calligaro, Daniel, to W. R. Chesnut Engineering, Inc. Machine for advancing strip material through a utilization apparatus. 4,033,522, Cl. 242-75.400.

- Chester, Nelson Sherwood; Laughon, Thomas Cecil; and Sindeiar, William Frank, to Black and Decker Manufacturing Company, The. Portable power angle tool and switch mechanism. 4,033,077, Cl. 51-170.00T.
- Chevalier, Andre, to Institut Francais du Petrole, des Carburants et Lubrifiants. Armored flexible pipe equipped with a rigid coupling. 4,033,612, Cl. 285-149.000.
- Chevron Research Company: *See*—
  - Jacobson, Robert L.; and Ormiston, Robert M., 4,033,898, Cl. 252-416.000
  - Singer, Malcolm S., 4,034,105, Cl. 424-300.000.
- Chiba Communications Industries, Inc.. *See*—
  - Kotezawa, Katsutaka; Onodera, Toshimi; Hayashi, Setsuo, and Shimanuki, Fujio, 4,034,295, Cl. 325-39.000.
- Chiba, Kunji. *See*—
  - Sasayama, Chikanobu; Suzuki, Osamu; Shimizu, Takeshi; and Chiba, Kunji, 4,033,107, Cl. 57-81.000.
- Chicago Pneumatic Tool Company. *See*—
  - Hetzler, Robert B.; and Pierson, Gerald L., 4,033,129, Cl. 60-486.000.
- Chireau, Roland F., to Yardney Electric Corporation. Separator for secondary alkaline batteries. 4,034,144, Cl. 429-144.000.
- Chitose Corporation: *See*—
  - Hoshi, Sadao, 4,033,350, Cl. 128-303 130.
- Cho, Susumu, Erickson, Paul Milton, and Reynolds, Gary Raymond, to Motorola, Inc. Audio signal quality indicator. 4,034,299, Cl. 325-363.000.
- Christian, Joseph C., and Steele, Arthur J., to Metrodata, Inc. Spark ignition gas flow control system. 4,033,711, Cl. 431-66.000.
- Christink, Maurice O. Outboard motor service tank. 4,033,184, Cl. 73-117.100.
- Christopoulos, John: *See*—
  - Mishcon, Lester; and Christopoulos, John, 4,033,150, Cl. 66-138.000.
- Chrysler Corporation: *See*—
  - Hoetger, Robert Arthur; Hagaman, James Albert; and Nortman, William, 4,033,436, Cl. 192-3.300.
  - Smith, Robert H.; and Benford, Howard L., 4,033,605, Cl. 280-664.000.
- Chu, Paul: *See*—
  - Flaum, Stephen S; Connolly, Francis A.; and Chu, Paul, 4,033,217, Cl. 83-425.400.
- Chuang, Vincent T *See*—
  - Omietanski, George M.; Furbee, Harold D., and Chuang, Vincent T., 4,033,990, Cl. 260-448.20B.
- Ciba-Geigy AG. *See*—
  - Beffa, Fabio, Back, Gerhard; and Steiner, Eginhard, 4,033,942, Cl. 260-145.00A
  - Defago, Raymond, Ramanathan, Visvanathan; and Back, Gerhard, 4,033,716, Cl. 8-2.50A
- Ciba-Geigy Corporation: *See*—
  - Begrich, Rainer, 4,033,944, Cl. 260-153.000.
  - Burdeska, Kurt, and Schwander, Hansrudolf, 4,033,965, Cl. 260-279.00R.
  - Grieder, Alfred, 4,034,043, Cl. 260-578.000.
  - Habermeier, Jurgen, 4,034,018, Cl. 260-860.000.
  - Lind, Hanns; Rody, Jean; and Brunnetti, Heimo, 4,034,006, Cl. 260-521.00C.
  - Mattern, Gunter, 4,033,975, Cl. 260-296.00R.
  - Moser, Hans, 4,034,108, Cl. 424-309.000.
  - Ramanathan, Visvanathan; Della Casa, Angelo; de Montmollin, Rene; Hegar, Gert; and Schutz, Hans Ulrich, 4,033,943, Cl. 260-153.000.
  - Randell, Donald Richard, Cook, Barry; and Chalmers, Alexander Michael, 4,033,928, Cl. 260-45.80N.
  - Schwander, Hansrudolf, 4,033,973, Cl. 260-295.00F.
- Ciga-Geigy Corporation: *See*—
  - Habermeier, Jurgen, 4,034,019, Cl. 260-860.000
- Cincinnati Milacron, Inc.: *See*—
  - Baker, Cyril Walter, 4,033,252, Cl. 100-99 000.
  - Suer, James David, 4,034,415, Cl. 361-24 000.
- Cirino, John F. Release assembly for ski binding. 4,033,604, Cl 280-628.000.
- Claasen, Theodoor Antonius Carel Maria. *See*—
  - Butterweck, Hans-Jurgen, Claasen, Theodoor Antonius Carel Maria; Mecklenbrauker, Wolfgang Friedrich Georg, and Peek, Johannes Bernhard Heinrich, 4,034,196, Cl. 235-156.000.
- Clairol Incorporated: *See*—
  - Walter, Henry J.; and Kunz, Raymond W., 4,034,201, Cl. 219-222.000.
- Clark, Douglas. *See*—
  - Bickerdike, Robert Lewis; Clark, Douglas, Eastabrook, John Norman; Hughes, Garyth; Mair, William Norman, Partridge, Peter George, and Ranson, Harry Christopher, 4,033,793, Cl. 148-32.000.
- Clark, Franklin F.; Nikolic, Cvetko B., and Queneau, Paul B., to Amax Inc. Separation of cobalt from nickel by ozonation in the presence of ammonium salts. 4,034,059, Cl. 423-144.000.
- Clark, Robert M.; and Cronin, John C., to Gould Inc. Contamination control device. 4,034,147, Cl. 174-14.00R.
- Claudius Peters AG. *See*—
  - Stamer, Walter, 4,033,549, Cl. 251-86.000.
- Clayton, John Peter: *See*—
  - Bentley, Peter Hubert; and Clayton, John Peter, 4,033,979, C¹ 260-306.70C.
- Clean Energy Corporation: *See*—
  - Cramer, Frank B., 4,033,113, Cl. 60-39.020.
- Cline, Harvey E.: *See*—
  - Anthony, Thomas R.; and Cline, Harvey E., 4,033,786, Cl 148-1.500.
- Clotfelter, Wayman N., to United States of America, National Aeronautics and Space Administration. Method for measuring biaxial stress in a body subjected to stress inducing loads. 4,033,182, Cl. 73-88.00R.
- Cocjin, Diosdado L.; and Masongsong, Artemio M., to Cocjin, Diosdado L. Spilled oil retriever and anti-water pollution water craft. 4,033,876, Cl. 210-242.00S.
- Cocuzza, Gioacchino; Torreggiani, Gianni; and Sfregola, Michele, to Societa' Italiana Resine S I.R. S.p.A. Process for the purification of ethylene oxide. 4,033,617, Cl. 203-27.000.
- Coder, Glen L. Double adhesive masking tape. 4,033,803, Cl. 156-71.000.
- Coe, Thomas F. Phase-locked loop oscillator. 4,034,310, Cl. 331-11.000.
- Cohen, Harvey K.: *See*—
  - Conn, Arnold; and Cohen, Harvey K., 4,033,719, Cl. 21-102.00R.
- Cohen, Marvin P.; Shavel, John, Jr.; and von Strandtmann, Max, to Warner-Lambert Company. [2-(4-Oxo-4H-1-benzopyran-2-yl)ethenyl]benzonitriles and benzoic acids. 4,033,845, Cl. 260-240.00D.
- Cole, Gerald S.; Kovacs, Bela V.; Sensoli, Robert A.; and Smartt, Herschel B., to Ford Motor Company. Continuous stream treatment of ductile iron. 4,033,766, Cl. 75-123.0CB.
- Colegate, Terence Dudley; Farnworth, Christopher Robert; and Davis, Eric Joseph, to Laporte Industries Limited. Recovery of metals. 4,033,764, Cl. 423-24.000.
- Coleman, Lester Earl, to Lubrizol Corporation, The. Water-soluble hydroxyalkylated and alkoxyalkylated compositions derived from N-3-oxo-hydrocarbon-substituted acrylamides. 4,033,921, Cl. 260-29.60H.
- Colgate-Palmolive Company: *See*—
  - Warren, William C.; Volpe, Anthony R.; and Rustogi, Kedar N., 4,033,008, Cl. 15-167.00R.
- Collin, Per Harald, to ASEA Aktiebolag. Furnace for melting solid ferrous pieces. 4,033,562, Cl. 266-216.000.
- Colorflo Limited: *See*—
  - Farrow, Harold F., 4,033,258, Cl. 101-158.000.
- Colt Industries Operating Corporation: *See*—
  - Miller, Robert J., 4,034,026, Cl. 261-23.00A.
- Colvert, James H.; Jahnke, Frederick C.; and Williams, Dale, to Texaco Inc. Fluidized catalytic cracking process with improved intermediate cycle gas oil stripping. 4,033,856, Cl. 208-102.000.
- Colvert, James H.: *See*—
  - Williams, Dale, Colvert, James H.; and Jahnke, Frederick C., 4,033,857, Cl. 208-102.000.
- Combined Scientific Resources Corporation: *See*—
  - DeSalvo, Ernest J.; and Zarlengo, Marco D., 4,033,333, Cl. 128-2.06E.
- Combustion Engineering, Inc.: *See*—
  - Sullivan, Robert Patton, 4,033,298, Cl. 122-510.000.
- Commissariat a l'Energie Atomique: *See*—
  - Balanca, Charles; and Charles, Gilbert, 4,034,362, Cl. 340-347.0AD.
  - Bregeon, Louis, Dupuy, Gerard; Lerouge, Bernard; and Schwartz, Jean-Pierre, 4,033,814, Cl. 176-63.000.
  - le Gressus, Claude; Massignon, Daniel; and Sopizet, Rene, 4,034,220, Cl. 250-310.000.
- Compaan, Klaas, and Bouwhuis, Gijsbertus, to U.S. Philips Corporation. Apparatus for positional control of a reading head in a device for reproducing optically coded video disk recordings. 4,034,403, Cl. 358-128.000.
- Compagnie Honeywell Bull (Societe Anonyme): *See*—
  - Hostein, Claude, 4,034,346, Cl. 364-900.000.
- Comtelco (U.K.) Limited: *See*—
  - Hill, John, and Turczanski, Henryk, 4,034,326, Cl. 337-34.000.
- Concast AG. *See*—
  - Fluckiger, Friedrich, 4,033,558, Cl. 266-50.000.
  - Schmid, Markus, 4,033,404, Cl 164-260 000.
- Conn, Arnold, and Cohen, Harvey K. Ultraviolet sterilizer. 4,033,719, Cl. 21-102.00R
- Conn, John L.; and Spector, George. Ocean tide and wave energy converter. 4,034,231, Cl. 290-53.000.
- Connolly, Francis A.: *See*—
  - Flaum, Stephen S.; Connolly, Francis A.; and Chu, Paul, 4,033,217, Cl. 83-425.400.
- Consupak, Inc.: *See*—
  - Farrell, John Jerome, 4,034,036, Cl. 264-89.000.
- Continental Group, Inc., The: *See*—
  - Manuel, Ernesto H., 4,034,132, Cl. 428-36.000.
- Continental Oil Company *See*—
  - Fredd, John V., and Hill, William G., 4,033,408, Cl. 166-75.00R.
  - Starks, Charles M., 4,033,983, Cl. 260-33.6UA.
  - Waters, Kenneth H., 4,033,278, Cl. 114-245.000.
- Cook, Barry: *See*—
  - Randell, Donald Richard, Cook, Barry; and Chalmers, Alexander Michael, 4,033,928, Cl 260-45.80N.
- Cook, James A., Jr., to PPG Industries, Inc. Hydrogen peroxide stabilization with triamides of phosphorus. 4,034,064, Cl. 423-272.000.
- Cook, Martin Christopher; Gregory, Gordon Ian; and Bradshaw, Janice, to Glaxo Laboratories Limited. 3-Hydroxymethyl-7β-(2-alkoxy-or benzyloxyimino-2-arylacetamido)ceph-3-em-4-carboxylic acids and salts thereof 4,033,950, Cl. 260-243 00C

- Cooley, Jerry A Method and means for punching sheet members. 4,033,037, Cl. 30-363 000
- Cooper, Jerry D Steam generator apparatus. 4,034,203, Cl 219-272 000.
- Coquard, Jean, Sedivy, Pierre; Ruaud, Michel, and Verrier, Jean, to Rhone-Poulenc Industries Bioresorbable surgical articles. 4,032,993, Cl. 3-1.000.
- Corinthios, Michael J. Chess game apparatus 4,033,586, Cl 273-131.00K
- Corning Glass Works. *See*—
  - Baumgartner, Charles E., and Bihuniak, Peter P., 4,033,780, Cl. 106-69 000.
  - Grossman, David G., 4,033,775, Cl 106-39 700
  - Mjos, Shirley A., and Piasio, Roger N., 4,034,072, Cl 424-1.000
  - Weetall, Howard H., 4,034,073, Cl 424-1 000
  - Winkler, Ernel R., 4,033,779, Cl. 106-62.000.
- Cottingham, Michael H. Cover for padlock. 4,033,156, Cl 70-56.000
- Coulson, James; and Nearn, Malcolm Richard, to Lever Brothers Company. Process for making toothpaste 4,034,076, Cl. 424-49.000.
- Couture, Paul A.: *See*—
  - Jentoft, Arthur P., and Couture, Paul A., 4,033,246, Cl. 98-42 00R.
- Cox, Diane M., to Raymond Lee Organization, Inc., The. Transparent tailgate for stationwagons and pickup trucks 4,033,619, Cl. 296-21.000.
- Cragoe, Edward J., Jr.; and Jones, James H., to Merck & Co., Inc. 8-Aza-9-oxo(and dioxo)-thia-11,12-secoprostaglandins. 4,033,996, Cl. 260-490.000.
- Craigie, Samuel W., to M. L. Aviation Company Limited Cartridge holders. 4,033,226, Cl. 89-1 50F.
- Cram, Bryan L.: *See*—
  - Morris, Joseph W., Cram, Bryan L.; and Marchese, Vincent P., 4,033,267, Cl. 102-70.00R.
- Cramer, Frank B., to Clean Energy Corporation. Steam generation with coal. 4,033,113, Cl. 60-39.020.
- Cramer, Jerry W.: *See*—
  - Paddock, Paul F; and Cramer, Jerry W., 4,033,450, Cl. 198-648.000.
- Creative Innovations: *See*—
  - Bennett, Bruce A., 4,033,159, Cl. 70-233.000.
- Crompton & Knowles Corporation: *See*—
  - Wueger, Karl W., 4,033,384, Cl. 139-452.000.
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- Cronin, John C.: *See*—
  - Clark, Robert M.; and Cronin, John C., 4,034,147, Cl 174-14.00R.
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- Crowley, George C., to Northern Electric Company. Electric blanket control circuit. 4,034,185, Cl. 219-212 000.
- Cryderman, Robert L.: *See*—
  - Hamburg, Emil G., Cryderman, Robert L., and Butler, John F., 4,033,789, Cl. 148-12.00F.
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  - Sant'Agostino, Marcello, 4,034,340, Cl. 340-146.10R.
- Cudmore, Patrick J Aerodynamic hanging birdhouse. 4,033,296, Cl. 119-23.000.
- Cullen, James W.: *See*—
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  - Culpepper, Bertram C., Jr.; and Wilson, Richard C., 4,033,802, Cl 156-71.000.
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- Curlow, Rolf Lennart, to AB Gustavsbergs Fabriker. Corner clamp 4,033,570, Cl. 269-41.000.
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- Curtis, M. David, to Hooker Chemicals & Plastics Corporation. Method of preparing arsenic trifluoride 4,034,069, Cl 423-489 000
- Curtis, Omer E., Jr.; Tuller, Harold W.; O'Neill, Charles T., and Nussbaum, Ralph W., to Allied Chemical Corporation. Production of polyanhydride epoxide prepolymer compositions. 4,034,014, Cl 260-837.00R.
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  - de Pierre, Richard, Forgays, Gilbert Jerome; Behling, Hans Heinrich; and Curtis, William Childs, 4,034,373, Cl. 343-7.700.
- Cuthbert, Roy A *See*—
  - Silverstein, Robert M., Gore, William E., Pearce, Glenn T., Cuthbert, Roy A., Simeone, John B., Lanier, Gerald N., and Peacock, John W., 4,034,080, Cl 424-84.000
- Czernik, Daniel E.; and Brady, John F., to Felt Products Mfg Co Bearing pad assembly 4,033,005, Cl 14-16 100.
- Dahlstrom, Baesley I *See*—
  - Hill, James E.; Dahlstrom, Baesley I; and Fisher, Robert D., 4,034,210, Cl 235-61.12N
- Daihatsu Motor Co., Ltd *See*—
  - Morita, Eiichi, Toda, Akira, Kobayashi, Toru; and Fujii, Hiroshi, 4,033,206, Cl 82-2 00B
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  - Sasayama, Chikanobu, Suzuki, Osamu, Shimizu, Takeshi, and Chiba, Kunji, 4,033,107, Cl 57-81 000
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  - Nicolaisen, Holger, Andersen, Finn Schnoor, and Tandrup, Leif Borge, 4,034,327, Cl. 337-41 000
- Danon, Joseph Solomon, to Singer Company, The Latch assembly for slam-shut valves. 4,033,374, Cl 137-461.000
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  - Lyman, Geroge F., 4,033,058, Cl 40-97 000
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  - Aveneau, Andre A.; and de Passoz, Guy A., 4,034,236, Cl 307-261.000.
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- Deslauriers, Clovis F Rotary stripping wheel 4,033,240, Cl 93-36.00A.
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- Dude, Henry Albert, to Eastman Kodak Company. Apparatus for coating sheet material. 4,033,290, Cl. 118-266.000
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  - Moran, Thomas M., 4,033,535, Cl 248-56.000
  - Walton, Erlen B., 4,033,301, Cl. 123-32.00G.
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- Eli Lilly and Company *See—*
  - Molloy, Bryan B., 4,034,011, Cl 260-570.00R
  - Stilz, John G.; and Jackson, Richard L., 4,033,941, Cl. 260-112.50R
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  - Murawski, Frank H., Elliott, James W., Richards, Fred W.; and Johns, Gordon L., 4,033,336, Cl 128-2.05R.
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  - Bays, David Edmund, Peel, Mervyn Evan, Waters, David Martin, and Ellis, Gwynn Pennant, 4,034,075, Cl 424-45.000
- Emerson Electric Co.: *See—*
  - Crow, William D., Ottersbach, Thomas V.; and Hildebrandt, Eugene F., 4,034,173, Cl 200-80.00R
- EMI Limited *See—*
  - Heavens, Michael, James, Richard Charles; and Slinn, Dennis Stanley, 4,034,224, Cl 250-439.00P.
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  - Stowell, Michael James, Watts, Brian Michael, Emley, Edward Frederick, and Grimes, Roger, 4,033,794, Cl. 148-32.000.
- Endo, Hiroshi *See—*
  - Toriumi, Shiro; Endo, Hiroshi; Ueda, Nobuo, and Yamagishi, Seiichi, 4,033,684, Cl. 353-27.00A
- Endo, Toshiaki, and Hatta, Toshiro, to Nissan Motor Co., Ltd. Vehicle floor trimming fastening arrangement 4,033,011, Cl 24-73.0FT
- Endriz, John Guiry: *See—*
  - Catanese, Carmen Anthony, Endriz, John Guiry; and Rajchman, Jan Aleksander, 4,034,255, Cl. 313-400.000.
- Energex Limited *See—*
  - Lutes, Kenneth Vaughn; Desmon, Leland Golde, and Dodge, Edward Dana, 4,033,505, Cl 236-15.0BD
- Engelhard Minerals & Chemicals Corporation *See—*
  - Jameson, M Phillip, and Huege, Fred R., 4,034,058, Cl. 423-118.000
- Engesland, Arne, to Lista Og Mosjoen Aluminiumverk, Elkem Aluminum A/S & Co. Apparatus for gas collection in aluminum smelting furnaces 4,033,846, Cl. 204-247.000
- Engesvik, Bjorn I.: *See—*
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- Engineered Safety Products, Inc. *See—*
  - Barr, Douglas, 4,033,276, Cl. 114-190.000.
- England, Albert O., Jr. Desk mounting for telephone 4,033,651, Cl 312-237.000
- England, Robert W. Stand up toilet 4,032,998, Cl 4-111.000
- Engler, Dietrich *See—*
  - Baron, Gerhard, Hafke, Carl, Engler, Dietrich; Reimert, Rainer, and Blaum, Eberhard, 4,033,730, Cl 48-86.00R
- Engler, Theodore T. Digital segment display to braille converter. 4,033,053, Cl. 35-35.00A
- Engleway Corporation *See—*
  - Vandeweghe, Joseph L., 4,032,991, Cl 2-173.000
- Enzell, Curt R *See—*
  - Almqvist, Sven-Olof, Enzell, Curt R.; Hjern, Lasse O.; Artho, Antoine, and Koch, Robert, 4,033,362, Cl. 131-264.000.
- Enzmann, Sigmund Johann Method for separating foreign solid particles from a liquid 4,033,866, Cl 210-42.00S.
- Epsilon Lambda Electronics Corporation. *See—*
  - Knox, Robert M., and Toulios, Peter P., 4,034,377, Cl 343-180.000.
- Erickson, Paul Milton. *See—*
  - Cho, Susumu; Erickson, Paul Milton; and Reynolds, Gary Raymond, 4,034,299, Cl. 325-363.000.
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- Ericson, Eric A., and Kaufhold, Frederick D., to General Electric Company. High current electrical joint apparatus. 4,033,660, Cl 339-75.00M.
- Erikson, J. Alden. *See—*
  - Chang, Wen-Hsuan, Erikson, J. Alden, and Scriven, Roger L., 4,034,017, Cl. 260-859.00R.
- Ernest Scragg & Sons Limited. *See—*
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- Eshima, Masanori. *See—*
  - Nakashima, Akinobu, and Eshima, Masanori, 4,034,246, Cl 310-81.000
- Essex Group, Inc. *See—*
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- Essex International, Inc. *See—*
  - DuRocher, Gideon A., and DuRocher, Daniel J., 4,034,265, Cl 361-25.000
- Estes, John H. *See—*
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- Etablissement Public dit Agence Nationale de Valorisation: *See—*
  - Vanhelle, Michel E., 4,033,102, Cl 57-12.000
- Etablissements Bertrand Faure. *See—*
  - Thary, Christian, Bernard, Armand R., Labadie, Jean Francois, and De La Taille, Olivier P., 4,033,623, Cl. 297-390.000
- Etablissements Poutrait-Morin. *See—*
  - Bouder, Paul C., 4,033,199, Cl 74-594.600
- Ethyl Corporation. *See—*
  - Johnston, James D., Sanders, Robert N., and Wood, James M., Jr., 4,033,758, Cl 75-67.00R
  - Johnston, James D., Sanders, Robert N., and Wood, James M., Jr., 4,033,759, Cl 75-67.00R
- Evans, Dafydd W., to Towmotor Corporation. Article hold-down device. 4,033,424, Cl 180-68.500
- Evans, Frederick P. *See—*
  - Taylor, Herbert E., and Evans, Frederick P., 4,033,289, Cl 118-227.000
- Evans, John H., to Stant Manufacturing Company, Inc. Roll-over gas cap. 4,033,475, Cl 220-202.000
- Evans, William F. *See—*
  - Merola, Carl R., Evans, William F., and Shaffer, Raymond E., 4,033,738, Cl. 62-158.000.
- Evrard, Gerard Maurice Gaspard, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Vibration absorber. 4,033,533, Cl 248-358.00R
- Exxon Production Research Company. *See—*
  - Cunningham, Allen B., 4,034,333, Cl 340-15.5TA.
  - Garcia, Juan A., 4,033,640, Cl. 308-4.00A
- F. J. Burrus & Cie. *See—*
  - Almqvist, Sven-Olof, Enzell, Curt R., Hjern, Lasse O., Artho, Antoine, and Koch, Robert, 4,033,362, Cl. 131-264.000
- F. L. Smidth & Co. *See—*
  - Trelby, Ib Verner, 4,033,376, Cl. 137-580.000.
- F & W Company, Inc. *See—*
  - Frank, Eldon M., 4,033,469, Cl 214-131.00A
- Fabrica Espanola Magnetos, S.A. *See—*
  - Montoya, Jose Maria Tarrafeta, 4,033,635, Cl 303-109.000.
- Fabricius-Hansen, Rolf Leonard. *See—*
  - Ahlen, Karl Gustav, and Fabricius-Hansen, Rolf Leonard, 4,033,202, Cl. 74-866.000.
- Failes, Michael, to Canadian Instrumentation and Research Limited, and Film Opticals of Canada Limited. Optical teaching aid. 4,033,052, Cl 35-19.00B
- Failli, Amedeo. *See—*
  - Ferland, Jean-Marie, Failli, Amedeo, Immer, Hans U., and Gotz, Manfred K., 4,033,974, Cl 260-295.50R
- Fair, Richard Barton, Hayes, John Saylor, and Rosser, William Morgan, to Bell Telephone Laboratories, Incorporated. Dividing metal plated semiconductor wafers. 4,033,027, Cl 29-583.000.
- Falk, Roland. *See—*
  - Woellhaf, Josef, Balz, Werner, Falk, Roland, Scheffel, Dieter, Richter, Volker, and Willmann, Paul, 4,033,288, Cl 118-52.000.
- Falsey, Henry T.: *See—*
  - Wadge, James C., Falsey, Henry T.; and Johnson, Perry L., 4,033,704, Cl. 415-80.000.
- Farber, Bertrand F. *See—*
  - Cronin, Donald L., Farber, Bertrand F., Gehm, Hartmut K., and Goldin, Daniel S., 4,034,280, Cl. 363-25.000
- Farge, Daniel. *See—*
  - Berger, Christian, Farge, Daniel; Gros, Georges, Messer, Mayer Naoum, and Moutonnier, Claude, 4,034,088, Cl 424-246.000
  - Berger, Christian; Farge, Daniel, Gros, Georges, Messer, Mayer Naoum; and Moutonnier, Claude, 4,034,090, Cl 424-246.000.
- Farnworth, Christopher Robert. *See—*
  - Colegate, Terence Dudley; Farnworth, Christopher Robert, and Davis, Eric Joseph, 4,033,764, Cl. 423-24.000.
- Farr, John B., to Standard Oil Company (Indiana). Downhole seismic source. 4,033,429, Cl. 181-106.000.
- Farr, M. Paul. *See—*
  - Dunn, Howard J.; and Farr, M. Paul, 4,034,121, Cl 426-565.000.
- Farrell, John Jerome, to Consupak, Inc. Parison control in longitudinal stretch. 4,034,036, Cl. 264-89.000.
- Farrell, Michael J. *See—*
  - Willis, Barry G., Schade, Henry A., Jr., and Farrell, Michael J., 4,033,330, Cl 128-2.00G.
- Farrow, Harold F., to Colorflo Limited. Printing apparatus. 4,033,258, Cl 101-158.000.
- Faubl, Hermann. *See—*
  - Cronin, Timothy H., Faubl, Hermann; Hoffman, William W.; and Korst, James J., 4,034,040, Cl 260-570.900.
- Fawn Engineering Co.. *See—*
  - Wirstlin, Arthur N., and Albright, Henry J., 4,033,442, Cl. 194-17.000
- Federal Business Products, Inc.. *See—*
  - Neill, Jimmie, and Wise, Lester V., 4,033,807, Cl. 156-384.000.
- Federal-Mogul Corporation. *See—*
  - Ladin, Eli M., 4,033,440, Cl. 192-98.000
- Felt Products Mfg. Co. *See—*
  - Czernik, Daniel E.; and Brady, John F., 4,033,005, Cl 14-16.100.
  - Moerk, John C., Jr., 4,033,702, Cl. 404-69.000.
- Felton, George F., Jr., to Suntech, Inc. Recycleable metalworking liquid. 4,033,886, Cl. 252-34.700.
- Fenn Manufacturing Company, The. *See—*
  - Verbickas, Robert C., 4,033,075, Cl. 51-80.00A
- Ferland, Jean-Marie, Failli, Amedeo, Immer, Hans U.; and Gotz, Manfred K., to American Home Products Corporation. Pyridylmethyl esters of N-(phenoxyalkanoyl)peptide derivatives. 4,033,974, Cl. 260-295.50R.
- Fernandez, Eloy; Simeth, Claus, and Herzan, Georg, to Roland Offsetmaschinenfabrik Faber & Schleicher AG. Device for driving the plate cylinder in rotary printing presses, particularly offset printing presses. 4,033,261, Cl. 101-248.000.
- Fernandez, John F. Bingo instrument. 4,033,589, Cl. 273-148.00R.
- Fernicola, Robert C., to Union Carbide Corporation. Welding torch oscillator control system. 4,034,184, Cl. 219-124.000.
- Ferrari, Patrick T., to Xerox Corporation. Copier document ejector. 4,033,694, Cl. 355-76.000.
- Fiat Societa per Azioni: *See—*
  - Bertone, Antonino; Rivetti, Enrico; and Cattaneo, Maurizio, 4,033,638, Cl. 303-116.000.
  - Maioglio, Mauro; and Jacoel, Rafael, 4,033,305, Cl. 123-117.00D
  - Palazzetti, Mario; and Grisotto, Franco, 4,034,271, Cl 361-332.000.
- Fikse, Tyman H. Adjustable-length semitrailer chassis and method of semitrailer maneuvering. 4,033,625, Cl. 298-22.00R.
- Film Opticals of Canada Limited: *See—*
  - Failes, Michael, 4,033,052, Cl. 35-19.00B.
- Firdaus, Asad, to International Business Machines Corporation. Method and system for sensing an identifying means. 4,033,173, Cl. 73-37.000.
- Firester, Arthur Herbert, to RCA Corporation. System for recording redundant fourier-transform hologram. 4,033,665, Cl. 350-3.500.
- Firmenich S.A.. *See—*
  - Sundt, Erling; and Ohloff, Gunther, 4,034,044, Cl. 260-586.00R.
- Fischer & Porter Co.: *See—*
  - Herzl, Peter J., 4,033,188, Cl. 73-194.0VS.
  - Herzl, Peter J.; and Metzger, Harold W., 4,033,189, Cl. 73-194.0VS.
- Fisher, Michael H.: *See—*
  - ten Broeke, Jan; Grabowski, Edward J. J.; Flataker, Lars M.; Fisher, Michael H.; and Patchett, Arthur A., 4,033,968, Cl. 260-288.0CF.
- Fisher, Robert D.: *See—*
  - Hill, James E.; Dahlstrom, Baesley I.; and Fisher, Robert D., 4,034,210, Cl. 235-61.12N.
- Fisk, James C. Strip stock lifter. 4,033,168, Cl. 72-420.000.
- Flamand, Guy, to Carnaud Total Interplastic. Apparatus for testing hollow bodies. 4,033,172, Cl. 73-37.000.
- Flamig, Hans: *See—*
  - Schiel, Christian; and Flamig, Hans, 4,033,049, Cl. 34-115.000.
- Flataker, Lars M.: *See—*
  - ten Broeke, Jan, Grabowski, Edward J. J.; Flataker, Lars M.; Fisher, Michael H.; and Patchett, Arthur A., 4,033,968, Cl. 260-288.0CF.
- Flattau, Theodore: *See—*
  - United States of America, National Aeronautics and Space Administration; Flattau, Theodore; Lange, Ronald Albert; Mellars, John Walter; Peyton, Bernard Joseph; and Wolczok, John Martin, 4,033,882, Cl. 250-199.000.
- Flaum, Stephen S., Connolly, Francis A.; and Chu, Paul, to S&S Corrugated Paper Machinery Co., Inc. Slitter having carrier for selective adjustment of a plurality of heads. 4,033,217, Cl. 83-425.400
- Fleck, Harry Ronald, and Mignosa, Charles Philip, to International Business Machines Corporation. Magnetic recording medium with lubricant. 4,034,133, Cl. 428-64.000.
- Fleck, Horst G.. *See—*
  - Hudson, Donald C., Morris, Charles R.; Fleck, Horst G.; and Senghaas, Karl A., 4,034,225, Cl 250-471.000.
- Fleming, James William, Jr., to Bell Telephone Laboratories, Incorporated. Multimode optical fiber. 4,033,667, Cl. 350-96.0WG.
- Fleming, Phillip F., and Campbell, Steven J., to Gehl Company. Forage harvester. 4,033,518, Cl 241-47.000
- Fletcher, Keith Ernest. *See—*
  - Lorch, Edgar Adolf, Fletcher, Keith Ernest, and Page, David, 4,033,884, Cl. 250-496.000
- Fletcher, Kenneth S., III, to Foxboro Company, The. On-line amperometric analysis system and method incorporating automatic flow compensation. 4,033,830, Cl 204-1.00T.

- Flock Development and Research Company Limited. *See—*
  - McCalla, Charles, 4,033,010, Cl 16-114.00R.
- Fluckiger, Friedrich, to Concast AG. Apparatus for cutting a steel strand located in a supporting guide arrangement of a continuous casting installation. 4,033,558, Cl 266-50.000
- FMC Corporation. *See—*
  - Carlson, Ronald H., 4,033,959, Cl 260-248.00C
  - Hardy, Donald, Sr., and Orwoll, Edward Francis, 4,034,023, Cl 260-973.000
  - McRobert, Leon R., 4,033,100, Cl 56-328.00R
  - Mencacci, Samuel A., 4,033,093, Cl. 53-112.00B
  - Wright, Carl Leonard, and Beacham, Harry Hoyt, 4,034,136, Cl 428-246.000
- Foa, Marco. *See—*
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- Fogarty, A. Edward: *See—*
  - Strongin, Ned, Fogarty, A. Edward; and Fogarty, Bonnie Rose, 4,033,070, Cl. 46-79.000
  - Strongin, Ned; Fogarty, A. Edward; and Fogarty, Bonnie Rose, 4,033,071, Cl 46-118.000.
- Fogarty, Bonnie Rose: *See—*
  - Strongin, Ned, Fogarty, A. Edward, and Fogarty, Bonnie Rose, 4,033,070, Cl 46-79.000
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- Fong, Leong Q., to Motch & Merryweather Machinery Company, The. Fluidized bed for treating granular material. 4,033,555, Cl 259-4.00R.
- Fontana, Giampiero, to Buxton, Incorporated. Key case head. 4,033,162, Cl. 70-456.00B
- Food Technology Products. *See—*
  - Glabe, Elmer F., 4,034,117, Cl 426-335.000
  - Ziemke, William H., and Glabe, Elmer F., 4,034,125, Cl 426-650.000.
- Ford Motor Company: *See—*
  - Cole, Gerald S., Kovacs, Bela V., Sensoli, Robert A., and Smartt, Herschel B., 4,033,766, Cl. 75-123.0CB
  - Reneerkens, Josef, 4,033,644, Cl. 308-207.00A
  - Stockton, Thomas R., 4,033,200, Cl. 74-740.000.
  - Tsoi-Hei Ma, Thomas, 4,034,028, Cl. 261-41.00R.
  - Wu, Hai, and Jones, Charles M., 4,033,303, Cl 123-41.850
- Foreman, Donald S., to Honeywell Inc. Sine-to-square wave converter. 4,034,240, Cl. 307-252.00F.
- Foreman, Gerald E., and Worsley, Peter K., to Universal Oil Products Company. Spiral wound membrane module for direct osmosis separations. 4,033,878, Cl. 210-321.00A.
- Foreman, Larry W. Amusement game. 4,033,585, Cl. 273-120.00R
- Forgays, Gilbert Jerome. *See—*
  - de Pierre, Richard, Forgays, Gilbert Jerome; Behling, Hans Heinrich, and Curtis, William Childs, 4,034,373, Cl. 343-7.700.
- Forget, Leonel. Umbrella tent. 4,033,366, Cl. 135-2.000
- Foss, Robert Paul, to Du Pont de Nemours, E. I., and Company. Copolymers of pivalolactone and isoprene or butadiene. 4,034,021, Cl. 260-887.000.
- Fourman, Robert G.: *See—*
  - Klepak, Philip B.; Richardson, David I., and Fourman, Robert G., 4,033,365, Cl. 132-89.000.
- Fowler, Gary K. Disposable cup holder. 4,033,489, Cl. 224-48.00C
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  - Bolza, Frederick; Sadek, Lubos Vojtech; and Fox, Richard, 4,033,264, Cl. 102-24.00R.
- Foxboro Company, The. *See—*
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- Fr. Sauter AG., Fabrik elektr. Apparate. *See—*
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- Francis, James Nelson. *See—*
  - Kasai, Paul Haruo, Francis, James Nelson, and Bishop, Roland Justin, Jr., 4,034,065, Cl 423-328.000.
- Frank, Eldon M., to F & W Company, Inc. Front end loader and method of mounting same on tractor. 4,033,469, Cl. 214-131.00A
- Fred M. Dellorfano, Jr. and Donald P. Massa, Trustees of The Stoneleigh Trust u/d/t: *See—*
  - Massa, Frank, 4,033,180, Cl 73-71.5US
- Fred Whitaker Company. *See—*
  - Whitaker, Ralph, 4,033,717, Cl 8-14.000.
- Fredd, John V.; and Hill, William G., to Continental Oil Company. Go-devil storage and discharge assembly. 4,033,408, Cl. 166-75.00R.
- Frederick, Leonard L. Pile driving hammer, apparatus and method. 4,033,139, Cl 61-53.500
- Fredrick M. Kerr. *See—*
  - Carrere, Ricardo Haro, 4,034,033, Cl 264-36.000
- Free, John Marshall; and Jeunelot, Charles William, to Hoffmann-La Roche Inc. System for coordination and documentation of material handling. 4,034,339, Cl. 340-146.10C.
- Freed, Meier E., and Potoski, John R., to American Home Products Corporation. 1,3-Bridged amino tetralins. 4,034,041, Cl 260-571.000.
- Freehauf, Eugene G., Hollingsworth, Gene C.; and Welsh, David Edward, to Zero Manufacturing Company. Low profile integrated circuit socket. 4,033,656, Cl. 339-17.0CF.
- Freeman, Daniel L. *See—*
  - Friedel, William C., Jr., Bettencourt, Thomas S., and Freeman, Daniel L., 4,033,099, Cl 56-327.00R
- Frentzen, Hermann Josef; Hendrix, Gerhard, Huppertz, Manfred, Ritter, Hans Georg, and Wittek, Fritz, to Mannesmann Aktiengesellschaft. Edge working machine with hold down for sheet metal to be worked. 4,033,568, Cl. 269-26.000
- Freund, Isaac, to Bar-Ilan University. Method of and means for producing radiation in the X-ray region. 4,034,226, Cl 250-493.000
- Frey, Frederick E., to Rockwell International Corporation. Paper advancing mechanism. 4,033,560, Cl. 226-157.000
- Frey, Otto, to Sulzer Brothers Limited. Hip joint prosthesis. 4,032,994, Cl 3-1.912
- Friedel, William C., Jr., Bettencourt, Thomas S., and Freeman, Daniel L., to University of California, The Regents of the. Tomato harvesting employing electronic sorting. 4,033,099, Cl 56-327.00R
- Fritz, David Paul, Anderson, John Dale, Pruitt, Martin Eugene, Mahagan, Deroy Ernest, and Buller, Richard James, to Hesston Corporation. Continuous load stack-forming method and machine. 4,033,101, Cl 56-344.000.
- Fritz, Thomas W., Gilbo, Charles F., and Johnson, Norman A., to Armstrong Cork Company. Back fastening of mobile home ceiling boards. 4,033,083, Cl. 52-484.000
- Frohberger, Paul-Ernst. *See—*
  - Daum, Werner, Brandes, Wilhelm, and Frohberger, Paul-Ernst, 4,034,104, Cl 424-289.000
- Fromel, Gerhard, and Langenberger, Peter, to Robert Bosch GmbH. Fuel injection valve. 4,033,507, Cl 239-102.000
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  - United States of America, National Aeronautics and Space Administration, Frost, James D., Jr., and Hillman, Carl E., Jr., 4,033,334, Cl 128-2.10F
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- Fuji Photo Film Co., Ltd. *See—*
  - Tamai, Yasuo, Honjo, Satoru, Osawa, Sadao, Satomura, Masato, Osada, Chiaki, Nagashima, Wakio, and Takashina, Naomitsu, 4,033,890, Cl 252-62.10L
- Fujii, Hiroshi. *See—*
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- Fujimoto, Sakae, to Ricoh Co., Ltd. Automatic sheet feed and delivery apparatus. 4,033,575, Cl 271-3.000
- Fujimoto, Yoshinobu. *See—*
  - Fujiwara, Yoshio, Naito, Keiichi, Fujimoto, Yoshinobu, Odashima, Tooru, and Sada, Tomohiko, 4,033,840, Cl 204-159.170
- Fujishiro, Takeshi, and Sunano, Naomasa, to Nissan Motor Co., Ltd., and Shinyei Kaisha. Hydrocarbon concentration sensor for use in engine exhaust gas. 4,033,169, Cl 73-23.000
- Fujisou, Tokuo. *See—*
  - Ohmori, Tadashi, and Fujisou, Tokuo, 4,033,854, Cl 208-14.000
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  - Tanigawa, Kou; Hashikawa, Kenzo; and Ota, Jun, 4,034,369, Cl 340-52.00F
- Fujiwara, Yoshio, Naito, Keiichi, Fujimoto, Yoshinobu; Odashima, Tooru; and Sada, Tomohiko, to Sony Corporation. Thermosetting acryloyloxy-terminate butadiene polymers. 4,033,840, Cl 204-159.170.
- Fukata, Yasuo. *See—*
  - Nakagome, Yukio, and Fukata, Yasuo, 4,034,404, Cl 358-142.000
- Fukuda, Takeo, and Tashiro, Isao, to Tokyo Shibaura Electric Co., Ltd. Analog-digital converter. 4,034,364, Cl 340-347.0NT
- Fukuoka, Tatsuo. Footwear. 4,033,054, Cl 36-11.500
- Fukushima, Yoshikiyo, to Nippon Concrete Industries Co. Ltd. Concrete pole to be connected with a wood pole and method of replacing the lower part of the wood pole with the concrete pole. 4,033,080, Cl 52-223.00R
- Funahashi, Takaji. Rotary date stamp. 4,033,257, Cl 101-111.000
- Funakoshi, Yoshiro, Matsumura, Yoshihiko, Yamamoto, Masaki, and Komeda, Hiromu, to Takeda Chemical Industries, Ltd. Process for coating granular materials. 4,034,126, Cl 427-8.000
- Furbee, Harold D. *See—*
  - Omietanski, George M., Furbee, Harold D., and Chuang, Vincent T., 4,033,990, Cl 260-448.20B
- Fusco, Anthony F. Foldable mudflap assembly. 4,033,599, Cl 280-154.50R
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  - Hedrick, Ross M., and Gabbert, James D., 4,034,015, Cl 260-857.0FG
- GAF Corporation: *See—*
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  - Grossen, Walter; Gagnaux, Andre; and Chariatte, Edgar, 4,034,229, Cl. 250-541.000.
- Gahler, Egon; Heintke, Hans Eberhard, and Dietrich, Rolf, to Braun

Aktiengesellschaft. Charging circuit for a flash capacitor. 4,034,278, Cl. 320-1.000.
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  Gruber, Werner; Galinke, Joachim; and Keil, Jurgen, 4,034,145, Cl. 526-328.000.
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  Durant, Graham John, Ganellin, Charon Robin, and Owen, Geoffrey Robert, 4,034,101, Cl. 424-273.000
Garcia, Juan A., to Exxon Production Research Company. Seal bearing apparatus. 4,033,640, Cl. 308-4.00A.
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  Middleton, Charles G., and Volpe, Vincent F., 4,033,494, Cl. 226-83.000
Gardano, Andrea: *See*—
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Gardner, Delbert J., to Bendix Corporation, The. Two stage servomotor 4,033,131, Cl. 60-553.000
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  Untch, Karl G., and Gardner, John O., 4,033,978, Cl. 260-306.70R.
Gastaud, Jean Marie. Derivatives of 17α-hydroxy, 19-norpregn-4-ene-3,20-dione 4,033,988, Cl. 260-397.400.
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Gebr Eickhoff, Maschinenfabrik und Eisengiesserei m b H *See*—
  Dinkelbach, Anton, 4,033,626, Cl. 299-1.000
Gehl Company *See*—
  Fleming, Phillip F.; and Campbell, Steven J., 4,033,518, Cl. 241-47.000.
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  Cronin, Donald L., Farber, Bertrand F., Gehm, Hartmut K., and Goldin, Daniel S., 4,034,280, Cl. 363-25.000
Geist, James J. Articulated floating barrier. 4,033,137, Cl. 61-1.00F
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  Rosar, Edward C., Dulin, Jacques M., Genco, Joseph M., and Rosenberg, Harvey S., 4,034,063, Cl. 423-244.000.
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  Eberle, William J., 4,033,402, Cl. 164-150.000.
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  Newman, Ray, and Affa, Steve, 4,033,381, Cl. 138-113.000
General Dynamics Corporation *See*—
  Krikorian, Esther, and Sneed, Richard J., 4,033,843, Cl. 204-192.00P
General Electric Company *See*—
  Anthony, Thomas R., and Cline, Harvey E., 4,033,786, Cl. 148-1.500
  Avery, Ralph W., 4,034,249, Cl. 310-253.000
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  Ericson, Eric A., and Kaufhold, Frederick D., 4,033,660, Cl. 339-75.00M
  Giorgi, Robert A., and Loyd, James E., III, 4,034,297, Cl. 325-166.000.
  Hay, Allan S., 4,033,982, Cl. 260-327.00H
  Hoffman, Mary V., 4,034,257, Cl. 313-487.000.
  Mark, Victor, 4,033,930, Cl. 260-45.90R.
  McFadyen, Robert J., and Peil, William, 4,034,298, Cl. 325-318.000
  McVey, Charles I., 4,034,252, Cl. 313-217.000
  Nutter, Norman E., and Hoffman, Herbert N., 4,033,234, Cl. 91-384.000
  Raabe, Rodney Dean, and Dittberner, Ardie Reinhard, 4,034,170, Cl. 200-50.00A
  Scott, Garland E., Jr., and Levenson, Michael K., 4,033,743, Cl. 65-30.00R
  Strong, Herbert M., and Tuft, Roy E., 4,034,066, Cl. 423-446.000
  Wilkinson, Stanley B., 4,034,269, Cl. 361-79.000.
  Ziemba, Richard T., 4,033,266, Cl. 102-70.20R
General Foods Corporation *See*—
  Hamell, Matthew, Stefanucci, Arthur, and Ward, William W., 4,034,116, Cl. 426-131.000.
General Latex and Chemical Corporation *See*—
  Hopkins, Henry S., Jr., and Vargo, Donald L., 4,033,908, Cl. 260-2.5AW
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  Brodmann, Franz J., and Varker, Richard D., 4,033,783, Cl. 106-120.000.
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  Philibert, Robert A., 4,033,167, Cl. 72-367.000
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  Hargis, Ivan Glen, Livigni, Russell Anthony, and Aggarwal, Sundar Lal, 4,033,900, Cl. 252-431.00L.
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  Zinsmeyer, Herbert G., Johnson, Rodney L., Genz, Ralph H., and Setliff, James E., 4,033,883, Cl. 250-231.0SE
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  Pearl, David Raymond, 4,033,214, Cl. 83-174.000
Gerlach, John N., to Kennecott Copper Corporation. Extractions of copper from solutions by reduction with anthraquinols. 4,033,765, Cl. 75-108.000
Gerlach, Robert L.; and Rossini, George D., to Varian Associates, Inc. Interchangeable specimen trays and apparatus for a vacuum type testing system. 4,033,904, Cl. 250-491.000.
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  Capes, Charles E.; Germain, Rene J.; McIlhinney, Allan E., Puddington, Ira E.; and Sirianni, Aurelio F., 4,033,729, Cl. 44-1.00A
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  Meckler, Gershon, 4,033,740, Cl. 62-259.000.
Gerstein, Terry, to Revlon, Inc. Non-irritating shampoo compositions containing stearyl amine oxide. 4,033,895, Cl. 252-106.000.
Gertsch AG *See*—
  Horn, Hans, 4,033,603, Cl. 280-618.000.
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  Tybus, Gerd, Ebner, Ludwig; Waldhoer, Rudolf, Bichler, Peter, Bier, Wilhelm, Happe, Peter, and Weis, Frowald, 4,033,021, Cl. 29-157.00C.
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  De Haes, Louis Maria, Vermeulen, Leon Louis, Gevers, Hugo Karel, and De Winter, Walter Frans, 4,033,770, Cl. 96-28.000.
Giaimo, Joseph. Combination drinking cup and storage container. 4,033,453, Cl. 206-217.000
Giamei, Anthony F.; and Kear, Bernard H., to United Technologies Corporation. Composite single crystal article. 4,033,792, Cl. 148-32.000.
Gibbs, Charles D. Air wipe. 4,033,785, Cl. 134-15.000.
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Gillern, M. Frank, to Weyerhaeuser Company. Acetone-formaldehyde-resorcinol resin compositions and adhesives prepared therefrom. 4,034,012, Cl. 260-828.000
Gilmore, Guy T., to Multi-Fab, Inc. Facing tool. 4,033,208, Cl. 82-4.00C.
Gilpin, William Cecil, Heasman, Noel; and Williamson, John, to Steetley Limited. Process for making magnesia. 4,033,778, Cl. 106-58.000
Giorgi, Robert A.; and Loyd, James E., III, to General Electric Company. Circuit for disabling a radio transmitter which is continuously operated longer than a predetermined time. 4,034,297, Cl. 325-166.000.
Girling Limited. *See*—
  Bayliss, John Patrick, 4,033,435, Cl. 188-173.000.
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  Holtmyer, Marlin D., Githens, Charles J.; and Tinsley, John M., 4,033,415, Cl. 166-308.000.
Givner, Morris Lincoln; and Schilling, Guenther, to American Home Products Corporation. Pregnancy test device. 4,033,723, Cl. 23-253.00R
Glabe, Elmer F., to Food Technology Products. Process for preparing forage crop animal feeds. 4,034,117, Cl. 426-335.000.
Glabe, Elmer F. *See*—
  Ziemke, William H., and Glabe, Elmer F., 4,034,125, Cl. 426-650.000.
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  Cook, Martin Christopher; Gregory, Gordon Ian, and Bradshaw, Janice, 4,033,950, Cl. 260-243.00C.
Glickstein, Myer, and Tuomy, Justin M., to United States of America, Army. Compressed, freeze-dried cottage cheese and method of making. 4,034,123, Cl. 426-582.000.
Gloersen, Stig *See*—
  Gloersen, Stig Torleif, 4,033,811, Cl. 162-17.000
Gloersen, Stig Torleif, to Gloersen, Stig. Method and apparatus for filling of fiber material and liquid to steam phase in treatment vessel. 4,033,811, Cl. 162-17.000
Glover, Douglas Wade, Askman, Jan Philip, and Herrmann, Henry Otto, Jr., to AMP Incorporated. High voltage connector with crow bar 4,034,172, Cl. 200-51.100.
Gloxhuber, Christian *See*—
  Ploger, Walter, Schmidt-Dunker, Manfred; and Gloxhuber, Christian, 4,034,086, Cl. 424-200.000.
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  Strutzel, Hans, Gneuss, Detlef, and Klenk, Ludwig, 4,034,055, Cl. 264-95.000
Godard, Bernard, and Gomitoli, Roger, to La Cellophane. Sheet feeding devices 4,033,577, Cl. 271-128.000.
Godtfring, Jack H. *See*—
  Klee, David J., and Godtfring, Jack H., 4,033,140, Cl. 62-223.000
Goebel, Hermann, to Bayer Aktiengesellschaft. Tetrakisazo dyestuffs. 4,033,946, Cl. 260-166.000
Goes, Michael J. Fluid controlled security lock. 4,033,161, Cl. 70-275.000
Goff, Cobb S *See*—
  Borton, Gary L., Goff, Cobb S., and Malloy, Richard J., 4,033,771, Cl. 96-60.0BF
Goins, John T. Method for stimulating the recovery of crude oil. 4,033,411, Cl. 166-257.000
Gold, Nicholas, to Polaroid Corporation. Imbibition chamber adapter for self-developing camera. 4,034,386, Cl. 354-86.000.
Goldin, Daniel S. *See*—
  Cronin, Donald L., Farber, Bertrand F., Gehm, Hartmut K., and Goldin, Daniel S., 4,034,280, Cl. 363-25.000.

Goldmacher, Howard K. Film registration device 4,034,393, Cl. 354-354.000
Goldman, Mark R *See*—
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Goloff, Alexander; and Brubaker, Hiram A., to Caterpillar Tractor Co. Apparatus for machining end housings 4,033,231, Cl. 90-24.300.
Golya, William R., and Doornwaard, John, to Saxonburg Ceramics, Inc. Composition of ceramic material 4,033,776, Cl. 106-46.000
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  Godard, Bernard, and Gomitoli, Roger, 4,033,577, Cl. 271-128.000
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  Schoenberg, Emanuel, 4,034,000, Cl. 260-502.600
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Goto, Eizo, to Tokyo Shibaura Electric Co., Ltd. Sheath heater 4,034,330, Cl. 338-238.000
Gottesman, Roy Tully, to Tenneco Chemicals, Inc. Process for the production of halogenated aromatic carboxylic acids 4,034,007, Cl. 260-524.00R
Gotz, Manfred K *See*—
  Ferland, Jean-Marie, Failli, Amedeo, Immer, Hans U., and Gotz, Manfred K., 4,033,974, Cl. 260-295.50R
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  Clark, Robert M., and Cronin, John C., 4,034,147, Cl. 174-14.00R
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Granquist, William T., to NL Industries, Inc. Cracking hydrocarbons over laminar heavy metal aluminosilicates. 4,033,858, Cl. 208-115.000
Gratzmuller, Jean Louis. Protracted-blast electric circuit-breaker for alternating currents. 4,034,175, Cl. 200-150.00R
Graul, William E.: *See*—
  Schorsch, John B.; Graul, William E., and Barash, David, 4,033,142, Cl. 62-381.000.
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  Hann, Thomas C. A., 4,033,853, Cl. 208-11.0LE
Green, Garry J. Grass trimming apparatus. 4,033,098, Cl. 56-17.500
Greenquist, Duane R., to Hoover Ball and Bearing Company. Side door bin with improved hinge support. 4,033,476, Cl. 220-334.000.
Gregor, Harry P. Pressure-driven enzyme-coupled membranes 4,033,817, Cl. 195-2.000
Gregor, Harry P. Enzyme-coupled ultrafiltration membranes 4,033,822, Cl. 195-68.000
Gregorian, Raznic S., and Hoernle, Hans R., to United Merchants and Manufacturers, Inc. Laminates and coated substrates 4,034,134, Cl. 428-86.000
Gregory, Gordon Ian *See*—
  Cook, Martin Christopher, Gregory, Gordon Ian, and Bradshaw, Janice, 4,033,950, Cl. 260-243.00C
Gregory, Ralph R., and Benesh, Peter, to National Upper Cervical Chiropractic Research Association, Inc. Machine for determining vertebrae locations in the human body 4,033,329, Cl. 128-2.00S
Greif Bros. Corporation *See*—
  Santoni, Cesar, 4,033,454, Cl. 206-386.000
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  Webster, Robert B., and Gretz, Charles, 4,034,216, Cl. 240-78.00F
Grieder, Alfred, to Ciba-Geigy Corporation. Alcoholic hydrolysis of 2-formylaminochlorotoluene 4,034,043, Cl. 260-578.000
Grier, Nathaniel, Dybas, Richard A., and Strelitz, Robert A., to Merck & Co., Inc. Dibicyclo[3.1.1] and [2.2.1] heptyl and dibicyclo [3.1.1] and [2.2.1] heptenyl polyamines having a piperidine moiety 4,033,748, Cl. 71-67.000
Grimes, Roger *See*—
  Stowell, Michael James, Watts, Brian Michael, Emley, Edward Frederick, and Grimes, Roger, 4,033,794, Cl. 148-32.000
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  Palazzetti, Mario, and Grisotto, Franco, 4,034,271, Cl. 361-332.000.
Griswold, James L. French shoring assembly with stacking accessory 4,033,138, Cl. 61-41.00A
Gros, Eugene. Manufacture of articles of a substantially sack-like or tubular structure. 4,033,801, Cl. 156-70.000
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  Berger, Christian, Farge, Daniel, Gros, Georges, Messer, Mayer Naoum, and Moutonnier, Claude, 4,034,088, Cl. 424-246.000
  Berger, Christian, Farge, Daniel, Gros, Georges, Messer, Mayer Naoum, and Moutonnier, Claude, 4,034,090, Cl. 424-246.000
Gross, William G., to Armstrong Cork Company. Apparatus for applying adhesive to a furniture component 4,033,284, Cl. 118-3.000
Grosseau, Albert, to Societe Anonyme Automobiles Citroen. Hydraulic height-adjustment vehicle suspension 4,033,423, Cl. 180-41.000
Grossen, Walter, Gagnaux, Andre, and Chariatte, Edgar, to Fr. Sauter AG., Fabrik elektr. Apparate. Ozone generating apparatus 4,034,229, Cl. 250-541.000
Grossman, David G., to Corning Glass Works. Process for producing aluminous keatite ceramics. 4,033,775, Cl. 106-39.700.
Gruber, Werner, Galinke, Joachim, and Keil, Jurgen, to Henkel & Cie G m b H. Anaerobically hardening adhesives and sealants containing an organic percarboxylic acids 4,034,145, Cl. 526-328.000.
Grudzinskas, Charles Vincent, and Weiss, Martin Joseph. Novel compounds of the 11-deoxyprostaglandin E_3, R_3, and F_3 series 4,033,992, Cl. 260-456.00R
Grundy, Reed H., to Westinghouse Air Brake Company. Most restrictive digital to analog converter 4,034,365, Cl. 340-347.0DA.
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  Gsching, Wilhelm, deceased, 4,033,239, Cl. 92-58.000
Gsching, Wilhelm, deceased (by Gsching, Irmgard, heiress), to Sulzer Brothers Limited. Radial piston machine 4,033,239, Cl. 92-58.000
GTE Automatic Electric Laboratories Incorporated *See*—
  Hrdlicka, Eugene R., Vincolese, George J., and Szuberla, John H., 4,034,157, Cl. 179-1.0PC
GTE Laboratories Incorporated *See*—
  Carlsen, W. John, 4,034,355, Cl. 340-173.0LM
Guegan, Yves. Shock absorber pad of molded fibers for the drop casting of ingots 4,033,546, Cl. 249-174.000
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  Burgat, Georges, and Guillemaut, Bernard, 4,033,096, Cl. 53-386.000
Gulf Research & Development Company *See*—
  Hoffmann, Otto L., 4,033,756, Cl. 71-118.000
Gunjigake, Koreaki, Hasegawa, Masashi, Oizumi, Hiroshi, and Ogata, Yoshio, to Denki Kagaku Kogyo Kabushiki Kaisha. Solid diffusion dopants for semiconductors and method of making the same 4,033,790, Cl. 148-22.000
Gunning, David W *See*—
  Currie, William E., Gunning, David W., and Russell, John G., 4,033,022, Cl. 29-237.000
Gurwell, William E., and Shaler, Amos J., to Eaton Corporation. Method of forming a composite by infiltrating a porous preform 4,033,400, Cl. 164-98.000
Guss, Stephen B., Goldman, Mark R., and Zir, Leonard M. Cardiac catheter and method of using same 4,033,331, Cl. 128-2.00M.
Gustafsson, Berth Ulrik, to Projectus Industriprodukter AB. Method for thermal running of a heat pump plant and plant for carrying out the method 4,033,141, Cl. 62-238.000.
Haake, Inc., *See*—
  Kromer, Heiner M., and Ossman, John, 4,033,557, Cl. 259-192.000
Haas, David J., to North American Philips Corporation. Transmission x-ray tube 4,034,251, Cl. 313-59.000
Habermeier, Jurgen, to Ciba-Geigy Corporation. Linear polyesters based on s-triazinedicarboxylic acids. 4,034,018, Cl. 260-860.000.
Habermeier, Jurgen, to Ciga-Geigy Corporation. Linear copolyesters based on terephthalic acid and/or isophthalic acid. 4,034,019, Cl. 260-860.000
Hadary, Joseph. Toothbrush 4,033,007, Cl. 15-172.000
Haddad, Ihsan A., and Arsenault, Alvin R., to Instrumentation Laboratory, Inc. Cell culture system 4,033,825, Cl. 195-127.000
Haddock, Don E., deceased (by Haddock, Joan L., administratrix), to Electronic Devices, Inc. Vehicle alarm apparatus 4,034,337, Cl. 340-63.000
Haddock, Joan L., administratrix *See*—
  Haddock, Don E., deceased, 4,034,337, Cl. 340-63.000
Haeder, Gert Wilhelm, to Rank Organisation Limited, The. Transducer with rearwardly disposed damping elements 4,034,165, Cl. 179-115.50R
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  Baron, Gerhard, Hafke, Carl, Engler, Dietrich, Reimert, Rainer, and Blaum, Eberhard, 4,033,730, Cl. 48-86.00R
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  Hoetger, Robert Arthur, Hagaman, James Albert, and Nortman, William, 4,033,436, Cl. 192-3.300
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  Denny, William Michael, Hagen, Russell Louis, and Leung, Steve Ka-Lai, 4,034,353, Cl. 364-200.000.
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  Kreuz, Alois, and Hahn, Joachim, 4,033,191, Cl. 73-431.000
Haines, Norman William. Brick tie. 4,033,085, Cl. 52-698.000
Hakuju Institute for Health Science Co., Ltd. *See*—
  Hara, Takaaki, 4,033,356, Cl. 128-405.000
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  Horst, William R., and Hale, William J., 4,034,211, Cl. 235-61.12N
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  Holtmyer, Marlin D., Githens, Charles J., and Tinsley, John M., 4,033,415, Cl. 166-308.000.
  Labyer, Harold S., and Dodson, James C., 4,033,701, Cl. 403-13.000
  Lawson, Michael B., and Snyder, Kenneth J., 4,033,784, Cl. 134-20.000
Hallock, David B., to Rockwell International Corporation. Method and apparatus for generating a non-linear signal 4,034,304, Cl. 328-142.000

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Tomioka, Tatsuyuki, Yukami, Noboru, Hamaguchi, Yoshi, and Yamashita, Kiyoharu, 4,034,187, Cl 219-216.000.

Hamano, Sachiyuki, Kanazawa, Tamotsu, and Kitamura, Shin-ichi, to Eisai Co, Ltd Bis-(meta-amidinophenoxy)-compounds and pharmacologically acceptable acid addition salts thereof 4,034,010, Cl 260-564 00R

Hamblin, Richard David, to Archibald Kenrick and Sons Limited. Shelf supports 4,033,540, Cl 248-246 000

Hamburg, Emil G, Cryderman, Robert L, and Butler, John F, to Jones & Laughlin Steel Corporation Method of producing a high strength steel having uniform elongation. 4,033,789, Cl. 148-12.00F

Hamell, Matthew, Stefanucci, Arthur, and Ward, William W, to General Foods Corporation Packaged roasted coffee products 4,034,116, Cl 426-131.000.

Hamlet, Buck C *See—*

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Hanaoka, Seiji, to Kabushiki Kaisha Suwa Seikosha Printer 4,033,256, Cl 101-99 000

Hancock, Allen W, II, and Vanderwerff, William D, to Sun Ventures, Inc. Process for making aromatic acids 4,034,005, Cl 260-515 00P

Hann, Thomas C A, to Great Canadian Oil Sands Limited Process and apparatus for heating and deaerating raw bituminous froth 4,033,853, Cl 208-11 0LE

Hanning, Robert Apparatus for making thermoplastic articles with porous cores and less porous or nonporous skins 4,033,710, Cl 425-543 000

Hansel, William B, and Lindeman, Myrl A, to Suntech, Inc Interlock and latching systems for a dispensing nozzle 4,033,389, Cl 141-207 000

Hanson, Delon C, to Hewlett-Packard Company Precision optical fiber switch 4,033,669, Cl 350-96 00C

Hanson, Ronald P, to Ideal Industries, Inc Conduit fitting 4,033,614, Cl 285-248 000

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Hoppe, William C, and Hanson, Theodore L, 4,033,477, Cl 221-114 000

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Tybus, Gerd, Ebner, Ludwig, Waldhoer, Rudolf, Bichler, Peter, Bier, Wilhelm, Happe, Peter, and Weis, Frowald, 4,033,021, Cl 29-157 00C

Hara, Takaaki, to Hakuju Institute for Health Science Co, Ltd Apparatus for therapeutical treatment and stimulation of muscles by low-frequency oscillating electric current 4,033,356, Cl 128-405 000

Harada, Saburo *See—*

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Harazoe, Yoshiaki, Kurakami, Shigeru, Okamoto, Michio, and Hasegawa, Ichiro, to Kabushiki Kaisha Komatsu Seisakusho Automatic safety and alarming apparatus for construction equipments 4,034,335, Cl 340-52 00F

Hardway, Edward V, Jr, and Holtman, William H, to Cavitron Corporation Activity and respiration monitor 4,033,332, Cl 128-2.00S

Hardy, Donald, Sr., and Orwoll, Edward Francis, to FMC Corporation Process for preparing mixed phosphate ester compositions 4,034,023, Cl. 260-973 000

Hargis, Ivan Glen, Livigni, Russell Anthony, and Aggarwal, Sundar Lal, to General Tire & Rubber Company, The Composition useful in anionic polymerization 4,033,900, Cl 252-431 00L

Harrington, Duane Earl Integral cigarette paper holder element 4,033,358, Cl 131-15 00R.

Harris Corporation *See—*

Richmond, Abraham W, 4,033,263, Cl 101-416 00A

Harris, Garrett H Protective mounting for outboard motors 4,033,530, Cl. 248-4 000

Harris, Ian Richard *See—*

Horsewell, Henry George, and Harris, Ian Richard, 4,033,361, Cl 131-262 00A

Harris, Nicholas D, to Morton-Norwich Products, Inc Vinylbenzyl ester of an N-BOC amino acid 4,033,998, Cl 260-471 00C

Harrison, Norman, to Lucas Electrical Company Limited Method for plating 4,033,834, Cl 204-15 000

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Hartemann, Pierre, to Thomson-CSF System for measuring the frequency of an electrical signal 4,034,288, Cl 324-80 000

Hartog, Jan, and Zwagemakers, Johannes Maria Antonius, to U S Philips Corporation Aralkylaminoz sulfones having spasmolytic activities. 4,034,103, Cl 424-282 000

Harvey, Robin J *See—*

Lutz, Michael A, and Harvey, Robin J, 4,034,261, Cl 315-344 000

Harvey, Walter W; Randlett, Myron R, and Bangerskis, Karlis I, to Kennecott Copper Corporation Method for series electrowinning and electrorefining of metals 4,033,839, Cl. 204-108 000

Hase, Akira *See—*

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Hasegawa, Katsuji, to Meinan Machinery Works, Inc. Method of and device for severing a veneer sheet. 4,033,212, Cl. 83-13.000

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Klauck, David E, 4,034,268, Cl 361-111 000

Heavens, Michael, James, Richard Charles, and Slinn, Dennis Stanley, to EMI Limited Patient positioning and supporting arrangement 4,034,224, Cl 250-439 00P

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Hecht, Ralph Julius, to United Technologies Corporation Superalloy base having a coating containing silicon for corrosion/oxidation protection 4,034,142, Cl 428-678 000

Heckman, LeRoy Francis, Jr, and Pickard, James Bruce, to RCA Corporation High power coaxial cavity resonator tunable over a broad band of frequencies 4,034,320, Cl 333-82 00B

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Heeren, Richard H, to Teletype Corporation Logic circuits and on-chip four phase FET clock generator made therefrom 4,034,242, Cl 307-269 000

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Fritz, David Paul, Anderson, John Dale, Pruitt, Martin Eugene, Mahagan, Deroy Ernest, and Buller, Richard James, 4,033,101, Cl 56-344 000

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Hill, John, and Turczanski, Henryk, to Comteleo (U K) Limited Temperature sensitive trip device 4,034,326, Cl 337-34 000

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John, Veit, 4,033,307, Cl 123-119 00A

Martini, Thomas, 4,033,984, Cl 260-340 600

Meininger, Fritz, Hunger, Klaus, and Springer, Hartmut, 4,033,980, Cl 260-314 500

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Holmes, G Thomas, to Aluminum Company of America Electrolytic reduction cell 4,033,836, Cl 204-67 000
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Hosaka, Hideo, and Yoneda, Hiromi, to Nippon Soda Company Limited Herbicidal composition 4,033,750, Cl 71-90 000
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Bloink, Harry William, 4,033,018, Cl. 29-105 00A
Weaver, William Norfred, 4,033,457, Cl 206-390 000
Imai, Hirozo; and Maeda, Yasuo, to Matsushita Electric Works, Ltd Inner blade member for electric dry shaver 4,033,034, Cl 30-43 920
Imai, Isao, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Looper 4,033,492, Cl 226-25.000
IMC Chemical Group, Inc.. *See—*
Briedis, Juozas; and Jurisch, Louis A , 4,033,976, Cl 260-299 000
Immer, Hans U . *See—*
Ferland, Jean-Marie, Failli, Amedeo, Immer, Hans U.; and Gotz, Manfred K , 4,033,974, Cl 260-295 50R
Imperial Chemical Industries Limited *See—*
Borthwick, James; and Morman, James Forrester, 4,033,359, Cl 131-17.0AC
Maisey, Roy Frederick, 4,033,951, Cl 260-243 00R.
Smith, Leslie Harold, 4,034,106, Cl 424-304.000
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Imperial Chemical Industries Limited: *See—*
Steel, Margaret Lillian; and Holt, Frank, Re. 29,295.
Inada, Masami, Kawabata, Yasuhiro, and Sato, Katsujiro, to Aisin Seiki Kabushiki Kaisha; and Toyota Jidosha Kogyo Kabushiki Kaisha Air flow control means for automobile engine exhaust gas cleaning means 4,033,125, Cl 60-290 000
Industrial Resources, Inc *See—*
Rosar, Edward C , Dulin, Jacques M , Genco, Joseph M , and Rosenberg, Harvey S , 4,034,063, Cl 423-244 000
Ing C Olivetti & C , S p A *See—*
Oddicini, Giuseppe, 4,033,445, Cl 197-151 000
Ing C Olivetti & C , S p A Ufficio Brevetti *See—*
Dalmasso, Claudio, 4,033,672, Cl 350-160 0LC
Inoue, Atushi *See—*
Ishiyama, Hideki, Inoue, Atushi; and Ieki, Hideharu, 4,034,318, Cl 333-72 000
Inoue, Morio *See—*
Itoh, Kunio, and Inoue, Morio, 4,034,311, Cl 331-94 50H
Inoue, Mutsuhiro *See—*
Uno, Keiichi, and Inoue, Mutsuhiro, 4,033,685, Cl 353-82 000
Inoue, Takahiro *See—*
Hirayama, Kazuhiro, Tsukada, Syusei, and Inoue, Takahiro, 4,033,687, Cl 355-1 000
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Chevalier, Andre, 4,033,612, Cl 285-149 000
Instrumentation Laboratory, Inc *See—*
Haddad, Ihsan A , and Arsenault, Alvin R , 4,033,825, Cl 195-127 000
Intamin AG *See—*
Spieldiener, Robert, Spieldiener, Reinhold, and Saiko, Alphons, 4,033,602, Cl 280-605 000
Intel Corporation *See—*
Pashley, Richard D , 4,033,026, Cl 29-571 000
Intercontinental Marine Limited *See—*
Higgs, William York, 4,033,002, Cl 9-14 000
International Business Machines Corporation *See—*
Berry, Brian S , and Pritchet, Walter C , 4,033,795, Cl 148-108 000
Briska, Marian, and Eisenbraun, Ewald, 4,034,130, Cl 427-248 00C
Buron, Rene Henri, 4,034,159, Cl 179-15.0AT
Demsky, Herbert M , Mathisen, Einar S , Schumann, Paul A , Jr , and Tong, Alvin H , 4,033,698, Cl 356-173 000
Firdaus, Asad, 4,033,173, Cl 73-37 000
Fleck, Harry Ronald, and Mignosa, Charles Philip, 4,034,133, Cl 428-64 000
Howley, Frank E , Jones, John W., and Logue, Joseph C., 4,034,356, Cl 340-173 00R
Kraemer, Edward Joseph, and Patel, Tulsidas Ramlal, 4,034,411, Cl 360-98 000
Love, Robert D , Cullen, James W , and Kruppa, Robert W , 4,034,243, Cl 307-304 000
Mehta, Kay Beharat, and Voegeli, Otto, 4,034,357, Cl 340-174 01F
Seki, Hajime, 4,033,673, Cl 350-160 00R
Vaughn, Julian Edgar, 4,034,309, Cl 331-1 00A
International Combustion Australia Limited *See—*
Brander, James Edward, 4,033,193, Cl 74-61 000
International Paper Company *See—*
La Rosa, John, 4,033,353, Cl 128-351 000
International Publishing Corporation Ltd *See—*
Owen, David Gregory, Ashworth, John Vernon, and Radcliffe, Paul Anthony Beaufort, 4,034,400, Cl 358-75 000
International Standard Electric Corporation *See—*
Barton, Paul, 4,034,376, Cl 343-112 00R
Sterling, Henley F., and Drake, Miles P , 4,033,832, Cl 204-15 000
International Synthetic Rubber Company, Limited, The *See—*
Moore, John David, and Wheeler, Ian Robert, 4,034,020, Cl 260 880 00R
International Telephone and Telegraph Corporation *See—*
Kruger, Bradford E , 4,034,374, Cl 343-16 00R
Tobey, Hubert Earl, Hood, John William, Masiuk, Alphonse Michael, Irvin, Dee Lavern, and Moller, George Otto, 4,033,254, Cl 101-44 000.
Interroyal Corporation *See—*
Benoit, Roland A , and Duprey, Richard H , 4,033,639, Cl 308-3 600
Inzana, Margaret, and Terrett, Joann Eye make-up shield 4,033,364, Cl 132 88 500
Irvin, Dee Lavern *See—*
Tobey, Hubert Earl, Hood, John William, Masiuk, Alphonse Michael, Irvin, Dee Lavern, and Moller, George Otto, 4,033,254, Cl 101 44 000
Isayama, Takuro, to Ricoh Co , Ltd Ink ejection apparatus for printer 4,034,380, Cl 346-140 00R
Ishikawa, Hisao *See—*
Sawaki, Mikio, Iwataki, Isao, Hirono, Yoshihiko, and Ishikawa, Hisao, 4,033,754, Cl 71-112 000
Ishikawa, Kazuo *See—*
Hirosawa, Koichiro, Ishikawa, Kazuo, Ogasawara, Tsunehiko, and Murakami, Noboru, 4,033,203, Cl 74 869 000
Ishikawajima-Harima Jukogyo Kabushiki Kaisha *See—*
Imai, Isao, 4,033,492, Cl 226-25 000
Ueno, Masayuki, and Sano, Fumiaki, 4,033,565, Cl 266-273 000
Ishiyama, Hideki, Inoue, Atushi, and Ieki, Hideharu, to Murata Manufacturing Co , Ltd Elastic surface wave filter 4,034,318, Cl 333 72 000
Ishizaka Sunao, and Kawahara, Yasuhito, to Nippon Kogaku K K Exposure indicator device in a single lens reflex camera with a TTL exposure meter contained therein 4,034,392, Cl 354-289 000
Isono, Tomoyuki, and Nakada, Toshio, to Nippon Electric Company, Ltd Automatic postal-code-number reading system 4,034,341, Cl 340-146 30H
Isozaki, Osamu, Watanabe, Tadashi, and Sakamoto, Masahiro, to Kansai Paint Company, Ltd Process for producing unsaturated resin emulsion 4,033,920, Cl 260-29 60H
Ito, Fumio *See—*
Mashimo, Yukio, Ito, Tadashi, Shinoda, Nobuhiko, Sakurada, Nobuaki, and Ito, Fumio, 4,034,383, Cl 354-23 00D
Ito, Jiro *See—*
Aoki, Yutaka, Hase, Akira, and Ito, Jiro, 4,033,728, Cl 44-1 00R
Ito, Tadashi *See—*
Mashimo, Yukio, Ito, Tadashi, Shinoda, Nobuhiko, Sakurada, Nobuaki, and Ito, Fumio, 4,034,383, Cl. 354-23 00D
Itoh, Kunio, and Inoue, Morio, to Matsushita Electronics Corporation Semiconductor laser 4,034,311, Cl 331-94 50H
Iwashita, Tomonori, and Kozuki, Susumu, to Canon Kabushiki Kaisha Film transport driving and braking apparatus for a photographic camera 4,034,388, Cl 354-173 000
Iwataki, Isao *See—*
Sawaki, Mikio, Iwataki, Isao, Hirono, Yoshihiko, and Ishikawa, Hisao, 4,033,754, Cl 71-112 000
J C Penney Company *See—*
Jay, Aubrey, and Jacobs, Maurice A , 4,032,989, Cl 2-73 000
J F Pritchard and Company *See—*
Swenson, Leonard K , 4,033,735, Cl 62-9 000
J I Case Company *See—*
Hirsch, Arthur Edward, 4,033,375, Cl 137-493.900.
Moehle, Kenneth Albert, and Taschner, Raymond George, 4,033,542, Cl 248-358.0AA.
Parquet, Donald James, and Pedersen, Carl Oluf, 4,033,870, Cl 210-90 000

- J I M Corporation *See—*
  - Stanfield, Jay E., 4,033,576, Cl 271-5 000
- J M Voith GmbH *See—*
  - Schiel, Christian, and Flamig, Hans, 4,033,049, Cl 34-115 000
- J P Stevens & Co , Inc . *See—*
  - Pensa, Ildo Emil, and Rau, Robert Otto, 4,032,992, Cl 2-243 00R
- J P Tool, Inc *See—*
  - Peuterbaugh, Bruce G , 4,033,207, Cl 82-2 00E
- J & S Tool Company, Inc . *See—*
  - Swenson, Henry F , 4,033,210, Cl. 82-31 000
  - Swenson, Henry F , 4,033,211, Cl 82-33 00R
- J T Baker Chemical Company *See—*
  - Barnard, Alfred J , Jr , and Lance, Russell C , Jr , 4,033,897, Cl 252-408 000
- Jackson, James J , to Veeder Industries, Inc Electronic access control system 4,034,193, Cl 235-151 340
- Jackson, John Lambert *See—*
  - Archibald, John Leheup, and Jackson, John Lambert, 4,034,098, Cl 424-267 000
- Jackson, Richard L *See—*
  - Stilz, John G , and Jackson, Richard L , 4,033,941, Cl 260-112 50R
- Jacob Amstutz *See—*
  - Amstutz, Jacob, and Amstutz, Paul G , 4,033,127, Cl 60-455 000
- Jacob, David S *See—*
  - United States of America, National Aeronautics and Space Administration, and Jacob, David S , 4,033,479, Cl 222-61 000.
- Jacobi, Eckart *See—*
  - Karges, Hermann Erich, Heimburger, Norbert, and Jacobi, Eckart, 4,033,824, Cl 195-99 000
- Jacobi, Edgar F , and Madden, Mark R Automated irrigation system 4,033,508, Cl 239-177 000
- Jacobs, Maurice A *See—*
  - Jay, Aubrey, and Jacobs, Maurice A , 4,032,989, Cl 2-73.000
- Jacobson, Ralph Spencer Screw and screw driver 4,033,244, Cl 85-45 000
- Jacobson, Robert L , and Ormiston, Robert M , to Chevron Research Company In situ hydrocarbon conversion catalyst regeneration without sulfur contamination of vessels communicating with catalyst reactor 4,033,898, Cl 252-416 000
- Jacoel, Rafael *See—*
  - Maioglio, Mauro, and Jacoel, Rafael, 4,033,305, Cl 123-117 00D
- Jacques, Donald F , and Lange, K Robert, to Betz Laboratories, Inc. Chromate reduction in aqueous medium 4,033,867, Cl 210-28 000
- Jaffe, Walther, to Lebema Eledtriska Aktiebolag Marking tapes for marking articles 4,033,057, Cl 40-21 00R
- Jahnke, Frederick C *See—*
  - Colvert, James H , Jahnke, Frederick C , and Williams, Dale, 4,033,856, Cl 208-102 000
  - Williams, Dale, Colvert, James H , and Jahnke, Frederick C , 4,033,857, Cl 208-102 000
- Jaki, Friedrich *See—*
  - Kroger, Uwe, Jaki, Friedrich, Brammer, Hartmut G , Ehrmann, Karl, Magdefrau, Herbert, Brand, Gunter, Kalippke, Harald, and Rink, Rolf, 4,033,315, Cl 123-146 50A
- Jakobs, Willy, and Kryczun, Alfred, to Klockner-Humboldt-Deutz Aktiengesellschaft Device for the separation of mixtures of at least partially molten metals, metal compounds and/or metal-containing slags in a centrifugal force field 4,033,563, Cl 266-204 000
- James B Carter Limited *See—*
  - Windsor, Lynne E., and Smorang, Lawrence, 4,034,204, Cl 219-368 000
- James, Richard Charles *See—*
  - Heavens, Michael, James, Richard Charles, and Slinn, Dennis Stanley, 4,034,224, Cl. 250-439 00P
- Jameson, M Phillip, and Huege, Fred R , to Engelhard Minerals & Chemicals Corporation Method for producing synthetic sodium aluminosilicate ion-exchange material from calcined kaolin clay 4,034,058, Cl 423-118 000
- Janome Sewing Machine Co *See—*
  - Kasuga, Noboru, 4,033,273, Cl. 112-274 000
- Janoski, Edward J *See—*
  - Schneider, Abraham, and Janoski, Edward J , 4,033,799, Cl 149-120.000.
- Jansen, Josephus Johannes Maria, to Koninklijke Textielfabrieken Liquid separation of sock string 4,033,151, Cl 66-147 000.
- Janssen, Peter Johannes Hubertus, to U S. Philips Corporation Television facsimile transmission system 4,034,405, Cl 358-147 000
- Jarnuszkiewicz, Stanislaw, to Politechnika Krakowska Four-stroke, multicylinder, spark ignition, fuel injection internal combustion engine. 4,033,302, Cl. 123-59 0BM
- Jarrett, James Oswald *See—*
  - Jarrett, William Fleming Hoggan, Jarrett, James Oswald, and Mackey, Lindsay Joan, 4,034,081, Cl 424-89 000
- Jarrett, William Fleming Hoggan, Jarrett, James Oswald, and Mackey, Lindsay Joan, to University of Glasgow Vaccines against feline leukemia 4,034,081, Cl 424-89 000.
- Jay, Aubrey, and Jacobs, Maurice A , to J C. Penney Company Garment liner 4,032,989, Cl 2-73 000
- Jeffries Truck Parts & Equipment, Inc *See—*
  - Cameron, John Stratton, 4,033,607, Cl 280-711 000
- Jenkins, David Conwil *See—*
  - King, Leslie George, Lee, Glyn Evan, Martin, George Christopher James, and Jenkins, David Conwil, 4,034,107, Cl 424-309 000
- Jennison, James M , and Williams, Henry Thomas, to Thompson Manufacturing Company Arc-traversing water sprinkler 4,033,510, Cl 239-230 000
- Jentoft, Arthur P , and Couture, Paul A , to Wasco Products, Inc. Vent 4,033,246, Cl 98-42 00R
- Jentzsch, Arndt *See—*
  - Johne, Hans, Jentzsch, Arndt, and Schumann, Gunter, 4,033,262, Cl 101-350 000
- Jeunelot, Charles William *See—*
  - Free, John Marshall, and Jeunelot, Charles William, 4,034,339, Cl 340-146.10C
- John, Veit, to Hoechst Aktiengesellschaft. Process and device for preparing ignitable fuel mixtures. 4,033,307, Cl 123-119.00A
- John Wyeth & Brother Limited *See—*
  - Archibald, John Leheup, and Jackson, John Lambert, 4,034,098, Cl 424 267 000
  - Tipton, Peter William, 4,033,809, Cl 156-572 000
- John Z Delorean Corporation. *See—*
  - Hofer, Peter H , 4,034,137, Cl. 428-308 000.
- John Zink Company *See—*
  - Reed, Robert D , and McGill, Eugene C., 4,033,725, Cl 23-277 00C
- Johne, Hans, Jentzsch, Arndt, and Schumann, Gunter, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen Ink applicator for printing apparatus. 4,033,262, Cl 101-350 000
- Johns, Gordon L . *See—*
  - Murawski, Frank H , Elliott, James W., Richards, Fred W , and Johns, Gordon L., 4,033,336, Cl 128-2 05R
- Johnsen, Edward L. Multi-ply lottery tickets or like articles, continuous business form and method for producing same. 4,033,611, Cl 283-6 000
- Johnson, Clifford T , and McCubbin, Melvin J , to United States of America, Navy. Anti-compromise device. 4,033,265, Cl 102-56 0SC
- Johnson Controls, Inc *See—*
  - Matthews, Russell B., 4,034,270, Cl. 361-256.000.
- Johnson, Edwin Samuel, and White, Wilfrid Francis, to Abbott Laboratories. Method to prevent reproduction in warm-blooded female animals with nonapeptides 4,034,082, Cl. 424-177 000.
- Johnson, Ernest Carlisle. *See—*
  - Wortham, Joseph Sidney; and Johnson, Ernest Carlisle, 4,034,120, Cl 426-531.000.
- Johnson, Harold L., to Deering Milliken Research Corporation. Electronic control system for dyeing and printing materials. 4,033,154, Cl 68-205 00R
- Johnson, Howard L., and Junck, John A., to Caterpillar Tractor Co. All hydraulic motor grader circuitry 4,033,236, Cl 91-463.000.
- Johnson & Johnson. *See—*
  - Cepuritis, Talivaldis, 4,033,348, Cl. 128-287.000.
  - Klepak, Philip B , Richardson, David I , and Fourman, Robert G., 4,033,365, Cl 132-89.000.
  - Scrivens, George W , 4,033,341, Cl 128-132.00D
- Johnson, Norman A *See—*
  - Fritz, Thomas W., Gilbo, Charles F., and Johnson, Norman A., 4,033,083, Cl 52-484.000.
- Johnson, Oliver Wendell, to Eaton Corporation. Controller for fluid pressure operated devices 4,033,377, Cl 137-596.000.
- Johnson, Paul A , and Pinkalla, Hamilton A. Dental impression compound 4,033,774, Cl 106-35.000.
- Johnson, Perry L *See—*
  - Wadge, James C , Falsey, Henry T., and Johnson, Perry L., 4,033,704, Cl 415-80.000.
- Johnson, Rodney L. *See—*
  - Zinsmeyer, Herbert G , Johnson, Rodney L., Genz, Ralph H., and Setliff, James E., 4,033,883, Cl 250-231 0SE.
- Johnson, Thomas E , to Chas S Lewis & Co , Inc. Ductile corrosion resistant alloy 4,033,767, Cl 75-170.000
- Johnston, James D , Sanders, Robert N , and Wood, James M., Jr., to Ethyl Corporation. Process for producing magnesium utilizing aluminum-silicon alloy reductant 4,033,758, Cl 75-67.00R.
- Johnston, James D , Sanders, Robert N ; and Wood, James M., Jr., to Ethyl Corporation Process for producing magnesium utilizing aluminum metal reductant 4,033,759, Cl 75-67 00R
- Johnston, Ronald J , to Aluma Building Systems Incorporated Wall forming structure for poured concrete walls. 4,033,544, Cl 249-40 000
- Johnston, Taylor C Tent apparatus for fumigation of buildings. 4,033,367, Cl 135-8 000
- Jones, Charles M *See—*
  - Wu, Hai, and Jones, Charles M., 4,033,303, Cl. 123-41 850.
- Jones, James H *See—*
  - Cragoe, Edward J , Jr., and Jones, James H., 4,033,996, Cl 260-490 000
- Jones, John W . *See—*
  - Howley, Frank E., Jones, John W., and Logue, Joseph C , 4,034,356, Cl 340-173 00R.
- Jones & Laughlin Steel Corporation *See—*
  - Hamburg, Emil G , Cryderman, Robert L , and Butler, John F , 4,033,789, Cl 148-12 00F
- Jones, Norman Stewart, to Pneupac Limited Lung ventilation equipment 4,033,343, Cl 128-145 800
- Jones, Stewart Barry, and Williams, Keith Rushworth, to U.S. Philips Corporation Microstrip gunn oscillator with varactor tuning 4,034,313, Cl 331-96 000
- Jordan, Robert Kenneth Carboxylation metallation process 4,034,037, Cl 260-429.00R

- Josef Bautz GmbH. *See—*
  - Moosbrucker, Karl, 4,033,628, Cl 302-34 000.
- Joyce, Jack *See—*
  - List, Harold A , Baker, Jack H , and Joyce, Jack, 4,033,183, Cl. 73-88.50R
- Joyce, Peter Waterworth *See—*
  - Thwaites, Peter John, and Joyce, Peter Waterworth, 4,033,251, Cl 100-95 000
- Jun, Wilhelm Meyer Invalid wheel-chair 4,033,624, Cl 297-434 000
- Junck, John A *See—*
  - Johnson, Howard L., and Junck, John A , 4,033,236, Cl 91-463 000
- Junemann, Hubert Template following mechanism 4,033,192, Cl 74-29.000.
- Junghanns, Paul, and Burger, Friedhelm, to Wilh Engstfeld, a Kommanditgesellschaft Crucible for melting, heat retention and pouring of metals 4,033,564, Cl. 266-242.000.
- Jureit, John Calvin, Leutwyler, Roy, Brodsky, Larry, Kushner, Benjamin; and Castillo, Adolfo, to Automated Building Components, Inc Methods for fabricating wooden frames and the like. 4,033,025, Cl 29-417 000
- Jurisch, Louis A : *See—*
  - Briedis, Juozas; and Jurisch, Louis A., 4,033,976, Cl 260-299 000.
- Jury, Gene R. Furnace and cold air return systems 4,033,320, Cl 126-110.00R.
- Kabushiki Kaisha Daini Seikosha: *See—*
  - Matsuura, Eiichi, 4,033,111, Cl 58-106 500
- Kabushiki Kaisha Komatsu Seisakusho *See—*
  - Aoyama, Ryozo, Matsuda, Yukinobu, and Urushima, Mitsuo, 4,033,128, Cl 60-484.000
  - Harazoe, Yoshiaki, Kurakami, Shigeru, Okamoto, Michio, and Hasegawa, Ichiro, 4,034,335, Cl. 340-52.00F.
  - Sugimoto, Yutaka, 4,033,553, Cl 254-185.00B.
  - Sugimoto, Yutaka, and Shiota, Ryoji, 4,033,554, Cl 254-185.00B.
- Kabushiki Kaisha Seikosha *See—*
  - Watanabe, Akira, and Harada, Saburo, 4,033,017, Cl. 29-25.350.
- Kabushiki Kaisha Suwa Seikosha *See—*
  - Hanaoka, Seiji, 4,033,256, Cl. 101-99.000
  - Kodaira, Mitsuharu, 4,034,303, Cl 328-62.000.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho *See—*
  - Sasayama, Chikanobu, Suzuki, Osamu, Shimizu, Takeshi, and Chiba, Kunji, 4,033,107, Cl. 57-81.000
- Kabushiki Kaisha Toyota Chuo Kenkyusho *See—*
  - Asai, Kiyokazu; and Takeuchi, Akihiro, 4,034,244, Cl 310-8 200
- Kachik, Robert H.: *See—*
  - Bieniosek, Chester E., Kachik, Robert H., and Pignocco, Arthur J., 4,033,399, Cl. 164-54.000.
- Kaczkowski, Zbigniew, to Polska Akademia Nauk, Instytut Fizyki. Magnetostrictive alloy. 4,033,791, Cl 148-31.550.
- Kaeding, Warren W.; and Young, Lewis B., to Mobil Oil Corporation Selective production of para-xylene. 4,034,053, Cl. 260-672 00T.
- Kaiser Glass Fiber Corporation. *See—*
  - Nichols, Claude R.; and Helberg, Keith A., 4,033,742, Cl. 65-2.000.
- Kalinoski, Richard W. *See—*
  - Karas, Edwin L.; Annino, Raymond; and Kalinoski, Richard W., 4,033,171, Cl. 73-23.100.
- Kalippke, Harald *See—*
  - Kroger, Uwe, Jaki, Friedrich, Brammer, Hartmut G.; Ehrmann, Karl, Magdefrau, Herbert, Brand, Gunter, Kalippke, Harald; and Rink, Rolf, 4,033,315, Cl 123-146.50A
- Kalnberz, Viktor Konstantinovich. Surgical compression-distraction instrument 4,033,340, Cl 128-92.00A
- Kaltenbach & Voigt. *See—*
  - Bareth, Erich, and Loge, Hans, 4,033,040, Cl 32-27.000.
  - Lohn, Gerd, and Braun, Anton, 4,033,039, Cl. 32-26 000.
- Kamatics Corporation *See—*
  - Orkin, Stanley S , 4,033,019, Cl. 29-149.50B
- Kaminaka, Nobuyuki, Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, to Matsushita Electric Industrial Co , Ltd Magnetic head 4,034,414, Cl 360-113 000.
- Kamiuchi, Jun-ichi *See—*
  - Mitsui, Hisayasu; Kamiuchi, Jun-ichi, Kumazawa, Ryozi, Umemoto, Kimikazu; Yamada, Toshimitsu; Yoshida, Katsuhiko, and Takechi, Taichi, 4,033,805, Cl. 156-185.000
- Kamo, Hisao, Kuroda, Masahiro, and Okano, Susumu, to Tokyo Shibaura Electric Co , Ltd. Schottky semiconductor device 4,034,394, Cl 357-15.000.
- Kamp, Heinz, to W Schlafhorst & Co Method and device for replacing a sliver container 4,033,104, Cl 57-34 00R
- Kanai, Kenji. *See—*
  - Kaminaka, Nobuyuki, Kanai, Kenji, Nouchi, Norimoto, and Nomura, Noboru, 4,034,414, Cl 360-113.000
- Kanazawa, Tamotsu. *See—*
  - Hamano, Sachiyuki, Kanazawa, Tamotsu, and Kitamura, Shin-ichi, 4,034,010, Cl 260-564 00R
- Kanbara, Tohru *See—*
  - Uemura, Michihiko, Kanbara, Tohru, and Igarashi, Yutaka, 4,034,317, Cl 333-30 00R
- Kanbayashi, Tetsusaburo. *See—*
  - Kobayashi, Toshihiko, Kanbayashi, Tetsusaburo, Ichioka, Satoshi, Takeuchi, Shinjiro, and Matsushima, Yukinori, 4,034,180, Cl 219-85 0BM
- Kanbe, Takao, Kaneko, Yoshio, and Nomura, Satoshi, to Nisshin Flour Milling Co., Ltd. Method and apparatus for preventing cave-in of baked goods 4,034,119, Cl 426-497 000
- Kanebo, Ltd. *See—*
  - Sawa, Yoshio, 4,033,966, Cl 260-286 00Q
- Kanegafuchi Kagaku Kogyo Kabushiki Kaisha *See*
  - Suzuki, Kazuo, and Akuta, Shinichiro, 4,034,410, Cl 360-55 000
- Kaneko, Yoshio. *See—*
  - Kanbe, Takao, Kaneko, Yoshio, and Nomura, Satoshi, 4,034,119, Cl 426-497.000
- Kansai Paint Company, Ltd *See—*
  - Isozaki, Osamu, Watanabe, Tadashi, and Sakamoto, Masahiro, 4,033,920, Cl 260-29.60H
- Kao, Wen-Ling *See—*
  - Strike, Donald P., and Kao, Wen-Ling, 4,034,002, Cl 260-514.00D
- Kaplan, Murray Arthur, and Granatek, Alphonse Peter, to Bristol-Myers Company Aqueous suspensions of 7-[D-α-amino-α-(p-hydroxyphenyl)-acetamido]-3-(1,2,3-triazol-5-ylthiomethyl)-3-cephem-4-carboxylic acid 1,2-propylene glycolate 4,034,089, Cl 424-246 000
- Kaprelian, Charles Edward Teaching machine having response dependent programming 4,033,050, Cl 35-9 00R
- Karas, Edwin L., Annino, Raymond, and Kalinoski, Richard W , to Foxboro Company, The Pneumatic detector for chromatographic analyzer 4,033,171, Cl 73-23 100
- Karges, Hermann Erich, Heimburger, Norbert, and Jacobi, Eckart, to Behringwerke Aktiengesellschaft Process for the determination of plasminogen 4,033,824, Cl 195-99 000
- Karl Kroyer St Anne's Limited *See—*
  - Kroyer, Karl Kristian Kobs, 4,033,709, Cl 425-224 000
- Kartzmark, Roy M , Jr , to United States of America, Navy Hydrodynamic configuration to be used on underwater launched, unpropelled bodies. 4,033,225, Cl 89-1 810
- Kasai, Paul Haruo, Francis, James Nelson, and Bishop, Roland Justin, Jr., to Union Carbide Corporation Preparation of CU+ zeolites 4,034,065, Cl 423-328 000.
- Kasai, Tsutomu. *See—*
  - Taninaka, Kuniaki, Kurono, Hitoshi, and Kasai, Tsutomu, 4,034,102, Cl 424-277 000
- Kasami, Akinobu *See—*
  - Naito, Makoto, Kawachi, Masaru, Sekiwa, Tetuo; Akatsuka, Minoru, Kasami, Akinobu, and Toyama, Masaharu, 4,033,291, Cl 118-412 000
- Kashio, Toshio, to Casio Computer Co , Ltd Recording device 4,034,209, Cl 235-61 90R
- Kashio, Toshio, to Casio Computer Co , Ltd Memory device with shift register usable as dynamic or static shift register 4,034,301, Cl 328-37 000
- Kashio, Toshio, to Casio Computer Co , Ltd Information-transmitting apparatus. 4,034,350, Cl 364-900.000
- Kaske, Alan D : *See—*
  - Torok, Ernest J , Kaske, Alan D , Krawczak, John A , and Paul, Maynard C , 4,034,359, Cl 340-174 0TF
- Kasuga, Noboru, to Janome Sewing Machine Co Sewing machine . 4,033,273, Cl 112-274 000
- Kato, Shougo *See—*
  - Nakamura, Yukio, Kato, Shougo, and Nagaoka, Shinji, 4,033,682, Cl. 352-235 000
- Katz, Irwin A *See—*
  - Hill, John Anthony, Katz, Irwin A., and Murphy, John H , 4,034,077, Cl 424-69 000
- Kauffman, David, to Shell Oil Company Monoethanolamine process for sulfur removal from circulating oil used in sour gas wells 4,033,410, Cl 166-244 00C
- Kaufhold, Frederick D *See—*
  - Ericson, Eric A , and Kaufhold, Frederick D , 4,033,660, Cl 339-75 00M
- Kaul, Bansi Lal, to Sandoz Ltd Naphthoquinone derivatives 4,033,963, Cl 260-256 40C
- Kawabata, Yasuhiro *See—*
  - Inada, Masami, Kawabata, Yasuhiro, and Sato, Katsujiro, 4,033,125, Cl 60-290 000
- Kawachi, Masaru *See—*
  - Naito, Makoto, Kawachi, Masaru, Sekiwa, Tetuo, Akatsuka, Minoru, Kasami, Akinobu, and Toyama, Masaharu, 4,033,291, Cl 118-412 000
- Kawahara, Yasuhito *See—*
  - Ishizaka, Sunao, and Kawahara, Yasuhito, 4,034,392, Cl 354-289 000
- Kawai, Tsuneo, to Tokyo Shibaura Electric Co , Ltd Clothes dryer 4,033,047, Cl 34-82 000
- Kawamura, Yoshihisa, Saito, Masaaki, and Minami, Hidehiro, to Nissan Motor Co , Ltd Apparatus for mounting exhaust gas sensor 4,033,170, Cl 73-23 000
- Kawasaki Heavy Industries, Ltd *See—*
  - Takagi, Izumi, and Asazuma, Masayuki, 4,033,195, Cl 74 230 17M
- Kawecki Berylco Industries, Inc *See—*
  - Mockrin, Isadore, and Hobin, Martin A , 4,033,838, Cl 204-103 000
- Kear, Bernard H *See—*
  - Giamei, Anthony F , and Kear, Bernard H , 4,033,792, Cl 148-32 000
- Kedem, Abraham *See—*
  - Kedem, Ora, and Kedem, Abraham, 4,033,850, Cl 204-301 000
- Kedem, Ora, and Kedem, Abraham, to Yeda Research & Development Co Ltd Electrodialysis device 4,033,850, Cl 204-301 000

Keedwell, Cyril A., to Pall Corporation. Proportioning valve for volumetric proportioning of flow. 4,033,371, Cl. 137-100.000

Keil, Jurgen. *See*—

Gruber, Werner, Galinke, Joachim, and Keil, Jurgen, 4,034,145, Cl. 526-328.000.

Keller, Russell D., to Temco Metal Products Company, Inc. Safety connector for pressure tank. 4,033,369, Cl. 137-68.00R

Kelley, Russell D., to Mead Corporation, The. Production of a color developing record sheet containing metal-modified novolak resin particles. 4,034,128, Cl. 427-150.000

Kelly, Robert C., and Nelson, Norman A., to Upjohn Company, The. Analogs of thromboxane B_2 and processes for their synthesis. 4,033,949, Cl. 260-240.00R.

Kelsall, Frederick A., to Rexnord Inc. Self-counterweighted take-up. 4,033,451, Cl. 198-815.000.

Kemmerling, Robert A.. *See*—

Stone, Leonard R.; Aron, Steven J., Jr., and Kemmerling, Robert A., 4,033,885, Cl. 250-496.000.

Kemper, David C., to Burdette Company, The. Buss barr. 4,033,657, Cl. 339-19.000

Kemper, James M., to Monogram Industries, Inc. System and method for treating human waste. 4,032,995, Cl. 4-10.000

Kendale Industries, Inc.. *See*—

Miller, Donald A., and Setele, William O., 4,033,643, Cl. 308-187.200

Kennecott Copper Corporation. *See*—

Gerlach, John N., 4,033,765, Cl. 75-108.000

Harvey, Walter W., Randlett, Myron R., and Bangerskis, Karlis I., 4,033,839, Cl. 204-108.000

Little, Alma M., and Ralston, Harry R., 4,033,269, Cl. 110-160.000

Kentfield, John A. C., to Canadian Patents and Development Limited. Thrust augmenting fluid rectifier for a pulsed combustor. 4,033,120, Cl. 60-249.000

Kerb, Ulrich. *See*—

Nickolson, Robert C., Kerb, Ulrich, and Wiechert, Rudolf, 4,033,995, Cl. 260-468.500

Kern, Margaret Jean, to Raymond Lee Organization, Inc., The, a part interest. Sleeping bag. 4,033,001, Cl. 5-343.000

Kettering Toys, Inc. *See*—

Marks, Steven L., 4,033,223, Cl. 85-83.000

Keystone Industries, Inc. *See*—

Sheesley, Jay R., 4,033,616, Cl. 292-216.000

Kibby, Robert Milton, to Reynolds Metals Company. Carbothermic reduction process. 4,033,757, Cl. 75-10.00R

Kikuchi, Masaru. *See*—

Takahashi, Toshiro, Nagano, Toshihiro, Nakamura, Katsuhiko, Kikuchi, Masaru, and Suzuki, Kazuo, 4,033,024, Cl. 29-403.000.

Kilbourn, Edward E., and Weiler, Ernest D., to Rohm and Haas Company. 3-Pyridylmethyl-(N-substituted phenyl)-carbamate derivatives. 4,033,972, Cl. 260-294.80D

Kilguss, Heinz. *See*—

Bethmann, Heinz G., Kilguss, Heinz, and Simon, Horst, 4,034,391, Cl. 354-289.000

Kim, Chung Kyu, to Raytheon Company. Method for making avalanche semiconductor amplifier. 4,033,810, Cl. 156-656.000

Kim, Raymond W. H., to Bell & Howell Company. Forward-reverse multi speed film transport mechanism. 4,033,681, Cl. 352-173.000

Kindell, Jerry L., to Honeywell Information Systems, Inc. Multiple generating register. 4,034,198, Cl. 235-164.000.

King, Herbert Ray, to Milliken Research Corporation. Circular knitting machine with pivotally mounted access platform. 4,033,147, Cl. 66-8.000

King, Hewson Nicholas Graham, Mansell, John Revere, and Stubberfield, Pamela May, to U.S. Philips Corporation. Color tube having concentric phosphor ring pattern and electron multiplier channel plate. 4,034,254, Cl. 313-400.000

King, Joseph H. Arch axle sulky. 4,033,598, Cl. 280-63.000

King, Leslie George, Lee, Glyn Evan, Martin, George Christopher James, and Jenkins, David Conwil, to May and Baker Limited. Substituted (alkoxycarbonylthioureido)-(acylamino)-benzene derivatives. 4,034,107, Cl. 424-309.000

King, Thomas M. *See*—

Mitchell, Robert S., and King, Thomas M., 4,033,896, Cl. 252-389.00A.

Kiovsky, Thomas E., to Shell Oil Company. Dispersant VI improver. 4,033,888, Cl. 252-56.00D

Kiovsky, Thomas E., to Shell Oil Company. Terpolymer dispersant - VI improver. 4,033,889, Cl. 252-56.00D

Kirino, Osamu. *See*—

Hashimoto, Shunichi, and Kirino, Osamu, 4,033,752, Cl. 71-93.000.

Kirk, Norbert A. Body motion bicycle seat brake. 4,033,433, Cl. 188-25.000

Kirkel, David L., to Seaquist Valve Company. Anti-foaming assembly and method. 4,033,486, Cl. 222-190.000

Kirrish, Hail, and Provenzano, Albert J., to Textron, Inc. Container fastener system. 4,033,243, Cl. 85-4.000.

Kiselev, Jury Yakovlevich, Merkher, Alexandr Mikhailovich, and Sokolovsky, Stanislav Antonovich. Plasmatron. 4,034,250, Cl. 313-32.000.

Kishi, Hajimu, and Onoda, Fumio, to Oki Electric Industry Company, Ltd. Numerical control system having a symmetrical path generation means. 4,034,192, Cl. 235-151.110

Kitamura, Shin-ichi. *See*—

Hamano, Sachiyuki, Kanazawa, Tamotsu, and Kitamura, Shin-ichi, 4,034,010, Cl. 260-564.00R

Kittle, Paul A., to Rohm and Haas Company. Method for forming an inorganic thermal radiation control. 4,034,129, Cl. 427-163.000

Klauck, David E., to Heath Company. Speaker protection circuit. 4,034,268, Cl. 361-111.000

Klaus, Harald. *See*—

Kramer, Friedhelm, Wolfertz, Gunter, Klaus, Harald, Stanik, Raimund, Appelt, Horst Gustav, and Ramspott, Walter, 4,033,012, Cl. 24-90.00D

Klee, David J., and Godtfring, Jack H., to Air Products and Chemicals, Inc. Refrigeration system for shipping container. 4,033,140, Cl. 62-223.000.

Kleimann, Helmut, and von Bonin, Wulf, to Bayer Aktiengesellschaft. Process for molding polyurethane foams. 4,033,912, Cl. 260-2.5AH

Klein, Schanzlin & Becker Aktiengesellschaft. *See*—

Klepp, Christian, Koll, Gunter, and Matthias, Heinz Bernd, 4,033,877, Cl. 210-304.000

Kleist, Robert A., and Matula, Jerry, to Printronix, Inc. Print hammer actuator for dot matrix printers. 4,033,255, Cl. 101-93.040.

Klekar, Virginia M. End fitting for cargo bar. 4,033,268, Cl. 105-497.000

Klemm, Kurt, and Langenscheid, Erhard, to Byk Gulden Lomberg Chemische Fabrik GmbH. 4(1H)-pyrimidinones. 4,034,093, Cl. 424-251.000

Klenco Corporation. *See*—

Dugle, Thomas E., and Webb, Thomas L., 4,033,285, Cl. 118-4.000

Klenk, Ludwig. *See*—

Strutzel, Hans, Gneuss, Detlef, and Klenk, Ludwig, 4,034,055, Cl. 264-95.000

Klepak, Philip B., Richardson, David I., and Fourman, Robert G., to Johnson & Johnson. Flavored dental articles. 4,033,365, Cl. 132-89.000

Klepp, Christian, Koll, Gunter, and Matthias, Heinz Bernd, to Klein, Schanzlin & Becker Aktiengesellschaft. Cyclone for removing solid impurities from liquid in a pump and motor unit. 4,033,877, Cl. 210-304.000.

Klett, Stanley D. *See*—

Charland, Terrence D., and Klett, Stanley D., 4,033,294, Cl. 118-658.000

Klingenberg, Gordon U., to Xerox Corporation. Apparatus for developing latent electrostatic images. 4,033,292, Cl. 118-629.000.

Klippan GmbH Hamburg. *See*—

Uwe, Peters, and Minolla, Horst, 4,033,015, Cl. 24-230.0AL

Klock, Byron V. *See*—

Bennett, Richard H., Klock, Byron V., and Brockington, James W., 4,033,899, Cl. 252-420.000

Klockner-Humboldt-Deutz Aktiengesellschaft. *See*—

Howe, Hans-Ulrich, 4,033,312, Cl. 123-196.00R

Jakobs, Willy, and Kryczun, Alfred, 4,033,563, Cl. 266-204.000

Knapp, Ronald F. *See*—

Ambrose, Peter C., Jr., and Knapp, Ronald F., 4,033,501, Cl. 228-2.000

Knox, Robert M., and Toulios, Peter P., to Epsilon Lambda Electronics Corporation. Ferrite circulators and isolators and circuits incorporating the same. 4,034,377, Cl. 343-180.000.

Kobayashi, Hitoshi, and Tatemoto, Jirou. Hydroponic cultivation apparatus. 4,033,072, Cl. 47-62.000

Kobayashi, Toru. *See*—

Morita, Eiichi, Toda, Akira, Kobayashi, Toru, and Fujii, Hiroshi, 4,033,206, Cl. 82-2.00B.

Kobayashi, Toshihiko, Kanbayashi, Tetsusaburo; Ichioka, Satoshi, Takeuchi, Shinjiro, and Matsushima, Yukinori, to Kokusai Denshin Denwa Kabushiki Kaisha, and Mishima Kosan Co., Ltd. Method of continuously soldering small elements arranged generally in a line by a concentrated radiant energy source. 4,034,180, Cl. 219-85.0BM

Koberstein, Edgar, and Lakatos, Eduard, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Exhaust gas purifying catalyst and process of making and using same. 4,034,060, Cl. 423-213.500

Koch, Robert. *See*—

Almqvist, Sven-Olof, Enzell, Curt R., Hjern, Lasse O., Artho, Antoine, and Koch, Robert, 4,033,362, Cl. 131-264.000

Kodaira, Mitsuharu, to Kabushiki Kaisha Suwa Seikosha. Electronic pulse generating circuit for eliminating spike pulses. 4,034,303, Cl. 328-62.000

Kogge, Hans-Jurgen. *See*—

Sorgatz, Ulrich, and Kogge, Hans-Jurgen, 4,033,642, Cl. 308-26.000

Kohler, Arthur. Multiple passage plastic injection nozzle with heaters. 4,033,485, Cl. 222-146.0HE

Kokusai Denshin Denwa Kabushiki Kaisha. *See*—

Kobayashi, Toshihiko, Kanbayashi, Tetsusaburo, Ichioka, Satoshi, Takeuchi, Shinjiro, and Matsushima, Yukinori, 4,034,180, Cl. 219-85.0BM

Nakagome, Yukio, and Fukata, Yasuo, 4,034,404, Cl. 358-142.000

Koll, Gunter. *See*—

Klepp, Christian, Koll, Gunter, and Matthias, Heinz Bernd, 4,033,877, Cl. 210-304.000

Komeda, Hiromu. *See*—

Funakoshi, Yoshiro, Matsumura, Yoshihiko, Yamamoto, Masaki, and Komeda, Hiromu, 4,034,126, Cl. 427-8.000

Kondo, Yutaka. *See*—

Shingu, Iichi, Kondo, Yutaka, and Nishina, Shuho, 4,033,610, Cl. 280-737.000

Koninklijke Textielfabrieken. *See*—

Jansen, Josephus Johannes Maria, 4,033,151, Cl. 66-147.000

Konitz, William A. *See*—

Kuczkowski, John S., and Konitz, William A., 4,034,097, Cl. 424-263.000

Konort, Mark D.. *See*—

Lamberti, Vincent, and Konort, Mark D., 4,034,046, Cl. 260-607.00B

Koppenheffer, Gary Jay, and Rose, William Henry, to AMP Incorporated. Rotary switch housing having integral flexible detenting walls and rotor mounting structure. 4,034,178, Cl. 200-293.000

Kopytov, Alexandr Maximovich. *See*—

Tayakin, Jury Vasilievich, Sidorenko, Vladimir Pavlovich, Sirota, Alexandr Yakovlevich, Prokofiev, Jury Vladimirovich, and Kopytov, Alexandr Maximovich, 4,034,238, Cl. 307-221.00C

Kori, Seiji. *See*—

Hayashi, Masaki, Kori, Seiji, Miyake, Hajimu, Yamato, Takashi, and Suga, Hisashi, 4,034,003, Cl. 260-514.00D

Korst, James J.. *See*—

Cronin, Timothy H., Faubl, Hermann, Hoffman, William W., and Korst, James J., 4,034,040, Cl. 260-570.900.

Koshiga, Fusao, Tanaka, Jinkichi, and Watanabe, Itaru, to Nippon Kokan Kabushiki Kaisha. Method of multiple electrode gas shielded arc welding. 4,034,179, Cl. 219-74.000

Kotera, Hiroaki. *See*—

Tsuchiya, Hiroyoshi, Tsuda, Yukifumi, Hayami, Heijiro, and Kotera, Hiroaki, 4,034,406, Cl. 358-260.000

Kotezawa, Katsutaka, Onodera, Toshimi, Hayashi, Setsuo, and Shimanuki, Fujio, to Chiba Communications Industries, Inc. Radio communication system for simultaneous telecommunication between radio stations. 4,034,295, Cl. 325-39.000

Koto Denki Kabushiki Kaisha. *See*—

Watanabe, Akira, and Harada, Saburo, 4,033,017, Cl. 29-25.350

Kovacs, Bela V.: *See*—

Cole, Gerald S.; Kovacs, Bela V., Sensoli, Robert A., and Smartt, Herschel B., 4,033,766, Cl. 75-123.0CB

Kowalski, Gunter, to U.S. Philips Corporation. Device for measuring radiation absorption. 4,034,223, Cl. 250-369.000.

Koyo Seiko Company, Limited. *See*—

Yamada, Tomio, 4,033,645, Cl. 308-207.00A.

Kozuki, Susumu: *See*—

Iwashita, Tomonori, and Kozuki, Susumu, 4,034,388, Cl. 354-173.000.

Ohtaki, Shohei, Kozuki, Susumu; and Nakamura, Zenzo, 4,034,387, Cl. 354-126.000.

Kraemer, Edward Joseph; and Patel, Tulsidas Ramlal, to International Business Machines Corporation. Magnetic disk information storage apparatus. 4,034,411, Cl. 360-98.000.

Kramer, Friedhelm, Wolfertz, Gunter, Klaus, Harald, Stanik, Raimund, Appelt, Horst Gustav; and Ramspott, Walter, to Schaeffer-Homberg GmbH. Button, particularly for clothing pieces. 4,033,012, Cl. 24-90.00D

Krawczak, John A.. *See*—

Torok, Ernest J., Kaske, Alan D., Krawczak, John A., and Paul, Maynard C., 4,034,359, Cl. 340-174.0TF.

Krebs, Jacob, to Shatterproof Glass Corporation. Windowed oven doors. 4,033,321, Cl. 126-198.000

Krefting, Sherman. *See*—

Baron, Joseph J., Jr., and Krefting, Sherman, 4,033,922, Cl. 260-29.6RW

Krekel, Jorg: *See*—

Priemer, Joachim, Schenk, Norbert, Krekel, Jorg, and Schwerdtel, Wulf, 4,033,987, Cl. 260-346.400.

Krenzer, John, to Velsicol Chemical Corporation. 1-Thiadiazolyl-5-pyridylcarbonyloxyimidazolidinones. 4,033,753, Cl. 71-94.000

Kreuz, Alois, and Hahn, Joachim, to VDO Adolf Schindling AG. Indicating instrument and casing. 4,033,191, Cl. 73-431.000

Krikorian, Esther; and Sneed, Richard J., to General Dynamics Corporation. Simple method of preparing structurally high quality PbSnTe films. 4,033,843, Cl. 204-192.00P

Kroger, Uwe, Jaki, Friedrich, Brammer, Hartmut G., Ehrmann, Karl, Magdefrau, Herbert, Brand, Gunter, Kalippke, Harald, and Rink, Rolf, to Robert Bosch GmbH. Ignition distributor construction for internal combustion engines. 4,033,315, Cl. 123-146.50A

Krol, Johannes Wilhelmus Antonius. *See*—

Lersmacher, Bernhard, Seifert, Horst, and Krol, Johannes Wilhelmus Antonius, 4,034,031, Cl. 264-25.000

Kromer, Heiner M., and Ossman, John, to Haake, Inc. Method of recovery of material test samples. 4,033,557, Cl. 259-192.000

Kroyer, Karl Kristian Kobs, to Karl Kroyer St. Anne's Limited. Molding apparatus for ribbed product. 4,033,709, Cl. 425-224.000

Krueger, Bruno O., to Borden, Inc. Removal of oxygen from gas stream with copper catalyst. 4,034,062, Cl. 423-219.000

Kruger, Bradford E., to International Telephone and Telegraph Corporation. Sequential lobing track-while-scan radar. 4,034,374, Cl. 343-16.00R

Kruklitis, Karlis, to Burroughs Corporation. Magnetic character recognition system employing a dynamic threshold voltage determination system. 4,034,342, Cl. 340-146.3AG

Kruppa, Robert W. *See*—

Love, Robert D., Cullen, James W., and Kruppa, Robert W., 4,034,243, Cl. 307-304.000.

Krusche, Erwin. *See*—

Bauer, Wolfgang, Krusche, Erwin, and Ribka, Joachim, 4,033,945, Cl. 260-157.000

Kryczun, Alfred. *See*—

Jakobs, Willy, and Kryczun, Alfred, 4,033,563, Cl. 266-204.000.

Kuboto Tekko Kabushiki Kaisha. *See*—

Shikiya, Hajime, Nakanishi, Seiichi; Yoshida, Zitsuo, and Hirakawa, Kenkichi, 4,033,197, Cl. 74-331.000.

Kuczkowski, John S., and Konitz, William A., to Mortell Company. Synergistic biostatic composition. 4,034,097, Cl. 424-263.000.

Kuehl, John. Humane animal trap. 4,033,067, Cl. 43-90.000.

Kugelfischer Georg Schafer & Co.. *See*—

Lang, Franz, and Dees, Erwin, 4,033,646, Cl. 308-218.000.

Kumazawa, Ryozi. *See*—

Mitsui, Hisayasu; Kamiuchi, Jun-ichi, Kumazawa, Ryozi, Umemoto, Kimikazu, Yamada, Toshimitsu, Yoshida, Katsuhiko, and Takechi, Taichi, 4,033,805, Cl. 156-185.000

Kunioka, Kazuo, Kurihara, Kiwami, Sakasegawa, Koji, Ohsumi, Atushi, Watanabe, Akio, and Sakai, Kenichi, to Nippon Kokan Kabushiki Kaisha. Method of cooling a steel material without deformation. 4,033,737, Cl. 62-64.000

Kunz, Raymond W. *See*—

Walter, Henry J., and Kunz, Raymond W., 4,034,201, Cl. 219-222.000.

Kuo, Han C., Dotson, Ronald L., and Woodard, Kenneth E., Jr., to Olin Corporation. Plated metallic cathode. 4,033,837, Cl. 204-98.000

Kurakami, Shigeru. *See*—

Harazoe, Yoshiaki, Kurakami, Shigeru, Okamoto, Michio, and Hasegawa, Ichiro, 4,034,335, Cl. 340-52.00F.

Kuramochi, Kojiro, and Taga, Yutaka, to Toyota Jidosha Kogyo Kabushiki Kaisha. Governor supporting member and coupling means. 4,033,146, Cl. 64-23.000

Kuraray Co., Ltd. *See*—

Shimizu, Akira, Kusano, Manabu, and Takami, Takeshi, 4,033,933, Cl. 260-45.85R.

Kurihara, Kiwami. *See*—

Kunioka, Kazuo, Kurihara, Kiwami, Sakasegawa, Koji, Ohsumi, Atushi, Watanabe, Akio, and Sakai, Kenichi, 4,033,737, Cl. 62-64.000.

Kurland, Heinrich. *See*—

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Kuroda, Masahiro. *See*—

Kamo, Hisao, Kuroda, Masahiro, and Okano, Susumu, 4,034,394, Cl. 357-15.000

Kurono, Hitoshi. *See*—

Taninaka, Kuniaki, Kurono, Hitoshi, and Kasai, Tsutomu, 4,034,102, Cl. 424-277.000

Kurtz, Abraham Nathan, Thorsteinson, Erlind Magnus; and Decker, Harry Joe, to Union Carbide Corporation. Process for preparing unsaturated acids and aldehydes. 4,034,008, Cl. 260-533.00N

Kusano, Manabu. *See*—

Shimizu, Akira, Kusano, Manabu, and Takami, Takeshi, 4,033,933, Cl. 260-45.85R

Kushner, Benjamin. *See*—

Jureit, John Calvin, Leutwyler, Roy, Brodsky, Larry, Kushner, Benjamin, and Castillo, Adolfo, 4,033,025, Cl. 29-417.000.

Kushner, Jack, and Zwirblis, Henry G., to Delta Scientific Corporation. Conical liquid metering device. 4,033,482, Cl. 222-136.000.

Kustes, Eduard. *See*—

Ahrweiler, Karl-Heinz, and Leifeld, Ferdinand, 4,033,153, Cl. 68-205.00R

Kuzarov, Encho Janaki, to Warn Industries, Inc. Winch and method of assembling the same. 4,033,552, Cl. 254-166.000.

La Cellophane. *See*—

Godard, Bernard, and Gomitoli, Roger, 4,033,577, Cl. 271-128.000.

Labadie, Jean Francois. *See*—

Thary, Christian, Bernard, Armand R., Labadie, Jean Francois, and De La Taille, Olivier P., 4,033,623, Cl. 297-390.000

Labat, Pierre, to Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques (SAVIEM). Synchronizer with rocking key disengagement. 4,033,437, Cl. 192-53.00F

Labofina S.A. *See*—

De Roocker, Alain J. G., 4,033,887, Cl. 252-49.800

Laboratoire Belge de l'Industrie Electrique (LABORELEC). *See*—

Lecat, Albert Pierre Marie, 4,034,154, Cl. 174-127.000.

Laboratoire Roger Bellow. *See*—

Pesson, Marcel, 4,034,094, Cl. 424-251.000

Labyer, Harold S., and Dodson, James C., to Halliburton Company. Clamp — self aligning. 4,033,701, Cl. 403-13.000

LaCourte, Robert, to Lawrence Peska Associates, Inc., a part interest. Cuticle instrument. 4,033,363, Cl. 132-73.500

Ladin, Eli M., to Federal-Mogul Corporation. Self-aligning clutch bearing assembly. 4,033,440, Cl. 192-98.000

Laithwaite, Eric Roberts, to Vandervell Products Limited. Methods of manufacturing laminated metal strip bearing materials. 4,033,398, Cl. 164-49.000

Lakatos, Eduard. *See*—

Koberstein, Edgar, and Lakatos, Eduard, 4,034,060, Cl. 423-213.500

Lake, Norman M. Nasal protective splint. 4,033,342, Cl. 128-140.00N

Lamb, Gerald P. Terrarium planting implement. 4,033,618, Cl. 294-19.00R

Lamberti, Vincent, and Konort, Mark D., to Lever Brothers Company. Hydroxyaryldialkyl sulfonium halides. 4,034,046, Cl. 260-607.00B

Lampe, Donald R., White, Marvin H., and Mims, James H., to Westinghouse Electric Corporation. Programmable analog transversal filter 4,034,199, Cl 235-193.000

Lance, Richard T., and Papafingos, Pandelis N., to Alumax Mill Products, Inc. Aluminum dross recovery method 4,033,760, Cl. 75-68.00R

Lance, Russell C., Jr *See—*
Barnard, Alfred J., Jr., and Lance, Russell C., Jr., 4,033,897, Cl 252-408.000

Landis Tool Company *See—*
Price, Ralph E., 4,033,076, Cl 51-105.00R

Lane, Constance A., to Rohm and Haas Company Impact and melt strength improvement of poly(alkylene terephthalate) 4,034,013, Cl. 260-835.000

Lang, Donald D., to Spectra-Strip Corporation Twisted pair multiconductor ribbon cable with intermittent straight sections 4,034,148, Cl. 174-34.000

Lang, Franz, and Dees, Erwin, to Kugelfischer Georg Schafer & Co Roller bearing with rotatable guide cage 4,033,646, Cl 308-218.000

Lange, K Robert *See—*
Jacques, Donald F., and Lange, K Robert, 4,033,867, Cl 210-28.000

Lange, Ronald Albert *See—*
United States of America, National Aeronautics and Space Administration, Flattau, Theodore, Lange, Ronald Albert, Mellars, John Walter, Peyton, Bernard Joseph, and Wolczok, John Martin, 4,033,882, Cl 250-199.000

Langenberger, Peter *See—*
Fromel, Gerhard, and Langenberger, Peter, 4,033,507, Cl 239-102.000

Langenscheid, Erhard *See—*
Klemm, Kurt, and Langenscheid, Erhard, 4,034,093, Cl. 424-251.000

Lanier, Gerald N *See—*
Silverstein, Robert M., Gore, William E., Pearce, Glenn T., Cuthbert, Roy A., Simeone, John B., Lanier, Gerald N.; and Peacock, John W., 4,034,080, Cl 424-84.000

Laporte Industries Limited *See—*
Colegate, Terence Dudley, Farnworth, Christopher Robert, and Davis, Eric Joseph, 4,033,764, Cl 423-24.000

Lardon, Marcel A *See—*
Williams, David J., Lardon, Marcel A., Abkowitz, Martin A., and Pfister, Gustav, 4,033,769, Cl 96-1.500

La Rosa, John, to International Paper Company Tracheostomy tube 4,033,353, Cl 128-351.000

Larsen, Otis M., Larsen, Richard D., Tjernagel, Gerald P., and Marine, Steven L. Anaerobic system container 4,033,826, Cl 195-139.000

Larsen, Richard D. *See—*
Larsen, Otis M., Larsen, Richard D., Tjernagel, Gerald P., and Marine, Steven L., 4,033,826, Cl 195-139.000

Larson, Dallas J Rotary internal combustion engine 4,033,300, Cl 123-8.450

Larson, Willis August, to Magic Dot, Inc Membrane switch apparatus. 4,034,176, Cl 200-159.00B

Laughon, Thomas Cecil *See—*
Chester, Nelson Sherwood, Laughon, Thomas Cecil, and Sindelar, William Frank, 4,033,077, Cl 51-170.00T

LaVenture, Orville W., to Burroughs Corporation System for synchronizing and phase shifting switching regulators 4,034,232, Cl 307-32.000

Law, Harold Bell, to RCA Corporation Apparatus for forming a color television picture tube screen 4,034,382, Cl 354-1.000.

Lawrence Peska Associates, Inc *See—*
LaCourte, Robert, 4,033,363, Cl 132-73.500

Lawrence, Simone P Picture frame construction 4,033,060, Cl. 40-152.100

Lawrence, Victor Bernard, and Mina, Kent Vincent, to Bell Telephone Laboratories, Incorporated Digital filter circuit 4,034,197, Cl 235-156.000

Lawson, Leslie Edward, to Vickers Limited Desensitizing compositions for lithographic platemaking and printing which are aqueous solutions of copolymers of acrylamide with a carboxyl containing monomer and a desensitizing acidic additive 4,033,919, Cl 260-29.6TA

Lawson, Michael B., and Snyder, Kenneth J., to Halliburton Company Method for dissolving asphaltic material 4,033,784, Cl 134-20.000.

Lazarecky, Vincent. Snow remover 4,033,055, Cl 37-16.000

Lazio, Thomas Joseph *See—*
Ray, James Allen, and Lazio, Thomas Joseph, 4,033,782, Cl 106-104.000

Lebema Eledtriska Aktiebolag *See—*
Jaffe, Walther, 4,033,057, Cl 40-21.00R

Lecat, Albert Pierre Marie, to Laboratoire Belge de l'Industrie Electrique (LABORELEC) Device for reducing the radio and audible noise caused by corona on high voltage electrical installations 4,034,154, Cl 174-127.000.

Lee, Glyn Evan *See—*
King, Leslie George, Lee, Glyn Evan, Martin, George Christopher James, and Jenkins, David Conwil, 4,034,107, Cl 424-309.000.

Leeds and Micallef. *See—*
Micallef, Lewis A., 4,033,487, Cl 222-207.000

Leenhouts, Albert C., to Superior Electric Company, The Pulse to step error sensing circuit. 4,034,277, Cl. 318-685.000

le Gressus, Claude, Massignon, Daniel, and Sopizet, Rene, to Commissariat a l'Energie Atomique Process and apparatus for the elementary and chemical analysis of a sample by spectrum analysis of the energy of the secondary electrons 4,034,220, Cl 250-310.000

Leiber, Heinz, to Teldix GmbH Anti-lock regulating system 4,033,637, Cl 303-115.000

Leifeld, Ferdinand *See—*
Ahrweiler, Karl-Heinz, and Leifeld, Ferdinand, 4,033,153, Cl 68-205.00R

Lein, Werner, Reichenberger, Kurt, and Schanze, Klaus, to VEB Polygraph Leipzig Kombinat fur Polygraphische Maschinen und Ausrustungen Control system for multi-color rotary printing machines, especially for alternate one-side and two-side printing. 4,033,260, Cl. 101-232.000

Leitner, Lionel J Inflatable solar collector for swimming pool 4,033,326, Cl 126-271.000

Leland Stanford Junior University, The Board of Trustees of *See—*
Miles, Laughton E. M., 4,034,074, Cl. 424-1.000

Lendt, Hans-Jurgen *See—*
Muller, Kurt, Lendt, Hans-Jurgen, and Rimmrott, Manfred, 4,034,264, Cl 361-2.000.

Lengnick, Guenther Fritz, to SWS Silicones Corporation Cobalt-platinum catalyst 4,033,902, Cl 252-441.000

Leonard, John P., and Yates, Robert E., to United States of America, Army Feedback PDM encoder and method for actuating a pneumatic actuator with a digital autopilot 4,033,525, Cl 244-3.150

Lerner, Lewis Brian, and Davis, Thomas Francis, to AMP Incorporated Tin-nickel plating bath 4,033,835, Cl. 204-43.00S

Lerouge, Bernard *See—*
Bregeon, Louis, Dupuy, Gerard, Lerouge, Bernard, and Schwartz, Jean-Pierre, 4,033,814, Cl. 176-63.000

Lersmacher, Bernhard, Seifert, Horst, and Krol, Johannes Wilhelmus Antonius, to U S Philips Corporation Method of manufacturing grid electrodes for electron tubes 4,034,031, Cl. 264-25.000.

Less, Henry R Weatherproofing device for cameras 4,033,392, Cl 150-52.00J

Lessmann, Gerald G *See—*
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Leung, Steve Ka-Lai. *See—*
Denny, William Michael, Hagen, Russell Louis; and Leung, Steve Ka-Lai, 4,034,353, Cl 364-200.000.

Leutwyler, Roy *See—*
Jureit, John Calvin; Leutwyler, Roy; Brodsky, Larry, Kushner, Benjamin, and Castillo, Adolfo, 4,033,025, Cl. 29-417.000.

Lev, Yaacov; and Pritchard, Frederick R., to Shell Internationale Research Maatschappij B V. Device for detecting a failure in an insulation system. 4,034,286, Cl 324-71.00R

Levenson, Michael K *See—*
Scott, Garland E., Jr; and Levenson, Michael K., 4,033,743, Cl. 65-30.00R

Lever Brothers Company: *See—*
Coulson, James, and Nearn, Malcolm Richard, 4,034,076, Cl. 424-49.000.
Lamberti, Vincent; and Konort, Mark D., 4,034,046, Cl. 260-607.00B
van Dam, Antonius Franciscus, 4,034,124, Cl 426-602.000.

Levine, Fred Mounting assembly with selectively used one-piece or two-piece brackets 4,033,531, Cl. 248-16.000.

Levinson, Leo, to Xerox Corporation. Pin wheel feeding device. 4,033,493, Cl 226-81.000

Levinstein, Hyman Joseph *See—*
Alexander, Frank Bernard, Jr., Capio, Cesar Deduyo, Hauser, Victor Emerald, Jr., Levinstein, Hyman Joseph, Mogab, Cyril Joseph, Sinha, Ashok Kumar, and Wagner, Richard Siegfried, 4,033,287, Cl 118-49.10R

Levy, Harold Adjustable drip dry support apparatus. 4,033,538, Cl 248-214.000

Levy, Sidney. Method and apparatus for magnetically recording graphic information 4,034,409, Cl. 358-301.000.

Lewis, James Marvin; and Newyear, Raymond Willis, to Horizons Incorporated, a division of Horizons Research Incorporated. Radiation produced colored photopolymer systems. 4,033,773, Cl. 96-115.00P

Ley, Kurt. *See—*
Seng, Florin, and Ley, Kurt, 4,033,960, Cl 260-250.0QN.

Leybold-Heraeus GmbH & Co. *See—*
Sommerkamp, Peter; and Heil, Walter, 4,034,256, Cl 313-440.000.

Leyde, Warren L., to Pacific Technology Power monitoring and regulating circuit and method having an analog input representing power rate and a digital output for controlling the on/off states of a plurality of loads 4,034,233, Cl 307-41.000

Licentia Patent-Verwaltungs-G m b H.. *See—*
Meichsner, Othmar, and Queiser, Horst, 4,033,868, Cl 210-38.00C
Streckenbach, Wulf-Christian, 4,034,300, Cl. 325-390.000
Unrau, Udo, 4,034,315, Cl 333-10.000.
Wermuth, Jurgen, Dickopp, Gerhard, and Schroder, Ernst, 4,034,308, Cl 330-86.000

Lind, Hanns, Rody, Jean, and Brunnetti, Heimo, to Ciba-Geigy Corporation. Process for the manufacture of alkali salts of 3,5-disubstituted 4-hydroxybenzoic acids and their free acids. 4,034,006, Cl 260-521.00C

Lindahl, Robert F., and Morgan, Donald F., to Masco Corporation of Indiana Adjustable hitch ball mount for a trailer hitch 4,033,601, Cl 280-490.00R

Lindberg, Russell A *See—*
United States of America, National Aeronautics and Space Administration, Arcella, Frank G., Lessmann, Gerald G., and Lindberg, Russell A., 4,033,504, Cl 228-190.000.

Lindblad, Oskar Lennart Deflection device for safety belts for vehicles provided with band collecting means 4,033,594, Cl 297-389.000

Lindeman, Myrl A *See—*
Hansel, William B., and Lindeman, Myrl A., 4,033,389, Cl 141-207.000

Linden, Gaylord C. Method of stringing rackets. 4,033,582, Cl 273-73.00D

Lindenschmidt, Robert E., to Whirlpool Corporation Method of making refrigeration apparatus enclosure structure. 4,033,806, Cl 156-211.000

Lindstrom, Jon M., to Salk Institute for Biological Studies, The. Assay for myasthenia gravis. 4,033,722, Cl 23-230.300

Lindstrom, Ralph E. Tool for pulling underground service wire up a conduit 4,033,551, Cl. 254-134.30R

Linear Technology Inc *See—*
Barber, Herbert Douglas, and Salter, Gary Curtis, 4,034,306, Cl 330-30.00D.

Lipfert, Donald Ernest, to Deres Development Corporation Cushioning material construction 4,033,567, Cl 267-151.000

List, Harold A., Baker, Jack H., and Joyce, Jack, to Bethlehem Steel Corporation Horizontal- and vertical-roll force measuring system 4,033,183, Cl. 73-88.50R.

Lista Og Mosjoen Aluminiumverk, Elkem Aluminum A/S & Co *See—*
Engesland, Arne, 4,033,846, Cl 204-247.000

Little, Alma M.; and Ralston, Harry R., to Kennecott Copper Corporation Method and apparatus for controlling gas flow 4,033,269, Cl. 110-160.000.

Liu, Chao-Min, Palleroni, Norberto, Hermann, Theron, and Prosser, Barbara, to Hoffmann-La Roche Inc. Process to produce lysocellin. 4,033,823, Cl. 195-80.00R.

Liu, Hsing-Ching. Educational toy. 4,033,051, Cl. 35-9.00R

Liu, Robert C.. *See—*
Hughes, John L., Seyler, Jay K., and Liu, Robert C., 4,033,940, Cl. 260-112.50S

Livigni, Russell Anthony: *See—*
Hargis, Ivan Glen; Livigni, Russell Anthony, and Aggarwal, Sundar Lal, 4,033,900, Cl 252-431.00L.

Loest, Kent W.; and Schaefer, John T., to Southwire Company, National Steel Corporation, and Earth Sciences, Inc. Production of monobasic potassium phosphate by electrodialysis. 4,033,842, Cl. 204-180.00P

Loge, Hans. *See—*
Bareth, Erich, and Loge, Hans, 4,033,040, Cl 32-27.000

Logemann Brothers Company: *See—*
Schmalz, Roman, and Wolf, Robert J., 4,033,249, Cl 100-3.000.

Logue, Joseph C.: *See—*
Howley, Frank E., Jones, John W.; and Logue, Joseph C., 4,034,356, Cl. 340-173.00R.

Lohman, John H., and Brooke, Richard C., to Blackwell Burner Company Tar melting kettle. 4,033,328, Cl. 126-343.50A

Lohmar, Elmar. *See—*
Bollert, Ulrich, Lohmar, Elmar, and Ohorodnik, Alexander, 4,033,936, Cl. 260-75.00P

Lohn, Gerd, and Braun, Anton, to Kaltenbach & Voigt. Dental handpiece. 4,033,039, Cl. 32-26.000.

Long, E. David, to Allied Chemical Corporation Electromagnetically operated valve 4,033,513, Cl. 239-585.000.

Longi, Paolo *See—*
Bertelli, Guido; Roma, Pierpaolo, and Longi, Paolo, 4,033,915, Cl 260-28.50A.

Longworth, Alfred, to Radiation Limited Gaseous fuel burners 4,033,714, Cl 431-354.000

Lopez-Cepero, Oscar E. Fishing lure rack 4,033,648, Cl 312-100.000

Lorch, Edgar Adolf, Fletcher, Keith Ernest, and Page, David, to Radiochemical Centre Limited, The. Calibration source 4,033,884, Cl 250-496.000

Lorenz, Herbert *See—*
Eherius, Wiprecht, and Lorenz, Herbert, 4,034,034, Cl 264-39.000

Louden, Lester Richard; Blessington, Clement Auguston, and Beatty, Jerry Lon, to Dresser Industries, Inc Cleaning system for a continuous sensing oil-in-water monitor 4,034,219, Cl 250-301.000

Love, Robert D., Cullen, James W., and Kruppa, Robert W., to International Business Machines Corporation Logic array structure for depletion mode-FET load circuit technologies 4,034,243, Cl 307-304.000

Lovelace, Billy J., to Petro-Tex Chemical Corporation. Mo catalyzed chlorination of dichlorobutenes 4,034,049, Cl 260-658.00R

Loyd, James E., III *See—*
Giorgi, Robert A., and Loyd, James E., III, 4,034,297, Cl 325-166.000

Lubrizol Corporation, The *See—*
Coleman, Lester Earl, 4,033,921, Cl 260-29.60H
Miller, Leonard Edward, and Murfin, Donald Leon, 4,034,001, Cl. 260-513.00N
Vogel, Paul W., 4,034,038, Cl 260-462.00R

Lucas Electrical Company Limited: *See—*
Harrison, Norman, 4,033,834, Cl 204-15.000

Luebering, George W., to United States of America, National Aeronautics and Space Administration. Blade retainer assembly 4,033,705, Cl. 416-220.00R.

Lunde, James M., and Schwartz, John G., Jr., to Osceola Clutch & Brake Company. Chain saw coupling mechanism. 4,033,038, Cl 30-382.000

Lundh, Roy W., to Poseidom Marketing and Development Co. Extra heavy duty hydrostatic anchor together with its extra heavy duty tether cable 4,033,281, Cl 114-295.000

Luria, David Piston-type internal combustion engine 4,033,304, Cl 123-78.00A.

Lutes, Kenneth Vaughn; Desmon, Leland Golde, and Dodge, Edward Dana, to Energex Limited Cyclonic, multiple vortex type fuel burner with air/fuel ratio control system 4,033,505, Cl. 236-15.0BD

Lutts, William M., to Safetran Systems Corporation Portable rail saw 4,033,074, Cl 51-178.000

Lutz, Michael A., to Hughes Aircraft Company Gridded crossed-field tube and ignition method 4,034,260, Cl 315-344.000

Lutz, Michael A., and Harvey, Robin J., to Hughes Aircraft Company Gridded crossed-field tube 4,034,261, Cl 315-344.000

Lyman, Geroge F., to Data Packaging Corporation Picture display stand 4,033,058, Cl. 40-97.000.

Lynch, Thomas *See—*
Bierworth, David P., and Lynch, Thomas, 4,033,691, Cl 355-11.000.

M L Aviation Company Limited *See—*
Benning, Vernon A., 4,033,422, Cl 180-14.00C.
Craigie, Samuel W., 4,033,226, Cl. 89-1.50F

MacFarlane, Thomas R., and Skinner, Frank R., II, to Whirlpool Corporation Conveyor transfer apparatus pickup and dropoff sensor 4,033,448, Cl 198-465.000

Machlett Laboratories, Incorporated, The *See—*
Pellegrino, Anthony, 4,034,283, Cl 323-74.000

Mackey, Lindsay Joan *See—*
Jarrett, William Fleming Hoggan; Jarrett, James Oswald, and Mackey, Lindsay Joan, 4,034,081, Cl 424-89.000

Madden, Mark R *See—*
Jacobi, Edgar F., and Madden, Mark R., 4,033,508, Cl 239-177.000

Maeda, Yasuo *See—*
Imai, Hirozo, and Maeda, Yasuo, 4,033,034, Cl 30-43.920

Maeda, Yorishige, to Toyota Jidosha Kogyo Kabushiki Kaisha Timing belt tensioner 4,033,196, Cl 74-242.11R

Magdefrau, Herbert *See—*
Kroger, Uwe; Jaki, Friedrich, Brammer, Hartmut G.; Ehrmann, Karl, Magdefrau, Herbert, Brand, Gunter, Kalippke, Harald, and Rink, Rolf, 4,033,315, Cl 123-146.50A

Magic Dot, Inc.. *See—*
Larson, Willis August, 4,034,176, Cl 200-159.00B

Mahagan, Deroy Ernest *See—*
Fritz, David Paul, Anderson, John Dale, Pruitt, Martin Eugene, Mahagan, Deroy Ernest, and Buller, Richard James, 4,033,101, Cl 56-344.000

Maier, Bruno, to Siemens Aktiengesellschaft Apparatus and methods for differentiating between synchronous and asynchronous response signals in secondary radar devices 4,034,371, Cl 343-6.00R

Mailfert, Alain, and Renard, Michel, to Agence Nationale de Valorisation de la Recherche (ANVAR) Synchronous electrical machine having a superconductive field winding 4,034,245, Cl 310-52.000

Maioglio, Mauro, and Jacoel, Rafael, to Fiat Societa per Azioni Electronic ignition systems for an internal combustion engine 4,033,305, Cl 123-117.00D

Mair, William Norman *See—*
Bickerdike, Robert Lewis, Clark, Douglas, Eastabrook, John Norman; Hughes, Garyth, Mair, William Norman, Partridge, Peter George, and Ranson, Harry Christopher, 4,033,793, Cl 148-32.000

Maisey, Roy Frederick, to Imperial Chemical Industries Limited Morpholine derivative of a 1,4 benzothiazin-3-one 4,033,951, Cl 260-243.00R

Malcolm, George David Trailed vehicle suspensions 4,033,609, Cl 280-718.000

Malloy, Richard J *See—*
Borton, Gary L., Goff, Cobb S., and Malloy, Richard J., 4,033,771, Cl 96-60.0BF

Malueg, Richard M., to McDonnell Douglas Corporation Torque rejection soft mounted platform 4,033,541, Cl 248-358.00R

Mandlman, Mayar Richard, to Apex Glove Co., Inc Heat resistant glove having additional protective portion in gripping area 4,032,990, Cl 2-161.00R

Mandrin, Charles, to Sulzer Brothers Limited Plant and process for vaporizing and heating liquid natural gas 4,033,135, Cl 60-648.000

Manduley, Flavio M., and Dlugos, Daniel F., to Pitney Bowes, Inc General purpose digital logic monitor 4,034,287, Cl 324-73.00R

Manganaro, George Frank, to Electro-Matic Staplers, Inc Electromagnetic stapler and safety trigger therefor 4,033,500, Cl 227-131.000

Mangel, Karl. Optical control system for elevators 4,034,275, Cl 318-461.000

Mann, George, to Smiths Industries Limited Observer-identification of a target or other point of interest in a viewing field 4,034,401, Cl 358-93.000

Mannesmann Aktiengesellschaft *See—*
Frentzen, Hermann Josef, Hendrix, Gerhard, Huppertz, Manfred, Ritter, Hans Georg, and Wittek, Fritz, 4,033,568, Cl 269-26.000.

Mannesmannrohren-Werke AG. *See—*
Biller, Horst, and Huls, Friedrich, 4,033,164, Cl. 72-205.000

Manning, Harry F., to Textron, Inc Continuous molded slide fastener stringer and method and apparatus for manufacture. 4,033,014, Cl 24-205.16R.

Manoogian, Alex, and Pullen, Eric V., to Masco Corporation of Indiana. Single handle water faucet valve 4,033,373, Cl 137-454 600

Mansell, John Revere. *See*—

King, Hewson Nicholas Graham, Mansell, John Revere; and Stubberfield, Pamela May, 4,034,254, Cl 313-400.000

Manuel, Ernesto H., to Continental Group, Inc., The. Propylene polymer adhered to enamel coated metal surface. 4,034,132, Cl 428-36.000.

Manzoni, Sergio C Rotary engine 4,033,299, Cl. 123-8 430

Mapp, Calvin R Disposable syringe. 4,033,347, Cl. 128-227 000

Marathon Oil Company *See*—

Argabright, Perry A., Presley, C. Travis, and Wenger, Charles B., 4,033,937, Cl 260-77.5NC.

Marchese, Vincent P.. *See*—

Morris, Joseph W., Cram, Bryan L., and Marchese, Vincent P., 4,033,267, Cl 102-70 00R.

Marchesini, Bruno, and Martini, Fernando, to Rimar Meccanica S p A Apparatus for washing and subsequent drying of bolts of fabrics 4,033,152, Cl. 68-19.100

Marchot, Jules Albert. Structural member for load-bearing partitions or walls of buildings. 4,033,086, Cl. 52-656.000

Margerum, Donald Lee, to Northrop Corporation Velocity gate handoff system 4,034,372, Cl. 343-6.80R.

Marine Construction & Design Co. *See*—

McGrew, Jay L., 4,033,869, Cl 210-65 000

Marine, Steven L.. *See*—

Larsen, Otis M, Larsen, Richard D, Tjernagel, Gerald P, and Marine, Steven L, 4,033,826, Cl 195-139 000

Marino, Armando V, and Sora, Albert, to Zenith Radio Corporation Means for energizing a color television picture tube during manufacture. 4,034,171, Cl. 200-51 00R

Mark, Victor, to General Electric Company Flame retardant polycarbonate composition 4,033,930, Cl 260-45 90R

Markels, Michael, Jr, to World Resources Company Process for recovery of selected metal values from waste waters 4,035,763, Cl 75-97.00R.

Markert, Georg H, to Maschinefabrick Markert B V Method of and apparatus for packaging poultry specimens 4,033,088, Cl 53-29 000

Marks, Steven L., to Kettering Toys, Inc. Quick set adjustable fastener 4,033,223, Cl. 85-83 000

Marquardt, Kurt, and Buchholz, Reinhard, to Hager & Elsaesser Apparatus for the treatment of liquids 4,033,874, Cl 210-189 000

Marroquin, Emilio R., to Briles Manufacturing Head forming method 4,033,003, Cl 10-10 00R

Marshall, James F., to Honeywell Inc. Fabrication of semiconductor devices utilizing ion implantation 4,033,787, Cl 148-1.500

Marson Corporation *See*—

Di Maio, Anthony E., 4,033,480, Cl. 222-129.000

Marston, Peter G *See*—

Nolan, John J., and Marston, Peter G., 4,033,864, Cl. 209-223.00R.

Marti, Werner. *See*—

Andres, Werner, Diehl, Ernst, and Marti, Werner, 4,034,153, Cl 174-120.0SR.

Martin, Fred A Method of sweetening or mellowing onions 4,034,118, Cl. 426-431 000

Martin, George Christopher James. *See*—

King, Leslie George, Lee, Glyn Evan, Martin, George Christopher James, and Jenkins, David Conwil, 4,034,107, Cl. 424-309 000

Martin Marietta Corporation. *See*—

Ray, James Allen, and Lazio, Thomas Joseph, 4,033,782, Cl 106-104.000.

Martini, Fernando. *See*—

Marchesini, Bruno, and Martini, Fernando, 4,033,152, Cl. 68-19.100.

Martini, Thomas, to Hoechst Aktiengesellschaft Process for the manufacture of perfluoralkoxy-propionic acid fluoride. 4,033,984, Cl 260-340 600.

Martner, John G Ultrasonic gas stream liquid entrainment apparatus 4,034,025, Cl. 261-18.00A.

Maruo, Masaya. *See*—

Arikawa, Hiroo, and Maruo, Masaya, 4,034,329, Cl. 337-163 000

Masaki, Kenji, and Minami, Hidehiro, to Nissan Motor Co., Ltd Method of and system for controlling air fuel ratios of mixtures into an internal combustion engine. 4,033,122, Cl. 60-274.000.

Masaki, Kenji, and Ookubo, Yoshio, to Nissan Motor Co., Ltd Internal combustion engine exhaust gas after-burning system. 4,033,123, Cl 60-286.000.

Maschinefabriek Markert B.V.. *See*—

Markert, Georg H., 4,033,088, Cl 53-29 000.

Maschinenfabrik Augsburg-Nurnberg AG *See*—

Mayer, Karl, 4,033,016, Cl. 29-6.000.

Maschinenfabrik Rau oHG. *See*—

Rau, Willy, and Taus, Christian, 4,033,417, Cl 172-613 000

Masco Corporation of Indiana *See*—

Lindahl, Robert F.; and Morgan, Donald F., 4,033,601, Cl 280-490.00R.

Manoogian, Alex; and Pullen, Eric V, 4,033,373, Cl 137-454 600

Maserjian, Joseph: *See*—

Chern, Shy-Shiun, and Maserjian, Joseph, 4,033,286, Cl 118-49 000.

Mashimo, Yukio; Ito, Tadashi; Shinoda, Nobuhiko, Sakurada, Nobuaki, and Ito, Fumio, to Canon Kabushiki Kaisha Exposure control device 4,034,383, Cl 354-23 00D

Masiuk, Alphonse Michael *See*—

Tobey, Hubert Earl, Hood, John William, Masiuk, Alphonse Michael, Irvin, Dee Lavern, and Moller, George Otto, 4,033,254, Cl 101-44 000

Masongsong, Artemio M *See*—

Cocjin, Diosdado L., and Masongsong, Artemio M, 4,033,876, Cl 210-242 00S

Massa, Frank, to Fred M Dellorfano, Jr and Donald P Massa, Trustees of The Stoneleigh Trust u/d/t Ultrasonic microphone for operating with an accumulated layer of mud over its vibratile surface without change in sensitivity within its prescribed frequency range 4,033,180, Cl 73-71 5US

Massey-Ferguson Inc.: *See*—

Mueller, Otto, Jr., 4,033,425, Cl 180-77.00R.

Massignon, Daniel *See*—

le Gressus, Claude, Massignon, Daniel; and Sopizet, Rene, 4,034,220, Cl 250-310.000.

Mathisen, Einar S *See*—

Demsky, Herbert M, Mathisen, Einar S., Schumann, Paul A, Jr, and Tong, Alvin H, 4,033,698, Cl 356-173.000.

Matsuda, Yukinobu. *See*—

Aoyama, Ryozo, Matsuda, Yukinobu; and Urushima, Mitsuo, 4,033,128, Cl 60-484.000.

Matsui, Goro, Toda, Koji, Shimizu, Shigeki; Horiishi, Nanao; and Takedoi, Atushi, to Toda Kogyo Corporation. Magnetic particle powder of acicular ferric oxide used for magnetic recording material and a process for producing the same. 4,033,891, Cl. 252-62.560.

Matsumura, Yoshihiko *See*—

Funakoshi, Yoshiro; Matsumura, Yoshihiko, Yamamoto, Masaki, and Komeda, Hiromu, 4,034,126, Cl 427-8.000.

Matsushima, Yukinori *See*—

Kobayashi, Toshihiko; Kanbayashi, Tetsusaburo, Ichioka, Satoshi, Takeuchi, Shinjiro, and Matsushima, Yukinori, 4,034,180, Cl. 219-85.0BM.

Matsushita Electric Industrial Co., Ltd. *See*—

Kaminaka, Nobuyuki, Kanai, Kenji; Nouchi, Norimoto; and Nomura, Noboru, 4,034,414, Cl. 360-113.000.

Tomioka, Tatsuyuki, Yukami, Noboru; Hamaguchi, Yoshi; and Yamashita, Kiyoharu, 4,034,187, Cl. 219-216.000.

Tsuchiya, Hiroyoshi, Tsuda, Yukifumi, Hayami, Heijiro, and Kotera, Hiroaki, 4,034,406, Cl. 358-260 000.

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Imai, Hirozo, and Maeda, Yasuo, 4,033,034, Cl. 30-43.920.

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Maxwell, Ian E., to Shell Oil Company. Process for preparing modified silver catalysts 4,033,903, Cl 252-476.000.

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King, Leslie George, Lee, Glyn Evan, Martin, George Christopher James, and Jenkins, David Conwil, 4,034,107, Cl 424-309 000

May, Carl Jerome, Jr, to Bell Telephone Laboratories, Incorporated Smooth sequence generator for fractional division purposes 4,034,302, Cl 328-39.000.

Mayer, Karl, to Maschinenfabrik Augsburg-Nurnberg AG Crankshaft welded together from individual elements, and method of making same 4,033,016, Cl. 29-6.000.

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McArthur, Dennis P, to Union Oil Company of California Aluminum borate catalyst compositions and use thereof in chemical conversions 4,034,061, Cl 423-213 500

McCalla, Charles, to Flock Development and Research Company Limited Handles 4,033,010, Cl 16-114.00R

McCardell, Willard B, to Altair Tool & Engineering Inc Connector block and terminal assembly 4,033,663, Cl 339-128 000.

McClelland, Theodore M, III, to Westinghouse Electric Corporation Direction sensitive opto-electronic pulse initiator for electrical meters 4,034,292, Cl 324-157 000

McCord, Talmadge W Wind warning device 4,034,174, Cl 200-81.90R

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McGill, Eugene C: *See*—

Reed, Robert D., and McGill, Eugene C., 4,033,725, Cl 23-277 00C

McGrew, Jay L, to Marine Construction & Design Co Oil spill confining and directing apparatus and method using water spray booms 4,033,869, Cl 210-65.000.

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Capes, Charles E, Germain, Rene J, McIlhinney, Allan E, Puddington, Ira E.; and Sirianni, Aurelio F., 4,033,729, Cl 44-1.00A.

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McLaughlin, Robert L.; and Wood, Donald C., to DeSoto, Inc. Powder detergent compositions 4,033,894, Cl. 252-99 000

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McNamara, John V.: *See*—

Van Etten, Paul; and McNamara, John V, 4,034,363, Cl 340-347 00P.

McNeight, David Leslie; and Morris, William John, to Ernest Scragg & Sons Limited Yarn processing. 4,033,105, Cl 57-77 400

McRobert, Leon R., to FMC Corporation Windrowing machine with rotary brush and depth control unit. 4,033,100, Cl 56-328 00R

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Murawski, Frank H., Elliott, James W., Richards, Fred W, and Johns, Gordon L., 4,033,336, Cl. 128-2.05R

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Mehta, Kay Beharat, and Voegeli, Otto, to International Business Machines Corporation. Patterns for use in the field access propagation of a bubble lattice 4,034,357, Cl. 340-174 0TF

Meichsner, Othmar, and Queiser, Horst, to Licentia Patent-Verwaltungs-G.m.b H. Method and apparatus for processing contaminated wash water 4,033,868, Cl 210-38 00C

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Meiller, Francois. *See*—

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Meininger, Fritz, Hunger, Klaus; and Springer, Hartmut, to Hoechst Aktiengesellschaft. Phthalocyanine dyestuffs and process for preparing them. 4,033,980, Cl 260-314 500

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Menin, Albert S, and Bridges, Robert M, to Bendix Corporation, The Fish counter 4,034,331, Cl 340 3 00R

Merck & Co, Inc *See*—

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Cragoe, Edward J, Jr, and Jones, James H, 4,033,996, Cl 260-490 000

Grier, Nathaniel, Dybas, Richard A, and Strelitz, Robert A, 4,033,748, Cl 71-67 000

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Michael, Doreen Elizabeth Clip ring 4,033,143, Cl 63-2.000

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Miller, Leonard Edward, and Murfin, Donald Leon, to Lubrizol Corporation, The. Bis-amidoalkanesulfonic acids and salts thereof 4,034,001, Cl 260-513.00N

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Miller, Raymond A., Jr, and Thornton, Douglas M., to Ross Operating Valve Company Port thread 4,033,615, Cl 285-333.000

Miller, Robert J, to Colt Industries Operating Corporation. Multifunction fluid inlet valving means and reservoir means. 4,034,026, Cl. 261-23 00A

- Milliken Research Corporation: *See*—
  - King, Herbert Ray, 4,033,147, Cl. 66-8.000.
- Mima, James J. Bicycle lock. 4,033,160, Cl. 70-233.000.
- Mims, Herman D.; Willes, John A., and Gibson, Baylor D., to Celanese Corporation. Noise reducing textile traverse rod. 4,033,520, Cl. 242-43.00R
- Mims, James H., to Westinghouse Electric Corporation. Second order motion compensator for high resolution radar. 4,034,370, Cl. 343-5.0CM.
- Mims, James H.: *See*—
  - Lampe, Donald R., White, Marvin H., and Mims, James H., 4,034,199, Cl. 235-193.000.
- Mina, Kent Vincent. *See*—
  - Lawrence, Victor Bernard, and Mina, Kent Vincent, 4,034,197, Cl. 235-156.000.
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  - Kawamura, Yoshihisa, Saito, Masaaki, and Minami, Hidehiro, 4,033,170, Cl. 73-23.000
  - Masaki, Kenji, and Minami, Hidehiro, 4,033,122, Cl. 60-274.000
- Minami, Hiroshi, to Hokushin Electric Works, Ltd. Drive circuit for ultrasonic level gauge. 4,034,237, Cl. 307-268.000
- Mine, Katsutoshi, Nishio, Minoru, and Sumimura, Shinichi, to Toray Silicone Company, Ltd. Heat curable organopolysiloxane compositions containing adhesion additives. 4,033,924, Cl. 260-37.0SB
- Minnesota Mining and Manufacturing Company. *See*—
  - Brown, Harvey A., 4,033,948, Cl. 260-240.00A
  - Packard, James R., 4,034,181, Cl. 219-121.0EM
- Minolla, Horst. *See*—
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- Minolta Camera Kabushiki Kaisha. *See*—
  - Toriumi, Shiro, Endo, Hiroshi, Ueda, Nobuo, and Yamagishi, Seiichi, 4,033,684, Cl. 353-27.00A
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  - Virani, Gopal J., and Misencik, John J., 4,034,266, Cl. 361-42.000
- Mishcon, Lester, and Christopoulos, John, to Singer Company, The. Circular knitting machine for producing detachable strips of knitted fabric. 4,033,150, Cl. 66-138.000
- Mishima Kosan Co., Ltd. *See*—
  - Kobayashi, Toshihiko; Kanbayashi, Tetsusaburo, Ichioka, Satoshi, Takeuchi, Shinjiro, and Matsushima, Yukinori, 4,034,180, Cl. 219-85.0BM
- Mita Industrial Company, Ltd. *See*— ,
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- Mitchell, Robert S., and King, Thomas M., to Monsanto Company. Method of corrosion inhibition and compositions therefor. 4,033,896, Cl. 252-389.00A
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- Mitsubishi Chemical Industries Ltd. *See*—
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- Mitsubishi Gas Chemical Company, Inc. *See*—
  - Tamai, Yasuo, Honjo, Satoru, Osawa, Sadao, Satomura, Masato, Osada, Chiaki, Nagashima, Wakio, and Takashina, Naomitsu, 4,033,890, Cl. 252-62.10L
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- Mitsui, Hisayasu, Kamiuchi, Jun-ichi, Kumazawa, Ryozi; Umemoto, Kimikazu, Yamada, Toshimitsu; Yoshida, Katsuhiko, and Takechi, Taichi, to Tokyo Shibaura Electric Co., Ltd. Method for manufacturing an insulated electric coil. 4,033,805, Cl. 156-185.000
- Mitsui Toatsu Chemicals, Incorporated. *See*—
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- Mitutoyo Manufacturing Co., Ltd. *See*—
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- Miyake, Hajimu. *See*—
  - Hayashi, Masaki, Kori, Seiji, Miyake, Hajimu, Yamato, Takashi, and Suga, Hisashi, 4,034,003, Cl. 260-514.00D
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- Mockrin, Isadore, and Hobin, Martin A., to Kawecki Berylco Industries, Inc. Recovery of copper from waste nitrate liquors by electrolysis. 4,033,838, Cl. 204-103.000.
- Moehle, Kenneth Albert, and Taschner, Raymond George, to J. I. Case Company. Dual spring support. 4,033,542, Cl. 248-358.0AA
- Moerk, John C., Jr., to Felt Products Mfg. Co. Assemblies for sealing roadway curb gaps and method of sealing same. 4,033,702, Cl. 404-69.000
- Moertel, George B., to Textron, Inc. Method of making slide fastener coils. 4,034,056, Cl. 264-281.000.
- Mogab, Cyril Joseph. *See*—
  - Alexander, Frank Bernard, Jr., Capio, Cesar Deduyo, Hauser, Victor Emerald, Jr., Levinstein, Hyman Joseph, Mogab, Cyril Joseph, Sinha, Ashok Kumar, and Wagner, Richard Siegfried, 4,033,287, Cl. 118-49.10R
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- Mole, Cecil J., and Brenner, William C., to Westinghouse Electric Corporation. Segmented magnet homopolar torque converter. 4,034,248, Cl. 310-178.000
- Moller, George Otto. *See*—
  - Tobey, Hubert Earl, Hood, John William, Masiuk, Alphonse Michael, Irvin, Dee-Lavern, and Moller, George Otto, 4,033,254, Cl. 101-44.000.
- Molloy, Bryan B., to Eli Lilly and Company. 1,1-Diphenyl-4-(substituted-amino)butanes. 4,034,011, Cl. 260-570.00R
- Molnar, Albert J., Rudd, George E., and Meier, Joseph F., to Westinghouse Electric Corporation. Seal for large annular openings. 4,033,593, Cl. 277-212.00F
- Monaco, Robert F., and Derchak, Nicholas, to Sperry Rand Corporation. Apparatus for processing interrupts in microprocessing systems. 4,034,349, Cl. 364-200.000
- Mondshine, Thomas C., to NL Industries, Inc. Potassium-lime aqueous drilling fluids and method of preparing same. 4,033,893, Cl. 252-8.50A.
- Monogram Industries, Inc.: *See*—
  - Kemper, James M., 4,032,995, Cl. 4-10.000
  - Wilson, Leslie B., 4,033,222, Cl. 85-72.000
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  - Baldyga, Eugene P., 4,033,804, Cl. 156-84.000.
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  - Higgins, Thomas D., Jr.; and Newsom, Raymond A., 4,033,829, Cl. 203-9.000
  - Mitchell, Robert S.; and King, Thomas M., 4,033,896, Cl. 252-389.00A.
  - Wolf, William D., 4,033,907, Cl. 260-2.300.
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  - Bertelli, Guido, Roma, Pierpaolo; and Longi, Paolo, 4,033,915, Cl. 260-28.50A.
  - Cassar, Luigi, Foa, Marco, and Gardano, Andrea, 4,034,004, Cl. 260-515.00R
- Montoya, Jose Maria Tarrafeta, to Fabrica Espanola Magnetos, S.A. Electronic control devices applicable to anti-skid equipment in automobile vehicles. 4,033,635, Cl. 303-109.000.
- Moody, Roy A.; and Bulanda, John J., to Panduit Corporation. Solderless connector for insulated wires. 4,033,661, Cl. 339-98.000.
- Moore, John David; and Wheeler, Ian Robert, to International Synthetic Rubber Company, Limited, The. Graft copolymer preparation. 4,034,020, Cl. 260-880.00R.
- Moore, Michael E., *See*—
  - Chamberlain, Richard W.; and Moore, Michael E., 4,033,158, Cl. 70-202.000.
- Moore, Robert Milton. *See*—
  - Busanovich, Charles John; and Moore, Robert Milton, 4,034,127, Cl. 427-76.000.
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- Moosbrucker, Karl, to Josef Bautz GmbH. Particulate material conveying arrangement. 4,033,628, Cl. 302-34.000.
- Moran, Thomas M., to Eaton Corporation. Strain-relief bushing. 4,033,535, Cl. 248-56.000.
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- Morcom, Paul J. Fishing tackle box. 4,033,066, Cl. 43-54.50R
- Moreau, Andre, to Electricite de France (Service National). Protection of superheater tubes against corrosion. 4,033,297, Cl. 122-476.000
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  - Lindahl, Robert F.; and Morgan, Donald F., 4,033,601, Cl. 280-490.00R
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- Mori, Yoshiro, to Nissan Motor Co., Ltd. Reservoir tank. 4,033,872, Cl. 210-168.000
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- Morrow, William K., and Peterman, Walter B., Jr. Coke oven door seal. 4,033,828, Cl. 202-248.000
- Mortell Company. *See*—
  - Kuczkowski, John S., and Konitz, William A., 4,034,097, Cl. 424-263.000
- Mortensen, Thomas L. Method and apparatus for storing biological matter. 4,034,361, Cl. 340-272.000
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  - Harris, Nicholas D., 4,033,998, Cl. 260-471.00C.
- Morton, Scott A., to Hollon, Edmund D., a part interest. Fuel supply systems. 4,033,712, Cl. 431-90.000
- Moser, Hans, to Ciba-Geigy Corporation. N-(1'-alkoxycarbonylethyl)-N-haloacetyl-2,6-dialkylanilines for the control of phytopathogenic fungi. 4,034,108, Cl. 424-309.000
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  - Fong, Leong Q., 4,033,555, Cl. 259-4.00R.
- Motor Wheel Corporation. *See*—
  - Hubbard, Harold C., 4,033,630, Cl. 303-7.000.
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  - Schlosser, Werner, and Berger, Horst, 4,034,182, Cl. 219-121.0EM
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  - Cho, Susumu, Erickson, Paul Milton, and Reynolds, Gary Raymond, 4,034,299, Cl. 325-363.000
  - Dydyk, Michael, 4,034,314, Cl. 331-101.000
  - Rozylowicz, Edward Francis, and Twiselton, Steven Glen, 4,034,289, Cl. 324-95.000.
  - Tahara, Kumeo, 4,034,413, Cl. 360-106.000
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  - Sugihara, Kunihiko, Hioki, Kazuo, and Muranaka, Shigeo, 4,033,306, Cl. 123-119.00A
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  - Ishiyama, Hideki, Inoue, Atushi, and Ieki, Hideharu, 4,034,318, Cl. 333-72.000
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- Murphy, Dennis E., to McDonnell Douglas Corporation. Vent structure. 4,033,247, Cl. 98-119.000
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  - Phillips, Ian Ross, and Reynolds, Mervyn Frank, 4,033,346, Cl. 128-223.000
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  - Takahashi, Toshiro, Nagano, Toshihiro, Nakamura, Katsuhiko, Kikuchi, Masaru, and Suzuki, Kazuo, 4,033,024, Cl. 29-403.000
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  - Tsunekawa, Tokuichi, Nakamoto, Soichi, and Taguchi, Tetsuya, 4,034,384, Cl. 354-33.000
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  - Shikiya, Hajime, Nakanishi, Seiichi, Yoshida, Zitsuo, and Hirakawa, Kenkichi, 4,033,197, Cl. 74-331.000
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- National Semiconductor Corporation. *See*—
  - Pantiga, Gene N.; and Allen, Robert M., 4,033,844, Cl. 204-224.00R
- National Steel Corporation. *See*—
  - Loest, Kent W., and Schaefer, John T., 4,033,842, Cl. 204-180.00P
- National Upper Cervical Chiropractic Research Association, Inc. *See*—
  - Gregory, Ralph R., and Benesh, Peter, 4,033,329, Cl. 128-2.00S
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  - Thomas, David E., McCoy, Marion B., and Chaky, Michael J., 4,034,194, Cl. 235-153.0AC
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  - Coulson, James, and Nearn, Malcolm Richard, 4,034,076, Cl. 424-49.000
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  - Nelson, Richard D , 4,033,733, Cl. 55-274.000.
- Nelson, Norman A.. *See—*
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  - Michaels, Bertram, 4,033,044, Cl. 33-189.000
- Newland, Elwood L. Solar energy device 4,033,126, Cl 60-398.000
- Newman, Ray; and Affa, Steve, to General Connectors Corporation Hot air duct. 4,033,381, Cl. 138-113 000
- Newsom, Raymond A.. *See—*
  - Higgins, Thomas D , Jr , and Newsom, Raymond A , 4,033,829, Cl 203-9 000
- Newyear, Raymond Willis *See—*
  - Lewis, James Marvin, and Newyear, Raymond Willis, 4,033,773, Cl 96-115.00P
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- Nichols, Mark R , to United States of America, National Aeronautics and Space Administration. Dual cycle aircraft turbine engine 4,033,119, Cl 60-226.00R
- Nichting, Robert P , to Caterpillar Tractor Co Removable spline between clutch piston and cylinder. 4,033,439, Cl. 192-85.0AA
- Nickell, Louis G , to W R Grace & Co Ripening of sugarcane by use of ammonium isobutyrate 4,033,755, Cl 71-113 000.
- Nickles, Robert J , to Wisconsin Alumni Research Foundation Method and apparatus for multiplexing of physiological sensor signals with gamma ray camera data signals 4,033,335, Cl 128-2 05R
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- Nicolaisen, Holger, Andersen, Finn Schnoor, and Tandrup, Leif Borge, to Danfoss A/S Timing pulse generating switch 4,034,327, Cl 337-41 000
- Nicolas, Yves, to Schlumberger Technology Corporation Well flow measuring apparatus 4,033,187, Cl 73-155 000
- Nicolls, Wilfrid Edward Walter, to C A V Limited Fuel pumping apparatus with timing correction means. 4,033,310, Cl 123-139 0AP
- Nienow, John F , Higgins, Charles T , and Meyer, Leo F , to Philip Morris Incorporated Apparatus providing output indication of tobacco rod firmness 4,033,360, Cl 131-21 00B
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  - Shibahara, Masashi, 4,033,220, Cl 84-1 030
- Nihon Nohyaku Co Ltd *See—*
  - Taninaka, Kuniaki, Kurono, Hitoshi, and Kasai, Tsutomu, 4,034,102, Cl 424-277 000
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  - Clark, Franklin F , Nikolic, Cvetko B , and Queneau, Paul B , 4,034,059, Cl 423-144 000
- Nilsson, Bruno Yngve, to Boliden Aktiebolag Method and a device for determining gas generation with electrodes in contact with electrolytes 4,034,279, Cl 320-20 000
- Nilsson, Sven Arne Safety device for butterfly dampers 4,033,713, Cl 431-153 000
- Nippon Air Brake Company Ltd *See—*
  - Toi, Toshio, 4,033,233, Cl 91-374.000
- Nippon Concrete Industries Co Ltd . *See—*
  - Fukushima, Yoshikiyo, 4,033,080, Cl 52-223 00R
- Nippon Denso Co., Ltd.. *See—*
  - Arai, Hiroshi, 4,034,336, Cl 340-52 00F
- Nippon Electric Company, Ltd . *See—*
  - Isono, Tomoyuki, and Nakada, Toshio, 4,034,341, Cl 340-146 30H
  - Nakamura, Tetsuro, and Suzuki, Hideaki, 4,034,396, Cl 357-30 000
  - Sato, Yoichi, 4,034,305, Cl. 329-50 000.
- Nippon Electric Kagoshima, Limited *See—*
  - Yamauchi, Takashi, 4,034,253, Cl 313-317 000
- Nippon Gakki Seizo Kabushiki Kaisha *See—*
  - Deutsch, Ralph, 4,033,219, Cl. 84-1 030
  - Tomisawa, Norio, Uchiyama, Yasuji, Okumura, Takatoshi; and Takeda, Toshio, 4,033,221, Cl 84-1 030
- Nippon Kogaku K K *See—*
  - Ishizaka, Sunao, and Kawahara, Yasuhito, 4,034,392, Cl 354-289 000
  - Nohda, Masao, 4,033,696, Cl 356-126 000
  - Shimomura, Jun, 4,034,368, Cl 340-378 00R
  - Terasawa, Hidenori; and Mori, Ikuo, 4,033,675, Cl 350-216 000
- Nippon Kokan Kabushiki Kaisha *See—*
  - Arimura, Toru; and Fujita, Fumio, 4,033,165, Cl 72-205 000
  - Koshiga, Fusao, Tanaka, Jinkichi, and Watanabe, Itaru, 4,034,179, Cl. 219-74 000
  - Kunioka, Kazuo, Kurihara, Kiwami, Sakasegawa, Koji, Ohsumi, Atushi, Watanabe, Akio, and Sakai, Kenichi, 4,033,737, Cl. 62-64 000
- Nippon Oil Company, Ltd *See—*
  - Ohmori, Tadashi, and Fujisou, Tokuo, 4,033,854, Cl 208-14.000.
- Nippon Soda Company Limited *See—*
  - Hosaka, Hideo, and Yoneda, Hiromi, 4,033,750, Cl 71-90 000.
  - Sawaki, Mikio, Iwataki, Isao, Hirono, Yoshihiko, and Ishikawa, Hisao, 4,033,754, Cl 71-112 000
- Nippondenso Co , Ltd *See—*
  - Arai, Hiroshi, Nogami, Takahiro, Sugiura, Akio, Okamoto, Atutoshi, and Toyama, Koichi, 4,033,634, Cl 303-103 000
- Nishina, Shuho *See—*
  - Shingu, Iichi, Kondo, Yutaka, and Nishina, Shuho, 4,033,610, Cl 280-737 000
- Nishio, Minoru *See—*
  - Mine, Katsutoshi, Nishio, Minoru, and Sumimura, Shinichi, 4,033,924, Cl 260-37 0SB
- Nishizawa, Tsutomu *See—*
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- Nissan Motor Co , Ltd *See—*
  - Endo, Toshiaki, and Hatta, Toshiro, 4,033,011, Cl 24-73 0FT
  - Fujishiro, Takeshi, and Sunano, Naomasa, 4,033,169, Cl 73-23 000
  - Hayashi, Yoshimasa, Nakajima, Yasuo, Sugihara, Kunihiko, and Aoyama, Syunichi, 4,033,308, Cl 123-119 00A
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  - Kawamura, Yoshihisa, Saito, Masaaki, and Minami, Hidehiro, 4,033,170, Cl 73-23 000.
  - Masaki, Kenji, and Minami, Hidehiro, 4,033,122, Cl 60-274 000
  - Masaki, Kenji, and Ookubo, Yoshio, 4,033,123, Cl. 60-286.000
  - Mori, Yoshiro, 4,033,872, Cl 210-168.000.
  - Sugihara, Kunihiko, Hioki, Kazuo, and Muranaka, Shigeo, 4,033,306, Cl 123-119 00A
- Nisshin Flour Milling Co , Ltd . *See—*
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- Nissho-Iwai Co , Ltd. *See—*
  - Aoki, Yutaka, Hase, Akira, and Ito, Jiro, 4,033,728, Cl. 44-1.00R.
- NL Industries, Inc . *See—*
  - Granquist, William T , 4,033,858, Cl. 208-115 000.
  - Mondshine, Thomas C., 4,033,893, Cl. 252-8.50A.
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  - Kaminaka, Nobuyuki, Kanai, Kenji, Nouchi, Norimoto, and Nomura, Noboru, 4,034,414, Cl. 360-113 000.
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- Norris, Frank John, to Raymond Lee Organization, Inc., The. Illuminating insert for a drinking glass 4,034,213, Cl 240-6 40G
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  - Haas, David J , 4,034,251, Cl 313-59.000.
- Northern Electric Company *See—*
  - Crowley, George C , 4,034,185, Cl 219-212 000
- Northrop Corporation. *See—*
  - Margerum, Donald Lee, 4,034,372, Cl 343-6 80R.
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  - Hoetger, Robert Arthur, Hagaman, James Albert, and Nortman, William, 4,033,436, Cl 192-3 300
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  - Kaminaka, Nobuyuki, Kanai, Kenji, Nouchi, Norimoto, and Nomura, Noboru, 4,034,414, Cl 360-113.000.
- Nu-Concept Computer Systems, Inc. *See—*
  - Vandermark, Harold F , 4,034,202, Cl 219-230 000
- Nuclear Power Company (Whetstone) Limited *See—*
  - Webber, John William Robert, and Roberts, Anthony Charles, 4,033,815, Cl 176-87 000
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  - Curtis, Omer E , Jr , Tuller, Harold W., O'Neill, Charles T , and Nussbaum, Ralph W , 4,034,014, Cl 260-837 00R
- Nutter, Norman E , and Hoffman, Herbert N , to General Electric Company Throttle valve operator 4,033,234, Cl 91-384 000.
- N V Bekaert S A *See—*
  - Nijs, Marc, Vanassche, Frits, and De Kok, Johannes Arnoldus, 4,033,387, Cl 140-105 000.
- Nyberg, Ole *See*
  - Andorsen, John Peter, Revhaug, Helge; and Nyberg, Ole, 4,033,596, Cl 280-11 200
- O'Brien, John F , to Mercy Hospital and Mercy Orphan Asylum of Chicago, The Book desk 4,033,652, Cl 312-245 000
- O'Connell, Richard P , to Xerox Corporation Multi-mode reproducing machine 4,033,692, Cl 355-14 000

- Odashima, Tooru. *See—*
  - Fujiwara, Yoshio, Naito, Keiichi, Fujimoto, Yoshinobu, Odashima, Tooru, and Sada, Tomohiko, 4,033,840, Cl. 204-159 170.
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- Ogasahara, Tsunehiko *See—*
  - Murakami, Noboru, and Ogasahara, Tsunehiko, 4,033,368, Cl 137-54.000.
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  - Hirosawa, Koichiro, Ishikawa, Kazuo, Ogasawara, Tsunehiko, and Murakami, Noboru, 4,033,203, Cl. 74-869 000.
- Ogata, Yoshio: *See—*
  - Gunjigake, Koreaki, Hasegawa, Masashi, Oizumi, Hiroshi, and Ogata, Yoshio, 4,033,790, Cl. 148-22.000.
- Ogawa, Youji. *See—*
  - Sano, Shunichi, and Ogawa, Youji, 4,034,324, Cl 335-212 000
- O'Grady, Thomas Raymond. Spring type ball pitching device 4,033,318, Cl. 124-7 000
- Ohba, Masahiro *See—*
  - Totuka, Kaoru, Ohwaki, Isao, Ohba, Masahiro, and Nakamura, Shinji, 4,033,592, Cl 274-38 000
- Ohloff, Gunther *See—*
  - Sundt, Erling, and Ohloff, Gunther, 4,034,044, Cl. 260-586 00R
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- Ohorodnik, Alexander: *See—*
  - Bollert, Ulrich, Lohmar, Elmar; and Ohorodnik, Alexander, 4,033,936, Cl. 260-75.00P.
- Ohsumi, Atushi *See—*
  - Kunioka, Kazuo; Kurihara, Kiwami, Sakasegawa, Koji, Ohsumi, Atushi, Watanabe, Akio, and Sakai, Kenichi, 4,033,737, Cl 62-64 000.
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- Ohtani, Toshiyuki: *See—*
  - Sakamaki, Hisashi; and Ohtani, Toshiyuki, 4,034,189, Cl 219-216 000.
- Ohwaki, Isao: *See—*
  - Totuka, Kaoru, Ohwaki, Isao; Ohba, Masahiro, and Nakamura, Shinji, 4,033,592, Cl 274-38.000
- Oizumi, Hiroshi. *See—*
  - Gunjigake, Koreaki; Hasegawa, Masashi, Oizumi, Hiroshi, and Ogata, Yoshio, 4,033,790, Cl. 148-22.000.
- Okamoto, Atutoshi: *See—*
  - Arai, Hiroshi; Nogami, Takahiro, Sugiura, Akio; Okamoto, Atutoshi; and Toyama, Koichi, 4,033,634, Cl. 303-103.000.
- Okamoto, Michio *See—*
  - Harazoe, Yoshiaki, Kurakami, Shigeru, Okamoto, Michio; and Hasegawa, Ichiro, 4,034,335, Cl. 340-52.00F.
- Okano, Susumu: *See—*
  - Kamo, Hisao; Kuroda, Masahiro; and Okano, Susumu, 4,034,394, Cl 357-15 000
- Oki Electric Industry Company, Ltd *See—*
  - Homma, Rokuro, 4,034,323, Cl 335-129 000.
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- Okubo, Ichiro: *See—*
  - Tsujimoto, Michihiro, Tsukahara, Ryoichi, Nishizawa, Tsutomu, and Okubo, Ichiro, 4,033,923, Cl. 260-37 00N
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  - Baker, Joseph E., 4,033,847, Cl 204-250 000
  - Kuo, Han C , Dotson, Ronald L , and Woodard, Kenneth E , Jr , 4,033,837, Cl 204-98 000
  - Wojtowicz, John A , and Gavin, David F , 4,034,070, Cl 423-489 000
- Oliver, Willie R Horse race board game apparatus 4,033,587, Cl 273-134 0CH
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- Olsson, David L., to TRW Inc Coupled bar microwave bandpass filter 4,034,319, Cl 333-73 00R
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- O'Neill, Charles T *See—*
  - Curtis, Omer E , Jr , Tuller, Harold W , O'Neill, Charles T , and Nussbaum, Ralph W , 4,034,014, Cl 260-837 00R
- Ono Pharmaceutical Co., Ltd *See—*
  - Hayashi, Masaki, Kori, Seiji, Miyake, Hajimu, Yamato, Takashi, and Suga, Hisashi, 4,034,003, Cl 260-514 00D
- Onoda, Fumio. *See—*
  - Kishi, Hajimu, and Onoda, Fumio, 4,034,192, Cl 235-151 110
- Onoda, Takeru, and Wada, Keisuke, to Mitsubishi Chemical Industries Ltd. Process for preparing a carboxylic ester 4,033,999, Cl 260-488.0CD
- Onodera, Toshimi *See—*
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  - Besik, Ferdinand, 4,033,875, Cl. 210-197.000.
- Ookubo, Yoshio. *See—*
  - Masaki, Kenji, and Ookubo, Yoshio, 4,033,123, Cl. 60-286.000
- Orkin, Stanley S., to Kamatics Corporation Method of assembling bearings 4,033,019, Cl 29-149.50B
- Ormiston, Robert M *See—*
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  - Ornsteen, Robert L., 4,033,484, Cl. 222-146 0HE.
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- Orthmann, Jurgen, to AGFA-Gevaert, Aktiengesellschaft Color copying apparatus. 4,033,688, Cl. 355-4.000
- Orwoll, Edward Francis. *See—*
  - Hardy, Donald, Sr , and Orwoll, Edward Francis, 4,034,023, Cl 260-973 000
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  - Tamai, Yasuo; Honjo, Satoru, Osawa, Sadao, Satomura, Masato, Osada, Chiaki, Nagashima, Wakio, and Takashina, Naomitsu, 4,033,890, Cl. 252-62.10L.
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  - Lunde, James M , and Schwartz, John G., Jr., 4,033,038, Cl 30-382 000
- Ossman, John *See—*
  - Kromer, Heiner M , and Ossman, John, 4,033,557, Cl 259-192 000
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  - Sader, George, and Osswald, Dieter, 4,033,695, Cl 355-87 000
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  - Eberle, Frederick L , and Ostrofsky, Bernard, 4,033,176, Cl 73-67 900
- Ota, Jun *See—*
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- Owen, Geoffrey Robert *See—*
  - Durant, Graham John, Ganellin, Charon Robin, and Owen, Geoffrey Robert, 4,034,101, Cl 424-273 000
- Owens-Illinois, Inc *See*
  - Heier, Robert J , 4,033,447, Cl 198-441 000
  - Pei, Yu K , 4,033,327, Cl 126-271 000
  - Rhoads, Roger R , 4,034,131, Cl 428-35 000
  - Young, Chung Chang, 4,033,777, Cl 106-52 000
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  - Taylor, Herbert E , and Evans, Frederick P , 4,033,289, Cl 118-227 000
- Pacific Technology *See—*
  - Leyde, Warren L , 4,034,233, Cl 307-41 000
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  - Wall, Frederick, 4,033,871, Cl 210-96 00R
- Paddock, Paul F , and Cramer, Jerry W , to Sunkist Growers, Inc Conveyor with removable receptacles 4,033,450, Cl 198-648 000
- Page, David *See—*
  - Lorch, Edgar Adolf, Fletcher, Keith Ernest, and Page, David, 4,033,884, Cl 250-496.000
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- Pall Corporation *See—*
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  - Liu, Chao-Min, Palleroni, Norberto, Hermann, Theron, and Prosser, Barbara, 4,033,823, Cl. 195-80 00R
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  - Sprung, Joseph A., Panasik, Theodore; and Holmes, James J., 4,033,772, Cl 96-114.000
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  - Moody, Roy A., and Bulanda, John J., 4,033,661, Cl 339-98 000
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  - Sorenson, James L., Pannier, Karl A., Jr., and Reynolds, Gordon S., 4,033,345, Cl 128-214.00R
- Pantiga, Gene N., and Allen, Robert M., to National Semiconductor Corporation Apparatus for selectively plating lead frames 4,033,844, Cl 204-224 00R
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  - Lance, Richard T., and Papafingos, Pandelis N., 4,033,760, Cl 75-68 00R
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  - Spencer, Harvey J., 4,033,862, Cl 209-73 000.
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  - Currie, William E., Gunning, David W., and Russell, John G., 4,033,022, Cl 29-237 000
- Parquet, Donald James, and Pedersen, Carl Oluf, to J I Case Company Dual oil filter automatic switching system. 4,033,870, Cl 210-90 000
- Parsons, Roger R., to Raven Industries, Inc Deflation cap for pressurized hot air airship 4,033,527, Cl 244-99 000
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  - Bickerdike, Robert Lewis, Clark, Douglas, Eastabrook, John Norman, Hughes, Garyth, Mair, William Norman, Partridge, Peter George, and Ranson, Harry Christopher, 4,033,793, Cl 148-32 000
- Pashley, Richard D., to Intel Corporation High density/high speed MOS process and device 4,033,026, Cl 29-571 000
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- Passmore, Michael Edward Anthony Rigid structure 4,034,135, Cl 428-184 000
- Pasturczak, Vincent S., to Bell & Howell Company. Rapid film rewind mechanism 4,033,680, Cl 352-124 000
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  - ten Broeke, Jan, Grabowski, Edward J J, Flataker, Lars M., Fisher, Michael H., and Patchett, Arthur A., 4,033,968, Cl. 260-288 0CF
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- Patterson, Bernard A. Non-fat dried whipping composition 4,034,122, Cl 426-570 000
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  - Torok, Ernest J., Kaske, Alan D., Krawczak, John A., and Paul, Maynard C., 4,034,359, Cl 340-174 0TF
- Pauliukonis, Richard S Compressed gas valve with constant flow 4,033,378, Cl 137-614.190.
- Paxton, Charles F., to Weltronic Company Welding and automation control system 4,034,212, Cl 235-151 100
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- Peacock, John W *See*—
  - Silverstein, Robert M., Gore, William E., Pearce, Glenn T., Cuthbert, Roy A., Simeone, John B., Lanier, Gerald N., and Peacock, John W., 4,034,080, Cl. 424-84 000
- Pearce, Glenn T.. *See*—
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- Pearl, David Raymond, to Gerber Garment Technology, Inc Blade sharpener 4,033,214, Cl 83-174.000.
- Peddinghaus, Rolf. *See*—
  - Wepner, Joachim, 4,033,571, Cl. 269-315 000
- Pedersen, Carl Oluf. *See*—
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  - Butterweck, Hans-Jurgen, Claasen, Theodoor Antonius Carel Maria, Mecklenbrauker, Wolfgang Friedrich Georg, and Peek, Johannes Bernhard Heinrich, 4,034,196, Cl 235-156 000
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  - Bays, David Edmund, Peel, Mervyn Evan, Waters, David Martin, and Ellis, Gwynn Pennant, 4,034,075, Cl. 424-45 000
- Pei, Yu K., to Owens-Illinois, Inc Solar energy collector module system 4,033,327, Cl 126-271 000
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  - McFadyen, Robert J., and Peil, William, 4,034,298, Cl 325-318 000
- Pellegrino, Anthony, to Machlett Laboratories, Incorporated, The Compensated voltage divider 4,034,283, Cl 323-74 000
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  - Brouillard, Robert Ernest, 4,033,820, Cl 195-31.00R.
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  - Hudson, Donald C., Morris, Charles R., Fleck, Horst G., and Senghaas, Karl A., 4,034,225, Cl. 250-471.000.
- Penrod, Glen H., to Gould Inc. Range top element. 4,034,206, Cl 219-464 000
- Pensa, Ildo Emil, and Rau, Robert Otto, to J P Stevens & Co., Inc Controlling degree of reaction by controlling heat input in cellulose textile-reactant systems 4,032,992, Cl 2-243.00R
- Peplow, Marvin J.; and Wells, Peter M., Jr., to Ideal Industries, Inc Hand-held wall receptacle wiring tester with oppositely disposed push/pull surfaces for insertion and removal of the tester. 4,034,284, Cl 324-51 000
- Perciaccante, Vincent Anthony: *See*—
  - Augurt, Thomas Anthony; Rosensaft, Michael Norman, and Perciaccante, Vincent Anthony, 4,033,938, Cl. 260-78.30R.
- Perkins, Fred M., Jr Modular building system. 4,033,081, Cl. 52-263 000
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  - Waly, Adnan, 4,033,686, Cl. 353-120.000.
- Personal Products Company *See*—
  - Siragusa, Judith Ann, 4,034,084, Cl. 424-180.000.
- Pesson, Marcel, to Laboratoire Roger Bellow 8-Alkyl-5-oxo-5,8-dihydro-pyrido(2,3-d)pyrimidine-6-carboxylic acids for treating urinary tract infections 4,034,094, Cl. 424-251.000.
- Peterman, Walter B., Jr.. *See*—
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- Petersen, Niel R., to MTS Systems Corporation. Pneumatic linear spring device. 4,033,566, Cl. 267-126.000.
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  - Loveláce, Billy J., 4,034,049, Cl. 260-658.00R.
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  - Brown, Wilburn Kelly, 4,033,468, Cl. 214-130.00R.
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- Peyton, Bernard Joseph. *See*—
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- Pfister, Gustav. *See*—
  - Williams, David J.; Lardon, Marcel A.; Abkowitz, Martin A.; and Pfister, Gustav, 4,033,769, Cl. 96-1.500.
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  - Cronin, Timothy H., Faubl, Hermann; Hoffman, William W.; and Korst, James J., 4,034,040, Cl. 260-570.900.
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  - Nienow, John F.; Higgins, Charles T.; and Meyer, Leo F., 4,033,360, Cl. 131-21.00B.
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  - Bates, Danny E., 4,034,195, Cl 235-153.0AC
  - Vautrain, Lucien H., 4,033,727, Cl. 23-288.00R
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- Pichl, Heinz Housing for outboard motors. 4,033,282, Cl. 115-17 000.
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  - Heckman, LeRoy Francis, Jr., and Pickard, James Bruce, 4,034,320, Cl 333-82 00B
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- Pietsch, Wolfgang B., to Midrex Corporation Apparatus for continuous passivation of sponge iron material 4,033,559, Cl 266-122 000
- Pignocco, Arthur J *See*—
  - Bieniosek, Chester E., Kachik, Robert H., and Pignocco, Arthur J., 4,033,399, Cl 164-54 000
- Pinkalla, Hamilton A *See*—
  - Johnson, Paul A., and Pinkalla, Hamilton A., 4,033,774, Cl 106-35 000

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  - Morroni, Pino D., 4,033,627, Cl 301-111 000
- Piontkowski, Carl, to C & D Distributors, Inc Wood splitter 4,033,390, Cl 144-193 00D
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  - Bunge, Ernst, Rothgordt, Ulf, Ehlers, Bernd, and Piotrowski, Herbert, 4,033,443, Cl 197-1 00R
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  - Soffge, Friedhelm, Piper, Ortwin, and Albrecht, Gerhard, 4,033,006, Cl 14-75 000
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  - Zolss, Gerhard, Pittner, Heribert, and Stormann-Menninger-Lerchenthal, Heimo, 4,034,009, Cl 260-553 00A
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  - Thomasset, Andre Alphonse, 4,033,396, Cl 160-332 000
- Platt, Stephen A., to Platt, Stephen A., and Platt, Vernet B Tape drive apparatus 4,033,495, Cl. 226-186.000
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  - Platt, Stephen A., 4,033,495, Cl 226-186 000
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  - Rhomberg, Alfred, Berger, Herbert, Stach, Kurt, deceased, Plattner, Werner, administrator, Vomel, Wolfgang, and Sauer, Winfriede, 4,033,967, Cl 260-287 0CF
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- Plempel, Manfred. *See*—
  - Wenzelburger, Jurgen, Buchel, Karl Heinz, Plempel, Manfred, and Meiser, Werner, 4,033,964, Cl 260-268 00C
- Plessey Handel und Investments A G *See*—
  - Hollis, John Edward, 4,034,166, Cl 179-170.0NC.
- Ploger, Walter, Schmidt-Dunker, Manfred, and Gloxhuber, Christian, to Henkel & Cie G m.b H Pyrrolidone-5,5-diphosphonic acids 4,034,086, Cl 424-200.000
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  - Jones, Norman Stewart, 4,033,343, Cl. 128-145.800
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  - Gold, Nicholas, 4,034,386, Cl. 354-86.000.
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  - Jarnuszkiewicz, Stanislaw, 4,033,302, Cl. 123-59.0BM
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  - Kaczkowski, Zbigniew, 4,033,791, Cl. 148-31.550
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  - Aeda, Petrus Marinus, 4,034,057, Cl 264-297.000.
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  - Dmitriev, Vasily Petrovich, Polyakov, Anatoly Mikhailovich, Tomilin, Alexandr Grigorievich, and Shushpan, Stanislav Mikhailovich, 4,033,116, Cl. 60-39 28R
- Polygulf Associates: *See*—
  - Horowitz, Carl, and Dichter, Michael, 4,033,852, Cl 208-8 000.
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  - Bram, Georges Eugene, 4,033,613, Cl. 285-184.000
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  - Lundh, Roy W., 4,033,281, Cl 114-295 000
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  - Rolfe, Hugh Hieron, 4,033,496, Cl 226-188 000
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  - Sevenet, Thierry, Thal, Claude, Potier, Pierre, and Husson, Henri Philippe, 4,033,969, Cl 260-293.530.
- Potoski, John R. *See*—
  - Freed, Meier E., and Potoski, John R., 4,034,041, Cl 260-571 000
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- Powell, James E., to Shell Oil Company. N-(Arylsulfonyl)-2-nitro-2(tetrahydro-2H-1,3-thiazin-2-ylidene)acetamides 4,034,091, Cl 424-246.000
- Powell, William R Mass flow solar energy receiver 4,033,118, Cl 60-641.000.
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  - Chang, Wen-Hsuan, Erikson, J Alden, and Scriven, Roger L., 4,034,017, Cl 260-859.00R
  - Cook, James A., Jr., 4,034,064, Cl 423-272.000
  - Drummond, Warren W., 4,033,741, Cl 65-2 000
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- Pridham, Brian Frederick Knitting machine stand 4,033,537, Cl 248 165 000
- Priemer, Joachim, Schenk, Norbert, Krekel, Jorg, and Schwerdtel, Wulf, to Bayer Aktiengesellschaft Isolating naphthoquinone and phthalic anhydride from naphthalene oxidation product 4,033,987, Cl 260-346 400
- Priest, Anthony Victor Norton, and Schorr, Murray Arnold, to Barker, Alfred Walter Position-transmitting equipment 4,033,132, Cl 60 572 000
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  - Kleist, Robert A., and Matula, Jerry, 4,033,255, Cl 101-93 040
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  - Berry, Brian S., and Pritchet, Walter C., 4,033,795, Cl 148-108 000
- Probert, Geoffrey, Jr., to Bell Telephone Laboratories, Incorporated Method and apparatus for controlling a multiprocessor system 4,034,347, Cl 364-200 000
- Procter & Gamble Company, The *See*—
  - Holcombe, Thomas Charles, and Schultz, Robert Howard, 4,033,718, Cl 8-103 000
  - Mattson, Fred Hugh, 4,034,083, Cl 424-180 000
- Product Automation and Control Limited *See*—
  - Wade, Kenneth Robinson, 4,034,235, Cl. 307-117 000
- Production Specialties, Inc *See*—
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  - Demarcq, Michel, and Sleziona, Joseph, 4,034,022, Cl 260-955 000
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  - Gustafsson, Berth Ulrik, 4,033,141, Cl 62-238 000
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  - Tayakin, Jury Vasilievich, Sidorenko, Vladimir Pavlovich, Sirota, Alexandr Yakovlevich, Prokofiev, Jury Vladimirovich, and Kopytov, Alexandr Maximovich, 4,034,238, Cl 307-221 00C
- Promecam Sisson-Lehmann *See*—
  - Cailloux, Paul, 4,033,572, Cl 269-320.000
- Properzi, Giulio Casting wheel for a continuous casting machine of the wheel and belt type 4,033,405, Cl 164-278 000
- Propper Manufacturing Company, Inc *See*—
  - Raczkowski, Jan, 4,033,337, Cl 128-2 05C
- Prosser, Barbara *See*—
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- Provenzano, Albert J *See*—
  - Kirrish, Hail, and Provenzano, Albert J., 4,033,243, Cl 85-4 000
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- Przybyla, Richard L., to Dow Corning Corporation Heat-curable silicone elastomers having unprimed adhesion 4,034,140, Cl 428-447 000
- Przygocki, Witold C., to Acme Manufacturing Company Combination quick removal and adjustable width work pressure back-up roll or billet roll 4,033,497, Cl 226-194 000
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  - McNally, Thomas J., Mehling, Sigfried, and Puchalski, Walter J., 4,033,185, Cl 73-147 000
- Puddington, Ira E. *See*—
  - Capes, Charles E., Germain, Rene J., McIlhinney, Allan E., Puddington, Ira E., and Sirianni, Aurelio F., 4,033,729, Cl 44-1 00A
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- Pullen, Eric V *See*—
  - Manoogian, Alex, and Pullen, Eric V., 4,033,373, Cl 137-454 600
- Pureco Systems, Inc., *See*—
  - Stoltenberg, Donald A., 4,033,873, Cl 210-186 000
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- Pyrotenax of Canada Limited *See*—
  - Howie, David Malcolm, McKenzie, Roy Victor W., and Snape, James Ronald, 4,033,028, Cl. 29-611.000
- Quadriga Art Co., Inc. *See*—
  - Schulhof, Thomas B.; and Schulhof, Ronald M., 4,033,061, Cl 40-158.00R
- Quaker Oats Company, The. *See*—
  - Anderson, Hugh C., 4,033,925, Cl 260-42.530
- Queiser, Horst: *See*—
  - Meichsner, Othmar, and Queiser, Horst, 4,033,868, Cl 210-38.00C
- Queneau, Paul B. *See*—
  - Clark, Franklin F., Nikolic, Cvetko B., and Queneau, Paul B., 4,034,059, Cl 423-144.000
- Quintilliano, Robert L., to Hooker Chemicals & Plastics Corporation Heat exchanger cleaning system 4,033,407, Cl 165-95.000
- R. E. Phelon Company, Inc., *See*—
  - Burson, Bob O., 4,033,311, Cl 123-179.00K
- Raabe, Rodney Dean, and Dittberner, Ardie Reinhard, to General Electric Company Electrical transfer switching apparatus having door interlock and plural switch interlock 4,034,170, Cl 200-50.00A
- Raczkowski, Jan, to Propper Manufacturing Company, Inc Self-donned Sphygmomanometer cuff 4,033,337, Cl 128-2.05C
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  - Owen, David Gregory, Ashworth, John Vernon, and Radcliffe, Paul Anthony Beaufort, 4,034,400, Cl 358-75.000
- Radiation Limited *See*—
  - Longworth, Alfred, 4,033,714, Cl 431-354.000
- Radiochemical Centre Limited, The *See*—
  - Lorch, Edgar Adolf, Fletcher, Keith Ernest, and Page, David, 4,033,884, Cl 250-496.000
- Radtke, Charles S., to American Can Company Method of forming an opening tab in sheet metal container end closures 4,033,275, Cl 113-121.00C
- Rajchman, Jan Aleksander *See*—
  - Catanese, Carmen Anthony, Endriz, John Guiry; and Rajchman, Jan Aleksander, 4,034,255, Cl 313-400.000
- Raley, Paul H., Dunbeker, George H., and Stark, Eugene E., to Rheem Manufacturing Company Molded plastic container 4,033,473, Cl 220-66.000
- Ralston, Harry R. *See*—
  - Little, Alma M., and Ralston, Harry R., 4,033,269, Cl 110-160.000
- Ralston Purina Company *See*—
  - Dunn, Howard J., and Farr, M. Paul, 4,034,121, Cl 426-565.000
  - Van Horn, Earl Thomas, 4,034,078, Cl 424-76.000
- Ramanathan, Visvanathan, Della Casa, Angelo, de Montmollin, Rene, Hegar, Gert, and Schutz, Hans Ulrich, to Ciba-Geigy Corporation Fiber reactive water soluble 2,4,6-triamino, 3-cyano pyridine-(5) azo dyestuffs 4,033,943, Cl 260-153.000
- Ramanathan, Visvanathan *See*—
  - Defago, Raymond, Ramanathan, Visvanathan; and Back, Gerhard, 4,033,716, Cl 8-2.50A
- Ramspott, Walter *See*—
  - Kramer, Friedhelm, Wolfertz, Gunter, Klaus, Harald, Stanik, Raimund, Appelt, Horst Gustav, and Ramspott, Walter, 4,033,012, Cl 24-90.00D
- Randell, Donald Richard, Cook, Barry, and Chalmèrs, Alexander Michael, to Ciba-Geigy Corporation Stabilized epoxy resins 4,033,928, Cl 260-45.80N
- Randlett, Myron R. *See*—
  - Harvey, Walter W., Randlett, Myron R., and Bangerskis, Karlis I., 4,033,839, Cl 204-108.000
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  - Haeder, Gert Wilhelm, 4,034,165, Cl 179-115.50R
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  - Ohmori, Hitoshi; and Horie, Kiyoshi, 4,033,293, Cl 118-653.000
  - Takiguchi, Koichi, 4,034,188, Cl 219-216.000
- Ranson, Harry Christopher *See*—
  - Bickerdike, Robert Lewis, Clark, Douglas, Eastabrook, John Norman, Hughes, Garyth; Mair, William Norman, Partridge, Peter George, and Ranson, Harry Christopher, 4,033,793, Cl 148-32.000
- Raschle, Josef, to Heberlein & Co. AG Friction disc for driving twist tubes rotating at high speeds 4,033,106, Cl 57-77.450
- Rast, Gustaf J., Jr *See*—
  - Ashley, James R., Barley, Thomas A., and Rast, Gustaf J., Jr., 4,034,285, Cl 324-57.00R.
- Rathbun, Donald J., to Honeywell Information Systems, Inc Apparatus, including delay means, for sampling and recovering data recorded by the double transition recording technique 4,034,348, Cl 364-200.000.
- Rau, Robert Otto. *See*—
  - Pensa, Ildo Emil; and Rau, Robert Otto, 4,032,992, Cl 2-243.00R
- Rau, Willy, and Taus, Christian, to Maschinenfabrik Rau oHG Agricultural machine 4,033,417, Cl 172-613.000
- Raven Industries, Inc. *See*—
  - Parsons, Roger R., 4,033,527, Cl 244-99.000
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- Raymond Lee Organization, Inc., The *See*—
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  - Bolden, Edward J., 4,033,430, Cl 181-144.000.
  - Cox, Diane M., 4,033,619, Cl 296-21.000
  - Kern, Margaret Jean, 4,033,001, Cl 5-343.000
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- Raytheon Company *See*—
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  - Seidel, Harry W., 4,033,322, Cl 126-200.000.
- RCA Corporation *See*—
  - Bloom, Allen, and Ross, Daniel Louis, 4,033,905, Cl 252-500.000
  - Busanovich, Charles John, and Moore, Robert Milton, 4,034,127, Cl 427-76.000
  - Catanese, Carmen Anthony, Endriz, John Guiry, and Rajchman, Jan Aleksander, 4,034,255, Cl 313-400.000
  - de Pierre, Richard, Forgays, Gilbert Jerome, Behling, Hans Heinrich, and Curtis, William Childs, 4,034,373, Cl 343-7.700
  - Dietz, Wolfgang Friedrich Wilhelm, 4,034,262, Cl 315-408.000
  - Dietz, Wolfgang Friedrich Wilhelm, 4,034,263, Cl 315-408.000
  - Drukier, Ira, and Mykietyn, Edward, 4,034,399, Cl. 357-68.000
  - Firester, Arthur Herbert, 4,033,665, Cl. 350-3.500
  - Heckman, LeRoy Francis, Jr., and Pickard, James Bruce, 4,034,320, Cl 333-82.00B
  - Law, Harold Bell, 4,034,382, Cl 354-1.000
  - Schade, Otto Heinrich, Jr., 4,034,239, Cl 307-238.000
  - Schade, Otto Heinrich, Jr., 4,034,307, Cl 330-35.000
- Reed, Jack Owen Recovery of chorionic gonadotropic hormone from pregnant mares 4,033,344, Cl. 128-214.00R
- Reed, Robert D., and McGill, Eugene C., to John Zink Company. Apparatus for NO$_x$ control using steam-hydrocarbon injection 4,033,725, Cl 23-277.00C
- Reichel, Wilfried Apparatus having multiple heating wires for heating of a flat workpiece. 4,034,205, Cl 219-385.000.
- Reichenberger, Kurt: *See*—
  - Lein, Werner; Reichenberger, Kurt; and Schanze, Klaus, 4,033,260, Cl. 101-232.000
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- Reneerkens, Josef, to Ford Motor Company Method for preloading bearing 4,033,644, Cl 308-207.00A
- Rentmeester, Kenneth Richard, to American Can Company. Tubular body with a lap side seam 4,033,474, Cl. 220-75.000
- Republic Steel Corporation *See*—
  - Stone, Leonard R., Aron, Steven J., Jr.; and Kemmerling, Robert A., 4,033,885, Cl. 250-496.000
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  - Schwartz, Joseph B., and Restaino, Frederick A., 4,034,035, Cl 264-77.000
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  - Pfoutz, Ray W., Mauritz, Karl H., and Skurla, John P., 4,033,697, Cl 356-160.000.
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  - Ward, James C., and Davis, Robert Wayne, 4,033,606, Cl 280-682.000
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  - Cho, Susumu, Erickson, Paul Milton, and Reynolds, Gary Raymond, 4,034,299, Cl 325-363.000
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- Reynolds Metals Company *See*—
  - Kibby, Robert Milton, 4,033,757, Cl 75-10.00R
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- Rhoads, Roger R., to Owens-Illinois, Inc Container with improved heat shrunk cellular sleeve 4,034,131, Cl 428-35.000
- Rhomberg, Alfred, Berger, Herbert, Stach, Kurt, deceased, Plattner, Werner, administrator, Vomel, Wolfgang, and Sauer, Winfriede, to Boehringer Mannheim G m b H Cyclopenteno[1,2-h]quinol-4-one derivatives 4,033,967, Cl 260-287.0CF
- Rhomberg, Alfred, Berger, Herbert, Stach, Kurt, deceased, by Plattner, Werner, administrator, Vomel, Wolfgang, and Sauer, Winfriede, to Boehringer Mannheim G m b H Nitrogen containing derivatives of cyclopenteno-quinolone compounds and bacteriostatic compositions 4,034,096, Cl 424-258.000

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  - Berger, Christian, Farge, Daniel, Gros, Georges, Messer, Mayer Naoum, and Moutonnier, Claude, 4,034,090, Cl 424-246.000
  - Coquard, Jean, Sedivy, Pierre; Ruaud, Michel, and Verrier, Jean, 4,032,993, Cl 3-1.000
  - Mazarguil, Honore, Meiller, Francois, and Monsan, Pierre, 4,034,139, Cl 428-405.000.
  - Seigneurin, Laurent, and Brunet, Michel, 4,034,067, Cl 423-462.000
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  - Fujimoto, Sakae, 4,033,575, Cl 271-3.000
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- Robison, Charles D Container 4,033,455, Cl. 206-391.000
- Roch, Jacques Leon, to Electroglas, Inc. Micro-circuit test probe. 4,034,293, Cl. 324-158.00P
- Rockwell International Corporation *See*—
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  - Hallock, David B., 4,034,304, Cl 328-142.000
- Roda, Emilio, to Roda Macchine S.A Apparatus for manufacturing cardboard tubes. 4,033,241, Cl. 93-39.10R
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- Ruegger, Richard A, to United States of America, Navy Bending and cutting tool 4,033,388, Cl 140-106 000
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  - Bourgeois, Armand E., 4,033,529, Cl. 244-151 00B
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- Sirianni, Aurelio F.: *See—*
  - Capes, Charles E , Germain, Rene J ; McIlhinney, Allan E.; Puddington, Ira E., and Sirianni, Aurelio F., 4,033,729, Cl 44-1.00A.
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  - Tayakin, Jury Vasilievich, Sidorenko, Vladimir Pavlovich, Sirota, Alexandr Yakovlevich; Prokofiev, Jury Vladimirovich, and Kopytov, Alexandr Maximovich, 4,034,238, Cl 307-221 00C.
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  - MacFarlane, Thomas R., and Skinner, Frank R., II, 4,033,448, Cl 198-465.000.
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- Slaughter, Nan Burke: *See—*
  - Slaughter, Albert E., and Slaughter, Nan Burke, 4,033,023, Cl 29-401.00B.
- Sleziona, Joseph: *See—*
  - Demarcq, Michel; and Sleziona, Joseph, 4,034,022, Cl. 260-955.000.
- Slinn, Dennis Stanley. *See—*
  - Heavens, Michael, James, Richard Charles; and Slinn, Dennis Stanley, 4,034,224, Cl. 250-439 00P
- Slo Release, Inc.: *See—*
  - Moore, William Percy, 4,033,745, Cl. 71-28 000.
- Smartt, Herschel B.: *See—*
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  - Durant, Graham John; Ganellin, Charon Robin; and Owen, Geoffrey Robert, 4,034,101, Cl. 424-273.000.
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- SmithKline Corporation: *See—*
  - Berges, David A , 4,034,092, Cl 424-246 000
- Smiths Industries Limited: *See—*
  - Mann, George, 4,034,401, Cl. 358-93.000
- Smorang, Lawrence. *See—*
  - Windsor, Lynne E.; and Smorang, Lawrence, 4,034,204, Cl 219-368.000.
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  - Howie, David Malcolm, McKenzie, Roy Victor W., and Snape, James Ronald, 4,033,028, Cl 29-611.000.
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  - Krikorian, Esther, and Sneed, Richard J., 4,033,843, Cl 204-192 00P
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  - Cocuzza, Gioacchino, Torreggiani, Gianni; and Sfregola, Michele, 4,033,617, Cl. 203-27.000
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  - Grosseau, Albert, 4,033,423, Cl. 180-41 000.
- Societe Anonyme de Telecommunications *See—*
  - Aveneau, Andre A., and de Passoz, Guy A., 4,034,236, Cl. 307-261 000.
- Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques (SAVIEM) *See—*
  - Labat, Pierre, 4,033,437, Cl. 192-53 00F.
- Societe d'Appareillage Electrique Saparfi: *See—*
  - Canonne, Paul, 4,034,322, Cl. 335-42.000
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  - Evrard, Gerard Maurice Gaspard, 4,033,533, Cl 248-358.00R
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  - Dhelft, Patrick, 4,033,561, Cl. 266-193 000.
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  - le Gressus, Claude; Massignon, Daniel; and Sopizet, Rene, 4,034,220, Cl 250-310 000
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  - Marino, Armando V , and Sora, Albert, 4,034,171, Cl 200-51.00R.
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  - Sorenson, James L., Pannier, Karl A , Jr , and Reynolds, Gordon S., 4,033,345, Cl. 128-214 00R
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  - Burnett, Jack W., III, 4,034,150, Cl. 174-69.000
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  - Loest, Kent W., and Schaefer, John T., 4,033,842, Cl. 204-180 00P
- Spalding, Willard P., to Westinghouse Air Brake Company Automatic freight car brake apparatus with spring-applied fluid-pressure-released hand brake. 4,033,629, Cl 303-2 000
- Spanjer Brothers, Inc.: *See—*
  - Donatelle, Leo P., 4,033,218, Cl. 83-478.000.
- Spatz Corporation. *See—*
  - Spatz, Walter B., 4,033,700, Cl 401-180 000
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- Spector, George *See—*
  - Conn, John L., and Spector, George, 4,034,231, Cl. 290-53.000
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  - Lang, Donald D , 4,034,148, Cl 174-34 000
- Spencer, Harvey J., to Paper Converting Machine Company. Apparatus for handling wound rolls 4,033,862, Cl. 209-73 000.
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  - Monaco, Robert F., and Derchak, Nicholas, 4,034,349, Cl 364-200.000
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  - Wing, Willis G., 4,033,045, Cl 33-275.00G
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- Sprenkle, George Joseph *See—*
  - Romania, Samuel Richard, and Sprenkle, George Joseph, 4,033,032, Cl 29-764 000
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Bestel, John Louis, Haynes, Richard, and Srinivasan, Venkataraman, 4,033,833, Cl 204-15 000

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Rhomberg, Alfred, Berger, Herbert, Stach, Kurt, deceased, Plattner, Werner, administrator, Vomel, Wolfgang, and Sauer, Winfriede, 4,033,967, Cl. 260-287 0CF

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Stamer, Walter, to Claudius Peters AG Valve system for protection of the valve from abrasion 4,033,549, Cl 251-86 000

Standard Oil Company (Indiana) *See*—

Eberle, Frederick L., and Ostrofsky, Bernard, 4,033,176, Cl 73-67 900

Farr, John B., 4,033,429, Cl 181-106 000

Puskas, Imre, 4,034,052, Cl 260-671 00C

Stanfield, Jay E., to J I M Corporation Paper feeding and receiving systems for presses and duplicators 4,033,576, Cl 271-5 000

Stange, Klaus K., Smith, Richard E., Hamlin, Thomas J., and Cassano, James R., to Xerox Corporation Document handling apparatus 4,033,574, Cl 271-3 000

Stange, Klaus K., Smith, Richard E., Hamlin, Thomas J., and Cassano, James R., to Xerox Corporation Offset stacker 4,033,579, Cl 271-195 000

Stangroom, James Edward, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the Electric field responsive fluids 4,033,892, Cl 252-76 000

Stanik, Raimund *See*—

Kramer, Friedhelm, Wolfertz, Gunter, Klaus, Harald, Stanik, Raimund, Appelt, Horst Gustav, and Ramspott, Walter, 4,033,012, Cl 24-90 00D

Stanley, Richard B Synchronized linear actuator 4,033,194, Cl 74-89 150.

Stant Manufacturing Company, Inc *See*—

Evans, John H., 4,033,475, Cl 220-202 000

Stark, Eugene E. *See*—

Raley, Paul H., Dunbeker, George H., and Stark, Eugene E., 4,033,473, Cl 220-66 000

Starks, Charles M., to Continental Oil Company Nonflammable coating material 4,033,983, Cl 260-33 6UA

Starkweather, Gary K., to Xerox Corporation Flying spot scanner 4,034,408, Cl 358-293 000

Stauffer Chemical Company *See*—

Toy, Arthur D F., and Uhing, Eugene H., 4,034,024, Cl 260-981 000

Steel, Margaret Lillian; and Holt, Frank, to Imperial Chemical Industries, Limited. Treatment process. Re. 29,295, Cl. 106-308C.

Steele, Arthur J *See*—

Christian, Joseph C., and Steele, Arthur J., 4,033,711, Cl 431-66 000.

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Gilpin, William Cecil, Heasman, Noel, and Williamson, John, 4,033,778, Cl 106-58 000

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Hamell, Matthew, Stefanucci, Arthur, and Ward, William W., 4,034,116, Cl 426-131 000

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Beffa, Fabio, Back, Gerhard, and Steiner, Eginhard, 4,033,942, Cl 260-145 00A

Stenkvist, Sven-Einar Method and apparatus for equalizing the wall lining wear in three phase alternating current electric arc furnaces 4,034,146, Cl 13-11 000

Sterling, Henley F., and Drake, Miles P., to International Standard Electric Corporation Method for selective plating 4,033,832, Cl 204-15 000

Steward, John M Moving screen arrangement 4,034,272, Cl 318-7 000

Stewart, Robert C Vapor actuated power generating device 4,033,136, Cl. 60-671 000

Steyert, William A., Jr.; and Rosenblum, Stephen S Continuous, noncyclic magnetic refrigerator and method 4,033,734, Cl 62-3.000.

Stiles, Claude J.; and Tomo, Daniel, to National Distillers and Chemical Corporation. Plastic skin envelopes for glass bottles and the like 4,033,929, Cl 264-45.900

Stiles, Kenneth M., to Sea-Log Corporation Faired cable for anchoring offshore structures. 4,033,279, Cl 114-243 000

Stilz, John G.; and Jackson, Richard L., to Eli Lilly and Company Process for purifying glucagon. 4,033,941, Cl 260-112.50R

Stine, Joe C., to Houston Systems, Inc. Pipe handling system for vessels. 4,033,465, Cl. 214-13.000

Stockton, Thomas R., to Ford Motor Company Five speed overdrive transmission. 4,033,200, Cl 74-740 000.

Stokes, Kenneth B.. *See*—

Helland, John R., and Stokes, Kenneth B., 4,033,357, Cl 128-418.000

Stollenwerk, Hubert C., and Stollenwerk, Hubert F Fruit press 4,033,253, Cl. 100-118.000

Stollenwerk, Hubert F *See*—

Stollenwerk, Hubert C., and Stollenwerk, Hubert F., 4,033,253, Cl. 100-118 000

Stoltenberg, Donald A., to Pureco Systems, Inc Filtration apparatus and pressure seal. 4,033,873, Cl. 210-186 000

Stone, Clement A.. *See*—

Callery, Patrick S., Zenker, Nicolas, Wright, Jeremy, and Stone, Clement A., 4,034,100, Cl 424-272 000

Stone, Leonard R., Aron, Steven J., Jr., and Kemmerling, Robert A., to Republic Steel Corporation Apparatus for collimation of radiation signals for long distance transmission and method of construction therefor 4,033,885, Cl 250-496 000

Stone, Spencer A., to Deister Concentrator Company Inc Apparatus for separating high gravity from low gravity fractions of a coal or an ore 4,033,863, Cl 209-159 000

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Zolss, Gerhard, Pittner, Heribert, and Stormann-Menninger Lerchenthal, Heimo, 4,034,009, Cl 260-553 00A

Stoss, Peter, and Satzinger, Gerhard, to Warner-Lambert Company Thianthrene and phenoxathiine s-oximides 4,033,981, Cl 260 327 00M

Stowell, Michael James, Watts, Brian Michael, Emley, Edward Frederick, and Grimes, Roger, to British Aluminum Company, Limited, The, and T I (Group Services) Limited Aluminium base alloys 4,033,794, Cl 148-32 000

Streckenbach, Wulf-Christian, to Licentia Patent-Verwaltungs-G m b H. Circuit arrangement for evaluating received oscillations of a predetermined frequency 4,034,300, Cl 325-390 000

Strelitz, Robert A *See*—

Grier, Nathaniel, Dybas, Richard A., and Strelitz, Robert A., 4,033,748, Cl 71-67 000

Strempel, Thomas G., and Hora, Charles J., to Diamond Shamrock Corporation. Wafer electrode for an electrolytic cell 4,033,848, Cl 204-284 000

Strickler, Herbert S., to Allegheny General Hospital. Immunoassay procedures 4,034,071, Cl 424-1 000

Strike, Donald P., and Kao, Wen-Ling, to American Home Products Corporation Prostaglandin derivatives 4,034,002, Cl. 260-514 00D

Strike, Donald Peter, to American Home Products Corporation 15-Substituted prostanoic acid. 4,033,985, Cl 260-340.900.

Stroble, Michael F. Method and apparatus for releasing a drill string held by differential pressure. 4,033,414, Cl. 166-301.000.

Strong, Herbert M., and Tuft, Roy E., to General Electric Company Method and high pressure reaction vessel for quality control of diamond growth on diamond seed 4,034,066, Cl. 423-446.000

Strongin, Ned, Fogarty, A Edward, and Fogarty, Bonnie Rose. Toy foam glider 4,033,070, Cl 46-79 000

Strongin, Ned, Fogarty, A Edward, and Fogarty, Bonnie Rose. Sucking doll with cheekflexing means operated by turning bottle. 4,033,071, Cl 46-118 000

Strutzel, Hans, Gneuss, Detlef, and Klenk, Ludwig, to Hoechst Aktiengesellschaft Tubular film of polyethylene terephthalate and process for the production thereof. 4,034,055, Cl. 264-95.000.

Stubberfield, Pamela May *See*—

King, Hewson Nicholas Graham, Mansell, John Revere, and Stubberfield, Pamela May, 4,034,254, Cl. 313-400.000.

Studebaker, Thomas J. *See*—

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Sturesson, Rune, to Dynapac Maskin AB. Steering apparatus for road rollers 4,033,427, Cl. 180-140.000.

Stutzman, Howard A., to Atlas Industries, Inc Refrigeration compressor structures and their methods of construction. 4,033,707, Cl 417-312 000.

Suer, James David, to Cincinnati Milacron, Inc. Thermal protection for D C motors 4,034,415, Cl. 361-24 000.

Suga, Hisashi. *See*—

Hayashi, Masaki, Kori, Seiji, Miyake, Hajimu, Yamato, Takashi, and Suga, Hisashi, 4,034,003, Cl. 260-514.00D.

Sugihara, Kunihiko, Hioki, Kazuo, and Muranaka, Shigeo, to Nissan Motor Co., Ltd. Exhaust gas recirculation system. 4,033,306, Cl 123-119 00A

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Hayashi, Yoshimasa, Nakajima, Yasuo, Sugihara, Kunihiko, and Nagumo, Shin-ichi, 4,033,309, Cl 123-119 00A

Sugimoto, Yutaka, to Kabushiki Kaisha Komatsu Seisakusho: Double-drum winch 4,033,553, Cl. 254-185.00B

Sugimoto, Yutaka, and Shiota, Ryoji, to Kabushiki Kaisha Komatsu Seisakusho Double-drum winch. 4,033,554, Cl 254-185.00B

Sugioka, Takami *See*—

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Sugioka, Yasuji, to Taiyo Seiki Co., Ltd. Bookbinding machine 4,033,004, Cl 11-1 0AD

Sugiura, Akio *See*—

Arai, Hiroshi, Nogami, Takahiro, Sugiura, Akio; Okamoto, Atutoshi, and Toyama, Koichi, 4,033,634, Cl 303-103 000.

Sugiyama, Takashi, and Tsuda, Takashi, to Yokogawa Electric Works, Ltd Analog-to-digital converter utilizing a random noise source 4,034,367, Cl 340-347 0AD

Sullivan, Robert Patton, to Combustion Engineering, Inc. Bottom supported, hopper bottom furnace for pulverized coal firing 4,033,298, Cl 122-510 000

Sulzer Brothers Limited *See*—

Frey, Otto, 4,032,994, Cl 3-1 912

Gsching, Wilhelm, deceased, 4,033,239, Cl 92-58 000

Mandrin, Charles, 4,033,135, Cl 60-648.000

Rutz, Peter, 4,033,237, Cl 91-484 000

Wlodawer, Robert, 4,033,401, Cl 164-121 000

Sumimura, Shinichi *See*—

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Sumitomo Chemical Company, Ltd *See*

Hashimoto, Shunichi, and Kirino, Osamu, 4,033,752, Cl 71-93 000

Sasaki, Mitsuru, and Mukai, Kunio, 4,034,050, Cl 260-622 00R

Sun, Kwok K., to Upjohn Company, The Purification of methylenedianilines 4,034,039, Cl 260-570 00D

Sun Ventures, Inc *See*—

Hancock, Allen W., II, and Vanderwerff, William D., 4,034,005, Cl. 260-515 00P

Schneider, Abraham, and Janoski, Edward J., 4,033,799, Cl 149-120 000.

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Sunday, Brooks R.. *See*—

Schwender, Charles F., and Sunday, Brooks R., 4,033,961, Cl 260-251 00A

Sundeen, Joseph E.. *See*—

Hauck, Frederic Peter, and Sundeen, Joseph E., 4,033,971, Cl 260-293 720

Sunden, Olof Cellulose and cellulose products modified by silicic acid 4,033,913, Cl. 260-17.00R

Sundstrand Corporation: *See*—

Batts, Stephen S., 4,033,115, Cl 60-39 09R

Schaefer, John G., and Whitesel, Terry L., 4,033,706, Cl 417-79 000

Sundt, Erling, and Ohloff, Gunther, to Firmenich S A Menthone-8-thiol, carvomenthone-8-thiol and process for preparing same 4,034,044, Cl 260-586.00R.

Sunkist Growers, Inc *See*—

Paddock, Paul F., and Cramer, Jerry W., 4,033,450, Cl 198-648 000.

Suntech, Inc. *See*—

Angstadt, Howard P., 4,034,047, Cl 260-610 00B

Felton, George F., Jr., 4,033,886, Cl 252-34.700

Hansel, William B; and Lindeman, Myrl A., 4,033,389, Cl 141-207.000.

Sunwa Sharyo Mfg. Co., Ltd.. *See*—

Ikarimoto, Yasuaki, 4,033,421, Cl. 180-8.00A

Superior Electric Company, The. *See*—

Leenhouts, Albert C., 4,034,277, Cl. 318-685 000

Support Systems, Inc. *See*—

Doring, Lawrence C., and Williams, Robert E., Jr., 4,033,653, Cl 312-253.000.

Sussman, Walter. Gonioscope 4,033,679, Cl. 351-16 000

Suzuki, Hideaki *See*—

Nakamura, Tetsuro; and Suzuki, Hideaki, 4,034,396, Cl 357-30.000.

Suzuki, Kazuo, and Akuta, Shinichiro, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Magnetic recording medium 4,034,410, Cl 360-55.000

Suzuki, Kazuo. *See*—

Takahashi, Toshiro, Nagano, Toshihiro, Nakamura, Katsuhiko, Kikuchi, Masaru, and Suzuki, Kazuo, 4,033,024, Cl 29-403.000.

Suzuki, Osamu *See*—

Sasayama, Chikanobu, Suzuki, Osamu, Shimizu, Takeshi, and Chiba, Kunji, 4,033,107, Cl 57-81.000

Svenska Tobaks AB *See*—

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Sweet, David L.. *See*—

Sweet, Philip J., Hamlet, Buck C., and Sweet, David L., 4,033,608, Cl 280-711.000

Sweet, Philip J., Hamlet, Buck C., and Sweet, David L., to American Carrier Equipment Air spring unit 4,033,608, Cl 280-711 000

Sweet, Roger G., to Catalyst Research Corporation. Thermal deferred action battery with interconnecting, foldable electrodes 4,034,143, Cl. 429-112.000.

Swenson, Henry F., to J & S Tool Company, Inc Live center with hydraulic pressure indicator 4,033,210, Cl. 82-31 000

Swenson, Henry F., to J & S Tool Company, Inc Replaceable flinger for live centers 4,033,211, Cl 82-33 00R

Swenson, Leonard K., to J F Pritchard and Company Single mixed refrigerant, closed loop process for liquefying natural gas 4,033,735, Cl 62-9 000

Swiger, James W. Electrical connector 4,033,662, Cl 339-113 00R

SWS Silicones Corporation *See*—

Lengnick, Guenther Fritz, 4,033,902, Cl. 252-441 000

Syntex (U.S A.) Inc.. *See*—

Untch, Karl G., and Gardner, John O., 4,033,978, Cl 260-306 70R

Szekely, Akos. *See*—

Trumble, John H., and Szekely, Akos, 4,033,323, Cl 126-263 000

Szuberla, John H *See*—

Hrdlicka, Eugene R., Vincolese, George J., and Szuberla, John H., 4,034,157, Cl. 179-1 0PC

T I (Group Services) Limited *See*—

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Taga, Yutaka *See*—

Kuramochi, Kojiro, and Taga, Yutaka, 4,033,146, Cl 64-23 000

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Tsunekawa, Tokuichi, Nakamoto, Soichi, and Taguchi, Tetsuya, 4,034,384, Cl 354-33 000

Tahara, Kumeo, to Motorola, Inc Magnetic head lifting device 4,034,413, Cl 360-106 000

Taiyo Seiki Co., Ltd *See*

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Takagi, Izumi, and Asazuma, Masayuki, to Kawasaki Heavy Industries, Ltd Driven clutch device for V-belt type automatic transmission 4,033,195, Cl 74-230 17M

Takahashi, Toshiro, Nagano, Toshihiro, Nakamura, Katsuhiko, Kikuchi, Masaru, and Suzuki, Kazuo, to Riken Keikinzoku Kogyo Kabushiki Kaisha Method for producing extruded structural profiles from scrap materials of aluminum based metal 4,033,024, Cl 29 403 000

Takami, Takeshi *See*—

Shimizu, Akira, Kusano, Manabu, and Takami, Takeshi, 4,033,933, Cl 260-45 85R

Takase, Tsuneo, and Yamaguchi, Tetsuo, to Tokyo Shibaura Electric Co., Ltd Time correction circuits for electronic timepieces 4,033,109, Cl 58-85 500

Takashina, Naomitsu *See*

Tamai, Yasuo; Honjo, Satoru, Osawa, Sadao, Satomura, Masato, Osada, Chiaki, Nagashima, Wakio, and Takashina, Naomitsu, 4,033,890, Cl. 252-62 10L

Takechi, Taichi. *See*—

Mitsui, Hisayasu, Kamiuchi, Jun-ichi, Kumazawa, Ryozi, Umemoto, Kimikazu, Yamada, Toshimitsu, Yoshida, Katsuhiko, and Takechi, Taichi, 4,033,805, Cl 156-185 000

Takeda Chemical Industries, Ltd *See*—

Funakoshi, Yoshiro, Matsumura, Yoshihiko, Yamamoto, Masaki, and Komeda, Hiromu, 4,034,126, Cl 427-8.000

Takeda, Toshio *See*—

Tomisawa, Norio, Uchiyama, Yasuji, Okumura, Takatoshi, and Takeda, Toshio, 4,033,221, Cl 84-1 030

Takedoi, Atushi *See*—

Matsui; Goro, Toda, Koji, Shimizu, Shigeki, Horiishi, Nanao, and Takedoi, Atushi, 4,033,891, Cl 252-62 560

Takeuchi, Akihiro *See*—

Asai, Kiyokazu, and Takeuchi, Akihiro, 4,034,244, Cl 310-8 200

Takeuchi, Shinjiro *See*—

Kobayashi, Toshihiko, Kanbayashi, Tetsusaburo, Ichioka, Satoshi, Takeuchi, Shinjiro, and Matsushima, Yukinori, 4,034,180, Cl 219-85 0BM

Takezoe, Fumihiko, to Fuji Electric Company Ltd. Method and apparatus for transmitting common information in the information processing system. 4,034,351, Cl. 364-200 000

Takiguchi, Koichi, to Rank Xerox, Ltd Heat fixing device for copying machine. 4,034,188, Cl 219-216 000

Tamada, Minoru, Shikama, Takashi, and Nakamura, Toshikazu, to Murata Manufacturing Co., Ltd Positive temperature coefficient semiconductor heating element 4,034,207, Cl 219-517.000

Tamai, Yasuo, Honjo, Satoru, Osawa, Sadao; Satomura, Masato, Osada, Chiaki, Nagashima, Wakio, and Takashina, Naomitsu, to Fuji Photo Film Co., Ltd., and Mitsubishi Gas Chemical Company, Inc Liquid developer for electrophotography 4,033,890, Cl 252 62 10L

Tamiya, Tatsuo, to Senko Medical Instrument Mfg Co Ltd Oxygenator having a variable capacity oxygenating tube 4,033,724, Cl 23-258 5BH

Tanaka, Jinkichi *See*—

Koshiga, Fusao, Tanaka, Jinkichi, and Watanabe, Itaru, 4,034,179, Cl 219-74 000.

Tancredi, Henry J. Image viewing apparatus 4,033,683, Cl 353-7 000

Tandrup, Leif Borge. *See*

Nicolaisen, Holger, Andersen, Finn Schnoor, and Tandrup, Leif Borge, 4,034,327, Cl 337-41 000

Tanigawa, Kou, Hashikawa, Kenzo, and Ota, Jun, to Fujitsu Ten Ltd., and Toyota Jidosha Kogyo Kabushiki Kaisha Check circuit for checking vehicle warning system 4,034,369, Cl 340 52 00F

Taninaka, Kuniaki, Kurono, Hitoshi, and Kasai, Tsutomu, to Nihon Nohyaku Co Ltd 4-Substituted-1,3-dithiolan-2-ylidene malonates and pharmaceutical compositions containing the same 4,034,102, Cl 424-277 000

Tanton, George A., and Smith, James L., to United States of America, Army Zeeman effect optical isolator 4,033,670, Cl 350-151 000

Taschner, Raymond George *See*—

Moehle, Kenneth Albert, and Taschner, Raymond George, 4,033,542, Cl 248-358 0AA

Tashiro, Eiji, to Tokyo Plywood Kabushiki Kaisha Plate block 4,033,082, Cl 52 316 000

Tashiro, Isao *See*—

Fukuda, Takeo, and Tashiro, Isao, 4,034,364, Cl 340-347 0NT

Tatemoto, Jirou *See*—

Kobayashi, Hitoshi, and Tatemoto, Jirou, 4,033,072, Cl 47-62 000

Taube, Donald R., to Essex Group, Inc. Apparatus and method for forming dynamoelectric machine field windings by pushing 4,033,385, Cl 140-92 100

Taubert, Werner, to Siemens Aktiengesellschaft Three-position ribbon guide for printer. 4,033,446, Cl 197-157 000

Taus, Christian *See*—

Rau, Willy, and Taus, Christian, 4,033,417, Cl 172-613 000.

Tausch, Gerald, to Miller-Holzwarth, Inc Periscope blackout blind construction. 4,033,677, Cl. 350-301.000.

Tayakin, Jury Vasilievich, Sidorenko, Vladimir Pavlovich, Sirota, Alexandr Yakovlevich, Prokofiev, Jury Vladimirovich, and Kopytov, Alexandr Maximovich Field effect transistor information transfer circuit for use in storage register 4,034,238, Cl. 307-221 00C

Taylor, Gregg W., to A H P., Inc Analysis of gentian violet residue in tissue 4,033,721, Cl 23-230.00B

Taylor, Herbert E , and Evans, Frederick P., to P/A Industries, Inc Fluid flow distribution device and strip oiler system utilizing the same 4,033,289, Cl. 118-227 000

Taylor, Ronald Wayne *See*—
    Berenson, Walter Louis, and Taylor, Ronald Wayne, 4,034,296, Cl. 325-62 000

Taylor, Thomas N ; and Schoppe, Wayne F., to Xerox Corporation Stack elevating apparatus 4,033,578, Cl 271-157 000

Taylor Woodrow Construction Limited *See*—
    Webber, John William Robert, and Roberts, Anthony Charles, 4,033,815, Cl 176-87 000

Teijin Limited *See*—
    Abe, Isamu, and Sugioka, Takami, 4,033,519, Cl 242-18 00A

Teijin Seiki Co , Ltd *See*—
    Abe, Isamu, and Sugioka, Takami, 4,033,519, Cl 242-18 00A

Tektronix, Inc *See*—
    Allen, David William, and Borchert, Marshall Bond, 4,034,291, Cl 324-121 00R

Telautograph Corporation *See*—
    Muller, Alex Marcel, and Tyrrell, Joseph Leslie, 4,034,155, Cl 178-19 000

Teldix GmbH *See*—
    Leiber, Heinz, 4,033,637, Cl 303-115 000

Teletype Corporation *See*—
    Berry, James M , 4,034,379, Cl 346-1 000
    Heeren, Richard H., 4,034,242, Cl 307-269 000

Temco Metal Products Company, Inc *See*—
    Keller, Russell D , 4,033,369, Cl 137-68 00R

ten Broeke, Jan, Grabowski, Edward J J., Flataker, Lars M , Fisher, Michael H , and Patchett, Arthur A , to Merck & Co , Inc Diazatetracyclododecanes 4,033,968, Cl 260-288 0CF

Tenneco Chemicals, Inc *See*—
    Gottesman, Roy Tully, 4,034,007, Cl 260-524 00R

Terasawa, Hidenori, and Mori, Ikeo, to Nippon Kogaku K K Wide angle lens 4,033,675, Cl 350-216 000

Terrett, Joann *See*—
    Inzana, Margaret, and Terrett, Joann, 4,033,364, Cl 132-88 500

Texaco Inc *See*—
    Bennett, Richard H , Klock, Byron V , and Brockington, James W , 4,033,899, Cl 252-420 000
    Buinicky, Ernest P , Durkin, Joseph A , and Estes, John H , 4,033,901, Cl 252-432 000
    Colvert, James H , Jahnke, Frederick C., and Williams, Dale, 4,033,856, Cl 208-102.000
    Williams, Dale, Colvert, James H , and Jahnke, Frederick C , 4,033,857, Cl. 208-102 000

Texas Instruments Incorporated *See*—
    Ehlers, Brian C.; and Boulanger, Henry J , 4,034,234, Cl 307-116.000.

Textron, Inc *See*—
    Kirrish, Hail, and Provenzano, Albert J , 4,033,243, Cl. 85-4 000
    Manning, Harry F , 4,033,014, Cl 24-205.16R
    Moertel, George B , 4,034,056, Cl 264-281 000

Thal, Claude. *See*—
    Sevenet, Thierry, Thal, Claude, Potier, Pierre; and Husson, Henri Philippe, 4,033,969, Cl 260-293 530

Thary, Christian, Bernard, Armand R , Labadie, Jean Francois, and De La Taille, Olivier P , to Etablissements Bertrand Faure Child's safety restraint for use in a vehicle 4,033,623, Cl 297-390 000

Thermology, Inc.. *See*—
    Trumble, John H., and Szekely, Akos, 4,033,323, Cl 126-263 000.

Therrien, Norman W. Display container 4,033,452, Cl 206-.830

Thetford Corporation *See*—
    Sargent, Frak T., and Antos, John M., 4,032,996, Cl 4-17 000.

Thimmonier S.A.. *See*—
    Burgat, Georges, and Guillemaut, Bernard, 4,033,096, Cl 53-386.000.

Thomas, David E.; McCoy, Marion B ; and Chaky, Michael J , to NCR Corporation. Method and apparatus for testing data processing machines. 4,034,194, Cl 235-153 0AC.

Thomasset, Andre Alphonse, to Planet-Wattohm Oscillating suspension for strips of plastic material 4,033,396, Cl 160-332 000

Thompson Manufacturing Company *See*—
    Jennison, James M., and Williams, Henry Thomas, 4,033,510, Cl 239-230.000.

Thomson-CSF: *See*—
    Armand, Marc, 4,034,312, Cl 331-96 000
    Hartemann, Pierre, 4,034,288, Cl. 324-80.000.
    Mourier, Georges, 4,034,258, Cl 315-39.000.
    Renard, Yves, 4,034,282, Cl. 323-17.000

Thorn, Lawrence B.: *See*—
    Betts, Robert E.; Thorn, Lawrence B , and Maykut, Albert R , 4,033,121, Cl. 60-271.000

Thornton, Douglas M.. *See*—
    Miller, Raymond A., Jr., and Thornton, Douglas M , 4,033,615, Cl 285-333.000.

Thorsteinson, Erlind Magnus *See*—
    Kurtz, Abraham Nathan, Thorsteinson, Erlind Magnus, and Decker, Harry Joe, 4,034,008, Cl 260 533 00N

Thwaites, Peter John, and Joyce, Peter Waterworth, to Dufaylite Developments Limited Structural cellular materials 4,033,251, Cl 100-95 000

Tieman, Charles H., to Shell Oil Company 1,1,1-Trichloro-3-nitro-3-(tetrahydro-2H-1,3-thiazin 2 ylidene)-2-propanone 4,033,952, Cl 260-243 00R

Tieman, Charles H , to Shell Oil Company 3-(5,6 Dihydro 4H-1,3-thiazin-2-yl)-3-nitro-2-propenoic acid 4,033,953, Cl 260-243 00R

Tieman, Charles H , to Shell Oil Company 3,4-Dihydro-7-hydroxy-8-nitro-2H-pyrrolo(2,1-b)-(1,3)thiazin-6(7H)-one. 4,033,954, Cl 260-243 00R

Tien, Rex Y *See*—
    Castenson, Richard L , Hazen, James R., and Tien, Rex Y , 4,033,986, Cl 260-345 200

Tinsley, John M *See*
    Holtmyer, Marlin D , Githens, Charles J , and Tinsley, John M , 4,033,415, Cl 166-308 000

Tipton, Larry J , to ACF Industries, Incorporated Metering rod control for an air valve carburetor 4,034,029, Cl 261-44.00R

Tipton, Peter William, to John Wyeth & Brother Limited Apparatus for handling coverslips 4,033,809, Cl 156-572 000.

Tjernagel, Gerald P *See*—
    Larsen, Otis M , Larsen, Richard D , Tjernagel, Gerald P , and Marine, Steven L., 4,033,826, Cl. 195-139.000

Tobey, Hubert Earl, Hood, John William, Masiuk, Alphonse Michael, Irvin, Dee Lavern, and Moller, George Otto, to International Telephone and Telegraph Corporation. Method and apparatus for printing on the side of empty boxes 4,033,254, Cl 101-44 000

Toda, Akira *See*—
    Morita, Eiichi, Toda, Akira, Kobayashi, Toru, and Fujii, Hiroshi, 4,033,206, Cl 82-2.00B

Toda Kogyo Corporation *See*—
    Matsui, Goro, Toda, Koji, Shimizu, Shigeki, Horiishi, Nanao, and Takedoi, Atushi, 4,033,891, Cl 252-62.560.

Toda, Koji *See*—
    Matsui, Goro, Toda, Koji, Shimizu, Shigeki, Horiishi, Nanao, and Takedoi, Atushi, 4,033,891, Cl. 252-62.560.

Toi, Toshio, to Nippon Air Brake Company Ltd. Fluid pressure operable servo positioner 4,033,233, Cl. 91-374.000.

Tokyo Plywood Kabushiki Kaisha. *See*—
    Tashiro, Eiji, 4,033,082, Cl 52-316.000.

Tokyo Shibaura Electric Co., Ltd *See*—
    Fukuda, Takeo, and Tashiro, Isao, 4,034,364, Cl 340-347.0NT
    Goto, Eizo, 4,034,330, Cl. 338-238.000
    Kamo, Hisao, Kuroda, Masahiro, and Okano, Susumu, 4,034,394, Cl 357-15 000.
    Kawai, Tsuneo, 4,033,047, Cl. 34-82.000
    Mitsui, Hisayasu, Kamiuchi, Jun-ichi; Kumazawa, Ryozi; Umemoto, Kimikazu, Yamada, Toshimitsu; Yoshida, Katsuhiko, and Takechi, Taichi, 4,033,805, Cl. 156-185.000
    Naito, Makoto, Kawachi, Masaru; Sekiwa, Tetuo; Akatsuka, Minoru; Kasami, Akinobu, and Toyama, Masaharu, 4,033,291, Cl. 118-412 000
    Sano, Shunichi, and Ogawa, Youji, 4,034,324, Cl 335-212.000.
    Takase, Tsuneo, and Yamaguchi, Tetsuo, 4,033,109, Cl. 58-85 500.

Tomilin, Alexandr Grigorievich *See*—
    Dmitriev, Vasily Petrovich, Polyakov, Anatoly Mikhailovich, Tomilin, Alexandr Grigorievich, and Shushpan, Stanislav Mikhailovich, 4,033,116, Cl. 60-39 28R

Tomioka, Tatsuyuki, Yukami, Noboru, Hamaguchi, Yoshi; and Yamashita, Kiyoharu, to Matsushita Electric Industrial Co., Ltd Thermal printing head 4,034,187, Cl 219-216.000

Tomisawa, Norio, Uchiyama, Yasuji, Okumura, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha Key switch system 4,033,221, Cl 84-1 030

Tomlinson, Barrett L., and Hill, Howard D. W., to Varian Associates, Inc Spectrometer means employing linear synthesized RF excitation 4,034,191, Cl. 235-151.300.

Tomo, Daniel *See*—
    Stiles, Claude J , and Tomo, Daniel, 4,033,929, Cl 264-45 900.

Tong, Alvin H *See*—
    Demsky, Hernert M., Mathisen, Einar S , Schumann, Paul A., Jr., and Tong, Alvin H , 4,033,698, Cl. 356-173.000.

Tooley, Clyde E , to Upjohn Company, The Pneumatic valve interlock system 4,033,379, Cl 137-637 100

Toombs, Thomas N *See*—
    Dill, Hans G , and Toombs, Thomas N., 4,033,797, Cl 148-187 000.

Toray Silicone Company, Ltd *See*—
    Mine, Katsutoshi, Nishio, Minoru, and Sumimura, Shinichi, 4,033,924, Cl. 260-37.0SB

Toriumi, Shiro, Endo, Hiroshi, Ueda, Nobuo, and Yamagishi, Seiichi, to Minolta Camera Kabushiki Kaisha Microfiche reader means 4,033,684, Cl 353-27 00A

Torok, Ernest J , Kaske, Alan D , Krawczak, John A , and Paul, Maynard C , to Sperry Rand Corporation Magneto-resistive readout of a cross-tie wall memory system using a pillar and concentric ring probe 4,034,359, Cl 340-174.0TF

Torreggiani, Gianni *See*—
    Cocuzza, Gioacchino, Torreggiani, Gianni, and Sfregola, Michele, 4,033,617, Cl 203-27 000

Totuka, Kaoru, Ohwaki, Isao, Ohba, Masahiro, and Nakamura, Shinji, to Victor Company of Japan, Limited Record disc cutting stylus 4,033,592, Cl 274 38 000

Toulios, Peter P *See*—
    Knox, Robert M , and Toulios, Peter P , 4,034,377, Cl 343-180 000

Towler, Martin L *See*—
    Bracey, Jep T , 4,034,030, Cl 261-64 00D

Towmotor Corporation *See*—
    Evans, Dafydd W , 4,033,424, Cl 180 68 500

Toy, Arthur D F , and Uhing, Eugene H , to Stauffer Chemical Company Method of preparing trialkyl tetrathiophosphates 4,034,024, Cl 260 981 000

Toyama, Koichi *See*—
    Arai, Hiroshi, Nogami, Takahiro, Sugiura, Akio, Okamoto, Atutoshi, and Toyama, Koichi, 4,033,634, Cl 303-103 000

Toyama, Masaharu *See*—
    Naito, Makoto, Kawachi, Masaru, Sekiwa, Tetuo, Akatsuka, Minoru, Kasami, Akinobu, and Toyama, Masaharu, 4,033,291, Cl 118-412 000

Toyota Jidosha Kogyo Kabushiki Kaisha *See*—
    Arai, Hiroshi, Nogami, Takahiro, Sugiura, Akio, Okamoto, Atutoshi, and Toyama, Koichi, 4,033,634, Cl 303-103 000
    Arai, Hiroshi, 4,034,336, Cl 340-52 00F
    Inada, Masami, Kawabata, Yasuhiro, and Sato, Katsujiro, 4,033,125, Cl 60-290 000
    Kuramochi, Kojiro, and Taga, Yutaka, 4,033,146, Cl 64-23 000
    Maeda, Yorishige, 4,033,196, Cl 74-242.11R.
    Sakai, Ichio, 4,033,201, Cl 74-869 000
    Shingu, Iichi, Kondo, Yutaka, and Nishina, Shuho, 4,033,610, Cl 280-737 000
    Tanigawa, Kou, Hashikawa, Kenzo, and Ota, Jun, 4,034,369, Cl 340-52.00F

Trelby, Ib Verner, to F L Smidth & Co Rotary drum plant with water introduction system 4,033,376, Cl 137-580 000

Treuner, Uwe D , to E R Squibb & Sons, Inc 4-Morpholino derivatives of pyrazolo[1,5-a]-quinoxaline-3-carboxylic acids and esters 4,033,958, Cl 260-247 20B

Tribotech *See*—
    Cain, Earl S., Carlson, Jerome A , and Goodrich, George E , 4,033,641, Cl 308-15 000

Trimmer, David G Beam cutting and mitering device. 4,033,035, Cl. 30-122 000

Trost, Allen J , to Ampex Corporation. Pilot signal luminance correction means for video recording apparatus. 4,034,397, Cl 358-8 000

Troutner, Arthur L., to Trus Joist Corporation. Sequencing die and method for forming truss webs from metal tubing 4,033,166, Cl 72-334 000

Troutner, Arthur L , to Trus Joist Corporation Apparatus and method for forming planks for use in chord components of integral truss-supported decks. 4,033,391, Cl. 144-321 000

Trumble, John H.; and Szekely, Akos, to Thermology, Inc. Heat transfer sleeve for chemical heaters. 4,033,323, Cl. 126-263.000

Trus Joist Corporation: *See*—
    Troutner, Arthur L., 4,033,166, Cl 72-334.000
    Troutner, Arthur L , 4,033,391, Cl. 144-321 000

TRW Inc.. *See*—
    Cronin, Donald L., Farber, Bertrand F., Gehm, Hartmut K., and Goldin, Daniel S., 4,034,280, Cl. 363-25 000
    Hudgens, Bernard C., 4,033,020, Cl. 29-149 5NM
    Olsson, David L., 4,034,319, Cl 333-73.00R.
    White, Peter G., 4,034,190, Cl. 235-151.300

Tscheulin, Guenther *See*—
    Hofer, Kurt, and Tscheulin, Guenther, 4,033,957, Cl 260-246 00B

Tsoi-Hei Ma, Thomas, to Ford Motor Company Variable venturi carburetor 4,034,028, Cl 261-41 00R

Tsuchiya, Hiroyoshi; Tsuda, Yukifumi, Hayami, Heijiro, and Kotera, Hiroaki, to Matsushita Electric Industrial Co , Ltd Facsimile signal transmission system 4,034,406, Cl 358-260.000.

Tsuda, Takashi. *See*—
    Sugiyama, Takashi, and Tsuda, Takashi, 4,034,367, Cl. 340-347.0AD

Tsuda, Yukifumi *See*—
    Tsuchiya, Hiroyoshi, Tsuda, Yukifemi, Hayami, Heijiro, and Kotera, Hiroaki, 4,034,406, Cl 358-260 000

Tsujimoto, Michihiro, Tsukahara, Ryoichi, Nishizawa, Tsutomu, and Okubo, Ichiro, to Mitsui Toatsu Chemicals, Incorporated Coloring resins by mixing naphthacenequinones therewith. 4,033,923, Cl 260-37.00N.

Tsukada, Syusei: *See*—
    Hirayama, Kazuhiro, Tsukada, Syusei, and Inoue, Takahiro, 4,033,687, Cl 355-1 000

Tsukahara, Ryoichi *See*—
    Tsujimoto, Michihiro, Tsukahara, Ryoichi, Nishizawa, Tsutomu, and Okubo, Ichiro, 4,033,923, Cl 260-37 00N

Tsunekawa, Tokuichi, Nakamoto Soichi, and Taguchi, Tetsuya, to Canon Kabushiki Kaisha Exposure meter circuit of camera with matching network for flash device. 4,034,384, Cl 354-33 000

Tuft, Roy E *See*—
    Strong, Herbert M , and Tuft Roy E , 4,034,066, Cl 423-446 000

Tuller, Harold W *See*—
    Curtis, Omer E , Jr , Tuller, Harold W O'Neill, Charles T , and Nussbaum, Ralph W , 4,034,014, Cl 260-837 00R

Tuomy, Justin M *See*—
    Glickstein, Myer, and Tuomy, Justin M , 4,034,123, Cl 426-582 000

Turcotte, Ronald E , to Schlumberger Technology Corporation Focused detection logging technique 4,034,218, Cl 250-269 000

Turczanski, Henryk *See*—
    Hill, John, and Turczanski, Henryk, 4,034,326, Cl 337-34.000

Turrentine, Fred C . *See*—
    Hicks, Prentiss C , and Turrentine, Fred C , 4,033,481, Cl 222-134 000

Twiselton, Steven Glen *See*—
    Rozylowicz, Edward Francis, and Twiselton, Steven Glen, 4,034,289, Cl 324-95 000

Tybus, Gerd, Ebner, Ludwig, Waldhoer, Rudolf, Bichler, Peter, Bier, Wilhelm, Happe, Peter, and Weis, Frowald, to Messerschmitt-Bolkow-Blohm GmbH, and Gesellschaft fur Kernforschung m b H Gas separation nozzles and method and apparatus for producing such nozzles 4,033,021, Cl 29 157 00C

Tyrrell, Joseph Leslie *See*—
    Muller, Alex Marcel, and Tyrrell, Joseph Leslie, 4,034,155, Cl 178 19 000

Ubukata, Takao *See*—
    Morita, Kouichi, Sekine, Hirohito, and Ubukata, Takao, 4,034,281, Cl 323 17 000

Uchiyama, Yasuji *See*—
    Tomisawa, Norio, Uchiyama, Yasuji, Okumura, Takatoshi, and Takeda, Toshio, 4,033,221, Cl 84-1 030

Ueda, Nobuo *See*
    Toriumi, Shiro, Endo, Hiroshi, Ueda, Nobuo, and Yamagishi, Seiichi, 4,033,684, Cl 353-27 00A

Uemura, Michihiko, Kanbara, Tohru, and Igarashi, Yutaka, to Asahi Glass Co , Ltd Ultrasonic delay lines and method of making the same 4,034,317, Cl 333-30 00R

Ueno, Masayuki, and Sano, Fumiaki, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha Mud gun having clamping device 4,033,565, Cl 266-273 000

Uhing, Eugene H *See*—
    Toy, Arthur D F , and Uhing, Eugene H , 4,034,024, Cl 260 981 000

Uhlig, Fritz, to Hoechst Aktiengesellschaft Process for the production of planographic printing forms by means of laser beams 4,034,183, Cl 219 122 0LM

Ulisi, Moreno, to Saint-Gobain Industries Manufacture of a window by breaking the edges of a sheet of glass along a score 4,033,490, Cl 225-1 000

Umemoto, Kimikazu *See*—
    Mitsui, Hisayasu, Kamiuchi, Jun-ichi, Kumazawa, Ryozi, Umemoto, Kimikazu, Yamada, Toshimitsu, Yoshida, Katsuhiko, and Takechi, Taichi, 4,033,805, Cl 156-185 000

Union Carbide Corporation *See*—
    Eichin, Harry P , 4,033,382, Cl 138-118 100
    Fernicola, Robert C., 4,034,184, Cl 219-124 000
    Kasai, Paul Haruo, Francis, James Nelson, and Bishop, Roland Justin, Jr , 4,034,065, Cl 423-328 000
    Kurtz, Abraham Nathan, Thorsteinson, Erlind Magnus, and Decker, Harry Joe, 4,034,008, Cl 260-533 00N
    Ometanski, George M , Furbee, Harold D , and Chuang, Vincent T , 4,033,990, Cl 260-448 20B
    Papa, Anthony Joseph, 4,033,909, Cl 260-2.50F.
    Papa, Anthony Joseph, 4,033,910, Cl 260-2 50F.
    Sandner, Michael Ray, and Prokai, Bela, 4,033,911, Cl 260-2.5AC

Union Corporation *See*—
    Schorsch, John B , Graul, William E., and Barash, David, 4,033,142, Cl 62-381 000

Union Oil Company of California *See*—
    Bewley, William L., and Wilkinson, Herbert F., deceased, 4,033,467, Cl 214 23 000
    McArthur, Dennis P , 4,034,061, Cl 423-213 500
    Young, Donald C , 4,033,746, Cl 71-30 000
    Young, Donald C , 4,033,747, Cl 71-30 000

Uniroyal Inc *See*—
    Whelan, William Paul, Jr , 4,033,916, Cl 260-28 50A.

United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the *See*—
    Bickerdike, Robert Lewis, Clark, Douglas, Eastabrook, John Norman, Hughes, Garyth, Mair, William Norman, Partridge, Peter George, and Ranson, Harry Christopher, 4,033,793, Cl 148-32 000
    Stangroom, James Edward, 4,033,892, Cl 252-76 000.

United Merchants and Manufacturers, Inc *See*—
    Gregorian, Razmic S.; and Hoernle, Hans R , 4,034,134, Cl 428-86 000

United States of America
    Administrator, Environmental Protection Agency. *See*—
        Smith, Richard Dunham, 4,033,117, Cl 60-39 46S
    Agriculture *See*—
        Silverstein, Robert M , Gore, William E , Pearce, Glenn T , Cuthbert, Roy A , Simeone, John B , Lanier, Gerald N , and Peacock, John W , 4,034,080, Cl 424-84 000
    Air Force *See*—
        Van Etten, Paul, and McNamara, John V.; 4,034,363, Cl 340-347 00P
        Willmore, Robert R , 4,034,156, Cl 178-22 000.
    Army *See*—
        Ashley, James R , Barley, Thomas A , and Rast, Gustaf J., Jr , 4,034,285, Cl 324-57 00R

  Betts, Robert E., Thorn, Lawrence B., and Maykut, Albert R., 4,033,121, Cl 60-271.000.
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VDO Adolf Schindling AG *See*—
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  Johne, Hans, Jentzsch, Arndt, and Schumann, Gunter, 4,033,262, Cl 101-350 000
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  Capuano, Terry D., 4,033,394, Cl 151-21 00C
  Jackson, James J., 4,034,193, Cl 235-151.340
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  Weiss, Franz, Baumgartner, Friedrich; and Zach, Werner, 4,033,514, Cl 239-662 000
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  Anderson, Arnold L., 4,033,926, Cl. 260-45 75B
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  Lawson, Leslie Edward, 4,033,919, Cl 260-29.6TA.
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Vogel, Paul W., to Lubrizol Corporation, The Boron-containing esters 4,034,038, Cl 260-462 00R
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  Hoehn, Hans, Bernstein, Jack; and Vogt, Berthold Richard, 4,033,970, Cl 260-293 610
Voigt, John E. *See*—
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  Sorgatz, Ulrich, and Kogge, Hans-Jurgen, 4,033,642, Cl 308-26.000
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  Warren, William C., Volpe, Anthony R., and Rustogi, Kedar N., 4,033,008, Cl 15-167 00R
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  Kleimann, Helmut, and von Bonin, Wulf, 4,033,912, Cl 260 2 5AH
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  Cohen, Marvin P., Shavel, John, Jr., and von Strandtmann, Max, 4,033,845, Cl 260-240.00D.
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  Mureso, Vladimir, 4,033,148, Cl 66-50 00R
W A Whitney Corporation *See*—
  Brolund, Theodore F., and Helgert, James F., 4,033,216, Cl 83-413 000
W R Chesnut Engineering, Inc *See*—
  Chesnut, W Richard, and Calligaro, Daniel, 4,033,522, Cl 242-75 400
W R Grace & Co *See*—
  Nickell, Louis G., 4,033,755, Cl 71 113 000
  Rogers, Austin S., 4,033,413, Cl 166-301 000
  Wortham, Joseph Sidney, and Johnson, Ernest Carlisle, 4,034,120, Cl 426 531 000
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  Kamp, Heinz, 4,033,104, Cl 57 34 00R
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  Holloway, Richard L., Edison, Robert R., and Wachtel, Stephen J., 4,033,861, Cl 208 211 000
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  Dempf, Dominik, Fruhwirth, Otto, and Schmidhammer, Ludwig, 4,034,051, Cl 260 652 50R
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Walker, James Edwin Fluid sheet solar collector 4,033,325, Cl 126-271 000
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Wallin, Erik W., to Barracudaverken Aktiebolag Laminated camouflage material 4,034,375, Cl 343-18 00A
Walter, Henry J., and Kunz, Raymond W., to Clairol Incorporated Steam curling iron having interchangeable hair winding mandrels 4,034,201, Cl 219-222 000
Walton, Erlen B., to Eaton Corporation Fluid distributor logic 4,033,301, Cl 123-32 00G
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Waly, Adnan, to Personal Communications, Inc Micro-image records 4,033,686, Cl 353-120 000
Ward, James C., and Davis, Robert Wayne, to Reyco Industries, Inc Vehicle tandem suspensions 4,033,606, Cl 280-682 000
Ward, James H., Jr., and Medley, Max W., Jr., to E-Systems, Inc Method and apparatus for microstrip termination 4,034,321, Cl 333-84 00M
Ward, William W *See*—
  Hamell, Matthew, Stefanucci, Arthur, and Ward, William W., 4,034,116, Cl 426-131 000
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  Kuzarov, Encho Janaki, 4,033,552, Cl 254-166 000
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  Cohen, Marvin P., Shavel, John, Jr., and von Strandtmann, Max, 4,033,845, Cl 260-240 00D
  Schwender, Charles F., and Sunday, Brooks R., 4,033,961, Cl 260-251 00A
  Stoss, Peter, and Satzinger, Gerhard, 4,033,981, Cl 260-327 00M
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ing displaced meter and socket terminals 4,034,290, Cl 324-110.000.

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  - Jentoft, Arthur P., and Couture, Paul A., 4,033,246, Cl. 98-42.00R.
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- Watanabe, Itaru: *See—*
  - Koshiga, Fusao, Tanaka, Jinkichi, and Watanabe, Itaru, 4,034,179, Cl. 219-74.000.
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  - Isozaki, Osamu, Watanabe, Tadashi, and Sakamoto, Masahiro, 4,033,920, Cl. 260-29.60H.
- Waters, David Martin: *See—*
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- Weaver, William Norfred, to Illinois Tool Works Inc. Reel-windable container carrier stock. 4,033,457, Cl 206-390.000.
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- Weber, Richard C. Thread protector. 4,033,380, Cl 138-96.00T.
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  - Boodman, Norman S., and Weil, Richard C., 4,034,048, Cl. 260-621.00H.
- Weiler, Ernest D.: *See—*
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- Weiss, Martin Joseph. *See—*
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- Wells, Peter M., Jr.: *See—*
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- Welsh, David Edward: *See—*
  - Freehauf, Eugene G., Hollingsworth, Gene C., and Welsh, David Edward, 4,033,656, Cl 339-17.0CF.
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  - Paxton, Charles F., 4,034,212, Cl 235-151.100.
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B 339,446	4,001,067	Feb. 24, 1976	Jan 4, 1977
B 340,170	4,000,444	Mar 30, 1976	Dec. 28, 1976
B 344,669	4,013,655	Mar 16, 1976	Mar. 22, 1977
B 347,661	3,999,218	Mar 16, 1976	Dec. 21, 1976
B 348,433	3,984,405	Feb. 3, 1976	Oct 5, 1976
B 349,370	3,989,684	Jan 27, 1976	Nov 2, 1976
B 351,455	4,001,309	Feb 24, 1976	Jan 4, 1977
B 354,222	4,012,305	Mar 23, 1976	Mar 15, 1977
B 354,959	3,995,996	Feb 17, 1976	Dec. 7, 1976
B 356,187	3,981,222	Jan 20, 1976	Sep 21, 1976
B 356,470	4,014,789	Mar 23, 1976	Mar. 29, 1977
B 357,526	4,001,319	Mar 23, 1976	Jan 4, 1977
B 358,260	3,989,661	Mar 30, 1976	Nov 2, 1976
B 358,427	3,989,896	Feb 3, 1976	Nov 2, 1976
B 359,768	4,013,684	Mar 30, 1976	Mar 22, 1977
B 359,901	3,981,729	Jan 13, 1976	Sep 21, 1976
B 361,954	4,014,753	Apr 6, 1976	Mar 29, 1977
B 363,565	4,004,821	Mar 30, 1976	Jan 25, 1977
B 364,797	3,996,131	Feb. 17, 1976	Dec 7, 1976
B 367,092	4,014,920	Apr 13, 1976	Mar 29, 1977
B 367,305	3,998,640	Mar 2, 1976	Dec 21, 1976
B 367,621	3,989,589	Feb. 3, 1976	Nov. 2, 1976
B 369,221	3,985,834	Feb 24, 1976	Oct 12, 1976
B 369,373	4,013,683	Mar 23, 1976	Mar 22, 1977
B 369,379	4,013,754	Mar 30, 1976	Mar 22, 1977
B 370,309	3,989,640	Jan 20, 1976	Nov 2, 1976
B 371,095	4,005,074	Mar 23, 1976	Jan 25, 1977
B 371,635	4,010,290	Mar 23, 1976	Mar. 1, 1977
B 371,912	3,995,738	Mar 2, 1976	Dec. 7, 1976
B 372,016	3,989,685	Mar 9, 1976	Nov. 2, 1976
B 372,232	4,000,967	Mar 16, 1976	Jan 4, 1977
B 372,722	3,998,925	Mar 9, 1976	Dec. 21, 1976
B 373,354	3,989,870	Jan 27, 1976	Nov 2, 1976
B 374,553	4,008,394	Mar. 30, 1976	Feb 15, 1977
B 374,588	3,985,899	Jan 27, 1976	Oct. 12, 1976
B 376,749	4,014,856	Mar 30, 1976	Mar. 29, 1977
B 378,513	3,981,750	Jan 27, 1976	Sep 21, 1976
B 378,760	4,001,477	Mar 9, 1976	Jan 4, 1977
B 379,177	3,981,976	Jan 27, 1976	Sep 21, 1976
B 380,137	4,014,802	Mar 23, 1976	Mar 29, 1977
B 381,006	4,009,447	Apr 6, 1976	Feb 22, 1977
B 381,709	3,984,587	Jan. 13, 1976	Oct 5, 1976
B 381,985	3,990,775	Feb 3, 1976	Nov 9, 1976
B 382,120	4,013,639	Mar 23, 1976	Mar 22, 1977
B 383,697	4,008,211	Feb 17, 1976	Feb 15, 1977
B 384,225	3,998,523	Mar 16, 1976	Dec. 21, 1976
B 384,330	3,985,613	Jan 27, 1976	Oct 12, 1976
B 384,654	3,992,681	Feb 24, 1976	Nov 16, 1976
B 385,024	3,994,911	Feb 10, 1976	Nov. 30, 1976
B 385,483	3,993,684	Feb 17, 1976	Nov 23, 1976
B 385,631	3,982,924	Jan 27, 1976	Sep 28, 1976
B 386,257	3,981,915	Feb 3, 1976	Sep 21, 1976
B 386,673	3,993,717	Feb. 3, 1976	Nov 23, 1976
B 386,828	3,992,440	Feb 3, 1976	Nov. 16, 1976
B 387,337	D 243,157	Mar 16, 1976	Jan 25, 1977
B 388,675	4,012,459	Mar 30, 1976	Mar. 15, 1977
B 389,155	4,000,970	Mar 30, 1976	Jan 4, 1977
B 389,304	3,986,829	Jan 27, 1976	Oct. 19, 1976
B 390,031	3,985,799	Jan 13, 1976	Oct 12, 1976
B 390,408	3,992,426	Feb 3, 1976	Nov 16, 1976
B 390,979	4,003,850	Mar 23, 1976	Jan 18, 1977
B 391,473	3,988,370	Mar 2, 1976	Oct. 26, 1976
B 391,797	3,988,046	Mar 9, 1976	Oct 26, 1976
B 391,828	4,014,933	Apr 6, 1976	Mar. 29, 1977
B 391,844	3,999,165	Mar 16, 1976	Dec. 21, 1976
B 392,798	3,996,249	Mar 30, 1976	Dec 7, 1976
B 394,248	3,989,764	Jan 27, 1976	Nov. 2, 1976
B 394,350	3,982,200	Jan 13, 1976	Sep 21, 1976
B 394,742	4,009,285	Apr 13, 1976	Feb 22, 1977
B 395,554	3,998,156	Mar 9, 1976	Dec. 21, 1976
B 395,975	4,001,085	Mar 2, 1976	Jan 4, 1977
B 396,164	3,989,590	Feb 3, 1976	Nov 2, 1976
B 396,377	D 243,148	Apr 6, 1976	Jan 25, 1977
B 397,674	3,998,438	Mar 16, 1976	Dec. 21, 1976
B 398,084	3,996,239	Feb 3, 1976	Dec. 7, 1976
B 398,220	3,990,834	Feb. 3, 1976	Nov. 9, 1976
B 398,488	3,987,991	Feb. 24, 1976	Oct 26, 1976
B 399,098	3,997,665	Feb 24, 1976	Dec. 14, 1976
B 399,632	4,001,046	Mar. 9, 1976	Jan 4, 1977
B 399,908	3,983,323	Jan. 13, 1976	Sep. 28, 1976
B 400,871	3,988,893	Feb 17, 1976	Nov 2, 1976
B 401,042	D 242,197	Mar. 16, 1976	Nov. 9, 1976
B 401,221	4,014,791	Apr 6, 1976	Mar. 29, 1977
B 402,162	3,994,902	Mar 2, 1976	Nov 30, 1976
B 402,328	3,995,545	Apr. 6, 1976	Dec. 7, 1976
B 402,553	3,983,219	Feb. 17, 1976	Sep 28, 1976
B 402,657	4,013,665	Apr 6, 1976	Mar. 22, 1977
B 402,929	3,991,251	Feb 3, 1976	Nov 9, 1976
B 403,076	4,014,917	Apr 20, 1976	Mar 29, 1977
B 403,243	3,996,232	Mar 30, 1976	Dec. 7, 1976
B 403,326	4,001,212	Mar 23, 1976	Jan 4, 1977
B 403,477	3,995,315	Feb 3, 1976	Nov 30, 1976
B 403,507	3,982,095	Feb 10, 1976	Sep 21, 1976
B 403,766	3,994,834	Feb 10, 1976	Nov 30, 1976
B 403,883	4,001,481	Mar. 23, 1976	Jan 4, 1977
B 405,726	3,981,241	Jan 13, 1976	Sep 21, 1976
B 406,546	D 242,966	Mar 16, 1976	Jan 11, 1977
B 407,205	4,000,966	Mar 16, 1976	Jan. 4, 1977
B 407,737	3,992,546	Feb 3, 1976	Nov. 16, 1976
B 407,812	4,010,006	Mar 23, 1976	Mar 1, 1977
B 408,123	4,014,887	Apr 13, 1976	Mar. 29, 1977
B 409,848	3,983,270	Jan 27, 1976	Sep 28, 1976
B 410,074	4,001,303	Feb 24, 1976	Jan 4, 1977
B 410,694	3,995,530	Mar 23, 1976	Dec. 7, 1976
B 411,471	3,982,933	Feb 17, 1976	Sep 28, 1976
B 411,624	4,001,205	Mar. 16, 1976	Jan 4, 1977
B 411,765	3,993,428	Feb 24, 1976	Nov 23, 1976
B 412,068	3,981,244	Jan 13, 1976	Sep. 21, 1976
B 412,124	4,007,000	Mar 23, 1976	Feb 8, 1977
B 413,379	4,001,325	Mar 9, 1976	Jan 4, 1977
B 414,028	3,993,738	Feb. 17, 1976	Nov. 23, 1976
B 414,266	3,993,614	Feb 10, 1976	Nov. 23, 1976
B 414,481	3,982,979	Jan 20, 1976	Sep. 28, 1976
B 414,971	D 242,208	Feb. 10, 1976	Nov 9, 1976
B 415,021	3,994,173	Mar 2, 1976	Nov. 30, 1976
B 415,122	3,997,503	Feb 10, 1976	Dec 14, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,590	4,009,317	Mar. 23, 1976	Feb. 22, 1977	B 440,632	4,014,955	Apr. 13, 1976	Mar. 29, 1977
B 416,257	4,001,335	Mar. 16, 1976	Jan 4, 1977	B 440,633	4,000,116	Feb 10, 1976	Dec. 28, 1976
B 416,589	3,990,363	Jan. 27, 1976	Nov. 9, 1976	B 440,858	3,993,670	Feb. 3, 1976	Nov. 23, 1976
B 417,014	3,981,851	Jan 13, 1976	Sep. 21, 1976	B 441,543	4,014,755	Mar 23, 1976	Mar. 29, 1977
B 417,164	4,001,360	Mar. 2, 1976	Jan 4, 1977	B 441,605	4,026,862	Feb. 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar 9, 1976	Oct. 12, 1976	B 441,723	3,988,249	Mar. 16, 1976	Oct. 26, 1976
B 417,498	4,013,471	Mar. 23, 1976	Mar 22, 1977	B 441,789	4,001,449	Mar. 30, 1976	Jan. 4, 1977
B 418,489	3,989,592	Jan 13, 1976	Nov. 2, 1976	B 442,163	D 242,192	Mar 16, 1976	Nov. 9, 1976
B 419,173	3,999,728	Mar 9, 1976	Dec. 28, 1976	B 442,295	4,000,477	Mar. 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar. 2, 1976	Nov 2, 1976	B 442,431	4,011,260	Mar. 23, 1976	Mar. 8, 1977
B 420,176	4,001,017	Mar 16, 1976	Jan 4, 1977	B 442,810	3,997,533	Feb 24, 1976	Dec. 14, 1976
B 420,321	3,990,645	Mar 30, 1976	Nov. 9, 1976	B 442,866	3,982,351	Feb. 24, 1976	Sep. 28, 1976
B 420,472	3,993,934	Feb 24, 1976	Nov 23, 1976	B 442,953	4,002,657	Mar. 23, 1976	Jan. 11, 1977
B 421,373	4,001,326	Mar 23, 1976	Jan 4, 1977	B 442,970	3,989,890	Feb 3, 1976	Nov. 2, 1976
B 421,608	4,013,806	Mar 23, 1976	Mar 22, 1977	B 443,163	3,981,242	Feb. 3, 1976	Sep 21, 1976
B 421,975	3,994,693	Mar 2, 1976	Nov. 30, 1976	B 443,446	D 242,494	Apr. 6, 1976	Nov. 23, 1976
B 422,063	3,994,835	Feb 3, 1976	Nov. 30, 1976	B 443,563	3,996,204	Feb. 24, 1976	Dec. 7, 1976
B 422,156	4,010,401	Mar 23, 1976	Mar 1, 1977	B 443,647	3,990,737	Feb. 17, 1976	Nov. 9, 1976
B 423,365	3,996,186	Feb 17, 1976	Dec. 7, 1976	B 443,712	3,982,233	Jan. 27, 1976	Sep. 21, 1976
B 423,404	3,990,958	Mar 2, 1976	Nov 9, 1976	B 444,078	4,014,854	Mar. 23, 1976	Mar. 29, 1977
B 423,441	3,997,137	Feb. 17, 1976	Dec. 14, 1976	B 444,294	4,013,634	Mar 30, 1976	Mar. 22, 1977
B 423,867	3,990,844	Feb. 3, 1976	Nov. 9, 1976	B 444,437	3,995,171	Mar. 9, 1976	Nov. 30, 1976
B 423,883	3,986,871	Jan. 27, 1976	Oct 19, 1976	B 445,166	4,001,252	Mar. 2, 1976	Jan. 4, 1977
B 424,354	D 242,416	Feb 10, 1976	Nov 23, 1976	B 445,459	3,988,889	Feb. 3, 1976	Nov. 2, 1976
B 424,410	4,021,196	Mar 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Nov. 30, 1976
B 424,989	3,990,569	Feb 3, 1976	Nov 9, 1976	B 445,690	3,999,584	Feb 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar 23, 1976	Jan 11, 1977	B 446,107	4,001,276	Mar. 9, 1976	Jan. 4, 1977
B 425,285	4,014,676	Apr 13, 1976	Mar 29, 1977	B 446,956	4,014,765	Apr. 13, 1976	Mar. 29, 1977
B 425,462	3,998,396	Mar 9, 1976	Dec 21, 1976	B 447,000	3,984,419	Feb. 3, 1976	Oct. 5, 1976
B 425,588	3,985,111	Jan 13, 1976	Oct 12, 1976	B 447,440	3,991,724	Feb. 17, 1976	Nov. 16, 1976
B 426,157	4,013,714	Mar 23, 1976	Mar. 22, 1977	B 449,892	3,997,919	Mar. 23, 1976	Dec. 14, 1976
B 426,227	3,999,028	Mar 2, 1976	Dec 21, 1976	B 449,988	4,014,794	Mar. 30, 1976	Mar. 29, 1977
B 426,266	3,998,839	Mar 2, 1976	Dec. 21, 1976	B 450,196	3,997,701	Feb. 10, 1976	Dec. 14, 1976
B 426,274	4,014,949	Jan. 20, 1976	Mar 29, 1977	B 450,413	4,007,463	Mar 23, 1976	Feb. 8, 1977
B 426,424	3,993,742	Feb. 3, 1976	Nov. 23, 1976	B 450,521	3,982,838	Feb. 17, 1976	Sep. 28, 1976
B 426,639	3,992,539	Feb 3, 1976	Nov 16, 1976	B 450,701	3,991,084	Mar. 16, 1976	Nov. 9, 1976
B 426,819	3,995,868	Feb. 17, 1976	Dec. 7, 1976	B 450,708	3,989,724	Mar. 9, 1976	Nov. 2, 1976
B 427,883	3,982,277	Jan 20, 1976	Sep. 21, 1976	B 450,870	3,998,951	Mar. 16, 1976	Dec. 21, 1976
B 427,946	4,006,161	Mar 23, 1976	Feb 1, 1977	B 450,967	3,983,055	Jan. 13, 1976	Sep. 28, 1976
B 428,103	4,000,211	Feb 10, 1976	Dec. 28, 1976	B 451,248	3,997,758	Mar. 2, 1976	Dec. 14, 1976
B 428,271	3,987,415	Mar 23, 1976	Oct. 19, 1976	B 451,308	3,991,037	Feb. 17, 1976	Nov. 9, 1976
B 428,408	3,995,252	Mar 2, 1976	Nov 30, 1976	B 451,396	4,000,450	Apr. 13, 1976	Dec. 28, 1976
B 428,877	3,984,649	Jan 27, 1976	Oct 5, 1976	B 451,438	Re 29,066	Mar. 2, 1976	Dec. 7, 1976
B 429,018	3,990,061	Feb. 10, 1976	Nov 2, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct 12, 1976
B 429,027	4,001,260	Mar 23, 1976	Jan 4, 1977	B 452,034	4,002,367	Mar. 23, 1976	Jan 11, 1977
B 429,157	3,990,628	Jan 27, 1976	Nov 9, 1976	B 452,138	4,004,278	Mar. 23, 1976	Jan. 18, 1977
B 429,434	3,989,223	Feb. 17, 1976	Nov 2, 1976	B 452,293	4,014,726	Mar. 30, 1976	Mar. 29, 1977
B 430,157	3,992,465	Feb 17, 1976	Nov 16, 1976	B 452,501	4,001,111	Mar. 16, 1976	Jan. 4, 1977
B 430,172	3,982,563	Jan 13, 1976	Sep. 28, 1976	B 452,672	3,981,602	Jan. 13, 1976	Sep. 21, 1976
B 430,213	4,013,514	Mar 30, 1976	Mar. 22, 1977	B 452,879	4,001,089	Mar. 16, 1976	Jan. 4, 1977
B 430,276	3,982,171	Jan 20, 1976	Sep 21, 1976	B 452,883	3,981,735	Jan. 27, 1976	Sep. 21, 1976
B 430,287	D 242,489	Feb 10, 1976	Nov. 23, 1976	B 452,915	4,013,933	Mar 30, 1976	Mar. 22, 1977
B 430,326	4,003,581	Mar 23, 1976	Jan 18, 1977	B 452,938	3,994,719	Feb. 17, 1976	Nov. 30, 1976
B 430,334	3,981,677	Jan 27, 1976	Sep 21, 1976	B 452,944	4,009,773	Mar 30, 1976	Mar. 1, 1977
B 431,072	3,985,610	Jan 20, 1976	Oct 12, 1976	B 453,031	3,998,678	Mar. 16, 1976	Dec. 21, 1976
B 431,334	3,988,095	Mar 16, 1976	Oct 26, 1976	B 453,067	4,005,394	Mar. 23, 1976	Jan. 25, 1977
B 431,713	4,000,167	Feb. 10 1976	Dec. 28, 1976	B 453,238	3,997,063	Mar. 2, 1976	Dec. 14, 1976
B 431,785	3,999,950	Feb 24, 1976	Dec. 28, 1976	B 453,432	4,000,514	Mar. 16, 1976	Dec. 28, 1976
B 431,797	4,007,290	Mar 30, 1976	Feb 8, 1977	B 453,533	3,997,744	Feb 17, 1976	Dec. 14, 1976
B 432,049	3,995,123	Mar 23, 1976	Nov 30, 1976	B 453,616	3,987,376	Jan. 27, 1976	Oct. 19, 1976
B 432,140	3,999,163	Mar 23, 1976	Dec. 21, 1976	B 453,759	3,989,790	Jan 27, 1976	Nov. 2, 1976
B 432,265	4,013,480	Mar. 23, 1976	Mar 22, 1977	B 453,960	4,014,701	Apr. 13, 1976	Mar. 29, 1977
B 432,594	4,003,404	Mar 30, 1976	Jan 18, 1977	B 454,283	3,995,153	Feb 3, 1976	Nov. 30, 1976
B 432,969	3,997,017	Mar. 2, 1976	Dec 14, 1976	B 454,833	4,008,733	Mar 30, 1976	Feb. 22, 1977
B 432,991	3,991,669	Mar 2, 1976	Nov 16, 1976	B 455,425	3,990,060	Feb 3, 1976	Nov. 2, 1976
B 433,094	3,987,768	Jan 27, 1976	Oct 26, 1976	B 455,481	3,991,092	Feb 24, 1976	Nov. 9, 1976
B 433,707	4,013,594	Mar 23, 1976	Mar 22, 1977	B 455,486	4,001,353	Mar 16, 1976	Jan. 4, 1977
B 433,892	4,016,061	Apr 6, 1976	Apr 5, 1977	B 455,686	4,001,156	Mar 2, 1976	Jan. 4, 1977
B 433,930	4,012,324	Mar 23, 1976	Mar. 15, 1977	B 455,759	3,984,242	Feb 24, 1976	Oct. 5, 1976
B 434,206	3,994,610	Feb 3, 1976	Nov 30, 1976	B 455,806	3,998,919	Mar. 23, 1976	Dec. 21, 1976
B 434,441	D 242,849	Mar 16, 1976	Dec. 28, 1976	B 456,069	3,998,991	Mar 9, 1976	Dec. 21, 1976
B 435,481	4,000,892	Mar 9, 1976	Jan 4, 1977	B 456,148	3,984,269	Jan 13, 1976	Oct. 5, 1976
B 435,570	4,000,908	Mar 16, 1976	Jan 4, 1977	B 456,153	3,997,992	Mar 9, 1976	Dec. 21, 1976
B 435,617	4,001,234	Mar 16, 1976	Jan. 4, 1977	B 456,384	4,014,859	Apr 6, 1976	Mar. 29, 1977
B 436,724	3,991,856	Feb. 24, 1976	Nov 16, 1976	B 456,579	3,993,715	Feb. 10, 1976	Nov. 23, 1976
B 437,209	4,001,193	Feb. 3, 1976	Jan 4, 1977	B 456,869	4,001,277	Mar. 9, 1976	Jan 4, 1977
B 437,559	3,993,287	Feb. 3, 1976	Nov 23, 1976	B 456,900	3,996,262	Feb 3, 1976	Dec 7, 1976
B 437,596	3,985,638	Jan 27, 1976	Oct 12, 1976	B 456,905	4,013,431	Mar 23, 1976	Mar 22, 1977
B 437,894	4,001,015	Mar 2, 1976	Jan 4, 1977	B 457,547	3,996,397	Feb 17, 1976	Dec. 7, 1976
B 437,986	4,011,399	Apr 20, 1976	Mar. 8, 1977	B 457,850	3,993,586	Feb 10, 1976	Nov. 23, 1976
B 438,048	4,001,394	Mar 23, 1976	Jan 4, 1977	B 457,862	3,987,195	Jan 27, 1976	Oct. 19, 1976
B 438,484	3,992,451	Feb. 17, 1976	Nov 16, 1976	B 457,886	3,988,498	Jan 13, 1976	Oct. 26, 1976
B 438,882	3,983,719	Feb 24, 1976	Oct 5, 1976	B 457,931	4,001,229	Mar 16, 1976	Jan 4, 1977
B 438,916	3,983,050	Jan 13, 1976	Sep 28, 1976	B 458,500	3,997,805	Feb. 24, 1976	Dec. 14, 1976
B 439,542	3,982,199	Jan 27, 1976	Sep 21, 1976	B 458,617	3,984,422	Feb 3, 1976	Oct 5, 1976
B 439,778	4,001,455	Feb 3, 1976	Jan 4, 1977	B 458,964	3,996,615	Mar 2, 1976	Dec. 7, 1976
B 440,548	4,001,271	Mar 16, 1976	Jan 4, 1977	B 459,190	4,010,786	Mar 30, 1976	Mar. 8, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 459,381	4,000,017	Mar. 9, 1976	Dec 28, 1976	B 475,385	4,001,071	Mar 9, 1976	Jan 4, 1977
B 459,408	4,018,890	Mar. 23, 1976	Apr. 19, 1977	B 475,681	3,983,332	Jan 20, 1976	Sep 28, 1976
B 459,597	3,996,711	Feb 17, 1976	Dec. 14, 1976	B 476,267	4,005,068	Apr 6, 1976	Jan 25, 1977
B 459,811	3,982,173	Jan 20, 1976	Sep 21, 1976	B 476,372	3,985,771	Feb 24, 1976	Oct 12, 1976
B 459,821	4,005,954	Mar. 30, 1976	Feb 1, 1977	B 476,542	4,013,549	Mar 30, 1976	Mar 22, 1977
B 460,388	3,989,448	Jan 27, 1976	Nov 2, 1976	B 476,568	3,999,456	Mar 16, 1976	Dec 28, 1976
B 460,441	3,981,828	Jan 13, 1976	Sep 21, 1976	B 476,577	3,982,070	Jan 20, 1976	Sep. 21, 1976
B 460,846	3,985,817	Feb 24, 1976	Oct 12, 1976	B 476,681	3,986,181	Jan 13, 1976	Oct 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov 16, 1976	B 476,776	3,998,715	Mar 23, 1976	Dec 21, 1976
B 461,250	4,000,768	Mar. 16, 1976	Jan 4, 1977	B 476,967	3,995,206	Mar 9, 1976	Nov 30, 1976
B 461,336	3,982,231	Feb 3, 1976	Sep. 21, 1976	B 477,252	3,985,759	Jan 13, 1976	Oct 12, 1976
B 461,352	3,981,681	Jan 13, 1976	Sep 21, 1976	B 477,481	3,991,076	Feb 3, 1976	Nov 9, 1976
B 461,685	4,013,661	Mar. 30, 1976	Mar. 22, 1977	B 477,584	D 242,855	Apr 6, 1976	Dec 28, 1976
B 461,752	4,016,541	Apr 20, 1976	Apr 5, 1977	B 477,597	3,993,912	Feb 17, 1976	Nov 23, 1976
B 461,874	3,982,276	Jan 27, 1976	Sep 21, 1976	B 477,892	4,010,355	Mar 30, 1976	Mar 1, 1977
B 462,030	4,009,342	Mar. 23, 1976	Feb. 22, 1977	B 478,234	4,010,421	Mar 30, 1976	Mar 1, 1977
B 462,386	3,988,188	Jan 13, 1976	Oct 26, 1976	B 478,739	3,992,253	Feb 17, 1976	Nov 16, 1976
B 462,424	3,989,602	Feb. 24, 1976	Nov 2, 1976	B 479,175	3,985,700	Feb 17, 1976	Oct 12, 1976
B 462,828	3,998,395	Mar. 9, 1976	Dec. 21, 1976	B 479,242	3,983,074	Feb 17, 1976	Sep 28, 1976
B 462,893	3,984,253	Feb 24, 1976	Oct 5, 1976	B 479,502	3,999,030	Mar 16, 1976	Dec 21, 1976
B 463,322	3,989,982	Jan 20, 1976	Nov 2, 1976	B 479,681	D 242,672	Mar 16, 1976	Dec 14, 1976
B 463,388	3,992,605	Feb 10, 1976	Nov 16, 1976	B 479,969	4,001,132	Mar 9, 1976	Jan 4, 1977
B 463,473	4,002,068	Mar 23, 1976	Jan 11, 1977	B 480,114	4,001,327	Mar 2, 1976	Jan 4, 1977
B 463,591	4,015,051	Mar 30, 1976	Mar 29, 1977	B 480,251	4,008,700	Mar 23, 1976	Feb 22, 1977
B 463,671	3,985,385	Jan 13, 1976	Oct 12, 1976	B 480,287	4,006,029	Mar 30, 1976	Feb 1, 1977
B 464,027	3,999,390	Mar 16, 1976	Dec 28, 1976	B 480,292	3,994,011	Mar 16, 1976	Nov 23, 1976
B 464,290	3,990,307	Feb 3, 1976	Nov 9, 1976	B 480,350	3,994,164	Feb 10, 1976	Nov 30, 1976
B 464,491	4,015,612	Mar 30, 1976	Apr 5, 1977	B 480,384	3,999,737	Mar 23, 1976	Dec 28, 1976
B 464,587	3,991,091	Feb 3, 1976	Nov 9, 1976	B 480,452	3,994,923	Feb 10, 1976	Nov 30, 1976
B 464,593	3,997,659	Mar. 9, 1976	Dec. 14, 1976	B 480,473	3,995,608	Mar 2, 1976	Dec 7, 1976
B 465,145	3,981,148	Jan 27, 1976	Sep 21, 1976	B 480,604	3,985,251	Jan 13, 1976	Oct 12, 1976
B 465,202	3,989,757	Feb. 24, 1976	Nov 2, 1976	B 480,625	3,996,227	Feb 24, 1976	Dec 7, 1976
B 465,393	3,987,390	Jan 27, 1976	Oct. 19, 1976	B 480,662	3,988,382	Mar 2, 1976	Oct 26, 1976
B 465,688	3,989,770	Jan 27, 1976	Nov 2, 1976	B 480,740	3,996,431	Mar 2, 1976	Dec 7, 1976
B 465,955	3,997,502	Feb 3, 1976	Dec. 14, 1976	B 480,749	3,999,207	Mar 9, 1976	Dec. 21, 1976
B 466,304	4,007,095	Mar. 23, 1976	Feb 8, 1977	B 480,987	4,001,459	Mar 30, 1976	Jan 4, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 481,048	3,998,542	Mar 16, 1976	Dec 21, 1976
B 466,390	3,983,349	Feb. 24, 1976	Sep. 28, 1976	B 481,190	4,013,468	Mar 30, 1976	Mar 22, 1977
B 466,419	4,011,087	Mar 23, 1976	Mar 8, 1977	B 481,600	3,981,235	Jan 27, 1976	Sep 21, 1976
B 466,444	3,986,039	Jan 20, 1976	Oct 12, 1976	B 481,737	3,982,057	Jan 13, 1976	Sep 21, 1976
B 466,906	3,993,037	Mar. 16, 1976	Nov 23, 1976	B 481,778	4,001,385	Mar 30, 1976	Jan 4, 1977
B 466,929	3,991,195	Jan 27, 1976	Nov 9, 1976	B 481,930	3,992,717	Feb 24, 1976	Nov 16, 1976
B 467,250	3,997,428	Feb. 3, 1976	Dec. 14, 1976	B 481,989	4,008,337	Mar 23, 1976	Feb 15, 1977
B 467,328	3,997,599	Mar 9, 1976	Dec. 14, 1976	B 482,058	4,001,398	Mar 2, 1976	Jan 4, 1977
B 467,412	3,981,265	Jan 13, 1976	Sep. 21, 1976	B 482,660	3,995,026	Feb 10, 1976	Nov 30, 1976
B 467,486	3,991,725	Mar. 16, 1976	Nov. 16, 1976	B 482,709	3,985,733	Feb 24, 1976	Oct 12, 1976
B 467,971	3,983,453	Jan 13, 1976	Sep. 28, 1976	B 482,907	3,984,811	Jan 20, 1976	Oct 5, 1976
B 468,052	3,988,335	Feb 10, 1976	Oct. 26, 1976	B 483,247	4,001,889	Apr 13, 1976	Jan 4, 1977
B 468,100	3,995,107	Mar. 9, 1976	Nov 30, 1976	B 483,256	3,981,723	Feb 10, 1976	Sep 21, 1976
B 468,330	4,001,475	Mar 16, 1976	Jan 4, 1977	B 483,268	3,995,215	Mar. 9, 1976	Nov. 30, 1976
B 468,350	3,981,922	Jan 13, 1976	Sep 21, 1976	B 483,606	3,986,990	Jan 27, 1976	Oct 19, 1976
B 468,421	4,014,739	Mar 30, 1976	Mar 29, 1977	B 483,615	3,988,637	Jan 27, 1976	Oct 26, 1976
B 468,603	4,003,839	Mar 23, 1976	Jan. 18, 1977	B 483,746	4,014,923	Mar 23, 1976	Mar 29, 1977
B 469,036	4,005,926	Mar 16, 1976	Feb. 1, 1977	B 483,762	3,993,608	Feb 10, 1976	Nov 23, 1976
B 469,468	4,000,220	Mar 16, 1976	Dec 28, 1976	B 483,865	3,985,693	Jan 13, 1976	Oct 12, 1976
B 469,947	3,984,153	Jan 20, 1976	Oct 5, 1976	B 484,029	3,983,558	Feb 10, 1976	Sep 28, 1976
B 470,170	3,986,410	Jan 13, 1976	Oct 19, 1976	B 484,067	3,992,374	Feb 17, 1976	Nov 16, 1976
B 470,305	4,014,043	Apr 6, 1976	Mar. 22, 1977	B 484,068	3,994,937	Mar 2, 1976	Nov 30, 1976
B 470,348	3,981,929	Jan 13, 1976	Sep 21, 1976	B 484,121	3,997,770	Mar 16, 1976	Dec. 14, 1976
B 470,576	3,997,507	Feb 24, 1976	Dec 14, 1976	B 484,269	4,000,159	Feb 10, 1976	Dec 28, 1976
B 470,601	3,985,655	Mar. 9, 1976	Oct 12, 1976	B 484,332	3,986,540	Mar 2, 1976	Oct. 19, 1976
B 470,798	3,987,480	Jan 20, 1976	Oct 19, 1976	B 484,365	3,983,578	Jan 27, 1976	Sep 28, 1976
B 470,853	4,002,101	Mar 23, 1976	Jan. 11, 1977	B 484,419	4,001,292	Mar 9, 1976	Jan 4, 1977
B 470,899	3,996,441	Mar 2, 1976	Dec 7, 1976	B 484,437	4,013,740	Mar 30, 1976	Mar 22, 1977
B 470,900	4,001,213	Mar 2, 1976	Jan 4, 1977	B 484,482	3,994,017	Mar 23, 1976	Nov 23, 1976
B 470,945	4,014,848	Apr 13, 1976	Mar 29, 1977	B 484,769	3,999,498	Mar 16, 1976	Dec 28, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan 4, 1977	B 485,051	3,992,418	Feb 17, 1976	Nov 16, 1976
B 471,221	3,981,974	Jan 13, 1976	Sep 21, 1976	B 485,060	3,983,067	Feb 17, 1976	Sep 28, 1976
B 471,405	3,993,576	Feb 10, 1976	Nov 23, 1976	B 485,169	3,989,791	Mar 16, 1976	Nov 2, 1976
B 471,494	3,993,660	Mar 16, 1976	Nov 23, 1976	B 485,188	4,001,170	Mar 16, 1976	Jan. 4, 1977
B 471,579	3,985,689	Jan 13, 1976	Oct 12, 1976	B 485,401	3,985,859	Jan 27, 1976	Oct 12, 1976
B 471,617	3,994,871	Feb. 10, 1976	Nov 30, 1976	B 485,575	3,996,565	Feb 24, 1976	Dec. 7, 1976
B 471,681	4,012,844	Apr 13, 1976	Mar 22, 1977	B 485,926	4,006,357	Mar 23, 1976	Feb. 1, 1977
B 471,735	3,989,408	Feb 3, 1976	Nov 2, 1976	B 485,972	4,017,472	Mar 23, 1976	Apr. 12, 1977
B 471,836	4,000,150	Feb 24, 1976	Dec. 28, 1976	B 486,280	3,983,130	Feb 3, 1976	Sep 28, 1976
B 472,241	3,992,453	Feb 17, 1976	Nov 16, 1976	B 486,614	3,995,835	Feb 17, 1976	Dec 7, 1976
B 472,256	3,985,789	Jan 13, 1976	Oct 12, 1976	B 486,678	4,001,273	Mar 2, 1976	Jan. 4, 1977
B 472,284	3,982,078	Jan 13, 1976	Sep. 21, 1976	B 486,828	3,989,651	Mar 2, 1976	Nov 2, 1976
B 472,591	4,013,029	Apr 6, 1976	Mar 22, 1977	B 487,062	D 241,256	Feb 10, 1976	Nov 9, 1976
B 472,760	4,001,330	Apr 13, 1976	Jan 4, 1977	B 487,078	4,012,895	Mar 30, 1976	Mar 22, 1977
B 473,039	3,985,747	Feb 10, 1976	Oct 12, 1976	B 487,133	3,989,826	Jan 27, 1976	Nov 2, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct 12, 1976	B 487,260	3,990,610	Jan 27, 1976	Nov 9, 1976
B 473,813	3,989,071	Mar 9, 1976	Nov 2, 1976	B 487,411	3,983,579	Feb 24, 1976	Sep. 28, 1976
B 473,972	3,984,043	Jan 13, 1976	Oct 5, 1976	B 487,423	3,998,810	Mar 2, 1976	Dec. 21, 1976
B 474,573	3,988,375	Jan 20, 1976	Oct 26, 1976	B 487,427	3,995,788	Mar 2, 1976	Dec. 7, 1976
B 474,747	3,997,704	Feb 24, 1976	Dec. 14, 1976	B 487,467	4,014,847	Apr 13, 1976	Mar 29, 1977
B 475,236	3,989,990	Feb 3, 1976	Nov 2, 1976	B 487,529	4,022,750	Mar 30, 1976	May 10, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 488,111	3,985,765	Jan 13, 1976	Oct 12, 1976
B 488,395	3,982,245	Jan 27, 1976	Sep. 21, 1976
B 488,634	3,982,158	Jan 20, 1976	Sep 21, 1976
B 488,756	3,991,810	Mar. 16, 1976	Nov. 16, 1976
B 488,836	4,013,121	Mar. 30, 1976	Mar. 22, 1977
B 489,290	3,998,081	Feb 17, 1976	Dec 21, 1976
B 489,328	3,990,088	Jan 20, 1976	Nov. 2, 1976
B 489,331	3,996,175	Feb 17, 1976	Dec 7, 1976
B 489,485	D 243,266	Apr 13, 1976	Feb 1, 1977
B 489,550	4,000,710	Mar. 16, 1976	Jan 4, 1977
B 489,685	3,984,085	Feb 24, 1976	Oct 5, 1976
B 490,067	3,986,600	Jan 27, 1976	Oct 19, 1976
B 490,547	3,999,439	Feb. 24, 1976	Dec 28, 1976
B 490,551	D 243,168	Apr 6, 1976	Jan 25, 1977
B 490,589	3,990,680	Feb 3, 1976	Nov 9, 1976
B 490,623	3,996,964	Mar 2, 1976	Dec. 14, 1976
B 490,647	3,985,196	Feb 24, 1976	Oct 12, 1976
B 490,806	3,989,486	Feb 3, 1976	Nov 2, 1976
B 490,812	3,998,842	Mar. 30, 1976	Dec 21, 1976
B 490,946	3,993,652	Feb 17, 1976	Nov 23, 1976
B 490,995	3,995,031	Feb 3, 1976	Nov 30, 1976
B 491,032	3,981,892	Feb 10, 1976	Sep. 21, 1976
B 491,052	3,985,790	Mar 2, 1976	Oct 12, 1976
B 491,111	3,997,916	Feb 17, 1976	Dec 14, 1976
B 491,455	3,991,167	Feb 3, 1976	Nov 9, 1976
B 491,501	3,984,914	Jan 13, 1976	Oct 12, 1976
B 491,618	4,007,950	Mar 16, 1976	Feb. 15, 1977
B 491,650	3,999,044	Mar 9, 1976	Dec. 21, 1976
B 491,673	3,994,770	Feb 17, 1976	Nov. 30, 1976
B 491,776	3,986,298	Mar 16, 1976	Oct 19, 1976
B 491,883	3,984,412	Feb 3, 1976	Oct 5, 1976
B 491,906	D 242,223	Feb 10, 1976	Nov 9, 1976
B 492,039	3,997,541	Feb 24, 1976	Dec. 14, 1976
B 492,093	4,003,658	Mar 23, 1976	Jan. 18, 1977
B 492,120	3,995,692	Feb 24, 1976	Dec 7, 1976
B 492,301	3,981,073	Jan 13, 1976	Sep 21, 1976
B 492,373	4,010,908	Mar 30, 1976	Mar. 8, 1977
B 492,688	3,983,415	Jan 20, 1976	Sep 28, 1976
B 492,716	3,998,739	Mar 2, 1976	Dec 21, 1976
B 492,774	4,001,843	Mar 9, 1976	Jan 4, 1977
B 492,902	3,993,859	Feb 24, 1976	Nov 23, 1976
B 492,946	3,991,303	Jan 27, 1976	Nov 9, 1976
B 493,254	D 243,267	Apr 13, 1976	Feb 1, 1977
B 493,370	3,984,792	Mar. 16, 1976	Oct 5, 1976
B 493,463	4,013,510	Mar. 23, 1976	Mar 22, 1977
B 493,474	4,013,565	Mar 23, 1976	Mar 22, 1977
B 493,501	3,988,061	Feb 3, 1976	Oct 26, 1976
B 493,686	4,008,338	Mar 23, 1976	Feb 15, 1977
B 493,955	3,989,830	Mar 9, 1976	Nov. 2, 1976
B 493,981	3,990,165	Mar 9, 1976	Nov. 9, 1976
B 494,138	4,034,002	Mar 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb 10, 1976	Oct 5, 1976
B 494,339	4,001,255	Mar 16, 1976	Jan. 4, 1977
B 494,383	3,991,289	Feb. 3, 1976	Nov 9, 1976
B 494,669	3,991,104	Feb 3, 1976	Nov 9, 1976
B 494,691	3,987,457	Mar 16, 1976	Oct 19, 1976
B 494,806	3,989,210	Feb 3, 1976	Nov. 2, 1976
B 494,944	3,992,469	Feb 17, 1976	Nov 16, 1976
B 495,185	3,999,166	Mar 9, 1976	Dec 21, 1976
B 495,331	4,000,456	Mar 16, 1976	Dec 28, 1976
B 495,402	3,983,988	Feb 17, 1976	Oct 5, 1976
B 495,408	4,000,222	Feb 3, 1976	Dec 28, 1976
B 495,489	3,984,571	Feb. 3, 1976	Oct 5, 1976
B 495,550	3,993,666	Feb 3, 1976	Nov 23, 1976
B 495,554	3,993,665	Feb 3, 1976	Nov 23, 1976
B 495,759	3,989,998	Feb 3, 1976	Nov 2, 1976
B 495,781	4,013,699	Mar 23, 1976	Mar 22, 1977
B 495,903	3,995,997	Feb 17, 1976	Dec. 7, 1976
B 496,430	3,991,140	Feb 10, 1976	Nov 9, 1976
B 496,431	3,985,894	Jan 13, 1976	Oct. 12, 1976
B 496,487	3,982,261	Jan 20, 1976	Sep 21, 1976
B 496,500	3,985,962	Feb 3, 1976	Oct 12, 1976
B 496,502	3,987,444	Jan 20, 1976	Oct. 19, 1976
B 496,792	3,999,959	Feb 17, 1976	Dec 28, 1976
B 496,964	3,999,219	Apr 20, 1976	Dec. 21, 1976
B 496,999	3,983,804	Jan 27, 1976	Oct 5, 1976
B 497,021	3,985,039	Jan 13, 1976	Oct. 12, 1976
B 497,194	3,988,267	Feb. 3, 1976	Oct 26, 1976
B 497,292	3,994,052	Feb 3, 1976	Nov 30, 1976
B 497,293	4,011,412	Mar 30, 1976	Mar 8, 1977
B 497,473	3,990,839	Feb 3, 1976	Nov 9, 1976
B 497,571	4,009,997	Mar. 23, 1976	Mar 1, 1977
B 497,584	3,988,184	Feb 24, 1976	Oct 26, 1976
B 497,702	3,996,589	Mar 2, 1976	Dec. 7, 1976
B 497,780	3,997,500	Feb 24, 1976	Dec 14, 1976
B 497,853	3,987,934	Feb 17, 1976	Oct 26, 1976
B 497,896	D 243,091	Apr 6, 1976	Jan 18, 1977
B 497,960	3,991,325	Jan 20, 1976	Nov. 9, 1976
B 498,208	4,001,480	Apr 13, 1976	Jan. 4, 1977
B 498,288	4,013,657	Mar. 23, 1976	Mar 22, 1977
B 498,775	3,993,868	Mar 2, 1976	Nov. 23, 1976
B 498,205	3,989,611	Feb. 10, 1976	Nov 2, 1976
B 498,500	3,982,241	Jan. 20, 1976	Sep. 21, 1976
B 498,775	3,993,868	Mar. 2, 1976	Nov. 23, 1976
B 498,820	3,996,670	Mar 9, 1976	Dec. 14, 1976
B 498,951	3,996,907	Mar. 2, 1976	Dec. 14, 1976
B 499,171	3,985,192	Jan. 27, 1976	Oct. 12, 1976
B 499,209	3,995,907	Feb 24, 1976	Dec. 7, 1976
B 499,227	3,981,344	Jan. 27, 1976	Sep. 21, 1976
B 499,324	4,001,375	Mar. 16, 1976	Jan. 4, 1977
B 499,352	3,981,391	Jan. 27, 1976	Sep. 21, 1976
B 499,370	4,013,544	Mar. 30, 1976	Mar. 22, 1977
B 499,718	3,990,058	Jan 27, 1976	Nov. 2, 1976
B 499,786	4,000,663	Mar. 16, 1976	Jan. 4, 1977
B 500,171	3,997,262	Mar 30, 1976	Dec. 14, 1976
B 500,176	3,995,316	Feb 3, 1976	Nov. 30, 1976
B 500,408	D 242,721	Mar. 16, 1976	Dec. 14, 1976
B 500,945	3,996,817	Feb. 24, 1976	Dec. 14, 1976
B 500,959	4,014,853	Apr 13, 1976	Mar. 29, 1977
B 500,981	3,984,681	Jan 27, 1976	Oct. 5, 1976
B 501,122	3,981,385	Feb. 17, 1976	Sep. 21, 1976
B 501,181	3,984,761	Feb. 10, 1976	Oct 5, 1976
B 501,253	3,994,015	Feb. 3, 1976	Nov. 23, 1976
B 501,317	3,985,643	Jan. 13, 1976	Oct. 12, 1976
B 501,379	4,013,696	Mar. 30, 1976	Mar. 22, 1977
B 501,415	3,982,051	Jan. 13, 1976	Sep 21, 1976
B 501,482	4,012,650	Jan. 13, 1976	Mar. 15, 1977
B 501,503	4,001,640	Mar 2, 1976	Jan. 4, 1977
B 501,540	3,985,694	Jan. 13, 1976	Oct. 12, 1976
B 501,975	3,998,466	Mar. 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan 13, 1976	Sep. 21, 1976
B 502,151	3,998,614	Mar. 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar. 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan. 13, 1976	Sep. 21, 1976
B 502,381	D 242,231	Mar. 16, 1976	Nov. 9, 1976
B 502,540	3,983,698	Jan. 13, 1976	Oct. 5, 1976
B 502,571	D 242,433	Apr 6, 1976	Nov. 23, 1976
B 502,589	3,989,652	Jan. 27, 1976	Nov. 2, 1976
B 502,652	3,989,186	Feb. 24, 1976	Nov. 2, 1976
B 502,667	3,991,431	Feb 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan. 27, 1976	Sep. 21, 1976
B 502,993	3,992,489	Feb. 17, 1976	Nov. 16, 1976
B 503,029	3,986,879	Jan 27, 1976	Oct. 19, 1976
B 503,345	4,001,235	Feb. 24, 1976	Jan. 4, 1977
B 503,371	4,009,401	Mar 30, 1976	Feb. 22, 1977
B 503,436	3,988,819	Feb. 24, 1976	Nov. 2, 1976
B 503,456	4,007,702	Mar. 23, 1976	Feb. 15, 1977
B 503,521	3,999,646	Mar. 16, 1976	Dec. 28, 1976
B 503,579	3,989,680	Feb. 10, 1976	Nov. 2, 1976
B 503,618	3,997,782	Mar. 9, 1976	Dec. 14, 1976
B 503,742	3,989,756	Feb 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar. 23, 1976	Apr. 5, 1977
B 503,780	3,990,055	Mar. 16, 1976	Nov. 2, 1976
B 503,817	3,988,307	Jan. 13, 1976	Oct 26, 1976
B 504,056	3,993,923	Feb 24, 1976	Nov. 23, 1976
B 504,061	3,987,534	Mar. 16, 1976	Oct. 26, 1976
B 504,156	3,999,048	Mar. 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan 13, 1976	Sep. 21, 1976
B 504,404	3,996,499	Feb 24, 1976	Dec. 7, 1976
B 504,405	4,007,401	Apr. 13, 1976	Feb. 8, 1977
B 504,439	3,999,398	Mar 16, 1976	Dec. 28, 1976
B 504,503	3,999,210	Mar. 9, 1976	Dec. 21, 1976
B 504,582	4,005,138	Mar 30, 1976	Jan 25, 1977
B 504,778	3,986,650	Feb 24, 1976	Oct. 19, 1976
B 504,877	3,997,564	Feb 24, 1976	Dec 14, 1976
B 504,899	3,991,273	Mar 9, 1976	Nov. 9, 1976
B 505,126	3,981,745	Feb 10, 1976	Sep. 21, 1976
B 505,221	4,013,627	Mar 30, 1976	Mar 22, 1977
B 505,582	4,001,659	Mar 23, 1976	Jan. 4, 1977
B 505,689	3,987,631	Mar 2, 1976	Oct. 26, 1976
B 505,813	3,985,175	Jan 13, 1976	Oct 12, 1976
B 506,144	3,991,147	Feb 10, 1976	Nov. 9, 1976
B 506,148	3,988,319	Feb 3, 1976	Oct. 26, 1976
B 506,167	3,990,652	Feb 10, 1976	Nov. 9, 1976
B 506,286	3,982,085	Jan 20, 1976	Sep. 21, 1976
B 506,461	3,987,348	Jan 20, 1976	Oct 19, 1976
B 506,566	3,985,402	Jan 20, 1976	Oct. 12, 1976
B 506,624	3,999,695	Mar 9, 1976	Dec. 28, 1976
B 506,648	3,994,857	Feb 3, 1976	Nov. 30, 1976
B 506,744	3,981,176	Jan 13, 1976	Sep 21, 1976
B 506,760	4,012,835	Apr 13, 1976	Mar 22, 1977
B 506,839	4,005,389	Mar 23, 1976	Jan. 25, 1977
B 506,840	4,002,928	Mar 23, 1976	Jan 11, 1977
B 506,916	3,986,140	Feb 3, 1976	Oct 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,926	3,993,232	Feb 17, 1976	Nov. 23, 1976
B 507,087	3,991,389	Feb 17, 1976	Nov. 9, 1976
B 507,131	4,000,499	Mar 2, 1976	Dec. 28, 1976
B 507,166	4,014,738	Apr 13, 1976	Mar. 29, 1977
B 507,396	3,995,167	Feb 10, 1976	Nov 30, 1976
B 507,476	3,994,680	Feb 10, 1976	Nov. 30, 1976
B 507,647	3,982,240	Jan 27, 1976	Sep. 21, 1976
B 508,118	3,992,283	Feb 17, 1976	Nov 16, 1976
B 508,119	3,992,285	Feb 17, 1976	Nov. 16, 1976
B 508,369	3,985,847	Jan. 13, 1976	Oct. 12, 1976
B 508,639	4,004,194	Mar. 23, 1976	Jan 18, 1977
B 508,817	3,989,891	Feb 3, 1976	Nov. 2, 1976
B 508,878	3,994,117	Feb 3, 1976	Nov. 30, 1976
B 508,940	3,981,321	Feb. 17, 1976	Sep 21, 1976
B 508,961	3,987,477	Feb. 3, 1976	Oct 19, 1976
B 509,043	3,996,767	Feb. 24, 1976	Dec. 14, 1976
B 509,165	3,999,155	Mar 2, 1976	Dec. 21, 1976
B 509,185	3,989,996	Feb 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb. 24, 1976	Sep 28, 1976
B 509,474	3,997,260	Feb. 17, 1976	Dec. 14, 1976
B 509,586	4,006,645	Feb 3, 1976	Feb. 8, 1977
B 509,606	3,989,986	Feb 3, 1976	Nov. 2, 1976
B 509,772	3,999,004	Mar. 16, 1976	Dec. 21, 1976
B 509,819	4,014,712	Apr. 13, 1976	Mar 29, 1977
B 510,026	4,016,763	Apr 13, 1976	Apr. 12, 1977
B 510,184	D 242,784	Apr. 6, 1976	Dec. 21, 1976
B 510,278	4,008,972	Mar 30, 1976	Feb. 22, 1977
B 510,281	3,993,215	Mar 9, 1976	Nov. 23, 1976
B 510,346	D 242,207	Feb. 10, 1976	Nov. 9, 1976
B 510,458	4,000,221	Feb 10, 1976	Dec 28, 1976
B 510,521	3,990,656	Mar. 2, 1976	Nov. 9, 1976
B 510,588	3,981,539	Jan 27, 1976	Sep 21, 1976
B 510,677	3,989,541	Feb 24, 1976	Nov 2, 1976
B 510,682	4,000,978	Mar. 30, 1976	Jan. 4, 1977
B 510,836	4,013,795	Mar. 23, 1976	Mar. 22, 1977
B 510,850	3,989,841	Feb. 3, 1976	Nov. 2, 1976
B 510,855	3,981,059	Jan. 27, 1976	Sep. 21, 1976
B 511,907	3,999,622	Mar. 30, 1976	Dec. 28, 1976
B 510,998	3,992,336	Feb 10, 1976	Nov. 16, 1976
B 511,002	3,998,717	Mar. 2, 1976	Dec. 21, 1976
B 511,099	3,990,162	Feb. 3, 1976	Nov. 9, 1976
B 511,156	3,981,364	Jan. 27, 1976	Sep. 21, 1976
B 511,346	3,984,072	Jan 27, 1976	Oct. 5, 1976
B 511,407	3,981,485	Feb 10, 1976	Sep. 21, 1976
B 511,454	3,982,333	Feb. 24, 1976	Sep. 28, 1976
B 511,665	4,001,037	Mar 2, 1976	Jan 4, 1977
B 511,885	3,981,346	Jan. 27, 1976	Sep 21, 1976
B 511,886	3,989,991	Feb. 3, 1976	Nov 2, 1976
B 511,909	3,981,183	Feb 17, 1976	Sep. 21, 1976
B 512,324	3,985,084	Feb 17, 1976	Oct. 12, 1976
B 512,547	3,984,193	Jan. 13, 1976	Oct. 5, 1976
B 512,745	3,981,294	Jan. 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr. 13, 1976	Mar. 29, 1977
B 512,818	3,997,363	Apr 6, 1976	Dec. 14, 1976
B 512,849	3,982,141	Feb 3, 1976	Sep. 21, 1976
B 512,964	3,995,279	Feb 10, 1976	Nov. 30, 1976
B 513,014	3,991,113	Feb 10, 1976	Nov 9, 1976
B 513,027	3,995,143	Feb 17, 1976	Nov 30, 1976
B 513,134	4,006,764	Mar 23, 1976	Feb. 8, 1977
B 513,280	3,988,211	Jan. 20, 1976	Oct. 26, 1976
B 513,368	3,982,138	Feb 3, 1976	Sep. 21, 1976
B 513,706	3,986,064	Jan. 13, 1976	Oct. 12, 1976
B 513,756	3,993,869	Feb. 3, 1976	Nov. 23, 1976
B 513,781	4,001,324	Feb 24, 1976	Jan. 4, 1977
B 513,789	3,981,599	Feb 3, 1976	Sep. 21, 1976
B 513,791	4,008,608	Mar 30, 1976	Feb 22, 1977
B 514,259	4,013,649	Mar 23, 1976	Mar. 22, 1977
B 514,687	3,986,522	Jan 27, 1976	Oct 19, 1976
B 514,839	4,033,816	Mar. 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb. 17, 1976	Nov 2, 1976
B 515,303	3,987,939	Jan 20, 1976	Oct 26, 1976
B 515,368	4,014,733	Apr 6, 1976	Mar 29, 1977
B 515,452	3,995,243	Feb 10, 1976	Nov. 30, 1976
B 515,455	3,982,149	Jan 27, 1976	Sep. 21, 1976
B 515,642	4,001,258	Feb. 24, 1976	Jan. 4, 1977
B 515,908	3,984,676	Jan 20, 1976	Oct. 5, 1976
B 516,002	3,988,638	Jan. 13, 1976	Oct. 26, 1976
B 516,032	3,986,634	Jan 27, 1976	Oct. 19, 1976
B 516,047	3,985,741	Feb 10, 1976	Oct. 12, 1976
B 516,060	3,983,572	Feb 17, 1976	Sep. 28, 1976
B 516,069	3,986,208	Mar 16, 1976	Oct. 12, 1976
B 516,296	3,984,404	Feb 3, 1976	Oct. 5, 1976
B 516,537	3,996,784	Feb 17, 1976	Dec 14, 1976
B 516,564	3,993,931	Feb 17, 1976	Nov 23, 1976
B 516,609	3,994,486	Feb 24, 1976	Nov. 30, 1976
B 516,625	4,013,542	Mar 30, 1976	Mar. 22, 1977
B 516,804	3,991,209	Mar 23, 1976	Nov 9, 1976
B 516,825	3,988,885	Feb. 3, 1976	Nov. 2, 1976
B 517,273	D 242,798	Mar 16, 1976	Dec. 21, 1976
B 517,504	3,999,855	Mar 9, 1976	Dec. 28, 1976
B 517,668	4,013,423	Apr 6, 1976	Mar. 22, 1977
B 517,762	3,986,065	Mar 16, 1976	Oct. 12, 1976
B 517,858	4,000,999	Feb. 17, 1976	Jan. 4, 1977
B 517,956	D 243,088	Apr 6, 1976	Jan. 18, 1977
B 517,957	D 243,089	Apr 6, 1976	Jan. 18, 1977
B 518,076	4,014,914	Mar 30, 1976	Mar. 29, 1977
B 518,226	3,993,509	Feb. 10, 1976	Nov 23, 1976
B 518,326	4,008,282	Mar. 23, 1976	Feb 15, 1977
B 518,656	3,989,732	Feb 17, 1976	Nov 2, 1976
B 518,859	3,989,971	Feb 3, 1976	Nov 2, 1976
B 518,999	3,990,323	Feb. 3, 1976	Nov 9, 1976
B 519,095	3,993,621	Feb 24, 1976	Nov 23, 1976
B 519,355	4,014,829	Apr 13, 1976	Mar. 29, 1977
B 519,377	3,987,223	Jan 27, 1976	Oct 19, 1976
B 519,446	3,985,815	Feb 24, 1976	Oct. 12, 1976
B 519,485	3,991,134	Feb 10, 1976	Nov 9, 1976
B 519,486	3,992,481	Feb 17, 1976	Nov 16, 1976
B 519,487	3,992,337	Feb. 17, 1976	Nov 16, 1976
B 519,599	3,995,350	Feb 17, 1976	Dec. 7, 1976
B 519,623	4,012,049	Apr 6, 1976	Mar 15, 1977
B 519,680	4,014,660	Mar. 30, 1976	Mar 29, 1977
B 519,932	3,988,618	Feb. 3, 1976	Oct 26, 1976
B 519,979	3,982,067	Feb. 3, 1976	Sep 21, 1976
B 520,063	3,989,934	Mar 2, 1976	Nov. 2, 1976
B 520,075	3,989,935	Feb 24, 1976	Nov 2, 1976
B 520,076	3,989,936	Mar 2, 1976	Nov 2, 1976
B 520,082	3,989,937	Mar 23, 1976	Nov 2, 1976
B 520,115	4,003,072	Mar 23, 1976	Jan. 11, 1977
B 520,227	4,002,823	Mar 30, 1976	Jan. 11, 1977
B 520,256	3,985,730	Jan 13, 1976	Oct. 12, 1976
B 520,277	3,995,635	Feb 17, 1976	Dec 7, 1975
B 520,341	3,992,028	Mar 16, 1976	Nov. 16, 1976
B 520,384	3,986,592	Jan 27, 1976	Oct. 19, 1976
B 520,514	3,988,308	Mar 9, 1976	Oct. 26, 1976
B 520,534	3,997,119	Feb 17, 1976	Dec 14, 1976
B 520,543	3,986,768	Jan 27, 1976	Oct 19, 1976
B 520,546	4,001,133	Mar. 2, 1976	Jan. 4, 1977
B 520,613	3,991,341	Mar 16, 1976	Nov. 9, 1976
B 520,658	3,998,778	Mar. 9, 1976	Dec. 21, 1976
B 520,878	4,014,849	Apr. 6, 1976	Mar. 29, 1977
B 520,884	4,000,433	Mar. 16, 1976	Dec. 28, 1976
B 520,924	3,982,113	Jan. 27, 1976	Sep. 21, 1976
B 520,928	3,983,617	Jan. 13, 1976	Oct 5, 1976
B 520,952	4,000,876	Mar 16, 1976	Jan. 4, 1977
B 520,995	4,009,996	Mar. 23, 1976	Mar. 1, 1977
B 521,025	3,998,838	Mar. 23, 1976	Dec. 21, 1976
B 521,044	3,983,435	Feb. 24, 1976	Sep. 28, 1976
B 521,045	3,983,433	Feb. 24, 1976	Sep. 28, 1976
B 521,046	3,983,434	Feb. 24, 1976	Sep. 28, 1976
B 521,125	3,994,865	Feb 10, 1976	Nov. 30, 1976
B 521,126	3,997,510	Feb 10, 1976	Dec. 14, 1976
B 521,127	3,996,201	Feb 17, 1976	Dec. 7, 1976
B 521,128	3,997,511	Feb 10, 1976	Dec 14, 1976
B 521,324	3,983,143	Jan 27, 1976	Sep 28, 1976
B 521,480	3,982,665	Jan. 13, 1976	Sep. 28, 1976
B 521,600	3,981,458	Jan 27, 1976	Sep 21, 1976
B 521,612	4,000,251	Mar. 9, 1976	Dec 28, 1976
B 521,620	3,983,749	Jan 27, 1976	Oct. 5, 1976
B 521,643	3,997,567	Mar. 2, 1976	Dec 14, 1976
B 521,711	3,989,835	Feb 10, 1976	Nov 2, 1976
B 521,793	3,996,981	Feb. 24, 1976	Dec. 14, 1976
B 521,984	3,983,220	Feb 17, 1976	Sep 28, 1976
B 521,985	4,012,404	Mar 23, 1976	Mar. 15, 1977
B 521,986	3,981,607	Feb. 3, 1976	Sep. 21, 1976
B 522,009	3,995,444	Feb 17, 1976	Dec 7, 1976
B 522,038	3,993,119	Feb 3, 1976	Nov 23, 1976
B 522,227	3,992,904	Mar 30, 1976	Nov. 23, 1976
B 522,309	3,991,603	Feb 3, 1976	Nov 16, 1976
B 522,354	3,984,959	Jan 20, 1976	Oct 12, 1976
B 522,446	4,001,194	Mar 30, 1976	Jan. 4, 1977
B 522,537	3,999,587	Mar 30, 1976	Dec. 28, 1976
B 522,567	3,996,238	Feb 17, 1976	Dec 7, 1976
B 522,568	D 242,785	Apr 6, 1976	Dec. 21, 1976
B 522,577	3,982,123	Jan 27, 1976	Sep. 21, 1976
B 522,629	4,001,155	Mar. 16, 1976	Jan 4, 1977
B 523,226	4,006,367	Mar 23, 1976	Feb 1, 1977
B 523,696	3,986,071	Jan 13, 1976	Oct 12, 1976
B 523,885	3,981,040	Feb. 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar 23, 1976	Oct. 26, 1976
B 524,026	3,992,206	Feb 10, 1976	Nov 16, 1976
B 524,121	3,982,536	Feb. 3, 1976	Sep 28, 1976
B 524,179	3,985,872	Jan. 13, 1976	Oct 12, 1976
B 524,464	3,985,580	Feb. 10, 1976	Oct 12, 1976
B 524,806	4,000,065	Mar 2, 1976	Dec. 28, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 524,849	4,014,938	Mar. 23, 1976	Mar. 29, 1977	B 534,680	4,014,904	Apr. 20, 1976	Mar. 29, 1977
B 525,133	3,996,481	Mar. 23, 1976	Dec. 7, 1976	B 534,767	3,982,180	Feb. 3, 1976	Sep. 21, 1976
B 525,204	4,001,109	Mar. 16, 1976	Jan. 4, 1977	B 534,915	4,012,668	Mar. 23, 1976	Mar. 15, 1977
B 525,809	3,985,040	Feb. 24, 1976	Oct. 12, 1976	B 534,991	3,983,517	Jan. 27, 1976	Sep. 28, 1976
B 525,961	3,985,557	Jan. 13, 1976	Oct. 12, 1976	B 535,076	3,981,718	Jan 20, 1976	Sep. 21, 1976
B 526,106	3,990,073	Jan 27, 1976	Nov. 2, 1976	B 535,209	4,001,873	Mar. 16, 1976	Jan. 4, 1977
B 526,190	3,982,129	Feb. 17, 1976	Sep. 21, 1976	B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 526,279	4,013,138	Apr 13, 1976	Mar. 22, 1977	B 535,268	3,999,045	Mar. 30, 1976	Dec. 21, 1976
B 526,289	3,992,641	Feb. 24, 1976	Nov. 16, 1976	B 535,386	3,981,150	Jan 13, 1976	Sep. 21, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov. 16, 1976	B 535,391	3,981,386	Jan. 27, 1976	Sep. 21, 1976
B 526,445	3,984,978	Jan. 20, 1976	Oct. 12, 1976	B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 526,447	4,000,052	Feb. 24, 1976	Dec. 28, 1976	B 535,437	3,997,555	Feb. 24, 1976	Dec. 14, 1976
B 526,510	3,989,708	Jan. 20, 1976	Nov. 2, 1976	B 535,448	3,997,123	Mar. 16, 1976	Dec. 14, 1976
B 526,654	4,011,534	Mar. 23, 1976	Mar. 8, 1977	B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 526,942	4,013,700	Mar. 30, 1976	Mar. 22, 1977	B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 526,997	3,985,695	Jan 13, 1976	Oct. 12, 1976	B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 527,040	4,013,515	Mar. 23, 1976	Mar. 22, 1977	B 536,009	3,982,112	Jan. 27, 1976	Sep. 21, 1976
B 527,054	3,981,559	Feb 17, 1976	Sep 21, 1976	B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 527,171	3,998,248	Mar. 9, 1976	Dec. 21, 1976	B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 527,187	3,995,202	Feb 17, 1976	Nov. 30, 1976	B 536,403	3,998,341	Mar. 23, 1976	Dec. 21, 1976
B 527,333	3,999,732	Mar. 23, 1976	Dec. 28, 1976	B 536,511	3,995,989	Mar. 9, 1976	Dec. 7, 1976
B 527,669	3,982,206	Jan. 13, 1976	Sep. 21, 1976	B 536,675	3,985,773	Jan. 20, 1976	Oct. 12, 1976
B 527,693	3,995,233	Feb. 3, 1976	Nov. 30, 1976	B 536,923	4,007,828	Mar. 30, 1976	Feb. 15, 1977
B 527,788	D 242,337	Feb. 10, 1976	Nov. 16, 1976	B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 527,972	4,000,016	Mar 9, 1976	Dec. 28, 1976	B 537,058	4,000,969	Mar. 23, 1976	Jan. 4, 1977
B 527,999	3,981,682	Feb 3, 1976	Sep. 21, 1976	B 537,102	3,981,829	Jan. 13, 1976	Sep. 21, 1976
B 528,297	4,001,138	Mar 16, 1976	Jan. 4, 1977	B 537,709	3,981,368	Jan. 13, 1976	Sep. 21, 1976
B 528,303	3,991,023	Feb. 10, 1976	Nov. 9, 1976	B 537,711	3,985,748	Jan. 13, 1976	Oct. 12, 1976
B 528,401	3,991,619	Feb 3, 1976	Nov. 16, 1976	B 537,722	3,985,423	Feb. 3, 1976	Oct. 12, 1976
B 528,756	3,990,476	Feb. 3, 1976	Nov. 9, 1976	B 537,903	3,986,492	Jan. 20, 1976	Oct. 19, 1976
B 528,761	3,982,221	Feb. 10, 1976	Sep 21, 1976	B 538,472	3,992,884	Feb. 3, 1976	Nov. 23, 1976
B 528,962	3,989,666	Feb. 24, 1976	Nov 2, 1976	B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 528,966	3,989,667	Feb. 24, 1976	Nov 2, 1976	B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 529,156	3,989,158	Jan 13, 1976	Nov. 2, 1976	B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 529,194	4,000,776	Mar 23, 1976	Jan 4, 1977	B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 529,214	4,013,004	Apr. 20, 1976	Mar. 22, 1977	B 539,746	3,983,423	Feb. 17, 1976	Sep. 28, 1976
B 529,659	3,996,875	Feb 24, 1976	Dec. 14, 1976	B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 529,836	3,994,345	Feb. 3, 1976	Nov. 30, 1976	B 540,218	3,986,108	Feb. 10, 1976	Oct. 12, 1976
B 529,925	4,014,003	Mar 30, 1976	Mar. 22, 1977	B 540,632	3,981,600	Jan. 13, 1976	Sep. 21, 1976
B 529,974	3,987,098	Feb. 17, 1976	Oct. 19, 1976	B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 530,174	3,993,635	Feb. 24, 1976	Nov. 23, 1976	B 540,767	3,986,010	Mar. 16, 1976	Oct. 12, 1976
B 530,255	3,996,103	Mar. 2, 1976	Dec. 7, 1976	B 540,872	3,982,135	Jan 20, 1976	Sep. 21, 1976
B 530,263	4,009,736	Mar. 30, 1976	Mar. 1, 1977	B 540,888	4,005,528	Mar. 30, 1976	Feb. 1, 1977
B 530,285	4,013,903	Apr. 6, 1976	Mar. 22, 1977	B 541,015	3,993,208	Jan 27, 1976	Nov. 23, 1976
B 530,303	4,006,029	Mar. 23, 1976	Feb. 1, 1977	B 541,376	3,981,690	Feb. 17, 1976	Sep. 21, 1976
B 530,318	3,985,752	Jan. 13, 1976	Oct. 12, 1976	B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 530,437	4,014,857	Apr. 13, 1976	Mar. 29, 1977	B 541,464	3,995,424	Feb. 17, 1976	Dec. 7, 1976
B 530,569	3,999,865	Mar. 16, 1976	Dec. 28, 1976	B 541,496	3,982,232	Jan. 27, 1976	Sep. 21, 1976
B 530,580	4,001,151	Mar. 2, 1976	Jan. 4, 1977	B 541,501	4,005,826	Apr. 13, 1976	Feb. 1, 1977
B 530,605	3,989,064	Feb. 3, 1976	Nov. 2, 1976	B 541,517	3,986,156	Jan. 13, 1976	Oct. 12, 1976
B 530,709	4,012,944	Apr 6, 1976	Mar. 22, 1977	B 541,710	3,994,472	Feb. 24, 1976	Nov. 30, 1976
B 530,813	3,986,131	Feb. 17, 1976	Oct. 12, 1976	B 542,135	3,986,939	Feb. 10, 1976	Oct. 19, 1976
B 530,873	4,001,016	Feb. 17, 1976	Jan. 4, 1977	B 542,158	3,981,886	Jan. 13, 1976	Sep. 21, 1976
B 530,925	3,983,161	Feb 24, 1976	Sep. 28, 1976	B 542,226	3,993,748	Feb. 24, 1976	Nov. 23, 1976
B 531,096	3,984,415	Feb. 10, 1976	Oct. 5, 1976	B 542,258	4,013,536	Mar. 23, 1976	Mar. 22, 1977
B 531,267	3,997,040	Feb 24, 1976	Dec. 14, 1976	B 543,078	3,995,687	Feb. 17, 1976	Dec. 7, 1976
B 531,425	3,992,595	Feb. 3, 1976	Nov. 16, 1976	B 543,941	3,985,528	Jan. 13, 1976	Oct. 12, 1976
B 531,566	3,997,820	Mar. 16, 1976	Dec. 14, 1976	B 544,034	3,997,175	Feb. 17, 1976	Dec. 14, 1976
B 531,686	3,990,017	Mar. 23, 1976	Nov. 2, 1976	B 544,476	3,993,585	Feb. 24, 1976	Nov. 23, 1976
B 531,753	3,988,843	Mar 2, 1976	Nov. 2, 1976	B 544,899	3,994,962	Feb. 17, 1976	Nov. 30, 1976
B 531,929	3,986,067	Jan 20, 1976	Oct. 12, 1976	B 544,961	3,983,492	Jan. 13, 1976	Sep. 28, 1976
B 532,005	3,992,397	Feb. 24, 1976	Nov 16, 1976	B 545,050	3,982,073	Jan. 20, 1976	Sep. 21, 1976
B 532,140	4,001,299	Mar 2, 1976	Jan. 4, 1977	B 545,265	D 243,090	Apr. 13, 1976	Jan. 18, 1977
B 532,319	3,990,292	Feb. 3, 1976	Nov. 9, 1976	B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 532,326	3,993,959	Mar 23, 1976	Nov 23, 1976	B 545,344	4,012,746	Mar. 30, 1976	Mar. 15, 1977
B 532,424	D 242,292	Feb. 10, 1976	Nov. 9, 1976	B 545,464	3,992,387	Feb. 10, 1976	Nov. 16, 1976
B 532,476	3,992,756	Feb. 3, 1976	Nov. 23, 1976	B 545,630	3,981,337	Jan. 27, 1976	Sep. 21, 1976
B 532,477	4,014,895	Apr. 13, 1976	Mar. 29, 1977	B 545,777	4,004,906	Jan. 27, 1976	Jan. 25, 1977
B 532,679	4,010,706	Apr. 6, 1976	Mar. 8, 1977	B 545,856	4,006,939	Mar. 30, 1976	Feb. 8, 1977
B 532,901	3,984,318	Jan. 13, 1976	Oct. 5, 1976	B 545,935	3,990,337	Jan. 27, 1976	Nov. 9, 1976
B 532,969	3,981,706	Jan. 13, 1976	Sep. 21, 1976	B 545,945	3,995,260	Jan. 27, 1976	Nov. 30, 1976
B 532,976	4,000,837	Mar. 23, 1976	Jan 4, 1977	B 546,097	3,999,309	Mar. 23, 1976	Dec. 28, 1976
B 533,056	3,983,969	Jan. 13, 1976	Oct 5, 1976	B 546,295	3,987,070	Jan 20, 1976	Oct. 19, 1976
B 533,259	3,999,556	Feb. 24, 1976	Dec. 28, 1976	B 546,426	3,982,063	Jan. 27, 1976	Sep. 21, 1976
B 533,454	3,996,566	Mar. 2, 1976	Dec 7, 1976	B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 533,580	3,982,255	Feb. 3, 1976	Sep. 21, 1976	B 546,665	3,990,062	Jan. 20, 1976	Nov. 2, 1976
B 533,652	4,000,196	Mar. 23, 1976	Dec. 28, 1976	B 546,677	4,015,654	Apr. 6, 1976	Apr. 5, 1977
B 533,734	3,984,799	Jan. 27, 1976	Oct. 5, 1976	B 546,911	3,981,058	Jan. 13, 1976	Sep. 21, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct. 19, 1976	B 546,922	3,987,742	Mar. 16, 1976	Oct. 26, 1976
B 534,016	3,983,381	Feb 3, 1976	Sep. 28, 1976	B 547,016	3,999,741	Mar. 23, 1976	Dec. 28, 1976
B 534,313	3,981,675	Jan. 27, 1976	Sep. 21, 1976	B 547,208	4,001,218	Feb. 24, 1976	Jan. 4, 1977
B 534,314	3,981,786	Feb. 10, 1976	Sep. 21, 1976	B 547,547	3,997,670	Feb. 24, 1976	Dec. 14, 1976
B 534,333	3,981,480	Feb 17, 1976	Sep. 21, 1976	B 547,994	3,990,081	Jan. 20, 1976	Nov. 2, 1976
B 534,334	D 242,722	Mar. 16, 1976	Dec. 14, 1976	B 548,028	3,991,517	Feb. 3, 1976	Nov. 16, 1976
B 534,443	3,989,970	Jan. 27, 1976	Nov. 2, 1976	B 548,058	3,983,050	Feb 17, 1976	Sep. 28, 1976
B 534,574	3,995,624	Feb 24, 1976	Dec. 7, 1976	B 548,155	3,981,477	Jan. 13, 1976	Sep. 21, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov 9, 1976	B 548,440	3,993,401	Feb 3, 1976	Nov. 23, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 548,302	3,983,414	Feb 17, 1976	Sep. 28, 1976	B 562,698	3,983,972	Jan 13, 1976	Oct 5, 1976
B 548,440	3,993,401	Feb 3, 1976	Nov. 23, 1976	B 562,813	3,985,491	Feb. 3, 1976	Oct 12, 1976
B 548,462	D 242,283	Feb. 10, 1976	Nov. 9, 1976	B 563,070	3,996,230	Mar. 9, 1976	Dec. 7, 1976
B 548,688	3,995,984	Mar. 9, 1976	Dec 7, 1976	B 563,165	4,000,977	Mar 9, 1976	Jan. 4, 1977
B 548,719	3,990,553	Feb. 17, 1976	Nov. 9, 1976	B 563,244	3,983,562	Jan 27, 1976	Sep. 28, 1976
B 548,978	3,998,139	Mar. 9, 1976	Dec. 21, 1976	B 563,301	3,995,589	Feb. 17, 1976	Dec. 7, 1976
B 549,198	3,981,975	Jan 13, 1976	Sep. 21, 1976	B 563,412	3,992,127	Feb. 24, 1976	Nov. 16, 1976
B 549,244	3,981,125	Jan 27, 1976	Sep. 21, 1976	B 563,419	3,999,051	Mar 23, 1976	Dec. 21, 1976
B 549,394	3,981,611	Jan 27, 1976	Sep 21, 1976	B 563,722	3,990,925	Jan 13, 1976	Nov 9, 1976
B 549,931	3,986,141	Jan 20, 1976	Oct. 12, 1976	B 563,780	3,987,769	Feb 3, 1976	Oct. 26, 1976
B 549,964	3,995,899	Feb. 24, 1976	Dec. 7, 1976	B 563,932	4,000,638	Mar. 23, 1976	Jan 4, 1977
B 550,693	3,982,194	Jan 20, 1976	Sep. 21, 1976	B 564,252	4,001,293	Mar. 2, 1976	Jan 4, 1977
B 550,744	3,993,550	Feb. 17, 1976	Nov 23, 1976	B 564,255	4,015,996	Mar 30, 1976	Apr 5, 1977
B 550,810	4,000,910	Mar 23, 1976	Jan 4, 1977	B 564,314	3,984,996	Jan 20, 1976	Oct 12, 1976
B 551,133	3,996,740	Mar 2, 1976	Dec. 14, 1976	B 564,902	4,001,351	Mar. 23, 1976	Jan 4, 1977
B 551,463	3,996,254	Feb. 17, 1976	Dec. 7, 1976	B 565,180	3,981,685	Jan 27, 1976	Sep 21, 1976
B 551,527	3,982,599	Jan. 13, 1976	Sep. 28, 1976	B 565,275	3,990,299	Apr 6, 1976	Nov 9, 1976
B 551,809	3,996,743	Feb. 24, 1976	Dec. 14, 1976	B 565,717	3,999,138	Apr. 13, 1976	Dec 21, 1976
B 551,952	Re 29,059	Mar 2, 1976	Dec. 7, 1976	B 565,754	4,011,626	Mar 30, 1976	Mar 15, 1977
B 552,006	3,992,129	Feb. 3, 1976	Nov 16, 1976	B 566,464	3,996,367	Feb 3, 1976	Dec 7, 1976
B 552,489	3,994,864	Feb. 10, 1976	Nov. 30, 1976	B 566,556	3,998,511	Mar 23, 1976	Dec 21, 1976
B 552,498	3,983,139	Jan. 13, 1976	Sep. 28, 1976	B 566,572	3,988,590	Mar 16, 1976	Oct 26, 1976
B 552,508	4,001,250	Mar 16, 1976	Jan 4, 1977	B 566,585	4,001,083	Mar. 2, 1976	Jan 4, 1977
B 552,629	3,994,773	Mar 23, 1976	Nov. 30, 1976	B 567,058	3,985,188	Jan 13, 1976	Oct 12, 1976
B 552,709	4,001,467	Mar. 23, 1976	Jan. 4, 1977	B 567,076	4,011,187	Mar 23, 1976	Mar 8, 1977
B 552,932	3,989,292	Feb 3, 1976	Nov 2, 1976	B 567,158	3,988,073	Mar 23, 1976	Oct 26, 1976
B 553,421	4,001,146	Mar. 23, 1976	Jan 4, 1977	B 567,207	3,991,689	Apr 13, 1976	Nov 16, 1976
B 553,460	3,990,019	Feb. 3, 1976	Nov. 2, 1976	B 567,435	3,995,724	Feb 3, 1976	Dec 7, 1976
B 553,584	3,992,456	Feb. 17, 1976	Nov. 16, 1976	B 567,854	3,985,038	Feb. 3, 1976	Oct 12, 1976
B 553,629	3,999,242	Feb. 24, 1976	Dec. 28, 1976	B 567,892	4,000,855	Mar 16, 1976	Jan 4, 1977
B 554,039	3,999,944	Feb. 24, 1976	Dec. 28, 1976	B 568,226	3,992,698	Feb. 24, 1976	Nov 16, 1976
B 554,164	4,001,465	Mar. 9, 1976	Jan. 4, 1977	B 568,770	3,982,213	Feb 10, 1976	Sep 21, 1976
B 554,283	3,981,152	Jan 27, 1976	Sep 21, 1976	B 569,125	3,986,980	Feb 24, 1976	Oct 19, 1976
B 554,291	4,001,209	Mar. 9, 1976	Jan. 4, 1977	B 569,293	4,004,149	Mar 30, 1976	Jan 18, 1977
B 554,380	4,001,147	Mar. 9, 1976	Jan. 4, 1977	B 569,501	3,999,250	Mar 9, 1976	Dec 28, 1976
B 554,594	3,985,960	Jan. 20, 1976	Oct. 12, 1976	B 569,519	3,993,133	Feb 3, 1976	Nov 23, 1976
B 554,655	4,015,048	Feb. 24, 1976	Mar. 29, 1977	B 569,646	3,985,222	Jan 13, 1976	Oct 12, 1976
B 554,848	4,001,265	Feb. 24, 1976	Jan. 4, 1977	B 569,859	3,994,160	Mar 9, 1976	Nov 30, 1976
B 554,939	3,994,013	Feb. 10, 1976	Nov 23, 1976	B 570,172	3,987,763	Feb 3, 1976	Oct 26, 1976
B 555,146	4,007,636	Apr. 20, 1976	Feb. 15, 1977	B 570,615	3,998,570	Mar 23, 1976	Dec 21, 1976
B 555,437	3,991,152	Feb. 3, 1976	Nov 9, 1976	B 570,862	3,991,639	Feb 24, 1976	Nov 16, 1976
B 555,456	3,993,423	Mar 30, 1976	Nov. 23, 1976	B 571,219	3,991,388	Feb 24, 1976	Nov. 9, 1976
B 555,772	3,982,641	Jan. 13, 1976	Sep 28, 1976	B 571,638	4,001,244	Mar 9, 1976	Jan 4, 1977
B 556,057	3,985,349	Jan. 13, 1976	Oct. 12, 1976	B 571,659	3,995,186	Apr 13, 1976	Nov 30, 1976
B 556,496	3,990,244	Mar. 16, 1976	Nov. 9, 1976	B 572,642	3,990,715	Feb 10, 1976	Nov 9, 1976
B 556,897	3,992,972	Feb. 3, 1976	Nov 23, 1976	B 572,726	4,015,020	Feb 24, 1976	Mar 29, 1977
B 557,153	3,991,603	Feb. 3, 1976	Nov. 16, 1976	B 573,033	3,995,224	Mar 23, 1976	Nov 30, 1976
B 557,274	4,016,375	Mar. 23, 1976	Apr. 5, 1977	B 573,114	4,014,843	Apr 6, 1976	Mar 29, 1977
B 557,299	3,990,357	Feb 3, 1976	Nov. 9, 1976	B 573,991	4,013,704	Mar 30, 1976	Mar 22, 1977
B 557,621	3,990,800	Feb 3, 1976	Nov. 9, 1976	B 573,994	4,000,641	Mar 23, 1976	Jan 4, 1977
B 557,721	4,013,435	Mar. 23, 1976	Mar. 22, 1977	B 574,128	3,982,961	Feb 17, 1976	Sep 28, 1976
B 557,856	3,991,019	Feb. 10, 1976	Nov. 9, 1976	B 574,616	4,000,424	Mar 2, 1976	Dec 28, 1976
B 558,220	3,990,009	Jan. 27, 1976	Nov 2, 1976	B 574,996	3,989,718	Feb 17, 1976	Nov 2, 1976
B 558,251	3,981,289	Jan. 13, 1976	Sep. 21, 1976	B 575,583	4,000,928	Mar 16, 1976	Jan 4, 1977
B 558,813	3,989,188	Feb. 3, 1976	Nov. 2, 1976	B 575,757	3,981,170	Jan 27, 1976	Sep 21, 1976
B 558,818	3,983,762	Jan. 13, 1976	Oct. 5, 1976	B 575,761	4,013,123	Apr 13, 1976	Mar 22, 1977
B 558,819	3,990,160	Feb. 3, 1976	Nov 9, 1976	B 575,776	4,013,124	Apr 20, 1976	Mar 22, 1977
B 558,973	3,981,126	Feb 10, 1976	Sep. 21, 1976	B 575,851	3,985,826	Feb 10, 1976	Oct 12, 1976
B 559,111	3,984,854	Feb. 24, 1976	Oct. 5, 1976	B 576,385	4,009,498	Mar 30, 1976	Mar 1, 1977
B 559,142	4,001,124	Mar. 2, 1976	Jan 4, 1977	B 576,859	3,991,526	Feb 24, 1976	Nov. 16, 1976
B 559,394	4,016,094	Apr. 20, 1976	Apr 5, 1977	B 576,903	3,995,032	Feb. 3, 1976	Nov 30, 1976
B 559,441	4,013,609	Mar 23, 1976	Mar 22, 1977	B 578,447	3,982,658	Jan 20, 1976	Sep 28, 1976
B 559,631	4,011,406	Mar. 23, 1976	Mar. 8, 1977	B 579,104	3,982,081	Jan 27, 1976	Sep. 21, 1976
B 559,697	3,995,770	Mar. 16, 1976	Dec. 7, 1976	B 579,116	3,986,227	Feb 3, 1976	Oct 19, 1976
B 559,700	4,001,189	Mar 23, 1976	Jan 4, 1977	B 579,153	4,013,745	Mar 30, 1976	Mar 22, 1977
B 559,701	4,001,190	Mar. 23, 1976	Jan. 4, 1977	B 579,806	3,995,318	Feb 3, 1976	Nov 30, 1976
B 559,737	3,984,668	Jan 20, 1976	Oct 5, 1976	B 580,379	4,000,796	Apr 6, 1976	Jan 4, 1977
B 559,954	3,982,673	Feb. 3, 1976	Sep 28, 1976	B 580,826	3,988,391	Feb 17, 1976	Oct 26, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct. 19, 1976	B 580,921	3,984,054	Jan 13, 1976	Oct 5, 1976
B 560,488	3,989,940	Mar. 16, 1976	Nov 2, 1976	B 581,843	4,000,562	Mar 16, 1976	Jan 4, 1977
B 560,717	3,982,034	Feb 10, 1976	Sep. 21, 1976	B 583,051	3,990,714	Feb 3, 1976	Nov 9, 1976
B 560,765	3,983,389	Feb 3, 1976	Sep. 28, 1976	B 583,089	3,982,174	Jan 27, 1976	Sep 21, 1976
B 561,062	D 242,248	Feb 10, 1976	Nov. 9, 1976	B 583,712	3,995,064	Feb 10, 1976	Nov 30, 1976
B 561,165	4,013,002	Mar 30, 1976	Mar 22, 1977	B 584,520	3,981,149	Jan 27, 1976	Sep 21, 1976
B 561,166	4,011,809	Mar 30, 1976	Mar 15, 1977	B 584,997	4,000,030	Mar 9, 1976	Dec 28, 1976
B 561,365	4,005,078	Apr. 13, 1976	Jan. 25, 1977	B 585,247	3,989,914	Feb 3, 1976	Nov 2, 1976
B 561,387	3,985,706	Feb. 10, 1976	Oct. 12, 1976	B 585,731	3,993,603	Feb 3, 1976	Nov 23, 1976
B 561,405	4,003,770	Mar 30, 1976	Jan 18, 1977	B 586,215	3,985,302	Jan 20, 1976	Oct 12, 1976
B 561,712	3,992,126	Feb. 17, 1976	Nov 16, 1976	B 586,380	3,983,885	Mar. 2, 1976	Oct 5, 1976
B 561,732	3,991,460	Feb 3, 1976	Nov 16, 1976	B 586,387	3,981,311	Feb 3, 1976	Sep 21, 1976
B 561,764	3,984,634	Jan. 27, 1976	Oct 5, 1976	B 586,663	3,992,080	Feb 3, 1976	Nov 16, 1976
B 561,770	4,000,366	Mar 16, 1976	Dec 28, 1976	B 587,118	Re 29,067	Mar 2, 1976	Dec 7, 1976
B 561,784	3,984,710	Jan. 27, 1976	Oct 5, 1976	B 587,786	3,991,204	Feb 17, 1976	Nov 9, 1976
B 562,413	4,000,930	Mar 16, 1976	Jan 4, 1977	B 587,936	3,999,052	Mar 23, 1976	Dec 21, 1976
B 562,462	3,985,836	Jan 13, 1976	Oct. 12, 1976	B 589,179	4,001,102	Mar 23, 1976	Jan 4, 1977
B 562,519	4,013,125	Mar 30, 1976	Mar 22, 1977	B 589,687	3,995,349	Mar. 23, 1976	Dec. 7, 1976
B 562,601	3,998,360	Mar 16, 1976	Dec. 21, 1976	B 589,966	3,985,828	Feb 17, 1976	Oct 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 590,158	3,985,163	Feb. 10, 1976	Oct. 12, 1976
B 590,159	3,985,164	Feb. 3, 1976	Oct. 12, 1976
B 590,502	4,001,171	Mar. 23, 1976	Jan. 4, 1977
B 591,141	4,013,631	Mar. 23, 1976	Mar. 22, 1977
B 592,143	3,984,713	Jan. 27, 1976	Oct. 5, 1976
B 592,146	4,001,084	Mar. 2, 1976	Jan. 4, 1977
B 592,658	4,001,164	Mar. 23, 1976	Jan. 4, 1977
B 593,781	4,015,953	Mar. 16, 1976	Apr. 5, 1977
B 594,871	3,999,245	Mar. 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb. 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar. 30, 1976	Jan. 4, 1977
B 657,438	3,985,701	Jan 20, 1976	Oct. 12, 1976
B 747,785	3,981,899	Feb 10, 1976	Sep. 21, 1976
B 750,679	4,007,049	Mar. 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb 3, 1976	Sep. 21, 1976
B 845,044	4,001,338	Mar. 30, 1976	Jan 4, 1977
B 848,336	3,993,752	Mar. 30, 1976	Nov. 23, 1976

LIST OF DEFENSIVE PUBLICATIONS

APPLICANTS TO WHOM

DEFENSIVE PUBLICATIONS WERE ISSUED ON THE 5TH DAY OF JULY, 1977

Published at the request of the applicant or owner in accordance with the Notice of Dec 16, 1969, 869 O. G 687.

Davidson, William J *See—*
  Innes, Ian R, and Davidson, William J, T960,003, Cl 424-337 000

Innes, Ian R, and Davidson, William J Alleviation of tissue damage with bis(substitutedphenyl)mercaptoles. T960,003, 7-5-77, Cl 424-337 000.

Knight, George R Culvert construction T960,001, 7-5-77, Cl 61-16 000

Moon, Roger A Fuel enrichment control circuit for an internal combustion engine T960,002, 7-5-77, Cl 123-32 0EA

Neville, Garth Emanuel Apparatus for concurrent measurement of polymer melt T960,004, 7-5-77, Cl 73-55 000

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 5TH DAY OF JULY, 1977

Note —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice)

Ansonia Clock Company, Inc.. *See—*
  Nofziger, Dale, Re. 29,290, Cl 116-124.00R

Ball Brothers Research Corporation: *See—*
  Krutsinger, Jack K.; Bullai, Carl N.; and Munson, Robert E., Re. 29,296, Cl. 343-700.0MS

Bullai, Carl N.: *See—*
  Krutsinger, Jack K.; Bullai, Carl N.; and Munson, Robert E, Re. 29,296, Cl. 343-700.0MS.

Burlington Industries, Inc.: *See—*
  Illman, Walter F., Malpass, Robert C.; and Conklin, Delano M, Re. 29,287, Cl. 28-178.000.

Capetti, Federico.'*See—*
  Terzuolo, Giancarlo; and Capetti, Federico, Re. 29,289, Cl 101-232.000.

Caterpillar Tractor Co.: *See—*
  Ehlke, Charles C.; Strohschein, Donald K., and Yancey, John W, Re. 29,293, Cl. 192-13.00R.

Chemical Instruments Corporation: *See—*
  Schilling, Robert G, Jr., Re 29,288, Cl. 73-101.000

Conklin, Delano M.: *See—*
  Illman, Walter F, Malpass, Robert C.; and Conklin, Delano M, Re. 29,287, Cl. 28-178.000.

Ehlke, Charles C; Strohschein, Donald K, and Yancey, John W, to Caterpillar Tractor Co Pedal actuated steering clutch and brake controls for tractors Re 29,293, Cl. 192-13.00R

Illman, Walter F., Malpass, Robert C., and Conklin, Delano M, to Burlington Industries, Inc. Apparatus for applying hot melt size material to textile yarns. Re. 29,287, Cl. 28-178.000

Krutsinger, Jack K, Bullai, Carl N, and Munson, Robert E, to Ball Brothers Research Corporation. Dual slot microstrip antenna device Re. 29,296, Cl 343-700.0MS

Malpass, Robert C *See—*
  Illman, Walter F, Malpass, Robert C, and Conklin, Delano M, Re 29,287, Cl 28-178.000

Munson, Robert E *See—*
  Krutsinger, Jack K, Bullai, Carl N, and Munson, Robert E, Re 29,296, Cl 343-700.0MS

Nofziger, Dale, to Ansonia Clock Company, Inc Pendulum and escapement anchor relationship indicator and setter Re 29,290, Cl 116-124.00R

Peak, Leonard R Portable animal feed bunk and method of feeding stacked or baled hay Re 29,291, Cl 119-60.000

Pierre, Marcel J, to Societe Materiel pour Toutes Applications Plastiques - M A P Press for moulding gramophone records or the like Re 29,294, Cl 425-590.000

Schilling, Robert G, Jr, to Chemical Instruments Corporation Material analyzing apparatus and method Re 29,288, Cl 73-101.000

Societa Nebiolo S p A. *See—*
  Terzuolo, Giancarlo, and Capetti, Federico, Re 29,289, Cl 101-232.000

Societe Materiel pour Toutes Applications Plastiques - M A P *See—*
  Pierre, Marcel J, Re 29,294, Cl 425-590.000

Strohschein, Donald K *See—*
  Ehlke, Charles C, Strohschein, Donald K, and Yancey, John W, Re 29,293, Cl 192-13.00R

Sundstrand Corporation *See—*
  Tennis, Francis H, Re 29,292, Cl 137-596.000

Tennis, Francis H, to Sundstrand Corporation Control valve means for fluid motors Re 29,292, Cl 137-596.000

Terzuolo, Giancarlo, and Capetti, Federico, to Societa Nebiolo S p A Printing press with variable speed transfer cylinder Re 29,289, Cl 101-232.000

Yancey, John W *See—*
  Ehlke, Charles C, Strohschein, Donald K, and Yancey, John W, Re 29,293, Cl 192-13.00R

LIST OF PLANT PATENTEES

Cerro Gordo, Inc *See—*
  Ito, Tokuyasu, and Ikuta, Hideo, 4,069, Cl 88.000

Ikuta, Hideo *See—*
  Ito, Tokuyasu, and Ikuta, Hideo, 4,069, Cl 88.000.

Ito, Tokuyasu, and Ikuta, Hideo, to Cerro Gordo, Inc Rubber plant (Ficus Gold King) 4,069, 7-5-77, Cl 88.000

Kono, Yoshio Clear Yellow May Shoesmith 4,071, 7-5-77, Cl. 78.000

Mikkelsens Inc *See—*
  Woodriff, Leslie, 4,073, Cl 68.000

Moore, Ralph S Rose plant 4,070, 7-5-77, Cl 9.000

Nakayama, Hitoshi P Peach tree 4,072, 7-5-77, Cl 43.000

Woodriff, Leslie, to Mikkelsens Inc Begonia plant. 4,073, 7-5-77, Cl 68.000

LIST OF DESIGN PATENTEES

- Adams, Ruey C., to Cosco, Inc. Playpen. 244,890, 7-5-77, Cl. D6-13.000.
- AMP Incorporated: *See—*
  - Brunner, Richard Roy; and Boenzli, Gabriel, 244,904, Cl D8-58.000.
  - Hooper, Dean Roosevelt, Jr., 244,944, Cl D13-24.000
- Anthon, Edmund H , III Motorcycle utility box. 244,927, 7-5-77, Cl. D12-158.000.
- Armstrong, Robert H. Combined liquid dispenser and mounting bracket. 244,929, 7-5-77, Cl D15-112 000.
- Ballert Orthopedic Corporation *See—*
  - Perser, Donald A.; and Cook, Michael Franz Helmut, 244,886, Cl. D2-264 000
- Balmer, James G., Jr., to Xerox Corporation Film reel. 244,943, 7-5-77, Cl. D14-10 000.
- Bear Co., Ltd., *See—*
  - Ueno, Naohiro, 244,916, Cl. D10-38.000.
- Beatrice Goods Co.. *See—*
  - Chow, Ho, 244,936, Cl. D23-7 000.
- Beautiline Systems Limited *See—*
  - Bobrovniczky, Bertalan Tamas, 244,942, Cl. D25-75.000.
- Bergo, Ralph M *See—*
  - Hauser, Stephen G., Keith, Keith S , Bergo, Ralph M , and DiSorbo, Robert T , 244,934, Cl D16-14 000
- Bleser, Richard K , to Overman AB Pool toy 244,958, 7-5-77, Cl D34-15 0JJ
- Bobrovniczky, Bertalan Tamas, to Beautiline Systems Limited Eight-sided tubular post 244,942, 7-5-77, Cl D25-75 000.
- Boenzli, Gabriel *See—*
  - Brunner, Richard Roy, and Boenzli, Gabriel, 244,904, Cl D8-58.000
- Boldt, Melvin H , Chuboff, David P , and Franek, Wayne, to Zenith Radio Corporation Combined phonograph and stereo receiver 244,961, 7-5-77, Cl D14-5 000
- Brandenfels, Carl, to HT Products, Inc. Combined carving block and cutlery rack 244,899, 7-5-77, Cl D6-157.000.
- Brandenfels, Carl, to H T Products, Inc Mobile kitchen table. 244,913, 7-5-77, Cl D6-179 000
- Brune, Thomas J Building 244,940, 7-5-77, Cl D25-17 000
- Brunner, Richard Roy; and Boenzli, Gabriel, to AMP Incorporated Device for severing hypodermic needles and the like 244,904, 7-5-77, Cl D8-58 000
- Burris Industries, Incorporated: *See—*
  - Grachten, Erich, 244,896, Cl D6-63 000
- Caldwell, Dale: *See—*
  - Miller, Paul D , and Caldwell, Dale, 244,931, Cl D16-3 000
- Canon Kabushiki Kaisha. *See—*
  - Yatabe, Toru; Komine, Yoshio; and Shimizu, Ichiro, 244,933, Cl. D16-04.000
- Carnation Company *See—*
  - Foley, Robert D.; and Morris, Glynn C., 244,948, Cl. D30-16.000.
- CBS Inc.: *See—*
  - Moustakas, Matthew A., and Hoel, Per O , 244,959, Cl D34-15.00J.
- Chasen, Lee Richard, and Einhorn, Ruediger, to Coats & Clark, Inc. Hook 244,910, 7-5-77, Cl. D8-367 000.
- Chow, Ho, to Beatrice Goods Co. Sprinkler 244,936, 7-5-77, Cl. D23-7.000
- Chuboff, David P *See—*
  - Boldt, Melvin H , Chuboff, David P., and Franek, Wayne, 244,961, Cl D14-5.000
- Circle Industries, Inc *See—*
  - Oakes, James P., 244,928, Cl D12-158.000.
- Coats & Clark, Inc.. *See—*
  - Chasen, Lee Richard, and Einhorn, Ruediger, 244,910, Cl. D8-367.000.
- Cook, Michael Franz Helmut. *See—*
  - Perser, Donald A.; and Cook, Michael Franz Helmut, 244,886, Cl D2-264 000.
- Cosco, Inc.: *See—*
  - Adams, Ruey C , 244,890, Cl. D6-13.000.
- Cuccio, John, to Sybron Corporation Blood pressure testing kit 244,945, 7-5-77, Cl D24-21.000.
- Cudzik, Daniel F , to Reynolds Metals Company End closure for a container. 244,915, 7-5-77, Cl D9-255.000
- Diehl, Hans. Ottoman. 244,893, 7-5-77, Cl D6-36.000
- Diehl, Hans Chair 244,895, 7-5-77, Cl D6-56 000
- DiSorbo, Robert T.. *See—*
  - Hauser, Stephen G., Keith, Keith S , Bergo, Ralph M., and DiSorbo, Robert T , 244,934, Cl. D16-14.000
- Douglas, Patrick Joseph *See—*
  - O'Neill, Patrick; Douglas, Patrick Joseph, and Mallaghan, Michael Lee, 244,925, Cl. D12-58 000.
- Dunlop Limited. *See—*
  - Robertson, George McIntyre, 244,926, Cl D12-143.000
- Efficiency Dispensers Corporation. *See—*
  - Herbst, Clarence A., Sr., and Kling, Harvey I , 244,911, Cl D9-53.000.
- Einhorn, Ruediger *See—*
  - Chasen, Lee Richard, and Einhorn, Ruediger, 244,910, Cl D8-367 000
- Engelmann, Stefan Display receptacle for eyeglasses or the like. 244,891, 7-5-77, Cl D6-24.000
- Foley, Robert D., and Morris, Glynn C., to Carnation Company Self-feeding pet food bowl. 244,948, 7-5-77, Cl D30-16 000
- Franek, Wayne *See—*
  - Boldt, Melvin H , Chuboff, David P., and Franek, Wayne, 244,961, Cl D14-5 000
- Frick, Berndt Ebbe. Housing for typewriter or teleprinter 244,964, 7-5-77, Cl D64-11 00R
- Fuji Photo Film Co., Ltd *See—*
  - Fukuda, Hiroshi, 244,932, Cl. D16-06 000.
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- GAF Corporation *See—*
  - Miller, Paul D , and Caldwell, Dale, 244,931, Cl. D16-3.000
- General Mills Fun Group, Inc. *See—*
  - McMahon, John F., 244,950, Cl. D34-2.00R.
  - McMahon, John F., 244,951, Cl. D34-2.00R.
  - McMahon, John F , 244,952, Cl D34-2.00R.
  - McMahon, John F , 244,953, Cl D34-2.00R
  - McMahon, John F , 244,954, Cl D34-2 00R
  - McMahon, John F., 244,955, Cl D34-2.00R.
- Gerber, William C. Dual compartment pet feeding dish 244,947, 7-5-77, Cl D30-16 000
- Gibbs, Antony Richard. Console design 244,906, 7-5-77, Cl. D6-181.000
- Gill, Frank L., to Hi-Shear Corporation Nut. 244,909, 7-5-77, Cl. D8-397.000.
- Grachten, Erich, to Burris Industries, Incorporated Sofa bed 244,896, 7-5-77, Cl D6-63 000.
- H. T Products, Inc . *See—*
  - Brandenfels, Carl, 244,913, Cl. D6-179.000.
- Haines, Walter W., Sr. Neckwear. 244,887, 7-5-77, Cl. D2-351.000.
- Harman, Edgar G Swimming pool liner or similar article. 244,939, 7-5-77, Cl. D25-2.000.
- Harter Corporation: *See—*
  - Koepke, Earl H., 244,892, Cl. D6-31 000.
- Hashiba, Takeo Venetian shutter 244,941, 7-5-77, Cl D25-47 000
- Hatter, Edwin E., and Pierce, Bartrom W., to Hi-Shear Corporation. Nut 244,908, 7-5-77, Cl. D8-397.000.
- Hauser, Stephen G., Keith, Keith S.; Bergo, Ralph M., and DiSorbo, Robert T., to Stromberg Datagraphix, Inc. Microfilm reader 244,934, 7-5-77, Cl. D16-14 000.
- Heath Company *See—*
  - Sizer, Stuart Walter, 244,962, Cl. D14-75.000
- Herbst, Clarence A , Sr.; and Kling, Harvey I., to Efficiency Dispensers Corporation. Battery water dispenser. 244,911, 7-5-77, Cl. D9-53.000
- Hi-Shear Corporation. *See—*
  - Gill, Frank L., 244,909, Cl. D8-397.000.
  - Hatter, Edwin E., and Pierce, Bartrom W., 244,908, Cl. D8-397.000.
- Hildebrand, Oliver W., to Wirecraft Manufacturing Company. Frankfurter roasting stick 244,903, 7-5-77, Cl D7-106.000.
- Hoel, Per O *See—*
  - Moustakas, Matthew A ; and Hoel, Per O., 244,959, Cl D34-15 00J
- Hooper, Dean Roosevelt, Jr , to AMP Incorporated Mounting adaptor for electrical connector. 244,944, 7-5-77, Cl. D13-24.000.
- Hoshino, Kunio, to Matsushita Electric Industrial Co., Ltd Portable radio. 244,963, 7-5-77, Cl D14-70 000.
- Houk, Le Roy M , to Wasco Products, Inc. Syphon 244,937, 7-5-77, Cl. D23-40.000.
- HT Products, Inc *See—*
  - Brandenfels, Carl, 244,899, Cl. D6-157.000.
- Jabel Incorporated *See—*
  - Kaluschny, Erwin, 244,919, Cl D11-36.000.
- Jones, George Ernest, Tangreda, Antonio; and Tangreda, Gerardino, to Olympic Metal Products Limited Sulky. 244,923, 7-5-77, Cl D12-19.000
- Kaluschny, Erwin, to Jabel Incorporated Diamond ring. 244,919, 7-5-77, Cl D11-36.000.
- Kaywood, Wiley Kit Aquarium 244,946, 7-5-77, Cl. D30-6 000.
- Keith, Keith S.. *See—*
  - Hauser, Stephen G , Keith, Keith S , Bergo, Ralph M , and DiSorbo, Robert T , 244,934, Cl D16-14 000.
- Kelman, Pepi G Earring 244,920, 7-5-77, Cl D11-75 000
- Kitrell, John V Safety reflector for bicycles or the like 244,918, 7-5-77, Cl D10-111 000
- Kling, Harvey I *See—*
  - Herbst, Clarence A , Sr., and Kling, Harvey I , 244,911, Cl D9-53 000
- Koepke, Earl H , to Harter Corporation Swivel chair 244,892, 7-5-77, Cl ,D6-31 000
- Komine, Yoshio *See—*
  - Yatabe, Toru, Komine, Yoshio, and Shimizu, Ichiro, 244,933, Cl D16-04 000
- Kristiansen, Erik Behrentz Hole marking and scoring pin for miniature golf game 244,956, 7-5-77, Cl D34-5 0NN
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- Longeau, Jacques, to Societe Anonyme de Vehicules Industries et d'Equipements Mecaniques Saviem Combined armoured vehicle body and gun-turret 244,922, 7-5-77, Cl D12-12 000
- Mallaghan, Michael Lee *See—*
  - O'Neill, Patrick, Douglas, Patrick Joseph, and Mallaghan, Michael Lee, 244,925, Cl D12 58 000
- Matsumoto, Yutaka Hanger body 244,901, 7-5-77, Cl D6-257 000
- Matsushita Electric Industrial Co , Ltd *See—*
  - Hoshino, Kunio, 244,963, Cl D14-70 000
- McMahon, John F , to General Mills Fun Group, Inc Toy wheeled figure 244,950, 7-5-77, Cl D34 2 00R
- McMahon, John F., to General Mills Fun Group, Inc Toy wheeled figure 244,951, 7-5-77, Cl D34-2 00R
- McMahon, John F , to General Mills Fun Group, Inc Toy wheeled figure 244,952, 7-5-77, Cl D34-2 00R
- McMahon, John F., to General Mills Fun Group, Inc Toy wheeled figure 244,953, 7-5-77, Cl D34-2 00R.
- McMahon, John F., to General Mills Fun Group, Inc. Toy wheeled figure 244,954, 7-5-77, Cl D34-2 00R
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- Morris, Glynn C.. *See—*
  - Foley, Robert D., and Morris, Glynn C., 244,948, Cl D30-16 000
- Moustakas, Matthew A , and Hoel, Per O , to CBS Inc. Crib toy 244,959, 7-5-77, Cl. D34-15.00J
- Neuschwander, Louise I Combined sewing table and cover therefor 244,889, 7-5-77, Cl D6-4 000
- Nicol, Douglas John Bag 244,914, 7-5-77, Cl D9-249 000
- Oakes, James P., to Circle Industries, Inc Motorcycle luggage rack 244,928, 7-5-77, Cl D12-158 000.
- Olympic Metal Products Limited *See—*
  - Jones, George Ernest, Tangreda, Antonio, and Tangreda, Gerardino, 244,923, Cl D12-19 000.
- O'Neill, Patrick, Douglas, Patrick Joseph, and Mallaghan, Michael Lee, to Powerscreen International Limited Screening apparatus for quarrying 244,925, 7-5-77, Cl. D12-58 000
- Overman AB *See—*
  - Bleser, Richard K , 244,958, Cl. D34-15 0JJ
  - Tillberg, Robert, 244,894, Cl. D6-47 000.
- Patterson, John R Instrument display housing or similar article 244,930, 7-5-77, Cl D12-192.000.
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- Pierce, Bartrom W.. *See—*
  - Hatter, Edwin E.; and Pierce, Bartrom W , 244,908, Cl D8 397 000.
- Powerscreen International Limited *See—*
  - O'Neill, Patrick, Douglas, Patrick Joseph; and Mallaghan, Michael Lee, 244,925, Cl D12-58 000.
- Reynolds Metals Company *See—*
  - Cudzik, Daniel F., 244,915, Cl D9-255 000.
- Robertson, George McIntyre, to Dunlop Limited Tire for a vehicle wheel 244,926, 7-5-77, Cl D12-143 000
- Rocchia, Peter A., to Wicker Works, The Chair 244,897, 7-5-77, Cl D6-67 000
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- Savage, James G *See*
  - Trezise, Richard D , and Savage, James G , 244,965, Cl D64 11 00A
- Scheibner, Helen E. Storage cart for athletic equipment 244,924, 7-5-77, Cl. D12-29 000
- Schroeder, Peter E Curtain material 587 244,960, 7-5-77, Cl D47-6 00R
- Serafini, Joseph P *See —*
  - Shafer, Gregory, and Serafini, Joseph P , 244,888, Cl D6 4 000
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- Shimizu, Ichiro *See—*
  - Yatabe, Toru, Komine, Yoshio, and Shimizu, Ichiro, 244,933, Cl D16-04 000
- Sizer, Stuart Walter, to Heath Company Tuner 244,962, 7-5-77, Cl D14-75 000
- Smith, Marley A Game board 244,957, 7-5-77, Cl D34-5 550
- Societe Anonyme de Vehicules Industriels et d'Equipements Mecaniques Saviem *See—*
  - Longeau, Jacques, 244,921, Cl D12-12 000
- Societe Anonyme de Vehicules Industries et d'Equipements Mecaniques Saviem *See—*
  - Longeau, Jacques, 244,922, Cl D12-12 000
- Stromberg Datagraphix, Inc *See*
  - Hauser, Stephen G , Keith, Keith S , Bergo, Ralph M , and DiSorbo, Robert T , 244,934, Cl D16-14 000
- Sybron Corporation *See—*
  - Cuccio, John, 244,945, Cl D24-21 000
- Tangreda, Antonio. *See—*
  - Jones, George Ernest, Tangreda, Antonio, and Tangreda, Gerardino, 244,923, Cl D12-19 000
- Tangreda, Gerardino. *See—*
  - Jones, George Ernest, Tangreda, Antonio, and Tangreda, Gerardino, 244,923, Cl D12-19 000
- Tillberg, Robert, to Overman AB Settee 244,894, 7-5-77, Cl D6-47 000
- Trezise, Richard D , and Savage, James G , to Xerox Corporation Ribbon cartridge 244,965, 7-5-77, Cl D64-11 00A
- Ueno, Naohiro, to Bear Co , Ltd Digital wristwatch 244,916, 7-5 77, Cl D10-38 000
- Viazzoli, Alfred A Dental saw 244,938, 7-5-77, Cl D24-8 000
- Vonder Haar, Gary C Salad server 244,902, 7-5-77, Cl D7-3 000
- Wach, Karl Support for an egg or the like 244,905, 7-5-77, Cl D8-72 000
- Wasco Products, Inc *See—*
  - Houk, Le Roy M , 244,937, Cl D23 40 000
- Waxman, Leon E Table 244,900, 7-5 77, Cl D6-179 000
- Welker, Scott D Shelter 244,949, 7-5-77, Cl D30-1 000
- Wheeler, Loren C Page aligner for an open book or the like 244,935, 7-5-77, Cl D19-99 000
- Wicker Works, The *See—*
  - Rocchia, Peter A , 244,897, Cl D6-67 000
  - Rocchia, Peter A , 244,898, Cl D6-74 000
- Wirecraft Manufacturing Company *See—*
  - Hildebrand, Oliver W , 244,903, Cl D7-106 000
- Xerox Corporation *See —*
  - Balmer, James G , Jr , 244,943, Cl D14-10 000
  - Trezise, Richard D , and Savage, James G , 244,965, Cl D64-11 00A
- Yatabe, Toru, Komine, Yoshio, and Shimizu, Ichiro, to Canon Kabushiki Kaisha Motion picture camera 244,933, 7-5 77, Cl D16-04 000
- Zamora Conesa, Diego Bottle 244,912, 7-5-77, Cl D9 167 000
- Zenith Radio Corporation *See*
  - Boldt, Melvin H , Chuboff, David P , and Franek, Wayne, 244,961, Cl D14-5 000

CLASSIFICATION OF PATENTS

ISSUED JULY 5, 1977

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

73	4,032,989
161 R	4,032,990
173	4,032,991
243 R	4,032,992

CLASS 3

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1 912	4,032,994

CLASS 4

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17	4,032,996
52	4,032,997
111	4,032,998

CLASS 5

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343	4,033,001

CLASS 8

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CLASS 9

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CLASS 10

10 R	4,033,003

CLASS 11

1 AD	4,033,004

CLASS 13

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CLASS 14

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75	4,033,006

CLASS 15

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258.5 BH	4,033,724
277 C	4,033,725
288 B	4,033,726
288 R	4,033,727

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201 B	4,033,013
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CLASS 29

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25 35	4,033,017
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149 5 B	4,033,019
149 5 NM	4,033,020
157 C	4,033,021
237	4,033,022
401 B	4,033,023
403	4,033,024
417	4,033,025
571	4,033,026
583	4,033,027
611	4,033,028
622	4,033,029
	4,033,030
626	4,033,031
764	4,033,032
824	4,033,033

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363	4,033,037
382	4,033,038

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27	4,033,040

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143 R	4,033,043
181 R	4,033,042
189	4,033,044
275 G	4,033,045
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CLASS 35

9 R	4,033,050
	4,033,051
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CLASS 36

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54 5 R	4,033,066
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CLASS 46

1 L	4,033,068
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79	4,033,070
118	4,033,071

CLASS 47

62	4,033,072

CLASS 48

86 R	4,033,730

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38	4,033,073

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105 R	4,033,076
170 T	4,033,077
178	4,033,074

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99	4,033,079
223 R	4,033,080
263	4,033,081
316	4,033,082
484	4,033,083
573	4,033,084
656	4,033,086
698	4,033,085
741	4,033,087

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242	4,033,094
248	4,033,095
386	4,033,096

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274	4,033,733

CLASS 56

17 5	4,033,098
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328 R	4,033,100
344	4,033,101

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34 HS	4,033,103
34 R	4,033,104
77 4	4,033,105
77.45	4,033,106
81	4,033,107

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85 5	4,033,109
88 R	4,033,110
106.5	4,033,111

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226 R	4,033,119
249	4,033,120
271	4,033,121
274	4,033,122
286	4,033,123
290	4,033,124
	4,033,125
398	4,033,126
455	4,033,127
484	4,033,128
486	4,033,129
523	4,033,130
553	4,033,131
572	4,033,132
606	4,033,133
641	4,033,118
	4,033,134
648	4,033,135
671	4,033,136

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53 5	4,033,139

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9	4,033,735
10	4,033,736
64	4,033,737
158	4,033,738
202	4,033,739
223	4,033,140
238	4,033,141
259	4,033,740
381	4,033,142

CLASS 63

2	4,033,143

CLASS 64

12	4,033,144
21	4,033,145
23	4,033,146

CLASS 65

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	4,033,742
30 R	4,033,743
362	4,033,744

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111	4,033,149
138	4,033,150
147	4,033,151

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205 R	4,033,153
	4,033,154

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	4,033,156
85	4,033,157
202	4,033,158
233	4,033,159
	4,033,160
275	4,033,161
456 B	4,033,162

CLASS 71

28	4,033,745
30	4,033,746
	4,033,747
67	4,033,748
86	4,033,749
90	4,033,750
92	4,033,751
93	4,033,752
94	4,033,753
112	4,033,754
113	4,033,755
118	4,033,756

CLASS 72

121	4,033,163
205	4,033,164
	4,033,165
334	4,033,166
367	4,033,167
420	4,033,168

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	4,033,170
23 1	4,033,171
37	4,033,172
	4,033,173
40	4,033,174
49 2	4,033,175
67.9	4,033,176
	4,033,177
71 4	4,033,179
71 5 US	4,033,178
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88 5 R	4,033,183
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117 1	4,033,184
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154	4,033,186
155	4,033,187
194 VS	4,033,188
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431	4,033,191

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61	4,033,193
89 15	4,033,194
230 17 M	4,033,195
242 11 R	4,033,196
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443	4,033,198
594 6	4,033,199
740	4,033,200
866	4,033,202
869	4,033,201
	4,033,203

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67 R	4,033,758
	4,033,759
68 R	4,033,760
77	4,033,761
96	4,033,762
97 R	4,033,763
108	4,033,765
123 CB	4,033,766
170	4,033,767

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CLASS 82

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4 C	4,033,208
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31	4,033,210
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56	4,033,213
174	4,033,214
204	4,033,215
413	4,033,216
425.4	4,033,217
478	4,033,218

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1 03	4,033,219
	4,033,220
	4,033,221

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45	4,033,244
72	4,033,222
83	4,033,223

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1 5 F	4,033,226
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13 4	4,033,230
24 3	4,033,231

CLASS 91

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374	4,033,233
384	4,033,234
396	4,033,235
463	4,033,236
484	4,033,237
505	4,033,238

CLASS 92

58	4,033,239

CLASS 93

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39 1 R	4,033,241
51 R	4,033,242

CLASS 96

1 5	4,033,768
	4,033,769
28	4,033,770
60 BF	4,033,771
114	4,033,772
115 P	4,033,773

CLASS 98

2 12	4,033,245
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CLASS 99

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53	4,033,250
95	4,033,251
99	4,033,252
118	4,033,253

CLASS 101

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99	4,033,256
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	4,033,260
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70 2 R	4,033,266

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CLASS 106

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39 7	4,033,775
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52	4,033,777
58	4,033,778
62	4,033,779
69	4,033,780
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104	4,033,782
120	4,033,783

CLASS 110

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CLASS 111

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CLASS 112

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CLASS 113

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CLASS 114

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245	4,033,278
255	4,033,280
295	4,033,281

CLASS 115

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CLASS 118

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49	4,033,286
49 1 R	4,033,287
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266	4,033,290
412	4,033,291
629	4,033,292
653	4,033,293
658	4,033,294

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8 45	4,033,300
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41 85	4,033,303
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119 A	4,033,306
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139 AP	4,033,310
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343 5 A 4,033,328

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4,033,332
2 05 C 4,033,337
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2 1 F 4,033,334
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132 D 4,033,341
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145 8 4,033,343
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CLASS 134
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20 4,033,784

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2 4,033,366
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CLASS 139
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CLASS 150
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21 C 4,033,394

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211 4,033,806
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572 4,033,809
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90 CS 4,034,163
100.11 4,034,164
115 5 R 4,034,165
170 NC 4,034,166
178 4,034,167

CLASS 180
8 A 4,033,421
14 C 4,033,422
41 4,033,423
68.5 4,033,424
77 R 4,033,425
79.1 4,033,426
140 4,033,427

CLASS 181
36 C 4,033,428
106 4,033,429
144 4,033,430
152 4,033,431

CLASS 184
1.5 4,033,432

CLASS 188
25 4,033,433
75 4,033,434
173 4,033,435

CLASS 191
2 4,034,168

CLASS 192
3.3 4,033,436
13 R Re 29,293
53 F 4,033,437
84 A 4,033,438
85 AA 4,033,439
98 4,033,440

CLASS 193
38 4,033,441

CLASS 194
17 4,033,442

CLASS 195
1 8 4,033,816
2 4,033,817
7 4,033,818
29 4,033,819
31 R 4,033,820
49 4,033,821
68 4,033,822
80 R 4,033,823
99 4,033,824
127 4,033,825
139 4,033,826

CLASS 197
1 R 4,033,443
4,033,444
151 4,033,445
157 4,033,446

CLASS 198
441 4,033,447
465 4,033,448
520 4,033,449
648 4,033,450
815 4,033,451

CLASS 200
50 A 4,034,169
4,034,170
51 R 4,034,171
51 1 4,034,172
80 R 4,034,173
81 9 R 4,034,174
150 R 4,034,175
159 B 4,034,176
159 R 4,034,177
293 4,034,178

CLASS 202
248 4,033,827
4,033,828

CLASS 203
9 4,033,829
27 4,033,617

CLASS 204
1 T 4,033,830
11 4,033,831
15 4,033,832
4,033,833
4,033,834
43 S 4,033,835
67 4,033,836
98 4,033,837
103 4,033,838
108 4,033,839
159 17 4,033,840
180 P 4,033,842
180 R 4,033,841
192 P 4,033,843
224 R 4,033,844
247 4,033,846
250 4,033,847
284 4,033,848
286 4,033,849
301 4,033,850
302 4,033,851

CLASS 206
83 4,033,452
217 4,033,453
347 4,033,456
386 4,033,454
390 4,033,457
391 4,033,455

CLASS 208
8 4,033,852
11 LF 4,033,853
14 4,033,854
25 4,033,855
102 4,033,856
4,033,857
115 4,033,858
179 4,033,859
206 4,033,860
211 4,033,861

CLASS 209
11 4,033,458
73 4,033,862
159 4,033,863
223 R 4,033,864
275 4,033,865

CLASS 210
28 4,033,867
38 C 4,033,868
42 S 4,033,866
65 4,033,869
90 4,033,870
96 R 4,033,871
168 4,033,872
186 4,033,873
189 4,033,874
197 4,033,875
242 S 4,033,876
304 4,033,877
321 A 4,033,878
369 4,033,879
424 4,033,880
491 4,033,881

CLASS 211
20 4,033,459
60 SK 4,033,460
86 4,033,461
94 4,033,462

CLASS 214
1 H 4,033,463
10 5 R 4,033,464
13 4,033,465
17 CB 4,033,466
23 4,033,467
130 R 4,033,468
131 A 4,033,469
152 4,033,470
671 4,033,471

CLASS 215
256 4,033,472

CLASS 219
74 4,034,179
85 BM 4,034,180
121 EM 4,034,181
4,034,182
122 LM 4,034,183
124 4,034,184
212 4,034,185
216 4,034,186
4,034,187
4,034,188
4,034,189
218 4,034,200
222 4,034,201
230 4,034,202
272 4,034,203
368 4,034,204
385 4,034,205
464 4,034,206
517 4,034,207

CLASS 220
66 4,033,473
75 4,033,474
202 4,033,475
334 4,033,476

CLASS 221
114 4,033,477
279 4,033,478

CLASS 222
61 4,033,479
129 4,033,480
134 4,033,481
136 4,033,482
145 4,033,483
146 HF 4,033,484
4,033,485
190 4,033,486
207 4,033,487

CLASS 224
5 V 4,033,488
48 C 4,033,489

CLASS 225
1 4,033,490

CLASS 226
11 4,033,491
25 4,033,492
81 4,033,493
83 4,033,494
157 4,033,560
186 4,033,495
188 4,033,496
194 4,033,497

CLASS 227
30 4,033,498
120 4,033,499
131 4,033,500

CLASS 228
2 4,033,501
56 4,033,502
124 4,033,503
190 4,033,504

CLASS 235
61.12 N 4,034,210
4,034,211
61.5 S 4,034,208
61.9 R 4,034,209
151 1 4,034,212
151.11 4,034,192
151.3 4,034,190
4,034,191
151.34 4,034,193
153 AC 4,034,194
4,034,195
156 4,034,196
4,034,197
164 4,034,198
193 4,034,199

CLASS 236
15 BD 4,033,505

CLASS 239
15 4,033,506
102 4,033,507
177 4,033,508
226 4,033,509
230 4,033,510
346 4,033,511
423 4,033,512
585 4,033,513
662 4,033,514

CLASS 240
6.4 G 4,034,213
10 L 4,034,215
70 4,034,214
78 F 4,034,216
103 R 4,034,217

CLASS 241
27 4,033,515
30 4,033,516
46.11 4,033,517
47 4,033,518

CLASS 242
18 A 4,033,519
43 R 4,033,520
56 A 4,033,521
75 4 4,033,522
198 4,033,523

CLASS 244
3.15 4,033,525
15 4,033,526
99 4,033,527
139 4,033,528
151 B 4,033,529
158 4,033,524

CLASS 248
4 4,033,530
16 4,033,531
17 4,033,532
49 4,033,534
56 4,033,535
160 4,033,536
165 4,033,537
214 4,033,538
228 4,033,539
246 4,033,540
358 AA 4,033,542
358 R 4,033,533
4,033,541
412 4,033,543

CLASS 249
40 4,033,544
98 4,033,545
174 4,033,546
193 4,033,547
194 4,033,548

CLASS 250
199 4,033,882
231 SE 4,033,883
269 4,034,218
301 4,034,219
310 4,034,220
324 4,034,221
355 4,034,222
369 4,034,223
439 P 4,034,224
471 4,034,225
491 4,033,904
493 4,034,226
496 4,033,884
4,033,885
507 4,034,227
511 4,034,228
541 4,034,229
568 4,034,230

CLASS 251
86 4,033,549
328 4,033,550

CLASS 252
8.5 A 4,033,893
34.7 4,033,886
49.8 4,033,887
56 D 4,033,888
4,033,889
62.1 L 4,033,890
62.56 4,033,891
76 4,033,892
99 4,033,894
106 4,033,895
389 A 4,033,896
408 4,033,897
416 4,033,898
420 4,033,899
431 L 4,033,900
432 4,033,901
441 4,033,902
476 4,033,903
500 4,033,905
519 4,033,906

CLASS 254
134 3 R 4,033,551
166 4,033,552
185 B 4,033,553
4,033,554

CLASS 259
4 R 4,033,555
191 4,033,556
192 4,033,557

CLASS 260
2.3 4,033,907
2.5 AC 4,033,911
2.5 AH 4,033,912
2.5 AW 4,033,908
2.5 F 4,033,909
4,033,910
17 R 4,033,913
17.2 4,033,914
28.5 A 4,033,915
4,033,916
29 2 N 4,033,917
29 6 H 4,033,920
4,033,921
29.6 RW 4,033,922
29.6 TA 4,033,919
29.6 WB 4,033,918
33 6 UA 4,033,983
37 N 4,033,923
37 SB 4,033,924
42.53 4,033,925
45 7 P 4,033,927
45.75 B 4,033,926
4,033,932
45.75 R 4,033,931
45.8 N 4,033,928
45.85 R 4,033,933
45.9 R 4,033,930
46.5 G 4,033,934
67.6 R 4,033,935
75 P 4,033,936
77.5 NC 4,033,937
78.3 R 4,033,938
112.5 R 4,033,941
112 5 S 4,033,940
145 A 4,033,942
153 4,033,943
4,033,944
157 4,033,945
166 4,033,946
239 3 T 4,033,947
240 A 4,033,948

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240 D 4,033,845
240 R 4,033,949
243 C 4,033,950
4,033,956
243 R 4,033,951
4,033,952
4,033,953
4,033,954
4,033,955
246 B 4,033,957
247 2 B 4,033,958
248 C 4,033,959
250 QN 4,033,960
251 A 4,033,961
256 4 C 4,033,963
256.4 N 4,033,962
268 C 4,033,964
279 R 4,033,965
286 Q 4,033,966
287 CF 4,033,967
288 CF 4,033,968
293.53 4,033,969
293.61 4,033,970
293 72 4,033,971
294 8 D 4,033,972
295 F 4,033,973
295 5 R 4,033,974
296 R 4,033,975
299 4,033,976
302 F 4,033,977
306 7 C 4,033,979
306 7 R 4,033,978
314 5 4,033,980
327 H 4,033,982
327 M 4,033,981
340 6 4,033,984
340.9 4,033,985
345 2 4,033,986
346 4 4,033,987
397.4 4,033,988
408 4,033,989
429 R 4,034,037
448 2 B 4,033,990
448 2 E 4,033,991
456 R 4,033,992
462 R 4,034,038
463 4,033,993
4,033,997
468 R 4,033,994
468.5 4,033,995
471 C 4,033,998
488 CD 4,033,999
490 4,033,996
502 6 4,034,000
513 N 4,034,001
514 D 4,034,002
4,034,003
515 P 4,034,005
515 R 4,034,004
521 C 4,034,006
524 R 4,034,007
533 N 4,034,008
553 A 4,034,009
564 R 4,034,010
570 D 4,034,039
570 R 4,034,011
570 9 4,034,040
571 4,034,041
576 4,034,042
578 4,034,043
586 R 4,034,044
590 FB 4,034,045
607 B 4,034,046
610 B 4,034,047
621 H 4,034,048
622 R 4,034,050
652 5 R 4,034,051
658 R 4,034,049
671 C 4,034,052
672 T 4,034,053
828 4,034,012
835 4,034,013
837 R 4,034,014
857 PG 4,034,015
858 4,034,016
859 R 4,034,017
860 4,034,018
4,034,019
878 R 4,033,939
880 R 4,034,020
887 4,034,021
955 4,034,022
973 4,034,023
981 4,034,024

CLASS 261
18 A 4,034,025
23 A 4,034,026
41 R 4,034,028
44 R 4,034,029
64 D 4,034,030

CLASS 264
25 4,034,031
28 4,034,032
32 4,034,027
36 4,034,033
39 4,034,034
45 9 4,033,929
77 4,034,035
89 4,034,036
93 4,034,054
95 4,034,055
281 4,034,056
297 4,034,057

CLASS 266
50 4,033,558
122 4,033,559
193 4,033,561
204 4,033,563
216 4,033,562
242 4,033,564
273 4,033,565

CLASS 267
126 4,033,566
151 4,033,567

CLASS 269
26 4,033,568
4,033,569
41 4,033,570
315 4,033,571
320 4,033,572

CLASS 270
30 4,033,573

CLASS 271
3 4,033,574
4,033,575
5 4,033,576
128 4,033,577
157 4,033,578
195 4,033,579

CLASS 272
137 4,033,580

CLASS 273
55 B 4,033,581
73 D 4,033,582
73 R 4,033,583
85 A 4,033,584
120 R 4,033,585
131 K 4,033,586
134 CH 4,033,587
138 A 4,033,588
148 R 4,033,589
149 R 4,033,590

CLASS 274
23 R 4,033,591
38 4,033,592

CLASS 277
212 F 4,033,593

CLASS 280
5 22 4,033,595
11 2 4,033,596
46 4,033,597
63 4,033,598
154 5 R 4,033,599
414 R 4,033,600
490 R 4,033,601
605 4,033,602
618 4,033,603
628 4,033,604
664 4,033,605
682 4,033,606
711 4,033,607
4,033,608
718 4,033,609
737 4,033,610

CLASS 283
6 4,033,611

CLASS 285
149 4,033,612
184 4,033,613
248 4,033,614
333 4,033,615

CLASS 290
53 4,034,231

CLASS 292
216 4,033,616

CLASS 294
19 R 4,033,618

CLASS 296
21 4,033,619
24 C 4,033,620
137 B 4,033,621

CLASS 297
250 4,033,622
389 4,033,594
390 4,033,623
434 4,033,624

CLASS 298
22 R 4,033,625

CLASS 299
1 4,033,626

CLASS 301
111 4,033,627

CLASS 302
34 4,033,628

CLASS 303
2 4,033,629
7 4,033,630
50 4,033,631
74 4,033,632
97 4,033,633
103 4,033,634
109 4,033,635
114 4,033,636
115 4,033,637
116 4,033,638

CLASS 307
32 4,034,232
41 4,034,233
116 4,034,234
117 4,034,235
221 C 4,034,238
238 4,034,239
252 F 4,034,240
261 4,034,236
264 4,034,241
268 4,034,237
269 4,034,242
304 4,034,243

CLASS 308
3 6 4,033,639
4 A 4,033,640
15 4,033,641
26 4,033,642
187 2 4,033,643
207 A 4,033,644
4,033,645
218 4,033,646
227 4,033,647

CLASS 310
8 2 4,034,244
52 4,034,245
81 4,034,246
164 4,034,247
178 4,034,248
253 4,034,249

CLASS 312
100 4,033,648
201 4,033,649
206 4,033,650
237 4,033,651
245 4,033,652
253 4,033,653

CLASS 313
32 4,034,250
59 4,034,251
217 4,034,252
317 4,034,253
400 4,034,254
4,034,255
440 4,034,256
487 4,034,257

CLASS 315
39 4,034,258
93 4,034,259
344 4,034,260
4,034,261
408 4,034,262
4,034,263

CLASS 318
7 4,034,272
149 4,034,273
334 4,034,274
461 4,034,275
608 4,034,276
685 4,034,277

CLASS 320
1 4,034,278
20 4,034,279

CLASS 323
17 4,034,281
4,034,282
74 4,034,283

CLASS 324
51 4,034,284
57 R 4,034,285
71 R 4,034,286
73 R 4,034,287
80 4,034,288
95 4,034,289
110 4,034,290
121 R 4,034,291
157 4,034,292
158 P 4,034,293

CLASS 325
38 R 4,034,294
39 4,034,295
62 4,034,296
166 4,034,297
318 4,034,298
363 4,034,299
390 4,034,300

CLASS 328
37 4,034,301
39 4,034,302
62 4,034,303
142 4,034,304

CLASS 329
50 4,034,305

CLASS 330
30 D 4,034,306
35 4,034,307
86 4,034,308

CLASS 331
1 A 4,034,309
11 4,034,310
94 5 H 4,034,311
96 4,034,312
4,034,313
101 4,034,314

CLASS 333
10 4,034,315
11 4,034,316
30 R 4,034,317
72 4,034,318
73 R 4,034,319
82 B 4,034,320
84 M 4,034,321

CLASS 335
42 4,034,322
129 4,034,323
212 4,034,324

CLASS 336
75 4,034,325

CLASS 337
34 4,034,326
41 4,034,327
159 4,034,328
163 4,034,329

CLASS 338
238 4,034,330

CLASS 339
14 R 4,033,655
17 CF 4,033,656
19 4,033,657
32 R 4,033,658
60 R 4,033,659
75 M 4,033,660
98 4,033,661
113 R 4,033,662
128 4,033,663
143 R 4,033,654
236 4,033,664

CLASS 340
3 R 4,034,331
9 4,034,332
15 5 TA 4,034,333
27 R 4,034,334
52 F 4,034,335
4,034,336
4,034,369
63 4,034,337
66 4,034,338
146 1 C 4,034,339
146 1 R 4,034,340
146 3 AG 4,034,342
146 3 H 4,034,341
4,034,344
146 3 MA 4,034,343
173 LM 4,034,355
173 R 4,034,356
174 TF 4,034,357
4,034,358
4,034,359
253 A 4,034,360
272 4,034,361
347 AD 4,034,362
4,034,366
4,034,367
347 DA 4,034,365
347 NT 4,034,364
347 P 4,034,363
378 R 4,034,368

CLASS 343
5 CM 4,034,370
6 R 4,034,371
6 8 R 4,034,372
7 7 4,034,373
16 R 4,034,374
18 A 4,034,375
112 R 4,034,376
180 4,034,377
700 MS Re 29,296
781 CA 4,034,378

CLASS 346
1 4,034,379
140 R 4,034,380
151 4,034,381

CLASS 350
3 5 4,033,665
91 4,033,666
96 C 4,033,668
4,033,669
96 WG 4,033,667
151 4,033,670
160 LC 4,033,671
4,033,672
160 R 4,033,673
184 4,033,674
216 4,033,675
295 4,033,676
301 4,033,677
302 4,033,678

CLASS 351
16 4,033,679

CLASS 352
124 4,033,680
173 4,033,681
235 4,033,682

CLASS 353
7 4,033,683
27 A 4,033,684
82 4,033,685
120 4,033,686

CLASS 354
1 4,034,382
23 D 4,034,383
33 4,034,384
38 4,034,385
86 4,034,386
126 4,034,387
173 4,034,388
244 4,034,390
289 4,034,391
4,034,392
322 4,034,389
354 4,034,393

CLASS 355
1 4,033,687
4 4,033,688
8 4,033,689
9 4,033,690
11 4,033,691
14 4,033,692
71 4,033,693
76 4,033,694
87 4,033,695

CLASS 356
126 4,033,696
160 4,033,697
173 4,033,698
205 4,033,699

CLASS 357
15 4,034,394
28 4,034,395
30 4,034,396
68 4,034,399

CLASS 358
8 4,034,397
60 4,034,398
75 4,034,400
93 4,034,401
114 4,034,402
128 4,034,403
142 4,034,404
147 4,034,405
260 4,034,406
267 4,034,407
293 4,034,408
301 4,034,409

CLASS 360
55 4,034,410
98 4,034,411
103 4,034,412
106 4,034,413
113 4,034,414

CLASS 361
2 4,034,264
24 4,034,415
25 4,034,265
42 4,034,266
44 4,034,267
79 4,034,269
111 4,034,268
256 4,034,270
332 4,034,271

CLASS 363
25 4,034,280

CLASS 364
200 4,034,345
4,034,347
4,034,348
4,034,349
4,034,351
4,034,352
4,034,353
900 4,034,346
4,034,350
4,034,354

CLASS 401
180 4,033,700

CLASS 403
13 4,033,701

CLASS 404
69 4,033,702

CLASS 408
211 4,033,703

CLASS 415
80 4,033,704

CLASS 416
220 R 4,033,705

CLASS 417
79 4,033,706
312 4,033,707

CLASS 418
9 4,033,708

CLASS 423
24 4,033,764
118 4,034,058
144 4,034,059
213 5 4,034,060
4,034,061
219 4,034,062
244 4,034,063
272 4,034,064
328 4,034,065
446 4,034,066
462 4,034,067
465 4,034,068
489 4,034,069
4,034,070

CLASS 424
1 4,034,071
4,034,072
4,034,073
4,034,074
45 4,034,075
49 4,034,076
69 4,034,077
76 4,034,078
83 4,034,079
84 4,034,080
89 4,034,081
177 4,034,082
180 4,034,083
4,034,084
200 4,034,085
4,034,086
240 4,034,087
246 4,034,088
4,034,089
4,034,090
4,034,091
4,034,092
251 4,034,093
4,034,094
256 4,034,095
258 4,034,096
263 4,034,097
267 4,034,098
271 4,034,099
272 4,034,100
273 4,034,101
277 4,034,102
282 4,034,103
289 4,034,104
300 4,034,105
304 4,034,106
309 4,034,107
4,034,108
311 4,034,109
4,034,110
319 4,034,111
321 4,034,112
330 4,034,113
333 4,034,114

CLASSIFICATION OF PATENTS

CLASS 425		431	4,034,118	**CLASS 427**		36	4,034,132	473	4,034,141	90	4,033,712
224	4,033,709	497	4,034,119	8	4,034,126	64	4,034,133	678	4,034,142	153	4,033,713
543	4,033,710	531	4,034,120	76	4,034,127	86	4,034,134	**CLASS 429**		354	4,033,714
590	Re.29,294	565	4,034,121	150	4,034,128	184	4,034,135	112	4,034,143	**CLASS 432**	
CLASS 426		570	4,034,122	163	4,034,129	246	4,034,136	144	4,034,144	4	4,033,715
43	4,034,115	582	4,034,123	248 C	4,034,130	308	4,034,137	**CLASS 431**		**CLASS 526**	
131	4,034,116	602	4,034,124	**CLASS 428**		378	4,034,138	66	4,033,711	328	4,034,145
335	4,034,117	650	4,034,125	35	4,034,131	405	4,034,139				
						447	4,034,140				

CLASSIFICATION OF DESIGNS

D2—	264	244,886		179	244,900		249	244,914		158	244,927	D19—	99	244,935	D34—	2 R	244,950
	351	244,887			244,913		255	244,915			244,928	D23—	7	244,936			244,951
D6—	4	244,888		181	244,906	D10—	38	244,916		192	244,930		40	244,937			244,952
		244,889		257	244,901		109	244,917	D13—	24	244,944	D24—	8	244,938			244,953
	13	244,890	D7—	3	244,902		111	244,918	D14—	5	244,961		21	244,945			244,954
	24	244,891		106	244,903	D11—	36	244,919		10	244,943	D25—	2	244,939			244,955
	31	244,892	D8—	58	244,904		75	244,920		70	244,963		17	244,940		5 NN	244,956
	36	244,893		72	244,905	D12—	12	244,921		75	244,962		47	244,941		5.55	244,957
	47	244,894		367	244,910			244,922	D15—	112	244,929		75	244,942		15 J	244,959
	56	244,895		395	244,907		19	244,923	D16—	3	244,931	D30—	1	244,949		15 JJ	244,958
	63	244,896		397	244,908		29	244,924		04	244,933		6	244,946	D47—	6 R	244,960
	67	244,897			244,909		58	244,925		06	244,932		16	244,947	D64—	11 A	244,965
	74	244,898	D9—	53	244,911		143	244,926		14	244,934			244,948		11 R	244,964
	157	244,899		167	244,912												

CLASSIFICATION OF PLANTS

P.—	9	4,070		43	4,072		68	4,073		78	4,071		88	4,069			

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

61—	16 T960,001	73—	55 T960,004	123—	32 EA T960,002	424—	337 T960,003				

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

(U.S. States, Territories and Armed Forces, the Commonwealth of Puerto Rico, and the Canal Zone)

Alabama	1	Kentucky	21	Oregon	41
Alaska	2	Louisiana	22	Pennsylvania	42
American Samoa	3	Maine	23	Puerto Rico	43
Arizona	4	Maryland	24	Rhode Island	44
Arkansas	5	Massachusetts	25	South Carolina	45
California	6	Michigan	26	South Dakota	46
Canal Zone	7	Minnesota	27	Tennessee	47
Colorado	8	Mississippi	28	Texas	48
Connecticut	9	Missouri	29	Utah	49
Delaware	10	Montana	30	Vermont	50
District of Columbia	11	Nebraska	31	Virginia	51
Florida	12	Nevada	32	Virgin Islands	52
Georgia	13	New Hampshire	33	Washington	53
Guam	14	New Jersey	34	West Virginia	54
Hawaii	15	New Mexico	35	Wisconsin	55
Idaho	16	New York	36	Wyoming	56
Illinois	17	North Carolina	37	U.S. Air Force	57
Indiana	18	North Dakota	38	U.S. Army	58
Iowa	19	Ohio	39	U.S. Navy	59
Kansas	20	Oklahoma	40		

(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

PATENTS

1 :	4,033,121		4,033,406		4,033,954		4,034,361		4,033,598		4,033,925
	4,033,182		4,033,432		4,033,955	9	4,033,019		4,033,650		4,033,926
	4,033,525		4,033,450		4,033,978		4,033,075		4,033,678		4,033,929
	4,033,670		4,033,460		4,034,025		4,033,137		4,033,847		4,033,932
	4,033,676		4,033,467		4,034,032		4,033,167		4,034,115		4,033,940
	4,034,174		4,033,479		4,034,061		4,033,177		4,034,142		4,033,976
2 :	4,033,041		4,033,483		4,034,074		4,033,214		4,034,321		4,033,997
	4,033,489		4,033,488		4,034,105		4,033,242	13	4,033,089		4,034,052
4 :	4,033,588		4,033,493		4,034,113		4,033,390		4,033,721		4,034,063
	4,033,620		4,033,503		4,034,121		4,033,394	16	4,033,166		4,034,082
	4,033,779		4,033,505		4,034,125		4,033,462		4,033,391		4,034,097
	4,034,198		4,033,508		4,034,133		4,033,501	17	Re 29,293		4,034,117
	4,034,314		4,033,510		4,034,138		4,033,639		4,033,005		4,034,122
5 :	4,033,081		4,033,526		4,034,148		4,033,648		4,033,065		4,034,132
	4,033,190		4,033,541		4,034,155		4,033,660		4,033,068		4,034,157
	4,033,280		4,033,555		4,034,190		4,033,686		4,033,115		4,034,167
6 :	4,032,995		4,033,560		4,034,191		4,033,792		4,033,158		4,034,171
	4,033,003		4,033,580		4,034,215		4,033,907		4,033,216		4,034,185
	4,033,013		4,033,582		4,034,216		4,033,916		4,033,218		4,034,210
	4,033,026		4,033,595		4,034,232		4,033,938		4,033,230		4,034,242
	4,033,029		4,033,599		4,034,260		4,034,024		4,033,231		4,034,259
	4,033,033		4,033,607		4,034,261		4,034,039		4,033,235		4,034,275
	4,033,035		4,033,608		4,034,272		4,034,040		4,033,236		4,034,284
	4,033,043		4,033,618		4,034,276		4,034,054		4,033,243		4,034,289
	4,033,048		4,033,641		4,034,280		4,034,070		4,033,274		4,034,296
	4,033,063		4,033,651		4,034,293		4,034,143		4,033,348		4,034,299
	4,033,090		4,033,654		4,034,309		4,034,144		4,033,382		4,034,325
	4,033,099		4,033,656		4,034,310		4,034,193		4,033,433		4,034,360
	4,033,113		4,033,659		4,034,319		4,034,201		4,033,439		4,034,377
	4,033,117		4,033,664		4,034,331		4,034,218		4,033,457		4,034,379
	4,033,133		4,033,669		4,034,343		4,034,227		4,033,468	18	4,033,020
	4,033,149		4,033,673		4,034,353		4,034,251		4,033,474		4,033,112
	4,033,159		4,033,697		4,034,357		4,034,266		4,033,486		4,033,131
	4,033,160		4,033,700		4,034,372		4,034,277		4,033,494		4,033,176
	4,033,219		4,033,703		4,034,374		4,034,287		4,033,573		4,033,318
	4,033,222		4,033,722		4,034,397	10	4,033,749		4,033,614		4,033,375
	4,033,224		4,033,742		4,034,402		4,033,751		4,033,616		4,033,385
	4,033,225		4,033,746		4,034,408		4,034,021		4,033,631		4,033,475
	4,033,247		4,033,747		4,034,411		4,034,194		4,033,643		4,033,601
	4,033,255		4,033,760		4,034,412	12	4,033,025		4,033,652		4,033,744
	4,033,265		4,033,788	8	Re 29,296		4,033,053		4,033,661		4,033,806
	4,033,268		4,033,796		4,033,046		4,033,100		4,033,680		4,033,863
	4,033,270		4,033,797		4,033,324		4,033,150		4,033,681		4,033,930
	4,033,279		4,033,803		4,033,397		4,033,263		4,033,702		4,033,941
	4,033,281		4,033,843		4,033,515		4,033,336		4,033,706		4,034,011
	4,033,286		4,033,844		4,033,704		4,033,339		4,033,726		4,034,270
	4,033,292		4,033,859		4,033,842		4,033,347		4,033,736	19	Re 29,291
	4,033,330		4,033,878		4,033,869		4,033,367		4,033,753		4,033,037
	4,033,338		4,033,898		4,033,937		4,033,478		4,033,860		4,033,098
	4,033,358		4,033,904		4,034,059		4,033,499		4,033,861		4,033,228
	4,033,374		4,033,935		4,034,285		4,033,531		4,033,873		4,033,442
	4,033,381		4,033,952		4,034,294		4,033,538		4,033,894		4,033,469
	4,033,388		4,033,953		4,034,347		4,033,581		4,033,917		4,033,733

	4,033,820		4,033,448		4,033,822		4,033,865		4,034,164	47	4,033,074
	4,033,870		4,033,495		4,033,823		4,033,871		4,034,195		4,033,205
	4,034,304		4,033,497		4,033,833		4,033,881	41	4,033,127		4,033,298
20	4,033,101		4,033,536		4,033,845		4,033,882		4,033,369		4,033,455
	4,033,271		4,033,569		4,033,905		4,033,895		4,033,481		4,033,458
	4,033,756		4,033,605		4,033,922		4,033,901		4,033,552		4,033,653
21	4,033,215		4,033,611		4,033,939		4,033,911		4,034,291		4,033,655
22	4,033,409		4,033,615		4,033,959		4,033,934	42	4,033,014		4,033,837
	4,033,509		4,033,627		4,033,961		4,033,982		4,033,027		4,034,120
	4,033,600		4,033,630		4,033,962		4,033,992		4,033,032	48	4,033,066
	4,033,758		4,033,663		4,033,968		4,033,998		4,033,050		4,033,186
	4,033,759		4,033,766		4,033,971		4,034,065		4,033,076		4,033,208
23	4,033,246		4,033,781		4,034,007		4,034,066		4,033,083		4,033,328
	4,033,484		4,033,802		4,034,014		4,034,073		4,033,129		4,033,332
	4,033,567		4,033,816		4,034,036		4,034,080		4,033,140		4,033,334
24	4,033,007		4,033,828		4,034,045		4,034,089		4,033,142		4,033,386
	4,033,077		4,033,851		4,034,046		4,034,116		4,033,183		4,033,408
	4,033,118		4,033,902		4,034,053		4,034,141		4,033,185		4,033,410
	4,033,267		4,033,931		4,034,058		4,034,168		4,033,188		4,033,411
	4,033,320		4,033,949		4,034,077		4,034,213		4,033,189		4,033,413
	4,033,720		4,033,989		4,034,084		4,034,230		4,033,284		4,033,414
	4,033,740		4,034,026		4,034,110		4,034,283		4,033,322		4,033,429
	4,033,755		4,034,027		4,034,127		4,034,298		4,033,342		4,033,465
	4,034,100		4,034,069		4,034,149		4,034,356		4,033,354		4,033,640
	4,034,136		4,034,087		4,034,151		4,034,363		4,033,389		4,033,707
	4,034,156		4,034,099		4,034,152		4,034,399		4,033,399		4,033,727
	4,034,199		4,034,137		4,034,197		4,034,407		4,033,402		4,033,829
	4,034,208		4,034,140		4,034,239	37	Re.29,287		4,033,441		4,033,856
	4,034,273		4,034,177		4,034,255		4,033,520		4,033,456		4,033,857
	4,034,370		4,034,212		4,034,302		4,033,559		4,033,504		4,033,858
25	4,033,009		4,034,265		4,034,307		4,033,585		4,033,583		4,033,883
	4,033,031		4,034,268		4,034,339		4,033,785		4,033,593		4,033,888
	4,033,058		4,034,342		4,034,358		4,033,836		4,033,622		4,033,889
	4,033,067		4,034,354		4,034,378		4,034,079		4,033,629		4,033,893
	4,033,171	27	4,033,038		4,034,382		4,034,161		4,033,632		4,034,030
	4,033,180		4,033,355		4,034,409		4,034,162		4,033,658		4,034,049
	4,033,234		4,033,357	35	4,033,073		4,034,290		4,033,683		4,034,118
	4,033,276		4,033,377		4,033,734		4,034,292		4,033,717		4,034,158
	4,033,289		4,033,466	36	Re.29,288		4,034,352		4,033,738		4,034,163
	4,033,296		4,033,566		4,032,989	39	4,033,022		4,033,741		4,034,203
	4,033,311		4,033,787		4,033,044		4,033,144		4,033,776		4,034,219
	4,033,384		4,033,826		4,033,045		4,033,156		4,033,783		4,034,225
	4,033,452		4,033,948		4,033,060		4,033,163		4,033,789		4,034,333
	4,033,480		4,034,170		4,033,061		4,033,250		4,033,798		
	4,033,502		4,034,181		4,033,070		4,033,285		4,033,799	49 :	4,033,269
	4,033,604		4,034,240		4,033,071		4,033,316		4,033,807		4,033,300
	4,033,715		4,034,359		4,033,091		4,033,327		4,033,827		4,033,345
	4,033,765		4,034,395		4,033,093		4,033,349		4,033,835	50 :	4,033,266
	4,033,800	28	4,033,530		4,033,108		4,033,372		4,033,838	51 :	4,033,079
	4,033,804	29	4,033,477		4,033,110		4,033,378		4,033,867		4,033,084
	4,033,810		4,033,528		4,033,145		4,033,380		4,033,886		4,033,119
	4,033,825		4,033,606		4,033,155		4,033,424		4,033,897		4,033,178
	4,033,830		4,033,735		4,033,173		4,033,447		4,033,947		4,033,283
	4,033,831		4,033,896		4,033,217		4,033,464		4,033,972		4,033,325
	4,033,839		4,033,914		4,033,229		4,033,485		4,033,985		4,033,360
	4,033,864		4,034,015		4,033,240		4,033,512		4,033,996		4,033,745
	4,033,927		4,034,029		4,033,248		4,033,535		4,034,002		4,033,757
	4,034,072		4,034,078		4,033,290		4,033,677		4,034,005		4,033,763
	4,034,123		4,034,173		4,033,294		4,033,705		4,034 013		4,033,899
	4,034,214	31	4,033,416		4,033,313		4,033,718		4,034,017		4,034,243
	4,034,328		4,033,476		4,033,337		4,033,743		4,034,022		4,034,297
	4,034,348	32	4,033,042		4,033,353		4,033,773		4,034,035	53 :	Re.29,290
	4,034,355		4,033,087		4,033,363		4,033,777		4,034,037		4,032,998
	4,034,366	33	4,033,529		4,033,364		4,033,782		4,034,041		4,033,030
	4,034,373	34 :	4,032,991		4,033,395		4,033,841		4,034,047		4,033,036
	4,034,386		4,032,992		4,033,420		4,033,848		4,034,048		4,033,136
	4,034,393		4,033,008		4,033,430		4,033,849		4,034,056		4,033,179
26 :	4,032,996		4,033,095		4,033,461		4,033,885		4,034,071		4,033,319
	4,032,999		4,033,139		4,033,482		4,033,900		4,034,092		4,033,551
	4,033,018		4,033,161		4,033,511		4,033,908		4,034,114		4,033,625
	4,033,055		4,033,210		4,033,513		4,033,921		4,034,129		4,033,813
	4,033,126		4,033,211		4,033,516		4,033,956		4,034,147		4,034,012
	4,033,138		4,033,223		4,033,523		4,033,990		4,034,169		4,034,233
	4,033,168		4,033,253		4,033,524		4,034,000		4,034,172		4,034,334
	4,033,194		4,033,254		4,033,557		4,034,001		4,034,178	54 :	4,033,662
	4,033,200		4,033,275		4,033,574		4,034,038		4,034,202		4,033,909
	4,033,207		4,033,287		4,033,578		4,034,062		4,034,248		4,033,910
	4,033,232		4,033,326		4,033,579		4,034,064		4,034,249		4,034,008
	4,033,245		4,033,331		4,033,587		4,034,083		4,034,262		4,034,016
	4,033,272		4,033,333		4,033,589		4,034,128		4,034,263	55 :	Re.29,292
	4,033,301		4,033,341		4,033,619		4,034,131		4,034,267		4,032,990
	4,033,303		4,033,344		4,033,666		4,034,206		4,034,269		4,033,249
	4,033,314		4,033,365		4,033,679		4,034,211		4,034,320		4,033,323
	4,033,321		4,033,419		4,033,692		4,034,252		4,034,349		4,033,335
	4,033,329		4,033,453		4,033,694		4,034,257		4,034,365		4,033,438
	4,033,373		4,033,473		4,033,698		4,034,338	43	4,033,023		4,033,451
	4,033,379		4,033,487		4,033,708		4,034,415		4,033,069		4,033,459
	4,033,393		4,033,500		4,033,719	40	4,033,278	44	4,033,986		4,033,518
	4,033,400		4,033,522		4,033,768		4,033,415		4,034,234		4,033,542
	4,033,403		4,033,657		4,033,769		4,033,550	45	4,033,147		4,033,545
	4,033,407		4,033,665		4,033,771		4,033,576		4,033,154		4,033,691
	4,033,425		4,033,667		4,033,772		4,033,647		4,034,134		4,033,767
	4,033,426		4,033,668		4,033,775		4,033,701		4,034,150		4,033,774
	4,033,431		4,033,671		4,033,780		4,033,711		4,034,184		4,033,862
	4,033,436		4,033,748		4,033,786		4,033,725		4,034,231		4,033,866
	4,033,440		4,033,761		4,033,795		4,033,784		4,034,337		4,034,176
	4,033,444		4,033,817		4,033,852		4,033,983	46	4,033,527	56	4,033,712

DESIGN PATENTS

6	244,897		244,937		244,911	26	244,892	36	244,891	41	244,889
	244,898		244,938		244,961		244,943		244,905		244,899
	244,900		244,946	18	244,890		244,962		244,910		244,913
	244,908		244,948		244,940	27	244,902		244,930		244,929
	244,909		244,965	25	244,950	29	244,903		244,931	42	244,887
	244,917	8	244,888		244,951	31	244,918		244,958		244,904
	244,920		244,935		244,952	34	244,919	39	244,907		244,944
	244,927		244,939		244,953		244,936		244,949	51	244,915
	244,928	9	244,945		244,954		244,947		244,957	53	244,924
	244,934	17	244,886		244,955		244,959				

PLANT PATENTS

6	4,070		4,071		4,072		4,073				

DEFENSIVE PUBLICATIONS APPLICATIONS

[Notice of Dec. 16, 1969, 869 O.G. 6877]

2	T960,001	26	T960,002	47	T960,004						

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OFFICIAL GAZETTE of the UNITED STATES PATENT and TRADEMARK OFFICE

July 12, 1977 Volume 960 Number 2

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PATENT AND TRADEMARK OFFICE NOTICES

Implementation of Patent Cooperation Treaty

[37 CFR Parts 1, 3 and 5]

Extension of Time for Comments on Proposed Rules Changes

AGENCY: Patent and Trademark Office, Commerce.

ACTION: Extension of Comment Period.

SUMMARY: This document extends the time to present comments on the proposed rulemaking relating to "Implementation of Patent Cooperation Treaty." This action is taken since the necessary ratifications or accessions for the Patent Cooperation Treaty to enter into force have not yet been deposited with the World Intellectual Property Organization in Geneva, Switzerland and since a number of requests for more time for comment have been received. Accordingly, the date for presenting comments announced in the Federal Register of January 12, 1977 (42 F.R. 2632–2644) and the OFFICIAL GAZETTE of February 8, 1977 (955 O.G. 350–363) is extended until August 31, 1977. A hearing on the proposed rule changes was held on May 26, 1977, and no further hearing will be held.

DATES: Time for written comments extended to August 31, 1977.

ADDRESSES: Address written comments to the Commissioner of Patents and Trademarks, Washington, D.C. 20231. Written comments and transcript of hearing will be available for public inspection in Room 11E–10 of Building 3, Crystal Plaza, at 2021 Jefferson Davis Highway, Arlington, Virginia.

FOR FURTHER INFORMATION CONTACT: Mr. Louis O. Maassel by telephone at (703) 557–3070, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.

June 2, 1977.

C. MARSHALL DANN,
Commissioner of Patents and Trademarks.

Approved: June 15, 1977.

JORDAN J. BARUCH,
Assistant Secretary for Science and Technology.

[FR Doc. 77–17884; Filed 6–22–77; 8:45 a.m.]
Published in 42 F.R. 31812, June 23, 1977

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,367,778, Re. S.N. 794,489, Filed May 6, 1977, Cl. 96/64, SILVER SALT DIRECT POSITIVE EMULSION, Robert W. Berriman, et al., Owner of Record: *Eastman Kodak Company, Rochester, N.Y.,* Attorney or Agent: Carl O. Thomas, et al., Ex. Gp.: 166

3,605,225, Re. S.N. 787,745, Filed Apr. 15, 1977, Cl. 28/72.16, METHOD OF TREATING YARNS TO PROVIDE KINKING AND/OR MOTTLED EFFECTS IN FABRIC, Kirkland H. Gibson, et al., Owner of Record: *H. G. P. Corp., Johnston, R.I.,* Attorney or Agent: Herbert B. Barlow, et al., Ex. Gp.: 352

3,643,625, Re. S.N. 790,493, Filed Apr. 25, 1977, Cl. 118/48, THIN-FILM DEPOSITION APPARATUS, Gunard O. B. Mahl, Owner of Record: *Carl Herrmann Associates, Inc., Menlo Park, Calif.,* Attorney or Agent: Hubert E. Dubb, et al., Ex. Gp.: 352

3,739,861, Re. S.N. 792,298, Filed Apr. 29, 1977, Cl. 172/793, BLADE LIFT/CENTERSHIFT CONTROLS FOR MOTOR GRADERS, Harold M. Johnson, et al., Owner of Record: *Caterpillar Tractor Company, Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, et al., Ex. Gp.: 334

3,805,724, Re. S.N. 793,168, Filed May 2, 1977, Cl. 114/7, SAILBOAT CANOPY APPARATUS, Frank W. Butler, Owner of Record: *Inventor,* Attorney or Agent: Robert E. Geauque, Ex. Gp.: 315

3,858,752, Re. S.N. 789,454, Filed Apr. 21, 1977, Cl. 220/325, CONTAINER HAVING IMPROVED RESEALABLE CLOSURE SYSTEM, Richard T. Marvin, Jr., et al., Owner of Record: *Plastics Research Corporation, Los Angeles, Calif.,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 241

3,887,863, Re. S.N. 799,760, Filed May 23, 1977, Cl. 323/19, SOLID-STATE REGULATED VOLTAGE SUPPLY, Adrian Paul Brokaw, Owner of Record: *Analog Devices, Incorporated, Norwood, Mass.,* Attorney or Agent: Howard M. Bollinger, et al., Ex. Gp.: 212

3,917,150, Re. S.N. 795,668, Filed May 10, 1977, Cl. 288/159, SEALS AND METHOD OF MANUFACTURE THEREOF, John Gilbert Ferguson, et al., Owner of Record: *Rolls-Royce (1971) Limited, London, England,* Attorney or Agent: Davidson C. Miller, et al., Ex. Gp.: 323

3,953,591, Re. S.N. 794,582, Filed May 6, 1977, Cl. 424/80, FATTY ACID, POLYSILOXANE AND WATER-SOLUBLE POLYMER CONTAINING SKIN CONDITIONING EMULSION, William Earl Snyder, Owner of Record: *Procter & Gamble Company, Cincinnati, Ohio,* Attorney or Agent: Richard C. Witte, et al., Ex. Gp.: 125

3,957,184, Re. S.N. 799,118, Filed May 20, 1977, Cl. 224/8 R, BACK PACK WITH RESILIENT BANDS FOR SPACING THE PACK FROM THE WEARER, Daniel A. Shurman, Owner of Record: *Inventor,* Attorney or Agent: Esther O. Kegan, et al., Ex. Gp.: 314

3,959,868, Re. S.N. 797,331, Filed May 16, 1977, Cl. 29/203 DT, TOOL AND ADAPTER FOR ELECTRICAL CONNECTOR UNIT USING INSULATION PIERCING CONTACTS, Istvan Mathe, Owner of Record: *Bunker Ramo Corporation, Oak Brook, Ill.,* Attorney or Agent: Frederick M. Arbuckle, et al., Ex. Gp.: 321

3,961,421, Re. S.N. 789,458, Filed Apr. 21, 1977, Cl. 32/14 A, ORTHODONTIC ELASTIC BAND WITH VARYING OUTER PERIPHERY, Melvin Wallshein, Owner of Record: *Inventor,* Attorney or Agent: Robert D. Flynn, et al., Ex. Gp.: 333

3,966,044, Re. S.N. 790,450, Filed Apr. 25, 1977, Cl. 206/427, SCRAPLESS PLASTIC SHEET MULTI-PACKAGING DEVICE, Ernest Ray Cunningham, Owner of Record: *Grip-Pak Systems, Inc., St. Louis, Mo.,* Attorney or Agent: Michael Kovac, Ex. Gp.: 241

3,966,271, Re. S.N. 796,792, Filed May 13, 1977, Cl. 303/69, FLUID BRAKE CONTROL SYSTEM, Eugene Douglas McEathron, Owner of Record: *General Signal Corporation, Rochester, N.Y.,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 315

3,967,864, Re. S.N. 796,783, Filed May 13, 1977, Cl. 303/81, FLUID BRAKE CONTROL SYSTEM, Eugene Douglas McEathron, Owner of Record: *General Signal Corporation, Rochester, N.Y.,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 315

3,971,247, Re. S.N. 792,478, Filed Apr. 29, 1977, Cl. 73/27 R, FLUID MEASURING APPARATUS, Jerome A. Rodder, Owner of Record: *Inventor,* Attorney or Agent: Robert L. Parker, et al., Ex. Gp.: 244

3,975,747, Re. S.N. 796,659, Filed May 13, 1977, Cl. 354/60 E, OFF-PHOTOMETRIC-RANGE INDICATOR FOR EXPOSURE METER, Kenji Toyoda, Owner of Record: *Nippon Kogaku K.K., Tokyo, Japan,* Attorney or Agent: Joseph M. Fitzpatrick, et al., Ex. Gp.: 211

3,977,727, Re. S.N. 796,330, Filed May 12, 1977, Cl. 301/97, RIM WITH BEAD UNSEAT RESTRAINT, William A. Glasenapp, et al., Owner of Record: *The B. F. Goodrich Company, New York, N.Y.,* Attorney or Agent: Harry F. Pepper, Jr., et al., Ex. Gp.: 311

3,979,027, Re. S.N. 798,498, Filed May 19, 1977, Cl. 222/193, PRODUCT PRESSURIZED COMPRESSED AIR DISPENSER HAVING IMPROVED PRODUCT CONTROL VALVE ACTUATOR, Herbert H. Loeffler, Owner of Record: *Ciba-Geigy Corporation, Ardsley, N.Y.,* Attorney or Agent: John E. Lind, et al., Ex. Gp.: 311

4,002,202, Re. S.N. 794,800, Filed May 9, 1977, Cl. 166/65 M, FAIL-SAFE SAFETY CUT-OFF VALVE FOR A FLUID WELL, Donald L. Huebsch, et al., Owner of Record: *Inventors,* Attorney or Agent: W. D. Sellers, et al., Ex. Gp.: 354

4,003,751, Re. S.N. 794,420, Filed May 6, 1977, Cl. 106/20, COATING AND INK COMPOSITIONS, Charles H. Carder, Owner of Record: *Union Carbide Corporation, New York, N.Y.,* Attorney or Agent: James C. Arvantes, et al., Ex. Gp.: 142

4,005,627, Re. S.N. 801,193, Filed May 27, 1977, Cl. 83/674, ROTARY CUTTER DRUMS, Richard Adrian Craddy, Owner of Record: *Masson Scott Thrissell Engineering Limited, Bristol, Great Britain,* Attorney or Agent: Arthur H. Seidel, et al., Ex. Gp.: 324

4,010,813, Re. S.N. 797,602, Filed May 16, 1977, Cl. 180/73 C, LEADING LINK TYPE INDEPENDENT SYSTEMS, Andre Quignoit, Owner of Record: *Inventor,* Attorney or Agent: Harold James, et al., Ex. Gp.: 316

4,022,004, Re. S.N. 795,666, Filed May 10, 1977, Cl. 56/346, HAY STACKING MACHINE, Donald L. Henke, Owner of Record: *Creston Manufacturing Company, Inc., Creston, Nebr.,* Attorney or Agent: Richard O. Bartz, et al., Ex. Gp.: 333

PATENT NOTICES

Certificates of Correction for the Week of July 12, 1977

Re. 29,090
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D. 237,578
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Disclaimers

3,611,432.—*Robert E. Babcock* and *Charlie B. Turner*, Hendersonville and *Howard T. Jones*, Flat Rock, N.C. COMBINED OPERATING CIRCUIT FOR GASEOUS DISCHARGE AND INCANDESCENT LAMPS. Patent dated Oct. 5, 1971. Disclaimer filed Apr. 14, 1977, by the assignee, *General Electric Company.*

Hereby enters this disclaimer to claims 4, 5, 6 and 7 of said patent.

3,699,355.—*Charles Felix Madrazo*, North Palm Beach; *Edwin Maxwell Fulcher* and *Kevin Patrick McDonagh*, Lake Park, Fla. GATE CIRCUIT. Patent dated Oct. 17, 1972. Disclaimer filed Apr. 14, 1977, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 4, 5 and 6 of said patent.

3,726,851.—*Alvin Carl Litke*, West Seneca, N.Y. WATER-SOLUBLE BENZOTHIAZOLYLPHENYL - AZO - BARBITURIC ACID DYESTUFFS. Patent dated Apr. 10, 1973. Disclaimer filed May 31, 1977, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to claim 8 of said patent.

3,755,525.—*David S. Sheridan*, Argyle, N.Y. and *Isaac S. Jackson*, Greenwich, N.Y. METHOD OF MAKING MULTIPLE LUMEN TUBING FOR MEDICO-SURGICAL TUBES. Patent dated Aug. 28, 1973. Disclaimer filed Apr. 14, 1977, by the assignee *Mallinckrodt, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3,788,802.—*Alvin Carl Litke*, West Seneca, N.Y. PAPER DYED WITH WATER SOLUBLE BENZOTHIAZOLYLPHENYLAZOBARBITURIC ACID DYESTUFFS. Patent dated Jan. 29, 1974. Disclaimer filed May 31, 1977, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to claim 8 of said patent.

3,887,914.—*Yukio Sato; Youjiro Shigemori; Yoshio Mitumori* and *Tadashi Suzuki*, Shizuoka, Japan. CONTACTLESS BUZZER. Patent dated June 3, 1975. Disclaimer filed Apr. 19, 1977, by the assignee, *Star Seimitsu Kabushiki Kaisha.*

Hereby enters this disclaimer to claim 3 of said patent.

3,988,871.—*Henry Moomey*, Kentwood, Mich. SUSPENDED CEILING CONSTRUCTION. Patent dated Nov. 2, 1976. Disclaimer filed Apr. 25, 1977, by the inventor.

Hereby enters this disclaimer to the entire term of said patent.

4,009,331.—*Richard Joseph Sypula*, Rochester, N.Y. VIDEO NOISE REDUCTION CIRCUIT. Patent dated Feb. 22, 1977. Disclaimer filed May 16, 1977, by the assignee, *Eastman Kodak Company.*

Hereby enters this disclaimer to the entire term of said patent.

4,015,438.—*Robert C. Kinsell*, Los Angeles; *James C. Noe*, Canoga Park; *John P. Byrne*, Westminster, Calif. AIR CYCLE AIR CONDITIONING SYSTEM FOR VEHICLES. Patent dated Apr. 5, 1977. Disclaimer filed Apr. 25, 1977, by the assignee, *The Garrett Corporation.*

Hereby enters this disclaimer to claims 1–16 of said patent.

Disclaimer and Dedication

3,905,370.—*John P. Lazdowski*, Franklin, Mass. DISPOSABLE DOUCHE PRODUCT. Patent dated Sept. 16, 1975. Disclaimer filed May 20, 1977, by the assignee *International Paper Company.*

Hereby enters this disclaimer to claims 1–6 and dedicates to the Public the entire term of said patent.

Dedication

3,787,508.—*Eddie Bob Walker*, Lake Jackson, Tex. SOLID, CURABLE POLYEPOXIDES MODIFIED WITH HYDROLYZED LIQUID POLYEPOXIDES. Patent dated Jan. 22, 1974. Dedication filed Apr. 4, 1977, by the assignee *The Dow Chemical Company.*

Hereby dedicates to the Public the entire term of said patent.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 18, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-11-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-1-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-29-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-10-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-20-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during June 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 2,939,145 to 2,943,326, inclusive
Plant Patents	Numbers 1,950 to 1,956, inclusive

REISSUES

JULY 12, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

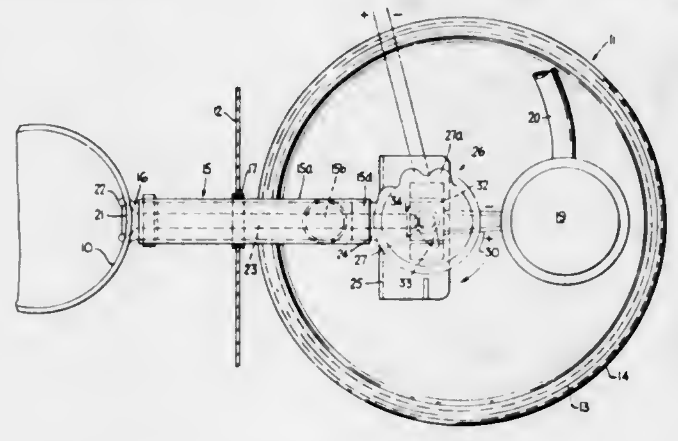
Re. 29,297
CHEMICAL CLOSETS

Montague Hiller, 20 Carrington Avenue, Borehamwood, Hertfordshire, England

Original No. 3,748,663, dated July 31, 1973, Ser. No. 121,839, Mar. 8, 1971. Application for reissue July 30, 1975, Ser. No. 600,477

Int. Cl.² A47K *11/02;* **A61L** *11/00*

U.S. Cl. 4—115 **12 Claims**



1. A transportable chemical closet comprising a casing for containing a chemical solution in a lower region thereof, a lavatory pan or bowl located within said casing at an upper region thereof and having a discharge aperture at its lower part, closure means for said discharge aperture, said closure means being constrained to keep said discharge aperture closed at least when said pan or bowl is in use, and a flushing unit comprising a casing constituting a chamber for a flushing fluid, means defining an inlet passage to said chamber from a lower region of said pan or bowl, means defining an outlet passage to said pan or bowl from said chamber, means associated with said outlet passage for withdrawing the flushing fluid from said chamber through said outlet passage to said pan or bowl, said inlet passage being adapted so that solid waste material as is normally deposited in a lavatory pan or bowl cannot pass therethrough and so that liquid can only pass therethrough when said fluid withdrawing means is operating, when, with said closure means closed, the flushing fluid is circulated in a closed flow path which includes said pan or bowl and bypasses said lower region of the casing.

Re. 29,298
DEPOSITION OF VAPORIZED FLAVORANT ON TOBACCO

Jon F. Banks, Louisville, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Original No. 3,800,806, dated Apr. 2, 1974, Ser. No. 203,206, Nov. 30, 1971. Application for reissue Dec. 11, 1975, Ser. No. 639,963

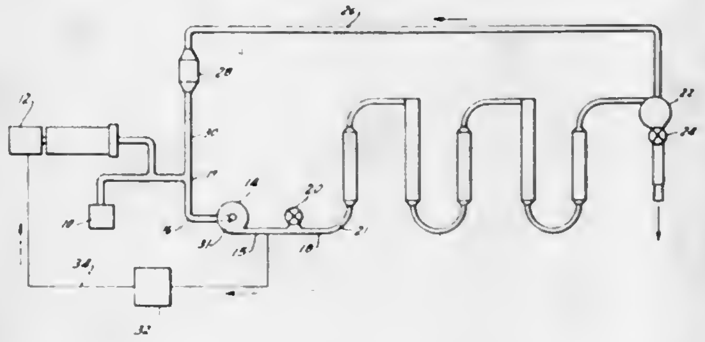
Int. Cl.² A24B *15/04*

U.S. Cl. 131—144 **6 Claims**

4. A method of treating tobacco comprising:

a. introducing by vapor injection menthol in heated vapor form in the absence of a volatile or semi-volatile carrier fluid into a conduit having a heated air stream maintained at a temperature within the range of from [about] 75° to 150° F, the temperature of said air stream being [above the vaporizing temperature of said menthol] *maintained at a level sufficient to prevent condensation of said vaporized flavorant in said conduit prior to adsorption of said menthol on the tobacco*, a vaporized menthol being in the proportion of from between 15 to 30 milligrams per cubic foot of heated air to form a uniform concentration of said menthol in said air stream;

b. injecting tobacco into said conduit and into said mixture of said heated air and vaporized menthol at a point downstream from said vapor injection at the outlet side of a negative pressure producing means;



c. keeping said tobacco and vaporized menthol in said conduit in contact for a period of time of [from] between 3 and 15 seconds to permit uniform adsorption of said menthol at a menthol level of at least [about] 0.2 percent on said tobacco; and finally separating the flavored tobacco from said conduit.

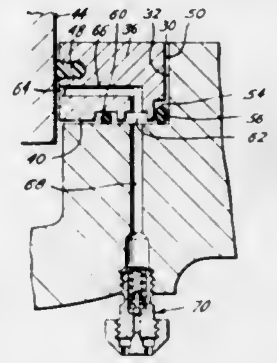
Re. 29,299
SELF SEALING GATE VALVE

Ralph M. Estes, and Robert O. Wynn, both of Houston, Tex., assignors to ACF Industries, Incorporated, New York, N.Y.

Original No. 3,078,865, dated Feb. 26, 1963, Ser. No. 100,162, Apr. 3, 1961. Application for reissue Nov. 22, 1976, Ser. No. 743,999

Int. Cl.² F16K *3/36*

U.S. Cl. 137—246.22 **8 Claims**



1. A through conduit gate valve comprised of a housing with a bore therethrough, a valve chamber intersecting said bore, a reciprocating slab gate member located in said valve chamber, said gate member provided with a passage alignable with the bore in the open position and a solid portion to cover said bore in the closed position, facing annular recesses surrounding said bore, each recess having an end wall intersecting the bore, an annular wall coaxial with the bore, one side open to the bore and one end open to the valve chamber, a seat member in each of said recesses, each seat member formed of an annular ring having a lesser outer diameter than the annular wall of its recess whereby each seat member loosely fits into its recess, each seat member provided with a passage aligned with the bore, the axial length of each seat member being greater than the axial length of its recess whereby a portion of each seat member protrudes into the valve chamber to form a

sealing face for co-operation with a face of the gate member, each sealing face provided with an annular groove, a deformable plastic sealing member positioned in said annular groove, said deformable plastic sealing member extending beyond the plane of the sealing face to form an annular ring of sealing contact area, each seat member having an axially outward face which opposes the end wall of its recess, the radially outer corner of said axially outward face provided with a rectangular notch which together with the corner formed by the end wall and the annular wall of the recess forms a rectangular chamber, a resilient O-ring positioned in said chamber forming a seal between the seat member and its recess, said O-ring having an initial outer diameter approximating the outer diameter of the seat member and a thickness substantially less than the radial depth of the chamber and greater than the axial length of the chamber, the gate member, sealing surfaces of the seat member and the distance between the end walls of the recesses being so proportioned that there is a slight interference between all sealing surfaces on assembly, the seat member having an annular groove about its periphery axially inward of the corner notch, said groove being generally rectangular in shape, a resilient O-ring positioned in said annular peripheral groove, the thickness of said O-ring being such that it is greater than the radial depth of the groove and less than the axial length of the groove, said seat member provided with a second annular groove about its periphery, said second groove positioned between the first annular peripheral groove and corner notch, the sealing face of the seat member provided with an annular groove of greater diameter than the deformable plastic sealing member, a number of spaced passages connecting the annular groove of the sealing face with the second annular peripheral groove, the housing provided with a passage having one end communicating with the second annular peripheral groove and the other end provided with a lubricant fitting to permit the introduction of sealant to the sealing face of the sealing member, the O-ring defining a restraining chamber whereby the sealant introduced through the fitting is directed into the second annular peripheral groove, passage and sealing face annular groove, the differential in the areas of the restraining chamber being such that there is a resultant force tending to force the upstream seat forward to more intimate contact with the gate, the reactive force of the sealant against the gate being of a lesser magnitude than the force tending to move the seat forward.

Re. 29,300

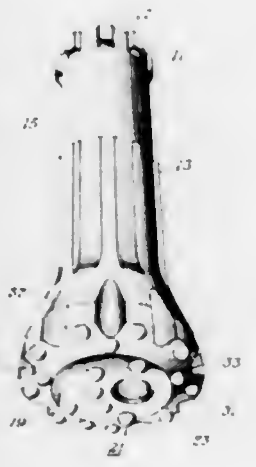
ROTARY PERCUSSION EARTH BORING BIT

Mark Leslie Bender, Pearland, Tex., assignor to Hughes Tool Company, Houston, Tex.

Original No. 3,918,538, dated Nov. 11, 1975, Ser. No. 484,838, July 1, 1974. Application for reissue Aug. 30, 1976, Ser. No. 719,204

Int. Cl.² E21C *13/06*

U.S. Cl. 175—410 **4 Claims**



1. An improved geometric configuration for a rotary-percussion earth-boring bit that includes a body having torque transmission means on an upper region, an anvil upper surface and an enlarged lower region with a transverse face containing button type inserts, the improvement comprising:
- a bevel formed at the corner between the transverse face and the enlarged lower region;
- an outer row of circumferentially spaced inserts protruding from said bevel;
- an inner row of circumferentially spaced inserts located inwardly wholly on said bevel and between the circumferentially spaced inserts of the outer row;
- the inserts of the inner and outer rows having longitudinal axes that are substantially normal to the bevel.

Re. 29,301

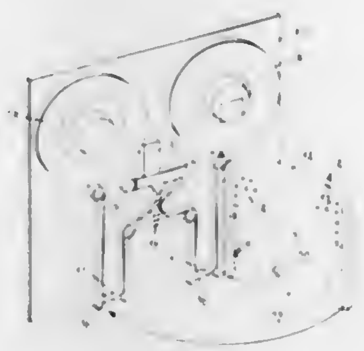
NOISE MUFFLER FOR MAGNETIC TAPE VACUUM COLUMN

Ning Kong, Boulder, Colo., assignor to International Business Machines Corporation, Armonk, N.Y.

Original No. 3,688,866, dated Sept. 5, 1972, Ser. No. 176,081, Aug. 30, 1971. Application for reissue June 5, 1973, Ser. No. 367,301

Int. Cl.² G11B *15/58, 23/12*

U.S. Cl. 242—182 **12 Claims**



1. A noise muffler for a vacuum column in a magnetic tape transport for preventing the emission of noise from the vacuum column, said muffler comprising:
- means for mismatching the acoustical impedance near the top of said column so that sound waves in the column will tend to be reflected at the top of the column back into the column;
- means for generating interference between sound waves within the vacuum column so as to dissipate the noise within the vacuum column.

Re. 29,302

BAG DIAPHRAGMS AND BAG DIAPHRAGM OPERATED AIR DAMPERS

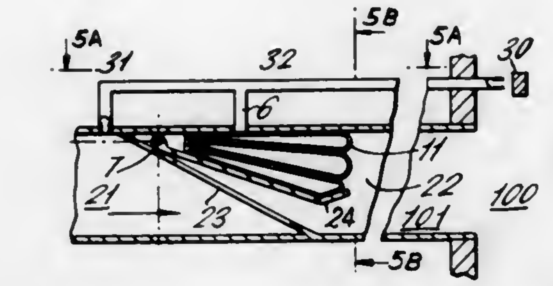
Guido Amandus De Lepeleire, Heverlee, Belgium, assignor to Danfoss A/S, Nordborg, Denmark

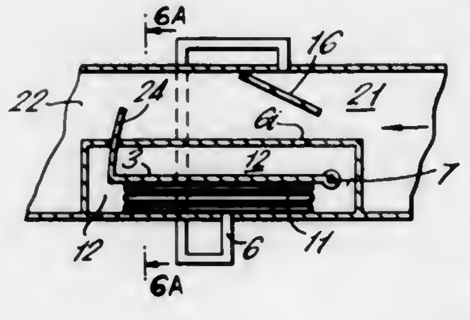
Original No. 3,804,364, dated Apr. 16, 1974, Ser. No. 166,954, July 28, 1971. Continuation of Ser. No. 501,288, Aug. 28, 1974. Application for reissue Mar. 15, 1976, Ser. No. 667,076

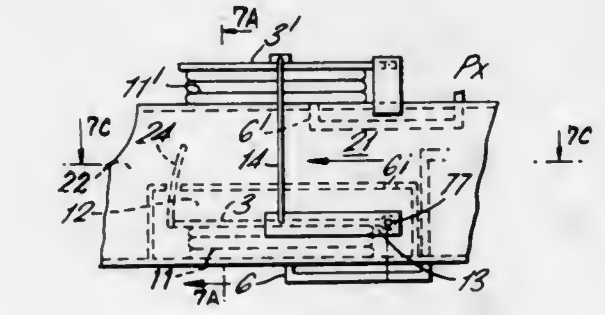
Int. Cl.² F01B *19/02;* **F16J** *3/00*

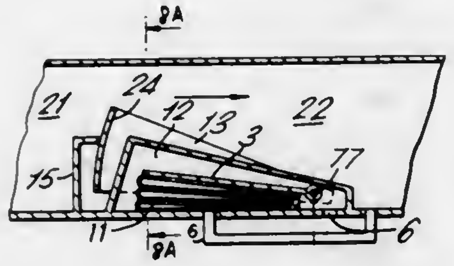
U.S. Cl. 251—43 **7 Claims**

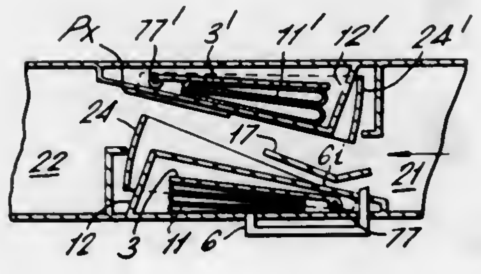
1. A pneumatically operated valve assembly comprising first and second rigid plate members mounted for movement relative to each other and being in oppositely facing relation to each other, guide means for guiding the movement of one of said members relative to the other of said members, bag means sandwiched between said plate members, *said bag means including a plurality of stacked bags having air passage means between adjacent ones of said bags*, said bag means having first portions thereof fixedly secured to *at least one of* said plate members and second portions thereof extending between said plate members, said second portions being characterized by the absence of any significant bending resistance *to allow for the complete collapsing of said bag means due to the weight of one of said plate members upon deflation of said bag means*, and aperture means in said one of said plate *members* [first plate member] for admitting and exhausting air to and from said bag means to adjust the position of said second plate member relative to the position of said first plate member.











Re. 29,303

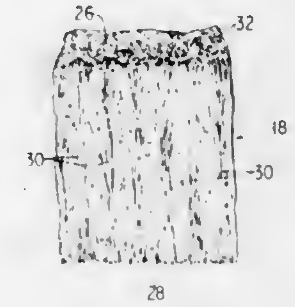
TENNIS BALL INCLUDING NEEDLE PUNCHED FABRIC COVER

Redmond Power Fraser, Jr., Greenwich, Conn., and Elbirt A. Woodward, Watch Hill, R.I., assignors to GAF Corporation, New York, N.Y.

Original No. 3,396,970, dated Aug. 13, 1968, Ser. No. 527,706, Feb. 15, 1966. Application for reissue Sept. 22, 1975, Ser. No. 615,839

Int. Cl.² A63B *39/06*

U.S. Cl. 273—61 R **1 Claim**



1. A tennis ball comprising a resilient spherical supporting member, a [felt-like] fabric cover member stretched over the outer surface of said supporting member, said fabric *consisting of a sheet of felt material in which the fibers thereof extend in planes substantially parallel with the upper and lower surfaces thereof*, having a large number of fibers [extending] *of said sheet being oriented* substantially perpendicular to the upper and lower surfaces of the [fabric and] *sheet being* needle-punched therefrom [,] *said perpendicularly oriented fibers being interspersed and interlocked with successive parallel layers of the fibers of the sheet, a substantial number of said perpendicularly oriented fibers projecting above said upper surface of said sheet*, and adhesive means adhering said cover member to said supporting surface.

Re. 29,304

PLASMA LIGHT SOURCE FOR SPECTROSCOPIC INVESTIGATION

Stanley Greenfield; Iorwerth Llewelyn William Jones, and Christopher Thomas Berry, all of Birmingham, England, assignors to Raydne Limited, Workingham and Albright & Wilson (Mfg.) Limited, Oldbury, both of, England

Original No. 3,467,471, dated Sept. 16, 1969, Ser. No. 404,625, Oct. 19, 1964. Application for reissue Nov. 3, 1975, Ser. No. 628,071

Claims priority, application United Kingdom, Oct. 21, 1963, 41456/63; Mar. 6, 1964, 9535/64; Oct. 5, 1964, 40487/64

Int. Cl.² G01N *21/54, 1/04;* **G01J** *3/28, 3/50*

U.S. Cl. 356—85 **13 Claims**

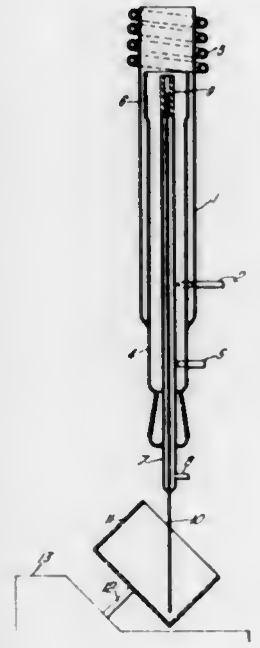
13. Apparatus for carrying out spectroscopic investigation of a sample, comprising:
- *a first tubular member;*
- *a coil which surrounds a portion of said first tubular member and defines a plasma-forming region within said first tubular member;*
- *a high frequency generator coupled to said coil for supplying electrical energy to said coil at a predetermined frequency and power, said coil and its connections being wholly external to said first tubular member;*
- *a second tubular member coaxially arranged within said first tubular member to form a first cylindrical channel within said first tubular member;*
- *an inlet in said first tubular member for injecting an insulating gas at a given rate into said first cylindrical channel;*
- *a third member coaxially arranged within said second tubular member to form a second cylindrical channel within said second tubular member, said second and third tubular members terminating substantially at said plasma-forming region;*
- *means for producing an annular plasma having a low temper-*

ature substantially central region and a tail flame, including:

an inlet in a side wall portion of said second tubular member remote from said plasma-forming region for injecting a plasma gas at a given rate into said second cylindrical channel such that said injected plasma gas flows along said second cylindrical channel toward said plasma-forming region;

an inlet in a side wall portion of said third tubular member remote from said plasma-forming region for injecting a carrier gas for a sample;

said given rates of injection of said insulating gas and plasma gas, and said predetermined frequency and power of said high frequency generator being such that: (i) the insulating gas, the plasma gas and the carrier gas flow in their respective channels towards the region of the coil in three coaxial laminar streams, and (ii) the plasma formed by the plasma gas at the plasma-forming region is of annular form and has a tail flame; and



means for passing a sample through said third tubular member with said carrier gas to inject the sample into the central region of said annular plasma in said plasma-forming region, whereby said carrier gas carries the sample through said low temperature substantially central region surrounded by said annular plasma and then into said tail flame.

Re. 29,305

HYDROPHILIC-COLLOID SILVER HALIDE EMULSION HARDENED WITH A BISVINYLSULFONYL COMPOUND

Donald M. Burness, and Robert A. Silverman, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Original No. 3,841,872, dated Oct. 15, 1974, Ser. No. 293,698, Sept. 29, 1972. Application for reissue Oct. 15, 1976, Ser. No. 732,572

Int. Cl.² G03C *1/30*

U.S. Cl. 96—67 **11 Claims**

9. A photographic element comprising a support and at least one radiation-sensitive hydrophilic colloid layer containing silver halide and at least one hydrophilic colloid layer hardened with a compound having two vinylsulfonyl radicals coupled through a divalent hydrocarbon radical chosen from the group consisting of:

a. an unsubstituted alkenylene having from 2 to 6 carbon atoms or an unsubstituted alkylene radical having from 1 to 6 carbon atoms,

b. —X—Y—X— in which X is an unsubstituted alkylene group having 1 or 2 carbon atoms and Y is an unsubstituted phenylene group, and

c. phenyl-substituted methylene.

Re. 29,306

Patent Not Issued For This Number

PLANT PATENTS

GRANTED JULY 12, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,074

VARIEGATED PIGGY-BACK PLANT

Richard Joseph Nowakowski, 2560 Ridgeway Drive, National City, Calif. 92050

Filed Aug. 5, 1976, Ser. No. 712,031

Int. Cl.² A01H *5/12*

U.S. Cl. Plt.—88 **1 Claim**

1. A new and distinct variety of piggy-back plant (*Tolmiea menziesii* variety variegata) substantially as herein shown and described, characterized particularly as to the novel variegated foliage, a new and vigorous decorative type plant.

4,075

DWARF PEACH TREE

Frederic W. Anderson, Merced, Calif., assignor to Stribling's Nurseries, Inc., Merced, Calif.

Filed Aug. 9, 1976, Ser. No. 712,843

Int. Cl.² A01H *5/03*

U.S. Cl. Plt.—43 **1 Claim**

1. A new and distinct variety of genetically dwarf peach tree, substantially as shown and described, which is of medium size, vigorous, spreading, foliated with large, lanceolate, acutely pointed leaves having a crenate margin, blooms with large pink flowers, and is a regular and productive bearer of large to medium size, uniform, symmetrical freestone fruit having yellow skin overspread to a substantial extent with red, yellow flesh, and a beige stone; the variety having the general characteristics of the Empress, the seed parent, but is distinctive, in comparison, by fruit which is of better eating quality and ripens about 3 weeks earlier.

4,076

NECTARINE TREE

Fredric W. Anderson, Merced, Calif., assignor to Stark Bro's Nurseries and Orchards Co., Louisiana, Mo.

Filed Aug. 24, 1976, Ser. No. 717,465

Int. Cl.² A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is large, vigorous, upright to spreading, open, foliated with large to medium, lanceolate, acutely pointed leaves having a glandular, crenate margin, blooms with large pink flowers, and is a regular and productive bearer of large to medium, uniform, symmetrical, globose to oblong, freestone fruit having yellow skin overspread with red, and yellow flesh; the variety being particularly characterized by fruit of good to best eating quality, which has the firmness and good shipping qualities of the seed parent, Red Diamond nectarine, but ripens with the pollen parent, May Grand nectarine.

4,077

GRAPEVINE

Frederic W. Anderson, 826 W. 22nd St., Merced, Calif. 95340

Filed Sept. 27, 1976, Ser. No. 727,159

Int. Cl.² A01H *5/03*

U.S. Cl. Plt.—47 **1 Claim**

1. A new and distinct variety of grapevine, of the Thompson Seedless class, substantially as illustrated and described, which is of medium vigor, medium in trunk size, foliated with medium size cordate leaves having five lobes, blooming mid-season with fertile flowers, and productive to medium productive on medium length, straight canes of early ripening, medium size, single-shouldered, tapering clusters of seedless berries having excellent keeping quality and very good shipping quality; the variety, in comparison to the Thompson Seedless resembles the same in most respects, but ripens about 2 weeks earlier, and, in comparison to the Perlette, has larger and more open clusters with more uniform size of the berries, and ripens about 1 week earlier.

PATENTS

GRANTED JULY 12, 1977

ERRATA

For CLASS	See PATENT NO.
165-001	4,034,420
428-576	4,034,454
005-114	4,034,518
040-308	4,034,539
040-086 A	4,034,540
211-041	4,034,871
244-003.16	4,034,949
294-083 R	4,034,992
075-246	4,035,159
346-165	4,035,244
252-160	4,035,257
252-171	4,035,258
252-175	4,035,259
252-447	4,035,260
252-455 R	4,035,261
252-456	4,035,262
252-459	4,035,263
252-467	4,035,264
252-510	4,035,265
252-512	4,035,266
252-548	4,035,267
204-299 R	4,035,377
427-261	4,035,500
358-130	4,035,579
178-069.1	4,035,601
235-078 RC	4,035,616
235-088 N	4,035,617
361-103	4,035,692
361-120	4,035,693
361-400	4,035,694
361-400	4,035,695
361-203	4,035,696
361-289	4,035,697
363-037	4,035,710
363-157	4,035,711
355-003 R	4,035,750
343-017.2 PC	4,035,775
364-900	4,035,776
364-200	4,035,777
364-200	4,035,778
364-200	4,035,779
364-900	4,035,780
364-900	4,035,781

PATENTS

GRANTED JULY 12, 1977

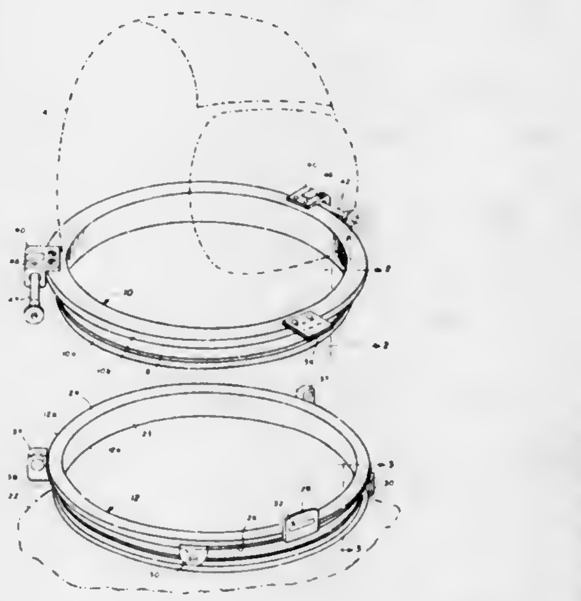
NOTE—A cross reference listing of applications published under Trial Voluntary Protest Program on January 28, 1975 is located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,034,416

DIVING HELMET BREECH RING CONNECTION

William R. Buffkin, and William W. McCrory, both of Panama City, Fla., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 22, 1976, Ser. No. 734,833
Int. Cl.² B63C *11/04*
U.S. Cl. 2—2.1 R **7 Claims**



1. A breech ring connector for removably securing a helmet to a suit, said breech ring connector comprising:

an upper ring member, adapted to be fixed to the lower edge of a helmet, said upper ring member comprising a first cylindrical portion depending from a first outwardly extending flange portion and defining a central opening for receiving the head of a wearer, a lower ring member, adapted to be fixed in the neck opening of a suit, said lower ring member comprising a second cylindrical portion depending from a second outwardly extending flange portion and defining a substantially cylindrical opening;

said upper ring member being nestable with said lower ring member with said first cylindrical portion disposed within said cylindrical opening of said lower ring member and said first flange portion overlying said second flange portion;

an elastomeric ring carried by one of said first and second cylindrical portions for effecting sealing therebetween when said first ring member is nested with said second ring member;

a slotted plate extending upwardly from the outer edge of said lower ring member;

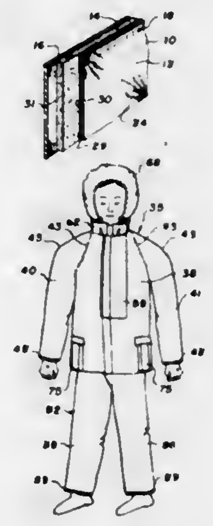
a tongue extending radially from the outer edge of said upper ring member for cooperating pivotal engagement with said slotted member;

first and second locking means, each disposed substantially 120° from said tongue and said slotted plate and from one another, for releasably securing said upper and lower ring members together.

4,034,417

PROTECTIVE GARMENTS

William G. Ellis, West Vancouver, Canada, assignor to Can-Gard Protective Wear Ltd., North Vancouver, Canada
Filed June 9, 1975, Ser. No. 584,839
Int. Cl.² A41D *31/00*
U.S. Cl. 2—81 **25 Claims**



1. A garment for protecting a wearer thereof against heat and cold, moisture, chemicals and gas, comprising a main section for enclosing a portion of the body of a wearer and tubular sections connected to and opening into the main section and positioned so that limbs of the wearer can extend therethrough; said main and tubular sections comprising an outer shell of light-weight fabric capable of withstanding high temperatures up to about 850° F for up to about 14 seconds before starting to char, said fabric being tightly woven from synthetic yarn and having a waterproof coating on its inner surface such that the coated fabric is substantially non-absorbent to water and substantially moistureproof under water pressure of up to about 200 psi, a relatively thicker liner of relatively soft and heat resistant fabric, and an inner shell of light-weight, fire-resistant, moisture-repellant fabric, said outer shell, liner and inner shell being secured together at edges thereof and being free from each other between said edges and forming a cloth unit, said liner, besides helping to protect the wearer, acting as a spacer in the cloth unit to give the latter a predetermined thickness, and the free portions of said outer shell, liner and inner shell being free to move relative to each other while the garment is being worn allow for air insulation and circulation and allow for easy flexing of the cloth unit.

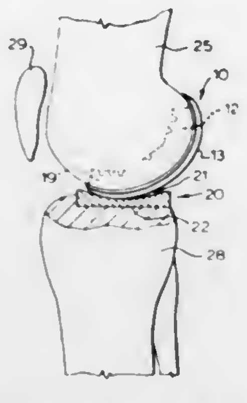
4,034,418

ARTIFICIAL KNEE JOINT

Robert W. Jackson; Frederick P. Dewar; David L. MacIntosh; John P. Kostuik, and Robin Black, all of Toronto, Canada, assignors to The Governing Council of the University of Toronto, Toronto, Canada
Filed May 11, 1976, Ser. No. 685,379
Claims priority, application Canada, May 26, 1975, 227803
Int. Cl.² A61F *1/24*
U.S. Cl. 3—1.911 **10 Claims**

1. An artificial knee joint adapted for surgical insertion into a knee, comprising at least one artificial femoral member of durable, rigid, smooth biocompatible material, the femoral member having a rear portion with a rear end face which is arcuate polycentred in the sagittal plane and arcuate in the coronal plane; and a front portion having front end face and being adapted to be received in a groove cut in the condyle of the femur of the knee so that said rear end face extends down-

wardly and constitutes the inferior surface of the femoral member and the front end face constitutes the superior surface of the femoral member, said superior surface presenting three different planar portions, angularly disposed relative to one another, and at different angles to the coronal plane; and at least one artificial tibial member of plate-like form with a smooth shallow concave upper surface of durable biocompatible material, the lower surface thereof being adapted to be received on the tibia bone of the knee.



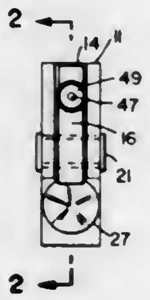
4,034,419
FULL EXTENSION LOCK FOR PROSTHETIC KNEE JOINT

Roy Daniel Roberts, San Jose, Calif., assignor to Hosmer/Dorrance Corporation, Campbell, Calif.

Filed Aug. 27, 1975, Ser. No. 608,389

Int. Cl.^{2} A61F *1/04*

U.S. Cl. 3—26 **12 Claims**



1. A device for locking in fixed relationship two hinged members, comprising;
   - a housing secured to one of the hinged members,
   - an extension link joined at one end to the other hinged member, said extension link translating and slidably extending through a passageway in said housing,
   - latch means secured to said housing for releasably retaining the other end of said extension link,
   - release means secured in said housing for releasing said latch means, and
   - actuator means remote from said housing for controlling said release means.

4,034,420
TEMPERATURE BALANCING METHOD FOR REVERSING HEAT EXCHANGERS

Akiyoshi Gotoh; Takumi Mizokawa, both of Kobe; Yukio Sawada, Kako, and Taichi Katsuki, Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

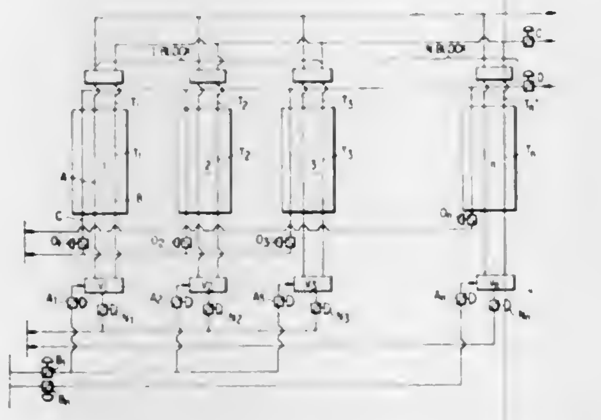
Filed Mar. 29, 1976, Ser. No. 671,437

Claims priority, application Japan, Mar. 27, 1975, 50-38204

Int. Cl.^{2} F25J *5/00*

U.S. Cl. 165—1 **3 Claims**

1. A method of automatically balancing the temperature of a plurality of cores of reversing heat exchangers connected in parallel relationship wherein each heat exchanger has a feed stream and at least one heat medium stream, said feed streams and said heat medium stream being changed over alternately at a given interval, said method comprising the steps of:
   - detecting the temperature of a particular core of the reversing heat exchangers whenever the feed stream and the heat medium stream are altered;
   - calculating a mean temperature of the cores from the detected values on the latest certain change-over period with respect to the current time instant;
   - calculating a mean temperature of all heat exchangers from the calculated mean temperature;
   - calculating deviation and deviation trend in temperature of respective heat exchangers in depence on a difference between the mean temperature of each core and the mean temperature of all eachangers; and
   - feeding back a system deviation in dependence on said deviation and deviation trend to control valve for balancing the temperature of reversing heat exchangers.



4,034,421
VACUUM SEWER SYSTEM INCLUDING A COLLECTING TANK

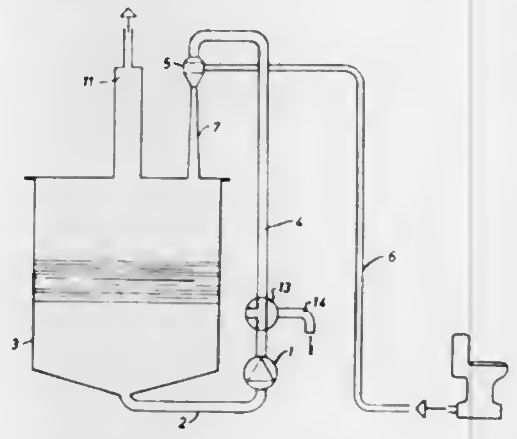
Lars Wilhelm Pihl, Bromolla; Lars Bjarne Johansen, Ahus; Carl Göran Herbert Carlsson, Tomelilla, and Karl Allan Bonde Mollerstedt, Fjalkinge, all of Sweden, assignors to IFO AB, Sweden

Filed Apr. 22, 1976, Ser. No. 679,422

Claims priority, application Sweden, Apr. 23, 1975, 7504682

Int. Cl.^{2} E03D *1/00, 3/00, 5/00*

U.S. Cl. 4—10 **7 Claims**



1. In a vacuum sewer system comprising in combination
   - a. a collecting tank for receiving liquid-mixed wastes,
   - b. a circulating pump with an inlet and an outlet connected to the collecting tank, said circulating pump being adapted to circulate the wastes in said tank for agitation, comminution and aeration thereof, and
   - c. a liquid jet pump, said pump being inserted in said path of circulation to establish the necessary vacuum for the sewer system.

4,034,422
DEVICE FOR DISPOSAL OF MATERIALS, PARTICULARLY OF HOUSEHOLD AND KITCHEN WASTE

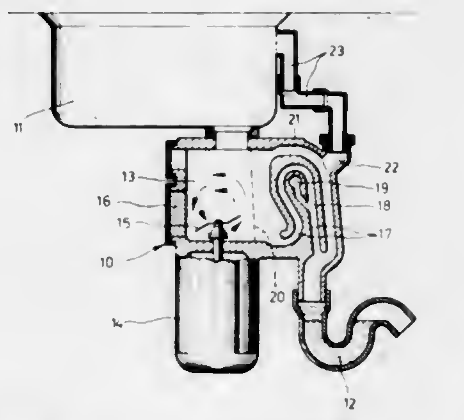
Karlheinz Farber; Rolf Mayer, and Alexander Rupp, all of Giengen, Germany, assignors to Bosch-Siemens Hausgerate GmbH, Stuttgart, Germany

Filed Jan. 28, 1976, Ser. No. 653,033

Claims priority, application Germany, Feb. 1, 1975, 2504164

Int. Cl.^{2} E03C *1/18;* **B02C** *4/32, 7/14, 9/04*

U.S. Cl. 4—187 R **15 Claims**



1. A waste disposal device comprising:
   - a receptacle for holding liquid and waste material:
   - a liquid drainline secured to said receptacle;
   - a collecting tank connected in said drainline to collect said liquid and waste materials from said receptacle;
   - a waste disintegrator extending into said collecting tank;
   - drive means for operating said waste disintegrator; and
   - control means in said drainline for actuating said drive means upon collection of liquid over a given level in said collecting tank and upon the flow of said liquid out of said tank through said drainline, said control means including pressure sensitive switching means for sensing a change in pressure in said drainline upon the occurence of said flow of liquid to actuate said motor.

4,034,423
VALVE CONTROLLED FLUSHING SYSTEM

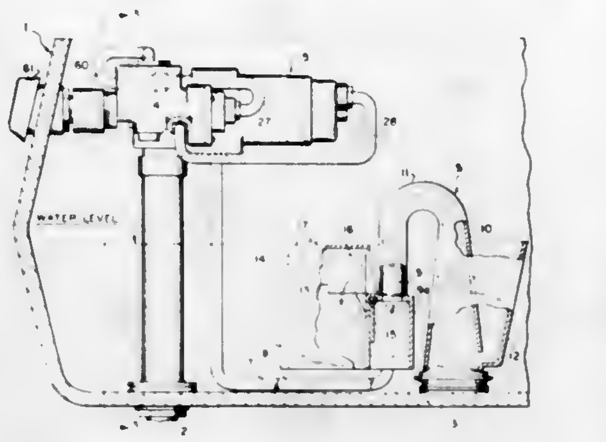
Peter M. Milnes, Sheboygan, Wis., assignor to Kohler Co., Kohler, Wis.

Filed June 29, 1976, Ser. No. 700,912

Int. Cl.^{2} E03D *1/36*

U.S. Cl. 4—41 **9 Claims**

1. A valve controlled flushing system for use with a tank-type toilet comprises:
   - a. a siphon flush valve positioned in said tank and adapted to convey tank water from said tank to the toilet bowl,
   - b. a control valve for controlling the flow of supply water into said siphon flush valve to both pump tank water through said siphon flush valve and trigger siphonic action within and through said siphon flush valve, said control valve having a pressure biased piston which is ordinarily seated against the water supply and a pressure chamber located behind and exposed to the rear face of the piston,
   - c. a bypass passage leading from the water supply to the pressure chamber, and
   - d. actuating means located in the bypass passage between the water supply and the pressure chamber of the control valve, said actuating means ordinarily allowing the free flow of line pressure to the pressure chamber where the pressure is sensed by the rear face of the piston to maintain the control valve in a closed position said actuating means being triggerable to block line pressure to the pressure chamber and relieve the pressure upon the rear face of the piston thus allowing water supply pressure to move the piston from its seat thereby permitting flow through the control valve to the flush valve to initiate the flushing cycle.



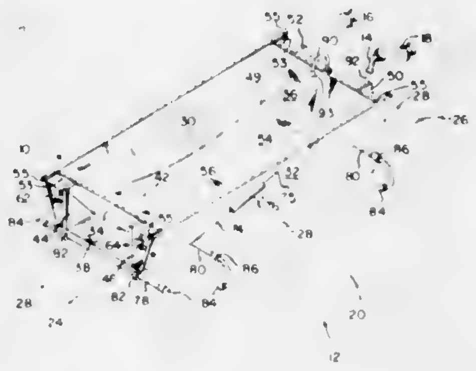
4,034,424
AUXILIARY BATHTUB FOR INVALIDS

John E. Budlong, 9308 26th Place NW., Seattle, Wash. 98117

Filed Nov. 3, 1975, Ser. No. 627,947

Int. Cl.^{2} A47K *3/00, 3/06*

U.S. Cl. 4—173 R **10 Claims**

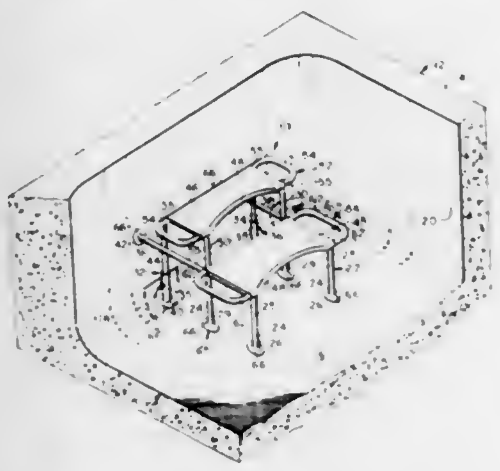


1. An auxiliary bathtub for horizontal placement to be used on the top of a conventional bathtub and for vertical placement during temporary non use at the end of the conventional bathtub opposite the faucet end, and for convenient manipulation between such placements, utilizing rolling and pivoting movement, and for convenient filling and draining by using the faucets and drain of the conventional bathtub, thereby providing an invalid with an opportunity of bathing at a level of the top of the conventional bath and essentially near a normal sitting level in a regular bathroom facility, comprising:
   - a. a frame for receiving upright walls which in turn define a bathing volume and for placement over a conventional bathtub,
   - b. upright end walls defining the ends of the bathing volume, each end wall being secured to the frame
   - c. upright side walls defining the sides of a bathing volume, each side wall being secured to the frame, and at least one side wall being pivotally secured for movement to a horizontal position substantially in the plane of the frame;
   - d. a seat secured to the frame and positioned adjacent one end wall substantially in the plane of the frame; and
   - e. a flexible, continuous, and watertight, liner defining a bathing volume draped over the seat, ends walls and side walls, having sufficient material to accommodate the

pivoting of one side wall to the horizontal position substantially in the plane of the frame and the seat when then the side wall becomes an extension of the seat for an invalid to use in getting to the coplanar seat, the liner being secured at its top to the tops of the end walls and side walls.

4,034,425
BATHTUBE SLIDE DEVICE

Aaltje Van Riemsdyck, 218 23 82nd Ave., Queens Village, N.Y. 11427
Filed Sept. 8, 1976, Ser. No. 721,427
Int. Cl.² A47K *3/12*
U.S. Cl. 4—185 R **10 Claims**

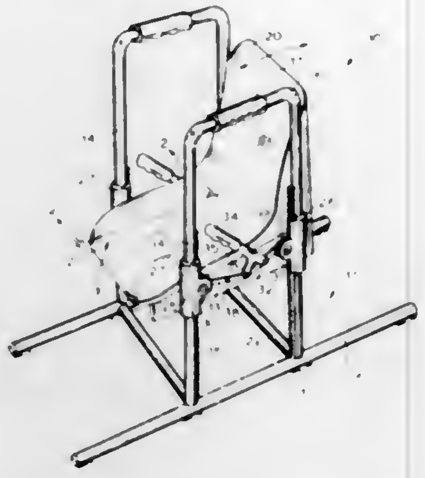


1. A bathtub support device, comprising:
- a. support means which comprises
  - i. a first pair of vertically disposed spaced apart support members extending upwardly from the bottom of the bathtub,
  - ii. a pair of vertically disposed spaced apart legs extending upwardly from the bottom of the bathtub and above said first pair,
  - iii. horizontally disposed coupling members rigidly connecting each pair of said support members and said support legs with one end of said coupling members adapted to be positioned adjacent the bathtub wall,
- b. a lower seat extending between said horizontally disposed spaced apart coupling members,
- c. an upper seat extending vertically above said lower seat and between said spaced apart legs,
- d. securing means associated with the respective terminal ends of said support members, support legs, and coupling members to removably secure the bathtub support to the bottom and side of the bathtub for retaining the support in position in the bathtub during use thereof, said securing means including vacuum cups mounted on said terminal ends,
- e. upper gripping means associated with said upper seat and extending on each side thereof and connected to said support legs for gripping by the user of the support, and
- f. lower gripping means associated with said lower seat and extending on each side thereof.

4,034,426
BATH TUB LIFT CHAIR APPARATUS

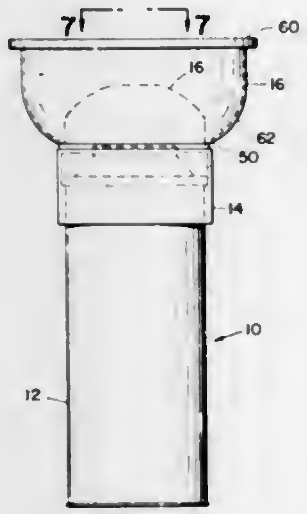
Charles W. Hardwick, 600 W. 27th St., Sanford, Fla. 32771; Ann Hardwick Smith, and Kinnaman Browning Smith, both of 702 Sargeant St., Waycross, Ga. 31501
Filed Sept. 20, 1976, Ser. No. 724,912
Int. Cl.² A47K *3/12*
U.S. Cl. 4—185 L **13 Claims**

1. A bathtub lift chair comprising in combination:
- a frame having a supporting base;
- a rockable chair rockably mounted to said frame adapted to be rocked to and fro thereon; and
- means for raising and lowering said rockable chair responsive to the rocking of said chair by an occupant of said chair whereby an invalid can be lowered or raised in a bathtub by the rocking of said chair.



4,034,427
AEROSOL DRAIN OPENER DEVICE

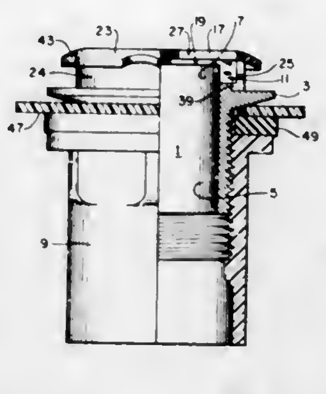
John F. Breznock, Dublin; Richard E. Melrose, Lafayette, and Richard N. Miller, Pleasanton, all of Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Jan. 26, 1976, Ser. No. 652,399
Int. Cl.² E03D *11/00*
U.S. Cl. 4—255 **12 Claims**



1. In an aerosol propellant device for cleaning waste blockages in conduits by a hydraulic ram effect, said device comprising an aerosol, propellant containing container having an inverted vertical action valve assembly including a valve stem controlling a valve for delivery of propellant from said container, means biasing said valve stem to the closed position wherein no propellant is discharged, a nozzle movably mounted on said container for selective movement to actuate said valve by movement of said valve stem in opposition to said means biasing said valve stem, and spring means intermediate said nozzle and said container for biasing said nozzle in the direction of said means biasing said valve stem, and wherein said spring means comprises a curved disc spring defining an outer circumference for abutting said container, said disc spring further having a substantially regressive load/deflection curve in a working deflection range.

4,034,428
ADJUSTABLE DRAIN CONTROL ASSEMBLY

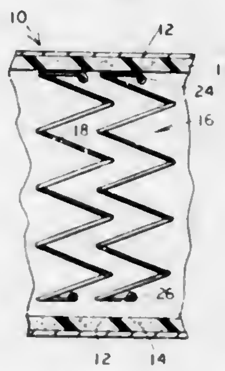
Roy A. Jacuzzi, Moraga, Calif., assignor to Jacuzzi Research, Inc., Berkeley, Calif.
Filed Jan. 27, 1975, Ser. No. 544,223
Int. Cl.² A47K *1/14*
U.S. Cl. 4—287 **2 Claims**



1. An adjustable drain control assembly comprising a hollow cylindrical component having an external flange in proximity to one end thereof to divide said component into a long section and a short section, said short section having peripheral notches in the edge thereof, leaving intervening peripheral ridges, segments extending from said peripheral ridges and merging to define openings between them which, with the peripheral notches in the edge of said short section, establish enlarged passageways into said cylindrical component having a total flow capacity of the order of that of said cylindrical component, a cap spanning the end of said shorter section and including a cylindrical flange surrounding said notched rim in sliding relationship thereto, said cap inclusive of its cylindrical flange, having openings simultaneously alignable with the openings forming said enlarged passageways, and means rotatably securing said cap in its position over the end of said shorter section, said means for rotatably securing said cap over the end of such shorter section including a peripheral channel formed externally in the notched edge of said shorter section and an inwardly directed flange on said cap meshing with said channel in slidable relationship with the walls thereof.

4,034,429
INNER SPRING CONSTRUCTION FOR MATTRESSES, CUSHIONS AND THE LIKE

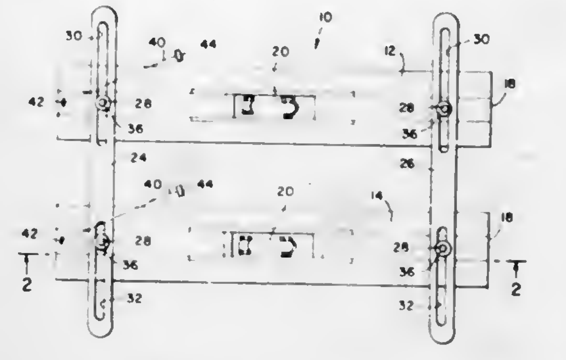
Lewis M. Smith, 38 Richland Ave., San Francisco, Calif. 94110
Filed Apr. 27, 1976, Ser. No. 680,738
Int. Cl.² A47C *23/04, 25/00*
U.S. Cl. 5—256 **1 Claim**



1. A spring construction for use in an inner spring mattress or the like comprising helical coil springs, each said spring consisting of (1) a plurality of central coils having concave side portions and convex corner portions, and (2) flat top and bottom coils each having an end looped upon itself.

4,034,430
WATER-WALKING APPARATUS

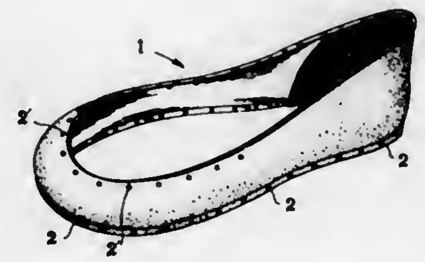
Albert W. Joyce, Wildwood Commons, Rte. 2, Box 232-31, Wildwood, Fla. 32785
Filed Nov. 28, 1975, Ser. No. 636,215
Int. Cl.² B63H *16/08;* **A63C** *15/04*
U.S. Cl. 9—310 D **5 Claims**



1. Apparatus for walking on water comprising in combination:
- a pair of elongated buoyant pontoons;
- a boot in each of said pontoons for receiving and supporting the foot of a person;
- a paddle element mounted at the bottom and extending transversely of said pontoons, said paddle element being pivotable by water pressure between a substantially vertical position and a rearward substantially horizontal position;
- transverse stabilizer means including a pair of elongated members secured to the upper surface of each of said pontoons, each of said elongated members having a pair of longitudinally spaced slots, bolt means being secured to each of said pontoons and extending upwardly through the respective slots to pivotally and slidably connect each of said elongated members to said pontoons whereby said pontoons are interconnected so as to be movable longitudinally and laterally relative to each other;
- and balancing means for the user of the apparatus.

4,034,431
METHOD FOR MANUFACTURING A FOOTWEAR

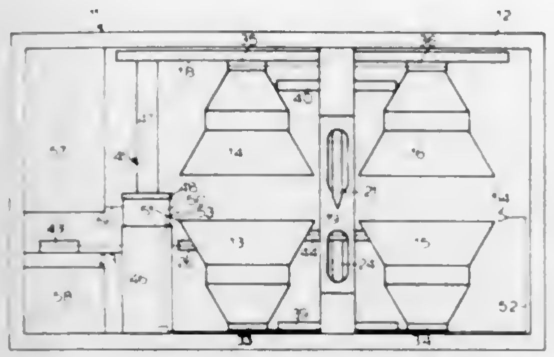
Tatsuo Fukuoka, 3, 3-Ban, 2-Chome, Shin-Minami-Fukushima, Tokushima, Japan
Continuation-in-part of Ser. No. 511,243, Oct. 2, 1974, Pat. No. 3,952,358, which is a continuation-in-part of Ser. No. 402,967, Oct. 3, 1973, abandoned. This application Nov. 5, 1975, Ser. No. 629,116
Int. Cl.² A43D *9/00;* **A43B** *3/14*
U.S. Cl. 12—142 MC **6 Claims**



1. In a method for manufacturing a shoe, the improvement comprising injection molding a three-dimensional lateral side section from molten resinous material in a cavity of a molding machine, injection molding a sole from molten resinous material in the molding machine integrally together with said molded lateral side section, and connecting an upper section to said lateral side section.

4,034,432
SPECTACLE CLEANING APPARATUS

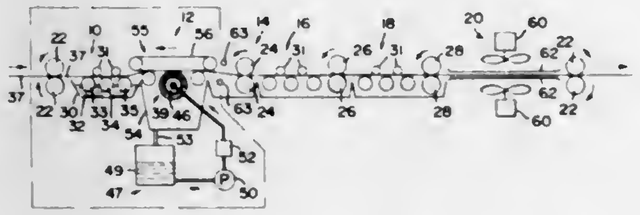
James M. Sullivan, 1424 Sampson, Butte, Mont. 59701
Filed June 8, 1976, Ser. No. 693,935
Int. Cl.² A46B *13/02*
U.S. Cl. 15—21 C **10 Claims**



1. Spectacle cleaning apparatus including resilient nose piece supporting means, the two pairs of cooperating opposed rotatable brushing means located on either side of said nose piece supporting means, positioning means for changing the spacing between respective brushing means of each pair, drive means for rotating each brushing means, connecting means operatively connecting said drive means with said resilient nose piece supporting means to continously change the position of said supporting means as said brushing means are rotated, and holding means to maintain the nose piece of spectacles against said supporting means as the position of said supporting means changes.

4,034,433
WASH-OFF PROCESSOR

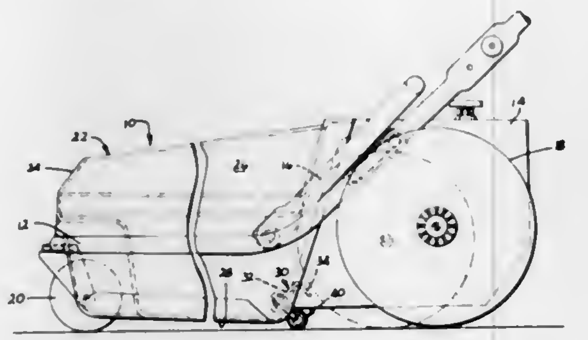
Thomas W. Slingsby, Old Saybrook, Conn., assignor to Richmond Graphic Systems, Inc., Providence, R.I. and Andograin-Kulka, B. V., Netherlands
Filed Mar. 10, 1975, Ser. No. 556,895
Int. Cl.² G03D *5/06*
U.S. Cl. 15—77 **15 Claims**



1. A processor for photographic plates of the type incorporating a wash-off facility, said processor comprising: a housing, transporting means movably connected to said housing and disposed to at least partially define a path of travel of the plates through said housing, drive means movably connected to said transporter means in driving relation thereto, whereby said transporting means operates at a preselected speed to transport the plates through said housing; a developer station disposed in fluid communication with said path of travel; at least one scrub station comprising a scrub element rotatably mounted within said housing in plate engaging relation to said path of travel, said scrub element comprising a substantially open configuration at least partially defining a path of fluid flow through said scrub element, fluid delivery means including nozzle means mounted on the interior of said scrub element and disposed to direct fluid therefrom along said path of fluid flow into said path of travel of the plate, scrub backup means including a flexible element movably mounted within said housing and extending along the length of said path of travel defined by the area of contact of said scrub element and the plate and further disposed both upstream and downstream of said scrub element, said scrub element and said flexible element disposed in cooperative relation to one another on opposite sides of said path of travel and plates passing therealong; both said flexible backup element and said scrub element connected to said drive means, said flexible backup element comprising a continuous belt connected in driven relation to said driving means and traveling at a peripheral speed less than that of said scrub element, said scrub element and said flexible backup means disposed to engage oppositely disposed surfaces of a plate traveling along said path of travel; said scrub element positioned relative to said path of travel so as to direct waste particles from the plate away from said path of travel, whereby the scrub element provides a scrubbing action to the preselected surface of the plate passing along said path of travel.

4,034,434
SWEEPER DUST SEAL

Thomas S. Block, Muskegon, Mich., assignor to Clarke-Gravely Corporation, Muskegon, Mich.
Filed Feb. 4, 1976, Ser. No. 655,059
Int. Cl.² E01H *1/04*
U.S. Cl. 15—79 R **5 Claims**



1. A roller-type dust seal for use with a sweeper having a generally horizontally positioned, open ended dust bin, said seal comprising:

an axle having an elongated base positioned adjacent the inlet of the dust bin;

means for attaching said axle to said dust bin and for permitting movement of said elongated base in a generally vertical direction; and

a plurality of roller segments concentric with said elongated base, said roller segments each having a generally hollow, cylindrical shape and an inner diameter greater than the diameter of said elongated base, said rollers further having a relatively hard inner peripheral surface and a relatively soft outer peripheral surface whereby said roller segments are free to move radially of said axle and said elongated base of said axle is free floating and may also move in a vertical direction, said axle being generally U-shaped having legs extending generally perpendicular from the ends of said elongated base, said base and said legs being in substantially the same plane, the plane of said axle being positioned at an acute angle from the horizontal plane of said dust bin and said elongated base trailing said dust bin in the direction of travel of said sweeper.

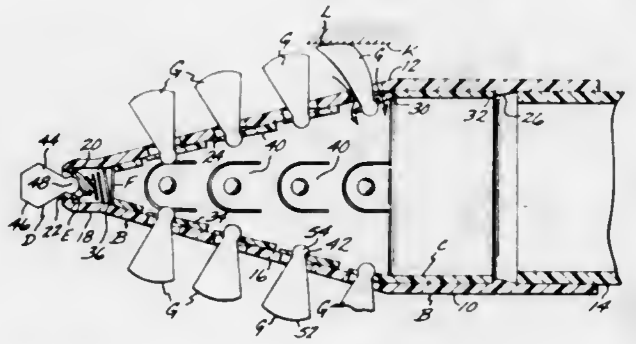
4,034,435
VACUUM CLEANER ACCESSORY

Jeannette Grabathy, 12151 Salerno St., Garden Grove, Calif. 92846
Filed June 21, 1976, Ser. No. 698,267
Int. Cl.² A47L *9/06*
U.S. Cl. 15—398 **2 Claims**

1. In combination with a power driven vacuum cleaner having a flexible hose extending therefrom that has a first free end and in which hose a negative pressure is maintained, a combined dirt and dust loosening and retrieving device removably mounted on said free end of said hose, said device including:

a. a first housing that includes a first cylindrical shell having first and second ends, said first end developing into a first conical shell that has an apex in which a first port is defined, said first conical shell having a plurality of circumferentially and longitudinally spaced second ports therein, said first cylindrical shell having a transverse circumferential resilient rib extending inwardly from the interior surface thereof, and said rib situated intermediate said first and second ends of said first cylindrical shell;

b. a second housing molded from a resilient polymerized resin, said second housing including a second cylindrical shell that has first and second ends, said first end of said second shell developing into a second conical shell that has a truncated apex portion, said second conical shell having a plurality of circumferentially and longitudinally spaced U-shaped slits formed therein that define resilient tabs within the confines thereof, said tabs of greater area than that of said second ports, said second housing of such dimensions as to fit snugly within said first housing and being held in a fixed position therein by said rib engaging said first end of said second cylindrical shell, and said tabs being radially aligned with said second ports in said first conical shell and sealing said second ports when said tabs are in first positions;



c. a spring loaded sealing member disposed between the apex portions of said first and second conical shells, said sealing member at all times tending to assume a first position where it seals said first port in said first conical shell;

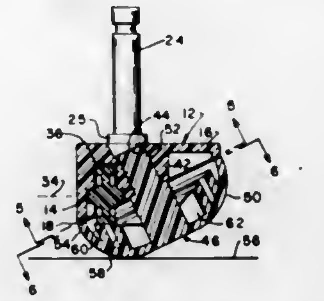
d. a first brush secured to said sealing member which first brush extends outwardly through said first port; and

e. a plurality of second brushes secured to said tabs and extending outwardly through said second ports, said first and second brushes sufficiently stiff as to move said spring loaded sealing member and said tabs with which they are associated to second positions when said first and second brushes are brought into pressure rubbing contact with a surface on which dust or dirt may exist, said rubbing contact tending to loosen said dust or dirt, and said sealing member and tabs when in said second positions allowing streams of velocity air to flow from the ambient atmosphere into the interior of said second housing, and said streams of air carrying said dust or dirt that has been loosened into the interior of said second housing for subsequent transfer through said hose to said vacuum cleaner.

4,034,436
CASTOR ASSEMBLY

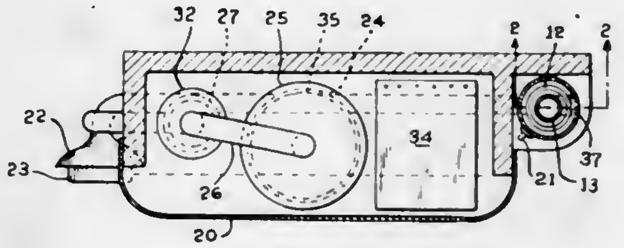
Daniel L. Ginder, 24 Arbutus Court, Walnut Creek, Calif. 94595
Filed Sept. 26, 1975, Ser. No. 617,044
Int. Cl.² B60B *33/00*
U.S. Cl. 16—18 A **5 Claims**

1. A castor assembly for supporting a frame or other structure for movement over a floor or other surface, comprising the combination of a bearing block mountable on the frame or other structure for rotation about a vertical axis, a castor roller mounted on the bearing block for rotation about a horizontal axis which is laterally spaced from the vertical axis, a self-laying track member having an outer surface which contacts the floor or other surface, said track member being mounted on the bearing block for rotation about an inclined axis lying in a plane passing through said horizontal axis, said inclined axis extending downwardly at an angle θ in the range of 22½° to 25° from a vertical direction, said track member having means forming an inner circular track concentric with the inclined axis and in rotatable contact against the castor roller.



4,034,437
PRESSURE-FREE FAIL-SAFE EMERGENCY DOOR CLOSER

Lyman H. Robertson, 3099 Peachtree Drive NE., Atlanta, Ga. 30305, and John D. White, 2015 Deren Way NE., Atlanta, Ga. 30345
Filed Sept. 19, 1975, Ser. No. 614,864
Int. Cl.² E05F *15/20*
U.S. Cl. 16—48.5 **3 Claims**

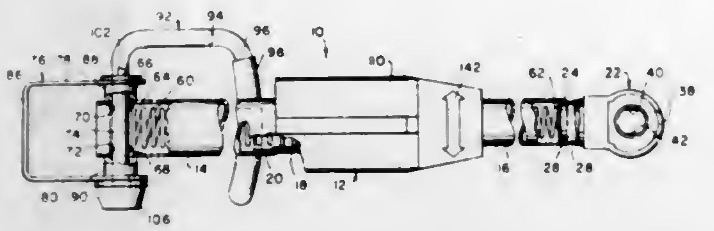


2. A door closer for closing a door on signal from a sensor circuit comprising, in combination: a frame; a shaft rotatably mounted on said frame; a closer arm one end of which is rigidly attached to the end of said shaft, the axes of said shaft and said closer arm being at nominal right angles to one another, and the opposite end of which is adapted to engage a door, said closer arm being biased to urge the door closed; a pin adapted to retain or release said closer arm slideably mounted in said frame; an electromagnet whose armature is mechanically linked to said pin; and a compressible coil spring mechanically linked to said pin and to said armature and whose force is opposed to the force of said electromagnet whereby the force of the electromagnet is superior and opposed to the force of the coil spring when energized and when de-energized the force of said coil spring is sufficient to cause the pin to move in an upward direction freeing the closer arm; an electrical power source and electrical circuitry connecting the coil of the electromagnet to the electrical power source; switching means within the electrical circuitry to receive a sensor signal and interrupt the electrical current to the coil on signal; a time delay device incorporated in said electrical circuitry for protection against instantaneous power interruptions; and means for resetting said door closer.

4,034,438
CLOSURE COUNTER-BALANCE

Louis R. Csokasy, Bristol, Ind., and Neil E. Robb, Jackson, Mich., assignors to Excel Industries, Incorporated, Elkhart, Ind.

Filed Oct. 17, 1975, Ser. No. 623,369
Int. Cl.^{2} E05F *5/06*
U.S. Cl. 16—85 **4 Claims**



1. A counter-balance for a movable closure on a structure comprising an outer tubular member and an inner tubular member, said tubular members being telescopingly connected together in sliding relationship, each of said tubular members having abutment structure at the outer end thereof, a compression coil spring within said members, the ends of said spring pressing against said abutment structures thereby urging said tubular members apart, said outer tubular member having a locking mechanism on the inner end thereof, said locking mechanism including structure to frictionally engage the inner tubular members to frictionally lock said members together, said locking mechanism including an inner hollow cylindrical element and an outer hollow cylindrical element, said inner hollow cylindrical element being secured on the inner end of said tubular member, a portion of said inner hollow cylindrical element extending beyond the inner end of said outer tubular member over the inner tubular member, said extending portion comprising a plurality of circumferentially spaced apart fingers, said outer hollow cylindrical element being received on said inner hollow cylindrical element, said outer hollow cylindrical element having an interior surface portion tapered radially inwardly, said tapered portion terminating in a section which has a diameter less than the outer diameter defined by said fingers whereby passage of said outer hollow cylindrical element onto said inner hollow cylindrical element eventually results in deflection of said fingers into frictional engagement with said inner tubular member as a consequence of contact of the fingers with said tapered interior surface portion of the outer hollow cylindrical element, said fingers being tapered radially inwardly from the outer surface of the bases thereof to the tips thereof at a slightly different angle than the taper of the tapered interior surface of the outer hollow cylindrical element to thereby result in a wedging action therewith.

4,034,439
TRAVERSE ROD FOR DECORATIONS, IN PARTICULAR FOR CURTAINS

Franz Köhne, 4 Bahnhofstrasse, Fleckenberg, Sauerland, Germany (5944)

Filed Dec. 10, 1975, Ser. No. 639,233
Claims priority, application Germany, Apr. 16, 1975, 2516645
Int. Cl.^{2} A47H *1/04*
U.S. Cl. 16—96 R **5 Claims**

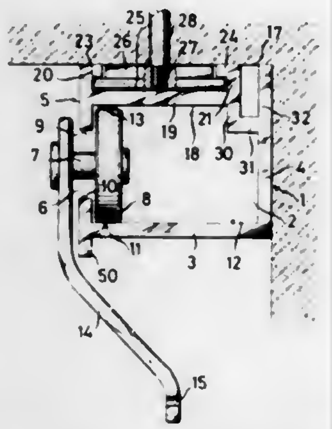
1. A traverse rod mountable on a building element by a variety of different types of mounting means for receiving hanger means for decorations, in particular, curtains, said hanger means being movable along said traverse rod for moving said decorations with respect to said building element, said traverse rod being suitable for use with a variety of different types of hanger means and in a variety of positions, said rod comprising:

a plurality of elongated walls joined to form a generally box-like hollow cross section for the rod having an axis of elongation normal to the cross section, said rod being orientable about the axis of elongation in a variety of positions with respect to the building element;

a first of said walls having an elongated opening (6) therein for receiving and movably retaining a variety of different types of hanger means for hanging the decorations;

a second of said walls (4) opposite said first wall having a portion (32) contiguous in a direction normal to the axis of elongation; and

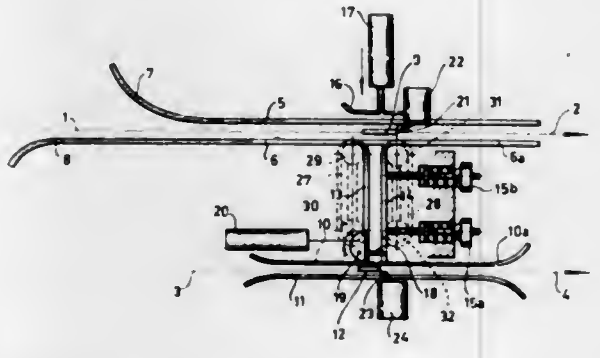
a third of said walls (18) adjacent said first wall having a pair of outwardly extending arms (20,21), a lip on each of said arms extending toward each other for forming a C-shaped recess (16) opening on the exterior of said third wall suitable for receiving a variety of different types of types of mounting means and hanger means, and for movably retaining the latter, one of said arms (21) being parallel to, but spaced from, said portion (32) and forming with said portion (32) a second recess (17) opening on the exterior of said third wall adjacent to said C-shaped recess, a web (31) lying within the hollow box-like hollow cross section of said rod and parallel to said third wall (18) for coaction with said one arm (21) and said third wall portion (32) for closing the bottom of said second recess (17) within said box-like hollow cross section, said second recess being suitable for receiving a mounting means for said rod.



4,034,440
DEVICE FOR TRANSFERRING SLAUGHTERED POULTRY

Martinus Petrus Gerardus van Mil, Boxmeer, Netherlands, assignor to Stork Brabant B. V., Boxmeer, Netherlands

Filed Sept. 8, 1975, Ser. No. 611,491
Claims priority, application Netherlands, Sept. 10, 1974, 7412044
Int. Cl.^{2} A22C *21/00*
U.S. Cl. 17—24 **8 Claims**

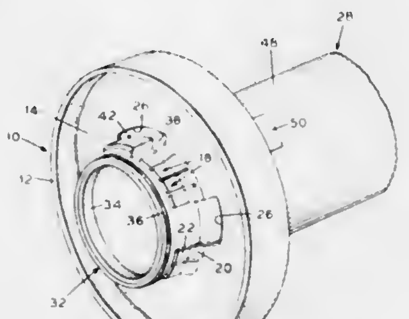


1. A device for transferring slaughtered poultry hanging by its legs on a shackle moving along one conveyor to a shackle advancing along another conveyor, comprising a first conveyor track having a plurality of first shackles moving therealong with slaughtered poultry suspended by their legs from said first shackles, first means along a portion of said first conveyor track for guiding said first shackles therealong, a second conveyor track having a plurality of second shackles moving therealong, second means along a portion of said second conveyor track for guiding said second shackles therealong, a transfer guide between said first and second guide means to receive the legs of slaughtered poultry, said transfer guide having a first end adjacent said first conveyor track such that the legs of poultry can be moved from a first shackle to said transfer guide, said transfer guide having a second end adjacent said second conveyor track, means for detecting the presence of a second shackle on said conveyor track in the vicinity of said transfer guide second end, and means at said transfer guide second end responsive to said detecting means for stopping the legs of poultry moving thereon and means for ejecting poultry from said transfer guide to a second shackle on said second conveyor track such that poultry is released from said stop means and pressed by said ejecting means from said transfer guide to a second shackle on said second conveyor track.

4,034,441
PRESIZING DISC WITH SELF-LOCKING MEANS

Vytautas Kupcikevicius, Chicago, and Anton Leroy Mika, Downers Grove, both of Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,275
Int. Cl.^{2} A22C *13/00*
U.S. Cl. 17—41 **21 Claims**

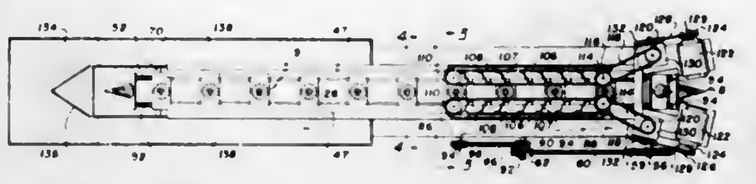


1. An improvement in a presizing disc for a shirred tubular casing length utilized in a stuffing apparatus, wherein said presizing disc is confined within an unshirred portion of said tubular casing length and is adapted to be mounted on a support sleeve of a stuffing horn assembly of a stuffing apparatus, said support sleeve having a first barrier and a second barrier and an annular groove disposed adjacent said first barrier, and wherein said presizing disc includes an annular casing length contacting portion and a wall support which is integrally associated with said contacting portion and extends inwardly therefrom to a terminal end portion of said wall support to thereby define an annulus adapted to mount said presizing disc onto said support sleeve, the improvement comprising self-locking means disposed on said terminal end portion of said wall support, said self-locking means including a resilient member integrally associated with said terminal end portion which is adapted to be urged outwardly away from the central axis of said presizing disc upon being advanced over said first barrier of said support sleeve and to resume its original configuration when confined in self-locking engagement on said sleeve in said annular groove disposed adjacent said first barrier, and being further adapted to be permanently deformed in a manner such as to clear said first barrier upon removal of said disc from said support sleeve.

4,034,442
APPARATUS FOR CLEANING FISH COLLARS

Gilbert Alexander MacKenzie, Vancouver, Canada, assignor to The Canadian Fishing Company Limited, Vancouver, Canada

Filed Mar. 1, 1976, Ser. No. 662,582
Int. Cl.^{2} A22C *25/00*
U.S. Cl. 17—55 **15 Claims**



1. An apparatus for cleaning fish collars, the apparatus comprising:

a plurality of holders, each dimensioned to receive a fish collar;

at least one blade on the exterior of each holder;

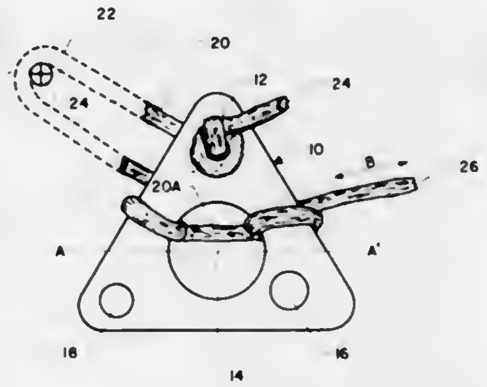
means to move the holders along a pathway; and

means to effect relative rotation of the collars and the blade, along at least a part of the pathway whereby the blade can clean the received collar.

4,034,443
KNOT-TYING DEVICE

Roland P. Turner, 3224 Harding St., Hollywood, Fla. 33021

Continuation of Ser. No. 288,510, Sept. 13, 1972, abandoned.
This application May 28, 1974, Ser. No. 473,696
Int. Cl.^{2} F16G *11/14*
U.S. Cl. 24—129 R **3 Claims**



1. A device in combination with a flexible line for securing a loop in one free end of said flexible line, said combination comprising:

a body member, said body member having a means for attaching the free end of said flexible line to said body member and said body member having a loop receiving aperture and at least two peripheral surface portions, each peripheral surface portion being disposed on opposite sides of said loop receiving aperture, said two peripheral surface portions being angularly disposed relative to each other such that relative to the means for attaching said line to said body on an axis towards said loop receiving aperture said peripheral side surface portions have an angular relative position which diverges away from when taken with said means for attaching said free end of said line to said body member; and

a flexible line having its free end connected to said means for attaching said free end of said line to said body portion and an intermediate segment of said flexible line having a loop portion received through said loop receiving aperture and connected back between said divergent peripheral surface portions such as to be looped about each peripheral surface portion, whereby a loop in said flexible line is secured between said free end connected to said body member and said intermediate line segment connected to said angularly diverging peripheral surface portions.

4,034,444

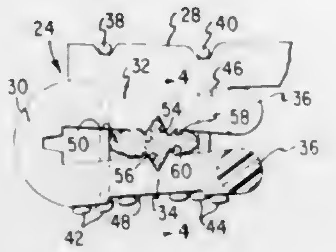
SLIDE FASTENER STRINGER

George B. Moertel, Crawford, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Jan. 9, 1975, Ser. No. 539,644

Int. Cl.² A44B *19/10, 19/40*

U.S. Cl. 24—205.1 C **11 Claims**



1. A stringer for a slide fastener comprising
a tape-like attachment portion,
a coupling element disposed along one edge of the attachment portion and being formed from a continuous filament into successive coupling sections;
said filament having a cross section with a curved outer boundary forming a curved outer surface on the filament;
each section having a head portion, a pair of leg portions extending from opposite sides of the head portion, and a connecting portion interconnecting to a leg portion of an adjoining section;
thread means securing each section to the attachment portion;
an elongated member extending in spaced relation to the connecting portion longitudinally throughout the length of the coupling element transversely between the pair of leg portions of each section and maintaining the pair of leg portions of each section in spaced relationship;
said pair of leg portions of each section being biased in gripping relationship against the elongated member;
sharp edge means formed in the curved surface on at least one of the pair of leg portions of each section and engaging the elongated member both longitudinally and transversely for restraining both longitudinal and transverse movement of the one leg portion of each section relative to the elongated member; and
further said pair of leg portions of each section having respective segments between the sharp edge means and the connecting portions free of any restraint relative to each other.

4,034,445

MOLDED TOP STOP AND APPARATUS AND METHOD OF MANUFACTURE

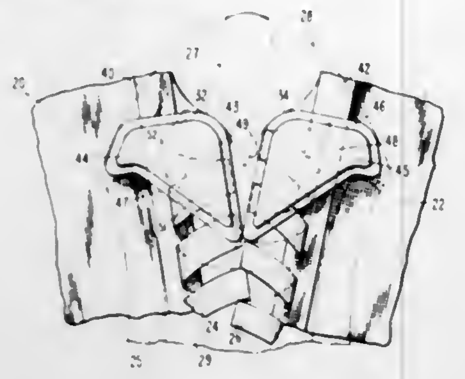
Milton Lewis Stephens, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed July 28, 1975, Ser. No. 599,516

Int. Cl.² A44B *19/36*

U.S. Cl. 24—205.11 F **5 Claims**

1. A pair of top stops for a slide fastener which has a pair of carrier tapes, interlocking fastening elements secured to inner edges of the tapes, and a slider with flanges and a divider forming a Y-shaped channel for opening and closing the interlocking fastening elements, each top stop comprising
a body molded around the exposed head portion of at least one end fastening element on each respective tape and molded to one side of a portion of the respective tape,
said body having a flange engaging portion extending over the respective tape in the path of movement of a respective one of the flanges and having an acute-angled bottom portion bounded by respective first and second substantially straight edges of the body,
said first edge extending substantially in alignment with the inner edges of the head portions of the fastening elements on the respective tape, and



said second edge extending from the bottom end of the body at an acute angle away from the first edge over the respective fastening elements and inner edge of the respective tape to the flange engaging portion such as to allow the bottom portion of the body to extend into the Y-shaped channel when the slide fastener is closed.

4,034,446

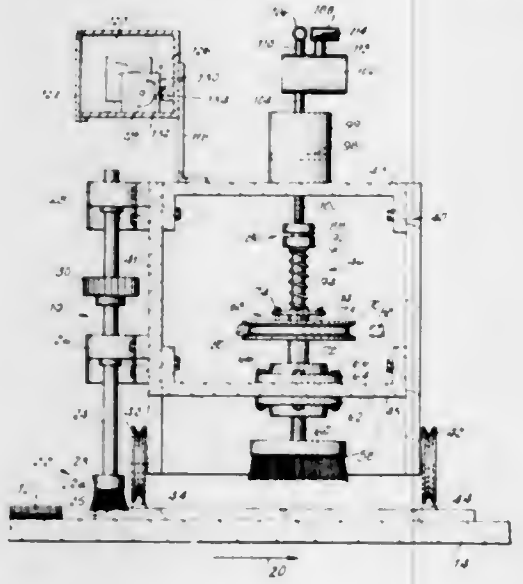
DOUBLE-TIERED SWIRLING MACHINE FOR PILE FABRIC

Nathan Rubaschek, Brooklyn, and Henry Rubinstein, Sunnyside, both of N.Y., assignors to Paris Processing Corporation and New York Blending Corporation, both of New York, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,105

Int. Cl.² D06C *23/02*

U.S. Cl. 26—2 R **8 Claims**



1. Apparatus for imparting a design to the surface of pile fabric comprising
a. a fabric platform adapted to receive pile fabric traveling through said apparatus in a first direction,
b. a frame adapted to move reciprocally between two positions in a second direction transverse to said first direction of movement of said traveling pile fabric,
c. a first tier of rotatable brushes disposed on said frame for continuous contact with the surface of said traveling pile fabric to impart a first pattern to said traveling pile fabric,
d. a second tier of rotatable brushes disposed on said frame for discontinuous contact with the surface of said traveling pile fabric to superimpose a second pattern on said traveling pile fabric, said second pattern being visually discernible from said first pattern,
e. means for reciprocating said frame and the first and second tiers of rotatable brushes disposed on the frame as a unit between said two positions,
f. drive means for imparting rotational motion to said first and second tiers of rotatable brushes,
g. means for causing selected brushes of said second tier of rotatable brushes to engage said traveling pile fabric, and
h. programming means for selective activation of said engaging means, as the pile fabric is traveling through the apparatus.

4,034,447

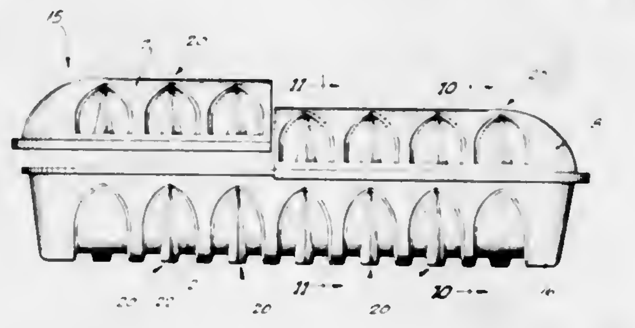
PAPIER-MACHE COFFIN

Harry Kollmann, Calgary, Canada, and Roland H. Goetsch, Wauwatosa, Wis., assignors to Idra AG, Switzerland

Filed Oct. 2, 1975, Ser. No. 618,753

Int. Cl.² A61G *17/00*

U.S. Cl. 27—2 **4 Claims**



1. A coffin for receiving the remains of a deceased humam; comprising a body molded in one piece of papier-mache to form a unitary structure having an open top; a cover molded of papier-mache to cover the opening for completely enclosing the remains within the coffin; a flange molded into the edge of said body which edge defines the open top of said body; and a complemenary flange molded into said cover for engagement with said flange on said body when said cover is closing the open top of said body, and the walls of said body and said cover progressively increase in thickness toward their respective flanges to cooperate with the flanges for strengthening the structure.

4,034,448

METHOD FOR MASS-PRODUCING BULB SOCKETS FOR MINIATURE LAMPS IN SERIES ON A SINGLE CABLE FLEXIBLE ELECTRIC CORD

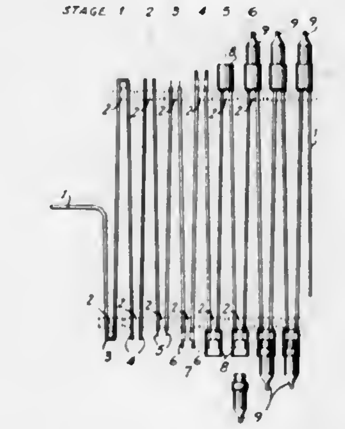
Dino Magherini, Via Osservatorio 36, Florence, Italy

Continuation of Ser. No. 531,818, Dec. 11, 1974, abandoned. This application Sept. 28, 1976, Ser. No. 727,522

Claims priority, application Italy, Dec. 12, 1973, 9718/73

Int. Cl.² H01J *9/18*

U.S. Cl. 29—25.16 **5 Claims**



1. A method for mass producing bulb sockets for plug-in miniature lights directly on a single-line, flexible electric cable having alternating turns, said method comprising the operational steps of: successively and intermittently passing the cable through a plurality of operational stages including cutting the cable at the turns in a first of the operational stages, thereby leaving two adjacent unconnected ends at each turn, baring the cable at the adjacent ends in a second operational stage, clinching two blade-like contact members on the bared ends in a third operational stage, injection molding plug-in miniature-lamp type sockets on the wire around the contact members in a fourth operational stage, and inserting a plug-in miniature lamp in ech of the sockets in a fifth operational stage, the injection molding of the sockets on the cable being effected in movable molds, effecting the operational steps in the stages simultaneously, thereby continuously producing a completed cable, placing a mold for said injection molding step in front of discrete portions of the cable, using each mold once for each intermittent operation of the operational stages, thereby enabling the molds to remain closed after said molding step for the time it takes the sockets to cool.

4,034,449

DEVICE FOR CRIMPING AND SHEARING CONTACTS FROM CONTACT STRIPS

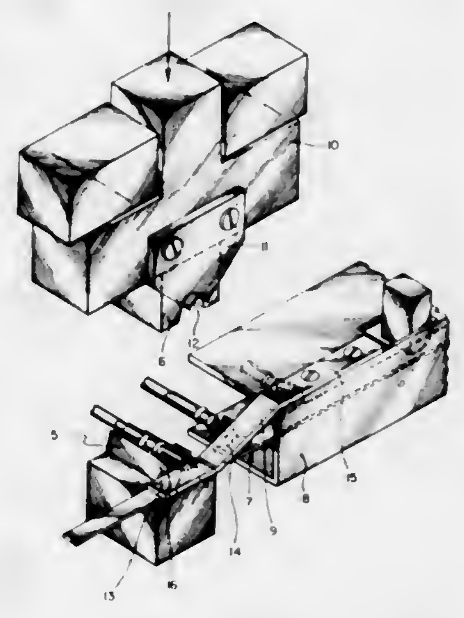
Alois Ruppert Resch, Heilbronn, Germany, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Apr. 12, 1976, Ser. No. 676,304

Claims priority, application Germany, Apr. 15, 1975, 2516450

Int. Cl.² H01R *11/08*

U.S. Cl. 29—33 M **5 Claims**



1. A device for crimping successive contacts of a contact strip about individual conductors and for shearing the contacts from a contact strip, said contact strip being of the type wherein a series of spaced contacts are joined to a common contact carrier strip, said device comprising:
a stationary crimping jaw for supporting a contact to be crimped;
a movable crimping jaw movable into a cooperating crimping relationship with said stationary crimping jaw for crimping a contact about a conductor; and
a shearing member for cutting the junction between a contact resting on and supported by said stationary crimping jaw and the carrier strip interconnecting successive contacts; said shearing member comprising a resilient leaf spring having a portion thereof disposed below the uppermost portion of said conductor and above said contact strip and resting flat against the carrier strip portion of said contact strip, said leaf spring projecting laterally beyond said stationary crimping jaw, and having an extending edge spaced apart from an adjacent cooperating edge of said stationary crimping jaw, and said leaf spring being adapted to be moved through a shearing stroke relative to said stationary jaw.

4,034,450

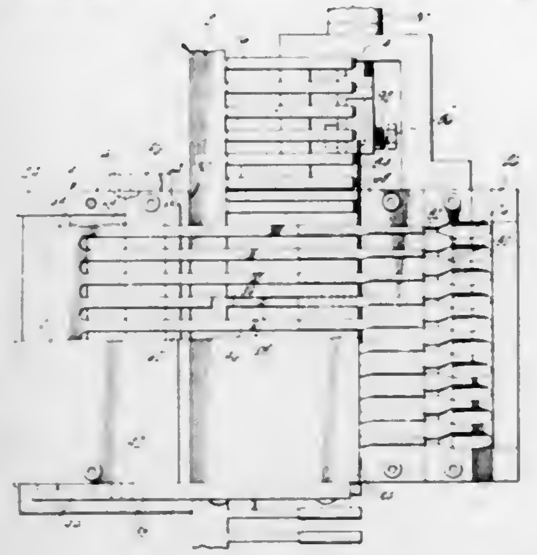
MARKER SLEEVE INSTALLATION

William Dominac Carlomagno, Redwood City, and Stephen Hunter Diaz, Los Altos, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed May 15, 1975, Ser. No. 577,731

Int. Cl.² B23P *19/00*

U.S. Cl. 29—33 E **8 Claims**



1. An apparatus for the facile installation of non-cylindrical sleeves on wire-like members, the sleeves being tightly and slidably arranged on non-cylindrical fingers extending from a carrier belt, the apparatus comprising

a base including a guideway for receiving the carrier belt and finger guideways for receiving fingers of the carrier belt with the sleeves arranged thereon;

stripper means for slidably forcing sleeves from the carrier belt fingers, said stripper means being slidably mounted on said base and including tines positioned to slide along each side of the carrier belt fingers in said finger guideways; and

a die fixed to said base and positioned to receive sleeves as they are stripped from the fingers, said die including a plurality of die passageways having sidewalls that narrow from a first width that accommodates the non-cylindrical sleeve dimension to a smaller second width to force the sleeves into a substantially cylindrical configuration when the sleeves are pressed into the die passageways by the stripper means.

4,034,451

TURNING TOOL WITH A CUTTING TIP

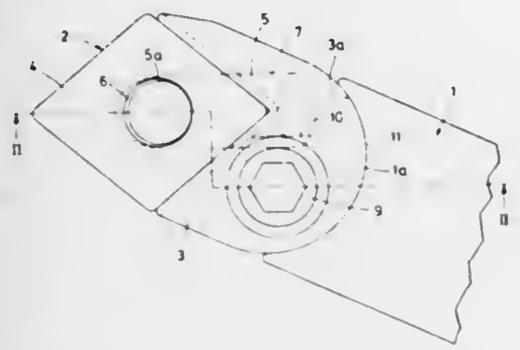
Pierre Kummer, 2720 Tramelan, Switzerland

Continuation of Ser. No. 491,507, July 24, 1974, abandoned. This application Jan. 2, 1976, Ser. No. 646,233

Claims priority, application Switzerland, July 31, 1973, 11183/73

Int. Cl.² B26D *1/00*

U.S. Cl. 29—96 **8 Claims**



1. A turning tool having an integrally bonded tool body, said tool body comprising a shank having a concave cylindrical end face extending over an arc of not more than 180° whose radius is substantially equal to one-half the width of the shank and whose height is equal to the height of the shank, a cutting tip-holding head having a convex cylindrical rear end face of the same radius as said concave face, and having a width equal to twice said radius and a height equal to the height of said convex surface, and a bonding material which integrally connects said convex end face to said concave end face to form an integral tool body, the only contact between the head and the shank being at said bonded end faces.

4. A method of manufacturing an assortment of turning tools each comprising a tool body for holding a cutting tip, comprising the steps of prefabricating a plurality of identical shanks, each having a concave cylindrical end face extending over an arc of not more than 180° whose radius is substantially equal to one-half the width of the shank and whose height is equal to the height of the shank, prefabricating a plurality of identical cutting tip-holding heads, each having a convex cylindrical rear end face of the same radius as said concave face, and each head having a width equal to twice said radius and a height equal to the height of said convex surface, and integrally bonding the convex end face of each head in the concave end face of one of said shanks, the only contact between the head and the shank being at said bonded end faces, and the heads being set in a variety of positions angularly displaced from one another.

4,034,452

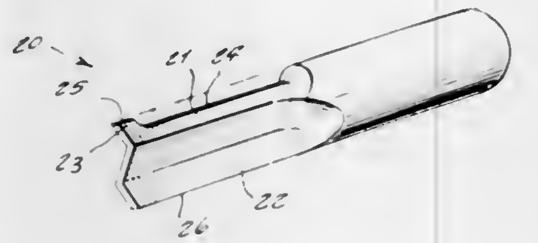
ROUTER BIT

J. Walter Edming, S. End Edming Road, P.O. Box 83, Glen Flora, Wis. 54526

Filed Apr. 12, 1976, Ser. No. 676,330

Int. Cl.² B26D *1/12*

U.S. Cl. 29—103 A **10 Claims**



1. A router bit for use in a routing machine to route a work piece comprising;

a. an elongated straight shank having one end adapted to fit into a chuck of said machine;

b. a routing head integral with and at the other end of said shank having one conventional flute and an opposing shorter flute of length less than the radius of said conventional flute; and

c. a tip portion extending from said opposing flute extending radially outward from said shorter flute equal to the radius of said shank whereby said router bit permits routed chips to fall readily through said workpiece while making a smooth cut, requiring minimal effort in routing in addition to reduced friction, heat, and back pressure in said router bit attempting to overcome compaction of said material resulting in said router bit maintaining its sharpness.

4,034,453

METHOD OF MANUFACTURING LOUVER FINS FOR USE IN HEAT EXCHANGER

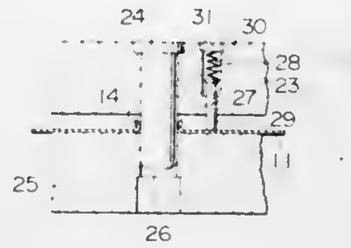
Syuuji Tomita; Yosihiro Miura, and Akito Kubota, all of Tochigi, Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,151

Claims priority, application Japan, Aug. 29, 1975, 50-103975

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 C **1 Claim**



1. In a method for producing louver fins for use in a heat exchanger, comprising the steps of forming in a sheet of thin fin blank a plurality of cylindrical collar portions in each of which a heat conductive tube is inserted, forming a plurality of bridge-shaped protruded louvers in parallel with the rows of cylindrical collar portions, and cutting the blank into a multiplicity of rows with a predetermined width, the improvement comprising the step of inserting a pilot pin in one of the cylindrical collars between the step of forming the louvers and the step of cutting the blank, whereby a transverse width of the louver fin to be cut is predetermined correctly.

4,034,454

COMPOSITE FOIL PREFORM FOR HIGH TEMPERATURE BRAZING

Francis S. Galasso, Manchester; Eugene J. Delgrosso, Wallingford, and Urban E. Kuntz, East Hartford, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Feb. 13, 1975, Ser. No. 549,846

Int. Cl.² B23K *35/30*

U.S. Cl. 428—576 **2 Claims**

1. A high temperature braze preform suitable for use in bonding together titanium, zirconium or alloys thereof comprising:

a composite foil comprising a central Ti-Zr sheet coated on both sides with nickel, the total foil composition consisting essentially of, by weight, 30.75 to 48.75 percent titanium, 30.75 to 48.75 percent zirconium and 2.5 to 38.5 percent nickel.

4,034,455

DEVICE FOR ASSEMBLING SLOTLESS STATOR OF ELECTRICAL MACHINE

Mikhail Alexandrovich Arakelov, ulitsa Oktyabrskaya, 303; Eduard Galaktionovich Gersamia, ulitsa Oktyabrskaya, 34, kv. 14; Tengiz Grigorievich Zedgenidze, prospekt I.Chavchavadze, 76, and Gennady Pavlovich Nozadze, ulitsa Lenina, 76, all of Tbilisi, U.S.S.R.

Continuation of Ser. No. 573,862, May 2, 1975, abandoned, which is a division of Ser. No. 445,998, Feb. 26, 1974, Pat. No. 3,892,034. This application Dec. 19, 1975, Ser. No. 642,246

Int. Cl.² H02K *15/06*

U.S. Cl. 29—736 **19 Claims**

1. A device for assembling a slotless stator of an electrical machine with an active distributed layer having coil groups cemented to a stator yoke, comprising:

a bed frame;

an assembling template having means for providing thereon an active distributed layer of a slotless stator of an electrical machine being assembled;

means for establishing a stationary magnetic field to magnetize said assembling template;

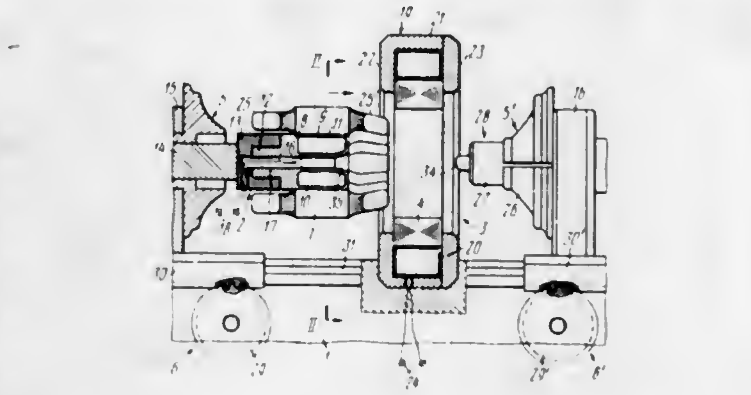
said assembling template including means for fixing thereon coil groups in given relative positions by said stationary magnetic field;

said means for establishing the stationary magnetic field to magnetize said magnetic template, comprising magnetizing windings of the assembling template, accommodated in said assembling template;

a base for said assembling template movably mounted on said bed frame;

a holder for the yoke, stationarily mounted on said bed frame, coaxially with said assembling template;

means for establishing a stationary magnetic field to magnetize the yoke of the slotless stator being assembled;



said means for establishing the stationary magnetic field to magnetize said yoke, comprising a magnetizing winding of the yoke holder;

said magnetizing winding of the yoke holder comprising an opening having a contour corresponding to an outer contour of said yoke of the slotless stator being assembled so that said yoke can be accomodated in said opening of said magnetizing winding of the yoke;

means for forming head portions of said coil groups by bending off and pressing around said head portions,

said means for forming the head portions of said coil groups, comprising two punches disposed at different sides of said yoke holder, coaxially, therewith and being coaxially reciprocal in relation to said yoke holder; and

a drive for providing movement and forces for assembling the slotless stator.

4,034,456

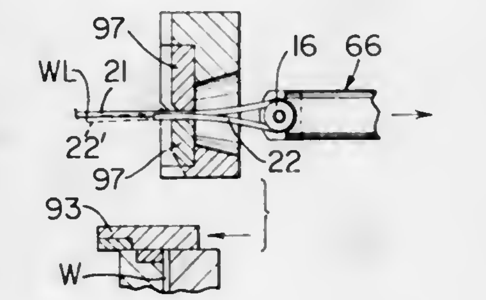
MACHINE FOR PROVIDING BALL ENDS ON MUSICAL INSTRUMENT STRINGS

Robert H. Bowers, 2010 Douglas Ave., Kalamazoo, Mich. 49006

Filed Dec. 11, 1975, Ser. No. 639,799

Int. Cl.² B23P *19/04*

U.S. Cl. 29—788 **27 Claims**



1. A ball-ender apparatus for securing an annular ball to a wire musical instrument string, comprising:

a frame;

ball support means supported for rotation and reciprocation between front and rear positions with respect to said frame;

ball feed means fixed with respect to said frame and carrying a column of balls above the front position of said ball support means for dropping a said ball on the ball support means;

wire feed means positioned with respect to said frame for feeding a wire partially past said ball on said ball support means and means adjustably responsive to said feeding for determining the length of wire fed;

twist means engaging said ball support means for securing said ball in a loop of the fed wire length by selectably forming at least the first of first and second twist systems in the fed wire length at the ball;

means positioned with respect to said ball support means and wire feed means for ejecting the interconnected ball and wire length.

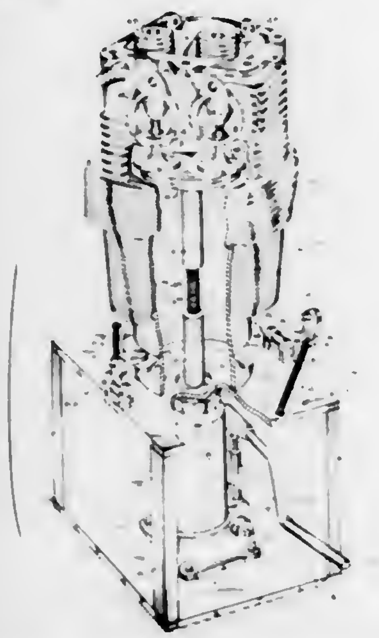
4,034,457
VALVE POSITIONING TOOL

Charles E. Conrader, 1619 S. Norman Drive, Melbourne, Fla. 32901

Filed June 26, 1975, Ser. No. 590,422

Int. Cl.² B23P *19/04*

U.S. Cl. 29—213 R **14 Claims**



1. A valve support means for positioning valves within an internal combustion engine cylinder head and piston sleeve assembly of the type having a flanged base and overhead valves, comprising in combination:

a frame;

a plurality of L-shaped members, each pivotally attached at one end to said frame and having at the opposite end thereof a pin assembly for engaging a corresponding aperture in said flanged base for restraining the movement thereof;

positioning means for locating said valves within said cylinder assembly, said positioning means including thereon a deformable communicating surface for resiliently communicating with and conforming to said valves of said cylinder assembly; and

extending means attached to said frame and said positioning means whereby said positioning means may be axially extended within said cylinder assembly.

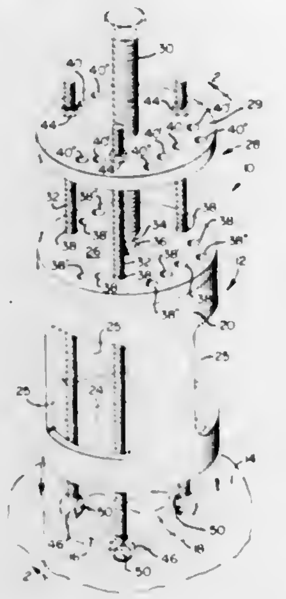
4,034,458
BEARING EXTRACTING TOOL

William R. Ford, and Everett R. Hall, both of Red Bluff, Calif., assignors to Diamond International Corporation, New York, N.Y.

Filed May 19, 1976, Ser. No. 687,999

Int. Cl.² B23P *19/04*

U.S. Cl. 29—259 **7 Claims**



1. Bearing extracting tool comprising a reaction housing adapted to be placed against machinery wall structure extending around bearing assembly and the end of a shaft or like member supported in the bearing assembly, the reaction housing having at least one open end which is to be placed against the machinery from which a bearing assembly is to be extracted, force receiving means at the free end of the reaction housing, and lifter means including portions extending through said force receiving means, said reaction housing and in a bearing assembly to be extracted,

said lifter means including a force applying member having an end adapted to be applied against said force receiving means for applying a lifting force thereagainst,

said force receiving means being in the form of a first rigid plate, said lifter means including a second rigid plate extending generally parallel to said first rigid plate, both of said rigid plates including a plurality of axially aligned perforations, said lifter means also including a plurality of lifter bars extending through aligned perforations in said first and second rigid plates,

said lifter bars extending through said perforations of said first rigid plate with adequate clearance for free movement therethrough,

said lifter bars being provided with means for transmitting lifting force from said second rigid plate to said lifter bars,

said lifter means also including an enlarged threaded bore and a force applying lifter bolt threadedly engaged in said bore, said bolt having a first end adapted to be applied against said first rigid plate to provide a lifting effect and a second end at which a turning effort may be applied,

said lifter bars being threaded and provided with nuts threaded thereon and disposed on said second rigid plate to permit adjustment of the effective length of said bars and to transfer lifting force from said second rigid plate to each of said lifter bars,

said lifter bars being provided with an enlarged end for insertion into a bearing assembly, said enlarged end having a generally spherical surface which is to be commensurate with the size of ball bearings of the bearing assembly to be removed, said enlarged end further having two generally parallel flat sides from which generally horizontal polar portions are omitted, and

said lifter bars including means for facilitating rotation of said bars and at the same time indicating whether or not said lifter bars are in extracting position.

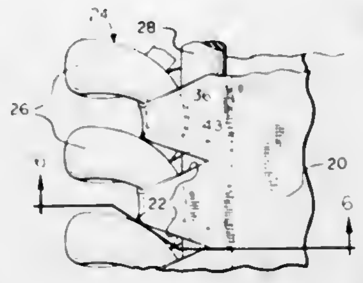
4,034,459
METHOD OF AND APPARATUS FOR MAKING SLIDE FASTENER

George B. Moertel, Crawford, Pa., assignor to Textron, Inc., Providence, R.I.

Division of Ser. No. 539,642, Jan. 9, 1975, Pat. No. 3,975,802. This application June 14, 1976, Ser. No. 695,871

Int. Cl.² B29D *5/00*

U.S. Cl. 29—408 **12 Claims**



1. A process of manufacturing a stringer for a slide fastener comprising

advancing a continuous strip of material,

cutting spaced slots transversely across the center of the advancing strip,

assembling a coupling element into the strip by forcing head portions of the coupling element through the slots within the strip such that strap portions formed by the spaced slots extend over heel portions of the coupling element,

folding the strip with the head portions protruding from the folded edge of the strip and the heel portions of the coupling element looped by the strap portions, and

securing the folded strip together to secure the coupling element to the folded edge.

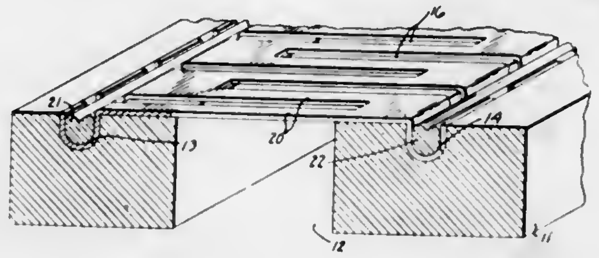
4,034,460
METHOD OF FORMING AN OPTICAL GRATING

Robert M. Hulle, Calabasas; John Ferrero, Chatsworth, and Gerard Pannullo, Canoga Park, all of Calif., assignors to Trans-Cal Industries, Inc., Van Nuys, Calif.

Filed Nov. 17, 1975, Ser. No. 632,186

Int. Cl.² B23P *17/00*

U.S. Cl. 29—418 **8 Claims**



1. The method of forming an optical grating having expansion characteristics the same as the thermal expansion characteristics of a preselected material, comprising

forming a frame plate of said material having an opening with parallel sides therein,

forming a thin sheet having a width greater than the width of said opening,

forming a row of first parallel slits in said sheet,

forming a row of second parallel slits in said sheet interposed between said slits but with portions of said second slits offset laterally beyond said first slits and with portions of said first slits offset laterally beyond said second slits,

physically interlocking said sheet to said plate along a first zone extending over the offset portions only of said first slits,

physically interlocking said sheet to said plate along a second zone extending over the offset portions only of said second slits, and thereafter

removing the portions of said sheet extending outwardly beyond said zones.

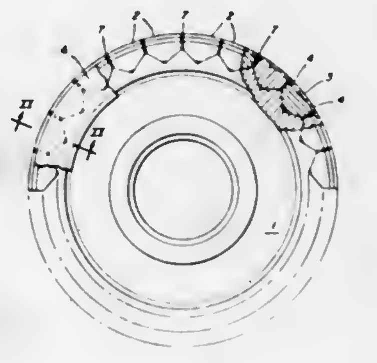
4,034,461
METHOD OF PROVIDING EXPANSION SHIMS FOR HOT BRIQUETTE SEGMENTED ROLLS

William L. Lauterbach, Upper St. Clair Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Division of Ser. No. 602,151, Aug. 6, 1975, Pat. No. 3,989,441, which is a division of Ser. No. 409,833, Oct. 26, 1973, Pat. No. 3,938,930. This application June 24, 1976, Ser. No. 699,741

Int. Cl.² B23P *19/00*

U.S. Cl. 29—428 **2 Claims**



1. Method of aligning mold segments on a hot roll briquette machine comprising assembling said mold segments in circumferentially spaced condition on a hot briquette roll with expansion gaps therebetween, and inserting shims in the expansion gaps thereof, said shims having melting points no higher than the temperature at which the mold segments achieve their greatest expansion under operating conditions.

4,034,462
METHOD FOR REPAIRING IRON MOLDS

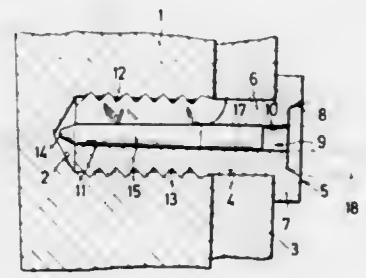
Guy Hentges, Residence Toulaire, France, assignor to Hilti Aktiengesellschaft, Liechtenstein

Continuation of Ser. No. 529,841, Dec. 5, 1974, abandoned, which is a division of Ser. No. 423,460, Dec. 10, 1973, abandoned. This application Dec. 5, 1975, Ser. No. 637,930

Claims priority, application Germany, Jan. 18, 1973, 2302410

Int. Cl.² B23P *7/00*

U.S. Cl. 29—401 D **1 Claim**



1. In the method for repairing a damaged iron mold and similar casting devices by bridging the damaged area with a metal plate and securing the plate by means of fastening elements inserted into apertures in the plate and prepared recesses in the iron mold,

the improvement which comprises shooting headed expansible hollow straddling dowels in said apertures and recesses, and radially expanding only the forward portions of said dowels with a powder-force-actuated setting device having an orifice of said setting device placed in a central bore of a dowel to be expanded.

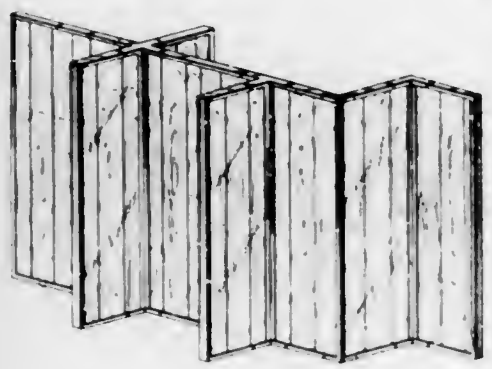
4,034,463
METHOD OF VERTICAL DISPLAY OF WALL PANELING

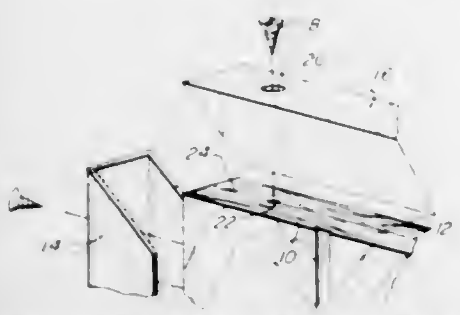
Robert E. Ryan, 608 Mountain Road, Smoke Rise, Kinnelon, N.J. 07405

Filed May 13, 1976, Ser. No. 686,055

Int. Cl.² B23P *11/02*

U.S. Cl. 29—446 **2 Claims**





1. A method of vertical display of wall paneling, comprising the steps of :

a. placement of a plurality of channel-shaped frame segments perimetrically about two back-to-back sheets of wall paneling, in order to form a complete frame about such units of said paneling;

b. formation of a plurality of pairs of aligned holes in both said frame segments and said wall paneling respectively, the second of each of said holes lying at the interface between said two sheets of paneling;

c. inserting and tightening, into said aligned holes, a corresponding plurality of screws such that an expansion of the edges of said paneling against said channel-shaped frame segments is achieved, thereby securing said panels within said channel-shaped frame segments; and

d. press-fittably securing adjacent portions of a plurality of units of said framed panels within a plurality of variously configured angled channels so as to thus obtain a free-standing wall system of virtually any desired configuration.

4,034,464
METHOD OF ALUMINUM CYLINDER HEAD VALVE SEAT COATING TRANSPLANT

Adolf Hetke, Livonia, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 27, 1975, Ser. No. 608,439

Int. Cl.² B22D *11/126*

U.S. Cl. 29—527.6 **4 Claims**

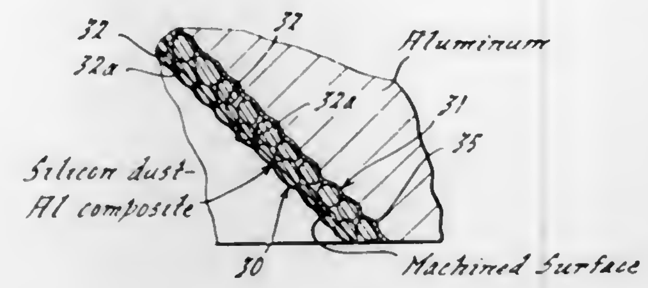
1. A method of making an aluminum casting having a self-fused silicon dust interior surface, the method comprising the steps of:

a. preparing a selectively collapsible core with a predetermined outer surface effective to define an interior surface for said casting,

b. depositing a low volatile, low-ash tacky material along a predetermined zone of the core outer surface,

c. depositing silicon dust having a grit size between 10–40 on said tacky material and removing any nonadhering dust, said adhered dust defining a valve seat zone,

d. after inserting said dusted core in proper position in a mold cavity, casting molten aluminum substantially devoid of silicon into said cavity,



e. after solidification and stripping of said casting from said mold, collapsing said core for removal of the core material, and

f. removing, by machining, no greater than 0.03 inches of said silicon dust bearing surface to expose a flat facet on the majority of silicon particles.

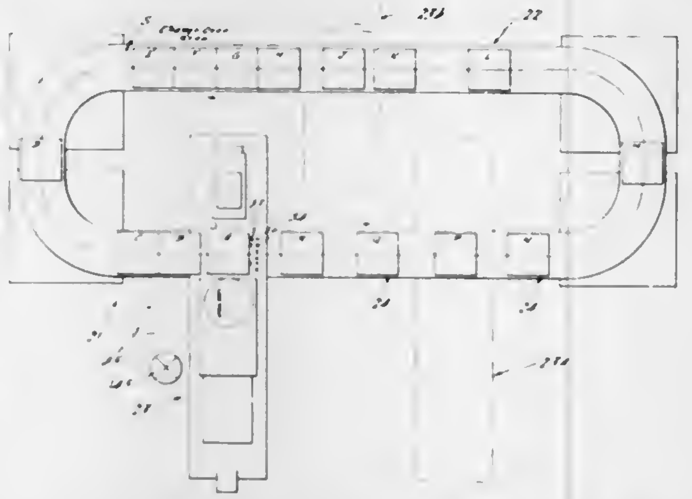
4,034,465
MACHINING CENTER AND METHOD OF OPERATION

Conway D. Shelton, Indianapolis, Ind., assignor to The Cross Company, Fraser, Mich.

Filed June 9, 1975, Ser. No. 585,026

Int. Cl.² B23Q *3/157*

U.S. Cl. 29—568 **27 Claims**



1. In a machining center, a fixed endless track defining a path of constant length, a plurality of tool heads slidably supported for movement along said track, whereby individual tool heads may be lifted off said track, a machining station on said track, means at said station for accurately locating and securing certain tool heads while still on the path of said track for a machining operation, tool head drive means at said station, means for selectively engaging said drive means with a secured tool head, work supporting means at said station, means for moving said work supporting means from a retracted position to a position in which the workpiece is engaged by the tools carried by the tool head and back to a retracted position, at least one endless driving member extending along said track, drive means continuously driving said driving member, and mutually engageable surfaces on said driving member and tool heads forming a yieldable driving connection, whereby certain tool heads may be advanced along said track while other tool heads are held stationary.

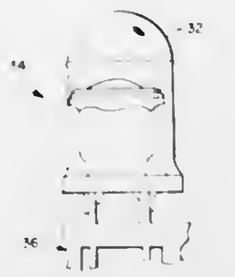
4,034,466
PACKAGE AND METHOD FOR A SEMICONDUCTOR RADIANT ENERGY EMITTING DEVICE

Gene P. Thome, Scottsdale, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 502,582, Sept. 3, 1974. This application Oct. 20, 1975, Ser. No. 623,683

Int. Cl.² B01J *17/00*

U.S. Cl. 29—588 **2 Claims**



1. A method of protecting a radiant energy emitting semiconductor chip package comprising the steps of:

a. providing a pair of continuous, separated electrically conducting leads, each having elongated portions, and each elongated portion terminating at a respective same one end in a pair of chip terminal locations angularly disposed with respect to its elongated portion, each of said elongated portions further including angular portions;

b. joining a semiconductor chip to said pair of chip terminal locations;

c. forming and disposing a continuous elastomeric resin encapsulating layer around said semiconductor chip and said angular portions and extending downwardly along said elongated portions so as to leave exposed the other same ends of said conducting leads;

d. forming and disposing a solid injection molded outer plastic acrylic or polycarbonate housing around and completely covering said encapsulating layer, said outer plastic housing and said encapsulating layer comprising material capable of transmitting radiant energy emitted by said semiconductor chip.

4,034,467
PROCESS FOR PRODUCING A MULTI-CHIP WIRING ARRANGEMENT

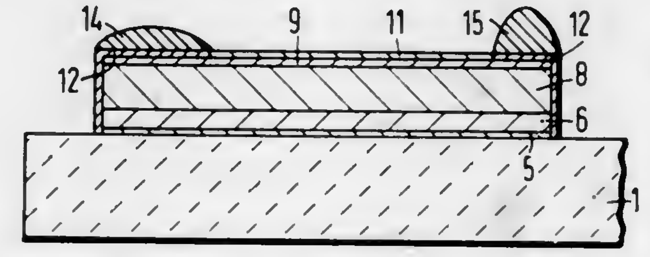
Michail Sapunarow, and Wolfgang Bade, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 2, 1975, Ser. No. 609,688

Claims priority, application Germany, Sept. 10, 1974, 2443245

Int. Cl.² B41M *3/08*

U.S. Cl. 29—625 **9 Claims**



1. A method for producing a multi-chip wiring arrangement having outer contacts for subsequent wiring and connection surfaces for being soldered to semiconductor modules in the flip-chip technique on an insulation carrier comprising the steps of:

obtaining a suitable carrier layer,

applying an adhesive layer and then a contacting layer onto a surface of the carrier,

applying a photo mask to the surface of the contacting layer to leave outer contacts, connection surfaces and conductor paths exposed while masking other areas,

metal depositing a conductive layer onto exposed areas of said contacting layer through said photo mask,

metal depositing an intermediate layer onto said conductive layer,

applying a second photo mask onto said intermediate layer to leave exposed the areas corresponding to said conductor paths,

depositing a solder rejecting layer onto said conductor paths through said second photo mask,

etching away the undesired regions of the adhesive layer and contacting layer, and

covering the outer contacts and connection surfaces with a solderable contact layer.

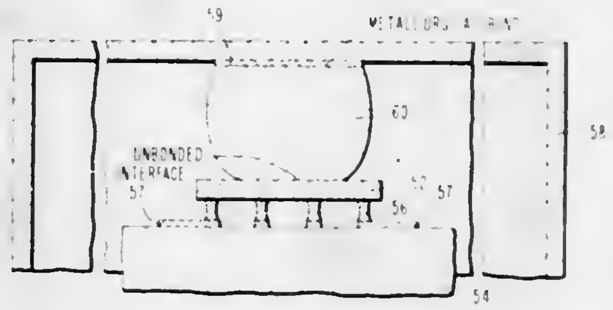
4,034,468
METHOD FOR MAKING CONDUCTION-COOLED CIRCUIT PACKAGE

Nicholas George Koopman, Hopewell Junction, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Filed Sept. 3, 1976, Ser. No. 720,470

Int. Cl.² H01R *43/00*

U.S. Cl. 29—628 **19 Claims**



1. In the method of fabricating a circuit package in which a heat-generating component is cooled by conduction of heat to a heat sink component, the improvement comprising:

metallurgically bonding a pad of solder to a major surface of either one or the other of said components;

positioning said solder pad adjacent to a major surface of the other of said components; and

heating said solder pad to a temperature and for a time sufficient to melt said solder pad to bring said solder pad into proximate, unbonded relationship with said major surface of said other component.

4,034,469
METHOD OF MAKING CONDUCTION-COOLED CIRCUIT PACKAGE

Nicholas George Koopman, Hopewell Junction, and Paul Anthony Totta, Poughkeepsie, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Sept. 3, 1976, Ser. No. 720,471

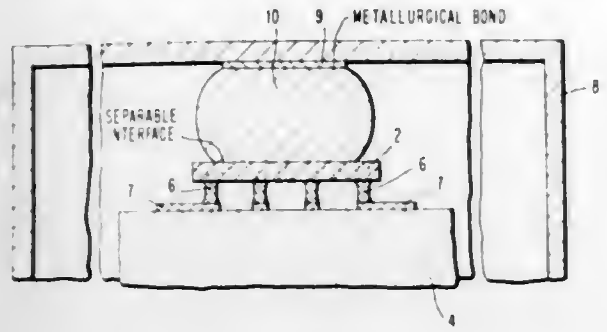
Int. Cl.² H01R *43/00*

U.S. Cl. 29—628 **16 Claims**

1. In the method of fabricating circuit package in which a heat-generating component is cooled by conduction of heat to a heat-sink component, the improvement comprising:

metallurgically bonding of a deformable mass of metal to a major surface of either one or the other of said components;

positioning said metal adjacent to a major surface of the other of said components; and compressing said metal against said major surface of the



other of said components to form an unbonded, separable interface therebetween.

4,034,470

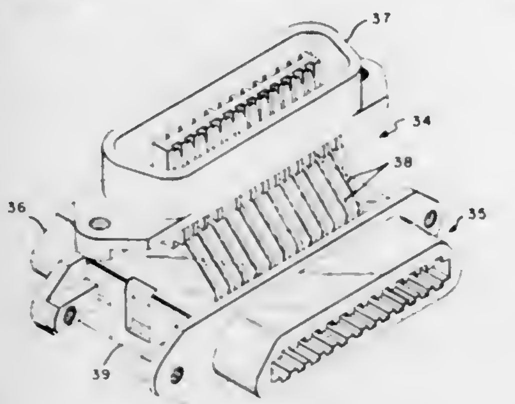
METHOD FOR FABRICATING MULTI-CONDUCTOR TAP CONNECTOR

George Allen Patton, Pfafftown, and John James Tucci, Winston-Salem, both of N.C., assignors to AMP Incorporated, Harrisburg, Pa.

Division of Ser. No. 514,148, Oct. 11, 1974, Pat. No. 3,963,300. This application Mar. 15, 1976, Ser. No. 667,044

Int. Cl.² H02G *15/00*

U.S. Cl. 29—629 **8 Claims**



1. A method of fabricating a multiconductor tap connector utilizing three individual multi-conductor connectors comprising a housing with terminals in corresponding terminal locations in which said three individual connectors are separately connected, said individual connectors each having distinct first and second parallel rows of contact terminals, each terminal location in any one connector being distinct and corresponding to the same distinct location in the other two connectors, said connectors having a rearward side, said terminals having conductor receiving portions located on said rearward side, said method comprising the steps of:

attaching separate conductors to the terminals in the first row of a first connector and attaching other separate conductors to the second row of terminals in a second connector,

positioning said first and second connectors with their rearward faces closely adjacent each other and with their mating faces facing in opposite directions so that said rows of terminals are parallel and said terminals all extend in the same direction,

lacing said separate conductors so that said conductors attached to said first row in said first connector are aligned with the terminals in the first row of said second connector and aligning said conductors attached to said second row of said second connector with said second row of said first connector,

attaching said aligned conductors to the first row in said second connector and the second row in said first connector, said conductors being attached intermediate their ends, with free ends remaining unattached,

positioning a third connector with its rearward face closely adjacent the rearward faces of and said first and second connectors and with the terminal rows in said third connector parallel to the rows in said first and second connectors, but with the terminals in said third connector perpendicular to the terminals said first and second connectors, and

aligning and attaching said conductors to terminals on said third connector so that terminals in said third connector are attached to corresponding terminals in said first and second connectors, with conductors joining terminals in said first row of said third connector with terminals in said first row of said second connector, and conductors joining terminals in said second row of said third connector with said second row in said first connector, whereby

a compact multi-conductor tap connector can be fabricated using three separate multi-conductor connectors.

4,034,471

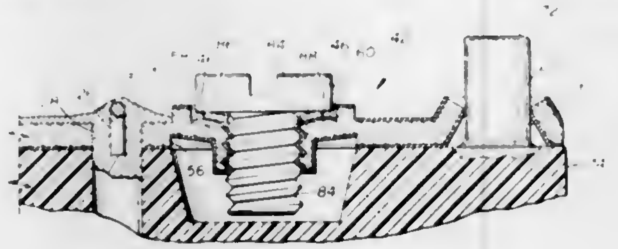
PROCESS OF ISOLATING BONDING MATERIAL ON A TERMINAL PLATE

Eugene E. Blas, Shreveport, La., assignor to Western Electric Company, Inc., New York, N.Y.

Filed May 3, 1976, Ser. No. 682,884

Int. Cl.² B21D *53/36*

U.S. Cl. 29—629 **11 Claims**



1. A method of blocking the flow of a bonding material tending to flow to a path toward an area on an article; comprising:

making the article of a base material repellent to the bonding material;

covering the article with a coating material receptive to the bonding material; and

deforming the repellent material and rupturing the recepting coating material to expose underlying repellent material and block the path of flow of the bonding material toward the area.

4,034,472

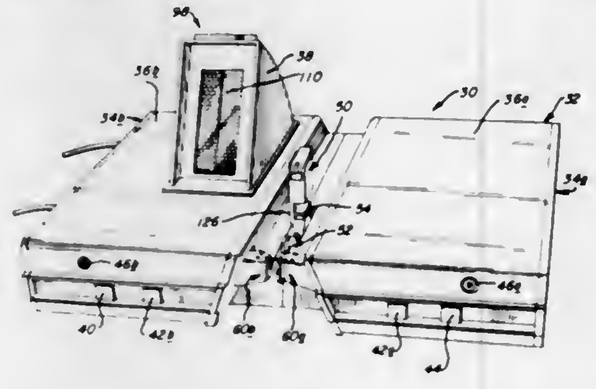
WIRE TERMINATION APPARATUS

William S. Cover, Glendale Heights; Jacob S. Haller, Northbrook, and James R. Quigley, Lombard, all of Ill., assignors to TRW Inc., Elk Grove Village, Ill.

Filed May 9, 1975, Ser. No. 576,148

Int. Cl.² H01R *43/04*

U.S. Cl. 29—749 **34 Claims**



1. In apparatus for successively terminating individual conductor wires of a group of such wires in separate laterally open parallel terminals distributed along the length of a connector by movement of each wire along a first path generally transversely of its longitudinal axis into a respective terminal of the connector, and including means for holding a connector, means for supporting a group of wires adjacent said connector, and wire stop means disposed opposite an open side of said terminals of a connector on said holding means for engaging a portion of a wire extending from said supporting means as said portion of said wire is moved transversely of said first path and locating a portion of such wire positioned thereagainst on said path, said apparatus providing an access passage to said stop means which is open from one side of said first path to permit said portion of each successive wire to be positioned against said stop means by movement of each successive wire transversely of its longitudinal axis and of said first path, the improvement comprising said stop means comprising wire stops located to orient such a wire portion positioned thereagainst in a first position on said path with the longitudinal axis of said portion substantially parallel to the axis of one of said terminals in said connector and with said portion in spaced relation to the connector, and means for transferring said wire portion from said first position into the respective terminal along said path while maintaining such parallel relationship.

4,034,473

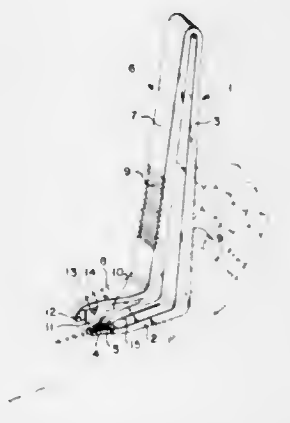
SUTURE CUTTER

Edwin A. May, Ridgewood, N.J., assignor to International Paper Company, New York, N.Y.

Filed Dec. 23, 1975, Ser. No. 643,668

Int. Cl.² B26B *17/04*

U.S. Cl. 30—181 **11 Claims**



1. A suture cutter for slicing a suture comprising:

a. a first arm having a first free with a substantially planar surface for insertion under a suture and an elongated portion extending at a first obtuse angle to said first free end;

b. a second arm having an elongated portion manually movable from a first position toward the elongated portion of said first arm into a second suture cut position, said second arm being connected to the elongated portion of said first arm, said elongated portions forming a handle for grasping said suture cutter, said second arm terminating in a second free end; and

c. cutter means on said second free end, said cutter means including a straight edge blase portion aligned at an angle to the elongated portion of said second arm and lying generally parallel to the planar surface of said first free end when the elongated portion of said second arm lies in said first position, the angular relationship of said straight edge blade portion and the elongated portion of said second arm and the planar surface of said first free end being such that said straight edge blade portion lies generally parallel to the planar surface of said first free end when the elongated portion of said second arm is moved into its second suture cut position thereby ensuring a slicing action to a suture held by said first arm in a direction substantially parallel to the planar surface of said first free end even in the absence of resilient flexing of said second arm as the elongated portion of said second arm is moved from its first position toward said first arm into its second position.

4,034,474

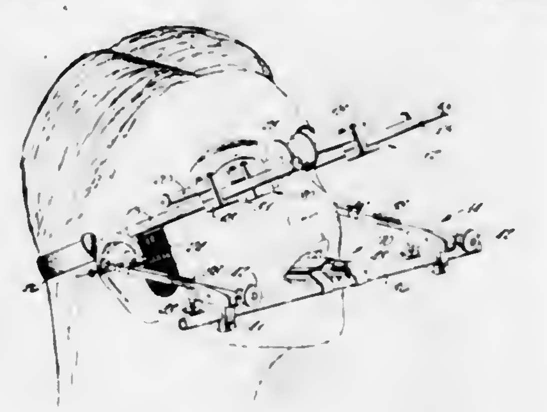
JAW MOVEMENT SIMULATION

Robert L. Lee, 22937 Grand Terrace Road, Colton, Calif. 92324

Filed July 1, 1974, Ser. No. 485,158

Int. Cl.² A61C *9/00*

U.S. Cl. 32—20 **34 Claims**



1. Dental apparatus for analyzing or recording jaw movements comprising:

an upper frame having two thin flat rigid recording plates, mounted to be positioned one on either side of a patient's head perpendicular to the horizontal axis of the patient's temporomandibular joints, said plates having a grid formed on their outer surface;

a lower frame affixed to the patient's mandible, said mandibular frame having a pair of side arms one on either side extending alongside but spaced from the patient's face, and means mounted on each of said side arms extending inwardly to engage said grids on the upper recording plates to monitor or record mandibular movements on said grid; and

means removably mounted on said upper frame for providing on said grid a reference line in a plane through said axis and a third point on the upper frame aligned with a point on the patient's face or nose, whereby measurements of said movements may be made in relation to said reference line.

4,034,475

DENTAL APPARATUS

Robert L. Lee, 22937 Grand Terrace Road, Colton, Calif. 92324

Continuation-in-part of Ser. No. 485,158, July 1, 1974. This application May 27, 1975, Ser. No. 581,203

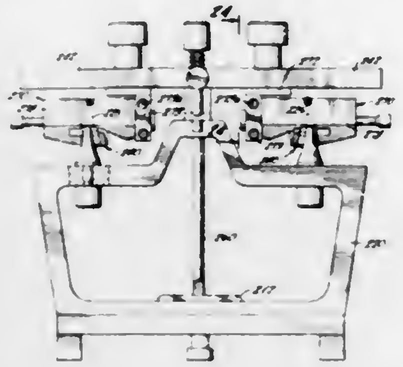
Int. Cl.² A61C *9/00*

U.S. Cl. 32—21 **24 Claims**

9. Dental apparatus for simulating human jaw movements comprising:

a dental articulator lower frame having a pair of spaced styluses;

a dental articulator upper frame including a pair of guide blocks having openings for receiving said styluses, said guide blocks being selected from a supply of blocks wherein said openings are preformed with fixed surfaces to guide styluses of an articulator to provide simulated human jaw movement, said fixed surfaces including an upper wall, an inner or medial wall, and a rear wall, said pair of guide blocks being selected to most closely simulate the side shift of the patient for whom the articulator is being used, and including means for mounting said blocks to be rotatably adjustable in the articulator around the hinge axis extending through the center of said styluses so that the blocks may be fixed in a position to enable said patient's protrusive jaw movement to be simulated.



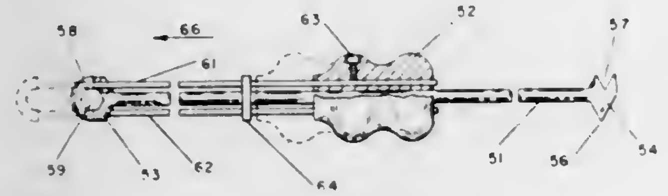
4,034,476
APPARATUS AND METHOD FOR DETERMINING TOOTH MOBILITY

Robert J. Johnson, 121 N. Range-Line Road, Carmel, Ind. 46032

Division of Ser. No. 477,770, June 10, 1974, Pat. No. 3,443,913. This application Dec. 15, 1975, Ser. No. 640,717

Int. Cl.² A61C *7/00*

U.S. Cl. 32—66 **8 Claims**



1. A dental manipulating tool comprising:
- a shaft having a yoke at one end;
- a rigid cap supported on said shaft and linearly movable with respect to said shaft;
- a pair of rods on opposite sides of said shaft and attached to said cap: ·
- a knob linearly movable on said shaft and connected to said pair of rods for movement of said cap toward and away from said yoke.

4,034,477
DIGITAL ELECTRO-OPTICAL MICROMETER AND GAGES

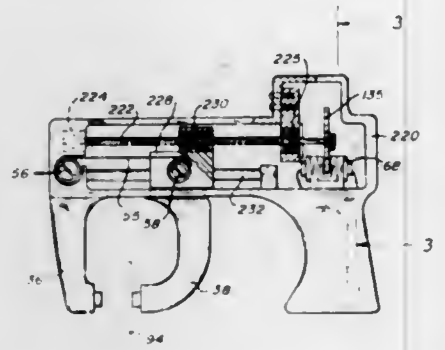
Geza Von Voros, Glen Rock, N.J., assignor to Optograms, Inc., Oakland, N.J.

Continuation-in-part of Ser. No. 496,325, Aug. 9, 1974, abandoned, which is a division of Ser. No. 229,944, Feb. 28, 1972, abandoned. This application Apr. 9, 1976, Ser. No. 675,689

Int. Cl.² G01B *7/02*

U.S. Cl. 33—143 L **2 Claims**

1. A digital electro-optical measuring micrometer, in which the measurement is precisely determined and initiates electrical pulses fed to a digital readout, said micrometer including: (a) a U-shaped housing transportable to a point of measurement and carrying all mechanically movable elements used to derive the precise measurement, said housing further including a fixedly supported anvil; (b) a movable anvil including a movable bracket slidably carried by and on a precision guide means supported by the housing and providing for movement toward and away from the fixedly supported anvil, said guide means disposed within the housing so that the movable anvil is precisely movable along a prescribed path and distance which is at least as great as a standard unit of measurement; (c) a constant force spring attached at one end to the housing and at the other end to the movable bracket so as to urge the movable anvil from the maximum open condition and toward the fixedly supported anvil and with said constant force applied at all intermediate positions therealong; (d) a precision theaded shaft in alignment with the precision guide means for the anvil having a fast thread formed on a portion thereof, this shaft rotatably and precisely positioned in the housing while fixed axially therein to prevent any longitudinal movement thereof while rotating; (e) a precision nut having a precision thread engaging means which is a precise mate to the fast thread on the precision shaft, said nut carried on and in immediate and positive driving engagement with the threaded portion of the precision threaded shaft, said nut carried by the movable bracket so that as the movable anvil is moved the shaft is rotated by the movement of the nut therealong; (f) a rotary disc-like interrupter member carried by and on the precision threaded shaft, said interrupter member precisely rotated with the rotational movement of the threaded shaft in response to the movement of the movable anvil against and with the bias of the constant force spring, said interrupter member having a sequence of equally spaced radially disposed lines thereon; (g) an encoder including a directed light source and at least a pair of photosensors carried by and as a part of said encoder, each photosensor adapted to receive a narrow beam of light from said source with said beam and photosensors arranged so that the line of the radial interrupter member interrupts the beam of light as the interrupter member is moved, said interruptions as read by the photosensor being converted to electrical pulse signal; (h) a dash pot having a piston connected to the movable anvil and movable in said dash pot, said piston movable by and with the movement of the movable anvil and having throttling means for establishing the maximum rotational speed of the interrupter member and the associated movable anvil in either of the two directions of movement to prevent bounce and to establish a sufficiently slow rate of the movement of the anvil whereat and whereby each every interruption of the beam of light is distinctly read by the photosensors to insure that each and every line on the rotating interrupter member as it interrupts the beam of light converts said interruptions to an electrical pulse signal, said pair of photosensors being optically aligned so as to produce substantially simultaneously phase-shifted waves and pulses each time a line interruption occurs and to feed this information to a discriminator circuit which ascertains from this information the direction of travel at that instant of time. and (i) a digital counter and read-out adapted to receive said electrical signals and convert said pulse signals to information which is fed to converting apparatus, said information corresponding to the precise linear position of the movable member.



4,034,478
VALVE SEAT CONCENTRICITY GAGE

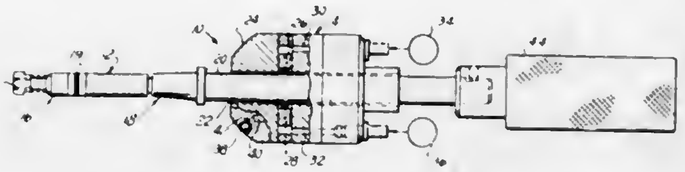
William Henry Yager, Mount Clemens, Mich., assignor to The Bendix Corporation, Southfield, Mich.

Filed May 11, 1976, Ser. No. 685,209

Int. Cl.² G01B *5/24, 13/19*

U.S. Cl. 33—181 AT **2 Claims**

1. A concentricity gaging arrangement for gaging eccentricity between centers of a bore and an aligned countersink comprising:
- arbor means including a stem arbor adapted to be aligned with said bore and having an extension portion thereon extending through said countersink;
- a spindle member having an at least partially spherical surface formed thereon and adapted to be received within said countersink, and further having a bore formed therein passing through the center of said spherical surface, said bore adapted to receive said stem arbor extension portion with a clearance space therebetween;
- gaging means generating signals corresponding to the clearance space between said stem arbor extension and said bore in said spindle member at a point even with the center of said spherical surface and at least one point about the circumference of said bore in said spindle member.



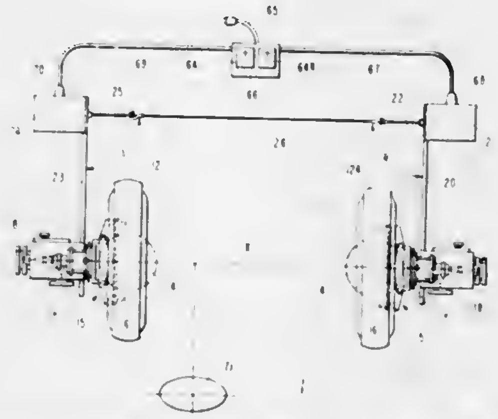
4,034,479
INSTRUMENT FOR MEASURING ANGLES AND FOR DETERMINING VEHICLE WHEEL ALIGNMENT CHARACTERISTICS

David A. Senften, Florissant, Mo., assignor to Hunter Engineering Company, Bridgeton, Mo.

Filed Apr. 9, 1976, Ser. No. 675,332

Int. Cl.² G01B *5/24, 7/30*

U.S. Cl. 33—203.15 **4 Claims**



1. A measuring instrument for determining the angular relation between a body under investigation and a reference line, said instrument comprising: support means attached to the body and having a surface representative of the position of the body; torque producing electro-magnetic means pivotally carried by said support means and including a magnet creating a magnetic field between its poles, a coil operably located in said magnetic field and movable in said magnetic field upon current flow in said coil creating magnetic coupling effects, and resilient means connected to said coil and locating said coil in said magnetic field in a predetermined normal position; a dual channel interrupter module carried by said support means and including a pair of spaced signal emitters and corresponding signal detectors; an interrupter means normally located in the spaced between said emitters and detectors to intercept signals substantially equally from said emitters, said interrupter being connected to said coil to move in response thereto; a source of direct current connected to said signal emitters and detectors; an amplifier having positive and negative current inputs and an output, said inputs being connected in circuit with separate ones of said detectors and said output being in circuit with said coil; first lever means representative of the reference line and fixed to said torque producing electro-magnetic means to move the same relative to said representative surface on said support means to an angle requiring determination, said first lever having an initial position relative to said interrupter means; pivot forming means carried by said torque producing electro-magnetic means in position to interconnect said interrupter means and said coil, said pivot forming means moving with said torque producing electromagnetic means and displacing said interrupter means, whereby said emitter signals are unbalanced and current to said coil changes the magnetic field coupling to return said interrupter to its normal location resulting in said first lever means and interrupter means assuming a different relationship; and means responsive to changes in the current in said coil to display the amount of relative change in the initial position of said first lever means relative to said interrupter means in terms of angular displacement of said first lever means from said representative surface.

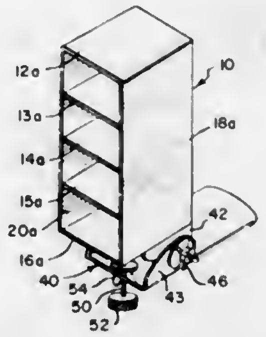
4,034,480
VISUAL DESCENT SIGHTING DEVICE FOR AIRCRAFT

William R. Mehrtens, 81 Remsen Circle, Yonkers, N.Y. 10710

Filed July 31, 1975, Ser. No. 600,633

Int. Cl.² G01C *21/00*

U.S. Cl. 33—264 **7 Claims**



1. A visual descent sighting device for aircraft to provide visual descent guidance to a pilot during landing comprising means for defining parallel sighting windows that are spaced an equal distance apart, said means having a three-dimensional ladder-type structure with at least two horizontal sighting plates, and at least one vertical member connected to said horizontal sighting plates and means for mounting said sighting windows on said aircraft in order that a landing area can be framed in a relatively small field of vision.

4,034,481
INSTRUMENT WHICH IS SENSITIVE TO ACCELERATIONS

Andries Johannes Stoltz, 90 Alcade Road, Lynnwood Glen, Pretoria, Transvaal, South Africa

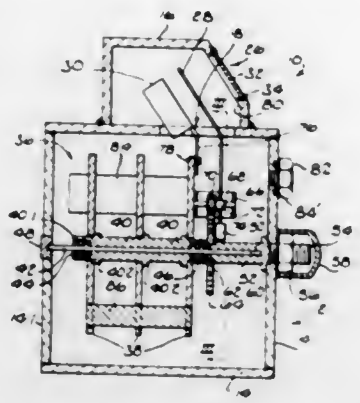
Filed Mar. 19, 1975, Ser. No. 559,707

Int. Cl.² G01C *9/12, 9/16*

U.S. Cl. 33—396 **6 Claims**

1. An instrument comprising:
- a. a liquid-filled casing,
- b. a float structure in the casing,
- c. means mounting the float structure for rotation about a horizontal axis relatively to the casing,
- d. the float structure comprising a pair of immersed floats the centres of bouyancy of which are spaced apart in the horizontal direction so as to lie one on each lateral side of said horizontal axis and each of which centres of bouyancy is above the horizontal plane containing said horizontal axis and the upward bouyancy derived forces on which act to maintain the float structure in a datum position with respect to horizontal, and
- e. means for converting relative movement between said casing and said float structure into an output reading,

such means being constituted by gears for mechanically amplifying the movement of the casing with respect to the float structure, and said gears comprising a sun gear fast with the casing and a planet gear rotatably mounted on



the float structure, there being a scale fast with the float structure and a needle fast with said planet wheel and positioned so as to move across the scale when said planet gear is rotated upon tilting of the casing.

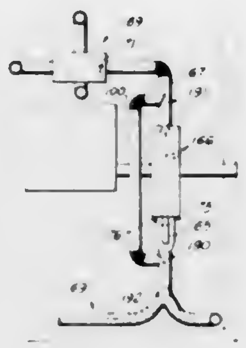
4,034,482
HEAT RECOVERY SYSTEM

Harry H. Briscoe, Rte. 10, Burnett Road, Rome, Ga. 30161

Filed June 13, 1975, Ser. No. 586,631

Int. Cl.^{2} F26B *3/00*

U.S. Cl. 34—35 **8 Claims**



1. A process for recovering heat from the exhaust gases of a clothes drier comprising the steps:
   - a. directing said drier exhaust gases through a first pathway;
   - b. directing the air flow in a home heating system through a second pathway sealed from and in conductive heat exchange relationship with said first pathway;
   - c. selectively bypassing one of said pathways when heat exchange is not desired;
   - d. said selectively bypassing step includes variably conducting said exhaust gases around said first pathway, out of heat exchange with said air flow in said second pathway.

4,034,483
SONAR BEAMFORMING APPARATUS SIMULATION

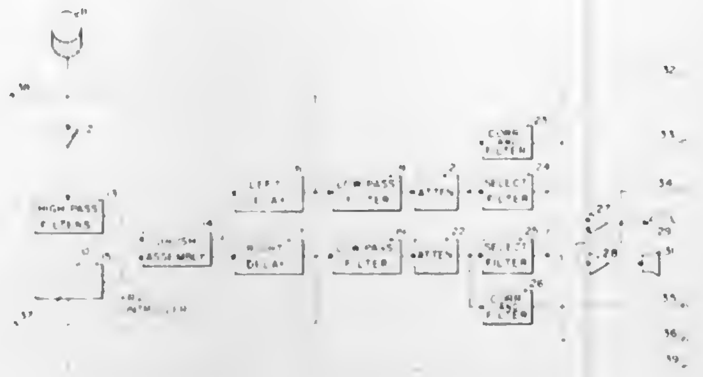
Frank Hutzler Bernstein, Baltimore, and Robert Richard Fontaine, Riverdale, both of Md., assignors to The Singer Company, Binghamton, N.Y.

Filed Jan. 20, 1976, Ser. No. 650,724

Int. Cl.^{2} G09B *9/00*

U.S. Cl. 35—10.4 **9 Claims**

1. A system for generating electrical signals to be substituted for normally received signals in navigational equipment, said system comprising means for providing signals to said navigational equipment which are representative of the signals normally provided by a plurality of actual signal sources; means for modifying each of said signals so that each of said signals that represents a separate actual source will be provided with a separate said modifying means in order to form said signals into two beams similar to the lobes of directional transmitting apparatus, and means for combining the outputs of said modifying means for each type of signal to form a composite signal having the characteristic of a right beam and a left beam with a specified orientation of both of said left and right beams.



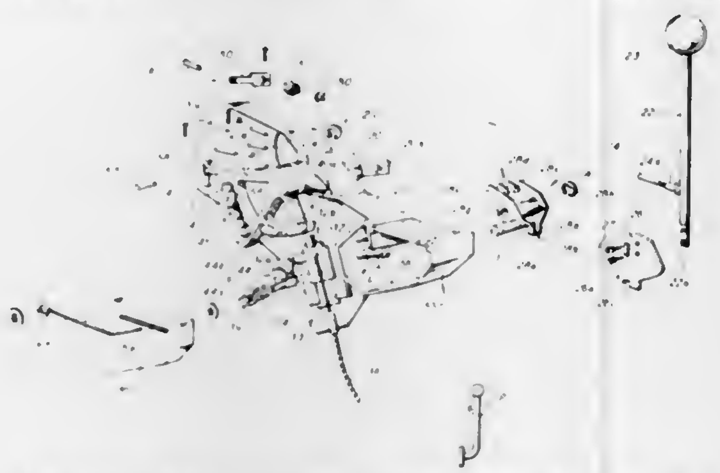
4,034,484
DRIVER TRAINING APPARATUS

John G. Radice, Binghamton, N.Y., assignor to Doron Precision Systems Inc., Binghamton, N.Y.

Filed June 24, 1976, Ser. No. 699,380

Int. Cl.^{2} G09B *9/04*

U.S. Cl. 35—11 **24 Claims**



1. Simulated transmission control apparatus for use in an automotive vehicle driver trainer, comprising, in combination: a frame member; a first shaft journalled for rotation in said frame member; a dummy shift lever pivotally connected to said first shaft; circuit board means fixedly mounted relative to said frame members; a plurality of magnetically actuatable reed switches mounted on said circuit board means; and magnet means connected to be moved by movement of said shift lever to actuate said switches to provide electrical signals indicating the position of said shift lever.

4,034,485
COMPOSITE FACE APPARATUS AND METHOD

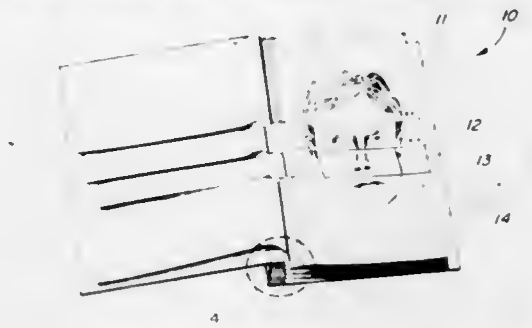
Savo Milutinovich, Hollywood, Calif., assignor to Savo, Inc., Hollywood, Calif.

Continuation of Ser. No. 552,762, Feb. 24, 1975, abandoned. This application May 19, 1976, Ser. No. 687,902

Int. Cl.^{2} G09B *1/06*

U.S. Cl. 35—28 **1 Claim**

1. Apparatus for creating a likeness of a human face comprising:
   - a. A plurality of stacks of opaque pages.
     1. each page bearing a unique representation of a facial part and a coded indicium,
     2. the pages of a stack of said plurality of stacks bearing representations of the same facial part,
     3. the stacks being positioned relative to one another such that the representations of the facial parts of the top pages of the stacks form a composite likeness of a face, the stacks being positioned successively adjacent one another, the edges of pages of of a stack adjacent another stack being essentially similar,
     4. The end points of the portions of facial outlines on the pages in each stack of pages being essentially superposed; and
   - b. binding means for maintaining the position of the stacks relative to one another such that the facial outline created by the top pages of the stacks of pages is essentially continuous from one stack to the next and for movably attaching the pages of each stack of pages together such that the pages of a stack of pages may be placed in a first position upon the stack and pages above a page selected to be viewed in a composite likeness may be moved to a second position not in the stack, each stack of pages having a side edge, the edge edge of each page being closer to the representation of a facial part than the side edge of the page immediately below it, the binding means including means for hingedly attaching each said page edge to the page below it.



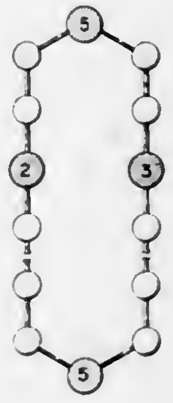
4,034,486
MATHEMATICAL BEADS

Rasjad Mills, 2101 "R" St., NW., Washington, D.C. 20008

Filed Oct. 3, 1975, Ser. No. 619,373

Int. Cl.^{2} G09B *19/02*

U.S. Cl. 35—30 **5 Claims**



1. Educational toy beads device comprising in combination: a plurality of beads permanently interconnected in a predetermined series including an answer bead located by bead total count of the series, equidistantly intermediate between other total beads of the series of which the other beads at least two question beads are spaced on opposite sides of the answer bead equidistantly from the answer bead, carrying on the question beads respectively predetermined numerical indicia which considered jointly bear a mathematical relationship which equals a mathematical answer-indicia carried on the answer bead.

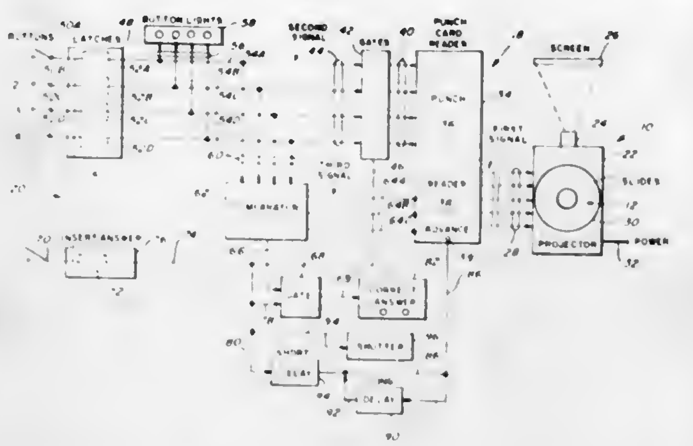
4,034,487
AUTOMATED TESTING STATIONS

John D. McReynolds, P.O. Box 267, Kittredge, Colo. 80457

Filed Mar. 6, 1975, Ser. No. 555,972

Int. Cl.^{2} G09B *5/02*

U.S. Cl. 35—48 R **7 Claims**



1. Automated fully portable testing apparatus comprising:
   - a. automated slide projector means including means responsive to the receipt of a first binary coded signal to select a slide corresponding to said first binary coded signal and to display said slide;
   - b. a plurality of slides each carrying a selected question and a group of A possible answers, one of which is the correct answer to the selected question, said slides mounted for selection and projection in said projector means;
   - c. punched card means containing a selected plurality of N possible columns for punching, each column containing a plurality of P possible rows in which said card can be punched, said group of P rows comprising:
     1. A group of A rows into one of which, responsive to a second binary coded signal, a hole can be punched corresponding to one of said A possible answers;
     2. a group of B rows into one of which at least one hole is prepunched, corresponding in binary coding to the correct answer and producing a third binary coded signal when sensed;
     3. a group of C rows into which at least one hole is prepunched, corresponding in binary coding to the number of a question, and of the corresponding slide, to be selected and producing a first binary coded signal when sensed;
   - d. portable combination card reading and punching means capable of holding and advancing said punched card means, and means to simultaneously read and punch on different rows in the same column of said punched card means, and including;
     1. means in response to said second binary coded signal, to punch a hole in at least one of said A rows, in a selected column K;
     2. means simultaneously to read the position of said punched holes in one, or more of said B rows of said same column K, corresponding to the correct answer, and means to transmit a third binary coded signal corresponding to said correct answer;
     3. means simultaneously to read the C rows of said same column K and to transmit to said projector means said first binary coded signal corresponding to which of the C rows contain punched holes; and
   - e. logic means including;
     1. a plurality of A push button means corresponding in number to the number of possible answers, and means responsive to said push button means to generate said second binary coded signal;
     2. single insertion push button means, and means responsive thereto to transmit to said card combination reading and punching means said second binary coded

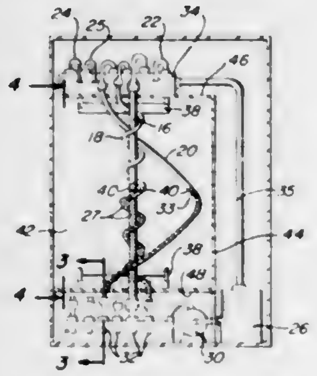
signal, whereby a hole is punched in a selected one of said A rows;

3. comparator means responsive to said third binary coded signal and to the selected push button to determine whether the selected answer is the correct one, and responsive thereto, means to display the result of said determination;

whereby the same punched card that carries the test program, step by step, in separate columns of the card, also carries in other rows, in those same columns, perforations punched in the course of the testing, providing results of the testing.

4,034,488
APPARATUS FOR DEMONSTRATING THE TRAVEL OF HEAVENLY BODIES

Samuel E. Trujillo, 4300 Otis St., Wheat Ridge, Colo. 80033
Filed Sept. 8, 1975, Ser. No. 611,140
Int. Cl.² G09B *27/02*
U.S. Cl. 35—45 **5 Claims**



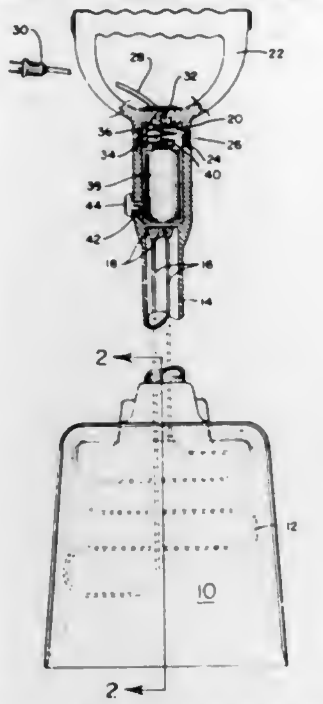
1. An apparatus for displaying the three-dimensional passage of the solar system through the universe, said solar system comprising the Sun and the planets, said apparatus comprising:

a plurality of bodies, each of said bodies representing a different heavenly object in said solar system,
at least one spiral ellipsoidal shaped transparent tube, said spiral ellipsoidal tube being configured to represent the orbit of one of said planets and one of said bodies representing said planet being disposed therein,
a linear shaped tube positioned at the foci of said spiral ellipsoidal tube, said linear shaped tube being configured to represent the path of said Sun and the body representing said Sun being disposed therein,
fluid in said spiral ellipsoidal tube and said linear shaped tube for supporting the bodies disposed therein, and
means for controlling the rate of ascent and descent of the fluid level in each of the tubes.

4,034,489
HEATED SNOW SHOVEL

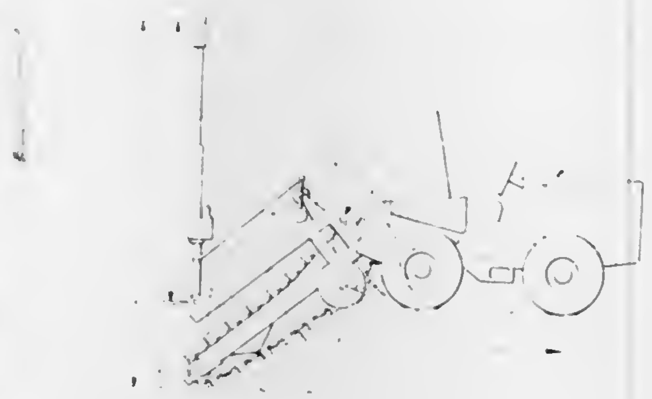
John F. Hughes, Jr., Buxton Road, Saco, Maine 04072
Filed June 18, 1976, Ser. No. 697,391
Int. Cl.² E01H *5/10*
U.S. Cl. 37—16 **8 Claims**

1. A heated snow shovel comprising a blade, said blade comprising a unitary housing, a heating element, a first portion of said heating element contained within said housing, a shaft, a passageway in said shaft, a second portion of said heating element disposed along said passageway, a handle, one end of said shaft secured to said blade, said passageway communicating with the interior portions of said housing, the other end of said shaft secured to said handle, a compartment, said compartment being disposed adjacent said handle and said other end of said shaft, a rechargeable battery, a power cord, means to recharge said battery when said power cord is energized with an operating current, means to energize said heating element from said battery and from said operating current, means to heat said blade when said heating element is energized, means to heat portions of said shaft and portions of said handle when said heating element is energized, means to manually control the energization of said heating element.



4,034,490
AUTOMATIC DEPTH CONTROL FOR ENDLESS CHAIN TYPE TRENCHER

Ted L. Teach, Dayton, Ohio, assignor to Laserplane Corporation, Dayton, Ohio
Filed Nov. 3, 1975, Ser. No. 628,095
Int. Cl.² E02F *5/06, 9/20, 9/26;* **G05G** *15/04*
U.S. Cl. 37—86 **5 Claims**



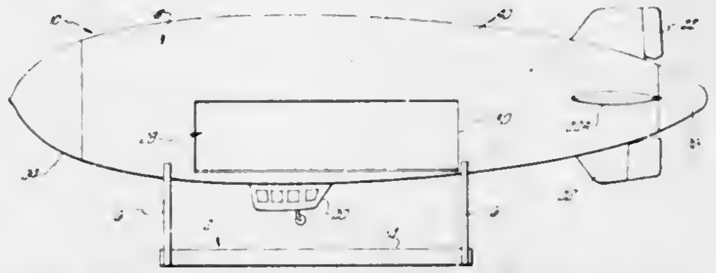
1. In a trencher of the type having an elongated digging frame having one end thereof pivotally mounted on a vehicle so that the other end is free for movement in a vertical plane parallel to the path of travel of the vehicle, said digging frame having two spaced sprockets traversed by an endless chain carrying a plurality of spaced digging scoops, means on the vehicle for driving the forward sprocket and power means for varying the pivotal angle of said digging frame relative to the horizontal, thereby determining the depth of the trench dug by said blades, the improvement comprising:

1. means for periodically sweeping a laser beam over the working area where the trench is to be dug, said beam defining a reference plane of known height relative to the desired depth of the trench;
2. an upstanding mast having its bottom end pivotally mounted directly on said digger frame adjacent said other free end thereof and above the rear sprocket for movement in a vertical plane;

3. means for maintaining said mast in a true vertical position irrespective of the angular position of said digging frame whereby the height of said mast varies as a trigonometric function of said pivotal angle and not directly proportional to the trench depth;
4. laser beam sensors carried by the top of said mast;
5. control circuit means responsive to said sensors for operating said power means to vary the angular position of said digging frame to maintain the trench depth at said desired level beneath said beam reference plane and
6. means for concurrently varying the height of said mast as a trigonometric function of the said pivotal angle of said digging frame relative to the horizontal.

4,034,491
MODEL BLIMP

David R. Fisher, Rancho Palos Verdes; Don C. Willis, Garden Grove; Frederick W. John; James R. Powers, both of Los Angeles; James M. Doyle, Encino; Lonnie D. Cooper, Hawthorne, and Dennis C. Rich, Los Angeles, all of Calif., assignors to Revell, Incorporated, Venice, Calif.
Filed Oct. 3, 1975, Ser. No. 619,228
Int. Cl.² G09F *11/23*
U.S. Cl. 40—33 **6 Claims**

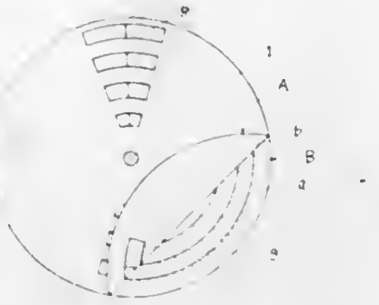


2. In an assemblable multi-part model blimp display kit, the combination including a model blimp and an information display associated therewith, comprising:

a hollow main body formed of matable sections adapted for intercoacting connectible assembly one to another;
an information displaying aperture formed in a side of said body;
a masking screen mountable in said aperture and having a preselected pattern of transparency thereon;
support members mountable within and supportable by the assembled body in a longitudinally spaced disposition therein;
a hollow frame member insertable in said body and movably carried by said spaced suuports;
an information carrying screen selectively mountable on said hollow frame member, the information on said screen being of a nature similar to the general pattern of transparency of said masking screen;
said information screen being positioned on and by said frame so as to dispose a portion thereof adjacent said masking screen for coaction therewith;
drive means mountable and supportable within said body for so moving said hollow frame member as to move said information screen relative to said masking screen;
illumination means mountable within the hollow frame adapted when actuated to cause illumination from within the interior thereof to pass through transparent portions of the information screen and fall on the masking screen,
the relative movement between the information screen and masking screen, in conjuction with the illumination from within, resulting in a changeable visual information display through said information displaying aperture.

4,034,492
FOREIGN EXCHANGE READY RECKONING CHART

Akira Matsuda, No. 7-C22-307, Shinsnri-Higashi, Toyonaka, Osaka, Japan
Filed Dec. 29, 1975, Ser. No. 645,294
Claims priority, application Japan, Jan. 13, 1975, 50-6603; Nov. 21, 1975, 50-158720[U]
Int. Cl.² G09F *11/04*
U.S. Cl. 40—70 R **7 Claims**



1. A foreign currency exchange device for determining the conversions between currencies of various countries, said device comprising:

a circular graduation plate having currency graduations thereon corresponding to the exchange ratios between currencies of various countries, said graduations radiating in concentric circles from the center of said plate and alternating between first normal upright standing graduations and second inverted graduations in every other concentric circle of graduations;
first indicator plate means over said circular graduation plate for aligning and comparing said graduations therethrough, said indicator plate means having first sectoral cut-out window portions therethrough corresponding to said first alternating concentric graduations on said graduation plate when said first graduations are upright and second sectoral cut-out window portions therethrough corresponding to said second alternating concentric graduations on said graduation plate when said second graduations are upright, whereby said first normal upright standing graduations appear in an upright position through said first cut-outs and said second inverted graduations appear in an upright position through said second cut-out window portions; and
eyelet means through said indicator plate means and said circular graduation plate for rotatably mounting said graduation plate and said indicator plates together.

4,034,493
FLUID NOVELTY DEVICE

Derek W. Ball, San Rafael, Calif., assignor to Wham-O Mfg. Co., San Gabriel, Calif.
Filed Oct. 29, 1975, Ser. No. 626,644
Int. Cl.² G09F *13/24*
U.S. Cl. 40—106.21 **13 Claims**

12. A display apparatus comprising:

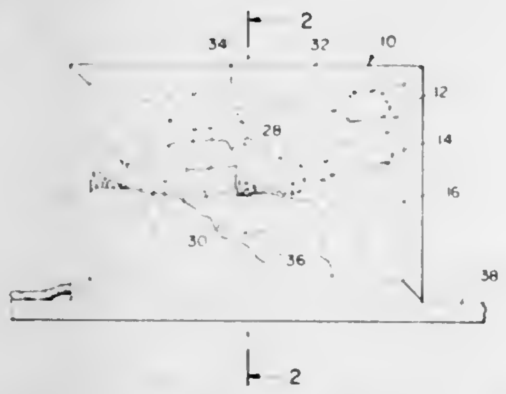
a sealed container defined by two thin, closely spaced apart transparent or translucent plates having a main chamber and at least one reservoir located at one end of the chamber, the spacing of the two plates being approximately equal to the thickness of one of said plates and the reservoir having at least one aperture opening into the main chamber,
a first liquid of a first specific gravity contained within the container,
a second liquid of a second specific gravity lighter than said first specific gravity contained within the container, the second liquid being immiscible with said first liquid and having a predetermined viscosity, and
at least one obstruction disposed in the main chamber in a

liquid flow path extending from the aperture, the obstruction being oriented within the chamber such that the flow

of the first liquid is diverted as it encounters the obstruction.

4,034,494
HOLIDAY LIGHT

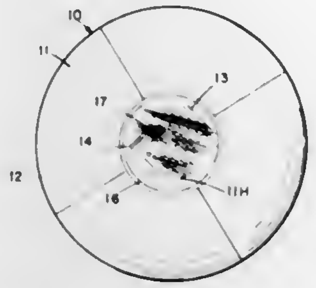
Chet M. Lane, 411 E. Passaic St., Apt. No. E, Hackensack, N.J. 07601
Filed Oct. 2, 1975, Ser. No. 618,774
Int. Cl.^{2} B44F *1/00*
U.S. Cl. 40—106.52 **7 Claims**



1. A picture display unit comprising: a frame an outer sheet of glass having indicia thereon, a colored overlay sheet positioned behind said outer sheet, a diffuser sheet positioned behind said overlay sheet, and a frame for supporting said sheets in juxtaposed relation, said frame further including therewithin a mirror facing towards the diffuser sheet, at least one disc rotatable about its center and serving as a light modifying means, a plurality of flags attached to the disc, one face of each flag having a light reflective coating, and the other face having a light absorbing coating, all similarly coated faces oriented in a similar direction, and a light source from which emanate rays of light which impinge upon the flags causing the disc to rotate due to impingement of light thereon, the rays of light passing directly or by reflection from the mirror to the diffuser sheet and through the outer sheet.

4,034,495
INFLATABLE TOY

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840
Continuation-in-part of Ser. No. 238,570, March 27, 1972, Pat. No. 3,884,554, which is a continuation-in-part of Ser. No. 849,177, Aug. 11, 1969, Pat. No. 3,684,614. This application Mar. 10, 1975, Ser. No. 556,976
Int. Cl.^{2} G09F *19/14*
U.S. Cl. 40—137 **10 Claims**

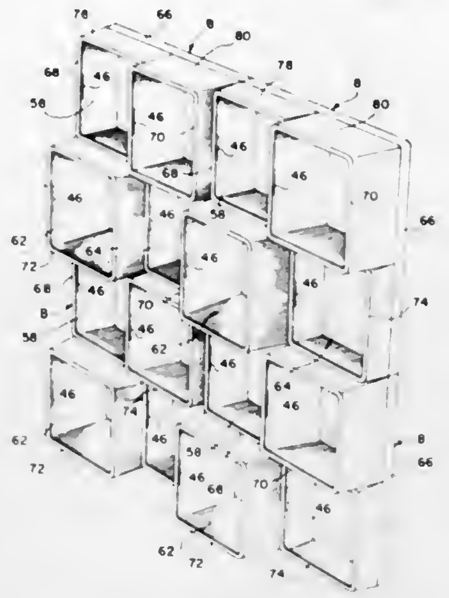


1. An inflatable structure comprising:
an enclosure made substantially of flexible sheet material and capable of retaining a gas under pressure,
said enclosure having opposed walls which are joined together and define respective first and second wall portions disposed so as to be predeterminately retained apart in fixed relation with respect to each other when the enclosure is internally gas pressurized and inflated,
said first wall portion being disposed to face an observer in front of said second wall portion,
a transparent part of said first wall portion through which said second wall portion of said enclosure may be viewed by an observer looking through said first wall portion of said enclosure,
part of said second wall portion of said enclosure which is viewable through said transparent part of said first wall portion being printed with first indicia defining areas thereof which are interposed between areas therebetween of different light contrasting characteristics than the characteristics of said first indicia,
second indicia printed on said transparent part of said first wall portion and arranged for cooperating with the images of said indicia printed on said second wall portion when viewed by an observer through said first wall portion,
said first and second indicia being shaped and disposed on said first and second wall portions so as to provide a dynamic display effect which appears to move to an observer as the angle between the line of sight of the observer and said enclosure varies by the relative movement of either with respect to the other.

4,034,496
MODULAR PICTURE HOLDER

Bernard Cohen, Philadelphia, Pa., assignor to C. F. Associates, Philadelphia, Pa.
Filed Apr. 21, 1975, Ser. No. 569,964
Int. Cl.^{2} G09F *1/12*
U.S. Cl. 40—152 **13 Claims**

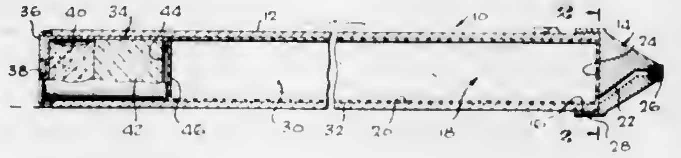
1. In an object holder, the combination of a plurality of four adjacent object receiving compartments in a unitary construction, defined by sides,
each compartment having at least one side adjacent to the side of another compartment, each compartment terminating forwardly in a front plane and rearwardly in a rear plane,
the two adjacent sides defining a canyon having a closed bottom and an open top therebetween, the two sides being in contact at the bottom and not being in contact at



the top, thereby giving an enhanced three dimensional visual effect.

4,034,497
SELF-DEFENSE DEVICE

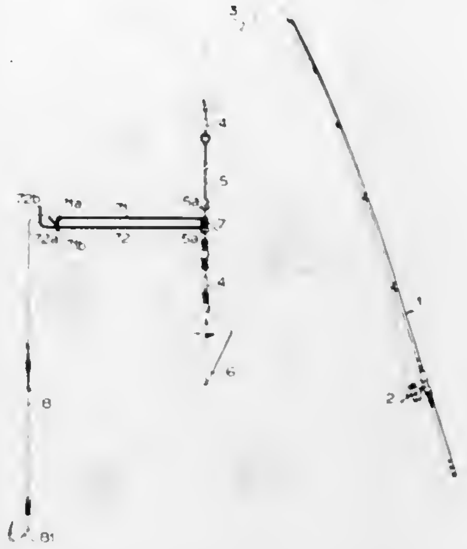
Roman L. Yanda, 15243 Vanowen St., Suite 307, Van Nuys, Calif. 91405
Continuation of Ser. No. 458,595, April 8, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,325
Int. Cl.^{2} F42B *5/16*
U.S. Cl. 42—1 G **9 Claims**



1. A non-lethal self-defense device comprising:
an enclosed liquid container; a chamber associated with said container to receive liquid activating means;
a restricted nozzle communicating with the liquid container to the exterior; the device having a construction whereby the nozzle can be manually directed in a desired direction;
non-toxic liquid in said container;
means for normally preventing said liquid from leaking out of said nozzle; and
activating means for heating and pressurizing said liquid in said container so that pressure is generated in said container and said liquid is heated and to inactivate said means for preventing liquid leaking out of said nozzle whereby a solid stream of heated liquid can be directed to repel an attacher while the device is manually held, said activating means including cartridge means insertable into said chamber, the cartridge means including material which brings about heating and pressurization of the liquid, said means for heating and pressurizing said liquid being a self-combusting means, said self-combusting means being black powder.

4,034,498
BEAM ASSEMBLY FOR FISHING

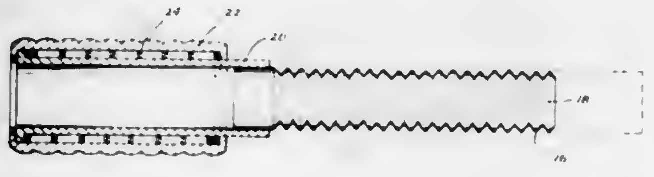
Yasuaki Ikarimoto, 1-9, Kita-Nekuromatsu, Sendai, Miyagi, Japan
Filed Jan. 15, 1976, Ser. No. 649,210
Int. Cl.^{2} A01K *97/00*
U.S. Cl. 43—15 **9 Claims**



1. A beam assembly for fishing, comprising a vertically alignable weight support having one end thereof connected with a line, a weight connected to the other end of said weight support, a pair of horizontally extending elastic beams mounted on said weight support and adapted to separate from each other at the free ends thereof, a leader connected to the outboard end of one of said elastic beams and engaging with an end of another one of said beams, and means for maintaining said beams in releasable engagement with each other, said beams being disengageable from each other when said leader is pulled for thereby striking a fish.

4,034,499
FLEXIBLE TUBE WITH INTERNAL RIDGES FOR PRODUCING MUSICAL SOUND

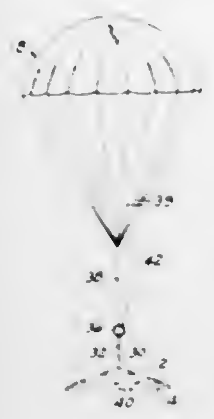
John J. Wild, 1100 E. 36th St., Minneapolis, Minn. 55407
Filed Sept. 3, 1970, Ser. No. 69,285
Int. Cl.^{2} A63H *5/00*
U.S. Cl. 46—52 **2 Claims**



1. A tone generator comprising a hollow tube which is open a both ends, a plurality of spaced, inwardly projecting ridges within the hollow interior of said tube, said ridges being shaped and positioned to produce a musical tone in response to the passage of an air stream through said tube, said tube being comprised of a flexible, semirigid material which is capable of being resonated at audible frequencies and sufficiently flexible to be grasped at one end and swung about the head of a user, and further comprising a hollow spring-loaded extensible handle attached to one end of said tube.

4,034,500
AIRBORNE SAUCER-LIKE TOY

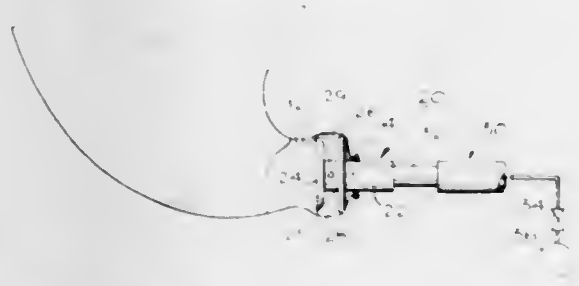
Nilson V. Ortiz, San Francisco, Calif., assignor to Nilson V. Ortiz and Francisco R. Rollojay, San Francisco, Calif.
Continuation-in-part of Ser. No. 521,824, Nov. 7, 1974, Pat. No. 3,959,918. This application May 27, 1976, Ser. No. 690,703
Int. Cl.² A63H *33/20*
U.S. Cl. 46—86 R **3 Claims**



1. In an aerial toy in combination with a collapsible toy parachute having shroud lines, the improvement comprising:
- a generally circular axially apertured body having an arcuate upper surface and a generally flat bottom surface,
  - said body having said shroud lines secured thereto and having a downwardly open recess formed in its bottom surface for nesting said toy parachute when in a collapsed position;
- a flap door hingedly connected with said body for opening and closing the recess and means for biasing said door to open position; and,
- support strand means for supporting said toy during launching, said support strand means being connected with said flap door opposite its hinged connection and associated with said body in a manner to maintain said flap door in recess closed position when the mass of said body is supported via the support strand means and to permit movement of said flap door to a recess open position when said body is airborne.

4,034,501
UNITARY INFLATION DEVICES FOR HELIUM BALLOONS AND THEIR LIKE

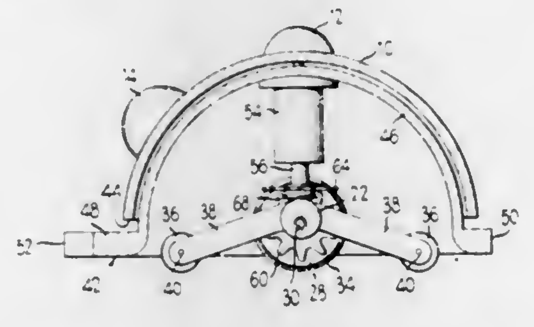
Abraham Zeyra, 1512 S. Bedford St., Los Angeles, Calif. 90035
Filed Dec. 29, 1975, Ser. No. 644,742
Int. Cl.² A63H *3/06*
U.S. Cl. 46—90 **10 Claims**



1. A unitary inflation device for inflatable artifacts with integral tubular inflation nozzles of elastic fabric substantially impervious to a gaseous inflating medium, said unitary inflation device comprising:
- an elongated tubular shank with internal channel means open to one end thereof and closed at the other end;
- a plurality of planar sealing disks, rigidly affixed to said tubular shank and extending therefrom in substantially orthogonal planes, spaced one from another, with an innermost of said disk proximate to said other end of said shank; and
- orifice means diametrally piercing said shank intermediate between at least one pair of said sealing disks and adapted to convey said inflating medium from said channel means into the annular space defined between said pair of sealing disks by the stretching thereof of said tubular inflation nozzle of the inflatable artifact.

4,034,502
WHEELED TOY

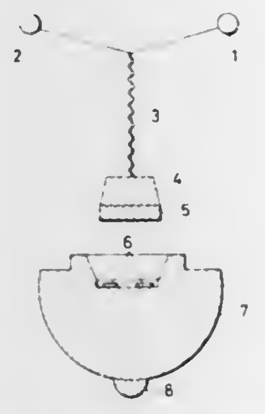
Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Sept. 7, 1976, Ser. No. 720,748
Int. Cl.² A63H *29/00*
U.S. Cl. 46—202 **16 Claims**



1. A wheeled toy, comprising: a frame portion for grasping by a user and for manual manipulation of the toy, wheel means journalled on said frame portion for rollingly supporting the frame portion for movement over a support surface, an impeller rotatably mounted on said frame portion and protruding outwardly therefrom in proximity to the support surface for engaging objects on the support sufacc as the toy is rolled thereover and propelling the objects away from the toy, and drive means operatively connecting said impeller and said wheel means for rotating the impeller in response to rotation of the wheel means as the toy is rolled over the support surface.

4,034,503
PEG TOP SPINNER

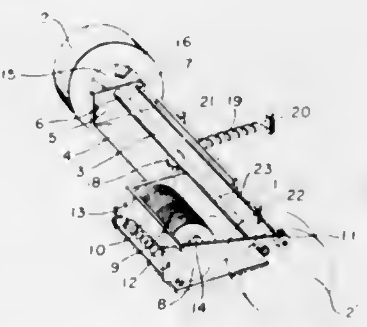
Peter Badura, Im alten Garten 2, 55 Trier - Tarforst, Germany
Filed Jan. 28, 1976, Ser. No. 652,902
Claims priority, application Germany, Feb. 11, 1975, 2505632
Int. Cl.² A63H *1/02*
U.S. Cl. 46—241 **4 Claims**



1. In a peg top including a top body having a tip on which the top body can spin, the improvement comprising spinner means for applying rotational drive to the top body including a spinner body having an upper end, twistable cord means attached to said spinner body upper end for imparting rotational force to said spinner body by untwisting of said cord means and magnetic means for detachably connecting said spinner body and a portion of the top body remote from its tip for imparting spinning of said spinner body to spin the top body followed by detachment of said spinner body from the top body and for thereafter reconnecting said spinner body to the top body while the top body continues spinning on its tip for imparting rotation of the top body to said spinner body to retwist said cord means.

4,034,504
DIRECTION CHANGING ELECTROMAGNETIC DEVICE FOR WHEELED TOYS

Shyohei Sudo, 1-18-5, Sumida, Sumida, Tokyo, Japan
Filed Apr. 16, 1976, Ser. No. 677,557
Claims priority, application Japan, May 22, 1975, 50-61189
Int. Cl.² A63H *30/04*
U.S. Cl. 46—254 **5 Claims**

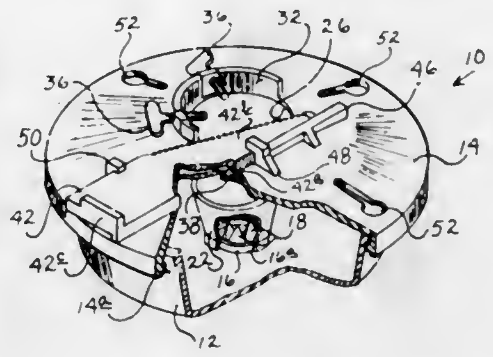


1. A direction changing and steering device for a moving toy to be operated by a wireless remote-control device, which comprises in combination: a base plate having two end parts, said end parts being bent upright to define axle supporting members, a wheel axle having two ends, wheels fixed at said two ends and passing through and being held by said axle supporting members of said base plate in a rotatable manner, an engaging disc having an inside surface with a plurality of recessed portions, said disc being fixed coaxially with and in one of said wheels so that said disc may not be rotated in idle, while the other wheel is made freely rotatable in idle, an operating rod arranged in parallel with said wheel axle in a laterally slidable manner through said upright end parts of said base plate so that one of the end parts thereof may be properly engaged with any one of the recessed portions in said engaging disc, when said operating rod is caused to move laterally, an electromagnet mounted on one part of said base plate, and a movable iron piece having two ends, one end of which is fixed on said other end of said operating rod and the other end of said movable iron piece is oscillatably supported in the vicinity of said electromagnet so as to cause the operating rod to shift sidewise, when said movable iron piece is attracted to and contacted with the iron core of said electromagnet, a pivot pin, said base plate being oscillatably fitted on the body of said moving toy by said pivot pin to enable said toy to change its moving direction on the pivot of the wheel, the rotation of said wheel being prevented by the operating rod engaged at its one tip end with said one of the recessed portions of said engaging disc provided inside of the wheel, when said movable iron piece contacts the iron core of said electromagnet by a control signal emitted from the outside.

4,034,505
TREE STAND

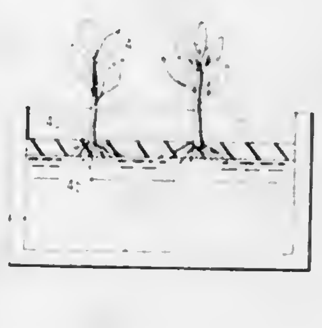
Michael L. Lydall, Rte. 2, Box 44 A-8, Philomath, Oreg. 97370
Filed Dec. 22, 1975, Ser. No. 643,031
Int. Cl.² A47G *7/00*
U.S. Cl. 47—40.5 **7 Claims**

1. A stand for an elongate, upright object such as a tree comprising
- a base including a fluid holding receptacle for receiving the butt end of the object,
- restraining means for engaging and restraining the butt end of the object against lateral movement relative to said base, and
- holding means attached to said base above said restraining means having an opening extending vertically therethrough for receiving a portion of said object above its butt end, said holding means including at least a pair of spaced apart screw-adjustable engaging means disposed in a substantially common horizontal plane on one side of and adjacent said opening and mounted for adjustable movement independently of each other into and away from said opening, an elongate wedge having an elongate, serrated, inclined engaging edge, and means mounting said wedge along the side of the opening opposite said engaging means in a substantially horizontal position for movement in a substantially horizontal plane paralleling and closely adjacent the plane of said engaging means, with movement of the wedge in one direction toward an engaging position causing said engaging edge thereof to progressively decrease the distance between said edge and said engaging means frictionally to grip and hold the object in said opening, and movement in the opposite direction toward a release position releasing the object.



4,034,506
HYDROPONIC METHOD USING A POROUS FOAM PLATE, AND A CONTAINER USED THEREWITH

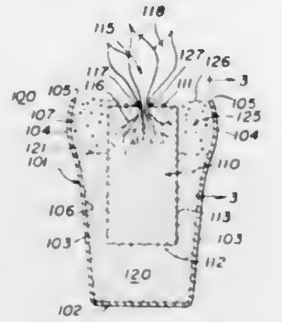
Tomio Kasahara, Hamamatsu, and Tomotaro Makita, Nagoya, both of Japan, assignors to Mitsubishi Petrochemical Company Limited, Tokyo and Yuka Badische Co., Ltd., Yokkaichi, both of, Japan
Filed Apr. 30, 1976, Ser. No. 681,972
Claims priority, application Japan, Apr. 30, 1975, 50-52781
Int. Cl.² A01G *31/00*
U.S. Cl. 47—64 **17 Claims**



1. A hydroponic container comprising a casing and a porous about 5 to about 35 mm thick foam plate having a porosity of about 20 to about 50 percent and a bulk density of about 8 to about 50 g/liter disposed on the surface of water contained in said casing, said porous foam plate consisting of an aggregate of foamed, essentially hydrophobic, substantially closed cell resin beads having been bonded to one another with a liquid adhesive of a viscosity of about 50 to about 7,000 cps at 20° C., and containing solids in an amount of about 30 to about 60 weight percent based on the total weight of the adhesive, with continuous open spaces among adjacent beads.

4,034,507
POTTED PLANT ASSEMBLY WITH GROWING PLANT THEREIN

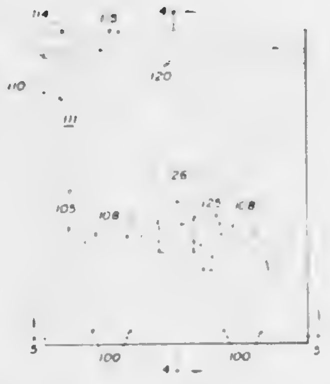
Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.
Filed Aug. 8, 1975, Ser. No. 603,125
Int. Cl.² A01G *9/02*
U.S. Cl. 47—66 **50 Claims**



1. A potted plant assembly comprising a container open at the upper end thereof, a body of material filling said container to a predetermined level therein, a quantity of foam-forming synthetic organic plastic resin distributed throughout said body of material, said quantity of synthetic organic plastic resin being reacted in situ to form an open-celled hydrophilic polymer binding said body of material into a co-hesive mass and to the adjacent inner surfaces of said container, a body of foam in said container extending from said predetermined level upwardly adjacent to the upper end of said container, said foam being an open-celled hydrophilic polymer of foam-forming synthetic organic plastic resin and being secured to the upper surface of said cohesive mass and to the adjacent inner surfaces of said container, and a growing plant having the roots thereof substantially uniformly disposed throughout the adjacent portions of said body of foam and the stalk thereof intimately surrounded by said body of foam and extending through the upper surface thereof, said body of foam having a density in the range from about 0.1 to about 0.2 gm. per cc.

4,034,508
POLYMERIZED SOIL WITH GROWING PLANT AND METHOD OF MAKING AND PACKAGE THEREFOR AND HANGER AND PLAQUE INCORPORATING THE SAME

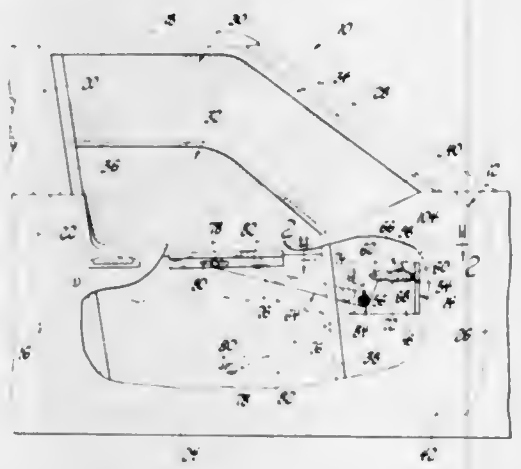
Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.
Filed Aug. 11, 1975, Ser. No. 603,753
Int. Cl.² A01G *9/02*
U.S. Cl. 47—84 **63 Claims**



1. A polymerized soil plug with a growing plant molded therein comprising a body of spongy open-celled hydrophilic polymer, a quantity of particles of soil mix distributed throughout said body of spongy polymer, and a growing plant having the roots thereof in said body of spongy polymer and having the stalk thereof extending outwardly from one surface of said body of spongy polymer, a quantity of foam-forming synthetic organic plastic resin being reacted in situ to form said body of spongy open-celled hydrophilic polymer binding said particles of soil mix therein and into a plug and binding said roots in said plug, said soil mix comprising from about 20% to about 80% by dry weight of said soil plug, said roots being distributed substantially uniformly throughout the adjacent portions of said plug and said stalk being intimately surrounded by said plug, thereby to provide a unitary self-supporting polymerized soil plug with a growing plant having its roots molded therein and its stalk molded therein and extending from one surface thereof.

4,034,509
WINDOW REGULATOR

Delbert Duane DeRees, Utica, Mich., assignor to American Motors Corporation, Detroit, Mich.
Filed Apr. 23, 1976, Ser. No. 679,537
Int. Cl.² E05F *11/44*
U.S. Cl. 49—353 **9 Claims**

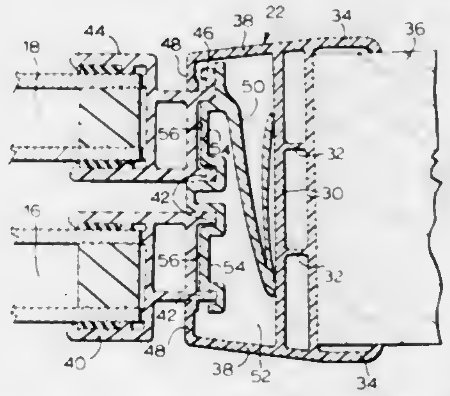


1. A window regulator for a vehicle body including a window movable between open and closed positions, the regulator comprising: a frame adapted to be mounted on the vehicle body; a control member of an L shape having long and short arms and a juncture therebetween pivotally mounted on the frame; said long arm having an outer end adapted to be connected to the window so that pivotal movement of the control member moves the window between its open and closed positions; a toggle linkage including a long link and a short link pivotally connected to each other about a first axis; means pivotally connecting the long link to the short arm of the control member about a second axis; pivotal actuator means supporting the short link on the frame for selective movement about a third axis so as to move the linkage between overlapping and extended positions and to thereby move the window between its open and closed positions; the first linkage axis moving across a line between the second and third axes upon linkage movement to either the overlapping or extended positions; and a stop mounted on the frame so as to engage and position the linkage in both its overlapping and extended positions and to thereby prevent window movement from the open or closed positions by forces applied directly to the window.

4,034,510
WINDOW CONSTRUCTION

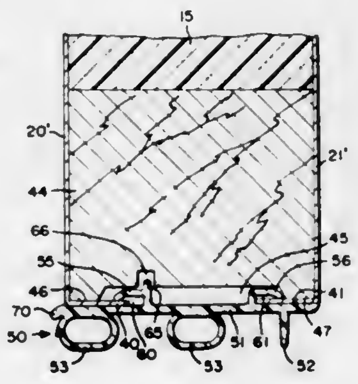
Alfred George Huelsekopf, Newmarket, Canada, assignor to Com-Dor Supply Limited, Downsview, Canada
Filed Nov. 1, 1976, Ser. No. 737,614
Int. Cl.² E05D *13/00*
U.S. Cl. 49—419 **9 Claims**

1. In a window assembly including; a plurality of frame members which provide, a header, a sill and a pair of jambs; a first window unit and a second window unit, each having a sash releasably mounted in said frame members, at least one of said frame members having, a channel extending longitudinally thereof, a first flange and a second flange on said frame member, said first and second flanges projecting from opposite sides of said channel towards one another and having first and second inner edges respectively, said first and second edges being spaced from one another to provide a passage opening into said channel, said first sash having a lip projecting laterally therefrom to overlap said first flange such that said first sash cannot be removed directly outwardly from said channel when said lip overlaps said flange, the improvement of: a sash locking member mounted within and extending longitudinally of said channel, said sash locking member having a width which is less than the width of said channel by an amount at least equal to the overlapping extent of said lip and flange and which is greater than the width of said passage so as to be laterally movable within said channel and retained within said channel by said first and second flanges, said sash locking member being resiliently urged towards said passage, said sash locking member being adapted to engage said first and second sashes when said first and second sashes are located in said passage to prevent lateral movement of said first and second sashes with respect to said sash locking member and lateral movement of said first sash with respect to said second sash, said first and second sashes engaging said frame to prevent movement of said sash locking member with respect to said frame whereby said lip cannot be moved out of said overlapping relationship with said flange when said second sash is located in said passage, said second sash being directly removable from said passage to release said sash locking member for lateral movement with respect to said frame to permit movement of said first sash to a position in which said lip is free to pass outwardly from said channel through said passage.



4,034,511
WEATHER STRIPPING CONSTRUCTION FOR METAL COVERED DOOR

William M. Bursk, Middletown, Ohio, assignor to Pease Company, Fairfield, Ohio
Filed Dec. 12, 1975, Ser. No. 640,199
Int. Cl.² E06B *7/16*
U.S. Cl. 49—488 **1 Claim**

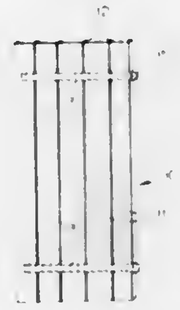


1. A door adapted for use as the exterior door of a dwelling or the like, comprising:

a. rectangular frame means including a bottom rail,
b. a separate sheet material skin covering each side of said frame means,
c. means securing said skins to the side edges of said frames,
d. said skins including substantially horizontal flange portions along the bottom edges thereof overlapping the bottom surface of said bottom rail,
e. said flange portions being dimensioned to extend inwardly towards one another less than one-half the width of said rail surface and thereby to provide an exposed strip of said surface,
f. weather stripping means underlying said rail surface and said flange portions and including:
    1. a main strip proportioned to cover said bottom rail surface and in sealing engagement with the bottom outside surfaces of said flange portions,
    2. a pair of lip members extending along the top of said main strip and cooperating therewith to define outwardly opening slots,
    3. said flange portions being received in said slots for cooperation with said lip members to attach said weather stripping means to said rail, and
    4. compressible means on the bottom side of said main strip for sealing engagement with a cooperating door sill,
g. said bottom rail surface further including a relatively narrow horizontally disposed land along each edge thereof and a lengthwise groove between said lands for receiving said lip members, said flange portion beings of sufficiently greater width than said lands to project therebeyond below said groove for reception in said slots defined by said lip members and said main strip; and
h. an upwardly projecting fin on one of said lip members forming a barrier to flow of moisture past said lip member, and means forming a supplemental groove in said rail surface for receiving said fin.

4,034,512
DOOR CONSTRUCTION

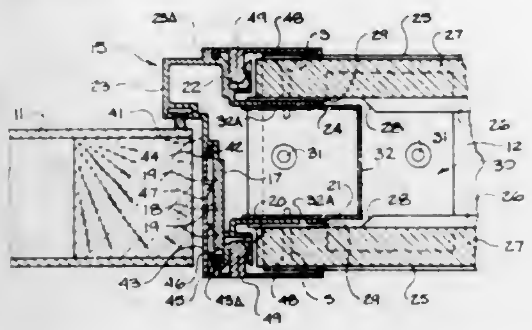
Walter Lindal, 3764 SW. 171 St., Seattle, Wash. 98166
Filed Aug. 18, 1975, Ser. No. 605,530
Int. Cl.² E06B *3/00*
U.S. Cl. 49—501 **7 Claims**



1. A door comprising a layer formed from a series of elongate vertical planks said planks being arranged in abutting side-by-side relationship and the planks being secured together by metal strips extending throughout the width of said layer in the plane of a major surface of said layer and contacting said planks in face-to-face engagement, said strips including fastener means in the form of series of integral nail-like projections extending from the strips substantially normal to the said plane and embedded in the planks of said layer, said strips extending to a lateral edge of the door and defining integral hinge means for mounting said door in a frame to pivot on an axis parallel to said edge.

4,034,513
STRUCTURAL MEMBERS FOR PANEL WALL AND DOOR MOUNTING

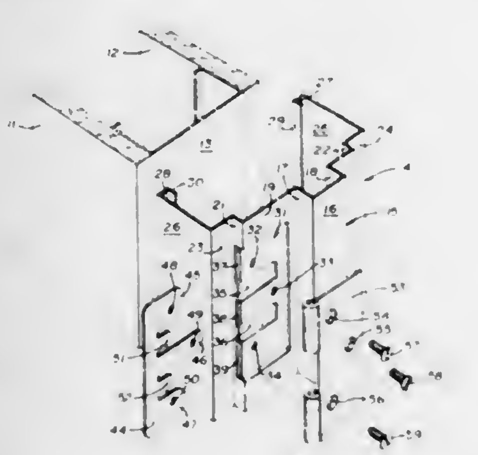
Cletus Richardson, 3419A Winnebago, St. Louis, Mo. 63118
Filed Oct. 3, 1975, Ser. No. 619,527
Int. Cl.^{2} E06B *1/04*
U.S. Cl. 49—504 **4 Claims**



1. A door mounting assembly for insertion in a panelled wall system, said assembly comprising: spaced apart jamb studs and a header member; said header member abutting said jamb studs at the upper ends thereof, said jamb studs and header member being selected from the same structural form having an elongated flat face flanked along one margin with a slot and an anchor flange and flanked along the opposite margin with a door stop rail and a slot and an anchor flange; jamb stud anchor means engaged with said anchor flanges; a finishing strip carried adjacent said elongated flat faces of said jamb studs and header member; and trim strips carried by said slots flanking said elongated flat faces of said jamb studs and said header member, said finishing strips and door stop rails defining the door receiving opening in the panelled wall system and said trim strips framing the door opening.

4,034,514
DOOR FRAME STRUCTURE HAVING QUICK MOUNTING HINGE MEANS

Eugene F. Cecil, deceased, late of Kewanee, Ill. (by Leona Cecil, administratrix), assignor to United States Gypsum Company, Chicago, Ill.
Filed Dec. 10, 1975, Ser. No. 639,538
Int. Cl.^{2} E06B *1/04, 9/38*
U.S. Cl. 49—504 **15 Claims**



1. A hinge jamb assembly adapted to be assembled in cooperation with a strike jamb and a horizontal head to form a door frame, comprising:

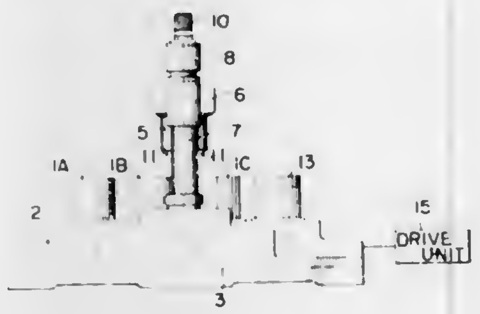
a. a hinge jamb of generally C-shaped cross-section comprising a channel-form door stop, front wall panels on each side of said door stop substantially perpendicular thereto, and main side wall panels for receiving a wall structure therebetween, the front wall panel on at least one side of said door stop having a secondary side wall panel provided with a plurality of slots therein connected to the front wall panel, and means connecting said secondary side wall panel to said main side wall panel, said front wall panel being embossed inwardly to define a hinge plate-receiving recess having a fastener-receiving aperture therein and being further inwardly embossed to define at least one alignment channel, and

b. a hinge anchor plate having a plurality of engagement tabs with fastener-engaging means provided therein adapted to be inserted into the slots of said secondary side wall panel, and at least one alignment tab adapted to be inserted into said alignment channel,

whereby a fastener means engaging a hinge plate may be inserted through the aperture in said recess and engaged with the engagement tab of said hinge anchor plate.

4,034,515
VERTICAL GRINDER

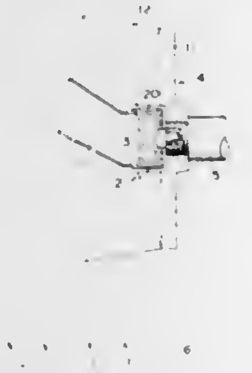
Ietatsu Ohno, 1-2, 1-chome, Kasuya, Setagaya, Tokyo, Japan
Filed Apr. 19, 1976, Ser. No. 677,985
Int. Cl.^{2} B24B *31/00;* **B08B** *3/00*
U.S. Cl. 51—7 **5 Claims**



1. A vertical grinder comprising a bed body movable in the horizontal direction, a plurality of grinding tanks containing respectively different kinds of grinding materials and arranged in parallel on said bed body, a vertically movable main spindle provided above the grinding tanks and at least one collet chuck rotatably provided on the lower end surface of said main spindle so as to fit a work.

4,034,516
CENTRIFUGAL BLASTING APPARATUS

Riichi Maeda, 30-1, Kitakata 2 chome, Ichikawa, Chiba, Japan
Continuation-in-part of Ser. No. 537,421, Dec. 30, 1974, Pat. No. 3,921,337. This application Sept. 19, 1975, Ser. No. 615,085
Claims priority, application Japan, May 17, 1974, 49-54455; May 17, 1974, 49-54456; July 19, 1974, 49-82284; Mar. 11, 1975, 50-28668; May 17, 1974, 49-54454
Int. Cl.^{2} B24C *5/06*
U.S. Cl. 51—432 **7 Claims**



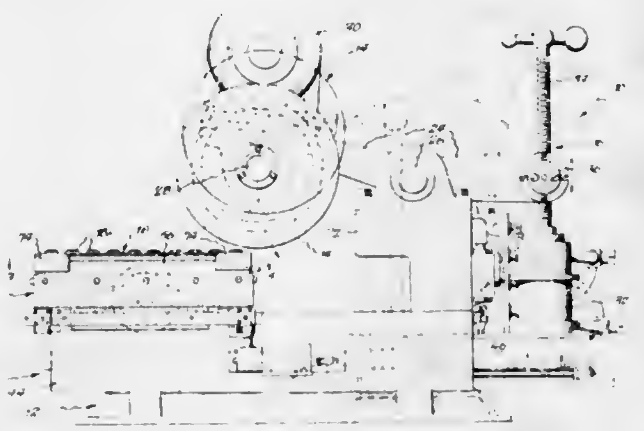
1. A centrifugal blasting apparatus including a chute, a stationary hollow cylindrical deflector connected at one open end thereof to said chute for receiving therewithin abrasive particles fed via said chute and having a feed slot extending through the peripheral wall thereof, a rotatable impeller positioned within said deflector with the axis of rotation thereof coinciding with the axis of the deflector for hurling the abrasive particles through said feed slot, a drive shaft carrying said impeller, and a rotatable blast wheel fixed to said drive shaft so as to be positioned concentrically with said deflector and rotated together with said impeller, said blast wheel comprising:

a. a disk fixed to said drive shaft; and

b. a plurality of vanes, attached to said disk and spaced equiangularly from each other, said vanes each comprising a first face having a substantially right-angled triangular configuration with a radially extending side edge and a radially inner, with respect to said drive shaft, edge and a second face having a substantially triangular configuration extending from the hypotenuse edge of said first face, at least a part of said second face slanting laterally and backwards with respect to the direction of rotation of said blast wheel, the distance from said disk to that apex of said second face which is opposite to the hypotenuse of said first face being greater than the length of the radially inner edge of said first face, the radial distance from said apex of said second face to the radially inner edge of said first face being greater than the radial length of said radially extending side edge of said first face, and said vanes being attached to said disk at said radially extending side edge of said first face in such a way that the radially inner edge of said first face toward the axis of rotation of said blast wheel and the apex of said first face remote from the axis of rotation with respect to the radially inner edge of said first face.

4,034,517
WORKPIECE FINISHING MACHINE

James W. Weatherell, and Francis R. Chesner, both of Olean, N.Y., assignors to Clair Mfg. Co., Inc., Olean, N.Y.
Filed Feb. 4, 1976, Ser. No. 655,267
Int. Cl.^{2} B24B *41/06*
U.S. Cl. 51—92 R **9 Claims**



1. In a workpiece finishing machine, the combination comprising:

a powered finishing roll;

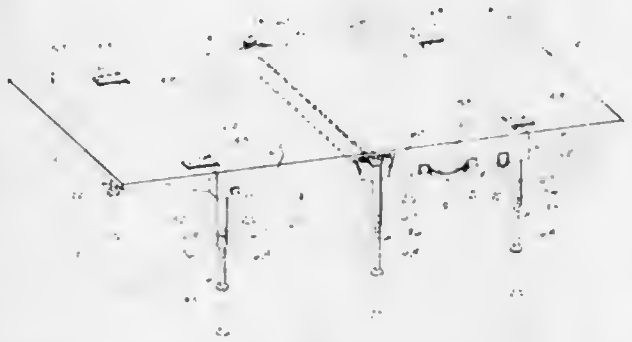
a workpiece holder having a plurality of workpiece receiving recesses opening through an upper surface thereof and a plurality of passageways arranged in flow communication with said recesses and opening through a lower surface thereof;

a work table assembly having a support surface for supportingly engaging said lower surface of said workpiece holder and means for selectively placing said passageways in flow communication with a source of vacuum, whereby to releasably retain said workpiece holder in engagement with said support surface and said workpieces seated within said recesses, said work table assembly being covered with a sheet of resiliently deformable material serving to define said support surface and including means to positionally locate said lower surface of said workpiece holder relative to said support surface, said sheet being apertured to afford flow communication with said source, and said passageways being arranged to open through said lower surface for alignment with at least certain of said apertures when said lower surface is engaged with said support surface; and

means for effecting relative movements of said support surface and said finishing roll for passing said workpieces in surface finishing engagement with said finishing roll.

4,034,518
PORTABLE COT AND TABLE CONVERTIBLE INTO CARRYING CASE

Francis J. Trecker, 7100 Mummy Mountain Road, Scottsdale, Ariz. 85253
Filed Feb. 9, 1976, Ser. No. 656,112
Int. Cl.^{2} A45F *1/00*
U.S. Cl. 5—114 **11 Claims**



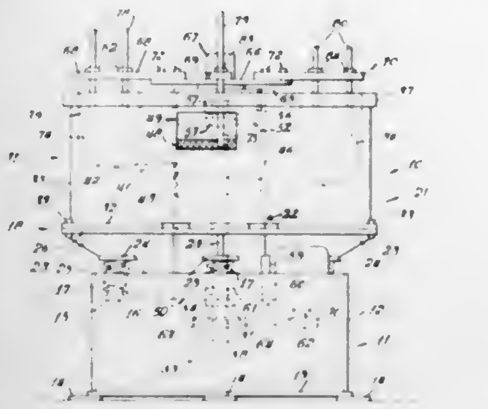
1. In a portable cot that is collapsible into a carrying case; a pair of box sections, each presenting an open side and an opposite closed side and being pivotably connected to each other so that the two box sections can be pivoted away from each other to an open position with their closed sides in the same plane to present a contiguous flat surface that a person can lie on and said box sections can be pivoted toward each other to a closed position with their open sides facing each other to form an enclosure; a pair of legs pivotably supported by each of said box sections so that said legs can be pivoted into the box section for storage and may be pivoted outwardly therefrom to operating position wherein the four legs will support the two box sections above the ground with the open sides facing the ground and the closed sides presenting a flat contiguous top in a horizontal position; and clamping means rigidly locking said two box sections together in the open position to provide rigidity and stability to the cot.

4,034,519
FINISHING APPARATUS AND METHOD HAVING COOPERATING MOVABLE PART-ISOLATING MEANS AND DISCHARGE PORT

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.
Continuation of Ser. No. 414,656, Nov. 12, 1973, Pat. No. 3,981,693. This application Jan. 14, 1976, Ser. No. 648,901
The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.
Int. Cl.^{2} B24B *31/06*
U.S. Cl. 51—163.1 **16 Claims**

1. Apparatus for treating the surface of parts or workpieces with loose finishing material while maintaining parts isolated from other parts and to prevent damage to parts as a result of collision therebetween, having a resiliently-supported vibratory finishing chamber in which the workpieces are vibrated with the finishing material, and in which the part-isolating means comprises partitions for separating the interior of the finishing chamber into individual compartments defined by adjacent partitions characterized in having, means for sup-

porting said partitions for movement along said finishing chamber and means for supporting said partitions for vibratory movement together with the contents of the finishing chamber, in having a discharge zone for discharge of the contents of an individual compartment when said individual compartment is in said discharge zone, in that said discharge



zone comprises discharge port means, and in that said adjacent partitions for part-isolation in said finishing chamber are spaced so as to straddle said discharge port means for discharge of the contents of an individual compartment, disposed between adjacent partitions, when said individual compartment is in said discharge zone and said discharge port means is in open or discharge position.

4,034,520

FINISHING APPARATUS HAVING PART-ISOLATING MEANS WHICH IS SUPPORTED FOR VIBRATION WITH THE FINISHING CHAMBER AND CARRIED ALONG BY CONTENTS THEREOF

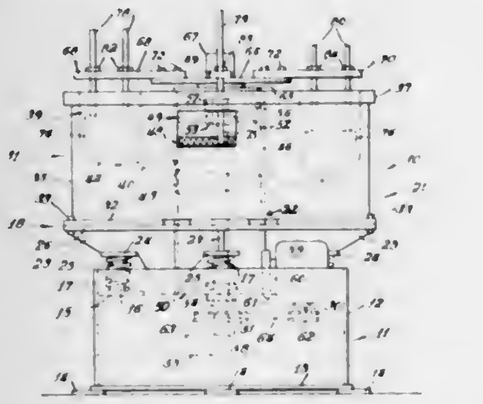
Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Continuation of Ser. No. 414,656, Nov. 12, 1973, Pat. No. 3,981,693. This application Jan. 26, 1976, Ser. No. 652,243

The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.

Int. Cl.² B24B *31/06*

U.S. Cl. 51—163.1 **17 Claims**



1. Apparatus for treating the surface of parts or workpieces with loose finishing material while maintaining parts isolated from other parts and to prevent damage to parts as a result of collision therebetween, having a resiliently-supported vibratory finishing chamber in which the parts are vibrated with the finishing material, characterized in that the part-isolating means comprises partitions for separating the interior of the finishing chamber into individual compartments defined by adjacent partitions, means for supporting said partitions for vibration with the finishing chamber and means for supporting said partitions for movement along said finishing chamber by the movement of the contents of said finishing chamber.

4,034,521

FINISHING APPARATUS HAVING PART-ISOLATING MEANS SUPPORTED AT THE FINISHING CHAMBER UPPER-EDGE REGION

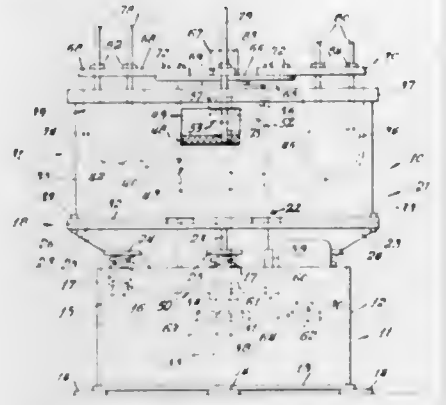
Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Continuation of Ser. No. 414,656, Nov. 12, 1973, Pat. No. 3,981,693. This application Dec. 17, 1975, Ser. No. 641,553

The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.

Int. Cl.² B24B *31/06*

U.S. Cl. 51—163.1 **39 Claims**



1. Apparatus for treating the surface of parts or workpieces with loose finishing material while maintaining parts and isolated from other parts to prevent and damage to parts as a result of collision therebetween, having a resiliently-supported vibratory finishing chamber in which the workpieces are vibrated with the finishing material, characterized in that the part-isolating means comprises transverse walls for separating the interior of the finishing chamber into individual chambers, which walls are adapted to be carried along by the contents of the finishing chamber and support means for supporting said walls on said chamber in the region of the upper edge of the finishing chamber or container for such movement with the contents of the finishing chamber.

4,034,522

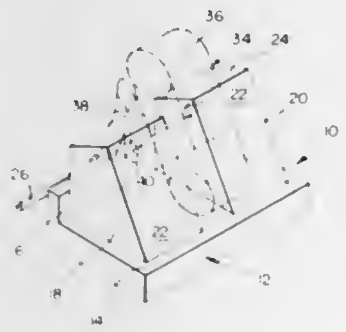
PORTABLE BELT SANDER STAND

John Miller, Box 79, S. Chatham, Mass. 02659

Filed Mar. 25, 1976, Ser. No. 670,574

Int. Cl.² B24B *41/00*

U.S. Cl. 51—166 R **7 Claims**



1. A support stand for a portable power tool having a handle and trigger for actuating operation of the tool when depressed, said stand comprising:

a base,

a pair of spaced upright blocks mounted on said base adapted to receive therebetween the handle of said power tool supported on said base, and

means connected to said blocks spanning the space between said blocks for insertion through the handle of said tool inserted between said blocks to depress the trigger of the tool and maintain said trigger in its depressed state to operate said tool,

said last name means including

a rod,

means on one of said blocks for swivelly receiving one end of said rod, and

stop means on the other end of said blocks for holding said rod stationary.

4,034,523

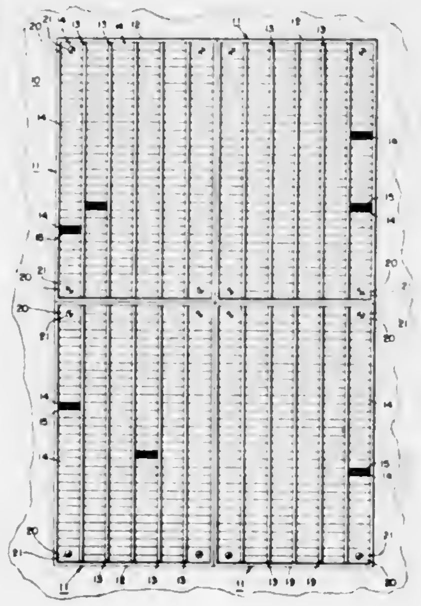
GRAFFITI PROTECTION

Reginald E. Saunders, 620 W. Diamond St., Philadelphia, Pa. 19122

Filed Oct. 2, 1975, Ser. No. 618,786

Int. Cl.² G09B *1/00;* **G09F** *11/02*

U.S. Cl. 52—29 **5 Claims**



1. Apparatus for protecting surfaces from graffiti comprising:

a plurality of rollers positioned adjacent each other and being individually rotatable to expose different portions of their surfaces;

said rollers being adapted to be positioned and maintained in position before the surface to be protected;

said rollers being of size and number to cover substantially the entire surface to be protected; wherein the rollers are mounted in a frame constructed and arranged to be positioned in front of the surface to be protected,

said apparatus comprising means to prevent axial movement of the rollers within the frame;

said rollers being mounted in the frame in a plurality of columns positioned side by side, said columns being defined by channel members, said channel members being secured to the frame;

wherein at least some of the channel members being spaced apart by the length of a roller.

4,034,524

MOVABLE PARTITION

Klaus Fromme, and Bernd Walther, both of Oldenburg, Germany, assignors to Firma Justin Huppe, Oldenburg, Germany

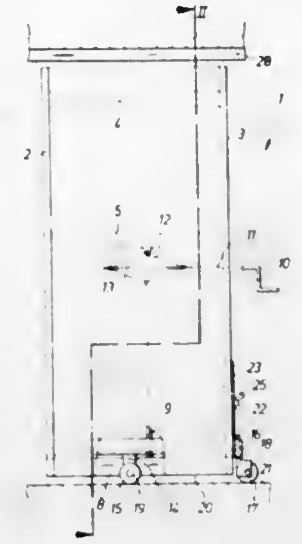
Filed Aug. 8, 1975, Ser. No. 603,003

Claims priority, application Germany, Aug. 14, 1974, 2438982

Int. Cl.² E04D *15/00*

U.S. Cl. 52—122 **8 Claims**

1. A movable partition comprising: a vertical wall element, means mounting a caster at the bottom of said wall element for moving said wall element to and from operating position, a pressure strip at the bottom of said wall element, substantially the same length as said wall element and interfitting therewith to seal said wall element to a floor, and pressure means for acting between said wall element and said pressure strip independently of said caster and of said caster mounting means for extending said pressure strip downwards relative to said wall element against the floor and thereby raising said wall element to lift said caster from the floor and to raise the top of said wall element against the ceiling.



4,034,525

STAIR STRUCTURE

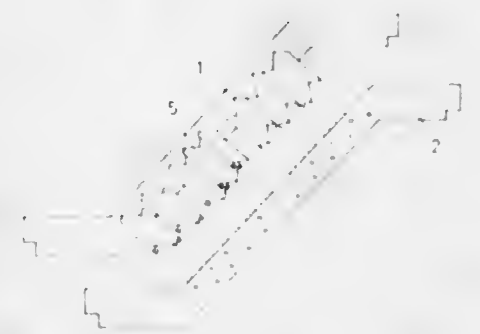
Seibun Yokomori, c/o Kabushiki Kaisha Yokomori Seisakusho, 29-2, Hatagaya 1-chome, Shibuya, Tokyo, Japan

Filed Sept. 16, 1975, Ser. No. 614,027

Claims priority, application Japan, Jan. 16, 1975, 50-7933[U]; Apr. 18, 1975, 50-53775[U]

Int. Cl.² E04F *11/00*

U.S. Cl. 52—188 **11 Claims**



1. A stairway structure comprising:

two parallel stringers spaced from each other, said stringers having a plurality of regularly-spaced holes therethrough;

a plurality of adjacent step member means for providing a stairway surface fitted between said stringers and having openings therethrough aligned with said regularly-spaced holes in said stringers, each step means comprised of:

a vertical plate-like member having a first rolled portion across one end thereof, said rolled portion forming a first opening therethrough,

a first horizontal plate-like member having a second rolled portion at one end thereof, said second rolled portion forming a second opening therethrough, said horizontal plate-like member being integrally formed with said vertical plate-like member at the end of said vertical plate-like member opposite said first rolled portion, said second opening being substantially the same size as said first opening, and

said first rolled portion of each step **member means is** positioned parallel to and is horizontally spaced from said second rolled portion of the step member means adjacent thereto; and

a plurality of fastening means fitted through said first and second openings in said step member means and fitted into said holes in said stringers for fastening said step member means to said stringers, whereby a stairway is formed.

4,034,526
STRUCTURE FOR PROVIDING AN ARCHITECTURAL SYSTEM AND METHOD FOR MAKING SUCH SYSTEM

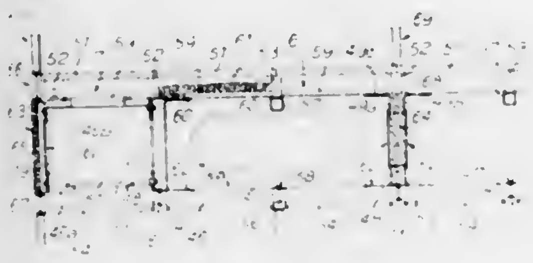
Francois G. Deslaugiers, 93, rue Didot, 75014 Paris, France

Filed Sept. 5, 1975, Ser. No. 610,898

Claims priority, application France, Sept. 10, 1974, 74.30634

Int. Cl.² E04B *5/48, 5/14*

U.S. Cl. 52—220 **13 Claims**



1. A modular autostable structure for an architectural system, said structure serving to divide the space occupied by said system and comprising:

a horizontal square meshed reference grill formed by two orthogonally directed sheets, each formed of rectilinear strips of width i spaced uniformly a distance p so that said grid is provided with squares with sides $p-i$ separated from the adjacent squares by a gap of width i; hollow cylindrical vertical supporting members each having a vertical axis passing through the center of a square in said grid;

horizontal supporting and supported members in the form of hollow bodies of the same external vertical dimensions and having vertical side walls provided with openings and internal transverse vertical partitions also provided with openings, said horizontal members having external horizontal dimensions which can be expressed as $mp+i$, kp or $np-i$, where m, k and n are positive integers, said horizontal members being arranged in a horizontal plane corresponding to one level of said system, in accordance with said reference grid, each of said horizontal supporting members connecting two vertical supporting members, the parallel adjacent horizontal members being separated by a gap of width i corresponding to one strip of said reference grid, and the internal space of said horizontal members forming a continuous space communicating with the internal space of at least one of said vertical supporting members, and having a plurality of access points to provide a duct for conveying fluids and current; and

connecting means connecting in strictly reversible manner the horizontal supporting members to the vertical supporting members and each horizontal supported member to at least one other horizontal member, said connecting means mechanically connecting resistant portions of said horizontal members, said resistant portions being constituted by said vertical side walls and transverse partitions, to ensure the continuity of said resistant portions in both directions of said reference grid.

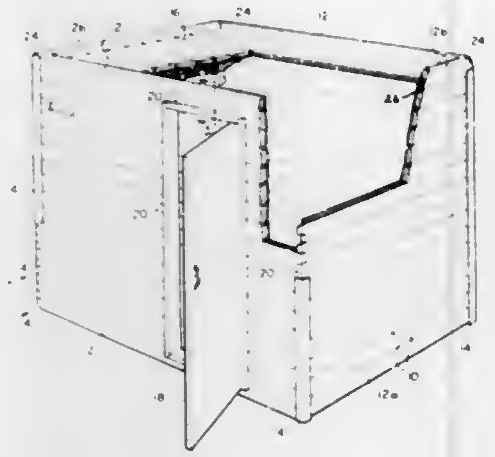
4,034,527
LOG CABIN CONSTRUCTION

Bert (Pertti) Olavi Jalasjaa, 519 Weber St. N., Waterloo, Ontario, Canada

Filed Mar. 15, 1976, Ser. No. 667,198

Int. Cl.² E04B *1/00;* **E04C** *1/10*

U.S. Cl. 52—233 **6 Claims**



1. A log wall corner construction for use in the construction of corners in the walls of log cabin type structures and the like wherein the walls of such log cabin or the like structures are formed of tongued and grooved planks laid edge to edge, with end portions of said planks arranged in pairs in interlocking overlying relation, a said pair comprising;

a first end portion of a first said plank, said first end portion having an end face and inner and outer faces, and upper and lower edges;

notch means formed in said first end portion, extending from a said edge to about an intermediate point of said first plank and extending from said inner to said outer face thereof;

an interlocking block portion, defined by a portion of said end of said first plank adjacent said notch means;

a second end portion of a second said plank, having an end face and inner and outer faces, and upper and lower edges;

notch means formed in said second end portion extending from a said edge to an intermediate point thereof and extending from said inner face to said outer face dimensioned to receive said block portion of said first end portion;

an interlocking block portion defined by a portion of said end of said second plank adjacent said notch means;

two sealing surfaces formed on one said end portion, transversely of the longitudinal axis of said plank adjacent said notch means, one said sealing surface being directed substantially towards said end, and the other sealing surface being directed inwardly whereby to form a projecting shoulder;

two sealing surfaces formed on the other said end portion extending transversely of the longitudinal axis of said plank forming a complementary recess being dimensioned and oriented to receive said projecting shoulder on said one end portion, whereby when said two end portions are interlocked with one another with the block portion of one said end portion located within the notch means of the other said end portion , and said block portions overlapping and registering one above the other, said sealing surfaces interengage and abut with one another, and,

fastening opening means in said block portions of both first and second end portions whereby fastening means may be interengaged between said overlapping block portions and operable to set up forces operating in a plane parallel to the axis of said planks diagonally across said corner whereby to draw said sealing surfaces into pressurized sealing engagement with said projecting shoulder fitting tightly into said complementary recess.

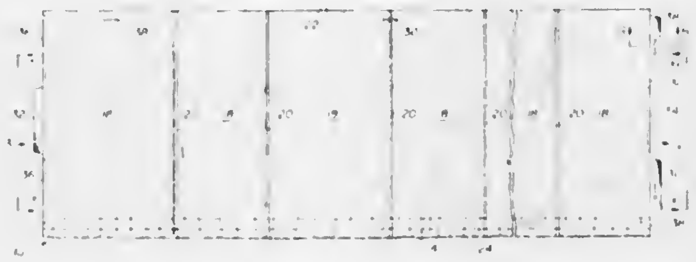
4,034,528
INSULATING VINYL SIDING

Stanley J. Sanders, Roslyn, and Vincent Fava, Massapequa, both of N.Y., assignors to Aegean Industries, Inc., Roslyn, N.Y.

Filed June 18, 1976, Ser. No. 697,416

Int. Cl.² E04D *1/34, 1/20, 1/28*

U.S. Cl. 52—309.4 **10 Claims**



1. An elongate generally planar laminar construction adapted to be nailed to a subsurface for use as a siding unit for home installation, said unit having substantial insulation value, said construction comprising a continuous decorative self-supporting outer facing layer composed of a thermoplastic polymer, said facing layer exhibiting a detailed surface geometry; said facing layer having extended top and bottom edges to form, respectively, a cooperating and mating tongue-and-groove arrangement, for interengagement with other such siding units; an inert at least semi-rigid foam filler as an internal thermal barrier, and a metallic foil backing layer being directly bonded to said filler to provide an integral coherent structure; the rear surface of the top edge portion of said siding unit being tapered forwardly to thereby form a gap between said siding unit and said subsurface to which said structure is fastened, the bottom edge of said siding unit having a depending flange portion whereby the depending flange portion of an upper disposed siding unit is adapted to be seated in the gap formed between the top edge of a lower disposed siding unit and the subsurface to thereby provide a rigid connection between said siding units, said unit providing per square foot an insulation value equivalent to at least standard fiberglass insulation.

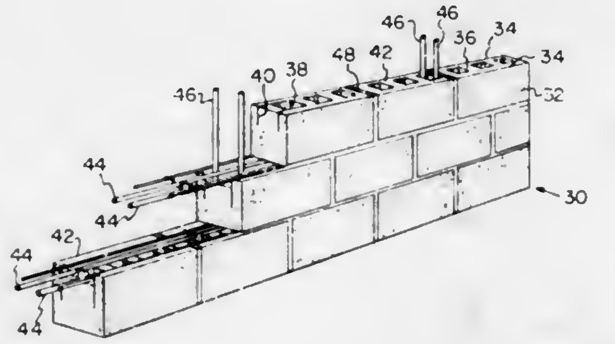
4,034,529
REBAR BOLSTER FOR SOLID GROUTED WALLS

Donald L. Lampus, 109 Cornwall Drive, O'Hara Township, Allegheny County, Pa. 15238

Filed June 3, 1976, Ser. No. 692,588

Int. Cl.² E04B *2/40*

U.S. Cl. 52—426 **4 Claims**



1. In a solid grouted wall formed of layers of blocks, with each layer defined by a plurality of blocks positioned in end to end relationship and having parallel face shells and spaces therebetween, and rebar extending along said spaces, the improvement comprising rebar supports comprising two parallel and laterally spaced longitudinally extending rods and a plurality of cross rod members positioned between the rods in spaced relationship and welded to each of the parallel rods along a surface thereof, each cross rod member positioned in a space between face shells and including at least one substantially U-shaped trough bent formed in the cross rod member and extending below the plane of the longitudinally extending rods a predetermined distance to maintain the rebar at or below said plane, said trough in adjacent cross rod members being aligned to accommodate the rebar, said longitudinally extending rods positioned on adjacent face shells to reinforce mortar joints and said cross rod members being in substantially vertical alignment from layer to layer to provide support for vertically positioned rebar

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4,034,530
SHEET METAL ROOFING SYSTEM

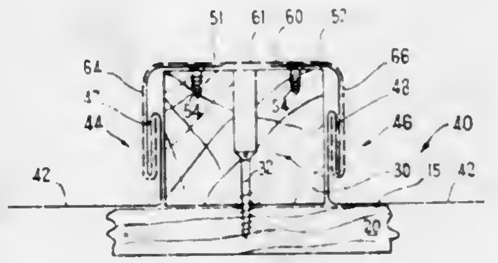
Louis Léonce Vallee, 6392 Maubourg Ave., Montreal, Quebec, Canada (H1M 2C8)

Filed Oct. 3, 1975, Ser. No. 619,504

Claims priority, application Canada, Aug. 21, 1975, 233923

Int. Cl.² E04D *3/366, 3/40*

U.S. Cl. 52—463 **13 Claims**



1. An improved metal roof covering comprising a plurality of parallel, equally spaced apart batten supports secured to said roof and extending in the direction of the slope of the roof, a plurality of pan sections each having a central region and two identical vertically projecting side walls with an inner downwardly directed double fold along each wall parallel to said central section and vertically spaced thereabove a short distance, each side wall terminating in a narrow strip located above the double fold for driving fasteners therethrough into the adjacent batten, there being no other fasteners to hold said pan sections in place on said roof, and a batten support covering cap made of thin sheet metal folded in the shape of an inverted U whose depending wings terminate into inner upwardly directed edges for fitting under said double folds.

4,034,531
CEILING SYSTEM

Henry A. Balinski, Hoffman Estates, Ill., assignor to United States Gypsum Company, Chicago, Ill.

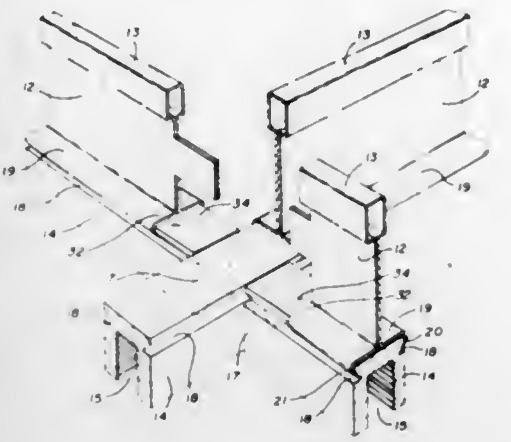
Filed Apr. 2, 1976, Ser. No. 672.949

Int. Cl.² E04B *5/52, 3/54*

U.S. Cl. 52—484 **8 Claims**

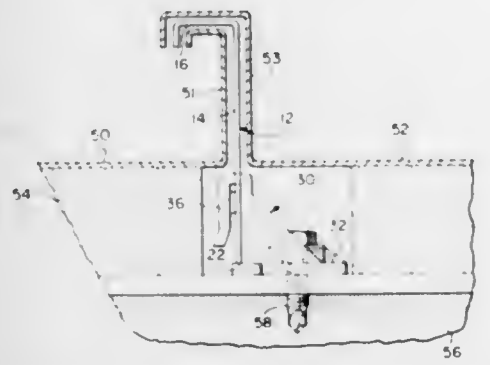
1. A suspended ceiling in which suspended ceiling panels are retained in place even though an exposed supporting ceiling runner is exposed to heat sufficient to cause deformation of the exposed portion, said ceiling comprising a plurality of interconnected support runners connected to a supporting structure and having ceiling panels resting on the support runners, said support runners comprising a decorative trim having a decorative lower surface and an engageable upper surface, and an inverted-T runner supportingly and movably engaged about the engageable upper surface of the decorative trim and extending along the decorative trim a distance sufficiently less than the length of the trim to prevent heat distor-

tion of the inverted-T runner; whereby when the ceiling system is exposed to heat the inverted-T runner continues to hold the ceiling even though the decorative trim becomes inoperable due to expansion caused by the heat.



4,034,532
ROOF HOLD DOWN CLIP ASSEMBLY

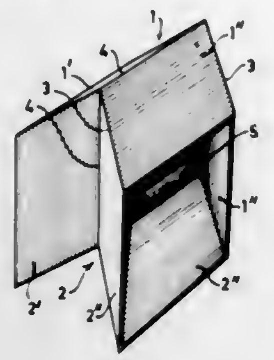
Ernest William Reinwall, Jr., McHenry, Ill., assignor to Illinois Tool Works Inc., Chicago, Ill.
Filed May 13, 1976, Ser. No. 685,839
Int. Cl.^{2} E04D *3/364*
U.S. Cl. 52—520 **9 Claims**



1. A roof hold down clip assembly including a clip member for engaging and retaining abutting edges of roof deck panels and an attachment foot member for securing the clip member to a support structure while allowing relative longitudinal movement between said members, the clip member including an upstanding web with a longitudinal upper edge defined by a flange extending laterally of the web in one direction, an elongate slot of a predetermined length formed in the web extending longitudinally between the margins thereof, the attachment foot member including a base with an upstanding leg section and a hook section with a predetermined width extending from the leg section, the width of the hook section being less than the predetermined length of the slot in the web, the foot member and clip member including cooperating means releasably retaining said members in a first longitudinal position relative to each other with said releasable means being in the form of a mating hole and protuberance means on the web of the clip and the foot member, allowing relative longitudinal movement between the two members when the base has been secured to the support structure and the flange cooperates with abutting edges of roof deck panels to secure said edges to the clip member.

4,034,533
BUILDING ELEMENT

Albertus Maria Faas, Sluisweg 2, Arkel, Netherlands
Filed Sept. 17, 1975, Ser. No. 614,325
Claims priority, application Netherlands, Sept. 25, 1974, 7412684
Int. Cl.^{2} E04C *1/10*
U.S. Cl. 52—589 **3 Claims**



1. A collapsible building element comprising:

no more than four face structures (1, 2) hingedly connected to each other, including a front face structure and a lower face structure, and a back face structure and an upper face structure, forming identical pairs;

said face structures (1, 2) being prismatically V-shaped so that said front and lower face structures (2) are inwardly-extending, and said back and upper face structures (1) are outwardly-extending;

said front and back V-shaped face structures being opposing and complementary in shape;

said upper and lower V-shaped face structures being opposing and complementary in shape;

all of said faces (1′, 1″, 2′, 2″) being interconnected by folding lines (3, 4) so that said building element may be collapsed and folded into a flat configuration (FIG. 3);

said folding lines (3, 4) including a V-shaped folding line (3) disposed between adjacent V-shaped face structures (1, 2) and a straight center folding line (4) disposed between said two faces (1′, 1″) of each of said V-shaped face structures (1);

said building element further including a detachable intermediary member (5) removably positioned within said building element to border on said straight center folding lines (4) so that said building element is form-retaining and rigid when in a folded-out configuration (FIG. 2) and to prevent unintended folding of said building element into said flat configuration (FIG. 3); and

said building element being made entirely of sheet material and being completely hollow and empty except for said detachable intermediary member (5) which is removably positioned within said building element to border on said straight center folding lines (4) when said building element is in said form-retaining and rigid folded-out configuration (FIG. 2).

4,034,534
LOUVERED CEILING

John Ludlum Taylor, Jagerslaan, Netherlands, assignor to Intalite International, Willemstaad, Netherlands Antilles
Continuation-in-part of Ser. No. 462,423, April 19, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,724
Claims priority, application Canada, Apr. 30, 1973, 169893
Int. Cl.^{2} E04C *2/42*
U.S. Cl. 52—668 **7 Claims**

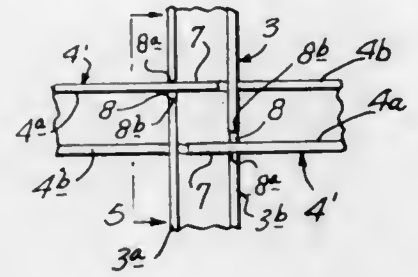
1. A light transmitting, louvered ceiling assembly comprising:

a. at least one runner of upwardly open channel section, comprising a first side-wall, a second side-wall and a base wall joining said side-walls;

b. a louver comprising first and second sections, adapted to be supported on said runner, each of said first and second sections comprising at least one upwardly open channel member having a third side-wall, a fourth side-wall and a base wall joining said side-walls;

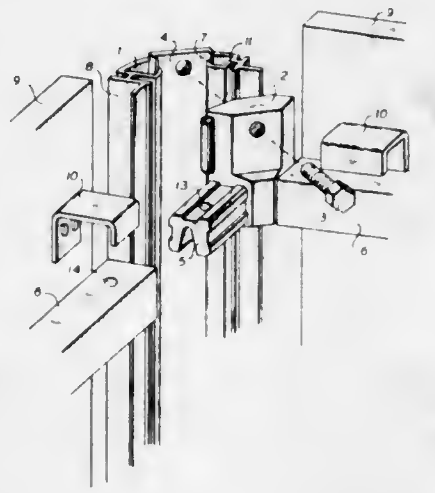
c. a downwardly extending slot disposed in each of said first and second side-walls of said runner, each of said slots having widened upper portion, a narrowed lower portion and a substantially vertical edge, the vertical edges of the slots in said first and second side-walls being offset from each other by a distance substantially equal to the spacing between said third and fourth side-walls;

d. each of said third side-walls comprising a downwardly extending hook-shaped extension, the extension from said first louver section being engaged in the slot in said runner first side-wall and the extension from said second louver section being engaged in the slot in said runner second side-wall, said extensions projecting within said runner channel, said third side-walls abutting against said vertical edges of said slots in proximity to said extensions, the fourth side-wall of said first louver section terminating in a substantially vertical edge which abuts against said runner first side-wall and the fourth side-wall of said second louver section terminating in a substantially vertical edge which abuts against said runner second side-wall, so as to prevent light leakage through said widened slot portions.



4,034,535
BUILDING SET FOR A BASE CONSTRUCTION OF A PILLAR CASING

Heinrich Dustmann, Dortmund-Kruckel, Germany, assignor to Dula-Werke Dustmann & Co., Dortmund, Germany
Filed July 21, 1975, Ser. No. 597,958
Claims priority, application Germany, July 29, 1974, 258314
Int. Cl.^{2} E04C *3/30*
U.S. Cl. 52—727 **11 Claims**



1. A kit having component parts capable of being assembled about a pillar to provide a facing for the pillar comprising:

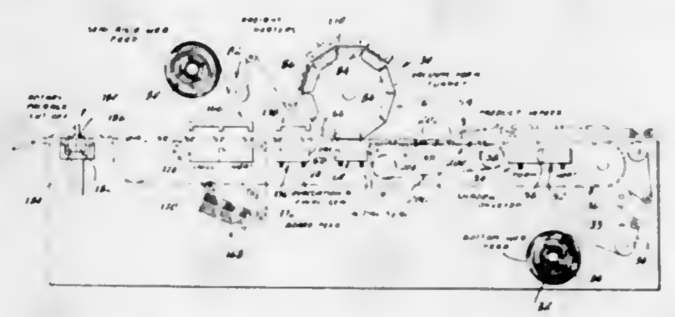
corner channels for disposition upright and at spaced intervals about the pillar each having two inwardly disposed confronting, spaced longitudinal flanges, and a back plate engaging the longitudinal flanges, of each corner channel, two sliding blocks for being secured to each corner channel by fastening thereof to the back plate of the channel at any desired elevation to provide one set of sliding blocks at a first elevation and a second set of sliding blocks at a second elevation spaced from the first elevation, and means for said fastening of the sliding blocks to the back plates,

a set of cross members for each set of sliding blocks joinable with the sliding blocks to provide two frames one at each of said elevations, surrounding the pillar, and facing panels and means for securing the facing panels to the frames for providing said facing for the pillar,

the sliding blocks having two lugs for mounting of the cross members on the sliding blocks with the lugs fitting matingly into the ends of the cross members.

4,034,536
PACKAGING APPARATUS AND TECHNIQUES

Reid A. Mahaffy, Montclair; Joel A. Hamilton, Englewood, and Wesley W. Pinney, Upper Montclair, all of N.J., assignors to Mahaffy & Harder Engineering Company, Totowa, N.J.
Continuation of Ser. No. 695,022, June 11, 1976, which is a continuation of Ser. No. 579,939, May 22, 1975, which is a continuation of Ser. No. 427,790, Dec. 23, 1973, which is a division of Ser. No. 258,320, May 31, 1972, Pat. No. 3,805,486. This application Nov. 26, 1976, Ser. No. 745,296
Int. Cl.^{2} B65B *31/02*
U.S. Cl. 53—22 A **10 Claims**



8. In a process for producing vacuum packaging comprising upper and lower sheets of packaging material sealed together around peripheral flanges with a packaged product therebetween, the interior regions of both sheets being formed outwardly in opposite directions, away from the peripheral flanges such that an upper segment of said product is above the flanges and a lower segment is below said flanges;

the improved method comprising the steps of:

placing the product with the adjacent two sheets of packaging material in an evacuation-and-seal chamber having separate isolated spaces above and below the packaging material;

evacuating said isolated spaces while evacuating the interior of the package;

applying sealing heat to said package material after evacuation of the packages has been effected; and

sequentially venting said spaces to atmosphere to develop an upwardly-directed force on the lower sheet of packaging material to push the product up against the upper sheet.

4,034,537

METHOD AND APPARATUS FOR THE CONTINUOUS MANUFACTURE OF PACKAGES FOR LIQUIDS

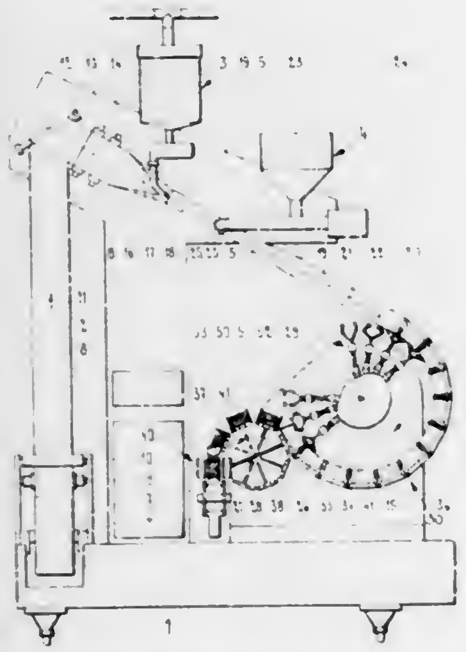
Wilhelm Reil, Bensheim-Auerbach, and Jörg Trabitzsch, Seeheim, both of Germany, assignors to Altstadter Verpackungs-Vertriebs GmbH, Hessen, Germany

Continuation of Ser. No. 489,838, July 18, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,414

Claims priority, application Germany, July 26, 1973, 2337939

Int. Cl.^{2} B65B *9/08*

U.S. Cl. 53—28 **19 Claims**



1. A method of making liquid filled packages wherein a web of material which is impervious to liquid on at least one side is folded and longitudinally welded to form a continuous tube having precreased therein all fold lines necessary for forming the packages, and the tube is filled with the liquid, including the steps of passing the filled tube continuously through a first part circular path while partly shaping the tube into longitudinally joined individual packages and shaping first side walls of the packages, said first side walls being on the radially inner side of said circular path of the tube, transversely welding the tube and separating the tube into individual partly shaped packages as the tube moves in said first part circular path and passing the packages through a second part circular path of opposite curvature to said first path, said partly shaped packages being folded and shaped to define second side walls opposite to said first side walls while passing through said second path.

4,034,538

METHOD AND APPARATUS FOR PRODUCING A CONTAINER

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany

Division of Ser. No. 495,741, Aug. 8, 1974, Pat. No. 3,956,865. This application Jan. 26, 1976, Ser. No. 652,016

Claims priority, application United Kingdom, Sept. 5, 1973, 41744/73

Int. Cl.^{2} B65B *19/04*

U.S. Cl. 53—148 **4 Claims**

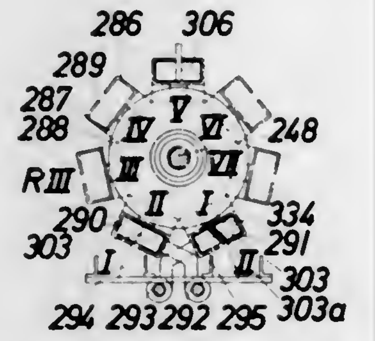
1. Apparatus in a cigarette packing machine for wrapping cigarette blocks and for feeding the blocks to a packing station, the apparatus comprising, in combination:

a. feeding revolver provided with at least three revolver cells angularly spaced about the axis of rotation of said revolver;

b. elongate conveying means defining at least two movable conveyor surfaces each to convey an individual succession of said cigarette blocks towards at least two of said revolver cells on said two revolver cells being situated at a charging station;

c. a plurality of transfer cells each pivotably mounted to be angularly displaceable between a first position, in which said transfer cells are disposed adjacent respective ones of said conveyor surfaces, and a second position in which said transfer cells are disposed in alignment with respective ones of said revolver cells at said charging station, one wall of each said transfer cell being provided with a slot therethrough;

d. a plurality of push-rods each mounted to be reciprocatably displaceable from a retracted position to an extended position and each carrying a pusher member adapted — during a forward stroke displacement of said push-rod — to be displaceable through a respective one of said transfer cells to displace an individual one of said cigarette blocks of each respective succession into a respective one of said at least two revolver cells at said charging station, each said push-rod being so disposed relative to said slot in said one wall of said respective transfer cell as to permit — on said pusher member being disposed in said extended position — said transfer cell to be angularly displaced from said second position to said first position;



e. means to rotate said revolver stepwise to bring each of said revolver cells successively to an output station situated adjacent said packing station; and

f. discharge means to discharge said cigarette block from said revolver cell at said output station.

4,034,539

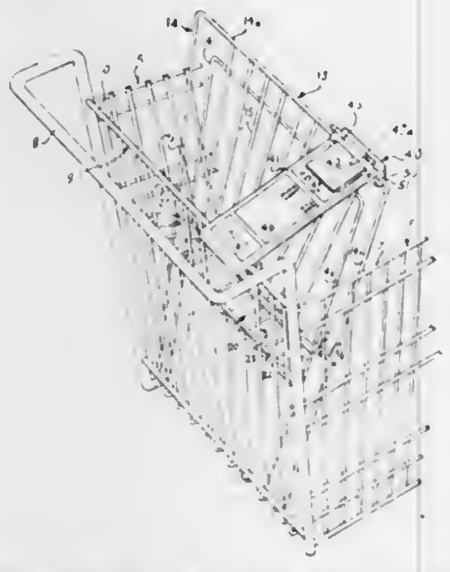
ATTACHMENT FOR SHOPPING CART

George C. Economy, 1807 Meadowdale Ave., Atlanta, Ga. 30306

Filed Nov. 24, 1975, Ser. No. 634,768

Int. Cl.^{2} G09F *21/00*

U.S. Cl. 40—308 **1 Claim**



1. In a shopping cart of the type including an open top basket with a rear wall pivotably supported at its upper portion about a horizontal axis so that its lower portion is swingable inwardly into the basket and an inner wall pivotally supported at its lower end to said rear wall with its upper portion swingable toward and away from the upper portion of said rear wall between positions adjacent said rear wall and spaced away from said rear wall, the combination therewith of an attachment connected at one of its end portions to the upper portion of said inner wall and of a length sufficient to extend over the upper portion of said rear wall when said inner wall is spaced away from said rear wall, said attachment being pivotable with respect to the inner wall so that it rests upon and is supported by the upper portion of said rear wall when said inner wall is spaced away from said rear wall and is slidable over the upper portion of said rear walls as said inner wall is moved toward or away from said rear wall and hangs in a downward attitude from said inner wall when said inner wall is adjacent said rear wall said attachment comprises a platform with a substantially flat surface facing upwardly when said inner wall is spaced away from said rear wall and said attachment rests upon the upper portion of said rear wall.

4,034,540

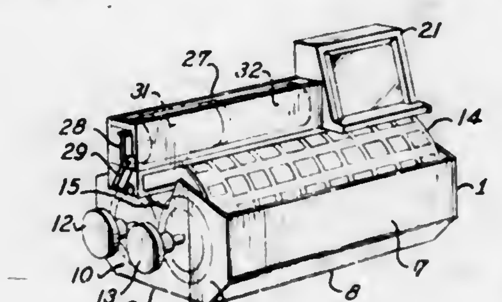
PORTABLE DUAL SPOOL MICROFILM READING DEVICE

Gary J. Rutherford, Atlanta, Ga., assignor to Microscroll, Inc., Atlanta, Ga.

Filed July 18, 1975, Ser. No. 597,041

Int. Cl.^{2} G09F *11/24*

U.S. Cl. 40—86 A **4 Claims**



1. A portable cassette reading device for reading microfilm having microphotographic images disposed thereon in frames located in rows and columns on said microfilm and for accessing any desired frame; comprising,

a roll microfilm cassette manufactured having two rotatable spools with said microfilm wound thereon, said cassette including manually operated means for winding said microfilm from one spool to the other in the row direction and track means running parallel to said spools in the column direction, a viewing area being located intermediate said spools adjacent to the front surface of said microfilm and running in the column direction,

a direct view-type microfilm reader, and

mounting means, removable from said cassette, for mounting said direct view-type microfilm reader on said track means for movement over and along said viewing area, said mounting means including means for mounting a lamp at a position behind the rear surface of said microfilm for illuminating the same frame as said reader is viewing and for movement with said reader, whereby any desired frame may be accessed by operating said means for winding to access a column of the desired frame and by moving said direct view-type microfilm reader and said lamp on said track means to access the row of the desired frame.

4,034,541

KNIFE OR FLAIL ATTACHMENT FOR FLAIL TYPE HARVESTER

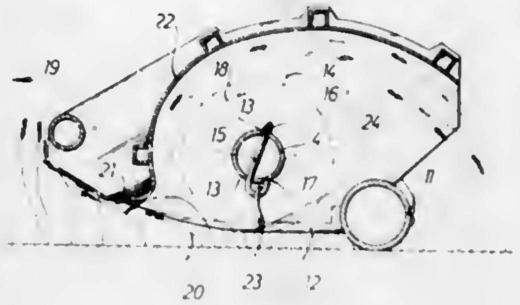
Alexander Jan Vogelenzang, Wageningsestraat 28, Andelst, Netherlands

Filed Mar. 3, 1976, Ser. No. 663,536

Claims priority, application Netherlands, Mar. 5, 1975, 7502630

Int. Cl.^{2} A01D *55/22*

U.S. Cl. 56—294 **6 Claims**



1. In a flail type harvester:

a horizontally extending rotor shaft having a connection hole extending inwardly from the periphery of said rotor shaft, said shaft further having a recess therein;

a flail having a hole therethrough;

and coupling means for connecting said flail to said rotor shaft, said coupling means comprising a bolt portion having a threaded portion at one end and extending through said connection hole in said rotor shaft, means for securing said bolt portion to said rotor shaft, and said coupling means further comprising a clamp portion including a hook connected to said bolt portion, said hook having its open portion facing the periphery of said rotor shaft and extending through said hole in said flail for pivotally receiving said flail thereon, said hook having an end which engages said recess on said rotor shaft.

4,034,542

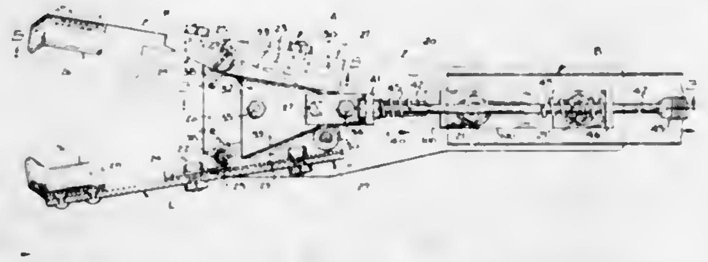
FRUIT PICKING IMPLEMENTS

Lesile K. Loehr, 530 Georgine Road, Fallbrook, Calif. 92028

Filed Apr. 19, 1976, Ser. No. 678,200

Int. Cl.^{2} A01D *46/24*

U.S. Cl. 56—333 **7 Claims**



1. An implement for picking fruit from a fruit-bearing tree comprising: a picking pole; a pair of fruit-grasping fingers mounted on one end of said picking pole such that relative movement toward and away from each other can occur between said fingers; first means associated with said one end of the picking pole and with said pair of fingers for causing one of said fingers to move into a fruit-grasping position with the other of said fingers; and second means for actuating the first means such that the pair of fruit-grasping fingers is effective for firmly gripping and holding fruit, said second means comprising; a spring connected to the first means, a latching mechanism connected to the spring, and a manually-operable force-applying element associated with the picking pole and connected to the latching mechanism for applying an actuating force through the latching mechanism and the spring to said first means such that manual operation of the force-applying element is effective for causing the fruit gripping action of the

pair of fingers and for activating the latching mechanism for causing the fruit-holding action of said pair of fingers.

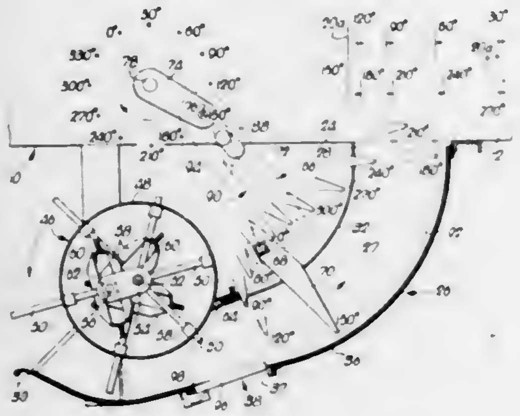
4,034,543
CROP DENSITY SENSING MECHANISM FOR BALER LOADING APPARATUS

Harold William Voth, Newton, and Allen Andrew White, Peabody, both of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Apr. 9, 1976, Ser. No. 675,475

Int. Cl.² A01D *39/00*

U.S. Cl. 56—341 **14 Claims**



1. In a baler:
a hollow bale case defining a baling chamber;
a plunger reciprocable within said chamber,
said case having an inlet for admitting a charge of material to the chamber for compaction by the plunger during its reciprocation;
a loading duct leading to said inlet;
apparatus for continuously feeding material into said duct to accumulate a charge of predetermined characteristics;
a loader for cyclically stuffing the charge from said duct into the chamber in timed relationship to reciprocation of the plunger; and
mechanism for temporarily deactivating the loader between cycles if a charge having said predetermined characteristics fails to accumulate in said duct during the preceding stuffing cycle,
said duct having an entry end remote from said inlet of the bale case,
said mechanism including a sensor adjacent said entry end and responsive to the density of the accumulating charge in said duct to control said deactivation.

4,034,544
METHOD AND APPARATUS FOR PRODUCING PLIED YARN AND PRODUCT THEREOF

Robert J. Clarkson, Winnsboro, S.C., assignor to Uniroyal Inc., New York, N.Y.

Continuation-in-part of Ser. No. 363,986, May 25, 1973, Pat. No. 3,820,316. This application June 11, 1974, Ser. No. 478,542

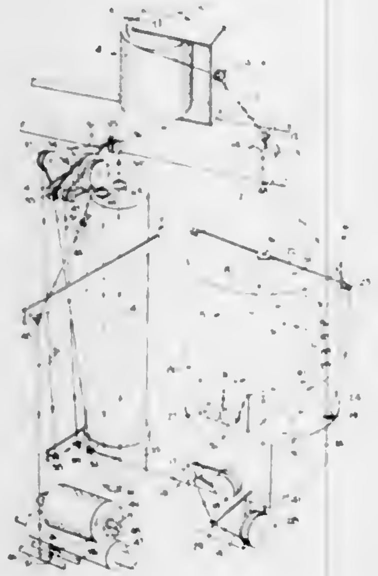
The portion of the term of this patent subsequent to June 28, 1991, has been disclaimed.

Int. Cl.² D02G *1/02*

U.S. Cl. 57—34 HS **18 Claims**

1. A method of producing plied spun staple yarn, said method comprising, in one continuous operation, the steps of:
a. drawing first and second spun staple yarns, at equal linear speeds and under low tension from respective yarn supplies;
b. isolating the first and second yarns so that the tensions on the yarns during plying are not transmitted to the yarns as they are removed from said yarn supplies;
c. plying said yarns to one another at a plying station by ballooning one of said yarns around the other while placing a false twist on each of said yarns;
d. drawing said plied yarn away from said plying station at a linear speed a predetermined amount greater than said first and second yarns are removed from their respective yarn supplies; thus subjecting said plied yarn to a tension much greater than the tension on said first and second yarns as they are removed from their respective yarn supplies.

4. The method of claim 1 wherein the following further steps are performed continuously therewith:
e. isolating the plied yarn so that the tension on the plied yarn as it is drawn from said plying point is not transmitted to said plied yarn during the twist-setting of said plied yarn;
f. drawing said yarn after under a tension substantially lower than the tension that it is drawn from said plying point first through a heating zone and then through a cooling and drying zone for twist-setting said plied yarn and enhancing its capacity to retain its resultant twist and bulk; and
g. drawing said twist-set plied yarn under increased tension from said cooling and drying zone to a take-up station for winding said twist-set plied yarn into a package.



10. A plied, spun staple yarn produced by the method of claim 4 and having substantially no pretwist memory in the component single ends of yarn after the plying thereof.

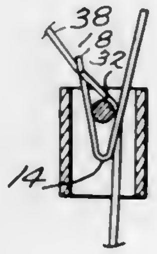
4,034,545
THREADING DEVICE AND METHOD FOR FALSE TWIST TUBES

Robert H. Walker, Greensboro, N.C., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Feb. 9, 1976, Ser. No. 656,588

Int. Cl.² D01H *17/00*

U.S. Cl. 57—34 R **5 Claims**



1. A yarn threading tool for threading a false-twist spindle of the type having a bore and a twist pin mounted in said bore with said twist pin extending transversely with respect to said bore, said tool comprising a first leg segment having a selected length, a second leg segment having length that is less than said selected length of said first leg segment, said second leg segment extending from said first leg segment at an acute angle so as to form a yarn retaining bend portion therebetween with said first and second leg segments lying in substantially the same plane, said second leg segment having a free end shaped to define a yarn catching hook portion which extends in a plane that is about 90°±45° to the plane defined by said first and second leg segments.

4,034,546
FALSE TWISTING SPINDLE OF FLUID JET DRIVING TYPE

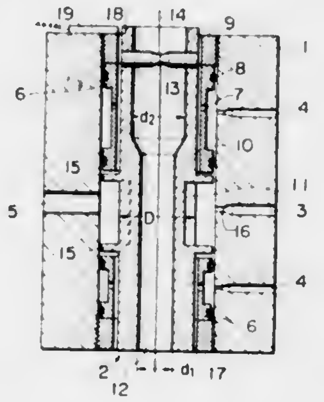
Hiroshi Hashizume, Kyotoshi, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyotoshi, Japan

Filed Feb. 9, 1976, Ser. No. 656,339

Claims priority, application Japan, Feb. 13, 1975, 50-18560

Int. Cl.² D01H *1/24, 7/92;* **D02G** *1/06*

U.S. Cl. 57—77.45 **7 Claims**



1. A false twisting spindle of the fluid jet driving type having a rotation number more than 1,000,000 r.p.m. comprising a housing, a rotary member including a tubular body having a twist pin in a yarn-passing hole perforated therein and a turbine blade for receiving a rotation inducing fluid and a fluid bearing supporting the rotary member, said rotary member and said fluid bearing being disposed in a hollow hole of the housing, wherein a diameter of said turbine blade D and a rotation number N of said rotary member have the following relation:

$$1 \leq D<5,$$

and

$$170.81-44(D-4/11)2 \leq N \leq 234.4-25/8(1.68+D)^2$$

in which N is expressed in 10^4 r.p.m. and D is expressed in mm, and wherein the diameter of the turbine blade is the same as the outside diameter of the tubular body of the rotary member.

4,034,547
COMPOSITE CABLE AND METHOD OF MAKING THE SAME

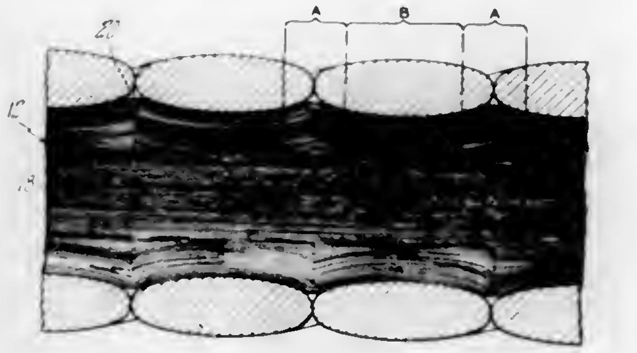
August W. Loos, c/o Loos & Company, Inc., Quasset Lake Road, Pomfret, Conn. 06258

Continuation-in-part of Ser. No. 603,672, Aug. 11, 1975, abandoned. This application July 6, 1976, Ser. No. 700,081

Int. Cl.² D07B *1/04*

U.S. Cl. 57—146 **16 Claims**

1. A cable comprising a synthetic core and a metal jacket, the jacket being formed of a plurality of continuous wirelike members helically laid in a layer about the core, the core being formed of a bundle of low stretch lightweight continuous fibers having a high tensile strength to density ratio, the core fibers having a specific tensile strength greater than that of the members of the metal jacket and serving as a reinforcing component for the metal jacket, the core fibers constituting a soft compressible bundle to effect maximum concentration of fibers for a given cross-section and filling interstices between the wirelike members of the metal jacket, the jacket including a plurality of individual wires helically laid in a layer about the core with the wires collectively effecting a hoop tension about the core and applying a compressive force to its outer surface radially inward, the outer surface of the bundle being compressively stressed radially inward in an alternating pattern which uniformly varies axially of the bundle form zones of minimum stress between wires to zone of maximum compressive stress intermediate the zones of minimum stress.



4,034,548
PROCESS FOR THE PRODUCTION OF STRETCH-TEXTURED YARNS WITH IMPROVED PROPERTIES

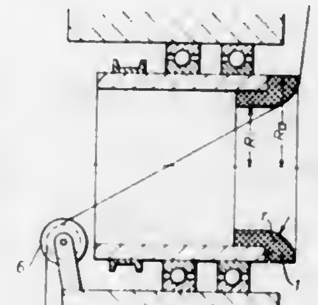
Michael Bueb, Opladen; Wolfgang Rellensmann, Zons, and Lothar Ruuprecht, Dormagen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 8, 1975, Ser. No. 575,704

Claims priority, application Germany, May 10, 1974, 2422690

Int. Cl.² D02G *1/02*

U.S. Cl. 57—157 TS **1 Claim**



1. In a process employing friction false twisters for the simultaneous stretch-texturing of synthetic filaments or yarns which are at least partly thermoplastic the improvement with comprises:
1. the ratio of the rotational speed of the false twister to the rate of travel of the filament or yarn so that the ratio S_2/S_1 of the tractive force on the filament or yarn after the false twister (S_2) to the tractive force on the filament or yarn before the false twister (S_1) is 1.0 to 1.4; and
2. maintaining the twisting in the filament or yarn at a value 5–50% in excess of that calculated from the Herberlein formula:

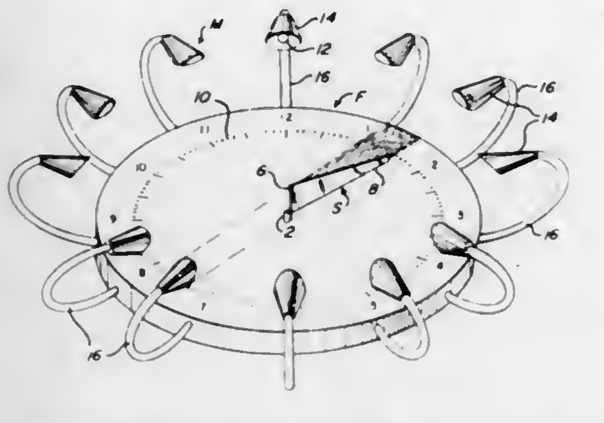
$$D = 306000/67 + T$$

wherein
D = the number of whole twists in the filament or yarn per meter of untwisted filament or yarn, and
T = the denier of the filament or yarn expressed as dtex (grams per 10,000 meter).

4,034,549
SHADOW CLOCK

Jon G. Danley, 1727 Seventh Ave., Greeley, Colo. 80631, and Arthur L. Meisner, 6172 S. Garfield Drive, Littleton, Colo. 80121

Filed Oct. 20, 1975, Ser. No. 623,819
Int. Cl.² G04B *19/30, 19/06*
U.S. Cl. 58—50 R **15 Claims**

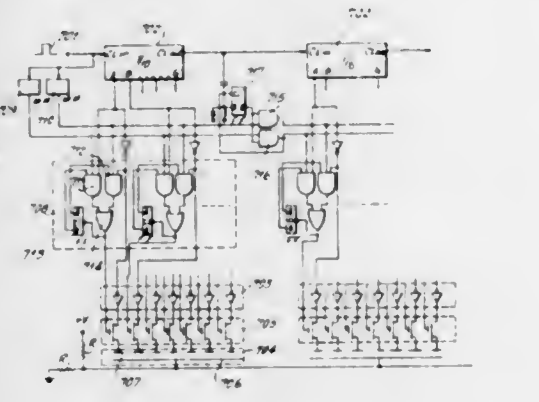


1. A clock for telling time by casting a shadow of a stylus, said clock comprising:
- a face having indicia spaced thereacross to divide said face into time increments;
- a stylus mounted for casting a shadow on said face;
- artificial light projecting means for illuminating said stylus to cast a shadow of said stylus on said face, said light projecting means includes a single light source mounted for movement along said face in a path parallel to said indicia; and
- a clock motor connected to at least one of said stylus, said light projecting means and said face to cause relative movement between said shadow and said indicia in timed relation, said light projecting means being connected to said clock motor for movement of said light projecting means in timed relation.

4,034,550
ELECTRONIC WRISTWATCH DIGITAL DISPLAY

Akihiko Kouchi; Shuji Takeda, and Hiroshi Takeshita, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Apr. 8, 1975, Ser. No. 566,636
Int. Cl.² G04B *19/30*
U.S. Cl. 58—50 R **3 Claims**

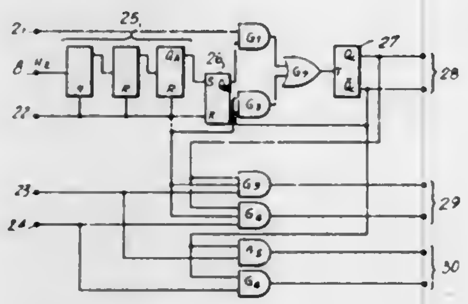


1. In an electronic wristwatch having electronic timekeeping circuitry for producing a periodic timekeeping signal representative of actual time, the improvement comprising at least one counter-decoder means adapted to receive said periodic timekeeping signal and in response thereto selectively produce a plurality of display segment drive signals, display means including a plurality of segmented electrodes forming a display digit and a further common electrode spaced apart from said segmented electrodes, said common electrode being referenced to a fixed potential, and an oxidation-reduction compound disposed between said segmented electrodes and said common electrode, a plurality of control switching means, each said control switching means being coupled to a display segment electrode, each said control switching means being adapted to receive said timekeeping signal and a respective segment driving signal and in response thereto effect a changing of the potential of said segmented electrode to change the condition of transparency of said portion of said oxidation-reduction sensitive compound between each said segmented electrode and said common electrode to correspond to the absence or presence of a segment drive signal applied to the segment electrode during each period of the timekeeping signal, each said control switching means further including a control switching circuit adapted to apply one of a first potential and second potential control signal once each period of said timekeeping signal, and a switching circuit adapted to receive said control signal, and in response to the potential thereof, reference said segmented electrode thereto, and including first and second mono-stable multi-vibrators adapted to receive said periodic timekeeping signals and in response thereto respectively produce first and second pulse width signals respectively determinative of the period to effect oxidation and reduction of the portions of the oxidation-reduction sensitive compounds between said first segmented electrodes and said common electrode, each said control switching circuit including first and second gate means respectively adapted to receive said first and second pulse width signals, and feedback gating means coupled to said first and second gating means for alternating the opening and closing of said first and second gating means, said first second gating means being adapted to receive said segment drive signals and in response thereto and the alternate opening and closing thereof apply said first and second potential control signal to said switching circuit for a duration determined by said pulse width signal.

4,034,551
SAFETY FEATURE FOR FUNCTION CONTROL CIRCUIT

Yoshito Ushiyama, Okaya, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed May 15, 1975, Ser. No. 577,964
Int. Cl.² G04B *19/27*
U.S. Cl. 58—85.5 **27 Claims**

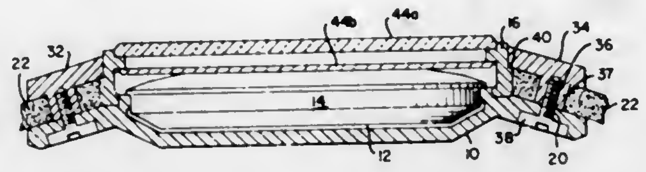


1. A function control circuit comprising in combination, function selecting means for producing one of a first and second function selecting signal, a multi-position switch means coupled to said function selecting means, said multi-position switch means being maintained in a quiescent position and being adapted to be displaced in a first direction to effect producing of a first function selecting signal by said function selecting means, and being further adapted to be displaced from a quiescent position in a second direction opposite to said first direction to effect producing of a second function selecting signal by said function selecting means, and inhibit means coupled to said multi-position switch means and said function selecting means, said inhibit means being disposed in response to displacement of said multi-position switch means in said first direction to inhibit producing of a second function selecting signal, said inhibit means in response to the return of said multi-position switch means from said first displaced direction being adapted to inhibit producing of said second function selecting signal until a predetermined interval of time after said multi-position switch means is returned from said first displaced direction.

4,034,552
WRIST WATCH

Charles Davidson, 35 Old Post Road N., Croton-on-Hudson, N.Y. 10520

Filed Apr. 5, 1976, Ser. No. 673,597
Int. Cl.² G04B *37/00, 39/00*
U.S. Cl. 58—88 R **6 Claims**

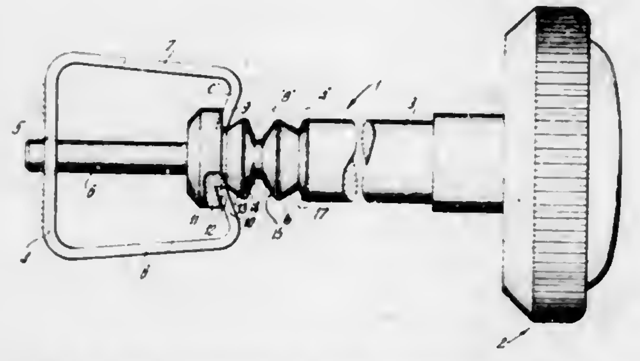


1. A wrist watch comprising a case having holes therethrough and a cavity therein adapted to receive a watch movement; first and second segments each having a selected outer contour and a selected inner contour; a wrist band having holes therethrough in alignment with the holes in said case; said first and second segments have threaded cavities in alignment with the holes in said case and the holes in said wrist band; and screw means for clamping together said first and second segments, said wrist band and said case; and wherein said screw means includes threaded screws passing through the holes in said case, the holes in said wrist band and into the threaded cavities in said first and second segments.

4,034,553
STEM DETENT ARRANGEMENT FOR WRISTWATCH

Paul Wuthrich, Watertown, Conn., assignor to Timex Corporation, Waterbury, Conn.

Filed July 11, 1975, Ser. No. 591,552
Int. Cl.² G04B *37/08, 23/12, 27/00*
U.S. Cl. 58—88 B **2 Claims**

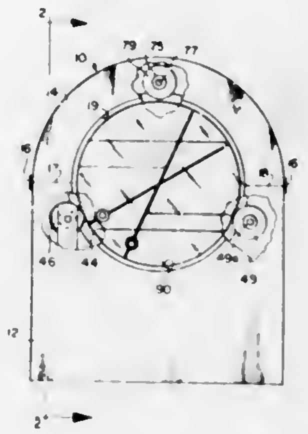


1. In a spring detenting arrangement for an axially slideable rotatable watch stem having a manually operated crown and having radially biased spring detenting means, the improvement comprising a plurality of alternately facing frusto-conical surfaces coaxially disposed in succession along said stem, including a first shallow frusto-conical surface, a second steep frusto-conical surface, a third steep frusto-conical surface, and a fourth shallow frusto-conical surface, the shallowness and the steepness of said surfaces being relative to each other and relative to the stem axis, said stem also including a flange with a negatively sloping surface adjacent and spaced from said first surface and adapted to prevent inadvertent disengagement of the stem from the watch.

4,034,554
CLOCK WITH MOVING COLORED DISPLAY

Israel Hadany, Jerusalem, Israel, assignor to International Product Development, Ltd., Los Angeles, Calif.

Filed Oct. 24, 1975, Ser. No. 625,599
Claims priority, application Spain, Apr. 18, 1975, 211626[U]
Int. Cl.² G04B *19/02, 45/00, 19/30*
U.S. Cl. 58—125 B **7 Claims**

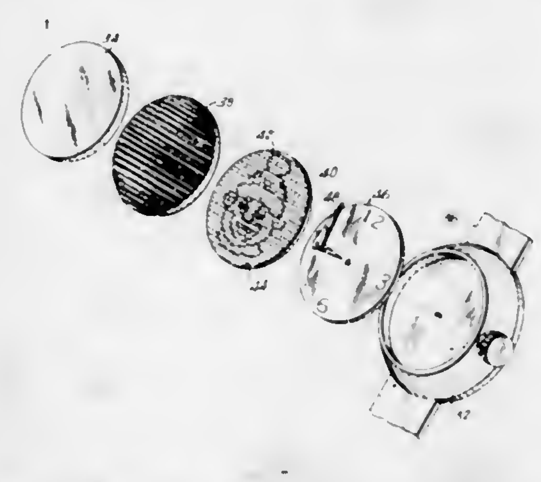


1. A clock comprising:
- a housing provided with a front face having a generally circular opening formed therein,
- a hollow closed receptacle rotatably mounted within the housing, having a transparent front wall and provided with an internal generally flat longitudinally extending partition carrying an indicium near one of its ends and dividing the interior of the receptacle into totally enclosed compartments,
- a quantity of flowable material partially filling each compartment,
- and means for rotating the receptacle at constant speed about an axis transverse to said partition and concentric with said opening.

4,034,555
LENTICULAR OPTICAL SYSTEM

Bruce A. Rosenthal, 6 Bulaire Road, E. Rockaway, N.Y. 11518

Filed Dec. 16, 1975, Ser. No. 641,257
Int. Cl.² G04B *19/06*
U.S. Cl. 58—127 R **7 Claims**



2. A watch including in combination a transparent sheet having a plane surface at one side thereof and its opposite surface constituted by a multiplicity of parallel lenticular lenses, a first composite image positioned with respect to the plane surface of the transparent sheet, said image being formed of a multiplicity of spaced apart parallel strips with transparent strips therebetween, a second composite image, a watch movement beneath said second composite image, watch hands viewable through said transparent sheet and

operatively connected to said watch movement, and a case forming an enclosure therefor.

4,034,556
ARRANGEMENT FOR CONTROLLING THE ENGAGEMENT OF A CHAIN WITH A CHAIN SHEAVE, SUCH AS A CABLE LIFTER OR WILDCAT

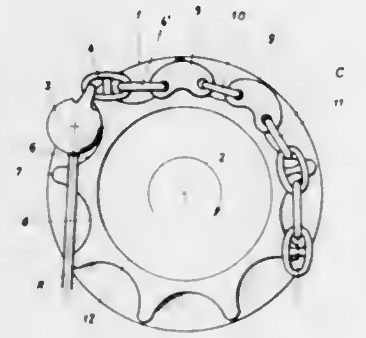
Simon Riber, Arendal, Norway, assignor to A/S Pusnes Mekaniske Verksted, Arendal, Norway

Filed Nov. 20, 1975, Ser. No. 633,820

Claims priority, application Norway, Nov. 25, 1974, 744220

Int. Cl.² F16G *13/18*

U.S. Cl. 59—78 **6 Claims**



1. The combination of a coupling link requiring to be engaged with a chain sheave in a predetermined position with respect to the pockets and teeth of the chain sheave, and
a chain comprising chain links of the common type of a configuration suitable for the normal functions of an anchoring or mooring chain and further comprising at least one chain link which is asymmetric about its longitudinal axis, one longitudinal side of the link being convex, the other longitudinal side being concave, the asymmetric link or links being so placed in the chain such that when the asymmetric links are engaged in vertical orientation between opposed teeth of the sheave, said coupling link will assume said predetermined position.

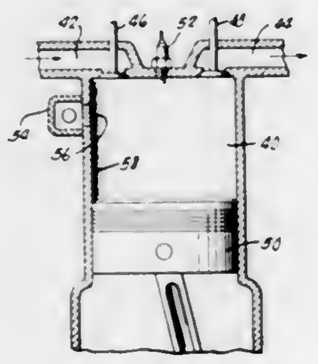
4,034,557
CONTROL OF THE INITIATION OF COMBUSTION AND CONTROL OF COMBUSTION

Anthony E. Cerkanowicz, Livingston, N.J., assignor to Photochem Industries, Inc., Fairfield, N.J.

Division of Ser. No. 468,543, May 9, 1974. This application Apr. 27, 1976, Ser. No. 680,870

Int. Cl.² F23H *5/26*

U.S. Cl. 60—39.06 **2 Claims**



1. In a method of controlling the initiation of combustion and controlling combustion within an internal combustion engine supplied with a combustible fuel-air mixture, the step comprising irradiating the mixture with ultraviolet energy in the region below about 2450 A and of sufficient intensity to initiate combustion at a temperature below the thermal ignition temperature of the mixture, in which the engine is an aircraft engine.

4,034,558
COOLING APPARATUS FOR SPLIT SHAFT GAS TURBINE

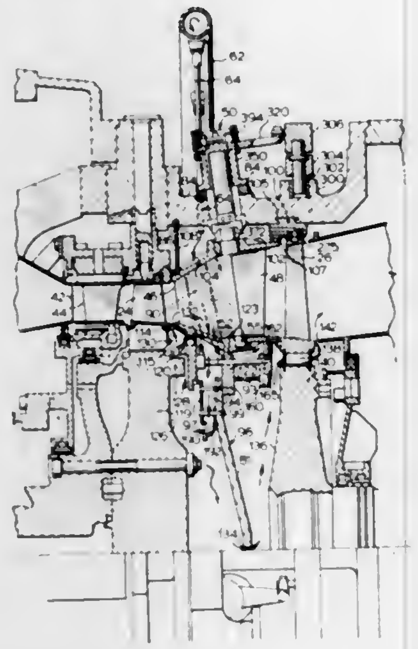
John Korta, and Walter R. Ward, both of Stoney Creek, Canada, assignors to Westinghouse Canada Limited, Hamilton, Canada

Filed June 17, 1976, Ser. No. 697,060

Claims priority, application Canada, Oct. 14, 1975, 237574/75

Int. Cl.² F02C *3/10, 7/18*

U.S. Cl. 60—39.16 R **1 Claim**



1. Cooling apparatus for cooling parts of a split shaft gas turbine in the region of the shaft split comprising, a turbine casing housing a compressor section and a power section, each section having a separate shaft mounted in suitable bearings for rotation of the shaft in each section, a stationary vane assembly mounted in the interior of said power section to deflect a hot gas stream in a predetermined direction, said vane assembly having a series of evenly spaced hollow vanes mounted in a circumferential manner therein, said vane assembly forming a first space between said casing and the vane assembly, said vane assembly serving to enclose a second space in the split shaft region of said turbine, said second space being formed in the interior of said turbine and being bounded by the compressor shaft and a compressor power disc mounted on the end thereof, and by the power shaft and a power disc mounted on the end thereof in the split shaft region, a diaphragm member mounted and supported by said vane assembly in said second space, said diaphragm member serving to divide the second space into two spaces, a forward compressor section space which has a controlled air outlet between said compressor power disc and said vane assembly, a rearward power section space having an outlet through a space in the blade root section of said power disc on said power shaft, bleed means on an intermediate stage of said compressor section, an enclosed compressed air housing surrounding said bleed means mounted on said compressor section, manifold means surrounding said turbine casing in the region of said shaft split, a plurality of tubes connected to said manifold means passing sealedly through said casing in circumferentially spaced relationship, said manifold means being connected to said compressed air housing to receive compressed air therefrom, said manifold having a first group of said plurality of tubes terminating in said first space, a second and third group of tubes of said plurality of tubes passing through said first space and through a predetermined number of said hollow vanes into said second space, said second group of tubes having air distribution conduit means connected thereto to direct air to the blade root section of said power disc on said power shaft, said third group of tubes being in communication with said forward compressor section space to provide cooling air for cooling said compressor power disc.

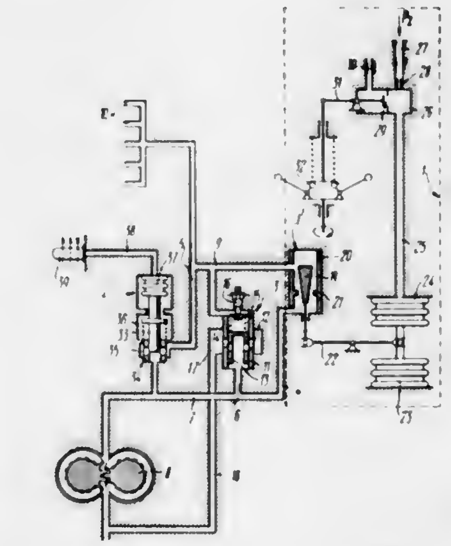
4,034,559
FUEL FEED CONTROL IN A GAS-TURBINE ENGINE

Vasily Petrovich Dmitriev, ulitsa Kalinina, 10, kv. 20; Andrei Alexandrovich Luzhin, ulitsa Kalinina, 22/36, kv. 18; Anatoly Mikhailovich Polyakov, ulitsa Gorkogo, 35, kv. 6; Alexandr Grigorievich Tomilin, ulitsa Kalinina, 28, kv. 22, and Stanislav Mikhailovich Shushpan, ulitsa Pushkina, 27/28, kv. 8, all of Stupino Moskovskoi oblasti, U.S.S.R.

Filed Dec. 2, 1975, Ser. No. 636,949

Int. Cl.² F02C *9/10*

U.S. Cl. 60—39.28 R **5 Claims**



1. In a combination of a fuel feed control with a gas-turbine engine whose combustion chamber is communicated through passageways with the fuel pump, said fuel feed control comprising: a device for a metered fuel feed to said combustion chamber; an actuator element of said fuel feed control, through which said fuel metering is effected; a valve adapted to maintain a preset fuel pressure differential across said actuator element; a corrector of the rate of fuel feed to said combustion chamber depending upon ambient air temperature, an improvement in which provision is made for three parallel passageways, and said actuator element, said valve and said fuel supply corrector are each mounted in one of the said passageways.

4,034,560
CENTRIFUGAL FLOW GAS TURBINE ENGINE WITH ANNULAR COMBUSTOR

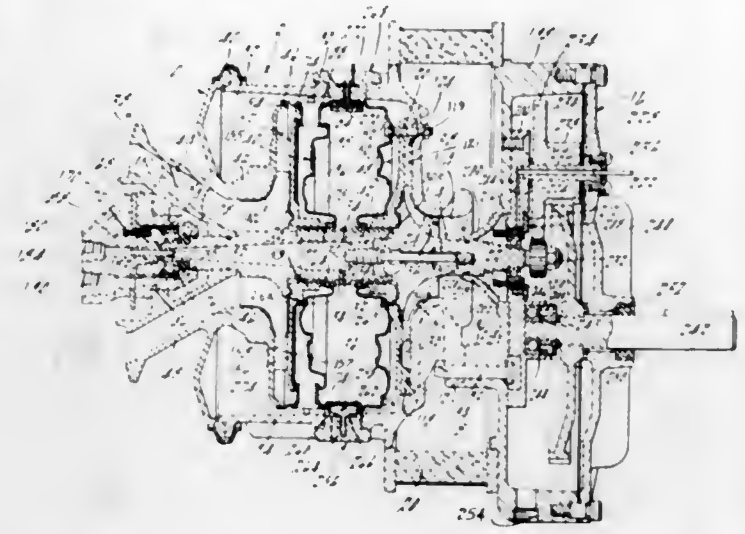
Richard Chute, Huntington Woods, Mich., assignor to Eaton Corporation, 02, Cleveland, Ohio

Filed Jan. 3, 1972, Ser. No. 214,703

Int. Cl.² F02C *3/08, 7/06, 7/22*

U.S. Cl. 60—39.08 **2 Claims**

1. In a gas turbine engine having a turbine rotor axially spaced from a compressor rotor by an annular combustion chamber, said rotors and combustion chamber being in fluid communication, and a housing encircling said rotors and said combustion chamber and being spaced from said combustion chamber, said housing having an upper portion and a lower portion, a drain plug located in said lower portion and comprising:
a body portion transversing said space between said housing and said combustion chamber, said body portion including
1. a reservoir,
2. a first passage communicating with said reservoir and said combustion chamber,
3. a second passage communicating with said reservoir and said space between said housing and said combustion chamber, and
4. a third passage communicating with said reservoir and the exterior of said housing; and



valve means normally spaced from and restricting said third passage and movable in response to a flow of gas through said third passage caused by an increase in pressure in said space between said housing and said combustion chamber above ambient pressure at the exterior of said housing to seal said third passage.

4,034,561
EXHAUST REACTION ASSEMBLY FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

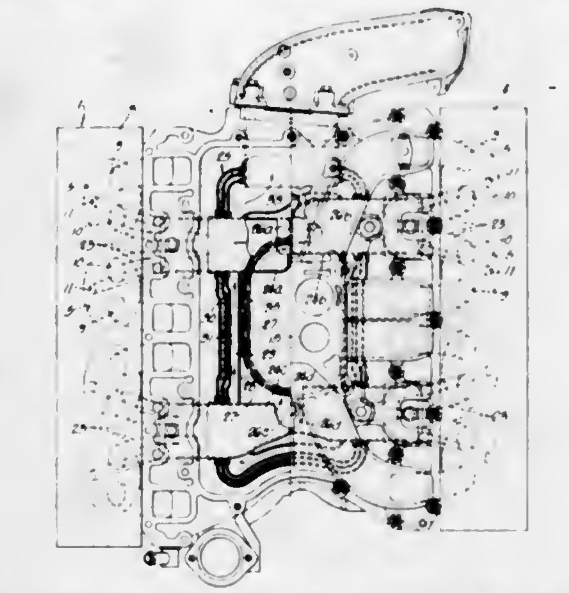
Yoshitoshi Sakurai, Niiza; Takao Okura, Saitama, and Shoichiro Irimajiri, Kawagoe, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,110

Claims priority, application Japan, Dec. 30, 1974, 49-2193

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **6 Claims**



1. In a multi-cylinder internal combustion spark ignition piston engine, the improvement comprising, in combination: an exhaust reaction chamber assembly having a first reaction chamber therein, a plurality of exhaust ports each leading from a cylinder, a plurality of exhaust tubes each connected to an adjacent pair of exhaust ports, respectively, and projecting into the interior of said first reaction chamber, each exhaust tube having a discharge end in close proximity and in confronting relationship with the discharge end of an adjacent exhaust tube so that exhaust gases discharged by each exhaust tube directly enter the confronting exhaust tube and also enter into the first reaction chamber through space between the confronting ends of the discharge tubes, means forming a

second reaction chamber surrounding the first reaction chamber, an opening connecting said reaction chambers, and means for discharging exhaust gases from the second reaction chamber.

4,034,562

EXHAUST REACTION APPARATUS FOR INTERNAL COMBUSTION ENGINE HAVING IN-LINE CYLINDERS

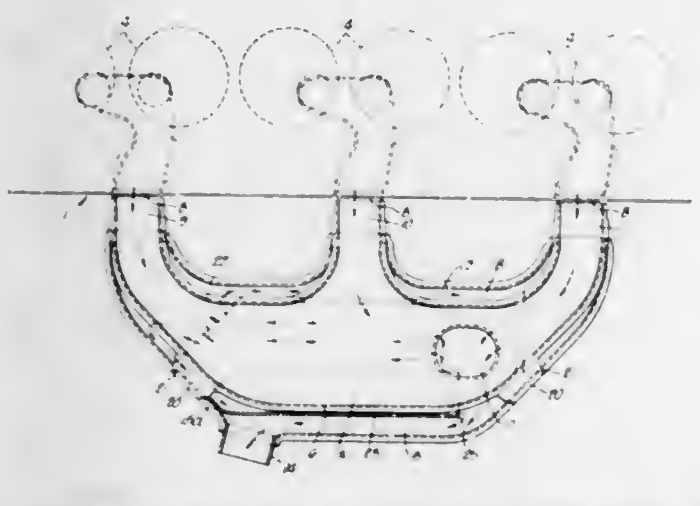
Eiji Taguchi, Tokyo, and Kenji Kimura, Wako, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 9, 1975, Ser. No. 639,096

Claims priority, application Japan, Dec. 11, 1974, 49-141525

Int. Cl.² F01N *3/10*

U.S. Cl. 60—282 **4 Claims**



1. For use with an internal combustion engine which discharges exhaust gases from a plurality of in-line cylinders, the improvement comprising, in combination: a series of exhaust pipes each having an inlet end connected to receive exhaust gases from at least one of the cylinders, respectively, walls forming a first reaction chamber connected to receive exhaust gases from each of said exhaust pipes, walls forming a second reaction chamber extending along the first reaction chamber in a direction parallel to the line of cylinders, walls forming a third reaction chamber surrounding and enclosing said first and second reaction chambers and surrounding and enclosing each of said exhaust pipes, the first reaction chamber having opening means near an exhaust pipe at one end of the series for discharging all of the exhaust gases from the first reaction chamber into the second reaction chamber, and the second reaction chamber having opening means near an exhaust pipe at the other end of the series for discharging all of the exhaust gases from the second reaction chamber into the third reaction chamber, a discharge pipe near said one end of the series, baffle means for leading all of the exhaust gases in the third reaction chamber to said discharge pipe.

4,034,563

LOAD SENSITIVE HYDRAULIC SYSTEM

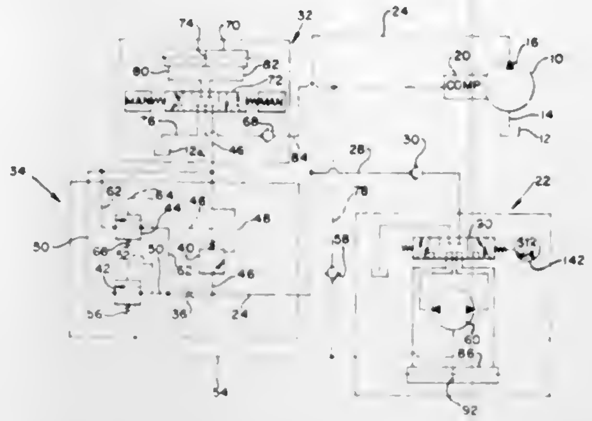
Harold R. Orth, Hinsdale, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed July 28, 1976, Ser. No. 709,349

Int. Cl.² F16H *39/46;* F15B *13/06*

U.S. Cl. 60—422 **7 Claims**

1. In a variable displacement hydraulic system having a variable displacement pump, a compensating circuit for effecting the displacement of said pump, a priority dependent work circuit, a secondary work circuit having a fluid delivery conduit and a flow compensating priority valve system including an orifice metering flow into said fluid compensating priority valve, a priority spool valve upstream of said orifice which when open allows fluid flow via a discharge passage to said secondary work circuit, an isolator valve downstream of said priority valve and said orifice which when opened allows fluid flow via a passage to said discharge passage and to said secondary work circuit, said flow compensating priority valve further including a relief valve downstream of said priority valve which when opened allows fluid flow to said secondary work circuit.



4,034,564

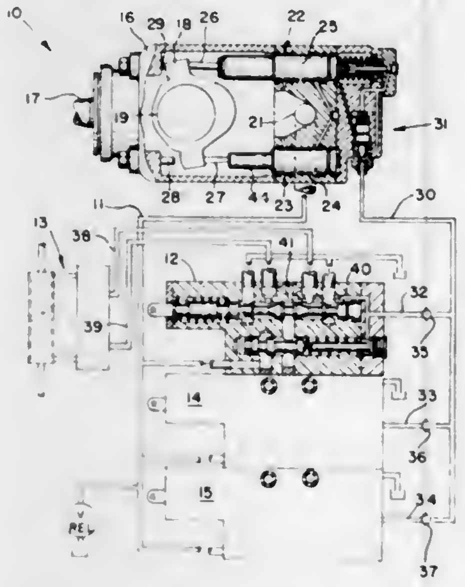
PISTON PUMP ASSEMBLY HAVING LOAD RESPONSIVE CONTROLS

Howard L. Johnson, Joliet, and Walter Z. Ruseff, New Lenox, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 23, 1976, Ser. No. 651,885

Int. Cl.² F16D *31/02*

U.S. Cl. 60—445 **6 Claims**



1. In a piston pump assembly having a housing, an angularly adjustable swash plate for controlling the volume of fluid discharged from the pump, a servo valve having a biasing means and being positioned in contact with the swash plate at a location sufficient for biasing the swash plate toward one of a maximum or minimum fluid discharge position, and means positioned in contact with the swash plate at a location sufficient for biasing the swash plate toward the other fluid discharge position, said means being in communication with fluid discharging from the pump for biasing the swash plate toward the other fluid discharge position, said means being in communication with fluid discharging from the pump for biasing the swash plate in response to the pressure of the discharging fluid, said discharge pressure being reduced, the improvement comprising:

means for controllably reducing operating load pressures and forming a modified load-pressure control signal, passing the modified load-pressure control signal to the servo valve, and imparting a biasing force on the servo valve in response to said modified load-pressure control signal, said modified load pressure signal being of a value less than the value of the reduced discharge pressure acting upon the biasing means of the swash plate.

4,034,565

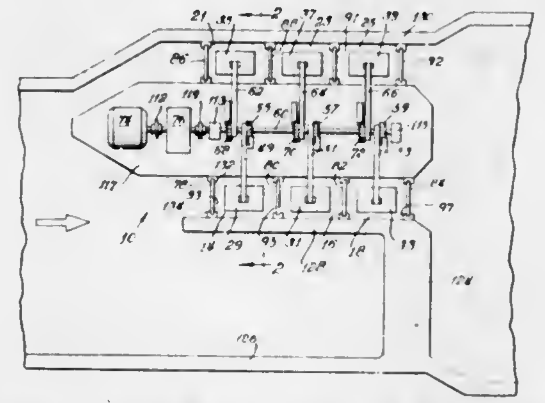
METHOD AND APPARATUS FOR GENERATING POWER

Charles E. McVeigh, 107 W. 9th St., Lacon, Ill. 61540

Filed Dec. 16, 1974, Ser. No. 529,789

Int. Cl.² F03C *1/00*

U.S. Cl. 60—503 **6 Claims**



1. A method of generating power comprising the steps of:

providing a plurality of elongated chambers each having an open top and each having a float mounted therewithin for axial and reciprocative movement with an inlet and an outlet communicating with the interior of said chambers;

disposing vertically said chambers in an intermediate portion of a constantly downwardly flowing body of water from an upperelevational portion thereof to a lower elevational portion thereof with their inlets and outlets communicating with said water;

positioning said inlets in fluid communication with the upstream flow of said water and positioning said outlets in fluid communication with the downstream flow of said water;

arranging said chambers substantially in a common plane;

alternatingly interrupting and permitting the flow of said body of water in said inlets through said chambers and out said outlets to cause their floats to be carried by said water in said chambers reciprocatively upwardly and downwardly within said chambers, said interrupting causing water to rise in said chambers and said permitting causing water to fall in said chambers;

providing ratchet means;

extending at least partially said ratchet means through the open tops of said chambers and connecting mechanically said ratchet means and said floats;

utilizing the thus caused reciprocative movement of said floats via said ratchet means;

disposing vertically the chambers in said intermediate portion of said flowing body of water in a side-by-side arrangement with the first mentioned chamber and extending in the direction of flow of said flowing body of water; and

positioning the inlets of said chambers in fluid communication with the upstream flow of said water via adjacent outlets of the adjacent chambers so that the inlets are upstream of the outlets.

4,034,566

HYDRAULIC BOOSTING APPARATUS IN BRAKING SYSTEM

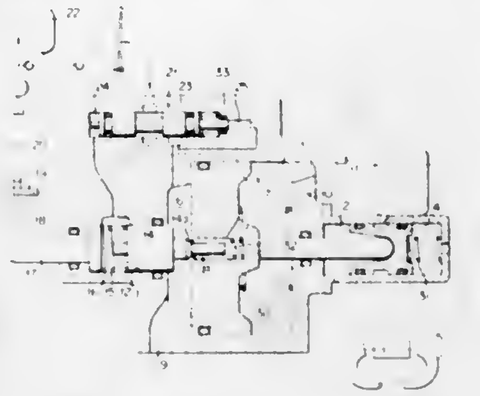
Toshitaka Suketomo, and Masaaki Ichimura, both of Kawasaki, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 30, 1975, Ser. No. 627,293

Claims priority, application Japan, Oct. 30, 1974, 49-130437

Int. Cl.² B60T *13/12*

U.S. Cl. 60—548 **5 Claims**



1. A hydraulic boosting apparatus in a braking system comprising, a housing, a booster cylinder in said housing and having an inner surface, a booster piston movably disposed in said booster cylinder at the center thereof, a first chamber defined between one end surface of said booster piston and the inner surface of said booster cylinder, a first bore disposed in said housing coaxially of said booster cylinder, a free spool disposed for movement in said first bore coaxially with said booster piston, said free spool having a portion at one end thereof extending into said booster cylinder, an operating spool movable with respect to said free spool and coaxially disposed in said first bore, a second chamber defined in said first bore between said free spool and said operating spool, said first chamber being out of fluid communication with said second chamber at all times, a valve means disposed in a second bore in said housing and having first and second operating chambers at the opposite ends thereof, said first operating chamber being in open communication with said first chamber for biasing the valve means in one direction and said second operating chamber being in open communication with said second chamber for biasing the valve means in a direction opposite to said one direction, and an accumulator means containing pressurized hydraulic oil and connected to said first chamber through said valve means when the pressure in said second operating chamber is sufficiently higher than the pressure in said first operating chamber, thereby causing said valve means to move in said opposite direction.

4,034,567

SELF-DRILLING THERMAL BOLT

Rolf Roggen, Grand-Lancy, Switzerland, assignor to Battelle Memorial Institute, Switzerland

Filed Dec. 12, 1975, Ser. No. 640,342

Claims priority, application Switzerland, Dec. 19, 1974, 16922/74

Int. Cl.² E21D *20/00*

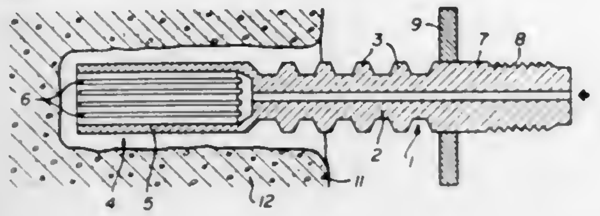
U.S. Cl. 61—35 **7 Claims**

1. A method of implanting an anchor in a compact material, comprising:

a. positioning a leading end portion of an anchor to be implanted in a compact material against a surface of the compact material;

b. effecting combustion at the leading end portion of the anchor and at a sufficiently high temperature to melt the compact material in a vicinity of the contact material immediately adjacent the leading end portion of the anchor;

c. progressively penetrating the compact material with the anchor to a certain depth by advancing it leading end first into the compact material while maintaining combustion at the leading end portion to progressively melt a portion of the compact material in the vicinity of the leading end portion of the progressively advancing anchor to progressively completely melt the compact material ahead of the progressively advancing leading end portion; and



d. terminating combustion after the anchor has penetrated the compact material to said certain depth and maintaining the anchor in position at said certain depth until the melted compact material and any combustion products have solidified, whereby the solidified material is effective to secure the anchor in the compact material.

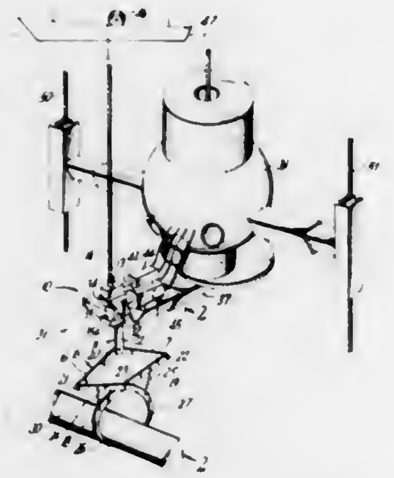
4,034,568
UNDERWATER CLAMPING MECHANISM

Burton Hoster Mason, Box 504, Covington, La. 70433

Filed Dec. 12, 1975, Ser. No. 640,013

Int. Cl.^{2} B63C *11/40*

U.S. Cl. 61—69 R **2 Claims**



1. In combination a submergible chamber having a movable work arm extending outwardly therefrom and means to hold said chamber in fixed relationship at an underwater work location, said movable work arm comprising a clamp, and a clamping mechanism for removing an object from an underwater location comprising a first member having clamp means at one end, and means to attach a surface connected wire at the other end, and a second member being formed with a seat for being engaged by the work arm clamp, so that said seat is non-rotatably secured in said work arm clamp and means for actuating said clamp means, said members being in sliding engagement, further comprising stop means to limit the movement of said first member and the pivoted clamp on the object, whereby the seated work arm guides the clamp means to said object and the clamped object is then taken up to the surface by the wire.

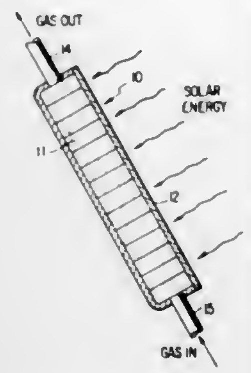
4,034,569
SORPTION SYSTEM FOR LOW-GRADE (SOLAR) HEAT UTILIZATION

Dimiter I. Tchernev, 9 Woodman Road, Chestnut Hill, Mass. 02167

Filed Nov. 4, 1974, Ser. No. 520,808

Int. Cl.^{2} F25B *17/08*

U.S. Cl. 62—2 **11 Claims**



1. A sorption system for low-grade heat utilization which comprises first and second hermetically sealed containers, a solid absorbent material contained in at least said first container, said first container being located where it is periodically heated by a low-grade heat source relative to said second container whereby the said absorbent material in said first container has a relative temperature higher than said second container for a period of time and during a further period of time the absorbent material in said first container has a lower relative temperature than said second container, a closed circuit between said containers, a gaseous fluid adapted to be absorbed by said absorbent material in said circuit and said first container, said circuit including a first line from said first condenser to a first condenser, a second line from said first condenser to a first gas expansion cooler means, a third line from said gas expansion means to said second container, a fourth line from said second container to a second condenser, a fifth line from said second condenser to a second gas expansion cooler means, and a sixth line from said second gas expansion cooler means to said first container.

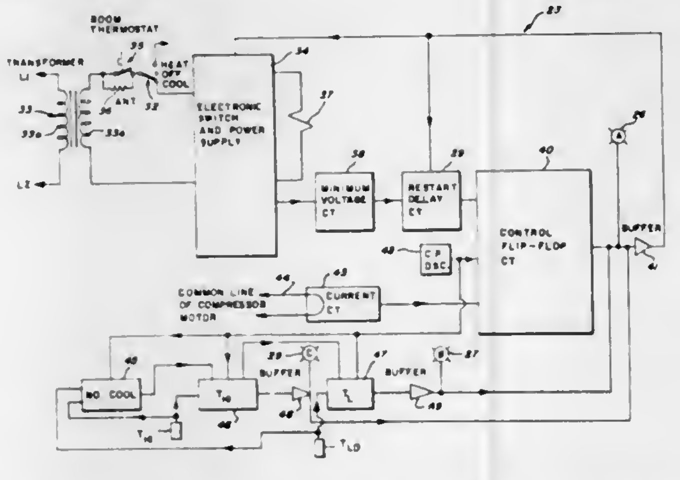
4,034,570
AIR CONDITIONER CONTROL

Richard M. Anderson, Smyrna; Robert S. McGill, III, Murfreesboro, and Robert W. Ramsey, Nashville, all of Tenn., assignors to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Dec. 29, 1975, Ser. No. 645,282

Int. Cl.^{2} F25B *49/00*

U.S. Cl. 62—158 **14 Claims**



1. In a control system for an air conditioner having an evaporator, a condenser, a compressor, a suction conduit for delivering refrigerant fluid from the evaporator to the compressor, an electric drive motor for driving the compressor hermetically sealed with the compressor whereby said compressor and motor are in heat transfer association with a portion of said suction conduit, and a control means for controlling connection of said drive motor to an electrical power source, the improvement comprising: a single temperature sensing element connected to said control means for preventing operation of the drive motor when the temperature of said suction conduit portion in said heat transfer association with the compressor and motor is alternatively below a first preselected temperature or above a second preselected high temperature.

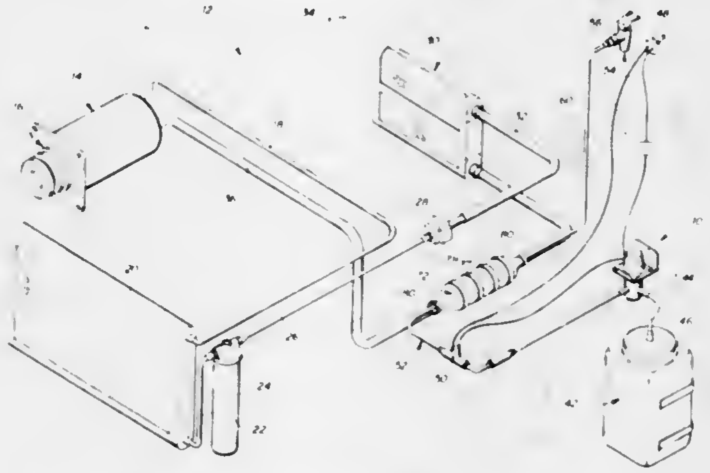
4,034,571
DRINKING WATER SUPPLY SYSTEM

Donald D. Bollinger, 3116 Sharpview Lane, Dallas, Tex. 75228

Filed Mar. 1, 1976, Ser. No. 662,872

Int. Cl.^{2} B60H *3/04*; B67D *5/62*

U.S. Cl. 62—244 **14 Claims**



1. A vehicular drinking water supply system comprising in combination:

a vehicular air conditioning system including:
  compressor means for supplying relatively high temperature, relatively high pressure working fluid;
  condenser means for receiving refrigerant from the compressor means and for supplying relatively high pressure, relatively low temperature refrigerant;
  expansion valve means for receiving refrigerant from the condenser means and for supplying relatively low pressure, extremely low temperature refrigerant;
  evaporator means for receiving refrigerant from the expansion valve means and for returning relatively low pressure, relatively high temperature refrigerant to the compressor means; and
  conduit means interconnecting the compressor means, the condenser means, the expansion valve means and the evaporator means;
  the conduit means of the air conditioning system including at least one conduit section which is maintained at a reduced temperature during the operation of the system;
  said conduit section which is maintained at reduced temperature comprising an unaltered component part of the vehicular air conditioning system;
reservoir means for receiving a quantity of potable water and for maintaining said water at ambient temperature;
potable water conduit means extending from the reservoir to a discharge point located within the passenger compartment of the vehicle; and
valve means for controlling the flow of water through the potable water conduit means;
a portion of the potable water conduit extending from the reservoir to the discharge outlet engaging the conduit section of the air conditioning system which is maintained at a reduced temperature during the operation thereof, whereby the water flowing through the potable water conduit from the reservoir to the discharge outlet is cooled by heat transfer to the refrigerant flowing through the conduit section of the air conditioning system;
the point of engagement of the air conditioning conduit section and the potable water conduit being substantially displaced from the reservoir means.

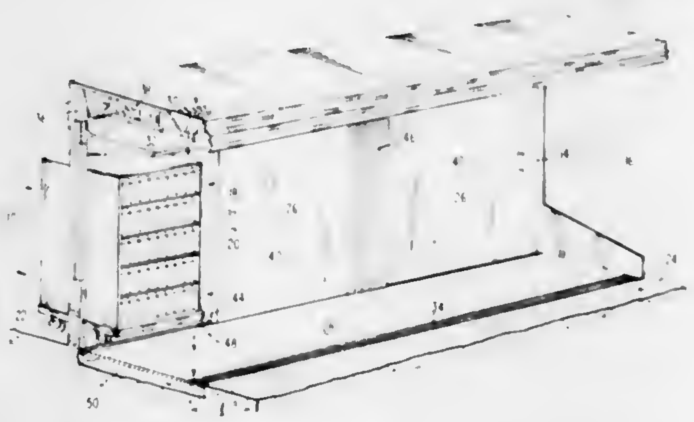
4,034,572
REFRIGERATED FRONT AND REAR LOADING DAIRY HANDLING CASE

Herbert R. Morris, Morrisville, and James Henry, Levittown, both of Pa., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed Aug. 20, 1976, Ser. No. 715,969

Int. Cl.^{2} A47F *3/04*; F25D *15/00*, *23/12*, G03F *7/02*

U.S. Cl. 62—256 **10 Claims**

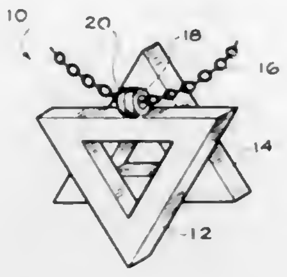


1. A universal roll-in refrigerated display case, of the open-front design to permit shoppers direct access to goods displayed therein, which comprises:

a. a stationary housing defining a refrigerated enclosure therein, said housing also defining a front opening to provide direct access to goods displayed within said enclosure from an adjacent shopper's aisle, said housing including a rear wall area at the opposite side of the case from the aisle and case floor, said case floor being at approximately the same level as the surrounding store floor;
b. air outlet means along the upper portion of said front opening to release a curtain of refrigerated air moving downwardly extending across said front opening;
c. air inlet means along the lower portion of said front opening to receive air from the downwardly moving curtain;
d. air circuit means extending from said inlet means to said outlet means to provide an air flow path therebetween;
e. refrigeration means positioned within said air circuit means for cooling the air prior to flow through said air outlet means;
f. door means positioned in said rear wall area of said housing extending upward from the level of said case floor, said door means being movable from a closed position to an opened position to allow movement of goods into said enclosure for display, said door means being hollow to define therein vertical air conduits which provide a portion of said air circuit means for carrying air from said inlet means to said outlet means; and
g. movable cart means adapted to transport goods to a display location within said housing from a storage location, said cart means adapted to be selectively moved into and out of a display position within said housing through said front opening and to be selectively moved into and out of a display position within said housing through said rear wall area when said door means is opened.

4,034,573
COMPOSITE ARTICLE FORMED BY SUPERPOSED SHAPES OF TWO MEMBERS

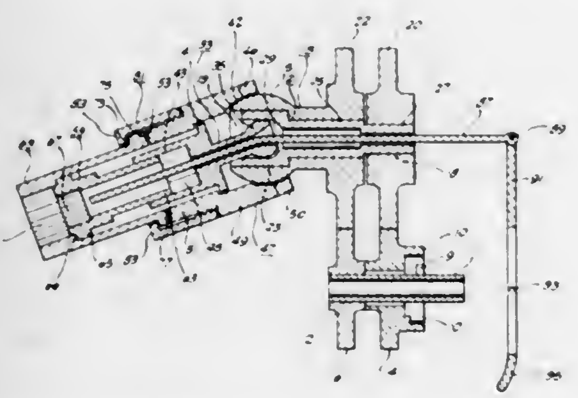
Henri Elkaim, 5 Rue de Quatre Fages, Paris, France (75005)
Filed Dec. 15, 1975, Ser. No. 640,657
Int. Cl.^{2} A44C *25/00*
U.S. Cl. 63—31 3 Claims



1. Article of manufacture comprising:
A. a first member having a major surface defining the principal shape of said member and a minor surface at an angle to said major surface and defining an edge portion;
B. First tab means permanently affixed to said edge portion and defining an opening therethrough having its axis aligned longitudinally of said edge portion;
C. A second member having a major surface defining the principal shape of said member and a minor surface at an angle to said major surface and defining an edge portion;
D. Second tab means permanently affixed to one of said surfaces of said second member and defining an opening generally aligned therealong;
E. A single longitudinal retaining means passing through the opening in each of said first and second tab means, said members each being free to move with respect to said retaining means and with respect to each other so that they may occupy mutually spaced positions thereon;
F. Each of said first and second members being a part of a composite article formed by their superimposed principal shapes when each said member is aligned beneath the tab means affixed thereto and said tab means are in juxtaposition.

4,034,574
UNIVERSAL BALL AND SOCKET SWIVEL JOINT

Alfred W. Kuder, Placentia, Calif., assignor to Frank A. Klaus, Fullerton, Calif.
Filed Nov. 4, 1975, Ser. No. 628,581
Int. Cl.^{2} F16D *3/02*
U.S. Cl. 64—7 6 Claims

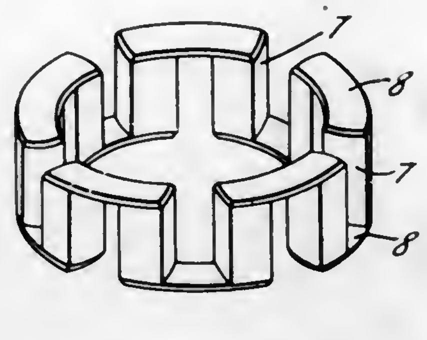


1. A first set of dual independent coaxial universal swivel joints, comprising:
an outer ball member having an axis of rotation and a projection of substantially spherical shape centered on said axis, the surface of said projection containing a plurality of facets aligned with and uniformly and symmetrically positioned angularly around said axis of rotation of said outer ball member, said outer ball member having a central opening therethrough symmetrical about said axis of rotation, said central opening being constructed and arranged to receive an inner socket member in coaxial rotary engagement therein;
an outer socket member having an axis of rotation and a central opening therethrough symmetrical about said axis of rotation, said central opening being constructed and arranged to receive an inner ball member in coaxial rotary engagement therein, one end of said central opening having a receptacle therein centered on said axis of rotation of said outer socket member which receives and mates with said projection of said outer ball member, said receptacle having a surface containing a plurality of facets aligned with and uniformly and symmetrically positioned angularly around said axis of rotation of said outer socket member, each of said facets of said receptacle of said outer socket member being positioned in sliding engagement with a respective facet of said projection of said outer ball member whereby rotation of one outer member rotates the other outer member independent of the relative angle between their respective axes of rotation thereby forming an outer universal swivel joint;
an inner ball member having an axis of rotation and a projection of substantially spherical shape centered on said axis, the surface of said projection containing a plurality of facets aligned with and uniformly and symmetrically positioned angularly around said axis of rotation of said inner ball member, said inner ball member being coaxially aligned and rotatably engaged in said central opening of said outer socket member with said projection of said inner ball member being positioned within said receptacle of said outer socket member; and
an inner socket member having an axis of rotation and a receptacle therein centered on said axis of rotation, said inner socket being coaxially aligned and rotatably engaged in said central opening in said outer ball member with said receptacle of said inner socket member being coaxially positioned within said projection of said outer ball member, said receptacle of said inner socket member receiving and mating with said projection of said inner ball member, said receptacle having a surface containing a plurality of facets aligned with and uniformly and symmetrically positioned angularly around said axis of rotation of said inner socket member, each of said facets of said receptacle of said inner socket member being positioned in sliding engagement with a respective facet of said projection of said inner ball member whereby rotation of one inner member rotates the other inner member independent of the relative angle between their respective axes of rotation and independent of the coaxial rotation of the outer members thereby forming dual independent coaxial universal swivel joints.

4,034,575
ANNULAR ELASTIC COMPONENT FOR FLEXIBLE JAW COUPLING

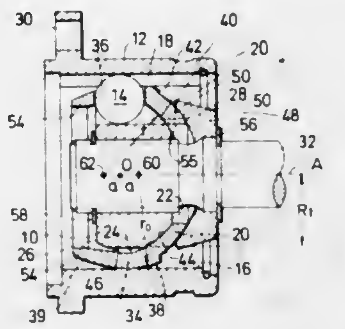
Harald Barth, Hermannstrasse 103, 668 Neunkirchen, Germany
Continuation-in-part of Ser. No. 350,143, April 11, 1973, Pat. No. 3,924,419. This application Nov. 6, 1975, Ser. No. 629,483
Claims priority, application Germany, May 7, 1975, 2520312
Int. Cl.^{2} F16D *3/64*
U.S. Cl. 64—14 10 Claims

1. An annular elastic component for providing elastic connection between opposed halves of a flexible connection, the annular elastic component including:
a plurality of shaped blocks disposed in an annular array, each block having an outer surface, an inner surface, opposed side surfaces, an axial length and opposed ends;
first bridging pieces connecting outer surfaces of adjacent of said shaped blocks, said bridging pieces each extending between a pair of adjacent shaped blocks in regions which extend axially from first ends thereof, the location of said bridging pieces varying in alternate fashion with respect to said opposed ends of said blocks from one pair of blocks to the next; and
ring means connected to said shaped blocks substantially midway between the opposed ends of each block.



4,034,576
CONSTANT VELOCITY UNIVERSAL JOINT

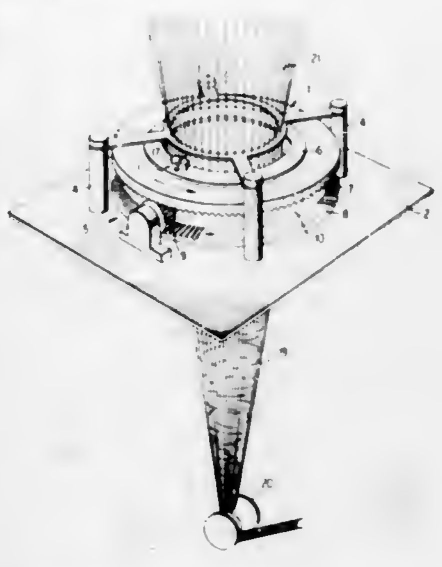
Koichi Takahashi, Yokohama; Nobuteru Hitomi, Yokosuka, and Taisuke Kizu, Fujisawa, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Dec. 30, 1975, Ser. No. 645,373
Claims priority, application Japan, Mar. 18, 1975, 50-31767
Int. Cl.^{2} F16D *3/30*
U.S. Cl. 64—21 21 Claims



1. A constant velocity universal joint comprising:
an outer member with an axial bore therethrough;
a ball retaining cage within said axial bore and having a first curved outer surface portion which engages said axial bore, a second curved outer surface portion adjacent one end thereof and a curved inner surface portion adjacent said one end, the center of curvature of said first outer surface portion and the center of curvature of at least one of said second outer surface portion of said cage and inner surface portion of said cage being offset by an equal amount on opposite sides of the joint center along the joint axis;
an inner member within said ball retaining cage and having a curved outer surface portion which engages said inner surface portion of said cage;
balls mounted in grooves between said outer and inner members and retained by said cage; and
a restraining member movable with said inner member and having a curved inner surface which engages said second outer surface portion of said cage to assist in preventing relative axial movement between said cage and inner member in at least one direction.

4,034,577
METHOD OF AND APPARATUS FOR CIRCULAR KNITTING

Joseph Puthon, Lyon, France, assignor to Rhone-Poulenc-Textile, Paris, France
Filed July 18, 1975, Ser. No. 597,183
Claims priority, application France, July 18, 1974, 74.25292
Int. Cl.^{2} D04B *35/00*
U.S. Cl. 66—1 R 6 Claims

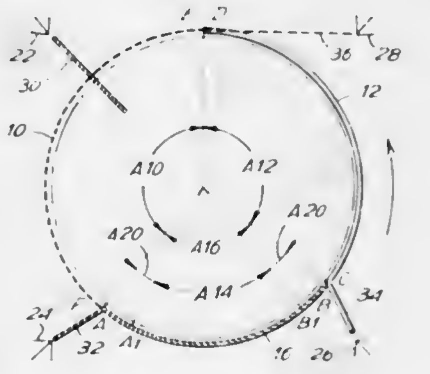


1. Knitting apparatus comprising
a. yarn guide means for guiding a plurality of spaced yarns in circular parallel relationship,
b. knitting means including
c. a looping member mounted for rotation about its axis having
d. a lateral portion and
e. a hook
f. means for traversing said looping member transversely of and adjacent to said spaced yarns by orbiting the looping member completely around the yarn circle,
g. and said knitting means including means for driving said looping member to rotate about said axis thereof to form interengaging single-twist loops in adjacent of said spaced yarn.

4,034,578
TIGHTS

Paolo Conti, Firenze, Italy, assignor to Billi, S.p.A., Firenze, Italy

Filed June 28, 1974, Ser. No. 484,465
Claims priority, application Italy, July 2, 1973, 9527/73
Int. Cl.^{2} D04B *9/18*
U.S. Cl. 66—49 6 Claims



1. A process for knitting, on a circular knitting machine having a needle cylinder, tights comprising a tubular element including a central zone arranged to form the pants portion of the tights and having a rectangular opening whose periphery

defines the waist line of the tights, said periphery being bounded, at least partly, by an elastic zone, said process comprising forming by means of reciprocating motion of the needle cylinder, a transverse band of elastic fabric at each longitudinal end of the said rectangular opening, forming, adjacent each of said transverse bands of elastic fabric, transverse edges of the rectangular opening by abandoning a first needle arc and resuming work by said first needle arc, forming, by means of said reciprocating motion of the needle cylinder, longitudinal bands of elastic using two independent elastic yarns, and with the needles of two second arcs of needles of small width adjacent said first arc of the needles, said longitudinal bands lying along the longitudinal edges of the opening, the residual fabric in correspondence of the rectangular opening zone being constituted by at least two fabric portions defined by courses of stitches formed by further adjacent arcs of needles with different yarn feeds, said second arcs of needles and said further needle arcs including at their ends at least one needle common with the continuous arcs whereby at least one stitch is formed with the yarns fed to the two contiguous arcs, and the needle cylinder being actuated with alternate angular strokes having an amplitude slightly higher than the larger of said arcs.

4,034,579

CONTINUOUS PRODUCTION OF FRINGED TEXTILE ARTICLES

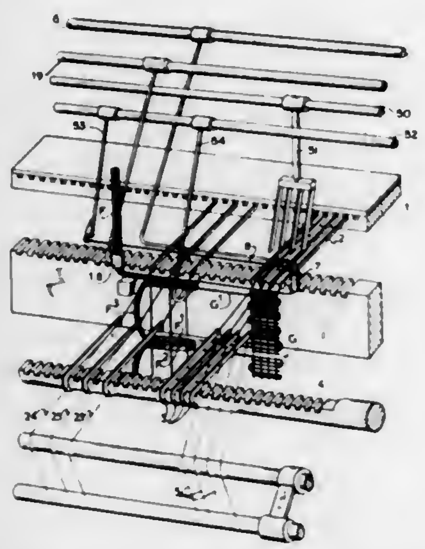
Georges Tillon, Saint-Etienne-Loire, France, assignor to Etablissements Giraudon S.A., Saint-Etienne-Loire, France

Filed Sept. 10, 1975, Ser. No. 612,177

Claims priority, application France, Sept. 13, 1974, 74.31730; July 31, 1975, 75.25701

Int. Cl.² D04B *23/14*

U.S. Cl. 66—85 R **17 Claims**



1. A method for continuous production of a fringed textile article comprised of a braid formed at intervals with weftwise projecting loops holding a fringe, comprising knitting a continuous weft yarn with warp to form said braid, periodically halting the knitting of the weft yarn with the warp while displacing a weft yarn guide weftwise from said braid to form a weftwise projecting part-loop of said continuous weft yarn, displacing towards said braid a fringe sliver guide to form a weftwise part-loop of a fringe sliver, displacing the guides relative to each other to displace one of the guides from one side of the other guide to the opposite side of said other guide to interloop the part-loops, returning said weft yarn guide weftwise to said braid to complete a projection loop of said continuous wefty yarn, resuming said knitting, returning said fringe sliver guide weftwise away from said braid to complete a loop of said fringe sliver, interconnecting the part-loops of said fringe sliver with first and second warp threads spaced apart weftwise, and severing the part-loops of said fringe sliver between said first and second warp threads to provide tassels forming said fringe.

4,034,580

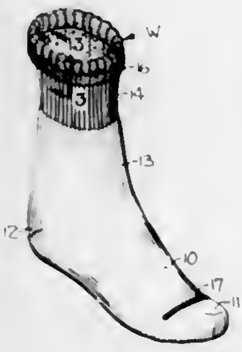
BOOT SOCK WITH STAY-UP CUFF AND METHOD

Otis W. Holder, Mount Airy, N.C., assignor to Oakdale Knitting Company, Mount Airy, N.C.

Filed Nov. 11, 1976, Ser. No. 740,801

Int. Cl.² D04B *9/54*

U.S. Cl. 66—172 E **13 Claims**



1. A sock including leg and foot portions comprising courses knit of a body yarn with a predetermined number of wales therein, and a stay-up cuff comprising an integrally knit outwardly turned welt including courses knit of the body yarn with a lesser number of wales than the number of wales in said leg and foot portions, said lesser number of wales in said outwardly turned welt being joined to selected wales only of the top of said leg portion, and a single-ply edge portion including courses knit of the body yarn with the same number of wales as said leg and foot portions, said single-ply edge portion being integrally knit with the lower edge of said outwardly turned welt and with the top of said leg portion and terminating in a non-ravel lower selvage edge, and turned welt being adapted to extend upwardly above the upper portion of an article of footwear with which said sock is to be worn to aid in preventing the entry of foreign matter and the like into the sock, and said single-ply edge portion being adapted to extend downover and cover the upper edge of the article of footwear to aid in preventing the sock from being drawn down into the article of footwear and the entry of foreign matter and the like into the article of footwear.

9. A method of knitting a sock including leg and foot portions comprising courses knit of a body yarn with a predetermined number of wales therein, and a stay-up cuff adapted to extend substantially coterminous with the upper portion of an article of footwear with which said sock is to be worn, said method comprising the steps of knitting a non-ravel selvage edge and a plurality of courses of a body yarn with a predetermined number of wales to form a single-ply edge portion, holding stitch loops in selected wales of the final course of said single-ply edge portion while forming a plurality of courses of stitch loops in the remaining wales to form a welt portion, knitting a single course while forming stitch loops in said predetermined number of wales to join opposed ends of said welt portion and to form an outwardly turned welt with the lower ends of said turned welt being integrally knit with said single-ply edge portion and said single course, and continuing to knit courses with the body yarn with stitch loops in said predetermoned number of wales to complete the knitting of the leg and foot portions of said sock.

4,034,581

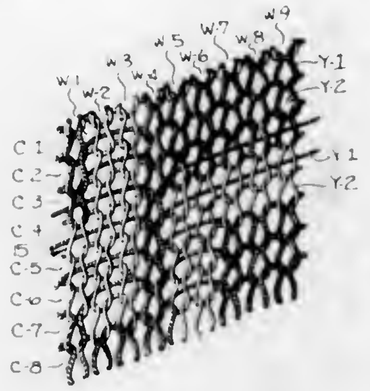
SOCK WITH PLATE AND FLOAT PATTERN AND METHOD

Homer L. Swafford, Statesville, N.C., assignor to Thorneburg Hosiery Mill, Inc., Statesville, N.C.

Filed Apr. 26, 1976, Ser. No. 680,179

Int. Cl.² D04B *9/46*

U.S. Cl. 66—180 **2 Claims**



1. In a sock including a leg consisting of successive courses knit of at least first and second yarns of different colors with the stitch loops forming adjacent wales, the combination therewith of a plate and float pattern comprising

a. areas extending throughout at least a major portion of said leg and being knit with said first and second yarns in plated relationship and with said first yarn being positioned on the outside and said second yarn being positioned on the inside so that the color of said first yarn predominates in said areas,

b. spaced apart pattern areas in said leg being knit of said second yarn only with said first yarn being floated inside of said spaced apart pattern areas, and

c. single wale areas extending over at least three successive courses between said spaced apart pattern areas (b) in which said first and second yarns are knit in plated relationship with said first yarn being positioned on the outside and said second yarn being positioned on the inside so that said single wale areas are the same color as said first yarn and with said first yarn being floated inside of the wales adjacent opposite sides of said single wale areas and in said spaced apart pattern areas said spaced apart pattern areas (b) adjacent one side of said single wale areas (c) extend below said three successive courses and said spaced apart pattern areas (b) at the opposite side of said single wale areas (c) extend above said three successive courses .

4,034,582

STEERING COMPENSATION MEANS FOR GUIDE BARS UTILIZED IN WARP KNITTING MACHINES HAVING TWO NEEDLE BEDS

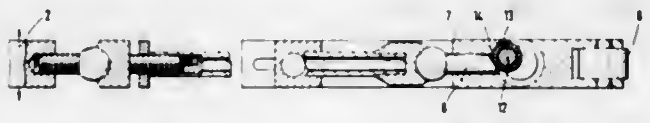
Johann Oppolzer, Urberach, Hessen, Germany, assignor to Karl Mayer Textilmaschinenfabrik GmbH, Obertshausen, Germany

Filed July 16, 1976, Ser. No. 705,986

Claims priority, application Germany, Aug. 23, 1975, 2537666

Int. Cl.² D04B *23/00*

U.S. Cl. 66—207 **7 Claims**



1. A warp knitting machine guide bar compensation apparatus comprising:

a push rod connectable to a guide bar on a warp knitting machine;

a pushing means for imparting a pushing motion to said push rod; and,

a compensation means located between said pushing means and said push rod for modifying the pushing motion of said pushing means in response to the angular displacement of said guide bar, said compensation means including:

a linkage means connected to said push rod; and,

an eccentric means connected to said linkage means and adapted to influence the movement of said push rod.

4,034,583

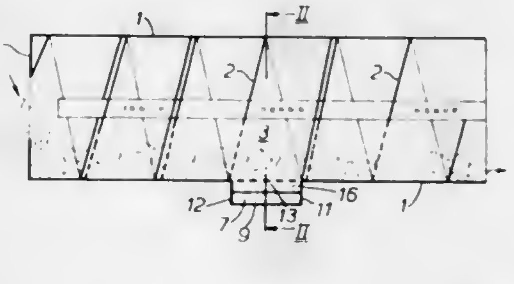
WASHING MACHINES

Heinz Miessler, Schulenburg, Leiner, Germany, assignor to Firma Vosswerk GmbH, Germany

Filed Mar. 3, 1976, Ser. No. 663,285

Int. Cl.² D06F *21/02, 37/08*

U.S. Cl. 68—16 **1 Claim**



1. In a washing machine, a washing drum rotatable in either direction of rotation, screw conveyor means rotatable with the drum and dividing the interior of the drum into a plurality of separate treatment zones, at least one of said zones forming a principal-washing zone of the machine, means defining a chamber mounted on the washing drum in the region of the principal washing zone, said chamber enclosing a surface portion of the drum, the surface portion of the drum enclosed by the chamber consisting of a perforated of a surface portion and a solid surface portion which joins the perforated surface portion at a boundary, partition means forming a liquid-containing pocket within the chamber, said partition means comprising an angle plate having two limbs, one of said limbs being secured to the drum in the region of said boundary and extending outwardly from the drum, and the other limb extending transversely from the said one limb and facing the solid surface portion whereby said pocket is at least partly filled with liquid at every angular position of the drum, and liquid heating means located in the pocket.

4,034,584

DYEING AND PRINTING OF MATERIALS

Norman E. Klein, Inman, and William H. Stewart, Jr., Spartanburg, both of S.C., assignors to Milliken Research Corporation, Spartanburg, S.C.

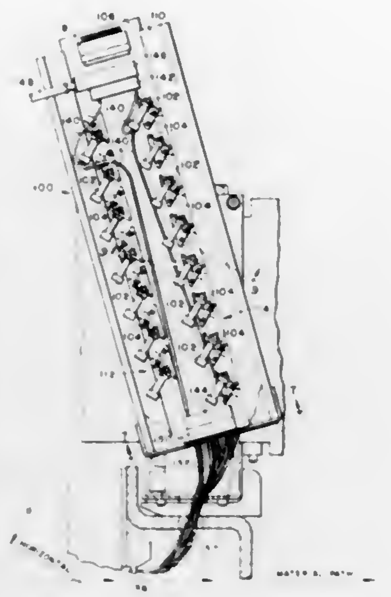
Division of Ser. No. 493,186, July 30, 1974, which is a continuation-in-part of Ser. No. 430,454, Jan. 3, 1974, abandoned. This application Apr. 2, 1976, Ser. No. 673,243

Int. Cl.² D06B *1/02*

U.S. Cl. 68—205 R **7 Claims**

1. In apparatus for printing a moving material including means for directing a plurality of continuously flowing dye streams towards the material to be printed, means for supplying air under pressure to deflect the dye streams away from the material to be printed, and means for controlling the flow of said pressurized air to said dye streams; the improvement therewith wherein said flow controlling means includes a plurality of electromagnetic valves, and means positioning the

valves in closely spaced relation and in a three dimensional geometric lattice whereby the magnetic lines of force of each valve intersect the magnetic axis of each of its adjacent valves at generally right angle.



4,034,585

PROCESS OF COMPRESSION STRESSING METALS TO INCREASE THE FATIGUE STRENGTH THEREOF

John C. Straub, 2508 Lincolnway West, South Bend, Ind. 46628

Filed Aug. 25, 1975, Ser. No. 607,241

Int. Cl.² C21D *7/06;* **B21B** *1/00*

U.S. Cl. 72—53 **9 Claims**

1. A process of compression stressing a metal work piece by shot peening or surface rolling thereof to increase the fatigue strength thereof consisting of the step of compression stressing substantially the entire selected surface of the work piece by imparting compression stresses of a value so related to the thickness, the hardness and the notch sensitivity of the work piece as to avoid the formation of surface cracks during the peening or rolling operation and produce a distribution of residual stresses in the work piece favorable to increase of fatigue strength, and a second step of compression stressing said work piece following the first step by imparting substantially uniformly to the selected surface of the initially stressed work piece compression stresses of greater magnitude to produce a greater depth of residual compressive stress in the work piece.

4,034,586

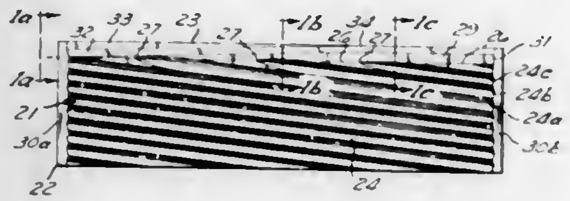
THREAD ROLLING DIE AND METHOD OF THREAD ROLLING

Richard H. Corrette, Olmsted Falls, Ohio, assignor to Colt Industries Operating Corporation, West Hartford, Conn.

Filed May 24, 1976, Ser. No. 689,588

Int. Cl.² B21D *13/04*

U.S. Cl. 72—88 **13 Claims**



12. A method of forming threaded fasteners having an annular rib substantially adjacent the end of threads thereon comprising rolling a blank against a die working face having thread forming grooves which fade in depth at their ends to produce threads which are tapered at their ends to substantially the root diameter of said thread, and displacing material of said blank to a depth of at least as deep as the roots of said threads from adjacent said ends axially of said blank to form an annular rib spaced from said ends.

4,034,587

CONCRETE REINFORCEMENT RODS

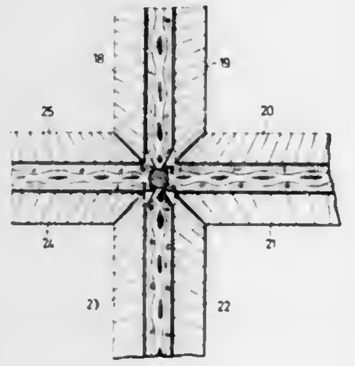
Wilhelm Schwarz, Schlusselfeld, Germany

Division of Ser. No. 385,252, Aug. 3, 1973, abandoned, which is a continuation of Ser. No. 160,360, Aug. 7, 1971, abandoned. This application June 17, 1975, Ser. No. 587,692

Claims priority, application Germany, July 8, 1970, 2033759; Sept. 29, 1970, 2047708

Int. Cl.² B21H *8/02*

U.S. Cl. 72—194 **8 Claims**



1. Apparatus for rolling a rod into a reinforcing rod for concrete and for forming laterally spaced cold rolled serpentine ribs on the outer surface of the rod which ribs extend generally in the axial direction of the rod, comprising a plurality of rolls each mounted for rotation about an axis and each said roll having a calibrating surface formed on and extending around the outer circumference thereof and said calibrating surface arranged to contact the outer surface of the rod, said rolls positioned angularly apart forming a pass therebetween for the rod with the calibrating surfaces of said rolls defining the pass, each said calibrating surface having a pair of spaced circumferentially extending edges along each of the opposite sides of the calibrating surface, each said roll having a pair of cheeks extending transversely of the axis of said roll and a flank extending between each said cheek and the adjacent edge of said calibrating surface, said flanks extending outwardly from the pass formed by said rolls and adjacent said flanks on the adjacent surfaces of said rolls being disposed in spaced relation forming an open gap between adjacent rolls extending outwardly from said pass wherein the ribs are formed on the rod, said calibrating surface on each said roll having a circumferential center line spaced equidistantly from its edges and the edges of said calibrating surface having a continuously varying dimension from said circumferential center line alternating periodically in a regular repetitive manner between a maximum and a minimum spacing.

4,034,588

METHODS OF PIERCING AND ENLARGING ELONGATE METAL MEMBERS SUCH AS SEAMLESS TUBES

Lewis A. Way, and Robert C. Williams, both of Columbiana, Ohio, assignors to Columbiana Foundry Company, Columbiana, Ohio

Continuation-in-part of Ser. No. 36,406, May 11, 1970, Pat. No. 3,962,897, which is a division of Ser. No. 493,234. Oct. 5, 1965, abandoned. This application July 6, 1976, Ser. No. 702,686

The portion of the term of this patent subsequent to June 15, 1993, has been disclaimed.

Int. Cl.² B21B *17/10*

U.S. Cl. 72—209 **5 Claims**

1. A method of piercing and enlarging elongated metal members such as seamless tube, particularly such members containing slag inclusions comprising the steps of urging said metal member at an elevated temperature above about 1750° F. over one of a piercing and enlarging point by rollig whereby said point passes through and forms an axial opening in the metal member, said point being formed of an alloy consisting essentially of 0.015% to 2% carbon, about 5% to 65% cobalt, about 15% to 35% chromium, up to about 30% iron and amounts of boron, nickel, silicon, molybdenum, vanadium aluminum, tantalum, tungsten, titanium, copper and columbium for imparting the qualities generally associated therewith without detrimentally affecting the hot hardness and resistance to erosion of said alloy at said elevated temperature.

4,034,589

MILL FOR ROLLING CONTINUOUSLY CAST INGOT

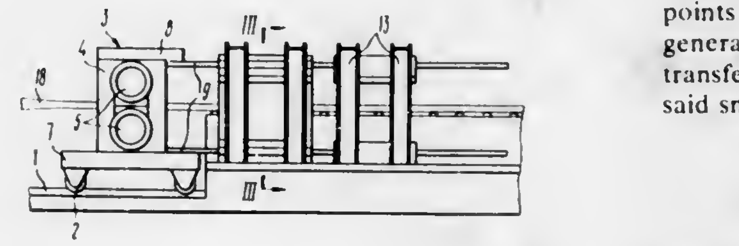
Evgeny Alexeevich Korshunov, pereulok Otdelny, 5a, kv. 29, Sverdlovsk, U.S.S.R.

Filed Oct. 7, 1976, Ser. No. 730,364

Claims priority, application U.S.S.R., Oct. 15, 1975, 2177704

Int. Cl.² B21B *13/22, 35/00*

U.S. Cl. 72—214 **4 Claims**



1. A mill for rolling a continuously cast ingot, said mill rolling the ingor intermittently, comprising: a movable mill stand mounted on slideways running parallel to the axis of rolling, said stand having a stage-separator set up on said slideways; housings each of which is provided with braces, said housings being fixed on said stage-separator; a top-mill separator interconnecting said housings; grooved mill rolls arranged inside said housings, roll necks of said grooved mill rolls protruding outside said braces; hydraulic driving means mounted on the braces of said housings and coupled to said roll necks which project beyond a side of a pair of said braces; gearing means meshing with each other and fitted on said roll necks project beyond a side of another pair of said braces, a drive adapted for reciprocating said movable mill stand, said drive being equipped with static linear inductors installed in proximity to a zone of displacement of said movable mill stand, and with at least two electrically conductive bars connected rigidly to said movable mill stand, said bars being disposed in a zone of influence of said inductors and having a length exceeding that of said inductors.

4,034,590

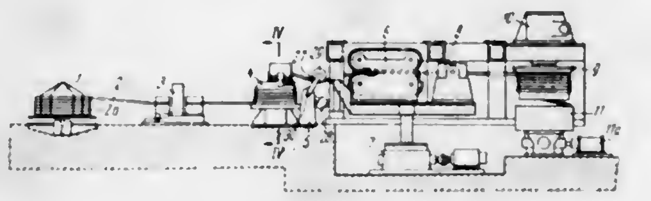
BILLET-STORAGE DEVICE FOR DRAWBENCHES

Jury Fedorovich Shevakin, Telegrafny pereulok, 11/16, kv. 53; Pavel Vasilievich Bashilov, Profsojuznaya ulitsa, 106/47, kv. 29; Igor Iosifovich Dobkin, 2 Avtozavodsky proezd, 5, korpus 1, kv. 6, all of Moscow; Mikhail Iosifovich Temkin, ulitsa Lenina, 9, kv. 46; Lev Borisovich Kuznetsov, ulitsa Lenina, 4, kv. 8, both of Kolchugino Vladimirskoi oblasti; Vitaly Vyacheslavovich Kotov, Raketny bulvar, 9, korpus 2, kv. 133; Fikrat Seidaliogly Seidaliev, ulitsa Golovacheva, 17, kv. 125, both of Moscow; Efim Moiseevich Donskoi, ulitsa Mayakovskogo, 4, kv. 6, Elektrostal Moskovskoi oblasti; Valentin Vasilievich Belkin, ulitsa Kakhovka, 23, korpus, 2, kv. 101, Moscow, and Evgeny Fedorovich Prutkin, ulitsa Lenina, 52, korpus 2 kv. 71, Sverdlovsk, all of U.S.S.R.

Filed Oct. 17, 1975, Ser. No. 623,553

Int. Cl.² B21C *1/10*

U.S. Cl. 72—280 **2 Claims**



1. A billet-storage device for a drawbench, which avoids twisting the billet during operation, comprising: two blocks of different diameters having parallel axes mounted on a housing with an eccentricity and adopted for reeling the billet thereon and for unreeling it therefrom, said blocks having their bases disposed at right angles to their axes and having a possibility of running freely, the smaller diameter block being mounted rotatably about the axis of said larger diameter block, so as to be able to rotate in both directions, the displacement of the axes of said blocks being equal to half the difference between the diameters of the bases of said blocks; and a device for directing the billet during its transfer from said larger diameter block to said smaller diameter block, said device being made as a roller guide arranged intermediate of said blocks; as a result, during the rotation of said smaller diameter block about the axis of said larger diameter block, which takes places when the billets are joined and welded end to end, and with said blocks placed in any relative position, the peripheral points on the bases of said blocks are located on coinciding generatrices of the block surfaces, thus enabling a stepless transfer of the tubular billet from said larger diameter block to said smaller diameter block.

4,034,591

DEVICE FOR ENLARGING PIPE ENDS

Günter Rothenberger, Bad Homburg, Germany, assignor to Rothenberger GmbH KG and Werkzeuge-Maschinen KG, both of Frankfurt am Main, Germany

Filed Feb. 12, 1976, Ser. No. 657,658

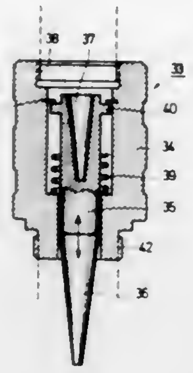
Claims priority, application Germany, Feb. 13, 1975, 2505915

Int. Cl.² B21D *41/02*

U.S. Cl. 72—393 **11 Claims**

1. Tool for enlarging pipe ends comprising toolholder body means containing axially movable mandrel means having a tapering end and capable of being displaced by an externally applied force, toolhead means exchangeably attachable to the toolholder body means coaxially with the mandrel means and containing a plurality of expanding members in the form of cylinder segment means radially displaceable by the axial displacement of the mandrel means and mounted so that they project axially from the toolhead means, the edge of the segment means facing the mandrel means forming a recess corresponding to the mandrel means taper, adapter means interposed between the toolholder body means and the toolhead means, and having a body containing an axially displaceable

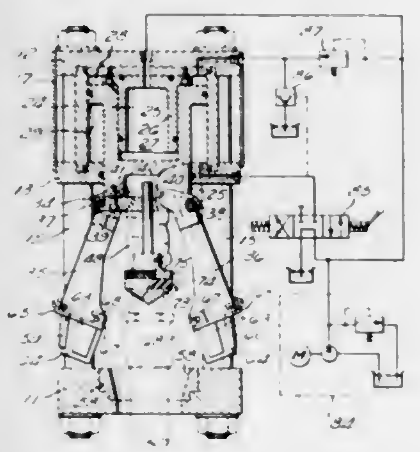
supplementary mandrel means having an elongated tapering end for cooperation with the exchangeable toolhead means, the other end of the supplementary mandrel means containing a recess shaped to receive the tapering end of the mandrel means mounted in the toolholder body means said adapter means transferring the motion of the mandrel means of the toolholder body to the expanding members of the exchangeable toolhead means.



4,034,592
CRIMPING MACHINE WITH AUTOMATIC HINGE OPEN PUSHERS

Karl K. Chen, Cleveland Heights; Hiralal V. Patel; Irving G. Frank, both of Euclid, and Donald Pistoor, Mayfield Heights, all of Ohio, assignors to The Weatherhead Company, Cleveland, Ohio

Filed Mar. 31, 1976, Ser. No. 672,295
Int. Cl.² B21D *39/00*
U.S. Cl. 72—402 32 Claims

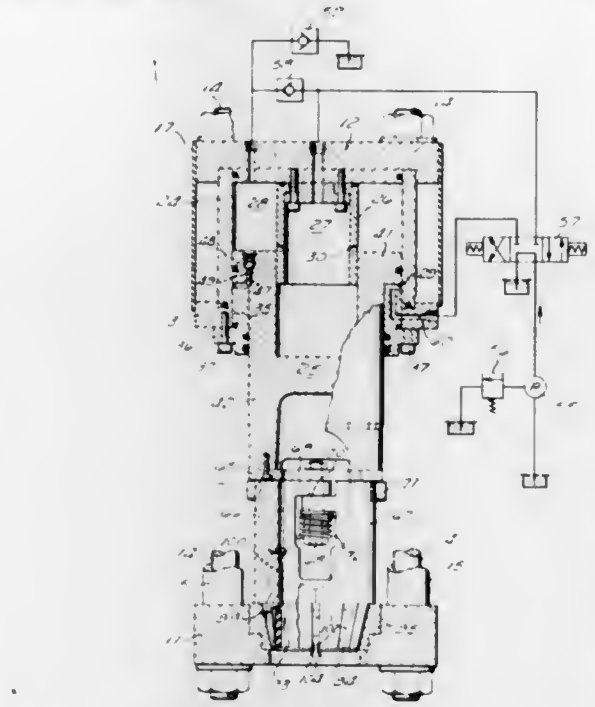


1. A machine for radially deforming a workpiece comprising a bed plate, a ram reciprocable along a longitudinal axis toward and away from said bed plate, a die assembly for receiving said workpiece, and a longitudinally extending pusher member disposed between said ram and said die assembly, said die assembly including a socket and a die section, said die section including a plurality of die segments and resilient means acting between adjacent ones of said die segments, said die segments each having an internal surface defining a part of a die cavity, first mounting means mounting said pusher member for longitudinal movement with said ram and for lateral movement along a predetermined path relative to said ram between a ram force transmitting position and a laterally disposed position, and second mounting means mounting said die section on said pusher member for longitudinal movement with said pusher member and said ram and for lateral movement with said pusher member relative to said ram.

4,034,593
CRIMPING MACHINE WITH AUTOMATIC SWING OPEN PUSHERS

Hiralal V. Patel, Euclid, Ohio, assignor to The Weatherhead Company, Cleveland, Ohio

Filed Apr. 9, 1976, Ser. No. 675,270
Int. Cl.² B21D *39/00*
U.S. Cl. 72—402 16 Claims



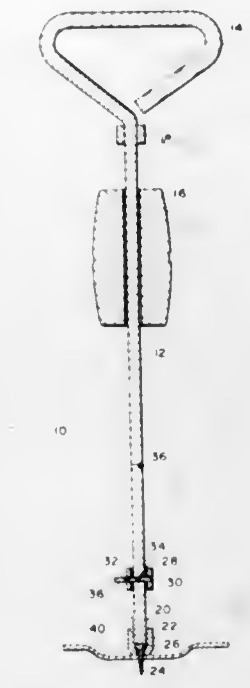
1. A machine for radially deforming a workpiece comprising a bed plate, a ram reciprocable along a longitudinal axis toward and away from said bed plate, a die assembly for receiving said workpiece, said die assembly including a sprocket and a die section, said die section including a first predetermined number of disjuncted die segments and resilient means acting between adjacent ones of said die segments, said first predetermined number being greater than two, said die segments each having an internal surface defining a part of a die cavity, and mounting means mounting said first predetermined number of disjuncted die segments and said resilient means for longitudinal movement with said ram into and out of said socket by said reciprocable movement of said ram, said mounting means including a second predetermined number of deflectable attachment arms extending away from said ram in a direction toward said bed plate, said second predetermined number being greater than zero and less than said first predetermined number, said attachment arms each having a first end and a second end, said first end being closer to said ram than said second end and said second end being closer to said bed plate than said first end when said ram is in a retracted position, said second end of said attachment arm being in a free radially outward position when said die section is removed from said socket, and said second end being in a deflected position radially inward of said free radially outward position when said die section is fully received in said socket by operation of said ram to radially inwardly displace said die segments to deform said workpiece.

4,034,594
VARIABLE IMPACT TOOL

Carl E. Morgan, Petaluma, Calif., assignor to Morgan Manufacturing Inc., Petaluma, Calif.

Filed Oct. 12, 1976, Ser. No. 731,706
Int. Cl.² B21J *13/08*
U.S. Cl. 72—457 5 Claims

1. A variable impact jar-transmitting tool comprising:
a shaft;
a handle on one end of said shaft;
an anvil on said shaft adjacent said handle;
a massive impact sleeve slideable on said shaft and adapted to be gripped manually;
means on the other end of said shaft for gripping a workpiece;
a collar slideable on said shaft intermediate said other end and said sleeve; and

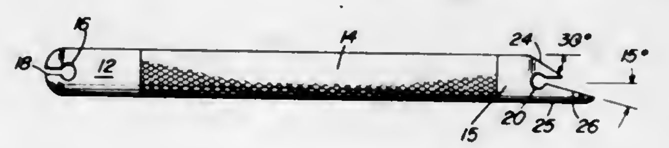


interengagable means on said collar and said shaft for locking said collar selectively in a first position adjacent said workpiece gripping means to enable maximum stroke of said impact sleeve and a second position displaced therefrom to limit said stroke and to provide substantial clearance between said collar and said gripping means.

4,034,595
SHEET METAL WORKING TOOL

Glen R. Smith, Rte. 2, Box 183, Lewiston, Mich. 49756

Filed Nov. 19, 1975, Ser. No. 633,453
Int. Cl.² B21D *19/00*
U.S. Cl. 72—458 9 Claims

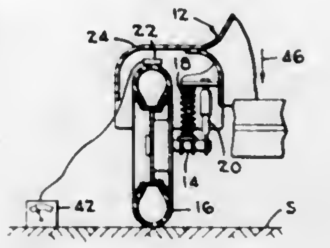


1. A tool for working on sheet metal to turn edges and open Pittsburgh locks comprising; a metal rod of steel having means at one end for edge turning, and means at the other end for opening Pittsburgh locks, the means for edge turning including a slot extending inwardly the depth of the desired edge and of the approximate width of the thickness of metal which it is desired to turn, the slot being approximately 1/16th inch in thickness and approximately 1/4 inch in depth, a hole provided parallel to and at the innermost end of said slot, said hole being of approximately 5/32nd inch in diameter, and the means for opening Pittsburgh locks including a hole drilled through the steel rod and in parallel with the first hole set forth above but at the other end of said rod, said hole having a slot of approximately 1/16th inch opening to the edge of said tool.

4,034,596
METHOD AND APPARATUS FOR TESTING SHOCK ABSORBERS AND THE LIKE

William P. Cargile, 206 El Granada Blvd., Half Moon Bay, Calif. 94019

Filed Aug. 23, 1976, Ser. No. 716,632
Int. Cl.² G01M *17/04*
U.S. Cl. 73—11 7 Claims

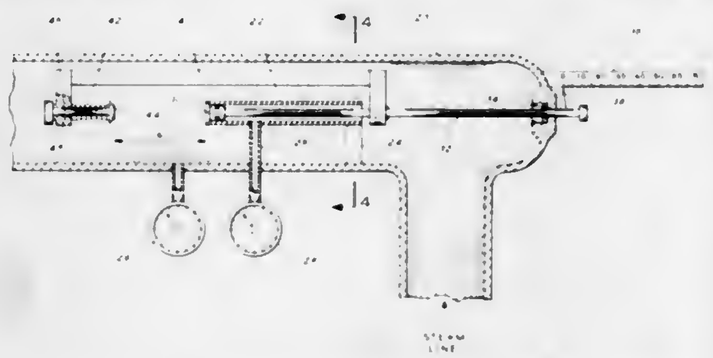


1. Apparatus for in situ testing of vehicular shock absorbers comprising a transducer having an antenna member, means for supporting said transducer immovably with respect to the vehicle axle so that said antenna forms a capacitance with a portion of the body of said vehicle, and means for measuring and analyzing the time variation of said capacitance in response to motion of the body relative the axle.

4,034,597
METHOD AND APPARATUS FOR MEASURING STEAM QUALITY

Oke A. Fredriksson, Fullerton, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 4, 1976, Ser. No. 729,245
Int. Cl.² G01K *17/06*; G01N *19/10*
U.S. Cl. 73—29 2 Claims



1. A method of estimating the quality of wet steam in a steam line comprising flowing wet steam in a steam line, establishing a sample chamber within said steam line, opening said sample chamber to wet steam flowing in said steam line to fill a known first volume of said sample chamber with a representative portion of the wet steam flowing in said steam line at the same temperature and pressure as the steam flowing in said line, closing said sample chamber to capture said representative portion of wet steam containing a liquid portion and a gaseous portion in said sample chamber, increasing the volume of said closed sample chamber to allow evaporation of the liquid portion of said representative portion while continuing to flow wet steam in said steam line past said closed sample chamber to maintain the temperature in said closed sample chamber substantially the same as the temperature of the wet steam in said steam line, observing the pressure in said closed sample chamber while continuing to increase the volume of said closed sample chamber to allow evaporation of substantially all of the liquid portion of said representative portion while simultaneously observing the volumetric increase in said closed sample chamber, noting the volumetric increase in said closed sample chamber at the time the pressure in said closed sample chamber begins to decrease its initial value indicating evaporation of substantially all of the liquid portion of said

representative portion and determining the approximate quality of wet steam flowing in said steam line by establishing the ratio of said volumetric increase in said closed sample chamber to said first volume of said sample chamber.

4,034,598

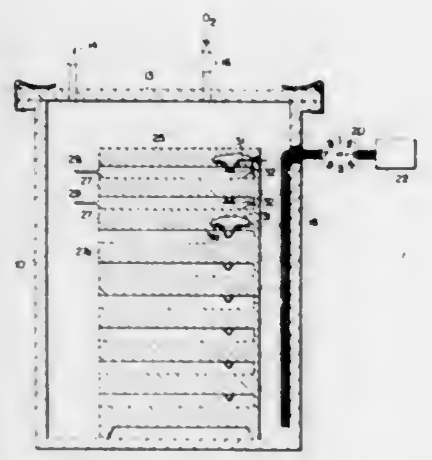
METHOD FOR TESTING SEALS OF ELECTRICAL ENERGY STORAGE DEVICES

Allan E. Ames, Reading; Alfredo G. Kniazzeh, and Paul Goldberg, both of West Newton, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Mar. 29, 1976, Ser. No. 671,288

Int. Cl.² G01M *3/04*

U.S. Cl. 73—40 **14 Claims**



9. A method for determining the seal integrity of batteries which comprises the steps of measuring the open circuit voltage of a battery, subjecting the battery to about a 100% oxygen atmosphere at at least 100 psig for about one minute and then measuring the open circuit voltage of the thus treated battery.

11. A method for determining the seal integrity of an electrical energy storage device which comprises the steps of measuring the weight of the device, subjecting the device to an oxygen atmosphere at an elevated pressure, and again measuring the weight of the thus tested device.

4,034,599

DEVICE FOR LOCATING DEFECTIVE FUEL

Robert N. Osborne, Alamo, Calif., assignor to General Electric Company, San Jose, Calif.

Filed June 18, 1975, Ser. No. 587,843

Int. Cl.² G01M *3/20; G21C 17/06*

U.S. Cl. 73—40.7 **11 Claims**

1. Apparatus for detecting defective nuclear fuel elements comprising:

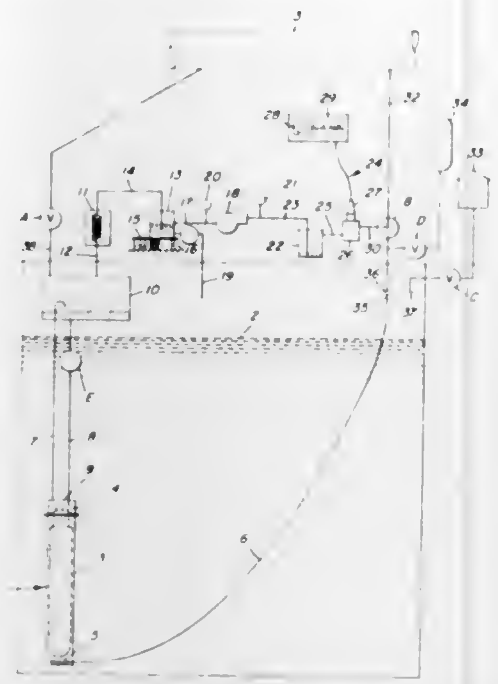
a. a test chamber filled with water for individually enclosing and sealing the fuel element to be tested, said test chamber having a gas sparger disposed at the bottom of said test chamber,

b. a reservoir connected to said test chamber for receiving water displaced from above the fuel element to effect a reduction in pressure in said test chamber and for receiving sample gas from said test chamber,

c. a pump for drawing sample gas from said reservoir,

d. a radiation monitor receiving sample gas from said pump, and

e. a two-way receiving sample gas from said monitor for selectively directing said sample gas back to said test chamber through said gas sparger to displace the water above the fuel element to effect a reduction in pressure in said test chamber and to simultaneously purge the water surrounding said fuel element of any fission gases pulled therefrom, and for selectively venting said sample gas to further reduce the pressure in said test chamber to a vacuum by means of said pump and to simultaneously purge the water surrounding the fuel element of any further fission gases pulled therefrom.



4,034,600

METHOD AND DEVICE FOR CHECKING CIGARETTES AND THE LIKE

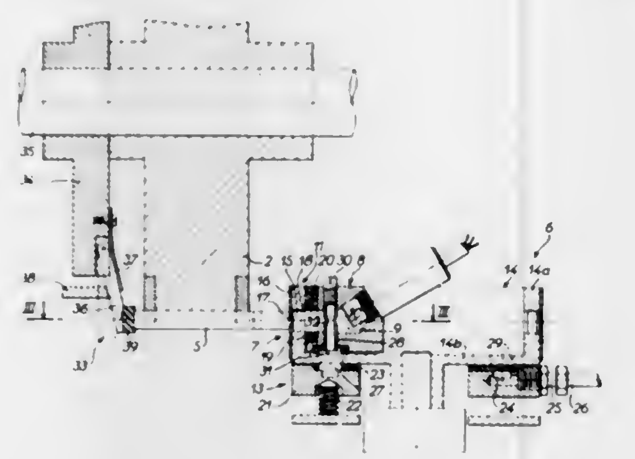
Roger Motte, Fresnes, France, assignor to Arenco-Decoufle, Paris, France

Filed Nov. 19, 1976, Ser. No. 743,396

Claims priority, application France, Nov. 27, 1975, 75.36338

Int. Cl.² G01M *3/26*

U.S. Cl. 73—41 **9 Claims**



1. In a method of checking finished cigarettes or other similar products, notably filter-tip cigarettes, in order to detect and reject defective cigarettes, comprising the steps of conveying continuously and transversally to their longitudinal axes a series of regularly spaced cigarettes, causing said cigarettes to move in succession past a checking station, feeding gas from a source of compressed gas successively into each cigarette moving past said checking station, said compressed gas being introduced into a chamber communicating with one end of the cigarette moving past said checking station while its other end is momentarily sealed, measuring the pressure of the gas thus fed to said cigarette, generating a signal representative of the measured pressure, comparing said signal with a predetermined threshold value representative of a minimum pressure corresponding to an acceptable cigarette, and generating a rejection signal when the instantaneous value of the measured pressure is lower than said minimum pressure, the improvement consisting in filling firstly said chamber with compressed gas so as to establish therein a pressure higher than said minimum pressure corresponding to an acceptable cigarette, cutting off the communication with said one end of the cigarette being checked, measuring a pressure drop resulting from the communication thus established between said chamber and the cigarette, and generating said rejection signal when the instantaneous value of the measured pressure drops below said minimum pressure.

4,034,601

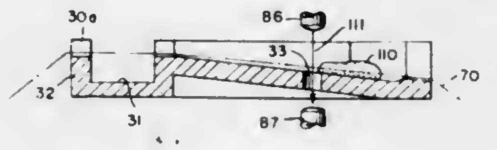
METHOD AND APPARATUS FOR DETERMINING COAGULATION TIMES

Mario Theodore Gelger, Wettingen, Switzerland, assignor to American Hospital Supply Corporation, Evanston, Ill.

Continuation of Ser. No. 500,911, Aug. 27, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 675,936

Int. Cl.² G01N *11/10, 33/16*

U.S. Cl. 73—64.1 **14 Claims**



1. A method for determining the coagulation time for a body of fluid, supported on a non-wettable surface, following the intermixing of a coagulation agent with said fluid, comprising the steps of

drawing a filament through said fluid body at a predetermined rate, and detecting when said body clings to said filament and commences to move therewith along and upon said surface, the interval between intermixing of said fluid and agent and the commencement of movement of said body bearing a direct relation to the actual coagulation time of said fluid.

4,034,602

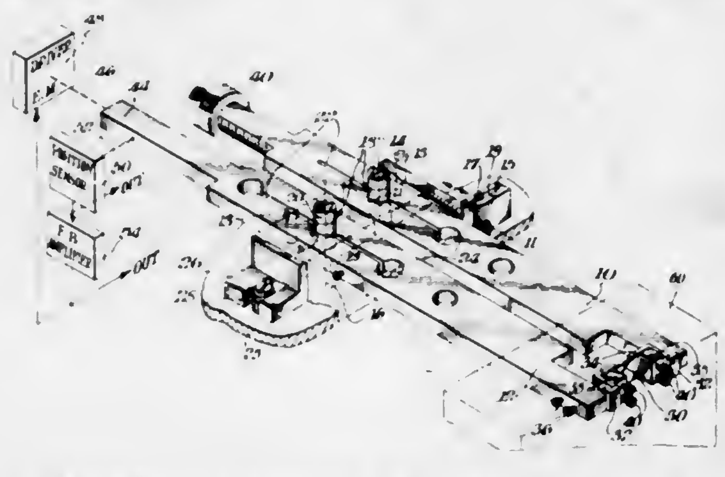
DYNAMIC MECHANICAL ANALYZER

Lecon Woo, Newark, Del., and John D. McGhee, Plymouth Meeting, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Feb. 27, 1976, Ser. No. 662,269

Int. Cl.² G01N *3/32*

U.S. Cl. 73—67.2 **15 Claims**



1. Apparatus for analyzing the dynamic properties of a sample comprising, in combination,

a pair of spaced, elongated members for engaging said sample therebetween,

pivot means for pivotally mounting said members for lateral in-phase pivotal motion generally in a common plane,

drive means for subjecting one of said members and hence, through said sample, the other of said members to vibratory motion in said plane, and

sensing means responsive to the movement of one of said members for providing a signal corresponding to said vibratory motion.

4,034,603

METHOD OF AN APPARATUS FOR TESTING THE HARDNESS OF MATERIALS

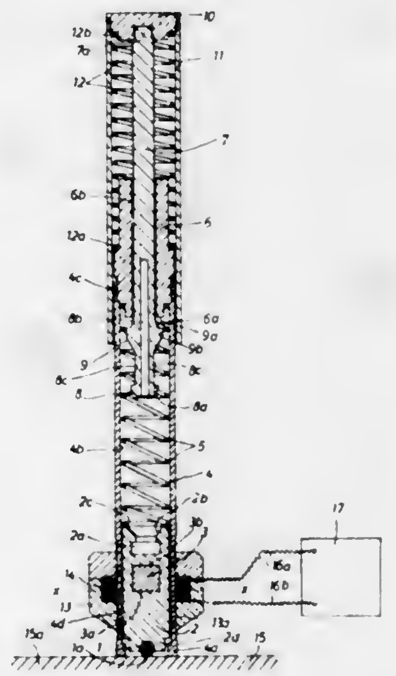
Dietmar Leeb, and Marco Brandestini, both of Zurich, Switzerland, assignors to Proceq SA, Zurich, Switzerland

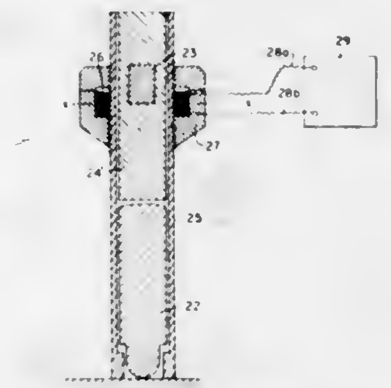
Continuation of Ser. No. 628,252, Nov. 3, 1975, abandoned. This application July 9, 1976, Ser. No. 703,471

Claims priority, application Germany, Nov. 7, 1974, 2452880

Int. Cl.² G01N *3/52*

U.S. Cl. 73—79 **28 Claims**





1. A method of testing the hardness of a material by means of an impact device, comprising the steps of:

a. providing an impact body member and a separate test member having a test tip;

b. providing means for driving said impact body member to engage said test member;

c. employing said driving means to drive the impact body member towards the material to be tested and to engage the test member thereby causing the test tip to impact said material and the test member to rebound therefrom;

d. determining the velocity of at least one of said members immediately prior to impact;

e. determining the velocity of at least one of said members immediately after impact; and

f. forming a measure of the hardness of the material from said velocities.

4,034,604

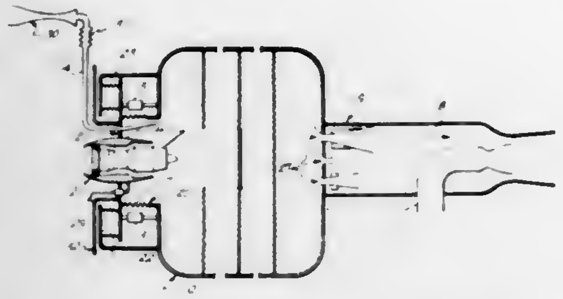
APPARATUS FOR DETERMINING CHARACTERISTICS OF TURBO-POWERED AIRPLANE ENGINE SIMULATORS

Reiner Decher, Bellevue; Eugene Howard Fromm, Seattle, and David Charles Tegeler, Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Sept. 29, 1975, Ser. No. 617,619

Int. Cl.² G01M *9/00;* **G01L** *5/13*

U.S. Cl. 73—147 **5 Claims**



1. Flight simulation apparatus comprising: a chamber having an inlet passage and an exhaust passage;

- means for causing movement of air through said exhaust passage;
- means in said exhaust passage for controlling air flow through said passage to a predetermined amount;
- an apertured plate outside of said chamber adjacent said inlet passage;
- flexible sealing means connecting said plate to said inlet passage;
- compensating expansible chamber means attached to said chamber and to said plate, said compensating expansible chamber means being responsive to the difference in pressure between the interior and the exterior of said chamber; and force measuring balance means interposed between said chamber and said plate.

4,034,605

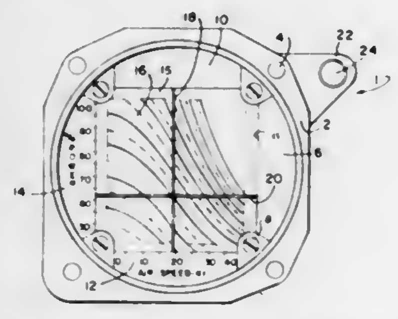
MANEUVER MARGIN PRESENTING

David Lee Green, Potomac, Md., assignor to Pacer Systems Inc., Burlington, Mass.

Filed Sept. 26, 1975, Ser. No. 617,000

Int. Cl.² G01C *21/00*

U.S. Cl. 73—178 H **35 Claims**



1. Maneuver margin presenting apparatus comprising moveable air speed input indicator means for presenting air speed, moveable engine power input indicator means for presenting engine power cooperating with the air speed input indicator means, and a comparator means positioned adjacent to the air speed input indicator means and the engine power input indicator means for presenting the engine power with respect to the air speed indicative of maneuver margin.

4,034,606

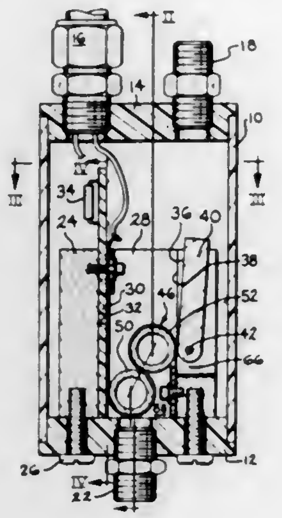
GAS FLOW TRANSDUCER UTILIZING ROLLING PISTON

Charles E. Wierzbicki, and William R. Leonards, both of Albuquerque, N. Mex., assignors to Sparton Corporation, Jackson, Mich.

Filed Dec. 15, 1975, Ser. No. 640,484

Int. Cl.² G01F *3/08, 1/24*

U.S. Cl. 73—208 **9 Claims**



1. A gas flow transducer comprising, in combination, a casing of a rectangular transverse cross section having a width and a length defining a chamber, a gas inlet port communicating with said chamber, a piston movably mounted in said chamber movable between minimum and maximum gas flow positions dependent upon the rate of gas flow into said chamber, said piston comprising a pair of cylindrical rollers each having a diameter less than the width of said chamber, parallel axes, and a length slightly less than the length of said chamber, an elongated gas outlet port communicating with said chamber at a location spaced from said inlet port and extending in the direction of piston movement, said piston controlling the location of gas flow into said outlet port, an electric signal circuit having a plurality of conducting terminals within said chamber spaced in the direction of piston movement, and electric conducting means mounted upon said piston engaging said terminals comprising a flexible band of electrical conducting material having a first end fixed with respect to said terminals, a central region passing about more than half of the circumferences of said rollers in an S-configuration and a second end fixed to said casing within said chamber, one of said rollers holding said band against said terminals during piston movement whereby said circuit produces an electric signal having characteristics dependent upon the position of said piston within said chamber.

4,034,607

FLOW MONITORING

Kenneth W. Martig, Jr., Olympia, Wash., assignor to Pro-Tech Inc., Paoli, Pa.

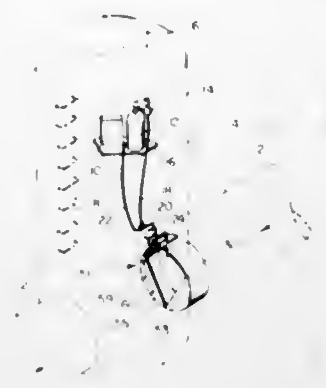
Continuation-in-part of Ser. No. 503,392, Sept. 5, 1974, Pat. No. 3,965,740. This application June 28, 1976, Ser. No. 700,394

Int. Cl.² G01F *1/20*

U.S. Cl. 73—215 **8 Claims**

1. In apparatus for monitoring flow in a conduit, the combination of support means configured to conform to the inside wall of the conduit and adapted to be compressed thereinto

and to be expanded against the inside wall thereof, adjustment means for expanding the support means against the inside wall



of the conduit, and flexible angle V-notch weir means supported by the support means.

4,034,608

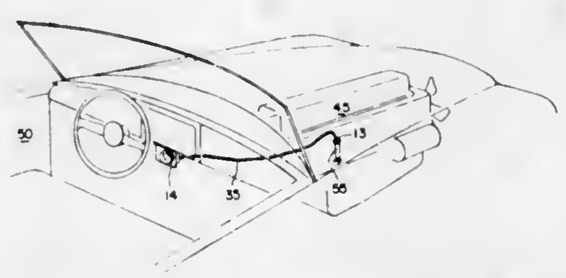
AUTOMOTIVE OIL GAUGE

Dixon J. Vincent, 585-25½ Road, Box 4, Grand Junction, Colo. 81501

Filed June 25, 1976, Ser. No. 700,056

Int. Cl.² G01F *23/10*

U.S. Cl. 73—313 **5 Claims**



1. An automotive oil gauge to provide a ready readout of the level of oil in an engine crankcase, the device comprising, in combination:

- a cylindrical hollow tube having an interior compartment along its length, a top surface and opposed bottom surface, with said tube being provided with external threads running a short distance along its length from said top surface, with a slot being further provided a short distance along the length of said tube from its bottom surface, and with a leaf spring affixed within the interior compartment of said tube so as to be positioned near said bottom surface and to be axially aligned with said slot with the tip of said leaf spring adjacent said bottom surface being biased inwardly; and
- a float mechanism consisting of opposed side surfaces, as blunt end surface and an opposed rounded end surface, tapered bottom and top surfaces, with said float mechanism assembled within said slot in the interior compartment of said hollow tube by means of a pin so as to provide a freely pivotable rotation thereon so that, when the bottom surface of said float mechanism is projected downwardly from the bottom surface of said hollow tube, said leaf spring is compressed against the inside surface of said hollow tube; and
- a cap consisting of a length of cylindrical tubing provided with internal threads for threadable engagement to said external threads on said hollow tube, with said tube securely affixed on one end to a cylindrical plate to which is affixed a float resistor and a flexible wire protector through which a wire is disposed and connected to said float resistor on one end and to a visual gauge on the opposite end; and
- a stiff wire disposed along the length of the internal compartment of said hollow tube and connected on one end to the rounded end surface of said float mechanism and to said float resistor on its other end; and
- a visual gauge designed to receive electrical impulses from said float resister to resistor readings for low, add, or full on the face of said gauge by means of a needle.

4,034,609

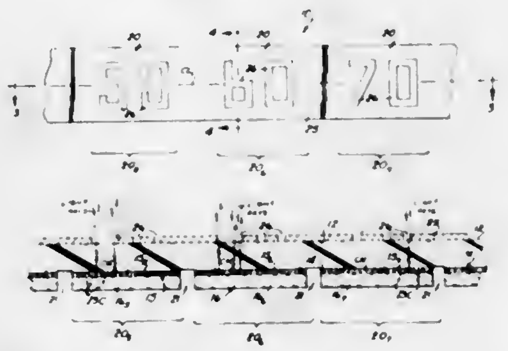
DIGITAL SENSING DEVICE

David L. Fuller, 1110 Mountain Creek Trail, Atlanta, Ga. 30328

Filed Jan. 2, 1976, Ser. No. 646,038

Int. Cl.² G01W *1/02*

U.S. Cl. 73—335 **12 Claims**



8. A sensing device for visually indicating changes in selected relative humidity conditions in a fluid medium comprising:

- a transparent support layer having a viewing side and a sensing side opposite said viewing side;
- an indicator layer operatively associated with the sensing side of the support layer comprising at least one filter cell including a transparent gelatin carrier material and an inorganic salt composition dispersed in said transparent carrier material that provides a known visible response to changes in relative humidity conditions in the filter cell; and,
- a reflective layer operatively associated with that side of said indicator layer opposite said support layer, said reflective layer being moisture permeable and exposed to the fluid medium whose relative humidity is to be quantified so that light passing through said support layer and said indicator layer is reflected back through said indicator layer and said support layer through the viewing side of said support layer so as to be visible from the viewing side of said support layer.

4,034,610

DIFFERENTIAL PRESSURE MEASURING DEVICE

Joseph Montgomery Biddle, Center Square, and Richard Malcolm Hickox, Abington, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Nov. 15, 1976, Ser. No. 741,614

Int. Cl.² G01L *9/04*

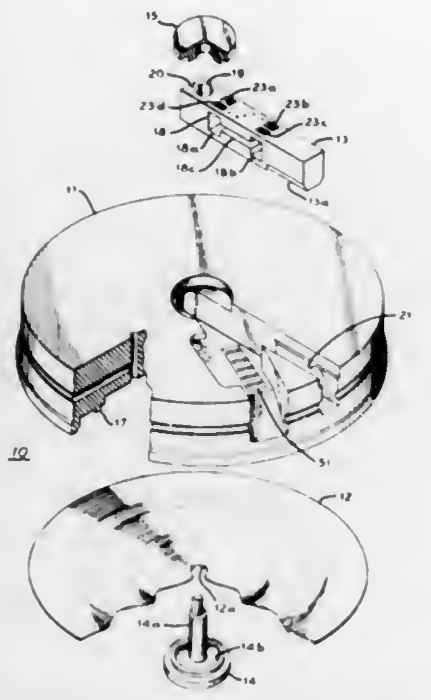
U.S. Cl. 73—398 AR **6 Claims**

1. A differential pressure capsule comprising:

- a housing member having a substantially cylindrical cavity formed therein;
- a ring-shaped body member having its periphery sealingly mounted in said housing member and having in one circular surface thereof a radially directed slot;
- a measuring diaphragm sealingly secured to the other circular surface of said ring-shaped body member to form with said housing a pair of cavities separated by said diaphragm;
- an axially aligned pin member attached to the center portion of said measuring diaphragm and extending through said ring-shaped body member;
- a beam member of substantially rectangular cross-section having a transverse slot therethrough, said slot forming

first regions of uniform cross-section areas of said beam separated by an intermediate region having a uniform cross-section area greater than said areas of said first regions, and a transverse hole through one end of said beam in direction perpendicular to said slot and of dimension to form a force fit with said axially aligned pin, the dimension of said beam in the direction transverse to said hole being such to form a force fit with said radially directed slot in said ring-shaped body member; and

electric strain gauge means secured to the outer face of said beam within said first regions to provide an electrical quantity varying linearly in accordance with the difference in fluid pressure existing in said housing member on each side of said measuring diaphragm.



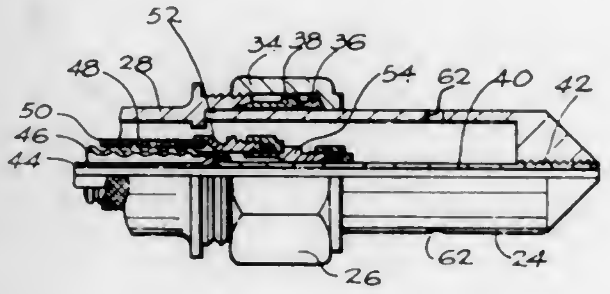
4,034,611
PARTICULATE SAMPLING PROBE

James E. Horling, Rahway, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Dec. 3, 1976, Ser. No. 747,453

Int. Cl.² G01N *1/24*

U.S. Cl. 73—421.5 R **14 Claims**



1. A particulate sampling probe for sampling particulates in a gas flow, comprising:

an outer tube configured to extend one end thereof into a gas flow; and

an inner tube removably disposed within the entire length of said outer tube, one end of said inner tube extending from the other end of said outer tube, said inner tube being at both ends for the passage of gas from said gas flow therethrough;

said outer tube being configured at both ends to close about said inner tube.

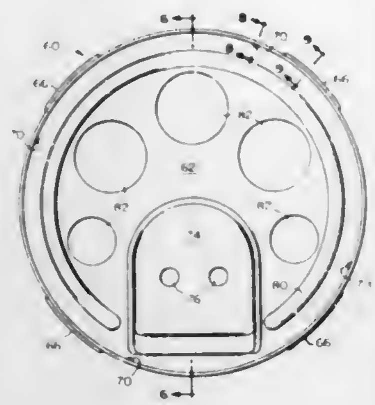
4,034,612
MULTIPLE PURPOSE INSTRUMENT HOUSING

Richard J. Buckwitz, Evanston, Ill., assignor to General Signal Corporation, Rochester, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,240

Int. Cl.² G01D *11/24;* **G01L** *19/14*

U.S. Cl. 73—431 **11 Claims**



1. In a pressure gauge assembly having a pressure responsive mechanism, a case enclosing said mechanism, and a transparent face plate for the front of said case, said case having a back plate and a generally cylindrical wall having an inner surface and an outer surface attached thereto, the improvement comprising:

a plurality of segmented thread projections protruding from one of said surfaces of said wall and extending in a helical path about said one surface of said wall, said projections being relatively short and forming a thread of relatively fine pitch, and a plurality of protuberances protruding from the other of said surfaces of said wall, whereby one of said projections and said protuberances function to mount said face plate.

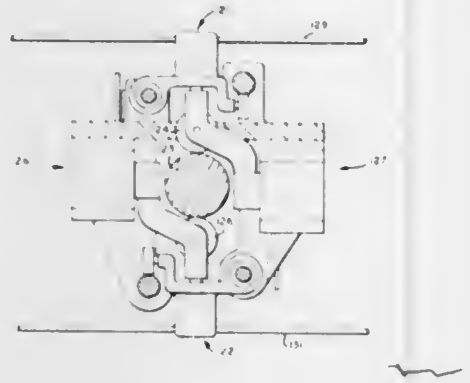
4,034,613
DISC DRIVE LINEAR ACTUATOR AND CONTROL SYSTEM THEREFOR

Martin O. Halfhill, 6876 Castle Rock Drive, San Jose, Calif. 95120, and Russell K. Brunner, 1039 Wood Duck Ave., Santa Clara, Calif. 95051

Division of Ser. No. 486,408, July 8, 1974, Pat. No. 3,922,718. This application May 21, 1975, Ser. No. 579,432

Int. Cl.² F16H *21/16*

U.S. Cl. 74—25 **15 Claims**



1. The linear actuator for transmitting motion separately to two different carriages comprising:

A. a drive shaft having a cylindrical surface;

B. a support mounting said drive shaft for rotation thereof about the axis of said cylindrical surface;

C. two separate carriages to be driven;

D. coupling means associated with each of said carriages for converting rotary motion of said drive shaft into translational motion of said respective carriages, said coupling means including for each of said carriages:

1. a roller;

2. means carried by said carriage for supporting said roller and maintaining the same in driving frictional engagement with said cylindrical surface of said drive shaft; and

3. roller control means for selectively changing angular orientation of the axis of rotation of each of said rollers between an orientation parallel to the axis of rotation of said cylindrical surface to one oblique with respect thereto in which rotation of said drive shaft and roller causes relative translational motion between said roller and said drive shaft, the roller control means for each of said rollers changing the angular orientation of the axis of its associated roller independently of the angular orientation of the axis of the other roller whereby the coaction of a single drive shaft with two separate carriages provides separate and independent motion of said two carriages; and

E. power means connected to one of said drive shafts and said rollers for rotating the same.

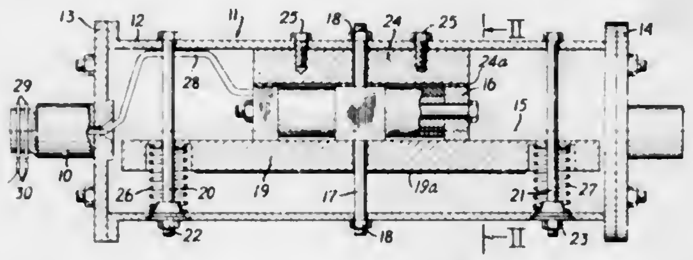
4,034,614
APPARATUS FOR GENERATING VIBRATIONS

Torsten Fors, Spanga, and Martin Norrman, Sollentuna, both of Sweden, assignors to Dynapac Maskin AB, Solna, Sweden

Filed Sept. 16, 1975, Ser. No. 613,936

Int. Cl.² F16H *33/00*

U.S. Cl. 74—61 **15 Claims**



1. Apparatus for generating vibrations comprising a rotatable shaft and at least two masses, means for mounting one mass on the shaft in a first eccentric position with respect to the center line of the shaft, means including a spring for mounting at least one other mass on the shaft in a second eccentric position with respect to the center line of the shaft, the other mass mounting means permitting outward radial movement of the other mass against the spring, and means for selectively locking the masses to each other, the first and second eccentric positions being selected so that the resultant eccentric moment of the masses in relation to the center line of the shaft is low or substantially zero when the shaft is stationary or rotating at low speed.

4,034,615
ENDLESS POWER TRANSMISSION BELT

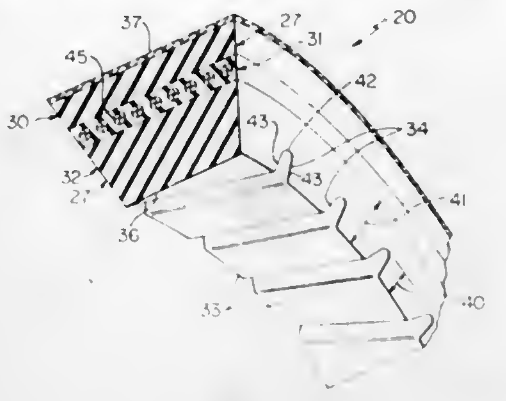
Alden W. Brooks, Springfield, Mo., assignor to Dayco Corporation, Dayton, Ohio

Filed Aug. 27, 1976, Ser. No. 718,294

Int. Cl.² F16H *7/00;* **F16G** *5/00*

U.S. Cl. 74—229 **20 Claims**

1. A toothed elastomeric endless power transmission belt for operation in an endless path around associated sheaves with minimum noise comprising, a compression section having a plurality of teeth defined by a plurality of grooves in said compression section extending at an angle other than 90° to said endless path, said grooves defining teeth which are adapted to enter and exit each of said associated sheaves gradually during belt operation and said grooves defining associated air-filled columns each of which due to its angular disposition is gradually covered and exposed as the column respectively enters and exits each of said associated sheaves during said belt operation resulting in said minimum noise



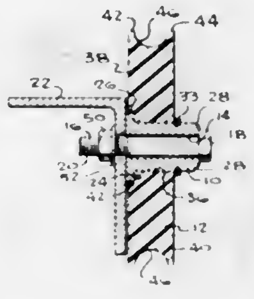
4,034,616
PULLEY MEANS

David A. Rauscher, 705 Formby Drive, Columbia, S.C. 29204

Filed Oct. 16, 1975, Ser. No. 623,006

Int. Cl.² F16H *55/36, 55/48*

U.S. Cl. 74—230.05 **3 Claims**



1. A low-friction, corrosion resistant pulley assembly comprising in combination, a stainless steel shaft means having a cylindrical outer bearing surface and a pulley member formed of a unitary body of polyethlene material having first and second parallel side faces, first and second parallel side flanges, an arcuate peripheral trough positioned between said first and second parallel side flanges, each of said side flanges having an arcuate outer surface as viewed in cross-section, a cylindrical pulley bearing surface matingly received over said cylindrical outer bearing surface of said stainless steel shaft for rotation thereon and additionally including a cylindrical recess formed in said pulley member concentric to the axis of said pulley and having a greater diameter than the diameter of said cylindrical pulley bearing surface extending inwardly from one of said side faces and a head flange on one end of said stainless steel shaft matingly received within said cylindrical recess in cooperation therewith.

4,034,617
STEPPED BELTING SPLICE

Nathan E. Guyer, Stoneham, Mass., assignor to American Biltrite Inc., Cambridge, Mass.

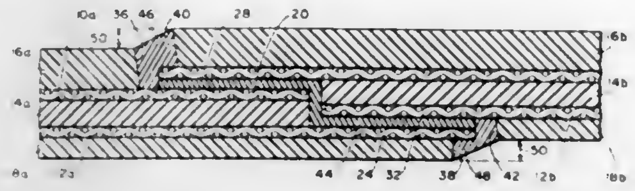
Filed Jan. 23, 1976, Ser. No. 651,860

Int. Cl.² F16G *1/00, 5/00;* **B65G** *15/14, 15/30*

U.S. Cl. 74—231 J **4 Claims**

3. In conveyor belting comprising at least two carcass plies of elastomeric ply intermediate said carcass plies, and outer plies of rubbery compound; an area in which all plies are severed thereby defining first and second belting ends spliced together in said area, each carcass ply of each belting end having a single surface at which a portion of the adjacent belting ply has been removed, each such surface of said first belting end facing the same direction and each such surface of

said second belting end facing the same direction, each such surface of said first belting end overlapping such a surface of



said second belting end, a layer of tie gum intermediate the surfaces of each overlapping pair.

4,034,618

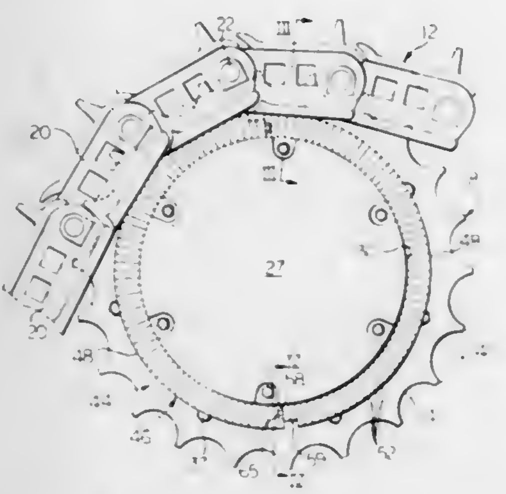
NOISE REDUCING APPARATUS FOR TRACK TYPE VEHICLE DRIVE SPROCKETS AND MEANS FOR ATTACHING SAME

Eugene R. Groff, Chillicothe; Lloyd K. Heinold, Peoria, and Harold L. Reinsma, Dunlap, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 22, 1976, Ser. No. 669,113

Int. Cl.² B62D *55/12*

U.S. Cl. 74—243 R **9 Claims**



1. Apparatus for reducing the noise generated by the meshing of an endless track and a drive sprocket of a track-type vehicle in which the track has a double chain defining a pair of inwardly facing rail surfaces which are disposed at a predetermined radial distance from the central axis of the sprocket when the track is fully seated with the sprocket, the apparatus comprising:

- a pair of cylindrical wall members extending in longitudinal coaxial relation from the opposite sides of the sprocket, said wall members each having an outer periphery spaced radially inwardly from a respective one of said rail surfaces;
- a pair of annular treads of resilient material mounted about the periphery of a respective one of said wall members in radial aligned relation with a corresponding one of said rail surfaces, each tread being sized so that, in a free state, its outer periphery is radially outward of said predetermined radial distance of its respective rail surface so that the rail surfaces engage and compress the treads before the track comes into full mesh with the sprocket, each of said treads being constructed from at least one arcuate segment having separable opposite ends;
- means for detachably securing each of said segments about said outer peripheries of said wall members so that replacement of said treads is possible without disturbing the sprocket or breaking the track chain; and
- wherein each of said segements of the treads is constructed from a plurality of separate, longitudinally disposed pads arranged in side-by-side abutting relation circumferentially about the wall members, each pad having an aligned opening forming a continuous cavity through its respective segment, a metal band disposed through said cavity having opposite ends adjacent the corresponding ends of said segments, and a pair of transverse retaining plates fixedly secured to the opposite ends of said band for compressively holding the pads therebetween.

4,034,619

MOTION REVERSAL DEVICE FOR MECHANISMS FOR COMPACT CASSETTES, MOVING SPOOL ARRANGEMENTS AND THE LIKE

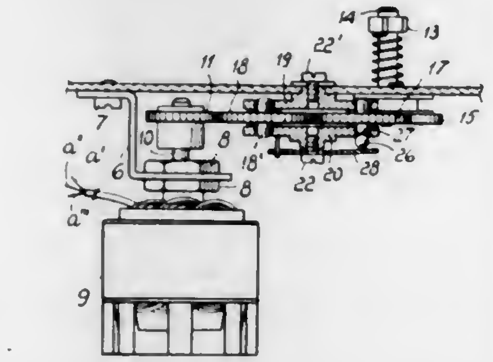
Renato Seregni, Cascina Emanuela, Solaro, Milan, Italy

Filed Jan. 16, 1976, Ser. No. 649,883

Claims priority, application Italy, Jan. 22, 1975, 19512/75

Int. Cl.² F16H *35/00, 57/00;* B65H *17/02*

U.S. Cl. 74—384 **5 Claims**



1. A motion reversal device for mechanisms for compact cassettes, moving spool arrangements and the like, comprising a frame; two alternatively tape drive and winding hub members rotatably supported on the said frame, first gear means supported on said frame and adapted to drive one of said hub members, second gear means supported on said frame and adapted to drive the other of said hub members, said first and said second gear means being arranged at a distance from each other to leave a free space therebetween, the device being characterized in that it further comprises, a rockable train of gears including a supporting structure for rotatably supporting the gears of said train of gears, said supporting structure being pivotally supported on said frame to allow the rocking motion of said train, said train of gears having on one of it ends an output gear arranged at least partially within said free space between said first and said second gear means, the rocking movement of said rockable pivotally supported structure allowing said output gear to alternatively mesh with said first and said second gear means, said train of gears having on its opposite end an input gear, reversible electric motor supported on said frame and having driving gear means constantly in mesh with said input gear of said train of gears in all positions of said rocking train gears, and driving gear means of said reversible motor urging said rocking train of gears selectively in mesh with said first and said second gear means depending on the direction of rotation of said reversible electric motor.

4,034,620

GEAR RETAINER

Thomas V. McNamara, and Elmer A. Richards, both of Kalamazoo, Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed May 19, 1976, Ser. No. 687,954

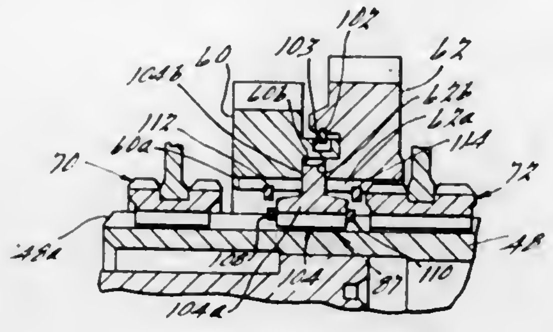
Int. Cl.² F16H *57/00, 3/08*

U.S. Cl. 74—410 **11 Claims**

1. In a transmission of the type having a mainshaft, at least two floating mainshaft gears encircling said mainshaft and axially positioned close together, a plurality of countershafts having countershaft gears supporting said mainshaft gears and driving said mainshaft gears at different rotative speeds, and clutch means selectively operative to clutch said mainshaft

gears to said mainshaft one at a time, the improvement comprising:

- thrust means fixed to said mainshaft and having thrust surfaces disposed between axially facing thrust surfaces defined by said mainshaft gears, said thrust means allowing radial movement of said mainshaft gears relative to said mainshaft and preventing axial movement of said mainshaft gears toward each other, whereby forces tending to move a clutched one of said mainshaft gears toward the unclutched mainshaft gear are reacted to the mainshaft through surfaces rotating at the same speed.



4,034,621

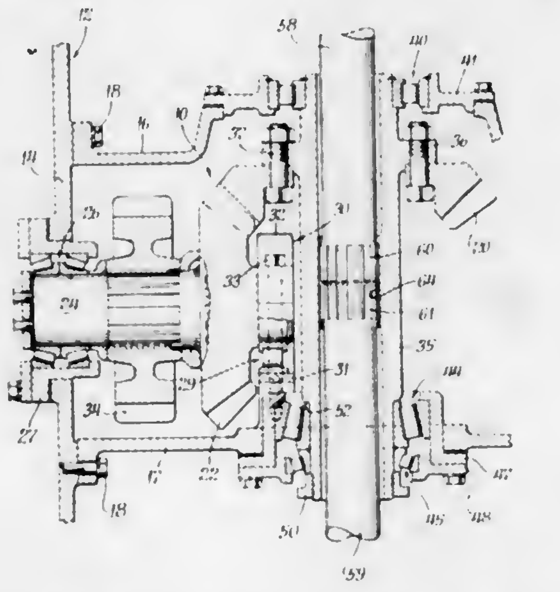
BEVEL GEAR DRIVE ASSEMBLY

Arthur J. Ritter, Jr., Metamora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation of Ser. No. 410,603, Oct. 29, 1973, abandoned. This application Jan. 26, 1976, Ser. No. 652,263

Int. Cl.² F16H *1/20, 1/40*

U.S. Cl. 74—424 **2 Claims**



1. A bevel gear drive assembly comprising:

- a casing having a first wall, a second wall and a third wall, said second and third walls extending substantially normally from said first wall and in a substantially parallel relationship;
- a quill shaft extending between said second and third walls;
- shaft means drivingly engaging said quill shaft;
- a pinion shaft rotatably supported adjacent a first end thereof in said first wall and extending normally therefrom to a second end thereof adjacent said quill shaft;
- a beveled pinion gear drivingly mounted on said pinion shaft distal said first wall;
- a bevel gear drivingly associated with said quill shaft and intermeshing with said beveled pinion gear;
- tapered bearing means for rotatably supporting said pinion shaft in said first wall;
- first bearing means for rotatably supporting said quill shaft in said second wall;
- a pinion shaft support assembly including second bearing means proximate said quill shaft for rotatably supporting said second end of said pinion shaft;

and,

- a quill shaft support assembly removably fixedly associated with said third wall including third bearing means for rotatably supporting said quill shaft;
- said second bearing means transmitting dynamic forces exerted by said pinion shaft to said third wall in a first direction and said third bearing means transmitting dynamic forces exerted by said quill shaft to said third wall in a second opposite direction.

4,034,622

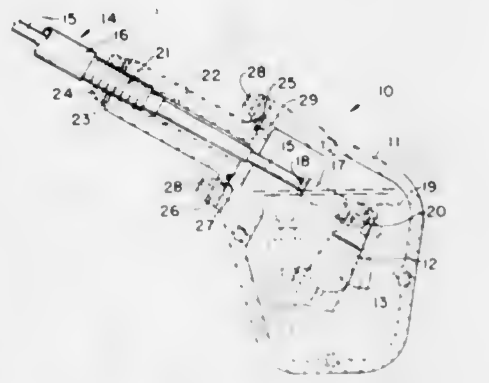
INFINITELY ADJUSTABLE CABLE CONTROLLED APPARATUS AND METHOD

James R. Deck, Eureka, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed June 17, 1976, Ser. No. 697,300

Int. Cl.² F16C *1/16*

U.S. Cl. 74—501 R **13 Claims**



1. An infinitely adjustable cable-controlled apparatus comprising

- a support member,
- a control member movably mounted on said support member,
- push-pull cable means connected to said control member for selectively moving the same,
- a bracket mounted on said support member and mounting said cable means thereon,
- adjustment means adjustably mounting said cable means on said bracket for axial movement thereon to selectively move and adjust the position of said control member relative to said support member upon rotation of said bracket, and
- retaining means mounting said bracket on said support member and for selectively permitting rotation of said bracket relative to said support member upon adjustment of said control member.

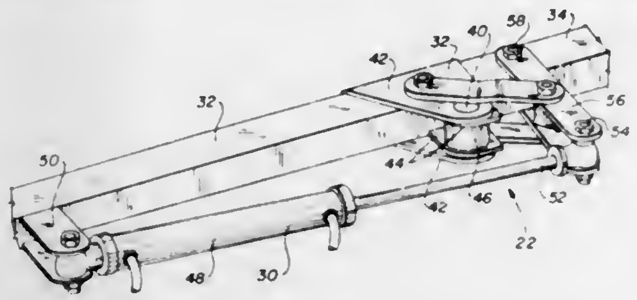
12. A method for adjusting a cable-controlled apparatuss comprising a housing, a control member movably mounted in said housing, a flexible push-pull cable means having a cable reciprocally mounted in a sheath thereof, a bracket detachably mounted on said housing and having said cable adjustably mounted for axial movement therein and a clamping member releasably clamping said bracket to said housing, comprising the steps of

- releasing said clamping member from said housing,
- rotating said bracket and simultaneously moving said cable means axially and also moving said control member and reclamping said clamping member to said housing to secure said bracket against rotation relative to said housing.

4,034,623
FOLDING MECHANISM FOR HINGED IMPLEMENT FRAME EXTENSIONS

James A. Boone; Galen R. Huffman, and Galen L. Neher, all of Quinter, Kans., assignors to Ideal Industries, Inc., Quinter, Kans.

Filed Feb. 13, 1974, Ser. No. 442,067
Int. Cl.² G05G *1/04*
U.S. Cl. 74—522 8 Claims

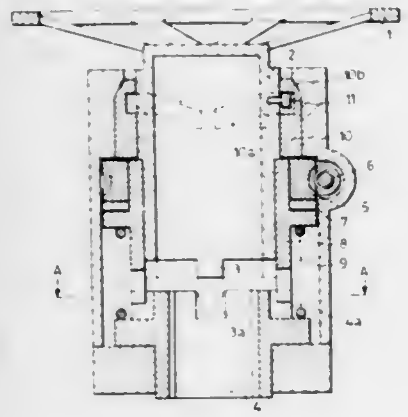


1. The foldable strut assembly connectable between the hingedly interconnected elements of an implement frame for moving same between an extended and a retracted position which comprise: first and second strut sections having the adjacent ends thereof hingedly connected for movement between a folded and an unfolded position; drive means including a linear actuator fastened to one of said first and second strut sections within the angle formed therebetween the folded position; a first link interconnecting the linear actuator with the other of said first and second strut sections at a point spaced from the hinged connection therebetween; and, a second link interconnecting a point intermediate the ends of the first link with said one strut section at a point remote from the hinged connection therebetween; said hinged connection between the strut sections cooperating with the connection of the links to the latter and to one another to define a pair of lever arms movable upon actuation of the drive means from a crossed relation in the extended position of the strut to a side-by-side relation in the folded position thereof.

4,034,624
VALVE ACTUATING DEVICE

Pierluigi Bianchini, Florence, Italy, assignor to Nuovo Pignone, S.p.A., Florence, Italy

Filed Mar. 26, 1976, Ser. No. 670,727
Claims priority, application Italy, Mar. 27, 1975, 21725/75
Int. Cl.² F16D *21/06*
U.S. Cl. 74—625 1 Claim



1. A valve actuating device for automatically clutching a handwheel to a valve actuator which manually opens and closes the valve, comprising:

a handwheel (1) for manual actuation of the valve,

a cylinder (2) integral with said handwheel (1) which has teeth (3) at its lower end,

a gear (5) about said cylinder (2) having teeth (7),

a worm (6) in constant mesh with said gear (5) having an integral drive shaft,

a cylinder (8) about said cylinder (2) which moves in response to vertical movement of said cylinder (8) and wherein said cylinder (8) includes recesses which normally are engaged by said teeth (7) of said gear (5) so as to be driven by said gear (5) and worm (6) for automatically clutching said handwheel (1) to the valve actuator,

a valve actuator member (4) including teeth (4*a*) which are in engagement with said recesses in said cylinder (8), and recesses (3*a*) for engagement by said teeth (3) of said cylinder (2),

a spring (9) between said cylinder (8) and said member (4) which normally biases said cylinder (8) into meshing engagement with said gear (5) and which normally operatively connects said gear (5) to said member (4),

a friction ring (10) about said cylinder (2) having a helical groove (10*a*) therein, and

a follower (11) secured to said cylinder (2) and in said helical groove (10*a*) for moving said cylinder (2) in response to manipulation of said handwheel (1),

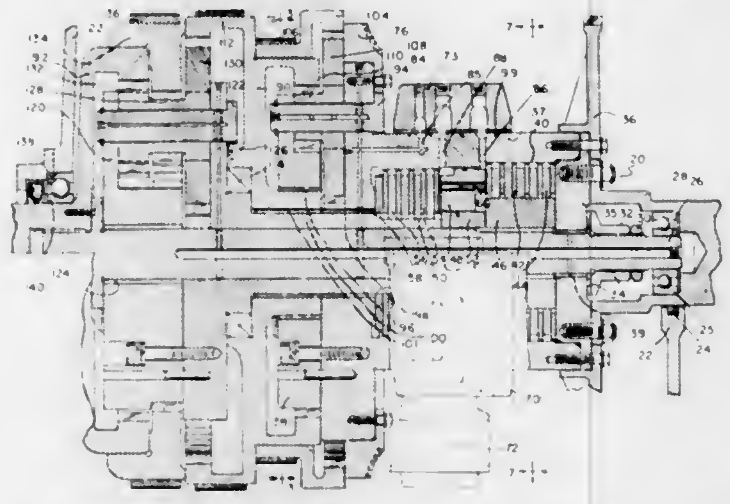
wherein rotation of said handwheel (1) in one direction causes said follower (11) to move said cylinders (2) and (8) downwardly, whereupon said cylinder (8) is moved clear of said gear (5) by overcoming the biasing action of said spring (9), and said teeth (3) on said cylinder (2) are brought into engagement with said recesses (3*a*) in said valve actuating member (4) for opening the valve, and

wherein rotation of said handwheel (1) in the opposite direction causes said follower (11) to move said cylinder (2) upwardly and, in turn, to cause said cylinder (8) to be moved upwardly by the biasing action of the spring (9), whereupon said recesses in said cylinder (8) are engaged by said teeth (7) of said gear (5) and said teeth (3) of said cylinder (2) are disengaged from said recesses (3*a*) in said member (4) for closing the valve.

4,034,625
MANUALLY CONTROLLED SEMI-AUTOMATIC STEP GEAR TRANSMISSION

Oliver E. Taintor, 7 Lynack Road, Hawthorne, N.J. 07506

Filed Dec. 24, 1975, Ser. No. 642,812
Int. Cl.² F16H *3/58*
U.S. Cl. 74—769 6 Claims



1. In hydraulic actuated epicyclically geared power transmissions having an engine input shaft and output load shaft, annulus gears with power cylinder and band control means and pinion gear clusters the combination comprising:

a forward transmission section dual clutch unit and integrated forward pinion carrier and related gear clusters receiving driving power from said engine shaft;

a main transmission shaft integrated with said load shaft and in communication with said dual clutch unit;

a rearward transmission section pinion carrier including a shaft projection in communication with said dual clutch unit and having pinion gear cluster means in communication with said load shaft and annulus gear supported on said load shaft;

a dual clutch unit capable of transmitting torque through said rear pinion carrier and said rear cluster to drive said load shaft;

said rear pinion cluster capable of transferring torque from said rear pinion carrier and giving reactive force to said load shaft resulting in a reverse gear ratio and capable of transferring torque to cause said load shaft to turn the same direction of said rear pionion carrier but at a reduced speed relative to the speed of said engine shaft;

a dual annulus gear in communication with said forward gear cluster and with said rear cluster to transmit torque from the forward transmission section to the rear section;

means in communication with said rear carrier to lock said dual annulus and rear carrier 'n step causing rotation as a unit at a reduced speed relative to the speed of said engine shaft, the reduction being in proportion to the ratio of said forward pinion cluster gears resulting in a second gear ratio;

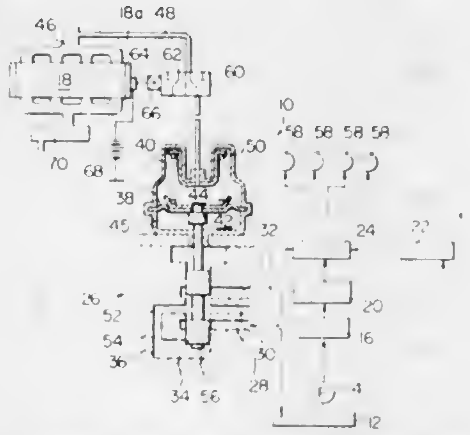
said dual clutch being capable of transmitting torque to said rear pinion carrier to unlock said forward and rear sections resulting in a third gear ratio which is a higher ratio than said second gear ratio; and

said dual clutch unit capable of transmitting torque through said main shaft to said load shaft resulting in direct drive.

4,034,626
CONTROL SYSTEM FOR LIMITING ENGINE SPEED DOWN ON AUTOMATIC TRANSMISSION SHIFTING AT LOW ENGINE TEMPERATURE

Masanori Udagawa, Musashino, and Toru Suyama, Tokorozawa, both of Japan, assignors to Nissan Motor Co., Ltd., Japan

Filed May 19, 1975, Ser. No. 578,423
Claims priority, application Japan, May 23, 1974, 49-58085[U]
Int. Cl.² B60K *41/18*, F01N *3/00*
U.S. Cl. 74—857 3 Claims

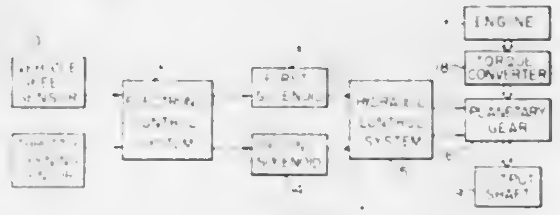


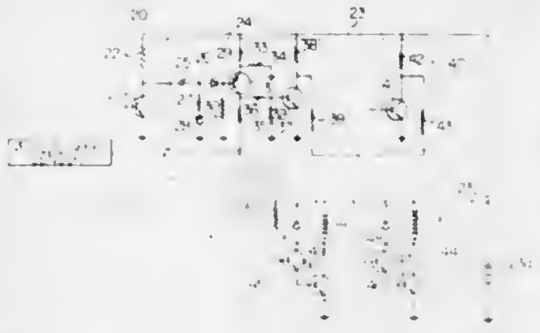
1. In a motor vehicle having an internal combustion engine, a thermal reactor for burning harmful substances in the exhaust gas before emission into the atmosphere and an automatic transmission of the type having a shifter valve for governing friction units, a governor valve for supplying a vehicle speed-sensitive governor pressure to the shifter valve, a throttle valve for supplying a throttle pressure responsive to vacuum developed in an intake manifold of the engine to the shifter valve and means to provide a regulated fluid pressure to the above three valves, the throttle valve having a flexible diaphragm, a face thereof being exposed to a chamber normally communicating with the intake manifold through a pipe, and means to modulate the regulated fluid pressure to a less magnitude of throttle pressure as the vacuum exerted on the diaphragm multiplies, an engine speed at which a shifting in the transmission occurs lowering as the vacuum multiplies, the improvement comprising a selector valve having a port communicating with the atmosphere and being mounted on said pipe such that said chamber normally communicates exclusively with said intake manifold, a temperature-sensitive switch attached to the engine and means to operate said selector valve at a position of said switch such that said chamber is caused to communicate exclusively with the atmosphere through said port, said switch being held at said position hereof when the temperature of the engine is below a predetermined temperature, thereby to raise the engine speed at which the shifting occurs and elevate the temperature of the exhaust gas.

4,034,627
ELECTRONIC CONTROL DEVICE FOR AN AUTOMATIC POWER TRANSMISSION

Masonori Mizote, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 20, 1971, Ser. No. 209,562
Claims priority, application Japan, Dec. 21, 1970, 45-114909
Int. Cl.² B60K *41/04*
U.S. Cl. 74—866 8 Claims





1. An electronic control system for a planetary gear set type automatic power transmission having a hydraulic power source, a hydraulic circuitry and hydraulically actuable friction elements to provide a required input/output shaft speed ratio, said control system comprising:

A. sensing means to sense vehicle speed;

B. sensing means to sense a requirement for downshifting from the lowest to the second lowest input/output speed ratio;

C. electronic control means responsive to said sensing means to generate a synchronizing time interval signal and to shift the transmission into the highest and overrunning input/output shaft speed ratio for the period of the time interval signal, the time interval signal being longer the higher the vehicle speed is in order to allow the engine speed to be completely synchronized with the transmission speed for smooth downshifting comprising:

1. a capacitor connected to said sensing means to sense a requirement for downshifting,
2. a diode connected to said capacitor,
3. a p-n-p transistor connected to its base to said diode,
4. an n-p-n transistor connected at its base to the collector of said p-n-p transistor and to said sensing means to sense vehicle speed,
5. a first amplifier connected to the collector of said n-p-n transistor,
6. a first solenoid energisable by said first amplifier,
7. a second amplifier connected to said sensing means to sense a requirement for downshifting,
8. a second solenoid energisable by said second amplifier, and
9. a d.c. power source, the arrangement being such that when said sensing means to sense a requirement for

downshifting sense such requirement, the base of said p-n-p transistor receives a voltage from said d.c. power source through a resistor, said capacitor and said diode rendering said p-n-p transistor nonconductive whereby the voltage at its collector is at negative potential for thereby rendering said n-p-n transistor nonconductive to cause energisation of said first solenoid by said first amplifier, and said second amplifier receiving simultaneously the same voltage as the capacitor to energise the second solenoid, whereby the transmission is shifted to the first speed overrunning ratio for the period of a synchronizing time interval signal, the length of which depends on the characteristics of the capacitor and vehicle speed and is longer the greater the vehicle speed is, and after the time interval signal, both transistors being rendered conductive, causing the first solenoid to be de-energised to effect the downshift; and

D. sensing means to sense the degree of opening of throttle valve of an engine carburetor, the electronic control system being responsive to said sensing means to sense the degree of opening of a throttle valve and to said sensing means to sense vehicle speed to develop a signal indicating the requirement for the downshifting.

4,034,628
OIL PRESSURE CONTROL SYSTEM FOR AN AUTOMATIC TRANSMISSION SYSTEM

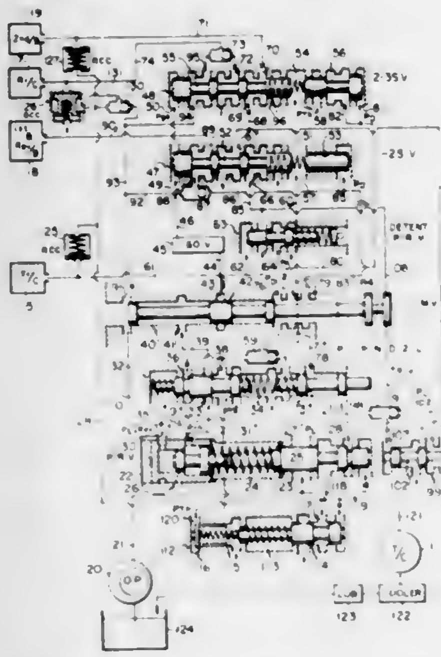
Toshimitsu Sakai, Okazaki; Kagenori Fukumura, and Tadashi Saito, both of Toyota, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed July 30, 1975, Ser. No. 600,138

Claims priority, application Japan, Apr. 17, 1975, 50-46701

Int. Cl.² B60K *41/18*

U.S. Cl. 74—869 **18 Claims**



1. An oil pressure control system for an automobile transmission system which includes a fluid torque converter, a transmission gear and friction engaging means for establishing a selected transmission engagement in said transmission gear, comprising:

a source of oil pressure;

a line pressure regulating valve which generates a regulated line pressure from the oil pressure of said source;

a throttle pressure regulating valve which generates a throttle pressure from said line pressure, said throttle pressure increasing as a throttle valve is opened;

a governor pressure regulating valve which generates a governor pressure from said line pressure, said governor pressure increasing as the vehicle speed increases;

a plurality of speed shift valves which are shifted due to a balance between said governor pressure and said throttle pressure so as to supply oil pressure to a selected element or elements in said friction engaging means;

a manual shift valve which is operated by hand to supply oil pressure to a particular element or elements of said friction engaging means and applying a restriction to a selected one of said speed shift valves;

a buffering accumulator for an element of said friction engaging means, said accumulator comprising a fluid displacing element which is supplied with oil pressure as a back pressure;

a back pressure regulating valve which generates a second oil pressure from said line pressure, said second pressure being lower than said line pressure and modified to vary in accordance with said throttle pressure; and

a switch-over valve adapted to deliver an output pressure to said buffering accumulator, said output pressure being a higher one of the two input pressures supplied thereto, wherein one of said two input pressures is said second pressure and the other of said two input pressures is either zero or said line pressure which appears at a port of said manual shift valve in accordance with the shifting of said manual shift valve.

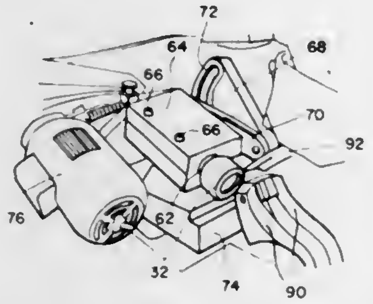
4,034,629
METHOD AND APPARATUS FOR AUTOMATIC EDGE GRINDING OF THE TEETH OF A CIRCULAR SAW TO AN IMPROVED CONTOUR

Horst Von Arnauld, 95 Grove St., and Daniel Joseph Murphy, 65 Walnut St., both of Oakland, N.J. 07436

Continuation-in-part of Ser. No. 540,449, Jan. 13, 1975, Pat. No. 3,964,349. This application June 17, 1976, Ser. No. 697,287

Int. Cl.² B23D *63/14*

U.S. Cl. 76—41 **15 Claims**



1. An apparatus for automatically grinding the teeth of a circular saw to an improved contour, said apparatus comprising:

a means for holding said circular saw;

a grinding means for edge grinding a portion of the face of a tooth of said circular saw to a substantially convex eliptical contour having a more negative rake angle than the remaining portion of the face of said tooth, said grinding means comprising a cup-shaped grinding wheel having an abrasive rim, said rim including an inner peripheral edge thereon;

a transport means for bringing the edge of said abrasive rim and said face of said tooth into grinding contact; and,

a sequencing means for controlling the automatic relative movements of the moving elements of said apparatus.

4,034,630
METHOD FOR GRINDING CIRCULAR SAW TEETH TO AN IMPROVED METAL BREAKING GEOMETRY

Robert H. Nowak, Mentor, Ohio, assignor to The Motch & Merryweather Machinery Company, Cleveland, Ohio

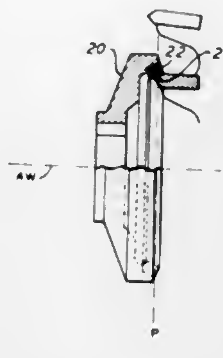
Division of Ser. No. 587,504, June 16, 1975. This application Mar. 3, 1976, Ser. No. 663,610

Int. Cl.² B23D *63/14*

U.S. Cl. 76—112 **2 Claims**

1. A method for grinding a tooth of a triple-chip type saw blade to an improved contour by means of a rotatable cup-shaped grinding wheel having an abrasive rim, the method comprising the steps of:

bringing the top portion of the front face of said tooth into contact with the abrasive rim of said rotatable grinding wheel; and,



grinding said top portion of the face of said tooth to a continuous curved contour having a more negative average rake angle than the remaining lower portion of the face of said tooth.

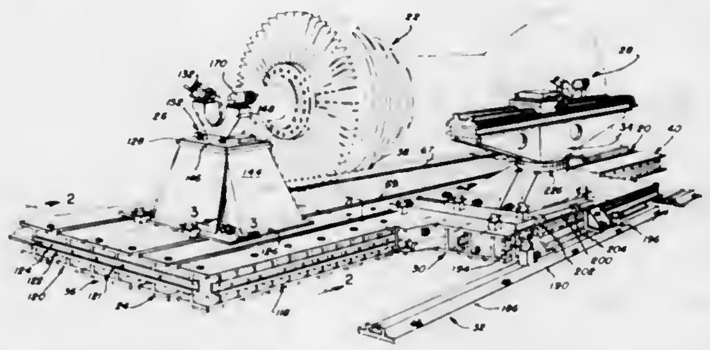
4,034,631
APPARATUS FOR SUPPORTING AND PRECISION TURNING OF LARGE ROTARY MEMBERS

Siegfried Schulz, Rolling Meadows, Ill., assignor to Continental Field Machining Co., Inc., Schaumburg, Ill.

Filed Oct. 26, 1976, Ser. No. 735,742

Int. Cl.² B23B *5/00, 17/00*

U.S. Cl. 82—2 R **15 Claims**



1. In an apparatus for supporting and turning a large rotatable work piece, said apparatus having a pair of spaced supports for rotatably supporting a large rotatable work piece, a cutter support for holding a cutter in position adjacent to the work piece, the improvement comprising a base for connecting the cutter support to the spaced supports in a selected spaced relationship and holding the spaced supports in a selected spaced relationship, said base including, a pair of I-beams spaced from each other, a plurality of beam connectors securing the I-beams to each other and holding the I-beams parallel to each other to form a gap of a uniform width between selected portions of the beams, a second pair of I-beams spaced from each other, another plurality of beam connectors securing the beams of the second pair to each other and holding the beams parallel to each other to form a gap of uniform width between the beams, a plurality of spacers securing the pairs of I-beams to each other, holding each pair of I-beams parallel to the other pair of I-beams and a selected surface of each of the beams in substantially one plane, and a plurality of levelers mounted on the I-beams for adjusting the selected surface of the I-beams to a substantially flat surface.

15. An apparatus for supporting and turning a large rotatable work piece, comprising, a base having a substantially flat upper surface, said base having three parallel T-slots formed in said upper surface, a plurality of levelers mounted on the lower portion of said base for adjusting the base to position the three T-slots into a substantially single plane, a side guide T-slot formed in the base on one side thereof, said side guide being parallel to the three parallel T-slots, a cutter support base releasably secured to the first-mentioned base at the side guide, a guide rail releasably secured to the cutter support base, a pair of support pedestals mounted on the first-mentioned base and being connected to said base in a pair of adjacent T-slots, said support pedestals being releasably slideably connected to said base, each of said support pedestals having a yoke in its upper portion for receipt of the rotatable work piece, a cutter support mounted on the cutter support base, said cutter support including a bed being connected to the third T-slot of the first-mentioned base, said bed having a pair of cutter T-slots substantially perpendicular to the three parallel T-slots, a support tower slideably mounted on the bed, a plurality of roller jacks connected to the support tower for raising the support tower relative to the bed for moving the tower relative to the bed, said tower having a rotatable connector for rotating an upper portion of the tower 360° relative to a lower portion of the tower, an elongated way connected to the upper portion of the tower, a second rotatable connector mounted on the way, and a cutter holder connected to the rotatable connector for rotating the cutter holder 360° relative to the tower.

4,034,632
PNEUMATICALLY OPERATED ROD WORKPIECE FEED MECHANISM FOR TURNING MACHINES

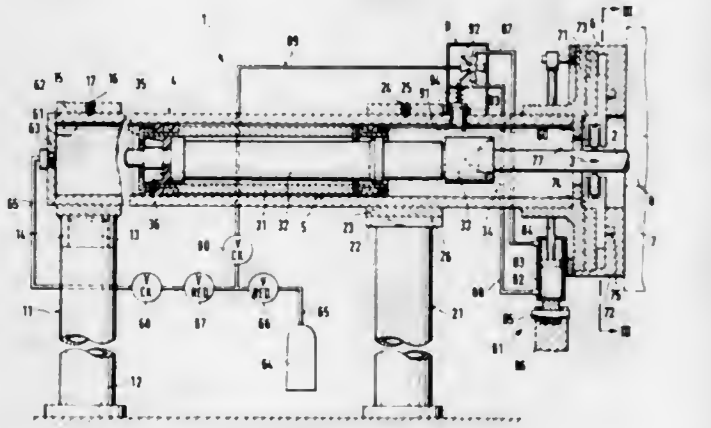
Alfred Lohner, Sagmuhlstrasse 1, Augsburg, Germany (8900)

Filed July 22, 1976, Ser. No. 707,504

Claims priority, application Germany, July 26, 1975, 2533502

Int. Cl.² B23B *13/00*

U.S. Cl. 82—2.5 **7 Claims**



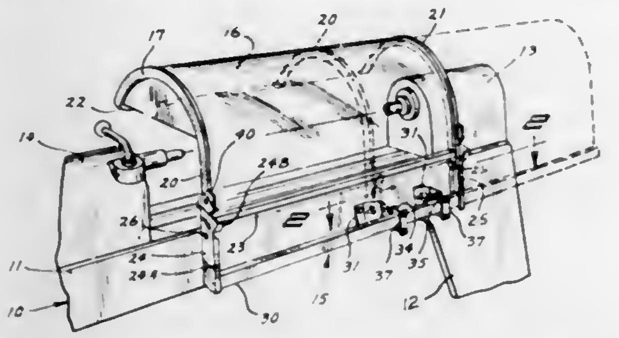
1. A fluid pressure operated rod workpiece feed mechanism for turning machines, comprising a hollow feed tube having a closed end and an opposite open end through which the rod workpiece is adapted to be fed, an axially displaceable feed piston in said feed tube, said feed piston having a first part and a second part telescopically received in said first part and having an end adjacent the open end of said feed tube with a rod workpiece centering head for receiving the rear end of the workpiece to be fed, said first piston part comprising a tubular member having a closed end with the end adjacent said feed tube closed end and with a fluid pressure opening therethrough, said second part being displaceable in said first part, a cam control mounted on said feed tube and projecting into the path of said feed piston, a backrest assembly including a plurality of radially arranged actuating rollers on said feed tube and being radially displaceable in said feed tube inwardly for engagement with the workpiece and outwardly to clear the periphery of said workpiece and said second part therebetween, and fluid pressure supply means connected to said cam control, said cam control having separate means for directing the fluid pressure supply to said feed tube for displacing said

feed piston and to said backrest assembly for displacing said centering rollers.

4,034,633
SAFETY SHIELD CONSTRUCTION

Paul S. Petersen, Minnetonka, Minn., assignor to Toolmark Co., Minneapolis, Minn.

Filed Feb. 23, 1976, Ser. No. 659,982
Int. Cl.² B23B *25/04*
U.S. Cl. 82—34 R **22 Claims**

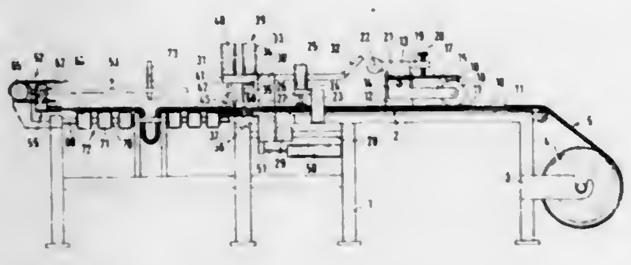


1. In a safety shield assembly having a support, and a movable shield member mounted on said support for movement between a first and a second position, the improvement comprising inertia actuated lock means for preventing said movable member from moving from said first position to said second position under acceleration forces exceeding a predetermined amount, said inertia lock means comprising a lock member, means to mount said lock member on said movable member for movement from a locked to an unlocked position, said lock means including a latch portion engageable with a portion of said support to prevent substantial movement of said movable member toward said second position when said movable member is in said first position and the lock member is in locked position, said lock member having a center of gravity positioned with respect to said means to mount said lock member so that said lock member is urged by gravity to move to unlocked position and being oriented so that inertia forces on the lock member will cause said lock member to move to said locked position when the acceleration of said moveable member from said first position toward said second position is greater than a predetermined amount.

4,034,634
APPARATUS AND METHOD FOR UNWINDING AND CUTTING A FABRIC WEB INTO INDIVIDUAL UNIFORM LENGTHS

Conrad Arbter, Mittelweg 9, Saal an der Saale, Germany (8741)

Filed Sept. 15, 1976, Ser. No. 723,227
Claims priority, application Germany, Oct. 3, 1975, 2544410
Int. Cl.² B26D *5/42;* **B65H** *17/36, 23/16*
U.S. Cl. 83—18 **13 Claims**

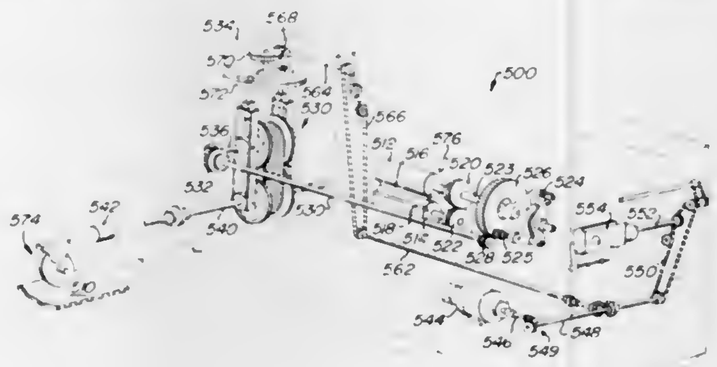


6. An apparatus for aligning a continuous fabric web having longitudinally extending areas of different thickness and which includes a thicker width area alternating with a thinner width area along the length thereof and with a boundary edge defined between each adjacent area, comprising a table over which the material is fed as it is drawn off a reel supply, means rotatably mounting the reel supply adjacent said table, a cutting device disposed across the table being movable through a plane of the table to sever the material, a carriage mounted on said table for movement in longitudinal directions, and an aligning device carried by said carriage and including a plurality of shoes extending across the width of the material in spaced lateral locations, biasing means effective when said aligning device is lowered to the material to press the individual shoes against the fabric material, means for raising and lowering said aligning device to engage the fabric material in the thinner width portions and to hold it by the operation of said biasing means on the individual shoes during movement of said carriage in a pull off direction whereby the shoes act to press against and partly slip over the thinner portions of the fabric until some alignment shoes engage against the boundary edge of the next adjacent thicker width portion and the others of said engagement members displace and distort the fabric web until the remaining shoes which remain in the aligned row with the other shoes substantially engage the boundary edge, a plurality of brake elements disposed across the fabric web between the reel supply of said aligning device, brake element mounting means supporting said brake elements for movement into and out of engagement with the fabric web, means for separately adjusting the braking force of each of said brake elements to vary the holding action thereof on the fabric web, said brake elements being engaged with said fabric web during movement of said carriage with said alignment device and cooperating with said alignment shoes to align the fabric web laterally in respect to the boundary edges between the adjacent areas of different thickness prior to it being cut by said cutting device, and pull off means engageable with said fabric web to pull off successive lengths of said fabric web from said reel supply and to position each area of lesser thickness into association with said alignment device.

4,034,635
DIGITAL CUT-OFF CONTROL

Allan Brent Woolston, Wynnewood, Pa., assignor to Molins Machine Company, Inc., Camden, N.J.

Filed Apr. 20, 1976, Ser. No. 678,562
Int. Cl.² B26D *1/56;* **B23D** *25/12*
U.S. Cl. 83—38 **10 Claims**



1. Apparatus for controlling the lengths of sheets cut by one or more cutting knives from a moving web including a positioning motor having a shaft operatively coupled to a variable speed transmission for varying the speed of the cutting knives, comprising:

- means for generating a set point signal indicative of a desired length of sheet to be cut from a moving web;
- digital means for computing and temporarily storing sheet length error in response to the speed of the web, the speed of a cutting knife and the set point signal;
- digital means for computing the actual length of sheet cut from the moving web and for generating a signal indicative thereof in response to the speeds of the web and the cutting knife;
- digital means for temporarily storing said signal indicative of said actual sheet length;

- digital means for cyclically incrementing and decrementing said temporary digital storing means;
- digital means for determining whether said sheet length error is within prescribed coarse limits of said desired sheet length in response to said cyclically incremented and decremented temporary digital storing means;
- means for determining whether said stored sheet length error is within a predetermined fine tolerance band of said desired sheet length;
- digital means for actuating a positioning motor at a first speed to correct said sheet length error if said sheet length error is determined to be outside said prescribed coarse limits and at a second speed if said sheet length error is determined to be within said prescribed coarse limits but outside said predetermined fine tolerance band;
- digital means for simulating the correction of said sheet length error effected by the positioning motor at said first and second speeds and for reducing said stored sheet length error and correcting said stored signal indicative of said actual sheet length as functions thereof; and
- means for terminating actuation of the positioning motor if said stored sheet length error is either reduced to zero or determined to be within said predetermined fine tolerance band.

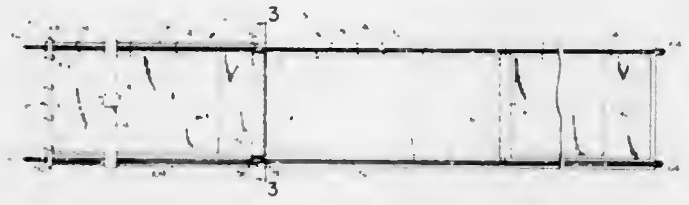
9. An improved method of operating a cut-off mechanism having one or more cutting knives for cutting sheets of uniform length from a moving web including computing actual sheet length and sheet length error and generating separate signals indicative thereof, comprising:

- temporarily storing signals indicative of actual sheet length and sheet length error;
- cyclically incrementing and decrementing said temporarily stored signal indicative of actual sheet length;
- digitally determining whether said sheet length error is within prescribed limits of said uniform sheet length as a function of said cyclically incrementing and decrementing step; and
- adjusting the speed of one or more cutting knives to correct said sheet length error if said sheet length error is determined to be outside said prescribed limits.

4,034,636
METHOD AND APPARATUS FOR PLACING A MULTI-PLY LAYUP OF SHEET MATERIAL ON A WORK TABLE

David R. Pearl, West Hartford, Conn., assignor to Gerber Garment Technology, Inc., East Hartford, Conn.

Filed July 16, 1975, Ser. No. 596,418
Int. Cl.² B26D *7/06;* **B65H** *35/00*
U.S. Cl. 83—401 **11 Claims**



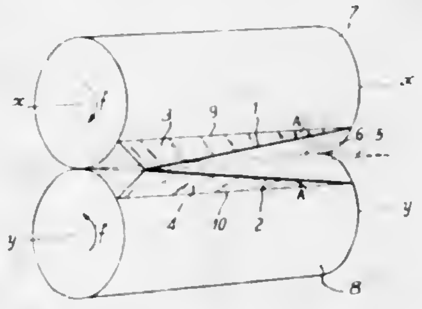
1. In combination with a cutting machine having a table defining a support surface for holding sheet material in a multi-ply layup while a cutting tool cuts through the material, the improvement comprising:

- a lay table positioned adjacent a selected side of the cutting table and having a support surface located to form an extension of the support surface of the cutting table;
- a storage reel connected for rotation to the lay table;
- an elongated planar member having one end rolled on the storage reel and an opposite end extending from the storage reel over the support surface of the lay table toward the cutting table from a side of the lay table remotely opposite the selected side of the cutting table, the elongated planar member having a length sufficient to reach from the storage reel across the support surfaces of the adjacent lay and cutting tables, the planar member also being slidable between the cutting and lay tables on the support surfaces of the tables and having an exposed surface area on which a layup of sheet material may be spread; and
- motor means engageable in driving relationship with said opposite end of the planar member for drawing the elongated member and a layup spread thereon between the support surfaces of the tables.

4,034,637
DOUBLE ROTOR SHEAR

Daniel Ollery, 9, Allee Niepce, Bouffemont Moiselles, France (95570)

Filed Apr. 6, 1976, Ser. No. 674,271
Claims priority, application France, July 4, 1975, 75.10781
Int. Cl.² B23D *25/08, 25/12;* **B26D** *1/56*
U.S. Cl. 83—341 **2 Claims**



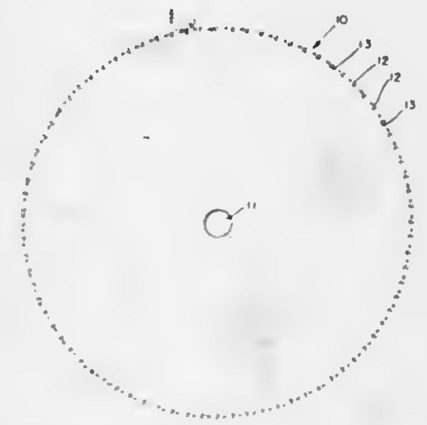
1. A shear, particularly for materials in strips, the shear comprising:

- at least one pair of blades operatively arranged to rotate in opposite directions with respect to two parallel axes of rotation, the cutting edge of each respective one of said blades being rectilinear and situated in a plane passing through the corresponding axis of rotation, being inclined at an angle with respect to said corresponding axis and being defined by the intersection of two plane faces of the corresponding blade, and wherein the two cutting edges of each said pair of blades, when operating, are at all times disposed symmetrically with respect to a given plane which passes through a line equidistant from said two axes of rotation, said given plane being normal to a plane defined by these axes.

4,034,638
CIRCULAR SAW HAVING REDUCED NOISE

Perry B. Drum, Lenoir, N.C., assignor to McCrary Saw & Tool Company, Lenoir, N.C.

Filed July 29, 1976, Ser. No. 709,589
Int. Cl.² B27B *33/08*
U.S. Cl. 83—835 **4 Claims**



1. A circular metal saw blade for maintaining a reduced

level of sound during work load cutting action comprising a circular disk having a central arbor port, said disk having a periphery with uniformly spaced shallow gullets therearound, each of said gullets having a radial depth of not more than 5/16 of an inch, a plurality of carbide tips secured to the disk periphery with one tip secured in juxtaposition to each gullet, each of said carbide tips extending a short distance circumferentially and extending forwardly over the deepest portion of said gullet, each of said tips having a tangential clearance of from 1° to 5° and from 0° to 3° radial clearance, and from 5° to 15° top clearance for a saw blade having a radius of 8 inches.

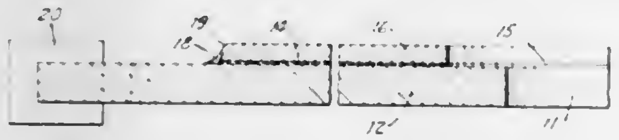
4,034,639
SOUND-DAMPED SAW BLADE

Donald B. Caldwell, Lake Elmo, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 16, 1976, Ser. No. 723,790

Int. Cl.^{2} B27B *33/08*

U.S. Cl. 83—835 **8 Claims**



1. A sound-damped saw blade comprising (a) a disc, (b) a layer of viscoelastic material adhered to one major surface of said disc and a thin sheet over and coextensive with said viscoelastic layer, wherein the diameter of said viscoelastic layer and said sheet is less than the diameter of said disc, and (c) an edge coating covering the circumferential edge of said viscoelastic layer and said sheet, wherein said coating has an abrasion resistance, as expressed in percentage haze, of less than about 30 percent.

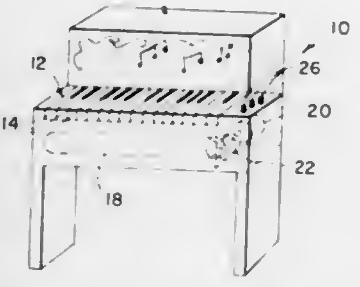
4,034,640
PROGRAMMABLE MANUALLY PLAYABLE PIANO

Mauricio Guillermo Escamilla, 37-26 58 St., Apt. 1 Front, Woodside, N.Y. 11377

Filed Dec. 23, 1975, Ser. No. 643,788

Int. Cl.^{2} G09B *15/08*

U.S. Cl. 84—478 **5 Claims**



1. A manually playable programmable piano comprising in combination:

a keyboard having a set of keys each of which is provided with a transparent section of sufficient dimensions to visually inspect a musical record positioned therebeneath, each of said keys being adapted upon activation to produce a selected musical note;

a roller mounted rotatably in said piano beneath said keyboard and in generally parallel relation therewith;

and musical record means detachably mountable on said roller having markings thereon arranged in a pattern representative of the progression and tempo of the notes of a musical composition viewable in predetermined sequence within the transparent sections of said keys.

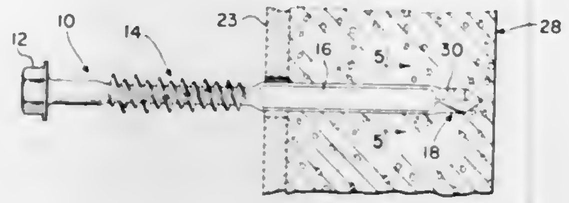
4,034,641
SELF-DRILLING AND TAPPING MASONRY ANCHOR

Elbert Eugene Williams, Jr., Wooddale, and Richard John Ernst, Palatine, both of Ill., assignors to Illinois Tool Works Inc., Chicago, Ill.

Filed July 9, 1976, Ser. No. 703,989

Int. Cl.^{2} F16B *25/00*

U.S. Cl. 85—41 **7 Claims**



1. In combination with a masonry work structure of predetermined thickness, a self-drilling and tapping masonry anchor comprising an elongate shank body with a drilling tip at one extremity and a radially enlarged driving head at the opposite extremity, the drilling tip including cutting edges defining a first predetermined radial dimension, the shank body including an upper region with a tapping and holding thread formed thereon having a predetermined crest diameter, said thread having an axially spaced root region with a maximum crest diameter which increases gradually from the lowermost region to the uppermost region with the lowermost region defining said predetermined crest diameter, the predetermined crest diameter of said thread thereby defining a second predetermined radial dimension, a lower shank body region forming axial stabilizing and material receiving means directly adjacent the drill tip with a cross-sectional configuration that includes third and fourth predetermined radial dimensions, respectively, defining maximum and minimum radial dimension on said lower shank region, the third, maximum, radial dimension on the lower shank region being defined by a plurality of circumferentially spaced longitudinally extending surfaces, the second predetermined radial dimension being greater than the first predetermined radial dimension thereby permitting at least the crests of the tapping and holding thread to be imbedded in the walls of the hole formed by the drill point, the third predetermined radial dimension being greater than the first predetermined radial dimension and less than the second predetermined radial dimension of the threads so that said lower body accurately sizes the hole and axially stabilizes the anchor during drilling while providing an area between the walls of the hole and the fourth, minimum, radial dimension of the lower shank region into which masonry dust can flow and accumulate, the drilling tip having an axial extent substantially less than the predetermined thickness of the workpiece, the lower shank body having a length substantially equal to said predetermined thickness.

4,034,642
BRAIDING MACHINE

Vincent Alfonso Iannucci, West Lawn; Rudolf Herbert Haehnel, Reading, and Ronald Scheck Schartel, North Whitfield, all of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Sept. 27, 1976, Ser. No. 727,092

Int. Cl.^{2} D04C *3/06, 3/42*

U.S. Cl. 87—48 **12 Claims**

1. A braiding machine for braiding a plurality of strands comprising:

a tubular member having a first rotatable table, a stationary sun gear and a second rotatable table mounted thereon;

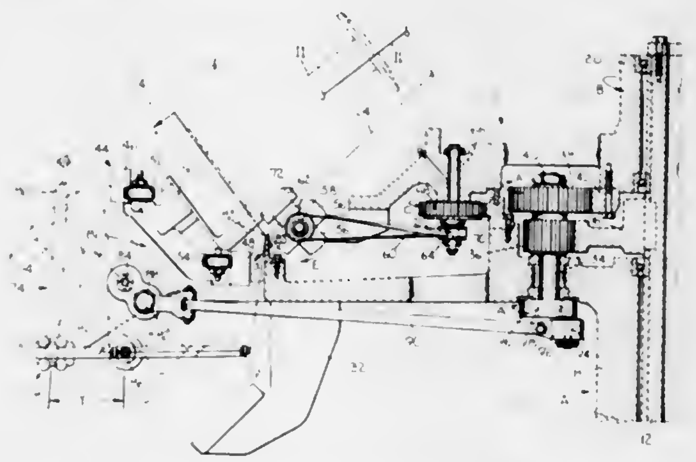
said first table being rotated in a first direction and including a circular array of rotatable shafts mounted thereon;

each of said rotatable shafts being parallel with said tubular member and having a planetary gear mounted thereon which said planetary gear is aligned with and engages said sun gear to cause rotation of said shaft as said first table rotates;

a drive gear fixedly mounted on at least one of said shafts in engagement with an encircling gear on said second table to cause said second table to rotate about said tubular member in an opposite direction from said direction;

said first table including a circular array of outer strand supply bobbins corresponding with said array of said shafts;

a circular track being mounted on said first table between said circular array of said outer strand supply bobbins and an area of said braiding, said track being segmented by there being a radial slot therethrough at each of said outer strand supply bobbins;



a strand guide arm aligned with each of said slots and pivotally mounted on said first table and connected by linkage and crank means to its corresponding said shaft to be oscillated thereby to direct said outer strand inwardly and outwardly of said circular track; and

each of a plurality of inner strand supply bobbins being mounted on said circular track for movement therealong in said opposite direction by an associated drive means mounted on said second table and adapted to prevent contact with said outer strands are inwardly of said circular track and a corresponding said inner strand supply bobbin.

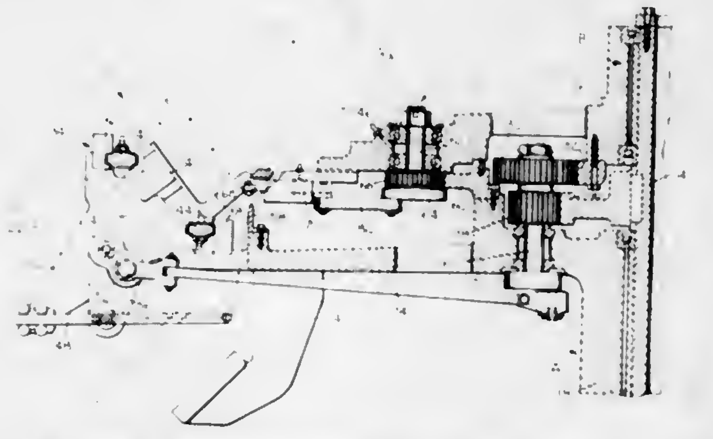
4,034,643
BOBBIN DRIVE MECHANISM FOR A ROTARY BRAIDER

Vincent Alfonso Iannucci, West Lawn; Rudolf Herbert Haehnel, Reading, and Ronald Scheck Schartel, North Whitfield, all of Pa., assignors to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 1, 1976, Ser. No. 737,220

Int. Cl.^{2} D04C *3/06, 3/42*

U.S. Cl. 87—48 **5 Claims**



1. A bobbin drive mechanism for a rotary braider of the type in which a circular array of outer strand supply bobbins and a circular array of inner strand supply bobbins are caused to rotate one array relative to the other, said outer strand supply bobbins being fixedly mounted on a first circular table of said braider, said inner strand supply bobbins being mounted for relative rotational movement about a circular track of said first table, and strands from the outer strand supply bobbins being capable of being guided inwardly and outwardly of said track and said inner strand supply bobbins thereon to produce braiding, said bobbin drive mechanism comprising:

a second circular table coaxially aligned with said first table and adapted to rotate relative thereto;

a circular gear mounted on said first table;

a circular array of pairs of shafts corresponding to said array of inner strand supply bobbins being mounted for rotation on said second table;

each said shaft being adjacent said circular gear and having a planetary gear fixedly mounted thereon in alignment with and engaging said circular gear to cause rotation of said shaft during said relative rotation of said first and said second tables;

a crank fixedly mounted on an end of said each of said shafts to rotate therewith;

a pair of radially extending dogs associated with each said inner strand supply bobbin being mounted on said second table and aligned with slot means of said associated inner strand supply bobbin;

linkage means between each said dog and a respective one of said cranks to cause inward and outward movement of said dog during rotation of said shaft; and

each of said cranks of said pair of shafts being prepositioned to cause one of said pair of said dogs to be in driving engagement with said slot means of said inner strand supply bobbin as the other of said pair of said dogs is displaced therefrom to allow said strands from said outer strand supply bobbin to freely pass therebetween.

4,034,644
FIREARM AND MAGAZINE CONSTRUCTION

Gerhard Hupp, Oberndorf (Neckar), and Helmut Mader, Schramberg, both of Germany, assignors to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft, Germany

Filed June 6, 1975, Ser. No. 584,292

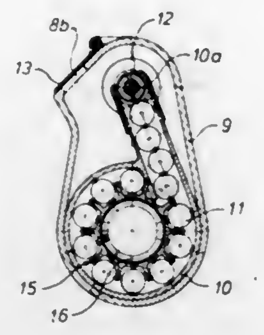
Claims priority, application Germany, June 10, 1974, 2427974

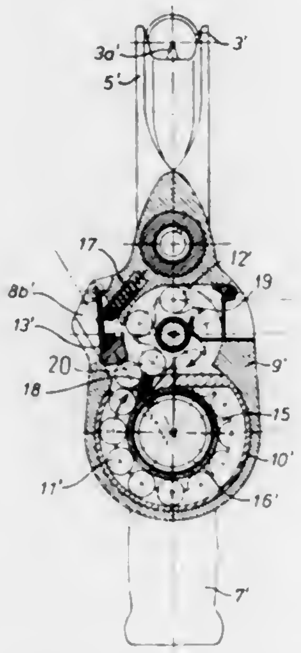
Int. Cl.^{2} F41C *25/06*

U.S. Cl. 89—33 BA **9 Claims**

1. A firearm, comprising a housing, a barrel mounted on said housing having a cartridge chamber, a magazine having a cartridge receptacle portion and formed in said housing and having a passage for cartridges extending between said receptacle portion and said cartridge chamber, said receptacle portion being a drum-like member rotatable in said housing and constructed to contain a plurality of cartridges therein in parallel relationship to said barrel, cartridge transport means in said magazine receptacle portion engageable with the cartridge therein to move said cartridges successively into alignment with said cartridge chamber, and a cartridge clip loading opening defined in said magazine housing communicating with said cartridge receptacle portion and having means thereon for positioning a cartridge loading container for transferring cartridges therefrom into said magazine receptacle portion and into association with said cartridge transport means, said cartridge receptacle portion including said drum-like member and a tangentially extending portion forming said passage, said tangentially extending portion being shiftable

upon rotation of said drum-like portion between a position in which the upper end thereof is aligned with said cartridge chamber and a position in which the upper end thereof is aligned with the loading opening.





4,034,645

METHOD FOR MANUFACTURING A GEAR-WHEEL FOR A ROTARY DISPLACEMENT MACHINE

Jan Tonnis Keijer, Rosmalen, Netherlands, assignor to Grasso's Koninklijke Machinefabrieken N.V., s-Hertogenbosch, Netherlands

Filed July 1, 1975, Ser. No. 592,198

Claims priority, application Netherlands, July 2, 1974, 7408947

Int. Cl.^{2} B23F *5/20*

U.S. Cl. 90—4 **2 Claims**

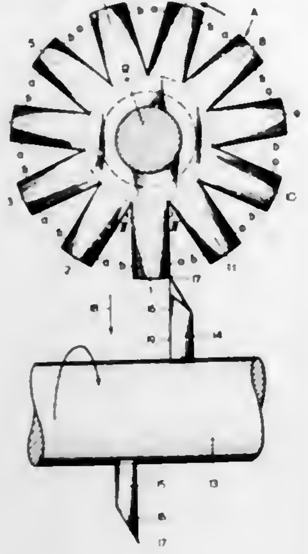
1. A method for shaping the teeth of a gearwheel blank to conform in a close sealing fit with the threads of a globoid worm, said gearwheel blank having *x* number of teeth and said worm having *y* number of threads, said method comprising the steps of:

supporting a gearwheel blank for rotation about a first axis;

supporting a cutting tool for rotation about a second axis, said tool having a cutting edge oriented substantially along a radius extending from said second axis, said second axis being located in a plane passing between the front and rear faces of said gearwheel blank and perpendicular to said first axis;

rotating said blank about said first axis at a predetermined multiple of *y* revolutions per minute; and

rotating said tool at the same predetermined multiple of *x* revolutions per minute about said second axis while simultaneously feeding said blank and said tool toward one another, whereby said tool shapes the flanks on a first of the sides of the teeth on said gearwheel blank.



4,034,646

THREAD MILLING APPARATUS

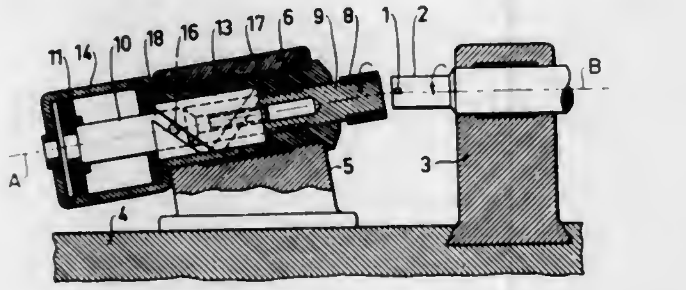
Gunnar Dahlin, Gavle, Sweden, assignor to Automatindustrier i Gavle AB, Gavle, Sweden

Filed June 25, 1975, Ser. No. 590,167

Claims priority, application Sweden, June 26, 1974, 7408398

Int. Cl.^{2} B23C *3/28*

U.S. Cl. 90—11.64 **5 Claims**



1. An apparatus for milling threads on a workpiece comprising a rotatably mounted workpiece holder, a cutting tool mounted adjacent said holder for rotation about an axis which is inclined in a vertical plane relative to the axis of rotation of said workpiece holder, horizontal projections of said two axes of rotation being longitudinally displaced from and substantially parallel to one another, the axis of rotation of said tool being located completely outside the contour of the thread that is to be milled on a workpiece carried by said holder, drive means rotating said workpiece holder and said cutting tool and controlling the respective rotational speeds of said holder and said tool in integer ratio to one another, and feeding means effecting relative translational motion of said rotating holder and rotating cutting tool in directions along their respective axes of rotation, said feeding means including means operative to superimpose a supplemental rotary motion proportional to the rate of said relative translational motion on one of said rotating workpiece holder and rotating tool, said rotatably mounted workpiece holder comprising an elongated cylindrical spindle mounted for rotation, an elongated cylindrical workpiece carrier supported by said spindle in coaxial relation thereto, said workpiece carrier having means for fixedly securing a workpiece thereto, said carrier including a lead screw in thread engagement with said spindle, said feeding means including means for turning said lead screw relative to said spindle to effect relative axial movement between said spindle and carrier.

4,034,647

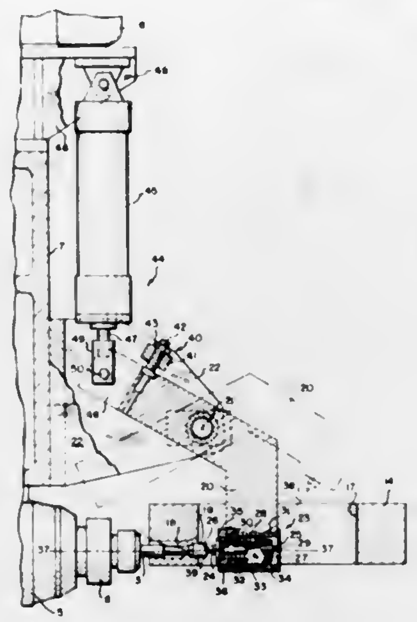
SUPPORT FOR MILLING CUTTER

Nils O. Hoglund, Short Hills, N.J., assignor to Hoglund Tri-Ordinate Corporation, Berkeley Heights, N.J.

Filed Oct. 30, 1975, Ser. No. 627,183

Int. Cl.^{2} B23C *1/025*

U.S. Cl. 90—20.5 **10 Claims**



1. In a milling apparatus having means for holding a workpiece at a milling station, a milling cutter having a shank end and a cutting end disposed at said station, and main support means for mounting said milling cutter for movement into milling engagement with the workpiece when positioned in the milling station and for withdrawing the cutter from the workpiece to permit movement thereof, the shank end of said milling cutter being mounted in said main support means for rotation about a predetermined axis extending through the other cutting end thereof, the improvement comprising:

a. a secondary cutter support means supporting the cutter at the cutting end for rotation about said predetermined axis; and

b. means for attaching said secondary support means to said main support means for pivoting movement between a first position supporting the cutting end of the cutter and a second position removed therefrom to permit movement of the workpiece, said pivoting movement taking place about a mounting axis extending perpendicular to said predetermined axis with the secondary support means moving along an arc which at one point has a tangent coincident with said predetermined axis, said one point corresponding to the first position of said secondary support means.

4,034,648

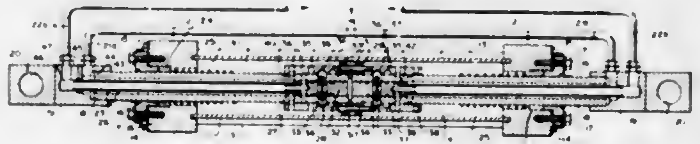
RECIPROCATING CYLINDER ASSEMBLY FOR SELF-PROPELLED SPRINKLER SYSTEMS

Ned K. Blackett, Jr., North Ogden, Utah, assignor to Dynapac, Inc., Salt Lake City, Utah

Filed Dec. 15, 1975, Ser. No. 640,971

Int. Cl.^{2} F01L *21/04*

U.S. Cl. 91—229 **4 Claims**



1. A reciprocating valve assembly comprising:

a. a cylinder tube encased at both ends by end plugs containing apertures therein,

b. a piston rod slidably engaged in fluid tight relationship through said end plugs in the cylinder tube, and having hollow end portions and a solid center core, each end of said center core containing seating means protruding outwardly therefrom and containing a passageway extending inwardly from said seating means into the center core a predetermined distance, said piston rod containing four operatives apertures adjacent the core ends and four additional apertures extending into the passageways of said solid core,

c. a piston surrounding the solid center core of the piston rod said piston being slidably engaged against the inner walls of the cylinder tube in fluid tight relationship thereby creating a fluid tight cylinder cavity on each side of the piston between the piston and said end plugs,

d. valve push rods of a predetermined length frictionally mounted in the piston parallel to the piston rod,

e. cylindrical slide valves which are separated from each other by the length of the valve push rods surrounding the piston rod on each side of the piston, each of said slide valves containing two notches adjacent the piston rod and also containing two sets of apertures, said valve slides being so positioned that one set of said slide valve apertures in one valve slide will be in alignment with the apertures on one side of the solid core of the piston rod and the other set of slide valve apertures in the other valve slide will be in alignment with the apertures extending into the passgeway of the solid core of the piston rod,

f. valve detents containing interposed valve springs inserted through the solid piston rod core on each side of the piston which are adapted to fit into the notches in the valve slides and be repositioned from one valve slide notch to the adjacent notch by means of hydraulic pressure,

g. compression springs mounted around the piston rod at either end of the cylinder tube adjacent the end plugs,

h. cylinder outlet tubes seated about the seating means of the solid core in communication with the solid core passageway and extending outwardly past the ends of the hollow piston rod portion thereby creating a piston rod cavity on either side of the solid core between the outer walls of the cylinder outlet tube and the inner walls of the hollow piston rod portions,

i. a clevis block fixedly attached to each end of the piston rod and containing apertures therein, one aperature of which is adapted to be in lfuid tight engagement with the piston rod cavity, and the other aperature of which is adapted to be in fluid tight relationship with the outer end of the cylinder outlet tubes,

j. inlet hydraulic hoses attached to the clevis blocks into the apertures engaged with each piston rod cavity,

k. outlet cylinder hoses attached to the clevis blocks into the aperatures engaged with each cylinder outlet tube, and the other set of slide valve aperatures.

l. drive means attached to the outside ends of each clevis block.

4,034,649

AUTOMATIC SELF-LEVELING FORKS

Samuel E. Harvey; Harvey W. Liberman, both of Knoxville, and Steven C. Voorhees, Oak Ridge, all of Tenn., assignors to Carrier Corporation, Syracuse, N.Y.

Division of Ser. No. 846,569, July 31, 1969, Pat. No. 3,827,587. This application Oct. 2, 1973, Ser. No. 402,714

Int. Cl.^{2} F15B *11/20, 11/22*

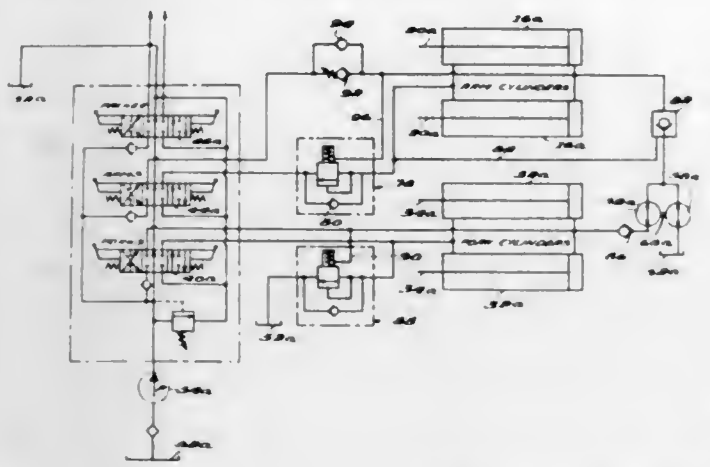
U.S. Cl. 91—412 **4 Claims**

1. A hydraulic system for controlling the related operation of at least a first and second fluid actuated motor, comprising:

a pressure fluid supply, a reservoir, and control valve means communicating with the fluid supply, reservoir and first motor;

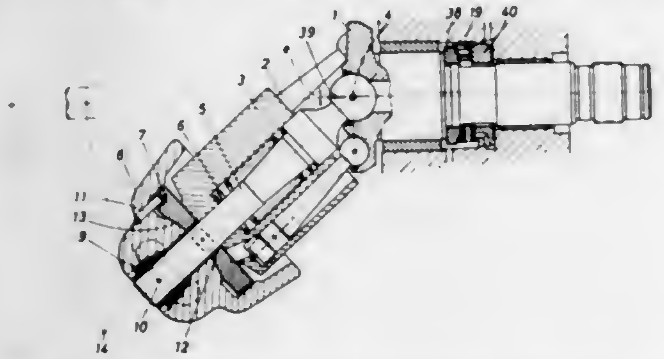
fluid transfer means operatively connected to said control valve means and the second motor to accommodate fluid flow therebetween;

- a first control element in said control valve means shiftable to a transfer position directing pressure fluid to the first motor to actuate same and directing fluid displaced from the first motor to said transfer means; and
- flow divider means interposed in said fluid transfer means for directing a predetermined portion of said displaced fluid to the second motor to actuate the same in correlation with actuation of the first motor.



4,034,650
AXIAL PISTON TYPE MACHINE

Hans Molly, Dr. Eugen-Essig-Strasse 48, 7502 Malsch, Krs. Karlsruhe, Germany
Division of Ser. No. 385,838, Aug. 6, 1973, Pat. No. 3,933,082. This application Dec. 22, 1975, Ser. No. 643,372
Int. Cl.² F01B *3/00*
U.S. Cl. 91—485 **15 Claims**

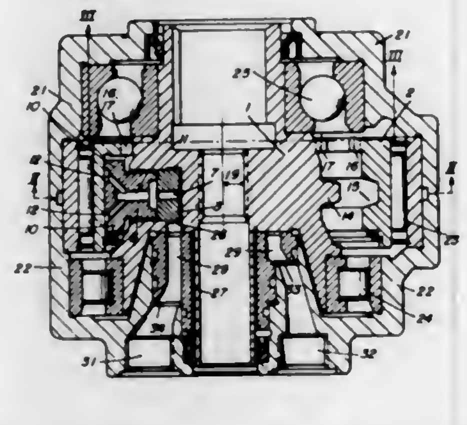


1. In an axial piston machine comprising a stationary casing, a drive flange, means mounting the drive flange for rotation about a first axis with respect to the casing, a barrel support, a cylinder barrel, means mounting the cylinder barrel for rotation about a second axis with respect to the barrel support, said cylinder barrel having first and second end surfaces, a circular array of cylinder bores about said second axis in said first end surface and fluid passages communicating with said cylinder bores and opening at said second end surface, said barrel support being pivotable about a pivot axis with respect to the stationary casing, means forming a valving surface stationary with respect to said barrel support in contact with said second end surface and having inlet and outlet ports therein, pistons in said cylinder bores respectively, piston rods for each of said pistons, each piston rod being connected to the respective piston for universal movement about a first rod-pivot point and connected to the drive flange for universal movement about a second rod-pivot point, said piston rods and pistons forming the driving connection for transmitting rotary motion between the drive flange and cylinder barrel, the improvement comprising:

- said means mounting the cylinder barrel comprising a barrel shaft having two ends with one of said ends of the shaft connected to the drive flange for universal pivotal movement about a first shaft-pivot point located on said first axis, and bearing means adjacent the other of said ends of the shaft supporting the barrel shaft on said barrel support for universal pivotal movement about a second shaft-pivot point with respect to said barrel support and for axial movement with respect to the barrel support;
- said cylinder barrel being rotatably mounted at both ends thereof on said barrel shaft and being axial movable thereon; and
- said means forming a valving surface comprising an intermediate disc having two opposed surfaces of different curvature one of which surfaces is said valving surface, the other of said two surfaces being spherical, said barrel support having a spherical surface mating with said spherical surface of the disc, said disc being restrained against rotation with respect to the barrel support while being free to move radially of said second axis with respect to the barrel support and barrel shaft.

4,034,651
FLUID-OPERATED RADIAL PISTON DEVICES

Karl Eickmann, 2420 Isshiki Hayama, Kanagawa, Japan
Continuation-in-part of Ser. No. 424,580, Dec. 13, 1973, abandoned. This application May 14, 1975, Ser. No. 577,338
Int. Cl.² P01B *13/06*
U.S. Cl. 91—488 **12 Claims**

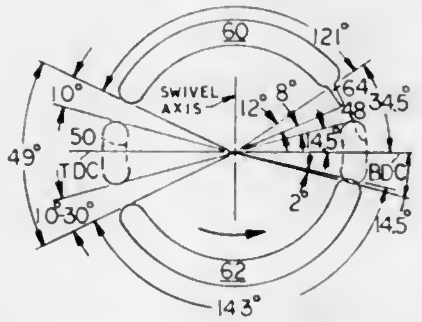


1. A radial-piston machine comprising: a housing; a bearing rotor rotatable in said housing about a bearing-rotor axis and formed with a plurality of angularly spaced radially opening swing seats; a working rotor rotatable in said housing about a working-rotor axis parallel to and spaced from said bearing-rotor axis and having a plurality of cylinders opening radially toward said bearing rotor, one of said rotors being formed with a guide ridge projecting radially toward the other rotor and said other rotor being formed with a radially open guide groove receiving said ridge at a zone of closest radial spacing between said rotors; gear means interconnecting said rotors for joint rotation at substantially the same angular speed; a piston radially reciprocal in each of said cylinders and having a side turned radially toward said bearing rotor and formed with a swing seat; and a plurality of connection members each having one swing-seat portion pivotally received in a respective swing seat of a respective piston and another swing-seat portion pivotally received in a respective swing seat of said bearing rotor, each of said connection members being extended axially in the respective swing seat of said other rotor and each being displaceable between a position bearing generally tangentially between the respective piston and said bearing rotor, and a position extending generally radially of one of said axes.

4,034,652
METHOD AND VALVE FACE CONFIGURATION FOR REDUCING NOISE IN A HYDRAULIC PUMP

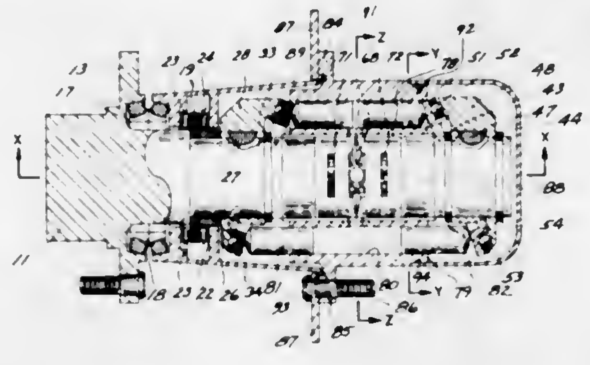
Robert J. Huebner, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 6, 1975, Ser. No. 555,926
Int. Cl.² F01B *13/04*
U.S. Cl. 91—499 **4 Claims**

1. In a hydraulic pump of a type having a cylinder head mounted in relation with a rotatable cylinder barrel, the cylinder barrel having a plurality of bores each reciprocably mounting a piston, the cylinder head forming a high pressure outlet port and a low pressure inlet port circumferentially arranged upon a valve face for periodic communication with the piston bores, the cylinder barrel also forming interconnecting passages for respectively communicating each piston bore with the valve face on the cylinder head, reciprocation of the pistons being timed in accordance with relative rotation between the cylinder head and the cylinder barrel, the improvement comprising configuration of the valve face upon the cylinder head to provide overlapping communication between each piston bore and the low pressure inlet port when the interconnecting passage for the respective bore is in a position corresponding to full retraction of the respective piston, the valve face forming a bleed slot for subsequently initiating communication of each interconnecting passage with the high pressure outlet ports, wherein the angular spacing between the inlet port and the bleed slot initiating communication with the outlet port, including a bottom dead center position for each interconnecting passage, is relatively less than the angular spacing between the outlet and inlet ports which includes a position corresponding to top dead center, and wherein the valve face is configured to block communication with the outlet port for a predetermined angular rotation of the cylinder barrel before the interconnecting passage reaches the top dead center position and remains blocked for an equivalent or greater angular rotation before communication with the inlet port.



4,034,653
AXIAL PISTON MOTOR

Arthur F. Anderson, 767 Iowa St., Blair, Nebr. 68008
Filed Feb. 3, 1975, Ser. No. 546,494
Int. Cl.² F01B *13/04*
U.S. Cl. 91—501 **9 Claims**

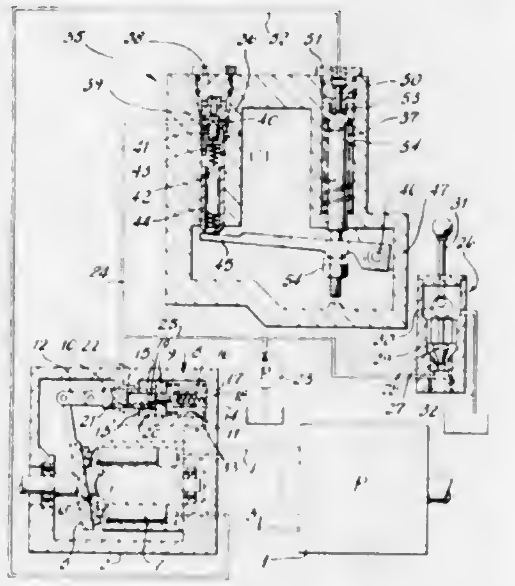


1. An axial piston motor comprising:

- a fixed spindle having at least one annular bearing groove formed therein and including a plurality of axial aligned needle bearings disposed in said groove;
- at least one angle plate secured to said spindle and having a bearing wall disposed at an angle to the axis of the plate;
- a thrust race detachably mounted on said angle plate and disposed parallel to said bearing wall;
- a rotor assembly means rotatably mounted on said spindle, said assembly including an annular sleeve rotatably mounted on said needle bearings and a rotor mounted on said annular sleeve having a plurality of cylinder bores formed therethrough;
- a plurality of pistons mounted in said plurality of cylinder bores in said rotor and coactable with said thrust race;
- fluid conduit means fluidly communicable with said pistons for carrying fluid to and from said pistons to cause said pistons to coact with said thrust race for rotating said assembly;
- pressure balancing means formed in said spindle in fluid communication with said fluid conduit means; and
- said pressure balancing means comprises at least one relief hole formed diametrically through said spindle.

4,034,654
CONTROL SYSTEMS FOR VARIABLE CAPACITY HYDRAULIC MACHINES

Carlo Pensa, Esino Lario, Como, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles
Filed Nov. 17, 1975, Ser. No. 632,598
Claims priority, application United Kingdom, Nov. 18, 1974, 49850/74
Int. Cl.² F01B *13/04*
U.S. Cl. 91—506 **3 Claims**



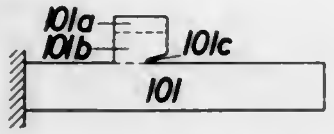
1. A hydrostatic transmission comprising a source of pressurised fluid, a variable capacity hydraulic motor connected to said pressure fluid; control means for varying the capacity of said motor including a source of pressurized fluid, a control line and means for varying the pressure in said control line; override means operable upon said control means to vary the capacity of said motor including means for venting said control line, a check valve positioned in said control line and biased in a closed direction and link means operable to vary said bias; and pressure sensing means for sensing the pressure of said fluid source and operable upon said override means upon attainment of a predetermined pressure to cause said override means to increase the capacity of said motor.

4,034,655
METHOD AND APPARATUS FOR PRODUCING A CONTAINER

Alfred Schmermund, 62 Kornerstrasse, 5820 Gevelsberg, Germany
Division of Ser. No. 495,741, Aug. 8, 1974, Pat. No. 3,956,865. This application Jan. 26, 1976, Ser. No. 652,014
Claims priority, application United Kingdom, Sept. 5, 1973, 41744/73
Int. Cl.² B31B *1/32*
U.S. Cl. 93—12 C **1 Claim**

1. A mandrel for use in manufacturing an elongate container from a blank previously folded along a line joining a

first and a second longitudinal portion of said blank, said mandrel comprising, in combination:
- an elongate main mandrel portion of substantially rectangular cross-section for supporting said longitudinal portions of said container blank;
- a subsidiary mandrel portion projecting from said main mandrel portion in a direction substantially perpendicular to the longitudinal dimension of said main mandrel portion and being of substantially rectangular cross-section in a plane perpendicular to said direction, said subsidiary mandrel portion projecting from a portion of said main mandrel portion intermediate the ends thereof;



- a recess defined between mutually facing surface portions of said main mandrel portion and said subsidiary mandrel portion, said recess having an opening facing towards one end of said main mandrel portion to receive parts of said blank immediately adjacent said fold line; and
- a passage extending through said subsidiary mandrel portion in a direction parallel with said longitudinal dimension of said elongate main mandrel portion and communicating with said recess to permit gripper means to extend through said passage thereby to grip said immediately adjacent parts of said blank in said recess.

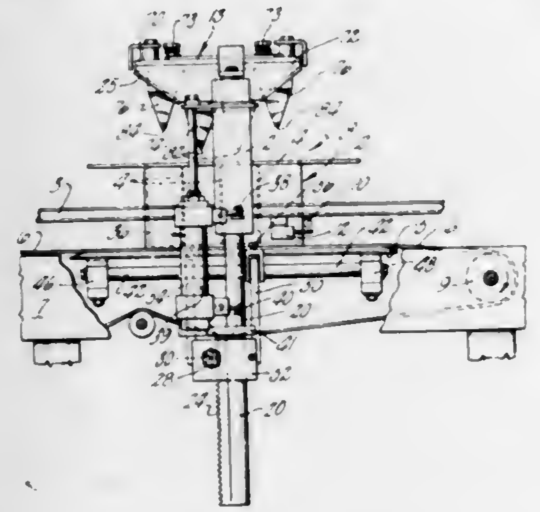
4,034,656
APPARATUS FOR STRAIGHTENING CELL-FORMING PARTITIONS IN A CARTON

John L. Raudat, North Madison, Conn., and Adam Z. Rydell, Decatur, Ga., assignors to Emhart Industries, Inc., Farmington, Conn.

Filed June 18, 1976, Ser. No. 697,798

Int. Cl.² B31D *3/04*

U.S. Cl. 93—37 R **7 Claims**



1. Apparatus for straightening cell-forming partitions in a carton, comprising:
- means for conveying cartons to and away from a partition straightening station;
- means for stopping each carton at said partition straightening station, including means for supporting each carton therein;
- a mandrel disposed in said partition straightening station adjacent and spaced from said carton supporting means a distance sufficient to allow a carton between said mandrel and said carton supporting means;
- a plurality of cones disposed on said mandrel and projecting towards said carton supporting means, at least one of said cones being greater in length than the other of said cones, said cones having perimetric dimensions which are slightly smaller than those of cells defined by the partitions; and
- means for moving said mandrel towards and away from said carton supporting means.

4,034,657
MANUFACTURE OF RECEPTACLES

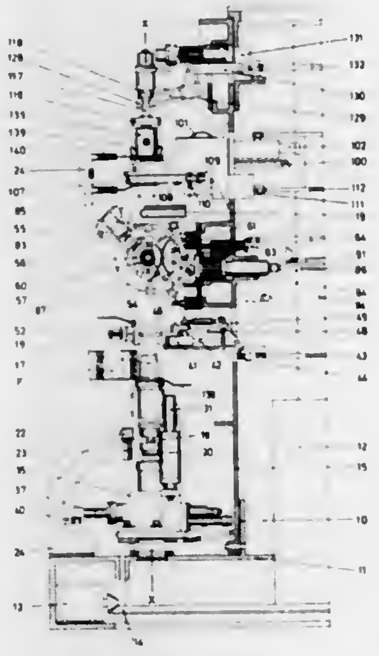
Pierre Boussageon, Paris, France, assignor to Societe Generale pour l'Emballage, Paris, France

Filed Feb. 20, 1975, Ser. No. 551,329

Claims priority, application France, Feb. 20, 1974, 74.05681; Feb. 21, 1974, 74.05901; Feb. 22, 1974, 74.06111

Int. Cl.² B31B *3/74*

U.S. Cl. 93—39.3 **12 Claims**



1. A method of automatically making thin-walled receptacles comprising a wall defining a body having an aperatures at opposite ends thereof, elements including a curved bottom attached to one end and a cover and border at the other end, the method comprising:
- supplying a first working station with a blank for the body,
- forming the blank into the body on a support having an axis of symmetry at the first working station,
- moving the body on its support along said axis directly from the first working station to a second working station,
- providing one end of the body with one of said elements at the second working station,
- grasping said one end of the body by grasping means at the second working station,
- tilting said grasping means to rotate the body to bring said other end of the body to a third working station,
- providing said other end with another of said elements at the third working station,
- gripping said other end of the body by gripping means,
- removing the body by said gripping means,
- and releasing the body, the aperture of the body at said one end being of a width which is less than or equal to that of the aperture at said other end.

4,034,658
TRAY FEEDER SYSTEM

Earle C. Sherman, West Monroe, La., assignor to Olinkraft, Inc., West Monroe, La. and Anheuser-Busch, Incorporated, St. Louis, Mo.

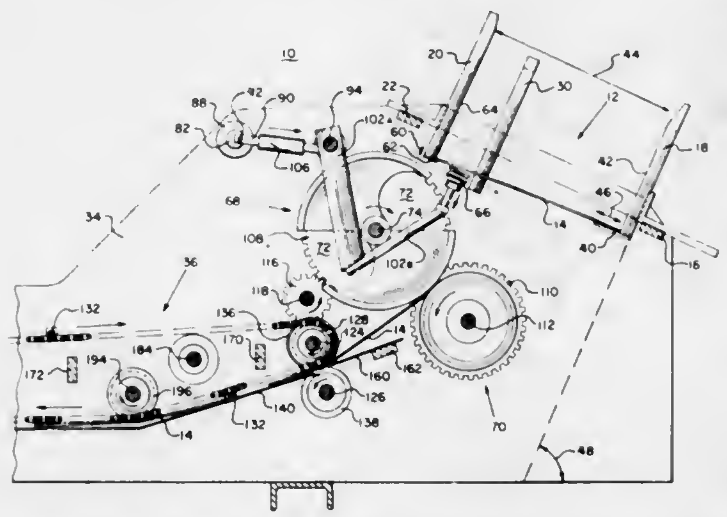
Filed Oct. 28, 1975, Ser. No. 626,210

Int. Cl.² B31B *3/02*

U.S. Cl. 93—49 M **26 Claims**

1. A tray feed for tray blanks of the type having a front flap, a rear flap and a pair of side flaps, all of the flaps being hingedly connected by scorelines to a bottom panel, said tray

feeder being designed to withdraw a plurality of unfolded tray blanks, one at a time, from a hopper without destroying the integrity of the withdrawn tray blank and to convey the withdrawn tray blank continuously to a downstream filler unit with the front and rear flaps of the tray blanks being turned upwardly to a vertical position while the side flaps are turned upwardly to a vertical position while the side flaps are turned downwardly to a vertical position prior to filling of the bottom panel with a predetermined quantity of cans or bottles, comprising:
- a. a hopper feeder unit, comprising
  - 1. an inclined hopper for receiving and holding the plurality of tray blanks;
  - 2. vacuum means, associated with said hopper, for withdrawing the tray blanks, one at a time, from said hopper by bending the tray blank downwardly from the front flap while pivoting the tray blank about the rear score-line, which hingedly connects the rear flap to the bottom panel;
  - 3. conveyor means, associated with said feeder unit, for conveying the withdrawn tray blank in a downward direction from said hopper and forward away from said hopper;
- b. first, horizontal conveyor unit means, associated with said hopper feeder unit, for receiving the downwardly and forwardly moving tray blank and continuously moving it horizontally forward away from said hopper;



- c. second, upwardly running, inclined kicker conveyor unit means, positioned below said first horizontal conveyor unit means, for kicking up and bending upwardly the front flap of the tray blank, about the front scoreline, which hingedly connects the front flap to the bottom panel, to an upwardly inclined position while said first conveyor unit means is continuously moving the tray blank in said forward, horizontal direction;
- d. hold-down means, positioned about said second conveyor unit means, for holding down the front flap as the tray blank moves in said forward horizontal direction said hold down means also for holding down the rear flap when the rear flap is bent upwardly;
- e. third generally horizontal conveyor unit means, associated with said second conveyor unit means for retaining the front flap in a vertical position while bending the rear flap about the rear scoreline to a vertical position, the rear flap being held down by said hold down means, said third conveyor unit means further serving to retain the rear flap in a vertical position while transporting the tray blank in said horizontal, forward direction; and
- f. turning means, associated with said third conveyorunit mens, for turning the side flaps about their scorelines to a downwardly vertical position while said front and rear flaps are being held in an upwardly vertical position.

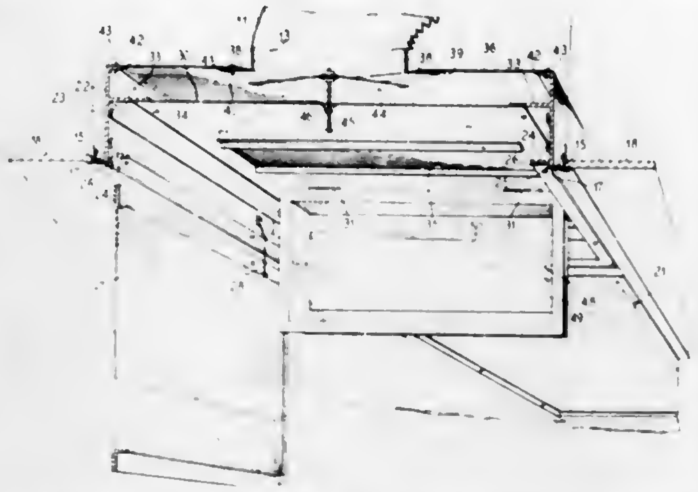
4,034,659
AIR DIFFUSION UNIT AND CONTROL MECHANISM THEREFOR

George K. Raider, 1S-132 Summit Ave., No. 301-B, Oakbrook Terrace, Ill. 60181

Filed Dec. 1, 1975, Ser. No. 636,409

Int. Cl.² F24F *13/06*

U.S. Cl. 98—40 D **14 Claims**



1. A method of balancing air volume output from laminar air flow diffusion modules having approximately equal outlet surface areas installed in a work space where the ambient air surrounding a performance of a task must be conditioned to a certain standard which includes the following steps:
- a. connecting inlets of said modules to an air supply means, said means supplying air to said modules,
- b. placing respective air diffusion plates carried in a bottom portion of each module in an open position,
- c. placing respective air diffusion units carried by each module adjacent to and upstream from said plate in an open position,
- d. setting respective air volume control valves carried by each module adjacent to and downstream from said inlet in a maximum open position,
- e. measuring the velocity of the supplied air with an anemometer as said air passes through an orifice opening in an intermediate plate, said plate being carried by each module and located between said air diffusion unit and said air volume control valve,
- f. selectively adjusting the air volume control valve such that the measured velocity of the air passing through each orifice opening equals all other measured velocities within 10 percent, and
- g. placing each air diffusion unit and each air diffusion plate to a normal position,

wherein said modules deliver to said work space air having a uniform laminar downward flow so as to maintain the ambient air surrounding the performance of the task within said standards of conditioning.

12. A pressure-displacement type ventilating apparatus comprising,
- a source of pressurized conditioned air,
- duct means leading from said source to a point of utilization,
- an outlet module connected to said duct means and more specifically comprising,
  - a module body,
  - a first distribution plenum carried by said body and having a suitable inlet connecting with said duct,
  - a second distribution plenum carried by said body and separated from said first distribution plenum by an intermediate plate,
  - an outlet diffusor forming a readily removable bottom of said second distribution plenum to allow a distribution of said air to a space below, said diffusor providing selective access to said intermediate plate,
  - intermediate diffusion means including a selectively sized

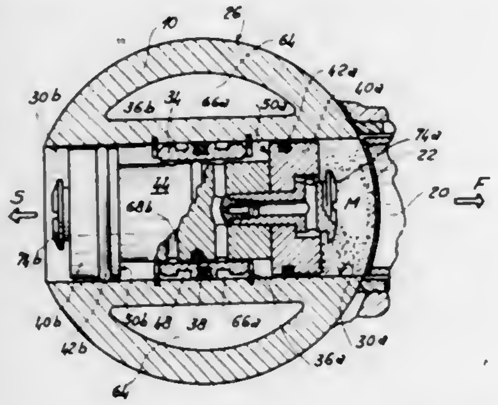
orifice opening in said intermediate plate to provide for a movement of said air between said first and second distribution plenums and hingeable diffusing means attached to a bottom of said intermediate plate and positioned to selectively cover said orifice opening and causing a diffusion of said air passing through said orifice and into said second distribution plenum, and

a control valve carried by said module body and controlling the admission of said air into said first distribution plenum,

wherein a volume of said air through said outlet diffusor may be selectively regulated by said control valve as a function of a velocity of said air passing through said orifice opening when said diffusing means is removed and said orifice opening is uncovered.

4,034,660
AUTOMATIC COFFEE-MAKING APPARATUS

Mario Egi, 5, Via Omboni, 20129 Milan, Italy
Filed Oct. 1, 1975, Ser. No. 618,605
Claims priority, application Italy, Oct. 4, 1974, 28066/74
Int. Cl.² A47J *31/00*
U.S. Cl. 99—289 R **7 Claims**

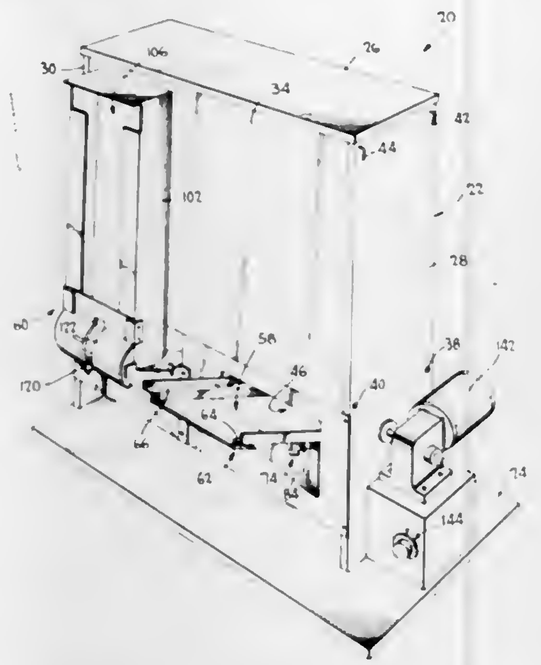


1. A coffee-making apparatus of the kind comprising a casing connected to a source of hot pressurized water, a rotor supported and driven for step-by-step rotation, said casing having a coffee inlet, a beverage percolation outlet and a spent coffee discharge outlet, said rotor having a peripheral wall, diametrically arranged and oppositely located equal cavities opening on said peripheral wall and oppositely located pistons each slidable in one of said cavities, the casing comprising a finely perforated diaphragm at said percolation outlet facing a cavity aligned with said outlet, said rotor being intermitently rotated for sequentially carrying each cavity to a first station facing said coffee inlet, to a second station facing said percolation outlet and diaphragm, to a third station facing said discharge outlet and then again at the first station for cycle repetition, while the opposite cavity is concurrently carried to face said discharge outlet,

wherein the improvement comprises an intermediate passage interconnecting said cavities and having its cross-sectional area less than that of said cavities, an intermediate component interconnecting said pistons sealingly slidable under the action of pressurized water in said intermediate passage, each piston dividing the cavity wherein it sealingly slides into an outer space open at said peripheral wall and an inner annular space defined by said intermediate component, a stepped rear face of the piston, the adjacent face portion of said intermediate passage and the wall of said cavity, the said rotor comprising duct means having their outlet in said annular space whereby hot pressurized water is supplied in said space at said percolation station to bias the piston toward said peripheral wall and compact an amount of fresh ground coffee under a give pressure between said piston and said perforated diaphragm, in said outer space.

4,034,661
APPARATUS FOR HEATING AND DISPENSING FOOD ARTICLES

Michael G. Boosalis, Fayetteville, and Thomas D. Wason, Raleigh, both of N.C., assignors to Michael Boosalis, N.C.
Filed June 8, 1976, Ser. No. 693,978
Int. Cl.² A47J *37/04*
U.S. Cl. 99—339 **24 Claims**



1. Apparatus for heating and dispensing food articles including elongated skewer-supported food articles, said apparatus comprising:

housing means including portions defining a feed opening and portions defining a discharge opening; each of said feed and discharge openings being elongated and large enough to receive a skewer-supported food article therethrough;

magazine means including laterally spaced support portions for carrying the opposite ends of at least one skewer adjacent said feed opening;

conveyor means disposed within said housing means and defining as elongated path of travel extending between said feed and discharge openings;

driving means operatively associated with said conveyor means for moving said conveyor means along said path;

heating means juxtaposed to said conveyor means along said path;

said conveyor means including a pair of continuous conveyor means laterally spaced from each other a distance less than the length of a skewer and greater than the length of the food article on a skewer;

at least one first skewer support means carried by one of said conveyor members for movement along said path therewith, said first skewer support means including bearing means for rotatably supporting one end of a skewer, and pickup means extending from said bearing means toward said housing means, said pickup means including portions underlying one end of a skewer carried by said magazine means as said conveyor means passes said feed opening to pickup that end of the skewer and feed it into said bearing means;

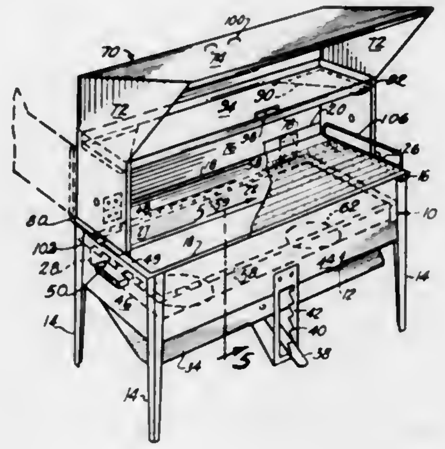
second skewer support means laterally aligned with each of said first skewer support means and carried by the other of said conveyor members for movement along said path therewith, each second skewer support means including gripping means for gripping the other end of a skewer in lateral alignment with said bearing means, pickup means extending toward said housing means, said pickup means of said second skewer support means underlying the other end of a skewer carried by said magazine means as said conveyor means passes said feed opening to pickup that end of the skewer, and rotating means for rotating said second skewer support means and thus a skewer gripped by said gripping means about an axis extending between said gripping means and said bearing means as said conveyor means moves along said path;

feeding cam means juxtaposed to said feed opening for pushing the other end of a skewer along said pickup means of said second skewer support means and into gripping relationship with said gripping means; and

stripping cam means juxtaposed to said discharge opening for stripping the other end of the skewer from said gripping means of said second skewer support means whereby the skewer-supported food article is dispensed through said discharge opening.

4,034,662
COOKING APPARATUS

Jack S. McLane, 1853B Vintage Court, NW. Park Apts., Marriot, Atlanta, Ga. 30060
Continuation of Ser. No. 187,972, Oct. 12, 1971, Pat. No. 3,982,476. This application Jan. 2, 1974, Ser. No. 430,066
Int. Cl.² A47J *37/07*
U.S. Cl. 99—445 **10 Claims**



1. A cooking apparatus operable for controlling flame flare-up in a cooking operation comprising, in combination:

a. A pan having a recessed fuel burning area operable for supporting heat producing means;

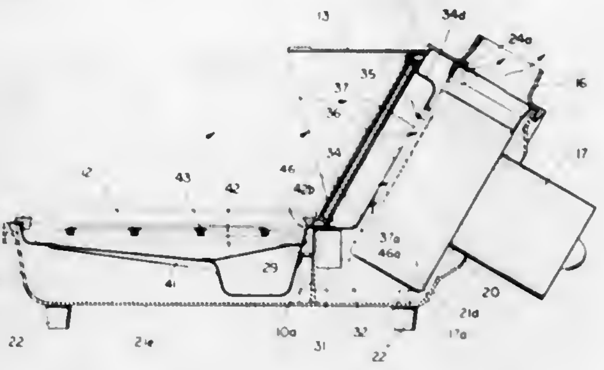
b. a cooking surface supported above said pan, said cooking surface including means for defining limited air flow passageways therethrough for controlling the amount of air passing through said cooking surface into the area between said pan and said cooking surface; and,

c. housing means extending around and completely enclosing the area between said pan and said cooking surface, said housing means defining limited air passage means into said pan above said fuel burning area, and means forming the combination of said cooking surface limited air passage means and said housing limited air passage means to collectively control the amount of oxygen supplied to said fuel burning area to prevent flame flare-up.

4,034,663
VENTILATED PORTABLE ELECTRIC GRILL

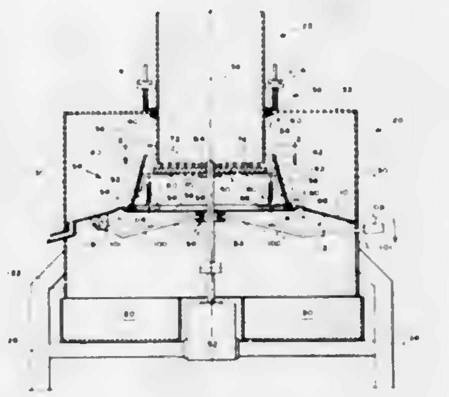
Louis J. Jenn; Thomas R. Field, and Joseph J. Cerola, all of Indianapolis, Ind., assignors to Jenn Air Corporation, Indianapolis, Ind.
Continuation-in-part of Ser. No. 498,628, Aug. 19, 1974, abandoned. This application June 23, 1975, Ser. No. 589,060
Int. Cl.² H05B *1/00;* A47J *37/06;* F23J *11/08*
U.S. Cl. 99—446 **3 Claims**

1. A portable electric cooking unit for countertop use comprising a housing of such size as to be capable of being positioned on a conventional kitchen countertop, said housing having a forwardly extending portion with an upwardly extending portion disposed at its rear margin, the height of said upwardly extending portion being substantially less than the forward extension of said forwardly extending portion, said forwardly extending portion having an open-topped dished configuration of relatively shallow depth compared to the overall height of said housing, a grease collector pan removably seated in said dished housing portion and having a sump area extending along the pan margin which is immediately adjacent said upwardly extending portion of the housing, an electrical radiant heating unit disposed in overlying relation to said pan in said forwardly extending housing portion, food supporting means overlying said heating unit, a shielding member removably mounted in said collector pan below the heating unit to overlie only said sump area to thereby shield said area from radiant heat emitted from the heating unit, the front face of said upwardly extending housing portion immediately adjacent said heating unit having an opening providing an inlet to the interior of said upwardly extending housing portion for smoke and fumes rising therefrom, and a power driven fan mounted within said upwardly extending portion of said housing for drawing air through said inlet and expelling it from said housing through an outlet therein.



4,034,664
JUICE EXTRACTOR

John R. Hassell, 2403 Tepper Lane, Salem, Oreg. 97303
Filed June 14, 1976, Ser. No. 695,581
Int. Cl.² A23N *1/00;* B02C *15/00;* B04B *5/10;* B26D *1/00*
U.S. Cl. 99—511 **11 Claims**



1. A centrifugal juice extractor for extracting juice from the plant material such as fruits and vegetables comprising:

a. a walled enclosure having peripheral sides;

b. an upright open-bottomed hopper member mounted adjacent the top of said enclosure so as to extend below the uppermost limit of said enclosure sides;

c. a horizontally oriented pulverizing member rotatably mounted within said enclosure a spaced distance from the open bottom of said hopper member, said pulverizing member being rotatable about an axis extending substantially vertically through said hopper member and including pulverizing means associated therewith for pulverizing, during said rotation, plant material impinging thereon into a mixture of its pulp and juice components and discharging said mixture outwardly from said pulverizing member through said space between said pulverizing member and hopper member under centrifugal force after pulverization;

d. means for rotating said pulverizing member about said axis;

e. an open-bottomed annular member attached to and surrounding said pulverizing member so as to be rotatable therewith for receiving said mixture discharged from said pulverizing member, said annular member having means defining apertures therein for impeding the outward flow under centrifugal force of said pulp component of said plant material while permitting said flow of said juice component therethrough;

f. collecting means within said enclosure for capturing said juice component of said plant material passing through said annular member and for conducting said juice component to the exterior of said enclosure;

g. a bottom member extending across the open bottom of said annular member, and rotatable therewith, said bottom member being selectively lowerable so as to permit said pulp component of said plant material contained within said annular member to pass under centrifugal force downwardly and outwardly toward the peripheral sides of said enclosure; and

i. means for selectively lowering said bottom member so as to permit said passage from within said annular member of said pulp component of said plant material.

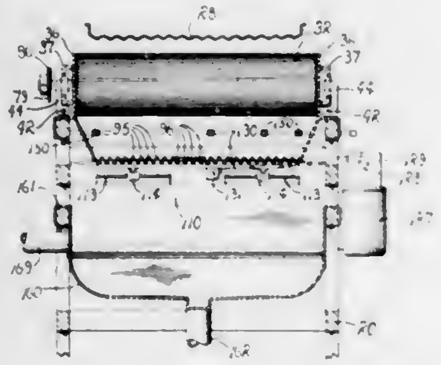
4,034,665
PISTACHIO HULLER

Jay J. McFarland, Bakersfield, and Bertram E. Saunders, Oildale, both of Calif., assignors to California Almond Orchards, Bakersfield, Calif.

Filed June 18, 1975, Ser. No. 587,918

Int. Cl.² A23N *5/05;* **A47J** *43/00;* **A23N** *7/00;* **A47J** *17/16*

U.S. Cl. 99—574 **15 Claims**



1. A two stage pistachio huller comprising first means for rupturing the pericarp of the pistachio and forming tag ends thereof adherent to the pistachios; and second means engageable with said tag ends to strip the pericarp from the pistachios, in which both of said means have coacting rollers, the first means having substantially horizontal and parallel rollers spaced for the passage of pistachios therebetween having adjacent peripheries traveled downwardly at different peripheral speeds, and the second means having substantially horizontal and parallel rollers having ends adapted to receive pistachios from the first means and opposite discharge ends, said rollers of the second means being spaced too closely for the passage of whole pistachios therebetween, and means to oscillate adjacent rollers of the second means alternately in opposite directions.

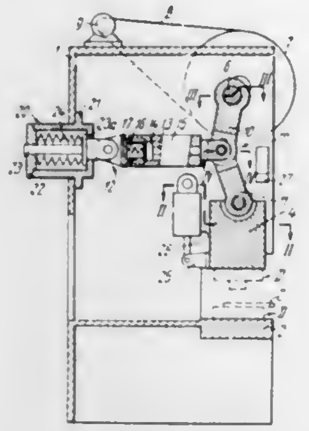
4,034,666
CRANK PRESS

Oleg Pavlovich Bigun, ulitsa Juzhno-Moravskaya, 56, kv. 27, and Grigory Matveevich Rodov, ulitsa 3 Internatsionala, 9, kv. 25, both of Voronezh, U.S.S.R.

Filed Dec. 8, 1975, Ser. No. 638,908

Int. Cl.² B30B *1/14, 1/16*

U.S. Cl. 100—231 **3 Claims**



1. A crank press including a tool comprising a frame with a bed for a work piece, guides mounted on said frame generally perpendicular to the surface of said bed, a slide disposed within said guides for translational movement and carrying said tool for moving same from a non-working position to a working position, a crankshaft mounted on said frame, a pair of toggle links pivotably connected at one end about a common axis and one of said pair having its other end pivotably connected to said crankshaft while the other of said pair having its other end pivotably connected to said slide; a fluid power cylinder having a moveable piston member pivotably connected at said common axis to said pair of toggle links, shock-absorbing means fixed to said frame and including a spring-loaded rod element disposed in the shock absorber, said cylinder being pivotably mounted to said shock-absorbing means which is fixedly mounted on said frame and said cylinder being disposed generally perpendicular to the axis of said slide, a compression spring urging said piston to permit the withdrawal of said slide from the working position upon release of fluid pressure acting on said piston.

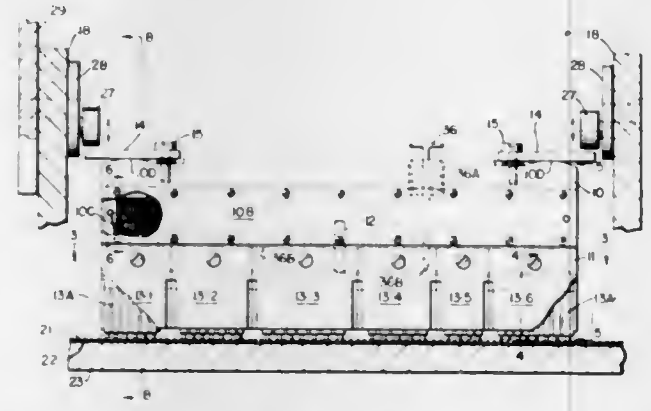
4,034,667
HOT STAMPING MACHINE WITH ROTATABLE HEAD

Vern W. Cartwright, Executive Airport, Sacramento, Calif. 95822, and Carlos W. Veach, 9021 Ashcroft Ave., Los Angeles, Calif. 90048

Continuation-in-part of Ser. No. 513,828, Oct. 10, 1974, abandoned. This application Aug. 1, 1975, Ser. No. 601,092

Int. Cl.² B44B *5/02*

U.S. Cl. 101—27 **3 Claims**



1. For use in numbering negatives or transparencies used in aerial photography, a rotatable imprinting head for hot stamping machines having a printing force applied to the imprinting head comprising in combination a bar-like static member, a movable bar-like member, a vertical pivotal connection between said static and movable members whereby said movable member can be selectively rotated horizontally about said vertical pivotal connection to the static member for 180° rotation relative thereto, heating means in said static member, type holder blocks detachably carried along the bottom of said movable member, and pressure adjusting means comprising a pair of arms, one arm extending off each end of the static member and connected thereto by a threaded adjustment screw at the inward portion of each arm, and said static member has a curved fulcrum proximate each end portion of the static member beneath a central portion of each arm whereby the arms are rocked over the curved fulcrum to increase or decrease printing pressure when the printing force is applied to the outer portions of the arms.

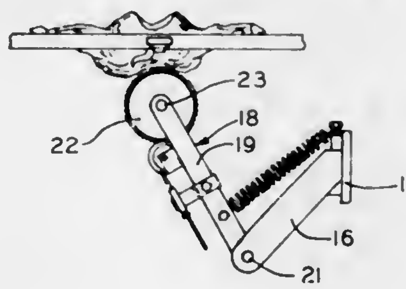
4,034,668
SYSTEM FOR MARKING CARCASSES

John Robert Picknick, and Bernard Joseph Gach, both of St. Joseph, Mo., assignors to Armour and Company, Phoenix, Ariz.

Filed Nov. 25, 1975, Ser. No. 635,226

Int. Cl.² B41F *17/00*

U.S. Cl. 101—35 **4 Claims**



1. In a system for marking animal carcasses including a conveyor rail, trolley means for supporting said carcasses on said rail, and for moving said carcasses along said rail in a consecutive manner while the carcasses depend from said trolley means, including a stationary bracket, an arm pivotly connected to said bracket and moveable about its pivot to bring its extended end toward and away from carcasses passing along said rail, and spring means for urging said extended end of said arm toward said carcasses, the improvement comprising a marking wheel rotatably mounted on said extended end of said arm and adapted to resiliently contact said carcasses passing on said rail as said extended end of said arm is moved toward said carcasses, said marking wheel having a cylindrical wall and spaced taped holes in said wall, and a holder containing a stamp therein having a threaded member turned into each of said holes, whereby when said wheel is moved into contact with a carcass passing along said rail said stamp prints on said carcass.

4,034,669
POSTAGE METER SETTING MECHANISM

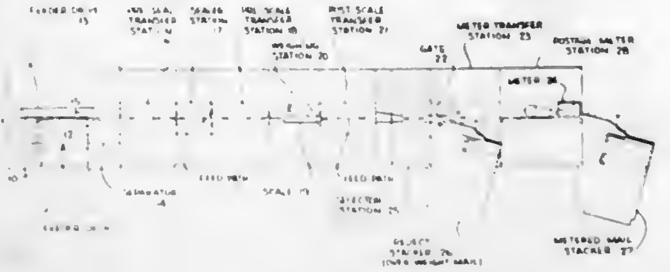
Gerald C. Freeman, Darien, Conn., assignor to Pitney-Bowes, Inc., Stamford, Conn.

Continuation of Ser. No. 476,617, June 5, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,053

Int. Cl.² B41L *47/46*

U.S. Cl. 101—91 **5 Claims**

1. A high speed automatic postage meter setting mechanism for a postage meter having a postage printing means, a number of banks of actuator assemblies of said meter each being settable to control a postage value to be printed by said postage printing means, said automatic mechanism comprising a plurality of stepper motors operatively connected to the banks of actuator assemblies of said meter, one stepper motor for each actuator assembly bank, said stepper motors turning through a given rotational distance corresponding to a particular actuator assembly setting, means for individually pulsing each of the stepper motors to turn through said given rotational distance so as to provide the postage printing means of said meter with a desired postage value, and electronic computational means for electronically calculating the postage value, said computational means being operatively connected to said pulsing means for influencing said pulsing means to supply the stepper motors with a number of pulses corresponding to said postage value.



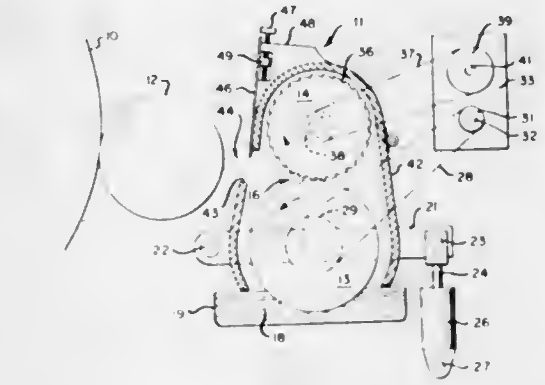
4,034,670
DAMPENING DEVICE FOR LITHOGRAPHIC PRINTING PRESS

Eugene N. Zavodny, Riverside, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1975, Ser. No. 561,600

Int. Cl.² B41F *7/30*

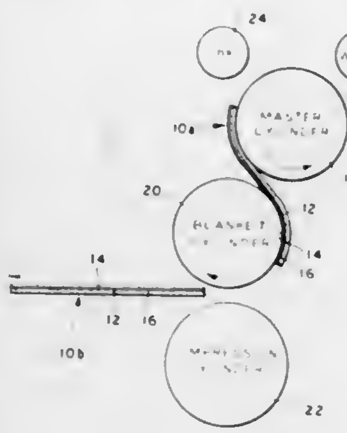
U.S. Cl. 101—148 **9 Claims**



1. A dampening mechanism for the plate cylinder of a rotary lithographic printing press comprising, a reservoir of dampening fluid, a supply roller having a smooth, continuous, resilient surface mounted for rotation about an axis parallel to the plate cylinder axis and with a portion of its surface immersed in said dampening fluid, a feed roller of rigid material mounted for rotation about an axis parallel to said supply roller and having its surface in pressure contact with said supply roller at a nip spaced from said reservoir, a plurality of circumferentially spaced, generally longitudinal grooves formed in the surface of said feed roller for sequentially advancing metered amounts of dampening fluid through said nip as the supply roller and the feed roller rotate, drive means for rotating said supply roller at a surface speed sufficient to convey a film of dampening fluid on its surface from said reservoir and to maintain a supply thereof at the said nip, and drive means for rotating said feed roller in an opposite direction with respect to and at a surface speed substantially greater than said supply roller whereby, upon passing through said nip, the longitudinal grooves sequentially advance metered amounts of dampening fluid through said nip and progressively spray said fluid toward the plate cylinder in the form of a substantially continuous, fine mist.

4,034,671
METHOD OF USING AN OFFSET LITHOGRAPHIC COMBINATION MASTER BLANKET SHEET

Frederick O. Bach, Villa Park, Ill., assignor to A. B. Dick Company, Chicago, Ill.
Division of Ser. No. 540,590, Jan. 13, 1975, abandoned. This application July 23, 1976, Ser. No. 708,183
Int. Cl.^{2} B41M *1/06;* **B41C** *1/10*
U.S. Cl. 101—451 **2 Claims**

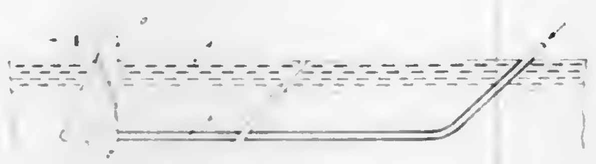


1. A method of printing with ink on copy sheets in a lithographic offset duplicating press including master, blanket and impression cylinders mounted for rotation, the master and impression cylinders being substantially in contacting engagement with the blanket cylinder, comprising the steps of:
- providing a first combination master/blanket sheet having a master layer comprising material having hydrophilic properties and a blanket layer of hydrophobic-oleophilic material, said master layer being predeterminedly imaged to provide a pattern of oleophilic areas for receipt thereat of printing inks;
- mounting said first sheet onto the surface of said master cylinder with said imaged master layer being exposed;
- providing a second combination master/blanket sheet having a master layer comprised of material having hydrophilic properties and a blanket layer of hydrophobic-oleophilic material;
- mounting said second sheet onto the surface of said blanket cylinder with said blanket layer being exposed;
- applying ink and water to the master layer of said first sheet whereby said imaged areas are inked and transferred to the blanket layer of said second sheet;
- feeding copy sheets into the nip of said impression and blanket cylinders to print said inked image on the sheet surfaces as they pass between the rotating impression and blanket cylinders;
- after completion of a copy run, removing said blanket and master sheets from respective cylinders; and
- mounting said first sheet to said blanket cylinder with the blanket layer thereof being exposed for a subsequent copy run.

4,034,672
LINEAR EXPLOSIVE

Robert E. Eckels, 2101 Youngfield St., Golden, Colo. 80401
Filed Jan. 2, 1976, Ser. No. 646,343
Int. Cl.^{2} F42D *3/00;* **F42B** *3/00*
U.S. Cl. 102—23 **14 Claims**

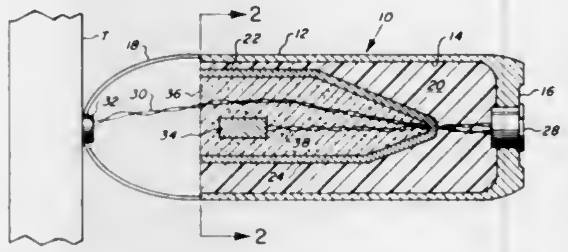
1. A linear explosive device for excavating, energy partitioning or impedence matching, consisting of
- a. an elongated flexible tube formed of one of the class of plastic and rubber, for positioning along the intended path of explosion,
- b. a smaller, elongated flexible tube formed of one of the class of plastic and rubber, positioned in said larger tube and fixedly secured in said large tube,
- c. one said tube being filled with a essentially liquid explosive charge,
- d. the other said tube being filled with an inert material, and



- e. detonating means secured to at least one end of said tubes in contact with the explosive charge.

4,034,673
ARMOR PENETRATION SHAPED-CHARGE PROJECTILE

Clayton J. Schneider, Jr., East Aurora, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.
Filed Feb. 23, 1976, Ser. No. 660,557
Int. Cl.^{2} F42B *13/10*
U.S. Cl. 102—56 SC **16 Claims**

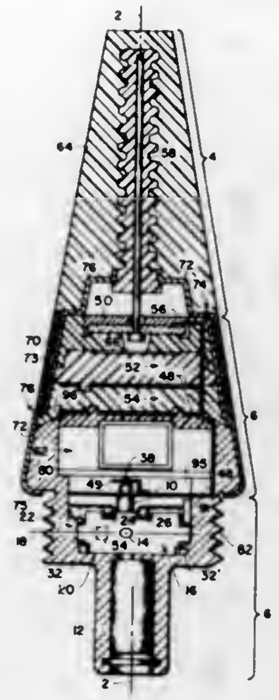


1. In an armor penetrating shaped charge having; a generally cylindrical pyrotechnic material, a liner projecting, at least in part, into said pyrotechnic material and having an outer dimension that is at most equal to the outer dimension of said pyrotechnic material, the improvement comprising;
- a. means for expanding the liner into a substantially conical shape having an outer dimension greater than said outer dimension of said pyrotechnic material.

4,034,674
COMPACT ELECTRICAL FUZE

Edgar John Abt, Tempe, Ariz., assignor to Motorola, Inc., Schaumburg, Ill.
Division of Ser. No. 644,212, Dec. 24, 1975. This application Oct. 6, 1976, Ser. No. 730,040
Int. Cl.^{2} F42C *13/00, 19/02*
U.S. Cl. 102—70.2 P **1 Claim**

1. In an electrical fuze for a projectile, having an electrical circuit, the improvement comprising:
- conductor means;
- a plurality of electrical components; and
- dielectric means being fabricated from a unitary thin planar flexible material, said conductor means being disposed on only one side of said dielectric means, said disposed conductor means and said dielectric means being shaped and bent to provide mounting for said plurality of electrical components in a plurality of mounting planes.



4,034,675
CATALYSTS - CONTAINING ABLATIVE RESONANCE SUPPRESSORS

David C. Sayles, Huntsville, Ala., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Aug. 20, 1970, Ser. No. 72,558
Int. Cl.^{2} F42B *1/00*
U.S. Cl. 102—102 **9 Claims**

1. A resonance rod of the type used in a solid propellant rocket motor to control combustion instability, said resonance rod comprised of phenolformaldehyde resin; a filler selected from carbon black and asbestos; and a burning rate catalyst selected from n-butylferrocene and n-hexylcarborane for release into the combustion zone of said rocket motor, said catalyst being releasable continuously into the combustion zone of said rocket motor as the solid propellant burning progresses within said rocket motor.

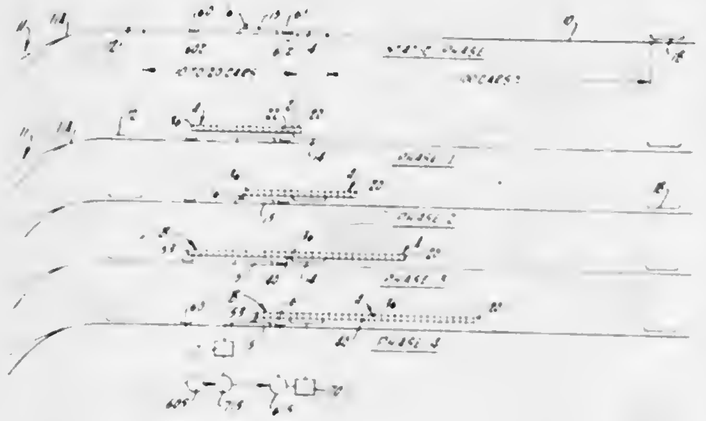
4,034,676
INHIBITOR COATING FOR SOLID ROCKET PROPELLENT CHARGE

Eduard Daume, Richterswil, Switzerland, assignor to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG, Zurich, Switzerland
Filed June 16, 1975, Ser. No. 587,322
Claims priority, application Switzerland, June 21, 1974, 8518/74
Int. Cl.^{2} F42B *1/00*
U.S. Cl. 102—103 **5 Claims**

1. The combination of an inhibitor coating and a solid double base propellant charge comprising:
- a. a polyurethane protective- and adhesion layer consisting essentially of a lowmolecular weight triisocyanate applied to the propellant charge;
- b. a castable insulating layer for protecting said propellant charge against undesired burning-off applied to said protective- and adhesion layer and comprising: (i) a binder of polyurethane, (ii) a fine granular cooling agent as filler;
- c. said polyurethane of the insulating layer being different from the polyurethane of said protective- and adhesion layer and possessing poor smoke developing properties;
- d. said filler containing aluminium hydroxide and possessing good packability;
- e. said protective- and adhesion layer being completely moisture hardened by atmospheric moisture before the application of the insulating layer and forming a barrier against plasticizer migration.

4,034,677
RAILROAD CLASSIFICATION YARDS

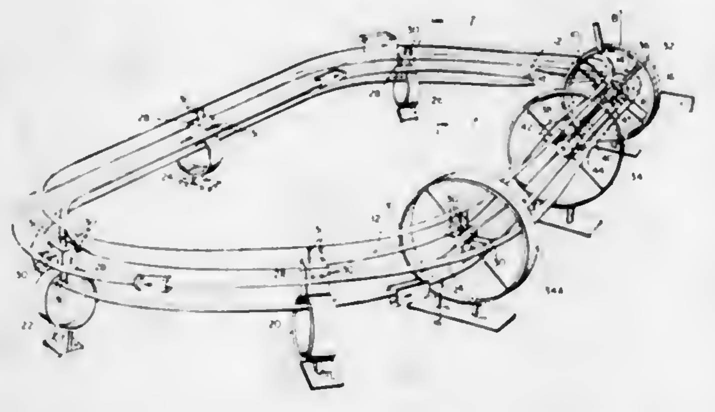
Earl E. Frank, Tallman, N.Y., assignor to Abex Corporation, New York, N.Y.
Filed Sept. 22, 1975, Ser. No. 615,378
Int. Cl.^{2} B61B *1/00*
U.S. Cl. 104—26 R **14 Claims**



1. A method for coupling railroad cars on a railroad storage track, wherein the track is equipped with an upstream car retarder and downstream car retarder, and wherein the track is also equipped with means to forcefully move cars toward a point downstream of the downstream retarder, comprising: operating the upstream retarder to slow the entering cars one-by-one to a predetermined speed, allowing each of the slowed cars to drift toward the downstream retarder, actuating the downstream retarder to stop and hold a lead car, maintaining the downstream retarder activated as additional cars drift toward the downstream retarder and couple themselves one to another as a block of coupled cars behind the lead car held in the downstream retarder, releasing the downstream retarder after a predetermined number of cars have been so coupled to form a block of cars, and actuating said means to propel the block of cars toward a point downstream of the second-named retarder.

4,034,678
TOY CAR AND TRACK SYSTEM

Warren Elvin Wilson, P.O. Box 4236, Incline Village, Nev. 89450
Filed Apr. 2, 1976, Ser. No. 673,279
Int. Cl.^{2} B61B *15/00*
U.S. Cl. 104—87 **1 Claim**



1. A toy train comprising a plurality of fixed monorail tracks, a plurality of flexible tracks and a switching device for

selectively interconnecting said fixed and flexible tracks, said switching device comprising a pair of stationary ring supports for supporting the ends of each of the fixed tracks, one of said stationary ring supports fixedly supporting one end of each of the fixed tracks, a rotatable disc adjacent the other of said stationary rings supporting the other end of said flexible tracks and adapted to selectively connect the latter with said fixed tracks.

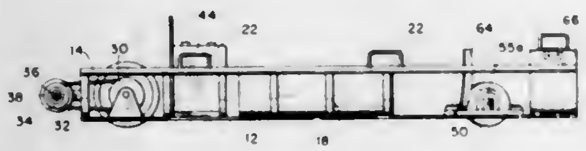
4,034,679
AUTOMATED PIPELINE CRAWLER

Teddy W. Gaither, R.R. 8, Box 387V, Tulsa, Okla. 74106, and James E. Ford, 11925 E. 1st, Tulsa, Okla. 74128

Continuation-in-part of Ser. No. 524,488, Nov. 18, 1974, abandoned. This application Apr. 19, 1976, Ser. No. 678,040

Int. Cl.² B62D *61/02*

U.S. Cl. 104—138 R **7 Claims**



1. A powered pipeline crawler comprising support frame means having upper elongated elements defining a substantially flat plane and lower transverse elements of an arcuate configuration complementary to the cross sectional configuration of the pipeline, personnel carrier means carried by the support frame means and being of an arcuate cross sectional configuration whereby the support frame means surrounds a portion of the personnel disposed on said personnel carrier means, driving wheel means journalled on the support frame means, power means operably connected with the driving wheel means for transmitting rotation thereto, steering wheel means journalled on the support frame means for steering the crawler during longitudinal movement thereof through the pipeline, wherein said steering wheel means comprises a frame assembly pivotally secured to the support frame means, a steering wheel member journalled on said frame assembly and movable simultaneously therewith, and handle means carried by said frame assembly for facilitating manual pivoting of said frame assembly to control the position of said steering wheel member for steering of the crawler and wherein said frame assembly comprises a first pair of spaced mutually parallel arm members, a second pair of spaced mutually parallel arm members having the opposite ends pivotally secured to the opposite ends of said first pair of arm members, and means for pivotally securing one pair of said spaced members to said support frame assembly.

4,034,680
DUAL-MODE BUS

Mitsuharu Hamada, Yokohama; Hiroshi Sugiyama, Hiratsuka; Hiromichi Uchiyama, Yokosuka, and Shinji Katayose, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed July 8, 1975, Ser. No. 593,948

Claims priority, application Japan, July 10, 1974, 49-78947

Int. Cl.² B60L *5/36;* **B61F** *9/00*

U.S. Cl. 104—140 **2 Claims**

1. In a dual-mode bus adapted to travel on a guideway having on both sides thereof two upstanding guide walls, at least one of said two upstanding guide walls being installed with an electric cable, comprising a rear axle having at both ends thereof wheels and an axle housing, a frame supported on the axle and a current collector engageable with the electric cable, the frame having two side frames:

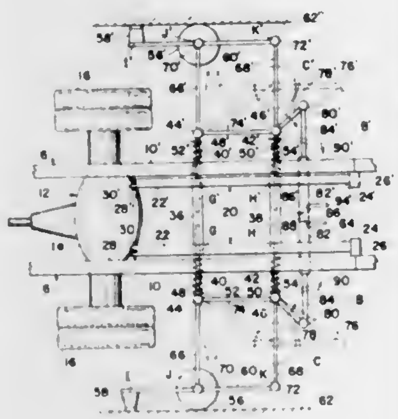
a floating support comprising two beams, said two beams being connected hingedly at their one ends to the axle housing at two transversely spaced locations thereon, respectively, and being connected at their opposite ends by shackles with the side frames, respectively, each of said two beams having two spaced portions, first one of each of said two beams being disposed nearer to the axle than second one of said two spaced portions thereof;

a first arm having a first portion and a second portion spaced from the first portion thereof,

a second arm having a first portion and a second portion spaced from the first portion thereof,

means mounting said first portions of said first arm and second arm to said first portions of said two beams and said second portions of said first arm and second arm to said second portions of said two beams, respectively;

a first guide wheel rotatably carried by said first arm and contacting with one of the two upstanding guide walls;



a second guide wheel rotatably carried by said second arm and contacting opposite one of the two upstanding guide walls;

at least one of said first and second arms carrying the current collector at a third portion, said third portion being spaced, farther than said first portion of said at least one arm, from said second portion of said at least one arm; and

resilient means for urging said first and second arms toward said one and said opposite one of the two upstanding guide walls, respectively.

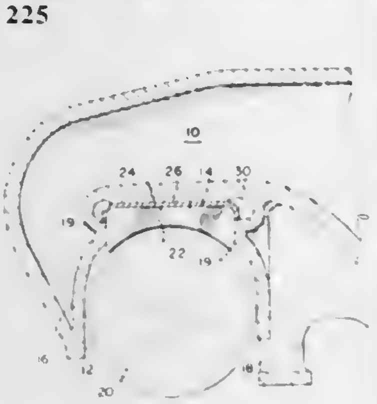
4,034,681
PEDESTAL ROOF WEAR LINER

Otto Walter Neumann, Chicago, and Frank Joseph Korpics, Streamwood, both of Ill., assignors to Amsted Industries Incorporated, Chicago, Ill.

Filed Aug. 4, 1975, Ser. No. 601,347

Int. Cl.² B61F *5/32, 15/20*

U.S. Cl. 105—225 **1 Claim**



1. In a pedestal type side frame with an integrally formed downwardly open jaw which includes a roof and depending legs said legs having opposed stop lugs, a bearing assembly received in the jaw, a bearing adapter overlying the bearing assembly, and a wear liner disposed between the roof and the adapter, the improvement wherein the wear liner includes a body portion having lateral edges extending longitudinally of the side frame, said body portion being welded to the roof

along at least a portion of said edges, said wear liner including depending legs which terminate above but closely adjacent to said opposed stop lugs and which are engageable with and retained in position by said stop lugs in the event of weld failure.

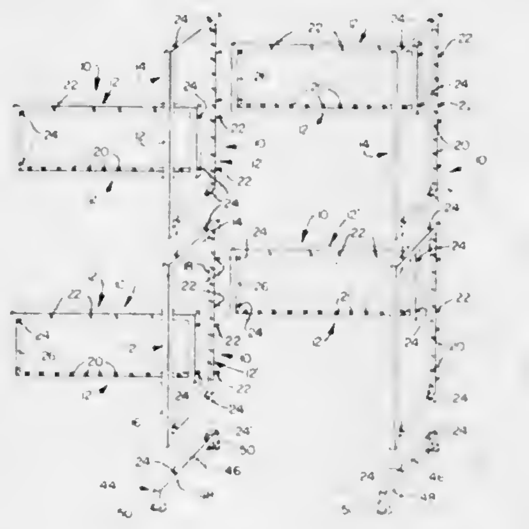
4,034,682
MODULAR STRUCTURE FOR THE SUPPORT OF SHELVES AND SIMILAR ARRANGEMENTS

David Bizinover, and Luis Feferbaum Gutfraind, both of Avenida Itaoca, 1863-1875, Rio de Janeiro, Guanabara, Brazil

Continuation-in-part of Ser. No. 449,348, March 8, 1974, abandoned. This application Nov. 19, 1975, Ser. No. 633,592

Int. Cl.² A47F *5/00*

U.S. Cl. 108—107 **4 Claims**



1. A shelving assembly comprising, a framework including a plurality of rigid interconnected four-sided rectangular frame members of identical configuration, each said frame member including a pair of parallel long side rails and a pair of parallel short end rails connected to each other to define an integral rectangular member, all of said rails including inner faces, outer faces and side faces, the side faces of at least one said side rail each having spaced aligned openings therein, the inner and outer faces of said end rails each having spaced aligned openings therein, the inner faces of said side rails each having opposed spaced-apart aligned openings therein, the spacing between adjacent ones of said openings in said side faces of said side rail equal to the spacing between adjacent ones of said openings in said end rails, three of said frame members laterally spaced from each other each with their long side rails disposed vertically, a fourth and fifth of said same frame members each with their long side rails disposed horizontally and disposed respectively between the first and second and the second and third of said three laterally spaced vertically disposed frame members, said outer faces of said end rails of said fourth and fifth frame members juxtaposed the side faces of said laterally spaced three frame member side rails, fastener means connecting said fourth and fifth frame members to said spaced vertically disposed frame members through related aligned said openings in the end rails of said fourth and fifth frame members and said openings in the side faces of said spaced side rails, shelf support means connected to said opposed aligned openings in said inner faces of said side rails of said spaced vertically disposed frame members, shelves removably disposed between said first and second and between said second and third frame members, each said shelf including hanger means at each end engageable with said shelf support means, said hanger means at one end of each said shelf transversely offset relative said hanger means at the opposite end of each said shelf to permit two said shelves to each have one end engageable with a common one of said shelf support means and said openings in said inner faces of said side rails are spaced intermediate the location of said openings in the related side faces of said side rails to allow insertion of said shelf support means and said fastener means through a common one of said side rails without interference therebetween and without interference between said end rails of said fourth and fifth frame members connected to said second frame member side rail.

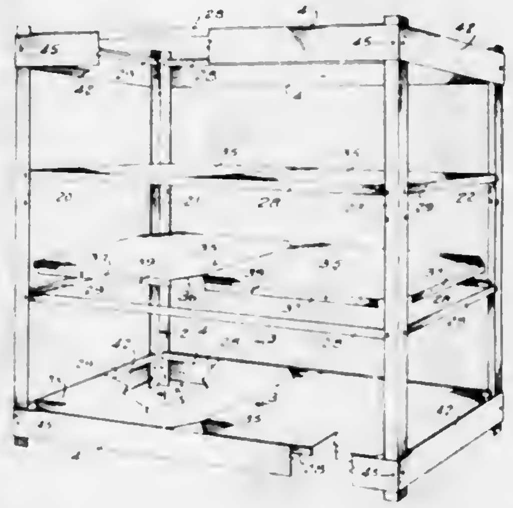
4,034,683
SHELVING STRUCTURE

Guy J. DiCenzo, 778 Hazelwood Drive, North Wales, Pa. 19454

Filed July 28, 1975, Ser. No. 599,767

Int. Cl.² A47B *3/00*

U.S. Cl. 108—111 **7 Claims**



1. A shelving structure comprising upright corner posts which, in cross-section, have two legs at right angles in each other, each leg having therealong on its inner face upwardly pointing prongs; struts which are U-shaped in cross-section and thereby present upwardly opening lengthwise slits, said struts having holes at their ends in their under sides which open up into said slits; said holes receiving said prongs to thereby support the struts, said struts being arranged in an encircling arrangement to thereby support and tie the post together, and shelves having depending flanges which are positioned in said slits to retain the shelves.

4,034,684
WORKBENCH AND FOLDABLE LEG ASSEMBLY THEREFOR

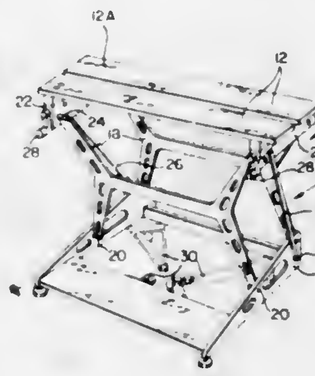
Norman Harold Carson; Raul Cirne, both of Brockville, and Horst Zahn, Ontario all of Canada, assignors to The Black and Decker Manufacturing Company, Towson, Md.

Filed Sept. 10, 1975, Ser. No. 612,073

Claims priority, application Canada, Sept. 12, 1974, 209110

Int. Cl.² A47B *3/00*

U.S. Cl. 108—127 **20 Claims**



1. A dual height workbench or the like comprising:

top members defining a working surface; a base defining longitudinal and transverse axes; support structure for supporting said top members above said base; and, a plurality of legs pivotally attached to said base adjacent outer edge portions of same and movable between inwardly folded inoperative positions corresponding to the lower height of the workbench and outwardly and downwardly inclined operative positions relative to said base corresponding to the higher position of the workbench, the pivotal attachment of the respective legs being such that each of said legs is capable of movement in an arc lying in a plane which is at an acute angle relative to the longitudinal and transverse axes of said base,

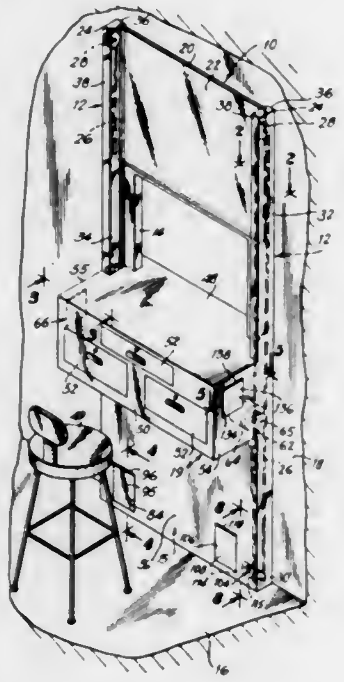
each said leg including at its upper end pivot axis defining means, with a portion of said upper end spaced from said pivot axis defining means being shaped to transmit thrust forces to said base and to limit the degree of outward pivotal motion of said leg thus to define the outwardly and downwardly inclined operative position of each leg, and,

said base being provided with a plurality of support feet for contacting a floor surface in the lower position of the workbench, each support foot being located adjacent a respective one of said legs, and each said leg having a recess or opening therein for receiving a portion of the associated support foot therein the operative position of such leg whereby to avoid interference between each leg and the adjacent support foot of the base.

4,034,685

TELLER'S SHIELD

James O. Word, 207 Sixth Ave., Hattiesburg, Miss. 39401
Filed Aug. 18, 1976, Ser. No. 715,239
Int. Cl.² E06B *9/04;* E05G *5/00*
U.S. Cl. 109—17 25 Claims



1. A teller's shield comprising:

a. a vertically extending shield mounted relative to a teller's cage and adapted to be moved from an open position in which access to the cage is obtainable, to a closed position in which access is unobtainable,

b. mounting means operatively associated with said teller's cage and said shield to permit vertical movement of said shield from said open to closed position, said mounting means including a cable connected to said shield,

c. foot activating means operatively associated with said mounting means,

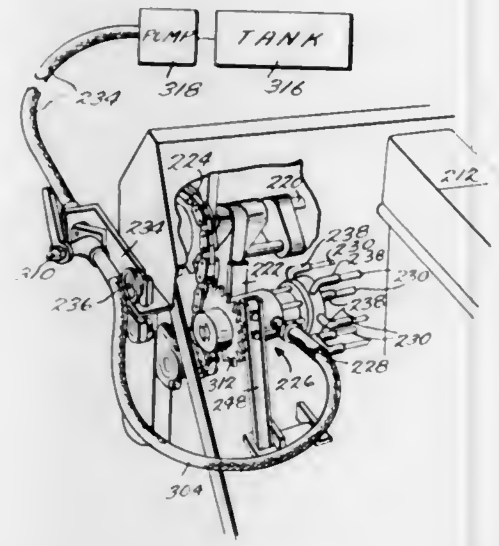
d. hand activating means operatively connected to said foot activating means, such that simultaneous engagement of said foot and hand activating means is required to release said shield for movement from the open position to the closed position, said foot and hand activating means being electrically powered, and

e. manual activating means operatively associated with said mounting means and capable of operation upon failure of the electric power to said foot and hand activating means, such that said shield may be lowered to the closed position notwithstanding a power failure.

4,034,686

INJECTOR FOR SOIL TREATING LIQUIDS

William C. Collins, Miami, Fla., assignor to Outboard Marine Corporation, Waukegan, Ill.
Continuation-in-part of Ser. No. 346,023, March 29, 1973, Pat. No. 3,926,131. This application Nov. 24, 1975, Ser. No. 634,758
Int. Cl.² A01C *23/02*
U.S. Cl. 111—7 4 Claims

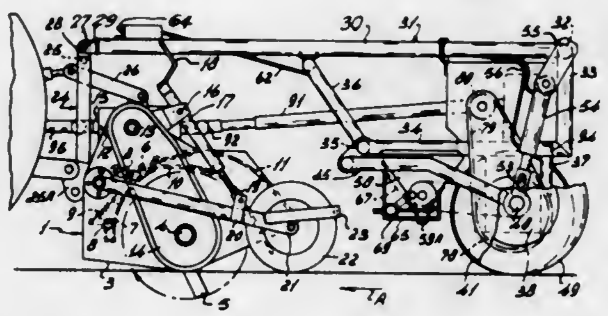


1. An injector for soil treating liquids comprising a frame, a source of rotary power supported by said frame, means for supporting said frame from the ground surface for permitting said frame to be drawn along the ground surface, a plurality of injection tines each having a downwardly directed tip, means mounting each injection tine on said frame in a generally vertical orientation and for cyclic reciprocation between an upper extreme wherein said tip is raised clear of the ground surface and a lower extreme wherein said tip has plunged beneath the ground surface, said mounting means including a crankshaft journalled for rotation on said frame and having a plurality of offset crank portions, an endless drive member driven by said source of rotary power and connected to said crankshaft so as to rotate said crankshaft by said source of rotary power, rotary-to-reciprocating drive means connecting respective crank portions to respective tines so that as said crankshaft is rotated said tines are reciprocated, means defining a nozzle adjacent each of said tips for dispensing treating liquid into the soil when said tips lie beneath the ground surface, means defining a passageway for treating liquid through each of said tines to said nozzle thereof, a flow-dividing valve mounted on said frame and including a housing having therein means defining a valve chamber, an inlet means communicating with said valve chamber, a plurality of outlet means communicating with said valve chamber, and a valve body received in said valve chamber, rotatable relative to said chamber, and including means defining a port having one end in communication with said valve inlet means and having another end which, as said valve body is rotated, is sequentially brought into and then out of communication with each of said valve outlet means, a plurality of conduit means connecting each of said valve outlet means to said passageway of at least one, but less than all, of said tines, a valve drive shaft secured to the valve body and extending out of said valve housing, and a rotary drive member mounted on said valve drive shaft and in driving engagement with said endless drive member so as to rotate said valve body and said crankshaft in timed relation, to thereby supply treating liquid through each passageway to each of said nozzles for injection into the ground only when said tips of said tines are beneath the ground surface.

4,034,687

CULTIVATORS

Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N. V., Maasland, Netherlands
Filed Apr. 24, 1975, Ser. No. 571,091
Claims priority, application Netherlands, May 2, 1974, 7405875
Int. Cl.² A01C *7/08*
U.S. Cl. 111—13 9 Claims

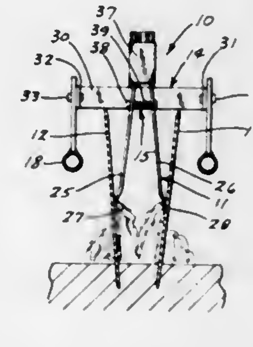


1. A soil cultivator in combination with a material delivery mechanism comprising a frame having a coupling member at the front thereof that is connectable to a prime mover, soil working means rotatably supported on said frame and said soil working means extending transverse to the normal direction of travel of the cultivator, driving means engaging said soil working means to rotate same, a power driven roller being positioned a substantial distance to the rear of said soil working means and said roller being rotatable about a horizontal axis, said material delivery mechanism being located between the soil working means and said roller, said roller and soil working means being interconnected by a supporting structure that is connected to said frame, a drive transmission of said driving means being drivenly connected to rotate said roller forwardly with respect to the direction of travel at a speed in excess of that required to match the speed of travel of said cultivator, said supporting structure being pivoted to a portion of said frame that supports said soil working means and pivotable about an axis that extends substantially perpendicular to the direction of travel; said mechanism and said roller being mounted on said supporting structure and the latter having ground wheels located adjacent the rear thereof and the ends of said roller.

4,034,688

DISC SCRAPING APPARATUS

Arnold E. Ernst, Wolverton, Minn. 56594
Filed Nov. 24, 1975, Ser. No. 634,614
Int. Cl.² A01C *5/00*
U.S. Cl. 111—87 2 Claims



1. A planter apparatus of the type having a pair of discs for breaking the ground surface during the planting operation; the discs being positioned with their front lower portions close together for entry into the soil and their upper rear portions spaced apart from each other in a diverging configuration, the improvement being means for scraping the inside peripheral surfaces of the discs as they rotate, the scraping means comprising:

a bracket unit rigidly secured to the planter apparatus, said bracket unit including:

a back element;

a first finger element having one end thereof rigidly attached to said back element;

a second finger element having one end thereof rigidly attached to said back element, said second finger element being spaced from said first finger element;

a cover plate rigidly attached to the other ends of the first and second finger elements; and

openings disposed in said first and second finger elements;

a blade unit positioned between said discs, said blade unit including:

a first blade, said first blade being substantially flat and having an outwardly extending scraping edge on one end thereof, said first blade having an upper opening therein and a centrally located opening therein;

a second blade, said second blade being substantially flat and having an outwardly extending scraping edge on one end thereof, said second blade having an upper opening therein and a centrally located opening therein;

a first pin means having a longitudinal axis and extending through the openings in said first and second finger elements and extending through and slideably received in said upper openings in said first and second blades for allowing pivoting of said blades along axes perpendicular to and intersecting with the axis of said first pin means; and

biasing means for keeping said blade unit in contact with said discs as the discs rotate, including:

second pin means slideably received in said centrally located openings of the first and second blades;

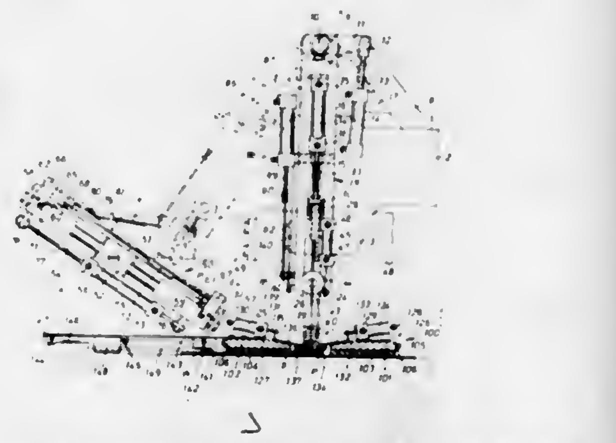
a coil compression spring surrounding said second pin means and being disposed between said first and second blades for biasing said first and second blades apart; and

means attached to each end of said second pin means for limiting the distance that the first and second blades can be pushed apart.

4,034,689

DEVICE FOR MANUFACTURING BRAIDED OPENINGS IN CUTS OF ARTICLES OF CLOTHING

Peter Hintzen, Krickenbach, and Erich Willenbacher, Karlsruhe, both of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany
Filed Aug. 11, 1976, Ser. No. 713,448
Claims priority, application Germany, Aug. 14, 1975, 7525743[U]
Int. Cl.² D05B *3/10*
U.S. Cl. 112—68 10 Claims



1. In a device for manufacturing braided openings in cuts of articles of clothing, of the type comprising a folding mechanism, for a braid strip, mounted at a location spaced from the stitch forming area of a two-needle sewing machine installed

in a table plate and having an arm shaft, a work clamp displaceable relative to the stitch forming area, and a cutting knife working between the needles, with folding of a braid strip being effected by a shape bar, having an inverted T-shape, adapted to be lowered into a folding groove, and by folding slides mounted for movement toward the shape bar to fold a braid strip about the shape bar, and further comprising a work clamp by which a cut of clothing and, if provided, a flap to be placed in contact with a folded braid strip, are received and fed to the stitch forming area: the improvement comprising, in combination, means mounting said folding mechanism, laterally of said stitch forming area and above the location where the cuts are fed to said stitch forming area, to extend in a plane inclined toward said table plate; a baseplate in said folding mechanism, formed with an elongated recess constituting said folding groove; a support; means mounting said shape bar for displacement vertically of said support; means mounting said support for pivoting, about an axis parallel to the axis of said arm shaft, between an initial position, in which said shape bar is aligned with said recess forming the folding groove, and a transfer position, in which said shape bar is aligned, in advance of said stitch forming area, with the direction of displacement of said work clamp, for effecting delivery of a braid strip and flap to said work clamp; and clamping bars, for a braid strip and a flap, mounted on said support on respective opposite sides of the web of said shape bar for displacement parallel to said web.

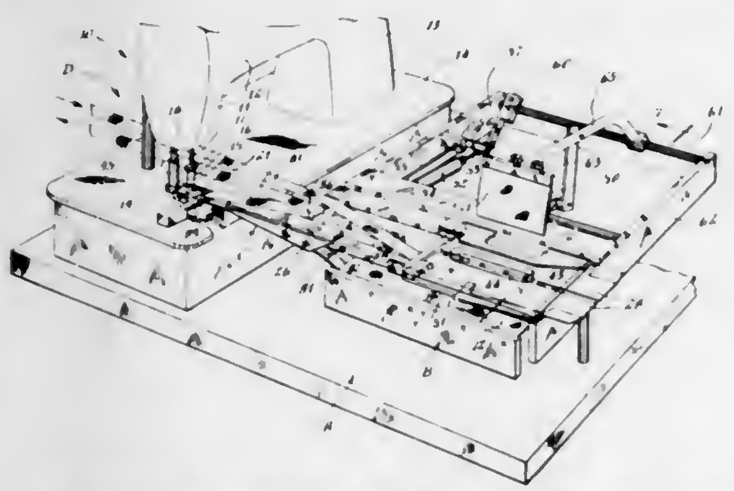
4,034,690
APPARATUS AND METHOD FOR FORMING BELT LOOPS

Louis William Breck, Jr., P.O. Box 9817, El Paso, Tex. 79988

Filed June 17, 1975, Ser. No. 587,743

Int. Cl.² D05B *35/00*

U.S. Cl. 112—121.27 8 Claims



1. Apparatus for making a belt loop from a fabric piece comprising:

means for folding the fabric piece to overlap longitudinal edges of the fabric piece along its length so as to provide a hidden longitudinal edge and an overlapped exposed longitudinal edge,

means for presenting the fabric piece in stationary alignment with respect to said means for folding the fabric piece, and

means for transporting the fabric piece to said folding means while maintaining the alignment of the fabric piece with respect to the folding means,

said means for presenting the fabric piece in stationary alignment including:

a chamber,

means for introducing a pressurized fluid into said chamber,

deflecting means within said chamber for changing the direction of flow of said pressurized fluid,

said means for introducing said fluid and said deflecting means being arranged to flow a portion of the fluid into contact with and generally parallel to the longitudinal edge of the fabric piece and to flow a portion of the fluid into contact with and generally perpendicular to said longitudinal edge, and

stop means within said chamber to contact a lateral edge of the fabric piece and a longitudinal edge of the fabric piece to position the fabric piece in contact with said fluid flow in stationary alignment with respect to said folding means,

said means for transporting the aligned fabric piece to the folding means including:

a transfer blade for contact with the aligned fabric piece in said chamber,

means for passing the transfer blade and aligned fabric piece through said chamber, and

a moving belt means positioned to receive said aligned fabric piece from said chamber and transfer blade and to transport said aligned fabric piece to said folding means, said moving belt means including:

means for raising said moving belt means towards said chamber as said transfer blade contacts said fabric piece.

4,034,691
SEWING MACHINE WITH A SUB-TABLE DEVICE

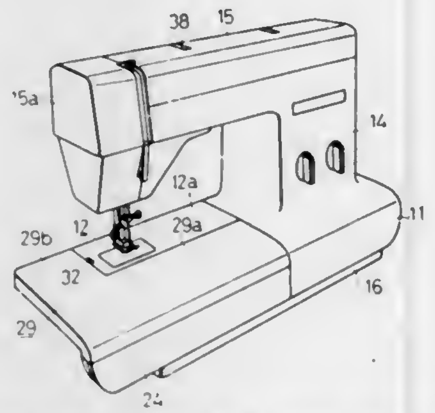
Tosio Sasaki, Inazawa, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Feb. 18, 1976, Ser. No. 658,969

Claims priority, application Japan, Mar. 4, 1975, 50-29995

Int. Cl.² D05B *75/00*

U.S. Cl. 112—258 5 Claims



1. In a sewing machine having a frame which includes:

a. a base (**11**),

b. a free lower arm (**12**) extending horizontally from said base and having a work supporting surface,

c. a standard (**14**) rising above said base,

d. an upper arm (**15**) extending from said standard generally parallel to said lower arm, and

e. a base plate (**16**) mounted under said base and extending generally parallel to and under said lower arm,

a sub-table device for converting said sewing machine from a free arm type to a flat bed type, comprising:

f. a connection plate (**24**) hinged to said base plate at a front edge thereof for movement between a fallen position in which said connection plate extends forwards from the front edge of the base plate and a raised position in which the connection plate rises above at the front edge of the base plate,

g. a support plate (**29**) hinged to said connection plate and adapted to shift between a lower position in which said support plate superposes on the connection plate in said fallen position and an upper position in which said support plate adjoins the front edge of said lower arm in the raised position of said connection plate,

h. means (**32, 33**) on said support plate and said lower arm for holding the support plate in said upper position when the support plate is shifted from said lower position to the upper position, in which a top surface of said support plate is substantially continuous with the work supporting surface of said lower arm, and,

i. spring means (**26**) mounted between the base plate and the connection plate and functioning on one side of a predetermined position in the movement path of said connection plate to move the latter to the raised position and functioning on the other side of said predetermined position to move the connection plate to the fallen position.

4,034,692
INSTALLATION FOR MAKING CANS OF METAL

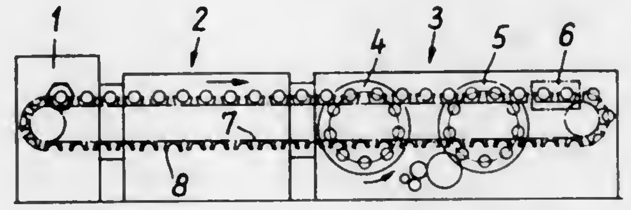
Heinrich Hennes, and Walter Sommer, both of Essen, Germany, assignors to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Continuation of Ser. No. 443,851, Feb. 19, 1974, abandoned. This application Sept. 9, 1975, Ser. No. 611,799

Claims priority, application Germany, Feb. 19, 1973, 2308132

Int. Cl.² B21D *51/26*

U.S. Cl. 113—7 R 3 Claims



1. An installation for making and treating cans of metal, which includes in combination: a plurality of stations for operating on cans connected by only one chain conveyor interconnecting all stations and having can holding means, said chain conveyor being angularly inclined in a transverse direction, means for intermittentley feeding a strip of sheet metal step by step to a first station having means for cutting disk blanks from said strip and including means for drawing said blanks to form cans, closed at one end and open at the other end and means for depositing said cans on said can holding means, a second station having means for performing successive washing steps on said cans, said cans being so arranged that cans on the angularly inclined chain have their open ends located at a lower level than for closed ends thereof, a third station having external heating means for receiving said cans for heating the outer sides of said cans and means for inside coating of the cans, and means to transfer said cans from said holding means to said external heating means and back to said holding means, a fourth station for receiving said cans on internal heating means for heating said cans internally and means for coating and printing the outer surface of said cans, and means to transfer said cans from said holding means to said internal heating means and back to said holding means, and a fifth station having means for successively necking, flanging and finishing the completed cans.

4,034,693
DEVICE FOR AUTOMATIC RAISING OF FISH TRAPS, CRAYFISH POTS, NETS AND THE LIKE

Clarence William Challenger, 16 Shadbolt St., Booragoon, Australia

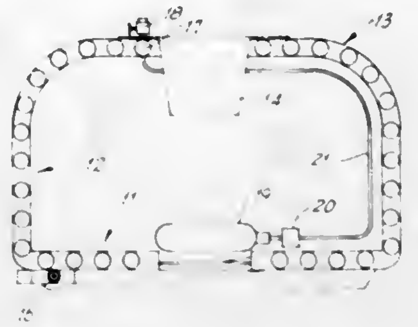
Filed June 20, 1975, Ser. No. 588,957

Claims priority, application Australia, Sept. 27, 1974, 9059/74

Int. Cl.² B63G *8/22*

U.S. Cl. 114—16 E 8 Claims

1. A trap for fish, crayfish and the like comprising a body formed from a length of plastic pressure pipe wound into a spiral to define a bottom, wall and top of the body, a gass cylinder and a control unit, one end of the pipe being open and the other end being connected to said gas cylinder through said control unit, a valve connected to said other end of said pipe, said pipe being filled through said valve with water to render said body non-buoyant, said control unit having a control valve actuated by a signal transmitted through the water in which the trap is located, the actuation of said control valve by said signal expelling water from said pipe by gas from said gas cylinder to render said body buoyant.



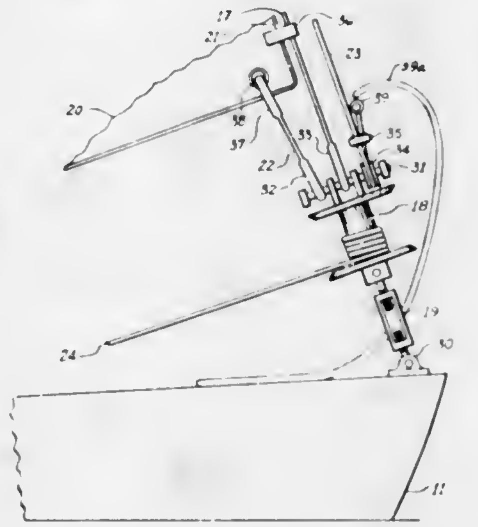
4,034,694
JIB FURLER

Newton Bradford Dismukes, 2952 Buttonwood Drive, Carrollton, Tex. 75006

Filed Sept. 5, 1975, Ser. No. 610,851

Int. Cl.² B63H *9/04*

U.S. Cl. 114—106 12 Claims



1. In a sailboat carrying a jib sail an improved jib furler apparatus rotatably spaced between an upper swivel attached to a mast and a lower swivel attached to a deck comprising:

a wire line stay

means for attaching said stay to said upper swivel

means for attaching said stay to said lower swivel

a halyard

means for attaching said halyard to said upper swivel

means for attaching said halyard to said lower swivel

means for selectively rotating said lower swivel whereby said jib is furled around said stay and halyard.

4,034,695
LUMBER WORK BOAT

Toshio Kitai, Nagoya, Japan, assignor to Kabushiki Kaisha Kitai Tekkosho, Nagoya, Japan

Filed June 25, 1976, Ser. No. 699,963

Claims priority, application Japan, Mar. 12, 1976, 51-26823

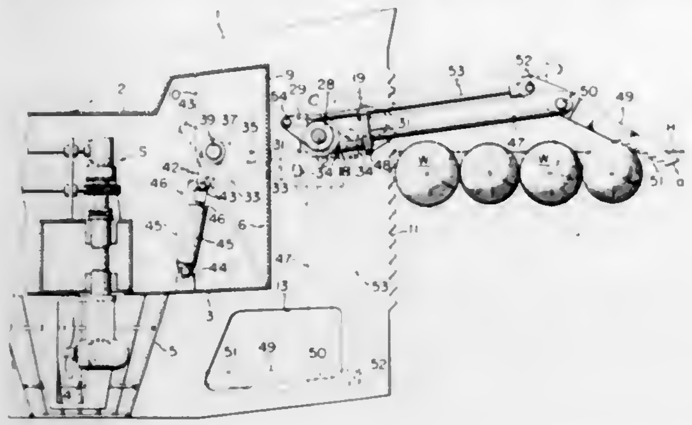
Int. Cl.² B63B *27/00*

U.S. Cl. 114—268 11 Claims

1. A lumber work boat comprising a hull including a bow portion with a forwardly open recess therein;

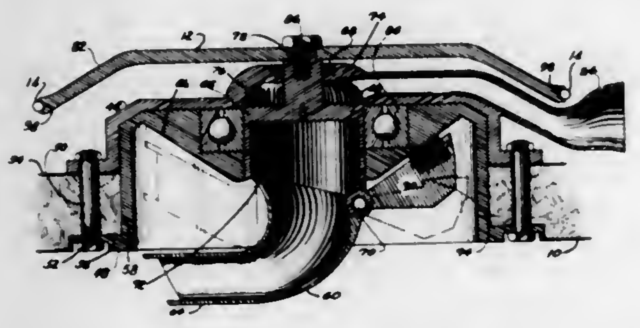
an operating arm assembly for handling lumber, a horizontal rotatable shaft extending through said recess and mounted in said hull supporting said assembly for movement between an inoperative position in which said assembly is received in said recess and an operative position

in which said assembly projects forwardly from said recess;
drive means disposed interiorly in said hull for driving said operating arm assembly; and
operating force transmitting means operatively connecting said drive means with said operating arm assembly and extending through said hull into said recess for transmitting driving force from said drive means to said operating arm assembly as an operating force for the lumber handling operation and for displacing said arm assembly between said operative and inoperative positions.



4,034,696
BOAT STABILIZER

Richard L. Kureth, 31742 Sheridan, Garden City, Mich. 48135
Continuation of Ser. No. 495,059, Aug. 5, 1974, abandoned, which is a division of Ser. No. 170,769, Aug. 11, 1971, Pat. No. 3,827,389. This application Feb. 23, 1976, Ser. No. 660,347
Int. Cl.² B65H *25/46*
U.S. Cl. 115—12 R **8 Claims**

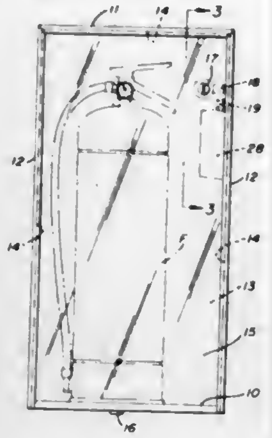


1. A stabilizer system for a boat comprising a pair of nozzles mounted to extend below the boat with one of said nozzles positioned adjacent the front of the boat and the other positioned adjacent the rear of the boat, each of said nozzles being provided with an outlet portion extending substantially parallel to the plane of the boat, means for pumping water through said nozzles, means for selectively rotating said nozzles about vertical axis, and means automatically retracting said nozzles into said boat upon nonoperation of said pumping means.

4,034,697
FIRE EXTINGUISHER CABINET

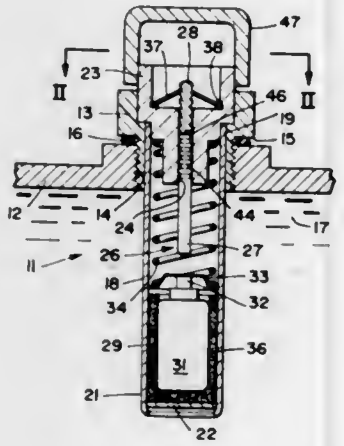
Walter E. Russell, Frederick, Md., assignor to A-T-O Inc., Willoughby, Ohio
Filed Feb. 4, 1976, Ser. No. 655,276
Int. Cl.² G08B *21/00, 13/08*
U.S. Cl. 116—100 **5 Claims**

1. A fire extinguisher cabinet and alarm comprising an enclosure arranged to hold and display a portable fire extinguisher, a removable transparent access panel in said enclosure, means in said panel having a movable actuating arm on an inner side of said panel and an alarm device positioned in said enclosure, a trigger member in said alarm device arranged for engagement by said actuating arm when said actuating arm is in a first position and when said transparent access panel is moved to provide access to said enclosure and the portable fire extinguisher therein, said movable actuating arm being movable from said first position to a second position where it cannot engage said trigger member, said trigger member arranged to actuate said alarm device.



4,034,698
MAXIMUM TEMPERATURE-INDICATOR

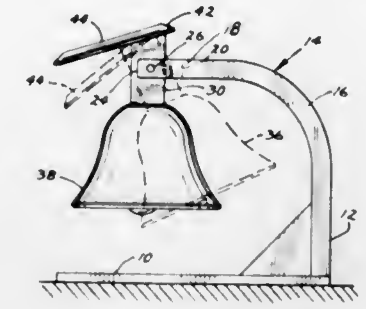
James C. Durand, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed July 16, 1976, Ser. No. 705,844
Int. Cl.² G01K *5/20, 5/44*
U.S. Cl. 116—114 Z **15 Claims**



1. A maximum temperature indicator device for storing an indication of the highest temperature which occurs in the region of said device during an interval of time, comprising:
housing means,
an indicator element mounted in said housing means for movement relative thereto,
guide means for constraining movement of said indicator element relative to said housing means to movement along a predetermined path, through an end of said housing means,
thermally expansible means mounted in proximity to a first end of said indicator element for moving said indicator element along said predetermined path a distance which is a function of the amount of temperature increase which occurs in said region, and
means for inhibiting return movement of said indicator element along said predetermined path.

4,034,699
DEVICE FOR HOUSEBREAKING A DOG

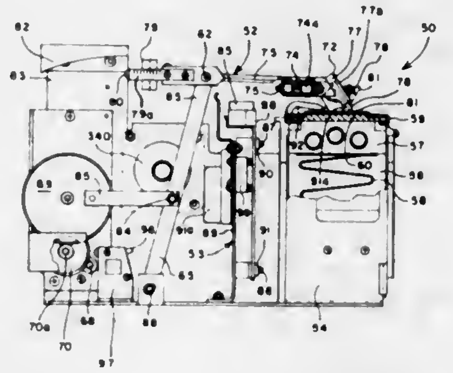
Earl E. Reichard, 1813 John Ave., Superior, Wis. 54880
Filed Nov. 24, 1975, Ser. No. 634,542
Int. Cl.² G10K *1/07*
U.S. Cl. 116—150 **1 Claim**



1. A device for animals to signal aid comprising:
a. a support means,
b. a curved hanger arm having one end secured to said support means adjacent the edge of the support means with the free end of the hanger arm overlying said support means,
c. a bell mount
d. means pivotally mounting said bell mount on the free end of said hanger arm,
e. a clapper bell mounted on the lower end of said bell mount,
f. an activator pad mounted on the upper end of and extending obliquely from said bell mount and in line with said hanger which when depressed pivots the bell mount and causes the bell to ring,
g. said means pivotally mounting said bell mount on said hanger arm including the free end of said hanger arm being bifurcated with said bell mount pivotally mounted in the bifurcation by means of a pin thereby allowing the activator pad to pivot about said pin.

4,034,700
SLIDE PREPARATION STATION

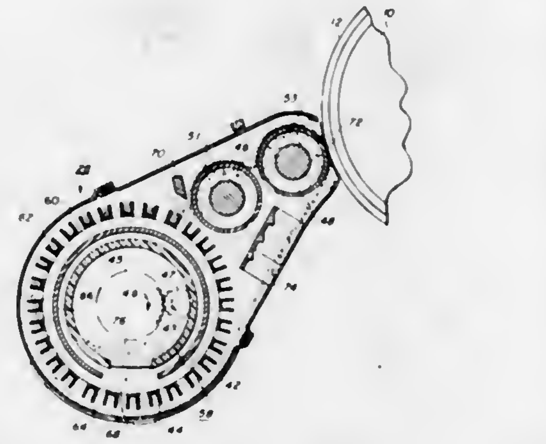
William W. Bassett, Wayzata, and Eugene D. Johnson, Spring Lake Park, both of Minn., assignors to Honeywell Inc., Minneapolis, Minn.
Filed May 25, 1976, Ser. No. 689,720
Int. Cl.² B05C *11/04*
U.S. Cl. 118—2 **24 Claims**



1. An integral smeared microscope slide preparation station comprising in combination:
smearing means for automatically establishing a smear of a fluid sample placed on a microscope slide, said smearing means further comprising;
slide support means,
spreading member having a smearing edge thereon for producing said smear,
means for maintaining said smearing edge in parallel relation to the surface of said slide during the smearing operation,
means for controlling the contact pressure between said smearing edge and said slide,
staining means for automatically staining smeared slides, said staining means further comprising;
conveyer means for carrying slides in a substantially horizontal disposition during the staining operation performed thereon,
a plurality of liquid dispensing means disposed along said conveyer means for applying a plurality of liquids to the upper surface of slides on said conveyer means at sequential, pre-determined intervals,
control means for controlling the operation of said smearing means and said staining means.

4,034,701
PARTICLE DISPENSER

James R. Davidson, Rochester; William J. Hanson, Pittsford, and Stephen K. Wilson, Webster, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed June 28, 1972, Ser. No. 266,875
Int. Cl.² G03G *15/08*
U.S. Cl. 118—7 **3 Claims**



1. An electrostatographic printing machine of the type having an electrostatic latent image of an original document to be reproduced recorded on an insulating medium, wherein the improvement includes:
a housing member defining a chamber for storing a developer mix comprising carrier granules and toner particles;
a generally tubular member journaled for oscillatory movement substantially about the longitudinal axis thereof in said housing member and defining a chamber for storing a supply of toner particles therein, said tubular member having a perforated portion arranged to prevent the passage of toner particles therethrough when said tubular member is stationary while allowing the passage of toner particles therethrough when said tubular member is oscillated;
means for oscillating said tubular member to dispense toner particles therefrom into the chamber of said housing member;
a stationary, generally cylindrical member disposed concentrically about said tubular member and spaced therefrom, said cylindrical member having an aperture therein substantially aligned with the perforated portion of said tubular member;
a rotary driven hub member spaced from and disposed concentrically about said cylindrical member with a plurality of spaced apertures therein adapted to enable the toner particles being dispensed from said tubular member to pass therethrough; and
a plurality of substantially equally spaced scoops mounted on said hub member at least one aperture interposed between each of said scoops, said scoops being arranged

to move the developer mix from a first region to a second region for discharge thereat.

4,034,702
APPARATUS FOR MANUFACTURING BIAS FABRIC

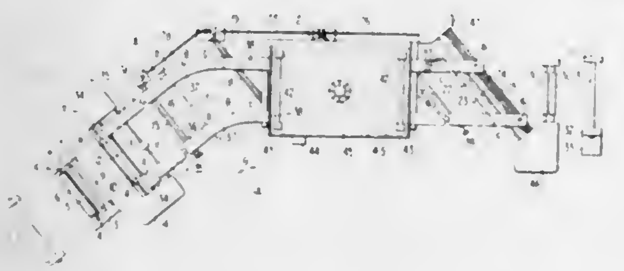
Kaname Shirasaka, Takatsuki; Yoshihiro Nakagami, Akashi; Takashi Tomiyori, Kobe; Masanori Ikemoto, Kobe, and Tsuneo Shaura, Kobe, all of Japan, assignors to Mitsubishi Belting, Ltd., Kobe, Japan

Continuation-in-part of Ser. No. 404,566, Oct. 9, 1973, abandoned. This application May 23, 1975, Ser. No. 580,280

Claims priority, application Japan, Oct. 9, 1972, 47-101417

Int. Cl.^{2} D06C *3/02*

U.S. Cl. 118—34 **7 Claims**



1. Apparatus fo manufacturinfg a bias fabric comprising fabric supply means for supplying a running length of fabric having orthogonally disposed warp and weft, means for gripping the opposed edges of said running length of fabric including a pair of endless tenter chains positioned in spaced apart relation, guide rail means for said chains including a first straight section having a pair of equal length rails, a curved section connected to said first straight section having a pair of curved rails of equal arc length with the radius of curvature of each arc greater than the initial width of said fabric and second straight section connected to said curved section having a pair of equal length rails, means for driving the opposing sides of said chains in the same direction, means for releasing the edges of the fabric disposed diagonally across said rails of said second straight section adjacent the free ends thereof and a take-up means for the fabric.

6. Apparatus as set forth in claim 1 further comprising resin impregnating means disposed intermediate said fabric supply means and said chains to apply a thermosetting resin and heating means disposed intermediate said curved path and said releasing means to set the bias in the fabric.

4,034,703
APPARATUS FOR EXTERNALLY COATING ENDLESS METAL TUBING AND LIKE ELONGATED METAL MEMBERS

Werner Scheiber, Frankfurt am Main, and Herbert Koppe, Langenselbold, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

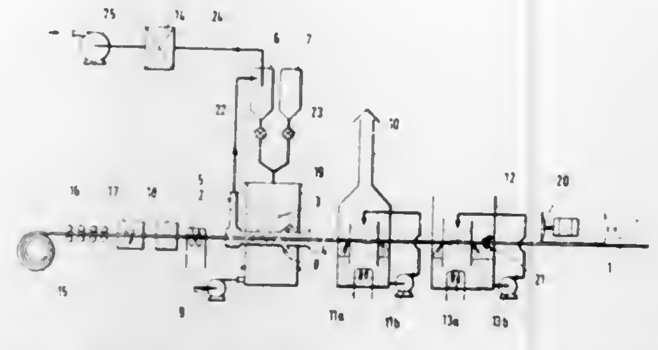
Filed Aug. 16, 1976, Ser. No. 714,826

Claims priority, application Germany, Sept. 25, 1975, 2542769

Int. Cl.^{2} B05C *19/02*

U.S. Cl. 118—35 **11 Claims**

1. An apparatus for externally coating an elongated metal member which comprises:
  means forming a fluidized bed of a synthetic-resin powder;
  means forming a transport path through said bed for said elongated metal member;
  means upstream of said bed along said path for heating said member to a temperature sufficient to cause said powder to adhere to the surface of said member;
  means forming a coating head in said bed along said member, said coating means having an annular opening communicating with said bed; and
  means spaced from said opening for applying suction to said head to draw powder from said bed through said head and along said member, thereby coating said member with said powder.



4,034,704
SUBSTRATE SUPPORT FOR VACUUM COATING INSTALLATION

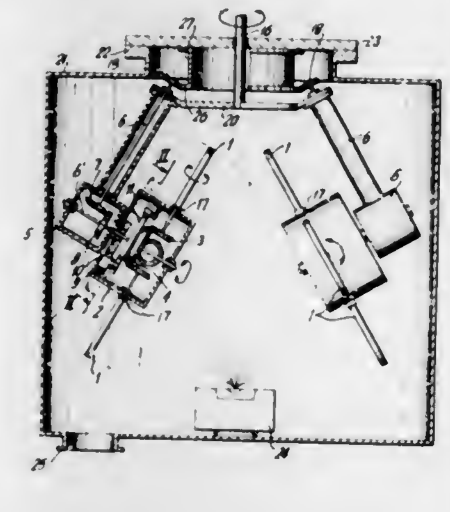
Hermann Wössner, Balzers, Liechtenstein, and Roman Schertler, Wolfurt, Austria, assignors to Balzers Patent und Beteiligungs AG, Liechtenstein

Filed Sept. 2, 1976, Ser. No. 719,707

Claims priority, application Switzerland, Sept. 2, 1975, 011355/75

Int. Cl.^{2} C23C *13/08*

U.S. Cl. 118—49 **5 Claims**



1. In a rotating substrate support for vacuum coating installations, of the type including a central drive by means of a shaft extending into a vacuum chamber in sealed relation thereto, plural support arms secured to the central shaft and each carrying a respective support head, respective support head drive shafts coupled to said central drive shaft, and plural substrate holding plates rotatably mounted on each support head and coupled together by a respective gear train for respective turning about their axes of rotation: the improvement comprising, in combination, two oppositely acting pawls mounted on each support head; a fixed cam plate respective to each support head; each gear train being a planetary gear train including a driving sun gear rotatable responsive to rotation of the associated support head drive shaft and planetary gears, each rotatable with a respective support plate, meshing with said driving sun gear; and a respective second cam plate secured to each driving sun gear for limited oscillation relative to the associated support head; said pawls being effective alternately to connect the associated fixed cam plate to the associated support head in accordance with respective opposite directions of rotation of said central drive shaft; the drive moment exerted on each support head drive shaft effecting rotation of the associated support head, through the associated cam plates and the then effective associated pawl, only when the turning position of the associated support plates corresponds to the direction of rotation of said central drive shaft; the drive moment exerted on each support head drive shaft, responsive to reverse rotation of said central drive shaft, effecting disengagement of the then engaged associated pawl to disconnect the associated cam plates, for turning of the associated support plates to another position responsive to relative rotation of the associated support head and the associated second cam, and engagement of the other associated pawl, for rotation of the support head in the reverse direction, whereby each direction of rotation of said support heads is associated with a specific turning position of the associated support plates.

4,034,705
SHAPED BODIES AND PRODUCTION OF SEMICONDUCTOR MATERIAL

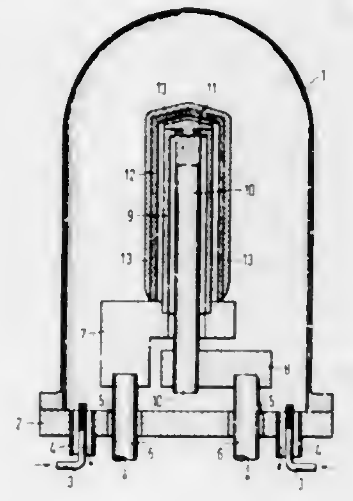
Wolfgang Dietze, Munich; Andreas Kasper, Garching-Hochbrueck, and Ulrich Rucha, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Division of Ser. No. 356,056, April 30, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,040

Claims priority, application Germany, May 16, 1972, 2223868

Int. Cl.^{2} C23C *13/08*

U.S. Cl. 118—49.1 **3 Claims**



1. Apparatus adapted for the preparation of shaped semiconductor bodies comprising
  A. A gas-tight vessel having at least one inlet port means and at least one outlet port means defined in the walls thereof,
  B. heater assembly means in said vessel, comprising
    1. and elongated, electrically conductive element means oriented in a generally vertical configuration and adapted to be heated to first predetermined temperatures by the direct passage of an electric current therethrough, said electrically conductive element means comprising
      a. an inner rod-like member.
      b. an outer tubular member generally coaxial with said rod-like member,
      c. the internal surfaces of said tubular member being generally equally spaced from the external surfaces of said rod-like member,
      d. the external surface portions of said tubular member being adapted for the emission of thermal energy therefrom when so electrically heated in a predetermined profile relative thereto,
    2. a pair of current conductive means extending through a wall of said vessel,
    3. support means adapted to position said electrically conductive element means in said vessel in a substantially vertical position and to functionally interconnect adjacent lower end regions of said rod-like member and said tubular member with said pair of current conductive means,
  C. hollow carrier body means positioned in spaced relationship to said tubular member,
  D. the spacing between the various oppositely disposed portions of the external surface of the outer tubular member of said heater assembly means and the internal surface of said hollow carrier body means being so predetermined with respect to the relative thickness of the various portions of said carrier body means, that external wall surfaces of said carrier body means opposed to the internal wall surfaces thereof adjacent said outer tubular member are adapted to be heated thereby in predetermined profile relative thereto to produce second predetermined temperatures on said external wall surfaces of the carrier body means which are lower than said first predetermined temperatures by at least 200° C., and are so correlated that the resulting shaped body produced thereon will have a specific predetermined thickness profile of uniformity or nonuniformity in dependence upon such thickness-spacing correlation, and
  E. a source of gaseous compound, functionally associated with said inlet port means, said compound being thermally decomposable at said second predetermined temperatures to produce a predetermined semiconductor material adapted to deposit upon the external wall surfaces of said carrier body means.

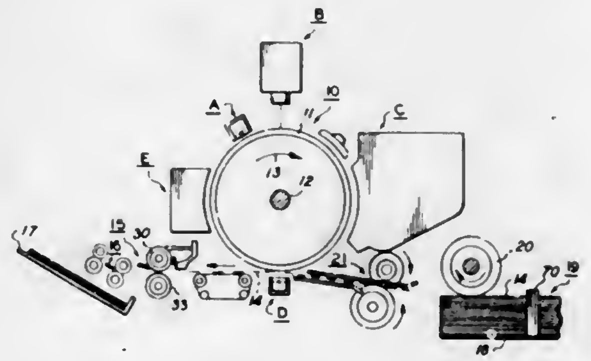
4,034,706
DUAL RELEASE AGENT CU-VITON FUSER

Rabin Moser, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 22, 1974, Ser. No. 490,545

Int. Cl.^{2} G03G *15/20*

U.S. Cl. 118—60 **8 Claims**



1. Contact fuser apparatus for fixing toner images to a support member, said apparatus comprising:
  a heated fuser roll structure;
  a backup roll structure forming a nip with said heated fuser roll structure through which said support member passes with said toner images contacting said heated fuser roll structure;
  means for applying a thermally degradable material to the surface of said fuser roll structure to thereby provide for chemical interaction between said surface to form a thin adhesive and a by-product of said thermally degradable material layer thereon; and
  means for applying release material to said adhesive layer to facilitate stripping of said support member with said toner images thereon from said fuser roll structure.

4,034,707

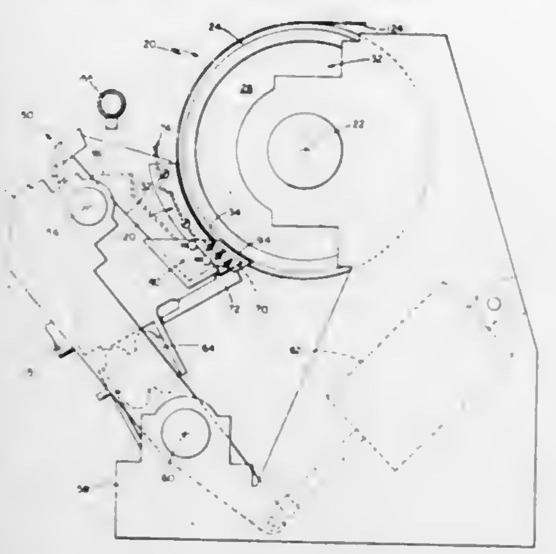
APPARATUS FOR COATING WEBS

Edwin S. Hansen, Worcester, Mass., assignor to Rice Barton Corporation, Worcester, Mass.

Filed Jan. 5, 1976, Ser. No. 646,526

Int. Cl.² B05C *3/18*

U.S. Cl. 118—407 **5 Claims**



1. In apparatus for coating a web, comprising a backup member having an axis; a coating head for receiving coating material and applying it to a web supported by said member for movement transverse to said axis, said head including portions defining the rear and bottom walls of a coating chamber; and a dike system for confining said coating material in said chamber,

said system comprising

a pair of inboard dikes spaced apart along said axis, each said inboard dike having a control surface shaped to conform to said backup member along a margin of said web and having an operating position in which said control surface is spaced from said backup member sufficiently to allow said coating material to bleed between said control surface and said web to coat said margin, said control surface in said operating position being sufficiently close to said backup member to confine most of said coating material to between said inboard dikes; and

a pair of outboard dikes respectively spaced outwardly from said inboard dikes along said axis, said outboard dikes each having a sealing surface and an operating position in which said sealing surface is in sealing contact with said backup member to prevent leakage of said coating material bleeding past said inboard dikes;

said head being provided with drainage openings for draining said coating material from the zones between said inboard and outboard dikes;

that improvement wherein the ends of said backup member are beveled to provide surfaces oblique to said axis, and said outboard dikes are beveled to cause said sealing surfaces to be parallel to and sealingly mate with said oblique surfaces of said backup member.

4,034,708

MODULAR DEVICE FOR PRODUCTION OF CAST PLASTIC EMBLEMS

William A. Fielder, Mount Sterling; Harold E. Wilson, Thornville, and Robert E. Waugh, Columbus, all of Ohio, assignors to The D. L. Auld Co., Columbus, Ohio

Filed Aug. 30, 1976, Ser. No. 718,578

Int. Cl.² B05B *5/02*

U.S. Cl. 118—642 **12 Claims**

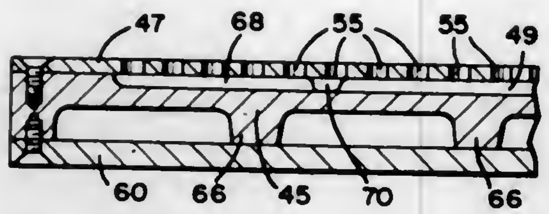
8. A machine for holding a release sheet on which is mounted an emblem substrate and for curing plastic cast on said substrate comprising:

platen means for holding the release sheet substantially flat during casting and curing of the plastic and for controlling the temperature of the release sheet and substrate,

radiation source means for providing radiation,

means for moving said radiation source means into a position above said platen means such that plastic cast on said substrate may be cured, and

exhaust means for drawing air across said platen and past said radiation source means, and for removing said air via an exhaust duct.



4,034,709

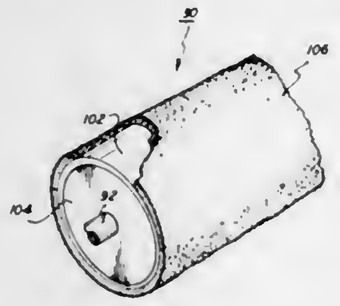
DEVELOPER ROLL

Lawrence J. Fraser, Rochester; Delmer G. Parker, Irondequoit, and Joseph L. Scaletta, Henrietta, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 22, 1975, Ser. No. 625,435

Int. Cl.² G03G *13/06*

U.S. Cl. 118—658 **14 Claims**



1. An apparatus for depositing a developer material on a surface having a latent image recorded thereon, including:

a tubular member comprising a hollow substantially non-magnetic roll with a layer of styrene-butadiene having conductive particles dispersed therethrough being coated on the exterior circumferential surface of the roll and having a surface finish at least of a magnitude sufficient to transport the developer material to the latent image, the layer coated on the roll of said tubular member preferably having a resistivity ranging from about 10^2 ohm-centimeters to about 10^8 ohm-centimeters, and the layer comprising about 87 percent styrene-butadiene by weight and about 13 percent conductive particles by weight; and

magnetic means disposed within the roll of said tubular member for creating a magnetic field about at least a portion of the periphery of said tubular member to attract magnetically the developer material to the layer on the roll thereof.

4,034,710

METHOD AND DEVICE FOR CATCHING AND PACKAGING LIVE FISH

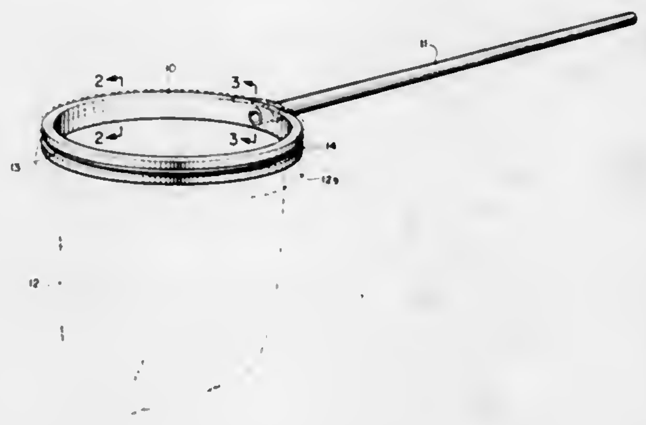
Alvie Carter, 632 S. 1st West, Salt Lake City, Utah 84101

Filed Jan. 2, 1976, Ser. No. 646,163

Int. Cl.² A01K *77/00*

U.S. Cl. 119—3 **11 Claims**

1. A method of capturing and packaging live fish swimming freely in a confined body of water, comprising detachably attaching the open mouth portion of an imperforate, transparent bag to a substantially rigid frame adapted to hold the bag open, said frame peripherally defining an opening substantially commensurate with the opening of the bag, having an elongate handle extending therefrom, and being free of projections that could harm the fish to be caught; manipulating the handle to introduce the frame and attached bag into and under the surface of the body of water and to at least partially fill the bag with water for easy maneuverability within the body of water; manipulating said frame and bag beneath the surface of said body of water from above said surface to entrap one or more fish within the bag; removing the frame and attached water-and-fish-containing bag from the body of water, while spilling out enough water, if necessary, for tight closing of the bag; detaching the so-filled bag from the frame; and tightly closing the mouth portion of the bag to form a closed package containing the captured fish and a protective quantity of water.



6. A device for catching and packaging live fish swimming freely in a confined body of water, comprising a substantially rigid frame adapted to receive an imperforate, transparent bag and to hold it open, said frame having a peripheral member defining an opening substantially commensurate with the opening of a bag to be received and being free of projections that could harm the fish to be caught; an elongate handle attached to and extending from the frame; an imperforate, transparent bag having an open mouth adapted for attachment to the frame in open position; and means for detachably attaching the mouth of the bag to and about the frame so that the bag is held in open position while capturing fish but may be easily detached and closed as a package for fish and water entrapped in the bag.

4,034,711

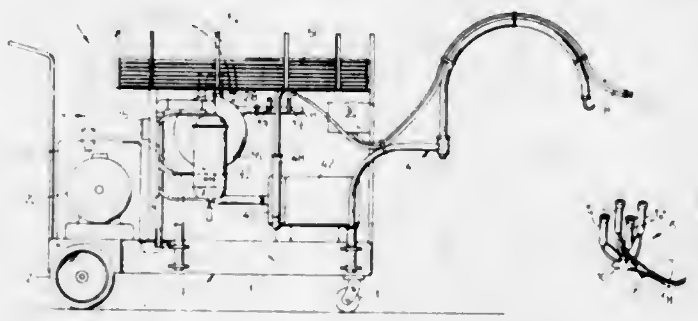
MOBILE MILK UNIT AND SYSTEM

Lloyd F. Bender, and Rolyn A. Schmid, both of Hayward, Wis., assignors to Bender Machine Works, Inc., Hayward, Wis.

Filed July 31, 1975, Ser. No. 600,813

Int. Cl.² A01J *5/00*

U.S. Cl. 119—14.11 **4 Claims**

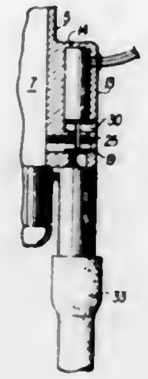


1. A mobile milking unit having components energizable from an electrical power source and for supplying milk to a bulk storage tank remote from said unit comprising: a mobile frame, a single milk receiver, a vacuum pump connected to said receiver for subjecting said receiver to vacuum, a first motor for driving said vacuum pump, means for connecting said first motor to said power source, a plurality of teat claw assemblies, a plurality of adjustably movable swing arms on said frame for supporting said plurality of teat claw assemblies, a plurality of milk conduits, each milk conduit connected for conveying milk from a teat claw assembly to said receiver in response to said vacuum in said receiver, a shut-off valve for each milk conduit for shutting off vacuum to a teat claw assembly not in use, an electrically operated pulsator energizable from said power source and operatively connected to said claw assemblies for selectively connecting said teat claw assemblies to said vacuum pump and to atmosphere to thereby alternately subject said claw assemblies to vacuum or atmosphere, electrically operated milk level sensing means connected to said receiver and energizable from said power source for providing electric signals indicative of milk level, a milk pump connected to said receiver for pumping milk from said receiver to said bulk storage tank, a second motor for driving said milk pump, an electrical contactor energizable from said power source for connecting said second motor to said power source, electrically operated milk level control means energizable from said power source and connected to said electrical contactor and to said milk level sensing means periodically for operating said milk pump to periodically empty said receiver into said bulk storage tank when milk in said receiver reaches a predetermined level as sensed by said milk level sensing means, and electrically operable pulsator timer means energizable from said power source and connected to said pulsator for cyclically energizing said pulsator from said source of power to effect timed control of the pulsations of said pulsator.

4. A mobile milking unit having components energizable from an electrical power source and for supplying milk to a bulk storage tank remote from said unit comprising: a mobile frame, a single milk receiver, a vacuum pump connected to said receiver for subjecting said receiver to vacuum, a first motor for driving said vacuum pump and connected to said power source, a plurality of teat claw assemblies, a plurality of adjustably movable swing arms on said frame for supporting said plurality of teat claw assemblies, a plurality of milk conduits, each milk conduit connected for conveying milk from one said teat claw assembly to said receiver due to said vacuum in said receiver, a shut-off valve for each milk conduit for shutting off vacuum to a teat claw assembly not in use, a solenoid operated pulsator valve energizable from said power source and operatively connected to said claw assemblies for selectively connecting said teat claw assemblies to said vacuum pump and atmosphere to thereby alternately subject said claw assemblies to vacuum or atmosphere, electrically operated milk level sensing means in said receiver and energizable from said power source for providing electric signals indicative of milk level, a milk pump connected to and for pumping milk from said receiver to said bulk storage tank, a second motor energizable from said power source for driving said milk pump, an electrical contactor for connecting said second motor to said source of power, electrically operated milk level control means energizable from said power source and connected to said contactor and to said milk level sensing means periodically for operating said milk pump to periodically empty said receiver into said bulk storage tank when milk in said receiver reaches a predetermined level as sensed by said milk level sensing means, said milk level control means comprising a relay for operating said contactor, a controlled rectifier for operating said relay, and electric control means for sensing sais signals and for operating said controlled rectifier in response thereto, and electrically operated pulsator timer means connected to said solenoid operated pulsator valve for cyclically energizing said pulsator from said power source to effect timed control of the pulsations of said pulsator valve, said pulsator timer means comprising a solid state multivibrator to establish an on-off duty cycle at a predetermined frequency, and a solid state switch cyclically operated by said multivibrator to effect operation of said solenoid operated pulsator, and a light actuated control rectifier to isolate said multivibrator from said solid state switch to prevent undesirable frequency changes.

4,034,712
PULSATION SYSTEM

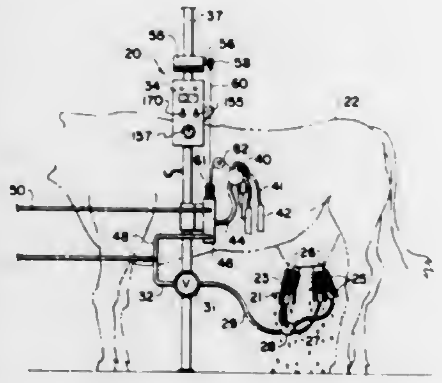
Lloyd P. Duncan, 3 River Bend Place, Washington, Mo. 63090
Filed Nov. 24, 1975, Ser. No. 634,331
Int. Cl.² A01J *5/04*
U.S. Cl. 119—14.36 **8 Claims**



1. A teat cup comprising an outer substantially rigid shell of hollow construction and an inner resilient inflation, said inflation extending through the shell and being housed within said shell in spaced apart relationship to leave a pulsation space, said inflation being heremetically sealable at each end with respect to the shell, a source of vacuum being connectable to the interior of said inflation, duct means in said shell opening into said space and means defining a first entrance communicating ambient air from the outside of the shell to said duct means, said inflation having a lower part that is connectable to said source of vacuum within a milk receiver and passage means communicating said vacuum to said duct means through means providing a second entrance, valve means in said duct means being movable to selectively block either said entrance, an electrical timer means connected to said valve means and said valve means being movable to place the duct means and space alternately in communication with ambient air and said source of vacuum, whereby said inflation is pulsed.

4,034,713
MILKING SYSTEM AND METHOD

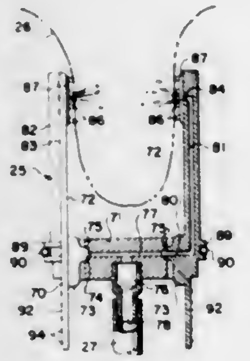
Raymond E. Umbaugh, 4150 Baseline Road, Boulder, Colo. 80303
Filed Nov. 4, 1975, Ser. No. 628,699
Int. Cl.² A01J *7/00*
U.S. Cl. 119—14.02 **20 Claims**



14. A method for milking an animal, said method comprising:
attaching a stimulator to at least one teat of an animal to be milked and supplying fluid through said stimulator into contact with said teat for a predetermined time period to induce said animal to let down milk;
removing said stimulator from said animal after said predetermined period of time, attaching the teat cups of a milker apparatus to the teats of a stimulated animal, after said stimulator has been removed from the animal and then initiating milking of the stimulated animal by said milker apparatus within a short time after stimulation has ended; and
sensing completion of milking and responsive thereto automatically terminating milking, retracting the milker apparatus from the animal, and cleaning said milker apparatus.

4,034,714
STIMULATING AND VALVING SYSTEM FOR MILKING

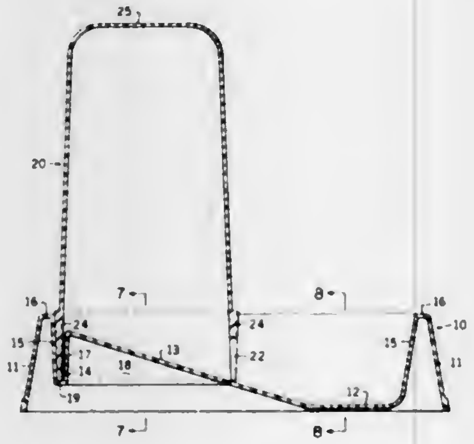
Raymond E. Umbaugh, Boulder, and Gene Alan Fisher, Lafayette, both of Colo., assignors to Raymond E. Umbaugh, Boulder, Colo.
Filed Nov. 4, 1975, Ser. No. 628,698
Int. Cl.² A01J *7/00*
U.S. Cl. 119—14.18 **9 Claims**



1. A stimulator unit to induce milk let down for milking of an animal having teats, said stimulator unit comprising:
a mounting element having fluid passage means therein; and
gripper means including a plurality of fingers each of which has one portion engaging said mounting element and a second portion for releasably gripping at least one teat of an animal to be stimulated, said gripper means including means connecting with said fluid passage means in said mounting element to conduct fluid toward a teat gripped by said gripper means so that a teat of an animal gripped between said second portions of each of said fingers is contacted by said fluid to thus stimulate the animal.

4,034,715
CONVERTIBLE PET FEEDER AND METHOD

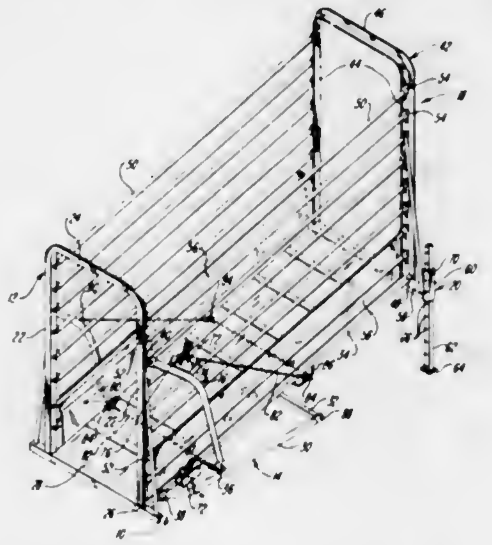
Robert Arner, North Canton, Ohio, assignor to Ralston Purina Company, St. Louis, Mo.
Filed Mar. 5, 1976, Ser. No. 664,124
Int. Cl.² A01K *5/00*
U.S. Cl. 119—51.5 **9 Claims**



1. A convertible pet feeder for feeding flowable solid or liquid materials, said feeder comprising:
a. a feeding tray having an inner wall about the tray and also having a floor, a portion of which is flat and is directly adjoining the base of at least a portion of the inner wall, the remaining portion of the floor being a ramp also having walls which define a groove between themselves and the remaining portion of the inner wall of the tray;
b. said feeder further comprising an open-ended container having a margin defining its open end, said margin having spaced apart recesses defining a mouth for solid materials and a spout for liquid materials, the open end being removably engaged in the groove of the tray with one of said spaced apart recesses being disposed over the ramp and the other recess being indisposed in the groove;
whereby selectively either solid or liquid material may flow out of the container, over the ramp and onto the floor of the tray.

4,034,716
PORTABLE STOCK LOADING CHUTE

William E. Fleming, P.O. Box 495, Hastings, Nebr. 68901
Filed Mar. 5, 1976, Ser. No. 664,143
Int. Cl.² A01K *29/00*
U.S. Cl. 119—82 **14 Claims**

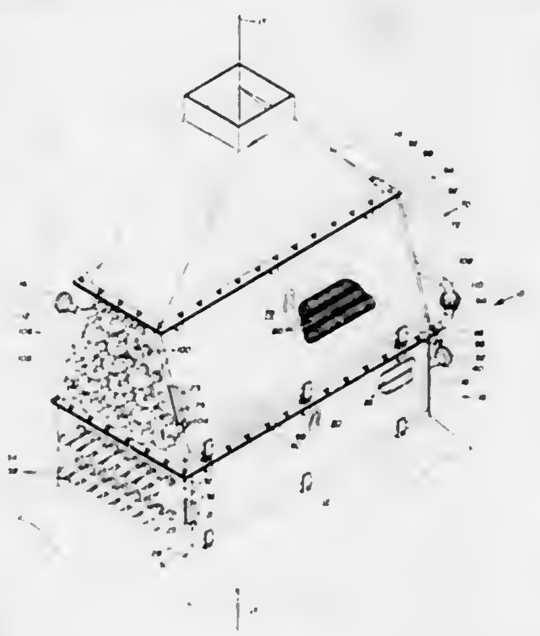


1. A portable stock loading chute comprising:
a substantially rigid framework having an upright frame defining an upright transverse plane and a supporting base lying in a generally horizontal plane extending forward from the lower end of the frame for supporting engagement with the ground;
the frame including a passageway for entry of stock;
an elongate ramp pivotally connected at its aft end to the lower end of the frame adjacent to the base and extending forward from the frame;
the ramp having a predetermined length and the base having a predetermined length more than half but substantially less than the full length of the ramp;
and lockable and releasable operating means interconnecting the framework and the ramp to positively raise the ramp against gravity to a forwardly and upwardly inclined position when supported by the base, and to positively raise the base against gravity upward toward the ramp when the latter is supported by the load platform of a transporting vehicle having a lower aft portion.

13. A method of transferring to the load platform of a transporting vehicle a stock loading chute having a supporting framework with a forwardly extending base defining a fulcrum at its forward end and an elongate ramp pivotally connected at its aft end to the lower aft end of the framework, comprising:
positively applying tension between the ramp and the framework to elevate the ramp about its pivotal connection to an upwardly and forwardly inclined attitude with respect to the base and locking it in elevated position;
moving the vehicle into loading position with its load platform underlying the forward portion of the ramp;
tilting the ramp forward about the fulcrum of the base to cause the ramp to lie in supported position on the load platform;
releasing the tension force on the ramp;
and positively applying tension between the ramp and the base to raise the base toward the ramp and free the fulcrum from contact with the ground.

4,034,717
MULTI-SECTION HEAT EXCHANGER MEANS

David N. Clum, and Fletcher O. Holt, both of Ponca City, Okla., assignors to Heater Technology, Inc., Ponca City, Okla.
Filed Sept. 10, 1975, Ser. No. 612,244
Int. Cl.² F22B *21/24;* **F28F** *9/22*
U.S. Cl. 122—359 **12 Claims**



1. A multi-section heat exchanger unit for recovering heat values from a heated gas stream, said unit including:
a. a first heat exchange section, said first heat exchange section comprising a first outer housing section having a heated gas inlet, a heated gas outlet, and a plurality of heat exchange pipe means, said heat exchange pipe means being positioned through said first outer housing section and in fluid communication with a first heat exchange fluid inlet and a first heat exchange fluid outlet to provide heat exchange fluid flow through said heat exchange pipe means and said first heat exchange section, said heat exchange pipe means comprising pipes positioned in a plurality of substantially parallel rows, said rows being substantially perpendicular to a vertical axis of said unit with alternate rows being positioned so that the pipes in alternate rows are positioned substantially between the pipes in adjacent rows, said pipes being joined at their ends by means for directing said heat exchange fluid flow through said pipes so that said fluid flows sequentially through a first pipe positioned in a first row, through a second pipe positioned in a second adjacent row, through a third pipe positioned in said first row in a repeating sequence through substantially all of said pipes in said first and second rows and then through a third row and a fourth row and subsequent rows in substantially the same repeating sequence so that said heat exchange fluid flows sequentially through substantially all of the pipes in said first heat transfer section to provide an improved first heat exchange section efficiency,
b. a second heat exchange section comprising a second outer housing section having a heated gas inlet, a heated gas outlet, said heated gas inlet of said second heat exchange section being in fluid communication with said heated gas outlet of said first heat exchange section, said second section including a plurality of heat exchange tube means, said tube means being positioned through said

second outer housing section and in fluid communication with a second heat exchange fluid inlet and a second heat exchange fluid outlet to provide heat exchange fluid flow through said tube means and said second heat exchange section, said second heat exchange fluid outlet being in fluid communication with said first heat exchange fluid inlet of said first heat exchange section, said second outer housing section being shaped to enclose an internal cross-sectional area, which decreases between its heated gas inlet and its heated gas outlet so that said area is at a maximum at its inlet.

4,034,718

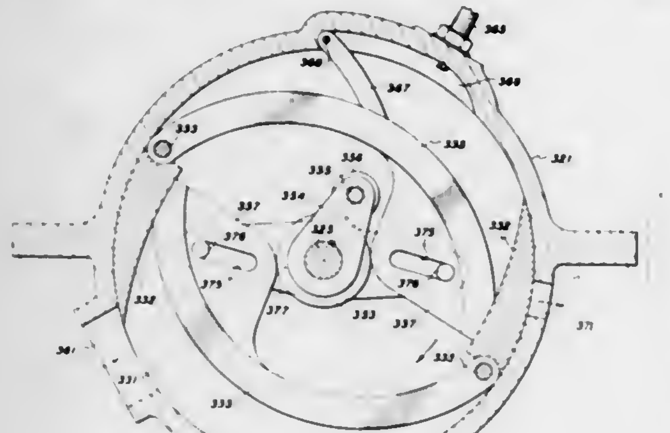
INTERNAL COMBUSTION ENGINE WITH ROTATING CHAMBERS

Ray S. Snider, 2505 East Ave., Rochester, N.Y. 14610

Continuation-in-part of Ser. No. 470,033, May 15, 1974, abandoned. This application Jan. 20, 1976, Ser. No. 650,717

Int. Cl.² F02B *55/00*

U.S. Cl. 123—8.45 7 Claims



2. An internal combustion engine comprising

a. a fixed casing defining a cylindrical chamber of substantially circular cross section therein, said casing having

i. an intake port at one point in the periphery of said cavity,

ii. an exhaust port at a different point in the periphery of said cavity, and

iii. a firing member in communication with said cavity at a point intermediate said intake port and said exhaust port,

b. a fixed shaft extending axially through said cavity substantially at the center thereof,

c. a rotor mounted for rotation on said shaft within said cavity, said rotor having

i. two circular plates both rotatably mounted on said shaft substantially parallel to and in axially spaced relation to each other, and

ii. a plurality of rigid struts rigidly connecting said plates to each other at their outer peripheral edges at a plurality of points circumferentially spaced from each other,

d. a plurality of flaps pivotally mounted on said rotor and constituting movable wall means of expansion chambers defined by surfaces of said movable wall means and surfaces of said struts and said rotor plates and said casing, and

e. means for swinging said pivoted flaps on their pivots to provide respective expansion chambers of relatively large volume as the respective chamber pass said intake port during rotation of said rotor and to compress the respective chambers to a smaller volume as the respective chambers closely approach said firing member, and for producing torque tending to turn said rotor relative to said shaft as the respective flaps are swung inwardly by pressure caused by combustion of contents of the respective chambers,

f. said last named means comprising linkage means connecting one of said flaps to another of said flaps to control movement of one flap from movement of the other flap.

4,034,719

CONTROL METHOD AND APPARATUS FOR COMBUSTION MOTORS

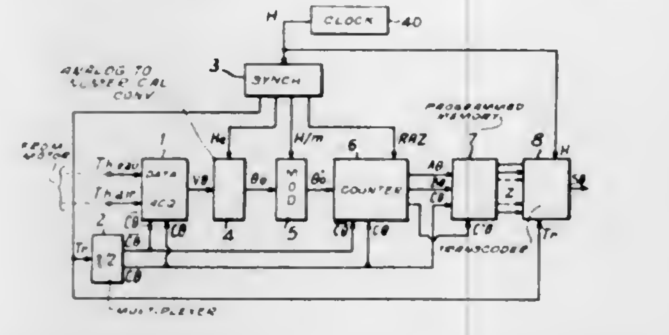
Louis Monpetit, L'Etang-la-Ville, France, assignor to Societe des Procedes Modernes d'Injection Sopromi, Clichy, France

Filed Dec. 5, 1974, Ser. No. 529,915

Claims priority, application France, Dec. 7, 1973, 73.43751

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EB 5 Claims



1. Apparatus for producing a control signal for modifying the duration of an injection signal of a fuel injection system of a combustion motor comprising sensor means adapted for measuring first and second operating parameters of the motor and producing corresponding first and second analog signals respectively representative thereof, means including multiplexing means for sequentially and alternately converting each of said first and second analog signals into respective third and fourth signals each having a duration representative of the corresponding first and second analog signals, means responsive to the duration of each of said third and fourth signals for producing respective first and second groups of pulses having a number representative of the duration of the respective third and fourth signals, processing means for sequentially receiving said first and second groups of pulses representative of each said third and fourth signals and alternately producing a respective first and second coded word in response to each said first and second group of pulses, programmed memory means alternately receiving each said first and second coded words and alternately producing a respective first and second output word corresponding thereto, each said first and second output word being respectively representative of the measured first and second engine parameters and transcoder means for alternately transforming each first and second output word into a respective control signal of predetermined time duration for modifying the duration of the injection signal for the fuel injection system.

4,034,720

INTERNAL COMBUSTION ENGINE

Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Feb. 28, 1975, Ser. No. 554,237

Claims priority, application Japan, Mar. 1, 1974, 49-24373; June 6, 1974, 49-64717; July 16, 1974, 49-81894

Int. Cl.² F02M *39/00;* **F02B** *19/10, 19/18*

U.S. Cl. 123—32 SP 22 Claims

1. An internal combustion engine comprising:

a cylinder;

a piston in said cylinder;

a cylinder head cooperating with said cylinder and said piston to define a main combustion chamber;

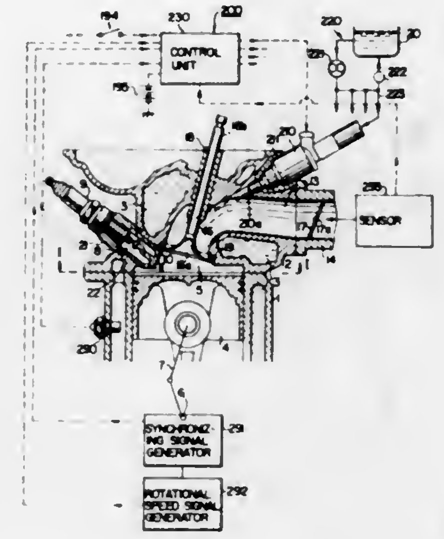
an intake valve having a valve stem and a valve head connected thereto;

an intake passage communicating with said main combustion chamber for supplying at least air thereto;

a fuel injection nozzle opening to said intake passage for injecting fuel thereinto, to thereby form an air-fuel mixture therein being mixed with the air supplied to said intake passage;

a fuel injection control system connected to said fuel injection nozzle for controlling said fuel injection nozzle to inject the fuel at least one time during a suction stroke and at least one more time during a stroke other than said suction stroke;

a trap chamber disposed in said cylinder head and having at least one suction aperture through which a portion of said air-fuel mixture is introduced into said trap chamber when said intake valve is opened,



said trap chamber also having at least one discharge aperture through which residual gas remaining in said trap chamber is discharged into said main combustion chamber when said portion of said air-fuel mixture is introduced into said trap chamber, and said trap chamber being entirely closed except for said suction and discharge apertures,

said suction and discharge apertures being small enough to achieve a torch jet ignition and being always in communication with said main combustion chamber during the time when said intake valve is closed so that the torch jet can spurt through both of said suction and discharge apertures; and

a spark plug having a set of electrodes for igniting the air-fuel mixture received in said trap chamber.

4,034,721

ELECTRICAL INDIRECT PETROL INJECTION SYSTEM FOR OTTO CYCLE ENGINES

Giuliano Lenzi, Arese (Milan), and Edoardo Rogora, Milan, both of Italy, assignors to Alfa Romeo S.p.A., Milan, Italy

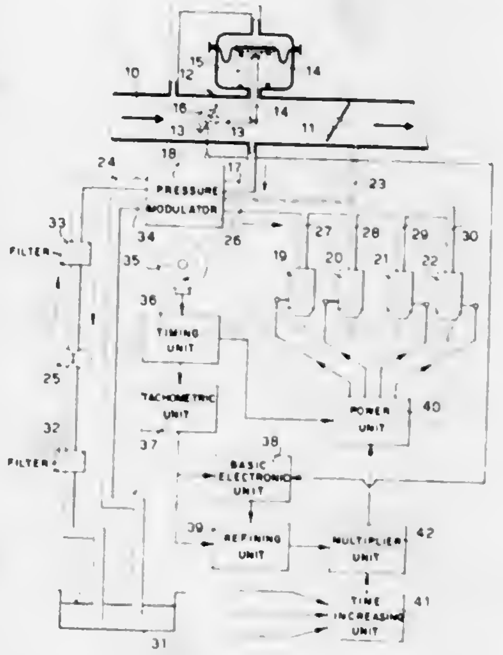
Filed July 15, 1975, Ser. No. 596,085

Claims priority, application Italy, July 16, 1974, 25235/74

Int. Cl.² F02D *1/04;* **F02B** *3/00*

U.S. Cl. 123—32 EB 10 Claims

1. An electronic indirect petrol injection system for an Otto cycle engine, the engine including a drive shaft and having a plurality of cylinders, each cylinder having an operative cycle including an intake stage, comprising at least one air intake duct, one electroinjector for each of the engine cylinders, a feed circuit to feed petrol to said electroinjectors under pressure, an electronic assembly for controlling injection timing and duration during the cylinder intake stage; a butterfly throttle valve in said engine intake duct for throttling air drawn in, a measuring element for determining air flow rate, said measuring element being disposed upstream of said throttle valve and including a throttle member defining the cross-section of an air passage port, the air being subjected to a pressure drop on traversing said port, said cross-section and said pressure drop varying with the engine air intake rate, a first mechanical-electrical transducer associated with said throttle member for generating an electrical signal indicative of the position assumed by said throttle member and hence of the air passage port cross-section; a petrol pressure modulator disposed in the petrol feed circuit for said electroinjectors and arranged to vary the pressure as a function of the intake air pressure drop through said throttle member; a second transducer for supplying an electrical signal containing tachometric and phase information relative to the drive shaft, said second transducer including a shaft rotatable at a speed proportional to the speed of the drive shaft and suitably phase displaced relative to the drive shaft, said electronic assembly including a tachometric unit for processing the electrical signal from said second transducer and for providing a signal in dependence of the engine rotation speed, a basic electronic unit for processing the signal supplied by said tachometric unit and the electrical signal indicative of the position of said throttle member, the latter electrical signal originating from said first transducer, said base unit also providing an electrical signal representing the time during which each of said electroinjectors needs to remain open to provide, in conjunction with the petrol feed pressure controlled by said modulator, the petrol delivery corresponding to a predetermined mixture ratio, the electronic assembly also comprising a refining unit for modifying, for each pair of values represented by the signal originating from said base unit and the tachometric signal, the time signal originating from said base unit, and hence the petrol delivery to said injectors and the mixture ratio in such a manner as to optimize the engine operation at all points throughout its range of use; and a unit arranged to distribute at a suitable timing to said electroinjectors the electrical signal determining the time and duration of opening of each of said electroinjectors during the time determined by the signal provided by said refining unit.



4,034,722

DIGITAL CONTROL FUEL INJECTION APPARATUS

Nobuaki Miyakawa, Hitachi, Japan, assignor to Hitachi, Ltd., Japan

Filed Feb. 9, 1976, Ser. No. 656,596

Claims priority, application Japan, Feb. 7, 1975, 50-15400

Int. Cl.² F02B *3/00*

U.S. Cl. 123—32 EB 6 Claims

1. A fuel injection apparatus for controlling the injection of fuel in an internal combustion engine wherein the quantity of injected fuel is determined in accordance with the value of a function $Z = f(X, Y)$ where X and Y represent first and second respective engine condition parameters, comprising

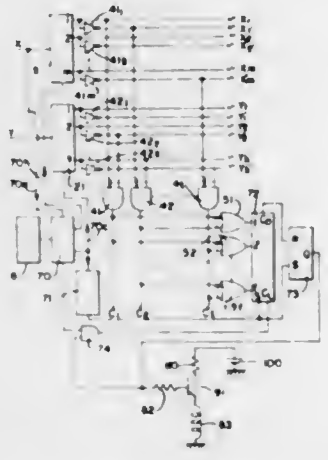
first means for generating an m bit first digital detection signal representative of said first engine condition parameter;

second means for generating an h bit second digital detection signal representative of said second engine condition parameter;

a first memory stage made up of a plurality of logic circuits corresponding to the value of the function Z for segmented divisions of the parameters X and Y;

third means, coupled between said first means and said first memory stage, for supplying a selected bit from said first digital detection signal to selected logical circuits of said first memory stage in accordance with the value of said function $Z=f(X, Y)$;

fourth means, coupled between said second means and said first memory stage, for supplying a selected bit from said second digital detection signal to selected logical circuits of said first memory stage in accordance with the value of said function $Z=f(X, Y)$;



a second memory stage made up of a plurality of logic circuits;

fifth means, coupled between said first memory stage and said second memory stage, for applying selected outputs of the logic circuits of said first memory stage to selected logic circuits of said second memory stage;

sixth means, coupled to said first and second means and said second memory stage, for generating a fuel injection duration pulse representative of the quantity of fuel to be injected by a fuel injection valve, in accordance with said first and second digital detection signals as controlled by the output of said second memory stage; and

a fuel injection valve, coupled to said sixth means, for injecting fuel into the engine in accordance with said fuel injection duration pulse.

4,034,723

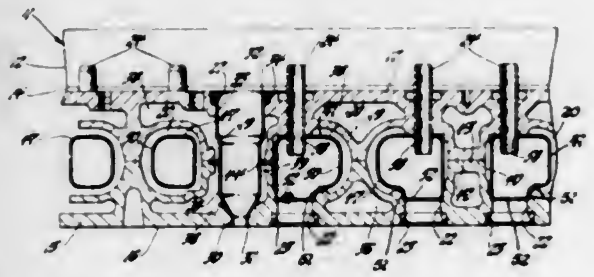
INSULATED, HIGH EFFICIENCY, LOW HEAT REJECTION, ENGINE CYLINDER HEAD

Nshan Hamparian, Brighton, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Oct. 6, 1975, Ser. No. 619,798

Int. Cl.² F01P *3/14;* **F02F** *1/26;* **F01N** *3/02*

U.S. Cl. 123—41.76 **5 Claims**



1. A cylinder head for an internal combustion engine, said cylinder head comprising

a housing having a combustion chamber defining lower wall, an upper wall spaced from said lower wall and a side wall connecting said upper and lower walls,

an exhaust cavity in said housing and extending through an opening in said side wall,

a plurality of spaced exhaust ports through said lower wall and connecting with said exhaust cavity

a component receiving tubular wall extending through said upper and lower walls and between said exhaust ports,

internal walls defining a lower coolant jacket along said lower wall, an upper coolant jacket along said upper wall and an annular connecting passage around said component receiving wall and connecting said lower and upper jackets to pass coolant therebetween,

a plurality of poppet exhaust valves, one for each exhaust port, reciprocably carried in valve guide bores in said upper wall, said guide bores being in heat exchange relation with said upper coolant jacket, said valves extending through said exhaust ports and having heads seatable on valve seats provided around said ports in said lower wall and in heat exchange relation with said lower coolant jacket,

an exhaust passage liner disposed in said exhaust cavity and preformed to define a smoothly curved exhaust passage connecting said spaced exhaust ports with said side wall opening to efficiently conduct exhaust gases from said ports through said cavity and opening, said passage liner being spaced from the walls of said cavity except at the ends of the liner and at intermediate support points to provide an insulating space around said passage liner and thereby limit the loss of exhaust heat to said cavity walls and to the cylinder head coolant jackets,

whereby in operation said component receiving wall, valve seats and valve guides are directly cooled by coolant in said connecting coolant chambers while cooling of exhaust passages is limited by said liner and the surrounding insulating space.

4,034,724

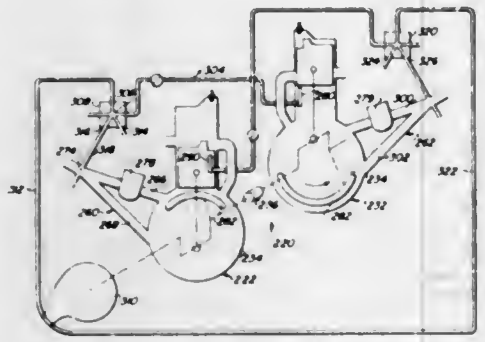
STRATIFIED CHARGING OF INTERNAL COMBUSTION ENGINES

Richard P. Flanagan, 11460 SW. 83 Terrace, Miami, Fla. 33173

Filed Apr. 14, 1976, Ser. No. 676,862

Int. Cl.² F02B *19/10*

U.S. Cl. 123—75 B **21 Claims**



1. In an internal combustion engine having at least first and second combustion sections, each combustion section including an induction arrangement, an exhaust arrangement and a combustion chamber, a system for providing a stratified charge of air and a fuel-rich fuel-air mixture to each combustion chamber, said system comprising:

an intake for each combustion chamber;

induction means associated with each intake, each induction means providing alternate sources of air at the intake, said alternate sources including a first intake air passage and a second intake air passage, each communicating with the intake;

means for supplying fuel to establish a fuel-rich fuel-air mixture in one of said first and second intake air passages of each induction means; and

fluidic means for switching the source of intake air from the first intake air passage to the second intake air passage during induction of a charge of fuel and air in one of said combustion sections in response to a cyclic pressure change in the other combustion section such that the charge passing into the intake will be stratified into portions of air and a fuel-rich fuel-air mixture.

4,034,725

ELECTRIC GOVERNOR

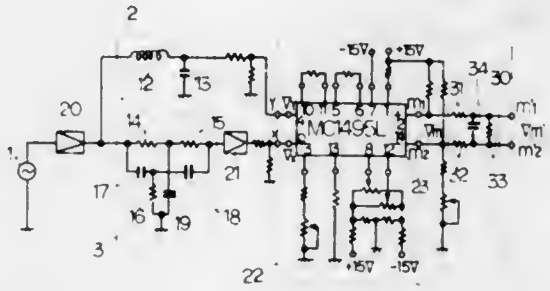
Osamu Ito, Toyota; Nobuhito Hobo, Inuyama; Yoshihiko Tsuzuki, Anjo, and Michio Iyoda, Aichi, all of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan

Filed Nov. 14, 1975, Ser. No. 632,178

Claims priority, application Japan, Nov. 28, 1974, 49-137286

Int. Cl.² F02D *1/04;* **F02P** *9/00*

U.S. Cl. 123—102 **3 Claims**



1. In combination:

an internal combustion engine; and

an electric govenor for said internal combustion engine having means for controlling engine speed, said governor including:

a sensor generating an engine speed signal for frequency of which is proportional to the engine rotational speed;

means, connected to said sensor for shifting the phase of said engine speed signal;

a filter circuit having a preset frequency and connected to said sensor, said filter circuit varying its gain and the phase of said engine speed signal in response to the difference between the frequency of said engine speed signal and said preset frequency;

means, connected to said phase shifting means and said filter circuit, for generating a drive signal which is obtained by multiplying the outputs of said phase shifting means and said filter circuit; and

means, connected to said multiplying means, for driving said speed control means in accordance with said drive signal.

4,034,726

TEMPERATURE COMPENSATED INTERNAL COMBUSTION ENGINE IGNITION SPARK VACUUM ADVANCE SYSTEM

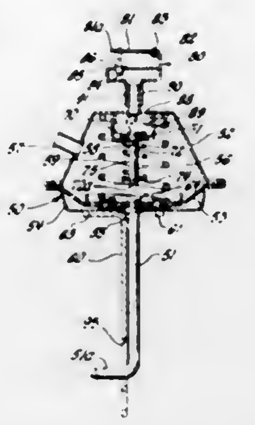
John H. Falge, Anderson, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 5, 1975, Ser. No. 610,623

Int. Cl.² F02P *5/04*

U.S. Cl. 123—117 A **2 Claims**

1. A temperature compensated internal combustion engine ignition spark vacuum advance system for varying the time an ignition spark potential is generated for each cylinder of and associated internal combustion engine in response to engine vacuum, comprising in combination; an ignition spark initiating mechanism for initiating the generation of an ignition spark potential for each cylinder of and in timed relationship with said engine of the type operable to vary the time each ignition spark potential is initiated and a vacuum actuator unit having an operating rod in operating engagement with said spark initiating mechanism, said vacuum actuator unit having an outer casing defining an enclosed space, a flexible diaphragm member in operating engagement with said operating rod and having opposite flat face surfaces located within said enclosed space and so positioned that it divides said enclosed space into a first chamber exposed to atmosphere and a second vacuum chamber, a vacuum port for said vacuum chamber in communication with engine vacuum, an exhaust port



for said vacuum chamber and a dual valve arrangement for said exhaust port including a first normally closed valve operable to the open position when engine vacuum is greater than a predetermined number of inches of mercury and a second temperature sensitive valve located between said first normally closed valve and atmosphere of the type which automatically operates to the closed position with ambient temperatures less than a predetermined value and to the open position with ambient temperatures greater than said predetermined value.

4,034,727

AUTOMOTIVE ENGINE CARBURETOR

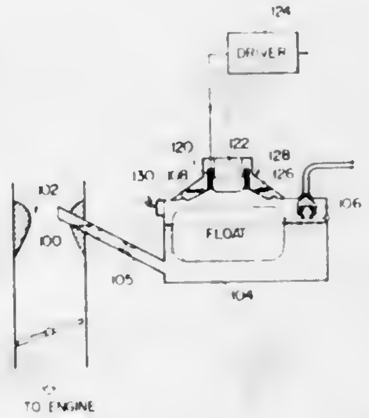
Shigeo Aono, Seki, and Makoto Anzai, Yokosuka, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 22, 1975, Ser. No. 643,125

Claims priority, application Japan, Dec. 24, 1974, 50-1419

Int. Cl.² F02B *33/00*

U.S. Cl. 123—119 EC **7 Claims**



1. An automotive engine carburetor comprising:

a venturi;

a float bowl for confining fuel therein;

a fuel passage provided between said float bowl and said venturi;

a diaphragm covering said float bowl providing an airtight seal therefor; and means responsive to an electrical signal applied thereto driving said diaphragm in order to control the pressure acting on the fuel being confined within said float bowl so as to regulate the amount of fuel sucked into said venturi through said fuel passage.

4,034,728
INSTALLATION FOR ACHIEVING AN AIR/FUEL MIXTURE

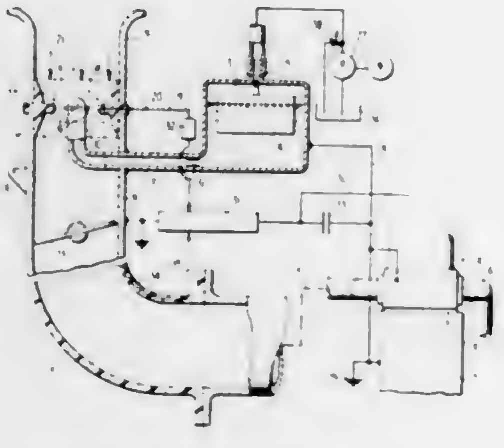
Helmut Säufferer, Esslingen, and Karl Willmann, Aichwald, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Jan. 9, 1975, Ser. No. 539,830

Claims priority, application Germany, Jan. 10, 1974, 2401047

Int. Cl.² F02B *51/04*

U.S. Cl. 123—119 E **64 Claims**



1. An installation for producing an air/fuel mixture for a mixture-aspirating, internal combustion engine comprising air conduction channel means through which air is sucked in, fuel atomizer means having at least one fuel nozzle means terminating in the air conduction channel means and traversed by the sucked-in air, and surface means arranged in the flow path of the mixture which are at different electrical potentials, said surface means including an electrode means electrically insulated with respect to the fuel nozzle means and arranged within the fuel atomizer means at a distance from each fuel nozzle means, the electrode means being arranged for substantially surrounding the fuel nozzle means with the potential difference being applied between the electrode means and the fuel nozzle means for providing an electrostatic field surrounding the fuel nozzle means.

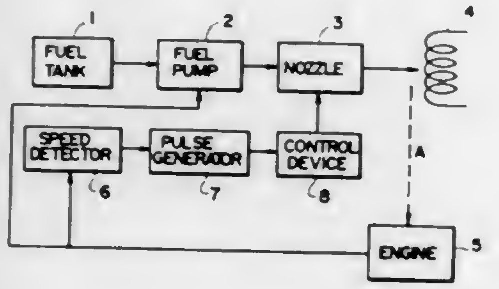
4,034,729
PREHEATING APPARATUS OF A DIESEL ENGINE

Yoshio Omachi; Ichiro Hasegawa, and Hiroshi Watanabe, all of Hiratsuka, Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Continuation-in-part of Ser. No. 498,095, Aug. 16, 1974, abandoned. This application Apr. 9, 1976, Ser. No. 675,464

Int. Cl.² F02M *31/00*

U.S. Cl. 123—122 G **1 Claim**



1. In preheating apparatus of a diesel engine of the type wherein, at the time of starting the engine, a fuel pump injects fuel through a nozzle into an air suction pipe of the engine, and the suction air preheated by the combustion of the fuel injected into the precombustion chamber is supplied into the combustion chamber of the engine, the improvement which comprises:

a speed detector producing a pulse whose high level periods per unit time increases in proportion to the speed of the engine:

A pulse generator receiving the pulse provided by said speed detector and producing the same type of pulses as the input pulses thereof until the revolution number of the engine reaches a predetermined value and pulses with a relatively narrow pulse width and a long interval when the revolution number has exceeded the predetermined value; and

a nozzle control device receiving the pulse from said pulse generator and causing said nozzle to open only during application of said pulses from said pulse generator.

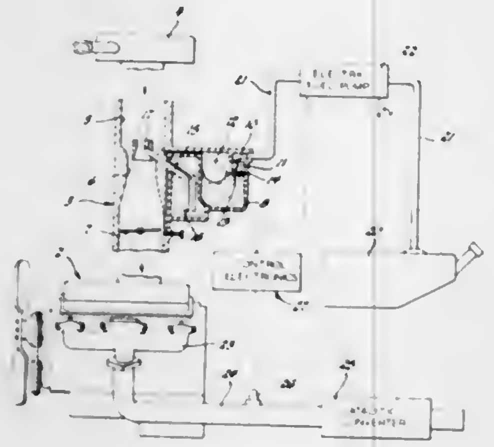
4,034,730
CLOSED LOOP CARBURETOR AIR-FUEL RATIO CONTROL APPARATUS

John A. Ayres, and William H. Holl, both of Flint, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Sept. 15, 1975, Ser. No. 613,314

Int. Cl.² F02M *39/00*

U.S. Cl. 123—139 AV **4 Claims**



1. Apparatus for supplying air and fuel to an internal combustion engine in a predetermined ratio, comprising:

a carburetor having a fuel bowl and defining an air passage into the engine, the carburetor further defining a fuel passage from the fuel bowl to the air passage by which fuel passage fuel is added to the air in the air passage for delivery to the engine, the rate of fuel flow through the fuel passage and hence the air-fuel ratio of the resulting air-fuel mixture being a function of the fuel level in the fuel bowl;

a float mechanism in the fuel bowl effective to sense the fuel level in the fuel bowl;

valve elements associated with the float mechanism and responsive thereto to pass fuel delivered thereto into the fuel bowl at rates tending to maintain, at a given delivered fuel pressure, a constant fuel level therein, the valve elements further being responsive to changing delivered fuel pressure to vary the constant fuel level;

a fuel reservoir;

fuel pump means effective to deliver fuel from the fuel reservoir to the valve elements at a pressure varying in response to a signal, whereby varying the signal alters the fuel level in the fuel bowl and thus the air-fuel ratio of the engine;

sensor means in the engine exhaust stream effective to generate a signal indicative of the ratio of air to fuel supplied to the engine, and

means responsive to the sensor means to apply the signal to the fuel pump means in feedback control to continuously vary the fuel pressure in a direction to reduce the deviation of the engine air-fuel ratio from the predetermined ratio, whereby the engine air-fuel ratio is maintained at substantially the predetermined ratio.

4,034,731
IGNITION SYSTEM FOR AN INTERNAL COMBUSTION ENGINE

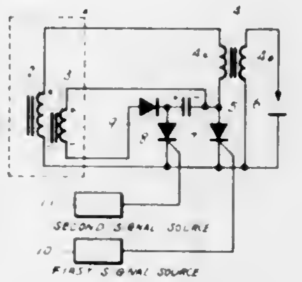
Hiroo Sato, Susono, Japan, assignor to Kokusan Denki Co., Ltd., Numazu, Japan

Filed Mar. 17, 1976, Ser. No. 667,550

Claims priority, application Japan, Mar. 18, 1975, 50-32566; Mar. 20, 1975, 50-33656

Int. Cl.² F02P *1/00*

U.S. Cl. 123—148 E **6 Claims**



1. An ignition system for an internal combustion engine having an AC generator rotating in synchronism with the engine, said ignition system comprising; an ignition coil having a primary winding and a secondary winding, an ignition plug connected across said secondary winding of said ignition coil, a first armature winding disposed in the generator to supply a current to said primary winding of said ignition coil, a first thyristor connected in series with said primary winding of said ignition coil to control the current through said primary winding, a second thyristor, a second armature winding disposed in the generator, a capacitor connected through a diode across said second armature winding, a first signal source to supply a first trigger signal to the gate of said first thyristor at a first angle, and a second signal source to supply a second trigger signal to the gate of said second thyristor at a second angle, said capacitor being further connected to apply a reverse voltage across the anode and cathode of said first thyristor when said second thyristor conducts, so that said first thyristor is turned off, whereby interruption of the current through said primary winding of said ignition coil induces a high volage in said secondary winding of said ignition coil.

4,034,732
NON-INCENDIVE SHUT-DOWN SYSTEM FOR ENGINE MAGNETOS

Glenn G. Van Burkleo, Corpus Christi, Tex., assignor to Exxon Production Research Company, Houston, Tex.

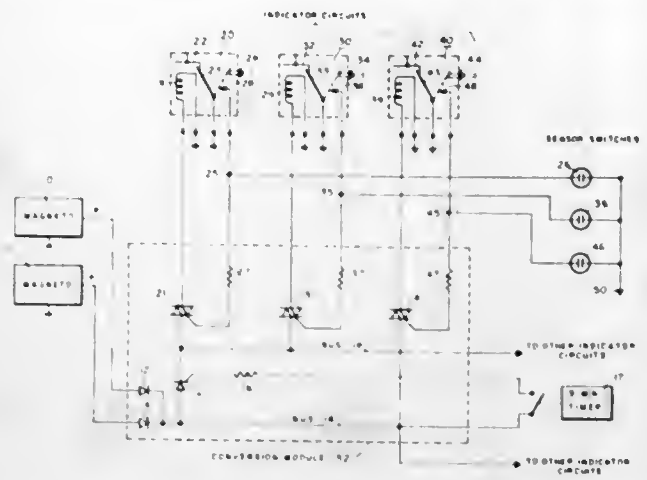
Filed July 10, 1975, Ser. No. 594,834

Int. Cl.² F02B *77/00*

U.S. Cl. 123—198 DC **6 Claims**

1. In a shut-down system for an internal combustion engine having a magneto circuit, said shut-down system including at least one sensor contact switch operable in response to a malfunction of said engine, and at least one indicator means which includes a switching means for generating a signal indicative of said malfunction, the improvement comprising:

a first semiconductor current switch having a control terminal coupled to said sensor contact switch to change the conducting state of said first semiconductor switch in response to a malfunction of said engine and having a current switching terminal coupled to said switching means to generate said signal indicating said malfunction and a second semiconductor current switch having a control terminal coupled to said switching means to change the state of said second semiconductor current switch to its conducting state in response to a malfunction indication and having a current switching terminal connected through a low impedance path to said magneto circuit, said second semiconductor current switch providing a low impedance current conducting path from said magneto circuit which disables said engine.



4,034,733
INTERNAL COMBUSTION ENGINE

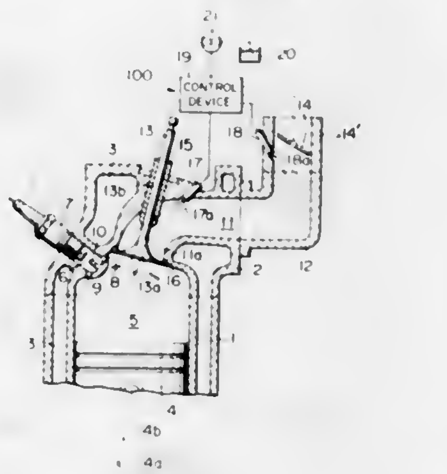
Masaaki Noguchi, Nagoya; Masaharu Sumiyoshi, Toyota; Yukiyasu Tanaka, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Mar. 11, 1975, Ser. No. 557,371

Claims priority, application Japan, Mar. 12, 1974, 49-28875; June 7, 1974, 49-65352; June 25, 1974, 49-72941

Int. Cl.² F02B *19/10, 3/00, 19/18*

U.S. Cl. 123—32 SP **15 Claims**



1. An internal combustion engine comprising:

a cylinder;

a piston in said cylinder

a cylinder head cooperating with said cylinder and said piston to define a main combustion chamber;

an intake valve having a valve stem and a valve head connected thereto;

an intake passage communicating with said main combustion chamber for supplying at least air thereto;

a trap chamber disposed in said cylinder head and having at least one suction aperture;

a throttle valve pivotally disposed in said intake passage for controlling the amount of the air passing therethrough;

a first fuel injection nozzle opening to said intake passage and directed towards said suction aperture of said trap chamber for injecting fuel into said intake passage to form a rich air-fuel mixture around said first fuel injection nozzle;

a second fuel injection nozzle opening to said intake passage downstream of and close to said throttle valve for injecting fuel thereinto to form a lean air-fuel mixture in said intake passage;

a fuel injection control system connected to said first and second fuel injection nozzles for controlling said first fuel injection nozzle to inject fuel at least one time during a suction stroke and said second fuel injection nozzle to inject fuel at least one time during any one of the strokes of said internal combustion engine;

a portion of said rich air-fuel mixture being introduced into said trap chamber through said suction aperture when said intake valve is opened and the remaining portion of said rich air-fuel mixture and said lean air-fuel mixture being introduced into said main combustion chamber when said intake valve is opened;

said trap chamber also having at least one discharge aperture through which residual gas remaining in said trap chamber is discharged into said main combustion chamber when said portion of said rich air-fuel mixture is introduced into said trap chamber, and said trap chamber being entirely closed except for said suction and discharge apertures,

said suction and discharge apertures being small enough to achieve torch jet ignition and being always in communication with said main combustion chamber during the time when said intake valve is kept closed so that the torch jet can spurt through both of said suction and discharge apertures, and

a spark plug having a set of electrodes for igniting the rich air-fuel mixture in said trap chamber.

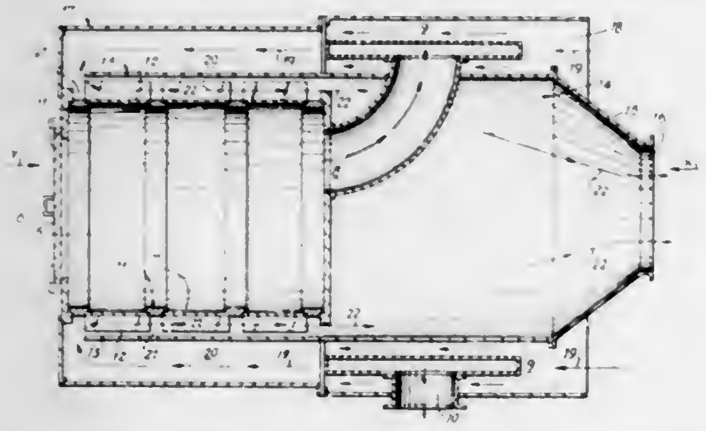
4,034,734
TUBELESS HEAT EXCHANGERS

Austin Birney, Salisbury, Rhodesia, assignor to Airflo Limited, Salisbury, Rhodesia

Filed May 7, 1975, Ser. No. 575,397

Int. Cl.² F24H *3/10*

U.S. Cl. 126—110 B **5 Claims**



1. A heat exchanger comprising a combustion chamber adapted to burn a fuel, said chamber having opposite ends with an inlet at one end for fuel and an outlet at the other end for exhaust gases, said chamber having an external wall with a plurality of radial fins on said wall, a sheath surrounding said combustion chamber, said sheath having an inner surface facing the external wall of said combustion chamber to define a heated air space, said fins projecting in said air space, said sheath having opposite ends one of which is axially spaced from the said one end of the combustion chamber to define a reversing passageway, the other end of the sheath extending axially beyond the other end of the combustion chamber and including a heated air chamber and outlet means for discharge of heated air, a second sheath surrounding the first sheath and defining an annular space therewith, said annular space having an inlet opening remote from the inlet of the combustion chamber for inlet of ambient air into said annular space which flows therethrough to said reversing passageway and then flows through said heated air space and past said fins to said heated air chamber and said outlet means, said second sheath comprising first and second coaxially disposed cylinders connected in end to end relation, the first cylinder surrounding the combustion chamber, the second cylinder surrounding the heated air chamber, a duct extending from said outlet of said combustion chamber for discharge of the exhaust gases, said duct passing through said first sheath, and an annular pre-heat chamber connected to said duct, said pre-heat chamber being disposed in said annular space within said second cylinder around said heated air chamber and in heat-transfer relation with the ambient air flowing in said annular space.

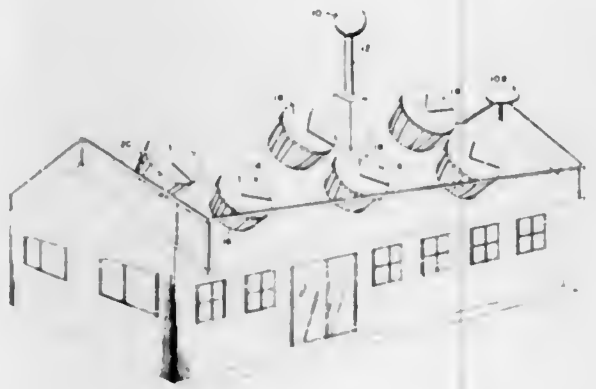
4,034,735
SOLAR ENERGY SYSTEM

Ralph L. Waldrip, 8005 Stillbrooke, Manassas, Va. 22110

Filed Feb. 4, 1976, Ser. No. 655,147

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **16 Claims**



1. A system for collecting solar energy comprising:

A. a target means for absorbing solar radiation positioned a pre-selected distance above the horizon,

B. a plurality of independently positionable reflector means fixed in the immediate vicinity of the target means for reflecting solar radiation to the target means, each reflector means including a base and a concave circular reflecting surface, the reflecting surface being substantially continuously reflective of incident visible and near infrared radiation except in a narrow slot-like area extending linearly from the center to the edge of the reflecting surface in which slot-like area the reflecting surface is transparent to at least a selected portion of any incident solar radiation, and

C. positioning means fixed to each reflector means underneath the reflecting surface and responsive to incident solar radiation for positioning the reflector means with respect to the target means and the sun such that solar radiation incident upon the reflector means will be directed toward the target means, the positioning means comprising:

  i. an axis means fixed to said base for defining an initial reference axis for the reflector means, said initial reference axis being substantially co-linear with a line drawn from the target means to the base,

  ii an axial brace member attached to the the reflector means and arranged co-linearly with said initial reference axis for rotation on that axis,

  iii. rotating means for rotating the axial brace member and reflector means about said initial reference axis, and

  iv angle deflecting means for deflecting the reflector means angularly from said initial reference axis,

said angle deflecting means comprising:

a. a reflector supporting member pivotally attached to the axial brace member for supporting said reflector means, the reflector supporting member being arranged substantially normal to a central portion of the reflecting surface of the reflector means, the reflector supporting member including at least one longitudinal slot on a side of the reflector supporting member,

b a sensor support member, pivotally attached to the axial

brace member at the same point of attachment as the reflector supporting member, the sensor support member and reflector supporting member defining a plane which includes the axial brace member and the slot-like area of the reflecting surface,

c. a first control arm pivotally connected to the axial brace member and pivotally and slidably received in the longitudinal slot in the reflector supporting member, and

d. a second control arm pivotally connected to the sensor support member and pivotally and slidably received in the longitudinal slot in the reflector supporting member at the same point as the first control arm such that when said reflector supporting member pivots in said plane through an angle θ, the sensor support member simultaneously pivots in said plane through an angle 2θ.

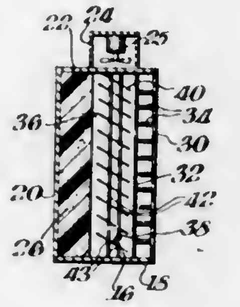
4,034,736
SOLAR HEATING METHOD AND APPARATUS

Maria Telkes, Newark, Del., assignor to The University of Delaware, Newark, Del.

Filed Dec. 11, 1974, Ser. No. 531,673

Int. Cl.² F24J *3/02*

U.S. Cl. 126—270 **30 Claims**



20. A solar air heater comprising, in combination:

a housing defining an absorber chamber,

said housing having a generally vertically disposed wall transparent to solar radiant energy.

a plurality of slats parallel to each other in an assembly that lies in a plane generally parallel to said wall, said slats being adapted to be heated by solar radiant energy and said slats being generally vertical one above the other, each of said slats having a highly reflective top surface and a highly reflective bottom surface thereby to effect multiple reflections of said solar radiant energy in a back and forth manner between adjacent slats, each reflection transferring additional radiant energy in the form of heat and light to a respective adjacent slat, and

circulating means for passing air across said slats, thereby to be heated by said slats.

24. A method of absorbing and utilizing solar radiant energy using slats adapted to absorb said energy comprising:

spacing said slats in a stacked, generally vertically disposed array,

parallelly positioning said slats in said array such that at least a portion of the top reflective face of each slat is exposed to said energy, and at least a portion of said exposed portion is transverse to the direction of said energy, said positioning being such that the sun's striking exposed proportions of slats produces multiple relfections in a back and forth manner between adjoining slats, each reflection transferring additional solar radiant energy in the form of heat and light to adjacent slats, the bottom surfaces of said slats which are reflective, and

passing air across said slats, thereby to heat said air.

4,034,737
SOLAR HEAT BOILER

Takeshi Kume, Amagasaki, Japan, assignor to Suehiro Seiki Company, Ltd., Japan

Filed June 23, 1975, Ser. No. 589,777

Claims priority, application Japan, June 21, 1974, 49-71574; June 21, 1974, 49-71575

Int. Cl.² 124J *3/02*

U.S. Cl. 126—271 **5 Claims**

1. A solar heat boiler apparatus comprising a base frame, a turning body rotatably mounted on said base frame for turning movement about a horizontal axis, a reflector mounting frame rotatably mounted on said turning body for rotation around an axis perpendicular to said horizontal axis, turning mechanisms coupled to said turning body and said reflector mounting frame for turning said turning body and said reflector mounting frame to direct the reflector mounting frame toward the sun, a plurality of curved mirrors mounted side by side on said reflector frame in a concave spherical arrangement to form a reflector unit, each curved mirror having the shape of a small area on the surface of a large cylinder, the mirrors in the arrangement being positioned on circular lines concentric with the optical axis of the concave spherical arrangement and to reflect rays incident on the reflector unit parallel to the optical axis of the concave spherical arrangement to a focal position on said optical axis, and a boiler unit at said focal position to receive the reflected rays.

4,034,738
SOLAR HEATING SYSTEM

Everett M. Barber, Jr., Guilford, Conn., assignor to Sunworks, Inc., Guilford, Conn.

Division of Ser. No. 453,353, March 21, 1974, Pat. No. 3,980,071. This application Feb. 12, 1976, Ser. No. 657,618

Int. Cl.² F24J *3/02*

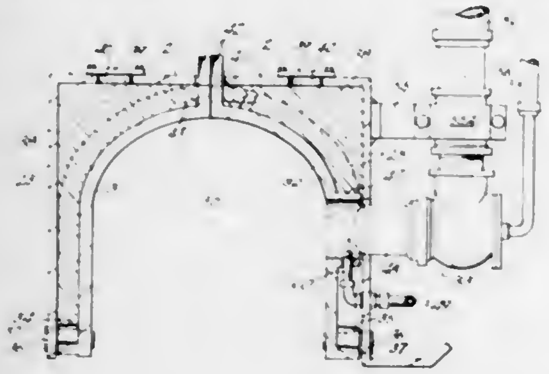
U.S. Cl. 126—271 **6 Claims**

1. A solar energy heating system, comprising a solar heat absorber, a heat storing device, means for utilizing heat in said

storing device, a heat exchange medium for transporting heat from said absorber to said storing device, a heat dissipating means, first and second conduit means for conveying the heat exchange medium between said absorber and said heat storing device, third conduit means operatively connectable between said first and second conduits to bypass to medium in said absorber from said storing device, said third conduit means including said dissipating means, means for normally circulating the medium through said first and second conduit means between said absorber and said storage device, and means responsive to the temperature of the medium reaching a predetermined value for connecting said third conduit means to pass said heat exchange medium from said absorber through said dissipating means.

4,034,739
FIELD SANITIZING APPARATUS

Leonard Boekelman, 2689 Everett, North Bend, Oreg. 97459
Filed Sept. 8, 1975, Ser. No. 611,193
Int. Cl.² F23C *5/00*
U.S. Cl. 126—271.2 A **3 Claims**

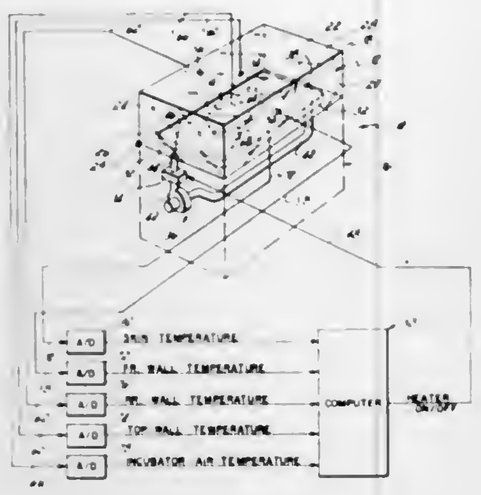


1. A heat generating apparatus for imparting elevated temperatures to the ground and the area immediately there below, said apparatus comprising,
a wheel supported chassis,
an elongate carrier of wall construction depending from said chassis and defining pin receiving openings,
a series of segmented metallic liner members removably mounted in pairs interiorly along the carrier structure and defining multiple downwardly opening burning chambers, said liner members including bosses defining openings for the reception of removable pins interconnecting the liner members to the carrier structure, each pair of liner members additionally including mutually abutting flanges,
burners for discharging a pressurized fuel-air mixture into each of said burning chambers, and
pin means coupling a liner member with a wall of said elongate carrier, said pin means in removable engagement with said wall and liner member to permit convenient removal and replacement of a liner member.

4,034,740
TEMPERATURE CONTROLLING METHODS AND APPARATUS

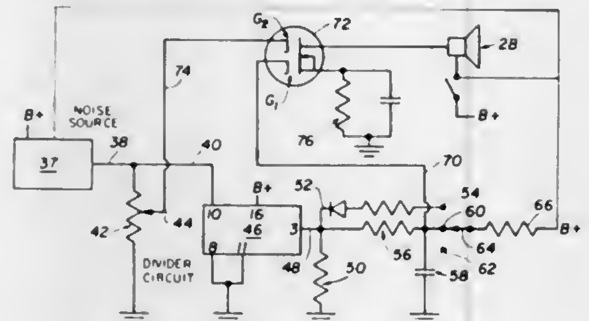
Harry D. Atherton; Neil K. Edwards, and Paul H. Perlstein, all of Medical Sciences Bldg. Rm. 6203, Dept. of Pediatrics, Eden Ave., Cincinnati, Ohio
Continuation-in-part of Ser. No. 472,362, May 22, 1974, Pat. No. 3,920,000. This application Oct. 14, 1975, Ser. No. 621,649
Int. Cl.² A61G *11/00*
U.S. Cl. 128—1 B **22 Claims**

1. A method of controlling the temperature inside an incubator having a heater for supplying warm air to said incubator, said method comprising the steps of:
a. measuring the temperature of the skin of an infant in the incubator,
b. measuring at least one other temperature within said incubator, said other temperature affecting the body temperature of the infant,
c. calculating an environment temperature and a control temperature, said environment temperature being a function of at least said other measured temperature and said control temperature being a function of the measured skin temperature of the infant and said environment temperature, said control temperature being equal to the sum of about one half the skin temperature and about one half said environment temperature, and
d. turning off said heater when said control temperature exceeds a first predetermined temperature.



4,034,741
NOISE GENERATOR AND TRANSMITTER

Guy Emery Adams, Monroe, and Jesse Carden, Jr., Piermont, both of N.Y., assignors to Solitron Devices, Inc., Tappan, N.Y.
Filed Feb. 17, 1976, Ser. No. 658,596
Int. Cl.² A61B *19/00*
U.S. Cl. 128—1 C **4 Claims**



4. A portable noise generator and transmitter comprising:
a housing including a pocket;
an electrical source within said housing;
noise generating means in said housing;
a divide circuit in said housing, said divide circuit connected to said noise generating means to divide same into repetitive pulses;
insulated gate means in said housing having one gate connected to said noise generating means and another gate connected to said divide circuit;
a modulator circuit between said divide circuit and said insulated gate means to provide an equal rate of gain increase, a steady gain and a first rate of increase and a different rate of decrease of the gain of the repetitive pulse of said divide circuit in obtaining the desired waveform from said insulated gate means of said noise generating means;
a speaker to broadcast the product of said noise generating means via said insulated gate means, said speaker being stowable in the pocket of said housing; and
control means on said housing to connect said electrical source to turn on and off said noise generating means said divide circuit and said modulator circuit and to control volume of said noise of said noise generating means.

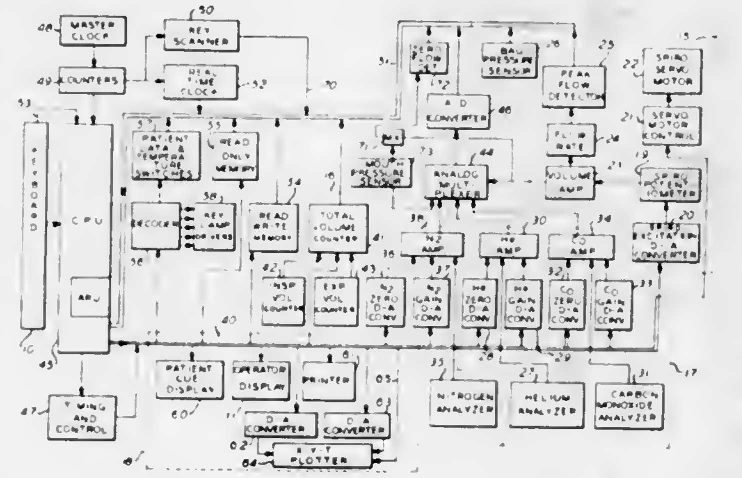
4,034,742
APPARATUS FOR MECHANICALLY ASSISTING CIRCULATION OF THE BLOOD IN THE HUMAN BODY

Herwig Thoma, 40/5, Maroltingergasse, Vienna, Austria
Continuation-in-part of Ser. No. 436,226, Jan. 24, 1974, abandoned. This application Jan. 23, 1976, Ser. No. 651,874
Claims priority, application Austria, Jan. 31, 1973, 850/73
Int. Cl.² A61M *1/03*; A61F *1/24*
U.S. Cl. 128—1 D **22 Claims**

1. Apparatus for mechanically assisting circulation of the blood in the human body comprising:
a. means defining a pumping chamber,
b. a diaphragm extending across said chamber separating said chamber into first and second compartments,
c. A first single conduit communicating with said second compartment for connection to the aorta of the human body whereby blood may flow between the aorta and said second compartment through said first conduit,
d. a second conduit for connection to pneumatic means and communicating with said first compartment whereby air may be caused to flow into and out of said first compartment to move said diaphragm and cause blood to flow into and out of said second compartment, and
e. variable resistance means extending through said first single conduit from said pumping chamber for positioning in the aorta downstream of the location in the aorta where said first single conduit is connected, said variable resistance means being arranged to periodically reduce blood flow through the aorta and simultaneously cause flow through said first single conduit into said second compartment.

4,034,743
AUTOMATED PULMONARY FUNCTION TESTING APPARATUS

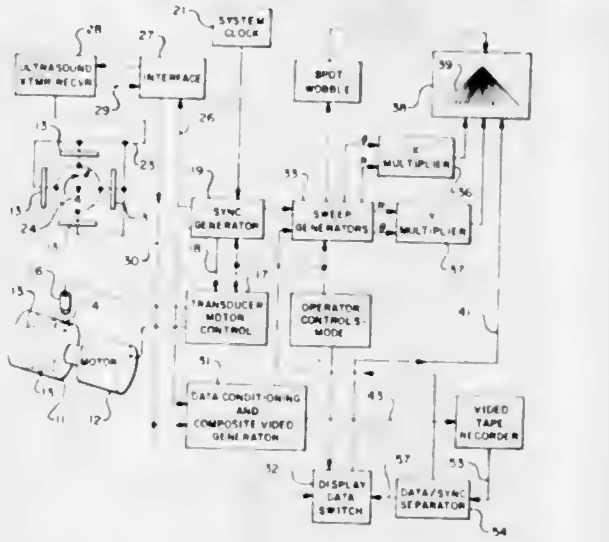
James R. Greenwood, Friendswood; Philip M. Miller, Houston, and Thomas S. Whitacre, Houston, all of Tex., assignors to Airco, Inc., Montvale, N.J.
Filed Oct. 24, 1975, Ser. No. 625,791
Int. Cl.² A61B *5/08*
U.S. Cl. 128—2.08 **2 Claims**



1. Automated pulmonary function testing apparatus comprising spirometer means responsive to the breathing efforts of a patient under test for producing electrical signals varying in magnitude in accordance with volumes of breathed gas, said spirometer means having a potentiometer to which an excitation signal is supplied, a central processing unit having an arithmetic unit therein; means for supplying digital representations of said electrical signals to said central processing unit for calculation in said arithmetic unit of one or more pulmonary function parameters; patient display means and operator display means both coupled to said central processing unit for visually displaying to the patient during a pulmonary function test instructions defining breathing efforts required of the patient, and for visually displaying the results of said test to said operator, respectively; keyboard means coupled to said central processing unit and having a plurality of test keys each of which corresponds to a particular pulmonary function test to be conducted and parameter key means associated with each of said test keys such that after a particular test is conducted, operation of said parameter key means enables calculation in said arithmetic unit, and display on said operator display means, of the parameter corresponding to said operated parameter key means, said keyboard means comprising means for supplying signals representing ambient temperature to said central processing unit for calculation in said arithmetic unit of spirometer potentiometer excitation signals corrected for difference between the water vapor partial pressure of (1) the exhaled breath of a patient under test and (2) the air in said spirometer means; and means for coupling said central processing unit to said spirometer potentiometer such that corrected excitation signals are supplied to said spirometer potentionmeter and subsequent correction of said electrical signals produced by said spirometer means for said difference in water partial pressure is rendered unnecessary.

4,034,744
ULTRASONIC SCANNING SYSTEM WITH VIDEO RECORDER

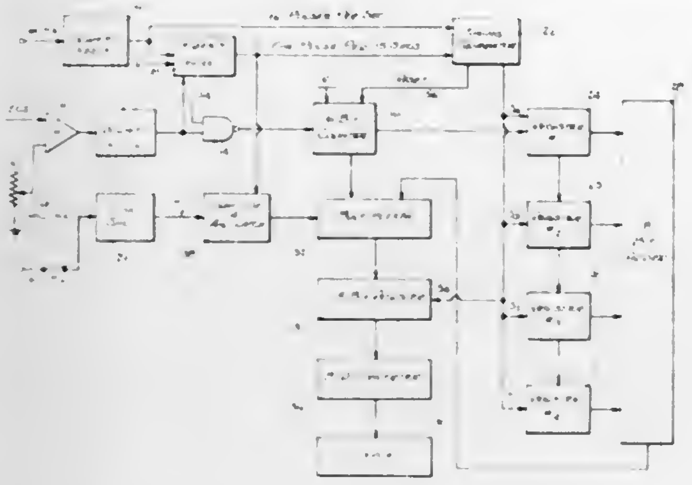
Paul R. Goldberg, Palo Alto, Calif., assignor to Smith Kline Instruments, Inc., Sunnyvale, Calif.
Filed Nov. 13, 1975, Ser. No. 631,623
Int. Cl.² A61B *10/00*
U.S. Cl. 128—2 V **12 Claims**



1. An ultrasonic scanning system including at least one ultrasonic transducer adapted to receive electrical pulses and transmit an ultrasonic beam and to receive ultrasonic energy and generate an electrical signal, means for causing said beam to periodically scan a predetermined sector in a predetermined time, means providing a signal at the beginning of each scan sector, means for applying pulses to the transducer at a predetermined rate to form a plurality of ultrasonic pulses which travel in scan lines, the period of said scan and rate of said pulses determining the number of scan lines scanned in each sector, a video recording means connected to said scanning system and serving to record a composite signal including said beginning of scan signal for each scan sector, the application of said pulses to form scan lines and the transducer output whereby when the recording is reproduced, processed and applied to control display means it forms a display of the scanned lines in said sector.

4,034,745
CARDIOTACHOMETER

Kenneth A. Bloom, Wellington Arms Apt., Apt. 6E, Lenox, Mass. 01240
Filed Mar. 15, 1976, Ser. No. 666,676
Int. Cl.² A61B *5/04*
U.S. Cl. 128—2.06 F **15 Claims**



1. A cardiotachometer comprising:

a sensor responsive to an ECG signal to provide a pulse train representing heart beats,

a clock providing a timing signal once each n seconds,

counting means responsive to said pulse train and to said timing signal to provide a count of the number of said pulses in said pulse train each n second time period, there being m of said time periods in sixty seconds, intermediate storage means coupled to the output of said counter means and to said timing signal to provide a count of the number of pulses in said pulse train during m successive n second time periods,

updating means coupled to said timing signal and to said intermediate storage means to update the count held by said intermediate storage once each n seconds,

a *p* bit output storage means,

multiplexer means having a first and second state, said multiplexer means when in said first state interfacing between said counter and the upper bits of said output storage means, said multiplexer means when in said second state interfacing between said intermediate storage means and said output storage means, and

latching means having a first state output signal and a second state output signal, said first state output signal of said latching means forcing said multiplexer into its first state and said second state output signal from said latching means forcing said multiplexer into its second state, said latching means being responsive to said timing signals to be switched into its second state in response to the mth one of said timing signals after said clock is initially turned on,

said timing signal being coupled to said output storage means to update said output storage means once each *n* seconds.

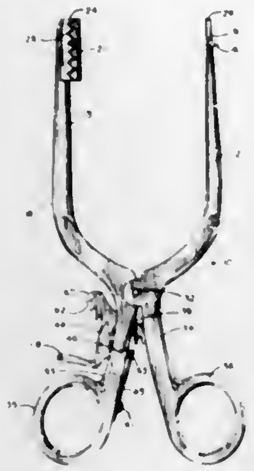
4,034,746
RETRACTOR

Robert W. Williams, 3201 S. Maryland Parkway, Las Vegas, Nev. 89109
Filed Aug. 1, 1975, Ser. No. 601,059
Int. Cl.² A61B *1/32*
U.S. Cl. 128—17 **9 Claims**

1. A retractor having a pair of arms being movable about a common pivot member and along a common plane,

the first arm of said pair having a handle secured at a first end and a rod member secured at a second opposite end thereof, said rod extending along a plane substantially normal to the common arm movement plane, and a pointed tip member at the end of said rod member said tip member directed away from a plate member and substantially parallel to the common arm movement plane,

the second arm of said pair having a handle secured at a first end and a plate member secured at a second opposite end thereof, said plate member having a first portion extending toward said rod member at an angle from said second arm, a second portion extending along a plane substantially parallel with said rod member and along a plane nominally normal to said common arm movement plane and a toothed edge opposite said second arm which edge is directed angularly away from said rod member.



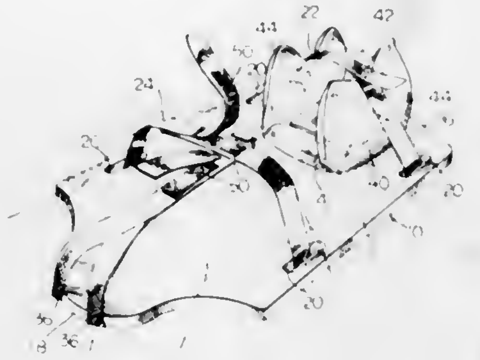
4,034,747
CERVICAL COLLAR

Pierre L. Leroy, Wilmington, Del., assignor to New Research and Development Lab., Inc., Wilmington, Del.
Filed Apr. 2, 1976, Ser. No. 673,152
Int. Cl.² A61F *5/00*
U.S. Cl. 128—68.1 **22 Claims**

1. A cervical collar for applying body heat to the area of treatment and for minimizing pressure on the brachial plexus comprising a body member made from a material which is heat insulating and flexible and conformable to the anatomy of the user and capable of maintaining the body heat from the user to thereby apply heat to the treated area, said body member having a central occipito-sinous section for extending from the user's occiput to the dorsal-four of the user, an acromial wing section attached to each side of the central section and extending therefrom, each acromial wing section being disposed for resting on the acromioclavicular joint, said body member having a lower peripheral width which extends from one acromia to the other through the dorsal four (D-4), and a lower peripheral width extending from the occiput to each acromia, a flap section connected to each acromial wing section, and connecting means on said flap sections for securing said flap sections together when said body member is disposed on the user.

4,034,748
SPINAL RESTRAINT DEVICE

Stephen E. Winner, 4515 Tamarack Drive, Fort Wayne, Ind. 46815
Filed Oct. 28, 1975, Ser. No. 625,948
Int. Cl.² A61F *5/04*
U.S. Cl. 128—87 R **2 Claims**



1. A body support comprising a planar elongate support member having a supporting length corresponding to the distance between the body head and the crotch; said member having first and second longitudinal edges;

a resilient head support mounted at the head end of said member; a first strap portion being mounted to said first longitudinal edge opposite said head support and transversely wrappable over said head support; a second strap portion being mounted to said second longitudinal edge opposite said head support and transversely wrappable over said first strap portion; x-ray transparent means for releasable contact attachment between said first and second strap portions to hold the body head against said head support;

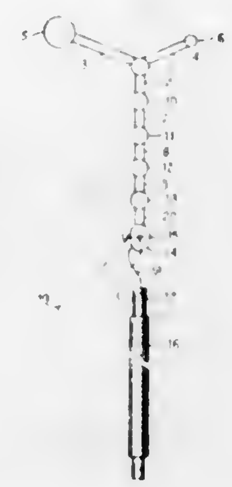
a third strap portion being affixed to said first longitudinal edge of said member at a longitudinal position corresponding to the body chest and transversely wrappable over said member; a fourth strap portion being mounted to the second longitudinal edge oppositely said third portion and transversely wrappable over said member in registration with said third position; x-ray transparent means for releasable contact attachment of said third and fourth strap portions;

said member having a supporting width corresponding to the body shoulder width; said supporting width extending between the body shoulder and waist, said member being contoured inwardly from a member position corresponding to the body waist to the crotch end of said member to provide unobstructed access to the body hips;

a fifth strap portion having bifurcated spaced ends attached at said crotch end, said bifurcated ends flowing into a single strap member; said single strap member extendable longitudinally and wrappable around said third and fourth portions when said third and fourth portions are in attached relation, and said single strap member being doubled back over onto itself after wrapping around said third and fourth members; x-ray transparent means for releasable contact attachment of said single strap member when doubled back onto itself.

4,034,749
INTRAUTERINE CONTRACEPTIVE DEVICE

Istvan Von Kesseru, Lima, Peru; Gerhard Laudahn, Berlin, Germany; Barbara Muhe, Berlin, Germany, and Gisela Schopflin, Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany
Continuation of Ser. No. 530,385, Dec. 6, 1974, abandoned. This application Dec. 15, 1975, Ser. No. 640,545
Claims priority, application Germany, Dec. 6, 1973, 2361206; Jan. 18, 1974, 2402882; June 1, 1974, 2426944
Int. Cl.² A61F *5/46*
U.S. Cl. 128—130 **24 Claims**



1. In a human intrauterine contraceptive device including a physiologically acceptable solid support, the improvement wherein:

said support is a Y-shaped synthetic resin body comprising,

a. a first resiliently deformable projection suitable for insertion into the body of a human uterus, comprising a first projecting elastomeric support member terminating at the distal end thereof in a first blunt, enlarged member,

b. a second resiliently deformable projection suitable for insertion into the body of a human uterus, comprising a second elastomeric support member terminating at the distal end thereof in a second blunt, enlarged member having a diameter less than the difference between the diameter of said first support member and that of said first blunt member, the length of said second projection being no greater than the length of said first support member, said first and second support members comprising the arms of said Y and each forming an obtuse angle at the intersection of said Y with respect to each other and with respect to the base of said Y, whereby said first and second support members can be deformed into substantially axial alignment with the base of said Y, and

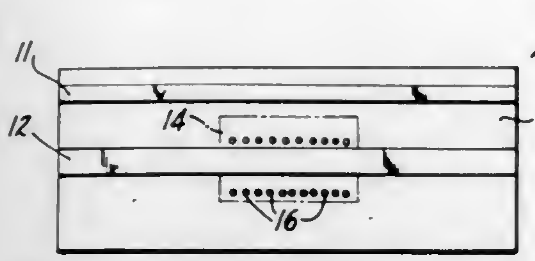
c. a cervical projection support member forming the base of said Y and having formed thereon a plurality of generally annular, longitudinally spaced protrusions to provide a gripping surface for cervix muscles.

4,034,750
ELECTROCHEMICALLY LINKING COLLAGEN FIBRILS TO ANIMAL TISSUE

Maurice Seiderman, 3306 Deronda Drive, Hollywood, Calif. 90068
Filed Apr. 22, 1975, Ser. No. 570,384
Int. Cl.² A61F *13/00*
U.S. Cl. 128—155 **25 Claims**

1. A collagen dispersion adapted for topical application to an animal body with a wound, lesion or the like, and useful for providing an adherent skin-like protective membrane of electrochemically-linked collagen fibrils over said wound, lesion or the like, said collagen fibrils also capable of electrochemicl-

ly-linking with exposed collagen fibrils of the wound, lesion or the like to form an electrochemical biological junction, said

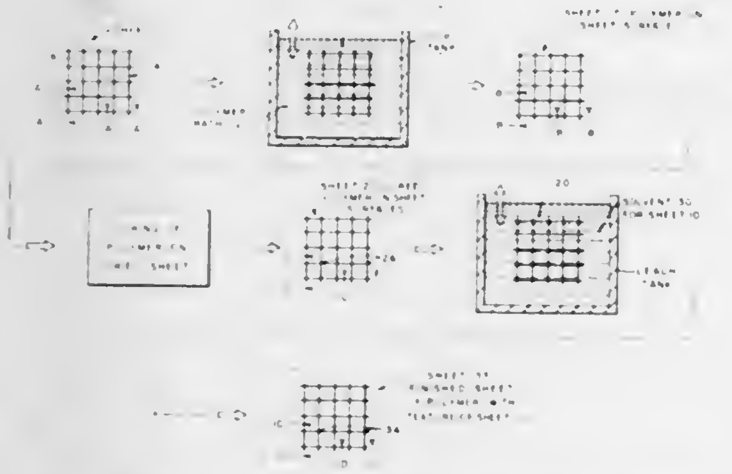


dispersion having a paste-like consistency and including collagen fibrils and an electrochemically effective amount of an electrolyte.

4,034,751
POLYMERIC SHEETS AS SYNTHETIC MEDICAL DRESSINGS OR COVERINGS FOR WOUNDS

John Hui-hsiung Hung, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Filed Nov. 24, 1975, Ser. No. 634,908
Int. Cl.^{2} A61L *15/01, 15/03*
U.S. Cl. 128—156 **11 Claims**



1. A synthetic medical dressing or covering for wounds comprising an integral, continuous, non-woven, non-fibrous, non-filamentary, non-foamed, drapable polymeric sheet at least one side of which has a fabric texture and comprises a plurality of interbonded continuous polymeric ribs defining between them recessed portions in said at least one side of the sheet, said ribs containing a plurality of elongated continuous channels interiorly located therein which extend in a direction generally parallel to the plane of the sheet to form a network of voids within said ribs which extend continuously throughout said at least one side of the sheet, said sheet having a water vapor phase transfer rate of about 2 to 20 mg./hr.-cm.^{2}, two dimensional elongation of at least about 100% in each direction, and an open area between the ribs of zero to about 60%.

4,034,752
DISPOSABLE DIAPER HAVING MULTIPLE TAPE TABS ADHERED TO DIAPER BACKING SHEET

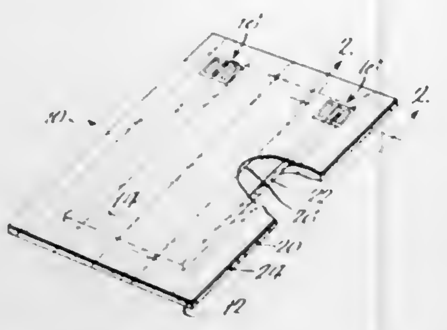
Ludwig Tritsch, Wilmette, Ill., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed Mar. 10, 1976, Ser. No. 665,663
Int. Cl.^{2} A61F *13/16*
U.S. Cl. 128—184 **10 Claims**

1. A disposable diaper having a facing sheet defining a diaper inside surface for direction toward an infant, a moisture-impervious backing sheet substantially coextensive with said facing sheet and defining a diaper outside surface, an absorbent panel positioned between said facing sheet and said backing sheet, and adhesive tab fastener means comprising:

a release region on the diaper outside surface spaced inwardly from the margins of said diaper;

at least one tape segment releasably parked on said release region, said tape segment having a pressure-sensitive adhesive coating on one face thereof which is releasably attached to said release region, each tape segment being positioned on said release region in its entirety inwardly from the margins of said diaper;

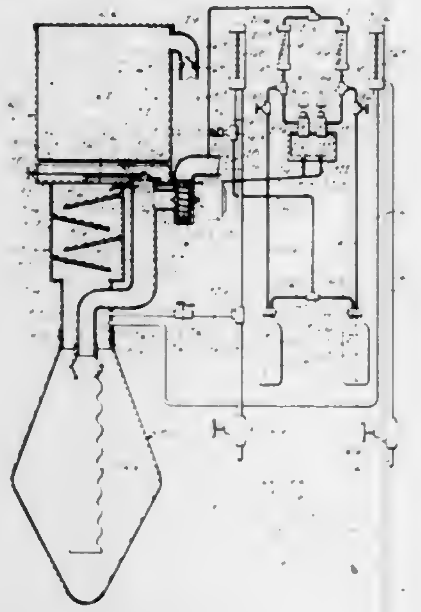


each said tape segment being removable from said release region and from said diaper in its entirety to make the entire adhesive-coated area thereof available for attachment to any desired position on said diaper for securing said diaper about an infant.

4,034,753
GAS ANESTHESIA MACHINE

Allan A. Connel, 14303 N. 60th St., Oak Park Heights, Stillwater, Minn. 55082

Filed Sept. 29, 1975, Ser. No. 617,989
Int. Cl.^{2} A61M *16/00;* **A62B** *7/02*
U.S. Cl. 128—188 **4 Claims**



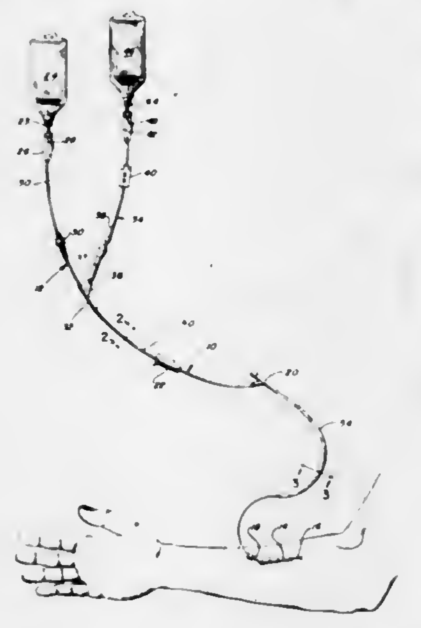
1. An anesthesia device including:
an exhalation duct,
a carbon dioxide absorption chamber to which said duct is connected,
a dry evaporator chamber connected to said absorption chamber for receiving gases therefrom,
a breathing bag connected to said dry evaporator chamber to receive gases passing therethrough,
an inhalation duct extending from the interior of said breathing bag,
said dry evaporator chamber including a series of spaced inclined baffles over which volatile liquid anesthetic may flow first in one direction and then in the opposite direction,
at least one pressurized volatile liquid anesthetic container,
a metering vial connected thereto by a tubular duct,
a manually operable normally closed valve in said tubular duct for supplying a predetermined amount of volatile liquid anesthetic to said metering vial,

a drip chamber connected to said metering vial to receive the liquid anesthetic a drop at a time, and
means connecting said drip chamber to the dry evaporator chamber above the uppermost of said baffles.

4,034,754
INTRAVENOUS SOLUTION SET HAVING A CONSTRICTED INNER DIAMETER PORTION

Robert Anthony Virag, Lake Zurich, Ill., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed Aug. 7, 1975, Ser. No. 602,614
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—214 R **16 Claims**



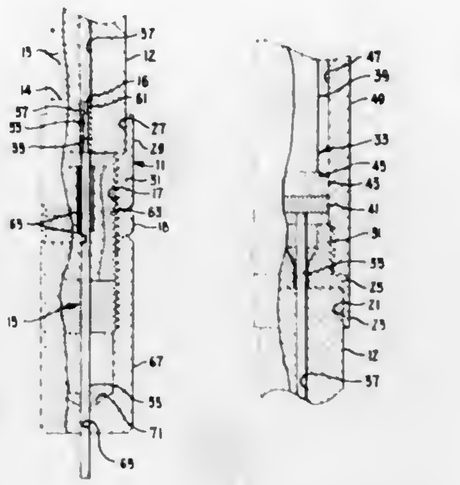
1. In a parenteral liquid infusion set which comprises flexible flow tubing, means for connection at one end of said flow tubing with blood vessel penetrating means, means for connection with a parenteral liquid source at the other end of said tubing, drip chamber means having a tubular drop-forming member at an upper end thereof of reduced inner diameter of 0.02 to 0.03 inch relative to the inner diameter of said flow tubing, and an intermediately-positioned site providing potential access of air to the interior of said set from the exterior, said site being positioned downstream from said drip chamber, but in the upper portion of the set, the improvement comprising, in combination: an integrally attached portion of said flexible fluid flow tubing positioned downstream from said access site defining a bore of reduced diameter, when compared with the bore size of the remainder of said flow tubing, said reduced diameter bore being from 0.01 to 0.04 inch in diameter and at least two inches in length, said reduced diameter bore being proportioned to prevent the creation of less than atmospheric pressure in said set between said reduced diameter bore and said drop-forming member in normal use, to prevent air from being sucked into said flow tubing through said intermediately-positioned axis site.

4,034,755
SYRINGE

Harold R. Schultz, Sparks, Nev., assignor to Hamilton Company, Reno, Nev.

Filed Sept. 16, 1975, Ser. No. 613,940
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—216 **8 Claims**

1. A syringe comprising a syringe body including a transparent hollow barrel having markings thereon for indicating the volume of a fluid held in said hollow body, said markings including a reference mark, a hollow needle assembly extending into said body and having one end positioned in said hollow barrel, said needle assembly having threaded adjusting means adjustably securing said needle assembly in said hollow body and being rotatable therein for allowing manual adjustment of the position of said needle assembly with respect to said body for lining up said one end of said needle assembly

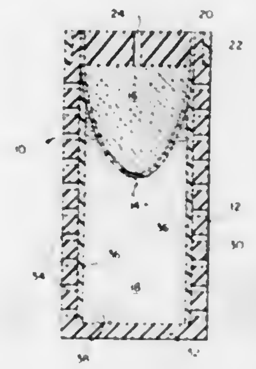


with said reference mark, and threaded locking means on said threaded adjusting means for engaging said body and locking the position of said needle assembly with respect to said body.

4,034,756
OSMOTICALLY DRIVEN FLUID DISPENSER

Takeru Higuchi, Lawrence, Kans., and Harold M. Leeper, Mountain View, Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 291,686, Sept. 25, 1972, Pat. No. 3,995,631, which is a continuation-in-part of Ser. No. 106,161, Jan. 13, 1971, abandoned. This application Mar. 12, 1976, Ser. No. 666,365
Int. Cl.^{2} A61M *5/00, 31/00;* **A61F** *5/46*
U.S. Cl. 128—260 **9 Claims**



1. An osmotically driven fluid dispenser for use in a surrounding aqueous environment consisting essentially of:
a. a single shape retaining closed canister that defines the exterior of the dispenser which exterior is exposed completely to the aqueous environment, at least a part of the wall of the canister being made of a material of controlled permeability to water;
b. an osmotically effective solute confined within the canister which, in aqueous solution, exhibits an osmotic pressure gradient across said portion of the canister wall against the water of said environment, said canister being substantially impermeable to the solute;
c. an outlet in the canister wall; and
d. a flexible bag adapted to hold the fluid to be dispensed and housed within the canister with its open end in sealed contact with a portion of the canister wall such that the outlet communicates with its interior and its interior is closed to the solute and aqueous solution thereof with the remainder of the bag being spaced from the remaining

portion of the canister wall and generally unsupported thereby, the exterior of said remainder being exposed to the solute and aqueous solution thereof, whereby water is imbibed into the canister from the environment through said part of the canister wall by the solute and the imbibed water exerts hydraulic pressure uniformly on the exterior of the flexible bag exposed thereto, causing the bag to collapse inwardly thus squeezing the fluid out of the bag via the outlet.

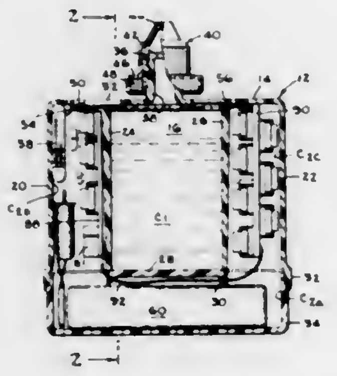
4,034,757
DISPENSER FOR PHARMACEUTICALS HAVING PATIENT COMPLIANCE MONITOR APPARATUS

Frederick Flagg Glover, Palo Alto, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed June 16, 1976, Ser. No. 696,664

Int. Cl.² A61M *31/00;* **B67D** *5/22*

U.S. Cl. 128—260 **8 Claims**



1. Apparatus for monitoring patient compliance with dosage instructions of a pharmaceutical comprising an impervious housing defining first and second mutually independent compartments, said housing including a neck defining a passage communicating with said first compartment to permit dispensing of the pharmaceutical from the first compartment through said passage, a cap removably engagable with said neck for selectively sealing said passage and said first compartment, an electronic counter disposed in said second compartment and having first and second inputs, said counter recording as an event only simultaneous excitation of said inputs, means responsive to removal of said cap for exciting said first input, and means responsive to movement of said housing to a position at which said neck is below said first compartment for exciting said second input so that said counter records the occurrence of each event when the housing is inverted with the cap removed.

4,034,758
OSMOTIC THERAPEUTIC SYSTEM FOR ADMINISTERING MEDICAMENT

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

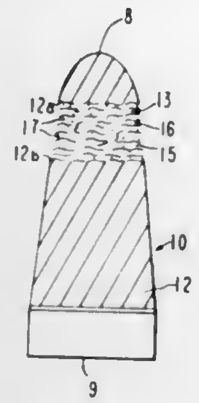
Continuation of Ser. No. 611,504, Sept. 8, 1975, Pat. No. 3,977,404. This application May 5, 1976, Ser. No. 683,275

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.² A61M *31/00*

U.S. Cl. 128—260 **20 Claims**

1. An osmotic therapeutic system for the continuous administration of a medicament to an environment of use, said system comprising:
  a. a wall formed of a material that maintains its integrity during the administration of medicament, is permeable to the passage of an external fluid present in the environment of use and is substantially impermeable to the passage of medicament, with the wall at least partially surrounding a reservoir;
  b. a reservoir formed of a material that provides a supporting structure for a multiplicity of microscopic sized interconnected pores;
  c. a medicament in the reservoir that can be administered from the system to produce a beneficial result;
  d. a passageway for administering the medicament from the system, said passageway communicating with the reservoir and the interior of the system; and
  e. wherein in operation with the system in the environment of use, external fluid is continuously imbibed through the wall into the reservoir in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby continuously forming a solution containing medicament which is administered from the system through the passageway to the exterior of the system at a controlled rate over a prolonged period of time to produce the beneficial result



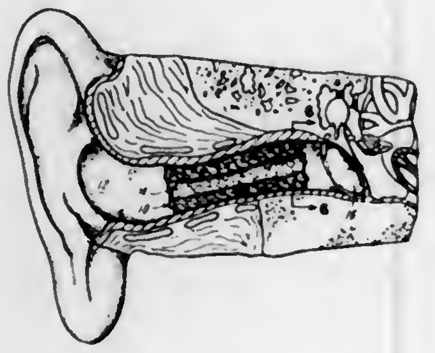
4,034,759
MOISTURE-EXPANDABLE PROSTHESIS

Raymond H. Haerr, Cincinnati, Ohio, assignor to Xomed, Inc., Cincinnati, Ohio

Filed Aug. 27, 1975, Ser. No. 608,148

Int. Cl.² A61F *1/18;* **A61M** *31/00*

U.S. Cl. 128—260 **9 Claims**



1. An elongate, compressed, collapsed, tubular, hollow, moisture-expandable ear canal prosthesis for applying medicament to an interior surface of an ear canal comprising a radially compressed, hollow cylinder of expanded, dehydrated, cellulose, sponge-like material wherein the outside diameter of said compressed, collapsed prosthesis approximates 2 mm, said material when hydrated by a medicament expands radially to the dimensions of the hollow cylinder prior to compression, whereby said prosthesis applies medicament to the interior surfaces of the ear canal when expanded, and is characterized by an open, axial passage therethrough.

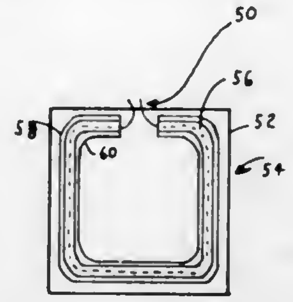
4,034,760
SELF CONTAINED DISPOSABLE DIAPER

Filitsa Amirsakis, 710 St. Andrews Lane, Crystal Lake, Ill. 60014

Filed Mar. 18, 1976, Ser. No. 668,065

Int. Cl.² A61F *13/16*

U.S. Cl. 128—287 **1 Claim**



1. A combined disposable infant diaper and disposable bag comprising:
  an absorbent fiber mat having a front and back side;
  a thin, waterproof, plastic sheet having an inner and an outer surface, said inner surface of said sheet affixed to said back of said mat to form a disposable diaper;
  a means for converting said diaper into a bag comprising a narrow elongated plastic frame of substantially closed configuration juxtaposed and attached to the outer surface of said sheet adjacent the periphery thereof said frame having longitudinal edge portions and a central portion disposable therebetween;
  means of affixing said longitudinal edge portions of said frame to said sheet and leaving a passage therebetween in said central portion of said frame;
  a drawstring disposed inside the entire length of said passage and extending out of said passage so that said drawstring may be grasped and pulled tight to gather the diaper to form a waterproof bag for the used diaper and tied to seal the bag.

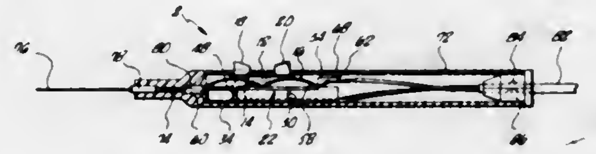
4,034,761
DISPOSABLE ELECTROSURGICAL SWITCHING ASSEMBLY

Earle F. Prater, Long Beach, and Frank L. Poole, Sante Fe Springs, both of Calif., assignors to The Birtcher Corporation, Los Angeles, Calif.

Filed Dec. 15, 1975, Ser. No. 640,739

Int. Cl.² A61B *17/36;* **A61N** *3/06;* **H01H** *9/06, 11/00*

U.S. Cl. 128—303.14 **22 Claims**



1. An electrosurgical instrument for selectively providing electrical energy to an electrode blade for cutting, coagulation and the like, comprising:
  a housing;
  a selector member movably mounted relative to the housing;
  at least a first and second electrical contact mounted within the housing and adapted to being connected to electrical energy; and
  a resilient member mounted within the housing and extending between the selector member and the first and second electrical contacts, the resilient member including means for conducting electricity and further including electrode blade mounting means at one end for connection to the electrode blade, the electrode blade mounting means being electrically connected to the means for conducting electricity, the selector member operatively moving the resilient member as desired by an operator to electrically interconnect the electrode blade, the means for conducting electricity and one of the first and second electrical contacts.

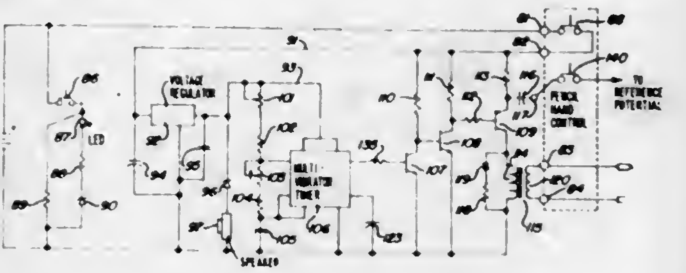
4,034,762
VAS CAUTERY APPARATUS

G. Ronald Cosens, Littleton, and Richard J. Drew, Englewood, both of Colo., assignors to Electro Medical Systems, Inc., Denver, Colo.

Filed Aug. 4, 1975, Ser. No. 601,793

Int. Cl.² A61B *17/36*

U.S. Cl. 128—303.17 **7 Claims**



1. An electrical apparatus for supplying an electrical energy waveform for use by an electrode device to effect electrocauterization of a transected vas, comprising:
  battery means for providing a supply of electrical power for said apparatus;
  means for providing source of substantially regulated potential from the battery power supply means;
  means connected to the regulated potential source means for producing a square wave having predetermined pulse width and pulse repetition rate; and
  means utilizing the square wave for supplying an output waveform of a pulse of one polarity having a maximum absolute potential followed by a spike of opposite polarity having an absolute potential greater than the maximum absolute potential of the pulse to increase utilization of the power supplied by the battery means.

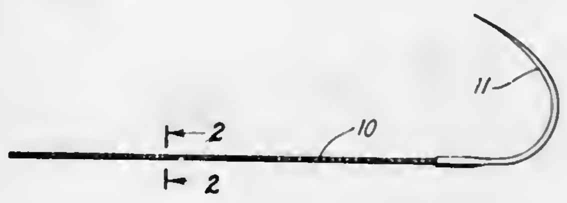
4,034,763
LIGAMENT FORMING SUTURE

Calvin H. Frazier, 1808 Verdugo Blvd., Glendale, Calif. 91208

Filed June 10, 1976, Ser. No. 694,845

Int. Cl.² A61L *17/00*

U.S. Cl. 128—335.5 **4 Claims**



1. A suture for attachment to a conventional suture needle for use within a human or animal body, said suture having a minimal outer dimension substantially comparable to that of said needle, said suture having sufficient physical strength to hold together for an extended period of time the members through which it passes, said suture being formed of loosely woven or expanded plastic material having a substantial degree of microporosity sufficient so that upon emplacement within the body said suture becomes penetrated with newly formed ligamentous tissues generated by the body, which ligamentous tissues are adapted to initially act to supplement and reinforce the physical holding action of said suture and which ligamentous tissues over an extended period of time are adapted to replace said suture and thereafter function in place of said suture to physically hold together the members through

which said suture initially passed in complete replacement of said suture and its function.

4,034,764
SMOKING MATERIAL AND METHOD FOR ITS PREPARATION

Norman B. Rainer; Charles B. Hoelzel, and William Ç. Hopkins, all of Richmond, Va., assignors to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 604,944

Int. Cl.² A24B *15/00;* **A24D** *1/18*

U.S. Cl. 131—2 **9 Claims**

1. A process for preparing a tobacco substitute smoking material comprising contacting a film-forming carbohydrate material with ozone such that at least 0.2 milliequivalent of carboxyl groups, per gram of ozone-treated carbohydrate material, is produced in the treated carbohydrate material and the film-forming carbohydrate material is reduced in molecular weight to the extent that an aqueous solution or dispersion of the carbohydrate after ozone treatment has a viscosity at least 30% less than the viscosity of an aqueous solution or dispersion containing an eqaul concentration of the carbohydrate prior to the ozone treatment or to the extent that the carbohydrate, initially insoluble in water, is at least rendered soluble or dispersible in water after ozone treatment.

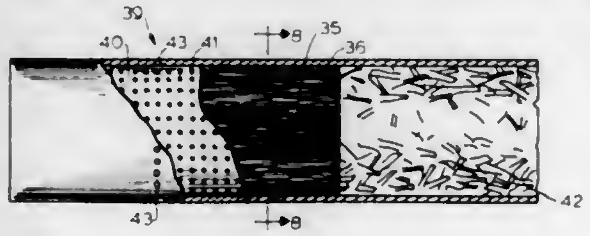
4,034,765
TOBACCO SMOKE FILTER

Floyd Van Hall, Durham, N.C., assignor to Liggett & Myers Incorporated, Durham, N.C.

Filed Oct. 30, 1975, Ser. No. 627,168

Int. Cl.² A24D *1/04;* **A24F** *5/04*

U.S. Cl. 131—10 A **4 Claims**



1. A tobacco filter cigarette comprising a tobacco column, a filter mouthpiece and a cylinder of tipping paper joining said filter mouthpiece to said tobacco column, said filter mouthpiece consisting of a first cylindrical passageway comprised of a coarse cellulose acetate fibrous tow having a dpf value from about 7 to about 9 and a total denier value from about 15,000 to about 25,000, said first passageway having a cross-sectional area that is no more than 25 percent of the total cross-sectional area of said filter,

a second passageway comprised of a compacted cellulose acetate fibrous tow having a dpf value from about 1 to about 5 and a total denier value of from about 10,000 to about 50,000, said second passageway circumferentially enveloping said first passageway, and said dpf value for the tow of said first passageway being from about 1.5 to 5 times the dpf value for the tow of said second passageway,

and a cylinder of air pervious plugwrap paper receiving and defining said second passageway, said tipping paper having a plurality of perforations communicating the surrounding air with said second passageway defining an air flow path having a draw resistance to complement said draw resistance of said first passageway whereby for a givendraw ventilation air, in an amount of from about 15 percent to about 60 percent of the total delivered puff volume, and relatively unfiltered smoke eneters the smoker's mouth.

4,034,766
REINFORCEMENT OF TOBACCO STRUCTURE

Robert A. Sanford, Prospect, Ky., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 542,589, Jan. 20, 1975, Pat. No. 3,948,275, which is a continuation of Ser. No. 259,296, June 2, 1972, abandoned. This application Apr. 2, 1976, Ser. No. 673,049

The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.

Int. Cl.² A24B *3/18*

U.S. Cl. 131—140 P **5 Claims**

1. A method of producing expanded tobacco having increased physical strength and a decreased tendency to collapse comprising:

a. impregnating tobacco with a sufficient amount of a solution of a non-toxic resin binder so that from about 0.25% to about 5% by weight, based on the weight of the tobacco, of said binder is provided; and

b. puffing the impregnated tobacco by subjecting it to microwave energy, whereby an expanded tobacco, containing a binder and having increased physical strength and decreased tendency to collapse is obtained.

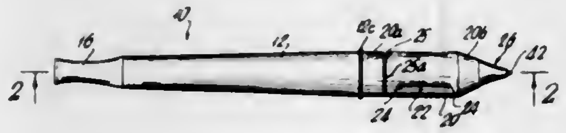
4,034,767
CIGARETTE HOLDER

Sergio DePinto, 97 Houston St., Staten Island, N.Y. 10302

Filed Aug. 23, 1976, Ser. No. 716,965

Int. Cl.² A24D *1/12, 5/10*

U.S. Cl. 131—175 **10 Claims**



1. A cigarette holder comprising an elongate stem having a longitudinal channel therethrough defining an axis and front and rear openings at the ends thereof; an ash container associated with one end of said stem at said front opening, said ash container including means for admitting air thereinto; a mouthpiece associated with the other end of said stem at said rear opening; biassing means provided within said longitudinal channel for urging a cigarette disposed in said longitudinal channel from said mouthpiece towards said ash container to thereby bring the lit end of the cigarette into said ash container; stop means for limiting the movement of the cigarette and maintaining the lit end of the cigarette substantially in the central portion of said ash container, said channel being defined by an inner cylindrical surface of said stem, said stop means including a coaxial end plug having a stop member projecting into said ash container a distance selected to maintain the lit end of the cigarette substantially in the central region of said ash container; a plurality of radial projections extending from said cylindrical surface and having the innermost portions thereof disposed on an imaginary coaxial cylindrical surface having a diameter substantially equal to the diameter of a cigarette, said front opening being dimensioned to slidingly receive a cigarette in sealing engagement to insure that smoke and air flow from said ash container into said stem primarily through the cigarette; and heat transfer limiting means between said ash container and said end plug, whereby the cigarette is supported by said radial projections at only selected surface portions thereof and urged by said biassing means to axially move towards said ash container to compensate for burned off portions of the cigarette to thereby maintain the lit end substantially centrally in said ash container, said means for admitting air being adapted to retain the burned ashes of the cigarette within said ash container, and whereby the lit portion of the cigarette is safely enclosed in said ash container, and the cigarette holder, with a lit cigarette therein, may be left on a surface without damaging the same.

4,034,768
NON FIBROUS CIGARETTE FILTER

Patrick J. Joyce, 103 Hubbard Avenue, Stamford, Conn. 06905

Filed May 14, 1975, Ser. No. 577,344

Int. Cl.² A24D *1/04*

U.S. Cl. 131—269 **2 Claims**

2. A porous smoke filter for absorption of tars, nicotine and combustion gases from tobacco smoke which comprises a self bonded mass of compressed dried and expanded non fibrous particles of a polymer of 2-pyrrolidone wherein the 2-pyrrolidone polymer particles have been expanded by contact with an aqueous acetic acid solution.

4,034,769
FINGERNAIL POLISHING APPARATUS

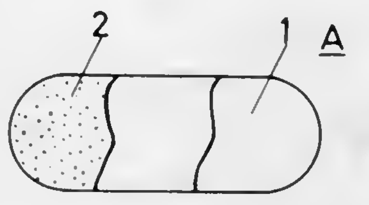
Koichi Nishimura, 13 - 4 Kitashinjuku 1-chome, Shinjuku, Tokyo, Japan (160)

Filed Aug. 3, 1976, Ser. No. 711,375

Claims priority, application Japan, Apr. 24, 1976, 51-5151509[U]

Int. Cl.² A45D *29/04*

U.S. Cl. 132—76.4 **8 Claims**



1. A fingernail polishing apparatus for use in the treatment of fingernails in a stepwise manner or in a random nanner depending upon the purpose of treating fingernails, the treatment covering the range of from an initial rough shaping to a final gloss making, said apparatus comprising, in combination:

a plurality of fingernail polishing means having the form of a sheet and having specific functions which depend upon the purpose of treating a fingernail, each of said plurality of polishing means comprising:

1. a base sheet made of elastic material cut to appropriate shape and thickness; and
2. a coating of abrasive media applied to said base sheet, said abrasive media comprising a mixture composed of abrasive material of varying grain size depending upon the function of said polishing means, adhesive material and distinguishing means.

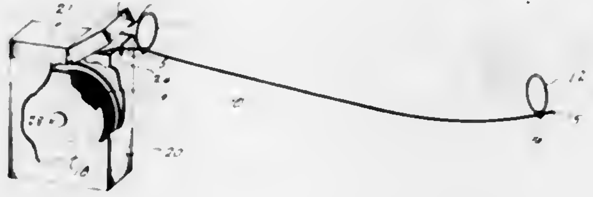
4,034,770
DENTAL FLOSS WITH FINGER LOOPS

Francis J. Trecker, 7100 Mummy Mountain Road, Scottsdale, Ariz. 85253

Filed Feb. 2, 1976, Ser. No. 654,215

Int. Cl.² A61C *15/00*

U.S. Cl. 132—90 **2 Claims**



1. In a device for cleaning the teeth of a human being; a continuous length of thread adapted to be inserted between the teeth and drawn longitudinally for removing particles of food and the like from between the teeth; a plurality of finger loops disposed at intervals along said length of thread to define useable lengths of thread for cleaning teeth between them, such loops being formed by looping the dental thread itself so that the user may insert a finger of each hand into the two loops for gripping the thread while drawing it back and forth between the teeth in a cleaning operation; a knot in the thread at each of said finger loops to secure the loop; a cutoff length of dental thread between each of said useable lengths to provide a length of thread that may be severed for separating the useable lengths of thread from the continuous length of thread without interrupting the useable lengths of thread; and the continuous length of thread with said finger loops attached is wound into a coil from which it may be withdrawn and the useable lengths of thread each with two finger loops attached may be individually separated from the continuous thread by severing the continuous thread at said cutoff lengths.

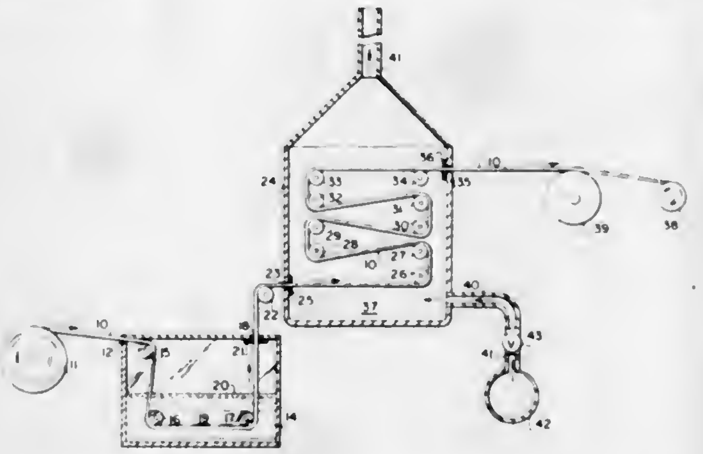
4,034,771
COATED DENTAL TEXTILE MATERIAL AND METHOD OF PREPARING AND USING THE SAME

William Cecil Guyton, 922 Porter Ave., Ocean Springs, Miss. 39564

Filed Feb. 20, 1975, Ser. No. 551,418

Int. Cl.² A61C *15/00*

U.S. Cl. 132—91 **24 Claims**



1. A method of preparing coated dental textile material for use in removing food deposits from the teeth and gingiva comprising applying an aqueous solution of a fluorine-containing compound to dental textile material, the dental textile material having a coating of an organic hydrophilic finish for textile material thereon and the coated surface thereof being hydrophilic in character, the said fluorine-containing compound being present in the aqueous solution in an amount to provide about 0.001–10% by weight of fluoride ion based upon the weight of the aqueous solution, and thereafter rapidly drying the dental textile material to produce a dry hydrophilic coating on the dental textile material which has dry fluorine-containing compound thereon, the fluorine-containing compound providing fluoride ion in a therapeutic amount to inhibit the formation of dental caries when the resultant coated dental textile material is intimately contacted with the teeth and gingiva to remove food deposits therefrom.

4,034,772
VAULTED MEMBRANE SHELTER

Carl Frederick Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Pleasant Ridge, Mich.

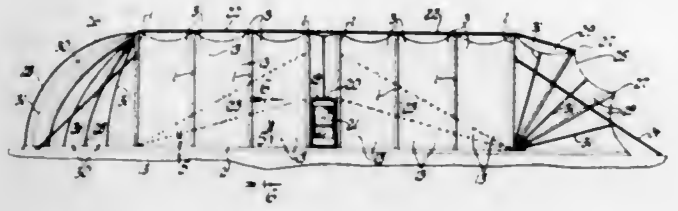
Continuation-in-part of Ser. No. 339,333, March 8, 1973, which is a continuation-in-part of Ser. No. 93,293, Nov. 27, 1970, abandoned. This application July 21, 1975, Ser. No. 597,970

Int. Cl.² A45F *1/12, 1/16*

U.S. Cl. 135—4 R **31 Claims**

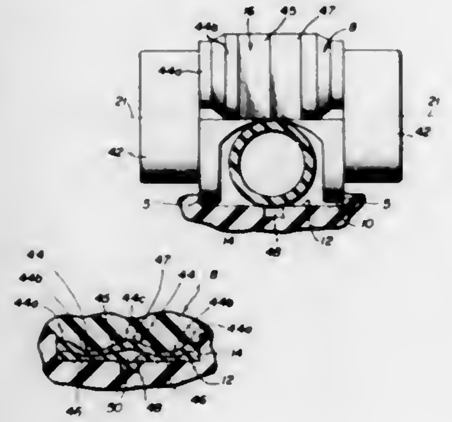
1. A vaulted membrane shelter comprising at least two substantially vertical arches with curved bights mounted on a base, face to face, but spaced apart with their respective ends aligned to form a framework; a flexible roof membrane ex-

tending between, and being operatively attached to, said arches and said base that is tensioned longitudinally and transversely with an inward concave curvature between at least the hights of said arches, said inward curvature having been formed by said membrane having a longer circumferential length at where it is operatively attached to said arches then its circumferential length in a vertical plane midway between said arches; and means acting between at least one of said vertical arches and said base for fixing said arches apart to maintain tension in said membrane.



4,034,773
METHOD AND APPARATUS FOR METERING FLUIDS

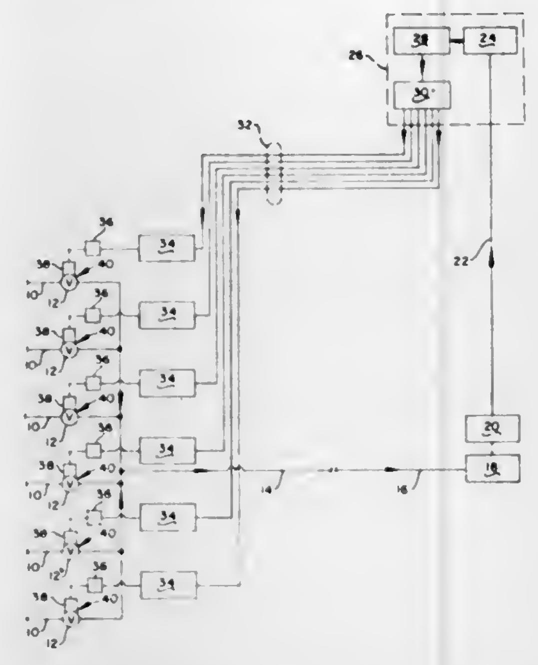
James A. Huggins, 551 W. Park Ave., Libertyville, Ill. 60048
Continuation-in-part of Ser. No. 423,387, Dec. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 320,242, Jan. 2, 1973, abandoned. This application Aug. 1, 1975, Ser. No. 601,089
Int. Cl.² F16K *7/06*
U.S. Cl. 137—1 **15 Claims**



1. A clamp for providing a stable fluid flow rate through a flexible tubing, said clamp comprising means forming a surface for receiving a portion of said tubing and supporting the same, and tube constricting means having first portions cooperating with first parts of said surface for providing opposed structures that compress diametrically opposed wall portions of the tubing an amount sufficient to shut off the tubing at spaced regions, and said constricting means also having means cooperating with a second part of said surface for providing structure defining a space for a reduced-flow passageway in the tubing, said opposed structures and said first portions being shaped to apply sufficient pressure to the tubing to reduce the wall thickness of the tubing, said structure defining the space for said reduced flow passageway being between said opposed structures, said opposed structures and the structure defining said space together providing a substantial confinement for the tubing extending around the tubing, and said constricting means including arm structure pivotal relative to said surface and including spaced peripheral parts constituting said first portions, said spaced peripheral parts being of such shape that upon pivoting of said arm structure to reduce fluid flow through said passageway said peripheral parts present progressively greater areas against said tubing to increase the extent of each of said spaced regions transversely of the tubing, and said first parts being relatively narrow to restrict said regions to narrow bands transversely of the tubing.

4,034,774
LOW POINT CONTROL SYSTEM

Henry F. Clymer, and John J. Kaltenbaugh, both of Dallas, Tex., assignors to Lone Star Gas Company, Dallas, Tex.
Filed July 7, 1975, Ser. No. 593,320
Int. Cl.² G05D *11/13*
U.S. Cl. 137—111 **14 Claims**



13. In a gas distribution system having a plurality of gas collection lines connected to a customer distribution network; control valve means, mounted in each of said collection lines, for adjusting the gas discharge from said collection lines to said distribution system; pressure sensing means mounted at a predetermined point in said distribution system for sensing the pressure at said predetermined point; control means for simultaneously producing a plurality of individual, first signals, equal in number to the number of said control valves, when the gas pressure sensed by said pressure sensing means is below a predetermined value or alternately producing a plurality of simultaneous individal, second signals, equal in number to the number of said control valves and differing from said first signals, when the gas pressure sensed by the pressure sensing means exceeds a predetermined value; means to transmit said first and second signals from said control means to said control valves such that the first signal increases the gas discharge from the collection lines and the second signal decreases the gas discharge from said collection lines; the improvement comprising, a plurality of time-adjusting means, operably connected between said control means and said control valves, for individually adjusting the time duration of each of the first and second signals applied to each of said control valves.

4,034,775
SEQUENCING VALVE

Roger D. Slagel, 641 NW. 74th Ave., Plantation, Fla. 33317
Filed May 10, 1976, Ser. No. 684,854
Int. Cl.² F16K *21/00*
U.S. Cl. 137—119 **7 Claims**

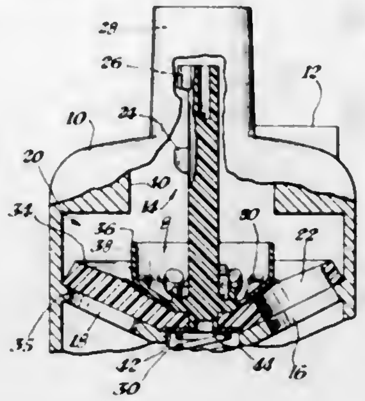
1. In a sequencing valve having an inlet portion with an inlet and having an outlet portion with at least one fluid outlet, an improved sequencing valve means comprising:

a main sealing means in said sequencing valve means, said sealing means movably connected for sealing at least one outlet port;

said main sealing means having a first surface for contact with said outlet portion for closing the fluid outlets, and an opposite surface;

said main sealing means movable for allowing fluid to flow from adjacent said opposite surface to adjacent said first surface,

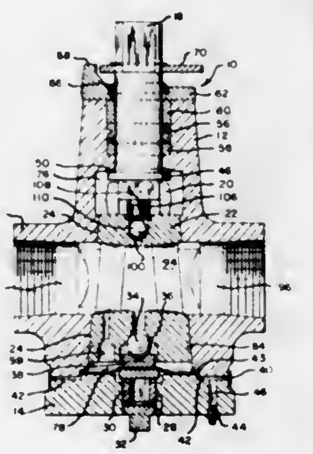
a generally cup-shaped inlet closure means connected in said sequencing valve and connected to said main sealing means and positioned for movement due to inlet fluid from a generally closed position with the inlet of the sequencing valve to a position generally spaced from said inlet, said cup-shaped means having a generally cup-shaped body to temporarily hold incoming fluid from the inlet,



said cup-shaped means having an opened port adjacent the bottom of said generally cup-shaped body to allow fluid to drain from said cup-shaped body at a particular fluid flow rate lower than the minimum operational fluid flow rate of the sequencing valve.

4,034,776
BALANCED PLUG VALVE

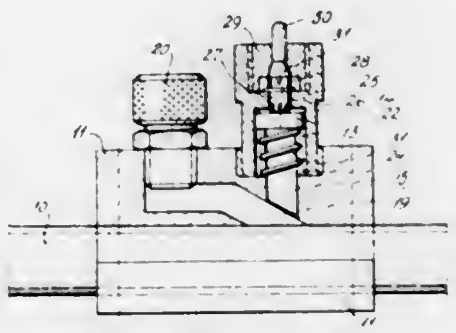
Siavash Eshghy, Pittsburgh, Pa., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed Oct. 24, 1975, Ser. No. 625,593
Int. Cl.² F16K *5/16, 5/22*
U.S. Cl. 137—246.22 **11 Claims**



1. A tapered plug valve comprising: a casing having a passageway therethrough for flow of fluid and a tapered bore intersecting said passageway; a tapered plug rotatably mounted in said tapered bore adapted to block said passageway in a valve closed position of said plug, said plug having a port adapted to connect and be in communication with said passageway in a valve open position, said plug and said casing providing an apex chamber at the small end of said tapered plug and a base chamber at the large end of the plug; means operative during valve open or valve partially open dynamic conditions for maintaining the axial position of the plug within the bore of the casing to prevent axial movement toward the apex chamber, said means including (1) stop means limiting axial movement of the plug toward one of the chambers (2) passage means for fluidly communicating both chambers to said port and (3) biasing means urging said plug toward said stop means thereby providing dynamic balancing of the plug in the casing.

4,034,777
APPARATUS TO PIERCE A FLUID-TRANSPORT PIPE AND CONTROL THE FLUID-FLOW THEREFROM

Sven Runo Vilhelm Gebelius, Fridhemsgatan 27, Stockholm, Sweden (S-11240)
Continuation of Ser. No. 501,252, Aug. 28, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,197
Claims priority, application Sweden, Sept. 10, 1973, 7312746
Int. Cl.² F16L *41/04*
U.S. Cl. 137—318 **3 Claims**



1. Apparatus for piercing and controlling fluid-flow from a pipe, comprising:

a. pipe connection means;

b. a fluid-conducting pipe extending through said pipe connection means,

said pipe connection means including at least one fluid-flow channel having an end portion opening to the outer surface of said fluid-conducting pipe where it is to be pierced, said pipe connection means including a guide channel intersecting said one fluid-flow channel and merging therewith at the outer surface of said fluid-conducting pipe, said fluid-flow channel extending angularly toward the longitudinal axis of said fluid-conducting pipe;

c. a percussion-operated, piercing member reciprocably supported in said guide channel and including a lower, transversely inclined end surface defining a lower piercing edge and point for penetrating the fluid-conducting pipe and displacing a portion therein comprising a flow-controlling flap extending angularly from the end of said fluid-flow channel into angular relation with respect to the longitudinal axis of said fluid-conducting pipe;

d. percussion-chamber means communicating with the upper end of said guide channel for accommodating an explosive charge for imposing a percussive force on the piercing member to drive it through the pipe, said displaced portion being complementary to the lower end surface of said piercing member and forming a valve seat when engaged by the lower end surface of said piercing member, said valve seat including said flow-controlling flap and said flap extending transversely and angularly into the direction of fluid-flow through the pipe;

e. spring means interposed between said piercing member and said pipe connection means for limiting movement of said piercing member through the pipe to cause the valve seat to be formed and normally urging the piercing member away from said pipe; and

f. an adjusting member including a manually-adjustable stem means engaged with said piercing member for adjusting the lower end surface of said piercing member relative to said flow-controlling flap for controlling fluid flow from the pipe to said one channel of the connection member.

4,034,778

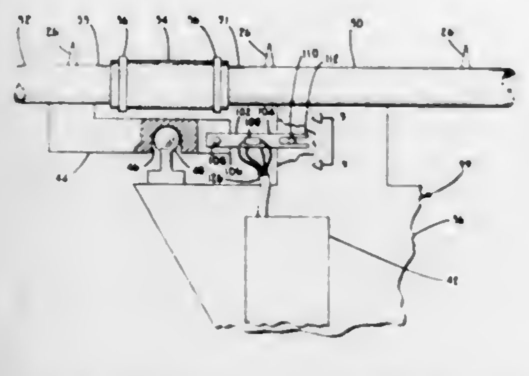
ALIGNMENT CONTROL SYSTEM PARTICULARLY SUITED TO CONTROL TRAVELING IRRIGATION SYSTEMS

Douglas E. Sage, 11019 127th Place NE., Kirkland, Wash. 98033, and George E. Sage, 22002 Fall City Road, Redmond, Wash. 98052

Filed Mar. 10, 1976, Ser. No. 665,686

Int. Cl.² B05B *3/00*

U.S. Cl. 137—344 **20 Claims**



4. In a mobile irrigation apparatus of the type having an elongated fluid distribution means including a plurality of articulating sections, a drive means associated with a section for propelling the corresponding section in a direction transverse to its longitudinal axis, and an alignment control means associated with the drive means for maintaining a substantially, aligned relationship between the driven and an adjacent section including a drive control responsive to an input signal to direct the operation of the drive means, the improvement wherein the alignment control means comprises:

a. a defelction surface attached to the driven section and the adjacent section so that the surface is variably stressed and deflected as the alignment in the horizontal plane of the sections vary;

b. a strain gauge attached to the deflection surface and responsive to the varying stresses;

c. means for electrically sensing the deflections sensed by the strain gauge and producing the input signal applied to the drive control indicative of the position of the driven section relative to the adjacent section so that the distribution means travels over an area to be irrigated with the individual sections remaining in a substantially aligned relationship.

4,034,779

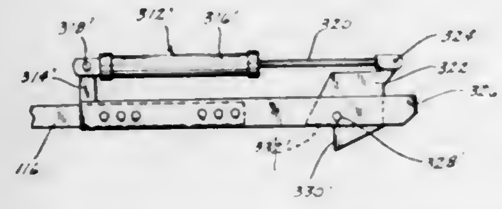
REVERSIBLE SELF-PROPELLED CENTER PIVOT SPRINKLER SYSTEM

Loren R. Townsend, Sidney, Nebr. 69162

Continuation-in-part of Ser. No. 664,184, March 5, 1976, Pat. No. 4,005,731. This application Apr. 28, 1976, Ser. No. 681,079

Int. Cl.² B05B *3/12*

U.S. Cl. 137—344 **2 Claims**



1. A reversible self-propelled center pivot sprinkler system comprising,

a water supply pipe movable about a center pivot point,

a plurality of spaced-apart, wheeled drive towers supporting said supply pipe above the area to be sprinkled,

a drive means on each of said towers to propel said towers to move said towers and supply pipe about said center pivot point,

each of said towers comprising a frame means having a pair of spaced-apart drive wheels rotatably mounted thereon,

a trojan bar means reciprocatably mounted on said frame means and movable between first and second positions, at least one double dog means on said trojan bar means for engagement with at least one of said drive wheels for selectively driving said wheel forwardly at times and for selectively driving said wheel rearwardly at other times,

a power means mounted on said frame means and being operatively connected to said trojan bar means to reciprocate said trojan bar means,

and a control means for controlling the operation of said power means so that the associated tower is propelled at the desired rate relative to the other towers in the system,

said double dog means comprising a plate means operatively pivotally mounted on said trojan bar means, said plate means having oppositely disposed dog surfaces formed therein, said plate means being selectively pivotally secured to said trojan bar means and being movable from a first position, wherein one of said dog surfaces will engage the lugs on said one wheel to drive said wheel and tower forwardly to a second position, wherein the other of said dog surfaces will engage the lugs on said one wheel to drive said wheel and tower rearwardly,

and a power cylinder pivotally connected to said plate means for moving said plate means between its first and second positions.

4,034,780

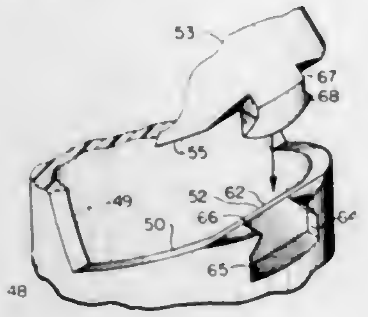
CHECK VALVE

Tibor Horvath, Brooklyn, N.Y., assignor to Aquology Corporation, Newark, N.J.

Continuation-in-part of Ser. No. 652,232, Jan. 26, 1976, abandoned. This application July 29, 1976, Ser. No. 709,807

Int. Cl.² F16K *15/03;* **F04F** *10/00*

U.S. Cl. 137—527.8 **1 Claim**



1. A check valve for use in a tube, said check valve comprising, in combination, a closure element formed as a portion of a cylindrical wall to nest within said tube, said closure element having a bottom edge and an upward extending edge, said edges being in planes intersecting at 90° at substantially the diameter of the cylindrical wall, said bottom edge extending to the side of said cylindrical wall to a first point, said upward extending edge extending to the side of said cylindrical wall to a second point above said first point, said second point being a greater distance from said first point than 1.41 times the inside diameter of said tube, a projection of said closure at said second point contacting said tube preventing the complete opening of said closure element, a tubular seat fixed in said tube having upwardly facing surfaces contacting the edges of said closure in the closed position, and a downward extension of said closure element from said first point, said extension having an enlarged end, said seat on its outersurface containing an opening with an enlarged lower portion and a smaller upper entrance, said enlarged end of said extension extending into said opening and interlocking therewith forming a hinge connection, said surface of said seat conforming to the bottom edge of said closure element extending in front of said opening, said bottom edge of said closure element extending in front of said extension making unbroken contact with said seat in the closed position, so that said closure element nests against said tube in an open position and is swung by downward flow to a closed position completely blocking said tube.

4,034,781

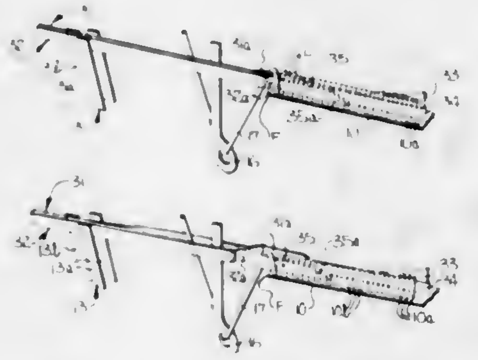
PILE FABRIC FORMING APPARATUS HAVING COOPERATING PAIRS OF PILE WIRES

Paul Anthony Czelusniak, Jr., Eden, N.C., assignor to Fieldcrest Mills, Inc., Eden, N.C.

Filed May 10, 1976, Ser. No. 684,877

Int. Cl.² D03D *39/20*

U.S. Cl. 139—46 **10 Claims**



1. In an apparatus for forming pile fabrics having cut and uncut pile tufts and wherein pile wires extend longitudinally of the fabric being formed and means are provided for positioning pile yarns laterally over and across the pile wires for forming pile loops thereon and for dipping the pile yarns into the fabric between the pile wires, the improvement wherein a plurality of the pile wires, are arranged in side-by-side cooperating pairs of first and second pile wires, only said first pile wires having cutting blades on frontal portions thereof, each cooperating pair of pile wires being so arranged that, while they occupy a first position they are in close proximity where the pile yarns are positioned thereover for forming pile loops extending over both wires, with such loops subsequently being cut by the cutting blade on the frontal portion of the respective first pile wire, means for imparting relative longitudinal movement to each cooperating pair of pile wires, and cooperating means on the pile wires of each cooperating pair and responsive to relative longitudinal movement of the pile wires to a second position for diverting the first pile wire laterally away from the second pile wire of the respective pair so that loops of pile yarn are formed over only the second pile wire and thus form uncut pile loops in the fabric.

4,034,782

CONNECTING MEMBER FOR SECURING PULL ELEMENTS TO LIFTING WIRES OF A JACQUARD MACHINE

Robert Bucher, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Feb. 3, 1976, Ser. No. 654,783

Claims priority, application Switzerland, Feb. 7, 1975, 1517/75

Int. Cl.² D03C *3/00, 3/40*

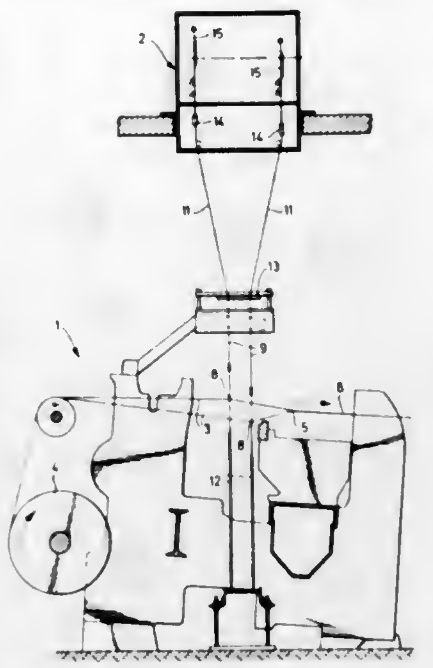
U.S. Cl. 139—85 **17 Claims**

1. In combination,

a lifting wire of a jacquard machine;

a pull element for controlling at least one warp yarn of a weaving machine; and

means for securing said pull element to said lifting wire, said means having a clip-like part at one end resiliently connected to said lifting wire in snap-fit clamped manner and a slot at an opposite end receiving said pull element for suspension therefrom.



4,034,783

ENDLESS-CHAIN SYSTEMS FOR FEEDING WEFT THREADS TO WEFT INSERTERS

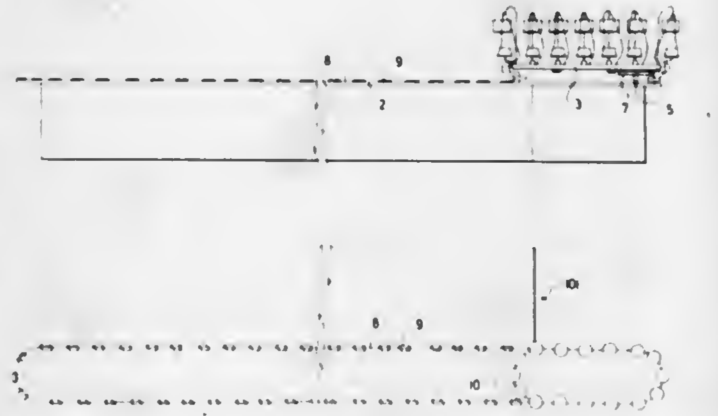
Josef Pech, and Frantisek Lapes, both of Brno, Czechoslovakia, assignors to Vyzkumny Ustav Bavlnarsky, Usti nad Orlici, Czechoslovakia

Filed Aug. 21, 1975, Ser. No. 606,573

Claims priority, application Czechoslovakia, Oct. 16, 1974, 7081/74

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 **13 Claims**

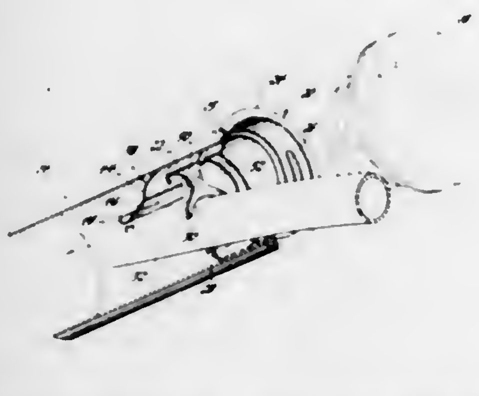


1. For use in a travelling-wave loom, a system for individually feeding a plurality of weft threads from a plurality of bobbins to weft inserters disposed in spaced relation along a first endless chain, the system comprising, in combination, a plurality of winding units individually associated with the bobbins and adapted to present the weft threads to the respective weft inserters, a second endless chain guided along an oval track, means for associating the winding units with spaced portions of the second chain, common drive means, and means associated with the first and second chains and adapted to cooperate with the common drive means for ideally effecting synchronous movement of the first and second chains, the improvement wherein the second chain comprises a plurality of rigid carrier members disposed in spaced relation, the movement effecting means comprises a contact surface disposed on each carrier member, and the associating

means comprises means for individually and removably connecting the winding units to the respective carrier members.

4,034,784
FILLER NECK TO INHIBIT USE OF LEADED FUEL

Frank W. Ball, and Paul R. Mutty, both of Lansing, Mich., assignors to General Motors Corporation, Detroit, Mich.
Continuation of Ser. No. 497,339, Aug. 14, 1974, abandoned. This application May 2, 1975, Ser. No. 573,903
Int. Cl.² B65D *29/02*
U.S. Cl. 141—348 4 Claims

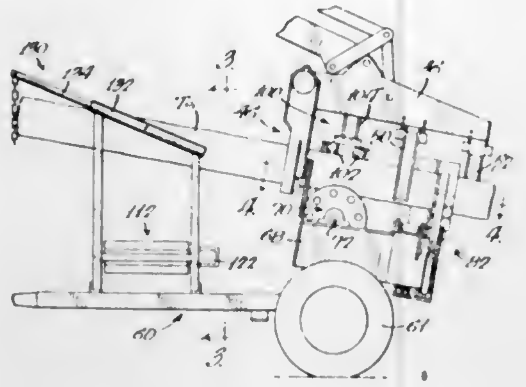


1. A fuel tank filler neck adapted to inhibit filling of a fuel tank by a leaded fuel nozzle and to permit filling of the fuel tank by an unleaded fuel nozzle, said leaded fuel nozzle having a diameter larger than the diameter of said unleaded fuel nozzle and further having a shut-off mechanism including a signal port, said mechanism being actuated to shut-off fuel flow when said signal port is covered by fuel, said filler neck comprising a restrictor recessed in and extending across the end of said filler neck, said restrictor having an opening with a diameter larger than the diameter of said unleaded fuel nozzle and smaller than the diameter of said leaded fuel nozzle to thereby permit insertion of said unleaded fuel nozzle through said restrictor and to obstruct insertion of said leaded fuel nozzle, said restrictor further having at least one aperture, and a deflector including a flat portion underlying at least a portion of said opening and a curved portion underlying at least a portion of said aperture, said deflector being displaceable by said unleaded fuel nozzle to admit fuel therefrom, said flat portion of said deflector intercepting fuel from said leaded fuel nozzle and diverting such fuel to said curved portion of said deflector which deflects such fuel through said aperture toward said signal port to actuate said mechanism and shut off fuel flow from said leaded fuel nozzle.

4,034,785
DELIMBING ATTACHMENT FOR TREE HARVESTING APPARATUS

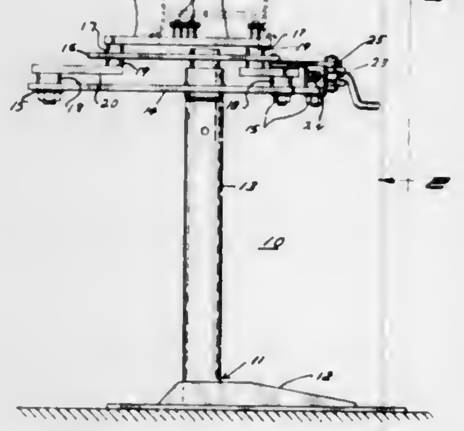
Frank J. Tucek, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.
Division of Ser. No. 517,461, Oct. 24, 1974, Pat. No. 3,939,886. This application Sept. 15, 1975, Ser. No. 613,418
Int. Cl.² A01G *23/08*
U.S. Cl. 144—2 Z 3 Claims

1. A tree processing attachment for use with a detachably mounted tree harvesting apparatus, said tree harvesting apparatus including first means operatively attached thereto with cutter means said tree processing attachment being mounted on said first means, comprising, a trailer including a frame supported by wheels and, a tree advancing roll rotatably supported about an axis on said frame, drive means for rotating said roll, a pair of jaws respectively pivotally supported on said frame by pivot pins extending generally perpendicular to the axis of said roll, a link chain connected at spaced points to the respective jaws at locations spaced from said pivot pins, cutting blades respectively fixed to respective links of said link chain, and drive means between said frame and said jaws for pivoting said jaws between open and closed positions, said link chain encircling a tree supported on said tree advancing roll when in said closed position so that said first means may be utilized to force said tree into engagement with said roll and said cutter means used to sever a tree into tree sections.



4,034,786
WHEEL CHUCK

Robert G. Feldmann, Minneapolis, and James A. Safar, St. Michael, both of Minn., assignors to Royal Industries, Inc., Osseo, Minn.
Filed Nov. 17, 1975, Ser. No. 632,300
Int. Cl.² B25H *1/00;* **B60C** *25/06*
U.S. Cl. 144—288 A 11 Claims



1. In a tire mounting and demounting machine, wheel chucking apparatus comprising:

a longitudinally elongated support member having opposing ends, one end being adapted to be mounted in a work area;

a first base means disposed on the other end of said support member;

a second base means also disposed on said other end of said support member, said first and second base means lying in parallel planes that are normal to the longitudinal axis of said support member, said first and second base means being rotatable with respect to each other; said first and second base means including like pluralities of circumferentially spaced apart apertures;

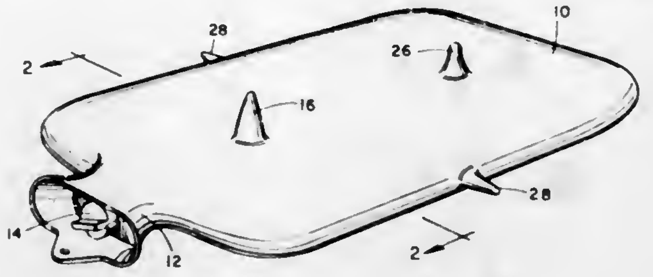
a like plurality of first links having opposed ends, each having a like plurality of pins rigidly mounted at each end, the pins at one end extending into the apertures in one of said first and second base means and the pins at the other end extending into the pertures in the other of said first and second base means;

a like plurality of second links having opposed ends, each having one end mounted on the pin at said other end of said first links and a wheel engaging jaw extending through the other end of said second link; and

means for establishing relative movement between said first and second base means.

4,034,787
HOT WATER BOTTLE WITH EAR WARMING PROJECTIONS

Eugene Ellis, 202 Coast Blvd., La Jolla, Calif. 92037
Filed Oct. 9, 1975, Ser. No. 621,222
Int. Cl.² A61F *7/12*
U.S. Cl. 150—2.1 2 Claims



1. A hot water bottle to heat the human outer ear cavity comprising:

a. a flexible watertight container being generally smooth in external contour and substantially flattened to define two generally planer sides;

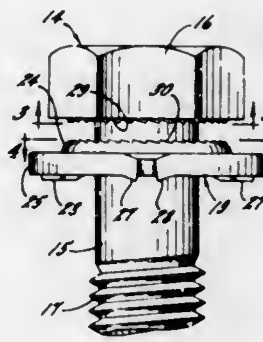
b. at least one generally conical projection shaped to substantially fill the outer human ear cavity and extending generally centrally and unobstructedly from one of said sides whereby said hot water bottle is conveniently useable on a horizontal surface;

c. said projection being at least in part hollow and internally communicating with said container to receive the circulation of hot water within sais container; and

d. means to completely fill said container and projection with hot water.

4,034,788
FASTENER ASSEMBLY

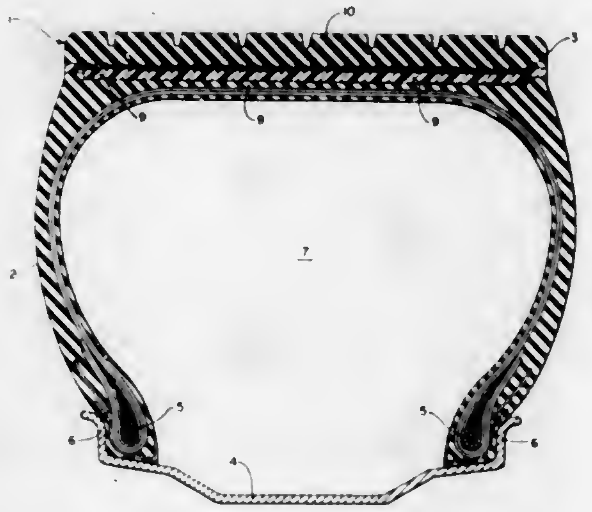
Robert R. Melone, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.
Filed Dec. 19, 1975, Ser. No. 642,351
Int. Cl.² F16B *39/26, 39/32*
U.S. Cl. 151—37 9 Claims



1. A fastener assembly for use in conjunction with a threaded section of a first member to secure the first member to a second member, said assembly comprising, a threaded element rotatable about an axis to mate with the threaded section for fastening the members together, a washer adapted to fit between said element and the second member, said washer having a central opening and having upper and lower surfaces, angularly spaced sets of first and second locking teeth integrally formed with said washer adjacent the outer periphery thereof and projecting substantially downwardly from the lower surface of said washer for embedding in the second member, the teeth of each of said sets being relatively close to each other and each set being spaced a substantial distance from the adjacent sets, the first teeth of each set facing in one substantially circumferential direction to keep said washer from turning in a tightening direction as said element is tightened down, the second teeth of each set facing the opposite substantially circumferential direction to keep said washer from turning in a loosening direction after said element is tightened down, the teeth of each set being located at opposite edges of a substantially U-shaped notch formed through and extending substantially radially of said washer and opening out of the outer periphery thereof, and a continuous bridge section displaced downwardly throughout the extent thereof from the upper and lower surfaces of said washer and extending around the closed end of each notch and between said first and second teeth in each set of said teeth to support the latter against substantial upward bending as said element is tightened down.

4,034,789
PNEUMATIC TIRE HAVING A REMOVABLE TREAD RING

Walter W. Curtiss, Jr., Brimfield, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 5, 1976, Ser. No. 647,272
Int. Cl.² B60C *11/02*
U.S. Cl. 152—187 4 Claims



1. In a vehicle tire comprising an inflatable tire carcass adapted to receive a removable tread ring in locked relationship under inflated conditions, said ring including an armor of metallic or polyamide members to provide resistance to tension in a longitudinal direction of the ring, the improvement wherein the tread ring has a layer of see-through elastomer suitable for use in a tire covering the inside of the armor to permit the position of each member to be determined

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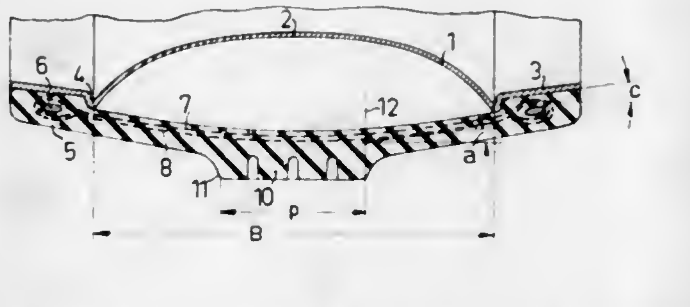
4,034,790
VEHICLE WHEEL EQUIPPED WITH PNEUMATIC TIRE

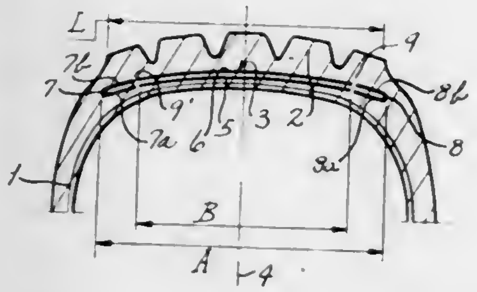
Peter Johannsen; Julius Peter, both of Hannover, and Gerhard Mauk, Wunstorf, all of Germany, assignors to Continental Gummi-Werke Aktiengesellschaft, Hannover, Germany
Filed Nov. 20, 1975, Ser. No. 633,982
Claims priority, application Germany, Nov. 21, 1974, 2455120
Int. Cl.² B60C *5/12*
U.S. Cl. 152—352 R 8 Claims



1. A vehicle wheel having a pneumatic tire mounted

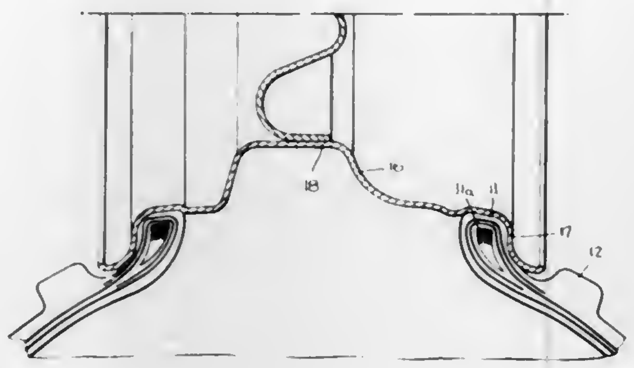
thereon, the tire body of which is only slightly outwardly arched, which includes in combination: a tread strip centrally arranged on said tire body and having a contact surface, said tread strip having sharply defined edges on said contact surface and having a width remaining substantially constant between said edges which is approximately one third the freely extended axial length of said tire body, a carcass in said tire body having at least one carcass layer radially inwardly of said contact surface and under rated load experiencing a change in orientation directly under said edges amounting from 10° to 30° from a convex configuration in an unstressed state substantially symmetrically into a concave configuration in a stressed state, said change in orientation resulting in response to said tire body being deflected radially inwardly and flattened in response to rated load acting on said tire.

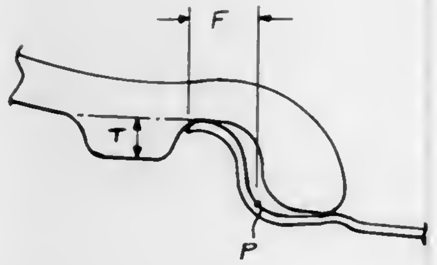
4,034,791
PNEUMATIC TIRE WITH REINFORCING BELT
Henri J. Mirtain, Compiegne, France, assignor to Uniroyal, S.A., Clairoix, France
Filed June 9, 1976, Ser. No. 694,276
Int. Cl.² B60C *9/18, 9/24*
U.S. Cl. 152—361 FP **34 Claims**



1. A pneumatic tire comprising an annular carcass having a radially outerlying crown portion, a tread constituting an annular cover surrounding the crown portion of said carcass, and an annular reinforcement belt interpositioned between the crown portion of said carcass and said tread, said reinforcement belt comprising, in cross-section, a pair of opposite, laterally disposed, crosswise spaced, first and second plies of a first cord material, each of said first and second plies being folded to form two respective flap portions having ends directed toward an equatorial plane of the tire and respective folded margins directed away from said equatorial plane, one of the flaps of each said first and second folded ply confronting at least a portion of the other said respective flap, a first ply of second cord material having opposite terminal ends being disposed between homologous ends of one of the pairs of corresponding opposite, laterally disposed flap portions such that said one pair of opposite, laterally disposed flap portions extends laterally beyond corresponding terminal ends of said first ply of second cord material in substantial alignment with said corresponding opposite terminal ends, and a second ply of said second cord material having opposite terminal ends, said second ply of second cord material being disposed adjacent said first ply of second cord material such that said second ply of second cord material does not extend laterally beyond the folded margins or between the confronting flap portions of the first and second folded plies, whereby said first and second plies of the first cord material are positioned at the marginal ends of said reinforcement belt and said first and second plies of the second cord material are positioned at the median portion of the reinforcement belt.

4,034,792
PNEUMATIC TIRE
Trevor M. Martin, Sterling Heights, Mich., assignor to Uniroyal Inc., New York, N.Y.
Filed Oct. 23, 1974, Ser. No. 517,357
Int. Cl.² B60C *17/00, 13/00, 15/00*
U.S. Cl. 152—379.1 **8 Claims**





1. The combination of a rim having two flanges against which the beads of a pneumatic tire are seated and a pneumatic tire mounted on the rim, the tire comprising: beads having inextensible bead members therein, sidewalls, and a tread, said sidewalls having their maximum spacing at a region of said sidewalls at a substantial distance from said flanges when the tire is inflated, each of said sidewalls having thereon a circumferentially extending rib adapted to surround the corresponding flange and spaced therefrom and located in close proximity thereto axially outside the outer end of said corresponding flange and extending radially inwardly of said corresponding flange when the tire is mounted on the rim and inflated, the overlap between each rib and the corresponding flange along a diameter of the tire when the tire is mounted on the rim and inflated being not substantially less than ten percent of the height of the corresponding flange along said diameter, said overlap and width of each rib being such that when the tire is mounted on the rim and deflated under load each rib abuts the corresponding flange and limits movement of the corresponding bead on the rim, whereby the tire is enabled to operate on the rim in a deflated condition.

4,034,793
PROCESS FOR CASTING A PLATE GRID FOR A LEAD-ACID STORAGE BATTERY
Tomoyuki Okura, Moriguchi; Takashi Tatsumi, Osaka; Hitoshi Watanabe, Moriguchi; Hiroaki Murayama, Moriguchi, and Yoichi Kobayashi, Moriguchi, all of Japan, assignors to Shin-Kobe Electric Machinery Co., Ltd., Tokyo, Japan
Filed Jan. 19, 1976, Ser. No. 649,984
Int. Cl.² B22C *9/22;* **B22D** *25/04, 27/16*
U.S. Cl. 164—63 **9 Claims**

1. A process for casting a plate grid for a lead-acid storage battery comprising the steps of preparing a casting die assembly including two interengagable die halves between which is formed a casting cavity to cast a plate grid therein, and pouring a molten metal of lead or lead alloy into said casting cavity to form said plate grid therein,

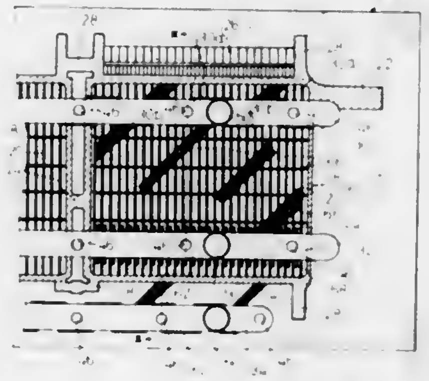
characterized by further comprising the step of venting any air in said casting cavity through gaps between said die

halves and then through a narrow air passage in at least one venting member received in either of said die halves so that said venting member is flush with the casting surface of the corresponding die half;

said air passing through an air path including a number of groups of obliquely extending parallel and linear narrow grooves in the casting surface of said corresponding die half, said narrow grooves being disposed across both of the longitudinal and latitudinal member forming groove portions of the casting cavity and reaching the air passage in the venting member whereby only the air reaches said air passage without any intrusion of said molten metal therein, said venting member at the top surface having cavity forming portions operatively associated with said die halves;

a space being provided in said venting member to communicate with said air passage to collect the air therein, and the air collected in said space forcedly exhausted through an air exhausting hole provided in said corresponding die half so as to communicate with said space in said venting member.

7. A casting die assembly for casting a plate grid for a lead-acid storage battery comprising two interengagable die halves having complementary casting cavity forming grooves; and an ingate to introduce a molten metal of lead or lead alloy into a casting cavity formed between said complementary casting cavity forming grooves,



characterized by further comprising at least one venting member received in a venting member receiving recess in either of said die halves on the casting surface thereof so that said venting member is flush with said casting surface of said corresponding die half, said venting member at the top surface having casting cavity forming portions operatively associated with said die halves;

a number of groups of obliquely extending parallel and linear narrow groove portions in the casting surface of the die half having said venting member receiving recess, said narror grooves forming an air path, an air passage formed between the wall of said venting member receiving recess and said venting member so as to communicate with said casting cavity forming grooves through said air path, said narrow grooves being disposed acorss both of the longitudinal and latitudinal member forming groove portions of the casting cavity and reaching the air passage in the venting member;

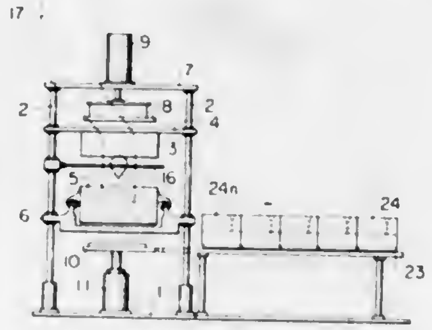
vent means to vent any air in said casting cavity through said air passge out of said die assembly, said vent means comprising a space provided in said venting member to communicate with said air passage and collect said air therein;

an air exhausting hole provided in said corresponding die half so as to communicate with said space in said venting member, and said air exhausting hole having a fitting to connect an exhauster to said air exhausting hole.

4,034,794
CASTING PROCESS WITH LIGNOSULFONATE-HUMATE-GRAPHITE MOLD COATINGS
Kenneth A. Gebler, Munster, Ind.; John M. Ferrara, Palos Heights, and Joseph V. Grothaus, South Holland, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.
Continuation-in-part of Ser. No. 627,645, Oct. 31, 1975, abandoned. This application Jan. 28, 1977, Ser. No. 763,468
Int. Cl.² B22C *3/00*
U.S. Cl. 164—72 **3 Claims**

1. In a method of forming steel ingots which comprises:
a. Coating the mold surface of an ingot mold;
b. Teeming molten steel into said mold;
c. Allowing said steel to solidify;
d. Removing said ingot from said mold;
the improvement comprising coating the mold prior to pouring with an aqueous dispersion comprising in percentages by weight:
  A. 1.0–1.0.0% of a humic acid or its alkali metal or alkaline earth metal salts;
  B 1.0–10.0% of graphite;
  C. 0.5–5.0% of an alkali metal lignosulfonate;
  D 75–97% of water.

4,034,795
FULL-AUTOMATIC MACHINE FOR CONTINUOUSLY FORMING HORIZONTAL SPLIT MOLDS IN SO-CALLED NON-PALLET AND NON-JACKET SYSTEM
Shigeji Otaki, 508-1 Aza-Idenoue, Tainoshima, Tamukae-cho, Kumamoto, Japan
Filed Jan. 7, 1975, Ser. No. 539,047
Claims priority, application Japan, Oct. 8, 1974, 49-115201; Oct. 8, 1974, 49-120941; Oct. 15, 1974, 49-123627; Oct. 15, 1974, 49-123628
Int. Cl.² B22C *15/08, 13/16, 17/00*
U.S. Cl. 164—173 **4 Claims**

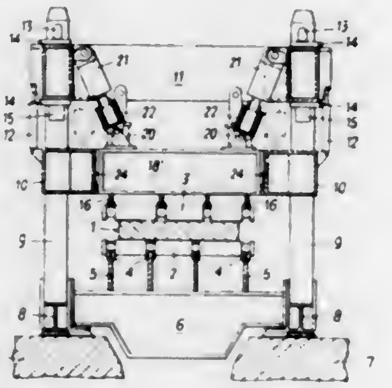


1. A vertical type machine, for continuously forming casting molds at high pressure, comprising, in combination, a bed plate; stays extending vertically upwardly from the corners of said bed plate; an upper mold frame support secured to the upper portions of said stays; an upper mold frame secured to said upper support to extend downwardly therefrom; a lower mold frame support mounted on said stays for vertical reciprocation therealong; a lower mold frame mounted on said lower support, a match plate supported on said stays for movement into and out of closing engagement with the lower surface of said upper mold frame, a stationary frame supported on the upper ends of said stays; an upper piston-cylinder actuator mounted on said stationary frame; an upper squeeze plate movable vertically by said upper actuator; a lower piston-cylinder actuator mounted on said bed plate; a lower squeeze plate movable vertically by said lower actuator; and a raw material sand tank mounted on said stationary frame and having its lower end bifurcated to form branched pipes having sand discharge outlets; said upper and lower mold frames being formed with ports registrable with said discharge outlets for blowing of sand into said mold frames.

4,034,796
CONTINUOUS CASTING PLANT ROLLER STAND

Lorenz Loibl, Baden; Werner Scheurecker, Linz; Franz Kagerhuber, Traun; Alois Scheinecker, and Gunter Holleis, both of Linz, all of Austria, assignors to Vereinigte Osterreichische Eisen- und Stahlwerke-Alpine Montan Aktiengesellschaft, Linz, Austria

Filed Aug. 30, 1976, Ser. No. 718,568
Claims priority, application Austria, Sept. 3, 1975, 6782/75
Int. Cl.² B22D *11/12*
U.S. Cl. 164—282 **3 Claims**



1. In a continuous casting plant roller stand of the type wherein two strand guiding parts are arranged opposite each other and are held together by drawing anchors, each of the strand guiding parts including roller carrying means on which rollers are arranged to lie opposite the rollers of the oppositely arranged strand guiding part, and wherein the roller carrying means of one of the strand guiding parts is movable relative to the surface of the strand to be cast by piston driving means and is guided in the roller stand, means protecting the rollers against overload, such as laminated springs, being provided and spacers to keep the rollers lying opposite each other at a predetermined distance, an improvement in one strand guiding part comprising:

said roller carrying means being a set of individually movable roller carriers carrying two rollers each,
said piston driving means actuating at least some of the individually movable roller carriers and including two piston driving elements for each of the roller carriers to be actuated thereby, the piston driving elements at one of their ends being connected to opposite ends of the pertaining roller carrier and at their other ends to the roller stand in such a manner that their ends connected to the roller stand are spaced at a distance exceeding the length of the pertaining roller carrier,
said means protecting the roller against overload being arranged at the ends of the piston driving elements, and said spacers being arranged at the drawing anchors.

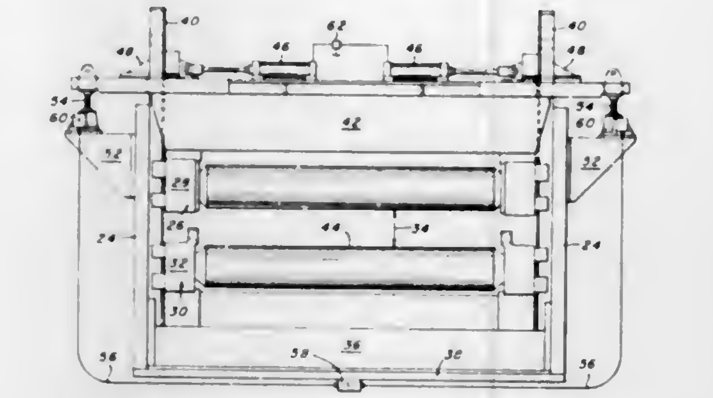
4,034,797
REMOTE-CONTROLLED INFINITELY ADJUSTABLE ROLL STAND

Quin Shen Yu, Forest Hill Borough, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Jan. 9, 1976, Ser. No. 647,697
Int. Cl.² B22D *11/12*
U.S. Cl. 164—282 **3 Claims**

2. In a roll-stand of a continuous caster which includes a frame which comprises a base member and respective side members extending perpendicularly from each end of said base member, a lower roll rotatably engaged in said frame, a subframe, an upper roll rotatably engaged in said subframe, said subframe being slidably engaged with said frame for movement in a direction parallel with said side members, wherein the axis of said lower roll is parallel to the axis of said upper roll, said frame being in a fixed position with respect to said caster, a means for adjusting the distance between said rolls, the combination therewith of an improved means for locking said rolls in their adjusted position, said locking means comprising:

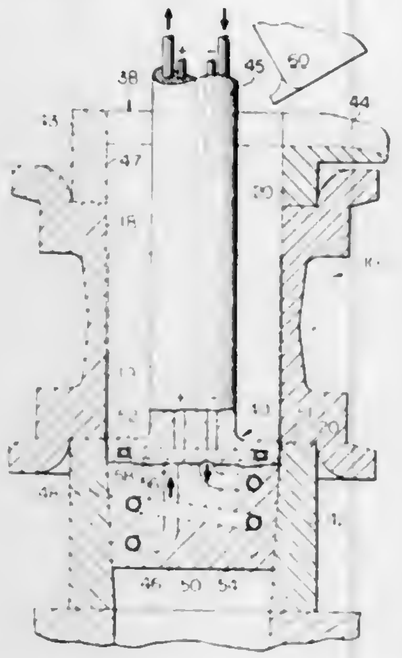
a. tapered keys slidably engaged with said subframe;
b. said frame having slots in said side members; and
c. remote-controlled means for engaging said tapered keys in said slots.



4,034,798
INTEGRALLY CAST BEARING, METHOD AND APPARATUS FOR MAKING SAME

Roger L. Boggs, Tazewell County; Harold L. Reinsma, and Glenn R. Gobble, both of Peoria County, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Division of Ser. No. 532,762, Dec. 16, 1974, Pat. No. 3,995,357. This application July 28, 1976, Ser. No. 709,149
Int. Cl.² B22D *15/02*
U.S. Cl. 164—281 R **2 Claims**



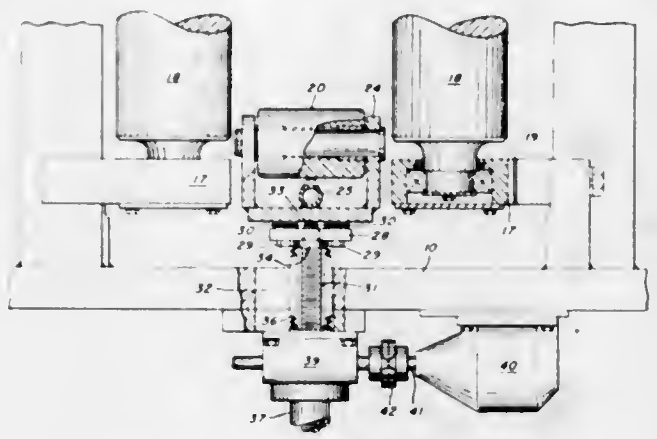
1. In an apparatus for casting a bearing integrally with a bore including a mandrel positionable in the bore, a bore facing surface of said mandrel being spaced from said bore a distance generally equal to the thickness of a molten material to be cast onto the bore, an improvement comprising:

cooling and solidifying means completely internal of said mandrel adjacent an end thereof which exits said bore last when said mandrel is drawn therefrom to progressively cool and solidify said material as said mandrel is drawn out of said bore by cooling said last exiting end of said mandrel; and
heating means in said mandrel intermediate said cooling and solidifying means and the other end thereof to maintain said material in a liquid state until said cooling and solidifying means passes thereadjacent as said mandrel is drawn out of said bore.

4,034,799
MECHANISM FOR ADJUSTING A GUIDE ROLL-RACK

Theodore T. Henke, Winfield Township, Butler County, and George J. Wagner, Jr., North Fayette Township, Allegheny County, both of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Oct. 30, 1975, Ser. No. 627,402
Int. Cl.² B22D *11/06;* B65G *13/00*
U.S. Cl. 164—282 **4 Claims**

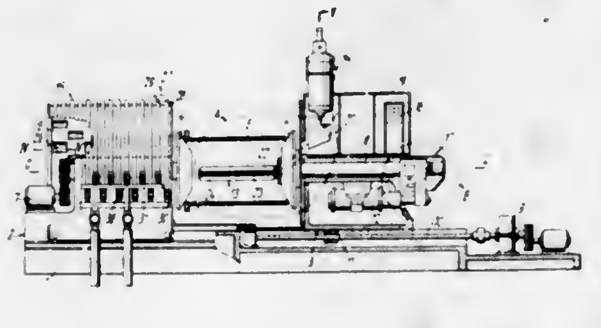


1. In a guide roll rack for confining a continuously formed casting which has broader and narrower faces, said rack including a frame, a plurality of rolls for contacting the broad faces of the casting, bearing means in said frame in which said rolls are journaled, a plurality of edge rolls for contacting the narrow faces of the casting, and bearing means in said frame in which edge rolls are journaled, the combination therewith of an improved mechanism for adjusting the position of said edge rolls and their bearing means to accommodate castings having different broad face dimensions, said mechanism comprising respective guide pins carried by the bearing means for said edge rolls, guide sleeves carried by said frame slidably receiving said pins, said pins supporting the bearing means for said edge rolls for movement in and out with respect to said frame, screw jacks connected to the bearing means for said edge rolls and extending through said frame, shafts and gearing mounted on the outside of said frame said screw jacks for moving said edge rolls and their bearing means in unison, and drive means remotely located connected to said shafts and gearing.

4,034,800
CENTRIFUGAL PLANT FOR PRODUCING BIMETALLIC SLEEVES

Alexandr Mikhailovich Pavlov, ulitsa Zapadnaya, 9, kv. 90; Alexandr Lukich Pyatibrat, ulitsa Pobedy, 20, korpus 4, kv. 56; Nikolai Dmitrievich Fomenko, prospekt Lenina, 31a, kv. 27; Nikolai Alexeevich Gorbachev, ulitsa Stalevarov, 4, kv. 42, and Viktor Loginovich Zotov, ulitsa Sovetskaya, 2/102, kv. 71, all of Elektrostal, Moskovskoi oblasti, U.S.S.R.

Filed Aug. 16, 1974, Ser. No. 498,221
Int. Cl.² B22D *13/02*
U.S. Cl. 164—288 **3 Claims**

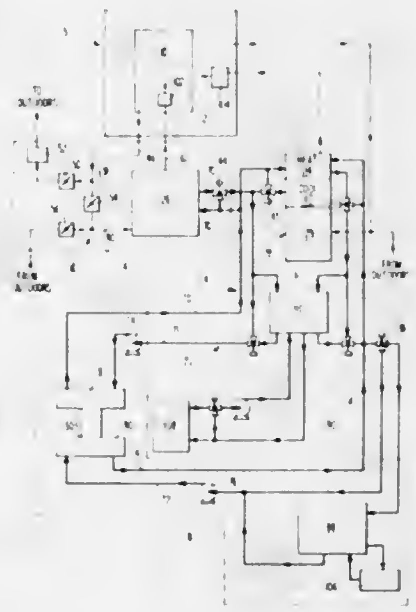


1. A centrifugal plant for producing thin-walled bimetallic sleeves (6) by pouring molten metal into the space of a sleeve that is rotated, the plant comprising: a bed (1); a stationary head stock (2) fixed rigidly on said bed; a tail stock (3) mounted movably on said bed and slidable along the axis of the sleeve being produced; cones (4,5) for high-precision centering and clamping the sleeve with direct contact from both sides, said cones being respectively set up on said head stock and said tail stock; a drive (7) mounted on said head stock for bringing its cone into rotation; a gear (9) installed on said bed for carrying said tail stock; a pneumatic drive (12) operatively associated with paid tailstock for centering and holding the sleeve between said cones in the course of the pouring of the metal so as to be rotated by said cones during the pouring; a fencing (16) mounted on said bed, movable towards the sleeve axis; a non-rotatable pouring device (13) operatively associated with one of said cones and provided with a pipe (22) insertable into the sleeve and along the axis of the latter, into which pipe the metal is fed, and which has an elongated opening (23) for discharging the metal; a chute (24) to which the metal is supplied through said elongated opening, said chute being rigidly connected to said pipe, inclined to the direction of rotation of the sleeve, and extending into close proximity of the internal wall of the rotated sleeve, so that the metal supplied to said chute is fed directly to said internal wall along the entire length of the sleeve, and flows off in the direction of rotation; means for forcefully feeding the metal into said pipe; and sprayers (26) staggered over the internal surface of said fencing and substantially annularly disposed for cooling the sleeves with a finely dispersed coolant, surrounding the outer periphery of the sleeve so that the entire external surface thereof is simultaneously exposed to the effect of the coolant.

4,034,801
OPTIMUM ENVIRONMENTAL CONTROL SYSTEM FOR A BUILDING

William F. Bernstein, Havertown, Pa., assignor to Robert J. Sigel, Inc., Narberth, Pa.

Filed Apr. 14, 1975, Ser. No. 568,051
Int. Cl.² F25B *29/00;* F24F *7/00*
U.S. Cl. 165—48 **7 Claims**



1. Apparatus for maintaining a controlled temperature in a building having first and second zones while utilizing a minimum amount of external energy for heat input to said zones, said first zone being located in the interior of the building and requiring a net removal of heat therefrom for the maintenance of said controlled temperature during the colder weather, said second zone being located within the building but more exterior than said first zone, said second zone requiring a net addition of heat thereto for the maintenance of said controlled temperature, said apparatus comprising:

a. air-handling means;
b. refrigeration means;
c. said air-handling means being adapted to transfer heat from said first zone to said refrigeration means;
d. said refrigeration means being adapted to transfer heat from said air-handling means to said second zone;
e. first control means for controlling the temperature in said first zone, said first control means including first means for controlling the mixing of air from outside the building with air from said first zone within the building;
f. second control means for controlling the temperature in said second zone by controlling said refrigeration means and said air-handling means, thereby to regulate the amount of heat transferred between said first and second zones, said second control means including means for controlling said refrigeration means;
g. said refrigeration means including a first fluid-loop heat-transfer means having therein a first fluid means as a heat transfer medium and a second fluid-loop heat-transfer means having therein a second fluid means as a heat transfer medium;
h. said refrigeration means further including:
  h-1. first heat-exchange means for removing heat from said first fluid means in said first fluid-loop heat-transfer means;
  h-2. second heat-exchange means for adding heat to said second fluid means in said second fluid-loop heat-transfer means.
  h-3. thermal connection means for optionally, selectably, thermally connecting said first heat-exchange means thereby optionally, selectably, facilitating the transfer of heat between said first fluid-loop heat-transfer means and said second fluip-loop heat-transfer means;
  h-4. first controller means for controlling said thermal connection means, thereby optionally selectably, permitting thermal connection of said first heat-exchange means and said second heat-exchange means in response to a sensed lower temperature of said second fluid-means heat-transfer medium below a first chosen temperature, and
  h-5. second controller means for controlling said thermal connection means, thereby permitting thermal connection of said first heat-exchange means and said second heat-exchange means, in response to an increase in the temperature of said first fluid means, which is utilized as a heat transfer medium, above a second chosen temperature.

4,034,802
RADIATOR MADE OF ALUMINUM FOR CENTRAL-HEATING PLANTS

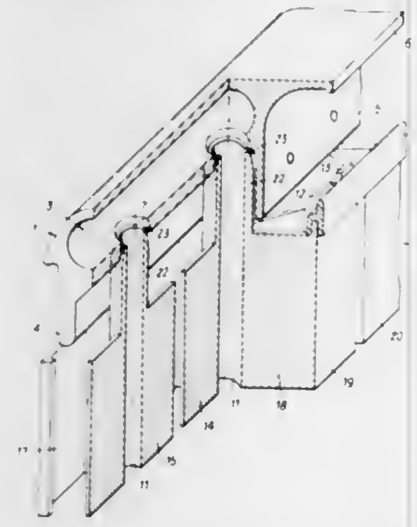
Alois Schwarz, Prantlstrasse near 53, St.Johann in Tirol, Austria

Filed Jan. 29, 1975, Ser. No. 545,029
Claims priority, application Austria, Aug. 7, 1974, 6474/74
Int. Cl.² F24H *9/08*
U.S. Cl. 165—55 **6 Claims**

1. A radiator made of extrudable heat conducting metal, comprising:

a pair of vertically spaced and parallel and elongated collector members each having contours extending parallel to the longitudinal axis thereof and as a result of an extruding thereof, said collector members having a first fluid conducting passageway extending therethrough and parallel to the longitudinal axis thereof, one of said contours being a flange extending generally horizontally from one side of at least the upper one of said collector members;

at least one elongated radiator member having fin-like contours thereon extending parallel to the longitudinal axis thereof and as a result of an extruding thereof, said fin-like contours including means defining a pair of horizontally spaced and parallel walls extending parallel to the longitudinal axis of said collector members, said radiator member having a second fluid conducting passageway extending therethrough and parallel to the longitudinal axis thereof and connected in fluid circuit with said first fluid conducting passageways in each of said collector members, said second fluid conducting passageway being located adjacent one of said walls of said radiator member and forming a hub from which said fin-like contours extend, said flange projecting over the upper ends of a major portion of said fin-like contours which are located between said hub and the other of said walls whereby a heated fluid supplied to said first and second fluid conducting passageways will heat said fin-like contours and air immediately adjacent thereto, said flange deflecting said rising heated air horizontally at the upper end of said radiator member;



at least the upper end of said radiator member has an elongated pipe piece coaxial with the axis of said second fluid conducting passageway and communicating therewith;

at least said upper one of said collector members includes means defining a third fluid conducting passageway communicating with said first fluid conducting passageway and adapted to receive said pipe piece therein; and

connecting means for connecting said collector members to said radiator member, said connecting means including means defining a elongated slot in said collector members extending parallel to the longitudinal axis thereof and adapted to straddle the edge one of said fin-like contours.

4,034,803
CORROSION RESISTANT TUBULAR AIR PREHEATER

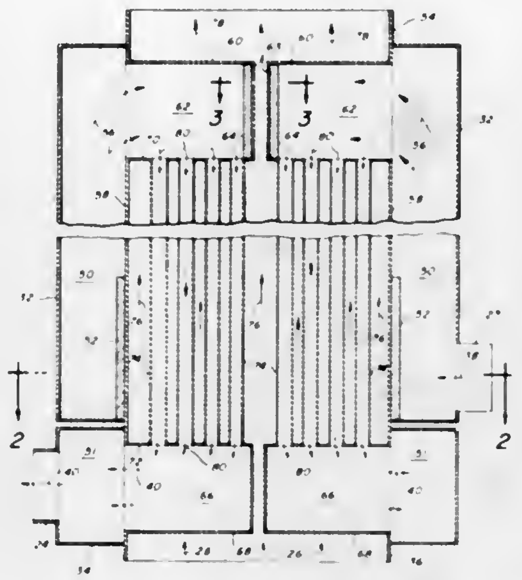
Robert D. Reed, and Wallace F. Hart, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed July 24, 1975, Ser. No. 598,782
Int. Cl.² F28F *19/00*
U.S. Cl. 165—103 **10 Claims**

1. A corrosion resistant tubular air preheater for transfer of heat from hot flue gases carrying corrosive vapors, without condensing said corrosive vapors, comprising:

a. an inner vertical cylindrical metal conduit or wall, for the upward flow of hot flue gas;
b. an outer vertical cylindrical metal wall of the same cross-section shape as said inner wall spaced outwardly from said inner wall forming an annular air inlet plenum;
c. a plurality of heat transfer elements and surfaces, including elements of narrow cross-section and including a plurality of vertical thin wall metal tubes connected between upper and lower plena;
d. said heat transfer elements inserted inside said inner wall with said upper plena connected to the top of said inlet plenum through said inner wall to an outlet plenum surrounding said inner wall below said inlet plenum;
e. inlet air conduit means connected to the bottom of said inlet plenum;
f. outlet air conduit means connected to said outlet plenum;

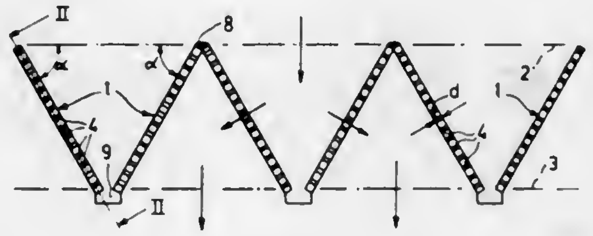
g. bypass means to control the flow velocity of cold air through said air preheater; and
h. thermal insulation covering selected portions of the heat transfer surfaces where condensation and corrosion is likely to occur;



whereby the cooling of said flue gases below the dew point of said corrosive vapors in the presence of water vapor is prevented.

4,034,804
MOTOR-CAR RADIATOR

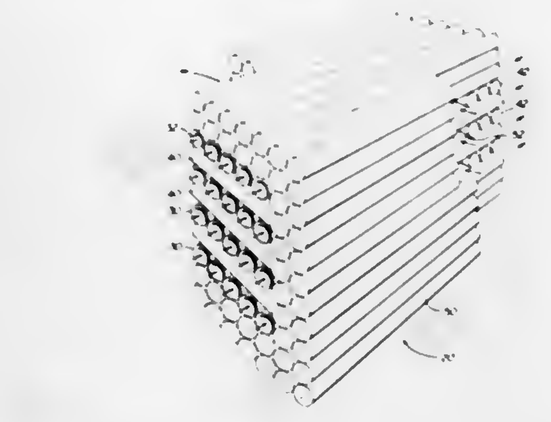
Roelf Jan Meijer, and Jan Mulder, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 379,708, July 16, 1973, abandoned, which is a continuation of Ser. No. 203,609, Dec. 1, 1971, abandoned. This application July 16, 1975, Ser. No. 596,020
Claims priority, application Netherlands, Sept. 23, 1971, 7113051
Int. Cl.² F28D *1/04*
U.S. Cl. 165—148 **9 Claims**



6. A radiator comprising at least one pair of substantially flat wall members having adjacent edges joined, forming a V-shape at the top and bottom ends thereof, junction means joining said adjacent edges, the closed part of the V being the rear of the radiator and the open part of the V being the front thereof, each wall member comprising a plurality of generally parallel pipes, a plurality of connection elements connecting said pipes in heat-transfer relationship and defining between these elements air ducts transverse of the plane of said wall member, the duct length being defined by the wall thickness having dimension L which is a maximum of 25 mm., the ducts also having a hydraulic diameter d_h, where L/d_h is less than 15, the radiator further comprising means for receiving water into and for discharging water from said pipes, said radiator comprising at least first and second of said V-shaped structures oriented similarly, with one wall member of one structure adjacent one wall member of the other structure, with adjacent front edges, second junction means joining said adjacent front edges along the length thereof, whereby the radiator defines in top and bottom views a zig-zag design.

4,034,805
RECUPERATOR STRUCTURES

Donald F. Mold, and Ronald G. Rice, both of Toledo, Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio
Continuation of Ser. No. 333,393, Feb. 16, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,791
Int. Cl.² C03C *23/20;* **C03B** *32/00;* **F28D** *7/00;* **F28F** *1/00*
U.S. Cl. 165—165 **4 Claims**



1. A counter-flow recuperator heat exchange assembly comprising

plural layers of first elongated hollow tubes of glass ceramic material each open at their opposite ends, said hollow tubes having an inside wall diameter-to-wall-thickness ratio of at least 6.0, said layers of first tubes being disposed in spaced apart parallel relation lengthwise of the recuperator structure having their openings at the opposite ends of said structure,

the first tubes in said layers being adapted for receiving a first fluid at one open end thereof and discharging said fluid at the opposite open end thereof,

plural layers of second elongated tubes of glass ceramic material each open at their opposite ends, said layers of second tubes being disposed in spaced apart relation and separated by a layer of said first tubes, said second tubes being of similar diameter-to-thickness ratio and substantially shorter in length than the first tubes, and disposed in each layer parallel to each other and substantially parallel to the tubes of said first tube layers,

the second tubes in said layers being adapted to receive a second fluid at one open end thereof, conduct said fluid in parallel counter-flow heat exchange relationship with said first fluid flowing in the layers of said first tubes, and discharge the second fluid at the opposite open end thereof,

sealant means bonding the walls of the superimposed first and second tubes of the several layers to one another by a sintered, powdered ceramic sealant material fused to the respective walls of said tubes, and

plural sets of rods of glass ceramic material disposed in each of the layers of said second tubes and spaced from both of the open ends of the second tubes in each of the layers thereof collectively enclosing the spacing around the open ends of the second tubes defining an inlet port at the one side of the recuperator structure for receiving said second fluid and connected to one open end of all of the second tubes and an outlet port at the opposite side of the recuperator structure for delivering said second fluid and connected to the other open end of all of the second tubes,

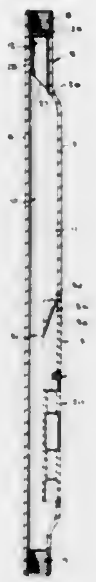
the inlet and outlet ports being connected only to each other through the hollow second tubes in the alternating layers thereof between said layers of first tubes,

the rods of said sets being fusion connected together and to the walls of said first and second tube layers to form an integral assembly.

4,034,806
TUBING SIDE POCKET MANDREL

Ferdinand M. McGinn, and Gerald P. Hebert, both of Lafayette, La., assignors to Production Specialties, Inc., Lafayette, La.

Filed Sept. 13, 1976, Ser. No. 722,533
Int. Cl.² E21B *23/00*
U.S. Cl. 166—117.5 2 Claims

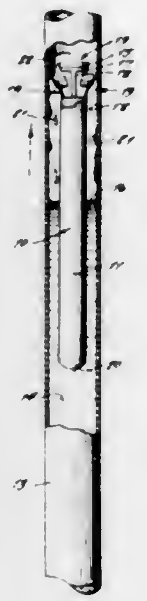


1. In a mandrel for use in a well tubing in which the mandrel body has an open bore for alignment with the well tubing and a pocket offset from the open bore for flow control devices, the invention comprising:
- a. a combination guide and guard aligned with the pocket, said guide and guard including:
  - 1. a semicircular housing forming part of the mandrel;
  - 2. sides facing towards the open bore;
  - 3. a curved sloping surface on the upper inner end of said semicircular housing which permits only flow control devices of predetermined size to pass therethrough and into the pocket; and
  - 4. vertically extending edge surfaces formed on the inner end of each of said sides,
- b. projection means between the pocket and the combination guide and guard to retain flow control devices in the pocket;
- c. an orienting sleeve in the open bore above the pocket for aligning a flow control device to be positioned in the pocket, said orienting sleeve including:
  - 1. an elongated hollow tubular body having an upper and lower end;
  - 2. said lower end extending upwardly at an angle relative to the longitudinal axis of said tubular body to form a sloping guide surface which extends upwardly and away from the pocket;
  - 3. a first slot extending longitudinally of said tubular body from the highest portion of said guide surface, said first slot terminating in spaced relation to said upper end of said tubular body;
  - 4. a second slot extending from the upper end of said first slot to the upper end of said tubular body; and
  - 5. said second slot being substantially smaller in width than said first slot to form a pair of aligned shoulders at the juncture of said first and second slot which are spaced from each other by said second slot whereby debris may discharge from said first slot through said second slot and into the tubing.

4,034,807
INSIDE PIPE WIPER

Edgar N. Prince, Great Bend, Kans., and George Spector, New York, N.Y., assignors to Edgar N. Prince, Great Bend, Kans.

Filed Aug. 12, 1975, Ser. No. 603,799
Int. Cl.² E21B *37/02*
U.S. Cl. 166—170 3 Claims



1. In an inside pipe wiper, the combination of an elongated barrel which at its upper end supports a plurality of wiper blade units each having a wiper blade for wiping an inside of a pipe, said barrel being of a specific weight so to float upon a surface of a mass of mud and oil with an upper end of said barrel extending upwardly above a surface of said mass, said blade units each comprising a flexible flat spring steel tongue connected to said barrel, said flat tongue normally urging said blades radially outwardly, said blades overlapping each other at their ends.

4,034,808
METHOD FOR PUMP-OFF DETECTION

Maurice M. Patterson, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Sept. 20, 1976, Ser. No. 724,838
Int. Cl.² E21B *47/00*; F04B *49/02*; G01L *5/00*
U.S. Cl. 166—250 7 Claims

1. A method for measuring the energy input to the rod string in a rod pumping unit comprising:
- measuring the load on the rod;
- obtaining the velocity of the rod; and
- multiplying the load times the velocity and integrating the product to obtain the energy input for each stroke in real time.

4,034,809
HYDROLYZED POLYACRYLAMIDE LATICES FOR SECONDARY OIL RECOVERY

Kenneth G. Phillips, River Forest; Robert Bernot, Chicago, and Edward G. Ballweber, Glenwood, all of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Filed Mar. 17, 1976, Ser. No. 667,767
Int. Cl.² E21B *43/22*
U.S. Cl. 166—270 12 Claims

1. A process for recovering oil from subterranean oil-bearing formations which comprises introducing via a well bore into said formations in the presence of water under inversion conditions, a treating medium comprising an acrylamide-acrylic acid copolymer, said acrylamide-acrylic acid copolymer having been formed by hydrolyzing a water-in-oil emulsion contained dispersed therein from 10-45% by weight of finely divided acrylamide polymer to such an extent that between 0.8 and about 67% of the amide groups originally present in the acrylamide polymer have been converted into carboxyl groups wherein the hydrolyzed water-in-oil emulsion of the treating medium is inverted after the treating medium is introduced into the oil-bearing formation.

4,034,810
OIL RECOVERY

Carl C. Holloway, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Dec. 1, 1975, Ser. No. 636,483
Int. Cl.² E21B *43/16*
U.S. Cl. 166—274 8 Claims

1. A process for the recovery of oil from subterranean formations comprising:
- a. injecting an oil-miscible fluid into the formation via at least one injection well to miscible displace oil,
- b. injecting gas and an aqueous liquid via at least one injection well into the formation to establish a two-phase gas/aqueous liquid system in the formation following said oil-miscible fluid under the provision that said gas and aqueous liquid are injected into said formation at a volume ratio which corresponds to a minimum total mobility and which is defined as that volume ratio of gas to aqueous liquid for which the total mobility for the two-phase gas/aqueous liquid system as a function of said volume ratio is at a minimum value,
- c. moving at least a portion of said oil-miscible fluid through the formation followed by said two-phase gas/aqueous liquid system and into at least one production well, and
- d. recovering oil-containing fluid from said production well.

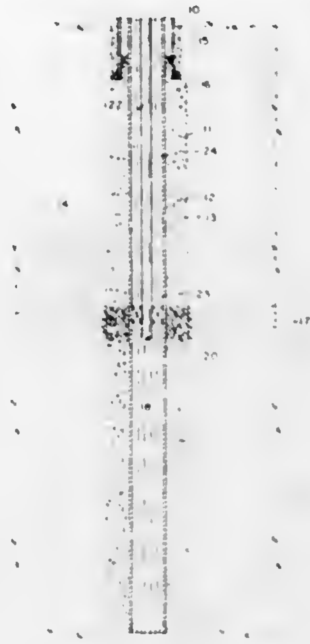
4,034,811
METHOD FOR SEALING A PERMEABLE SUBTERRANEAN FORMATION

Derry D. Sparlin, Ponca City, Okla., and Robert E. Crumb, Fort Worth, Tex., assignors to Continental Oil Company, Ponca City, Okla.

Filed Nov. 20, 1975, Ser. No. 633,764
Int. Cl.² E21B *33/138*
U.S. Cl. 166—295 6 Claims

1. A method for sealing a permeable subterranean formation adjacent to a wellbore wherein the method comprises:
- a. adding furfuryl alcohol to the wellbore at a site adjacent to the permeable subterranean formation,
- b. adding an acidic catalyst, selected from the group consisting of hydrochloric acid, phosphoric acid, and hypophosphorous acid, to the furfuryl alcohol at the site referred to in step (a),
- c. allowing polymerization to occur both in the wellbore and in the adjacent subterranean formation, and
- d. removing the polymerized material from the wellbore.

2. A method for sealing a permeable subterranean formation adjacent to a wellbore wherein the method comprises:
- a. adding sand to a slotted liner within a wellbore to the lower level of the area to be treated,
- b. adding gravel or similar material to the annulur space between the slotted liner and the underreamed wellbore,
- c. adding a liquid polymerizable material to the slotted liner at a site adjacent to the permeable subterranean formation,

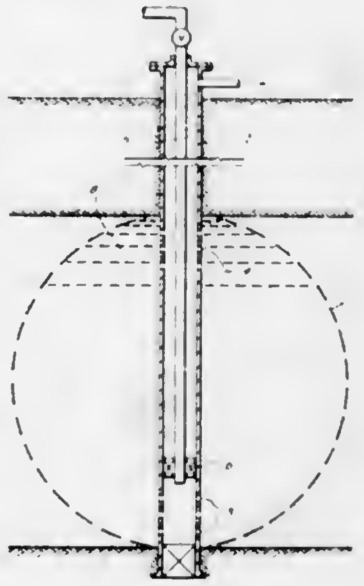


- d. adding an acidic catalyst to the liquid polymerizable material at the site defined in step (c),
- allowing polymerization to occur both in the wellbore and in the adjacent subterranean formation, and
- f. removing the polymerized material and the sand from the slotted liner.

4,034,812
METHOD FOR RECOVERING VISCOUS PETROLEUM FROM UNCONSOLIDATED MINERAL FORMATIONS

Richard H. Widmyer, Houston, Tex., assignor to Texaco Inc., New York, N.Y.

Filed July 28, 1975, Ser. No. 599,563
Int. Cl.² E21B *43/22*, *43/24*
U.S. Cl. 166—303 20 Claims



1. A method of recovering viscous petroleum from a subterranean, viscous petroleum-containing permeable formation, said formation containing a mineral matrix which is granular and substantially unconsolidated, including a tar sand deposit, said formation being penetrated by at least one well, said well containing two separate communication paths, the first communication path being between the surface of the earth and a

protion of the formation near the bottom thereof, and the second communication path being between the surface and portion of the formation near the top thereof, comprising:

a. introducing a heated fluid into the formation via the first communication path, at a gradually increasing injection pressure to a predetermined value less than the overburden fracturing pressure;

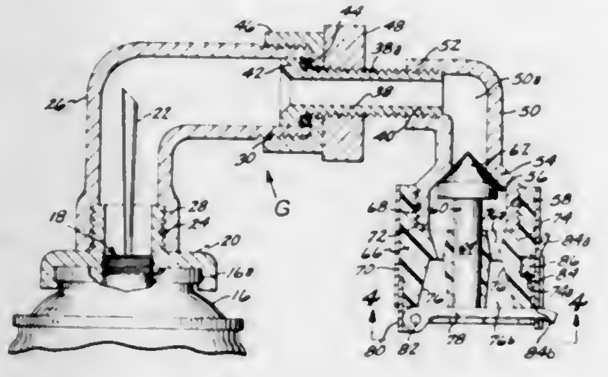
b. maintaining the heated fluid in the formation for a predetermined period of time sufficient to heat the viscous petroleum and allow the unconsolidated granular mineral matrix material to settle toward the bottom of the formation,

c. recovering viscous petroleum which has accumulated above the granular, unconsolidated material which is settled toward the bottom of the formation via the second communication path; and

d. repeating the above steps for a plurality of cycles to expand the zone from which petroleum is recovered adjacent the production well.

4,034,813
COMBINED FIRE EXTINGUISHER AND AUDIBLE ALARM

Norman C. Le Day, 11722 Palmwood Drive, Garden Grove, Calif. 92640
Filed Oct. 3, 1975, Ser. No. 619,447
Int. Cl.² A62C *3/00, 37/24;* **G08B** *17/04*
U.S. Cl. 169—26 **4 Claims**



1. A combined fire extinguisher and audible alarm capable of being adjustably supported from a wall to protect a desired area adjacent said wall:

a. a cylindrical container for a pressurized fire extinguishing fluid, said container including a top that supports an apertured normally closed valve;

b. a bracket that supports said container from said wall;

c. a first right angle tube that has first and second end portions;

d. first means for removably securing said first end portion to said top in communication with said valve;

e. second means for maintaining said valve in an open position when said first end portion is secured to said top;

f. a nozzle having a plurality of passages therein of such configuration that an audible noise is emitted therefrom as pressurized fluid flows therethrough;

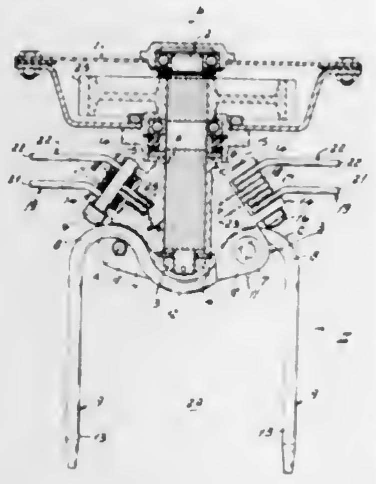
g. third means for adjustably supporting said nozzle from said second end portion;

h. a valve member movably supported in said nozzle, said valve member capable of occupying either a first or second position, said valve member when in said first position preventing flow of said pressurized fire extinguishing fluid through said passages; and

i. heat sensitive means that maintain said valve member in said first position until the temperature of the ambient atmosphere around said combined fire extinguisher and audible alarm rises above a predetermined maximum as a result of a fire in said area whereupon said heat sensitive means allows said pressurized fluid to move said valve member to said second position in which said pressurized fire extinguishing fluid discharges through said passages with emission of an audible noise to be transformed into a spray to extinguish said fire.

4,034,814
ROTARY HARROWS

Cornelis van der Lely, 7, Bruschenrain, Zug, Switzerland
Filed Sept. 9, 1975, Ser. No. 611,795
Claims priority, application Netherlands, Sept. 11, 1974, 7412052
Int. Cl.² A01B *33/06, 33/10*
U.S. Cl. 172—59 **13 Claims**



1. A soil-cultivating implement or rotary harrow comprising a frame and a plurality of soil-working members supported on said frame in a row that extends transverse to the normal direction of travel, at least one of said soil-working members being mounted on an upwardly extending shaft and comprising a support on said shaft, at least two soil-working tools connected to said support at the same side of the shaft, one above the other, and each tool being spaced laterally from said shaft, each of said two tools comprising a resilient tine and the tines of said two tools being deflectable above axes, the axes about which the tines are deflectable being inclined to one another.

4,034,815
BLADE LIFT FLOAT CIRCUIT FOR MOTOR GRADERS

Joseph E. Dezelan, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 20, 1975, Ser. No. 560,058
Int. Cl.² E02F *3/76;* **F15B** *13/04, 13/08*
U.S. Cl. 172—809 **7 Claims**

1. In a vehicle of the type having a work tool mounted thereon, at least one double acting cylinder, means connecting said cylinder to said work tool for selectively moving the same; a fluid circuit comprising:

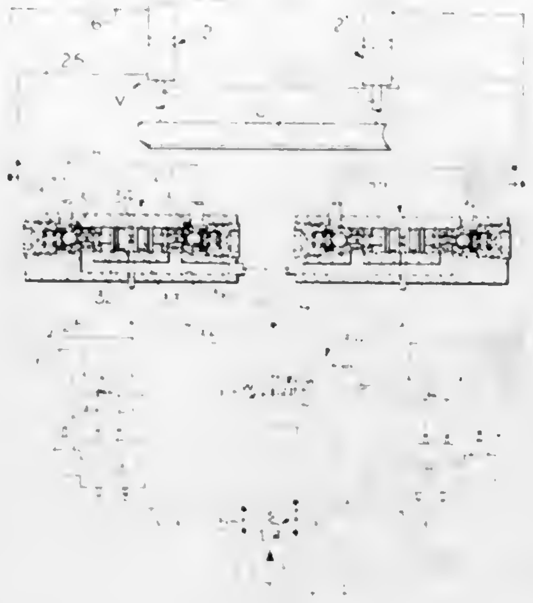
a fluid source;

means for pressurizing said fluid;

first control valve means for selectively communicating fluid from said means for pressurizing fluid via first passage means to rod and head ends of said cylinder;

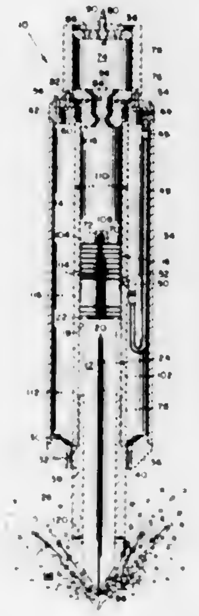
normally closed second control valve means including a housing defining bore, a pair of check valves mounted in said bore and each operatively connected via second passage means to said first passage means and normally blocking communication from a respective rod or head end of said cylinder, a pair of back-to-back pistons reciprocally mounted in said bore and defining with said bore a working chamber therebetween, said housing further defining a sole internal passage means directly communicating each of said check valves one to the other for receiving fluid therefrom upon opening thereof and further directly communicating with said fluid source; and,

third control valve means comprising a two position directional control valve movable between a normally closed position communicating said working chamber with said fluid source and an open position communicating pressurized fluid from said means for pressurizing fluid to said working chamber for urging said back-to-back pistons apart to directly interconnect said rod end of said cylinder, said head end of said cylinder and said fluid source.



4,034,816
DEMOLITION TOOL

Louis L. Lutich, 1714 Searcy, San Antonio, Tex. 78232, and Jesse W. Harris, 527 Sonnet Drive, San Antonio, Tex. 78216
Filed May 4, 1976, Ser. No. 683,173
Int. Cl.² B25D *1/00*
U.S. Cl. 173—15 **10 Claims**



1. A demolition tool for breaking solid materials, said demolition tool connecting to a source of low pressure gas, said demolition tool comprising:

outer housing means having an elongated axis;

inner housing means carried by and spaced apart from said outer housing means, said inner housing means being located within said outer housing means;

projectile means axially extendable from said inner housing means to a first predetermined point and retractable within said inner housing means to a second predetermined point, said projectile means having an enlarged upper portion;

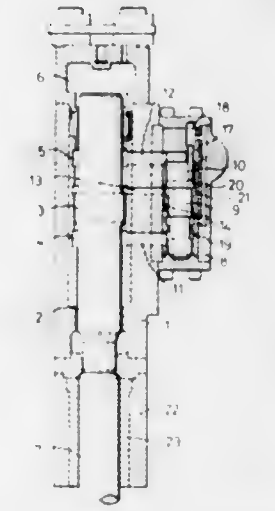
passage means for connecting said source of low pressure gas below said enlarged upper portion of said projectile means when said projectile means reaches an intermediate point between said first and second predetermined point during its upward movement in response to pressing said projectile means against said solid materials, said low pressure gas moving said projectile means upward to said second predetermined point;

means for periodically connecting high pressure gas through an upper opening in said inner housing means, said high pressure gas acting against a reduced cross-section area of said enlarged upper portion of said projectile means to drive said projectile means downward in response thereto, said high pressure gas acting against the entire enlarged upper portion upon said projectile means reaching a third predetermined point during its downward movement, said projectile means striking said solid material as said projectile means extends from a lower opening in said inner housing means; and

means for exhausting said high pressure gas from above said enlarged upper portion of said projectile means when said projectile means reaches a fourth predetermined point during the downward movement thereof.

4,034,817
IMPACT TOOL

Hiroshi Okada, Suita, Japan, assignor to Nippon Pneumatic Manufacturing Co., Ltd., Osaka, Japan
Filed Jan. 19, 1976, Ser. No. 650,027
Claims priority, application Japan, Mar. 18, 1975, 50-34774
Int. Cl.² B25D *9/00*
U.S. Cl. 173—134 **1 Claim**



1. An impact tool to be connected to a fluid source comprising:

a hollow cylinder having a closed upper end;

a tool holder secured to the lower end of said hollow cylinder;

a chisel movably mounted in said tool holder;

piston means reciprocally mounted in said hollow cylinder above said chisel for striking said chisel when said piston means moves downward, said piston means forming an upper chamber above itself within said hollow cylinder, and said piston means further having a larger diameter portion intermediately of its length, said larger diameter portion forming a lower chamber therebeneath and a middle chamber thereabove;

constant pressure means connected to the top of said hollow cylinder for supplying a constant pressure in said cylinder above said piston means;

a valve box attached to said hollow cylinder and having a fluid supply port thereinto and a fluid discharge port therefrom, said valve box further having a hollow valve chest therein connected at the lower portion thereof to said supply port and at the top portion thereof to said discharge port, said valve chest also being connected by first, second and third openings respectively to said lower, middle and upper chambers formed when said piston means is in its lowermost position;

a valve body having a longitudinal opening therethrough slidably mounted in said valve chest, said valve body having an outwardly extending flange surrounding the upper end thereof, said valve body in said hollow valve chest communicating fluid from said supply port through said valve chest into said lower chamber through said first opening when said valve body is in its lowermost position in said hollow valve chest, whereby fluid from said supply port can flow into said lower chamber and force upward against said piston means, and said opening through said valve body communicates said lower chamber with said discharge port when said valve body is in its uppermost position, whereby fluid can be expelled from beneath said piston means through said first opening into said valve chest and out said discharge opening;

rod means of smaller diameter than said valve body mounted within said valve box above said valve body and operatively connected to said supply port for forcing downward against said valve body due to the pressure of the fluid from said supply port;

said third opening connecting said upper chamber to said valve chest above said valve body therein; and

said second opening connecting said middle chamber above said larger diameter portion of said piston means having two branches connected into said valve chest beneath said flange on said valve body when said valve body is in its lowermost position.

4,034,818
SCALES, IN PARTICULAR SHOP SCALES

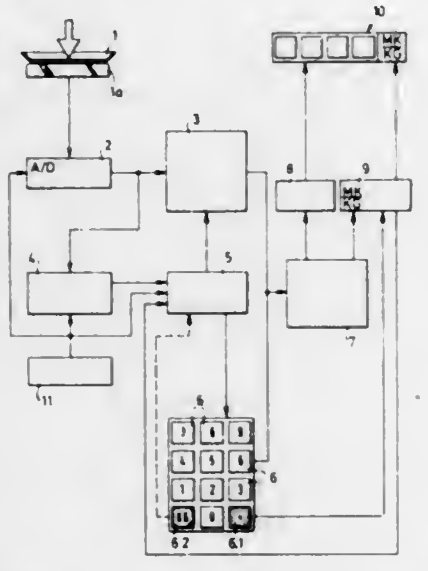
Waltteri Mattilainen, Helsinki, Finland, assignor to Vaaka-Nyholm, Finland

Filed Oct. 16, 1975, Ser. No. 623,034

Claims priority, application Finland, Oct. 24, 1974, 743109; Sept. 22, 1975, 752650

Int. Cl.^{2} G01G *19/40*

U.S. Cl. 177—25 **6 Claims**



1. In a scale with display means for digitally displaying weight, price per unit weight, and price data and having weight computing means for computing weight at automatically repeated periods, manual entry price means for entry of price per unit weight data, and calculator means supplied with the data from the weight computer means and manual entry price means, said calculator means computing price data, wherein the improvement comprises said manual entry price means and weight computing means having a common input to the calculator means, said display means being supplied with data from the calculator means and displaying weight, price per unit weight, and price sequentially, and selector means connected to the weight computing means and manual entry price means for allowing the passage of price per unit weight and price data sequentially after weight data has been unchanged during at least two of said repeated periods.

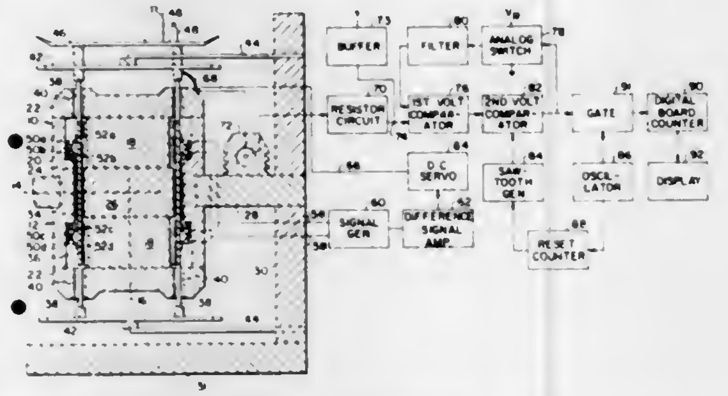
4,034,819
ELECTROMAGNETIC COMPENSATING BALANCE

Clifford B. Akers, San Jose; Roy A. Applequist, Sunnyvale; James E. Applequist, Saratoga, and D. James Guzy, Menlo Park, all of Calif., assignors to Arbor Laboratories, Inc., Palo Alto, Calif.

Filed Dec. 15, 1975, Ser. No. 641,152

Int. Cl.^{2} G01G *7/00*

U.S. Cl. 177—210 C **12 Claims**



1. An electromagnetic compensating balance device for measuring forces comprising:

a stationary permanent magnetic circuit means for generating a magnetic field;

an electromagnetic coil means movably mounted in said stationary magnetic circuit means for displacement relative thereto, said coil means including structural means for orienting said coil means with respect to said permanent magnet means for limited linear displacement on a predetermined axis;

transducer means mounted partially on said magnet circuit means and partially on said coil means for detecting displacements of said coil means relative to said stationary magnet and circuit means and defining a reference position of said coil with respect to said permanent magnet means, said transducer means including first means for compensating for error producing dimensional changes in said coil structure means along said axis and second means for compensating for positional changes of said coil structure means skew to said axis and for local environmental changes;

transducer circuit means cooperating with said transducer means for generating a transducer output signal related to displacements of said coil means from said reference position;

servo circuit means controlled by said transducer output signal for generating a direct current signal for driving said coil means toward said reference position; and

coil circuit means connecting said servo circuit means and said coil means for applying said current signal to said coil and actuating said coil toward said reference position, said coil circuit means including circuit means for providing an analog output signal representative of the magnitude of said direct current signal.

4,034,820
SUSPENSION SYSTEM FOR A SNOWMOBILE

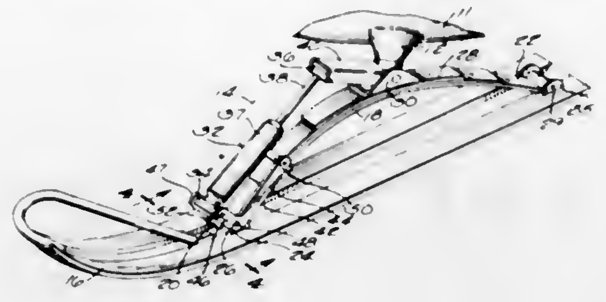
Thomas L. Barnhardt, Menomonee Falls, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.

Filed Mar. 24, 1976, Ser. No. 670,054

Int. Cl.^{2} B62M *27/02*

U.S. Cl. 180—5 R **9 Claims**

3. A suspension system for supporting a snowmobile body having a downwardly extending ski post comprising ski means disposed beneath the ski post, an elongated spring secured to the ski post for biasing the snowmobile body against substantially downward movement, shock absorber means having a lower end, and having an upper end secured to one of the ski post and said spring and a bell crank member having a first arm slidably engaging said elongated spring, having a second arm with an end portion secured to said lower end of said absorber means, and also having a junction portion between said arms, said junction portion being pivotally connected to said ski means, whereby to displace said lower end of said shock absorber means toward said upper end of said shock absorber means in response to a relative movement of said ski post toward said ski means.



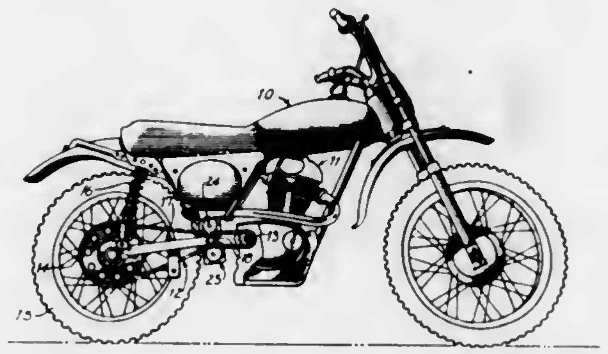
4,034,821
MOTORCYCLE CHAIN DRIVE

Richard B. Stoddard, and Harold T. Stoddard, both of Rte. 1, Box 15, Orofino, Idaho 83544

Filed June 9, 1976, Ser. No. 694,208

Int. Cl.^{2} B62M *9/02*

U.S. Cl. 180—32 **9 Claims**



1. In a powered wheel vehicle having a drive mechanism including a drive sprocket, a driven sprocket, an endless chain directly interconnecting the drive and driven sprockets and a swing arm means pivotably mounting the driven sprocket to the vehicle for about a transverse pivot axis located between the drive sprocket and driven sprocket axes; an improvement comprising:

first idler means above the pivot axis for engaging the endless chain from above its upper flight;

second idler means below the pivot axis for engaging the endless chain from below its lower flight;

wherein the first and second idler means are located so as to engage the chain flights at positions diametrically opposed to one aother through the pivot axis.

4,034,822
HITCH-STEERING, OSCILLATION AND DIFFERENTIAL SUPPORT FOR A MINING MACHINE OR THE LIKE

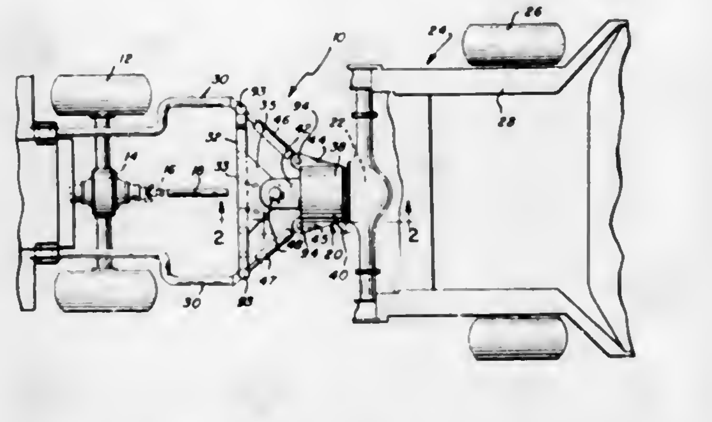
Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 5, 1976, Ser. No. 674,027

Int. Cl.^{2} B62D *59/00*

U.S. Cl. 180—51 **8 Claims**

1. A vehicle having a tractor portion and a trailer portion, a differential housing mounted on said trailer portion, a trunnion housing fastened directly to said differential housing, said trunnion housing being cylindrical in shape and projecting along an axis transverse to the axis of the differential housing, an oscillation housing encircling said trunnion housing and being rotatably mounted on said trunnion housing, said oscillation housing having a pair of outwardly extending vertically spaced apart tongues and a pair of horizontally spaced apart ears, a pair of vertically spaced apart tongues carried by said tractor and being pivotally connected to said tongues on said oscillation housing to permit pivotal movement between the tractor and trailer about the vertical axes of said pivotal connection, a pair of steering cylinders having one end of each mounted in spaced apart relationship on said tractor, the other end of each steering cylinder being connected to one of said ears on said oscillation housing whereby actuation of said steering cylinders pivots the tractor relative to the trailer about the vertical axes of the pivotal connection while permitting oscillation of the tractor relative to the trailer about the longitudinal axis of the trunnion housing and the oscillation housing.



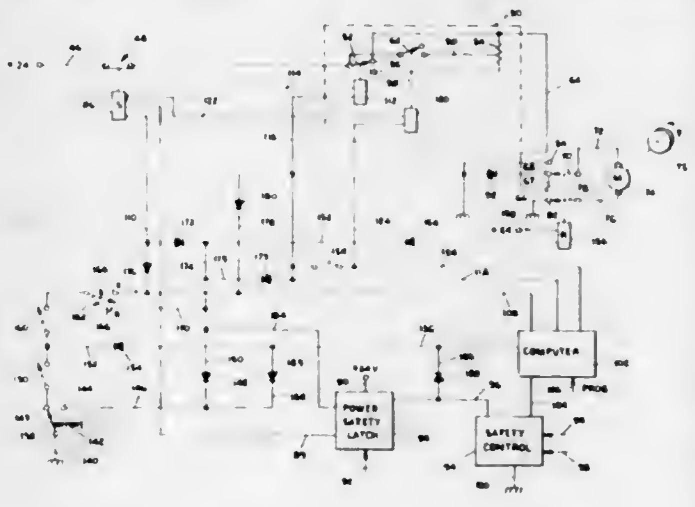
4,034,823
MANUAL REVERSE CONTROL FOR A MANUALLY OPERABLE AUTOMATICALLY CONTROLLED VEHICLE

Robert W. Houskamp, Grand Rapids, and Thomas E. Hainsworth, Alto, both of Mich., assignors to Lear Siegler, Inc., Santa Monica, Calif.

Filed Dec. 3, 1975, Ser. No. 637,196

Int. Cl.^{2} B62D *51/04*

U.S. Cl. 180—98 **18 Claims**



1. In a vehicle having:

a front and a back;

at least one steerable wheel;

drive means for driving said vehicle along a surface;

means coupled to the steerable wheel and to the drive means for automatically controlling the vehicle to follow a predetermined guide path;

a door positioned at the front of the vehicle;

manual control means positioned behind said door for manually controlling the steerable wheel and drive means while overriding said automatic control means such that said door must be opened in order to obtain access to said manual control means;

the improvement which comprises:

reverse control means, including a manually operable means positioned at an exterior location of said vehicle, coupled to said drive means to drive said vehicle in a reverse direction upon actuation of said manually operable means;

whereby said vehicle can be manually driven in a reverse direction without opening of said door.

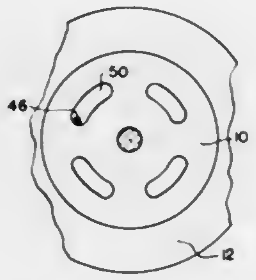
4,034,824
VEHICLE WHEEL LOCK ASSEMBLY

Harold P. Lucas, Detroit, Mich., assignor to Harold P. Lucas, Detroit, Mich.

Filed Dec. 29, 1975, Ser. No. 644,956

Int. Cl.^{2} B60R *25/08;* **B60T** *1/06*

U.S. Cl. 180—114 **4 Claims**



1. A vehicle wheel lock assembly for enabling the operator of a vehicle having a frame to lock two or more of the four wheels, at will, said vehicle wheel locking means comprising opposed pairs of reciprocal normally retracted locking rods guidably mounted on and movable transversely of said frame, adapted when advanced to respectively interlock with the adjacent wheels;

a pair of spaced manually reciprocal actuating rods guidably mounted on and movable longitudinally of said frame;

a control housing within the vehicle;

a manually operable control lever projected from and mounted upon said housing operably connected to said actuating rods for effecting selective reciprocal movements thereof;

and gear means on said frame interconnecting said locking rods and actuating rods, for establishing and disestablishing an operative locking connection between said locking rods and the adjacent vehicle wheel.

4,034,825
POWER ASSISTED VEHICLE STEERING

Frederick John Adams, Campton, England, assignor to Cam Gears Limited, Hitchin, England

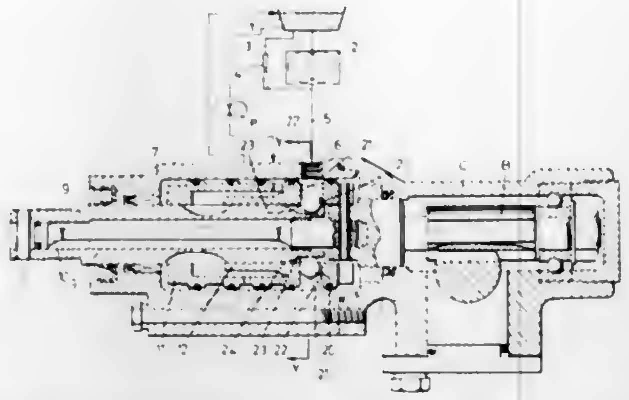
Filed Jan. 30, 1974, Ser. No. 437,930

Claims priority, application United Kingdom, Feb. 1, 1973, 5048/73

Int. Cl.^{2} B62D *5/08*

U.S. Cl. 180—143 **10 Claims**

1. A power assisted vehicle steering assembly comprising: a steering gear having a driving and a driven gear; a fluid servo mechanism operatively associated with said driven gear for providing assist thereto; a fluid control valve having a first portion operatively associated with said driving gear and a second portion operatively associated with the first valve portion to control fluid flow to said servo mechanism and adapted for manual actuation; a resilient member normally interconnecting the first and second valve portions permitting a relative displacement therebetween in response to manual actuation; locking means for selectively preventing relative displacement between said valve portions by interconnecting the first and second valve portions to eliminate the resilient member connection between said first and second valve portions; and means for controlling said locking means.



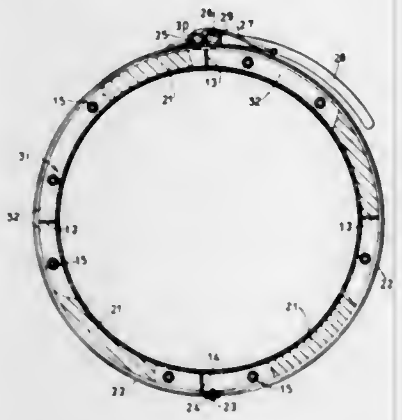
4,034,826
SILENCER FOR VENTILATION DUCTS

John S. Andrews, Barry, England, assignor to H. H. Robertson Company, Pittsburgh, Pa.

Filed July 18, 1975, Ser. No. 597,259

Int. Cl.^{2} F01N *1/24*

U.S. Cl. 181—36 B **4 Claims**



1. An acoustic silencer of the type interposed in ventilating duct systems comprising in combination: a perforate rigid inner cylinder; an annularly spaced outer cylinder; a ring flange secured peripherally at each end of the said inner perforate cylinder; structurally rigid spacer members disposed in the annular space between the said inner cylinder and the said outer cylinder and secured to the said ring flanges and extending substantially parallel to the axis of the said inner perforate cylinder, the said spacer members being spaced-apart from each other circumferentially of the said inner cylinder and dividing the said annular space into plural annular segments; sound absorbing elements disposed in each of the said annular segments and being retained in operable relation relative to the said inner cylinder by the said outer cylinder; said outer cylinder being secured to one of the said spaced members and having at least one operable joint extending between the said ring flanges; and a quick-release closure for retaining the said operable joint in a closed position.

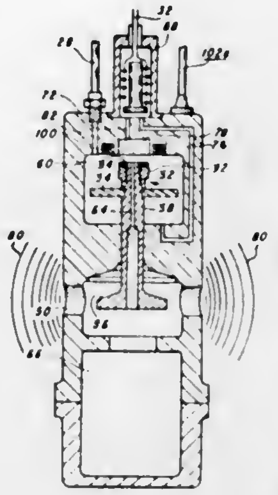
4,034,827
AIR GUN UTILIZING MAGNETIZED SHUTTLE

Arthur E. Leerskov, Jr., Sherman; John T. Thomson, Jr.; Frank J. Wilem, Jr., both of Dallas; Ernest R. Harrison, Jr., Plano, and Edward C. Banas, Jr., Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Filed Apr. 3, 1975, Ser. No. 564,931

Int. Cl.^{2} G01V *1/38*

U.S. Cl. 181—120 **33 Claims**



1. A method for controlling the time of firing of an air gun actuated through subjecting a shuttle to gas pressure to thereby accelerate said shuttle which releases compressed gas stored in said gun comprising the steps of:

monitoring movement of said shuttle having magnetic properties, and

sensing the signal produced in an electrical sensor resulting from said magnetic properties by acceleration of said shuttle is accelerated.

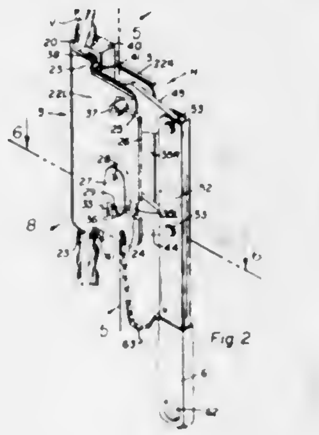
4,034,828
SHOCK ABSORBING CABLE CONNECTOR

Clarence W. Rose, Denver, and Fredies M. Elmore, Thornton, both of Colo., assignors to Rose Manufacturing Company, Englewood, Colo.

Filed Apr. 14, 1975, Ser. No. 567,812

Int. Cl.^{2} A62B *1/14;* **B65H** *59/16*

U.S. Cl. 182—5 **11 Claims**



1. A safety cable connector for attaching a workman to a suspended cable as by a lanyard having one end connected to the connector and the other end connected to the workman, said connector being easily moved up and down the cable when properly held by the workman, but locking into the cable when released, or when the workman falls as from a scaffold, said connector comprising:

a. a passageway through the connector, through which the cable extends, with the suspended cable therethrough holding the connector in an upright position;

b. a cam means engaging the cable within the connector, including a pivotally connected hand holding means for properly holding and adjusting the connector up or down the cable, said hand holding means moving downwardly with respect to the upright connector on the cable to shift the cam means to grip and lock the connector onto the cable and moving upwardly with respect to the connector to release the connector from the cable, whereby, whenever the workman is holding the connector at the hand holding means, the weight of the connector moves the hand holding means upwardly relative to the connector to release the grip of the connector on the cable;

c. a spring means urging said hand holding means towards the downward cable-locking position, but with the strength of the spring means being insufficient to overcome the weight of the connector whenever a workman is holding the connector at the hand holding means with the connector at the cable-releasing position, but with the strength of the spring means being sufficient to promptly move the hand holding means downwardly to the cable-locking position whenever the workman releases the connector or removes all upward force against the hand holding means as during a fall; and wherein

d. said connection of the lanyard to the connector is at said hand holding means;

e. said hand holding means always being essentially parallel to said passageway.

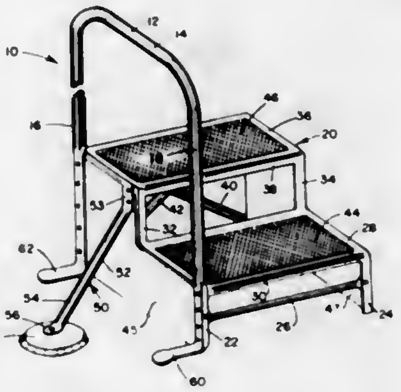
4,034,829
STEP STOOL

Paul J. Hoffman, 155 E. Haskel St., West St. Paul, Minn. 55118

Filed June 21, 1976, Ser. No. 697,872

Int. Cl.^{2} A47C *9/12;* **E06C** *7/00*

U.S. Cl. 182—106 **4 Claims**



1. A step stool comprising:

an upstanding rail for grasping by a person including

a pair of spaced apart rail support members for engaging the floor at one end thereof, and

a hand rail member extending in substantially a horizontal plane between the other ends of the rail support members and connected therebetween,

a frame extending to one side of the upstanding rail and including,

a flat upper platform extending below said hand rail, and

a flat lower platform extending below said upper platform, said platforms each joined at one side thereof to the upstanding rail,

an upper step member secured to the upper platform, and

a lower step member secured to the lower platform for supporting the user on the step members,

stabilizing means secured to said frame and including:

a stabilizing bar secured to said frame on the side of the hand rail and extending outwardly in angular relation thereto, and suction means for retaining the stabilizing means in removably fixed relation to the floor supporting the step stool, said suction means including a suction cup secured to the stabilizing bar at one end thereof and having its open end adapted for engagement with the floor, such that the weight of the user against the rail will prevent tipping of the step stool,

said stabilizing bar including:

a vertically extending flat lug at the upper end thereof,

an angularly disposed support member, and

a horizontally extending tab secured to the suction cup,

wherein the stabilizing bar extends outwardly from the hand rail by a dimension equal to at least 25 percent the width of the frame,

wherein said stabilizing means further includes a pair of outwardly extending floor engaging feet members connected with and outwardly extending from each rail support member such that additional leverage is obtained against tilting of the step stool by the user,

wherein the frame includes:

a first pair of upright members supporting the lower platform,

upright connecting members connecting the lower platform to the upper platform, and

a pair of side panels enclosing the sides of the frame.

4,034,830
LUBRICATING OIL PUMP

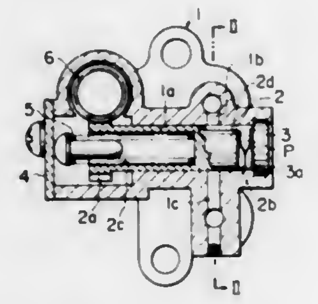
Osamu Mukai, Yokohama; Kokichi Fukuzawa, Yamato; Yoshiro Nagao, Chigasaki; Kenichi Kubota, Tokyo; Shigeiu Kobayashi, Tokyo, and Masakuni Shibuya, Tokyo, all of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 23, 1975, Ser. No. 598,389

Claims priority, application Japan, July 29, 1974, 49-90183[U]; Oct. 1, 1974, 49-117727[U]; Oct. 1, 1974, 49-117729[U]

Int. Cl.² F16N *13/04*

U.S. Cl. 184—27 R **5 Claims**



1. A lubricating oil pump comprising:

a pump body having a cylinder chamber therein;

a plunger rotatably and slidably fitted in said cylinder chamber and having a driving gear at one end and a lead portion at the other end thereof;

a guide plate fixed to said pump body in order to seal an open end of said cylinder chamber and having a projected portion engageable with said lead portion in order to give a stroke to said plunger;

a spring inserted in said plunger, pushing against said pump body and biasing said plunger in order to push said lead portion against said projected portion;

said lubricating oil pump being arranged to form a pump chamber by means of said cylinder chamber, the end portion of said plunger where said lead portion is formed and said guide plate;

a cut-off portion formed at the end of said plunger where said lead portion is formed;

said pump chamber being communicatable to a suction port and delivery port of said pump chamber through said cut-off portion; and

a gear meshed with said driving gear for powering the pump.

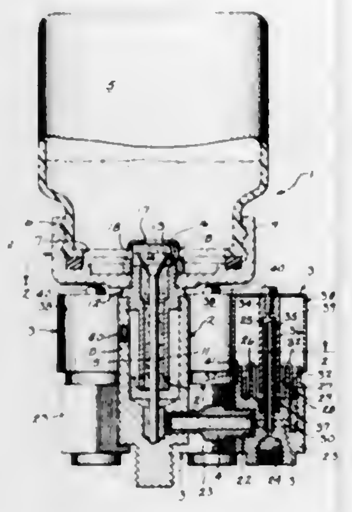
4,034,831
OILER ASSEMBLY

Donald G. Gruett, Manitowoc, Wis., assignor to Oil-Rite Corporation, Manitowoc, Wis.

Filed Mar. 8, 1973, Ser. No. 339,230

Int. Cl.² F01M *9/06*

U.S. Cl. 184—81 **8 Claims**



1. In an oiler assembly, a constant level supply of oil lubricant and at least one oil lubricant feed unit having a suction outlet, said feed unit being spaced laterally from the supply of oil lubricant and comprising a standpipe, hollow connecting means joining the feed unit and the supply and providing for the maintenance of a level of oil lubricant in the standpipe corresponding to the generally constant level maintained at the supply, a sump in the feed unit separated from the standpipe by a common wall, at least one U-shaped bare wire element extending over said common wall and disposed in intimate contact at least with the standpipe side of the wall and the upper edge of the wall to form opposed grooves with said wall whereby to carry oil lubricant from the standpipe into the sump, and passage means placing the suction outlet of the feed unit in communication with said sump with a portion of said passage means being disposed higher than said common wall.

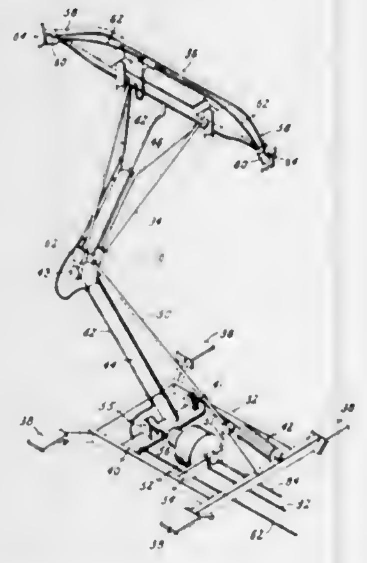
4,034,832
PANTOGRAPH EMERGENCY LOWERING SYSTEM

Carl B. Lewis, Erie, Pa., assignor to General Electric Company, Erie, Pa.

Filed Aug. 4, 1976, Ser. No. 711,750

Int. Cl.² B60L *5/14*

U.S. Cl. 191—86 **8 Claims**



1. For use on a traction vehicle having electric propulsion equipment that is powered from a wayside source comprising

an elevated electric power contact wire, a pantograph comprising:

a. support means adapted to be mounted on top of the vehicle and movable between extended and retracted positions;

b. a current collector connected to said support means and having an elongated upper contact surface disposed generally transverse to the direction of movement of the vehicle;

c. biasing means on said support means for varying said support means toward its extended position, whereby said collector is raised and said upper contact surface is urged into sliding engagement with the overhead contact wire;

d. counter-biasing means on said support means effective when actuated to move said support means to its retracted position in which said collector is lowered and said upper contact surface is disengaged from the overhead contact wire; and

e. a pair of automatic actuating means respectively disposed at opposite ends of said upper contact surface, each of said automatic actuating means being responsive to engagement by the overhead contact wire for actuating said counter-biasing means.

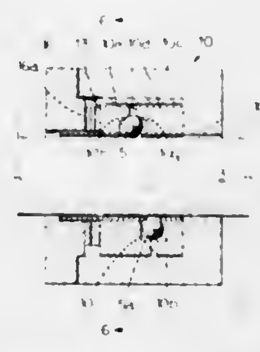
4,034,833
ROLLER CLUTCH

John Doise Jeter, Iowa Park, Tex., assignor to Texas Dynamatics, Inc., Dallas, Tex.

Continuation of Ser. No. 490,810, July 22, 1974, abandoned. This application Nov. 14, 1975, Ser. No. 631,864

Int. Cl.² F16D *3/34*

U.S. Cl. 192—45 **22 Claims**



1. A device for transmitting forces to a first member having a cylindrical outer surface to urge the member, if it moves, to move with a preselected relationship between its axial motion and its rotational motion relative to the device comprising; a housing having an opening through which said first member extends, with its cylindrical outer surface adjacent the side wall of the opening, surface contours in the side wall of the opening describing at least one elongated recess of finite length, opening toward the cylindrical surface of said first member and extending generally in a direction describing a helix about the axis of said member, means to communicate rollers between ends of said recess or recesses, a plurality of rollers filling said recess or recesses and communicating means so that movement of rollers longitudinally in the recess or recesses causes a generally sympathetic movement of all said rollers, said recess or recesses having such surface contour that rollers moving in contact with said member may move longitudinally along said recess or recesses, but will encounter the surface of said recess or recesses and be pinched between the recess surface and the surface of said member if the roller tends to move transverse the longitudinal direction of said recess or recesses to exert a resisting force against said member if said member tends to move in a direction that will increase the pinch forces to urge said member, if it moves, to move such that said rollers will move longitudinally in said recess or recesses to urge said member, if it moves, to move with a relationship between its axial and rotational motion that is related to the recess helix angle.

22. A device for transmitting forces to a first member having a cylindrical surface to urge the member, if it moves, to move with a preselected relationship between its rotational and axial motion relative to the device comprising: a housing with sidewall surfaces adjacent the cylindrical surface of said first member, surface contours in said sidewall describing at least one elongated recess having a longitudinal and a transverse dimension and opening toward said cylindrical surface, said longitudinal dimension extending generally in a direction for at least some distance along a helical path about the axis of said cylindrical surface, means to communicate rollers between ends of said recess or recesses so that rollers may endlessly circulate along said recess or recesses, said recess or recesses having such contour that rollers may move along the longitudinal dimension of said recess or recesses, but if said rollers move in at least one direction of said transverse dimension in said recess or recesses said rollers will encounter at least one confining surface area that will resist further transverse movement of said rollers and by way of said rollers will transmit tangential forces to the surface of said first member which will resist motion of said first member that tend to cause rollers to move farther in said transverse direction to urge said first member, if it moves, to move such that rollers move in a direction of said longitudinal dimension in said recess or recesses so that said first member moves, if it moves, with a relationship between its rotational and axial motion that is related to the helix angle of said helical path of said recess or recesses.

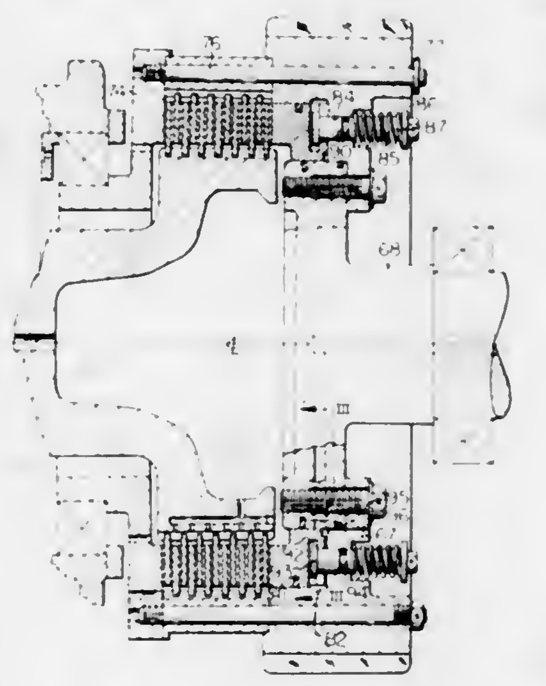
4,034,834
FLOATING PIN RETRACTORS FOR CLUTCH PISTONS

James G. Starling, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Jan. 28, 1976, Ser. No. 653,180

Int. Cl.² F16D *25/00*

U.S. Cl. 192—85 AA **5 Claims**



1. A clutch assembly for receiving and selectively transmitting rotary drive comprising:

axially spaced drive input and output rotary members, one of said rotary members having a plurality of angularly spaced-apart axially directed bores therethrough,

a plurality of clutch discs disposed between said rotary members, at least one of said discs being constrained to rotate with said one rotary member and at least one other of said discs being constrained to rotate with the other of said rotary members,

a clutch piston disposed between said one rotary member and said clutch discs for axial movement relative thereto, wherein said piston has a plurality of radially extending recesses opening at the peripheral surface of the piston and has radially extending slots each being adjacent one of said recesses and being of lesser width than the adjacent recess,

means for selectively urging said clutch piston towards said discs to engage said clutch assembly,

a plurality of retractor pins each extending through an associated one of said bores of said one rotary member and being axially movable therein, each of said pins being capable of limited sideward movement relative to said piston while having means for forcibly withdrawing said piston from said discs upon axial movement of said pins away from said discs, wherein each of said retractor pins extends into a separate one of said recesses through the adjacent one of said slots and has an end within said one of said recesses of greater width than said adjacent slot, and

resilient means for exerting a force on said pins which tends to draw said piston away from said discs.

4,034,835
CLUTCH AND THROTTLE CONTROL MECHANISM

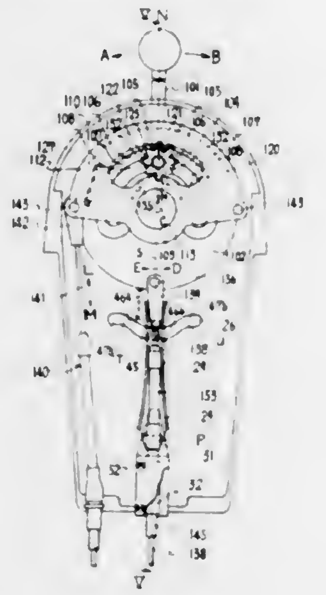
Masanao Baba, Takarazuka, Japan, assignor to Nippon Cable System Inc., Japan

Filed Mar. 13, 1975, Ser. No. 557,963

Claims priority, application Japan, July 26, 1974, 49-86193; Oct. 12, 1974, 49-117449

Int. Cl.² B60K ***21/00;*** **F16D** ***47/00***

U.S. Cl. 192—.098 **12 Claims**



1. A control mechanism comprising a lever, a throttle operating member turnable by the lever, rotatable gear means having at least one untoothed portion which engages the throttle operating member and is directly rotated thereby, a clutch operating member turnable by the gear means and mounted on a common axis with said throttle operating member and said lever, a throttle cable operable by the throttle operating member and a clutch cable operable by the clutch operating member, the clutch operating member being rockable and the throttle operating member alone being further rotatable after the throttle operating member and the clutch operating member are simultaneously rotated by the turning of the lever.

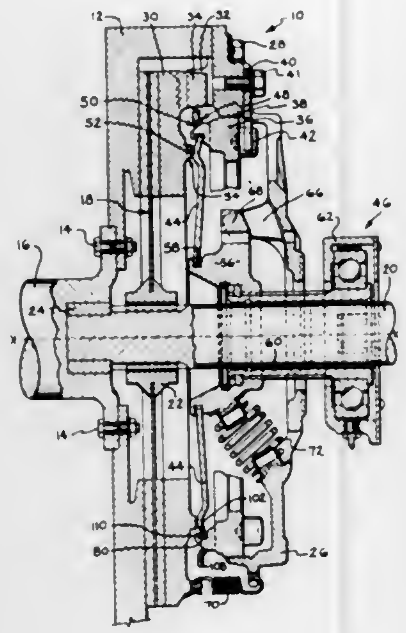
4,034,836
CLUTCH WITH FRICTION REDUCING LEVER ASSEMBLY

William H. Sink, Auburn, and Richard A. Flotow, Fort Wayne, both of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Feb. 27, 1976, Ser. No. 661,889

Int. Cl.² F16D ***13/50***

U.S. Cl. 192—99 A **6 Claims**



1. In a clutch adapted to drivingly connect rotatable drive and driven members and having a central axis; an axially stationary cover element for securement to a drive member for rotation therewith; an axially movable pressure plate element connected to the cover element for rotation therewith and limited axial movement relative thereto; resilient means for urging the pressure plate element axially into engagement with the driven member to clamp the same to the drive member; and pivotally movable levers disposed between the cover and pressure plate elements for moving the pressure plate element axially relative to the cover element into and out of engagement with the driven member; the improvement comprising:

opposed pivot and bearing portions on the levers; including longitudinally extending ribs and said pivot portion spaced radially outwardly of said bearing portion;

a pivot engaging means on one of the cover and pressure plate elements engaging said pivot portion of the lever;

an opposed bearing engaging means on the other of the cover and pressure plate elements engaging said bearing portion on the lever;

said pivot portion including an opening having spaced side walls and connecting radially inner and outer walls and a sharp knife-edge formed on said radially inner connecting wall with said inner connecting walls sloping radially inwardly and axially from said knife-edge toward the clutch central axis;

said pivot engaging means including an integral axially directed lug having spaced side walls and connecting inner and outer walls and a pivot axis formed on one of said connecting walls;

said lug extending into said opening with said sharp knife-edge engaging said pivot axis and said side walls and inner and outer connecting walls of said opening and lug coacting to define a positive restraint for said levers to prevent relative movement and maintain said sharp knife-edge in contact with said pivot axis during pivotal movement of said lever.

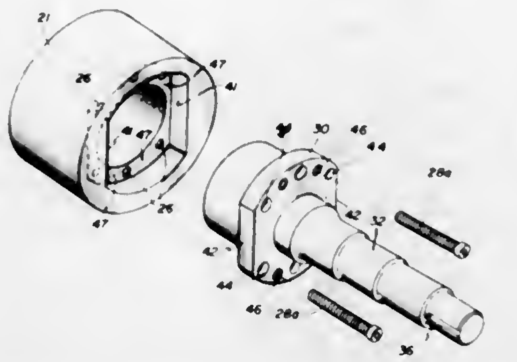
4,034,837
CONVEYOR ROLLER STRUCTURE

Joseph E. Vinarcsik, Homewood, and John A. Jachim, Chicago, both of Ill., assignors to Hi-Hard Rolls, Inc., Harvey, Ill.

Filed Nov. 7, 1975, Ser. No. 629,796

Int. Cl.² B65G ***39/00***

U.S. Cl. 193—37 **3 Claims**



1. A conveyor roller structure comprising; a roller sleeve, a first flange within said sleeve and extending radially inwardly thereof, and having a noncircular rotational restricting surface extending radially inwardly of the flange, a first plurality of threaded apertures in said first flange, stub shaft means for connection to said first flange, a second flange on said stub shaft means directed radially outwardly thereof and having a noncircular rotational restricting surface in nested, mating, torque-transferring contact with said first flange rotational restricting surface, a second plurality of apertures on said second flange and arranged for registry with said first plurality of threaded apertures for receiving threaded fasteners therein to secure said stub shaft to said roller sleeve, and a third plurality of threaded apertures formed in said second flange on a common radius with the first and second plurality of threaded apertures but located alternatively therebetween and diametrically opposed to one another to receive bolts therein, said bolts functioning as screw jacks for removing said stub shaft from roller sleeve.

4,034,838
APPARATUS FOR HANDLING PAPERS AND TISSUES

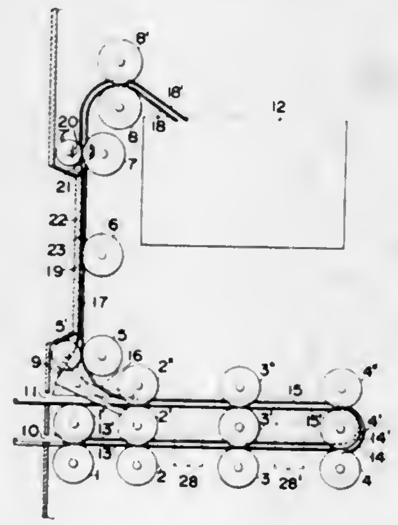
Isamu Uchida, Chigasaki, Japan, assignor to Laurel Bank Machine Co., Ltd., Tokyo, Japan

Filed Jan. 12, 1976, Ser. No. 648,745

Claims priority, application Japan, Jan. 14, 1975, 50-7220

Int. Cl.² G07F ***1/06***

U.S. Cl. 194—4 R **8 Claims**



1. An apparatus for handling papers and tissues comprising a delivery device for transporting paper money or the like, a device for discriminating the paper money or the like while it is being transported by the delivery device, a storage device for storing therein paper money discriminated by the discriminating device, means for delivering wrong paper money to a return outlet after passage through the discriminating device, means for/temporarily halting paper money which has been judged as being good by the discriminating device in a temporary reservoir disposed so that the paper money can be seen from the outside and means for feeding the paper money which has been temporarily stopped in the temporary reservoir for storage in the storage device controlled by signals indicating completion of prescribed operations such as money changing, receipt and disbursement.

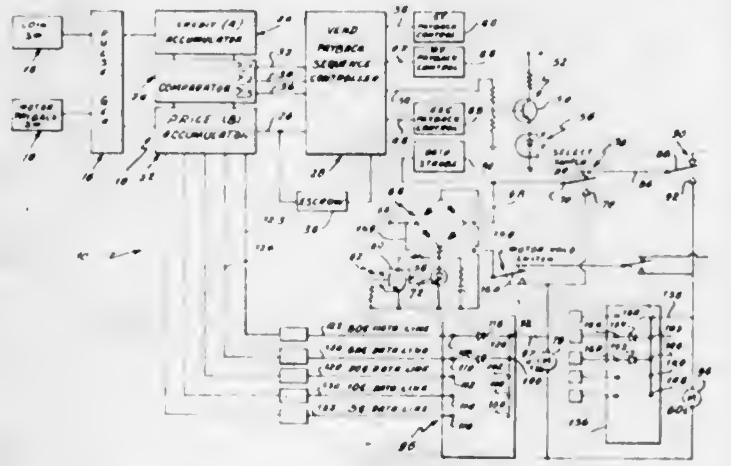
4,034,839
SIMPLIFIED MULTI-PRICE VEND CONTROL CIRCUIT

Larry D. Lee, St. Louis County, Mo., assignor to H. R. Electronics Company, High Ridge, Mo.

Filed Nov. 13, 1975, Ser. No. 631,721

Int. Cl.² G06F ***15/46;*** **G07F** ***11/00***

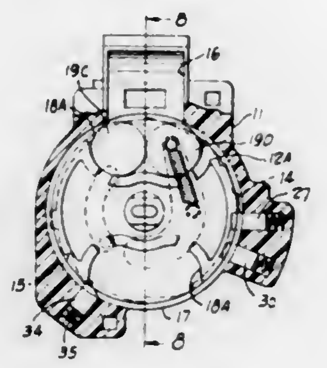
U.S. Cl. 194—10 **19 Claims**



1. In a vend control circuit having credit entry means for entering therein amounts that represent amounts deposited, a first accumulator including means to enter therein credit amounts from the credit entry means, price accumulator including input connection means thereto at which signals are produced to enter therein the price of a selected vend, means for comparing a credit amount entered into the first accumulator with a price entered in the price accumulator, said comparator means having output means at which signals are produced to initiate a vend operation whenever the amount entered in the first accumulator at least equals the price entered in the price accumulator, the improvement comprising a plurality of series connected vend select switches individually actuatable by a customer, a price matrix device and an associated vend motor associated with each of said select switches, each of said matrix devices having a plurality of input and output connections arranged in pairs, means connecting at least one of the input connections of each of the matrix devices to the corresponding output connection of said pair to enable electric signals to pass therebetween, means operatively connecting respective ones of the output connections of each of said matrix devices to corresponding inputs of the price accumulator for enabling entry therein in binary form of information representing a selected vend price, the price entered by each of said matrix devices when the associated selection switch is actuated depending on which input and output connection of the matrix devices have connections that enable electric signals to pass, a source of input pulses for connection to the selection switches whereby actuation of a selected one of the selection switches will enable pulses from said source to be applied to and through the respective pricing matrix device to the inputs of the price accumulator, said source of input pulses being insufficient to effectively energize the respective vend motor associated with the actuated selection switch to cause a vend to take place, and means responsive to a signal produced in the output means of the comparator means to establish a circuit to energize the associated vend motor when the amount entered in the first accumulator at least equals the vend price entered in the price accumulator,

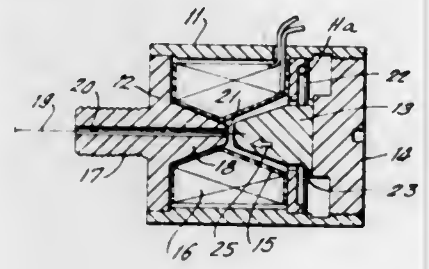
each of said vend motors including means associated therewith to establish a hold circuit to maintain the vend motor energized to complete a vend cycle, said last named means including means to deenergize the vend motor at the conclusion of a vend cycle.

4,034,840
LOCK MECHANISM
Morton L. Reitman, Pepper Pike, Ohio, assignor to Hospital Specialty Company, Solon, Ohio
Filed May 17, 1976, Ser. No. 686,792
Int. Cl.² G07F *5/04*
U.S. Cl. 194—65 **6 Claims**



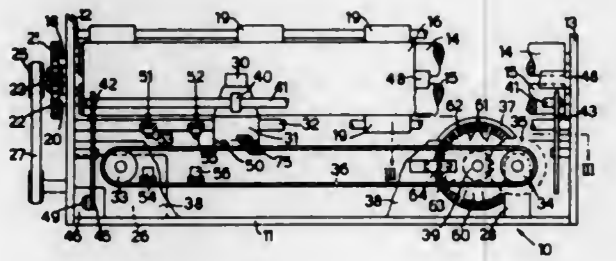
1. In a lock mechanism having a hollow casing having a transverse opening extending therethrough along the axis thereof from a first side to a second side of the casing, said casing having an inlet opening and an outlet opening extending through the wall thereof an diametrically opposite sides of said transverse opening, a first disk member mounted in said casing to rotate on the said axis of the casing, said first disk member having a handle portion extending through the said tranverse of said casing to said first side thereof for the manual rotation of the first disk member from said first side, said first disk member having a recess in its periphery to receive an operative coin to protrude radially from the periphery of the first disk member and adapted to register with said inlet opening for insertion of said coin thereon and to register with said outlet opening for discharge of a said coin or the like therefrom, a second disk member mounted in said casing adjacent said first disk member to rotate in said casing on a common axis with said first disk member, said second disk member having an engaging portion extending through the said transverse opening of the casing to said second side thereof for engagement with lock operating means to be controlled by said lock mechanism, biasing means joining said first and second disk members for biasing the second disk member to rotatably follow the rotation of said first disk member upon manual rotation by said handle portion, said second disk member having a projection extending radially outward therefrom, plunger means carried by said casing and resiliently urged radially inward toward the said common axis at a first location around the casing spaced from said inlet opening, said plunger means having a coin-engaging portion disposed in a first plane normal to the axis of said first disk member, said plunger means being positioned to be displaceable radially outwardly by a coin carried in the recess of the first disk member upon rotation thereof, said plunger means being located when the positioned radially inward to engage the said projection of the second disk member for blocking rotation thereof and when displaced radially outwardly to clear said projection of said second disk member and for permitting rotation thereof, said detent means carried by the casing and engaging the second disk member to permit rotation of the second disk member in one direction only relative to said casing, the improvement of said recess in the first disk member being dimensioned and shaped to receive more than one said coin so as to position at least one of the coins flat in said first plane normal to the axis of the first disk member and in the path of said coin-engaging portion of the said plunger means, said one coin being maintained in said position by other of said coins during rotation of the first disk member to engage and move said plunger means to displace the same radially outward to clear the said projection and thereby permit the said disk members to rotate beyond said plunger means.

4,034,841
PRINT WIRE ACTUATING DEVICE FOR A DOT MATRIX PRINTER
Sigeru Ohyama, and Aisuke Sekikawa, both of Tokyo, Japan, assignors to Nippon Electric Co., Ltd., Tokyo, Japan
Filed Oct. 21, 1975, Ser. No. 624,426
Claims priority, application Japan, Oct. 23, 1974, 49-122097; Feb. 12, 1975, 50-18331
Int. Cl.² H01F *7/08*
U.S. Cl. 197—1 R **5 Claims**



1. In a print wire actuating device for a dot matrix type printer, of the type which includes a solenoid assembly comprising a plunger type solenoid armature having a print wire fixed to the front end thereof in aligned relation therewith and a disc-like spring member supporting said solenoid armature and normally biasing said solenoid armature rearwardly into abutting engagement with stop means formed in the rear portion of said solenoid assembly, the improvement comprising: a rearwardly facing annular shoulder formed in said solenoid assembly and a radially outwardly extending annular flange formed on the periphery of said solenoid armature, said disc-like spring member comprising single circular disc having a continuous annular peripheral portion bearing against said rearwardly facing annular shoulder and having a plurality of mutually independent spoke portions extending radially inwardly from the annular peripheral portion, said spoke portions having inner end edges aligned to cooperatively define a central opening for fitting engagement with the flange of said solenoid armature but not fixed thereto.

4,034,842
ARRANGEMENT FOR DRIVING A PRINTING HEAD ALONG A PRINTING LINE
Felice Giacone, Giaveno (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Turin), Italy
Filed May 8, 1975, Ser. No. 575,758
Claims priority, application Italy, May 10, 1974, 68471/74
Int. Cl.² B41J *19/30, 19/92*
U.S. Cl. 197—82 **9 Claims**



1. An arrangement for driving a printing head along a printing line of a recording medium, comprising:

a reversible direct-current electric motor coupled to said head for the driving thereof at a speed substantially proportional to the supply voltage to said motor and energized through opposite supply voltages for moving said printing head in a forward movement and in a backward movement along said printing line, wherein said head is positioned at rest at a rest extremity of the printing line, from which the head starts for the forward movement and to which the head returns at the end of the backward movement;

driving means for causing said printing head to print only during said forward movement defining a printing stage thereof;

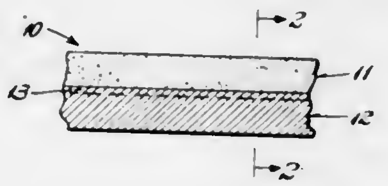
voltage generating means having a first, a second terminal and a third terminal and feeding to said first terminal a first substantially constant voltage, to said second terminal a second substantially constant voltage, of opposite polarity with respect to said first voltage and of greater magnitude than said first voltage and to said third terminal a third substantially constant voltage of the same polarity and of smaller magnitude than said second voltage;

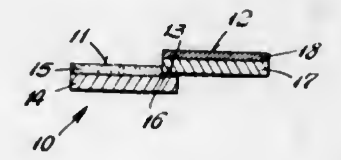
first switching means actuatable by said driving means for supplying said first voltage to said motor during said printing stage to move said head forward along the printing line at a first velocity;

second switching means actuatable by said driving means for supplying to said motor said second voltage, to move said head backward along the printing line at a second velocity greater than said first velocity; and

third switching means selectively actuable by said driving means for supplying to said motor said third voltage when the head is arriving at the rest extremity of the printing line during the backward movement thereof thereby giving to said head a slow final approach to said rest extremity for an exact positioning thereof.

4,034,843
SPLIT CORRECTION RIBBON AND METHOD
Douglas A. Newman; Albert E. Brown, and Allan T. Schlotzhauer, all of Glen Cove, N.Y., assignors to Columbia Ribbon and Carbon Manufacturing Co., Inc., Glen Cove, N.Y.
Continuation-in-part of Ser. No. 526,127, Nov. 22, 1974, Pat. No. 3,924,728. This application May 8, 1975, Ser. No. 575,819
Int. Cl.² B32B *7/02, 7/12;* **B41J** *31/05;* **C09J** *7/02.*
U.S. Cl. 197—172 **10 Claims**





1. A correction-imaging ribbon for use in pressure-imaging devices comprising (a) a first elongate strip of a flexible plastic film foundation having bonded to the front surface thereof a thin layer of a pressure-transferable imaging composition comprising synthetic resin binder material and coloring matter, and (b) a second elongate strip of a flexible plastic film foundation having bonded to the front surface thereof a latent adhesive layer which is substantially non-sticky to the touch but which becomes sticky under the effects of applied pressure, whereby an image formed on a copy sheet by typing aganist the back of said first elongate strip can be removed cleanly from said copy sheet by typing thereover against the back of said second elongate strip to cause the impressed area of said latent adhesive layer to stick to said image and pull it off the copy sheet, a marginal stripe of said latent adhesive layer of the second elongate strip being bonded directly to a marginal stripe of the rear surface of the plastic film foundation of the first elongate strip to provide a unitary correction-imaging ribbon.

7. A process for producing correction-imaging ribbons for use in pressure-imaging devices, comprising the steps of:

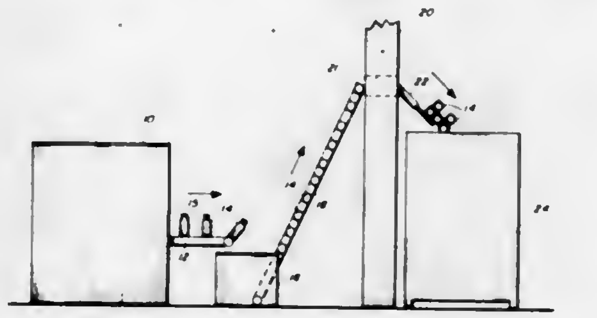
a. producing a first elongate strip by applying a thin layer of pressure-transferable imaging composition comprising synthetic resin binder material and coloring matter to a flexible plastic film foundation;

b. producing a second elongate strip by applying a latent adhesive correction layer to a flexible plastic film foundation, said layer being substantially non-adhesive to the touch but becoming sticky under the effects of applied presssure;

c. superposing said first elongate strip over said second elongate strip so that a marginal stripe of the film foundation of the first strip overlaps a marginal stripe of the latent adhesive layer of the second strip; and

d. applying pressure against said overlapped marginal stripes to render the marginal stripe of the latent adhesive layer of the second elongate strip sticky and cause it to bond to the marginal stripe of the film foundation of the first elongate strip to form a unitary correction-imaging ribbon.

4,034,844
SYSTEM AND METHOD FOR STORING, HANDLING AND ORIENTING BOTTLES AND THE LIKE
Tibor E. Deak, Mount Dora, and Leroy D. Magnus, Umatilla, both of Fla., assignors to Doric Foods, Corporation, Mount Dora, Fla.
Filed Oct. 14, 1975, Ser. No. 622,035
Int. Cl.² B65G *47/00*
U.S. Cl. 198—400 **10 Claims**



1. Apparatus for handling and orienting a plurality of randomly distributed containers of the type having a narrowed neck portion with respect to another portion of said container, the axis of each container extending axially through the neck, said handling and orienting apparatus comprising:

means for storing said randomly distributed containers;

means for removing said randomly distributed containers from said storing means and feeding said containers into a first means;

said first means fo receiving said containers from said removing means randomly distributed and for thereafter orienting the axes of all of said containers parallel with respect to each other, but with the necks of said containers pointed in different directions;

second means for receiving said containers from said first means conveying said containers in a first direction along a first plane, the axes of all of said containers being substantially parallel with said first plane; and

first and second cam races, each on one side of said second means along said first direction for engaging said container necks and orienting said containers, both said cam races engaging and rotating the necks thereof such that thereafter all of the axes are parallel with respect to each other in a second plane substantially normal to said first plane, and with all of said necks extending in a second direction substantially perpendicular to said first direction.

4,034,845
APPARATUS FOR STACKING PRINTED PRODUCTS CONTINUOUSLY ARRIVING FROM CONVEYOR MEANS, ESPECIALLY PRODUCTS ARRIVING IN AN IMBRICATED FORMATION

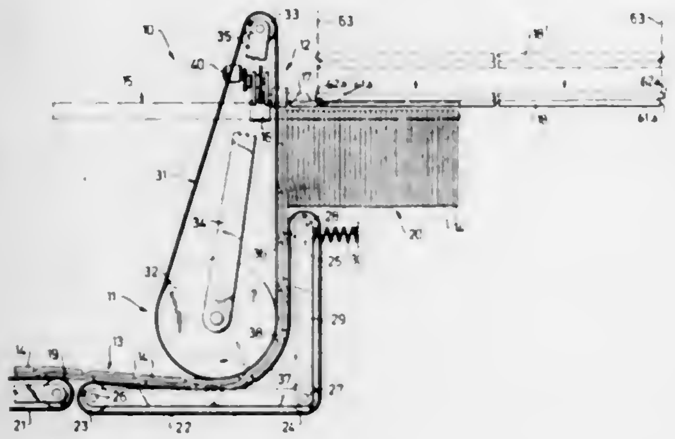
Werner Honegger, Rutl, Switzerland, assignor to Ferag AG, Hinwil, Switzerland

Filed Sept. 29, 1975, Ser. No. 617,932

Claims priority, application Sweden, Oct. 7, 1974, 7413409

Int. Cl.² B65G *47/00;* **B65H** *29/02, 31/22, 33/16*

U.S. Cl. 198—418 **28 Claims**



2. An apparatus for stacking products, such as printed products or the like continuously arriving from conveyor means, especially printed products arriving in an imbricated product formation, comprising conveyor means for the infeed of the products along a predetermined path of travel, a plurality of clamping elements structured to be elastically pre-biased towards one another, driven spreader means, said clamping elements being movable from a product clamping position into a spread position, means for movably guiding said clamping elements along a path of movement and through an operable zone of said driven spreader means for coaction therewith in order that said clamping elements are temporarily brought out of their clamping position into their spread position, the path of movement of the clamping elements at the region of the spreader means passing through the path of travel of the conveyor means for the infeed of said products, and the clamping elements are constituted by part of the elements of a lengthwise extending, multi-element spring element which is elastically expansible in the lengthwise direction thereof.

4,034,846
METHOD AND APPARATUS FOR PROVIDING AUTOMATIC STACKING OF MANUFACTURED PARTS

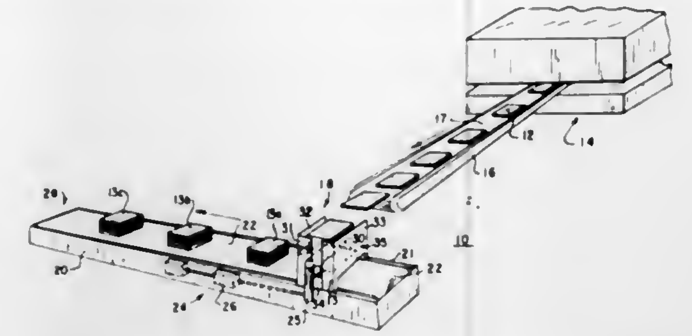
William J. Burgis, Park Ridge, and Gregory P. Stewart, Des Plaines, both of Ill., assignors to Bunting Magnetics Company, Elk GroveVillage, Ill.

Filed Apr. 25, 1975, Ser. No. 571,710

Int. Cl.² B65G *57/00*

U.S. Cl. 198—422 **14 Claims**

9. In a processing system including a production machinery for manufacturing parts of a magnetic material, apparatus for conveying said parts from said production machinery comprising in combination first conveyor means operable to convey said parts from said production machinery to a first location, second normally deenergized conveyor means at said first location, magnetic stacking means at said first location including hopper means for receiving said parts discharged from said first conveyor means and means for establishing a constant magnetic field within said hopper means for causing a given number of said parts to be suspended in said hopper means, and for permitting said suspended parts to drop onto said second conveyor means as further parts are discharged into said hopper means, control means including switching means for normally deenergizing said second conveyor means, and detecting means operable when a predetermined number of parts have been stacked on said second conveyor means to enable said switching means to energize said second conveyor means, to permit said stack of parts to be moved away from said first location towards a second location, said detecting means being responsive to said stack being moved from said stacking means to disable said switching means to deenergize said second conveyor means at a predetermined time after said stack has been moved from said first location.



4,034,847
GRANULAR MATTER FEEDING METHOD AND APPARATUS THEREFOR

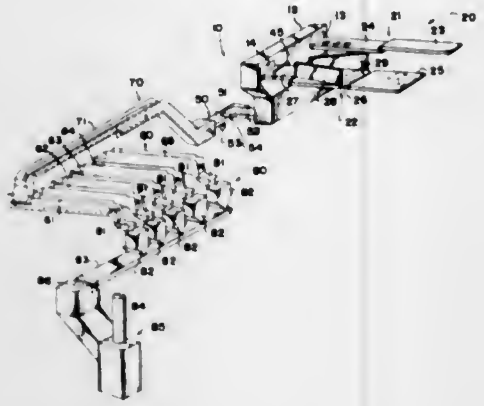
Haruyuki Takagi, Fujisawa; Hisakuni Yamashita, Chigasaki, and Korenobu Yufu, Hiratsuka, all of Japan, assignors to The Yokohama Rubber Co. Ltd., Japan

Filed May 28, 1975, Ser. No. 581,497

Claims priority, application Japan, July 13, 1974, 49-79753; July 18, 1974, 49-81777

Int. Cl.² B65G *69/14*

U.S. Cl. 198—505 **9 Claims**



2. An apparatus for automatically and successively feeding a desired amount of several selected kinds of rubber granules to a kneader, comprising:

a crusher for crushing unvulcanized rubber blocks into granules;

a first conveyor system for feeding said rubber blocks into said crusher;

a second conveyor system including a scale conveyor and a conveyor for transporting rubber granules from said crusher onto the scale conveyor which meters rubber granules per unit weight from said crusher;

a plurality of conveyors adapted to separately store the selected kinds of rubber granules, each storage conveyor having means for intermittently moving it forward for the purpose of storing a number of the unit weights of rubber granules which have been metered by said scale conveyor;

metering means located at the discharge end of each storage conveyor and adapted to meter a prescribed amount of the selected kinds of rubber granules to be fed into said kneader;

feeding means for feeding to said kneader the prescribed amount of each selected kind of rubber granules.

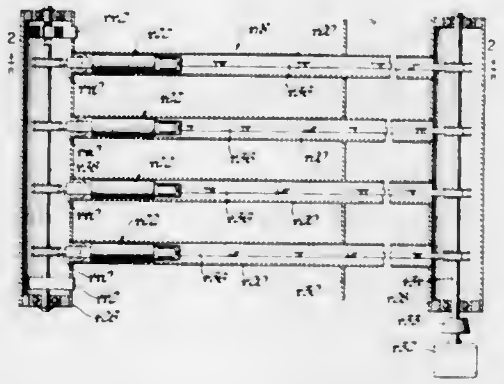
4,034,848
APPARATUS FOR HANDLING MAGNETICALLY ATTRACTIVE MATERIAL

Eldon G. Elliott, 32458 Maryland, Livonia, Mich. 48150

Continuation-in-part of Ser. No. 301,902, Oct. 30, 1972, abandoned, which is a division of Ser. No. 98,498, Dec. 16, 1970, Pat. No. 3,712,472. This application Dec. 26, 1974, Ser. No. 536,526

Int. Cl.² B65G *17/46*

U.S. Cl. 198—570 **19 Claims**



19. Apparatus for handling material by magnetic attraction comprising: a plurality of spaced, parallel tubes of nonmagnetic material; a magnet supported in each of said tubes for reciprocable movement along the length thereof between starting and dwell positions; mechanical motion transmitting means connected with each magnet; said motion transmitting means being selectively operable to move said magnet in opposite directions between said starting and dwell positions; power means connected with the motion transmitting means for each magnet for simultaneously driving said motion transmitting means; said motion transmitting means each extending from said power means through a respective one of the tubes into connection with the magnet therein whereby said magnets and motion transmitting means are prevented by the respective tubes from contacting material attracted by said magnets externally of said tubes; and barrier means operable to interrupt movement of articles and materials attracted by said magnets as the magnets travel toward the dwell position to cause such articles and materials to separate from the magnet as the magnet continues to move to the dwell position.

4,034,849
WATCH CASE FOR PROTECTING AND DISPLAYING A WATCH

Jerome A. Zakrajsek, Fredonia, Wis., assignor to Frank Mayer & Associates, Inc., Grafton, Wis.

Filed July 12, 1977, Ser. No. 704,545

Int. Cl.² B65D *5/50, 85/40*

U.S. Cl. 206—45.15 **7 Claims**

1. A watch case for storing and displaying a watch and comprising:

a base including a front side, a rear side, opposed spaced apart side walls and an upper surface supported between said side walls, said upper surface including an opening therein;

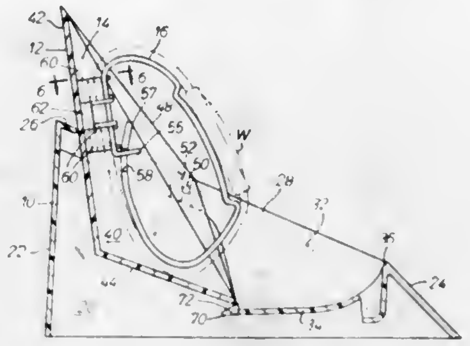
a cover pivotably supported within said opening and rotatable therein between a closed storage position and an open display position, said cover including a front edge, a rear edge, spaced apart sides and an inside surface defining a cavity, said front edge being disposed adjacent said front side of said base and supported by said base;

supporting means for pivotably supporting said cover for rotation within said opening, said supporting means including pivot pins extending between said sides of said cover and said side walls of said base;

latch means for releasably securing said cover in said open display position and comprising at least one ramp surface connected to said base within said opening below said upper surface, said ramp surface sloping upwardly toward said front side of said base and frictionally engageable with said front edge of said cover when the latter is rotated to said open display position;

a cuff for releasably supporting a watch; and

means for releasably attaching said cuff to said inside surface of said cover whereby said cuff and a watch supported thereon are supported within said cavity and movable with said cover from a storage position to a display position.



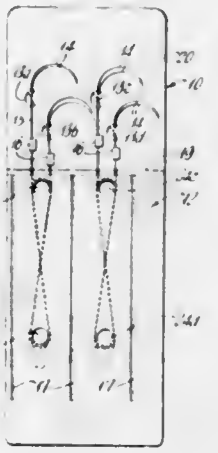
4,034,850
PACKAGE FOR DOUBLE-ARMED SUTURES WITH SELF-CENTERING PLEDGETS

Harvey B. Mandel, North Brunswick, and Michael Schuler, Piscataway, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.

Filed Mar. 10, 1976, Ser. No. 665,356

Int. Cl.² A61L *17/02*

U.S. Cl. 206—63.3 **23 Claims**



1. A suture package comprising at least two panels and a suture storage compartment between said panels, a suture strand contained within said compartment with both ends of said suture strand extending from the compartment, a needle affixed to each end of said suture strand, a pledget slidably attached to said suture strand adjacent one of said needles, and pledget centering means in one of said panels intermediate said pledget and said needle for centering the pledget on the suture strand as said suture strand is withdrawn from said compartment.

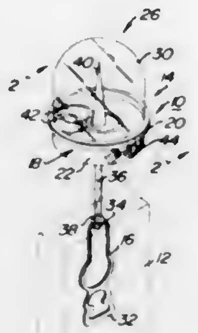
4,034,851
SOAP BUOY

Donald O. Barksdale, 2301 W. Lexington St., Baltimore, Md. 21223

Filed Sept. 1, 1976, Ser. No. 719,520

Int. Cl.² A47K *5/00;* **B63B** *21/52;* **C11D** *17/02*

U.S. Cl. 206—77.1 **10 Claims**



1. A soap buoy for visually marking a bar of soap in a body of water, comprising:

a. housing float means formed of a buoyant material for being visually observable on a surface of said body of water; and,

b. soap bar insertion means secured to said housing float means and inserted into said soap bar for locating said soap bar beneath said water surface.

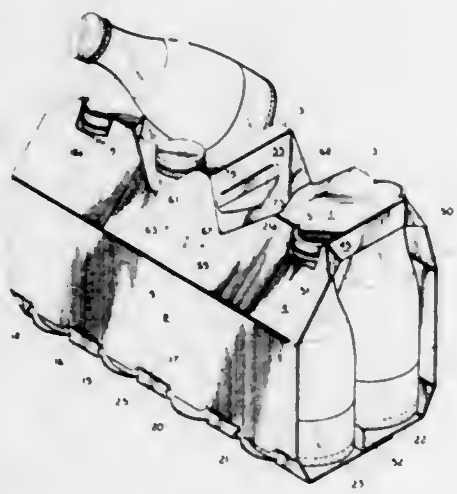
4,034,852
ARTICLE CARRIER

Homer W. Forrer, Jonesboro, Ga., assignor to The Mead Corporation, Dayton, Ohio

Filed Feb. 2, 1976, Ser. No. 654,701

Int. Cl.² B65D *5/46, 75/06*

U.S. Cl. 206—141 **5 Claims**



1. A carrier for packaging at least one row of articles comprising a top panel, a pair of top sloping panels foldably joined respectively to opposite sides of said top panel, a pair of side wall panels foldably joined respectively to the edges of said top sloping panels remote from said top panel, a pair of bottom panels foldably joined respectively along the bottom edges of said side wall panels, a pair of hand gripping panels each having a pair of spaced end edges, said pair of hand gripping panels being struck from said top panel and from said pair of top sloping panels and joined to said top panel respectively along a pair of spaced substantially parallel fold lines, said end edges of said hand gripping panels being disposed at substantially the same angle to vertical as said top sloping panels, and each of said end edges being disposed in general abutting engagement with the adjacent one of said top sloping panels so that the weight of the carrier is distributed over substantial areas of said top sloping panels, and a unitary web panel joined to each end edge of said hand gripping panels and to the adjacent one of said top sloping panels, each of said web panels being disposed respectively in substantial face contacting relation over the entire area thereof with said adjacent top sloping panels.

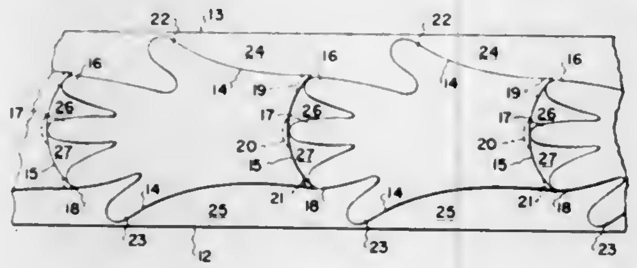
4,034,853
STRIP OR ROLL OF PLASTIC FILM GLOVES

Buford Bryan Smith, P.O. Box 3353, 109 N. Duncan Road, Champaign, Ill. 61820

Filed Apr. 16, 1975, Ser. No. 568,677

Int. Cl.² B65D *85/66, 85/67*

U.S. Cl. 206—278 **4 Claims**



1. A strip of plastic film gloves having separated thumb and fingers comprising two layers of plastic film heat sealed around the periphery of each glove to seal together the sides thereof and the periphery of each finger while leaving the wrist opening completely unobstructed and open, said strip being die cut to remove all of the film from the edges of each glove to the edges of the film layers and all of the film between the separated fingers of the respective gloves, and a plurality of fingers of each glove being severably connected to the wrist portion of the next adjacent glove whereby the gloves may be separated outside the peripheral seal of such fingers.

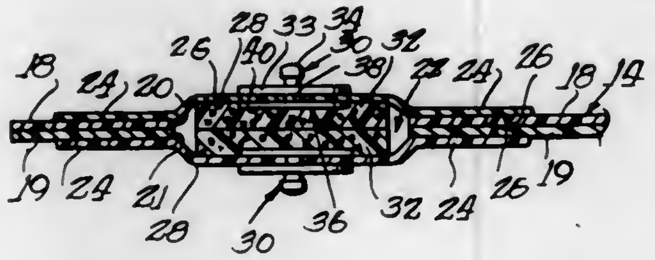
4,034,854
ELECTRODE PACKAGE

Albert J. Bevilacqua, Downers Grove, Ill., assignor to M I Systems, Inc., Westmont, Ill.

Filed July 16, 1976, Ser. No. 706,012

Int. Cl.² B65D *85/70;* **A61B** *5/04*

U.S. Cl. 206—370 **7 Claims**



1. A pre-gelled medical electrode assembly comprising a carrier member having at least one opening formed therein, and at least two medical electrode devices, mounted on said carrier member, each said electrode device comprising a base section having an adhesively-coated surface, an electrical connector element adapting said electrode for connection to a monitoring unit, and a pad of porous material secured to the adhesive surface of said base section in superposed relation to a surface of said connector member, and a quantity of electroconductive gel pre-applied to said pad, said electrode devices being mounted to opposite sides of said carrier member in overlying relation to said opening, by releasable engagement of the adhesively-coated surfaces of the respective base sections with said carrier member, said pre-gelled pads being received in said opening and disposed in face-to-face relation, with said respective base sections and the carrier member providing a sealed chamber for said pre-gelled pads to inhibit disipation of said gel prior to use.

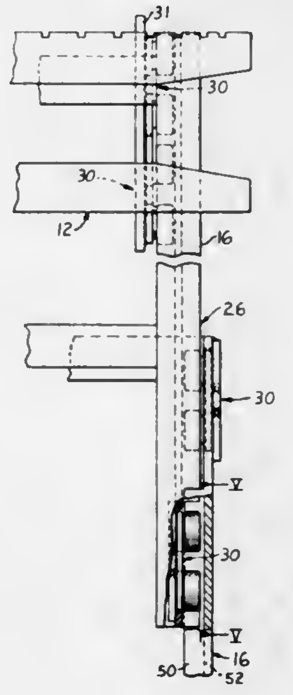
4,034,855
SUSPENDED GUIDE ROLLERS

Robert N. Stedman, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 25, 1975, Ser. No. 616,091

Int. Cl.² B66F *9/08*

U.S. Cl. 187—9 E **7 Claims**



1. In a system for guiding a first pair of elements of a pair of pairs of generally vertical elements to travel linearly relative to a second pair of elements of said pair of pairs, said second pair of elements comprising a pair of flanged upright members of a mast assembly, each of which comprises a pair of legs joined together by a bridge, which include means for constraining said first pair of elements to travel together, means for constraining said second pair of elements to travel together and contact means supported by said first pair of elements and maintaining contact with said second pair of elements, the improvement comprising using as said contact means:

a first pair of suspension devices one of which is supported by said first pair of elements, each suspension device having a first pair of spaced apart rollers removed from a respective position of support of each of said first pair of suspension devices positioned between the legs of and bearing against a respective one of said flanged upright members comprising said second pair of elements, each of said first suspension devices including an elongated member having a pair of bores disposed therein adjacent opposite ends thereof; a pair of shafts held within and extending from said bores, said rollers being rotatably mounted at said shaft; and means for pivotally suspending said elongated member intermediate said bores from said first pair of elements to equally distribute forces exerted on said first pair of elements by weight being lifted thereby to each of said rollers and thereby to each of said second pair of elements.

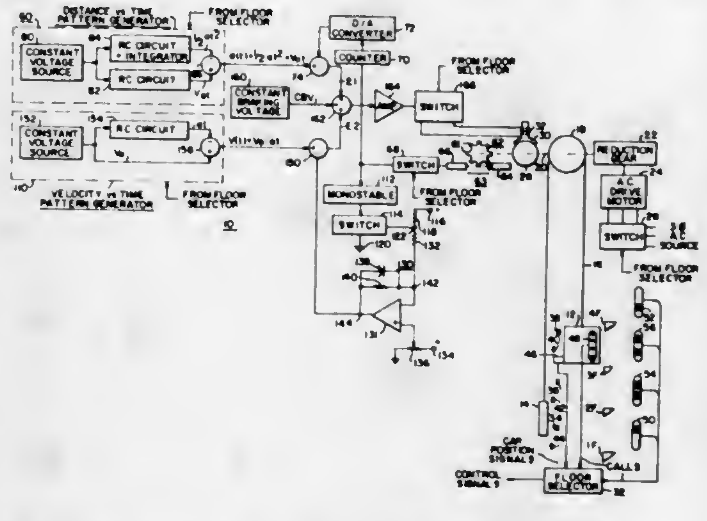
4,034,856
ELEVATOR SYSTEM

Henry A. Wehrli, III, and Franklin S. Malick, both of Monroeville, Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 12, 1975, Ser. No. 640,302

Int. Cl.² B66B *1/32*

U.S. Cl. 187—29 R **8 Claims**



1. An elevator system, comprising:

a structure having a plurality of floors,

an elevator car,

motive means for moving said elevator car in said structure to serve the floors,

deceleration control means providing an adjustable braking torque to stop said elevator car at a selected floor,

first feedback means providing a first feedback signal responsive to the position of the elevator car relative to a fixed deceleration path when the elevator car is to stop at a floor,

first pattern signal means providing a first pattern signal responsive to the desired position of the elevator car in the deceleration path with respect to time,

first error signal means providing a first error signal responsive to any difference between said first feedback signal and said first pattern signal,

second feedback means providing a second feedback signal responsive to the speed of the elevator car in the deceleration path,

second pattern means providing a second pattern signal responsive to the desired speed of the elevator car in the deceleration path with respect to a fixed time for the elevator car to traverse the deceleration path,

and second error signal means providing a second error signal responsive to any difference between said second feedback signal and said second pattern signal,

said deceleration control means providing a braking torque for said elevator car responsive to said first and second error signals.

4,034,857
VEHICLE DISC BRAKE

Toshio Kondo, Chiryu; Yoshinori Moir, and Kirou Kizaki, both of Toyota, all of Japan, assignors to Aisin Seiki Co., Kariya and Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, both of, Japan

Filed Mar. 29, 1976, Ser. No. 671,372

Claims priority, application Japan, Apr. 4, 1975, 50-40852

Int. Cl.² F16D *55/224, 66/02*

U.S. Cl. 188—73.3 **4 Claims**

1. A disc brake comprising:

a friction disc secured to a rotational portion of a vehicle wheel assembly to rotate therewith;

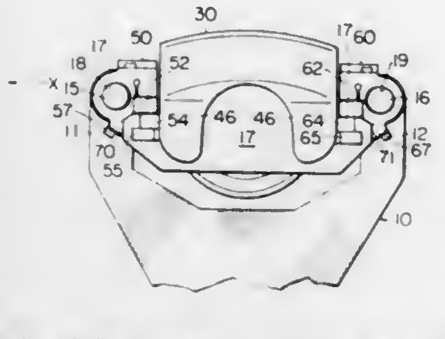
a stationary member secured to a fixed portion of the vehicle wheel assembly,

a movable member having a sliding fit on a first pair of parallel guiding means fastened to said stationary member by releasable securing means at one side of said disc,

brake actuating means fluidically operated within said movable member,

a first pad having a sliding fit on said stationary member at one side of said disc for shifting in the axial direction of the rotating disc to engage one side of said disc directly by said brake actuating means in the braking operation,

a second pad being slidingly supported on a second pair of



parallel guiding means extending from said stationary member to engage with the opposite side of said disc under a reaction force derived from application of said first pad to said disc, and

resilient clip means bearing against said movable member to urge the same into abutment relation against said second pad, said resilient clip means being formed of a thin gauge sheet metal of resilient nature and having a punched hole for receiving the corresponding second guiding means therein.

4,034,858

SUPPORT STRUCTURE FOR A DISC BRAKE CALIPER

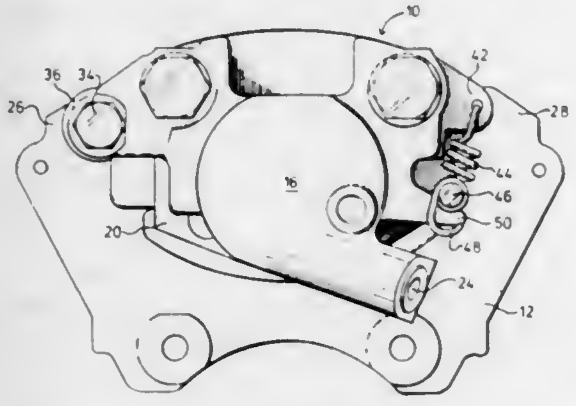
Heinrich Bernhard Rath, Vallendar (Rhine), Germany, assignor to Girling Limited, Birmingham, England

Filed Aug. 19, 1975, Ser. No. 605,854

Claims priority, application United Kingdom, Aug. 30, 1974, 37965/74

Int. Cl.^{2} F16D *55/224, 65/54*

U.S. Cl. 188—73.3 **2 Claims**



1. A disc brake comprising a fixed torque member and a caliper member for straddling a minor portion of the periphery of a rotatable disc and applying friction elements to opposite sides of the disc, one of said members being slideably and pivotably connected to the other of said members by only a single pin extending parallel to the axis of disc rotation, a tension spring circumferentially spaced from said pin and slideably engaging said torque member, said spring extending to a connection point on the caliper member to bias the caliper member about said pin and into engagement with the torque member, a projection carried by the torque member, and a lug carried by the caliper member separately from said connection point and normally closely spaced from but directly engageable with said projection in the event of pivoting of the caliper member about the pin against the biasing of the spring, said caliper lug being positioned to be also engageable with the spring so as to cause sliding thereof relative to the torque member upon sliding of the caliper member on the torque member greater than a predetermined amount.

4,034,859

CENTRIFUGAL BRAKE MECHANISM

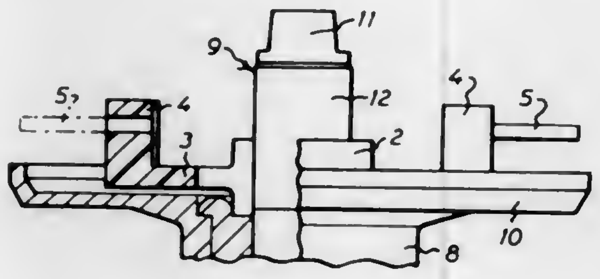
Börje Sigurd Moosberg, Morrum, Sweden, assignor to ABU Aktiebolag, Svangsta, Sweden

Filed Nov. 3, 1975, Ser. No. 627,921

Claims priority, application Sweden, Nov. 13, 1974, 7414234

Int. Cl.^{2} B60T *7/12*, **A01K** *89/02*

U.S. Cl. 188—185 **6 Claims**



1. In a reel having a rotating line spool, a centrifugal brake mechanism for braking said spool, a shaft supporting said spool and non-rotatably secured thereto, said shaft having formed thereon a coupling member adapted to be engaged to rotatably drive said shaft and said spool, a hub member mounted on said shaft axially inside said coupling member, said hub member having at least two radially disposed guide pin holders extending radially outwardly from said hub member, at least one relatively short guide pin mounted in said guide pin holders and extending substantially radially thereof and at least one shiftable body slidably mounted about said guide pins whereby said relatively short guide pins are positioned radially outward from said shaft a distance greater than the length of said pins and said shiftable bodies thereon may be moved under the influence of centrifugal force to a position radially displaced from said shaft a distance greater than the length of said relatively short guide pins.

4,034,860

TELESCOPING SHOCK ABSORBER WITH PLURAL VALVES

Erhard Leppich, Wolfsburg, Germany, assignor to Volkswagenwerk Aktiengesellschaft, Wolfsburg, Germany

Filed Mar. 19, 1975, Ser. No. 560,081

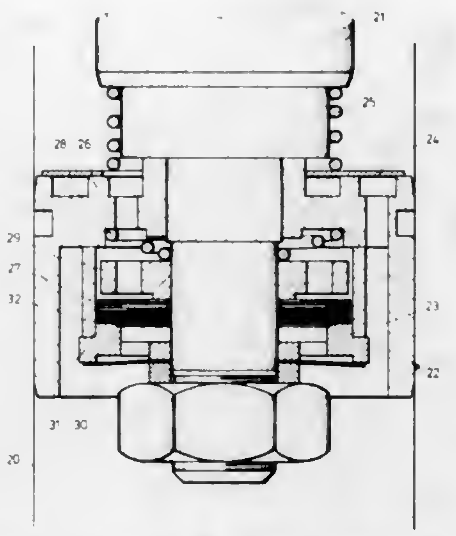
Claims priority, application Germany, Mar. 22, 1974, 2413833; Jan. 10, 1975, 2500826

Int. Cl.^{2} F16F *9/34*

U.S. Cl. 188—282 **10 Claims**

1. In a telescoping shock absorber having a cylinder containing a damping medium; a piston slidably disposed in the cylinder; means provided within the confines of the cylinder for defining separate first and second channels; valve means disposed in the first and second channels with opposite orientation to provide for a flow of the damping medium solely in a first direction in the first channel upon movement of the piston in a first direction of motion and to provide for a flow of the damping medium solely in a second direction in the second channel upon movement of the piston in a second direction of motion; the improvement wherein the valve means in at least one of said channels comprises

- a. a bypassless first valve having open and closed positions and arranged for opening in response to the pressure of the damping medium solely in the direction corresponding to the flow direction associated with said at least one channel; said first valve, when in its closed position, fully blocking a flow of the damping medium in any part of said at least one channel; said first valve being designed as a function of the desired damping characteristics of the telescoping shock absorber; and
- b. a bypassless second valve disposed downstream of said first valve with respect to the flow direction associated with said at least one channel; said second valve having open and closed positions and arranged for opening in response to the pressure of the damping medium solely in the direction corresponding to the flow direction associated with said at least one channel; said second valve, when in its closed position, fully blocking a flow of the damping medium in any part of said at least one channel; said second valve being a check valve arranged for opening at least approximately simultaneously with said first valve and for closing prior to the closing of said first valve.



4,034,861

PROCESS AND INSTALLATION FOR RECOVERING USABLE MATERIALS FROM WASTE MATERIAL CONTAINING METALS AND NON METALS

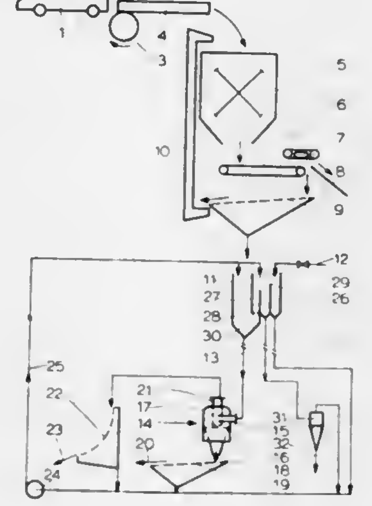
Freerk J. Fontein, Margraten, and Hubert H. Dreissen, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Dec. 12, 1975, Ser. No. 640,209

Claims priority, application Netherlands, Dec. 12, 1974, 7416164

Int. Cl.^{2} B03B *5/34*

U.S. Cl. 209—10 **8 Claims**



1. A process for recovering usuable materials from particulate scrap materials composed of non-ferromagnetic metals and non-metal components and separating the scrap into a non-metal portion and a non-ferromagnetic metal portion based upon the different respective specific gravities of said portions, the process including:

1. providing a hydrocyclone which includes a cylindrical portion, an overflow area, a cone-shaped portion having an apex area and a tangential feed means communicated to the cylindrical area;
2. mixing said particulate scrap including scrap particles less than about **6mm** in diameter with water to form a scrap/water mixture;
3. injecting the scrap/water mixture through the tangential feed means into the cylindrical portion of the hydrocyclone;
4. adjusting the cone portion of the hydrocyclone in an axial direction with respect to the cylindrical portion to selectively separate the scrap/water mixture into two portions each having different specific gravities,
   - a. discharging the heavier, predominantly metal-containing portion of the mixture from the apex area, and
   - b. discharging the lighter, predominantly non-metal containing portion of the mixture from the overflow area of the hydrocyclone, and thereafter
5. removing water from each of the thus separated metallic and non-metallic portions.

4,034,862

METHOD AND APPARATUS FOR SEPARATING PAPER AND PLASTIC

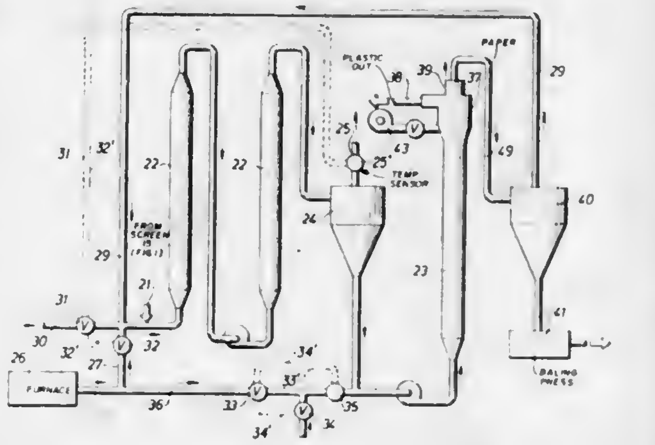
Marcel Selim Bahri, deceased, late of Saltsjo-Duvnas, Sweden; by Elin Bahri, heir and legal successor; heir and legal successor Bahri, both of Saltsjo-Duvnas, Sweden, and Jan-Mats Eneroth, Vaxjo, Sweden, assignors to AB Svenska Flaktfabriken, Nacka, Sweden

Filed Dec. 4, 1975, Ser. No. 637,650

Claims priority, application Sweden, Dec. 6, 1974, 7415328

Int. Cl.^{2} B07B *13/00*

U.S. Cl. 209—11 **9 Claims**



1. Method to separate thermoplastic material in the form of film from a moist mixture of paper and plastic, including the step of

conveying the mixture by a gas stream at an elevated temperature, the gas absorbing moisture while the mixture becomes dried and heated to a temperature at which the plastic film fragments contract to particles of higher weight per unit volume than that of the film;

separating the plastic particles and paper;

and separately collecting the plastic particles and the paper

the improvement wherein said conveying step comprises,

conveying said mixture in a first gas stream at an elevated temperature to dry said mixture,

freely releasing the moist first gas stream following the drying operation,

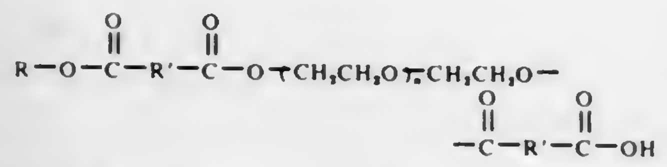
conveying said mixture in a second hot dry gas stream to cause the thermoplastic film fragments to contract and form particles,

recirculating the second gas stream to form said first gas stream subsequent to said collecting step.

4,034,863
NOVEL FLOTATION AGENTS FOR THE BENEFICIATION OF PHOSPHATE ORES

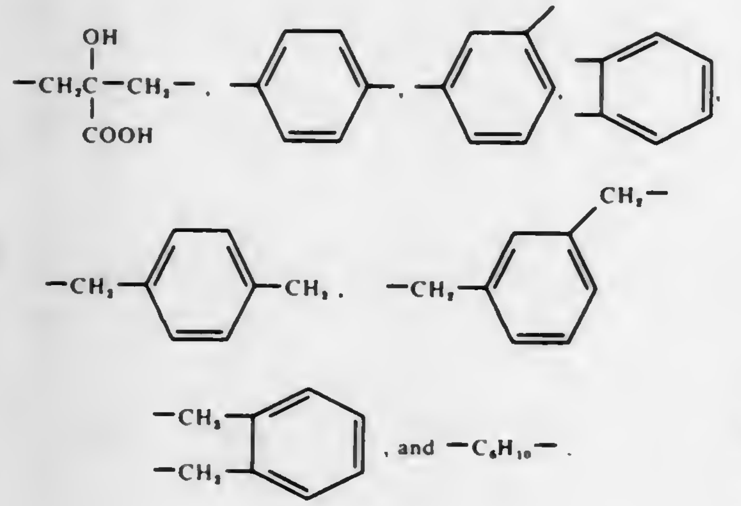
Samuel Shan Ning Wang, Cheshire, Conn., assignor to American Cyanamid Company, Stamford, Conn.
Filed Dec. 22, 1975, Ser. No. 642,937
Int. Cl.² B03D *1/02*
U.S. Cl. 209—166 **5 Claims**

1. A process for recovering non-sulfide minerals which comprises classifying the mineral to provide particles of flotation size, slurrying the sized mineral in aqueous medium, conditioning the slurry with effective amounts of fuel oil, alkali, and a partial ester of a polycarboxylic acid having at least one free carboxylic acid group, and floating the desired mineral values by fourth flotation, said partial ester having the structure



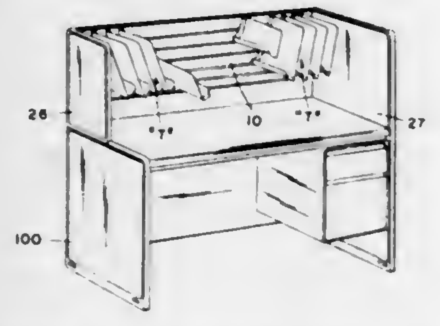
$$R-O-\overset{O}{\overset{\|}{C}}-R'-\overset{O}{\overset{\|}{C}}-O\left(CH_2CH_2O\right)_n CH_2CH_2O-\overset{O}{\overset{\|}{C}}-R'-\overset{O}{\overset{\|}{C}}-OH$$

wherein R is the radical remaining after removal of the hydroxyl group from a straight chain linear aliphatic alcohol of 12 to 22 carbon atoms, *n* is a number of 0-5, and R' is a bivalent grouping selected from $\left(CH_2\right)_m$ wherein *m* is a number of 1-6, —CH=CH—, —CHOHCH—, —CHOHCHOH—,



4,034,864
DOCUMENT HANDLING SYSTEM

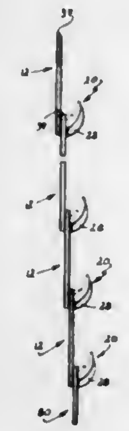
George F. Tyson; Robert A. Keeler, both of Grand Rapids, Mich., and Raymond L. Myers, Vestal, N.Y., assignors to Steelcase, Inc., Grand Rapids, Mich.
Filed Feb. 3, 1975, Ser. No. 546,280
Int. Cl.² A42F *7/10*
U.S. Cl. 211—50 **9 Claims**



1. In a manual paper handling system for processing and handling paper comprising a support structure presenting an upright support panel means for handling a plurality of trays therein; a plurality of trays; said trays and support structure having cooperative mounting means for permitting easy, removable hanging of said trays on said support panel; the improvement comprising: at least some of said trays having bottom, side and back walls with said mounting means adapted to mount said trays on said panel means with said back wall located adjacent said panel means; said bottom wall as it extends from said panel means being inclined upwardly from the horizontal and from said side wall being sloped upwardly at an angle less than 90° from a horizontal plane, said side wall having intersecting top and front edges with the top edge from the back to the front sloping downwardly and the front edge from bottom to top sloping rearwardly to provide better access for grabbing papers located within said tray, said side wall being sloped from bottom to top at an angle less than 90° from a vertical plane whereby papers placed therein tend to slide toward the back wall and the side wall and lean flat against the side wall.

4,034,865
SEGMENTAL ARTICULATED ARTICLE DISPLAY

John H. Batts, and Judd F. Garrison, both of Grand Rapids, Mich., assignors to John Thomas Batts, Inc., Zeeland, Mich.
Filed Jan. 2, 1976, Ser. No. 646,183
Int. Cl.² A47G *29/00*
U.S. Cl. 211—118 **25 Claims**



1. A segmental support hook for suspended article display devices including a plurality of interconnected links, each link comprising:

a rigid body having transversely spaced side members and longitudinally spaced end members interconnecting said side members one of said end members being circular in cross sectional throughout a substantial portion of its circumference;

a hook-like portion extending outwardly from said body and having an outer peripheral surface and an inner peripheral surface; and

detent means, adjacent the juncture of the inner peripheral surface of said hook-like portion with said body, for securely and pivotally receiving in a detent type fashion said one of the end members of another link, said hook-like portion including means for supporting an article display device.

4,034,866
HANGER SUPPORT STRUCTURE FOR SHIPPING CONTAINER

Leonard J. Beckwith, 16 Buttonwood Lane, Weston, Mass. 02193
Filed Nov. 4, 1975, Ser. No. 628,604
Int. Cl.² A47F *7/19*
U.S. Cl. 211—124 **3 Claims**

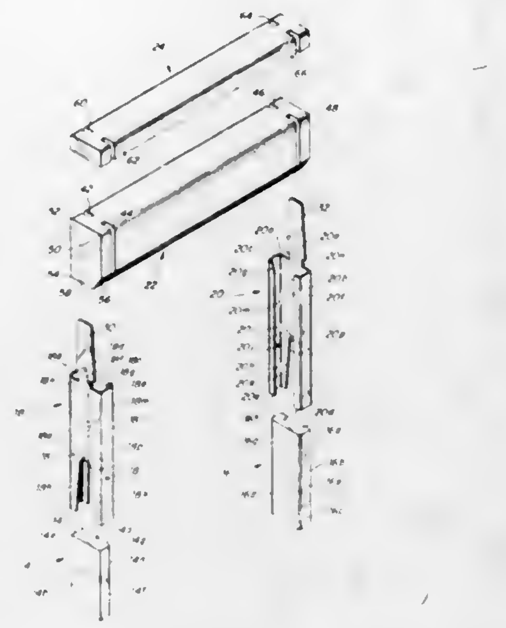
1. A hanger support structure for a shipping container comprising:

a pair of struts;

a pair of clips for receiving and extending above the top end of each of said struts, respectively; the part of each said clip extending above a said strut forming an engaging portion; each of said clips having a back wall, two side walls, joining said back wall, two keying segments joined to said side walls and forming a part of a front wall;

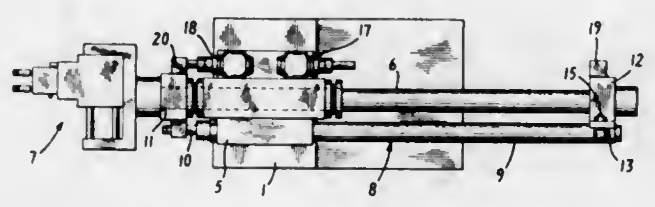
a cross-bar having a locking portion at each end including a pair of mortises on opposite sides of said cross-bar for engaging said keying segments with said locking portion which is received in said engaging portion of said clip; each said clip including a recess in the lower portion of its back wall of the same shape and size as a said locking portion; and

adhesive means on the back of each said strut for fastening each said strut to a portion of a shipping container.



4,034,867
HANDLING DEVICE

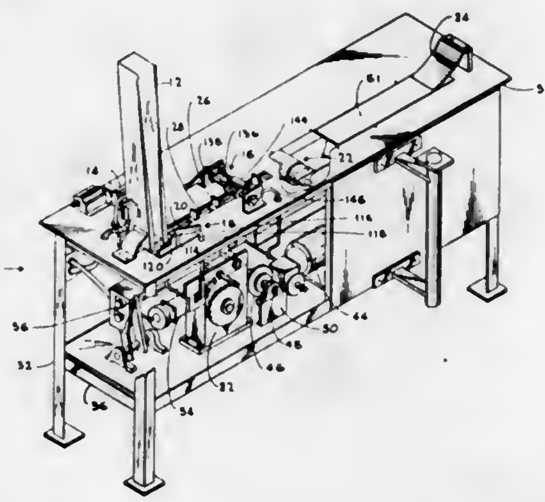
Minoru Akagawa, Funabashi, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan
Filed Nov. 24, 1975, Ser. No. 634,524
Claims priority, application Japan, Nov. 26, 1974, 49-143206[U]
Int. Cl.² B25J *9/00*
U.S. Cl. 214—1 BB **5 Claims**



1. A handling device comprising: a base; a head; mounting and positioning means mounting said head on said base and operable for positioning said head along a certain direction relative to said base; a linear transfer arm having a major length dimension and a pair of opposed ends, and slideably mounted on said head for sliding relative to said head along the major length dimension from a retracted position with a first of said ends adjacent said head and the second of said ends remote from said head to an extended position with said first end remote from said head and said second end adjacent said head; said head comprising means slideably mounting said transfer arm thereon for sliding along the major length dimension between the retracted position and the extended position; driving means operable for driving said linear transfer arm to slide along the major length dimension between the retracted position and the extended position, said driving means comprising an elongated housing mounted on said head and having a major length dimension parallel to the transfer arm length dimension and having a length extending from said head approximately equal to a length of a portion of said linear transfer arm extending from said head when said linear transfer arm is in the retracted position, said head comprising means fixedly mounting said driving means thereon and to extend therefrom parallel to and in the same direction as said linear transfer arm when said linear transfer arm is in the retracted position; and means for preventing rotation of said linear transfer arm about the major longitudinal dimension thereof, said means for preventing rotation comprising a member fixedly secured to said linear transfer arm at an end portion thereof adjacent said second end, and said member extending toward the housing of said driving means and freely engaging therewith for permitting translational movement of said member relative to said housing along the major length of said housing and for preventing rotational movement of said member relative to said housing thereby to prevent rotation of said linear transfer arm about the major longitudinal dimension thereof.

4,034,868
APPARATUS FOR EXTRACTING CONTENTS OF A PACKAGE

Wallace Loyd Rowland, Jr., Petersburg, Va., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Division of Ser. No. 562,740, March 27, 1975, Pat. No. 3,991,892. This application May 4, 1976, Ser. No. 683,036
Int. Cl.² B65G *65/04*
U.S. Cl. 214—8.5 G **5 Claims**



1. Apparatus for extracting both the inner and outer wrappings from a package containing a plurality of substantially rod shaped articles comprising

a. storage means for holding a plurality of packages to be extracted;

b. moving means for sequentially removing a package from said storage means and intermittently moving said package;

c. holding means adjacent for restraining a portion of the inner wrap during a first dwell period, thereby holding said inner wrap and contained articles substantially stationary;

d. outer wrap engaging means for engaging and removing the outer wrap during the first dwell period of said moving means, said outer wrap engaging means removing the outer wrap in a direction substantially parallel to the longitudinal axis of said package; and

e. inner wrap engaging means for engaging the inner wrap and removing the inner wrap from the articles during a second dwell period of said moving means.

4,034,869

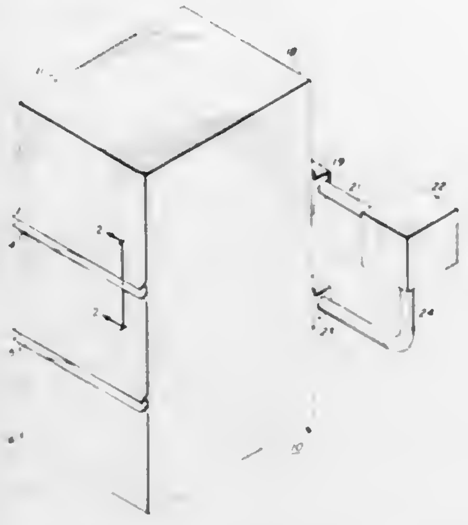
FLUID MEANS TO LOAD AND UNLOAD A VERTICALLY MOVABLE DOCUMENT STORAGE RACK

Klaus K. Stange, Pittsford; Richard E. Smith, Webster; Thomas J. Hamlin, Macedon, and James R. Cassano, Penfield, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Dec. 8, 1975, Ser. No. 638,584

Int. Cl.^{2} B65G *47/00*

U.S. Cl. 214—16.4 R **8 Claims**



1. Apparatus for storing documents, comprising:
- a. a housing having an opening;
- b. a rack located in the housing and having a plurality of parallel pockets for storing documents, the rack including a number of plates, a plurality of spacers, and means for fixing the spacers to the plates to provide the pockets;
- c. means for moving the rack to successively align each of said pockets with the opening; and
- d. first fluidic means for moving documents, in pockets brought into alignment with the opening, through the opening;

said housing including, on one side of the opening, an internal projection having a curved end and, on the other side of the opening another internal projection having a similarly curved end, each of the plates on the rack having a similarly curved end, adjacent plates being in near contact with the curved ends of the projections when a pocket is aligned with the opening.

4,034,870

DEVICE FOR INTRODUCING A SUBSTANCE, PARTICULARLY A PULVERULENT SUBSTANCE, FROM A CHAMBER HAVING A PRESSURE P1, INTO A CHAMBER HAVING A PRESSURE P2 HIGHER THAN P1

Bernard P. Duch, 201 Rue Saint-Denis, Colombes (Haute de Seine), France

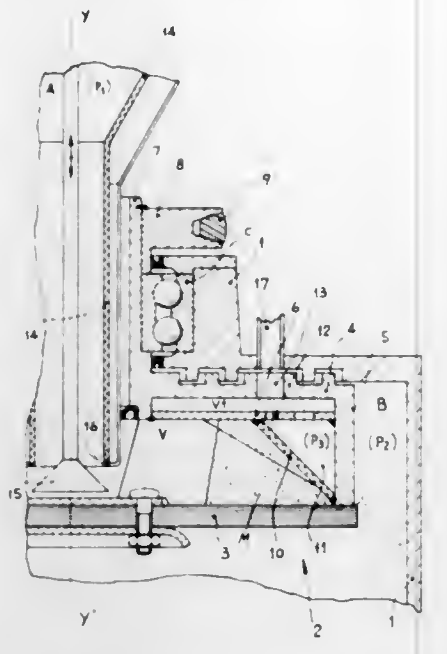
Filed May 15, 1975, Ser. No. 577,888

Claims priority, application France, May 15, 1974, 74.16886; May 6, 1975, 75.14200

Int. Cl.^{2} B65G *65/30*

U.S. Cl. 214—17 CB **2 Claims**

1. Apparatus for the introduction of a substance from a space under relatively low pressure to a space under higher pressure, comprising a stator which defines said space under higher pressure, a rotor that rotates within said stator and that defines said space under relatively low pressure, means to introduce said substance into said rotor, said rotor being formed in two parts that contact each other along a peripheral line, means mounting said two parts for movement of at least one of said parts away from the other of said parts in a direction parallel to the axis of rotation of the rotor, said rotor having a rigid perforated wall therein, on one side of which said material collects upon rotation of said rotor, and means for passing through said rigid wall a gas under a pressure higher than said higher pressure thereby to fluidify the material in the rotor.



4,034,871

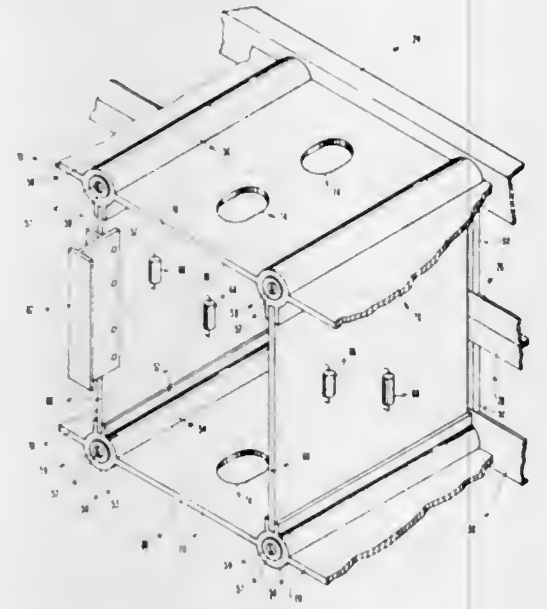
ADAPTER FOR MOUNTING PRINTED CIRCUIT CARDS

Adam A. Jorgensen, Fairport, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Continuation of Ser. No. 214,823, Jan. 3, 1972, abandoned. This application July 23, 1973, Ser. No. 381,960

Int. Cl.^{2} H02B *1/04*

U.S. Cl. 211—41 **10 Claims**



1. A printed circuit card adapter for mounting on a cantilevered elongated stud, said adapter comprising:
- a plurality of elongated bar-like members each having at least one inner surface area extending the entire length of said elongated member and having a generally tubular shape substantially conforming to an outer surface of the elongated stud on which said member is slideably mounted and a longitudinal axis coinciding with the longitudinal axis of said stud when mounted thereon;
- guide means disposed on each of said members and integral therewith adapted for slideably receiving an edge of a printed circuit board, the longitudinal axis of said each of said guide means being disposed substantially parallel to the longitudinal axis of the respective bar-like member and being essentially the same length as the stud, and
- a web interconnecting pairs of elongated bar-like members to form a strip of a plurality of elongated members whereby the longitudinal axis of all the elongated bar-like members are a common plane and are substantially parallel to each other, and wherein all the guide means on said members extend in the same direction from said common plane.

4,034,872

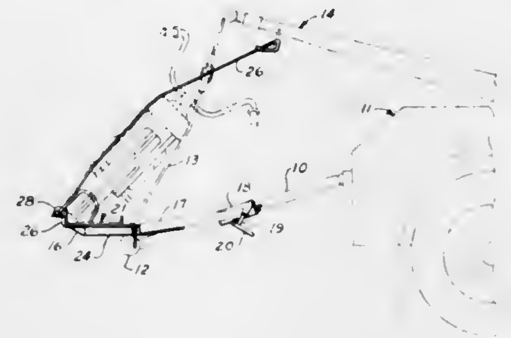
MOTORCYCLE RACK FOR A TOW TRUCK

David A. Jager, 625 S. Stadium, Oregon, Ohio 43616

Filed Aug. 20, 1976, Ser. No. 716,274

Int. Cl.^{2} B60P *3/12*

U.S. Cl. 214—86 A **4 Claims**



1. A motorcycle rack adapted to be mounted on a tow truck sling that consists of a V-shaped bracket the legs of which are pivoted to the truck and the nose of which is provided with a cross-bar hung by means of straps from a hoist, said rack comprising a fork adapted to be carried by said cross-bar in front of said straps and having two forwardly-extending legs the ends of which are adapted to be secured to the legs of said V-shaped bracket, said fork extending rearward past said straps and carrying a platform for supporting a motorcycle in a position leaning forward against said straps.

4,034,873

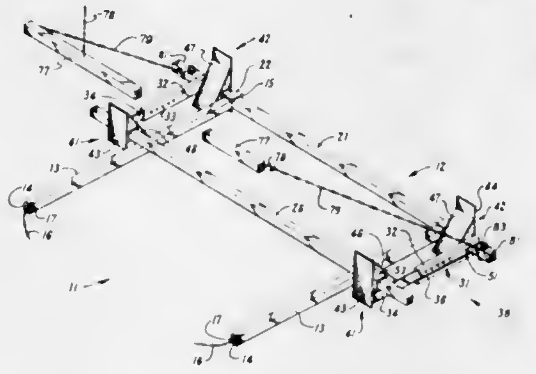
WHEEL SUPPORTING TOWING SLING ATTACHMENT

Robert C. Haring, 15 Parkway Court, Orinda, Calif. 94563

Filed Dec. 6, 1976, Ser. No. 747,504

Int. Cl.^{2} B60P *3/12*

U.S. Cl. 214—86 A **8 Claims**



1. A wheel supporting attachment for a tow truck sling comprising:
- a. a substantially horizontal frame includng an after transverse cross bar, a forward transverse cross bar, and a pair of longitudinal rails extending between a forward end and an after end, the after ends of said longitudinal rails being detachably secured to said after cross bar with intermediate portions of said longitudinal rails underlying said forward cross bar;
- b. a pair of fore and aft wheel cradles supported on said forward cross bar and said after cross bar, said wheel cradles being located on the opposite lateral sides of said frame and transversely spaced apart a distance such as to support a pair of wheels of a motor vehicle to be towed; and,
- c. means for attaching said frame to said sling with either the front wheels or the rear wheels of the vehicle to be towed lodged in said wheel cradles for elevation by said sling to vehicle towing position.

4,034,874

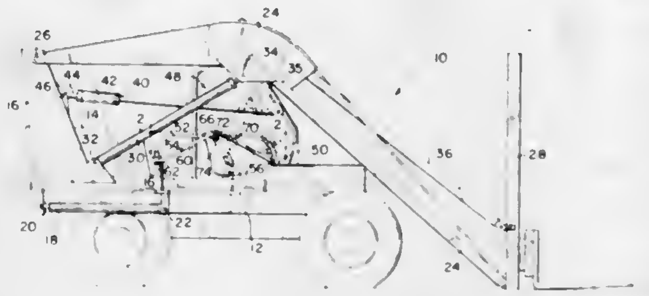
HOSE SUPPORTING LINKAGE

Cager K. Collins, Fairview, Ill., assignor to International Harvester Company, Chicago, Ill.

Filed Oct. 19, 1973, Ser. No. 408,205

Int. Cl.^{2} E02F *3/70*

U.S. Cl. 214—140 **3 Claims**



1. In a material handling machine having a wheeled frame, a carriage mounted on said frame for fore and aft movement, hydraulically actuated equipment carried by said carriage and a source of hydraulic fluid pressure on said frame; the improvement comprising:
- a first manifold on said carriage communicating with said equipment;
- a second manifold on said frame capable of communication with said source;
- a plurality of hoses extending between said manifolds;
- a first pair of links pivotally connected at one end to said carriage;
- a second pair of links pivotally connected at one end to said frame;
- pin means interconnecting the free ends of said first and second pairs of links; and
- clamp means for securing said hoses to said pin means.

4,034,875

LOAD HANDLING VEHICLE

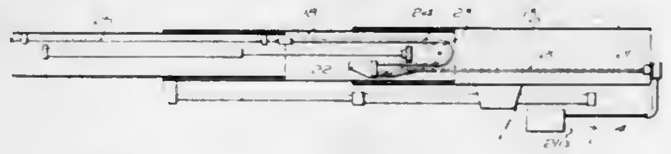
Stuart Pugh, Loughborough, and Eric Colley, Leicester, both of England, assignors to The Liner Concrete Machinery Company Limited, Wear, England

Filed Oct. 10, 1975, Ser. No. 621,449

Claims priority, application United Kingdom, Oct. 12, 1974, 44296/74

Int. Cl.^{2} B66C *23/00;* **B66F** *9/22*

U.S. Cl. 214—141 **4 Claims**

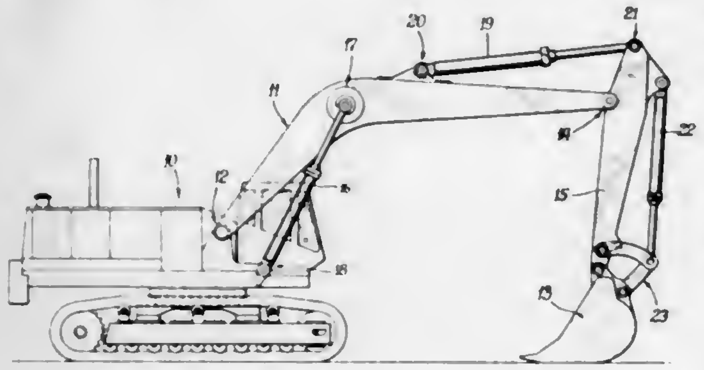


1. In a load handling vehicle having powered equipment operable by fluid under pressure conducted thereto by pipes, said vehicle having an extensible boom with telescoping sections, the improvement comprising: a first set of rigid pipes rigidly secured to the trailing end of an outermost section of the telescopically extensible boom and extending therethrough to a position adjacent the loading end thereof, a roller rotatably mounted on the trailing end of an intermediate section of the extensible boom, said second set of pipes being

flexible and disposed in the intermediate boom section and flexibly extending around said roller from the trailing end of the inner section of the extensible boom to a coupling connecting the first and second sets of pipes together at the position adjacent the leading end of the outermost section whereby fluid pressure is supplied to said equipment through said boom at any telescoping position thereof.

4,034,876
BOOM CONSTRUCTION AND METHOD FOR MAKING SAME

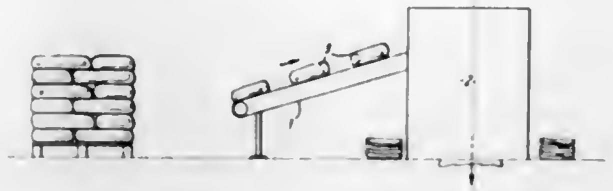
John W. Yancey, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Division of Ser. No. 472,965, May 28, 1974, Pat. No. 3,902,295. This application Apr. 23, 1975, Ser. No. 570,985
Int. Cl.² E02F *3/38*
U.S. Cl. 214—152 **7 Claims**



1. A method for making a boom comprising the steps of,
first cutting and shaping a pair of substantially identical upper and lower plates and a pair of substantially identical side plates,
forming openings in the side plates for receiving pivot bell castings therein,
joining a pair of pivot bell castings, having annular axial flange means and radial flange means which include a portion arranged to abut the inner surface portions of the side plates, by joining said annular axial flange means to respective ends of a cylindrical connecting member,
then welding the side plates to the radial flange means of said bell casting assemblies,
then tack welding one leg of an angle bar to the edges of the side plates so that each angle bar projects above said edges a predetermined amount for defining the width of subsequent lateral welds joining said side plates to upper and lower plates abutted thereagainst and for providing a backup member for such welds,
then positioning the assembly so formed on a lower plate and tack welding the assembly to the lower plate with the other legs of the angle bars abutting the lower plate,
thereafter positioning an upper plate on the top lateral edges of the side plates, also in abutting relationship with the other legs of the angle bars, and tack welding the upper plate to the assembly,
then turning the tack welded assembly on a first side plate and completing an annular weld of one bell casting to the other side plate and securing the upper and lower plates to said other side plate,
thereafter turning the assembly on to said other side plate and completing an annular weld of the other bell casting to the first side plate and securing the upper and lower plates to the first side plate.

4,034,877
APPARATUS FOR OPENING CONTAINERS

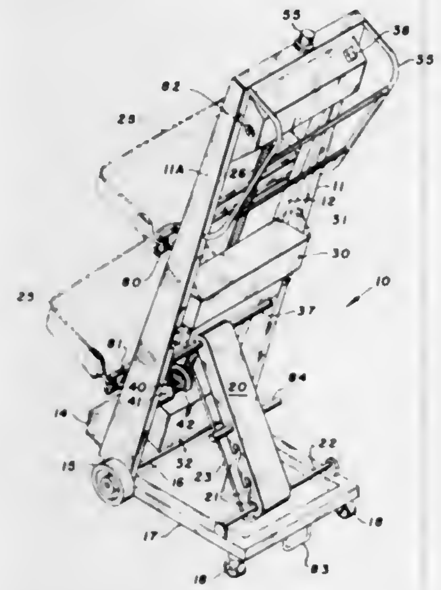
Stewart Bennison, Sunnybank, England, assignor to Bel-Tyne Company Limited, Stockport, England
Filed Sept. 2, 1975, Ser. No. 609,717
Int. Cl.² B65B *69/00*
U.S. Cl. 214—305 **24 Claims**



1. Apparatus for opening bags comprising conveyor means for conveying bags to a cutting gap, and cutting means disposed in said cutting gap, said conveyor means including means for holding said bags on opposite sides thereof with the broad faces of said bag lying in a vertical plane, and means for gripping the bag on opposite sides of said cutting means whereby opposite vertical faces of the bag are gripped to force the bag past said cutting means, to cut the bag into two halves, each half subsequently being conveyed laterally away from and on opposite sides of said cutting means by said gripping means, said means for gripping also for stripping a bag laterally away from the contents the contents of said bags to fall under the force of gravity from the bag past said cutting means.

4,034,878
ELECTRIC HAND TRUCKS

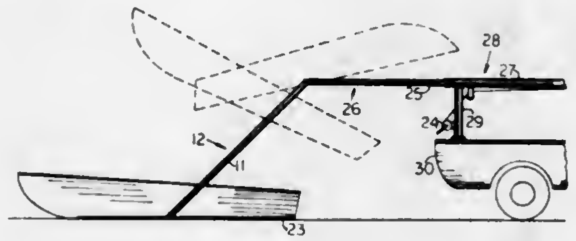
Anthony Fox, 8306 Queen Ave. South, Minneapolis, Minn. 55431
Filed June 7, 1976, Ser. No. 693,286
Int. Cl.² B62B *1/06*
U.S. Cl. 214—374 **5 Claims**



1. In a hand truck, first frame means, a second frame means telescopically engaging said first frame means and having a load bearing flange bed extending forwardly thereof an axle shaft mounted on said first frame means and having a pair of wheels mounted at opposed ends thereof for supporting said hand truck, a screw shaft mounted for rotation on said first frame means and having a load bearing nut means in engagement with said screw shaft and being coupled to said second frame means for raising and lowering said second frame in response to rotation of said screw shaft, and electrically powered rotation means for providing power for rotation of said shaft;
a. auxiliary carriage means swingably mounted upon the base of said first frame and having a pair of castors at the free end thereof mounted for rotatable support of said auxiliary carriage means, and bracket means secured to said first frame means at the first elevated location spaced from said axle shaft to form a triangular support for said first frame means;
b. winch means coupled to said first frame means and being mounted for rotation about shaft means, with said shaft means being coupled across said frame means generally parallel to said axle shaft and being disposed generally between said first elevated location and said axle shaft; and
c. ball pivot means coupled to the base of said flange bed for supporting said band truck for movement upon forward tilting of said hand truck about the axis of said axle shaft.

4,034,879
DEVICE FOR LOADING AND CARRYING BOATS ON TOP OF VEHICLES

Eric W. Cudmore, R.R. 1, Box 143, Walcott, Iowa 52773
Filed Aug. 16, 1976, Ser. No. 714,566
Int. Cl.² B60R *9/00*
U.S. Cl. 214—450 **7 Claims**

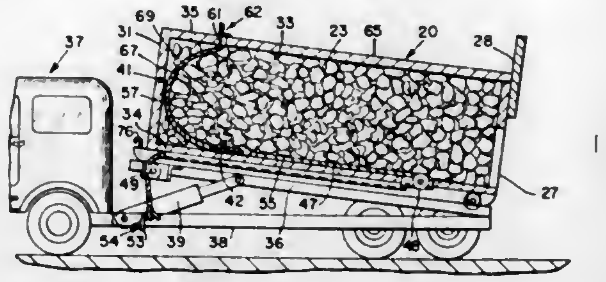


1. A vehicle top-mounted load carrier comprising:
an upper frame to be secured horizontally above a vehicle for supporting a load to be carried and a ramp extending slantingly downwardly from an end of said upper frame to facilitate loading, said upper frame and said ramp each having a pair of parallel side rails, the rails at each side being joined together end-to-end to provide a continuous rail,
a carrier bar extending transversely between said continuous rails, each end of said carrier bar being constrained to follow the respective one of said continuous rails and being readily movable therealong,
fastening means connected to said carrier bar for carrying a load to be attached thereto, said fastening means being rotatable on said carrier bar for permitting a load attached thereto to be rotated about said carrier bar to the extent of inverting the load to have a suitable portion of the load facing downwardly for subsequently supporting the load, the attached load being rotated while the load is suspended between opposite ones of said side rails at a position removed from the layer end of said ramp and from the vehicle to which the upper frame is attached,
load propelling means connected to said carrier bar for moving said carrier bar along said continuous rails to move said attached load to a position over said frame,
supporting means connected to said upper frame for securing said upper frame above a vehicle, and said frame having transverse members for supporting said attached load.

4,034,880
INSTANT LOAD RELEASE SYSTEM

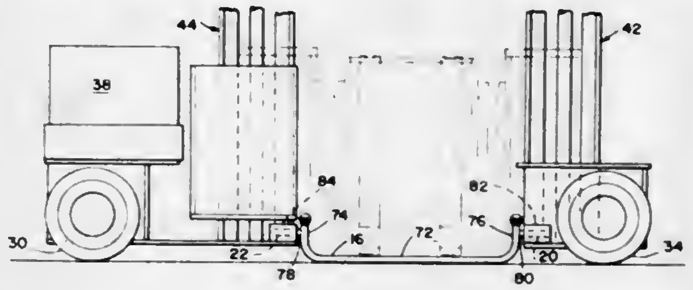
Lionel G. Frenette, Hudson, N.H., assignor to Victor T. Guertin, Trustee, Nashua, N.H.
Filed Jan. 19, 1976, Ser. No. 650,256
Int. Cl.² B60P *1/04*
U.S. Cl. 214—510 **8 Claims**

8. Apparatus for ejecting a frozen load of compacted waste from the rearward end of a roll-off container during tilting of said container on a tilt bed vehicle, said apparatus being of the type having an ejector bar pulled rearwardly along the floor of the container by the tilting of the vehicle and characterized by,
a pair of extension cables each extending from an opposite side of said bar, forwardly along said floor, thence upwardly along the front wall and thence rearwardly along the roof of said container to a terminal end anchored to said roof at a spaced distance in rear of said front wall,
the rearward pulling of said bar causing said extension cables to exert compressive, squeezing forces on the frozen front end of said load to free the same from adhesion to the adjacent walls of said container.



4,034,881
OUTRIGGER AND FRAME SUPPORT MEMBER

Lloyd K. Heinold, and Walter M. Shaffer, both of Peoria, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.
Filed Jan. 19, 1976, Ser. No. 650,204
Int. Cl.² B65G *47/00*
U.S. Cl. 214—730 **6 Claims**



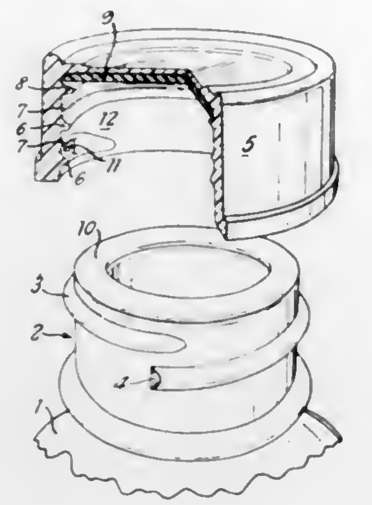
1. In a vehicle having front and rear separate and discrete body portions, a plurality of wheels on each of said front and rear body portions, a load handling means mounted on and extending between said body portions whereby loads may be picked up and deposited adjacent said vehicle, combination frame support and outrigger means comprising a pair of generally rectangular elongated members with flange means extending from each end thereof, means pivotally mounting said flange means to a respective body portion adjacent the lateral sides thereof, thereby interconnecting said front and rear body portions, providing additional vehicle structural integrity between said front and rear body portions and means selectively actuable to rotate said frame support and outriggers members on said mounting means from a first position to a ground engaging position to stabilize said vehicle during loading and unloading.

4,034,882
CONTAINER CLOSURES

Garth Wright, Greenford, England, assignor to Rockware Group Limited, England
Filed Oct. 15, 1976, Ser. No. 732,790
Claims priority, application United Kingdom, Oct. 15, 1975, 42322/75
Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*
U.S. Cl. 215—217 **13 Claims**

1. A container closure comprising a threaded neck member and a threaded closure cap member cooperating therewith, one such member bearing a raised helical thread having a stop end and the other member defining two helical paths in which

the helical thread may be engaged, one of which paths allows the cap member to be removed from the neck member and the other having at its end a blocking member adapted to engage

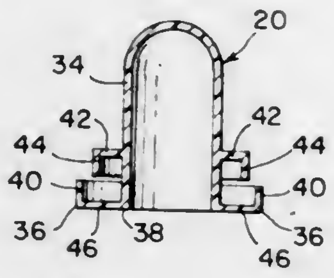


the stop end of the helical thread, and wherein the cap can be resiliently sprung axially to move the raised helical thread from one helical path to the other.

4,034,883
CLOSURE LID FOR HOME CANNING JAR

Walter J. Wojcik, 14799 Milan Oakville Road, Milan, Mich. 48160

Filed Aug. 3, 1976, Ser. No. 711,112
Int. Cl.² B65D *45/02*
U.S. Cl. 215—276 **5 Claims**

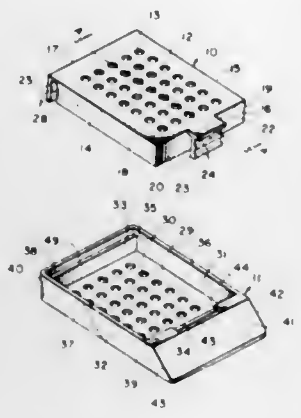


1. A closure lid adapted to be threadably received on an externally threaded neck of a canning jar, which comprises:
- a. a cap member adapted to be threadably received on said external threaded neck;
- b. a flexible dome shaped body extending upwardly through said cap member;
- c. first means for forming an air tight seal between said cap and said body;
- d. second means for forming an air tight seal between said body and an upper edge of said neck of said jar;
- e. said cap further includes a top having an enlarged central opening therethrough, an upper surface of said top having an annular groove therein, a lower surface of said top having an annular channel therein, said opening receiving said flexible dome shaped body therethrough, and an annular skirt having internal threads, said skirt affixed to an outer annular edge of said top and extending downwardly therefrom, said skirt adapted to threadably engage said neck.

4,034,884
BIOLOGICAL SPECIMEN PROCESS APPARATUS AND COVER MEMBER THEREFOR

Fred K. White, Glen Ellyn, Ill., assignor to Miles Laboratories, Inc., Elkhart, Ind.

Filed Mar. 20, 1975, Ser. No. 560,557
Int. Cl.² B65D *41/18*
U.S. Cl. 220—8 **10 Claims**

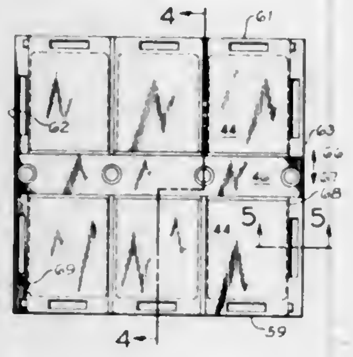


3. A cover member adapted for telescopic cooperation with an open-topped rectangular box-like base member having external abutment means and a perforated bottom wall to provide therewith biological specimen processing container apparatus of adjustable size, said cover member comprising an open-bottomed, rectangular box-like member having a perforated top wall, two opposing parallel longitudinal sidewalls and two opposing parallel transverse endwalls, said box-like member being formed at opposite sides thereof with detent members of generally L-shaped cross-section which project outwardly and thence downwardly from adjacent said top wall, said detent members each being formed with at least one protrusion thereon.

4,034,885
PARTS STORAGE AND DISPENSING CONTAINER

Paul J. Hunckler, Huntington, and Jeffrey J. Quinn, Indianapolis, both of Ind., assignors to Hunckler Products, Inc., Huntington, Ind.

Filed Aug. 12, 1976, Ser. No. 713,919
Int. Cl.² B65D *1/24, 51/18, 51/04*
U.S. Cl. 220—22 **14 Claims**

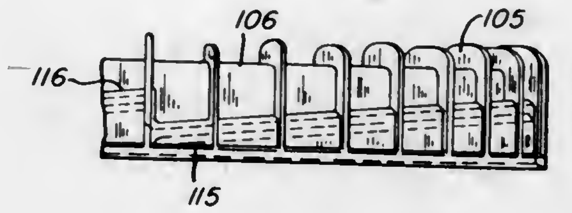


1. A parts storage and dispensing container comprising:
- a rectangular box having an open top and having a plurality of internal divider walls dividing the box into a plurality of upwardly-opening compartments, said box having outwardly-projecting, downwardly-facing ledge means thereon;
- a lid adapter frame having resilient clip means engaging said ledge means and securing said frame on top of said box; and
- lid means including a lid mount portion secured to said frame and having a plurality of lids hingedly connected to said mount portion and located to cover said compartments,
- said lids having resilient clip means engaging said ledge means to hold said lids in compartment-closing position.

4,034,886
PLASTIC LIDS AND PAILS

Herbert W. Galer, Pine Township, Allegheny County, Pa., assignor to United States Steel Corporation, Pittsburgh, Pa.

Filed Mar. 28, 1975, Ser. No. 563,262
Int. Cl.² B65D *7/44*
U.S. Cl. 220—72 **3 Claims**

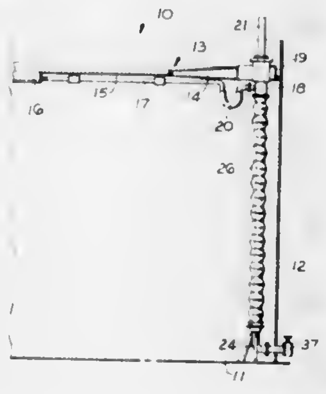


1. In a stiff molded plastic lid having a central closing portion and an inverted U-shaped rim, the outer wall of said rim including means for engagement with an open-head pail and the interior of said rim being dimensioned to receive a compressible gasket, said means for engagement being disposed to effect a seal by compression of said gasket between the upper rim of said pail and the interior of the inverted U-shaped rim in said lid, the improvement comprising an inverted U-shaped portion adjacent to said rim, said portion extending above the central closing portion and ending below the outer wall forming the arch of said rim, said inverted portion forming a support for a pail when said pail is positioned on said lid, and a plurality of thin upstanding members radially disposed about the periphery of said rim and extending upwardly above the wall forming the arch of said inverted U and outwardly from the outer wall of the rim in the region of said arch, said members having a length to thickness ratio sufficient to allow deflection of said members without substantial deflection of said rim, the number and spacing of said members being sufficient to position them close enough to each other relative to the curvature of said rim so that impact forces directed to said rim are absorbed and dissipated by said members to reduce substantially the intensity of force per unit area transmitted to the seal through said rim.

4,034,887
STORAGE TANK

William Raymond Sherlock, 100, Moss Lane, Sale, Cheshire, England

Filed Nov. 25, 1975, Ser. No. 635,047
Claims priority, application United Kingdom, Nov. 29, 1974, 51841/74
Int. Cl.² B65D *87/18*
U.S. Cl. 220—219 **6 Claims**

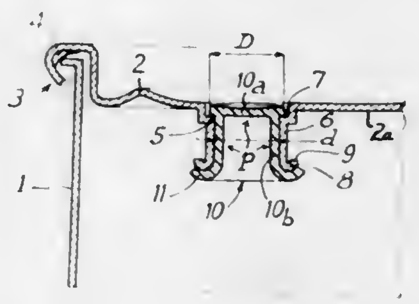


1. In combination with a tank including a base and a side wall and an apertured floating roof having an edge in sealed relationship with the side wall and a central sump, a roof drainage system comprising:
- a drain adjacent the base and extending outwardly of the tank,
- a generally vertically-disposed support pipe connected to the drain at its lower extremity and extending therefrom through the roof aperture at its upper extremity and having slots therethrough spaced along the length thereof,
- a liner disposed in circumscribing relationship with the support pipe in the area of adjacency of support pipe and roof and having an inlet leading therethrough intermediate the upper and lower terminals thereof,
- a first conduit disposed generally horizontally beneath the roof with an inboard terminal connecting to the sump and an outboard terminal disposed adjacent the side wall,
- a flexible interconnecting conduit interconnecting the outboard terminal of the first conduit and the liner inlet, and
- an extensible flexible sleeve circumscribing and extending along the length of the support pipe between and in sealed relationship with the drain at its lower extremity and the liner at its upper extremity.

4,034,888
CAN FOR CONTAINING BEVERAGES

Hubert M. Strauss, 6 Place Notre-Dame, Semur-en-Auxois (Cote d'Or), France

Filed Dec. 16, 1975, Ser. No. 641,359
Claims priority, application France, Dec. 17, 1974, 74.41574
Int. Cl.² B65D *41/02*
U.S. Cl. 220—260 **11 Claims**



1. A can for containing a beverage, comprising a metallic enclosure closed by a separate end, said end comprising an opening closed by a leakproof capsule retractable to the inside of the can, wherein said opening is formed by a tubular element securely fixed to said end and turned towards the inside of said can, and wherein said capsule is made of a semi-deformable rigid material having a disc of diameter slightly greater than the internal diameter of said tubular element, said disc being securely fixed to a tubular skirt whose external diameter is at most equal to the diameter of said tubular element, the end of said skirt opposite said disc being provided with external protuberance means for gripping said tubular element.

4,034,889
PLASTIC CONTAINER-COVER ASSEMBLY

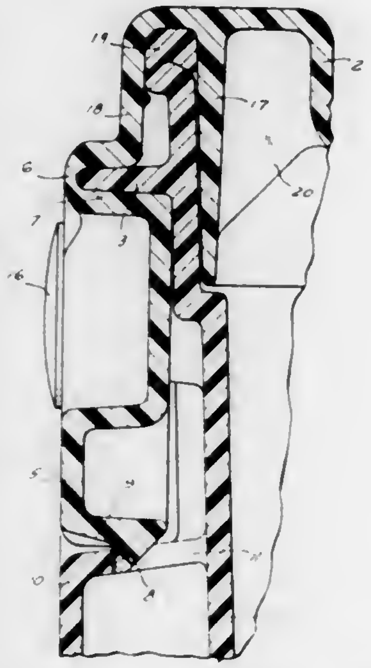
Theo Hammes, Cologne; Wilhelm Kühne, Wiesenbach; Gerhard Gohlke, Bammental, and Udo Hermann Maus, Mauer, Heidelberg, all of Germany, assignors to Mauser Kommanditgesellschaft, Bruhl, Germany

Filed Feb. 11, 1976, Ser. No. 657,108

Claims priority, application Germany, Oct. 3, 1975, 2544244

Int. Cl.² B65D *41/16, 45/16*

U.S. Cl. 220—306 **7 Claims**



1. A plastic container-cover assembly comprising
- a. a container body having a top opening;
- b. a first shoulder provided at the outside of the container close to the edge of its opening;
- c. a cover for said opening;
- d. an outside flange provided on said cover and extending downwardly and then at a sharp angle outwards, the outwardly pointed portion of the flange in the closed position abutting the upper side of said first container shoulder;
- e. a hinge provided in proximity to the outer edge of said outwardly pointed portion of said flange;
- f. at least two rigid closure flaps linked by said hinge to said flange for swinging from an open to a closed position;
- g. a first ledge formed on said flap and, in the closed position, extending inwards and abutting against the bottom side of said first container shoulder;
- h. a second, when closed, inwardly extending ledge formed on said flap spaced from said first ledge;
- i. a second shoulder formed on the outside of said container spaced from said first shoulder, and
- j. interlocking closure means formed on said second ledge of the flap and on the second shoulder of the container for securing the flap in the closed position.

4,034,890
BREAD BOX

Albert H. Baller, Box 146, Clinton, Mass. 01510

Filed Dec. 15, 1976, Ser. No. 753,581

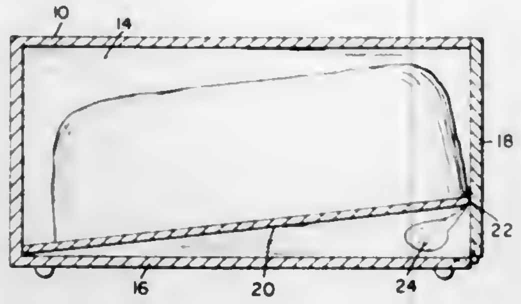
Int. Cl.² B65D *43/14, 51/04*

U.S. Cl. 220—334 **3 Claims**

1. A container comprising a top, side walls, bottom, an open front, and a movable door for closing the open front,

a floor, said floor having a forward edge located above the lower edges of the side walls and abutting the interior surface of the door when in closed position closing the open end of the container,

whereby material in an opened ended wrapper may be placed on the floor and the open end of the wrapper tucked in under the floor, the door sealingly abutting the floor edge and wrapper when closed.



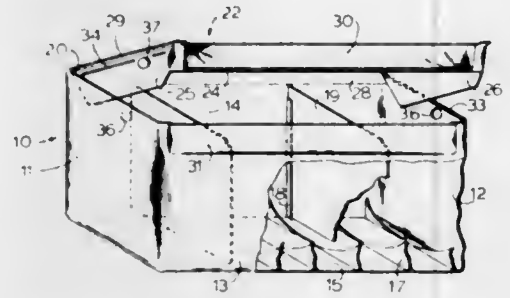
4,034,891
REFILLABLE CONTAINER FOR DISPENSING PHOTOSENSITIVE ROLLED SHEET

Lorrie E. Mecham, Canyon Country, Calif., assignor to Commercial Ventures, Ltd., Traverse City, Mich.

Filed Sept. 30, 1976, Ser. No. 728,313

Int. Cl.² B65D *43/14, 51/04*

U.S. Cl. 220—339 **6 Claims**



1. A container for dispensing light-sensitive rolled sheet comprising
- an integrally-formed molded plastic rectangular enclosure of such proportions as to be flexible under a manually applied torsional couple and having a bottom panel, front and rear side panels, a pair of opposed end panels, a top lid, further having an integral elastic hinge mounting said lid to said rear side panel, whereby to permit movement of said lid between an open and a closed position,
- said container being so molded with its lid open that on closing said hinge is elastically stressed,
- said lid having side margins extending over the adjacent edges of said end panels and further having a light-baffling stiffening skirt portion extending inwardly of said enclosure adjacent the inner surfaces of said side and end panels, and
- complementary detent means formed on the interior of each of said end panel and the exterior of those skirt portions inwardly adjacent thereto when the lid is closed,
- whereby manual application of a torsional couple about an axis parallel to said hinge so distorts the enclosure opening, relative to said stiffened lid, as to shift one or the other of said end panels away from the adjacent skirt portion of said lid, thereby releasing its complementary detent means there present, the elastic-stress in said hinge then drawing the lid open at said end panel.

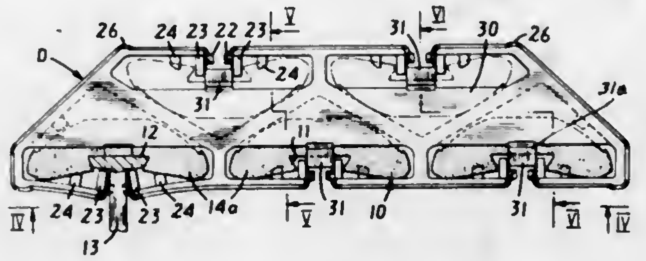
4,034,892
DISPENSER FOR RAZOR BLADE CARTRIDGES

Paul A. Braginetz, Staunton, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Aug. 14, 1974, Ser. No. 497,453

Int. Cl.² B26B *21/24;* **B65D** *83/10*

U.S. Cl. 221—64 **9 Claims**



1. A dispenser unit for elongated cutting blade cartridges said unit comprising a cellular arrangement of wall sections forming a plurality of cells connected together as an integral unit each cell having a longitudinal opening extending axially of the unit constructed and arranged to receive a cartridge longitudinally slidable in and out thereof, and each cell having a side with a longitudinally extending slot to receive the stem of a cartridge holder movable along the slot, and a common inner wall section with an immediately adjacent cell which has the said slot, the said side with the slot being arranged in each case at the exterior surface of the unit, the individual cells each having a generally triangular shape in cross section with the base of the triangle comprising the side with the slot arranged at the exterior surface of the unit, and at least one of the other sides being the wall section common with an adjacent cell interiorly of the unit.

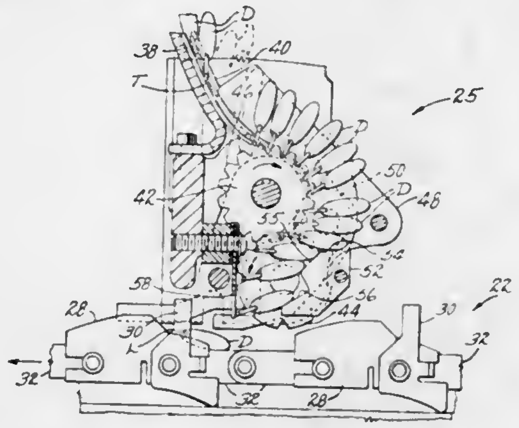
4,034,893
MACHINES FOR SEQUENCING DIVERSE COMPONENTS WITH COMPONENT SEPARATING AND GUIDING SURFACE

Armand L. Tardiff, Salem; Glover F. Broughton, Marblehead; David R. Delorey, Beverly, and Bangt R. Pearson, Magnolia, all of Mass., assignors to USM Corporation, Boston, Mass.

Division of Ser. No. 570,842, April 23, 1975, Pat. No. 3,971,193. This application Jan. 16, 1976, Ser. No. 649,908

Int. Cl.² H01R *43/00;* **B65H** *5/26*

U.S. Cl. 221—171 **5 Claims**



4. A sequencer for electrical components having their leads at least partly in coaxial relation, comprising a conveyor for advancing the components in a row with their bodies respectively trailing their leads, and a plurality of dispensers arranged in alignment with the conveyor for releasing successive components thereto, at least one of said dispensers comprising an arcuate guideway, a wheel cooperative with the guideway for advancing coaxial lead portions downwardly therein toward the conveyor, and a separator having a substantially horizontal upper stacking and lower relatively inclined surfaces slidably engageable by the bodies of the components as their leads descend in the guideway for deposit on the conveyor.

4,034,894
FILM-SHEET CASSETTE

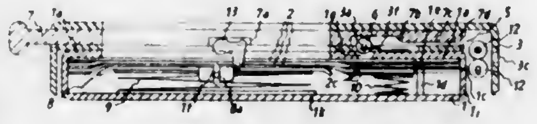
Peter Lermann, Narring, and Gunter Fauth, Unterhaching, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 25, 1976, Ser. No. 661,338

Claims priority, application Germany, Feb. 28, 1975, 2508705

Int. Cl.² B65H *1/08*

U.S. Cl. 221—227 **9 Claims**



1. An apparatus for holding a stack of sheets of photographic material and for dispensing same one at a time, said apparatus comprising:
- a cassette housing having a side wall and an end wall extending from said side wall and formed with a throughgoing slot;
- means including a spring for urging said stack with a predetermined spring pressure against said side wall with an end sheet of said stack pressing against said side wall, said side wall being formed with a throughgoing window alignable with said end sheet for exposure thereof;
- means including an operator engageable with said end sheet for sliding said end sheet off said stack and out of said housing through said slot; and
- means jointly operable with said operator for reducing said spring pressure during sliding of said end sheet.

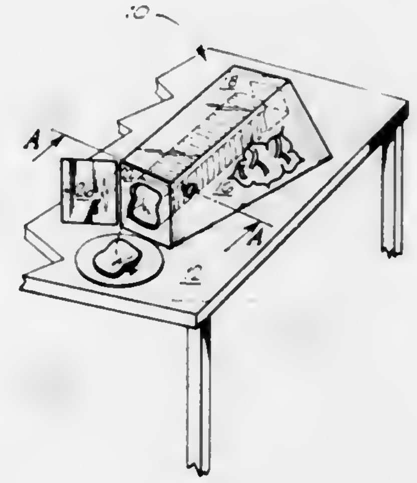
4,034,895
DEVICE FOR KEEPING BREAD FRESH

Enid Ortiz, 1928 Gerritt St., Philadelphia, Pa. 19146

Filed Oct. 21, 1975, Ser. No. 624,376

Int. Cl.² B65G *59/00*

U.S. Cl. 221—277 **4 Claims**



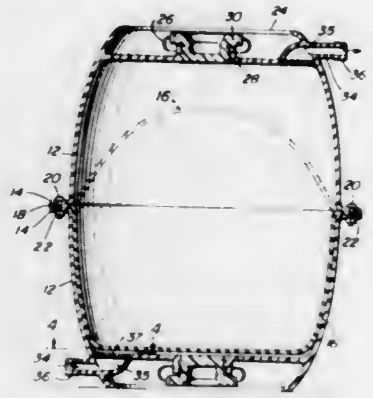
1. A bread storage and dispensing device comprising: an elongated housing dimensioned to store a plurality of slices of bread therein; support means interior of said housing for supporting said slices of bread in a substantially upright position and in a substantially uncompressed state on a surface which is inclined at an acute angle relative to the horizontal; closure means at the front and rear end portions of said housing; a shaft rotatably journaled in opposed side walls of said housing at a height above the top of the bread slices within said housing; an ejector element fixedly secured to said shaft to be rotatable therewith and including portions extending radially beyond opposed diametral locations of said shaft, the radial dimensions of said ejector portions being selected such that rotation of said shaft causes a first of said portions to urge

the slice of bread adjacent said front closure from the housing and the second ejector portion to pivot and be positioned between the next two succeeding slices of bread.

4,034,896

DIAPHRAGM CONTROLLED GARDEN AND ORCHARD SPRAYER

Walon K. Wilson, 2441 Adams St., Hollywood, Fla. 33020
Filed Dec. 18, 1975, Ser. No. 641,922
Int. Cl.² B65D *35/28*
U.S. Cl. 222—95 **5 Claims**



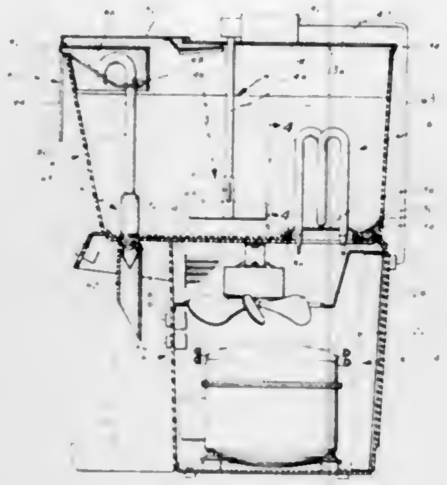
1. A garden and orchard sprayer assembly for containing and spraying insecticide mixes and the like comprising: means so that the assembly needs to be filled only once including; two identical canister half shells for the assembly each formed with an open end and a substantially closed end, an outer radially extending flange circumferentially around the open end of each canister half shell, the substantially closed end of each canister half shell having an axially extending flanged end portion concentric with the canister walls, a central large mouth opening in the closed end concentrically within the flange end portion of each canister half shell so as to be below the outer edge thereof so that when the large mouth opening is closed with a complementary large mouth plug and the assembly is resting on a surface by means of the axially extending flanged end portion the plug does not touch the surface, a removable large mouth plug mounted in the said central large mouth opening, diaphragm means mounted between the radially extending flanges of the two shells, and an inlet/outlet opening in the closed end of each canister half shell having a hose connection integral therewith and with a coupling end extending outwardly through the axially extending flanged end portion for connection to an ordinary type garden hose.

4,034,897

HIGH DENSITY LIQUID DISPENSER

Merle S. Brown, Cohasset, Mass., assignor to Jet Spray Cooler, Inc., Waltham, Mass.
Filed Feb. 13, 1976, Ser. No. 657,945
Int. Cl.² B67D *5/62*
U.S. Cl. 222—146 C **9 Claims**

1. A dispenser for heavy, quick drying liquids such as barium sulphate comprising
  a housing,
  a bowl seated on the housing and adapted to contain the liquid to be dispensed by the dispenser,
  refrigerating means disposed in the bowl for chilling the liquid in it,
  a circulator mounted in the bowl for moving the liquid about the refrigeration means and for maintaining the liquid in suspension,
  a tube defining a discharge spout in the bowl for withdrawing the liquid,
  a valve seat at the discharge spout,
  a valve body in the bowl and having a portion adapted to rest on the seat to close the spout,
said valve body lying within the bowl and biased to rest on the valve seat, said body having a lower portion spaced from the tube when the valve body is seated,
  a vent tube connected to the body and extending above the highest normal liquid level in the bowl,
  a passage through the body communicating with the tube at the passage top and open at the bottom in the spout below the seat,

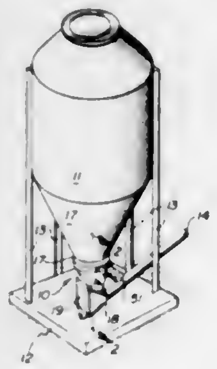


said passage in the body extending to the lower portion of the body and terminating on the body surface spaced from the tube,
an actuator operatively connected to the body and extending out of the bowl for raising the body off the seat.

4,034,898

BULK BIN DELIVERY AND METERING APPARATUS

Raymond W. Marttila, Goshen, and David L. McFarren, New Paris, both of Ind., assignors to Chore-Time Equipment, Inc., Milford, Ind.
Filed Dec. 22, 1975, Ser. No. 642,984
Int. Cl.² G01F *11/00*
U.S. Cl. 222—228 **14 Claims**

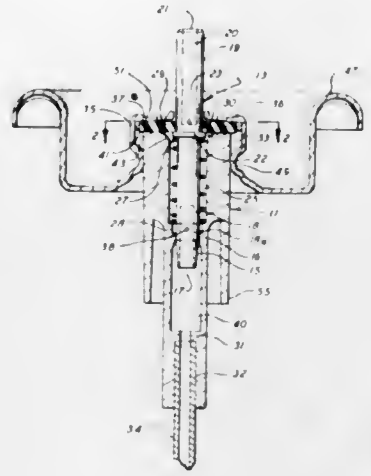


1. Apparatus for positively delivering a steady flow of feed to a receiver from a planar bin exhaust, comprising disk means mounted for rotation in the plane of the bin exhaust area and extending to sweep, when rotated, substantially the entire exhaust area, the rotatable means defining, together with the bin side, at least three apertures moving in the exhaust area in an endless path adjacent the bin side to cause feed to flow along the bin side continuously through the exhaust and directly into the receiver.

4,034,899

VALVE CONSTRUCTION

Philip Meshberg, 85 Old Oak Road, Fairfield, Conn. 06430
Continuation-in-part of Ser. No. 560,205, March 20, 1975, abandoned. This application Nov. 12, 1975, Ser. No. 630,953
Int. Cl.² B65D *83/14*
U.S. Cl. 222—321 **10 Claims**



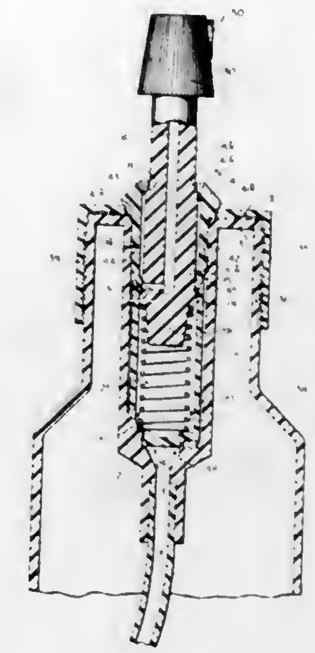
1. In a valve for closing off the bottom of a chamber in a dispensing device including:
  - a. a plastic housing having in its upper portion a cylindrical bore forming a chamber and having an annular sealing wall of smaller diameter below said chamber;
  - b. a cylindrical valve stem comprising:
    1. an upper portion containing valve means for use in communication between said chamber and a dispenser outlet;
    2. a second cylindrical portion below said upper portion and extending through said chamber;
    3. a part of the wall of said second portion in sealing contact with said sealing wall;
    4. a hollow recess in the bottom of said second portion extending to above the point of contact between said second portion and said sealing wall when said stem is in an upward, unoperated position;
    5. a crosshole through said second portion of said valve stem above said annular sealing wall permitting communication between said hollow recess and said chamber when said stem is in said upward, unoperated position;
  - c. a spring in said chamber closely surrounding said valve stem and urging said valve in an upward direction; and
  - d. means cooperating with said upper chamber to close off said valve means when said stem is in said upward unoperated position, the improvement comprising:
  - e. a flange formed in said metering chamber above the part of said second portion which contacts said annular sealing wall when said stem is depressed, said flange forming a bottom support for said spring, said flange being displaced upward from said sealing wall a distance at least equal to the stem travel during normal operation.

4,034,900

SPRAY PUMP ASSEMBLY

Robert X. Hafele, Baton Rouge, La., assignor to Ethyl Corporation, Richmond, Va.
Filed May 3, 1976, Ser. No. 682,730
Int. Cl.² G01F *11/06*
U.S. Cl. 222—321 **12 Claims**

1. A finger-operated pump assembly connectable to a container means comprising:
  - a. compression chamber means having a fluid inlet,
  - b. valve means loosely fitted inside the compression chamber means, said valve means being generally cylindrical in shape and hollow inside said valve means being movable between a first position in which said valve means closes said fluid inlet and a second position in which said fluid inlet is open,
  - c. piston means slidingly fitted inside said valve means, said

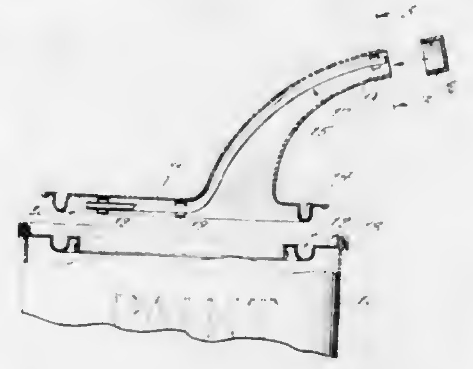


piston means having a passageway for conveying liquids from said compression chamber, and
  - d. resilient means fitted inside said valve means to urge said piston means away from one end of said valve means.

4,034,901

DRIPLESS SPOUT FOR PAINT CANS

Norman Kirk, 9 Rosedale Ave., Montclair, N.J. 07042
Continuation-in-part of Ser. No. 569,458, April 18, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,553
Int. Cl.² B65D *25/48*
U.S. Cl. 222—481.5 **3 Claims**



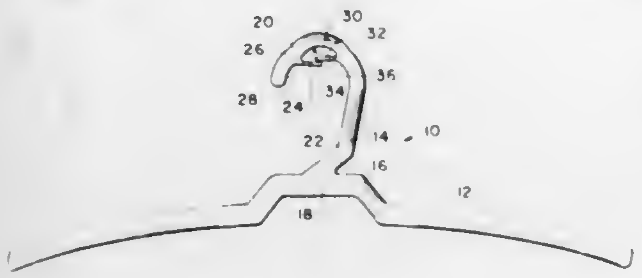
1. In a dripless paint can spout assembly, the combination of a paint can, a removable lid on said can, as circular, downward groove around a central opening on a top wall of said can, a circular downward bead on said lid engageable in said groove, and a spout formed on said lid; said spout containing an air vent comprised of a replaceable, flexible plastic tube of smaller diameter than a cross sectional size of said spout, said tube extending from a tip of said spout, through an entire length of said spout and adjacent an underside of said lid, a plurality of spring clips secured on said lid underside and inside said spout, said spring clips replaceably receiving and snap fitting around said tube; said spout being axially curved and tapered toward an outlet end, a first of said clips being secured near an outlet end of said spout, said flexible tube extending freely inside said curved tube from said clip at said outlet to a second of said clips secured on said lid underside and located adjacent an entry of said spout, a portion of said tube between said first and second clips, and between opposite ends of said arcuate spout being installed with a same arcuate

curved as said spout, whereby said tube portion is free to flex and whip a paint during a pouring operation.

4,034,902

LINE ENGAGING GARMENT HANGER

Doris Grillo, 51 Brookdale Gardens, Bloomfield, N.J. 07003
Filed July 19, 1976, Ser. No. 706,239
Int. Cl.^{2} A47J *51/095*
U.S. Cl. 223—85 **7 Claims**

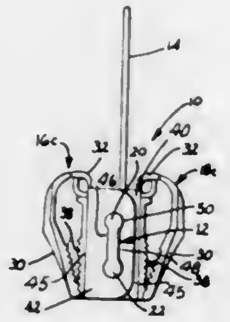


1. A garment hanger comprising
a first support means dimensioned to engage and support garments suspended thereon,
a substantially vertical neck element fixedly secured on one end thereof to said support means proximate the central portion thereof;
a hook element fixedly secured on one end thereof to the other end of said vertical neck element, said hook element adapted to engage and partially circumscribe a support when placed thereon;
a rigid tongue fixedly secured to a first portion of the inner edge of said hook element, said tongue falling in the same plane as said hook element and extending away from said first portion and;
a pivotal tongue hingedly affixed on one end thereof to a second portion of the inner edge of said hook element, and extending away from said second portion and towards said first portion, said pivotal tongue being urged into a position adjacent to said rigid tongue, such that the free ends of the tongues overlap, said pivotal and said rigid tongues and said inner edge removably enclosing said support therein when said hook element is placed thereon.

4,034,903

HANGER FOR ARTICLE DISPLAY

John H. Batts, Grand Rapids, Mich., assignor to John Thomas Batts, Inc., Zeeland, Mich.
Filed Jan. 2, 1976, Ser. No. 646,189
Int. Cl.^{2} A47J *51/14*
U.S. Cl. 223—96 **14 Claims**

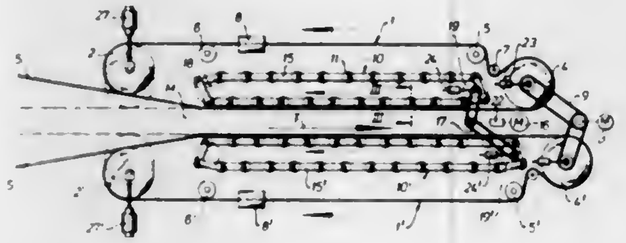


1. A hanger for the display of articles, comprising:
an elongated, rigid bar of non-circular cross section;
a first set of article engaging means slidably and non-pivotally mounted on said bar for gripping and suspending articles from the front surface of said bar;
a second set of article engaging means slidably and non-pivotally mounted on said bar for gripping and suspending articles from the rear surface of said bar; and
wherein at least one article engaging means of said first set of engaging means is slidably positionable in a generally back-to-back relationship with at least one of said article engaging means of said second set.

4,034,904

TWIN-BELT TRANSPORT SYSTEM

Franz Juditzki, Kreuztal-Buschhutten, Germany, assignor to Hoesch Aktiengesellschaft, Dortmund, Germany
Filed July 28, 1976, Ser. No. 709,259
Claims priority, application Germany, Aug. 8, 1975, 2535414
Int. Cl.^{2} B65H *17/34*
U.S. Cl. 226—1 **10 Claims**

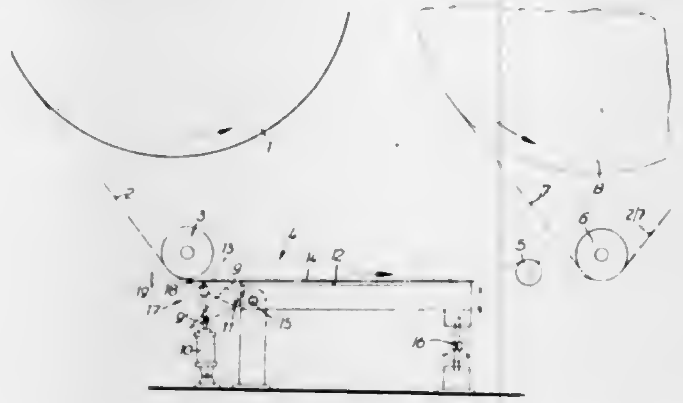


9. In a method of displacing a workpiece wherein said workpiece is gripped between a stretch of a transport belt usually advancing in a transport direction at a belt speed and a surface spaced from said stretch and wherein the stretch is pressed by rollers against said workpiece, the improvement comprising the step of continuously displacing said rollers back over said stretch counter to said direction.

4,034,905

FLAT ADVANCEMENT OF RUNNING WEB BETWEEN GUIDE ROLLERS

Karl-Otto Lansmich, Dusseldorf, Germany, assignor to Jagenberg Werke AG, Dusseldorf, Germany
Filed Jan. 30, 1975, Ser. No. 545,659
Claims priority, application Germany, Feb. 19, 1974, 2407848
Int. Cl.^{2} B65H *23/08*
U.S. Cl. 226—195 **5 Claims**



1. An apparatus for the flat advancement of a tissue paper web, comprising a pair of guide rollers between which a web is to be passed, a table having a guide surface positioned along the path of the web between the guide rollers, the guide rollers being spaced from one another a sufficient distance so as normally to result in fluttering of the web in passage therebetween over the table, and an air removal body in tandem with the table to form a vacuum zone between the web and the surface thereby drawing the web toward the surface while the web moves therealong, the air removal body having a sharp edge directed against the direction of the movement of the web, whereby there is minimized the fluttering which would otherwise occur.

4,034,906

DIFFUSION BONDING UTILIZING EUTECTIC FUGITIVE LIQUID PHASE

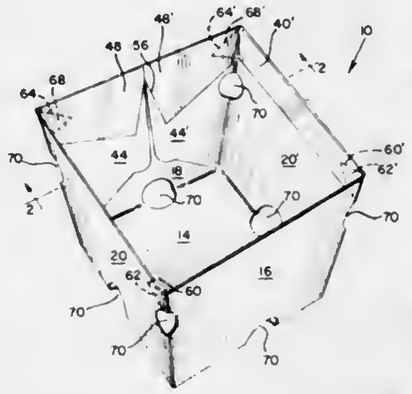
Carl E. Carlson, East Hartford, and Eugene J. Delgrosso, Wallingford, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.
Filed Feb. 13, 1975, Ser. No. 549,847
Int. Cl.^{2} B23K *35/30*
U.S. Cl. 228—194 **7 Claims**

1. A method of braze bonding metal surfaces selected from the group consisting of Ti, Zr and alloys thereof comprising the steps of:
placing a foil preform between a pair of said surfaces to be joined to define a joint assembly, the preform consisting essentially of a Ti-(50 + 6)Zr alloy foil having a thin eutectic depressant alloying agent layer on at least one side of said foil;
applying pressure across the joint comprising the surfaces to be joined with the foil preform sandwiched therebetween;
placing the assembly including the preform in a non-reacting atmosphere;
heating the assembly to a temperature in the range of 1625° F ± 75° F whereby the depressant will form a low melting point eutectic with the titanium and zirconium, the eutectic melting and filling the gaps between the surfaces to be joined;
continuing the application of heat to promote interdiffusion of the alloying agents and solidification at temperature; and
cooling the joint assembly after the desired interdiffusion has been achieved.

4,034,907

BERRY BASKET AND METHOD OF MAKING SAME

Arnold Bernard Engdahl, Jr., Irvin, Calif., assignor to Federal Paper Board Company, Inc., Montvale, N.J.
Filed Mar. 19, 1976, Ser. No. 668,462
Int. Cl.^{2} B65D *5/26, 5/22*
U.S. Cl. 229—32 **3 Claims**

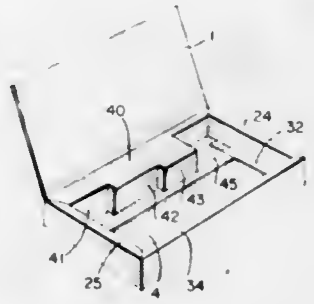


1. A blank for fabricating an open top container in the form of a berry basket which blank is formed of foldable paperboard or similar sheet material, said blank being cut and scored so as to provide a center bottom wall forming panel and side wall forming panels which extend from the edges of the bottom wall together with reinforcing panels cut from the four corners of the blank which are subdivided to provide along the outer side edges of the blank hinged edge reinforcing strips which edge strips are cut free from edge reinforcing strips formed along the intermediate side marginal portions of the blank, said strips being cut so as to leave at one end thereof integral hinged corner connecting tabs which are adapted to be connected so that when the container is completely formed they span the associated corners of the container, the other ends of said intermediate side edge reinforcing strips being cut so as to provide corner connecting tabs which are adapted for spanning the associated vertical corners of the container and for connection to edge reinforcing strips which are cut in the adjoining corner panels at that end of the blank, said reinforcing panels being scored to provide hinge lines for folding into overlying engagement with the adjoining side wall panel and said blank having strips of adhesive extending along the side margins and in the edge reinforcing strip areas enabling the edge reinforcing strips to be folded down onto adjoining blank areas in a predetermined sequence so that the corner connecting tabs on the edge reinforcing strips are engaged in corner spanning or bridging relation with the side wall forming panels and secured upon folding of the blank to complete the container whereby the corners are reinforced by said connecting tabs.

4,034,908

COMPARTMENTED DISPLAY CARTON

Hampton E. Forbes, Jr., Wilmington, and John M. Nock, New Castle, both of Del., assignors to Westvaco Corporation, New York, N.Y.
Filed July 19, 1976, Ser. No. 706,609
Int. Cl.^{2} B65D *5/22, 5/50*
U.S. Cl. 229—34 HW **1 Claim**



1. An easily erectable display carton formed from a single blank of finished one side paperboard or the like and adapted to be folded and assembled into a completed carton construction having finished interior and exterior surfaces comprising, a bottom wall, a pair of upstanding hollow side walls integral with said bottom wall including outer, top and inner portions and a first upstanding hollow end wall integral with said bottom wall including outer, top and inner portions, the improvement comprising an integral carton top and second upstanding hollow end wall integral with said bottom wall, said integral carton top and second hollow end wall comprising an outer end wall portion foldably attached to said bottom wall, a double panel carton top wherein the first panel thereof is foldably attached to the outer end wall portion of said second hollow end wall and the second panel thereof is foldably attached to the first panel of said double panel carton top, an end wall top portion foldably attached to the second panel of said double panel carton top, said end wall top portion including a plurality of offset and parallel score lines which divide the top portion into segments of different widths, and an end wall inner portion foldably attached to the end wall top portion of said second hollow end wall, said end wall inner portion including a plurality of offset and parallel cut lines which are coterminous with the ends of the score lines in the end wall top portion of said second hollow end wall to divide said end wall inner portion into segments of different width corresponding to the different width segments of said end wall top portion, said hollow side and end walls each including retaining means integral with said side and end wall inner portions which frictionally engage one another to hold said hollow side and end walls in the completed construction which comprises an interior divided into a plurality of compartments having different widths between the upstanding hollow side walls and different lengths between the first and second upstanding hollow end walls.

4,034,909
COLLAPSIBLE CONTAINER

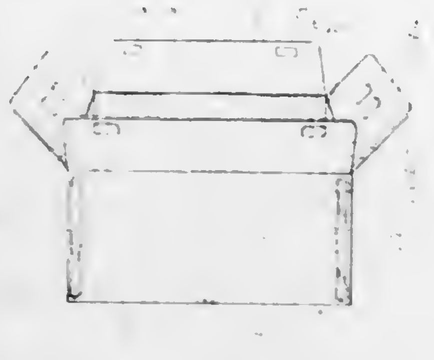
Mitsunori Toda, 334 Moguso, Hino, Tokyo, Japan

Filed Dec. 16, 1975, Ser. No. 641,292

Claims priority, application Japan, Dec. 29, 1974, 50-000401[U]

Int. Cl.² B65D *5/36, 13/04*

U.S. Cl. 229—41 B **7 Claims**



1. A collapsible container comprising four mutually interconnected rectangular side walls made from paperboard or cardboard; first bottom wall means extending from the lower edges of a first pair of the side walls adjacent to each other, and inwardly foldable, said first bottom wall means being in right angle relation with said first pair of the side walls when said container is erected, second bottom wall means extending from the lower edges of the other, second pair of side walls adjacent to each other, and inwardly foldable, said second bottom wall means being in right angle relation with the second pair of side walls and adapted to lie over said first bottom wall means when said container is erected; a first score line formed on said first bottom wall means to permit the latter to fold between said first pair of the side walls; a second score line formed on said second bottom wall means to permit the latter to fold between said second pair of the side walls; and a plurality of reinforcing members of hard or rigid material disposed along the opposite ends of each of said side walls.

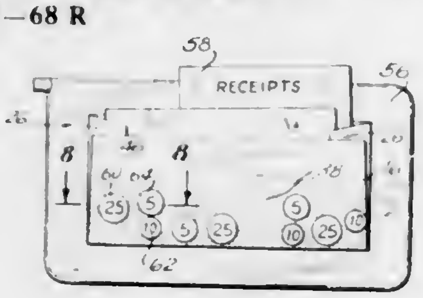
4,034,910
COMBINATION ADVERTISING, COIN AND RECEIPT HOLDING ENVELOPE

Arthur M. Rogers, Far Rockaway, N.Y., assignor to Exclusive Envelope Corporation, New York, N.Y.

Filed Feb. 13, 1976, Ser. No. 657,865

Int. Cl.² B65D *27/00*

U.S. Cl. 229—68 R **29 Claims**



1. A combination advertising, coin and paper holding envelope construction comprising
a front portion, and
a rear portion,
means securing said rear portion with respect to said front portion in a manner such as to form a pocket therebetween,
at least a part of said rear portion having an advertising message thereon,
at least a part of said front portion being provided with a tacky adhesive surface area,
fold means for enabling securement of an edge portion of said rear portion to a portion of said tacky adhesive surface area of said front portion by folding of said envelope,
said tacky adhesive surface area extending from the bottom edge of said front portion substantially to said fold means,
a first segment of said tacky adhesive surface area of said front portion being capable of securement to a support surface,
a second segment of said tacky adhesive surface area of said front portion being capable of removable securement of coins thereon, and
at least a portion of said pocket being capable of removable deposition of papers therein.

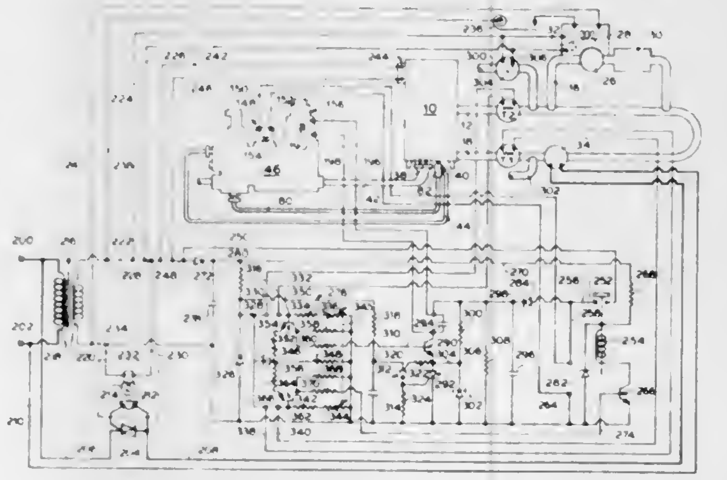
4,034,911
BURNER CONTROL SYSTEM

Robert L. Baysinger, St. Louis, and Harry E. Newport, Jr., Crestwood, both of Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed Dec. 4, 1975, Ser. No. 637,708

Int. Cl.² F24D *3/00*

U.S. Cl. 236—20 R **11 Claims**



1. In a gas burner control system for a boiler in a circulating hot water system,
a burner,
a main valve for controlling the flow of gas to said burner and including on-off control means,
a variably biased pressure regulator for controlling the rate of gas flow through said main valve including means operative to vary the bias of said regulator,
outlet water conduit means for conducting heated water from the boiler to a radiating system,
return water conduit means for conducting water to be heated back into the boiler from said radiating system,
means responsive to the temperature of water in said return water conduit means for controlling the operation of said on-off control means, and
means responsive to the temperature of water in said outlet water conduit means for controlling operation of said variable biasing means.

4,034,912
METHOD AND CONTROL ARRANGEMENT FOR A HEATING SYSTEM INCLUDING SOLAR AND FUEL-FIRED HEATING APPARATUS

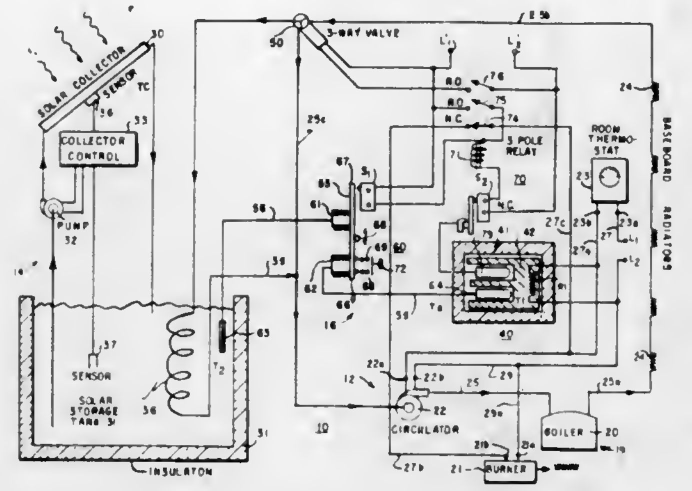
Thomas Edward Hayes, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed June 7, 1976, Ser. No. 693,523

Int. Cl.² F24J *3/02;* **F24D** *11/00*

U.S. Cl. 237—1 A **38 Claims**

1. In a heating system for a building including fuel-fired heating apparatus having a burner means operable when energized to supply heat to a first medium, and circulating means operable when energized to circulate said heated medium through areas of said building, and solar heating apparatus including storage means for storing a second medium and means for heating said second medium through solar energy, a control arrangement for enabling said first medium to be heated selectively by said burner means and said second medium, said control arrangement comprising first sensing means for providing a first output indicative of the heat load for said heating system, second sensing means for providing a second output indicative of the heating capability of said solar heating apparatus, controller means including comparator means responsive to said first and second outputs for providing a control output whenever said second output is greater than said first output, and switching means responsive to said control output to disable said burner means and to enable said first medium to be heated by said second medium prior to circulation through said areas by said circulating means.



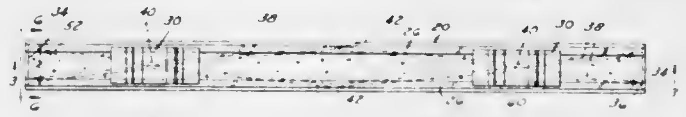
4,034,913
COMPOSITE RAILROAD TIE

David K. Hooper, 7573 Macomb Road, Grosse Ile, Mich. 48138

Filed Feb. 26, 1976, Ser. No. 661,610

Int. Cl.² E01B *3/32*

U.S. Cl. 238—98 **8 Claims**



1. An improvement in a reinforced, concrete filled railroad tie which comprises:
a. an elongate metallic shell extending the length of the tie having a base and integral side walls having a top portion wherein said side walls extend upwardly from the base to the height of the tie, and
b. a pair of reinforcing rods spanning substantially the length of the tie, each formed in a configuration of a wide W, each lying in a plane intersecting the base midway between the side walls and intersecting the top portion of each of said side wall, said formed rods having its free ends and its apices secured to the base and the side walls of the shell,
the shell being filled with concrete to cover and embed the reinforcing rods.

4,034,914
ACCUMULATOR FUEL NOZZLE WITH DUMP VALVE

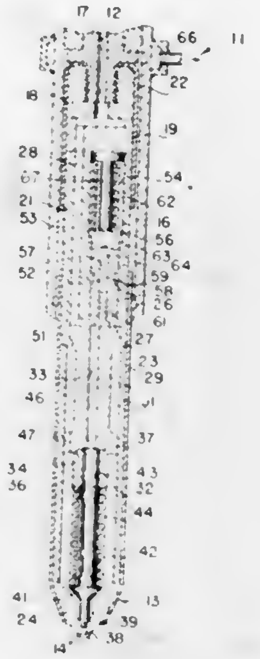
Clifford L. Richter, Chillicothe, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Mar. 22, 1976, Ser. No. 669,362

Int. Cl.² B05B *1/32*

U.S. Cl. 239—96 **7 Claims**

1. A dump valve means for increasing the responsiveness of an outlet valve means having a body forming an elongated chamber and an outlet valve means arranged at one end of the chamber for selectively and intermittently communicating the chamber with an injection orifice in response to fluid pressure in the chamber, wherein said dump valve means comprises a body having a spool slidably arranged in a spool bore and which is open at one end, spring means in said axial bore biasing said spool toward said open end, an axial bore in said spool, passage means for providing continuous communication between said axial bore and the elongated chamber, an inlet passage for delivering fluid to the chamber, means communicating fluid from said inlet passage to said one end of the spool bore and additional passage means communicating said axial bore with a drain when said spool is shifted against said spring means by fluid pressure in at least one of said spool bore and said axial bore.



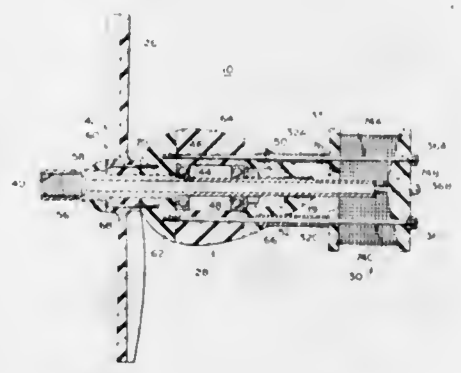
4,034,915
SPRAY NOZZLE

Edward Parish Garner, R.R. No. 2, Falls City, Nebr. 68355

Filed May 3, 1976, Ser. No. 682,256

Int. Cl.² B05B *3/02*

U.S. Cl. 239—171 **11 Claims**



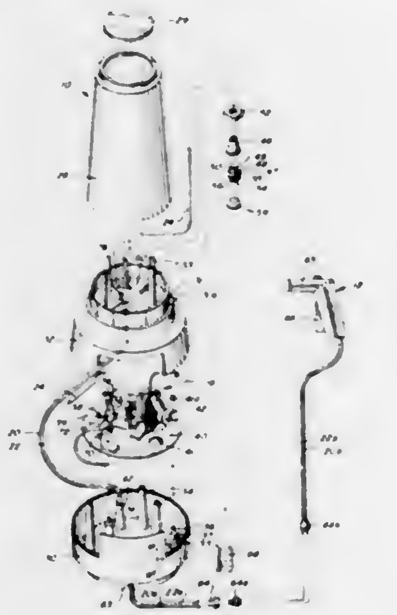
1. A nozzle for application of fluids as a mist containing droplets from an aircraft, comprising:
tube means for guiding fluid from a source of fluid;
said tube means having internal walls defining an inlet port and an outlet port;
screen means mounted for rotation with respect to said tube means for controlling the size of droplets emitted from said nozzle;
said outlet port being within said screen means;
said screen means including a solid rear wall portion and a screen surface;
said solid rear wall portion being substantially orthogonal to said tube means and positioned behind said outlet port and aligned therewith along the longitudinal axis of said tube means, whereby the direct flow of fluid from said outlet port contacts said solid rear wall portion;
said screen surface being orthogonal to said rear wall por-

tion, whereby fluid entering said screen means from said outlet port is emitted through said screen surface in droplets which are controlled in size by the mesh of said screen surface;
said screen means further including a front wall portion;
means for guiding the flow of air into said screen means;
said means for guiding including a nozzle body and internal walls in said front wall portion defining an opening;
said nozzle body having a surface curved downwardly forward of said opening in said front wall portion, whereby air passing over said body is guided through said opening within the screen means to mix with the fluid therein;
propeller means for rotating said screen means; and
said tube means extending through said opening.

4,034,916
SINGLE STATION SPRAY SYSTEM

John R. Forsberg, Arlington Heights, Ill., assignor to Helene Curtis Industries, Inc., Chicago, Ill.

Filed Dec. 12, 1975, Ser. No. 640,044
Int. Cl.² B05B *9/04*
U.S. Cl. 239—373 **7 Claims**

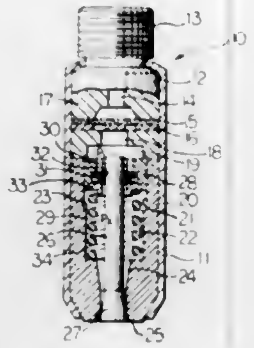


1. An air-liquid spray system comprising: a housing having a base assembly and a cover member removably connected to said base assembly, said base assembly including a base member and a body member receivable on said base member, said cover member, base member, and body member being generally circular in cross-section; a generally circular plate member positioned in said base assembly; means for preventing said plate member from rotating relative to said base assembly; a compressor secured to said plate member and including air filter means; an electric driving motor for said compressor secured to said plate member whereby air supplied to the compressor passes through said filter means; a replaceable liquid reservoir receivable on said body member and within said cover member; a flexible air conduit positioned within said housing and removably connected to said compressor at one end and removably connected to said reservoir at the opposite end; and a spray gun operably connected to said reservoir by means of an air inlet conduit and a liquid inlet conduit, wherein said compressor, said driving motor and said reservoir are all positioned within said housing in a relatively compact arrangement for supplying air and liquid to said spray gun.

4,034,917
VARIABLE ORIFICE FUEL INJECTION NOZZLE

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 22, 1975, Ser. No. 642,962
Int. Cl.² B05B *1/32;* **F02M** *61/08*
U.S. Cl. 239—453 **1 Claim**



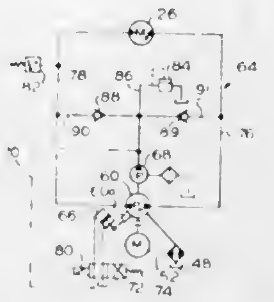
1. A variable orifice fuel injection nozzle comprising:
a housing having a central bore;
an inlet opening communicating with said bore;
an outlet in said housing in communication with said bore and defining a valve seat;
an elongate stemmed pintle valve reciprocally mounted in said housing and operative to engage said seat to close said opening, and operative in conjunction with said opening to define a variable opening;
damping means comprising a piston fixedly connected to said pintle valve and reciprocally mounted in said bore between said inlet and outlet openings to damp the opening of said valve to a control rate proportional to fluid pressures developed within said housing;
restricted passage means in said piston to provide restricted communication of fluid from the inlet side of said piston to the outlet side thereof;
said stemmed pintle valve including a stem connected at one end to said piston means, and a tapered valve head formed its other end to engage said valve seat;
spring means bearing at one end against a shoulder formed into said bore and against the outlet side of said piston at the other end thereof to bias said valve into engagement with said seat; and
check valve means permitting fluid flow through said restricted passage means from the inlet to the outlet side of said piston and preventing fluid flow from the outlet to the inlet side of said piston, said check valve means comprising a disc member surrounding said stem of said pintle valve adjacent the outlet opening of said restricted passage means, light spring means bearing against said disc member and a shoulder on said outlet side of said piston to bias said disc member into light engagement with the outlet side of said piston to cover said restricted passage means.

4,034,918
DRIVE ARRANGEMENT FOR ROTARY SHREDDING APPARATUS

Michael Culbertson, Sherwood, Oreg., and James E. Keller, Vancouver, Wash., assignors to Saturn Manufacturing, Inc., Wilsonville, Oreg.

Filed Aug. 6, 1975, Ser. No. 602,287
Int. Cl.² B02C *23/00*
U.S. Cl. 241—36 **11 Claims**

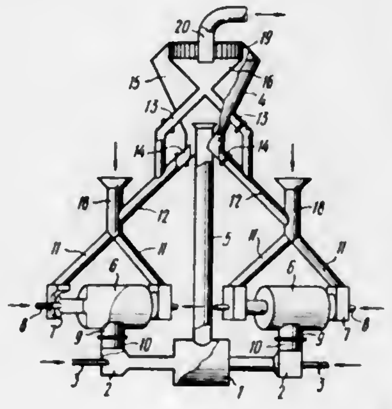
1. A drive arrangement for a shredding apparatus in which a pair of parallel spaced-apart driven cutter shafts mount coacting counterrotating disc-type cutter elements, said drive arrangement comprising:
hydraulic fluid-pumping means,
reversible hydraulic motor means,
hydraulic fluid circuit means containing said hydraulic pumping means and said hydraulic motor means,
flow-reversing means for reversing the flow of hydraulic fluid in said hydraulic circuit from said pumping means to said hydraulic motor means,
electrically operable means for actuating said flow-reversing means including a fluid pressure-operated electrical switch means in an electrical control circuit sensitive to hydraulic pressure in said hydraulic circuit,
said flow-reversing means including a flow-reversing valve in said hydraulic circuit means and said electrically operated means for actuating said flow-reversing means including a solenoid for shifting said valve from a normal position to a flow-reversing position, said solenoid being energizable by time delay means energized by said fluid pressure-operated electrical switch means,
said time delay means including a time delay relay in said electrical control circuit, said time delay relay being energizable by said fluid pressure-operated electrical switch means to close a relay contact for a predetermined length of time and thereby energize said solenoid to reverse the flow of fluid and thereby reverse said hydraulic motor means for the same said length of time.



4,034,919
AIR-STREAM MILL

Viktor Ivanovich Akunov, Nagatinskaya ulitsa, 83, korpus 2, kv. 420; Ivan Timofeevich Blinov, Kutuzovsky prospekt, 30/32, kv. 198; Viktor Fedorovich Boryakov, ulitsa Begovaya alleya, 3, kv. 801; Georgy Vladimirovich Zavadsky, Rizhsky proezd, 7, kv. 79, all of Moscow; Grigory Afanasievich Klimenko, ulitsa Engelsa, 9, kv. 15, Kiev; Grigory Stepanovich Krykhtin, prospekt Lenina, 76/2, kv. 45, Podolsk Moskovskoi oblasti; Nikolai Ippolitovich Ferens, ulitsa Vvedenskogo, 12, korpus 2, kv. 341, Moscow; Alexandr Lvovich Checkik, ulitsa Lenina, 39, kv. 111, and Vadim Petrovich Shanin, ulitsa Sverdlova, 4, kv. 20, both of Kiev, all of U.S.S.R.

Filed Oct. 24, 1975, Ser. No. 625,768
Int. Cl.² B02C *19/06*
U.S. Cl. 241—39 **3 Claims**

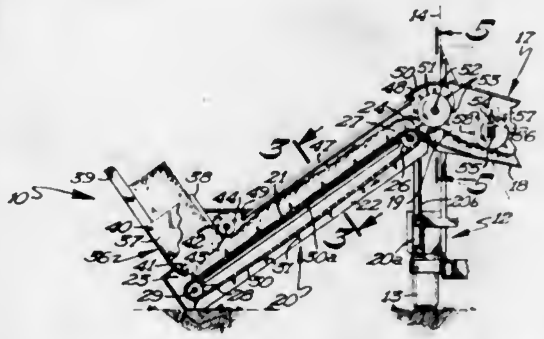


1. An air-stream mill for milling free-flowing, solid materials into a particulate condition comprising, means for defining two grinding chambers for each receiving therein in operation, large-lump, solid materials to be converted into free particles, means for introducing large-lump solid material into said grinding chambers as two separate flows, opposed injector means for each grinding chamber for impelling lumps of solid material in said flows as two oposed, counter-flowing streams each of a gas-solid mixture to convert the solid material in the streams into free particles by impingement of solid material in the streams against each other internally of a corresponding grinding chamber, means for defining a milling chamber for receiving solid material in a particulate condition from the two grinding chambers as two separate and independent flows, means for delivering particulate solid material from said grinding chambers to said milling chamber as two independent flows, opposed injector means for said milling chamber for impelling the particulate solid material in the last-mentioned two flows as opposed, counter-flowing streams each of a gas-solid mixture to impel the solid material particles in the streams against each other internally of the milling chamber to convert the particles received into smaller size particles, a two-stage separator for receiving the particles of solid material from said milling chamber in suspension in a stream of a gas-solid mixture and having means defining two-stages for separating the particles received into coarser and finer particles, means to deliver the particles from said milling chamber to said separator as a gas-solid mixture as a stream with particles in suspension therein, means in communication with a first stage of said separator to return the coarser particles to both the first-mentioned two flows for re-entry into said injector means for said grinding chambers for recycling through said grinding chambers, said milling chamber and said two-stage separator, means in a second stage of said separator for separating from the finer particles the finest particles and for discharging from the separator the finest particles as a flow of a finished material in a desired particulate condition, and means in communication with said second stage for delivering from the second stage the remaining finer particles separated from said finest particles and returning them for re-entry at least into said injector means of said milling chamber for recycling thereof through at least said milling chamber and said separator.

4,034,920
BALE FEEDER DEVICE

Richard S. Bradley, Fairmont, Minn., assignor to Arts-Way Manufacturing Co., Armstrong, Iowa

Filed Mar. 12, 1976, Ser. No. 666,474
Int. Cl.² B02C *13/286*
U.S. Cl. 241—101.7 **6 Claims**



1. A bale feeder device for use with a grinder mixer apparatus having a mobile chassis and having a mixing tank and a hammer mill mounted on said chassis, said device including:
an elongate substantially flat table structure having a material receiving end and having a discharge end,
means swingably mounting said bale feed device on said chassis for swinging movement between an operative position and an inoperative position,
said table structure when in the operative position projecting outwardly from the chassis and having its discharge end positioned adjacent the inlet of the hammer mill, and

said table structure when in the inoperative position being supported upon the chassis,

an elongate endless conveyor mechanism mounted on said table and extending longitudinally thereof and having bale engaging elements thereon for engaging a bale of hay to continuously forceably rip slab portions of hay from the bale,

a feed chute mounted on said table structure adjacent said material receiving end and projecting upwardly therefrom, said feed chute having a cross-sectional size slightly larger than the cross section of a bale of hay and receiving a bale of hay therein to position the bale of hay so that one end of the latter is disposed closely adjacent the table structure,

a driven slab feeder roll mounted on said table structure closely adjacent and forwardly of said feed chute and being positioned above said conveyor, said slab feeder roll cooperating with said conveyor mechanism to cause slab portions of hay to be conveyed toward said discharge end,

a feed roller mounted on the table structure adjacent the discharge end and cooperating with said conveyor mechanism to cause the slabs of hay material to be impelled into the hammer mill.

4,034,921
MILLING APPARATUS

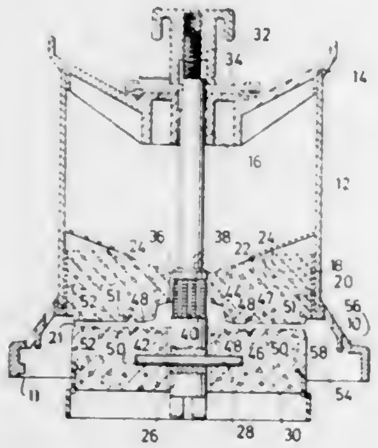
Johann Georg Schnitzer, Feldbergstrasse 26, 7742 St. Georgen, Germany

Filed July 18, 1975, Ser. No. 597,182

Claims priority, application Germany, July 18, 1974, 7424515[U]; Sept. 16, 1974, 2444152

Int. Cl.² B02C *7/18*

U.S. Cl. 241—157 **19 Claims**



1. An apparatus for the milling of feedstocks, including an upper millstone, rigidly held in a housing and provided with a central opening for the admission of said feedstock, and a lower millstone, rotatably secured to a driveshaft, having a pre-milling means for the reduction in size of said feedstock prior to the entry thereof into the fine-milling region between said millstones, said pre-milling means comprising.

a hob mounted on an extension of said driveshaft and being situated in said central opening;

cutters, located on said hob, jutting out from the surface of said driveshaft and being substantially at right angles thereto, said cutters being separated by gaps, and

at least one feedslot in the wall of said central opening narrowing in the direction of feed travel.

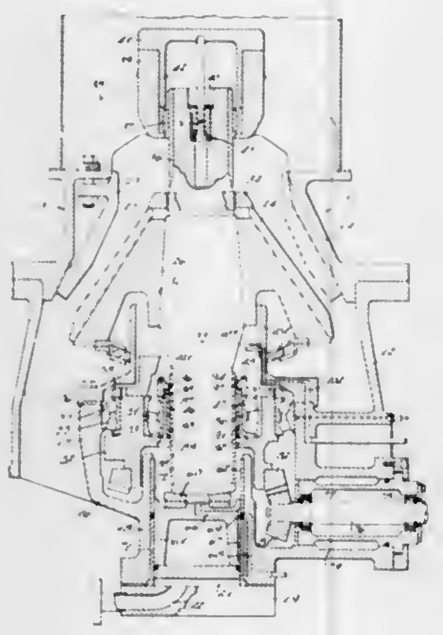
4,034,922
GYRATORY CRUSHER WITH BUSHING ASSEMBLY BETWEEN INNER ECCENTRIC ANTIFRICTION BEARING

Major Coxhill, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 8, 1976, Ser. No. 693,783

Int. Cl.² B02C *2/04*

U.S. Cl. 241—213 **3 Claims**



1. In a gyratory crusher having a frame, a crusher head carried by a shaft which is supported by the frame for rotation about its own axis, for gyratory movement about the axis of the frame and for adjustment under load in a vertical direction, a drive eccentric through which the shaft extends and operable to effect the gyratory movement of the shaft and crusher head, and having an inner antifriction bearing which is carried by the drive eccentric for rotatably supporting the shaft in the drive eccentric;

a bearing assembly interposed between the inner antifriction bearing and the shaft, said bearing assembly including two separate cylindrical sleeve members interengaged with each other, substantially over their entire length, and in concentric relationship, said inner cylindrical sleeve member being of relatively soft material and said outer cylindrical sleeve member being of a relatively harder material, said outer cylindrical sleeve member having an interference fit with the inner bearing race of the inner antifriction bearing to prevent relative movement between the bearing assembly and the inner antifriction bearing inner bearing race due to a rotating load, said inner cylindrical sleeve member having a clearance fit with the shaft to permit adjustment of the shaft under load in a vertical direction; and,

means to supply lubrication to the antifriction elements of the inner antifriction bearing and to the sliding surfaces present by said inner cylindrical sleeve member and the shaft;

whereby the shaft is rigidly supported in a radial direction by operation of the outer cylindrical sleeve member and said outer cylindrical sleeve member has an interference fit with the inner race of the inner antifriction bearing, and said inner cylindrical sleeve member of said bearing assembly provides for a clearance fit between itself and the shaft to provide for shaft movement under load in a vertical direction.

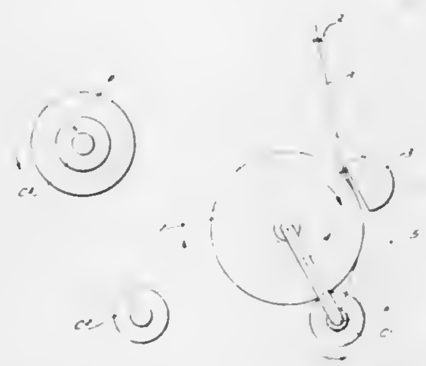
4,034,923
WINDER FOR YARN AND THE LIKE

Harry B. Miller, Hopedale, Mass., assignor to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft, Karlsruhe, Germany

Continuation-in-part of Ser. No. 354,920, April 26, 1973, Pat. No. 3,876,161. This application Mar. 7, 1975, Ser. No. 556,556

Int. Cl.² B65H *54/02, 67/04*

U.S. Cl. 242—18 A **9 Claims**



1. In a winder for yarn and the like, a combination comprising a drive roll having an axis of rotation; at least two rotatable chucks each adapted to have a yarn package formed thereon, said chucks each having an axial and being movable into and out of driven engagement with said drive roll; a traversing arrangement for traversing a running yarn which is being wound onto one of said chucks, so as to form a yarn package on the latter; yarn transfer means for effecting automatic transfer of said running yarn from said one chuck upon forming of the yarn package thereon to the empty other chuck while the same is in driven engagement with said drive roll, including an arm on said drive roll turnable about said axis of rotation thereof and having a free end portion arranged to travel in a path adjacent the axial end of said other chuck and intersecting the axis of rotation of the latter; and severing means on said free end portion of said arm for severing the running yarn from said arm when the yarn has begun to wind onto said other chuck.

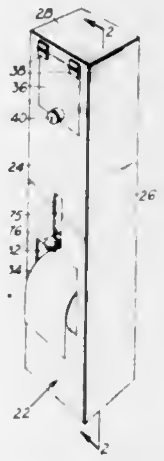
4,034,924
APPARATUS FOR DISPENSING AND HOLDING TISSUE ROLLS

Edward F. Carlisle, Portland, Oreg., assignor to Margaret Mary Carlisle, Portland, Oreg.

Filed Jan. 19, 1976, Ser. No. 650,197

Int. Cl.² B65H *19/04*

U.S. Cl. 242—55.3 **7 Claims**



1. Apparatus for dispensing tissue rolls comprising:

a. a housing having a window configured to display a roll of tissue,

b. first roll maintaining fingers mounted in the housing for movement between a closed position engaging a first roll of tissue and supporting the same rotatably in a position partially extending through the window and an open position disengaging the first roll,

c. second roll maintaining fingers mounted in the housing for movement between a closed position engaging a second roll of tissue and supporting the same spaced above a first roll of tissue and an open position disengaging the second roll,

d. third roll maintaining fingers mounted in the housing for movement between a closed position engaging a third roll of tissue and supporting the same above the second roll maintaining fingers and an open position disengaging the third roll,

e. operating means engaging the first, second and third fingers for moving them between said closed and open positions, and

f. retention means in the housing below the first roll maintaining fingers for supporting a full roll of tissue and locating the same in the position for engagement of the first roll maintaining fingers when in their closed position, while allowing passage of the core of an empty roll of tissue by gravity downward past the retention means.

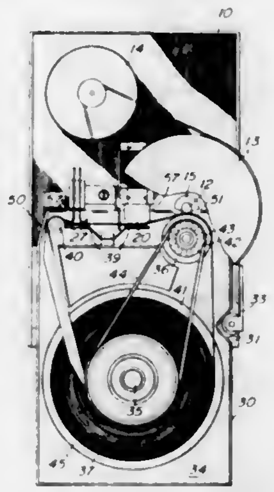
4,034,925
FRONT DRIVE CARTRIDGE-TAPE PLAYER SYSTEM WITH FAST FORWARD AND REVERSE MODES

Melvin Arthur Lace, Prospect Heights, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 31, 1975, Ser. No. 563,947

Int. Cl.² B65H *17/48*

U.S. Cl. 242—55.19 A **27 Claims**



1. A reversible continuous loop tape drive mechanism comprising,

a rotatably mounted hub means,

a rotatably mounted driven means,

a primary drive means, forcibly engaging the driven means, and operable to rotate the driven means in a forward or reverse direction,

a continuous tape loop wound about the hub,

means for guiding the tape between the driven means and the primary drive means at the engaging interface for driving the tape in a forward or reverse direction,

wherein the improvement comprises

a secondary drive means operable to transfer rotational drive from the driven means to the hub when the primary drive means is operating the driven means in the reverse direction, the secondary drive means otherwise effectively decoupling the driven means for the hub.

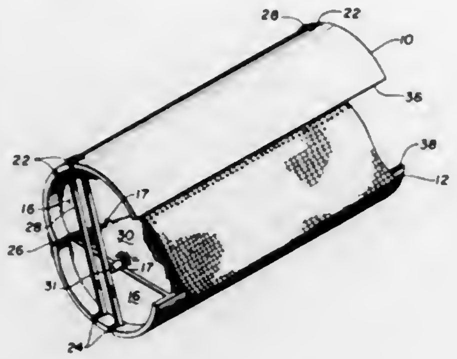
4,034,926
GAUZE DISPENSER

Rudolph Wegner, 7325 Craig Ave. E., Inner Grove Heights, Minn. 55075

Filed Feb. 4, 1976, Ser. No. 655,279

Int. Cl.^{2} B65D *13/00, 85/672*

U.S. Cl. 242—55.53 **2 Claims**



1. A dispenser for rolled gauze comprising:

a. a two-pieced hinged container formed from a cylindrical tube with closed ends, said tube being cut along its axis into an upper and lower portion which are hinged along one axially extending side which, in an opened condition, is adapted to receive a roll of gauze and, in a closed condition, encloses said roll of gauze, and inpinges upon the upper and lower surfaces of an unrolled end of said roll of gauze which passes through the junction between the two pieces of the container, a portion of said tube extending beyond its closed end and including at least a pair of slots in the portion of said tube extending beyond the closed end in each of the upper and lower portions of said tube, each pair of slots defining a projection therebetween and,

b. at least one rubber elastic band having one end inserted into said slots and over said projection from said upper portion and the other end inserted into said slots over the projection from said lower portion of said container to exert a closing force urging the container into a closed condition and applying force to the upper and lower surfaces of the unrolled end of the roll of gauze thereby inhibiting unintended movement.

4,034,927
CONTINUOUS LOOP TAPE CARTRIDGE

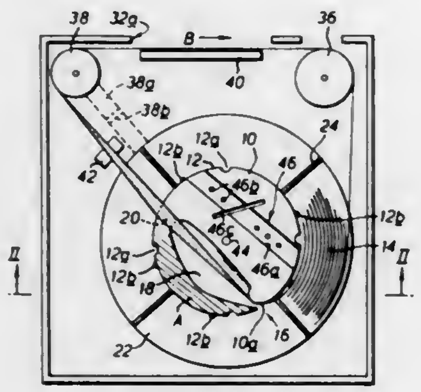
Edward Alexander Leshik, London, England, assignor to Hellermann Cassettes Limited, Crawley, England

Filed Sept. 30, 1975, Ser. No. 618,286

Claims priority, application United Kingdom, Oct. 1, 1974, 42554/74

Int. Cl.^{2} B65H *19/20*

U.S. Cl. 242—56 R **18 Claims**



18. A method of manufacturing a tape cartridge, comprising the steps of:

a. providing a housing including a base, a peripheral wall extending upwardly from the base and a removable lid, said peripheral wall containing at least one aperture affording access for a sensing head;

b. providing a tape pack carrier which includes
   1. a cylindrical hub, and
   2. tape supporting means extending radially of said hub, said hub extending upwardly from said supporting means,
   3. said hub containing a recess arranged generally centrally therein, having a top end remote from said tape supporting means and a slot extending generally radially inwardly in said hub in communication with said recess and having an open end at the top of said hub;
   4. said slot having two opposite, inclined sides, one side being higher than the other;

c. providing tape guiding means arranged within said housing chamber adjacent the housing peripheral wall;

d. providing a length of tape having opposite free end portions;

e. moving one of said free end portions of tape across said top of said hub and across said open end of said slot, said free end portion of tape lying in a plane parallel to the top of said hub;

f. moving further said one free end portion of tape across said open end of said slot until said one free end portion of tape engages said higher side of the slot;

g. deflecting said one free end portion of the tape into said slot upon engaging said higher side of the slot;

h. rotating said tape-pack carrier so as to wind said length of tape around said hub to form a pack of tape wound around said hub;

i. employing said tape supporting means to support one side of said tape pack as it develops;

j. splicing together the free ends of said tape length, to form a continuous loop, and holding the tape so that it extends in succession, from the innermost turn of the tape pack through the slot, in twisted relation through an angle of 90° through said recess to a plane normal to the hub axis and a location diametrically opposite said slot, in twisted relation back through the angle of 90° towards its original vertical orientation and back upon the tape pack as the outermost turn thereof;

k. lowering said tape pack carrier and tape into said housing so that said tape-supporting means sits on said housing base and said tape engages said tape guiding means;

l. securing said tape pack carrier against rotation about its axis relative to said base; and

m. applying said lid to close said housing.

4,034,928
METHOD AND APPARATUS FOR PRODUCING CORELESS ROLL ASSEMBLIES OF SEPARABLE BAGS

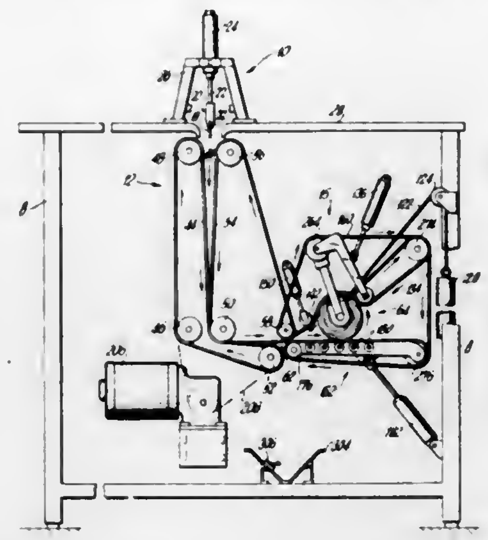
James Anthony McDonald, Palos Heights, Ill.; Robert Wayne Wolfe, Mountain Lakes, N.J., and Walter Theodore Bilik, Tinley Park, Ill., assignors to Union Carbide Corporation, New York, N.Y.

Filed June 29, 1976, Ser. No. 701,008

Int. Cl.^{2} B65H *75/00*

U.S. Cl. 242—59 **23 Claims**

1. An apparatus for producing coreless roll assemblies of discrete sheets or strands comprising means for guiding and advancing the discrete sheets or strands to a roll winding station, said winding means comprising an axially translatable and rotatable spindle having at least one port in its circumferential surface adapted for coupling to a gas supply; translatable guide means adapted for substantially circumscribing said spindle and guiding and aiding the advancement of the successive sheets around said spindle; and means operable after a predetermined number of sheets are wound on said spindle for actuating a first means for disengaging said translatable guide means from about said sheet wound spindle, for actuating a second means for forcing gas out through said port in the spindle to provide a gas bearing layer thereat, and for actuating a third means for axially withdrawing the spindle from the bore of the wound sheet assembly thereby producing a coreless roll of successively wound discrete sheets.



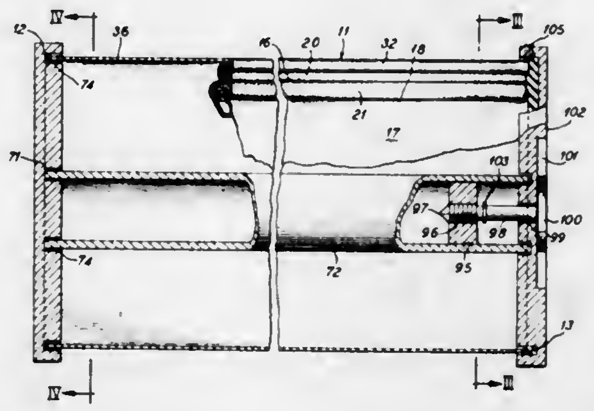
4,034,929
INPUT CASSETTE

Emanuel C. Ebner, Jr., Hudson, N.H., assignor to Graphic Systems, Inc.

Filed Apr. 10, 1975, Ser. No. 566,736

Int. Cl.^{2} G03B *1/02;* **B65H** *19/02*

U.S. Cl. 242—71.1 **3 Claims**



1. A roll sheet dispensing container comprising: a housing having a rigid hollow central body portion with a front wall, a dispensing slot through said front wall, end walls closing the housing, one of said end walls being removable from said housing and having an interior face with a groove therein receiving end edges of the central body portion, a tube disposed in said central body portion extending between the said end walls and engaging a second groove in the said inside face, releasable fastening means projecting through the removable end wall and engaging a portion carried by said tube for maintaining the removable end wall on the said central body portion, seal means sealing the said slot, the seal means comprising two removable seal members having U-shaped cross section portions which slidably index with ledges formed of material of the central body portion bent inwardly at the slot, the seal members comprising substantially rigid backing strips coated with a fabric-like covering which closes and seals the slot and means on the end walls maintaining the seal portions in position, the seal members being removable through an open end of the housing upon removal of the one of said end walls.

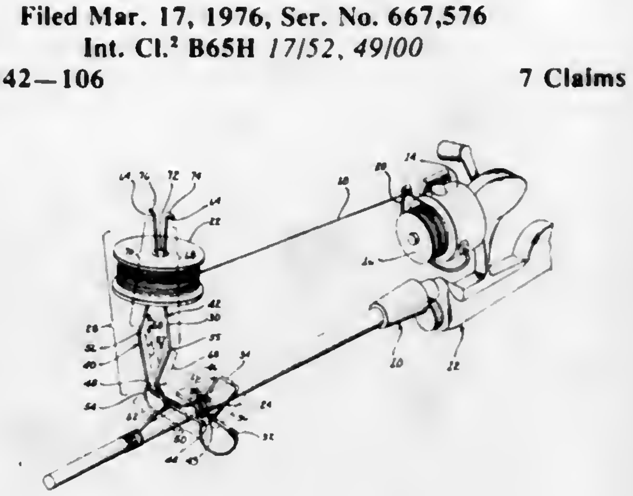
4,034,930
SPOOL HOLDING DEVICE

Curtis A. Stevenson, 3722 East Pasadena, Phoenix, Ariz. 85018

Filed Mar. 17, 1976, Ser. No. 667,576

Int. Cl.^{2} B65H *17/52, 49/00*

U.S. Cl. 242—106 **7 Claims**



1. A device for holding an apertured spool of line on a rod to reel the line from the spool onto a reel positioned on the rod, said device comprising in combination:

a. rod attaching means for releasably attaching said device to the rod, said attaching means comprising:
   i. a clip including a first member having an elongated face and a second member having an elongated face, said elongated faces being in opposed relationship and defining an elongated space therebetween of a shape conforming to the shape of the rod; and
   ii. biasing means urging said first and second members toward one another with a force of a magnitude sufficient to hold said clip in a relatively fixed position on the rod during winding of the line on the reel from the spool; and

b. first and second arms connected to said attaching means for supporting the spool, said first and seconds arms each having a spring tension urging said first and second arms in opposing directions and of a magnitude sufficient to be overcome manually to bring said first and second arms into close spaced relationship to pass through the aperture of the spool whereupon manual release of said first and second arms separates said first and second arms and the spring tension exerts a holding force on the spool sufficient to allow line to be withdrawn under tension from the spool onto the reel.

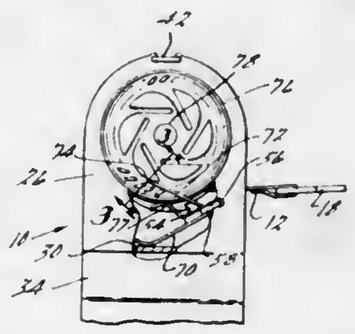
4,034,931
LOCKING SEAT BELT RETRACTOR

Robert C. Fisher, West Palm Beach, Fla., and Cecil A. Collins, Pontiac, Mich., assignors to Robert C. Fisher, West Palm Beach, Fla.

Filed Jan. 12, 1976, Ser. No. 648,396

Int. Cl.^{2} A62B *35/00;* **B65H** *75/48*

U.S. Cl. 242—107.4 D **14 Claims**

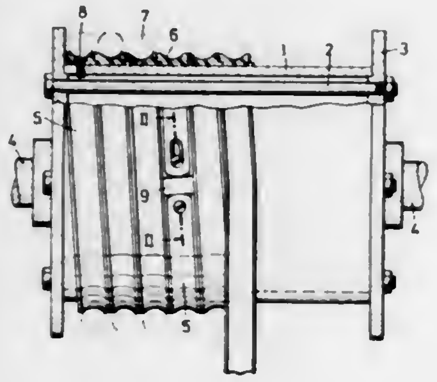


1. In a locking seat belt retractor comprising a frame, a spool mounted for rotation on said frame and adapted to have a belt wound thereon, a flexible belt wound on said spool, a

spring constantly urging said spool in one direction of rotation to retract the belt thereon, a ratchet and pawl mechanism operable when the ratchet and pawl are engaged to prevent belt extension by preventing rotation of said spool in the unwinding direction of rotation, said ratchet being rotatable with and connected to said spool, and said pawl being pivotedly mounted on said frame, the improvement comprising the combination of the foregoing elements with a locator plate rotatable with said spool and an indexing finger in operable engagement with said pawl, said locator plate having a first circular groove, a second circular groove concentric with said first groove, and a plurality of third grooves connecting said first and second grooves, said indexing finger having a portion in operative engagement with the grooves in said plate, said indexing finger portion being positioned in said first groove upon protraction of said belt thereby to position said pawl towards the disengaged position with respect to said ratchet, said finger moving through one of said third grooves to said second groove upon retraction of said belt thereby to condition said pawl for movement to the locked condition with respect to said ratchet.

4,034,932
METHODS FOR IMPARTING A GROOVED SURFACE TO CABLE DRUM SHELLS

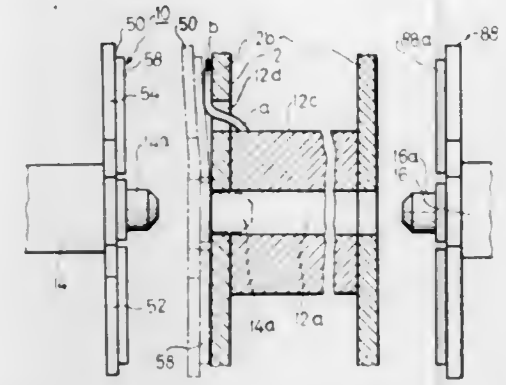
Alois Ferch, Fischer-Str. 9, D4040 Neuss, Rhineland, Germany
Filed Apr. 13, 1976, Ser. No. 676,506
Claims priority, application Germany, Apr. 18, 1975, 2517089
Int. Cl.² B65H *75/14, 75/34*
U.S. Cl. 242—117 **15 Claims**



1. A method for manufacturing a cable drum with a grooved surface for use in cable winches and the like, characterized by the steps of
- a. providing a cable drum core;
- b. coiling helically an elongated strand of flexible material onto said core surface; the outside surface of said elongated strand having a longitudinal groove therealong;
- c. attaching said elongated strand to said drum surface at points intermediate the ends thereof;
- d. said attaching step including attaching said strand at said points by two spaced apart attaching means;
- e. cutting out that portion of said elongated strand between said spaced apart attaching means; and
- f. providing the areas of said strands adjacent said attaching means with openings allowing relative longitudinal movement between said attaching means and said elongated strand.

4,034,933
REEL MOUNTING MEANS FOR A WIRE TAKE UP APPARATUS

Ryoichi Hara, and Masamichi Yajima, both of Ichihara, Japan, assignors to The Furukawa Electric Co., Ltd., Tokyo, Japan
Filed Dec. 17, 1975, Ser. No. 641,483
Claims priority, application Japan, Dec. 18, 1974, 49-152541[U]
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129.8 **2 Claims**

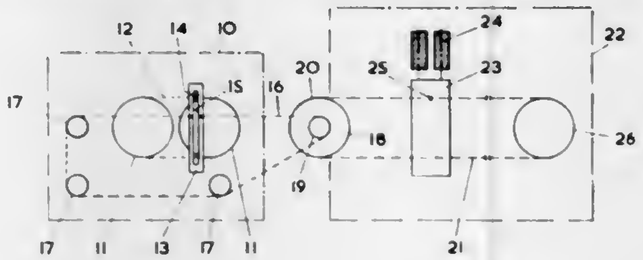


1. Reel mounting means for a wire take up apparatus comprising a pair of spindles axially movable so that the opposing ends of said spindles are received into an axial hole in a reel and so that a wire extending through an opening in one of the flanges of said reel with the end of said wire leading out of said reel flange, is fixed between said reel flange and the corresponding spindle, characterized by that at least one of said spindles on the side thereof facing the corresponding reel flange is provided with a pressurizing plate comprising a reel flange pressurizing body including at least one armlike first pressurizing piece of rigid material extending radially from an annular base at an angular space to be forced against said reel flange,

and a wire end securing body including at least one resilient second pressurizing piece provided individually from said first pressurizing piece to extend radially from said annular body and spaced individually in a circumferential direction from said first pressurizing piece to force said wire end against said corresponding reel flange whereby it is fixed between said pressurizing plate and said corresponding reel flange.

4,034,934
FILAMENT WINDING MACHINES

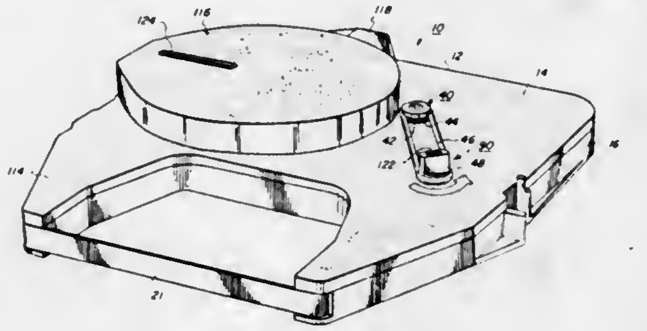
John Gordon Hardwick, Kidderminster, England, assignor to Imperial Metal Industries (Kynock) Limited, Birmingham, England
Filed May 22, 1975, Ser. No. 580,468
Claims priority, application United Kingdom, May 30, 1974, 24052/74
Int. Cl.² B65H *57/28*
U.S. Cl. 242—158 B **12 Claims**



1. In or for a filament winding machine, a filament guide system comprising: a guide carriage, a drive for said carriage comprising an endless member passing around rotary supports and linked to the carriage to reciprocate the latter, a reciprocable member, drive means for reciprocating said member, and a gear transmission linking the reciprocable member and said drive so that reciprocation of said member is transferred to the carriage with a predetermined amplification factor.

4,034,935
DUAL LEVEL RIBBON CARTRIDGE

Mario G. Plaza, Fremont, and Richard D. Trezise, Newark, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Nov. 19, 1975, Ser. No. 633,530
Int. Cl.² G03B *1/04;* **G11B** *15/32, 23/04*
U.S. Cl. 242—197 **8 Claims**



1. A ribbon cartridge comprising:

a housing;

a supply reel containing a supply of ribbon wound thereon;

a take-up reel;

means for rotatably mounting the supply reel in said housing;

means for rotatably mounting the take-up reel in said housing at a location spaced sufficiently vertically from said supply reel such that the lower edge of ribbon wound on the higher of said reels is above the upper edge of ribbon wound on the lower of said reels, and also spaced horizontally from said supply reel a distance such that the distance between the axes of rotation of said reels is less than maximum combined radii of ribbon wound on said reels; and

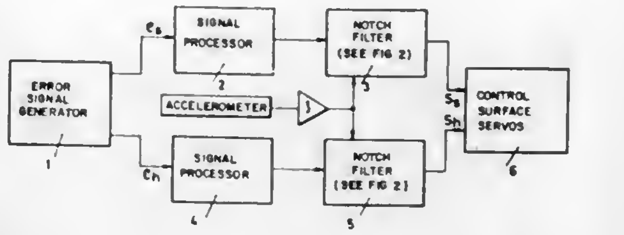
means for transferring ribbon along a predetermined path from said supply reel onto said take-up reel, said means for transferring comprising a capstan assembly, a pinch roller assembly, means for biasing said pinch roller assembly against said capstan assembly to form a nip through which said ribbon is fed, means for driving said capstan assembly to cause progression of ribbon through said nip and thus removal of ribbon from said supply reel, and means for kinematically coupling said capstan assembly to said take-up reel in order to rotate said take-up reel in the appropriate direction and speed to take up ribbon fed through said nip.

4,034,936
DEVICE FOR DAMPING THE TIPPING AND YAWING OSCILLATIONS OF THE GUIDANCE SYSTEM OF A FLYING VEHICLE

Sven Willner Eriksson, Karlskoga; Bengt Gustaf Lovung, Kallered; Hans Manne A. Salomonsson, and Rolf Hilding Sandlin, both of Karlskoga, all of Sweden, assignors to AB Bofors, Bofors, Sweden
Filed Dec. 24, 1975, Ser. No. 643,989
Int. Cl.² F41G *7/00*
U.S. Cl. 244—3.15 **4 Claims**

1. A guidance system for a flying vehicle including at least one guidance channel for converting an error signal to a command signal for a control surface servo of said vehicle, the improvement comprising means for damping oscillations in said channel in a narrow band at the natural frequency of the vehicle as the natural frequency varies as a function of vehicle speed, said means including:

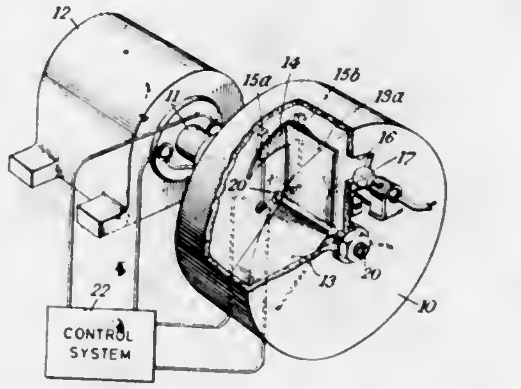
a notch filter in said channel, said notch filter having a controllable notch frequency and means for controlling the notch frequency of said filter to conform to the natural frequency of the vehicle,



means providing a time-dependent signal varying with the speed of the missile, said time-dependent signal coupled to a control input of said notch filter to control the notch frequency.

4,034,937
POSITION REFERENCE DEVICES

William James Fillery, Belfast, Northern Ireland, assignor to Short Brothers & Harland Limited, Belfast, Northern Ireland
Filed Nov. 7, 1975, Ser. No. 629,962
Claims priority, application United Kingdom, Nov. 12, 1974, 48929/74
Int. Cl.² G01P *15/02*
U.S. Cl. 244—3.21 **11 Claims**



1. An angular position reference device for measuring angular changes in the attitude of a moving body and comprising:

a drive means for connection to the moving body;

a closed chamber carried by the drive means for rotation thereby about an axis of rotation;

a liquid filling the chamber and forming an inertial mass;

a liquid position sensing means mounted within the chamber for rotation independently of the closed chamber about an axis co-axial with the axis of the closed chamber whereby the liquid position sensing means maintains a fixed position relative to the liquid inertial mass and defines a reference position of the liquid inertial mass fixed in space in a plane normal to the axis of rotation of the closed chamber;

a measuring means measuring changes in the relative angular positions of the liquid inertial mass and the moving body and the drive means in said plane normal to the axis of the closed chamber by measuring changes in the relative angular positions of the liquid position sensing means and the closed chamber from a datum position,

said measuring means producing an output which is a function of said relative movement and which is applied to the drive means to rotate the closed chamber about its axis relative to the body and restore the liquid position sensing means and the chamber to the datum position whereby the relative rotation between the closed chamber and the liquid inertial mass is reduced to a minimum to prevent drag between the closed chamber and the liquid inertial mass,

said output also providing a measure of said change in the angular position of the body from the reference position in space.

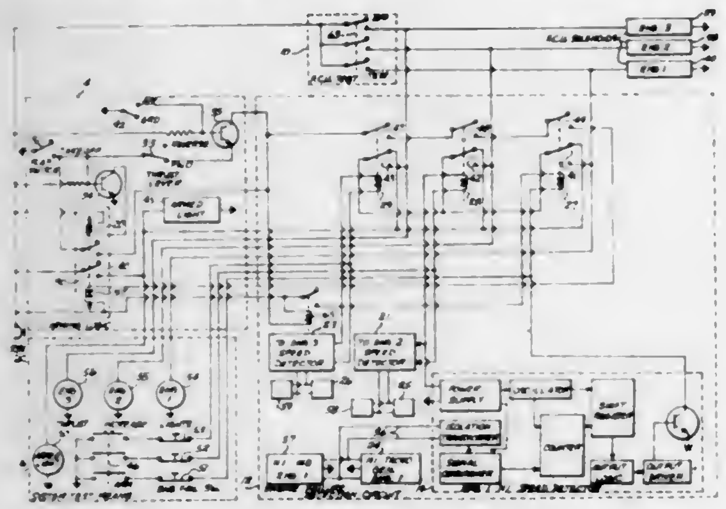
4,034,938
AUTOMATIC PERFORMANCE RESERVE (APR) SYSTEM HAVING MEANS INDICATIVE OF SYSTEM ARMED CONDITION

Alexander P. Borelan, Bellevue; James T. Giffin, Renton; Peter J. Louden, Mercer Island, and Malcolm L. Olthouse, Bellevue, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Continuation-in-part of Ser. No. 570,928, April 22, 1975, Pat. No. 3,987,279. This application Mar. 30, 1976, Ser. No. 671,924

Int. Cl.² B64D *25/00;* **G06F** *15/50*

U.S. Cl. 244—53 R **3 Claims**



1. In an automatic performance reserve system for an aircraft having a plurality of engines:
- first means associated respectively with each of said engines or providing increased fuel flow to the engine;
- speed detector circuit means associated respectively with each of said engines responsive to engine speed;
- relay means responsive to said speed detector circuit means for arming said automatic performance reserve system in response to engine speeds of said plurality of engines representative of take-off power;
- said relay means further responsive to said speed detector circuit means for detecting an engine speed representative of failure of one of said plurality of engines and actuating said first means associated with the remaining ones of said plurality of engines;
- second means for disarming said automatic performance reserve system subsequent to take-off of the aircraft and deactuating said first means associated with the remaining ones of said plurality of engines in the event of failure of one of said plurality of engines; and,
- system test circuit means coupled to said system for testing said system, said system test circuit means including thrust indicator means associated with said plurality of engines, and switching means representative of engine failure for energizing said thrust indicator means.

4,034,939
ASSEMBLY FOR SEALING THE MOUNTING OPENING FOR A FLYING HORIZONTAL STABILIZER ON A VERTICAL STABILIZER

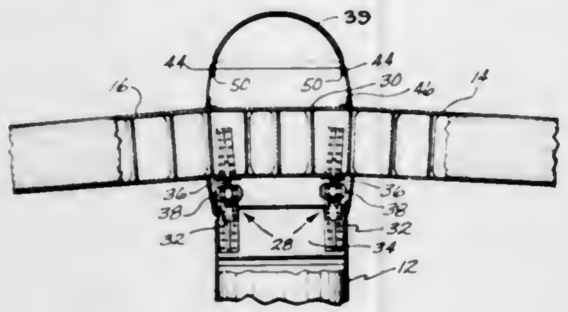
Thomas R. Ridley, Jr., Kent, and Gerald C. Simmons, Kirkland, both of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 5, 1975, Ser. No. 629,120

Int. Cl.² B64C *9/02*

U.S. Cl. 244—87 **9 Claims**

1. In an aircraft tail assembly including a vertical stabilizer and a flying horizontal stabilizer, said vertical stabilizer having a skin with a convex, outer airfoil surface, and an opening through said skin to the interior of said vertical stabilizer, said horizontal stabilizer having an inner end positioned adjacent said opening and a structural member affixed thereto and extending through said opening into said vertical stabilizer, and hinge means for mounting said horizontal stabilizer for upward and downward swinging movement about an axis oriented transversely to the chord line of said vertical stabilizer, the improvement comprising:
- a seal plate affixed to said horizontal stabilizer adjacent said vertical stabilizer, said seal plate being oriented transversely to said horizontal stabilizer and having a periphery so configured to cover the opening in said vertical stabilizer as said horizontal stabilizer swings about its axis, the periphery of said seal plate being spaced outwardly from the convex, outer surface of the skin of said vertical stabilizer, and;
- resilient seal means for sealing said opening relative to the air surrounding said vertical and horizontal stabilizers to retard air flow between the upper and lower surfaces of said horizontal stabilizer, said resilient seal means being affixed to the periphery of said seal plate and interposed between said seal plate and the convex, outer surface of the skin of said vertical stabilizer, said resilient seal means being partially flexed when said horizontal stabilizer is in a first predetermined position so that said seal means can flex bi-directionally transversely to the convex, outer surface of the skin of said vertical stabilizer as said horizontal stabilizer swings about its axis and allows the shape of the contact region of said resilient seal means to vary relative to the shape of the periphery of said seal plate, thereby maintaining a constant sealing relationship between said seal plate and the convex, outer surface of the skin of said vertical stabilizer as said horizontal stabilizer swings about its axis.



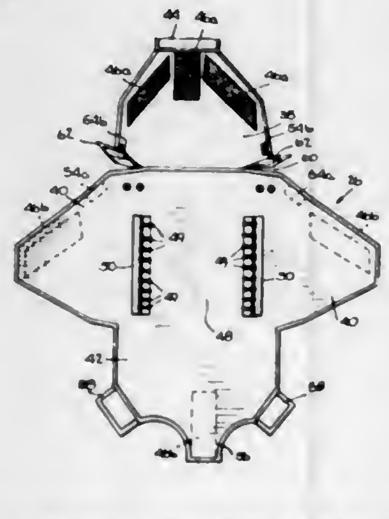
4,034,940
PARACHUTE CONTAINERS

Jerry Bird, Orange, Mass., assignor to Parachutes Incorporated, Orange, Mass.

Filed June 6, 1974, Ser. No. 477,007

Int. Cl.² B64D *17/46*

U.S. Cl. 244—148 **8 Claims**



1. A parachute container comprising a single unitary piece of flexible sheet material formed with a generally rectangular centrally located back panel, a bottom flap extending downwardly from a bottom edge of the back panel, a pair of side flaps extending outwardly from opposite side edges of the back panel, a top flap extending up from the remaining top edge of said back panel, said back panel being provided with rows of parachute suspension line storage elements, said bottom, side and top flaps being foldable over the back panel in mutually overlapping relationship to form a closed container with said top flap overlying said bottom and side flaps, said bottom and side flaps being otherwise unconnected to each other, fasteners attached to said container for securing said container to a parachute harness, separate reusable pull apart fastening means for separately, directly and independently interconnecting said top flap to each of said side flaps and to said bottom flap in their overlapped condition, said pull apart fastening means maintaining positive fastening of adjacent flaps against pulling forces in the planes of said overlapped flaps and operating in response to connecting and disconnecting forces applied transversely to the planes of said overlapped flaps for connecting the flaps to each other and for releasing the flaps from each other, respectively, and a flap pulling member connected to the top flap for pulling outwardly on said top flap to open said container, whereby such outward pulling simultaneously releases said fastening means and opens said flaps outwardly without need for resilient flap pulling elements on said container.

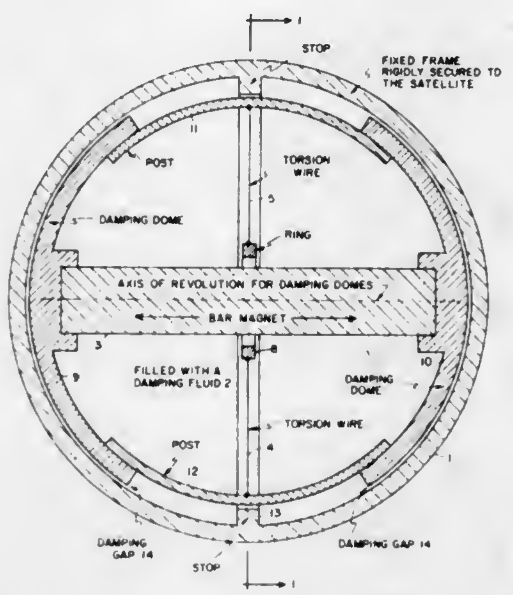
4,034,941
MAGNETIC ORIENTATION AND DAMPING DEVICE FOR SPACE VEHICLES

Sidney Godet, Little Falls, N.J., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Dec. 23, 1975, Ser. No. 643,739

Int. Cl.² B64G *1/00*

U.S. Cl. 244—166 **10 Claims**


STOP
FIXED FRAME RIGIDLY SECURED TO THE SATELLITE
POST
TORSION WIRE
DAMPING DOME
RING
AXIS OF REVOLUTION FOR DAMPING DOMES
BAR MAGNET
FILLED WITH A DAMPING FLUID 2
DAMPING DOME
TORSION WIRE
POST
12
DAMPING GAP 14
STOP
DAMPING GAP 14

1. A magnetic orientation and damping device for a space vehicle comprising:
- a fixed frame having at least a spherical inner surface rigidly secured to said vehicle;
- a damping fluid disposed within and completely filling said frame;
- first means to suspend a bar magnet within said frame, said first means enabling said bar magnet to move with respect to said frame, said first means and said bar magnet being completely immersed in and in contact with said fluid; and
- second means disposed within said frame completely immersed in said fluid secured to each end of said bar magnet and having at least an outer spherical surface spaced from said inner surface of said frame to dampen, in cooperation with said damping fluid, relative angular motion between said bar magnet and said frame.

4,034,942
METHOD OF LEADING A RAIL VEHICLE BY MEANS OF A CONTROL CENTER FROM AN AUTOMATICALLY CONTROLLED AREA TO AN AREA OF INDIVIDUAL CONTROL

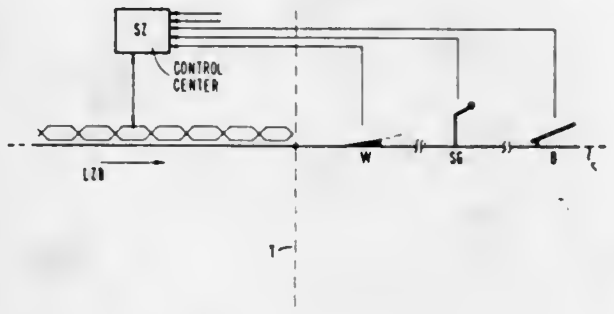
Ulrich Feucht, Ditzingen, and Martin Michler, Stuttgart-Ost, both of Germany, assignors to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 10, 1976, Ser. No. 665,489

Claims priority, application Germany, Mar. 24, 1975, 2512910

Int. Cl.² B61C *3/02*

U.S. Cl. 246—4 **6 Claims**



1. A method of leading a vehicle by means of a control center from an automatically controlled area to an area of individual control, taking into account signals and the like, comprising the steps of
- storing in said control center speed determining criteria in the area of individual control, e.g. maximum speed and stopping points;
- determining from said stored criteria a transition speed between said two areas and a transfer point between said two areas; and
- communicating said transition speed and said transfer point as running commands to said vehicle when it is still in said automatically controlled area.

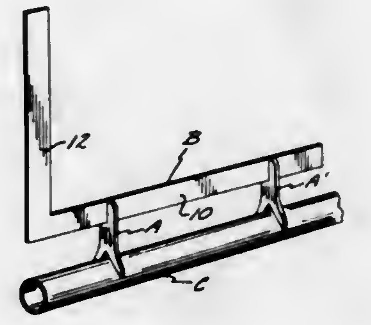
4,034,943
WELDER'S SQUARE SUPPORTING ASSEMBLY

James F. Freeman, 4344 Greenbrier Road, Long Beach, Calif. 90808

Filed July 19, 1976, Ser. No. 706,807

Int. Cl.² B43L *7/00;* **B31L** *7/00*

U.S. Cl. 248—1 **2 Claims**



1. An assembly for removably engaging a first leg of a welder's square in such a manner that a second leg of said welder's square is normally disposed to the longitudinal axis of a substantially horizontal elongate member when said assembly rests on an upwardly disposed portion thereof, said assembly including first and second supports of identical structure that can removably engage said first leg at desired longitudinal spacing thereon, each of said supports including:
- a. a generally Y-shaped body that has first, second and third

arms, said first and second arms adjacently disposed and defining a triangular space therebetween that is partially occupied by a transverse section of said elongate member when said first and second arms rest on transversely spaced sections of the outer surface of the latter, with said third arm substantially vertically disposed, said third arm having a slot extending downwardly therein from the upper extremity thereof, said slot defined by first and second transversely spaced side walls that are parallel to the longitudinal axis of said elongate member on which said support is mounted, said slot having a bottom that extends between said first and second side walls, and said body including a protuberance that extends from the upper extremity of said first side wall towards said second wall; and

b. a resilient elongate spring disposed in said slot, said spring having first and second ends, said first end in contact with said bottom, said second end in contact with said protuberance, and said spring of sufficient length as to assume a bowed configuration in said slot, and said spring and second side wall frictionally engaging a transverse section of said second leg to support said welders square from said support.

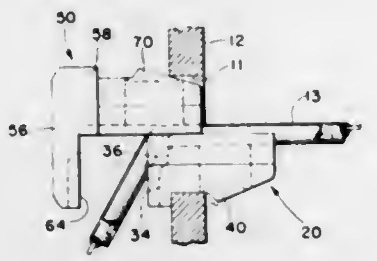
4,034,944
STRAIN-RELIEF BUSHING

Thomas M. Moran, Cleveland, Ohio, assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 361,737, May 18, 1973. This application Dec. 6, 1973, Ser. No. 422,235

Int. Cl.² F16L *5/00*

U.S. Cl. 248—56 **9 Claims**



1. A molded, one-piece, self-locking, strain-relief bushing assembly for mounting a conductor relative to a panel of predetermined thickness having an aperture through which the conductor passes such that the conductor will extend substantially normal to the panel on one side thereof and substantially parallel to the panel on the other side thereof, said bushing comprising:

a first complementary bushing member having an angled passageway for accepting a conductor therethrough; and

a second complementary bushing member being mateable with said first bushing member and having an angled passageway for accepting a conductor therethrough, each of said angled passageways having an axially extending portion and an intersecting radially extending portion, said first and second bushing members being hingeably connected by a flexible and frangible web that will allow said first member to be foldingly mated with said second member such that said first member is axially offset said second member to allow said first member of said bushing assembly to easily fit through the panel aperture with said second member extending only partially into the panel aperture and will then break as second member is forced fully into said aperture locking said bushing to said panel and encapturing said conductor in the cavity formed by said angled passageways.

4,034,945
DEVICE FOR SUSPENDING A NURSING BOTTLE

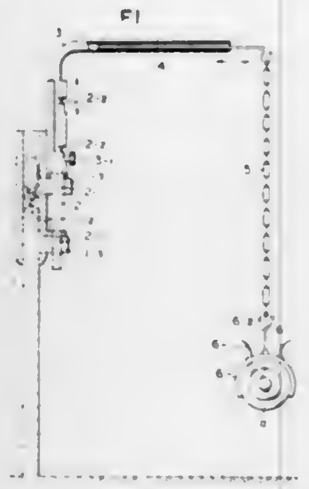
Isao Sato, 7-5, 5-chome, Washibetsucho, Noboribetsu, Hokkaido, Japan

Filed Dec. 15, 1975, Ser. No. 640,911

Claims priority, application Japan, Dec. 16, 1974, 49-152915[U]

Int. Cl.² A47D *15/00*

U.S. Cl. 248—103 **3 Claims**



1. A device for suspending a nursing bottle from a support member comprising:

bottle gripping means,

horizontally adjustable hook means operatively connected to said bottle gripping means, and

support means, supporting said hook means with means permitting pivotal adjustment of said support means in both a vertical direction and pivotally about a vertical axis, including spring clamp means secured to said support member, tube support means integrally connected to said clamp means, a vertical support tube pivotally disposed within said tube support means and having a plurality of detent engaging means vertically disposed thereon, and an L-shaped sleeve, supporting said hook means, slidably disposed within said vertical support tube and having detent means thereon for selectively engaging said detent engaging means of said vertical support tube.

4,034,946
MOUNTING DEVICE FOR LIGHTS

Judson Zimmer, Jr., Gloversville, N.Y., assignor to N. A. Taylor Co. Inc., Gloversville, N.Y.

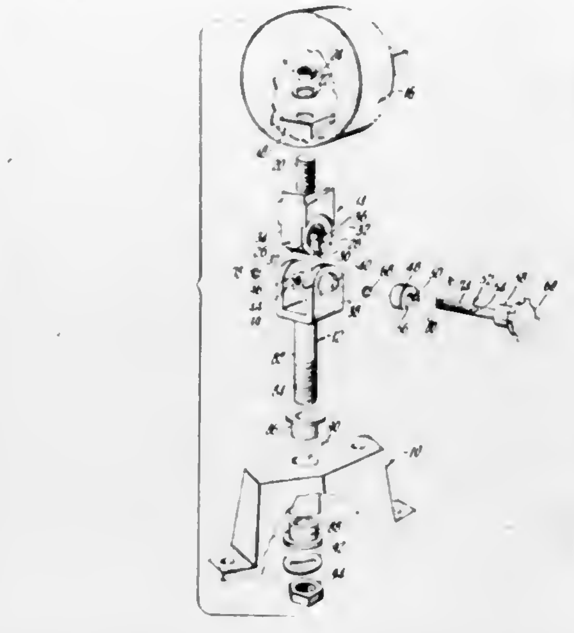
Filed Aug. 24, 1976, Ser. No. 717,145

Int. Cl.² F16M *11/12*

U.S. Cl. 248—183 **17 Claims**

1. A mount for removably mounting a light to a base member comprising first and second clevis members, means on one of said first and second clevises for mounting said light, and means on the other clevis for mounting the clevis to the base, said first clevis having a pair of arms defining a groove therebetween, said groove terminating in opposed faces of said first clevis, a gripping means on at least one of said opposed faces a pair of spaced arms on said second clevis, each of said spaced arms having a hole therein, the holes in said spaced arms being in alignment with each other, a stem, means for mounting said stem in said spaced holes and for permitting rotational movement of said stem in said spaced holes, said groove between the pair of arms in said first clevis straddling said stem between the said spaced arms of said second clevis, said stem having a cooperating gripping means thereon linearly translatable by rotation of said stem assembly, and located to cooperate with the gripping surface on said first clevis, said stem being rotatable to translate said cooperating gripping means between a first position in which said cooperating gripping means and gripping means engage each other to secure said first clevis in said second clevis and a second

position in which said gripping surfaces are out of engagement to permit repositioning of said first clevis with respect to said second clevis and removal of said first clevis from said second clevis.



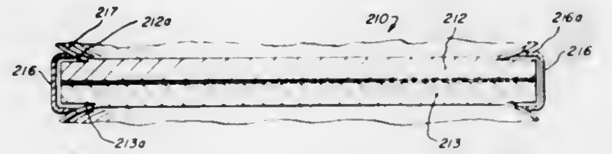
4,034,947
ROTATING SEAT DEVICE

Anthony Geisel, 5219 N. Spaulding Ave., Chicago, Ill. 60625

Filed July 24, 1975, Ser. No. 598,780

Int. Cl.² A47C *7/62*

U.S. Cl. 248—349 **1 Claim**



1. A device adapted to be removably positioned on a supporting seat for facilitating rotational movement of a seated body relative to the seat, said device comprising flexible disc-shape first and second members arranged in superposed relation and movable relative to one another about a substantially central transverse axis; flexible means intermediate said members for reducing friction therebetween; and an annular retainer element encompassing said first and second member, said element having flange portions extending inwardly towards said transverse axis and engaging surface portions of said first and second members, said flange portions being at least partially concealed by said first and second members.

4,034,948
VEHICLE SEAT STRUCTURE

Roy D. Brownell, Aurora, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Dec. 4, 1975, Ser. No. 637,603

Int. Cl.² A47C *1/026, 3/34*

U.S. Cl. 248—372 **13 Claims**

1. A vehicle seat structure comprising:

a base portion;

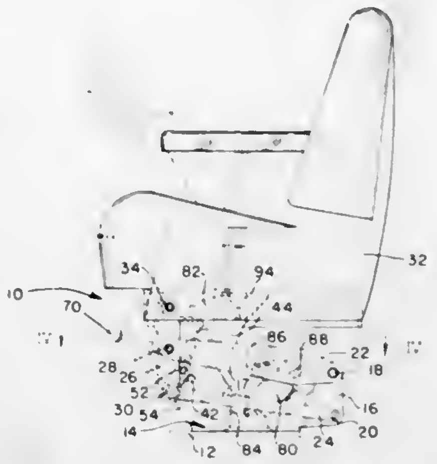
a seat portion;

first means operatively connecting said seat portion and said base portion for providing that said seat portion may be tilted with respect to said base portion;

second means operatively connecting said seat portion and said base portion for providing that said seat portion may be raised and lowered with respect to said base portion;

actuating bar means operatively controlling said first and second means, being movable to a first position to actuate said first means, being movable to a second position to actuate said second means, and being movable to a third position; and

position control means operatively connected with said actuating bar means comprising means for selectively determining the height disposition of said seat portion while the tilt disposition of said seat portion remains unchanged and means for selectively determining the tilt disposition of said seat portion with the actuating bar means being in said third position.



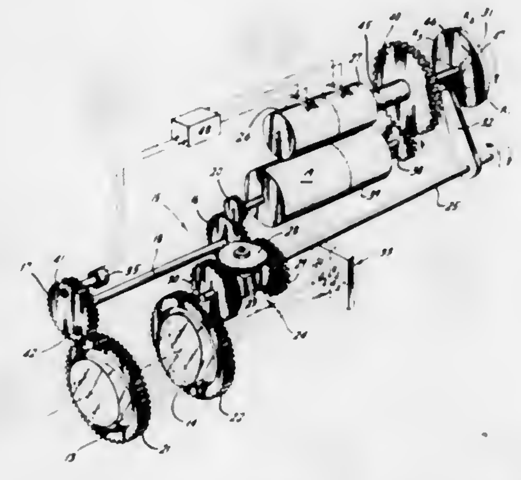
4,034,949
OPTICAL APPARATUS

Howard Frederick Hoesterey, Santa Ana, and John Weldon Cade, Orange, both of Calif., assignors to Philco Corporation, Dearborn, Mich.

Filed May 12, 1965, Ser. No. 456,606

Int. Cl.² F41G *7/00*

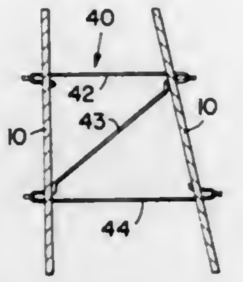
U.S. Cl. 244—3.16 **18 Claims**



1. In an optical tracking system, lens means defining an optical axis, radiant energy responsive means spaced from said lens means along said optical axis, a pair of radiant energy directing means disposed to be traversed by radiant energy passing along said optical axis from said lens means to said radiant energy responsive means, drive means for simultaneously rotating said radiant energy directing means whereby to rotate a beam of received radiant energy and cause the same to nutate about the optical axis and to trace a substantially circular image upon said radiant energy responsive means, and means for angularly adjusting one of said radiant energy directing means relative to the other to modify the radius of said circular image.

4,034,950
FORM TIE

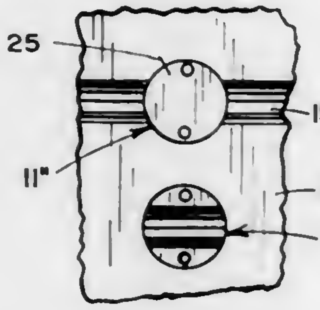
John M. Powell, 5169 Alum Rock Ave., San Jose, Calif. 95127
Continuation-in-part of Ser. No. 621,647, Oct. 14, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 724,714
Int. Cl.² E04G *17/08*
U.S. Cl. 249—46 **3 Claims**



1. A unitary form tie for use in fixing a pair of form sides in a selected spaced position with respect to each other at a given location against shear and transverse forces acting on said pair of form sides at said given location, said form tie comprising a unitary elongated metal member of a generally Z-shape configuration having generally parallel end portions joined by an intermediate diagonal portion, the free end of each said end portion having a bight formed therein terminating in a rectilinear tab extending transversely of said end portion, the other end of each end portion having a bight formed therein and a rectilinear brace portion interposed between said bight at the other end of each end portion and said intermediate diagonal portion of said member, said rectilinear brace portions extending substantially normal to said generally parallel end portions of said metal member of generally Z-shape configuration.

4,034,951
GATE FOR INJECTION MOLD DIE CHANNEL

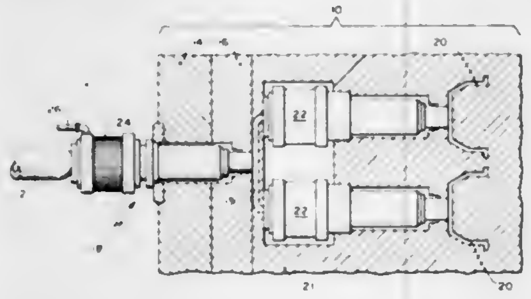
Edward B. A. Sokoloski, 404 W. Verona Ave., Verona, Wis. 53593
Filed Oct. 6, 1976, Ser. No. 730,281
Int. Cl.² B29C *1/00;* **B29F** *1/05*
U.S. Cl. 249—102 **2 Claims**



1. Injection mold die apparatus comprising in combination
a. a die member configured with a planar surface and with at least one die cavity and at least on communicating flow channel intersecting said surface,
b. at least one flow gate site opening disposed to intersect said flow channel extending across said flow channel, the axis of said opening being substantially perpendicular to said flow channel and wherein at least a portion of said opening is internally threaded,
c. at least one flow gate member at least partially externally threaded and configured complementary to said flow gate site opening to be precisely received in said flow gate site opening with the upper surface thereof when fully inserted configured and disposed to be flush with the planar surface of said die member and having a channel with the surface configuration of said flow channel and in alignment with said flow channel,
d. at least one flow plug member configured complementary to said flow gate site opening to be precisely received in said flow gate site opening with the upper surface thereof when fully inserted configured and disposed to be flush with the planar surface of said die member and having a totally planar surface to block said flow channel when disposed in said flow gate site opening, and at least one storage site disposed in said die member apart from said flow channel and configured with an opening having at least a portion internally threaded and complementary to said members in a manner similar to said flow gate opening to receive alternatively either said flow gate member or said flow plug member.

4,034,952
HOT PLASTIC INJECTION BUSHING

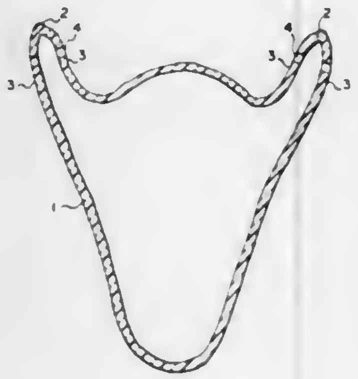
James M. Stewart, Greenville, S.C., assignor to Kenics Corporation, North Andover, Mass.
Filed Aug. 27, 1975, Ser. No. 608,106
Int. Cl.² B29F *1/00*
U.S. Cl. 249—105 **9 Claims**



1. A plastic injection bushing comprising:
a. an elongated member provided with a bore through which molten material is adapted to flow;
b. an interior wall surface of said member being in direct heat conduction relation to the wall of a heat pipe adjacent to said member;
c. said heat pipe comprising a hermetically sealed, evacuated chamber partially filled with a vaporizable liquid; and
d. heating means for supplying heat to a localized section of said chamber for heating said liquid to a predetermined value.

4,034,953
MOLD FOR BOOT

Anthony G. Cervinka, 12 Fairview Cres., Trenton, Canada
Continuation of Ser. No. 657,831, Feb. 13, 1976, abandoned. This application July 1, 1976, Ser. No. 701,961
Int. Cl.² B29C *11/00;* **B19H** *5/12*
U.S. Cl. 249—117 **1 Claim**



1. A mold for use in the slush molding of a boot with eyelet stays, comprising a shell mold defining a hollow boot-shaped cavity for receiving heat-curable plastisol having an interior surface comprising a front upper portion with a longitudinal centerline, and means for forming single thickness eyelet stays comprising two narrow, elongated grooves in said front upper portion in spaced apart relationship, one on each side of and collateral with said longitudinal centerline, each of said grooves being narrow enough and deep enough such that during the slush molding, the plastisol received therein forms a single thickness eyelet stay.

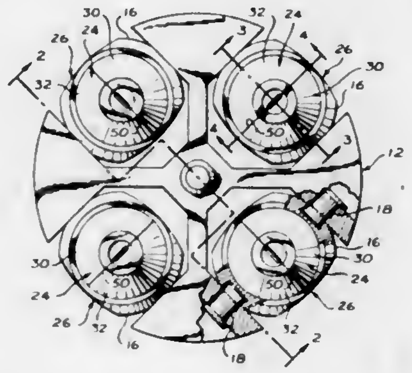
4,034,954
COPPER-NICKEL PLASTIC MOLD ALLOY AND RESULTANT MOLD

Paul J. Scherbner, Boyertown, Pa., assignor to Kawecki Berylco Industries, Inc., Reading, Pa.
Filed June 27, 1975, Ser. No. 591,054
Int. Cl.² B28B *7/34;* **C22C** *9/06*
U.S. Cl. 249—135 **5 Claims**

3. A shaped plastic injection mold suitable for the injection molding of shaped articles of fire-resistant plastics containing fire-retardant materials, said injection mold being fabricated from an alloy consisting essentially of between about 0.4 and 2.0 weight percent beryllium, between about 29.0 and 33.0 weight percent nickel, between about 0.4 and 1.0 weight percent iron, between about 0.4 and 1.0 weight percent manganese, between about 0.05 and 0.3 weight percent zirconium, between about 0.05 and 0.30 weight percent titanium, and the balance copper, said injection mold being further characterized by being able to withstand the corrosive effects of the fire-retardant materials.

4,034,955
CASTING APPARATUS

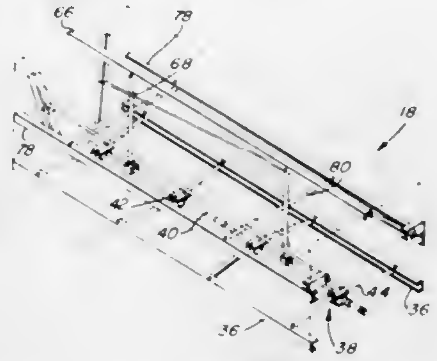
Henry W. Wallace, Southbridge, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Continuation-in-part of Ser. No. 594,905, July 10, 1975, Pat. No. 4,002,418. This application Sept. 23, 1976, Ser. No. 725,743
Int. Cl.² B29C *5/04*
U.S. Cl. 249—137 **8 Claims**



1. Centrifugal casting apparatus comprising the combination of:
a mold having an internal casting cavity with communication into said cavity adjacent a first end of the mold, an opposite second end of the mold normally being closed, said mold further being of an oval cross-sectional shape having orthogonal major and minor axes and tapered throughout its length;
a mold retaining sleeve having an internal circular taper substantially matching the portion of the taper of said mold in the plane of said major axis of said oval shape wherewith clearance is provided between said mold and sleeve in the plane of said minor axes when said mold is received in said sleeve for subsequent centrifugation: and
external portions of said sleeve being constructed and arranged to adapt said sleeve to a centrifuge.

4,034,956
APPARATUS FOR FORMING CRYPTS

H. Gordon Gates, Denver, Colo., assignor to Gates & Sons, Inc., Denver, Colo.
Filed Sept. 7, 1976, Ser. No. 720,894
Int. Cl.² B28B *7/30*
U.S. Cl. 249—180 **21 Claims**



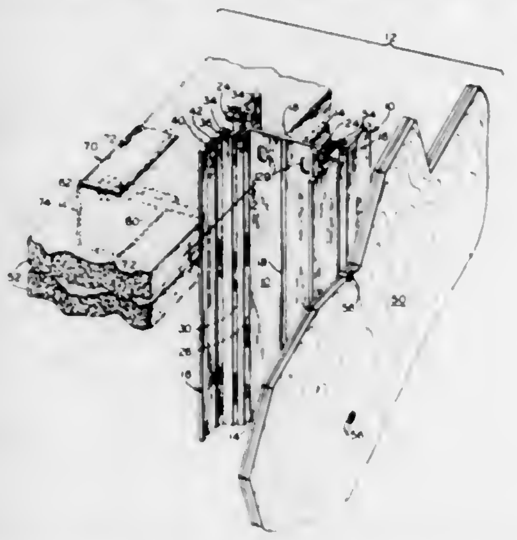
1. A collapsible form for use in pouring concrete structures having a plurality of elongate recesses in side by side spaced relation, comprising:
a main body having an upper wall, two depending side walls, and two corner connectors;
the upper and side walls being elongate and generally rectangular and planar and being formed of substantially rigid material;
the corner connectors being elongate and generally rectangular and formed of resilient sheet material and being of substantially the same length as the walls;
each connector comprising two elongate generally planar marginal attachment sections extending in planes generally perpendicular to each other and an elongate central section of laterally arcuate configuration;
the attachment sections of each connector being secured respectively to one longitudinal marginal section of the upper wall and to the upper longitudinal marginal section of one of the side walls to define an assembly in the form of an inverted channel having generally planar walls and rounded upper corners;
a reinforcing rail extending longitudinally along the lower portion of each side wall on its inner side and fixedly secured thereto;
actuating means locate in the lower portion of the main body and connected to the reinforcing rails and actuatable to force the rails away from and toward each other to expand and contract the main body laterally;
a back plate of rigid material corresponding in size and shape to the lateral dimensions of the expanded main body and located in contact with the aft ends of the walls to close the aft end of the main body;
anchorage means on the inner side of the back plate;
anchorage means at the forward portion of the main body;
and at least one elongate tie rod having means to engage both of said anchorage means and actuatable to draw and hold the back plate in firm engagement with the aft end of the main body.

4,034,957
CONCRETE FORMWORK INCLUDING I-BEAM SUPPORT

David L. Cody, Hoffman Estates, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Filed Feb. 17, 1976, Ser. No. 658,515
Int. Cl.² E04C *3/07;* **E04G** *9/04, 17/04*
U.S. Cl. 249—189 **5 Claims**

1. A concrete formwork comprising, in combination, a panel against which wet concrete is adapted to be poured in order to produce a concrete slab or wall, an elongated extruded metal structural member for said panel, said member being generally in the form of an I-beam, being adapted in

connection with one of its uses to extend horizontally, and having upper and lower flange arrangements connected together by an intermediate substantially planar web, said member being arranged so that one of its flange arrangements is positioned in abutment with the panel, the upper flange arrangement of said structural member embodying a pair of coplanar, horizontally extending bottom wall portions connected to and extending outwardly from the upper longitudinal edge region of the web, a pair of parallel, spaced apart, first side wall portions extending upwards from the bottom wall portions and having their lower edge regions connected to the outer edge regions of said bottom wall portions, a pair of coplanar, horizontally extending, ledge-forming portions extending outwards from the first side wall portions and having their inner edge regions connected to the upper edge regions of said first side wall portions, and a pair of parallel, spaced apart, vertically extending, second side wall portions extending upwards from the ledge-forming portions and having their lower edge regions connected to the outer edge regions of the ledge-forming portions, said second side wall portions being of greater height than the first side wall portions, having the inner opposed surfaces thereof smooth and continuous throughout their entire areas and defining with the ledge-forming portions a channel which is coextensive with the structural member, is of appreciable depth and of generally rectangular cross section, and is spaced from the bottom wall portions by the first side wall portions and the space between the latter, the upper edge regions of said second side wall portions being provided with coplanar inwardly and horizontally extending opposed seating flanges the inner edges of which are spaced apart in order to define a restricted outwardly opening mouth for the channel, said seating flanges being provided on their inner edge regions with short, downwardly extending, rigid, bead-like, right-angle ribs, the upper edge regions of said second side wall portions being further provided with coplanar outwardly and horizontally extending extensions of said seating flanges, the lower flange arrangements being identical in size, shape and construction to the upper flange arrangement but being positioned in inverted or up side down relation with respect thereto, and having the inner edge regions of its coplanar, horizontally extending bottom wall portions connected to the lower longitudinal edge region of the web of the structural member, an elongated wooden reaction nailing strip disposed within the channel of said one flange arrangement, having a width greater than the width of the restricted mouth of said last-mentioned channel and having a depth corresponding to the distance between the inner portions of the ribs and the adjacent faces of the ledge-forming portions to the end that it is securely and firmly captured in the associated channel, and a longitudinal series of fastening members projecting through the panel and extending through said restricted mouth of the one flange arrangement and into said wooden reaction nailing strip, thus drawing the latter against the adjacent ribs of the seating flanges of said one flange arrangement and, in turn, maintaining the last-mentioned seating flanges against the panel so as to connect the structural member to said panel.



4,034,958

INDEPENDENT DEVICE FOR OPENING AND CLOSING ROTARY VALVES BY REMOTE CONTROL

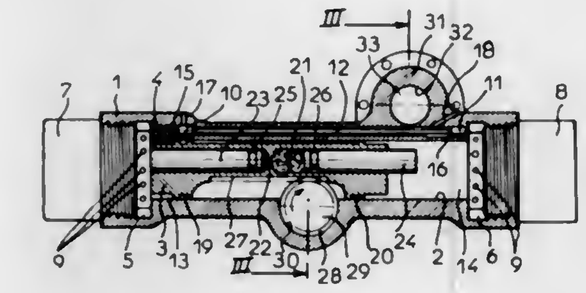
Jean Masclet, Paris, France, assignor to Messler Hispano, Montrouge, France

Filed May 6, 1975, Ser. No. 575,060

Claims priority, application France, June 14, 1974, 74.20828

Int. Cl.² F16K *31/124, 31/54*

U.S. Cl. 251—28 **5 Claims**



1. An independent device for opening and closing a rotary valve by remote control, said device comprising a piston-and-cylinder unit constituted by a cylinder having a main bore, a movable unit slidably mounted in fluid-tight manner in said bore for displacement in opposite directions, means for supplying a pressurized-fluid including two pressurized-fluid sources for displacing the movable unit in respective directions, a sequencing mechanism for simultaneously applying the fluid from one of the sources to a corresponding end face of the movable unit while bringing the other end face into communication with the atmosphere said movable unit including movement-damping means comprising two pistons slidably mounted in a fluid-tight manner and projecting at the ends of a bore extending axially along the movable unit, said bore having, in an intermediate section thereof, a reduced portion forming a throttling orifice through which is pressed a damping material which fills a cavity between the two pistons, and means for transmitting movement from said movable unit to the rotary valve comprising a rack carried by the movable unit, a pinion meshing with the rack, said pinion including a shaft, a first crank solidly connected to the shaft of the pinion, a second crank solidly connected to a pivot shaft of the rotary valve, and a connecting rod linked to the two cranks, the position of the connecting rod, on completion of the opening and closing movements of the valve, being such that the axes, along which the connecting rod is linked to the cranks, and the axis of rotation of said first crank are substantially aligned in the same plane.

4,034,959

VALVE SEAL RETAINING MEANS

Bertram L. Morrison, Houston, Tex., assignor to ACF Industries, Incorporated, New York, N.Y.

Filed Dec. 24, 1975, Ser. No. 644,233

Int. Cl.² F16K *3/02, 5/06*

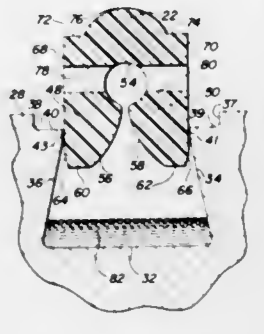
U.S. Cl. 251—315 **16 Claims**

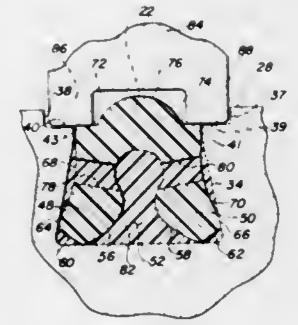
1. A valve, comprising:

a. a valve body having a valve chamber therein, flow passages in said valve body in communication with the valve chamber, a valve member positioned within the valve chamber and movable between open and closed positions relative to said flow passages,

b. an annular groove in said valve body around at least one of said flow passages having an open end and a closed end formed by a bottom wall, said groove defined by a pair of divergent side walls extending between said open end and said bottom wall and said groove having a width of said closed end substantially greater thn the width of at said open end,

c. an annular seal ring positioned in said groove adjacent to said bottom wall and extending beyond said open end and contacting said valve member, the width of the portion of said annular seal ring that is located adjacent to and extending through said annular groove open end is substantially less than the width of said annular groove open end, and





d. a chemical fastener between at least a portion of one of said walls and said seal ring to secure in said groove, said chemical fastener being of a consistency capable of flowing and displacement when said seal ring is positioned within the groove and subsequently curing into a firm consistency having a hardness at least as hard as said seal ring to secure said seal ring in said groove between said side walls against movement out of the groove, said chemical fastener being flowable from said annular groove between said annular groove open end and said seal ring upon insertion of said seal ring into said groove.

4,034,960

SPRING COMPRESSOR TOOL

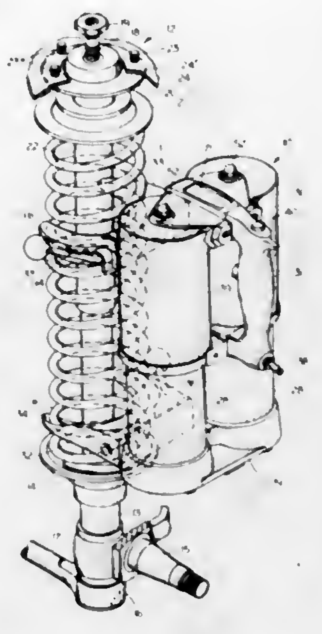
Kenneth D. Kloster, 5153 Rambo Lane, Toledo, Ohio 43623

Continuation-in-part of Ser. No. 547,918, Feb. 7, 1975, abandoned. This application Nov. 21, 1975, Ser. No. 634,148

Int. Cl.² B23P *19/04*

U.S. Cl. 254—10.5 **14 Claims**

1. A spring compressor tool for compressing a spring having opposed ends, comprising, in combination, a first pressure shoe having a generally U-shaped helical portion, said helical portion defining a slot, said slot receiving a first coil of such spring at a position intermediate such opposed spring ends for applying a force to such first spring coil, means for applying an opposing force to a second coil of such spring, means for adjusting said pressure shoe for aligning said slot with such first spring coil, said adjusting means including means for infinitely varying the position of said pressure shoe toward and away from said force applying means, and compression drive means positioned between said pressure shoe and said force applying means for moving said pressure shoe and said force applying means toward one another along a linear path to compress the portion of such spring located between said pressure shoe and said force applying means.



4,034,961

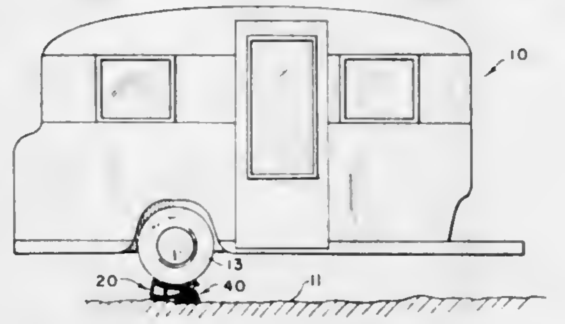
DRIVE-ON VEHICLE LEVELING DEVICE

Kenneth J. Breen, 5118 Mayview Road, Lyndhurst, Ohio 44124

Continuation-in-part of Ser. No. 495,779, Aug. 8, 1974, abandoned, which is a continuation-in-part of Ser. No. 360,934, May 16, 1973, abandoned. This application July 19, 1976, Ser. No. 706,442

Int. Cl.² F16M *13/00*

U.S. Cl. 254—94 **18 Claims**



1. A drive-on leveling device for elevating a vehicle wheel and maintaining the wheel in an elevated position, comprising:

a. a ramp-like structure having forward and rearward ends, having a drive-on wheel-engaging surface, and having a ground engaging surface;

b. the drive-on and ground engaging surfaces each extending substantially the full length of the structure between the ends, and each of the surfaces being arcuately curved along its full length;

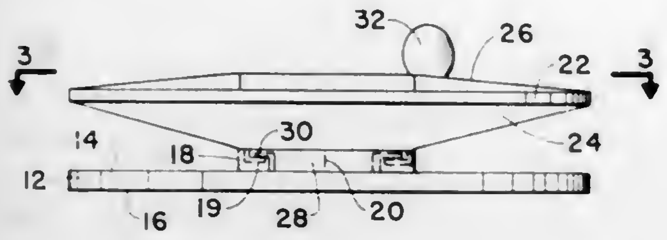
c. the drive-on and ground engaging surfaces intersecting to form a blunt-pointed forward end, and diverging one from the other along the full length of the structure as the surfaces extend away from the forward end;

d. the ground engaging surface having a radius of curvature which is less than the radius of curvature of the drive-on surface, whereby the leveling device will rock as the wheel to be elevated is driven on the drive-on surface to elevate the wheel and provide a stable support; and

e. the drive-on surface having a length which is less than the radius of the wheel to be elevated.

4,034,962
ELECTRICAL FISH TAPE REEL

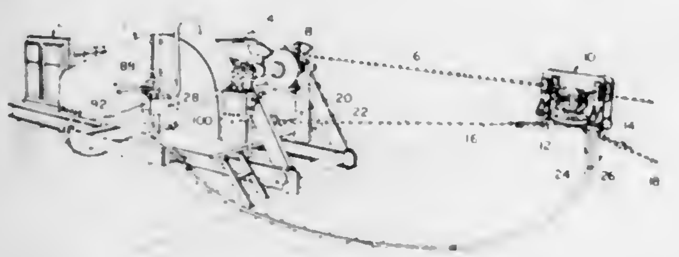
Wayne Thomsen, Grand Rapids, Minn., assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Aug. 3, 1976, Ser. No. 711,122
Int. Cl.² E21C *29/16*
U.S. Cl. 254—134.3 FT **5 Claims**



1. An electrical fish tape reel comprising a stationary base lying in a plane and having an inner face and an outer face, said outer face of said base being adapted for positioning on a flat surface, a spindle revolvably mounted on its longitudinal axis transversely on said inner face of said base, a plate lying in a plane and having an inner face and an outer face, said plate being secured to said spindle transversely to the longitudinal axis of said spindle, said plate projecting outwardly from said longitudinal axis of said spindle towards the periphery of said base to define a space between said base and said plate for reeling in and paying out electrical fish tape wound on said spindle, said space between said base and said plate tapering inwardly from the periphery of said plate toward said base, said spindle being secured to said base through first flange means for engaging second flange means mounted on said base for revolvably mounting said spindle on said base.

4,034,963
MECHANISM FOR MAINTAINING CONSTANT TENSION

Charles P. Warman, and Jack W. Moss, both of P.O. Box 1150, Wichita Falls, Tex. 76307
Continuation of Ser. No. 373,806, June 26, 1973, abandoned, which is a continuation of Ser. No. 687,538, Dec. 4, 1967, abandoned. This application Mar. 31, 1975, Ser. No. 563,788
Int. Cl.² B65D *1/48*
U.S. Cl. 254—173 B **3 Claims**

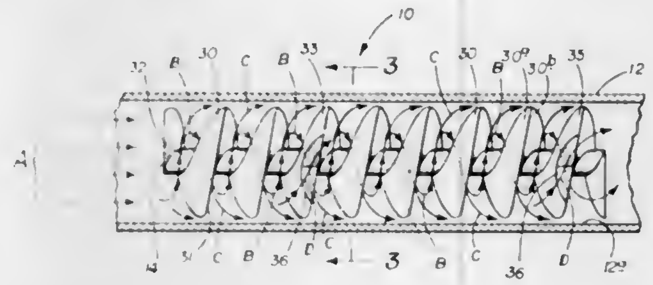


3. A constant tension, variable slip winching mechanism for use with a prime mover, which mechanism comprises;

a. a winch frame,
b. a shaft mounted on said winch frame,
c. a winch drum mounted on said shaft for rotation about the axis thereof,
  1. a cable connected to said winch drum and being wound thereon in winching relation,
d. drive means connected in driving relation with said drum, said drive means including reduction gearing connected in direct driving relation to said drum.
e. a continuous slip clutch interposed, in driving relation, in said drive means to said drum,
  1. said clutch including a conduit system for circulating a cooling medium therethrough and therefrom to continuously cool engaging parts within said clutch to permit the clutch to slip continuously, without being damaged by heat generated therein, to maintain the cable wound on said drum at a constant tension,
f. operator means for varying the rate of slippage of said clutch,
  1. said operator means being a diaphragm fluid actuated sensing means to sense the tension of a movable cable of the winching mechanism to automatically control the degree of clutch slip to maintain the tension on the cable constant, whether static or moving in either direction.

4,034,964
FLUIDIC MIXER

Charles L. Larson, Grants Pass, Oreg., assignor to Jeddeloh Bros. Sweed Mills, Inc., Gold Hill, Oreg.
Filed Nov. 12, 1975, Ser. No. 630,910
Int. Cl.² B01F *5/00*
U.S. Cl. 259—4 R **9 Claims**

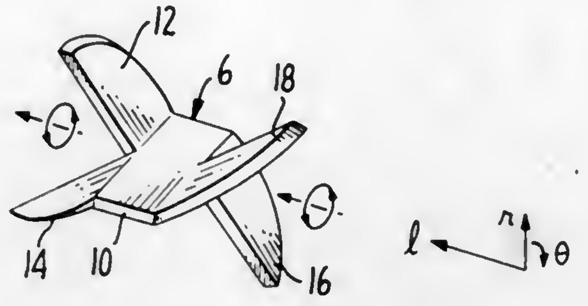


1. A mixer for commingling fluidic materials comprising:
elongate conduit means having a fluid introduction first end and a fluid discharge second end; and
elongate rod means received free of connection within said conduit means, said rod means including a core extending axially and substantially the length of said rod means to define a closed center wherein multiple helical flights are integrally joined to and radially extend from said core, said flights having peripheral diameters dimensioned less than the inside diameter of said conduit means such that a fluid flow region is provided between the outer periphery of said flights and said inside diameter for permitting a first portion of introduced fluidic materials to impinge against said helical flights and said core in a continuing spiral path and to permit a second portion of said introduced fluidic materials to travel in paths between said peripheral diameter and said inside diameter to thereby effect continuous commingling of the fluidic materials for eventual discharge.

4,034,965
MATERIAL DISTRIBUTING AND MIXING APPARATUS

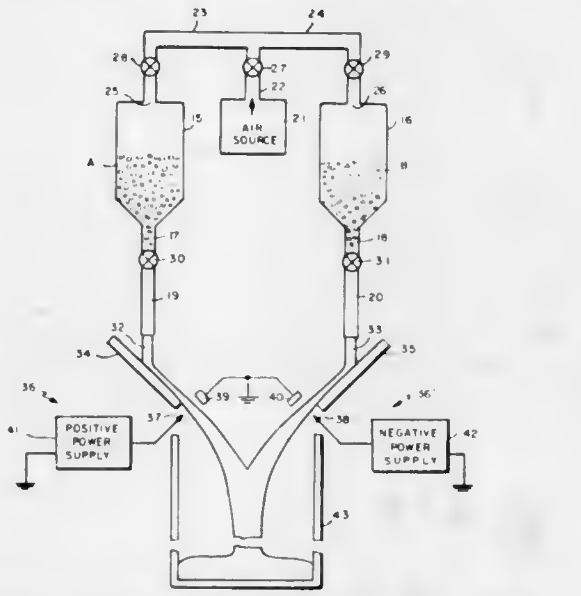
Leonard Tony King, Long Beach, Calif., assignor to Komax Systems, Inc., Carson, Calif.
Continuation-in-part of Ser. No. 428,865, Dec. 27, 1973, Pat. No. 3,923,288. This application Dec. 1, 1975, Ser. No. 636,713
Int. Cl.² B01F *15/02*
U.S. Cl. 259—4 AB **3 Claims**

1. An element for use in stationary material distribution apparatus, comprising
an article of manufacture having a flat generally rectangular central portion having first and second sets of ears affixed to opposite sides of said central portion, said sets of ears including first and second ears bent respectively in upward and downward directions relative to the plane of said central portion, each pair of ears located diagonally opposite one another across said central portion being bent in the same direction relative to the plane of said central portion.



4,034,966
METHOD AND APPARATUS FOR MIXING PARTICLES

Nam P. Suh, Sudbury, and Charles L. Tucker, III, Medford both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Nov. 5, 1975, Ser. No. 628,966
Int. Cl.² B01F *15/00*
U.S. Cl. 259—4 R **10 Claims**

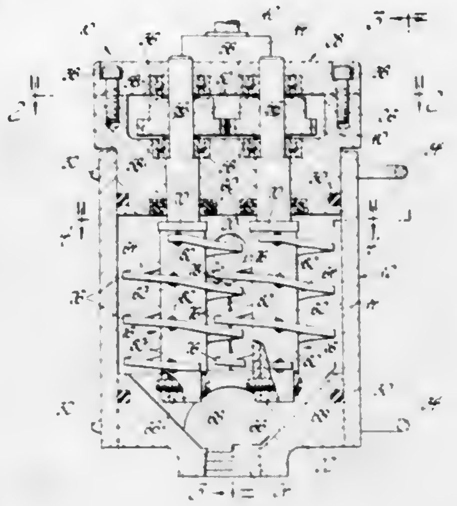


1. A method for mixing solid particles of two different types comprising the steps of
charging the particles of a first type with an electrical charge having a first polarity;
charging the particles of a second type with an electrical charge having a second polarity; and
causing said charged particles of both types to come into contact, said charged particles remaining in a substantially mobile state over a selected time period such that said particles combine to form a mixture having a mixing quality better than that of a random mixture thereof.

4,034,967
MIXER

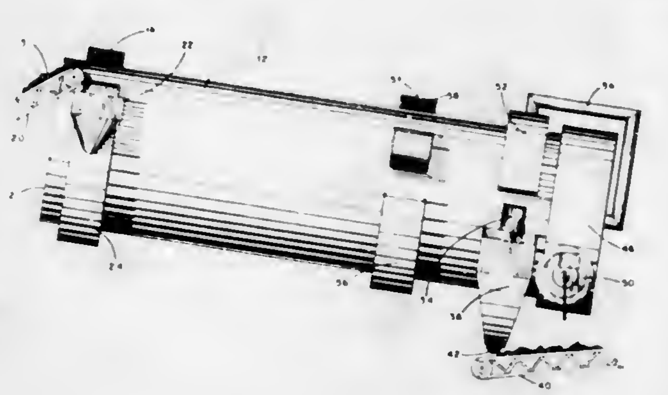
John A. Gustairs, 11226 82nd Ave., N., Apt. 101, Seminole, Fla. 33542
Filed Aug. 27, 1975, Ser. No. 608,136
Int. Cl.² B01F *7/08*
U.S. Cl. 259—6 **8 Claims**

1. A mixer comprising: a housing defining a mixing chamber for receiving components to be mixed; at least two rotors rotatably mounted by the housing within the mixing chamber; each of said rotors including an elongated shaft portion and a mixing element that is wound about the shaft portion in an axially spiraling manner so as to define radial lobes; said mixing elements being spaced from the associated shaft portions at the radial lobes so that the components being mixed can pass therethrough; the elements of the rotors being wound in the same direction with the same pitch and being arranged in a meshing relationship with each other; the lobes of the mixing elements having inner ends secured to the associated shaft portions and curved shapes extending radially between the inner ends thereof; each mixing element being secured to the associated shaft portion at the inner ends of the radial lobes for at least three times for each revolution thereabout; and drive means for rotating the rotors in the same direction at the same speed about their elongated shaft portions so the rotor elements thereof mesh with the radial lobes of each passing between those of the other to provide the mixing of components received within the mixing chamber into a homogeneous mixture.



4,034,968
ASPHALT MIXING APPARATUS

Robert L. Mendenhall, 1770 Industrial Road, Las Vegas, Nev. 89102
Continuation-in-part of Ser. Nos. 487,927, July 12, 1974, abandoned, Ser. No. 487,928, July 12, 1974, abandoned, and Ser. No. 488,518, July 15, 1974, Pat. No. 4,000,000. This application Aug. 1, 1975, Ser. No. 601,177
Int. Cl.² E01C *19/10*
U.S. Cl. 259—158 **13 Claims**



1. In an apparatus for heating and mixing asphalt-aggregate compositions comprising a rotatable elongated cylindrical drum having means at an input end for introducing said composition therein, means at the opposite output end for recovering said composition, a plurality of tubes extending through said drum for heating said composition, heating means at said opposite drum end for heating said composition gradually between said input end and said output end to a temperature above about 225° F, the improvement comprising at least one exhaust port along side drum intermediate said drum ends communicating with the drum interior at a location where said composition is heated to the boiling point of water.

8. A rotating drum for mixing asphalt-aggregate composi-

tion comprising an elongated rotatable drum, a plurality of output ports spaced along the drum exterior and communicating between the interior and exterior of said drum and through which said composition is recovered, a combustion chamber for heating the interior of said drum, and a stationary collar member extending around at least a portion of said drum overlying said output ports and a conduit communicating between said collar and said combustion chamber whereby gases exhausted by said output ports pass through said conduit and into said combustion chamber.

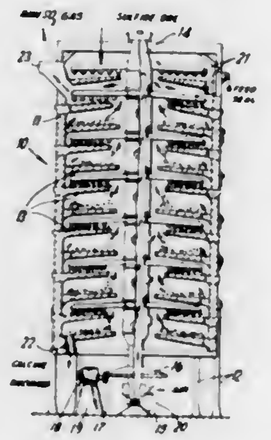
4,034,969
OXIDATION ROASTING OF ORE

George R. Grimes, Burgettstown, Pa., assignor to Amax, Inc., New York, N.Y.

Division of Ser. No. 538,181, Jan. 2, 1975, which is a continuation of Ser. No. 859,726, Sept. 22, 1969, abandoned. This application Aug. 12, 1976, Ser. No. 713,975

Int. Cl.^{2} C22B *1/00*

U.S. Cl. 266—82 **7 Claims**



1. An apparatus for roasting metal sulfide concentrates, said apparatus characterized by having at least one roasting zone comprising a hearth for supporting a bed of concentrate which comprises,

at least one spray nozzle directed into said hearth for feeding a spray mixture of liquid water droplets and air to said zone,

pipe means for feeding water under pressure to a first pressure-regulating water valve,

said first water valve being adapted to provide water at substantially constant pressure downstream of said valve,

a second water valve located downstream of said first water valve,

said second water valve being adjustably adapted to feed liquid water to said at least one spray nozzle at a predetermined pressure,

pipe means for feeding air under pressure to a first pressure-regulating air valve,

said first air valve being adapted to provide substantially constant air pressure downstream of said valve,

a second air valve located downstream of said first air valve,

said second air valve being adapted to feed air to said at least one spray nozzle at a predetermined pressure,

such that both said water and air emanating from said valves, respectively, are fed under predetermined pressures to said same nozzle to produce an air-liquid droplet spray mixture in said hearth,

a temperature-responsive control device for continually and automatically sensing the temperature in said hearth,

and means coupling said temperature-responsive control device to either the second water valve or the second air valve for actuating said valve to vary the ratio of liquid water to air fed to said spray nozzle by varying the pressure of one relative to the other in response to the difference in temperature between the temperature sensed and the desired roasting temperature,

whereby to control the roasting temperature at the hearth at substantially the desired temperature.

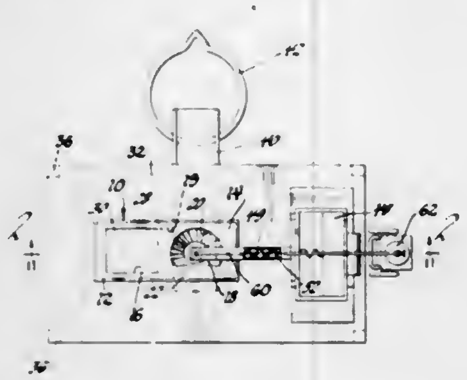
4,034,970
METHOD AND DEVICE FOR NODULARIZING CAST IRON

A. Hadi Kobalsi Abu Akeel, Sterling Heights, and Richard C. Jackson, Bloomfield Hills, both of Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Jan. 28, 1976, Ser. No. 652,907

Int. Cl.^{2} C21C *1/00*

U.S. Cl. 266—216 **7 Claims**



1. In a method for making nodular iron the steps of mixing additive materials into the molten cast iron comprising:

continuously bringing a stream of molten metal tangentially into a bottom-pour chamber at a cylindrical portion thereof so that said stream assumes a swirling configuration and forms a vortex in said chamber,

impinging said stream against a barrier positioned in the path of said swirling stream so that at least a portion of said stream folds over itself and falls toward the center of said vortex,

continuously introducing said additive materials into said vortex,

said stream portion falling toward the center of said vortex being operative to promote the mixing of said material and said metal and to increase the downward flow rate of said swirling stream.

4,034,971
CLAMP USABLE AS JIG AND LIFTING CLAMP

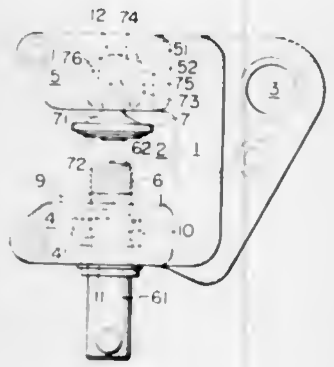
Yoshizo Tsuyama, Nara, Japan, assignor to Eagle Clamp Co., Ltd., Nara, Japan

Filed Sept. 13, 1976, Ser. No. 722,751

Claims priority, application Japan, Oct. 2, 1975, 50-119249

Int. Cl.^{2} B25B *1/10*

U.S. Cl. 269—249 **6 Claims**



1. A clamp of the type having a clamp body comprising a shackle for engagement with a pulling means and a pair of leg portions defining a slot therebetween for receiving an article to be gripped, a first jaw consisting of a screw rod mounted on one of the leg portions for movement into and out of the slot, a sleeve having a threaded hole in its axial direction, the screw rod threadedly mating with the sleeve, the sleeve being received in a hole formed in the one leg portion for allowing the sleeve to be advanced into and retracted from the slot but preventing the sleeve from being rotated, a second jaw consisting of a swivel jaw oppositely mounted on the other one of the leg portions for swiveling movement thereon, and precompressed spring means arranged within a gap formed between the inner wall of the hole of the one leg portion and the outer wall of the sleeve for biasing the sleeve towards the slot whereby friction force between the threaded surfaces of the screw rod and its mating threaded hole is increased when an article is gripped between the jaws.

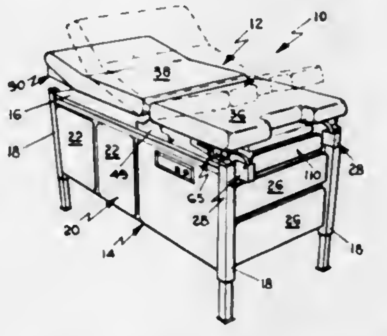
4,034,972
EXAMINATION TABLE

Warren J. Peterson, Stevens Point, Wis., assignor to Joerns Furniture Company, Stevens Point, Wis.

Filed Sept. 2, 1975, Ser. No. 609,172

Int. Cl.^{2} A61G *13/00*

U.S. Cl. 269—324 **8 Claims**



1. An articulated patient support cushion for an examination table, said cushion having a head support section and a seat support section, at least one of said sections being pivotable with respect to the other; means for supporting said sections on an examination table or the like having a surface underlying said cushion including means for pivotally supporting said pivotable section for movement in a generally vertical arc between at least a first generally horizontal position and a second position in which it is inclined upwardly at an angle to the first position; tilt means for holding said pivotable section in said positions, said tilt means including a pivoted, rigid, locking means, said locking means being pivotal by gravity on each side of a vertically extended center line, said locking means, when pivoted to one side of said center line, securely retaining said pivotal section in said second position; and a one-piece tray mounted beneath one of said head and seat support sections and having closed bottom and side walls and an open top adapted to abut the under surface of said one section, said tray adapted to hold therewithin and dispense therefrom paper from a roll for covering portions of said support cushion.

4,034,973
AUTOMATED IN-LINE MAILING SYSTEM

Kenneth A. Hams, Nazareth, Pa., assignor to Bell & Howell Company, Phillipsburg, N.J.

Filed Dec. 19, 1975, Ser. No. 642,276

Int. Cl.^{2} B41F *13/56*

U.S. Cl. 270—21 **20 Claims**

1. An automated in-line mailing system including:

a web supply means for supplying a sheet-web having indicia thereon;

a cutter means attached to said web-supply means for receiving said sheet web and cutting said sheet web into individual sheets, said cutter means including a drive means for driving said sheet web and a cutter control system communicating with said drive means for activating a cutting element at predetermined distances of travel of said sheet web past the cutting means;

a collector means for receiving said individual sheets from said cutter means, collecting said individual sheets into a pile, and thereafter asynchronously with said cutter means, depositing said pile with a receiving means; and,

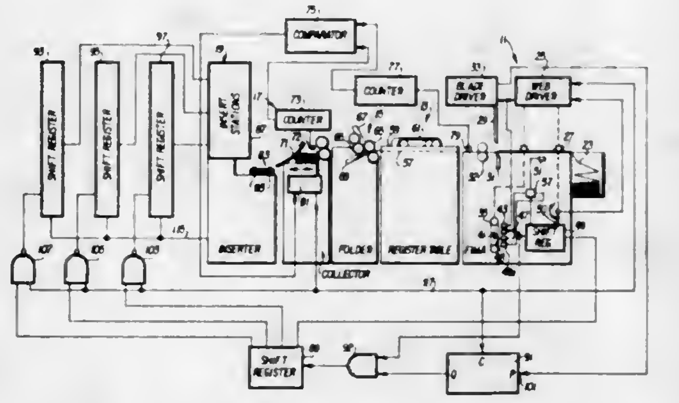
a control system including:

a sensor means for sensing said sheet-web indicia upstream of the cutting element;

a shift register attached to said sensor means for receiving and storing a signal in a first stage thereof in response to said sensor means detecting an indicia, said shift register being connected to said web-drive means and receiving signals therefrom for indexing stored signals through said shift register at a proportionate rate as said web-drive means drives said sheet web past said cutter means;

a sample-means for sampling a stage of said shift register, said sampler means being connected to the said web-drive means and inhibiting said web drive means in response to detecting a signal in said sample shift register stage; and,

a reactivating means connected between said collector means and said web-drive means for reactivating said web-drive means in response to said collector means depositing said pile with said receiving means.



11. An automated in-line mailing system including:

a web supply means for supplying a sheet web;

a cutter means attached to said web supply means for receiving said sheet web and activated for successively cutting said sheet web both longitudinally and transversely into dual individual sheet pairs;

a collecting means associated with said cutter means for receiving dual sheet pairs from said cutter means and collecting individual sheets of dual sheet pairs into separate dual piles and thereafter ejecting said piles from said collecting means; and

a control system means connected between said cutter means and said collecting means for controlling the flow of said sheet web and individual sheet pairs through said automated in-line mailing system, said control system means including a deactivating means for deactivating said cutter means and a reactivating means for reactivating said cutter means in response to said collector means ejecting either of said piles.

4,034,974
COLLATING SYSTEM

Bernard John Maopolski, Easton, Pa., assignor to Harris Corporation, Cleveland, Ohio

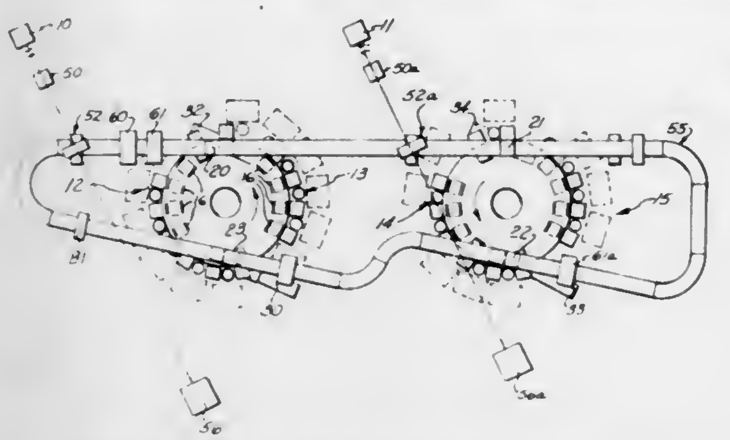
Continuation of Ser. No. 448,821, March 7, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,232

Int. Cl.^{2} B65H *5/30*

U.S. Cl. 270—55 **4 Claims**

1. A combined system of a plurality of printing presses and a plurality of collators for assembling a freshly printed signature with at least one preprinted signature and wherein each collator includes at least one hopper for receiving and storing said preprinted signatures and at least one on-line hopper for receiving said freshly printed signatures, a collating conveyor

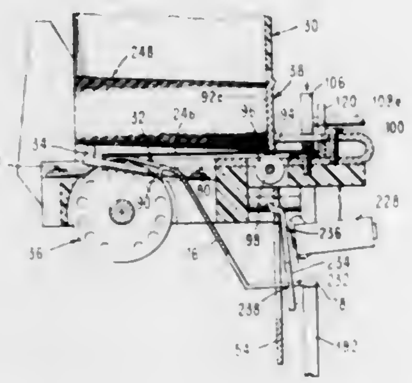
and means for feeding the signatures individually from each hopper to said collating conveyor for collating the signatures fed from each hopper, said system comprising
- a manifold conveying means for feeding signatures to each of said on-line hoppers, said manifold conveying means comprising a closed continuous conveyor system which extends adjacent to each of said on-line hoppers for deposit of signatures therefrom into said hoppers,
- conveying means for each of said printing presses for feeding freshly printed signatures to said manifold conveying means,
- switch means for diverting freshly printed signatures from



each conveying means for each of said printing presses to said manifold conveying means,
- divert gate means associated with each on-line hopper for diverting freshly printed signatures from said manifold conveying means to said on-line hopper, and control means for actuating
- said manifold conveying means, said conveying means for each printing press, said switch means, and said divert gate means so that said combined system is capable of operation in a plurality of modes including each priting press respectively supplying signatures to one on-line hopper or each printing press supplying signatures to all of said on-line hoppers.

4,034,975
READING MACHINE FOR PUNCHED DOCUMENT CARDS

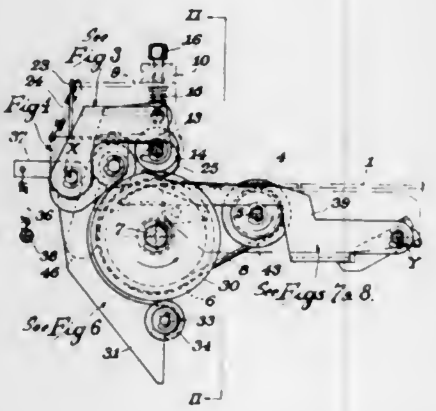
Mark Charles Agnew; John Ralph Reidenbach, and James Michael Rigotti, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 24, 1974, Ser. No. 473,595
Int. Cl.² B65H *3/06, 5/06*
U.S. Cl. 271—10 **11 Claims**



4. In a method for removing cards one at a time from a deck of the cards, said cards being of the type having a plurality of longitudinally extending rows and transversely extending columns for rectangular data representative holes through the card which have their long dimensions extending transversely of the card and with said rows being spaced apart so that there are substantial imperforate parts of the card between the holes of adjacent rows, the steps of:
- moving in translation the bottom card of the deck of cards in a direction at right angles to the longitudinal center line of the card and for a certain distance less than the width of the card to place the card in a position partially withdrawn from the card deck in which the holes of the card being moved in register with imperforate parts between the holes of adjacent rows of the next lowermost card in the deck, and
- then moving said bottom card from beneath the deck in a direction parallel with the longitudinal center line of the card for completely separating the card from the deck.

4,034,976
SHEET FEEDING APPARATUS

Leif Lundblad, Huddinge, Sweden, assignor to Inter Innovation AB, Sweden
Filed Apr. 2, 1976, Ser. No. 673,346
Claims priority, application Sweden, Apr. 7, 1975, 7503920
Int. Cl.² B65H *3/46, 3/52*
U.S. Cl. 271—10 **11 Claims**



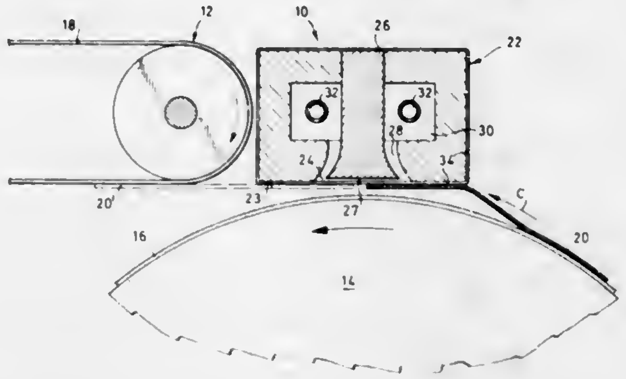
1. Apparatus for removing sheets from a stack of sheets and feeding the sheets one at a time to an output flow-path, said apparatus comprising:
- a. a frictional drive means for engaging and propelling a sheet in a forward direction,
- b. a resiliently mounted pressure member biased towards said drive means for pressing a sheet against said drive means,
- c. a stripper means for restraining plural sheets from passing along the flow-path,
- d. a sheet-engaging member disposed downstream of said pressure member, means biasing said sheet-engaging member to obstruct the flow-path while permitting movement of said sheet-engaging member away from the flow-path upon the passage of a sheet, and
- e. connection means connecting together the movements of said pressure member and sheet-engaging member for moving the pressure member away from said drive means upon movement of said sheet-engaging member by the passage of a sheet.

4,034,977
DETACHING DEVICE FOR A SHEET-SHAPED COPY SUPPORT

Helmut Jahn, Kelkheim, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Germany
Filed Dec. 18, 1975, Ser. No. 642,145
Claims priority, application Germany, Jan. 16, 1975, 2501487
Int. Cl.² B65H *29/56*
U.S. Cl. 271—174 **4 Claims**

1. A device for detaching a sheet-shaped copy support from a moving photoconductive layer by fluid pressure, the detaching device comprising:
- a. a body having one side for cooperation with a copy support;

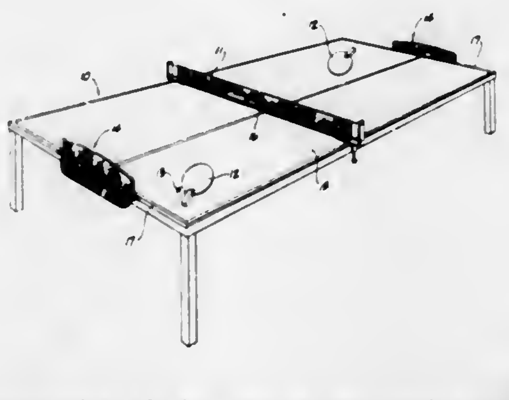
- b. a nozzle in said body, said nozzle having an outlet at said one side of said body;
- c. first directing means, operatively coupled with said nozzle, for directing flow of fluid from said nozzle so as to draw a copy support toward said one side of said body;
- d. second directing means, also operatively coupled with said nozzle, for directing flow of fluid away from the region of said nozzle outlet to discharge the fluid when a copy support has moved into close relationship with respect to said nozzle outlet;
- e. said second directing means including spacers arranged on both sides of said nozzle outlet for maintaining a copy support in spaced relation to said one side of said body;



- f. said spacers being elongated, straight elements arranged on said body in parallel relationship to one another and in oblique disposition with respect to the direction of transport of a copy support;
- g. said spacers comprising wires of a plastic material of a diameter of 1 mm or less disposed on said one side of said body;
- h. whereby the side of the copy support cooperating with the nozzle outlet is constantly subject to a pressure below atmospheric and oscillations of the copy support are prevented.

4,034,978
TABLE TENNIS TABLE GOAL CONVERSION KIT

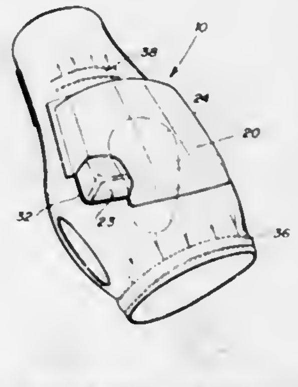
Clifford W. Becker, 10472 Gregory Court, St. Louis, Mo. 63128
Filed Oct. 14, 1975, Ser. No. 622,250
Int. Cl.² A63B *61/00*
U.S. Cl. 273—30 **3 Claims**



2. A conversion kit for use on the playing surface of a conventional table tennis table, the kit comprising:
- a. a pair of goals, each goal including:
  - 1. a frame having an upper member, opposed side members and a transverse lower member extending between said side members,
  - 2. a net of substantially limp material interconnected between said upper and lower frame members and having a connected length sufficient to provide a single, upper net portion between said members and a double, lower net portion depending below said lower member when said frame is substantially upright, said lower net portion forming a ball-receiving pocket,
- b. means for removably mounting said goal frames to each end of a table tennis table playing surface so that said ball-receiving pocket hangs below said playing surface of the table,
- c. the frame side members including end portions extending below said lower transverse member, and
- d. the mounting means including spaced socket members attachable to said table for receiving said frame end portions.

4,034,979
WEIGHTED BOWLING GLOVE

Lewis H. Wester, 6030 Sherry Lane, Dallas, Tex. 75225
Filed Aug. 18, 1975, Ser. No. 605,252
Int. Cl.² A63D *5/00*
U.S. Cl. 273—54 B **8 Claims**



1. A weight glove to be worn on a bowler's free hand comprising:
- a glove formed from a generally rectangular sheet of flexible material having a slot formed therethrough to accommodate the wearer's thumb;
- means for removably fastening said glove to the wearer's free hand;
- means for attaching a first anatomically shaped weight to said sheet to position said first weight adjacent the back of the wearer's hand;
- means for attaching a second anatomically shaped weight to said sheet to position said second weight adjacent the palm of the wearer's hand;
- said attaching means for said first and second weights comprising first and second weight receiving pockets each formed from attaching the edges of a cover sheet extending over the top of each of said weights to the surface of the glove,
- said second weight being adhesively affixed within said second weight receiving pocket to prevent movement of said second weight in said second pocket, and
- the combined weights of said first and second weights being sufficient to tend to counterbalance the one-sided pull of the bowling ball on the opposite side of the body during bowling in order to improve the balance of the bowler.

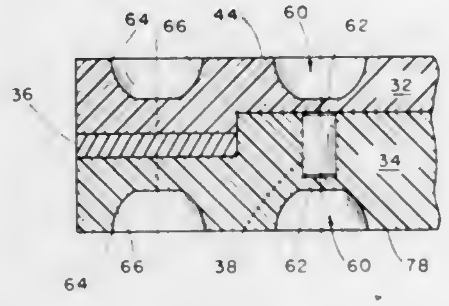
4,034,980
MAGNETIC GAME BOARD AND PLAYING PIECES

Ken Edward Sniderman, 1930 Riverside Drive, Apt. 1-B, Trenton, N.J. 08618
Filed Apr. 19, 1976, Ser. No. 677,970
Int. Cl.² A63F *3/00*
U.S. Cl. 273—131 AD **12 Claims**

12. In a two player game comprising a game board comprising a principal surface, the game board having a plurality of equidistantly spaced apart cavities arranged in longitudinal and lateral rows therein, board magnets being positioned in the cavities, each magnet having two oppositely oriented poles oriented orthogonal to said surface, the surface being divided into a plurality of playing squares, each board magnet underly-

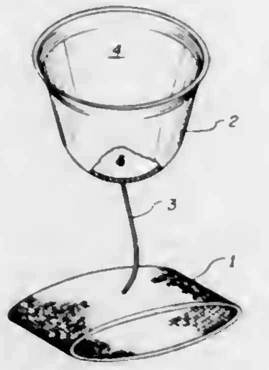
ing a square, a plurality of game pieces, the game pieces each having a first mirror-symmetric half, having a means thereon for distinguishing from a second mirror-symmetric half, each game piece exhibiting a first mirror-symmetric internal plane and an internal principal symmetry axis and comprising a piece magnet having two opposite poles, the piece exhibiting a second mirror-symmetric body plane and a second internal principal symmetric axis, the first plane coinciding with the second plane, the first axis coinciding with the second axis, one pole of said piece magnet being located in said first half in a preselected number of pieces, the other pole of said piece magnet being located in said second half in the remaining pieces, a portion of the pieces with the first mirror-symmetric half oriented away from the board being provided for one player, the remaining pieces having their second mirror-symmetric half oriented away from the board and being provided for another player, an improvement comprising:

- each playing piece being substantially spherical and adapted to automatically flip in a cavity in which a piece magnet pole encounters an opposite pole of a board magnet in said cavity;
- each playing square having a recession therein adapted to receive a playing piece, said recessions having walls of spherical curvature;
- the board magnets being asymmetrically and removably positioned and located only in at least a portion of said cavities;
- the position of the board magnets with respect to a player located at an edge of a surface being changeable by rotating the board to another edge whereby an increased element of change is present in the game.



4,034,981
TENNIS SERVE TRAINING AID

Thomas A. Veneziano, 10100 Westpark Drive, Houston, Tex. 77042
Filed July 19, 1976, Ser. No. 706,445
Int. Cl.² A63B *69/38*
U.S. Cl. 273—29 A 9 Claims

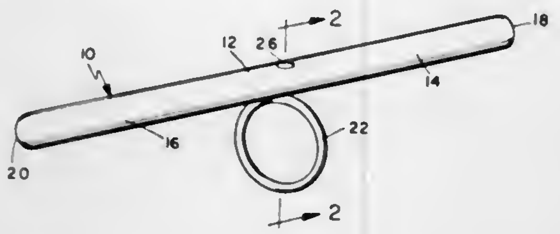


1. A tennis serving device comprising:

- a band adapted to encircle the palm and back of a user's hand;
- a cup member the exterior of which may be gripped by the fingers of said user's hand, said cup member being adapted to freely receive and release a conventional lawn tennis ball;
- said cup member being attached to the palm side of said band by tether means.

4,034,982
HAND HELD DEFENSIVE WEAPON

Roswitha Eva Rupprecht, and Francisco Javier Vargas, both of 4374 Louisiana St., San Diego, Calif. 92104
Filed Apr. 2, 1976, Ser. No. 673,079
Int. Cl.² F41B *15/00*
U.S. Cl. 273—84 12 Claims

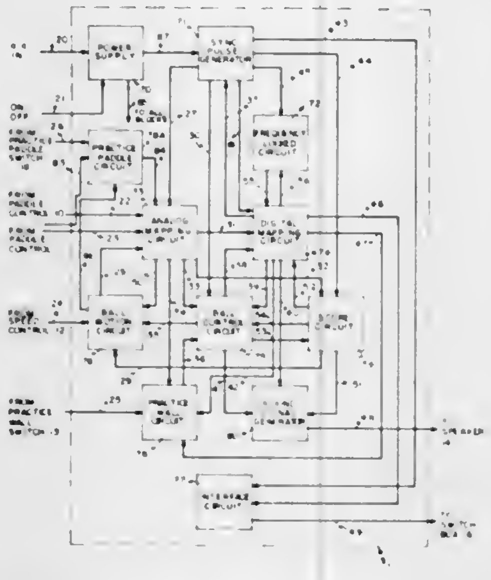


1. A hand held defensive weapon of the type that may be grasped in a defender's fist for use in fending off an attacker and for use by the defender in striking disabling defensive blows comprising:

- an elongated metal shaft for being grasped within the defender's substantially completely closed fist, said shaft having blunt striking ends and said shaft extending beyond the closed fist on at least one side thereof,
- a finger ring comprising a ring for being received over one of the defender's fingers near the base thereof,
- pivot means for mounting said ring on said shaft for pivotal movement between a first position wherein said shaft may be aligned with the defender's fingers and a second position orthogonally related to said first position wherein said shaft may be grasped by a defender's fist.

4,034,983
ELECTRONIC GAMES

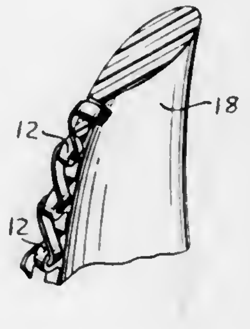
Glen R. Dash, Watertown; David J. Agans, and Gabor L. Szakacs, both of Boston, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.
Filed Dec. 11, 1975, Ser. No. 640,105
Int. Cl.² A63F *7/06;* **G08B** *5/22;* **H04N** *7/18*
U.S. Cl. 273—85 R 49 Claims



1. Playing apparatus that comprises, in combination: a television receiver that operates within a channel allocated for television broadcasting; and electronic control means adapted to produce on the image screen of the television receiver the simulation of at least part of a playing area and the simulation of active components of a game, said electronic control means comprising comparator means that serves to locate the horizontal and vertical coordinates of a point, that is, the *x* and *y* spatial location of the point, on the image screen, said comparator means comprising a first pair of comparators that act in combination to locate the horizontal coordinate of the point and a second pair of comparators that act in combination to locate the vertical coordinate of the point.

4,034,984
LACROSSE STICK

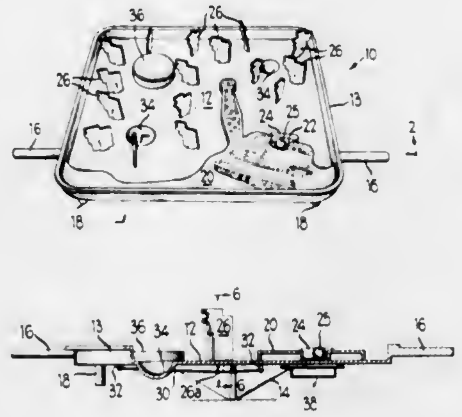
William C. Crawford, Owings Mills, and Jackie L. Davis, Aberdeen, both of Md., assignors to Wm. T. Burnett & Co., Incorporated, Baltimore, Md.
Filed Oct. 7, 1975, Se.. No. 620,396
Int. Cl.² A63B *59/02, 49/02*
U.S. Cl. 273—96 D 7 Claims



1. A head for a lacrosse stick comprising a generally V-shaped frame adapted to receive a web, said frame being defined by two side walls joined at a juncture and diverging therefrom, a transverse wall joining the ends of said side walls opposite of said juncture, and tab means positioned on at least said side walls for securement of a web onto said frame, said tab means being integrally formed with at least said side walls and constructed and arranged therewith to project inwardly thereof and substantially flush with the top surface thereof.

4,034,985
TIME-CONTROLLED TILTABLE BALL GAME

Jeffrey D. Breslow, Highland Park, and Eugene Jaworski, Park Ridge, both of Ill., assignors to Marvin Glass & Associates, Chicago, Ill.
Filed Aug. 20, 1976, Ser. No. 716,165
Int. Cl.² A63B *71/06, 63/04*
U.S. Cl. 273—110 15 Claims



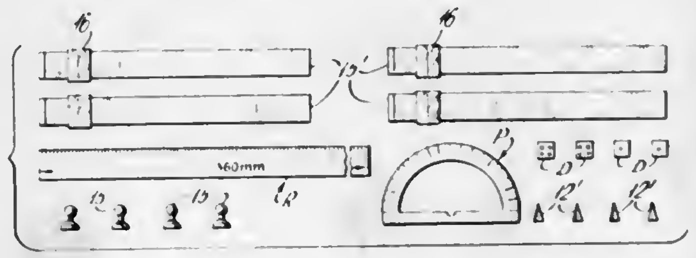
8. A device which is a game of skill and comprises a board having a lower surface and an upper surface with slots in said board and with an upstanding peripheral rim defining a playing area on said upper surface for supporting a playing piece for movement over said upper surface, a playing piece for movement over said upper surface, a plurality of upstanding target members extending above said upper surface for receiving impact from said playing piece, said target members having foot portions within the slots in said board with enlarged portions engaging the lower surface of the board, resilient means engaging the bottom of said foot portion to normally urge said targets upwardly from said slots upon dislodgement of said foot members from the lower surface of said board, said foot portions and slots being so proportioned that upon impact of a playing piece with one of said upstanding targets the foot portion thereof is dislodged from the slot whereby the target is driven upward by said resilient means.

11. A game device, comprising:

- a game board having an upper playing surface, a playing object for propelling over said playing surface in response to tilting of said board to move the playing object over the playing surface for scoring purposes, a receiver on said board having gate means for opening and closing said receiver, timer means operatively associated with said gate means and settable to a predetermined time interval responsive to opening said gate means, and means responsive to said timer for closing said gate means upon expiration of said time interval to block said playing object from entering said receiver.

4,034,986
GAME INVOLVING ESTIMATION OF SPATIAL RELATIONSHIPS

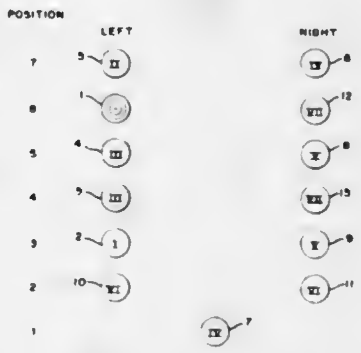
W. Robert Weidner, Whaley Lake, Holmes, N.Y. 12531
Filed Jan. 9, 1976, Ser. No. 647,888
Int. Cl.² A63F *3/00*
U.S. Cl. 273—134 B 11 Claims



10. A game comprising in combination, at least one rectilinear element devoid of measurement increments, means movable along said element for marking off a distance between the ends thereof and ruler means for measuring said distance.

4,034,987
GAME WITH GAMEPIECES HAVING POSITION-DENOTING INDICIA THEREON OR THEREUNDER

George J. Kelly, 215 Forrest Drive, Sanford, Fla. 32771
Continuation of Ser. No. 515,178, Oct. 16, 1974, abandoned.
This application Nov. 7, 1975, Ser. No. 629,794
Int. Cl.² A63F *9/00*
U.S. Cl. 273—137 R 3 Claims



1. A method of playing a game which comprises

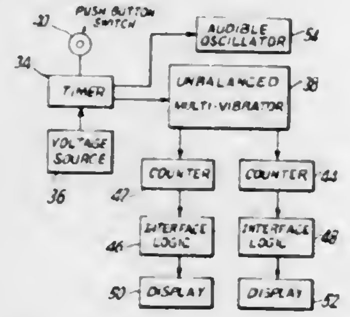
1. providing a set of gamepieces having position-denoting indicia on one side and being blank on the other side, said set comprising an odd number of gamepieces including a winning gamepiece, a plurality of duplicate gamepieces

numbered (3) and upwards and two single gamepieces numbered (1) and (2), and arranging said gamepieces respectively randomly in two columns such that the indicia are not revealed, and such that the odd gamepiece is arranged singly at an end of the columns in the position regarded as the number (1) position, the position in each column being regarded as sequentially numbered beginning with the number (2) in relation to their succeeding remoteness from the number (1) position, said indicia directing the player to the next position where he can choose to overturn a piece that has not been overturned in either of the columns,

2. revealing first the indicia of either of the two gamepieces in position (2), thereby directing the player to overturn a gamepiece in the next position as designated, and
3. revealing succesively the remaining gamepieces in the order of the position indicated by the revealed indicia until the winning gamepiece is played.

4,034,988
ELECTRONIC DICE

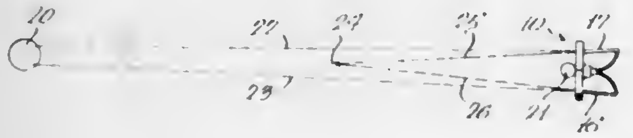
Sandor Goldner, 4308 10th Ave., Brooklyn, N.Y. 11219, and Jacob Lax, 850 44th St., Brooklyn, N.Y. 11220
Filed Oct. 31, 1975, Ser. No. 627,752
Int. Cl.² A63B *71/06*
U.S. Cl. 273—138 A **20 Claims**



1. A pair of electronic dice comprising, a single timing means for producing pulses for varying duration;
control switch means coupled to said timing means for controlling the beginning and duration of said timing pulses;
switching circuit means responsive to said single timing means and including a single unbalanced multivibrator for providing two random sequences of clock pulses during the duration of each of said timing pulses;
counting means coupled to the output of said switching circuit means for repetitively counting to a predetermined count, said counting means producing an output count for each sequence of clock pulses during each said timing pulse, said output count being dependent upon the total number of clock pulses in that sequence for that timing pulse, and
display means coupled to said counting means for displaying the output count for each sequence at the termination of each timing pulse.

4,034,989
GOLF BALL PUTTER

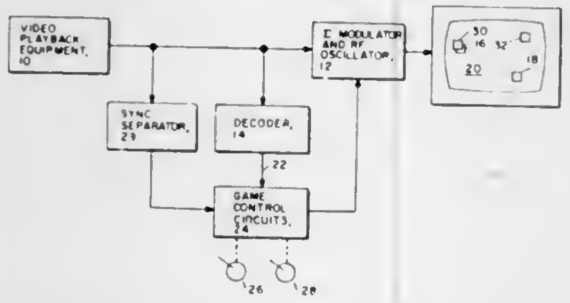
Aubrey P. Stewart, 801 Grove Ave., Corning, Iowa 50841
Filed Nov. 21, 1975, Ser. No. 633,967
Int. Cl.² A63B *53/04*
U.S. Cl. 273—164 **5 Claims**



4. In combination with a putter having a shaft secured to a head with the head having a flat front face for striking a golf ball, an alignment aid comprising a pair of horizontally spaced members extending rearwardly from said face, each of said spaced members being entirely elongate, substantially straight member with its entire peripheral surface diverging outwardly from the head, the arrangement being such that a forward projection of said members converges at a point approximately two feet in front of said face.

4,034,990
INTERACTIVE TELEVISION GAMING SYSTEM

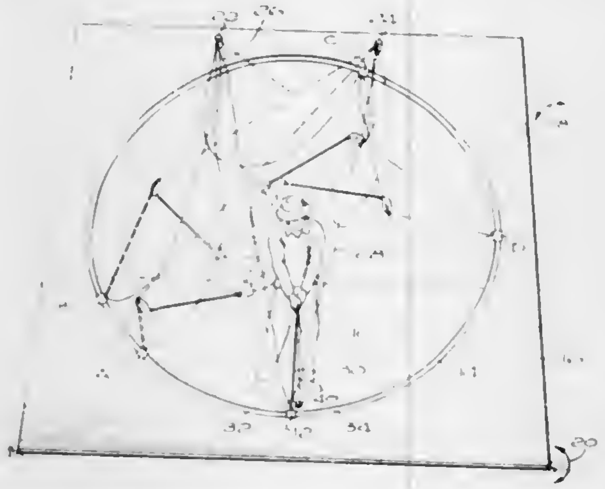
Ralph H. Baer, Manchester, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.
Filed May 2, 1975, Ser. No. 574,113
Int. Cl.² A63F *7/06;* **G08B** *5/22;* **H04N** *7/18*
U.S. Cl. 273—85 R **17 Claims**


VIDEO PLAYBACK EQUIPMENT, 10
Σ MODULATOR AND RF OSCILLATOR, 12
30
16
32
18
20
SYNC SEPARATOR, 23
DECODER, 14
22
GAME CONTROL CIRCUITS, 24
26
28

1. An interactive game system including game control circuits for generating signals representing location controllable symbols to be displayed on the screen of a cathode ray tube display and means for applying the output from said game control circuits to a raster scan cathode ray tube display, wherein the improvement comprises:
a source of prerecorded video signals to provide symbols; and
means for coupling said source of prerecorded video signals to said game control circuits so as to interact with the signals generated by said game control circuits.

4,034,991
SWING TRAINING APPARATUS

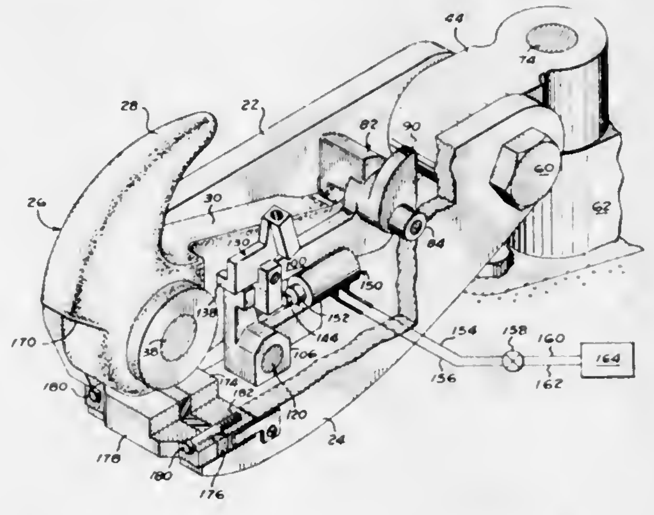
Jess Oppenheimer, 549 Moreno Ave., Los Angeles, Calif. 90049
Continuation-in-part of Ser. No. 452,231, March 18, 1974, Pat. No. 3,917,281. This application Oct. 30, 1975, Ser. No. 627,301
Int. Cl.² A63B *69/36*
U.S. Cl. 273—186 A **10 Claims**



1. Swing Training Apparatus for perfecting timing of a device to be swung by a user thereof comprising:
A. A weighted member;
B. Means engaging said weighted member to direct said member through a pre-determined path as said device is swung;
C. A first flexible cord secured at one end, passing through said weighted member and anchored at the other end to said device for positioning said device in the proper attitude at that point in a swing where maximum speed of said device is attained;
D. A second flexible cord secured at one end, passing through said device and anchored to said weighted member for applying a force to said device during the power portion of a swing to accelerate said device through the point of desired maximum speed thereof; and
E. Said first and second cords effectively releasing said device during that portion of said swing where maximum speed is attained while remaining in physical engagement therewith.

4,034,992
RELEASABLE HOOK

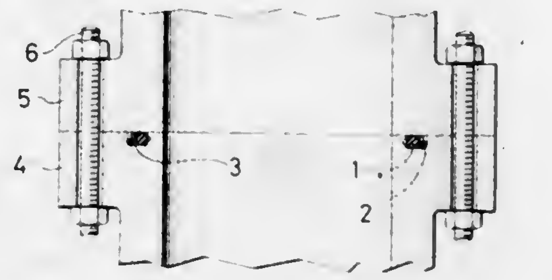
Irving Epstein, Mercer Island, Wash., assignor to Washington Chain & Supply, Inc., Seattle, Wash.
Filed July 17, 1975, Ser. No. 596,920
Int. Cl.² B66C *1/38*
U.S. Cl. 294—83 R **19 Claims**



1. A releasable hook comprising:
a. a frame;
b. a U-shaped hook having a hook means and a main body portion;
c. a first shaft on said frame;
d. said U-shaped hook being rotatably positioned on said first shaft;
e. said hook having a locking surface;
f. a locking pawl;
g. a second shaft on said frame;
h. said locking pawl being rotatably positioned on said second shaft;
i. said locking pawl having a locking bearing surface for engaging said locking surface of said hook to restrict movement of said U-shaped hook;
j. said locking bearing surface upon rotating away from said U-shaped hook releasing said U-shaped hook to rotate;
k. a control means for controlling the movement of said locking pawl;
l. said frame comprising a bumper juxtapositioned to said U-shaped hook;
m. said U-shaped hook having a bumper surface; and,
n. said U-shaped hook being capable of rotating around said first shaft with said bumper surface contacting said bumper.

4,034,993
SEALING APPARATUS

Masashi Okada, and Takeshi Aoki, both of Okayama, Japan, assignors to Mitsui Shipbuilding and Engineering Co., Ltd., Tokyo, Japan
Filed Nov. 19, 1975, Ser. No. 633,212
Claims priority, application Japan, Nov. 27, 1974, 49-144274
Int. Cl.² F16J *15/24*
U.S. Cl. 277—188 A **1 Claim**



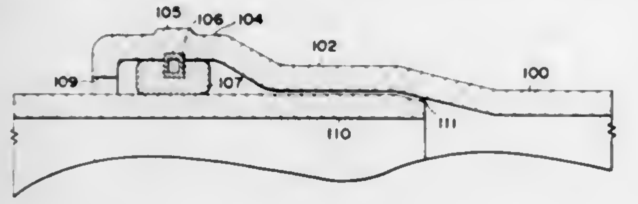
1. Flange sealing apparatus for sealing the gap between the confronting coupling surfaces of a pair of coupled flanges surrounding a fluid-containing pipe, comprising:
means defining a circular groove in the coupling surface of one of said flanges;
a resilient O-ring engaged in said groove and under compression between the bottom of said groove and the confronting coupling surface of the other of said flanges;
two backup rings engaged in said groove and engaging said O-ring on the atmosphere side thereof;
axially-extending grooves formed in the radially-inward side wall of said circular groove and extending from said confronting surface of said one flange to a position radially inward of said O-ring;
said sidewall containing a circumferential groove located radially inward of said O-ring connecting said axial grooves to each other;
said backup rings being positioned one above the other between the bottom of said groove and said confronting surface, and having inclined-plane surfaces such that the upper of said backup rings is urged upward against the confronting surface of the other of said flanges in responce to radially-outward pressure exerted by said O-ring;
whereby increased fluid pressure, supplied to the radially-inward side of said O-ring by way of said axially-extending grooves upon opening of the gap between said flange surfaces, causes said upper backup ring to move axially outward against said confronting surface of said other flange thereby to maintain backup of said O-ring.

4,034,994
TUBULAR END STRUCTURE OF PIPE

Ryozo Ohta; Jyunji Kashihara; Masayuki Sakaguchi; Toshio Nakamoto; Ikuo Yamamoto, and Michio Shibata, all of Sakai, Japan, assignors to Kubota Engineering Co, Ltd., Osaka, Japan
Continuation of Ser. No. 466,597, May 3, 1974, abandoned. This application Feb. 5, 1976, Ser. No. 655,625
Claims priority, application Japan, May 7, 1973, 48-50962; Nov. 2, 1973, 48-123565; Nov. 2, 1973, 48-123566; Nov. 2, 1973, 48-123567; Dec. 5, 1973, 48-136517
Int. Cl.² F16J *15/10*
U.S. Cl. 277—207 A **2 Claims**

1. A synthetic resin pipe joint in which an inner synthetic resin pipe is telescoped in an outer synthetic resin pipe, said outer pipe having a longitudinal end section having a first expanded portion and a second expanded portion, said second expanded portion forming an opening end of said outer pipe, said second expanded portion having an inner diameter greater than the inner diameter of said first expanded portion,

said inner pipe being telescopically disposed in said first and second expanded portions, said second expanded portion having an inner circumferential wall spaced from the outer wall of said inner pipe to define an annular space therebetween, a packing member disposed in said annular space, said packing member having axial ends, said inner circumferential wall of said second expanded portion extending beyond said axial ends of said packing member, said inner circumferential wall of said second expanded portion having an inner annular groove therein, said second expanded portion having an outer circumferential wall, an annular projecting section on said outer circumferential wall disposed generally radially outwardly of said inner annular groove, said packing member having an outer circumferential annular groove therein generally aligned with said inner annular groove in said inner circumferential wall of said second expanded portion, a metallic ring element disposed and fixed in said aligned grooves, said ring element having a radial thickness equal to approximately one-half the difference between the inner diameters of said second and first expanded portions, said packing member having an inner rim part disposed on one axial side of said ring element and an outer rim part disposed on the other axial side of said ring element, said rim parts contacting said inner circumferential wall of said second expanded portion and the outer wall of said inner pipe, said packing member having an intermediate part disposed between said ring element and said inner pipe and serving to separate said outer rim part from said inner rim part such that said outer and inner rim parts are acted upon independently as said inner pipe is telescopically inserted into said outer pipe, said ring element preventing said outer rim part from being axially displaced out of position as said outer rim part is engaged by said inner pipe during telescopic insertion of said inner pipe into said outer pipe.



4,034,995

TANDEM WHEELED ROLLER SKATE HAVING SPHEROIDAL ROLLERS

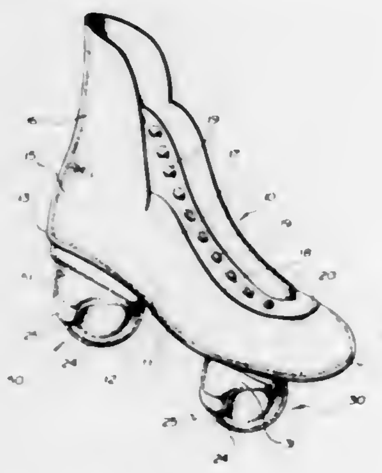
Daniel Forward, 60 Parkridge Road, Kirkland, Quebec; George Carr Woolley, 135 Berlioz Shore, Apt. 1N, Nuns Island, Quebec, and Donald Daoust, 2185 Manon Street, Chomedey, Quebec, all of Canada

Filed Nov. 12, 1975, Ser. No. 631,417

Claims priority, application Canada, Oct. 22, 1975, 238162

Int. Cl.² A63C *17/06*

U.S. Cl. 280—11.23 32 Claims



1. As a roller skating device, the combination of: a boot having the general appearance of an ice skate boot; a front roller assembly secured to the toe portion area of the boot, the front roller assembly including a bridge sub-assembly of an inverted generally U-frame shape, including a base and a pair of spaced apart depending wings, a hollow spheroidal roller having axially disposed diametrically opposed bearing surfaces, rotatably operatively engaged with respect to the spaced apart depending wings, the hollow roller being a globular roller comprising a hollow spheroidal, inner, rigid, relatively thin-walled core of structurally strong material, covered by a coating of a resilient material thereon; and a rear roller assembly secured to the heel portion of the rear area of the boot, including a bridge sub-assembly of an inverted generally U-frame shape, including a base and a pair of spaced apart depending wings, a hollow spheroidal roller having axially disposed diametrically opposed bearing surfaces rotatably operatively engaged with respect to the spaced apart depending wings, the hollow spheroidal roller being a globular roller comprising a hollow spheroidal, inner, rigid, relatively thin walled core of rigid structurally strong material covered with a coating of a resilient material.

4,034,996

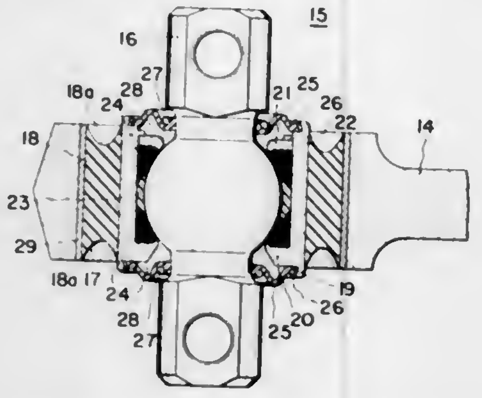
BALL JOINT FOR TORQUE ROD

Takeyoshi Manita, Kawagoe; Ichiro Seimiya, Yono; Kio Otani; Tadasuke Furutani, both of Ohmiya, and Saburo Sasakura, Tokyo, all of Japan, assignors to Saitamakiki Co., Ltd., Japan

Filed Oct. 8, 1975, Ser. No. 620,708

Int. Cl.² F16C *11/06*

U.S. Cl. 280—80 R 9 Claims



1. A shock absorbing wall joint in a torque rod for use in a heavy vehicle having a double-axle rear wheel arrangement, comprising;

a shaft having a spherical ball portion enclosed in a bearing housing having end openings and supported by brackets of the vehicle;

a spherical bearing ring of rigid, low friction material disposed in said bearing housing and adhered to the equatorial part of said ball portion;

oil-containing fabrics disposed on both sides of said bearing ring within said bearing housing;

a check ring and a guide wall holding therebetween said spherical bearing ring and said oil-containing fabrics within said bearing housing;

a pair of flexible dust covers encircling said shaft one on each side of said ball portion, the inner peripheries of said covers sliding on the outer peripheries of said shaft by their compression, and the outer peripheries of said dust covers fixed into the end openings of said bearing housing by means of cover support rings fused or bonded to the outer peripheries of said dust covers;

lubricant filling said bearing housing around said ball portion, and retained therein by said dust covers; and

an elastic band interposed between the outer periphery of said bearing housing and the inner periphery of a cylindrical shell, said cylindrical shell being fitted into one end of said torque rod, and forming a unitary construction together with said elastic band and said bearing housing.

4,034,997

WHEEL AND AXLE ARRANGEMENT FOR AGRICULTURAL VEHICLE

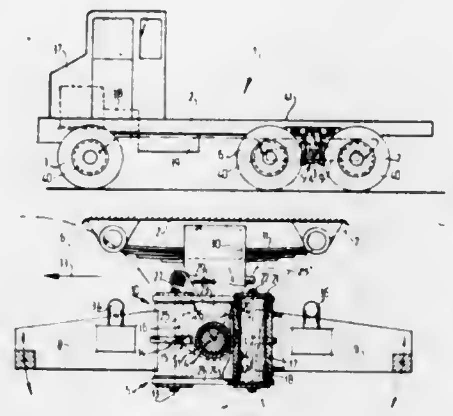
Pieter Adriaan Oosterling, and Hendricus Cornelis Van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm B.V., Nieuw-Vennep, Netherlands

Filed Sept. 18, 1975, Ser. No. 614,420

Claims priority, application Netherlands, Oct. 25, 1974, 7414017

Int. Cl.² B60B *35/00*; B62D *61/10*

U.S. Cl. 280—81 A 9 Claims



1. A vehicle comprising a frame, at least one substantially horizontal cross-shaft axle on each side of said frame, a cradle frame pivotally journalled on each said cross-shaft axle and consisting of at least one central section and two arms extending in opposite directions from said central section, a wheel journalled on each arm of the cradle frame, means pivotally connecting at least one of the two arms to the central section of the cradle frame so as to be pivotable about an upright axis whereby that wheel connected to said one arm is laterally swingable with such one arm to either side of a central position in which such wheel tracks a straight line, locking means for locking said one arm in said central position, and power means for actuating said locking means to urge said one arm to said central position, the locking means comprising at least one lock bolt adapted to turn about the cross-shaft axle.

4,034,998

APPARATUS FOR MOUNTING AND DISMOUNTING ATTACHMENTS

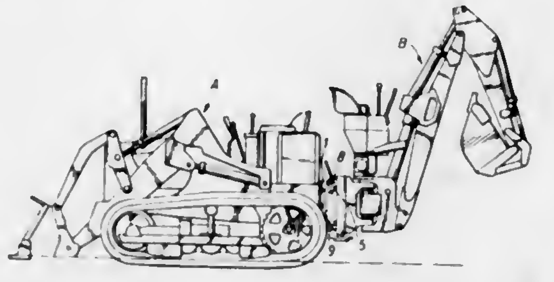
Katsuhiko Iijima, and Yoshiaki Sakurai, both of Sagamihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 627,009

Claims priority, application Japan, Nov. 15, 1974, 49-131638

Int. Cl.² B60D *1/02*

U.S. Cl. 280—461 R 3 Claims



1. A mounting apparatus for releasably mounting an attachment on a vehicle body, comprising:

a bracket for securement to the vehicle body;

a connecting member for securement to the attachment;

the bracket including two vertically spaced projections, each having means defining an upwardly opening notch;

the connecting member including two respective pins, vertically spaced and extending transversally, for being cradled in the respective notches to connect the connecting member to the bracket; and

a locking member, releasably actuable to prevent the connecting member from being raised sufficiently to permit the respective upper one of said pins from clearing the respective upper one of said notches;

the locking member including means providing a contact surface on the underside of the respective upper one of said projections; a transversally extending lock pin mounted for movement transversally between a first operative position wherein said lock pin underlies and engages said contact surface, and a second inoperative portion wherein said lock pin clears said contact surface sufficiently to permit the connecting member to be raised enough to disconnect the connecting member from the bracket; and a hitch lever member secured crank fashion to the lock pin for actuating the lock pin between said first and second positions thereof.

4,034,999

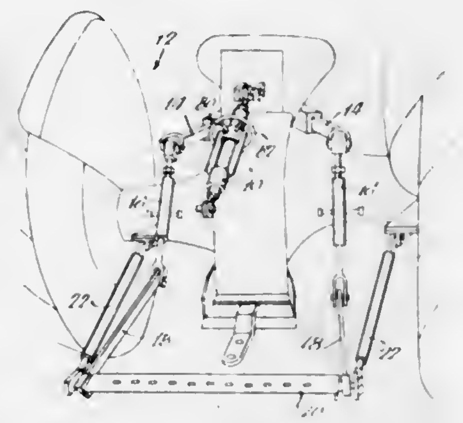
ADJUSTABLE TOP LINK FOR 3-POINT HITCH

Carl D. Jackson, Pendleton, Ind., assignor to Royal Industries, Inc., Sac City, Iowa

Filed Feb. 12, 1976, Ser. No. 657,450

Int. Cl.² B60D *1/16*

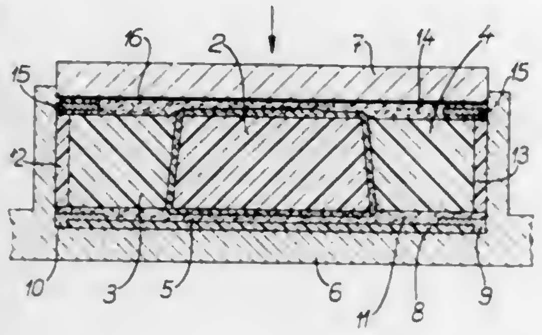
U.S. Cl. 280—461 A 11 Claims



1. For use in a 3-point hitch for a tractor or the like, wherein there is provided a top link of variable length and a pair of powered lift arms, the improvement wherein said top link includes an elongated threaded rod, means for securing the rod to one of a tractor or an implement or the like, a nut structure threaded on the rod, means for securing the nut structure to the other of a tractor or an implement, or the like, one of the nut structure and rod being split whereby relative radial movement between the rod and the nut structure may be effected to disengage the rod and the nut structure, and means for selectively precluding said relative radial movement, whereby said precluding means may be operated to permit relative radial movement, relative radial movement effected to disengage said rod and said nut structure relative axial movement rapidly effected without turning said nut structure on said rod until a desired length is attained, relative radial movement effected to re-engage said rod and said nut structure and said precluding means operated to preclude further relative radial movement to maintain said top link at said desired length, one of said securing means having a rotatable connection to the corresponding one of said rod and said nut structure on the longitudinal axis of said rod.

4,035,000
SKIS

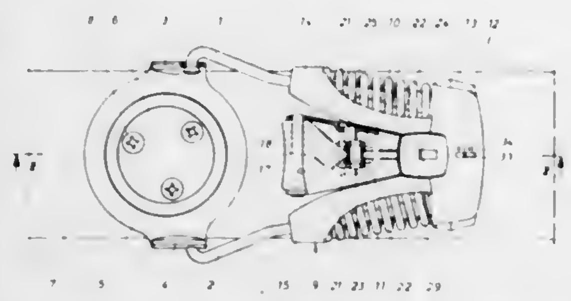
Daniel Lacroix, 76, route du Vivier - Bois d'Amont, 39220 Les Rousses, France
Continuation of Ser. No. 566,062, April 8, 1975, abandoned. This application Aug. 12, 1976, Ser. No. 713,962
Claims priority, application France, Apr. 9, 1974, 74.12477
Int. Cl.² A63C *5/00*
U.S. Cl. 280—610 **8 Claims**



1. In a ski of sandwich construction comprising an upper, a lower running sole having hard edges extending therealong, and an elongated core sandwiched between said upper and said sole with a first layer of stratified glass fibers in a polymerized resin disposed between said upper and said core and a second layer of stratified glass fibers in a polymerized resin disposed between said sole and said core, said core having a central part and two lateral parts of like solid material disposed side-by-side, each lateral part having directly thereon a hard external lateral surface coating outwardly of the core, the improvement wherein said core comprises a sleeve of glass fibers embedded in a polymerized resin circumferentially encasing solely said central part of the core along its entire length and about its entire axial periphery, each said lateral part being free of encasement by said encasing sleeve, said sleeve and resin herewith bonding said central part of the core to said first and second layers of stratified glass fibers and directly bonding said central part of the core to each said lateral part of the core, and resin in said first and second layers bonding said lateral parts of the core directly to said first and second layers of stratified glass fibers.

4,035,001
HEEL TIGHTENER FOR SAFETY SKI-BINDINGS

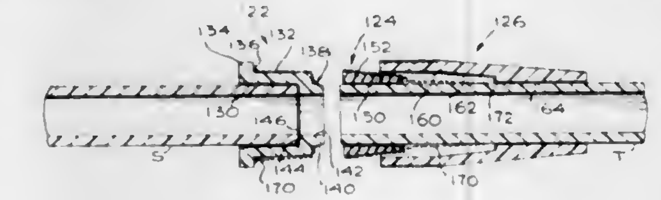
Roland Jungkind, Garmisch-Partenkirchen, Germany, assignor to Hannes Marker, Garmisch-Partenkirchen, Germany
Filed Jan. 28, 1976, Ser. No. 653,115
Claims priority, application Germany, Feb. 7, 1975, 2505312
Int. Cl.² A63C *9/08*
U.S. Cl. 280—626 **5 Claims**



1. A heel tightener for safety ski-bindings, comprising two tension members fixed directly or indirectly to the ski, each tension member adapted to pass along each side of a boot heel, a pusher member movable away from the ski along the tension members against the force of at last one spring, a transverse shaft connected to said pusher member, a tightening lever mounted to and pivotable about said transverse shaft, the tightening lever having a free end for engagement in the groove of a boot heel when in a clamping position and pivotable upwardly out of the plane of the tension members into a heel-releasing position, a counterbearing means for limiting the downward pivoting of the tightening lever into the clamping position, locking means for securing the tightening lever in its clamped position and for releasing the tightening lever after movement of the pusher member a predetermined distance away from the ski, wherein said locking means comprises first and second lever arms pivotally connected to each other at their ends, the opposite end of said first arm pivotally connected to said tightening lever, the opposite end of the second arm pivotally connected to said pusher member, and a locking lever means for retaining the first arm in a first position, said locking lever means pivotably mounted to said pusher member, and spring means for maintaining said locking lever means in its clamped position.

4,035,002
PIPE COUPLING

Hoyt S. Curtin, 3706 Capstan Circle, Westlake, Calif. 91361
Continuation-in-part of Ser. No. 537,093, Dec. 30, 1974, Pat. No. 3,971,574, which is a continuation-in-part of Ser. No. 329,727, Feb. 5, 1973, Pat. No. 3,857,588. This application July 7, 1975, Ser. No. 593,746
Int. Cl.² F16L *47/02*
U.S. Cl. 285—31 **6 Claims**



1. A pipe coupling for first and second pipes of predetermined size, comprising:

a tubular cap member having inner and outer surfaces, said inner surface having a diameter slightly larger than the outside diameter of said first pipe for adhesive mounting on said first pipe and including a flange projecting inwardly from said inner surface for abutting the end of said first pipe to position said cap member thereon;

a ring formed of flexible material having first and second ends and inner and outer surfaces, said ring inner surface having a substantially uniform diameter between said first and second ends slightly larger than the outside diameter of said second pipe for slidable movement therealong, said ring outer surface having a diameter substantially equal to said cap member outer surface diameter; and

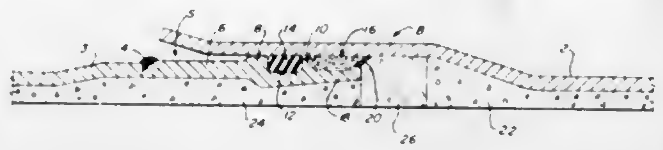
a tubular sleeve slidable along said second pipe and having a substantially smooth internal surface including a first portion having a diameter slightly larger than the diameter of said cap member outer surface and said ring outer surface for axial sliding movement of said sleeve over said cap and said ring for adhesive mounting thereto, and a second portion having a diameter slightly larger than the outer surface of said second pipe for adhesive mouting thereto, said sleeve having a substantially smooth external surface free of securing means;

said cap member having a relatively short tubular portion extending beyond said flange, said portion having an outer diameter slightly smaller than said ring inner surface diameter;

said sleeve internal surface being dimensioned to engage said ring when said sleeve is slid toward said cap member to force said ring around said short tubular portion and maintain it in compression.

4,035,003
PIPE JOINT FOR LARGE DIAMETER FLEXIBLE PIPES

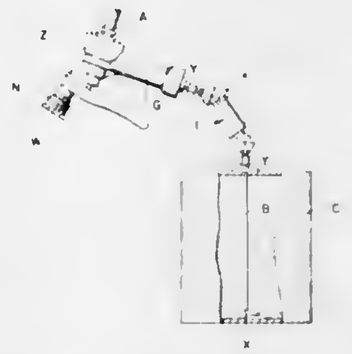
Kenneth E. James, Denver, Colo., assignor to Concrete Pipe Consultants, Inc., Englewood, Colo.
Filed Dec. 30, 1974, Ser. No. 537,274
Int. Cl.² F16L *9/14*
U.S. Cl. 285—55 **3 Claims**



1. A pipe joint for large diameter flexible pipe including:
a bell formed at one end of a first pipe section;
a spigot formed at one end of a second pipe section for attachment to the bell of the first pipe section to form said joint wherein the spigot includes:
first and second spaced annular ribs around said spigot forming an annular groove therebetween and spaced from the end thereof a distance at least equal to the width of the groove;
a gasket in said groove which completely fills said groove and engages both annular ribs having a peripheral edge extending beyond the peripheral edges of said ribs and engageable with the inner surface of said bell to form a liquid-tight seal;
a lip on said spigot extending between said end and said second rib a distance at least equal to the width of said gasket and spaced from said inner surface of said bell forming a recess which is wider than said groove for receiving a self-hardening filler;
a self-hardening filler in said recess which, when hardened, will hold said spigot and bell in radially fixed relationship so that said gasket forms a seal around the entire periphery of said joint with the inner surface of said bell, said filler substantially completely filling said recess and in contact with the inner surface of said bell; and
an outwardly extending protrusion on said lip forming an annular ridge for holding said filler in position relative to said spigot to assure radial fixity so that upon any longitudinal movement of said spigot with respect to said bell or any flexing of the joint said gasket will be maintained in sealing relationship with the inner surface of said bell.

4,035,004
BALL AND SOCKET CONNECTOR AND COMBINATION THEREOF WITH SPRAY GUN

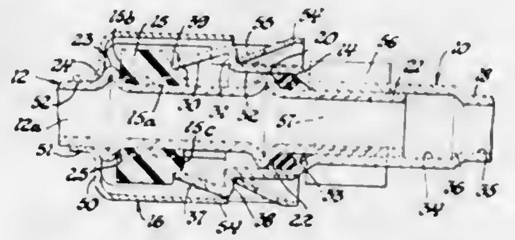
Robert W. Hengesbach, 7886 Munson Road, Mentor, Ohio 44060
Filed Mar. 18, 1976, Ser. No. 668,195
Int. Cl.² F16L *27/04*
U.S. Cl. 285—166 **11 Claims**



1. A fluid conducting bell and socket connector comprising:
a ball and socket joint, including a ball member and a socket member having complementary concentric spherical contact surfaces, respectively, and holding means holding the members together, with said surfaces in slip fitting contact relation with each other, for rocking of the members relative to each other about the common center of said surfaces;
said socket member having a central passage therethrough;
said ball member, in connected condition, having a first portion seated in said socket at on side of said contact surface of the socket and having a second portion exposed for access, for the opposite side of said socket surface, through said central passage;
said ball having a through passage which extends from said one portion through the other portion and which is open at its opposite ends;
a flexible imperforate fluid conducting tube connected to the ball member and constraining fluid passing through the joint from access to said complementary surfaces; and
complementary clamping means, in addition to said holding means, connected to the members and manually operable to clamp the members securely in selected relatively rocked positions.

4,035,005
QUICK CONNECT COUPLING WITH WEATHER SEAL

Patsy DeVincent, Dayton; Robert L. Jones, Bellbrook, and Michael P. Rose, Springboro, all of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed May 24, 1976, Ser. No. 688,965
Int. Cl.² F16L *21/02*
U.S. Cl. 285—319 **3 Claims**



1. A quick connect coupling comprising a tubular plug member including a tube having axially spaced apart first annular bead means and second annular bead means, said first annular bead means providing a first shoulder on said tube with a cylindrical pilot portion means extending from said first shoulder to a free end of said tube and a seal ring encircling said pilot portion in abutment against said first shoulder, said second annular bead means providing on opposite sides thereof a second shoulder and a third shoulder, said third shoulder facing in the same direction as said first shoulder, an annular weather seal of enlarged outside diameter encircling said tube in sealing engagement therewith between said first and second annular bead means in abutment against said third shoulder, a tubular socket member having a stepped cylindrical therethrough and defining a socket with internal annular cylindrical walls including a first wall adjacent the open end thereof of an internal diameter to loosely receive said bead means, a second wall of a smaller diameter than said first wall so as to slidably receive said first bead means, said second wall being connected to said first wall by an annular radial wall, and a third wall of still further reduced diameter to slidably receive said pilot portion, said socket member having an annular radial flange on the exterior thereof providing a ramped forward surface connected at one end by an annular end wall to said first wall and terminating at its other end at a radial shoulder, said tubular plug member being slidably received in said socket member to be in sealing relation to said socket when in a fully inserted position therein and, an outer retainer means connected to said tubular plug member for abutment against said second shoulder and positioned to extend over said socket member when said tubular plug member is inserted therein, said outer retainer means including a first detent leg means of an axial length to be engageable with

said radial shoulder when said tubular plug member is in said fully inserted position in said socket member and a second detent leg means of a length to be engageable with said radial shoulder to retain said tubular plug member within said socket in non-sealing, non-fully inserted position relative thereto, said end wall of said socket being axially pressed into abutment against said weather seal when said tubular plug member is in said fully inserted position in said socket whereby said weather seal sealingly closes said open end of said socket.

4,035,006
FLANGE CONNECTOR

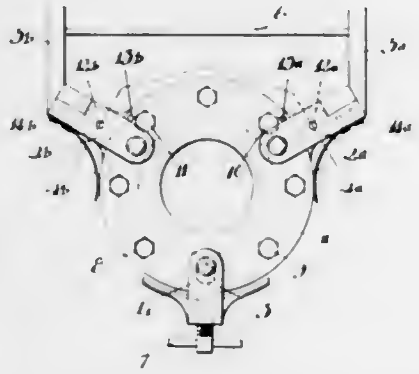
Junji Isoyama, 18, 5-chome, Tamanawa, Kamakura, Kanagawa, Japan

Filed Mar. 1, 1976, Ser. No. 662,996

Claims priority, application Japan, Mar. 22, 1975, 50-37232

Int. Cl.² F16L *17/02*

U.S. Cl. 285—364 **7 Claims**



1. A flange connector for connecting the end flanges of a pair of pipes used in the transportation of selected fluid materials comprising:

a pair of first U-shaped holding members;

an annular gasket positioned between a stationary and a movable one of the pipe flanges;

said pair of U-shaped holding members being affixed in circumferentially spaced relation to the upper portion of said gasket, the bright portions of said U-shaped holding members extending in overlying relation to first circumferential surfaces of the flanges;

a third U-shaped holding member affixed to the lower portion of said gasket and to the stationary flange in circumferentially spaced relation to both of said first U-shaped holding members, the bright portion of said third U-shaped holding member extending in overlying relation to second circumferential surfaces of the flanges;

clamping means on each of said first pair of U-shaped holding members adapted to adjust the axial movements of the movable flange relative to the stationary flange;

resilient means on each of said first pair of U-shaped holding members adapted to control the radial movements of the movable flange relative to the stationary flange;

clamping means on said third U-shaped holding member adapted to clamp same to the movable flange;

and adjusting means carried by said third U-shaped holding member movable radially thereof to be selectively engageable with the stationary flange.

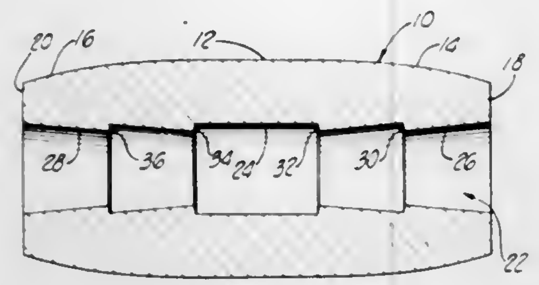
4,035,007
HEAT RECOVERABLE METALLIC COUPLING

John D. Harrison, Palo Alto, and James E. Jervis, Menlo Park, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Continuation of Ser. No. 51,809, July 2, 1970, which is a continuation-in-part of Ser. No. 852,722, Aug. 25, 1969, abandoned. This application Oct. 29, 1973, Ser. No. 410,314

Int. Cl.² F16L *25/00*

U.S. Cl. 285—381 **25 Claims**



1. An article comprising restraining means and a hollow, generally tubular heat recoverable member formed of a metallic material which exists in the austenitic phase at a first temperature and the martensitic phase at a second temperature, which member is capable, without the application of external force, of changing dimension in a first, radially inward direction when heated so as to pass from the martensitic to the austenitic state, and in an opposite, radially outward direction when then cooled to martensitic transition temperature, the restraint imposed by said means being such as to direct said change of dimension radially outward when temperature is so reduced.

4,035,008
AUTOMATIC PROTECTION DEVICE FOR A ROLLER BLIND AGAINST UNAUTHORIZED RAISING

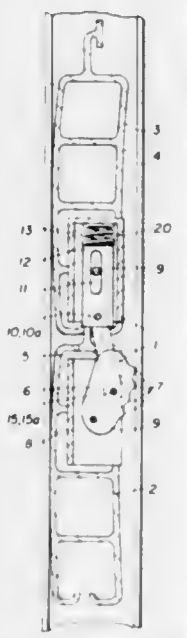
Walter Hardt, Hauptstrasse, Hilgert, Germany (5411)

Filed Mar. 1, 1976, Ser. No. 662,813

Claims priority, application Germany, Dec. 5, 1975, 2554667; Mar. 3, 1975, 7506593[U]

Int. Cl.² E05C *21/00*

U.S. Cl. 292—227 **10 Claims**



1. In an automatic protection device for a roller blind against unauthorized raising from the outside, by means of locking members which are disposed in the end face regions of roller blind bars and are designed as toggle joints, and whose two lever ends are linked in such a manner that, when the closed position of the roller blind shield is reached, the free toggle joint of each locking member is moved against guide channels of approximately U-shaped cross section of the end face regions of the roller blind bars, while upon raising the roller blind shield, the toggle joint of each locking membr is stretched, whereby the locking member can be moved out, perpendicularly to the plane of the roller blind shield, from the end face regions of the bars and can be brought into operative connection with at least one flange of the guide channel, the combination therewith of a compensating member arranged in said end face region of said roller blind bar and movable in said plane of said roller plane shield relative to said roller blind bar exerting on the free toggle joint through the action of an additional force means, a pressure urging said free toggle joint against said guide channel.

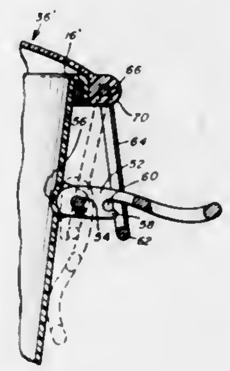
4,035,009
CONTAINER AND LOCKING LID

Stanley A. Jacobs, 45 Kohary Drive, New Haven, Conn. 06515

Filed May 28, 1974, Ser. No. 473,798

Int. Cl.² E05C *19/10*

U.S. Cl. 292—246 **10 Claims**



1. An improved latch for a container and lid therefor comprising:

a latch arm having inner and outer ends;

means mounting said latch arm between its ends, to the exterior of the sidewall of said container below the rim thereof and for pivotal movement between a first and second position about a substantially transverse axis, said axis being spaced outwardly from the sidewall of said container;

said sidewall of said container, at least in the region thereof which is adjacent said pivotal axis, being of resilient, deformable and flexible construction, the distance between said pivotal axis and said region of said container sidewall being less than the distance from said pivotal axis to the extremity of said inner end of said latch arm, the relative dimensions and location of the pivotal axis, latch arm and said region of said container sidewall being such as to cause said region of said sidewall to yieldably obstruct said inner end of said latch arm as said latch arm is pivoted from one of its positions to the other, said region of said container sidewall being resiliently deformed when said latch is pivoted from one of its positions to the other and returning toward its substantially undeformed shape in said one or other positions, said region of said container sidewall being cooperative with the inner end of the latch arm, when the latch is in either of its positions, to retain the latch arm in that position;

a member connected to and extending downwardly from the periphery of the container lid, said member having a transverse portion which, when the lid is on the container, may extend downwardly and be engaged by a portion of said latch arm;

said portion of said latch arm including means for engaging said transverse portion of said member to retain said member and draw said lid member downwardly in response to pivotal movement of said latch arm from one position thereof to the other.

4,035,010
DEVICE FOR GRIPPING AND LIFTING T-SHAPED STRUCTURAL MEMBER

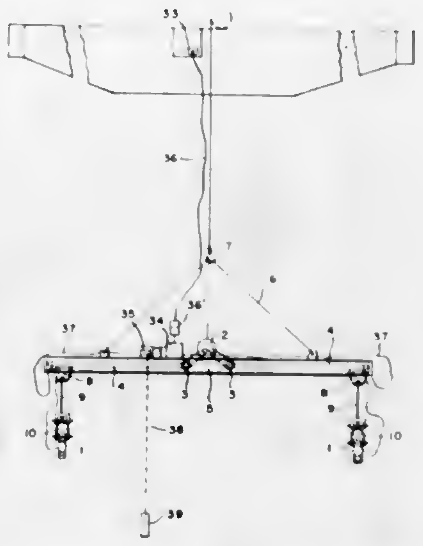
Hiroshi Kawashita; Takeshi Sakano, and Nobuyoshi Hanada, all of Kure, Japan, assignors to Ishikawajima-Harima Jukogyo Kabushiki Kaisha, Ote, Japan

Filed Mar. 25, 1976, Ser. No. 670,133

Claims priority, application Japan, May 8, 1975, 50-61871

Int. Cl.² B66C *1/64*

U.S. Cl. 294—81 R **4 Claims**



1. In a structural member gripping and lifting device of the type having a beam, a pair of trolleys mounted on the beam and means to vary the spacing between the trolleys, the improvement comprising a gripping unit suspended from each trolley, each unit including a support having a pair of spaced-apart gripping cams mounted thereon, means on the support for moving said cams toward each other to bring the cams into engagement with one face of said member adjacent opposite edges of the member, a pair of pressure plates engageable with the opposite face of said member so that the member is clamped between the cams and pressure plates, each of said pressure plates having a portion engageable with an edge of the structural member to move the plates into firm engagement with said opposite face of the member in response to operation of said moving means to move the cams toward each other, and a lifting shackle pivotally connected with said support and connected with a trolley.

4,035,011
SOFT SET RUNNING TOOL

Imre I. Gazda, Saginaw, and Joseph L. Pearce, Dallas, both of Tex., assignors to Otis Engineering Corporation, Dallas, Tex.

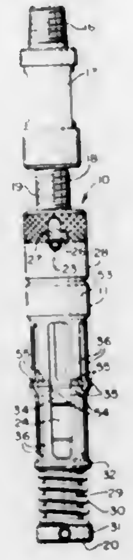
Filed Jan. 8, 1976, Ser. No. 647,341

Int. Cl.² E21B *31/02*

U.S. Cl. 294—86.18 **17 Claims**

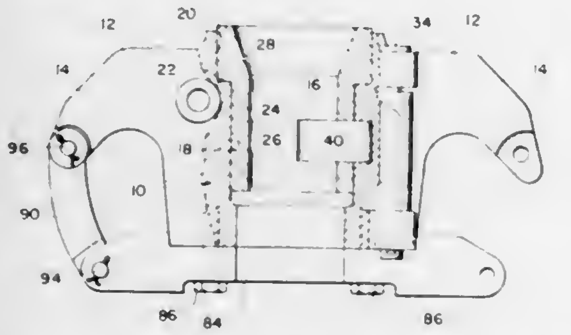
1. In a well running tool of the wire line suspended type adapted for running and positioning tool hangers with equipment mounted thereon and with the running tool disengagable from a position locked in the well tool hanger with predetermined release lifting force exerted through the wire line: mandrel means adapted for connection to a wire line and having resilient spring retaining means; collet means slidably mounted on said mandrel means; collet limit position stop means on said mandrel means; prestressed resilient spring means mounted on said mandrel means and confined between said retaining means and said collet means; tool hanger engaging means on said collet means; a locking member movable with said mandrel means between a tool hanger engaging means locking position against resilient force of said spring means to a non-locking position for disengagement of the running tool from a tool hanger; wherein said tool hanger engaging means on said collet means comprises locking projection means positioned on spring arm means of said collet

means; said locking projection means has cam surface means and is structured for locked containment in a fishing neck of a tool hanger when maintained in a locked state, and for cam release from said fishing neck when said locking member is moved to a non-locking position with continued release lifting force being exerted through the wire line; said spring arm means comprises a plurality of spring arms extended between an upper collet collar and a bottom collet annular ring that is a sliding fit on said mandrel means; said locking projection means are a plurality of cam ended locking projections mounted on said plurality of spring arms intermediate the ends of said spring arms and projecting radically outward therefrom; and, wherein said plurality of spring arms are shaped with a lesser radial spacing through a portion extending to alignment with and under said locking projections, and with a greater radial spacing through a portion extending from the region of said locking projections toward said upper collet collar.



4,035,012
DUAL ELEVATORS

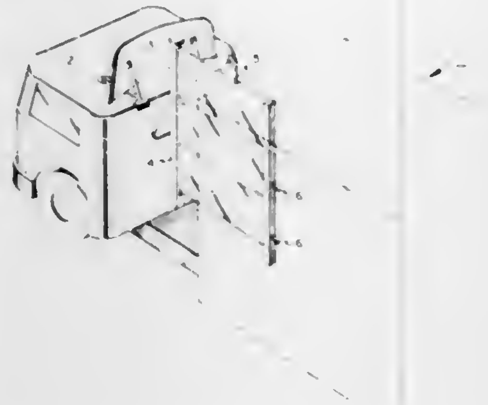
William C. Guier, 3100 E. 71st, Tulsa, Okla. 74136
Filed Dec. 31, 1975, Ser. No. 645,904
Int. Cl.² B66C *1/10;* **E21B** *19/06*
U.S. Cl. 294—90 **11 Claims**



1. An elevator apparatus handling stands of drill pipe in a mast or derrick, comprising:
- a. an elevator body having a central opening:
- b. a hinged door at the front of said body to close said opening;
- c. a shaft journalled in said body in a direction from front to back;
- d. a latch arm affixed to the front end of said shaft, the latch arm being movable from a first position where it overlaps a portion of said door to latch it in the closed position to a second position where it is clear of said door to unlatch it by rotation of said shaft;
- e. an operating means affixed to said shaft at the back of said elevator; and
- f. piston cylinder means connected between said operating means and said elevator body for latching and unlatching said door.

4,035,013
DRAG REDUCER FOR LAND VEHICLES

C. Webster Abbott, III, Bethany, Conn., assignor to Rudkin-Wiley Corporation, Stratford, Conn.
Filed Dec. 12, 1975, Ser. No. 640,225
Int. Cl.² B62D *35/00*
U.S. Cl. 296—1 S **2 Claims**



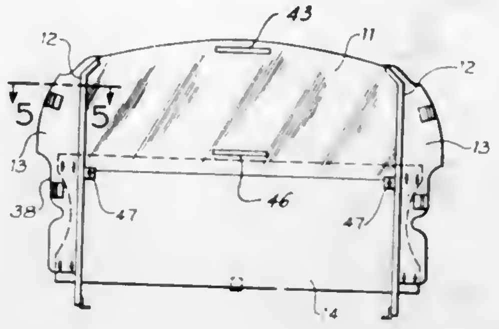
1. A drag reducer for mounting in the gap of a land vehicle wherein said gap is established by two substantially vertical surfaces defined by a rear panel of a leading element and a leading panel of a trailing element, and for partially stabilizing at least one vortex, the periphery of which is defined and confined by said drag reducer, a portion of said two surfaces and the slip stream along one of the open sides of the gap, said drag reducer comprising:
- A. a mounting bracket for securement
- B. roller means mounted within said bracket under tension;
- C. a flexible sheet member mounted along one vertical edge to said roller mans with additional flexible sheet material mounted about said roller means then required to fill the gap; and
- D. disconnectable attachment means mounted along the other material edge of said sheet material and removably attachable to the other of said surfaces;

whereby the drag reducing flexible member can be withdrawn from the mounting bracket on the first surface secured to the second surface, and maintained in this position by said tensioned roller means, thereby substantially completely filling the gap between said two surfaces while assuring that said sheet member remains completely unaffected by the pivoting, articulating, and independent movement of said two elements.

4,035,014
BULLET-RESISTANT RETRACTABLE SHIELD ASSEMBLY

Troy V. Sellers, 1749 N. Layman Ave., Indianapolis, Ind. 46218
Filed Dec. 16, 1975, Ser. No. 641,599
Int. Cl.² B60R *27/00*
U.S. Cl. 296—24 R **11 Claims**

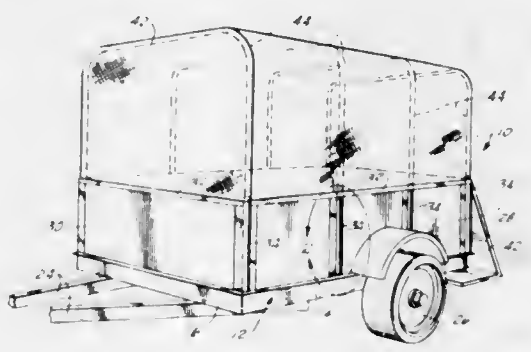
1. A bullet-resistant shield assembly for partitioning the passenger compartment of a motor vehicle and comprising:
- horizontally-spaced, generally upright side templates contoured to fit the compartment facing surfaces of vehicle doors rearwardly of a vehicle seat back;
- window channel means on said templates and facing each other;
- a window guidingly received in said channel means;
- a backplate secured to said templates behind said channel means,
- said window being movable in and guided by said channel means to an upper position in which it closes the area between the upper portion of the seat back and the ceiling of the passenger compartment and downwardly to a storage position, and
- window lock means secured to said channel means and operable from in front of said window to hold the window in its upper position;



said backplate extending horizontally from one of said side templates to the other of said templates, and extending vertically downward from a line above the location of the bottom of the window when the window is up, to a line adjacent the lowermost points on the side templates.

4,035,015
TRAILER

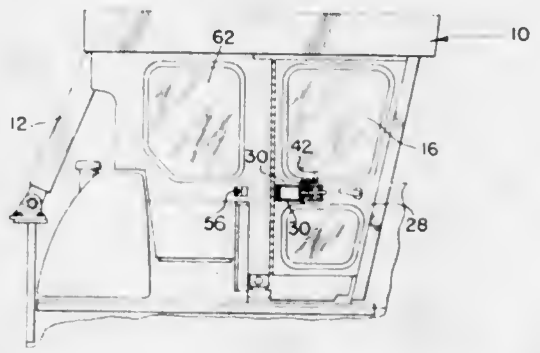
Marjorie Ann M. Smith, 3825 Valley Blvd. No. 56, Walnut, Calif. 91789
Filed Nov. 24, 1975, Ser. No. 634,611
Int. Cl.² B62D *25/02*
U.S. Cl. 296—28 R **2 Claims**



1. A transport vehicle comprising:
- a flatbed structure which includes a pair of spaced apart, elongated metal frame members extending along opposite outer edges of the flatbed structure;
- a separate series of spaced apart side wall sleeves extending along each frame member;
- each side wall sleeve comprising a single sheet metal piece of substantially uniform thickness having top and bottom edges and having side-by-side first and second regions extending between the top and bottom edges of the sheet metal piece, said first region forming the wall of an elongated rounded tube, said second region forming a generally planar flange integral with the wall of the tube and merging into the tube at the juncture between said first and second regions, the flange extending away from only one side of the tube, the tube projecting away from only one side of the plane defined by the flange, the flange being a single continuous piece extending from the top to the bottom of the tube;
- means integrally bonding a bottom portion of each side wall sleeve to a corresponding metal frame member to position the side wall sleeves in upright positions extending above the frame members, with the tube of each side wall sleeve facing outwardly away from the flatbed structure;
- a separate side panel extending along each frame member and abutting against the flanges of the upright side wall sleeves on the sides thereof remote from the outwardly facing tubes;
- means securing the side panels to the flanges abutted by the side panels, the side wall sleeves providing means for resisting outward forces applied along the length of the side panels; and
- a top structure for covering the flatbed including separate series of longitudinally spaced apart upright support members, each support member being releasably disposed in a corresponding one of the tubes in the upright side wall sleeves.

4,035,016
DOOR HOLDING ASSEMBLY

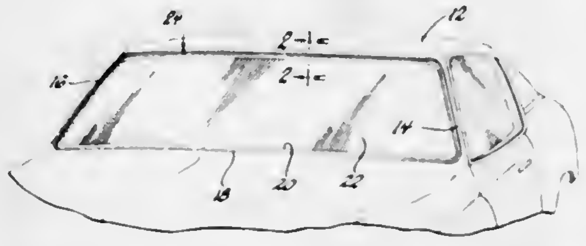
John S. Ricca, Bartonville, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Apr. 21, 1976, Ser. No. 678,847
Int. Cl.² B62D *23/00;* **E05C** *5/02*
U.S. Cl. 296—28 C **7 Claims**



1. A device for selectively holding a door against a stop comprising:
- a crank having a handle and an eccentric;
- means mounting said crank for rotation and adapted to be secured to one of a door and wall mounting a door;
- means defining a resilient linkage having one end connected to said eccentric;
- securing means including two elements selectively interconnectable, one of said elements being on said link other end and the other being adapted to be secured to the other of a door and a wall; and
- means for limiting rotation of the crank on said mounting means to allow over center action in said linkage means whereby the resilience of said linkage means may firmly hold a door against a stop.

4,035,017
WINDOW REVEAL MOLDING

Henry W. Griffin, Birmingham, and Thomas J. Nichter, Warren, both of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed May 7, 1976, Ser. No. 684,153
Int. Cl.² B60J *1/02*
U.S. Cl. 296—93 **3 Claims**



1. A decorative molding for use in a motor vehicle body having a window opening defined by an inwardly offset body panel flange structure formed by an inwardly extending wall and a wall extending parallel to the body panel, a window panel closing the window opening and when mounted therein

defining a space between the edge of the window panel and the inwardly extending wall, and a bead of curable adhesive interposed between the window panel and the parallel extending wall to mount the window panel on the body panel flange, said decorative molding concealing the space between the edge of the window panel and the inwardly extending wall and comprising: a thin-wall extruded plastic tubular member of generally rectangular cross-section having laterally spaced inner and outer side walls and a top and bottom wall, a channel recess formed in the inner side wall for receiving the edge of the window panel, the outer side wall being generally planar for surface contact with the inwardly extending wall, the bottom wall of the molding being embedded in the bead of curable adhesive so that the molding is adhesively retained on the parallel extending wall of the body panel flange, the top wall of the molding having a width not substantially exceeding the space between the edge of the window panel and the inwardly extending wall to provide a narrow decorative appearance and to facilitate bending of the molding around corners of relatively small radius.

4,035,018

DEVICE FOR DISTRIBUTING CONDITIONED AIR

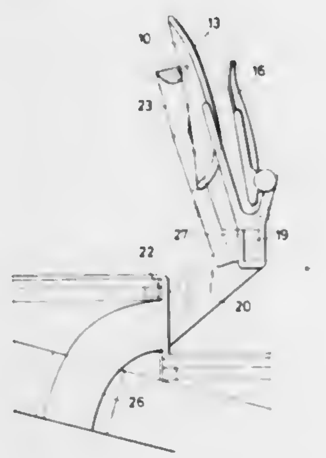
Kurt Erbele, Asperg, Germany, and Antonio Castelli, Bologna, Italy, assignors to Castelli KG, Aldingen, Germany

Filed Oct. 17, 1975, Ser. No. 623,380

Claims priority, application Germany, Oct. 22, 1974, 2450092

Int. Cl.^{2} A47C *7/72*

U.S. Cl. 297—180 **4 Claims**



1. An arrangement in combination for distribution of conditioned air to a row of seats in a room: a horizontal supporting beam having structure defining air passage means therein extending in the longitudinal direction of said beam, a plurality of seats mounted in common on said beam, said beam being provided with inlet means for conditioned air, air outlet means arranged on said beam for communicating with said passage means, discharge opening means connected to said air outlet means for discharging conditioned air from the interior of said beam into the room in which said seats are located, hollow supporting means extending downwardly and connected to said beam while respectively supporting said beam, said hollow supporting means comprising conditioned air conveying means communicating directly with said passage means, and forming part of said air inlet means and arranged in spaced relationship to each other in the longitudinal direction of said supporting beam and respectively having one end connected to said supporting beam for communication with said passage means in said supporting beam and having the other end arranged for communication with a source of conditioned air.

4,035,019

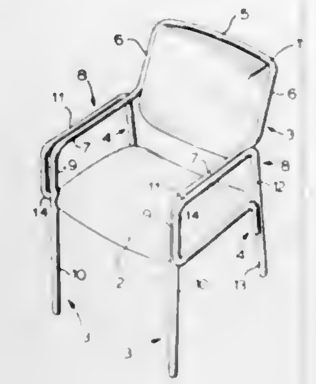
ARMCHAIRS HAVING TUBULAR FRAMES

Gregory Gabourie, 30 Hills Road, Ajax, Ontario, Canada

Filed Feb. 3, 1976, Ser. No. 654,945

Int. Cl.^{2} A47C *3/04*

U.S. Cl. 297—239 **8 Claims**



1. An armchair comprising a seat, a backrest, and a tubular frame supporting the seat and backrest and defining armrests, wherein the frame comprises a central tubular frame member and two flanking tubular frame members each formed from a single length of tubing, a centre portion of the central frame member defining a backrest frame surrounding the top and sides of the backrest, and each end portion of the central frame member extending in an adjacent fore and aft vertical plane with one of the flanking members so as to define therewith an armrest in the form of a closed quadrilateral loop in which a top rail of the armrest is formed by parallel substantially horizontal portions of said central and flanking members welded together, in which a front rail is formed by portions of said central and flanking members, and in which the bottom rail of the armrest includes a portion of one of the tubular members forming a seat side rail from which the seat is supported, the seat side rail being supported at front and rear by welds formed between the side rail and adjacent tubular frame member portions, and wherein the portions of the central and flanking members forming the front rails of the armrest are offset relative to one another whereby to provide means to locate the front legs of a further chair stacked thereon.

4,035,020

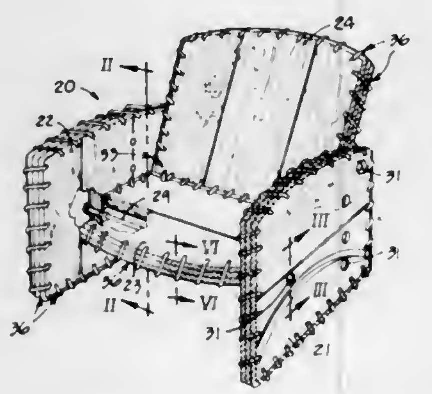
FURNITURE CONSTRUCTION

Donald B. Gold, 260 Canal St., San Rafael, Calif. 94901

Division of Ser. No. 504,061, Sept. 9, 1974. This application Dec. 15, 1975, Ser. No. 640,679

Int. Cl.^{2} A47C *3/02*

U.S. Cl. 297—258 **28 Claims**



1. In a furniture construction comprising a plurality of members attached together, the invention wherein at least one of said members comprises a panel having cushioned edging means secured on at least one edge thereof, said cushioned edging means comprising at least one continuous first fibrous rope at least substantially covering said edge and extending the full length of said edge, a plurality of apertures spaced along and inwardly of said edge and formed completely through said panel and a continuous second fibrous rope extending sequentially through said apertures in spiralled and wrapped relationship over said first rope to bind said first rope against the edge of said panel.

4,035,021

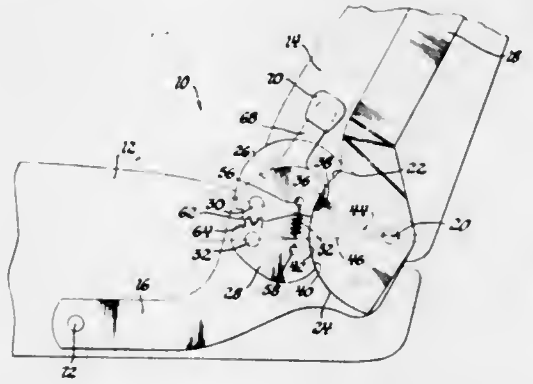
VEHICLE SEAT BACK RECLINING MECHANISM

Robert C. Krug, Birmingham, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Mar. 17, 1976, Ser. No. 667,638

Int. Cl.^{2} A47C *1/025*

U.S. Cl. 297—369 **3 Claims**



1. In a vehicle seat having a cushion frame member, a back frame member, and a seat back pivot means pivotally connecting the back frame member to the cushion frame member to permit adjustment of the angle of the back frame member relative the cushion frame member, the combination comprising:

a sector on one of the frame members being serrated to display a plurality of teeth;

first and second latch bars, each latch bar having teeth for meshing with the teeth of the sector;

first and second pivot means respectively mounting the first and second latch bars on the other of the frame members for pivotal movement between engaged positions in which the teeth of the latch bars engage the teeth of the sector and disengaged positions;

the first latch bar acting to block forward pivoting movement of the seat back by being wedged between the sector and the first pivot means of the first latch bar;

the second latch bar acting to block rearward pivoting of the seat back by being wedged between the sector and the second pivot means of the second latch bar;

and means interconnecting the latch bars so that pivotal movement of one of the latch bars toward the engaging position forcibly pivots the other latch bar toward the engaging position whereby both first and second latch bars block pivoting of the sector and back frame in either the forward or rearward direction relative the cushion frame member.

4,035,022

SELF-PROPELLED PICKUP DEVICE FOR PICKING UP MATERIALS LYING ON THE BOTTOM OF THE SEA

Udo Hahlbrock, Lubeck; Siegfried Steinkühler, Bad Schwartau; Heinz-Werner Vagt, Bad Schwartau; Johann-Gustav Voss, Bad Schwartau, and Ulrich Wäntig, Lubeck, all of Germany, assignors to O & K Orenstein & Koppel Aktiengesellschaft, Germany

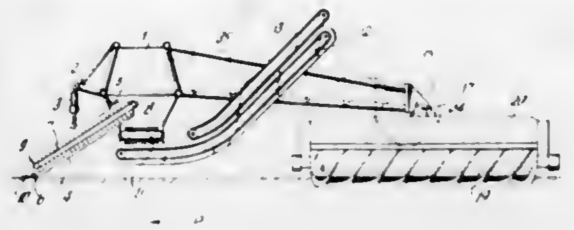
Filed Jan. 30, 1976, Ser. No. 653,729

Claims priority, application Germany, Feb. 5, 1975, 2504694

Int. Cl.^{2} E02F *7/00*

U.S. Cl. 299—8 **22 Claims**

1. In a self-propelled pickup device, for picking up material, such as manganese lumps, lying on the bottom of the sea, of the type having at least one cutting tool cutting into the ground and a cooperating conveying device, the improvement comprising, in combination, an undercarriage; means mounting said undercarriage for movement over the sea bottom; at least one upwardly and rearwardly inclined and forwardly projecting conveyor trough mounted on said undercarriage; a respective non-rotatable cutting tool mounted on and projecting from the leading lower end of each conveyor trough to dig into the ground, to a selected depth, responsive to forward movement of said undercarriage, for movement of the cut material over the upper surface of the cutting tool and onto the associated trough; elevating means; each conveyor trough feeding material to said elevating means; and a respective scraper chain extending along each conveyor trough to move material upwardly therealong.



4,035,023

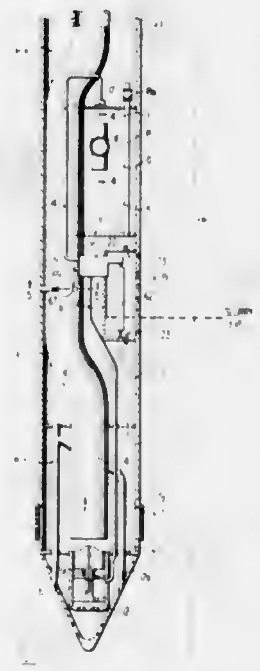
APPARATUS AND PROCESS FOR HYDRAULIC MINING

Clifford McDonald Cockrell, New Orleans, La., assignor to Freeport Minerals Company, New York, N.Y.

Filed July 15, 1975, Ser. No. 596,006

Int. Cl.^{2} E21C *41/08*

U.S. Cl. 299—17 **14 Claims**



1. Apparatus for mining a subterranean deposit of granular ore by forming a slurry thereof with a fluid comprising:

a. a rotatable tool string having a first fluid passage through which fluid flows downwardly and a first slurry passage through which a slurry of said fluid and granular ore flows upwardly,

b. supported therefrom underground a substantially rigid housing containing an outwardly directed cutting jet nozzle for impinging said fluid against said ore to form said slurry and having

1. a second fluid passage therein connecting said first fluid passage with said jet nozzle,
2. a slurry inlet through said housing,
3. a second slurry passage connecting said inlet with said first slurry passage,
4. a valve for controlling the amount of slurry passing

through said second slurry passage and into said first slurry passage, said valve being biased to close,

5. means to open said valve in response to hydraulic pressure in a fluid passage, and
6. means for introducing air under pressure into the slurry rising in said slurry passages to assist the rise of said slurry to ground level.

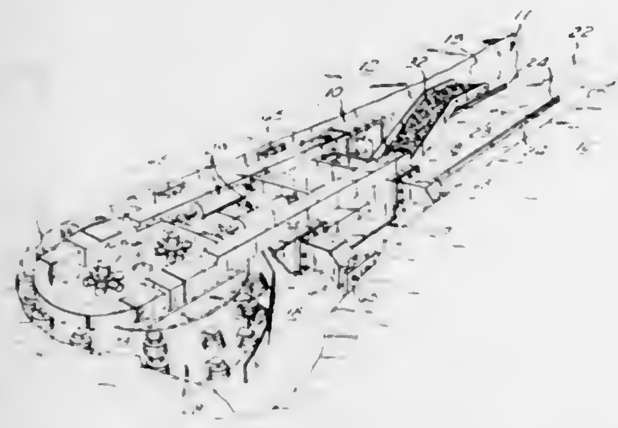
4,035,024
HARD ROCK TRENCH CUTTING MACHINE

Trevor Fink, University Heights, Ohio, assignor to Jarva, Inc., Solon, Ohio

Filed Dec. 15, 1975, Ser. No. 640,690

Int. Cl.² E21D *9/10*

U.S. Cl. 299—31 **24 Claims**



1. A hard rock trench cutting machine for cutting a trench having an end wall, two opposed side walls, a bottom wall, an open top, a longitudinal axis extending parallel to said side walls and to said bottom wall, and a lateral axis extending between said side walls perpendicular to said longitudinal axis and parallel to said bottom wall; said machine comprising a main body assembly and a cutter wheel assembly and a longitudinal thrust assembly; said main body assembly including at least two laterally opposed side wall support feet, said feet being constructed and arranged to move laterally between a retracted position away from said side walls and an extended position engaging said side walls, said support feet including lateral thrust means for pushing said support feet against said side walls with a force sufficient to secure said main body assembly against longitudinal movement relative to said side walls; said cutter wheel assembly including a cutter wheel support frame carried by said main body assembly, said cutter wheel support frame being longitudinally movably disposed relative to said main body assembly, a cutter wheel drum rotatably carried by said cutter wheel support frame for rotation about a rotational axis relative to said cutter wheel support frame, said rotational axis being perpendicular to said lateral axis, said cutter wheel drum having a generally cylindrical outer peripheral surface, said outer peripheral surface extending substantially from said bottom wall of said trench to said open top of said trench, a plurality of individual cutters mounted on said outer peripheral surface for engaging said trench end face, said individual cutters extending along said trench end face continuously from said bottom wall to said open top, rotational drive means rotating said cutter wheel drum about said rotational axis relative to said cutter wheel support frame; said longitudinal thrust assembly including longitudinal thrust means extending between said main body assembly and said cutter wheel assembly moving said cutter wheel support frame longitudinally between a retracted position and an extended position relative to said main body assembly when said rotational drive means rotates said cutter wheel drum, said longitudinal thrust means being constructed and arranged to push said cutter means against said end face when said lateral thrust means pushes said feet against said side walls.

4,035,025
MINERAL WINNING PLOUGHS

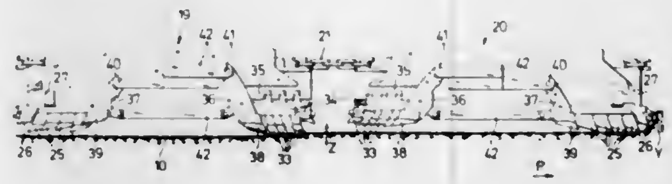
Martin Hermann, Lunen; Oswald Breuer, Dortmund-Husen, and Alois Hauschopp, Werne, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed Jan. 2, 1976, Ser. No. 646,102

Claims priority, application Germany, Jan. 9, 1975, 2500680

Int. Cl.² E21C *27/35*

U.S. Cl. 299—34 **16 Claims**



1. In a mineral winning plough having first and second spaced-apart bodies interconnected to move together along a mineral face in alternate directions to win mineral therefrom each body having cutter bits mounted to it; the improvement comprising: cutter bits arranged at end regions of each of the first and second bodies respectively relative to the directions of movement of the plough, wherein for each direction of movement of the plough at least some of the cutter bits mounted on the leading end region of the second body projects towards the mineral face as yet uncut, by a greater distance than the cutter bits on the leading end region of the first of the bodies, said cutter bits on the first and second bodies traversing said mineral face at the same height.

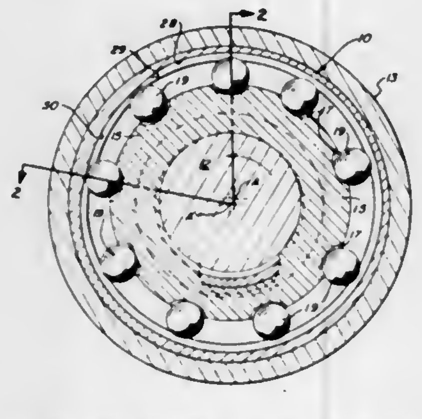
4,035,026
METHOD AND DEVICE FOR AIDING AND ENHANCING ROTARY MOTION

Henry Replin, Denver, Colo., assignor to Vector Bearing Corporation, Englewood, Colo.

Continuation-in-part of Ser. No. 538,684, Jan. 6, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,587

Int. Cl.² F16C *33/30*

U.S. Cl. 301—5 R **12 Claims**



1. A method of load-aiding rotary motion of a rotating member of a wheel bearing having inner and outer races, said member being radially displaced from a fixed member and having a load applied thereto horizontally offset from its center, said method comprising:

providing a non-circular portion on one of said outer and inner races, said non-circular portion of said race having a large diameter portion, a ramp portion, and a small diameter portion;

applying torque to the rotating member to induce rotation thereof;

displacing the rotating member to a non-concentric position relative to the fixed member by positioning bearing means between the members and causing said bearing means to sequentially exert a tangential force on said non-circular portion of said race, imposing at least part of the load from the fixed member to the rotating member at a position on the rotating member spaced from the center of the rotating member and in the direction having a substantial component in the direction of rotation of and spaced from the center of the rotating member;

whereby the load force imposed on the rotating member being offset from the center of rotation induces rotation, and thus is applied in a more advantageous manner than if the same load force were applied through the center of rotation.

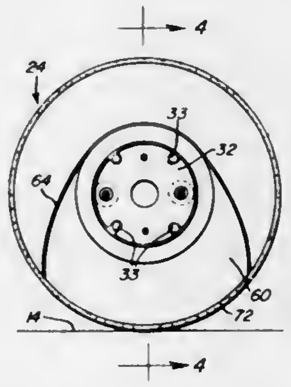
4,035,027
EMERGENCY WHEEL

John G. Lehtinen, 621 Lochaven, Union Lake, Mich. 48085

Continuation-in-part of Ser. No. 518,991, Oct. 29, 1974, abandoned. This application Nov. 20, 1975, Ser. No. 633,950

Int. Cl.² B60B *11/00*

U.S. Cl. 301—38 R **11 Claims**



1. For use in conjunction with a vehicle wheel of the type including a center portion mounted on a vehicle hub by fasteners secured through the central portion and supported from the hub, an emergency wheel defining a center axis thereof and including a first portion having means adapted for removable support from said central portion with said center axis substantially centered relative to said central portion and including a first radially outwardly projecting partial circular flange segment, a second portion, mounting means mounting said second portion on said first portion for rotation and shifting relative thereto about and along said axis between first and second relatively rotated and shifted positions, said second portion including a second radially outwardly projecting partial circular flange segment, said segments being disposed in axially spaced overlapped positions in axial registry with each other when said first and second portions are in said first positions and in positions out of axial registry with each other and disposed in a single plane normal to said axis and together forming a substantial continuous disc concentric with said axis when in said second positions, and means operative to releasably lock said first and second portions in said second positions.

4,035,028
WHEEL ASSEMBLIES AND COMPONENTS

Raymond J. Wilcox, 44 Via Casitas, San Luis Rey Downs, Calif. 92068

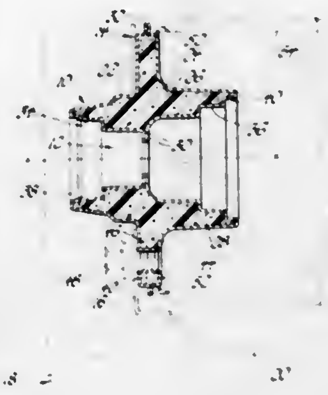
Filed July 14, 1975, Ser. No. 595,476

The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.

Int. Cl.² B60B *5/02*

U.S. Cl. 301—13 SM **29 Claims**

1. A vehicle wheel hub comprising: a plurality of metallic structural members generated about a central axis in annular configurations and secured to each other to define an annular cavity having an axially extending portion extending to opposite axial extremities of the hub and a radially extending portion projecting outwardly intermediate the axial extremities thereof; foam received within and filling the cavity and adhering to the metallic structural members to cooperate therewith as a load bearing component of the hub; said structural members of the hub defining a central opening for receiving a vehicle axle on which the hub is to be mounted and including



at least two axially spaced annular bearing seats within the central opening respectively adjacent the axial hub extremities for receiving antifriction bearings that mount the hub on the axle; the hub also including a mounting portion including spaced structural member portions with the foam in the radially extending cavity portion therebetween; and means for securing a disc of a vehicle wheel to the mounting portion of the hub to mount the wheel with respect to said axle.

4,035,029
APPARATUS FOR SEPARATING ENTANGLED OBJECTS FROM EACH OTHER, SUCH AS SPRINGS OR OTHER OBJECTS HAVING A TENDENCY TO HITCH TO EACH OTHER

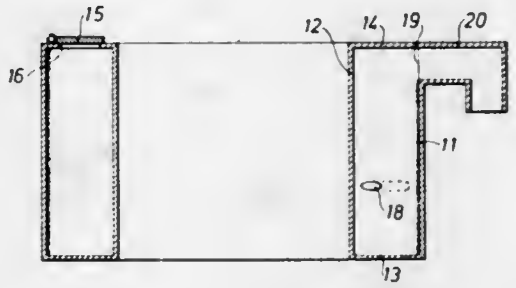
Jan Lindstrom, Taby, and Bengt Anders Fredrik Nilsson, Saltsjo-Duvnas, both of Sweden, assignors to Tekno-Detaljer AB, Sweden

Filed Oct. 8, 1975, Ser. No. 620,577

Claims priority, application Sweden, Oct. 16, 1974, 7413052

Int. Cl.² B65G *51/02*

U.S. Cl. 302—2 R **8 Claims**



1. An apparatus for separating individual entangled objects from each other, said apparatus comprising:

a receptacle for holding a supply of said objects and having a first end, a second and an object discharge opening adjacent said second end, said receptacle comprising:

an outer wall having an inner surface; and

an inner wall within said outer wall, said inner and outer walls being symmetrical about a common axis;

a multiplicity of discrete roughening elements comprised of welding spots distributed over said inner surface of said outer wall; and

means coupled to the interior of said receptacle between said inner and outer walls to provide a helical flow of air along said inner surface of said outer wall;

whereby said air flow moves said objects helically from said first end toward said discharge opening of said receptacle, said objects being directed against said inner surface of the outer wall by said air flow and being subjected to substantially continuous shocks and vibrations caused by collisions with said welding spots whereby said objects become disengaged from one another and are individually removed from said receptacle through said discharge opening.

4,035,030

DEVICE FOR PNEUMATICALLY CONVEYING FIBERS OR FIBER-CONTAINING MATERIALS

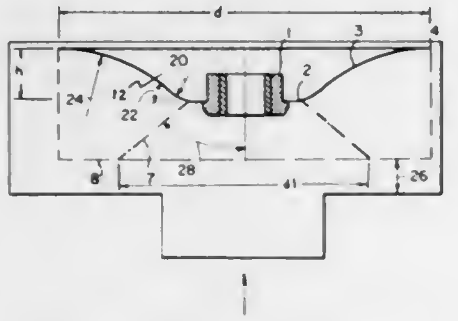
Friedrich Wilhelm Morgner, Grunenbaumchen, and Franz Hock, Heiligenhaus, both of Germany, assignors to Temafa, Textilmaschinenfabrik Meissner, Morgner & Co. GmbH, An der Zinkhutte, Germany

Filed July 7, 1975, Ser. No. 593,550

Claims priority, application Germany, July 5, 1974, 2432239

Int. Cl.² B65G *53/40*

U.S. Cl. 302—37 **11 Claims**



1. Apparatus for pneumatically conveying materials comprising:

an impeller supported for rotation about its longitudinal axis;

said impeller comprises a circular curved base portion that is raised in the center and slopes to the outer periphery wherein the transition from the raised center portion of the base to the outer periphery has a first portion (**20**) with an inward radius of curvature of 0.05 to 0.2 times the diameter of said impeller and a second portion (**24**) havifg an outward radius of curvature which is equal to 0.2 to 0.6 times the diameter of said impeller;

said impeller further compirses a plurality of backwardly curved blades connected to said circular curved base portion having a free outer edge and a slanted edge extending from the free outer edge to the raised center of said circular curved base portion; and including,

a housing surrounding said impeller having an inlet opening along the longidutindal axis of said impeller for receiving material to be conveyed.

4,035,031

CHECK VALVE FOR BRAKING PRESSURE CONTROL VALVE UNIT

Yoshihisa Nomura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Oct. 28, 1976, Ser. No. 736,463

Claims priority, application Japan, Mar. 16, 1976, 51-28336

Int. Cl.² B60T *8/18, 8/24, 8/26*

U.S. Cl. 303—6 C **9 Claims**

1. In a fluid pressure control valve unit for a vehicle braking system incorporated between a master cylinder and rear wheel brake cylinders, comprising:

a housing provided thereon with an inlet port for connection to the master cylinder and an outlet port for connection to the rear wheel brake cylinders and provided therein with a stepped bore connected at one end thereof to said inlet port and at the other end thereof to said outlet port;

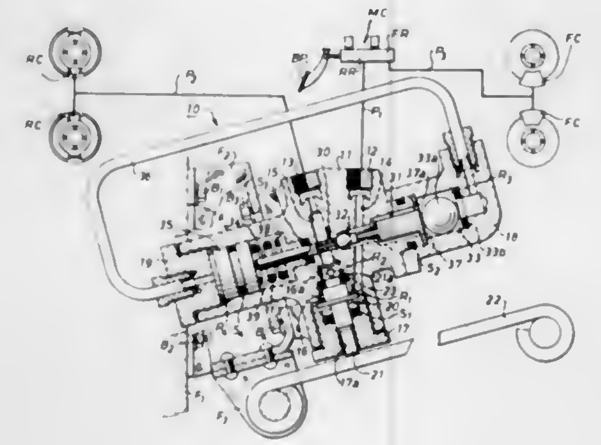
a differential piston which is slidably disposed within said stepped bore to provide first and second chambers, being in constant communication respectively with said inlet and outlet ports, and which has piston surfaces providing first and second effective piston areas whereby opposing displacement forces may be provided on said piston respectively in the directions toward and away from said outlet port, the first effective piston area being smaller than the second one;

a first valve part of said piston co-operable with a second valve part of the stepped bore wall for controlling intercommunication between said first and second chambers in dependence upon the position of said piston in said stepped bore; and

means for biasing said piston in the direction toward a normal position of said piston in which said first and second valve parts provide full communication between said first and second chambers;

the improvments which comprises

a second stepped bore provided within said housing and crossing a first internal passage between said inlet port and said first chamber and a second internal passage between said outlet port and said second chamber, said second stepped bore forming at a small diameter portion thereof a bypass passage between said first and second internal passages and forming at both ends thereof a third chamber in communication with said first internal passage and a fourth chamber connected to said third chamber;



an inertia-controlled valve provided within said third chamber for normally permitting communication between said third and fourth chambers but adapted to block the communication between said third and fourth chambers when said inertia-controlled valve is subjected to a deceleration in excess of a predetermined value;

a control piston slidably disposed within a large diameter portion of said second stepped bore to be moved in the direction toward said third chamber by fluid pressure applied to said fourth chamber from said third chamber;

a spring for biasing said control piston toward the original position against fluid pressure applied to said fourth chamber; and

a check valve means disposed within said bypass passage and adapted to co-operate with said control piston to normally close the bypass passage;

whereby when said control piston is moved by fluid pressure in said fourth chamber against said spring, said check valve means will open said bypass passage to provide direct communication between said first and second internal passages.

4,035,032

SKID CONTROL SYSTEM FOR TWO-WHEELED VEHICLES

Robert B. Bertolasi, Rockford, Ill., assignor to Kelsey-Hayes Company, Romulus, Mich.

Filed Apr. 9, 1976, Ser. No. 675,263

Int. Cl.² B60T *8/10*

U.S. Cl. 303—109 **7 Claims**

1. In combination in a skid control system for use in connection with controlling the braking action of at least one wheel of a vehicle, a wheel speed sensor for generating a signal in the form of a series of pulses representative of the wheel speed, a control circuit responsive to said wheel signal for controlling the braking action in accordance with said wheel signal, and a tachometer circuit connected to said sensor and said control circuit for converting said pulses to an analog signal representative of the speed of said one wheel for use by said control circuit, said tachometer circuit including a multiplicity of integrating circuits for integrating said pulses.

4,035,033

ANTI-SKID CONTROL SYSTEM

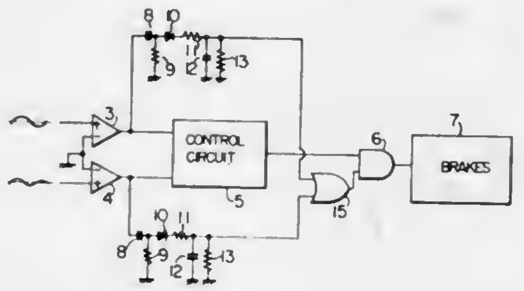
Tsugihiro Okada, Hitachi, and Norio Yokozawa, Fuchu, both of Japan, assignors to Hitachi, Ltd., Japan

Filed July 18, 1975, Ser. No. 597,175

Claims priority, application Japan, Aug. 5, 1974, 49-89072

Int. Cl.² B60T *8/10*

U.S. Cl. 303—109 **1 Claim**



1. An anti-skid control system for an automotive vehicle having a plurality of wheels comprising means for providing a signal representative of vehicle body speed, means for providing a signal representative of wheel speed, wherein the means for providing a signal representative of vehicle body speed is independent from the means for providing a signal representative of wheel speed, and control means for relieving the braking force imparted by brake means to the wheels depending on the relation between the vehicle body speed and the wheel speed, said system further comprising means responsive to the vehicle body speed signal for detecting the driving of the vehicle in a low vehicle speed range at which the full braking force can be imparted to the wheels without giving to any danger, and means for inhibiting the operation of said control means in such a low vehicle speed range, whereby the full breaking force can be imparted to the wheels in such low vehicle speed range while inhibiting said control means for fulfilling the primary function thereof, and wherein the outputs of said first and second comparators are further applied to a first and second means for providing output voltages proportional to said wheel speed and said vehicle body speed respectively, said two output voltages being combined in an additional circuit means for generating a signal whose output is used to inhibit the output from said control means when the two output voltages fall within a predetermined range.

4,035,034

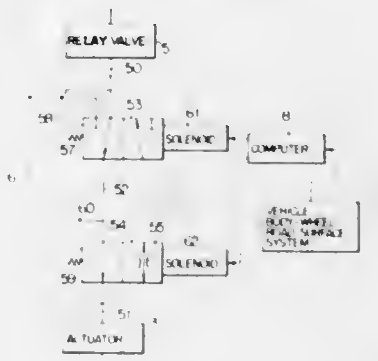
ANTISKID DEVICE FOR AIR BRAKES

Yukichi Sekiguchi, Yono, Japan, assignor to Sanwa Seiki Mfg. Co. Ltd., Japan

Continuation of Ser. No. 624,707, Oct. 22, 1975, abandoned. This application June 28, 1976, Ser. No. 700,728

Int. Cl.² B60T *8/02*

U.S. Cl. 303—115 **17 Claims**



1. An antiskid device for fluid pressure operated brakes having a signal producing means for producing a fluid pressure reducing signal when the fluid braking pressure has reached a pressure increase target value and to remove said pressure reducing signal when the braking pressure has reached a fluid pressure decrease target value; a modulator means responsive to the signal producing means to decrease or increase the braking pressure, the modulator comprising a first valve means movable between an open position allowing fluid pressure to pass therethrough and a pressure discharge position; a second valve means connected in series with said first valve means movable between an open position allowing fluid pressure to pass therethrough and a throttling position in which the fluid pressure passes therethrough in a reduced quantity; said signal producing means providing signals for sequentially and simultaneously actuating said first and second valve means whereby the rate of increase or the rate of decrease in the braking pressure is lessened before the braking pressure reaches the pressure increase target value or pressure decrease target value so as to thereby avoid an excessive rise or fall in the braking pressure above or below the respective target values.

4,035,035

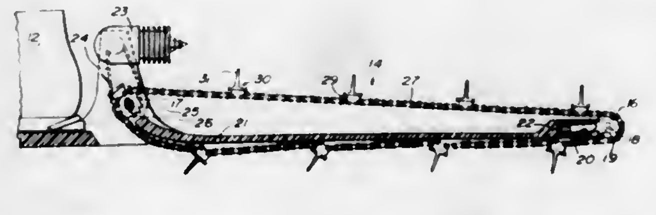
PROPULSION CLEAT FOR A POWER-DRIVEN SKI

Royce Hill Husted, Wheaton, Ill., assignor to Saroy Engineering, Wheaton, Ill.

Filed July 25, 1975, Ser. No. 599,003

Int. Cl.² B62D *55/26*

U.S. Cl. 305—13 **10 Claims**



1. In a power driven ski type of a device using a tread of the type having an endless linked chain, circulateably supported by sprockets, and a plurality of spaced propulsion cleats, each of said cleats having a snow engaging side opposite from a sprocket engaging side, a propulsion cleat comprising in combination,

a cleat attachment link forming part of said chain and having an attachment plate, and

a snow engaging section attached to said attachment plate and having a protruding portion made of a resilient material on the snow engaging side of the cleat for engaging with snow,

wherein said protruding portion is resiliently connected to said attachment link, for preventing the creation of a destructive shock by said protruding portion between said attachment link to said sprocket and said power driven ski type of a device, when said protruding portion accelerates and decelerates over said sprocket.

4,035,036

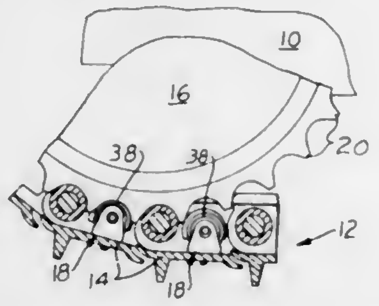
NOISE SUPPRESSING ELEMENT FOR CONTINUOUS TRACK OF CRAWLER TYPE VEHICLE AND METHOD OF OPERATING SAME

Roger L. Boggs, East Peoria; Eugene R. Groff, Chillicothe, and Paul L. Wright, Peoria, all of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Oct. 14, 1975, Ser. No. 622,206

Int. Cl.^{2} B62D *55/20*

U.S. Cl. 305—57 **3 Claims**



1. A noise suppressing assembly connectable to a track shoe of a continuous track of a crawler type vehicle, comprising:

a frame having first and second spaced uprights and being connectable to a track shoe, said uprights each having an opening therethrough, said frame including:

first and second elements each of a general L-configuration, each element having a leg extending from the associated upright with said legs each having an opening therethrough for connecting the first and second frame elements to a track shoe with ends of the frame legs adjacent one another,

a holding element overlying the leg ends and having openings therethrough substantially coaxial with the openings of the leg ends; and

a pin extending through each of the coaxial openings for connecting the first and second frame elements;

a resilient contacting element having a generally columnar cross-sectional configuration, a central opening extending therethrough, and an outside diameter sufficient for contacting one of a sprocket and a track wheel with an outer surface of the element and adjacent structure on an opposed outer surface of the element in the installed position on a track shoe;

an axle extending through the frame openings and the central opening for connecting the contacting element to and between the frame uprights, said axle having a diameter substantially, sufficiently smaller than at least one of the diameter of the frame openings and the diameter of the central opening of the contacting element for transversely and rotatably moving the contacting element relative to the frame in response to contact of the contacting element with one of the sprocket and wheel track; and

connecting means for maintaining the axle within the frame openings.

4,035,037

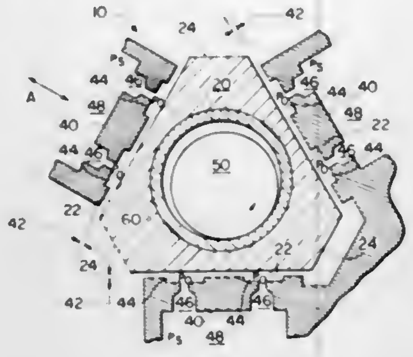
HYDROSTATIC BEARING SUPPORT

Robert E. Cunningham, Fairview Park, Ohio, assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Mar. 2, 1976, Ser. No. 663,008

Int. Cl.^{2} F16C *1/24*

U.S. Cl. 308—5 R **5 Claims**



1. A hydrostatic support system having improved dynamic damping characteristics for bearings used to support a rotating member, said support system comprising a bearing housing in which the bearings are disposed, said bearing housing having a substantially polygonal outer surface configuration as viewed in transverse cross-section perpendicular to the axis of rotation of the rotating member, and the outer surface of said housing forming at least three symmetrically disposed working faces; a pressure plate disposed relatively opposite each of said working faces and spaced therefrom such that a gap is defined between each working face and corresponding pressure plate when said housing is centered with respect to said pressure plates; and means for introducing fluid under pressure into said gaps to form supporting hydrostatic films between said working faces and said pressure plates such that said housing may be suspended between said pressure plates in spaced relationship thereto.

4,035,038

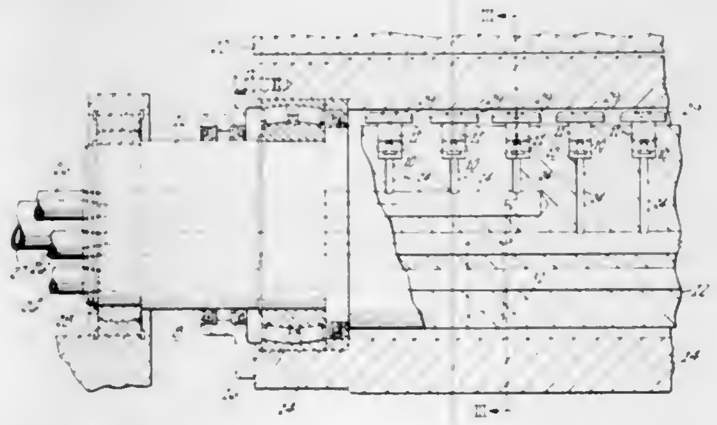
CONTROLLED DEFLECTION ROLL ASSEMBLY

John Crossley Hinchcliffe, Cheshire, and Peter Hold, Milford, both of Conn., assignors to USM Corporation, Boston, Mass.

Filed Feb. 17, 1976, Ser. No. 658,619

Int. Cl.^{2} F16C *7/04*

U.S. Cl. 308—9 **8 Claims**



1. A controlled deflection roll comprising:

a nonrotative shaft having a support arrangement near the ends thereof;

a shell roll journalled about said shaft, said shell roll and said shaft having a radial space therebetween;

at least one reciprocally mounted pressure-responsive piston disposed in a cavity which is radially inwardly disposed in said shaft;

a hydrostatic bearing pad disposed on the radially outer end of said piston;

a pressurized fluid supply arrangement within said shaft;

said hydrostatic bearing pad being comprised of a generally toroidal shape, and is made of a generally resilient, thin walled material to permit said hydrostatic bearing pad to flex under varying loads and angles of operaton.

4,035,039

ROCK BIT ASSEMBLY

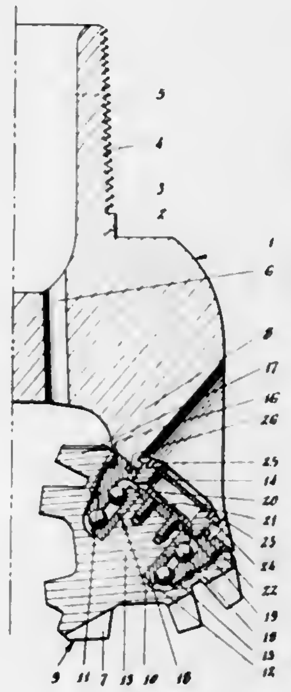
Carl Eric Johansson, Blaricum; Hans Bertil van Nederveen, Bosch en Duin, and Hendrikus Jan Kapaan, IJsselstein, all of Netherlands, assignors to SKF Industrial Trading and Development Company, B.V., Nieuwegein, Netherlands

Filed Feb. 13, 1976, Ser. No. 657,889

Claims priority, application Netherlands, Feb. 17, 1975, 7501815

Int. Cl.^{2} F16C *19/14*

U.S. Cl. 308—8.2 **10 Claims**



1. A rock bit assembly comprising, an integral drivable bit body, a cutter body including cutting means and having an extending central segment about which said cutting means are positioned, rolling bearing means including an inner race and an outer race, and rolling elements therebetween, means mounting one of said races to said cutter body extending central segment, and thereby forming an integral bearing unit and cutter body, means for disengageably mounting the other of said races to said drivable body, and means for sealing said rolling elements from the ingress of foreign material into the area of rolling contact in said rolling bearing means.

4,035,040

SELF-ALIGNING WHEEL MOUNTING STRUCTURE

William T. Yarris, Brook-Park, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

Filed July 9, 1976, Ser. No. 703,728

Int. Cl.^{2} F16C *23/08*

U.S. Cl. 308—72 **7 Claims**

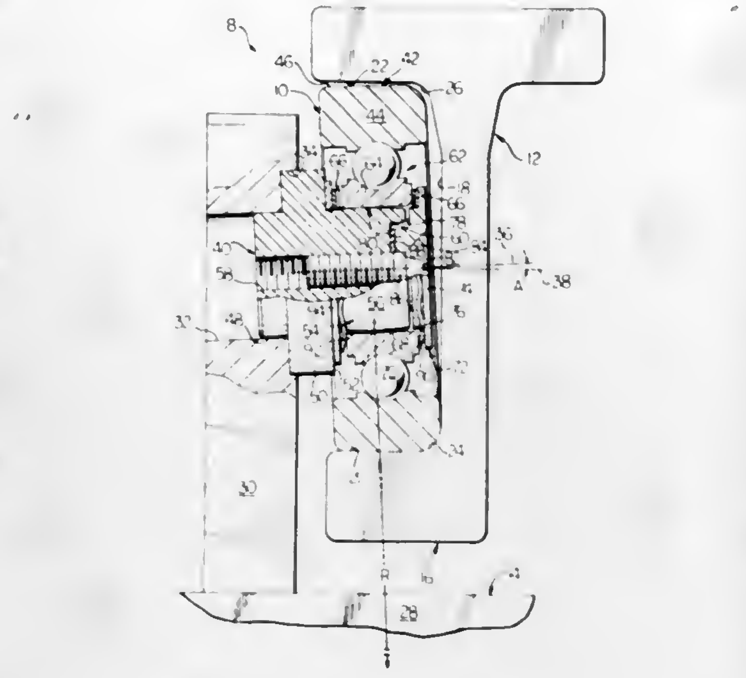
1. A self-aligning wheel mounting structure, comprising:

a supporting axle shaft having a crowned bearing seat thereon;

a bearing assembly having an inner race and a plurality of bearing elements peripherally disposed about said inner race, said inner race having a substantially cylindrical internal bore rockably mounted on said crowned bearing seat;

an annular tread portion freely rotatably supported on said bearing elements; and

resilient means on said shaft for axially biasing said inner race to a preselected position on said seat.



4,035,041

HYDRAULICALLY SUPPORTED THRUST BEARING

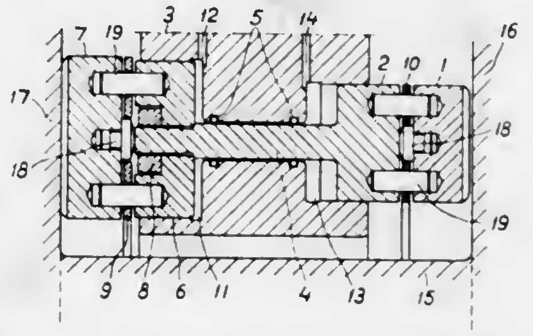
Birger Larsson, Finspong, Sweden, assignor to Stal-Laval Turbin AB, Finspong, Sweden

Continuation of Ser. No. 491,838, July 25, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,281

Claims priority, application Sweden, Aug. 1, 1973, 7310582

Int. Cl.^{2} F16C *17/04*

U.S. Cl. 308—135 **3 Claims**



1. In a thrust bearing having separate tiltably mounted bearing blocks annularly arranged surrounding the bearing axis and movably supported in a direction axial to the blocks, the improvement of a double acting thrust bearing enabling directing of the bearing pressure to displace a shaft in one or the other direction comprising a bearing box for positioning about a shaft, two groups of a plurality of separate bearing blocks arranged in plane ring segments on each side of the box for serving as a double acting bearing, each separate bearing block being movably supported on a hydraulic piston movable axially in a corresponding hydraulic cylinder formed in the corresponding side of the bearing box, the plurality of hydraulic cylinders on one side of the bearing box being interconnected by hydraulic pressure transmitting channels to form a pressure chamber in the corresponding side of the bearing box, the respective pressure chambers each being individually connected to a separate hydraulic pressure source so that each pressure chamber may possess variable pressure levels dependent upon the direction of the bearing pressure, the hydraulic pistons of one side of the bearing box being connected to the corresponding hydraulic pistons of the other side by a piston rod means slidably accommodated in bores in the bearing box

and sealing means preventing fluid communication between the opposite pressure chambers.

4,035,042
THRUST BEARING

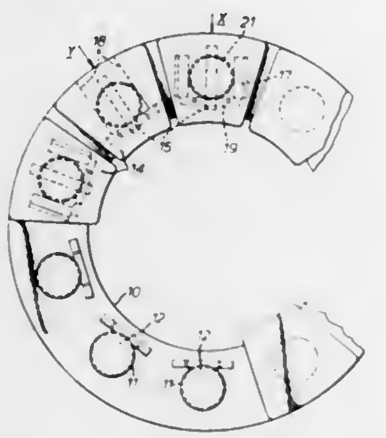
John Black O'Rourke, Uxbridge, and Peter Gordon Stopp, Hillingdon, both of England, assignors to The Glacier Metal Company Limited, England

Filed Mar. 19, 1976, Ser. No. 668,466

Claims priority, application United Kingdom, Mar. 20, 1975, 11685/75

Int. Cl.² F16C *17/06*

U.S. Cl. 308—160 **8 Claims**



1. A thrust bearing comprising:
a housing,
an annular ring of thrust pads in the housing,
a thrust pillar for each pad, each of said thrust pillars having opposed planar ends, and each pad being mounted on one of said planar ends of its pillar,
means provided either on each of said thrust pillars or each of said thrust pads for rendering said thrust pads capable of tilting on said thrust pillars, the pillars being located axially by having the other planar ends thereof disposed against a wall of the bearing housing, and
a cage ring locating the pillars circumferentially.

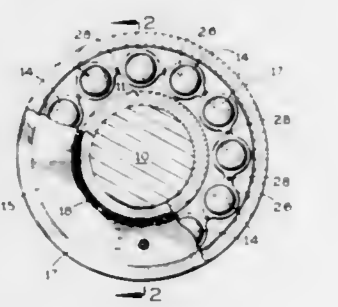
4,035,043
SIDE RACE BALL BEARING

Christian D. Markley, P.O. Box 384, Key West, Fla. 33040

Filed Apr. 8, 1976, Ser. No. 671,616

Int. Cl.² F16C *19/18*

U.S. Cl. 308—174 **19 Claims**



1. In a ball bearing having:
an annular inner race;
an annular outer race;
one of said races having an annular, concave bearing surface that faces in one axial direction;
the other of said races having an annular, concave bearing surface that is spaced axially from and faces toward said bearing surface of said one race;
and a row of circumferentially arranged, identical, spherical bearing balls engaged axially between said bearing surfaces of the inner and outer races;
each of said concave bearing surfaces of the inner and outer races projecting both radially inward and radially outward past the axial centerline of each ball;
the improvement wherein:
each of said concave bearing surfaces of the inner and outer races has a compound curvature with a first location of minimum radius from the center of each ball which is offset radially outward from the axial centerline of the ball and a second location of minimum radius from the center of each ball which is offset radially inward from the axial centerline of the ball, said minimum radius of the concave bearing surfaces being substantially equal to the radius of each ball, and each of said concave bearing surfaces throughout its annular extent having a larger radius from the center of each ball throughout its extent radially outward from said first minimum radius location thereon and throughout its extent radially inward from said second minimum radius location thereon.

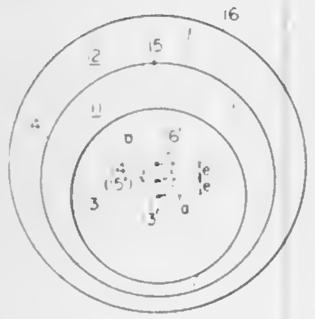
4,035,044
BEARING ASSEMBLY

Sadao Miyazaki, 17-10, Kaminoge 4, Setagayaku, Tokyo 158, Japan

Filed June 17, 1976, Ser. No. 696,933

Int. Cl.² F16C *33/30*

U.S. Cl. 308—183 **10 Claims**



1. A bearing assembly adjustable itself to provide a precise axial alignment of a shaft rotatably supported by the bearing with a predetermined reference position, comprising:
at least two rings each having axes of the outer circumference and the inner circumference eccentric at a predetermined value of eccentricity, said rings being disposed successively one inside the other in a manner such that an inner ring slidably rotatably contacts about its outer circumference the inner circumference of its immediately outer ring, the outermost ring being fitted into a receiving bore of a bearing support member, the innermost ring being fitted about the rotatable shaft receiving the latter through bearing means; and
a fastening means releasably holding the rings against rotation relative to each other and said receiving bore.

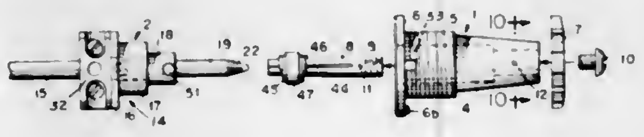
4,035,045
GROUNDING JACK

Tony Trevithick, Gurnee, Ill., assignor to Daniel Woodhead, Inc., Northbrook, Ill.

Filed Jan. 24, 1974, Ser. No. 436,178

Int. Cl.² H01R *3/06, 13/32*

U.S. Cl. 339—14 R **4 Claims**



1. A grounding jack adapted for use in association with the wall-mounted box of a grounded electrical receptacle in patient load centers of hospitals, and the like, comprising
a. a female portion including
1. an elongated outer covering of insulation material terminating at one end thereof in an enlarged annular flange member having inner and outer faces,
2. an inner current-carrying sleeve member fixed within said covering and adapted to be connected to ground,
b. said female portion being adapted to be received within an opening in the cover of said wall-mounted box with the inner face of said flange member abutting against the outer surface of said cover,
c. means to secure said female portion in place with respect to said box,
d. a male portion including
1. an elongated outer covering of insulation material, and
2. an inner current-carrying plug member having one end thereof extending outwardly beyond one end of said covering and adapted to be snugly received within said current-carrying sleeve member in contact therewith,
e. an axial slot in said flange member extending inwardly from the outer face thereof and communicating at the inner end thereof with an annular passage,
f. a radially extending locking lug on the outer covering of said male portion adapted to be received in said axially extending slot in said flange member, said male and female portions being relatively rotatable when in assembled relation, so that said locking lug will traverse the associated annular passage to the locking position thereof.

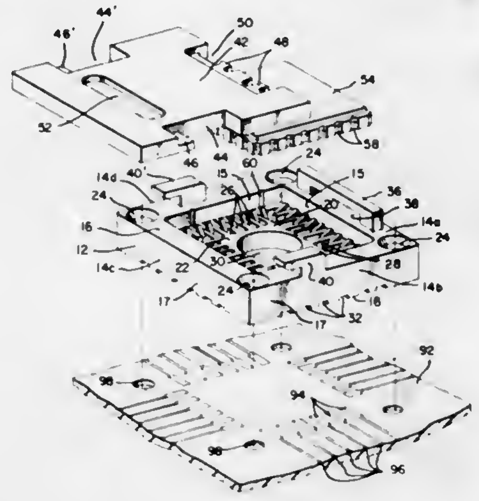
4,035,046
MINIATURE ELECTRICAL CONNECTOR FOR PARALLEL PANEL MEMBERS

James Albert Kloth, North St. Petersburg, Fla., assignor to AMP Incorporated, Harrisburg, Pa.

Filed Jan. 15, 1976, Ser. No. 649,438

Int. Cl.² H01R *9/04*

U.S. Cl. 339—17 CF **13 Claims**



1. An electrical connector for connecting a rectangular array of discrete terminal pads spaced-apart by a predetermined distance on a ceramic chip substrate carrier to corresponding terminal pads also spaced-apart by said predetermined distance in a similar rectangular array on a printed circuit board, said connector comprising:
a generally rectangular insulating supporting housing member, said member having first and second opposed, generally flat, parallel faces extending around the periphery of said housing member,
a substrate carrier support surface which is parallel to said first and second parallel faces and is located between said faces,
a plurality of cavities extending between said first face and said substrate carrier support surface, said cavities being generally spaced-apart by said predetermined distance,
a plurality of ribs, one of said ribs extending between each pair of adjacent cavities, said ribs extending transverse to said first face and said substrate carrier support surface,
a plate-like member on one side of said rectangular housing member extending transverse to said second face,
an elongated slot in said plate-like member, one edges of said slot comprising a portion of said second face,
two L-shaped members extending upwardly from said second face, said L-shaped members being on opposed sides of said housing member, said L-shaped members facing away from said elongated slot,
a plate-like cover member, said cover member having recesses extending inwardly from opposed sides and a flange extending parallel to the plane of said cover member and into each of said recesses,
tabs extending transverse to a third side of said cover member, said third side extending between said opposed sides of said cover member,
contact terminal means located in each of said cavities, said terminal means extending between said first face and said substrate carrier support surface,
whereby said ceramic chip substrate carrier can be positioned on said carrier support surface and said first face can be positioned on said printed circuit board with said terminal means establishing electrical contact between corresponding terminal pads on said ceramic chip substrate carrier and said printed circuit board and with said cover member positioned against said second face with said tabs engaging said slot and said flanges engaging said L-shaped members.

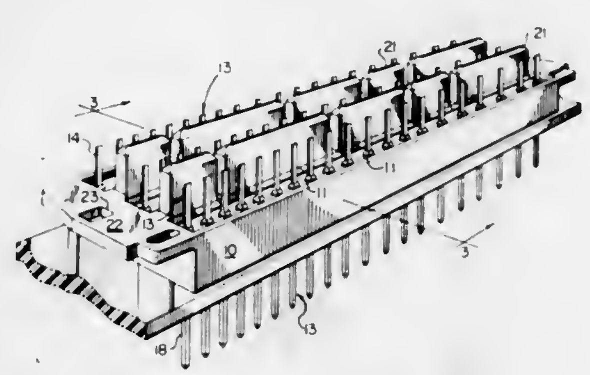
4,035,047
ELECTRICAL CONNECTOR

John Preston Ammon, Dallas, Tex., assignor to Elfab Corporation, Dallas, Tex.

Continuation of Ser. No. 534,442, Dec. 19, 1974, abandoned. This application Mar. 18, 1976, Ser. No. 668,219

Int. Cl.² H01R *13/04*

U.S. Cl. 339—17 C **11 Claims**

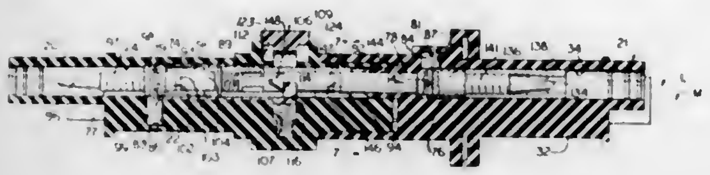


1. An electrical connector comprising:
an insulative substrate having contact receiving holes therein, said holes forming arrays lying along linear paths;
an insulative block having a plurality of sleeves formed therethrough, said sleeves being spaced for axial alignment with the apertures in said substrate; and
contacts received into the sleeves through said insulative block, said contacts each including intermediate portions being held within said block by frictional engagement with the inner walls of the sleeves, said contacts having lower portions rigidly mounted into the apertures in said substrate by press fitting, said contacts being held within the insulator sleeves by a retention force which is significantly less than the retention force holding the contact portions press fitted into the apertures in said mounting substrate to permit removal of the insulator from around the contacts without disturbing the rigid mounting of the contacts within the substrate.

4,035,048
GROUNDED CABLE CONNECTOR ASSEMBLY

Robert E. Piaget, and Charles W. Clyburn, both of Cincinnati, Ohio, assignors to I.C.M. Industries, Inc., Cincinnati, Ohio, a part interest

Filed Oct. 31, 1974, Ser. No. 568,361
Int. Cl.² H01R *13/54*
U.S. Cl. 339—91 R **14 Claims**

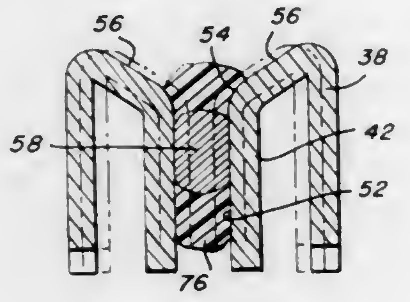


1. A cable connector assembly which comprises a pair of connector bodies, a pair of spaced parallel cable contact members mounted in each connector body, each cable contact member of one connector body being engageable with one of the cable contact members of the other connector body, a male ground contact member mounted in one of the connector bodies parallel to the cable contact members thereof and having a recess extending laterally therein, a female ground contact member mounted in the other cable connector body parallel to the cable contact members thereof, latch means in said other connector body movable transversely of the female ground contact member, first means precluding movement of said latch means into the path of said male ground contact member when the connector bodies are not in assembled relation and not precluding movement of the latch means into said recess in the male ground contact member when the connector bodies are in assemblied relation to present an abutment face in the path of withdrawal of a portion of the male ground contact member from the female ground contact member, means for attaching electrical cables to the cable contact members and means for attaching ground conductors to the ground contact members.

4,035,049
UNIVERSAL SOLDERLESS TERMINATION SYSTEM

William H. McKee, West Covina, Calif., assignor to TRW Inc., Elk Grove Village, Ill.

Filed Feb. 10, 1976, Ser. No. 656,866
Int. Cl.² H01R *9/08*
U.S. Cl. 339—97 R **22 Claims**



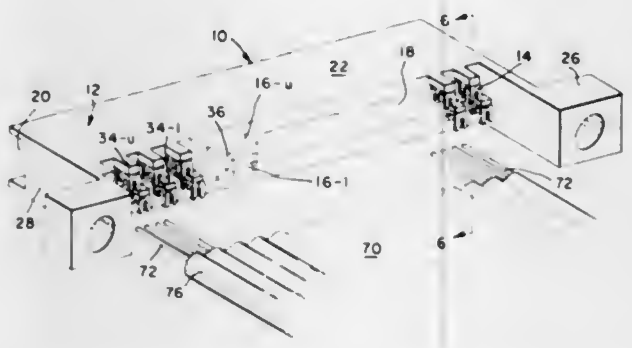
1. An electrical connector for interconnecting a plurality of insulation covered electrical conductors comprising an insulating housing and a plurality of contact elements of thin sheet metal construction mounted in the insulating housing, each contact element having a mating portion and a conductor termination portion, said termination portion including:

a pair of sidewall sections and a floor extending substantially therebetween to define an elongated channel;
at least one tab integral with and extending from the top edge of one of said sidewall sections, said tab being folded inward along said top edge and extending down toward said floor to define a contact jaw in said channel for electrically engaging a conductor inserted into the channel.

4,035,050
RIBBON COAXIAL CABLE CONNECTOR

Robert Volinskie, Hershey, Pa., assignor to AMP Incorporated, Harrisburg, Pa.

Filed May 5, 1976, Ser. No. 683,575
Int. Cl.² H01R *11/20, 13/46*
U.S. Cl. 339—99 R **2 Claims**



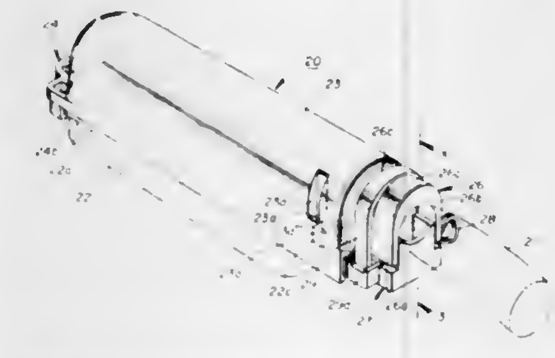
1. An electrical connector for a plurality of wires, which comprises:

a. an insulating housing having two rows of passages extending therethrough, one row overlying the other with each passage in the upper row being in direct alignment with a passage in the lower row, and further a platform extending outwardly from an edge defining an end face of each passage with the platforms in the upper row being laterally offset relative to the platforms in the lower row; and
b. a plurality of conductive contact members position in said passages, each contact member having on one end a terminal section projecting outward from an end face of the passages, said terminal sections in the upper row being laterally offset relative to the terminal sections in the lower row so that the base of each terminal section is in direct and abutting alignment with a platform, further each terminal section having on the surface opposite the base wire-receiving means for receiving and electrically terminating a wire, said wire-receiving means on all the terminal sections being oriented in the same direction.

4,035,051
ADJUSTABLE MOLDED HOOD ASSEMBLY FOR A CABLE CONNECTOR PLUG

Rodney J. Guy, Boulder, Colo., assignor to Western Electric Company, Inc., New York, N.Y.

Filed Oct. 19, 1976, Ser. No. 733,837
Int. Cl.² H01R *13/58*
U.S. Cl. 339—103 R **21 Claims**



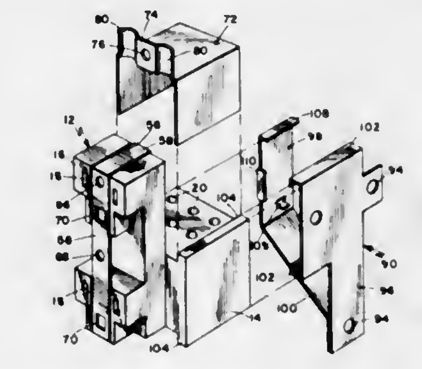
18. A cable terminating assembly, said composite assembly comprising:

a multi-conductor cable;
a cable connector plug having a plurality of electrical conductor-receiving terminals formed therein;
a cable tie, and
a main hood body having a cable-receiving opening at one end, and formed with an open sided connector-plug receiving cavity dimensioned to allow the terminating ends of the cable conductors to be separated from each other, connected to the respectively associated ones of the connector plug terminals, and shielded from the outside;
an integral hood extension that extends rearwardly from the open end of said hood body, and being formed into a substantially U-shaped configuration for telescopically receiving a pressure pad, with inner surface portions of the sidewalls thereof including integral guide means;
a cable engaging pressure pad formed with mutually disposed sides that are contoured to cooperate with said guide means formed in said extension so as to insure the accurate orientation of said pressure pad when telescopically received within said hood extension, said pressure pad further including at least one cable-engaging strain-relief rib that cooperates with inner contoured wall areas of said main hood body and hood extension to produce a strain-relief type of undulation in a terminating section of the cable confined within said hood;
integral retainer means formed in a forward end portion of said hood that cooperate with aligned forward portions of the connector plug so as to effect a snap-on type of engagement therebetween;
securement means formed near the rearward end of said hood body that allows positive slide-in engagement of aligned securement elements forming a part of the connector plug such that no separate and loose fastening members are required to effect reliable and permanent securement of the hood to the connector plug, and wherein
said cable tie is dimensioned to encircle said hood extension and pressure pad after a terminating section of said cable has been positioned therebetween, and wherein
said integral hood extension and pressure pad further selectively include a recessed area adapted to receive at least a portion of the cable tie head, and to confine the latter as said cable tie is drawn sufficiently taut so as to reliably clamp said cable between said hood extension and pressure pad, and produce said strain-relief undulation therein.

4,035,052
QUICK CONNECTOR ELECTRICAL UTILITY BOX

Louis Marrero, 13004 Via del Valedor, San Diego, Calif. 92129

Filed May 14, 1973, Ser. No. 359,982
Int. Cl.² H01R *13/60*
U.S. Cl. 339—122 F **8 Claims**



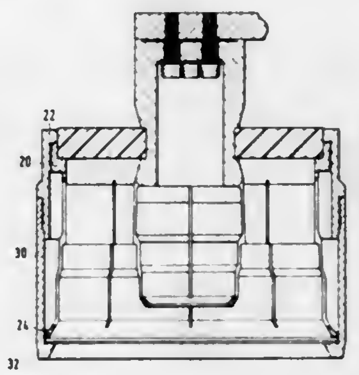
1. An electrical utility box assembly comprising:

a. a mounting bracket having a plurality of parallel tracks integral with said mounting bracket;
b. a wiring box with outlet openings therein and having
   i. a plurality of parallel rails complementing said tracks such that said wiring box is slideably receivable in said bracket, and
   ii. an electrical connection means mounted in said box and including
      a. terminal means connectable to wires, and
      b. a conductor means connected to certain of said terminal means and accessible from without said wiring box through said outlet openings;
   iii. a groove in the side thereof; and
c. a locking means for securing said wiring box against sliding in said bracket comprising:
   i. a tongue integral with said bracket which registers with said groove when said wiring box is inserted a predetermined distance into said bracket; and
   ii. a spring means biasing said tongue into said groove.

4,035,053
COAXIAL HF CONNECTOR

Georg Spinner, Am Eichberg 12, Feldkirchen, Westerham, Germany

Filed Nov. 11, 1975, Ser. No. 630,927
Claims priority, application Germany, Nov. 13, 1974, 2453841
Int. Cl.² H01R *13/06, 13/12, 17/06*
U.S. Cl. 339—177 E **9 Claims**



1. An electric conductor plug contact socket for a coaxial HF connector, comprising:

said socket having a front end and also having a rear end; said socket rear end being connectable to a conductor;
said socket having a front end portion extending rearwardly from its said front end; said socket having a step engageable by a plug means with which said socket cooperates; said step being at and defining the rear end of said socket front end portion;
said socket having small thickness, and a generally tubular construction; said socket front end portion being longitudinally slitted, with a plurality of slits, thereby dividing said front end portion into a plurality of small thickness contact sectors;
a closed ring at said socket front end; said slits beginning rearwardly of said closed ring; said closed ring having a first diameter;
substantially the entire said front end portion having a gradual conically tapering shape moving away from said front end toward said step and gradually tapering in diameter generally away from said first diameter;
said socket being so shaped and arranged that upon engagement of said socket and a plug means, said front end portion sectors are deformable toward said first diameter of said front end ring;
a second step of steeper conicity than the rest of said front end portion and defined in said front end portion and extending across all said slits; said second step dividing said front end portion into two gradual conically tapering parts.

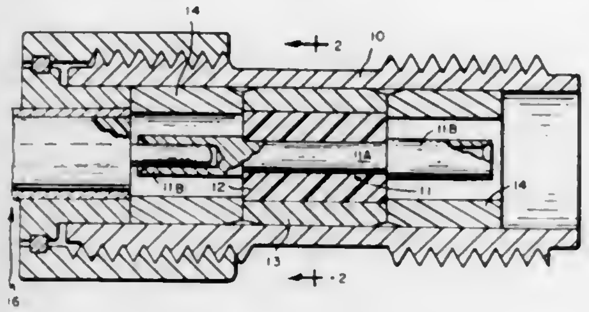
4,035,054
COAXIAL CONNECTOR

Ernest W. Lattanzi, Melrose, Mass., assignor to Kevlin Manufacturing Company, Woburn, Mass.

Filed Dec. 5, 1975, Ser. No. 637,935

Int. Cl.² H01R *17/04*

U.S. Cl. 339—177 R **12 Claims**



1. A coaxial connector comprising

a housing member adapted for mechanical engagement with a coaxial cable;

a center conductor member;

a dielectric member within which a central portion of said center conductor member is retained;

a conductive insert member within which said dielectric member and said portion of said center conductor member are retained to form an inner contact assembly, said inner contact assembly being positioned within said housing member at a preselected position therein, said center conductor member having further portions extending beyond said dielectric member and said conductive insert member coaxially of the interior of said housing member;

first and second conductive ring members fixedly positioned within said housing member adjacent each end of said inner contact assembly and out of contact with said center conductor member, the inner diameters of said ring members being smaller than the outer diameter of said dielectric member whereby said inner contact assembly is fixedly held at said pre-selected position within said housing member to prevent axial movement of said center conductor member therein.

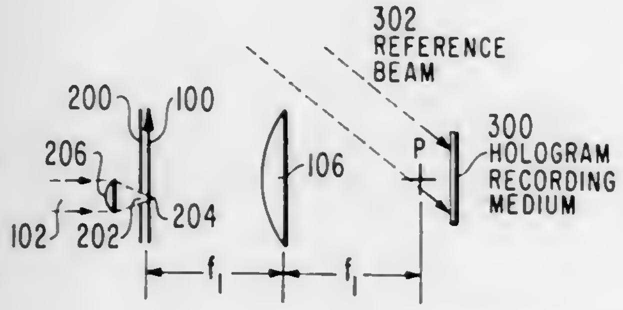
4,035,055
COHERENT WAVE IMAGING AND/OR RECORDING TECHNIQUE FOR REDUCING THE GENERATION OF SPURIOUS COHERENT-WAVE IMAGE PATTERNS

Michael Jay Lurie, East Brunswick, N.J., assignor to RCA Corporation, New York, N.Y.

Filed July 30, 1975, Ser. No. 600,507

Int. Cl.² G03H *1/16;* **G02B** *27/38*

U.S. Cl. 350—3.5 **8 Claims**



1. In a coherent-wave imaging and/or recording system including means for imaging and/or recording object-information from an object illuminated with coherent-wave energy, the improvement therein for reducing spurious coherent wave image patterns due to blemishes in said means for imaging and/or recording object information, said improvement comprising:

an optical system including masking means for sequentially imaging and/or recording object information of relatively small separate elemental regions of said object with divergent coherent wave energy from each respective separate region of said object, said coherent wave energy from each respective separate region being passed during each of said sequential imagings and/or recordings through a relatively large portion of the aperture of said imaging and/or recording means with respect to the size of an elemental region of said object.

4,035,056
BIPHENYL DERIVATIVE COMPOUNDS AND LIQUID CRYSTAL MATERIALS AND DEVICES CONTAINING SUCH COMPOUNDS

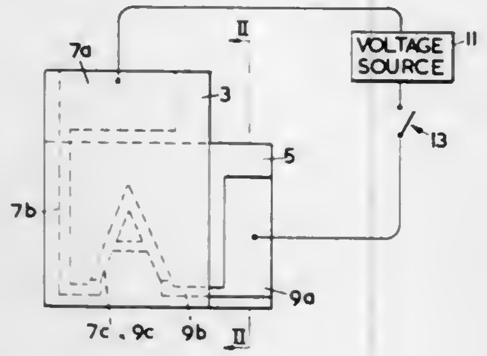
David Coates, Hessle, and George William Gray, Cottingham, both of England, assignors to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed Apr. 16, 1976, Ser. No. 677,820

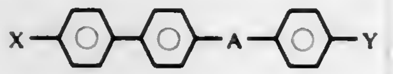
Claims priority, application United Kingdom, Apr. 22, 1975, 16643/75

Int. Cl.² G02F *1/13;* **C09K** *3/34;* **C07C** *121/64, 121/60, 121/66*

U.S. Cl. 350—160 LC **15 Claims**



1. A compound having the formula



(1)

and (2) derivatives thereof having one or more rings substituted with Cl or CH_3; and (3) derivatives of (1) or (2) having a group bridging two ortho positions adjacent to the interannular bond of the biphenyl ring system selected from the group consisting of $>CH_2$;$>C{=}O$ and $-HC{=}CH-$; wherein A is $(CH_2)_n$; $(CH_2)_nO$ or $O(CH_2)_n$; n is an integer of 1 to 4; and one of the groups X and Y is a cyano group and the other is hydrogen, alkyl, alkoxy or alkanoyloxy.

4,035,057
FLOOR OR CEILING SUPPORT MOUNTED MICROSCOPE FOR MICROSURGICAL APPLICATIONS

Friedrich Klein, Wedel, Holstein, Germany, assignor to J.D. Möller Optische Werke GmbH, Wedel, Holstein, Germany

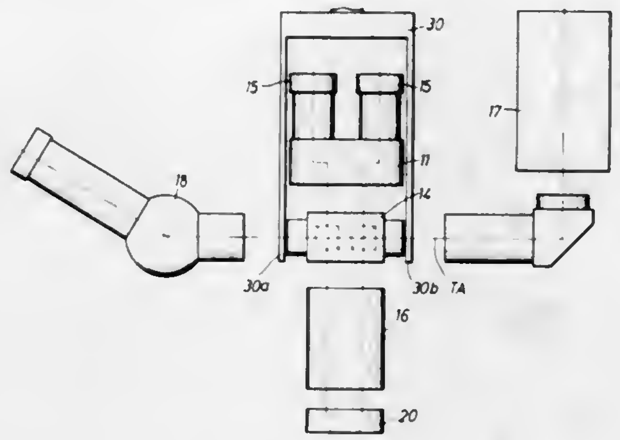
Filed July 22, 1975, Ser. No. 597,992

Claims priority, application Germany, Aug. 27, 1974, 2440958

Int. Cl.² G02B *23/16, 21/18*

U.S. Cl. 350—85 **3 Claims**

1. A microscope assembly for microsurgical applications adapted for mounting from a support and to have accessory units mounted in cooperative relationship therewith, said assembly comprising a microscope including a viewing unit, an eyepiece, an objective and a magnification changer, said microscope being arranged to define a main viewing path extending in a given direction along the optical axis of said objective, suspension mounting means defining a pivot axis extending perpendicularly to said given direction pivotally mounting said microscope from said support to enable rotative change of said viewing direction around said pivot axis, a beam splitter mounted intermediate said viewing unit and said magnification changer defining an auxiliary viewing path for said accessory units, said auxiliary viewing path extending at least over a portion of its length perpendicularly to said given direction of said main viewing path and coincident with said pivot axis of said microscope, said pivot axis defined by said suspension mounting means having an open central portion to define therethrough the coincident portion of said auxiliary viewing path, and at least one accessory unit mounted to receive an image identical to the image received by said microscope along said auxiliary viewing path.



4,035,058
ELECTRO-OPTICAL SWITCH AND A METHOD OF MANUFACTURING SAME

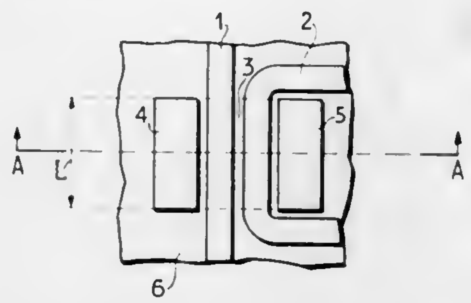
Michel Papuchon, Paris, France, assignor to Thomson-CSF, Paris, France

Filed June 10, 1975, Ser. No. 585,577

Claims priority, application France, June 14, 1974, 74.20717

Int. Cl.² G02B *5/14*

U.S. Cl. 350—96 C **7 Claims**



1. An electro-optical switch for conveying radiated energy from a first electro-optical guide to a second electro-optical guide wherein parts respectively of said first and second guides constituted by a ferroelectric material are arranged parallel with one another over a given length, known as the coupling length, at a distance from one another, said distance being adapted for causing the energy conveyance, said parts of said first and second guides being polarized in a transverse direction and in opposite senses, said electro-optical switch further comprising control means for delivering a control signal and electrical inductive means controlled by said control signal for applying to said parts of guides an electric field parallel to said transverse direction, said electric field inducing opposite index changes in said parts of guides, the conveyance of said energy being induced and stopped according to said changes.

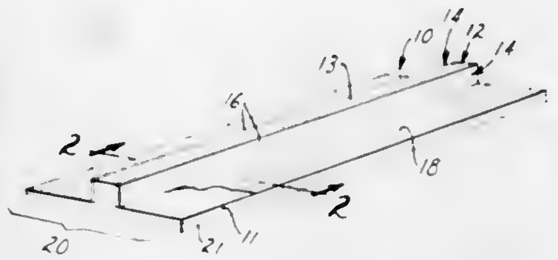
4,035,059
LOW-PROFILE RAISED RETROREFLECTIVE PAVEMENT MARKER

Robert D. DeMaster, Afton, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed June 13, 1975, Ser. No. 586,578

Int. Cl.² G02B *5/13*

U.S. Cl. 350—105 **8 Claims**



1. A low-profile raised retroreflective pavement marker that resists loosening and removal from a paved surface, comprising a flat dead-soft metal base sheet and a narrow elongated retroreflective strip adhered to one face of the base sheet; said strip being less than about one centimeter high, less than the base sheet in width, and comprised of an elastically deformable main body portion and an elastically deformable retroreflective structure that is united to the main body portion so as to form the exterior surface of at least portions of the strip, said exterior surface portions being at an angle of at least 20° to the base sheet.

4,035,060
ELECTRO-OPTIC DEVICE

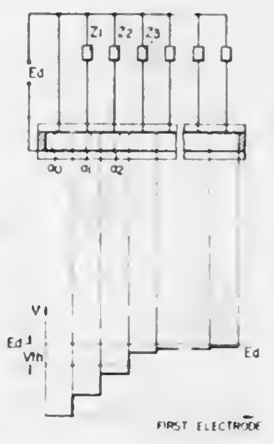
Ichiro Tsunoda; Satoshi Takeuchi, both of Kawaski; Yoichiro Hirao, Tokyo; Takeo Suzuki, Tokyo; Yoshihiro Nishiue, Tokyo; Katsumasa Tadokoro, Tokyo; Toshimasa Fukagawa, Tokyo; Isamu Harada, Warabi; Akira Misawa, and Kazuo Watanabe, both of Tokyo, all of Japan, assignors to Dainippon Printing Co., Ltd, Tokyo, Japan

Continuation-in-part of Ser. No. 399,481, Sept. 21, 1973, Pat. No. 3,944,330. This application Nov. 13, 1975, Ser. No. 631,706

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.² G02F *1/13*

U.S. Cl. 350—160 LC **11 Claims**



1. An electro-optic device comprising a first transparent substrate, a second substrate juxtaposed to the first substrate, a body of electro-optically variable liquid disposed between said substrates, a plurality of first electrodes disposed on the surface of the first substrate facing the second substrate, each individual one of said plurality of first electrodes having an area different from the area of the others, a second electrode provided on the surface of the second substrate facing the first substrate, said liquid interposing internal impedance between

said first electrodes and said second electrode, and a plurality of impedance elements external to said substrates and liquid, the impedances of different ones of said impedance elements being different from each other; each of said first electrodes being connected through a respective one of said impedance elements to a terminal of a voltage source, and said second electrode being connected to another terminal of the voltage source, so that there are a plurality of parallel circuits each comprising a respective one of said impedance elements in series with the respective internal impedance between a respective one of said first electrodes and said second electrode, whereby in each of said parallel circuits a first part of the voltage supplied from the voltage source exists across the respective internal impedance and a second part of the voltage from the voltage source exists across the respective impedance element, the ratios of the first part to the second part of the voltage being different at the different respective parallel circuits.

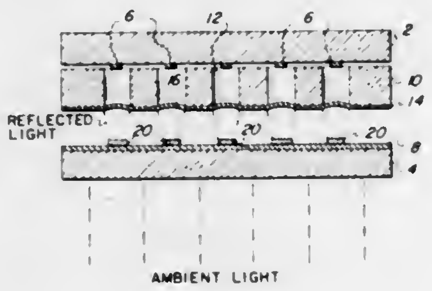
4,035,061
HONEYCOMB DISPLAY DEVICES

Nicholas K. Sheridon, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Mar. 26, 1976, Ser. No. 670,807

Int. Cl.² G02F *1/16*

U.S. Cl. 350—161 S **16 Claims**



1. An optical display system comprising:

an array of focusable imaging elements,

an array of light absorbing elements, one of said array of light absorbing elements being aligned with each one of said focusable imaging elements, and

means for changing the focusing point of the light rays incident upon selected of said imaging elements whereby the light rays incident upon said selected imaging elements are focused differently than is the light rays incident upon other of said imaging elements such that the amount of light rays falling upon the light absorbing elements aligned with said selected imaging elements is different than the amount of light rays falling upon said light absorbing elements aligned with said other of said imaging elements.

4,035,062
METHOD AND APPARATUS FOR PRODUCING AN IMAGE FROM A TRANSPARENT OBJECT

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Sing H. Lee, Del Mar, Calif., and Arnold R. Shulman, Bethesda, Md.

Filed Dec. 30, 1975, Ser. No. 645,500

Int. Cl.² G02B *5/08, 5/18*

U.S. Cl. 350—162 SF **15 Claims**

1. A method of producing an image from a transparent object disposed within the path of a coherent energy beam, comprising the steps of:

focusing said beam on a partially reflective and partially transmissive surface, said surface being inclined at an oblique angle to said object and having a first surface coated with an anti-reflecting material and a second surface coated with a partially reflecting and partially transmitting material;

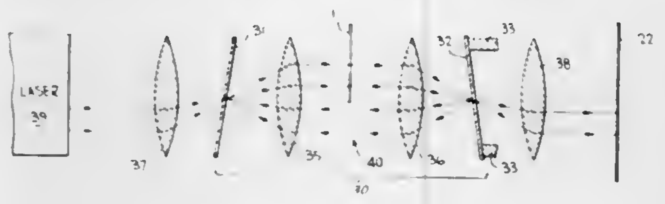
transmitting said beam through said surface;

collimating said trnasmitted beam;

passing said collimated beam through said object to form an image thereof;

focusing said image on another partially reflective and partially transmissive surface, said another surface being inclined opposite to and at said same oblique angle as said surface and having a first surface coated with an anti-reflecting material and a second surface coated with a partially reflecting and partially transmitting material;

reflecting said image from said another surface to said surface without passing through said object for selectively and independently filtering said reflected image;



re-reflecting said reflected image from said surface;

collimating said re-reflected image from said surface;

passing said collimated image through said object to form an enhanced image thereof;

enhancing said enhanced image plural times;

focusing said enhanced image on said another surface;

transmitting said enhanced image through said another surface; and

varying the distance between said surface and said another surface as a function of the wavelength of said beam for selectively increasing and decreasing the contrast of said enhanced image and for selectively making said enhanced image positive and negative relative to said object.

4,035,063
COMPACT WIDE-ANGLE PHOTOGRAPHIC LENS SYSTEM WITH A SHORT OVERALL LENGTH

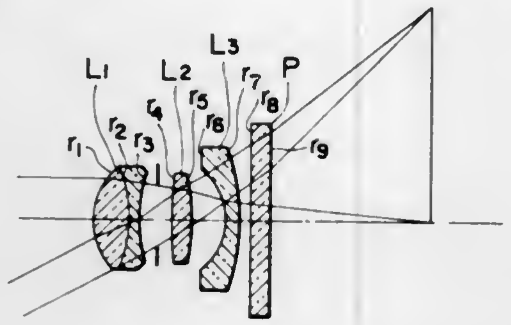
Yoshitsugi Ikeda, Hachioujl, Japan, assignor to Olympus Optical Co., Ltd., Japan

Filed May 13, 1975, Ser. No. 577,017

Claims priority, application Japan, May 14, 1974, 49-52837

Int. Cl.² G02B *3/04*

U.S. Cl. 350—189 **8 Claims**



1. A compact wide-angle photographic lens system with a short overall length comprising: a first, second and third lens components and a transparent plate member, said first lens component being a cemented doublet lens consisting of a positive lens and negative lens, said second lens component being a positive lens, and said third lens component being negative meniscus lens with its concave surface positioned toward the object side, said compact wide-angle photographic lens system with a short overall length satisfying the following conditions (1) through (4), said transparent plate member being arranged between said third lens component and image plane and having at least one surface formed as an aspherical

surface expressed by the following formulas (5) when the direction of the optical axis is represented by *x* axis and the direction perpendicular to the optical axis is represented by *y*axis:

1. $0.8f < f_1\ 1.56f$
2. $0.46f < -f_3 < 0.62f$
3. $0.30f < -r_5 < 0.56f$
4. $0.15f < -r_6 < 0.19f$
5. $x = Ay^4 + By^6 + Cy^8 + Dy^{10}\ \left|A\right| < 5/f^3 .\ B \times C < 0$

wherein reference symbol f represents the focal length of the lens system as a whole, reference symbols f_1 and f_3 respectively represent focal lengths of the first and third lens components, and reference symbols r_5 and r_6 respectively represent radii of curvature of the surface on the image side of the second lens component and of the surface of the object side of the third lens component.

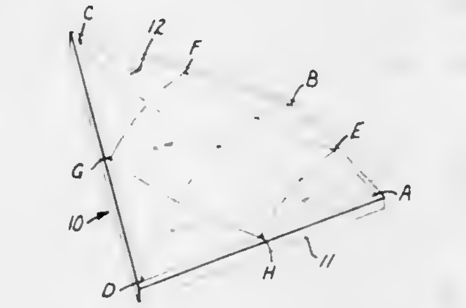
4,035,064
LIGHT CONCENTRATOR HAVING AN ANTICLASTIC REFLECTIVE SURFACE

Charles D. Cowman, Jr., St. Paul, Minn., and John P. G. Shepherd, River Falls, Wis., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Mar. 20, 1975, Ser. No. 560,541

Int. Cl.² G02B *5/10*

U.S. Cl. 350—293 **11 Claims**



4. An article having an anticlastic surface and comprising an elastic web having a specular reflective surface, spaced elongate rigid support members attached to opposite ends of said web and angularly offset about their mutual axis supporting said web for said reflective surface to occupy a minimum surface area between said supports and to have essentially straight lines connecting corresponding ends of said support members.

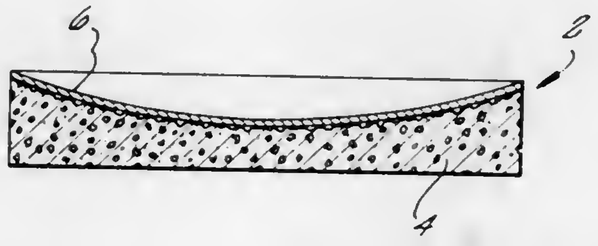
4,035,065
LIGHTWEIGHT REFLECTOR ASSEMBLY

James C. Fletcher, Administrator of the National Aeronautics and Space Administration, with respect to an invention of Maurice J. Argoud, Los Angeles, Calif.; Jack Jolley, Venice, Calif., and Walter L. Walker, Duarte, Calif.

Filed Sept. 24, 1975, Ser. No. 617,202

Int. Cl.² G02B *5/08;* B02B *7/18*

U.S. Cl. 350—310 **17 Claims**



1. A nonplanar solar energy reflector assembly for the reflection of solar energy comprising:

a nonplanar reflective member capable of reflecting solar energy including a protective outer thin glass surface having a sealed interior reflective surface and

a foam glass substrate member of cellular structure having approximately the same coefficient of thermal expansion as the reflective surface, the substrate member directly bonded to the reflective surface.

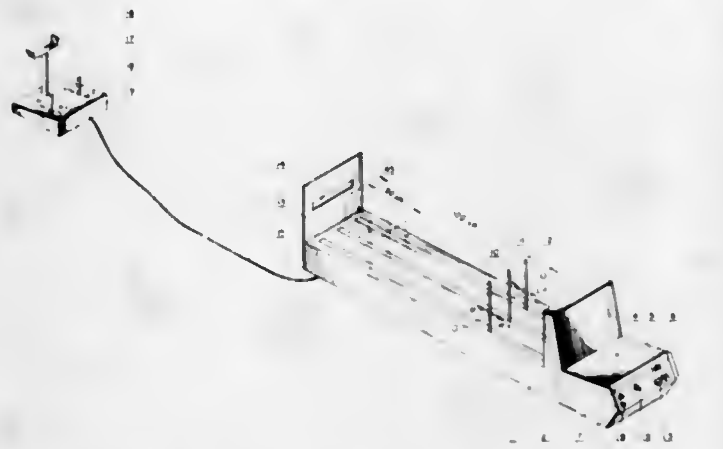
4,035,066
APPARATUS FOR TESTING STEREOSCOPIC VISION

Waclaw Kazimierz Slomski, 426 Wilkinson St., Syracuse, N.Y. 13204

Filed Mar. 19, 1975, Ser. No. 557,662

Int. Cl.² A61B *3/08*

U.S. Cl. 351—3 **3 Claims**



1. Apparatus for testing stereoscopic vision which comprises:

a casing having at least two longitudinal parallel side-by-side paths,

a mechanism mounted in said casing to be movable parallel to said paths and to be selectively positioned at various locations therein,

a first measuring means affixed to said mechanism which is located in one of said paths,

a second measuring means movably mounted in said mechanism which is in the other of said paths, driving means mounted in said mechanism for moving said second measuring means in either direction relative thereto and connective means for selectively connecting said second measuring means to said driving means,

a control desk provided with means for directing movement of said measuring means in either direction along said other path by actuating said connective means, said control desk being selectively fixed relative to said casing whereby a person being tested who is located at said control desk simultaneously views both said measuring means and controls the movement of said second measuring means to align same with said first measuring means by selectively connecting said second measuring means to said driving means.

4,035,067
CINECONVERSION MACHINE

Thomas Whatley, Washington, D.C., and William Drennen, Jr., Great Falls, Va., assignors to COMCORPS Communication Corporations Inc., Washington, D.C.

Continuation-in-part of Ser. No. 543,952, Jan. 24, 1975, which is a continuation of Ser. No. 297,241, Oct. 13, 1972, Pat. No. 3,867,022, which is a continuation-in-part of Ser. No. 92,315, Nov. 23, 1970, abandoned, which is a continuation-in-part of Ser. No. 866,240, Oct. 14, 1969, abandoned. This application Sept. 16, 1975, Ser. No. 613,798

Int. Cl.² G03B *21/32*

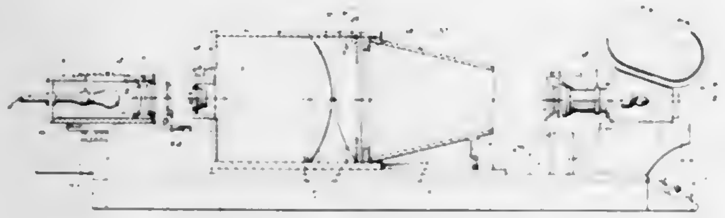
U.S. Cl. 352—85 **6 Claims**

1. An optical system or reproducing a picture with a variable rate of magnification, comprising:

support means for a picture to be reproduced on a distant receiving surface;

a projection objective rearwardly of said support means with a forward focal point to the rear of said support means for forming an aerial image of said picture at a location remote from said projection objective;

condensing lens means of a diameter substantially exceeding that of said projection objective positioned to intercept converging rays from said projection objective for locating said aerial image in a first intermediate plane proximal mal to said condensing lens means and training a diverging light cone from each point of said aerial image upon an optical axis common to said projection objective and said condensing lens means, each light cone having a centerline intersecting said axis in a common point conjugate to the rear nodal point of said projection objective; and



a varifocal objective centered on said axis rearwardly of said condensing lens means for projecting said aerial image with variable magnification rate upon a receiving surface to the rear thereof, said varifocal objective having a front component defining a natural entrance pupil and including a forward lens member disposed in a second intermediate plane substantially passing through said common point in which the cross-sectional area of each light cone from said aerial image is large enough for full illumination of said entrance pupil by light from all the points of said aerial image;

said front component comprising collimating lens means including said forward lens member of a focal length slightly exceeding the distance between said intermediate planes, thereby shifting the apparent origins of said light cones to a plane located forwardly of said first intermediate plane.

4,035,068

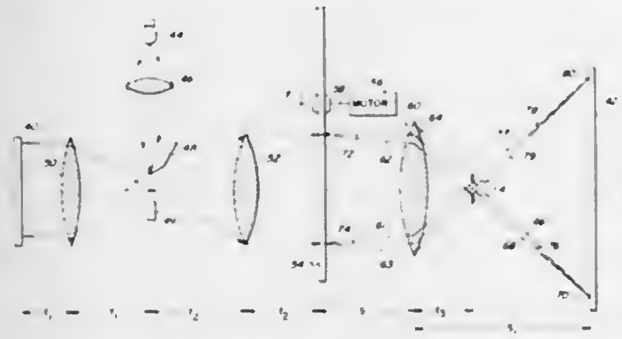
SPECKLE MINIMIZATION IN PROJECTION DISPLAYS BY REDUCING SPATIAL COHERENCE OF THE IMAGE LIGHT

Eric G. Rawson, Saratoga, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed June 25, 1975, Ser. No. 590,250

Int. Cl.^{2} G02B *23/00, 13/20;* G03B *21/00*

U.S. Cl. 353—122 **3 Claims**



1. A system for minimizing the speckle observed in an image projected onto a screen by reducing the spatial coherence of the image light, the image being formed on the surface of an image bearing member comprising:

an image bearing member having an image formed on a surface thereof and positioned in an image plane,

means for illuminating said image surface with light,

a first lens for focusing the light reflected from said image surface to form an image thereof at a first plane displaced from said image plane,

a diffusing screen having a distribution angle between 4° and 8° and characterized by a surface having small, concave scallops randomly located thereover, said diffusing screen being positioned at said first plane whereby the light image incident thereon is diffused as it passes therethrough,

a second lens for collecting the diffused light image and projecting the diffused image, said second lens forming an enlarged illuminating aperture at a distance spaced therefrom, and

a projection screen spaced from said illuminating aperture for receiving said projected image, said illuminating aperture subtending a relatively large angle at the projection screen whereby the spatial coherence of the image formed thereat is reduced.

4,035,069

EXPOSURE AND DEVELOPMENT SYSTEM FOR ELECTROPHOTOGRAPHY

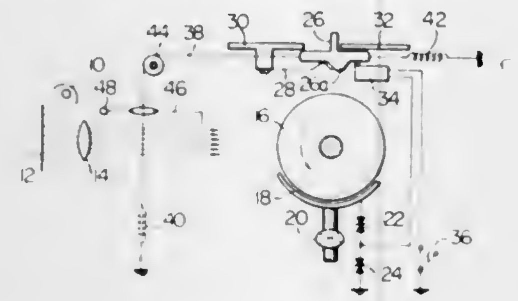
Takashi Yano, Tokyo, Japan, assignor to Ricoh Company, Ltd., Tokyo, Japan

Filed July 8, 1975, Ser. No. 594,181

Claims priority, application Japan, July 12, 1974, 49-79993

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—3 R **13 Claims**



1. A method of electrophotographically duplicating an original document having either normal or low contrast including the steps of radiating a light image of an original document of normal contrast with a first predetermined intensity onto a photoconductive member to form an electrostatic image, developing the electrostatic image using a developing electrode disposed adjacent to the photoconductive member, and a first predetermined voltage being applied to the developing electrode when duplicating an original document having normal contrast, the improvement comprising the steps, when duplicating an original document having low contrast, of:

a. adjusting the light image to have a second predetermined intensity which is lower than the first predetermined intensity, the second predetermined intensity being that at which the rate of change of photoconductivity of the photoconductive member with respect to a change in the intensity of the light image is substantially maximum; and

b. applying a second predetermined voltage which is higher than the first predetermined voltage to the developing electrode.

4,035,070

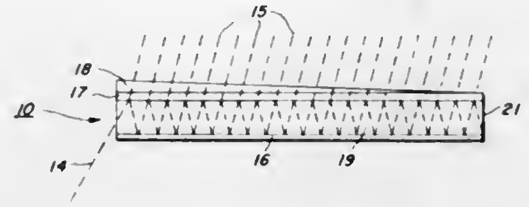
APPARATUS AND METHOD FOR OPTICAL GENERATION OF A STRUCTURED CHARGE-DISCHARGE PATTERN ON A PHOTORECEPTOR

Thomas J. Hammond, Penfield, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed Dec. 18, 1975, Ser. No. 642,103

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—3 R **8 Claims**



1. Apparatus for providing a multiplicity of collimated radiation beams from a single collimated radiation beam comprising:

a substantially totally reflecting first surface;

a second surface generally parallel to said first surface, said second surface being partially reflecting, said first and said second surface providing a cavity,

means for introducing said single collimated radiation beam into said cavity wherein said multiplicity of collimated beams is provided by radiation transmitted through said partially reflecting surface, and

a variable filter for generally equalizing intensity of said multiplicity of beams.

4,035,071

DEVELOPING PROCESS AND APPARATUS FOR ELECTROPHOTOGRAPHY

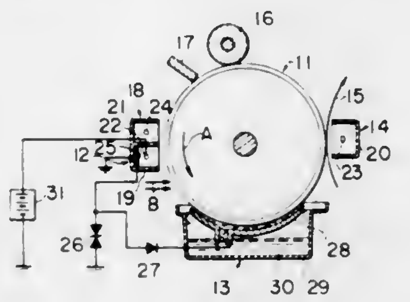
Seiichi Miyakawa, Nagareyama, and Akira Midorikawa, Yokohama, both of Japan, assignors to Ricoh Co., Ltd., Japan

Filed Oct. 22, 1975, Ser. No. 624,843

Claims priority, application Japan, Oct. 24, 1974, 49-122670

Int. Cl.^{2} G03G *15/10*

U.S. Cl. 355—10 **7 Claims**



1. A developer for electrophotography, comprising a drum having a curved photosensitive surface adapted to be impressed with a latent electrostatic image, a curved electrode plate arranged in closely spaced relationship to said drum photosensitive surface, means for impressing voltage on said electrode, and control means for controlling the voltage so that it has a potential at least equal to the lowest potential on the photosensitive surface, and means for supplying a developing solution between said electrode and said photosensitive surface, the developer including a liquid developer reservoir, said curved plate having an opening therethrough, and means for circulating liquid through said opening and permitting it to overflow on each side into said reservoir.

4,035,072

PROGRAMMABLE CONTROLLER FOR CONTROLLING REPRODUCTION MACHINES

David R. Deetz; Bernard C. Fisk, both of Dallas, Tex., and James M. Donohue, Los Alamitos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 496,665, Aug. 12, 1974, Pat. No. 3,944,360. This application Nov. 3, 1975, Ser. No. 628,673

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—14 **2 Claims**

1. In a reproduction machine for producing impressions of an original, the reproduction machine having a photosensitive member and a plurality of discrete operating components cooperable with one another and the photosensitive member to electrostatically produce impressions on support material, the improvement comprising:

a programmable controller for operating said photosensitive member and said components in an integrated manner to produce impressions electrostatically on said support material,

said controller including program storage means adapted to hold a master program for operating said machine, said master program including at least one sub-routine for independently operating a selected one of said machine components to the exclusion of the other machine components; and

control means for programming said controller to operate said one machine component alone for servicing thereof.

4,035,073

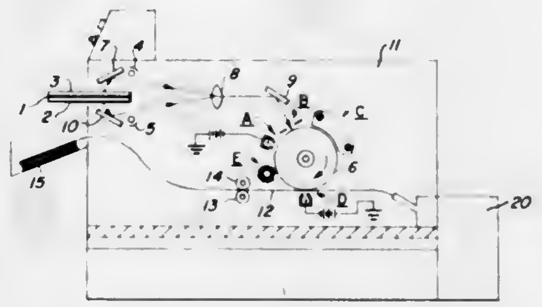
DUPLEX REPRODUCTION MACHINE

George Del Vecchio, North Rose, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 494,798, Aug. 5, 1974, abandoned. This application Aug. 21, 1975, Ser. No. 606,697

Int. Cl.^{2} G03B *27/32, 27/52*

U.S. Cl. 355—24 **12 Claims**



1. In a photocopying apparatus having a platen comprising a pair of transparent plates positioned face-to-face for receiving therebetween a document to be copied and means for reproducing the document from an optical image of the document; optical means for projecting an image of the document from the platen to the reproducing means including first illuminating means for illuminating one side of the document, means for projecting an image of the side illuminated by said first illuminating means to the reproducing means, a second illuminating means for illuminating the other side of the document, means for projecting an image of the side illuminated by the second illuminating means to the reproducing means, and means for sequentially actuating the first and second illuminating means for sequentially projecting the opposite sides of the document to the reproducing means, means to provide relative reciprocal movement between the platen and said projecting means for projecting a moving image to said reproducing means, and means for selectively actuating one or the other of said two illuminating means.

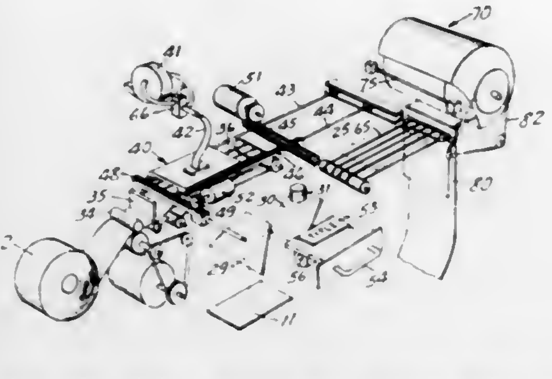
4,035,074
STEP AND REPEAT CAMERA HAVING AN IMPROVED FILM PROCESSOR

Lawrence A. Flor, Anoka, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 15, 1975, Ser. No. 640,871

Int. Cl.^{2} G03B *27/32;* **H05B** *3/44;* **G03B** *27/42, 27/52*

U.S. Cl. 355—27 **3 Claims**



1. A step and repeat camera for placing images of documents onto microfiche comprising:
a housing,
fixed support means for supporting a supply of unexposed light-sensitive heat-developable film,
means for advancing said film from said supply and placing the same in a reference position,
support means for contacting said film and placing the same in a fixed horizontal focal plane,
drive means for moving said support means and said film in mutually perpendicular X and Y directions incrementally to place successive areas of said film in a predetermined location,
lens and shutter means for imparting images from a support onto said film at said predetermined location, and
processing means for processing the exposed sheet of film upon exposure of a predetermined number of said areas, said processing device comprises
a conveyor for receiving an exposed film, said conveyor moving said film along a predetermined path,
a drum rotatably mounted about an axis transverse to the direction of movement of said conveyor, said axis supporting the periphery of said drum generally tangential to the path of movement of said conveyor,
a shoe disposed about and spaced from the periphery of said drum to allow a film to move therebetween,
heating means for heating at least one of said drum and shoe sufficiently to afford the development of a film as said film moves with said drum past said shoe,
corona charging means disposed adjacent said drum and said shoe for placing a charge on a section of film moved from said conveyor into contact with said drum and for removing the charge from a film after the same has passed about the surface of said drum to permit said sheet of material to fall edgewise from said surface of said drum, and
a vertically positioned chute disposed in a position generally tangential to a side of said drum and positioned below and normal to the path of said conveyor and at the end of said conveyor nearest said drum for receiving and discharging a film separated from said drum.

4,035,075
IMAGE SCANNING SYSTEM FOR COPY MACHINES

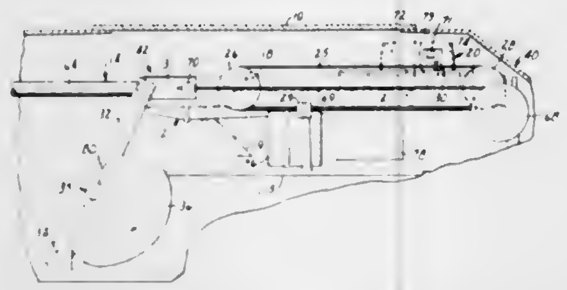
Charles G. Sprado, White Bear Lake, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 26, 1975, Ser. No. 635,693

Int. Cl.^{2} G03B *27/70*

U.S. Cl. 355—66 **11 Claims**

1. In a copy machine, an apparatus for scanning a stationary supporting means on which an original may be placed to impart an image therefrom onto a moving image-receiving member including
a frame,
a first carriage supported by said frame to move along a path of travel parallel to said stationary supporting means,
a second carriage supported for movement over a path of travel parallel to the path of said first carriage,
means interconnecting the second carriage to the first carriage and to said frame to afford movement of said second carriage in the same direction but at a rate twice that of said first carriage upon movement of said first carriage in a predetermined direction,



spring means connected to said first carriage for urging it in a first direction,
linkage means connected to said first carriage for transferring forces to said first carriage to move it along its said path, and
driven cam means for moving said linkage means to drive said first carriage along said path, said driven cam means having a profile affording continuously controlled acceleration, velocity and displacement of said first carriage and for affording a scan mode wherein said second carriage scans said supporting means at a constant velocity.

4,035,076
PHOTOGRAPHIC COPYING MACHINE

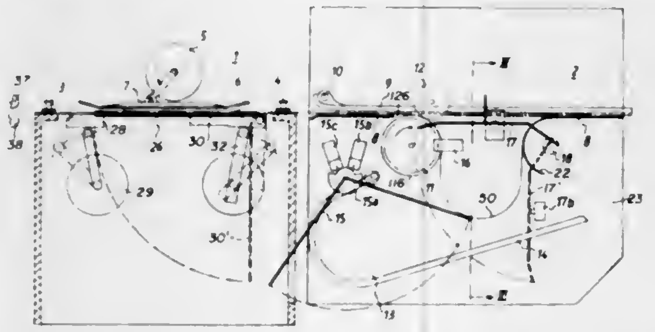
Christian Götze; Adolf Fleck; Karl Dreher, and Günther Heldrich, all of Munich, Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 369,457, Sept. 12, 1973, Pat. No. 3,946,922. This application Dec. 31, 1975, Ser. No. 645,910

Claims priority, application Germany, Sept. 13, 1972, 2244960

Int. Cl.^{2} G03B *27/58*

U.S. Cl. 355—72 **2 Claims**



1. In the apparatus wherein an elongated web of paper or the like is fed lengthwise, particularly in a photographic copying machine, a combination comprising, transporting means for advancing a web lengthwise; and guide means defining for the advancing web an elongated path wherein the web advances through and beyond a plurality of successive stations including a copying station, said guide means including first guide members adjacent to opposite sides of said path and providing at least one opening at the copying station which affords access to said path, at least one second guide member movable between operative and inoperative positions in which said second guide member respectively overlies at least a portion of and exposes said opening, and means for moving said second guide member between said positions thereof, so that said second guide member assumes said operative position during threading of the leader of a fresh web along said path, said second guide member being provided with means for sealingly engaging at least one of said first guide members in said operative position thereof, said one first guide member including a mask surrounding said opening at said copying station, said opening being sealed against passage of light therethrough in said operative position of said second guide member.

4,035,077
COPYING APPARATUS

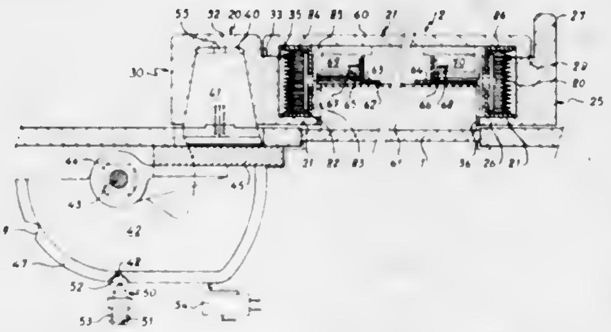
Johannes C. A. Vercoulen, Venlo, Netherlands, assignor to Océ-van der Grinten N.V., Venlo, Netherlands

Filed Feb. 25, 1976, Ser. No. 661,170

Claims priority, application Netherlands, Mar. 3, 1975, 7502462

Int. Cl.^{2} G03B *27/62*

U.S. Cl. 355—75 **9 Claims**



1. In a copying apparatus including a substantially horizontal transparent plate to support an original for exposure, a cover device for said plate, and means connected with said cover device whereby it is movable between an open position in which an original may be laid upon said plate and a closed position in which said device covers said plate and presses down upon the original , the improvement wherein said cover device comprises a bordering frame connected with said motive means and a platelike covering member arranged inside said frame to rest and press down upon the original when said frame is in closed position, said frame having thereon supporting elements upon which said covering member rests when said frame is in open position, said covering member being displaceable vertically relative to said frame by and according to the thickness of the original as said frame is moved to closed position, and means for guiding said covering member from vertically displaced position thereof to its position on said supporting elements as said frame is moved from closed to open position.

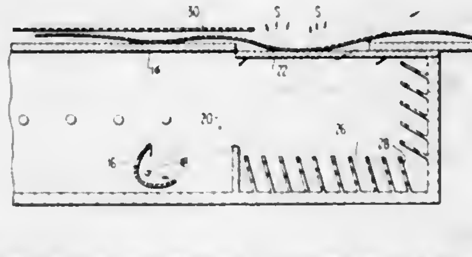
4,035,078
METHOD AND APPARATUS FOR INCREASING CONTRAST AND RESOLUTION FROM LOW DENSITY FILM

Harry W. Woo, 8104 Whittier Blvd., Bethesda, Md. 20034, and Paul Reichel, 3000 Valentine Ave., Bronx, N.Y. 10458

Filed Nov. 5, 1975, Ser. No. 629,165

Int. Cl.^{2} G03B *27/32, 27/16*

U.S. Cl. 355—77 **10 Claims**



9. A method of increasing contrast and resolution of images projected from low specular density images on photographic film including developed silver grains, said method comprising the steps of:
a. positioning a silver grained film having an image density of less than 0.3 in a position to be viewed, copied, or printed;
b. providing a light absorbing background spaced from a first side of the film; and
c. illuminating the film with a projected beam of light from a suitable source of illumination spaced from the film on the first side thereof in a location offset from the film and not between the film and the light absorbing background so that the beam of light is directed onto and passes through the film at an angle to an axis perpendicular to the plane of the film, whereby the silver grains scatter the light to increase contrast and resolution of images projected from the film and facilitate viewing of the film from the other side of the film against said light absorbing background.

4,035,079
METHOD OF AND DEVICE FOR INVESTIGATING SAMPLES BY A FLAME-FREE ATOM ABSORPTION PROCESS

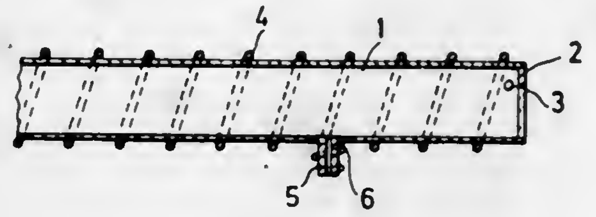
Klaus-Richard Sperling, Hamburg, Germany, assignor to The Federal Republic of Germany represented by Bundesministerium fur Forschung und Technologie, Bonn, Germany

Filed Sept. 2, 1975, Ser. No. 609,218

Claims priority, application Germany, Apr. 18, 1975, 2517163

Int. Cl.^{2} G01J *3/30;* **G01N** *21/16*

U.S. Cl. 356—85 **4 Claims**



1. A device for investigating samples by means of the flameless atom absorption process having measuring rays passing through the samples, which includes in combinaton: a tubular measuring cell closed at one end by an end wall translucent to said rays, electric heating means surrounding said cell for heating the latter to high temperatures, inlet means substantially tangentially leading into said measuring cell, small auxiliary chamber means including additional heating means for atomizing only the sample to be investigated, said auxiliary chamber means communicating through said first inlet means with the interior or said measuring cell and having second inlet means for conveying the substance to be atomized entirely into said auxiliary chamber means, said auxiliary chamber means also having third inlet means for admitting protective gas into said chamber means and having means for heating said protective gas, and means for passing a bundle of measuring rays through said translucent end wall and the tubular measuring cell having the atom cloud of the sample being investigated therein.

4,035,080

APPARATUS OF SPECTROSCOPY OF SCATTERING LIGHT

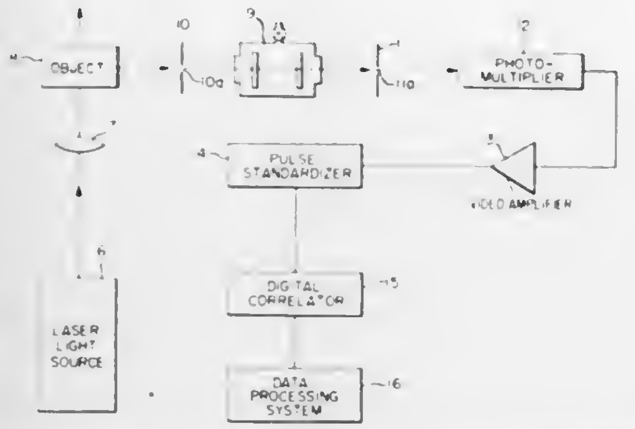
Takeshi Yamaguchi, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 14, 1975, Ser. No. 604,656

Claims priority, application Japan, Aug. 31, 1974, 49-99498

Int. Cl.² G01N *21/00;* G01B *9/02*

U.S. Cl. 356—103 **5 Claims**



1. A spectroscopic apparatus for measurement of the shape of the Brillouin component in scattered light from an object comprising:

a. a laser source for illuminating the object;

b. light restricting means adapted to satisfy a coherence condition for restricting a scattering angle of the scattered light from the object;

c. means for selecting a single Brillouin component among the plurality of spectrum components in the scattered light;

d. photo-correlation spectroscopy means for treating said single Brillouin component obtained by said selecting means.

4,035,081

LASER GYROSCOPE

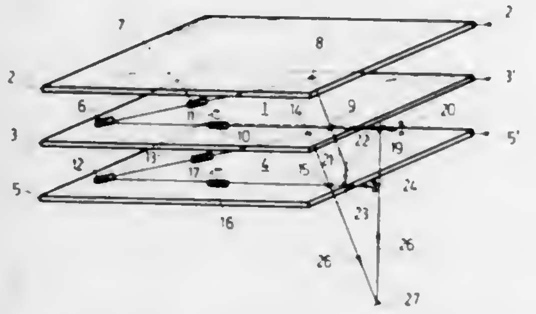
Gunther Sepp, Ottobrunn, and Gunthard Born, Taufkirchen, both of Germany, assignors to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Dec. 15, 1975, Ser. No. 640,888

Claims priority, application Germany, Dec. 21, 1974, 2460806

Int. Cl.² G01B *9/02*

U.S. Cl. 356—106 LR **15 Claims**



1. A laser gyroscope comprising a first ring laser device and a second separate ring laser device arranged in immediate proximity to each other to assure an optimal temperature contact between the two ring laser devices, each laser device including respective resonator means, temperature sensing means secured to said laser devices to sense any temperature variations in said laser devices, each of said laser devices further comprising first temperature variation compensating means and second compensating means, said first temperature variation compensating means being responsive to said temperature sensing means for tuning the corresponding resonator means in response to temperature variations, and alternating switch means operatively connected to said second compensating means for repeatedly changing the direction of travel of the laser beams in said first and second laser devices, whereby trajectory differences in said first and second ring laser devices are compensated and at any one instant the laser beam in one laser device travels in one direction and the laser beam in the other laser device travels in the opposite direction.

4,035,082

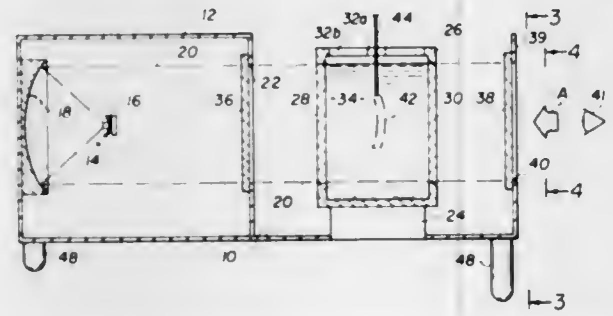
METHOD TO TEST FOR CHEMICALLY HARDENED GLASS LENSES

Morris Kirschen, Modesto, Calif., assignor to Kirk Optical Lens Co., Inc., Farmingdale, N.Y.

Filed Apr. 7, 1975, Ser. No. 565,345

Int. Cl.² G01B *11/16*

U.S. Cl. 356—114 **2 Claims**



1. A method to determine if a glass lens is chemically hardened including the steps of,

immersing the glass lens to be tested in a fluid medium having a refractive index substantially that of the glass lens with the peripheral rim of the glass lens unobstructed and visible,

placing the immersed glass lens between spaced crossed polarizers,

and passing an illuminating beam serially through one of the polarizers, the immersed glass lens and then the other of the polarizers to produce a light halo perimetrically about the glass lens when the same has been chemically treated.

4,035,083

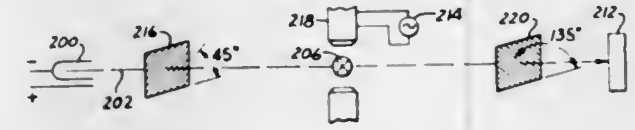
BACKGROUND CORRECTION IN SPECTRO-CHEMICAL ANALYSIS

Ray A. Woodriff, 521 W. Grant St., Bozeman, Mont. 59715, and Daniel T. Woodriff, 2308 - 10th St., Monroe, Wis. 53566

Division of Ser. No. 257,596, May 30, 1972. This application May 5, 1975, Ser. No. 575,046

Int. Cl.² G01N *21/40;* G01J *3/36*

U.S. Cl. 356—115 **10 Claims**



1. A method of providing a background corrected measure of the concentration of a sample element utilizing magnetic double refraction, comprising the steps of:

a. positioning a sample in a gaseous state containing an element having a given optical resonance wavelength on an optical axis,

b. subjecting the sample to a magnetic field transverse to said optical axis,

c. directing along the optical axis and at the sample a beam of plane polarized light having said resonance wavelength, at least at a given time said beam of plane polarized light being polarized at such an angle relative to the transverse magnetic field as to cause the light at the sample to divide into two components, one component having its electric vector parallel to the field and the other component having its electric vector perpendicular to the field,

d. permitting said two components to re-combine upon emergence from the sample to form an emergent beam polarized at an angle different from that of the incident beam of plane polarized light,

e. passing said polarized emergent beam through a polarizer crossed with respect to the polarization of the incident beam of plane polarized light, and

f. detecting the differential intensities of said polarized emergent beam after it passes through said polarizer at said given time and at some other time to provide a measure of the sample element concentration.

4,035,084

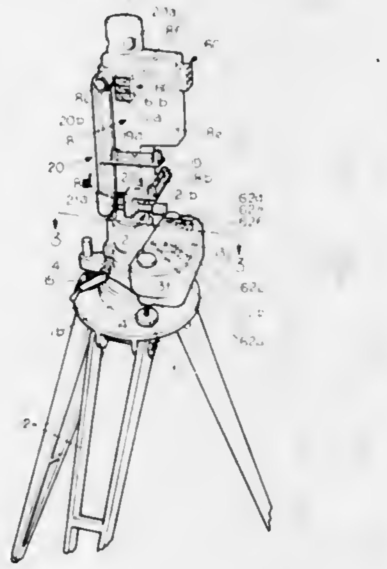
AUTOMATIC LEVELLING METHOD AND APPARATUS FOR ROTATING LASER BEAM TRANSMITTER

James D. Ramsay, 102 S. Clark Ave., Los Altos, Calif. 94022

Filed Feb. 19, 1976, Ser. No. 659,413

Int. Cl.² G01B *11/26;* G05B *1/06*

U.S. Cl. 356—152 **5 Claims**



5. The method for automatically positioning and maintaining a rotating laser beam in a desired plane, there being motor driven means for adjusting the position of the axis of rotation of the rotating beam, thereby tilting the plane of the rotating beam through a plurality of positions, comprising the steps of:

1. positioning two indentical laser beam reflectors remotely from said axis of rotation but within the path of the rotating laser beam, said reflectors being substantially angularly separated about the axis of rotation of the rotating beam and arranged to respectively reflect back to said laser beam generator a beam parallel to, but spaced from the rotating laser beam while the rotating beam is traversing the particular reflector;
2. positioning two laser beam receivers adjacent said axis of rotation in generally the same angular spacing relative to said axis as said reflectors so as to be capable of respectively receiving the said reflected beams, each of said receivers including a plurality of laser responsive cells stacked in parallel relationship to said axis; and
3. controlling said motor means in response to the selective energization of said laser responsive cells to adjust the axis of rotation of the rotating laser beam so that the rotating laser beam traverses both reflecting devices at the same relative position, whereby the relative displacements of the two remote reflectors in a plane parallel to the said axis of rotation on the rotating laser beam determines the tilt of the plane of the rotating laser beam.

4,035,085

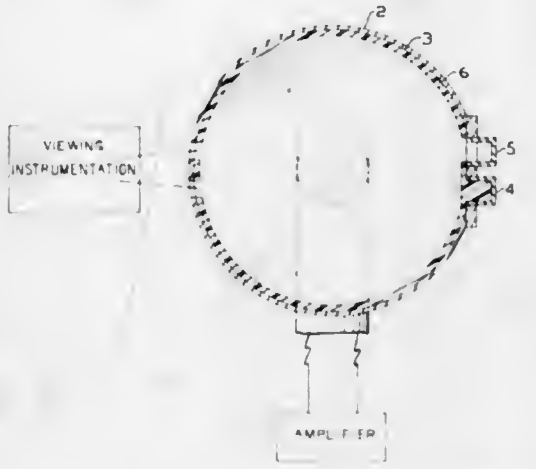
METHOD AND APPARATUS FOR COMPARING LIGHT REFLECTANCE OF A SAMPLE AGAINST A STANDARD

Jerome A. Seiner, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 375,198, June 29, 1973, Pat. No. 3,956,201, which is a division of Ser. No. 741,502, July 1, 1968, Pat. No. 3,764,364. This application Dec. 5, 1975, Ser. No. 638,213

Int. Cl.² G01J *3/46;* G01N *21/48*

U.S. Cl. 356—179 **10 Claims**



6. in an apparatus for comparing the light reflectance of a substance against a standard which includes a reflectance standard the improvement comprising a reflectance standard consisting essentially of at least one fluorinated aliphatic long chain addition polymer having at least one monomer wherein at least one fluorine atom is attached to a chain carbon atom, said standard being light stable and of sufficient thickness to reflect more than 90 percent of incident light having a wave length of from 2400 to 8000 Angstrom units.

8. In an apparatus for comparing the color of a substance against a standard which includes a color standard, the improvement comprising a color standard consisting essentially of (a) at least one fluorinated aliphatic long chain addition polymer having at least one monomer wherein at least one fluorine atom is attached to a chain carbon atom and (b) a coloring pigment, said standard being of sufficient thickness to reflect more than 90 percent of incident light having a wave length transparent to said pigment, said wave length being 2400 and 8000 angstrom units.

4,035,086

MULTI-CHANNEL ANALYZER FOR LIQUID CHROMATOGRAPHIC SEPARATIONS

Dietmar M. Schoeffel, and Armin K. Sonnenschein, both of Hillsdale, N.J., assignors to Schoeffel Instrument Corporation, Westwood, N.J.

Division of Ser. No. 450,676, March 13, 1974, Pat. No. 3,985,441. This application May 3, 1976, Ser. No. 682,718

Int. Cl.² G01N *21/22*

U.S. Cl. 356—205 **1 Claim**

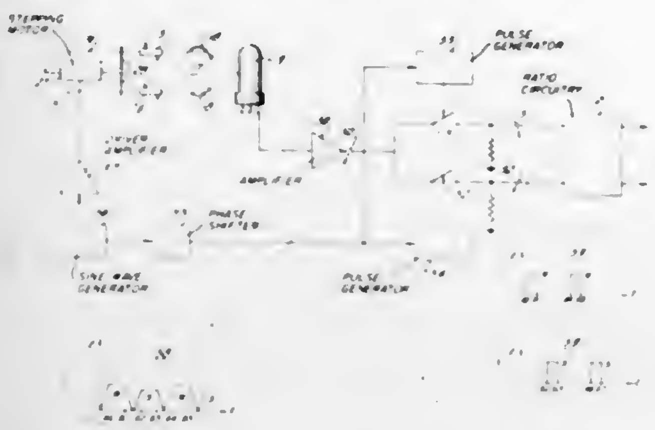
1. In a multi-channel analyzer for liquid chromatic separations having a chopper motor operating an opaque blade for precluding the passage of one of a pair of light beams at any given instant and a single photodetecting means for detecting the unimpeded light beam, focusing means for focusing the light beams on the photodetecting means and ratio circuitry, the improvement which comprises:

generating means for generating a signal;

means for applying the said signal to the chopper motor to actuate said chopper motor;

phase shift means separately connected to the generating means for shifting the phase of the output thereof an amount equal to the mechanical delay of the chopper motor;

a pair of pulse generating means connected to the output of the phase shifting means, one of the said pair operating on one half cycle of the generated signal and the other one of the said pair operating on the other half cycle;



switching means connected to the output of the photodetecting means and operated by the pair of pulse generating means whereby the two signals from the photodetecting means are alternately fed to the ratio circuitry.

4,035,087

CHEMICAL REACTION VELOCITY MEASURING APPARATUS

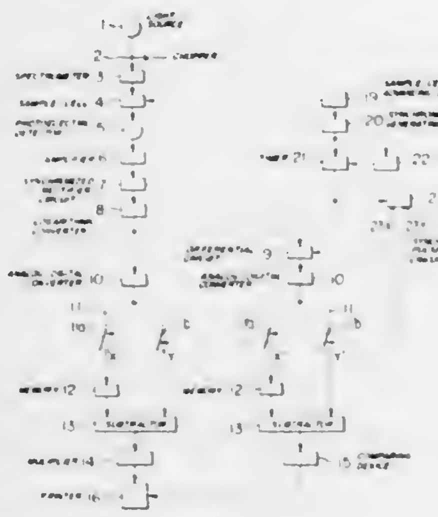
Hidetoshi Mori, Kawasaki; Teruo Shimamura, Yokosuka, and Yoshio Fukami, Yokohama, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Dec. 16, 1975, Ser. No. 641,268

Claims priority, application Japan, Dec. 26, 1974, 50-148385; Feb. 28, 1975, 50-23818

Int. Cl.² G01N *21/22*

U.S. Cl. 356—205 **18 Claims**



1. An apparatus for measuring reaction velocity of a sample from the difference of light absorbance measurements at two different times effected during a period wherein said absorbance is proportional to the reaction time, comprising

a differentiating circuit for converting the absorbance signals at said two times into respective first-order differential signals,

a subtractor for obtaining the difference of said two differential signals, and

a comparing means for comparing the output of said subtractor with a standard level,

an abnormality signal being indicated when said difference of first-order differential signals does not fall into said standard level.

4,035,088

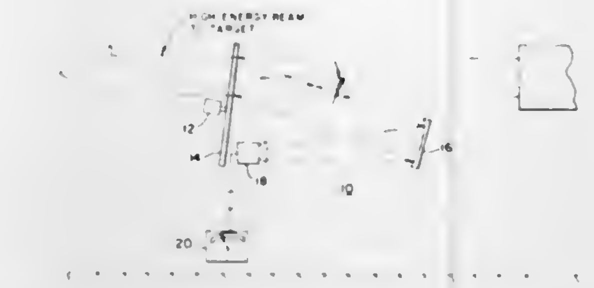
HIGH ENERGY LASER BEAM SAMPLING METER

Andrew H. Jenkins, and John J. Wachs, both of Huntsville, Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 5, 1975, Ser. No. 602,169

Int. Cl.² G01J *1/42*

U.S. Cl. 356—218 **5 Claims**



1. A high energy laser beam sampling apparatus comprising:

a. a wheel rotatably mounted in said laser beam, said wheel being in angular relation with the axis of said beam to reflect a portion of said beam therefrom said wheel including four highly reflective ribs having knife edges from which the beam portion is reflected, and a hub having said ribs secured thereto and extending radially therefrom;

b. means for rotating said wheel at a predetermined spin rate;

c. collecting and focusing means disposed for receiving and reflecting said portion of said beam therefrom;

d. sensing means for receiving said portion of said beam from said collecting and focusing means and providing a signal proportional to the intensity of said beam;

e. indicator means for receiving said signal and for providing a visual indication of the sampled energy.

4,035,089

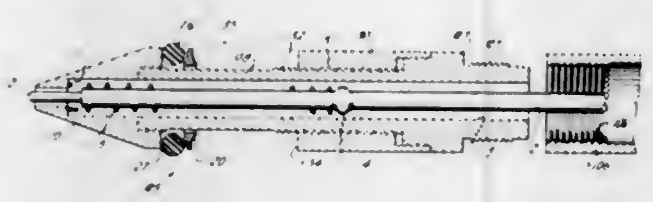
MECHANISM FOR VARYING THE FINGER GRIP AREA OF A WRITING IMPLEMENT

Allan E. Schwartz, 3 Bristol Place, Yonkers, N.Y. 10710, and Richard E. Frenkel, 17 Kingston Road, Scarsdale, N.Y. 10583

Continuation-in-part of Ser. No. 341,157, March 14, 1973, Pat. No. 3,915,021. This application Oct. 24, 1975, Ser. No. 625,669

Int. Cl.² B43K *7/00*

U.S. Cl. 401—6 **6 Claims**



1. A writing implement having an outer casing, a substantially cylindrical main body portion, means carried within said body portion for producing legible markings and having a writing tip exposed at one end of said body portion, said body portion having an area of reduced diameter to accommodate thereon a finger grip section, said finger grip section comprising a pluraltiy of compressible O-ring members axially aligned along said main body portion, a plurality of annularly shaped spacer elements carried on said main body portion and located between adjacent O-ring members, said spacer elements having an inside diameter approximately equal to the outside diameter of said reduced diameter area of said body portion so as to be supported thereon and having as flange and curved transition surface between said flange and the major surface of said element on both sides thereof, thus forming a contoured cross-sectional shape, said transition surface having a radius of curvature approximately equal to the cross-sectional radius of said O-rings forming a supporting socket therfore which has a shape complementary with the circumferential shape of adjacent O-ring members to provide support therefore, first and second abutment members carried on said body section and located on opposite sides of said finger grip section, one of said abutment members being axially movable toward and away from the other abutment member to effect compression of said O-ring members when said movable abutment member is moved toward the other abutment member so that the radial distance between said body section and the circumference of said O-ring members is increased when said abutment member is moved in one direction and decreased when said abutment member is moved in the other direction, thus varying the diameter of said finger grip section.

4,035,090

APPLICATOR

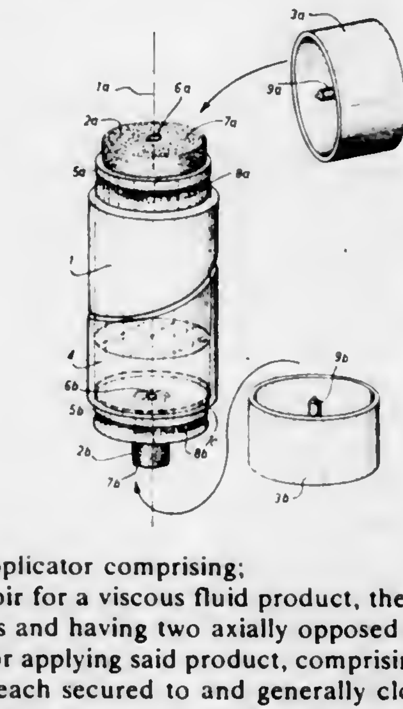
Payanotis Bavaveas, Paris, France, assignor to Eparco SA., France

Filed Jan. 11, 1974, Ser. No. 432,493

Claims priority, application France, Jan. 15, 1973, 73.01332

Int. Cl.² A47L *1/08, 13/12;* **B43M** *11/06*

U.S. Cl. 401—25 **4 Claims**



1. An applicator comprising;

a reservoir for a viscous fluid product, the reservoir having an axis and having two axially opposed ends;

means for applying said product, comprising two applicator pads, each secured to and generally closing one of said ends of the reservoir, said applicator pads having duct means defining ducts which extend through the pads in directions substantially parallel to said axis;

two support plates, each for one of said applicator pads, each support plate defining an orifice opposite a duct of the respective pad, the two support plates being rigidly mounted in the reservoir at the respective ends of the reservoir to support the respective pads;

two removable covers each applicable to one of said ends of the reservoir and, when so applied, enclosing the respective pad; and

pin means on each cover, projecting from the cover, said pin means extending through said ducts when said covers are applied to said ends;

whereby removal and renewed application of a cover, pursuant to removal of the other cover and downward disposition of the corresponding pad, enables the pin means of the first named cover to function as piston means for downwardly forcing parts of the product from the reservoir, through the downwardly disposed support plate orifice and applicator pad.

4,035,091

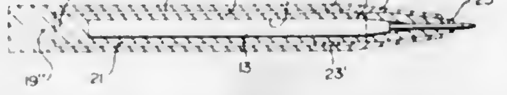
TRAINING DEVICE FOR STUDENTS OF STENOGRAPHY

Barbara B. Townsend, 1175 Wheaton St., Memphis, Tenn. 38117

Filed May 5, 1976, Ser. No. 683,314

Int. Cl.² B43K *25/00, 29/00*

U.S. Cl. 401—52 **13 Claims**



1. A training device for assisting a student in his endeavor to develop certain skills pertaining to the art of stenography, said training device comprising a writing instrument for manually scribing certain prescribed characters, and cumbersome weight means attached to said writing instrument for exercising and overdeveloping the student's muscles that are normally utilized while making the prescribed characters with the ultimate result being explicitly improved dexterity by the student when he subsequently substitutes said training device with a conventional writing instrument, said training device including an exterior barrel member, said barrel member substantially enveloping said writing instrument in a manner so that a cavity is established between the interior of said barrel member and the exterior of said writing instrument, said cumbersome weight means having a size and shape to substantially completely conform to said cavity with said barrel member also enveloping said weight means as said weight means is attached to said writing instrument.

4,035,092

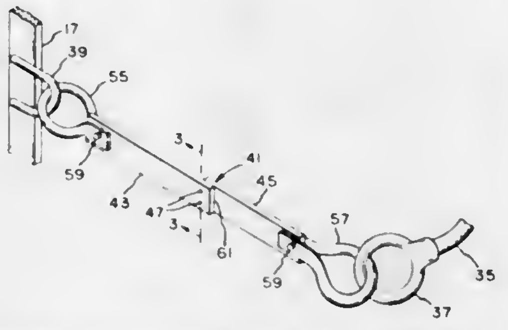
DUAL BREAKING STRENGTH WEAK LINK

Leland D. Adams, Jr., 38 Vista Drive, Kentfield, Calif. 94904

Continuation of Ser. No. 476,845, June 6, 1974, abandoned. This application July 10, 1975, Ser. No. 594,723

Int. Cl.² F16D *9/00*

U.S. Cl. 403—2 **5 Claims**

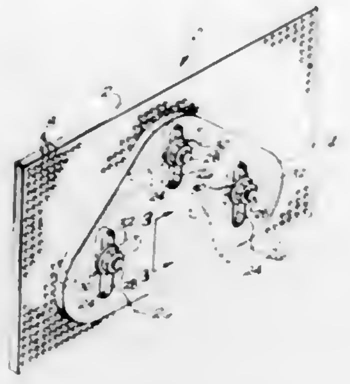


1. A weak link for securing a life raft painter to a vessel, said weak link comprising first and second bar members, said bar members being overlapped at their ends, rod means disposed through said bar members and securing them together at their overlapped ends, the distance between said rod means and the end edge of at least one of said bar members being short relative to the overall length of said one bar member whereby a high leverage may be obtained by pivoting said bar members about a fulcrum formed by said end edge to provide a low manual breaking strength while retaining a higher breaking strength for said weak link when subjected to tension force, and universal joint means secured at the opposite ends of said bar members whereby tension forces exerted on said universal joint means will result in a substantially pure tension force on the weak link.

4,035,093
BI-DIRECTIONAL ADJUSTABLE COUPLINGS

Charles Gordon Redshaw, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 1, 1976, Ser. No. 662,982
Int. Cl.² F16B *19/00*
U.S. Cl. 403—4 11 Claims

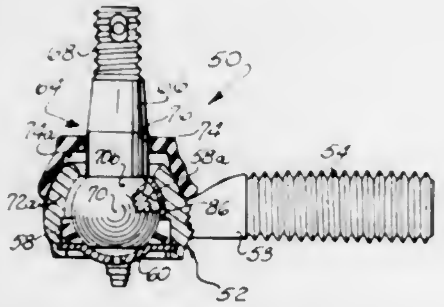


1. A coupling having bi-directional adjustment between a pair of matching members comprising: a first member having a series of uniformly spaced parallel rows of projections aligned to also extend in uniformly spaced parallel rows in a transverse direction, a second member shaped to accept and mate with the projections from the first member, means for adjustably locking the two surfaces together, and the projections are arranged in a pattern at 60° from each other to permit bi-directional movement at 90° and to permit 60° rotation between members and again permit bi-directional movement at 90°.

4,035,094
BALL AND SOCKET JOINT

Edward J. Herbenar, Birmingham, Mich., assignor to TRW Inc., Cleveland, Ohio

Filed Mar. 11, 1976, Ser. No. 666,017
Int. Cl.² F16C *11/06*
U.S. Cl. 403—144 12 Claims

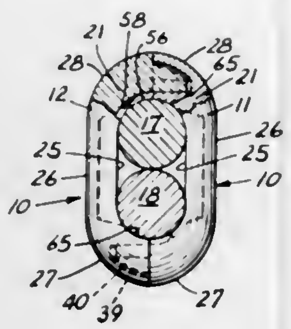


1. A ball and socket joint assembly comprises, a stud having an enlarged head and a socket having a housing, said housing including a cavity within which said head is received in bearing engagement, an end cap affixed to said housing and positioned in engagement with said head to urge said head into said bearing engagment with said cavity, an expander comprising the sole member interposed between said end cap and said head to transmit stud preloading force therebetween, said expander being compressed between said end cap and said head to provide a seat for said head and to take up wear by urging said head into said bearing engagement with said cavity, said expander having a central opening defined by an internal rim which is disposed in engagement with said head, said head having a bearing portion and wherein an area of head-expander contact is defined by the portion of the head engaged by said expander, and a liner bearing is provided between said cavity and said bearing portion of said head, said liner bearing terminating short of said area of contact, said expander being a belleville type spring, said opening being a center opening in said belleville type spring and the periphery of said opening serving as a seat for said head.

4,035,095
SPLIT ATTACHMENT

Thomas J. Hughes, Jr., Northbrook, Ill., assignor to EF & EF Industries, Inc., Hillside, Ill.

Filed Aug. 18, 1975, Ser. No. 605,750
Int. Cl.² B25G *3/00*
U.S. Cl. 403—282 4 Claims



1. A split attachment with a substantially continuous outer surface defined by two joined half pieces for tightly securing the attachment to an article, said half pieces being substantially identical, each of said half pieces having first and second end surfaces, the first end surface of each half piece abutting the second end surface of the other half piece when said half pieces are joined together about the article, a central recessed wall between said end surfaces for disposition about the article to be attached, a plate-like projection extending outwardly from said first surface, walls defining a recess in each of said second surfaces, said recesses being slightly smaller in size than at least one dimension of said plate-like projection for deforming the material of said plate-like projections and for wedgedly receiving and securing with the plate-like projection of the other one of said half pieces, a buttressing projection extending outwardly from said first end surface and being perpendicularly attached to said flat, plate-like projection to add strength thereto, and receiving recesses formed in said second end surface of slightly smaller cross-sectional area than said buttressing projection for deforming the material of the same and for wedgedly receiving and securing the latter therein.

4,035,096
LATCHING MECHANISM FOR A COLLAPSIBLE OVERHEAD GUARD

Robert Henry Miller, Cleveland, Ohio, assignor to Towmotor Corporation, Mentor, Ohio

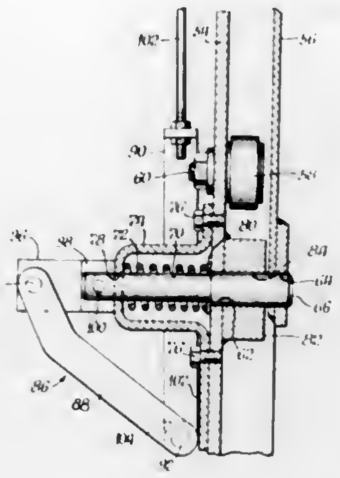
Filed Dec. 22, 1975, Ser. No. 643,414
Int. Cl.² F16B *7/10*
U.S. Cl. 403—322 9 Claims

1. A latching mechanism in combination with a first member relatively movable with respect to a second member, and having a first aperture in said first member alignable with a second aperture in said second member, said latching mechanism comprising:

a locking pin slidably fitted within said first aperture and engageable within said second aperture when said first and second members are positioned so that said apertures are in alignment;

means biasing said locking pin in a direction to be engaged within said second aperture; and,

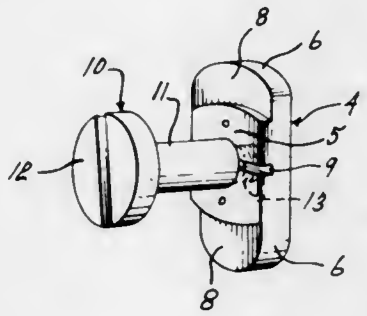
lever cam means pivotally connected to the end of said lock pin opposite to the end engageable within said second aperture and cammable against a bearing surface of said first member whereby said pin may be retracted against the force of the baising means to disengage from said second aperture wherein said lever cam means comprises a first lever defining a pair of opposite ends and means pivotally connecting one end of said first lever to said end of said pin opposite to the end engageable within said second aperture, a second lever defining a pair of ends, means pivotally connecting one end of said second lever to the other end of said first lever, said levers being positioned and of a length so that movement of said second lever in a direction generally parallel to said first and second members causes said locking pin to be moved opposite to the direction wherein it is engaged within said second aperture.



4,035,097
KNOCKDOWN CONNECTOR AND GUIDEWAY ASSEMBLY

Pierre Bachand, 11,725 Pavillon St., Apt. 3, Pierrefonds, Canada

Filed Mar. 15, 1976, Ser. No. 666,628
Claims priority, application United Kingdom, Mar. 21, 1975, 11838/75
Int. Cl.² F16D *39/00*
U.S. Cl. 403—348 8 Claims

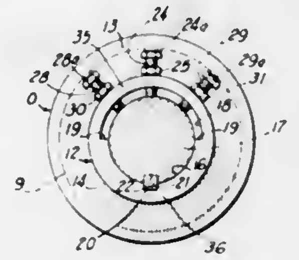


1. A knockdown connector and guideway assembly wherein the guideway is a box-shaped channel having a bottom wall, side walls and co-planar flanges extending from the outer edges of said side walls towards each other and separated by a slot of uniform width extending longitudinally of said channel, the inside face of said bottom wall and the inside faces of said flanges being uniformly spaced apart transversely of the channel along the length of the latter, and wherein the connector includes an elongated flat base member and a holding member, said base member having a central portion and opposite end portions, means removably securing said holding member to the central portion of said base member, said base member having a width less than the width of said slot and a length less than the distance separating said side walls, one main face of said base member being flat, said base member insertable within said channel through said slot, when in a position aligned with the latter and with one main face flat against said back wall, said base member rotatable in said channel about an axis of rotation passing through said central portion and perpendicular to said one main face from said first-named position to a blocked position wherein said end portions are aligned transversely of said slot, the other main face of said member defining at each of said two opposite end portions, a camming face extending transversely of the elongated base member and obliquely to said one main face, the taper of said camming faces extending in the same direction along a circle co-axial with said axis of rotation, said end portions tapering transversely thereof from a thickness at least equal to the distance between the inside face of said bottom wall and the inside faces of said flanges to a thickness less than said last-named distance, said central portion having coupling menas formed on the face of said central portion opposite said flat main face and exposed through said slot, when said base member is located within said channel, said coupling means serving to couple the base member with a tool to rotate said base member between said two positions, said end portions wedgingly engaging the internal faces of said flanges in the blocked position of said base member, said holding member securable to said base member by said securing means once said base member is in said blocked position, said holding member serving to engage and support a structural element by means of said blocked base member in a predetermined position along said channel, the end portions of said base member being free from frictional engagement with said side walls in the blocked position of base member.

4,035,098
QUICK RELEASE, SELF CENTERING, POWER TRANSFER ASSEMBLY

Herman Clyde Griffin, Rte. No. 2, Box 108, Ocilla, Ga. 31774

Filed July 28, 1975, Ser. No. 599,927
Int. Cl.² F16B *21/10*
U.S. Cl. 403—356 2 Claims



1. A power transfer assembly, for transferring power from a shaft to the periphery of said assembly, comprising:

a. a cylindrical shaft having a central axis and an end, said shaft having a first recess;

b. a circular rotatable power transfer member having a central axis and being positioned axially outwardly of said shaft beyond said end of said shaft so as to overlap the end thereof;

c. means on the periphery portion of said member by which power is transferred when the member is rotated;

d. a hub secured to and protruding sideways from said power transfer member for rotation therewith, said hub having a pair of opposed inside surfaces defining a central bore for receiving said shaft, one of said inside surfaces being concave, defining a first arc and forming a cradle conforming to the contour of one side portion of said shaft for snugly receiving said one side portion, said one of said inside surfaces having a second recess therein, the other of said inside surfaces being concave and defining a second arc, said first arc being concentric about said central axis of said member, the radius of said first arc being about equal to the radius of said shaft, the radius of said second arc being greater than the radius of said shaft by a spacing distance and said hub defining an exteriorly accessible threaded aperture through said other inside surface;

e. a set screw of sufficient length to pass through said aperture and traverse said spacing distance, for engaging said shaft opposite said one side and forcing said one side of said shaft against said one inside surface with the central axis of said shaft aligned with the central axis of said member;

f. a key in said first recess and said second recess diametrically opposed to said threaded aperture to prevent rotation of said shaft within said hub when said one side of said shaft is abutting said one inside surface of said hub and said threaded aperture being located axially along said hub such that its axis intersects the key approximately midway thereof when said power transfer member overlaps the end of said shaft; and

g additional set screws circumferentially spaced substantially equally on opposite sides of said set screw, said hub defining a plurality of apertures circumferentially spaced and passing through said other inside surface for receiving said additional set screws to engage said shaft opposite said one side and force said one side of said shaft against said one inside surface.

4,035,099

DRILL BIT LOCATING TOOL

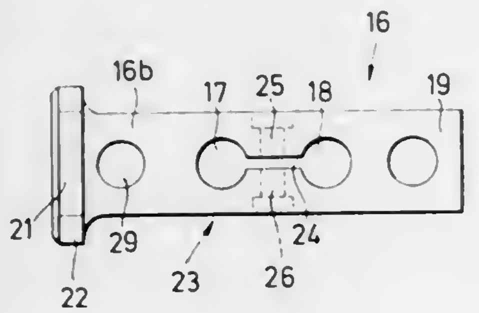
Paul Friederichs, Vilkerath, and Theodor Vitt, Porz-Eil, both of Germany, assignors to Prameta prazisionsmetall- und Kunststofferzeungnisse G. Baumann & Co., Germany

Filed Mar. 9, 1976, Ser. No. 665,319

Claims priority, application Germany, Mar. 14, 1975, 7508094[U]

Int. Cl.² B23B *49/00*

U.S. Cl. 408—103 **12 Claims**



1. A drill bit locating tool particularly adapted for locating drill holes associated with furniture hinges comprising a generally U-shaped member defined by a bight portion and a pair of legs, a first of said legs carrying means movable toward a second of said legs for clamping therebetween a portion of furniture which is to be drilled to form holes for fasteners to secure a hinge to the furniture portion, said second leg having a pair of apertured bushings for locating drill bits to form drill holes for an associated furniture hinge, an adaptor carried by said second leg, said adaptor being generally U-shaped in cross-section defined by a bight portion and a pair of legs, said adaptor being in embracing relationship to said second leg, and a pair of apertures in the bight portion of said adaptor for telescopically receiving said pair of bushings thereby locating said tool relative to a piece of furniture.

4,035,100

DRILLING TOOL WITH A DRILLING MEMBER AND A TOOL HOLDER INPUT UNIT

Wilm Krüger, Puchheim; Gerhard Rumpp, Inning, and Dieter Scholz, Unterpfaffenhofen, all of Germany, assignors to Dibotec Aktiengesellschaft, Zurich, Switzerland

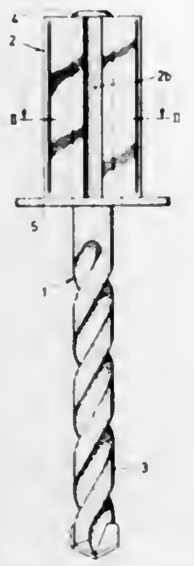
Filed Feb. 27, 1976, Ser. No. 662,232

Claims priority, application Germany, Mar. 3, 1975, 2509140

Int. Cl.² B23B *51/02*

U.S. Cl. 408—226 **13 Claims**

1. Drilling tool for use in the tool holder of a drilling machine comprising a drilling member including an axially elongated shank and an input unit including a shell laterally enclosing said shank and arranged to fit within the tool holder of the drilling machine, said shell being spaced radially outwardly from and non-rotatably connected to said shank, said shell having a large outer circumferential peripheral surface, wherein the improvement comprises that said input unit is hollow, said input unit includes webs axially co-extensive with said shell and said webs extending radially relative to said shank between said shank and said shell, and the outer circumferential peripheral surface of said shell is arranged to fit within the tool holder of the drilling machine.



4,035,101

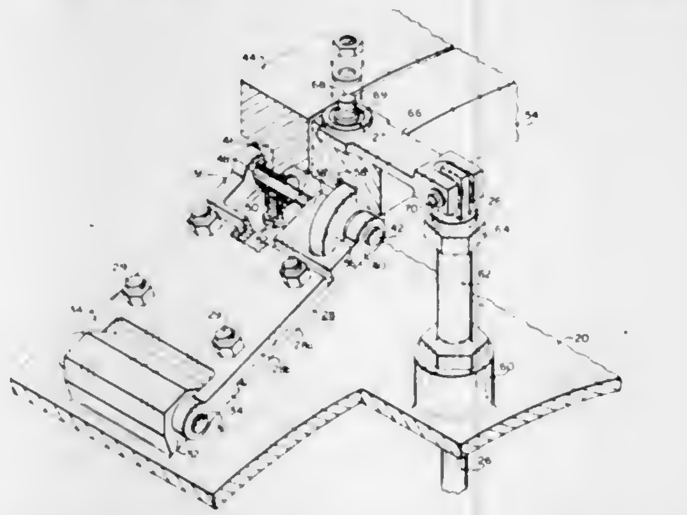
GAS TURBINE NOZZLE VANE ADJUSTING MECHANISM

Robert G. Glenn, Huntingdon Valley, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 24, 1976, Ser. No. 670,520

Int. Cl.² F01D *17/12*

U.S. Cl. 415—160 **6 Claims**



1. A mechanism for adjusting variable nozzle vanes of a gas turbine engine wherein said mechanism includes:

a stationary ring member encircling the housing of said engine in spaced concentric relation thereto and generally adjacent vane turning structure extending exteriorly of said housing;

means for mounting said stationary ring member to said housing at a substantially constant radial position regardless of dimensional changes in said housing due to temperature variations thereof comprising:

a circumferentially movable ring member encircling the housing in spaced relation thereto and adjacent said stationary ring member;

support structure attached to said stationary ring member and engaging said movable ring member for guided circumferential movement of said movable ring member; and,

lever means extending between said movable ring member and said external vane turning structure for transferring circumferential movement of said movable ring member to angular movement of said nozzle vanes;

a plurality of link members extending from said housing in a non-radial direction and pivotally attached at one end to said housing and pivotally attached at the opposite end to said stationary ring member whereby radial dimensional changes of said housing are compensated for by pivotal movement of said link members.

4,035,102

GAS TURBINE OF DISC-TYPE CONSTRUCTION

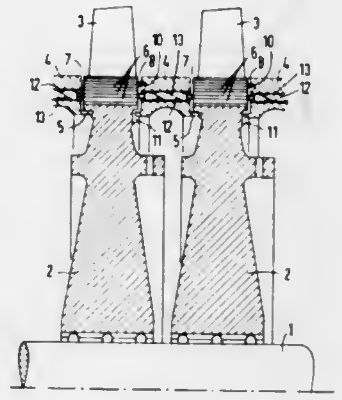
Helmut Maghon, Mulheim (Ruhr), Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Mar. 26, 1976, Ser. No. 670,862

Claims priority, application Germany, Apr. 1, 1975, 2514208

Int. Cl.² F01D *5/18*

U.S. Cl. 416—95 **3 Claims**



1. In a gas turbine of disc-type construction having turbine discs mounted on a rotor shaft, with rings of U-shaped cross section interposed therebetween, the turbine discs having respective rotor blades secured in blade feet thereon, and a cooling system for the rotor blade feet comprising axial grooves formed in the feet as well as free annular gaps located between respective end faces of the turbine discs and the intermediate rings over the radial elevation of the feet, one of the annular gaps serving as a coolant gas feed chamber and being closed radially outwardly by a sealing ring and being connected radially inwardly to radial coolant gas feed channels, the other of the annular gaps being radially outwardly open and being sealed radially inwardly against the respective turbine disc, the improvement wherein the intermediate rings are formed with substantially cylindrical bores extending axially therein from the respective one annular gap serving as a coolant gas feed chamber from a location close to and radially inwardly of the sealing ring to the respective other annular gap that is open radially outwardly, the axial grooves formed in the respective rotor blade foot and said bores formed in the respective intermediate ring being traversible concurrently in substantially opposite axial direction by coolant gas supplied from said one annular gap.

4,035,103

GAS LIFT MANDREL VALVE MECHANISM

Everett D. McMurry, and Bolling A. Abercombie, both of Houston, Tex., assignors to McMurry Oil Tools, Inc., Houston, Tex.

Filed Apr. 28, 1975, Ser. No. 571,905

Int. Cl.² F04F *1/18*

U.S. Cl. 417—109 **11 Claims**

1. A mandrel valve mechanism for controlling the flow of gas through a gas lift valve mechanism to achieve gas induced production of fluid from a well, said mandrel valve mechanism comprising:

a tubular mandrel adapted to be interconnected between sections of well tubing, said tubular mandrel being formed to define opening means intermediate the extremities thereof;

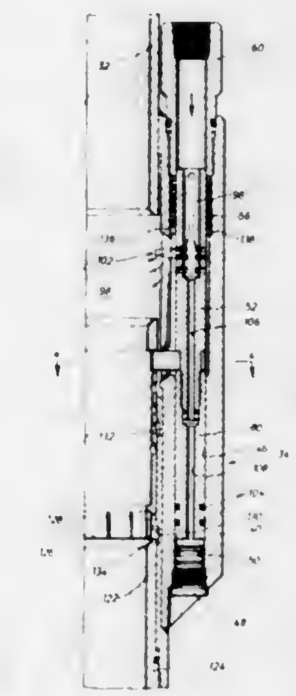
a valve housing being carried by said mandrel, said valve housing defining an internal valve chamber having an inlet opening and having an outlet opening disposed in registry with said opening means of said tubular mandrel;

a valve element disposed within said valve housing and being movable from a closed position to an open position, said valve element comprising:

an elongated element being formed to define a gas flow passage with gas inlet means of said gas flow passage being defined at one extremity of said elongated element and gas outlet means being defined intermediate the extremities of said elongated element, said gas inlet means being in fluid communication with said inlet opening and said gas outlet means being disposable in fluid communication with said outlet opening when said valve element is in the open position;

packing means being disposed between said elongated element and said valve housing and being located between said inlet and outlet openings of said valve housing, said gas outlet means of said elongated element being located upstream of said packing means in the closed position of said valve element and passing through said packing means upon movement of said elongated element from the closed position to the open position thereof; and

valve actuating means being movably disposed within said mandrel and having mechanical interconnection with said valve element, said valve actuating means imparting movement to said valve element responsive to movement of said valve actuating means within said mandrel, said valve actuating means being controllably movable responsive to manipulation thereof by a valve actuating tool that is movable within said well tubing of said well.



4,035,104

SELF-PRIMING CENTRIFUGAL PUMP

Frederic Buse, W. Allentown, Pa., assignor to Ingersoll-Rand Company, Woodcliff Lake, N.J.

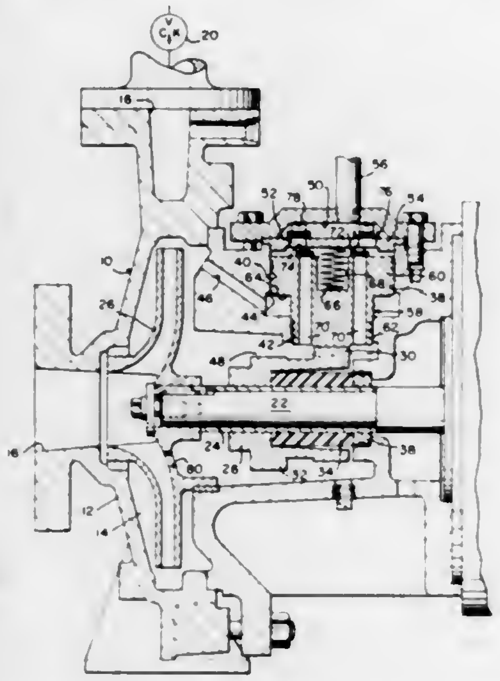
Continuation of Ser. No. 614,963, Sept. 19, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 750,026

Int. Cl.² F04D *9/00*

U.S. Cl. 417—202 **7 Claims**

1. A self-priming centrifugal pump comprising housing means containing an annular pumping chamber having inlet

and outlet means, rotary drive shaft means, rotary impeller means connected to said drive shaft means to be rotatably driven thereby and operatively associated with said pumping chamber for pressurizing fluid within said housing means and for pumping fluid through said pumping chamber, centrifugally, during its driven rotation, priming piston means movable within said housing for priming of the pump and operatively associated with said drive shaft means to be drivingly moved for said priming upon rotation of said drive shaft means, biasing means for causing said priming piston means to be retained out of said operative association with said drive shaft means during normal operation of the pump and permitting said operative association for said priming; further including a priming chamber, a discharge chamber, first and second passage means for communicating said priming chamber with said pumping chamber, and said discharge chamber with said priming chamber, respectively, and first and second valving means operatively disposed across said first and second passage means, respectively, and normally closed to prohibit communication between said priming and pumping chambers and said discharge and priming chambers; and wherein said first valving means comprises means operative in response to pressurized fluid, in said pumping chamber, to open said first valving means and admit pressurized fluid, from said pumping chamber, through said first passage means and said first valving means, into said priming chamber.



4,035,105
VARIABLE-OUTPUT PUMP CONTROL ARRANGEMENT

Jörg Dantlgraber, Lohr (Main), Germany, assignor to G. L. Rexroth GmbH, Lohr (Main), Germany

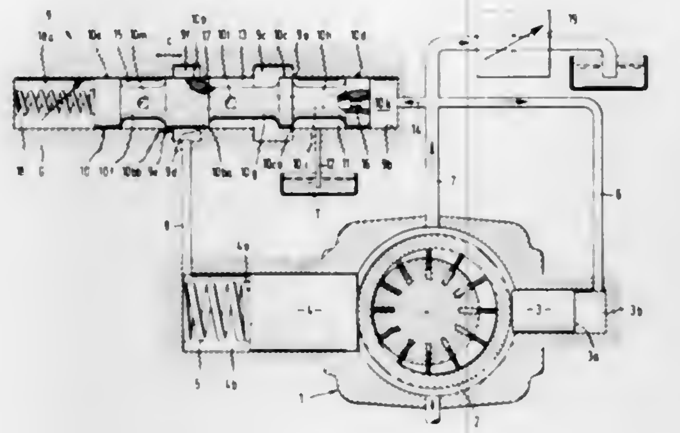
Filed Apr. 7, 1976, Ser. No. 674,742

Claims priority, application Germany, Apr. 16, 1975, 2516765

Int. Cl.² F04B *49/08*

U.S. Cl. 417—220 **16 Claims**

5. An arrangement for supplying a fluid to a user comprising, in combination, a fluid source; conduit means communicating said source with a user; a variable-output pump in said conduit means, having an output-adjusting element and operative for pumping the fluid from said source to the user; means for displacing said element, including a differential piston arrangement having a first surface facing in one direction and a second surface facing in an opposite direction and having a larger area than said first surface, first duct means for permanently admitting a control fluid to said first surface to thereby urge said element toward a low-output position, and second duct means for admitting the control fluid to said second surface to thereby urge said element toward a high-output position; and means for controlling said adjusting means in dependence on the pressure of the control fluid, including a slide valve having a housing interposed in said second duct means and having an elongated bore, relief duct means communicating said bore with said source, a slide mounted in said bore for movement longitudinally thereof and having an end face acted upon by the control fluid in one longitudinal direction and at least two control edges a first of which establishes and interrupts communication of said bore with said relief duct means and a second of which establishes and interrupts the admission of the control fluid to said second surface, and biasing means acting on said slide in the other longitudinal direction and urging said control edges toward the respective interrupting positions thereof, said second control edge being so spaced from said first control edge in said one longitudinal direction that it reaches and exceeds said interrupting position thereof before said first control edge reaches said interrupting position thereof; and bypass means in one of said housing and slide and operative for partially circumventing said second control edge as the latter approaches the interrupting position thereof.



4,035,106
CONTROL DEVICES FOR REVERSIBLE FLOW VARIABLE CAPACITY HYDRAULIC MACHINES

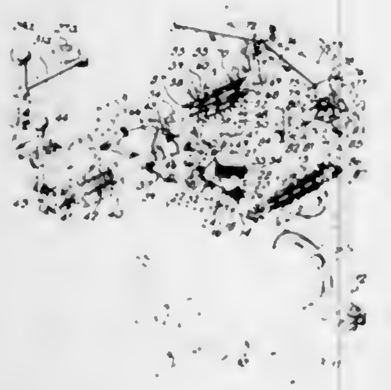
Carlo Pensa, Esino Lario, Como, Italy, assignor to Massey-Ferguson Services N.V., Curacao, Netherlands Antilles

Filed Nov. 17, 1975, Ser. No. 632,876

Claims priority, application United Kingdom, Nov. 18, 1974, 49871/74

Int. Cl.² F04B *1/26*

U.S. Cl. 417—222 **7 Claims**



1. Hydraulic apparatus comprising a hydraulic machine having an inlet and outlet for flow of fluid to and from said machine, an adjusting member for varying the capacity of said machine, motor means operative to cause movement of said adjusting member, a motor for moving said adjusting member, servo valve means for directing movement of said motor, means connecting said servo valve means with said motor means for moving said servo valve means by said motor means, valve means controlling movement of said motor means, an assembly movable conjointly with said adjusting member along a first axis and a mechanism interconnecting said valve means and said assembly, said mechanism including a first link pivotally mounted intermediate its ends so as to pivot about a second axis, said second axis not being parallel to said first axis, and a second link mounted to pivot about a third axis and to abut said first link on both sides of said second axis to transmit motion from said first link to said valve in response to outlet fluid pressure.

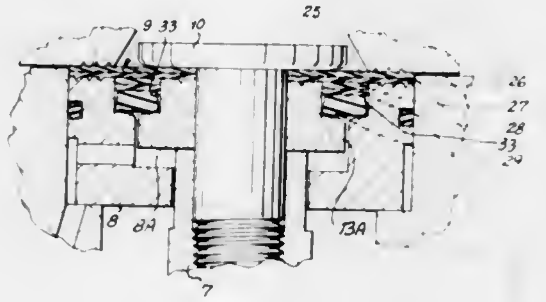
4,035,107
PUMP SYSTEM FOR HIGH PRESSURE ABRASIVE LIQUIDS

Stanley Frank Kesten, Glendale, and Miroslav Liska, Los Angeles, both of Calif., assignors to Durotech Co., Burbank, Calif.

Continuation of Ser. No. 565,685, April 7, 1975, abandoned. This application Sept. 15, 1976, Ser. No. 723,459

Int. Cl.² F04B *49/00, 43/04, 45/04;* **F01B** *19/02*

U.S. Cl. 417—310 **9 Claims**



1. In a high pressure, high velocity diaphragm pump having a housing, a cavity within the housing, a flexible diaphragm dividing said cavity into two separate chambers, said diaphragm being sealingly secured and supported in the housing along a peripheral portion of the diaphragm, one of said chambers being a pumping chamber having an inlet and an outlet for the fluid being pumped, the other of said chambers being a dry diaphragm actuation chamber,

said diaphragm being adapted to be rapidly flexedly reciprocated to create a suction in the pumping chamber when flexed away from the pumping chamber and to create a high discharge pressure in the pumping chamber when flexed toward the pumping chamber, means connected to the pumping chamber to permit fluid flow thereinto when the suction is created, means connected to the pumping chamber to permit fluid flow therefrom when the discharge pressure is created,

the improvement comprising means connected to and associated with said diaphragm within the dry actuation chamber, said means connected and associated including:

a driving reciprocating member being adapted to flex a central flexible portion of the diaphragm, said reciprocating member being connected to said flexible central portion so as to support said portion at the connection,

pivotal ring members being adapted to be pivoted by said reciprocating member and to support the flexible portion of the diaphragm between its peripheral portion and said connection, and

one or more thin washers extending between the diaphragm and the pivotal members to distribute the load on the pivotal members to the diaphragm in support of the diaphragm.

4,035,108
AXIAL FLOW PUMP FOR A PIVOTAL ROTOR

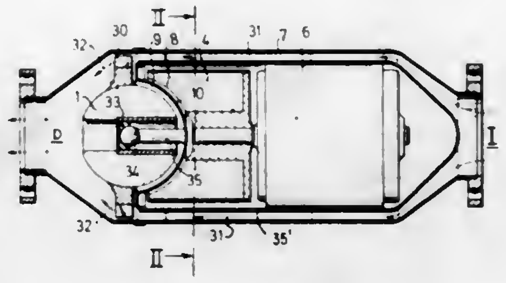
Nikolaus Laing, Hofener Weg 35-37, 7141 Aldingen near Stuttgart, Germany

Division of Ser. No. 414,254, Nov. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 293,102, Sept. 28, 1972, abandoned. This application Apr. 23, 1975, Ser. No. 570,828

Claims priority, application Australia, Oct. 7, 1971, 8658

Int. Cl.² F04B *17/00*

U.S. Cl. 417—365 **6 Claims**



1. An axial flow pump construction having a fluid inlet area and an axially extending fluid discharge area comprising a dynamically stabilized rotor having a first pole ring thereon, a second pole ring for producing a rotating magnetic field, a spherical gap between the second and first pole rings, a spherical bearing element rotatably and pivotally supporting said rotor whereby said rotor may rotate and pivot about the center of said spherical bearing element, and axial flow impeller blades on said rotor for directing flow of fluid therethrough from said inlet area to said discharge area whereby increased hydraulic pressure in said discharge area when said pump is operating will force said rotor in an axial direction onto said spherical bearing element.

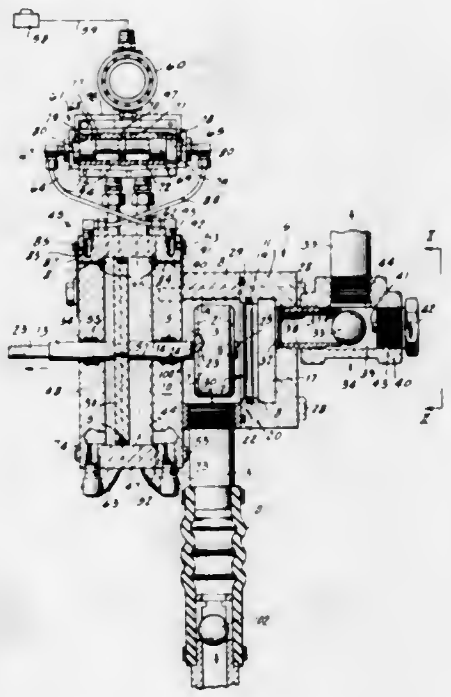
4,035,109
PUMP FOR FLUENT, AND ESPECIALLY HEAVY AND ABRASIVE MATERIALS

Edwin H. Drath, 1218 S. Patton, Arlington Heights, Ill. 60005, and Paul Schlosser, 6820 W. Fuqua Drive, Missouri City, Tex. 77459

Filed Aug. 25, 1975, Ser. No. 607,284

Int. Cl.² F04B *7/04*

U.S. Cl. 417—403 **20 Claims**



1. A pump for fluent materials and especially suitable for moving heavy fluent and abrasive materials, comprising:

a housing member providing a hollow cylinder chamber receptive of material to be pumped and having an axially extending chamber wall and opposite ends;

a piston within and shorter than the cylinder chamber and having its perimeter of smaller diameter than and in limited spaced gap relation to said wall so that material can flow through the gap;

a closure at one end of the cylinder chamber having means for guiding a piston rod of the piston for axial forward and return strokes of the piston relative to the opposite end of the cylinder chamber;

means for driving the piston rod and thereby the piston in said forward and return strokes;

a generally cup-shaped end closure rigid with said opposite end of the cylinder chamber, and said cup-shaped closure having a blind end chamber which forms a forward extension from the cylinder chamber and into which the piston extends a limited distance in the forward stroke of the piston, said blind end extension chamber having a wall diameter which is larger than the diameter of the piston perimeter so that there is a spaced gap relation between the piston perimeter and said extension chamber when the piston extends into said extension chamber;

means for introducing into said cylinder chamber material to be pumped;

check valved means for receiving pumped material from said extension chamber;

a rigid annular rib between said cylinder chamber and said extension chamber and having a radially inner annular rib surface which extends to a smaller diameter than the diameters of the cylinder chamber wall and the extension chamber wall but is of a substantially larger diameter than the piston perimeter diameter, said rib defining a port through which the piston moves freely and in substantial annularly spaced gap relation in a forward stroke from a position wherein the forward end of the piston is entirely within the cylinder chamber and clear of said rib to a position wherein the piston projects partially through said rib; and

a combination valving, sealing and wiping elastic ring engaged with said rib and having an annular portion projecting radially inwardly beyond said inner annular surface of the rib to a substantially smaller diameter than the diameter of the piston perimeter;

said projecting annular portion of the elastic ring extending across said gap and being engaged by the piston during the forward stroke through said rib into said extension chamber, and the piston perimeter elastically expanding the radially inwardly projecting portion of the elastic ring into a tensioned sealing and wiping annular gripping engagement with the piston perimeter and maintaining pumping pressure in said extension chamber against leakage past said rib and the piston during said forward stroke of the piston and the extension chamber;

said rib providing a rigid annular portion between said cylinder chamber and the elastic ring serving as a backup barrier for the elastic ring to prevent backward extrusion of the ring into the cylinder chamber due to pumping pressure in said extension chamber;

said piston producing a suction effect and developing a negative pressure in said extension chamber during the return stroke of the piston;

said piston completely withdrawing from the elastic ring at the end of said return stroke so that material can flow from said cylinder chamber past said piston and through said rib and said elastic ring into said extension chamber in response to said negative pressure;

said projecting annular portion of the elastic ring providing the only surface in the pump with which the perimeter of the piston engages at any time and all other surfaces within the pump including said rib remaining at all times substantially spaced from the piston perimeter.

4,035,110

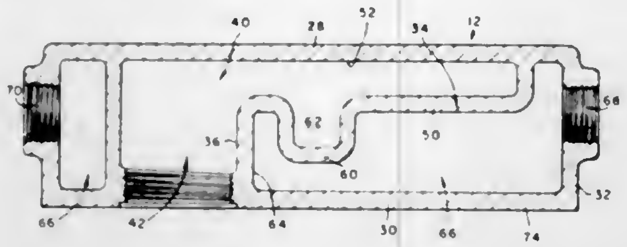
AIR COMPRESSOR CYLINDER HEAD

Rudolph J. Plasko, Jr., Elyria, Ohio, assignor to The Bendix Corporation, South Bend, Ind.

Filed Sept. 22, 1975, Ser. No. 615,443

Int. Cl.² F01B *31/08;* **F04B** *39/06*

U.S. Cl. 417—539 **3 Claims**



1. In an air compressor, a housing defining a cylinder therein, a piston slidably mounted in said cylinder, a head assembly for said housing having coolant-receiving and compressed air-receiving cavities therein, and valve means for controlling communication between said cylinder and said compressed air-receiving cavity, said head assembly including an upper wall having an outer surface communicating with ambient air, a lower wall, an outer wall interconnecting said upper and lower walls and having an outer surface communicating with ambient air, and an inner wall having a portion thereof extending transversely with respect to the outer wall between said upper wall and said lower wall, said inner wall cooperating with the other walls to define said compressed air-receiving and coolant-receiving cavities therebetween, one of said cavities being disposed generally above and the other of said cavities being disposed generally below said transversely extending portion, said cavity above said transversely extending portion being said compressed air-receiving cavity, the cavity below said transversely extending portion being said coolant-receiving cavity, said inner wall transversely extending portion being substantially parallel to said upper wall and cooperating with said upper wall to substantially define said compressed air-receiving cavity therebetween.

4,035,111

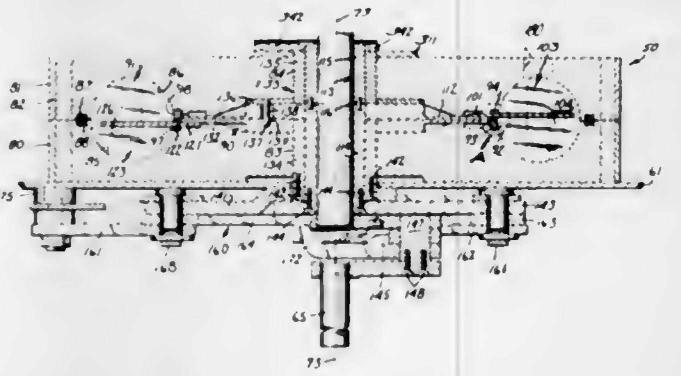
TOROIDAL ROTARY ENGINE

Peter J. Cronen, Sr., 16816 Gray's Blvd., Wayzata, Minn. 55391

Filed Aug. 6, 1975, Ser. No. 602,289

Int. Cl.² F01C *1/00*

U.S. Cl. 418—38 **2 Claims**



1. An engine comprising, in combination:

a stationary toroidal chamber having a closed axis, which is circular about an axis of radial symmetry, and having a circular cross section in any plane passing through said axis of symmetry;

first and second double-ended piston assemblies slidable without limit in said chamber for independent revolution about said axis of symmetry;

a pair of concentric pivot arms connected severally to said piston assemblies for rotary movement therewith about said xis of symmetry;

a crank shaft concentric with said axis of symmetry;

a rotatable linkage, for connecting said pivot arms in bidirection driving relation to said crank shaft, comprising four arms interlinked at pivots defining a quadrilateral, means connecting a first opposite pair of said pivots respectively to said pivot arms, and means connecting the second opposite pair of said pivots to said crank shaft;

means coacting with opposite arms only of said linkage to prevent movement of said piston assemblies in a first direction;

a set of three apertures communicating with said chamber at locations equally spaced about said axis of symmetry;

normally closed valve means communicating severally with said apertures for controlling both the ingress and the egress of energizing fluid thereat; and

valve actuating means connected individually to said piston assemblies for rotary motion therewith about said axis of symmetry to actuate said valve means in a predetermined sequence, whereby to enable said fluid to cause alternate arcuate movements of said piston assemblies in a second, opposite direction about said axis of symmetry, and produce rotation of said crank shaft.

4,035,112

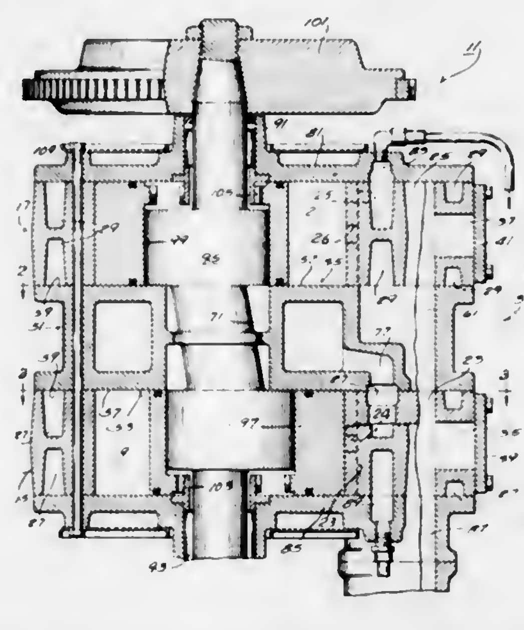
ROTARY ENGINE COOLING AND EXHAUST SYSTEM

Eugene R. Hackbarth, Kenosha, Wis., and Harry M. Ward, III, Waukegan, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Continuation of Ser. No. 444,048, Feb. 20, 1974, abandoned. This application July 16, 1975, Ser. No. 596,525

Int. Cl.² F01C *1/22, 21/06;* **F02B** *55/10*

U.S. Cl. 418—60 **21 Claims**



1. A rotary internal combustion engine comprising a housing assembly including first and second housing members extending in spaced, parallel and aligned relation to each other and respectively including wall means partially defining first and second trochoid shaped rotor cavities and additional wall means partially defining first and second water jackets respectively extending partially circumferentially of said first and second cavities and respectively including circumferentially spaced inlet and outlet ends in fluid communication solely within said respective housing members, a first wall member located adjacent to said first housing member remotely from said secomd housing member and including wall means further partially defining said first rotor cavity and also including coolant inlet means comunicating with said inlet end of said first water jacket, a second wall member located adjacent to said second housing member remotely from said first housing member and including wall means further defining said second rotor cavity and also including outlet means communicating with said outlet end of said second water jacket, and an intermediate member located between said first and second housing members and including wall means further defining said first and second rotor cavities and also including coolant conduit means communicating between said outlet end of said first water jacket and said inlet end of said second water jacket.

4,035,113

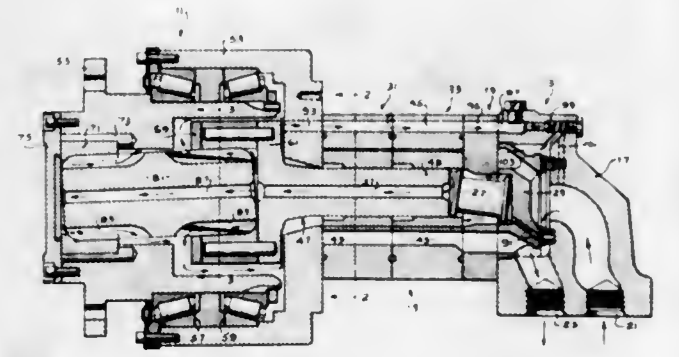
GEROTOR DEVICE WITH LUBRICANT SYSTEM

Hugh L. McDermott, Minneapolis, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Filed Jan. 30, 1976, Ser. No. 654,141

Int. Cl.² F03C *3/00;* **F04C** *15/00;* **F16D** *3/18;* **F01M** *1/00*

U.S. Cl. 418—61 B **9 Claims**



1. A rotary fluid pressure device comprising:

a. a casing;

b. a gerotor gear set operatively associated with said casing;

c. orbiting means associated with said gerotor gear set and defining first internal splines having both orbital and rotational movement;

d. a shaft assembly rotatably associated with said casing and defining second internal splines;

e. a connecting shaft member including first external splines in engagement with said first internal splines and second external splines in engagement with said second internal splines to transmit torque between said orbiting means and said shaft assembly;

f. said connecting shaft member having first and second ends and defining an axially oriented lubricant passage having first and second end portions disposed at the axial ends of said connecting shaft member adjacent said first and second external splines, respectively; said lubricant passage being in fluid communication only between said axial ends

g. said fluid pressure device including means defining a lubricant path disposed to communicate pressurized lubricant to said connecting shaft member, one portion of said pressurized lubricant flowing through a lubricant path including one of said first and second ends of said shaft member and said one of said first and second external splines, and another portion of said pressurized lubricant flowing through a lubricant path including the other of said first and second external splines, the other of said first and second ends of said connecting shaft member and said lubricant passage;

h. said fluid pressure device including means defining a return lubricant path, said first lubricant path and said second lubricant path flowing into said return lubricant path.

4,035,114

METHOD FOR REDUCING POWER CONSUMPTION IN A LIQUID-COOLED ROTARY COMPRESSOR BY TREATING THE LIQUID

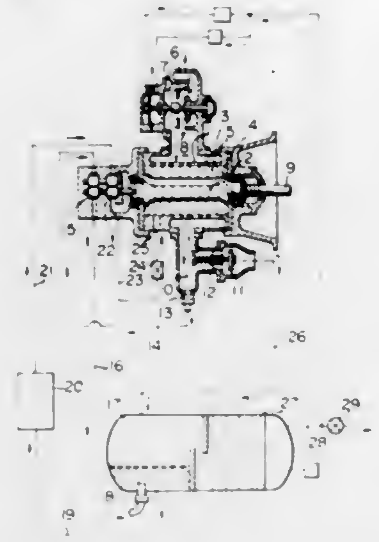
Goro Sato, Atami, Japan, assignor to Hokuetsu Kogyo Co., Ltd., Japan

Filed Aug. 5, 1975, Ser. No. 602,125

Claims priority, application Japan, Sept. 2, 1974, 49-99960

Int. Cl.² F01C *21/04;* **C04C** *29/02*

U.S. Cl. 418—84 3 Claims



1. In the method of operating a liquid-cooled type rotary compressor of the type which includes a cylinder having an inlet opening and an outlet opening, rotary means provided in said cylinder, at least one compression chamber defined between said rotary means and said cylinder, an unloader connected to said cylinder to communicate with said inlet opening, said cylinder also having a delivery chamber in a lower part of the cylinder, said delivery chamber having an upper opening, gas outlet and a liquid drainage opening, said upper opening communicating to said outlet opening, a reservoir having a gas space for compressed gas and a liquid space for liquid for cooling, lubricating and sealing, first conduit means connecting the lower part of said cylinder and said reservoir to communicate with said gas outlet and the gas space in said reservoir, second conduit means connecting said reservoir and the lower part of said cylinder to communicate with said liquid drainage opening and said liquid space in said reservoir, a liquid drainage pump provided in said second conduit means, third conduit means connecting said cylinder and said reservoir to communicate with said at least one compression chamber and said liquid space in said reservoir, and a regulator provided in said third conduit means for adjusting the amount of liquid to be injected into said at least one compression chamber, the improvement characterized by the steps of delivering from said compression chamber into said delivery chamber a mixture of said compressed gas and liquid, separating the gas and liquid components of said mixture immediately after the mixture is delivered into said delivery chamber, the liquid taking its own way in said second conduit means separately from the gas in said first conduit means, and pumping said liquid from said delivery chamber into said reservoir whereby the pressure in the delivery chamber can be decreased to reduce back pressure in the compressor and thereby reduce the power consumed by the compressor.

4,035,115

VANE PUMP

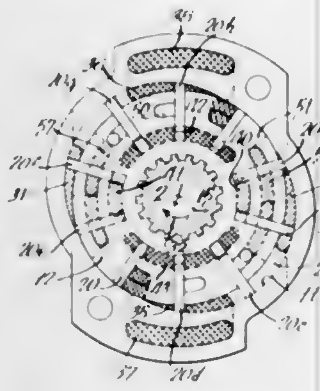
Lowell D. Hansen, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Jan. 14, 1975, Ser. No. 540,836

Int. Cl.² F04C *1/00, 15/02*

U.S. Cl. 418—183 2 Claims

1. A vane pump having a casing with a rotor having a plurality of slots with inner and outer ends, port plate means positioned at the sides of said rotor, a plurality of vanes movably mounted one in each of said slots, a cam ring surrounding said rotor for controlling the position of said vanes relative to the rotor and with rotation of the rotor moving the space between successive vanes first through an intake area and then through a pressure discharge area, arcuate inlet port means in the port plate means in the intake area for supplying fluid to spaces between vanes, outlet port means in the port plate means in the pressure discharge area for receiving fluid under pressure from spaces between vanes, a plurality of passages in said rotor located radially beyond the inner ends of said slots and extending between side faces of the rotor and opening outwardly thereto, there being one of said passages associated with each of said spaces between vanes and with a passage having a radial opening to said space centrally of the rotor width, and additional arcuate port means in the port plate means in the intake area exposed to said rotor side faces and in alignment with said passages and having a length greater than the first arcuate port means to provide a port section located angularly in advance of the inlet port means and opening to successive ones of said passages for additional flow access area to a space between vanes in advance of flow to a space between vanes from the inlet port means and without communication with the inner ends of said slots to increase the time for filling of a space while in said intake area.



4,035,116

PROCESS AND APPARATUS FOR FORMING ESSENTIALLY SPHERICAL PELLETS DIRECTLY FROM A MELT

John L. O'Brien, Winchester; Robert R. Perron, Beverly, and Peter F. Strong, Harvard, all of Mass., assignors to Arthur D. Little, Inc., Cambridge, Mass.

Filed Sept. 10, 1976, Ser. No. 722,008

Int. Cl.² B22D *23/08;* **B22F** *9/00*

U.S. Cl. 425—10 36 Claims

20. An apparatus for forming solid pellets directly from a melt, comprising in combination

a. a columnar vessel for containing a melt, having a columnar section and terminating at its lower end in manifold means having an orifice plate slanted such that the normal to said orifice plate forms an acute angle with the vertical;

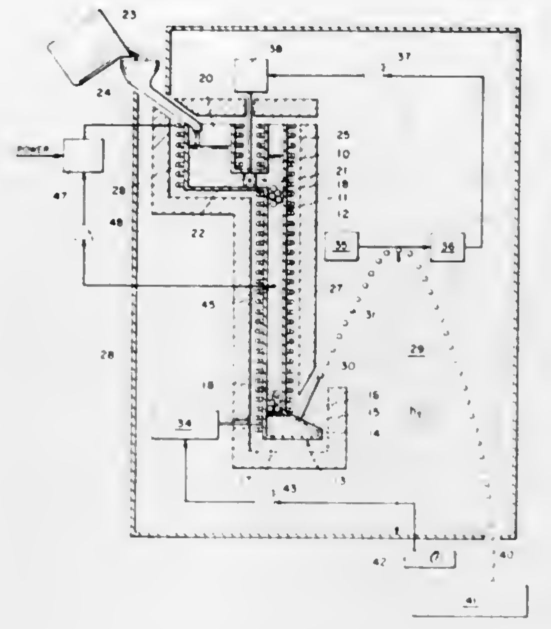
b. at least one orifice in said orifice plate arranged to impart an upwardly directed trajectory to a jet of said melt directed therethrough from said vessel;

c. means to impart vibratory motion to said lower end of said columnar vessel whereby individual pellets are formed from said jet to continue in said trajectory;

d. means to maintain the level of said melt within said columnar vessel at an essentially constant predetermined level;

e. means to isolate said melt jet from acoustically and hydrodynamically induced disturbances in said columnar section of said columnar vessel; and

f. heating means to maintain said melt at an essentially constant predetermined temperature.



4,035,117

CHARGING MEANS FOR A VULCANIZING PRESS

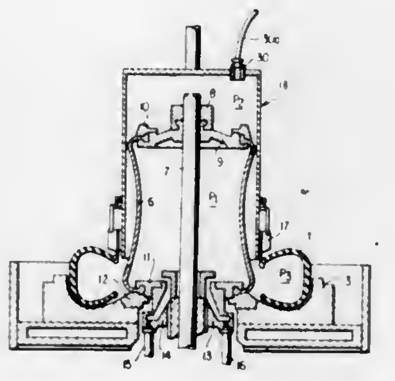
Kazuhiko Nakagawa, and Yasuhiko Fujieda, both of Kobe, Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed May 24, 1976, Ser. No. 689,061

Claims priority, application Japan, May 22, 1975, 50-62220

Int. Cl.² B29H *5/04*

U.S. Cl. 425—19 8 Claims



1. A charging means for a vulcanizing press compressing a cylinder concentric with a vulcanizing mold for a tire, a piston rod vertically movable in said cylinder, and a gas-tight cylindrical bladder of a flexible material supported between the top of said piston rod and the top of said cylinder;

said charging means comprising a hollow cylindrical body disposed above and vertically movable with respect to the mold and having an inner diameter greater than the outer diameter of the bladder, said hollow cylindrical body being provided with a fluid inlet means for maintaining the pressure within the space defined between the inner surface of the hollow cylindrical body and the outer surface of the bladder to be higher than the pressure within the bladder, and said hollow cylindrical body is also provided on the lower end of the outer periphery thereof with a tire retaining means capable of closing and opening in the radial direction for holding the upper bead of a tire to be fitted in the mold for vulcanization.

4,035,118

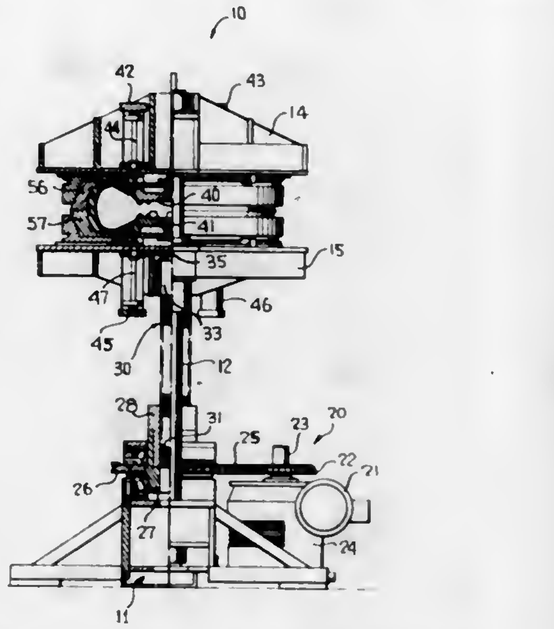
SELF-CENTERING MATRICES FOR RETREADING MOLDS

Kenneth T. MacMillan, 4992 Wesleyan Woods Drive, Macon, Ga. 31204

Division of Ser. No. 391,816, Aug. 27, 1973, Pat. No. 3,997,284. This application Nov. 5, 1975, Ser. No. 628,900

Int. Cl.² B29H *5/04*

U.S. Cl. 425—25 2 Claims



1. A retreading mold comprising a pair of relatively movable platens, means for supporting said platens during relative movement therebetween, means for imparting relative motion to said platens between spaced open and closed positions thereof, an annular matrix carried by each platen and thereby similarly being moved between said open and closed positions, said motion imparting means including a reciprocal member, said reciprocal member being disposed generally axially of said matrices, means between said reciprocal member and one of said platens for effecting self-centering between said platens in the closed position thereof, and self-centering means being curved surface contact means between said one platen and said reciprocal member, said reciprocal member being a screw having a free terminal end defining said curved surface contact means, said screw having an end portion remote from said free terminal end, said screw having a vertical axis, said motion imparting means including in addition to said screw a nut in exterior threaded relationship to said screw, means for generally precluding vertical movement of said nut, means for selectively oppositely rotating said nut to impart reciprocal movement to said screw whereby said platens are moved between said open and closed positions, a reservoir adapted to house a lubricant, and said reservoir being disposed to receive said screw remote end portion for lubricating the latter.

4,035,119

TIRE MOLD

Arthur W. Beres, Akron; Helmut Dernbach, Cuyahoga Falls, and Richard A. Raymondi, Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

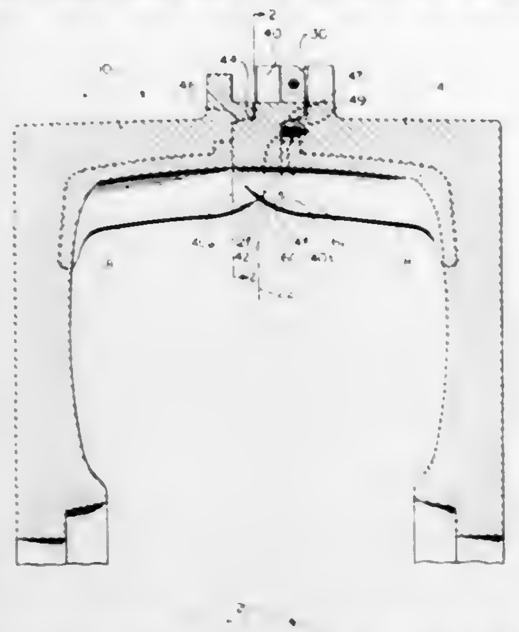
Filed Aug. 18, 1976, Ser. No. 715,755

Int. Cl.² B29H *5/02*

U.S. Cl. 425—46 3 Claims

1. A tire mold comprising an annular top part and an annular bottom part each including a sidewall molding portion and an annularly integral tread molding portion, the tread molding portion terminating at a plane face normal to the mold axis, spaced from the mid-circumferential plane of the mold and having tread molding pattern of projections and depressions for molding at least one-third of the width of the tread of a tire to be molded in the mold; one said mold part having a plurality of hinge lugs spaced angularly about the mold axis and affixed

on the periphery of the mold part adjacent said face thereof; and a center ring having an upper and a lower plane surface and a tread molding pattern for molding not more than one-third of the width of the tread of a tire to be molded in the mold, said ring comprising a plurality of arcuate sections each swingably connected respectively to a pair of said hinge lugs; the plane face of each said part being in coplanar contact with the respectively associated plane surface of said ring while the mold is closed.



4,035,120
APPARATUS FOR MAKING SAWDUST CHIPBOARD

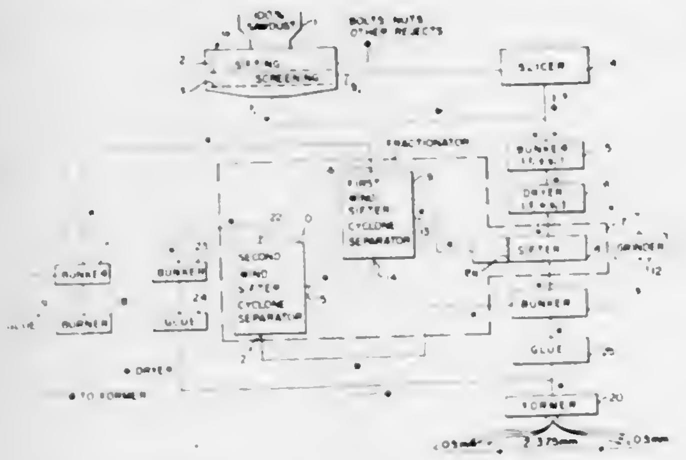
Erik Gustav Lennart Eriksson, Karlstad, Sweden, assignor to AB Karlstadplattan, Karlstad, Sweden

Division of Ser. No. 478,952, June 13, 1974, Pat. No. 3,959,195, which is a continuation-in-part of Ser. No. 136,774, April 23, 1971, abandoned. This application Jan. 29, 1976, Ser. No. 653,394

Claims priority, application Sweden, Apr. 24, 1970, 5740/70

Int. Cl.² B29J *5/02*

U.S. Cl. 425—81 **3 Claims**



1. An apparatus for making chipboard from substantially 100% sawdust and comprising means for sifting and screening sawdust particles of varied width, length and thickness to form a first source of sawdust of at least 18 mesh size and a second sawdust source of between at least about 4 mesh to under about 18 mesh size, means for slicing the particles in the second source to from about 7 mesh to less than about 35 mesh size, bunker means for combining the first and second sources, fractionating means operatively connected with said bunker means for separating said combined sources into a relatively coarse and a relatively fine fraction, said fractionating means including cyclone separator means for further dividing said relatively fine fraction into at least two further fractions having particles from about greater than 25 to about 60 and from about 14 to less than about 25 mesh size, respectively, second bunker means supplied with said relatively coarse fractions and with the coarser of the further fractions, first binder means for supplying a binder material to said sawdust particles from said second bunker means, third bunker means supplied with the finer of said further fractions, second binder means for supplying a binder material to the finer of said further fractions from the third bunker means, and windlayering means supplied with said binder applied particles on a forming surface for forming a chipboard.

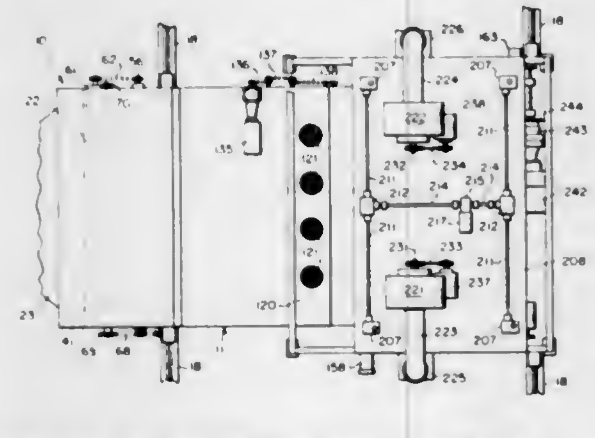
4,035,121
MACHINE FOR FORMING LIGNOCELLULOSIC FIBER MATS

Dennis E. Wood, Rochester, N.Y., assignor to Rando Machine Corporation, Macedon, N.Y.

Filed Feb. 25, 1976, Ser. No. 661,350

Int. Cl.² B29J *5/00*

U.S. Cl. 425—83 **18 Claims**



1. A machine for forming fiber mats, comprising
a housing having therein a chamber,
a pair of endless belt members,
means mounting said members on said housing for travel in endless paths adjacent said chamber and with respective runs thereof disposed in spaced, confronting relation,
means for feeding fibers into the upper end of said chamber,
means connecting an opening in the lower end of said chamber with one end of the space formed between said confronting runs of said belt members,
means for creating a vacuum in said space adjacent said one end thereof whereby fibers in said chamber are drawn by suction through said opening into said one end of said space,
said mounting means supporting confronting portions of said belt members for travel along converging paths adjacent said one end of said space, and for travel along parallel paths adjacent the opposite end of said space, and
means for driving said members so that said confronting runs thereof travel at the same rate from said one end toward the opposite end of said space, whereby fibers entering said one end of said space are compacted between, and conveyed by, the confronting runs of said members from said one to the opposite end of aid spaced where they are discharged in the form of a fiber mat.

4,035,122
SOAP SAVING DEVICE

John Daniel Cavanaugh, 2282 Clover Ave., Anaheim, Calif. 92801

Filed Aug. 22, 1975, Ser. No. 606,751

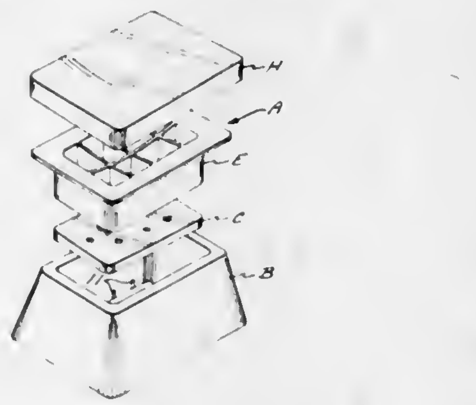
Int. Cl.² B29C *3/00, 27/00*

U.S. Cl. 425—84 **4 Claims**

1. A device for use in saving soap by reforming remnants of bars of soap and scrap soap into a bar of usable size, said device including:

a. housing that defines a vertically extending space when said housing is resting on a horizontal surface, said housing having a plurality of vertically directed recesses formed in a lower portion thereof;

b. a platen slidably movable in said vertically extending space, said platen being adapted to occupy a first position in said vertically extending space wherein it is in contact with said surface, said platen when in said first position being capable of supporting said remnants of bars of soap and scrap soap thereon within the confines of said vertically extending space, and said platen having a plurality of spaced apertures formed therein, and said platen including a first plate having a first concave upper surface and a first side wall that extends downwardly from the periphery of said first plate, said first side wall slidably engaging the interior of said housing and when said platen is in said first position said first side wall cooperates with said recesses to define vertical passages through which water can escape during the reforming of said remnants and scraps of soap into a usable bar; and,



c. a plunger slidably mounted in an upper portion of said vertically extending space, said plunger and platen when disposed in said housing cooperatively defining a confined space of variable volume therebetween wherein said remnants and scraps of soap are disposed, said plunger when manually forced towards said platen reducing the volume of said confined space and compressing said remnants and scraps of soap to reform the same to a usable bar of soap that has the volume and shape of said confined space of reduced volume, with any surplus water associated with said remnants and scraps flowing therefrom through said apertures during the reforming of said remnants and scraps into said usable bar of soap, with said usable bar of soap after formation thereof being ejected from said housing by removing said plunger from said housing and then manually moving said platen from said first position towards the position previously occupied by said plunger.

4,035,123
APPARATUS FOR ELECTRICALLY TESTING MOLDED CORD-SETS DURING THE MOLDING OPERATION

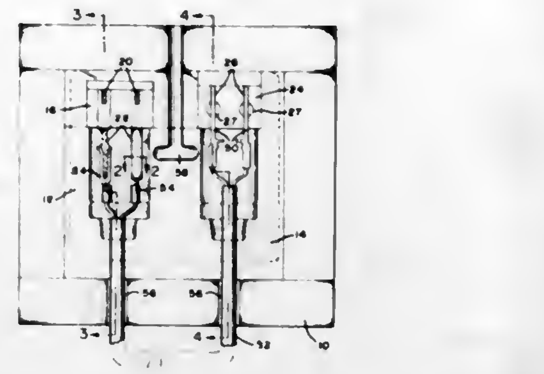
William E. Ferris, deceased, late of Stamford, Conn.; by Gail Hennessy, executrix, New Fairfield, Conn.; John Doumas, Wilton, and Harry McCarter, Old Greenwich, both of Conn., assignors to Consolidated Foods Corporation, Chicago, Ill.

Division of Ser. No. 514,391, Oct. 15, 1974. This application Dec. 19, 1975, Ser. No. 642,408

Int. Cl.² B29C *27/00*

U.S. Cl. 425—129 R **5 Claims**

1. In an injection molding machine for manufacturing electrical cord-sets, an electrically conducting mold having upper and lower mold cavities for simultaneously molding a female receptacle having female contacts and a male plug having male contacts to opposite ends of an electric cord, locater means associated with said mold cavities for positioning said male and female contacts within the respective cavities prior to and during the molding operation, electrical conducting means for connecting said female and male contacts while positioned by said locater means to test circuits for electrically testing the cord set, and circuit interrupters operable by the opening of the mold for interrupting the circuits established by said conducting means to thereby disconnect said female and male contacts from said test circuits.



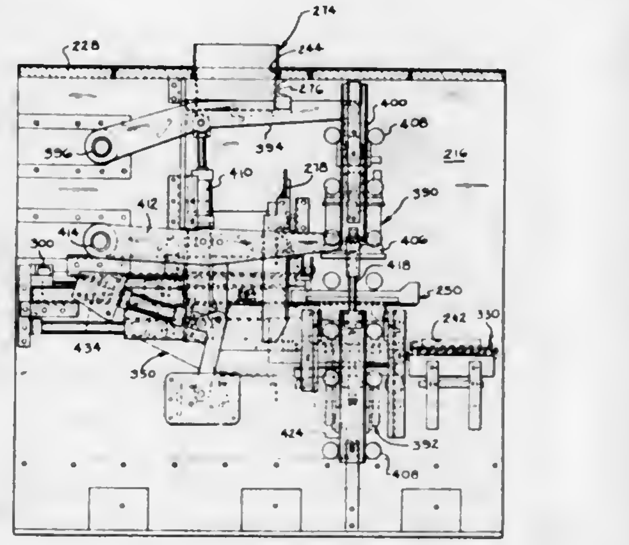
4,035,124
BLOCK MOLDING MACHINE

Milo G. Balhorn, Waterloo, Iowa, assignor to Old Fort International, Inc., Adrian, Mich.

Division of Ser. No. 544,137, Jan. 27, 1975, Pat. No. 3,961,874. This application Feb. 13, 1976, Ser. No. 657,746

Int. Cl.² B28B *3/04*

U.S. Cl. 425—139 **8 Claims**



1. In a block molding machine, a frame, a moldbox open at the top and bottom supported by the frame, material feed means located above said moldbox for feeding material into said moldbox, vibration means supported by said frame for vibrating said moldbox for compressing and sizing a block in the moldbox, a strip mechanism mounted on said frame for supporting a pallet under said moldbox, a head assembly mounted on said frame for compressing material in said moldbox during vibrational movement of the moldbox, said strip mechanism and said head assembly each having separate and independent actuating means, said actuating means being structurally interconnected for (1) raising said head assembly relative to said strip mechanism an amount sufficient to enable feeding of material into said moldbox by said material feed means, (2) subsequently holding said head assembly and said strip mechanism rigidly together as a unit when a block has been sized in the moldbox and (3) lowering said head assembly and strip mechanism simultaneously while holding them rigidly together as a unit for stripping the block from the moldbox.

4,035,125

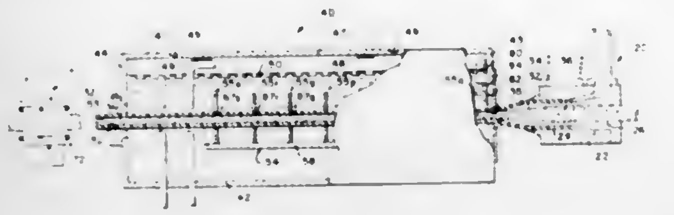
JAM PREVENTION UNIT FOR EXTRUSION PROCESS

Alex S. Gergely, Bon Air, Va., assignor to Philip Morris Incorporated, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,509

Int. Cl.² B29F *3/00*

U.S. Cl. 425—141 **13 Claims**



1. Apparatus for forming a continuous thermoplastic extrudate, including:

a. means for extruding the extrudate of thermoplastic material to a predetermined dimension, said extrudate being heated to a temperature at which it can be plastically deformed;

b. means for defining a chamber for receiving a liquid coolant therein and having an entrance sizing aperture and an exit aperture;

c. means for advancing said heated extrudate through said entrance sizing aperture into said chamber, and through said exit aperture from said chamber;

d. an assembly disposed within said chamber and including a plurality of spaced discs having sizing apertures axially aligned with each other and said entrance sizing and exit apertures of said chambers;

e. detection means operative to provide a control signal upon occurrence of a jam at said entrance sizing aperture;

f. drive means coupled to said assembly and responsive to said control signal for driving said assembly in the extrudate direction that said advancing means directs the extrudate, whereby upon detection of an extrudate jam at said entrance sizing aperture, said assembly is moved in the extrudate direction, thereby tending to stretch the extrudate and tending to free it from said sizing apertures of said disc; and

g. extrudate severing means responsive to said control signal for severing the extrudate at a point adjacent said entrance sizing aperture into said coolant chamber.

4,035,126

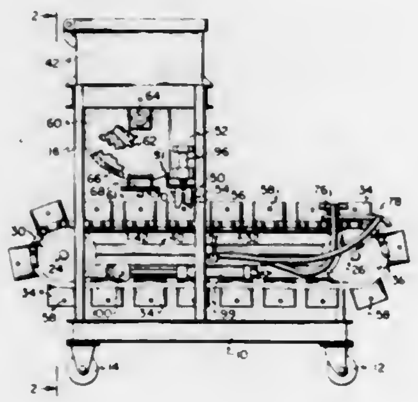
MOLDING APPARATUS

Roland Vernon Manning, Salt Lake City, Utah, assignor to Manning Target Systems, Inc., Salt Lake City, Utah

Continuation of Ser. No. 450,660, March 13, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,321

Int. Cl.² B29C *3/06*

U.S. Cl. 425—157 **9 Claims**



1. Apparatus for molding frangible targets from a hot melt, comprising:

a supporting frame including an elongated horizontally disposed support surface;

a continuous belt mounted within said supporting frame for movement in a loop around said support surface such that the belt passes horizontally over and adjacent said support surface;

a plurality of female dies, each having internal cooling channels and constituting means for forming a first side of a frangible target, said female dies being carried by said continuous belt in a series of groups, with the individual dies of each group arranged in a pattern transverse the outer surface of said loop;

belt driving means for advancing said groups of female dies intermittently around said loop so that each said group is positioned for an interval at selected locations in the following sequence:

a filling station, with the female dies of a group located atop said loop oriented to receive a charge of hot melt,

a target-forming station with the female dies of said group located atop said support structure,

a target discharge station with the female dies of said group oriented to discharge their contents;

hot melt discharge means mounted above said frame support in the vicinity of said filling station and including means for introducing a substantially identical metered amount of hot melt into each of the female dies in a said group positioned at said station;

an array of male dies, corresponding in number and arrangement to the female dies within said group mounted above said support surface in the vicinity of said-target-forming station for reciprocative mating with said female dies after said female dies are charged with hot melt, said male dies constituting means for forming a second side opposite said first side of a frangible target; and

means for introducing coolant to the internal cooling channels of each said female die at approximately the same temperature and at approximately the same rate, constituting means for cooling said female dies approximately identically to produce frangible targets of approximately identical frangible characteristics.

4,035,127

MELT SPINNING APPARATUS

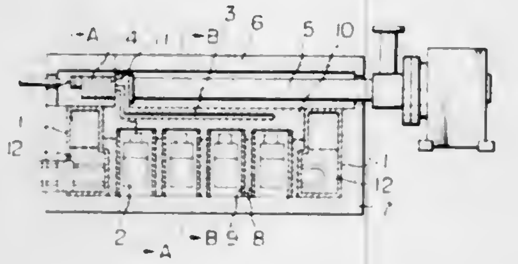
Masafumi Ogasawara, Otsu; Nobu Yamaguchi, Shiga, and Yoshio Tsuchiyama, Kyoto, all of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Filed Dec. 20, 1974, Ser. No. 534,795

Claims priority, application Japan, Dec. 25, 1973, 48-143708; June 22, 1973, 48-73550

Int. Cl.² D01D *3/00*

U.S. Cl. 425—192 S **11 Claims**



1. An apparatus for melt spinning a fiber-forming synthetic polymer comprising at least one screw-type extruder for melting and extruding the synthetic polymer, at least one metering pump for metering the synthetic polymer, a plurality of spinning packs arranged in a horizontal line parallel to the axis of the extruder and directly beneath the extruder and a plurality of conducts for permitting the molten polymer to pass therethrough from the metering pump to each spinning pack, characterized in that

the metering pump, the spinning packs and the conduits are positioned inside a heating frame provided with a heating means; said heating frame being encased, together with the portion of the extruder to be heated, in a casing of a thermal insulation material; and

the conduits extend on a substantially horizontal plane located above the spinning packs and beneath the extruder; and the extruder and the metering pump form a substantially horizontal line.

4,035,128

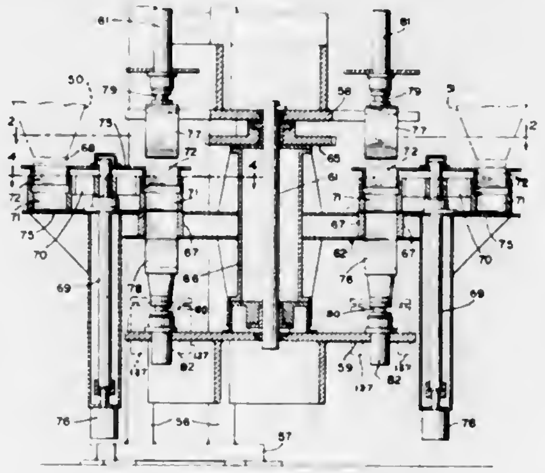
BRICK PRESS AND ASSOCIATED EQUIPMENT FOR MAKING BRICKS

Frede Hilmar Drostholm, Vedbaek; Harry Jensen, Gentofte, and Per Willadsen, Melby, all of Denmark, assignors to Frede Hilmar Drostholm, Vedbaek, Denmark

Filed Sept. 30, 1974, Ser. No. 510,145

Int. Cl.² B28B *3/06;* **B30B** *11/10;* **B28B** *5/08, 13/02*

U.S. Cl. 425—259 **23 Claims**



1. A press for forming bricks from charges of particulate material, comprising a turntable, at least three brick molds each having openings at opposite sides and mounted on the turntable in angularly spaced relation about the axis of the turntable, and mechanism including reciprocable press elements in fixed locations spaced around the axis of the turntable and establishing a plurality of fixed operating stations including precompression, compression and ejection stations angularly spaced about the axis of the turntable and through which the molds are successively carried by movement of the turntable, the reciprocable press elements of the mechanism providing the precompression and compression stations each includes that a pair of movable press plungers mounted to engage the charge in each mold through the opposite side openings of the mold when each mold is in the respective precompression or compression station, separate power means for applying pressure to the precompression and compressoon plungers, the power means for the compression plungers providing for application of higher pressure than the power means for the precompression plungers, and the mechanism establishing the precompression station further including means providing for shift of the mean position of the charge in the mold concurrently with precompression.

4,035,129

CONTINUOUS CURING DEVICE FOR LONGITUDINALLY EXTENDED PRODUCTS

Jukka Seppo Karppo, Helsinki, and Matti Akseli Aaltonen, Espoo, both of Finland, assignors to Oy Nokia AB, Helsinki, Finland

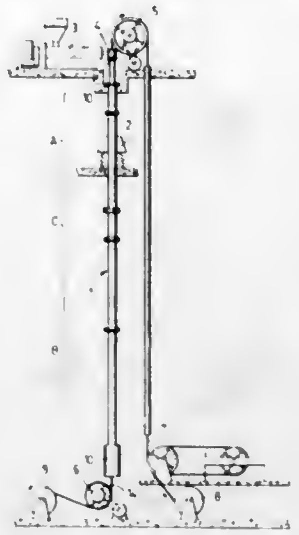
Filed July 20, 1976, Ser. No. 707,098

Claims priority, application Finland, Oct. 21, 1975, 752942

Int. Cl.² B29H *5/24, 5/28, 7/14*

U.S. Cl. 425—445 **7 Claims**

1. A device for the continuous curing of longitudinally extended crosslinkable products, such as cables, consisting of a curing tube through which the product undergoing crosslinking is drawn, and which comprises a heating zone, a cooling zone, the necessary equipment for heating the product in the heating zone up to the crosslinking temperature and the equipment for cooling the crosslinked product in the cooling zone, characterised in that wherein the curing tube itself is



connected to at least one voltage supply so that the walls of the curing tube function as an electrical resistance in order to heat the tube material, thus forming a heating mantle which radiates heat to the crosslinkable product.

4,035,130

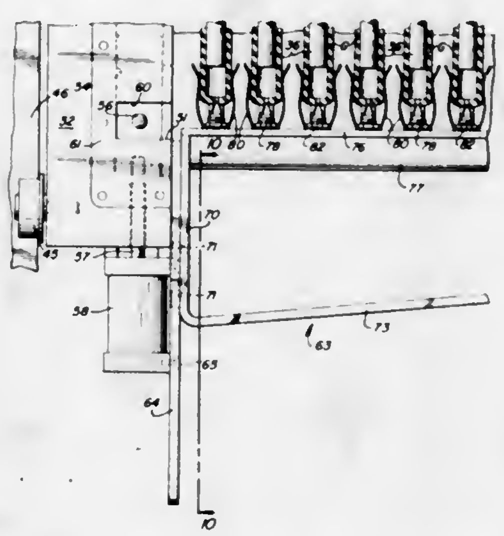
GOLF GRIP MOLDING MACHINE

James H. Taylor, 12 - 8th St., Barberton, Ohio 44203

Continuation of Ser. No. 583,857, June 4, 1975, abandoned. This application Oct. 27, 1976, Ser. No. 736,064

Int. Cl.² B29C *7/00*

U.S. Cl. 425—437 **11 Claims**



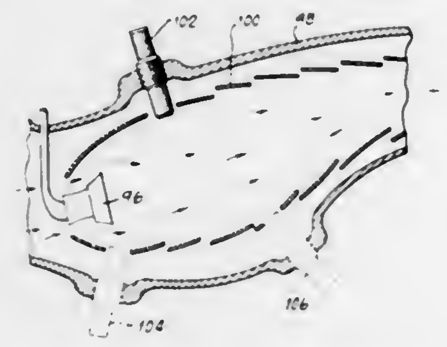
1. In a molding machine having upper and lower mold platens containing mating cavity plates and a ram operated by fluid pressure to bring the cavity plates together in mating relation, a mandrel frame between and parallel to said mold platens, a plurality of elongated mandrels mounted in parallel relationship within said frame for defining tubular articles within the mold cavities, means on the machine for supporting said mandrel frame when the mold platens are separated, a cap molding bar having cavities for forming the ends of said tubular articles and mounted in said mandrel frame transversely of the mandrels at one end thereof for movement in the plane of said mandrel frame toward and away from the ends of said mandrels, said cap bar in abutment with said cavity plates at said one end of the mandrel frame during molding, means for moving said cap bar away from the ends of the mandrels when said cavity plates are separated, and gang stripping means for stripping the molded articles from the mandrels and movably mounted on said frame for movement

into and out of engagement with the exposed ends of the mandrels when the cap bar has been moved away from them.

4,035,131
CONTROL OF THE INITIATION OF COMBUSTION AND CONTROL OF COMBUSTION

Anthony E. Cerkanowicz, 8 Fieldstone Drive, Livingston, N.J. 07039, assignor to Photochem Industries, Inc., Fairfield, N.J.

Filed May 9, 1974, Ser. No. 468,543
Int. Cl.² F23N *5/20*
U.S. Cl. 431—6 **23 Claims**

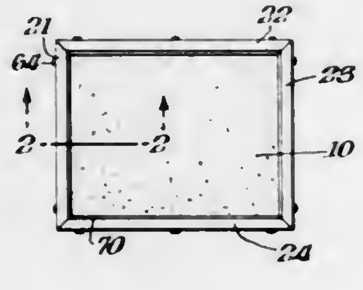


1. In a method of controlling the initiation of combustion and controlling combustion in a mixture that includes fuel and an oxidizer, the step comprising irradiating the mixture with ultraviolet energy sufficient to precondition the mixture by the photodissociative creation of a combustion intermediary species in a concentration below that required for the photochemical initiation of combustion at the temperature of the mixture but above the concentration of said species that would exist at the thermal ignition temperature of the mixture.

4,035,132
GAS-FIRED RADIANT HEATER

Thomas M. Smith, P.O. Box C94, 114 Villinger Ave., Cinnaminson, N.J. 08077

Filed Apr. 7, 1976, Ser. No. 674,409
Int. Cl.² F23D *13/12*
U.S. Cl. 431—7 **11 Claims**

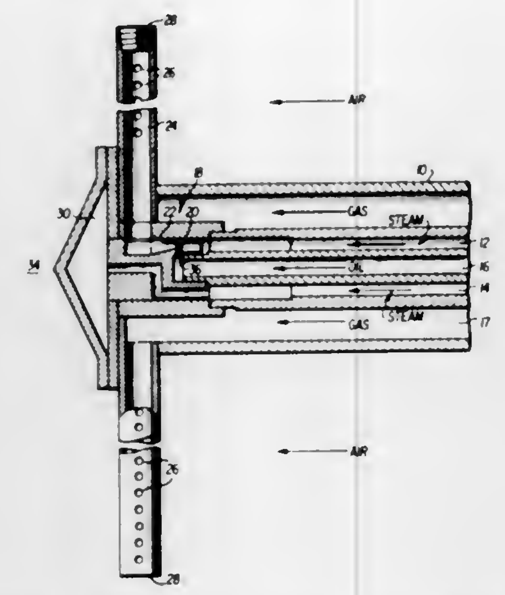


1. In the operation of a gas-fired radiant heater having a supported porous refractory panel through which a gaseous combustion mixture is passed and burned on the face of the panel from which the mixture emerges, the improvement according to which a narrow stream of relatively cold noncombustible gas is also passed through the panel immediately adjacent the panel support, as the combustion mixture is passed through and burned, to help cool the support.

4,035,133
ROTARY BURNER CONTROL

Donald W. Larcen, 2417 Grenoble Road, Richmond, Va. 23229

Filed Mar. 5, 1976, Ser. No. 664,214
Int. Cl.² F23M *1/02*
U.S. Cl. 431—12 **15 Claims**



1. A method of operating a rotary burner of the type in which quantities of fuel and steam are controlled by respective steam-flow and fuel-flow control valves to deliver steam and fuel into an air stream through a rotating member, said method comprising the steps of:

determining the amount of fuel flow that is required thru said burner to produce various values of heat release;

adjusting a ratio-control device to provide an output signal level to said steam-flow control valve corresponding to a desired steam flow for each given fuel flow in a series of fuel flows;

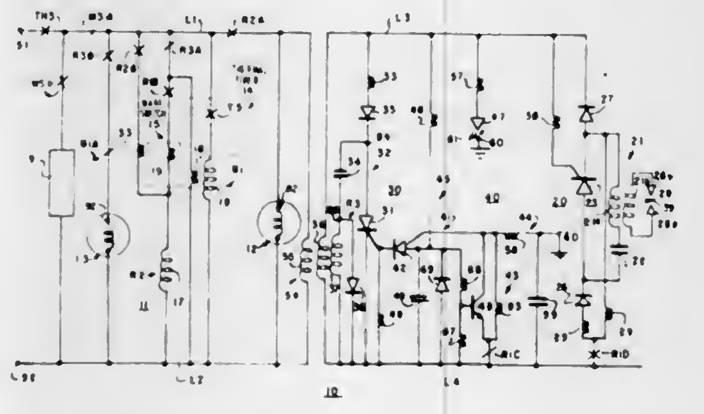
setting said fuel-flow control valve to provide a flow of fuel corresponding to a desired heat release value; and

regulating said steam flow in accordance with the previously adjusted output signal level from said ratio-control device corresponding to said desired heat release value.

4,035,134
ELECTRONIC VALVE SEAT LEAK DETECTOR

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Oct. 14, 1975, Ser. No. 621,670
Int. Cl.² F23N *5/24*
U.S. Cl. 431—21 **27 Claims**

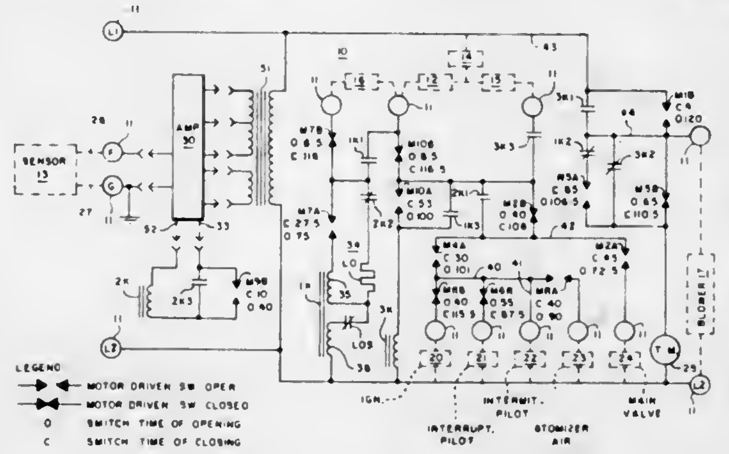


1. In an automatic fuel ignition system including pilot valve means operable when energized to supply fuel to a pilot outlet for ignition to provide a pilot flame at said pilot outlet, main valve means operable when energized to supply fuel to a burner apparatus for ignition by the pilot flame to provide a flame at said burner apparatus, a control arrangement comprising timeout means operable when energized to effect the deactivation of the system at a predetermined time after said timeout means is energized, delay means enabled in response to a request signal which activates the system to effect the energization of said pilot valve means and said timeout means, said delay means delaying the energization of said pilot valve means and said timeout means for a first time interval following the activation of the system, actuator means operable when enabled to effect the energization of said main valve means and to cause said delay means to deenergize said timeout means, and flame sensing means operable in the absence of a flame at said pilot outlet during said first time interval to enable said actuator means when a flame thereafter becomes established at said pilot outlet, said delay means being responsive to said actuator means to delay the energization of said main valve means for a further time interval after a pilot flame is established, and said flame sensing means being operable to disable said actuator means in the event a flame is provided at said burner apparatus during said further time interval to thereby prevent the energization of said main valve means and to permit said delay means to be enabled to energize said timeout means to effect the deactivation of the system.

4,035,135
POSTPURGE PILOT BURNER SEQUENCING MEANS

Roelof F. Jacobsz, Blaine, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Feb. 5, 1976, Ser. No. 655,351
Int. Cl.² F23N *5/00*
U.S. Cl. 431—29 **7 Claims**

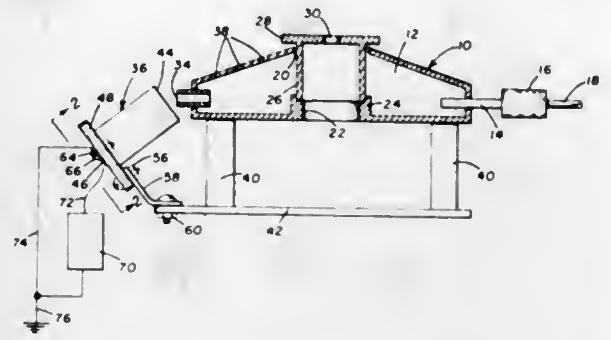


1. A fuel burner sequencing means for controlling a fuel burner in response to a controller and which includes a pilot burner that is temporarily kept burning after a main burner is turned off thereby insuring complete combustion of fuel, including: motor operated cam controlled switch means and relay operated switch means; flame sensor and amplifier means controlling a portion of said relay operated switch means in response to a flame at said burners; said sequencing means responsive to said controller to provide a prepurge and a normal fuel burner ignition cycle to establish a flame at said main burner with said flame monitored by said flame sensor and amplifier means; said sequencing means including safety lockout means operable to stop said sequencing means and turn off fuel to said burners in the event said flame sensor and amplifier means fails to sense a flame at said burners; and said sequencing means further responsive to a termination sequence of operation of said fuel burner to initiate a postpurge pilot mode of operation whereby said pilot burner is provided with fuel prior to the termination of a flame at said main burner and wherein said pilot burner is ignited by said main burner; said flame sensor and amplifier means continuing to monitor said pilot burner during said postpurge pilot mode of operation without allowing said safety lockout means to stop said sequencing means while said pilot burner burns off any residual fuel from said main burner; said pilot burner being deenergized by said cam controlled switch means and said relay operated switch means to prepare the fuel burner for a subsequent cycle.

4,035,136
PIEZOELECTRIC IGNITION SYSTEM FOR GAS BURNERS

Glenn N. Howatt, Metuchen, N.J., and David J. Horvath, Aurora, Ohio, assignors to Vernitron Corporation, Great Neck, N.Y.

Filed Sept. 11, 1975, Ser. No. 612,378
Int. Cl.² F24C *3/10*
U.S. Cl. 431—191 **16 Claims**

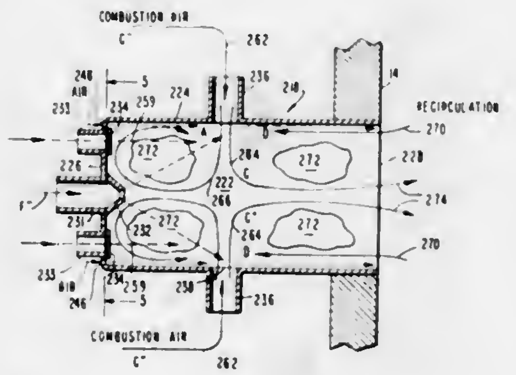


1. A spark ignition system for gas burners comprising: gas burner means for burning combustible fuel gas and having burner port means for flow of fuel gas therethrough, an elongated flash tube means having front and rear ends and being mounted with said front end thereof positioned adjacent said port means for flow of uncombusted fuel gas through said tube from said front end to said rear end thereof, said tube being mounted with said rear end thereof laterally spaced from said burner means to be out of contact with the flame from said burner means after said fuel gas is combusted, said tube being made of high temperature resistant dielectric material, a pair of electrodes mounted directly to said tube and having electrode ends spaced apart at said rear end to define a spark gap, and selectively operable voltage means for applying an electrical potential difference across said electrodes to generate a spark across said gap.

4,035,137
BURNER UNIT

John K. Arand, Palos Verdes Peninsula, Calif., assignor to Forney Engineering Company, Carrollton, Tex.

Continuation-in-part of Ser. No. 354,564, April 26, 1973, abandoned. This application Feb. 12, 1975, Ser. No. 549,272
Int. Cl.² F23C *5/10*
U.S. Cl. 431—285 **5 Claims**



1. A fuel burner assembly for the combustion of liquid and gaseous fuels comprising an elongated cylindrical wall defining an internal cylindrical burner chamber, an end plate mounted on said cylindrical wall having an inlet opening at one end for introducing fuel into said burner chamber and an exhaust port at the opposite end for exhausting the products of combustion, said cylindrical wall being positioned along a horizontal axis, oil nozzle means at said inlet opening coaxially positioned along said horizontal axis, said end plate formed

with a plurality of gas jet openings equally spaced apart in a plane such that said gas jet openings are positioned parallel with respect to said horizontal axis, gas nozzles mounted in each of said jet openings, said cylindrical wall having a plurality of orifices equal in number to said gas jet openings and medially located between said inlet opening and said exhaust port for introducing combustion air into said burner chamber, said orifices positioned in a plane which is substantially perpendicular to said horizontal axis, means for supplying jets of air at each of said orifices such that said combustion air is within a range below and above the theoretical combustion air required for complete combustion of the fuel in said burner chamber, whereby a portion of said jets of air is circulated towards said inlet opening to mix with a portion of said fuel and thereafter flow along said cylindrical wall towards said exhaust port and the remainder of said jets of air is mixed with said fuel and is conveyed towards said exhaust port for combustion as it is discharged.

4,035,138

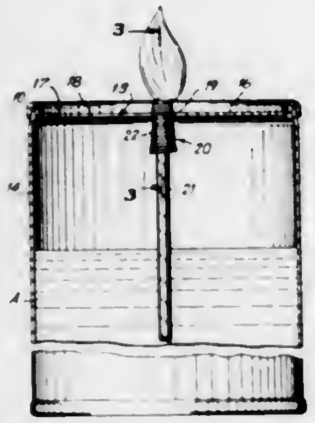
APPARATUS FOR CONVERTING A BEVERAGE CONTAINER INTO A LAMP

Ben Walters, 2751 S. Ocean Drive, Hollywood, Fla. 33019

Filed Aug. 25, 1976, Ser. No. 717,740

Int. Cl.^{2} F23D *3/24*

U.S. Cl. 431—320 **9 Claims**



1. A liquid fuel lamp comprising a fuel reservoir defining sheet metal container including a cylindrical peripheral wall and top and bottom walls, said top wall having an opening therein with longitudinally extending inwardly convergent side edges, a tubular wick holder registering with said opening proximate the inner end of said opening and engaging the edges of said opening to restrain the movement of said wick holder and a wick member registering with said wick holder and depending therefrom into said reservoir and projecting above said wick holder.

4,035,139

METHOD OF HEAT TREATING FINE GRANULAR MATERIAL

Wolf Goldmann; Georg Schepers, both of Ennigerloh; Horst Ritzmann, Enniger, and Heinz-Werner Thiemeyer, Neubeckum, all of Germany, assignors to Polysius AG, Neubeckum, Germany

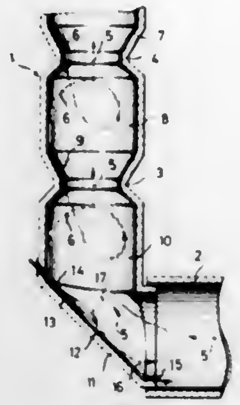
Filed Mar. 18, 1976, Ser. No. 667,884

Claims priority, application Germany, May 22, 1975, 2522598

Int. Cl.^{2} F27B *15/00, 7/02*

U.S. Cl. 432—14 **4 Claims**

1. A method of heat-treating fine granular material entering a rotary kiln, in a chamber which forms a material inlet and an exhaust gas outlet at one end of a rotary kiln, and which has an inclined bottom surface arranged to cause preheated fine material deposited thereon to slide by gravity into the end of the rotary kiln, wherein the improvement comprises the steps of depositing a dense stream of fine granular material on such inclined surface, introducing unburned fuel in finely divided form into the upper portion of the dense stream of material flowing down the inclined surface to cause the fuel to become intimately mixed with the material, and causing hot gas to be discharged from the kiln in contact with the mixed stream of material and fuel at such a velocity as to entrain a substantial proportion of such stream, to cause combustion of the fuel in the entrained material.



4,035,140

FIXING DEVICE IN AN ELECTROPHOTOGRAPHIC COPYING MACHINE

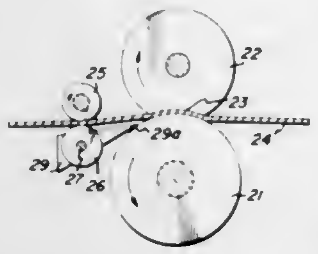
Shinichi Tsuda; Yoshio Nakajo; Kenkichi Tagawa; Hayami Hirai, and Shunji Takagi, all of Ebina, Japan, assignors to Rank Xerox Ltd., London, England

Filed Oct. 4, 1976, Ser. No. 729,529

Claims priority, application Japan, Oct. 28, 1975, 50-146072[U]

Int. Cl.^{2} B65H *29/56*

U.S. Cl. 432—60 **2 Claims**



1. A fixing device in an electrophotographic copying machine, wherein stripping members (**29**), each being in contact with the surface of a heating roll (**21**), and opposing conveying rolls (**25** and **26**), which serve to convey a support material (**24**) while the latter is held therebetween, are positioned on a feedout side of the heating roll (**21**) for thermally fixing a thermoplastic material on said support material (**24**) and a pressure roll in contact with the heating roll to form a nip therebetween (**22**), characterized in that said conveying rolls (**25** and **26**) have their peripheral speeds higher than that of said heating roll (**21**).

4,035,141

SUPPORT RAIL FOR FURNACES

Rüdiger Knaak, Neuss, Germany, assignor to Koppers-Wistra-Ofenbau GmbH, Duesseldorf, Germany

Filed Feb. 9, 1976, Ser. No. 656,583

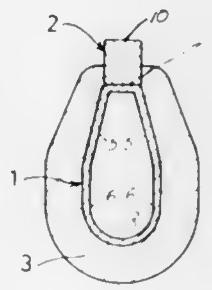
Claims priority, application Germany, Feb. 7, 1975, 2505130

Int. Cl.^{2} F27D *3/02*

U.S. Cl. 432—234 **15 Claims**

1. In a furnace for heat-treating workpieces, a workpiece support arrangement designed to minimally interfer with the flow of furnace heat in upward direction towards the under-

sides of the workpieces being supported, the support arrangement comprising, in combination, a workpiece-engaging element adapted to support a workpiece which is to be advanced through and heat-treated in the furnace; and an elongated, internally cooled supporting member comprised of an upper first section including a generally horizontal top wall having a mounting surface which extends in the direction of the elongation of said supporting member and upon which said element is mounted, said first section also including first side walls, said generally horizontal top wall forming a bridge from which said first side walls downwardly diverge in straight lines to define at the bottom of said first section a maximum breadth, said supporting member also having a lower second section including respective second side walls spaced from each other a distance not exceeding said maximum breadth, whereby furnace heat flowing upwardly toward the underside of a supported workpiece along the side walls of the lower section can flow without hindrance from the side walls of the lower section up to and along the side walls of the upper section.



4,035,142

CONTINUOUS HEATING FURNACE FOR ELONGATED METAL INGOTS

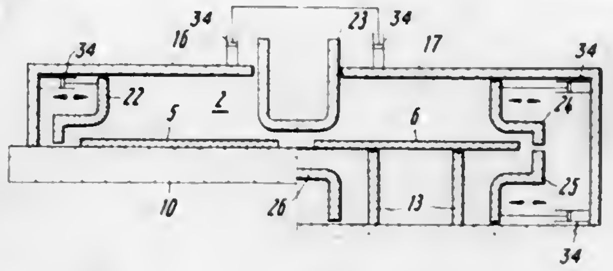
Ernst Hatzenbichler, Dusseldorf, and Eckard Bunzel, Kaarst, both of Germany, assignors to "OFU" Ofenbau-Union GmbH, Dusseldorf, Germany

Filed Dec. 15, 1975, Ser. No. 641,017

Claims priority, application Germany, Dec. 17, 1974, 2459511

Int. Cl.^{2} F27D *23/00*

U.S. Cl. 432—249 **6 Claims**



1. Continuous heating furnace having a plurality of walls defining an enclosure formed with a heating chamber for elongated metal ingots, such as slab ingots, through which the ingots are transportable transversely in at least one row along at least one conveying route, each of the ingots having two ends and being heatable predominantly by heat radiated from the walls of the furnace, comprising a plurality of screening shields arranged adjacent the conveying route at the ends of the ingots, said screening shields being mounted in said furnace and arranged in front of at least one of said walls for shielding the ends of the ingots against the heat radiated from the walls of the furnace, said shields including horizontal and vertical portions confronting said ends of the ingots and defining at least one niche accommodating one end of the ingot and reducing the size of the heating chamber of the furnace adjacent the end of the ingot, said shields facing the upper and side surfaces of said end of the ingot at said niche, and means adjustably positioning the shields relative to the furnace wall to adjust the spacing with the ingot and thereby define the size of the niches.

4,035,143

WATER-INSOLUBLE AZO DYESTUFFS

Ernst Heinrich, Frankfurt am Main; Joachim Ribka, Offenbach am Main, and Joachim Valentin, Frankfurt am Main, all of Germany, assignors to Cassella Farbwerke Mainkur Aktiengesellschaft, Germany

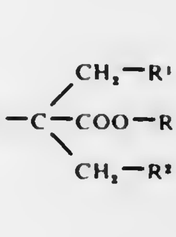
Continuation-in-part of Ser. No. 498,461, Aug. 19, 1974, abandoned, which is a division of Ser. No. 410,804, Oct. 29, 1973, abandoned. This application Nov. 11, 1975, Ser. No. 631,170

Claims priority, application Germany, Nov. 4, 1972, 2254017

Int. Cl.² D06P *3/00, 5/00;* **C07C** *107/06;* **C09B** *29/14*

U.S. Cl. 8—4 **7 Claims**

1. In the process of dyeing and printing synthetic hydrophobic fibers and films, the improvement which comprises employing a dyestuff of the formula



wherein

D is phenyl, naphthyl, thiazolyl, benzothiazolyl, benzisothiazolyl or triazolyl or one of said radicals substituted with at least one member selected from the group consisting of alkyl having 1 to 4 carbon atoms, alkoxy having 1 to 4 carbon atoms, nitro, cyano, alkylsulfonyl having 1 to 4 carbon atoms, alkylthio having 1 to 4 carbon atoms, chlorine, bromine and phenylazo;

X is hydrogen, alkoxy having 1 to 6 carbon atoms or said alkoxy substituted with a member selected from the group consisting of hydroxy, alkoxy having 1 to 4 carbon atoms, phenoxy and alkyl substituted phenoxy having 1 to 4 carbon atoms in said alkyl moiety;

Y is hydrogen; alkyl having 1 to 5 carbon atoms; alkenyl having 2 to 5 carbon atoms; said alkyl or alkenyl substituted by halogen, hydroxy, alkoxy having 1 to 4 carbon atoms, phenoxy, alkyl substituted phenoxy having 1 to 4 carbon atoms in said alkyl moiety, phenyl or alkyl substituted phenyl having 1 to 4 carbon atoms in said alkyl moiety; cycloalkyl having from 3 to 8 carbon atoms; said cycloalkyl substituted with at least one member selected from the group consisting of halogen, cyano, alkyl having 1 to 3 carbon atoms and alkoxy having 1 to 3 carbon atoms; phenyl; phenyl substituted withat least one member selected from the group consisting of halogen, cyano, alkyl having 1 to 3 carbon atoms and alkoxy having 1 to 3 carbon atoms; pyridyl; thiazolyl; benzothiazolyl; imidazolyl; benzimidazolyl; thienyl; furyl; pyrrolyl; alkoxy having 1 to 6 carbon atoms; said alkoxy substituted with a member selected from the group consisting of hydroxy, alkoxy having 1 to 4 carbon atoms, phenoxy and alkyl substituted phenoxy wherein said alkyl moiety has from 1 to 4 carbon atoms; phenoxy; alkoxy substituted phenoxy having 1 to 4 carbon atoms in said alkoxy moiety or —NHR⁴ wherein R⁴ is alkyl having 1 to 6 carbon atoms; alkenyl having 2 to 6 carbon atoms; cycloalkyl having 3 to 8 carbon atoms; benzyl; phenethyl; phenyl or said cycloalkyl or phenyl substituted by at least one member selected from the group consisting of halogen, cyano, alkyl having 1 to 3 carbon atoms and alkoxy having 1 to 3 carbon atoms;

R¹ and R² are hydrogen or alkyl having 1 to 3 carbon atoms and

R³ is alkyl having 1 to 5 carbon atoms or said alkyl substituted by a member selected from the group consisting of halogen, alkoxy having 1 to 2 carbon atoms, alkoxy substituted alkoxy wherein each alkoxy group has 1 to 2 carbon atoms, phenoxy, phenoxy substituted alkoxy having 1 to 2 carbon atoms in said alkoxy moiety and phenyl.

4,035,144

DYEING PREPARATIONS CONTAINING BORIC ACID FOR PREPARING WATER-INSOLUBLE AZO DYESTUFFS ON FIBER

Hasso Hertel, Muhlheim am Main, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed July 8, 1975, Ser. No. 594,112

Claims priority, application Germany, July 11, 1974, 2433232

Int. Cl.² C07C *113/00;* **D06P** *3/68, 1/74*

U.S. Cl. 8—44 **4 Claims**

1. In a dyeing preparation comprising a diazonium or tetrazonium compound of an aromatic mono- or diamine suitable in ice-color dyeing and having a pKa-value of more than 2.5, and a buffer substance, the improvement wherein boric acid is the buffer substance in an amount of from 150 to 900 molar precent calculated on the azonium salt.

4,035,145

QUATERNARY N-(2,3-EPOXYALKYL)-AMMONIUM COMPOUNDS

Roland Gipp, Cologne; Otto Berenstecher, Bensberg-Refrath, and Horst Renziehausen, Monheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

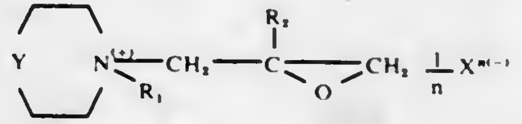
Filed Feb. 14, 1975, Ser. No. 549,851

Claims priority, application Germany, Feb. 15, 1974, 2407147

Int. Cl.² D06P *5/02*

U.S. Cl. 8—74 **10 Claims**

1. In a process for dyeing cellulose fiber materials with substantive dyestuffs, the improvement comprising employing a quaternary N-(2,3-epoxyalkyl)-ammonium compound of the formula



in which

Y is an oxygen atom or sulphur atom, a $—CH_213$ group or a direct bond,

R_1 is a C_1-C_4-alkyl group or a C_2-C_4-alkyl group unsubstituted or substituted by an OH group, R_2 is hydrogen or methyl,

$X^{n(-)}$ is an anion, and

n is 1, 2 or 3

as a fixing agent for the dyestuffs.

4,035,146

BINDING OF ANTIMICROBIAL COMPOUNDS TO A HYDROXYL CONTAINING SUBSTRATE WITH CYANURIC CHLORIDE

Mortimer Wilkes Brenner, Scarsdale, and Louis Laufer, New York, both of N.Y., assignors to Schwarz Services International Ltd., Mount Vernon, N.Y.

Filed Oct. 20, 1975, Ser. No. 623,744

Int. Cl.² C14C *5/00*

U.S. Cl. 8—94.21 **5 Claims**

1. The method of bonding an amine, quanido or quaternary ammonium containing antimicrobial compound selected from the group consisting of chlorhexidine acetate, streptomycin sulfate, neomycin sulfate, alkyl dimethyl benzyl ammonium chloride, trimethyl octyl decyl ammonium chloride, cetyl dimethyl benzyl ammonium chloride and mixtures thereof to a hydroxyl containing substrate taken from the group consisting of cellulose, starches and leather comprising the steps of:

A. reacting the substrate with cyanuric chloride in a solution to chemically bond the cyanuric chloride to the substrate.

B. and then reacting an effective amount of antimicrobial in solution with the cyanuric chloride on the substrate to chemically bond the cyanuric chloride to the antimicrobial, said cyanuric chloride being present in an amount effective to bond the antimicrobial to the substrate through the cyanuric chloride.

4,035,147
CELLULOSIC MATERIALS CAPABLE OF ABSORBING WATER OF AQUEOUS SOLUTIONS, AND THEIR PRODUCTION

Solange Sangenis, Grenoble; Gilbert Guiroy, Saint-Egreve, both of France, and Jean Quere, Risjwick, Netherlands, assignors to Centre Technique de l'Industrie des Papiers, Cartons et Celluloses, Grenoble Cedex, France

Filed Apr. 2, 1974, Ser. No. 457,345
Claims priority, application France, Apr. 5, 1973, 73.12376
Int. Cl.² D06M *13/14*
U.S. Cl. 8—116.4 **27 Claims**

1. In a method of treating cellulosic materials by cross-linking said materials with a cross-linking agent in the presence of an acid catalyst, the improvement that comprises putting the cellulosic material to be treated with the cross-linking agent and acid catalyst into the form of dry, substantially dehydrated, non-swollen individualized fibers devoid of inter-fiber bonds, the inter-fiber bonds, if present initially, being broken, and contacting said material in said form, with a medium containing said cross-linking agent and said acid catalyst, the water content of said medium being sufficiently reduced to avoid swelling of the fibers during cross-linking thereof.

4,035,148
CARPET CLEANING AND SOIL REPELLENT COMPOSITIONS

Carroll A. Metzger; Fred M. Habermehl III, both of Hamilton, and Ned C. Webb, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed May 6, 1976, Ser. No. 683,584
Int. Cl.² C11D *7/16, 17/20,* **D06M** *11/08, 11/12*
U.S. Cl. 8—137 **22 Claims**

1. A substantially surfactant-free composition useful for cleaning of carpets and imparting thereto a soil repellent finish consisting essentially of:
  a. a water-soluble phosphate, and
  b. a water-insoluble particulate alumina having an ultimate particle size less than 3 microns;

wherein the ratio of phosphate to alumina is from 1:1 to 1:25 and wherein the composition contains less than 1% surfactant based on the phosphate-alumina mixture.

16. A method of cleaning a carpet and imparting a soil repellent finish thereto comprising the steps of:
  1. applying an effective amount to the carpet of a substantially surfactant-free composition consisting essentially of:
    a. from 0.2% to 4% of a water-soluble phosphate;
    b. from 1% to 10% of a water-insoluble particulate alumina having an ultimate particle size less than 3 microns; and
    c. the balance water wherein the composition contains less than 1% surfactant based on the phosphate-alumina mixture; and
  2. drying and vacuuming the carpet.

4,035,149
VAPOR BARRIERS FOR LIQUID CONSERVATION

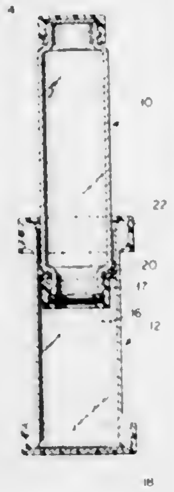
Paul R. Scott; Wilmer D. Johnston, and Jerome L. Kyrish, all of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Filed Jan. 15, 1975, Ser. No. 541,171
Int. Cl.² B01J *1/18*
U.S. Cl. 21—60.5 R **4 Claims**

1. A method for inhibiting evaporation of volatile non-aqueous liquids by covering the surface of said liquids with a floating layer of expanded cereal grain.

4,035,150
TEST FOR OCCULT BLOOD IN AN EMULSIFIED AQUEOUS/ORGANIC SYSTEM

Russell M. Jaffe, Greenbelt, Md., assignor to The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C. Continuation-in-part of Ser. No. 616,129, Sept. 24, 1975, abandoned, and a continuation-in-part of Ser. No. 498,109, Aug. 16, 1974, abandoned. This application July 7, 1976, Ser. No. 703,244
Int. Cl.² G01N *31/22, 33/16*
U.S. Cl. 23—230 B **4 Claims**



1. A method of detecting occult blood in a sample which comprises carrying out the reaction in the organic phase selected from the group consisting of methylene dichloride, petroleum ether, and dioxane of an aqueous/organic bi-phase system wherein a sample of occult blood is added to the aqueous phase, the bi-phase system is emulsified, and a standard color-forming reaction involving solubilized hemoglobin (heme), peroxide, and dye is carried out in the organic phase.

4,035,151
POWDER-AND-GAS VIBRATING REACTOR

Thomas Czerny, Glashutten; Hans von Döhren, Frankfurt am Main; Lothar Lösch; August Winsel, both of Kelkheim, Taunus, all of Germany, and Kurt Ziegler, deceased, late of Summern, Germany (by Rosemary Ziegler, heiress), assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Jan. 28, 1975, Ser. No. 544,753
Claims priority, application Germany, Jan. 29, 1974, 2403998
Int. Cl.² B01F *3/06, 11/00;* **B01J** *8/08, 8/16*
U.S. Cl. 23—252 R **5 Claims**

1. Apparatus for chemically reacting a powdery material and a gas comprising:

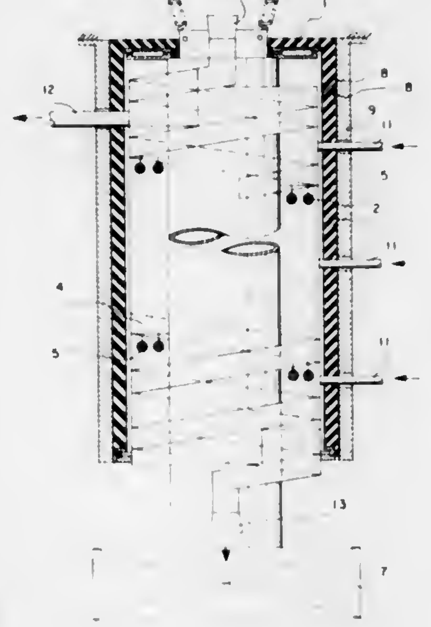
a vibratory spiral conveyor which includes a spiral chute having its axis positioned generally vertically, a chamber enclosing the chute, and means for producing axial vibration of the chute;

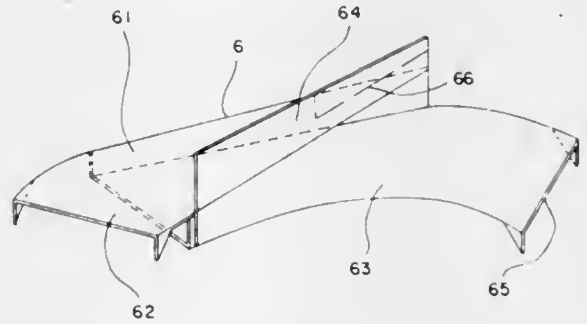
means for introducing said powdery material at the top of said conveyor at a predetermined rate to form a substantially continuous descending layer on the chute end means for withdrawing said powdery material at the bottom;

means for introducing gas into the chamber below said conveyor top and means for withdrawing said gas at or near the conveyor top together with the gaseous reaction products, therby to produce a countercurrent flow of powdery material and gas in the chamber along the chute,

the gas introducing means being constructed to introduce the gas at a rate to maintain in the counter-current flow a quantity of gas in excess of that required to react with the powdery material; temperature control means positioned below the chute of the spiral conveyor; and

mixing means disposed along the spiral chute, said mixing means comprising a pair of vertically and longitudinally displaced surfaces and a vertical partition extending between and along one edge of the surfaces, the upper surface having its upstream edge postitioned transversely along the middle of the cross-section of the powdery material layer flowing down said chute and the lower surface having its upstream edge positioned adjacent the floor of said chute, both surfaces rising relative to the chute in a downstream direction, the upper surface having an upturned lip bounding the downstream edge of the upper surface generally transversely to the direction of powdery material flow, and a space being provided between said vertical partition and the sidewall of the chute, whereby an upper layer of said powdery material flows along said upper surface, is discharged into said space, and flows therefrom beneath the downstream edge of said lower surface, and a lower layer of said powdery material flows along said lower surface and is discharged from the downstream edge thereof onto the top od the discharged upper layer.

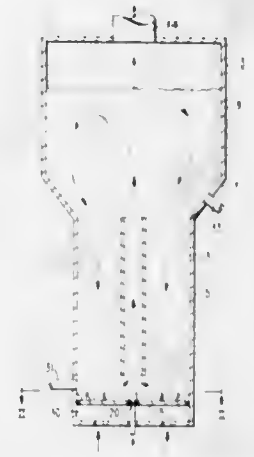




4,035,152
DISTRIBUTION PLATE FOR RECIRCULATING FLUIDIZED BED

Wen-ching Yang, Export; Edward J. Vidt, and Dale L. Keairns, both of Pittsburgh, all of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed May 24, 1976, Ser. No. 689,625
Int. Cl.² B05B *1/14;* **B01J** *8/44*
U.S. Cl. 23—284 **4 Claims**



1. A distribution plate for a fluidized bed of particulate material having a centrally disposed generally vertically draft tube, said distribution plate comprising a generally flat plate coextensive with the lower portion of said fluidized bed, an opening registering with said draft tube centrally disposed within said plate, a plurality of apertures disposed adjacent the periphery of said plate, a plurality of wedge shaped cover blocks having grooves extending across each block, said grooves being disposed to register with said apertures, said cover blocks being disposed so that one surface thereof slopes downwardly and inwardly from the periphery of said plate, means for supplying pressurized fluid to said central opening and means for supplying pressurized fluid to said apertures, whereby said particulate material is fluidized and circulated upwardly through the draft tube and downwardly around the outside of said draft tube with no dead spots occurring within the fluidized bed.

4,035,153
FLUIDIZED CRACKING CATALYST REGENERATION APPARATUS

Dorrance P. Bunn, Jr.; Dale Williams; Henry B. Jones, all of Houston, and John P. MacLean, Stafford, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1976, Ser. No. 684,509
Int. Cl.² B01J *8/08, 37/12*
U.S. Cl. 23—288 B **7 Claims**

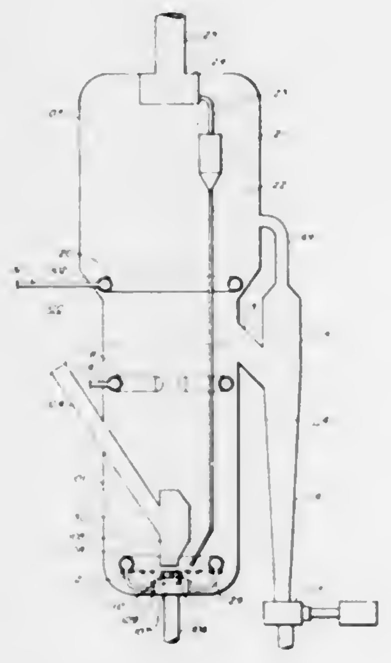
1. Fluidized catalyst regeneration apparatus, which comprises in cooperation:
  a. a vertical regenerator vessel (100) comprising a cylindrical lower regenerator section (101) having a closed bottom and an open top, a frusto-conic transition section (102) having an open top and an open bottom, and a cylindrical upper regenerator section (103) having a closed top and an open bottom, wherein the open top of lower regenerator section (101) is in direct communication with the open bottom of transition section (102) and wherein the open top of transition section (102) is in direct communication with the open bottom of upper regenerator section (103);
  b. spent catalyst distribution means (130) for transferring spent catalyst from outside said regenerator vessel (100) into about the axial center of the bottom portion of said lower regenerator section (101);

c. primary regeneration gas distribution means (**129**), located below said spent catalyst distribution means **130** in axial alignment with the center line of said lower regenerator section (**101**), for distributing an oxygen containing primary regeneration gas radially into the bottom portion of said lower regenerator section (**101**);

d. primary regeneration gas conduit (**106**), passing upwardly through the bottom of said lower regenerator section (**101**) and in open communication with said primary regeneration gas distribution means (**129**);

e. a plurality of trim gas injection means (**118**) in the upper portion of lower regenerator section (**101**) for radially distributing oxygen containing gas into selected portions of the cross-sectional area of lower regenerator section (**101**);

f. a regenerated catalyst standpipe (**114**) located outside reactor vessel (**100**), comprising an upper cylindrical standpipe section (**115**) having an opening in the side wall, having a top with an opening therein and having an open bottom, and a conical standpipe section (**116**) having an open top in communication with the lower open end of said upper standpipe section **115** and having an open bottom;



g. a regenerated catalyst duct (**113**) having open ends, directed downwardly at an angle of about 45° to 60° from the vertical, wherein the open upper end of duct (**113**) is in communication with the interior of lower regenerator section (**101**) above said trim gas injection means (**118**) via an opening in the side wall of section (**101**), and wherein the open lower end of duct (**113**) is in communication with the opening in the side wall of upper cylindrical standpipe section (**115**);

h. a deaeration gas line (**69**) for providing communication from the opening in the top of upper cylindrical standpipe section (**115**) to an opening in the side wall of upper regenerator section (**103**);

i. secondary regeneration gas distribution means (**120**) for radially distributing an oxygen containing seondary regeneration gas into transition section (**102**);

j. catalyst-gas separation means (**121**) within said upper regenerator section (**103**) for separating catalyst from spent regeneration gas;

k. vent means in communication with said catalyst-gas separation means (**121**) for removing spent regeneration gas from said catalyst regeneration apparatus; and

l. a vertical conduit (**122**), the upper end of which is in communication with catalyst-gas separation means (**121**), for transferring separated catalyst from said catalyst-gas separation means (**121**) to the bottom portion of said lower regenerator section (**101**).

4,035,154

APPARATUS FOR THE PREPARATION OF A COMPOUND OR AN ALLOY

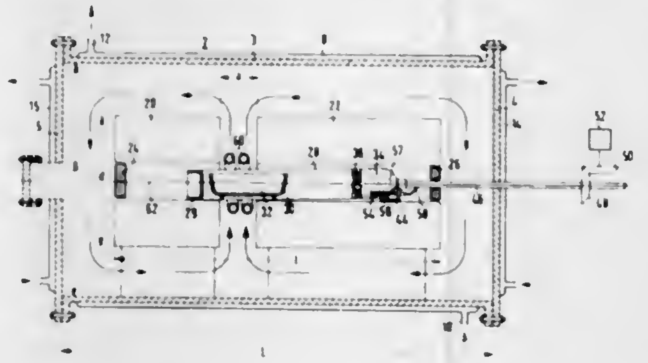
Gunter Raab, Erlangen, and Klaus Zeuch, Eckental, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Mar. 17, 1975, Ser. No. 559,014

Claims priority, application Germany, Mar. 27, 1974, 2414776

Int. Cl.² B01D *9/00*; **B01J** *17/08*

U.S. Cl. 23—273 SP **13 Claims**



1. In apparatus for the preparation of a compound or alloy which includes one compound having considerably higher vapor pressure than the other, the apparatus including a closed horizontal reaction tube whose ends are surrounded by closely spaced hollow, cylindrical heating ovens, the tube and ovens being arranged in a closed pressurized vessel with the ovens one behind the other in the axial direction of the tube, with additional heating means surrounding a narrow portion of the reaction tube situated between the heating ovens, and means to move at least a portion of the closed horizontal reaction tube through the narrow zone between said heating ovens, an arrangement which permits improved cooling of the narrow zone between the heating ovens comprising:

a. the heating ovens spaced from the inside of the pressurized vessel so that a free space remains between said ovens and said vessel at all points, said space being in communication with the narrow zone between the heating ovens;

b. means closing off the ends of the heating ovens facing away from the tube;

c. a cooling gas of high thermal conductivity filling said free space and contacting the inside of said pressurized vessel; and

d. means for cooling said pressurized vessel, whereby said pressurized vessel will cool said cooling gas causing convection currents to be set up which, because of said ovens being closed off will be concentrated in the narrow portion of said tube between said ovens to thereby carry out improved cooling of the tube at said narrow portion.

4,035,155

METHOD OF HIGH SPEED SCINTILLATION AUTORADIOGRAPHY

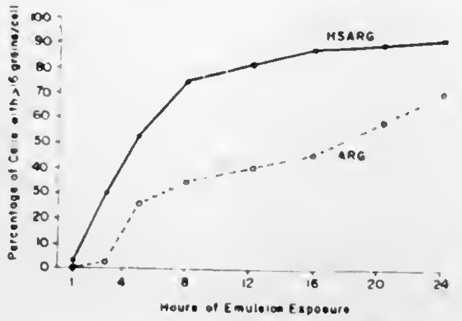
Brian G. M. Durie, and Sydney E. Salmon, both of Tucson, Ariz., assignors to University Patents, Inc., Stamford, Conn.

Filed Oct. 30, 1975, Ser. No. 627,218

Int. Cl.² G01N *23/00, 23/04*

U.S. Cl. 23—230.3 **5 Claims**

1. In a method of measuring physiological changes in tissue which comprises labeling an essential cell constituent with a radioactive isotope by incubating cells with a radiolabeled cell constituent selected from the group consisting of nucleic acids, enzymes, proteins and hormones, which contain a radioisotope as a structural atom thereof, mixing said labeled cells with a liquid scintillator on the surface of a silver halide photographic slide, exposing the silver halide to emissions from the radioisotope, thereby activating silver ions on the slide, developing the slide to produce silver crystals thereon, and determining the relative number of silver crystals as a measure of the radioactivity of the cells and the physiological activity thereof, the improvement wherein the radioactive nucleic acid, enzyme, protein or hormone component each has a specific activity of at least 40 curies per millimole and the silver halide is exposed to the radioactive nucleic acid or enzyme at a temperature not greater than −20° C.



4,035,156

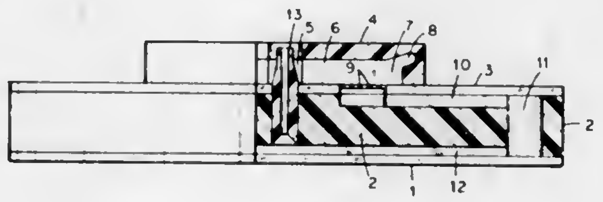
FILTER TYPE ROTOR FOR MULTISTATION PHOTOMETER

Starling E. Shumate, II, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Jan. 21, 1977, Ser. No. 761,026

Int. Cl.² B04B *5/12*; **G01N** *3/16, 21/00, 1/10*

U.S. Cl. 23—259 **3 Claims**



1. In a multistation dynamic photometer system provided with a rotor containing a plurality of cuvets at the outer extremity thereof, means for feeding blood plasma filtrate samples to said cuvets, means for loading reagents into said cuvets, and means for photometrically analyzing the resulting mixtures in said cuvets while said rotor is rotated at a selected high speed, said rotor being of the laminated disc-type having a central sample-loading port, liquid-dividing means, sample-distributing passageways, sample-receiving chambers, sample-sedimentation chamber provided with outlets ports, downstream liquid passageways, and cuvets, all in radial register, the improvement thereupon comprising filter means sealably interposed between the outlets of said sedimentation chambers and said downstream passage-ways, said sedimentation chambers being located radially centrifugal to said filter means and said filter means being disposed so that the entrant surfaces thereof face generally contracentripetally with respect to the axis of the rotation of said rotor to thus permit cells to sediment free from said filter means and avoid collection of said cells upon the filter means, said sedimentation chambers being provided with respective sediment sumps for collection of said cells.

4,035,157

APPARATUS FOR TREATING EXHAUST GASES FROM CASTING MOLDS

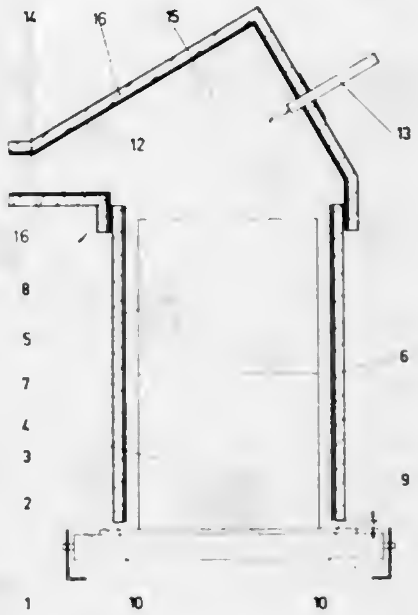
Hans Riester, Schaffhausen, Switzerland, assignor to Georg Fischer Aktiengesellschaft, Schaffhausen, Switzerland

Division of Ser. No. 444,693, Feb. 21, 1974, Pat. No. 3,941,868. This application Dec. 18, 1975, Ser. No. 642,236

Claims priority, application Switzerland, Feb. 24, 1973, 2635/73

Int. Cl.² F23C *11/04*; **F23J** *5/04*

U.S. Cl. 23—277 C **8 Claims**



1. Apparatus for collecting and burning exhaust gases generated in plastic-bonded sand used in forming molds, comprising an enclosure including a pair of laterally spaced, upwardly extending sides, each having a lower end and an upper end, a roof extending over the sides, and a conveyor device positioned at and movable in the direction of the lower ends of said sides with said enclosure defining a space for receiving a mold formed of the plastic-bonded sand directly from its casting location and movably supported on said conveyor device for passage through said enclosure, air inlet ports located between the lower ends of said sides and said conveyor device and opening directly into said enclosure for admitting combustion air directly into the space formed by said enclosure, said roof defining a combustion chamber above and open directly to the space for the molds within said enclosure, a gas exhaust conduit connected to said enclosure and opening to the combustion chamber formed therein, and an ignition source mounted in said enclosure solely for commencing the ignition of the mixture of the exhaust gases generated by the plastic binder used in the molding sand and the combustion air in said combustion chamber so that the exhaust gases are burned within said enclosure and are not discharged to the surrounding environment.

4,035,158

PROCESS AND APPARATUS FOR BURNING HYDROGEN SULFIDE AND OTHER COMBUSTIBLE FLUID TO RECOVER SULFUR

Gerald W. Scott, Tulsa, and Eugene C. McGill, Skiatook, both of Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Apr. 25, 1975, Ser. No. 571,525

Int. Cl.² B01J *1/00*, **C01B** *17/04*; **F23C** *5/00*

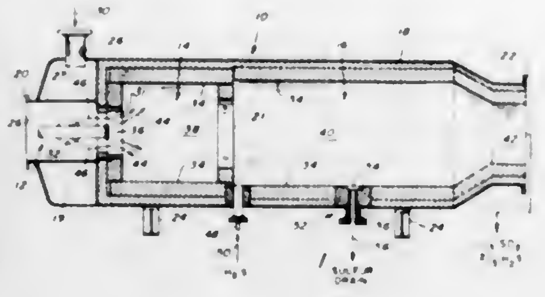
U.S. Cl. 23—278 **6 Claims**

1. Apparatus for burning a first hydrogen sulfide fluid stream and a second organic sulfur fluid stream into a product suitable for recovery of free sulfur therefrom, comprising:

a. a reactor housing means comprising an internally insulated cylindrical chamber of substantially constant diameter having an annular wall partially closing an inlet end, and an outlet end, a selected portion of the interior space downstream of said inlet end defining a combustion section, and the remaining portion downstream thereof of said chamber defining a reaction section;

b. first burner means positioned axially through a central opening at said inlet end, providing an annular space between said first burner means and said central opening, and means to pass a selected smaller portion of said first hydrogen sulfide stream through said first burner means;

c. a second burner means positioned in the said annular space and means to supply all of said second fluid stream through said second burner means;



d. air inlet and plenum means for providing combustion air through said annular space, and

e. plural injection means to the interior of said reactor at about the downstream junction between said combustion space and said reaction space, said injection means spaced circumferentially about said housing, and means for injecting the remaining portion of said first hydrogen sulfide stream through said injection means.

4,035,159

IRON-BASE SINTERED ALLOY FOR VALVE SEAT

Kametaro Hashimoto; Kenji Ushitani; Youichi Serino; Tetsuya Suganuma, all of Toyota; Seishu Mitani, Kyoto, and Kunizou Imanishi, Nagoya, all of Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed Mar. 3, 1976, Ser. No. 663,519

Int. Cl.² B22F *3/00*

U.S. Cl. 75—246 **9 Claims**

1. Method of manufacturing an iron-base sintered alloy for use in valve seats which comprises the steps of adding 0.2 – 15% carbon in the form of graphite powder, and at least two additives selected from the group consisting of 0.3 – 1.5% manganese, 0.2 – 1.5% sulfur, 0.5 – 8% molybdenum, and 0.2 – 2.5% silicon by weight to a constituent alloy in powder form having an iron base and containing 6 – 20% chromium and 0 – 2.0% nickel by weight, molding the resulting mixture to a required shape by applying pressure thereto, and then sintering the molding at a temperature of 1120° – 1200° C to yield an alloy having a sintered density of 6.2 – 6.8 g/cm³.

4,035,160

METHOD FOR MANUFACTURING A CONVEX OR CONCAVE LAPPING TOOL

Shinji Taguchi, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 484,102, June 28, 1974, abandoned. This application Jan. 21, 1976, Ser. No. 650,977

Claims priority, application Japan, July 4, 1973, 48-75525

Int. Cl.² C09K *3/14;* **B29C** *1/02*

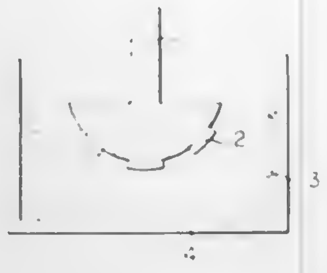
U.S. Cl. 51—295 **6 Claims**

1. A method for manufacturing a lapping tool for grinding or polishing glass comprising a metallic tool body and a plurality of synthetic resin pellets joined to said body on its surface, which method comprises the steps of:

a. providing a convex or concave shaping mold containing pellet cavity portions which have an adhesive-free property relative to hardened casting resin;

b. pouring a liquid resin selected from the group consisting of liquid epoxy resin, liquid polyurethane resin, liquid acrylic resin, and liquid polyethylene terephthalate, into said mold in a quantity sufficient to fill only the pellet cavity portions therein;

c. hardening the liquid resin in said pellet cavity portions of said mold while press-contacting therewith a metallic blank lapping tool body corresponding in size and shape to said mold, said blank tool body being of a metallic material to which said resin adheres at least after the resin hardens, and



d. thereafter removing the lapping tool with the pellets adhering thereto from said mold.

4,035,161

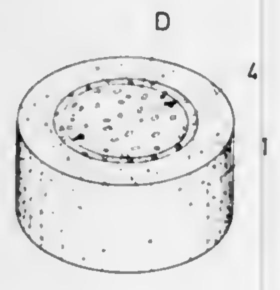
GRINDING WHEEL AND HUB AND METHOD OF FORMING THE SAME

Ernst Geissler, Schwaz; Wilheim Haidacher, and Heinrich Ofer, both of Vomp, all of Austria, assignors to Tyrolit-Schleifmittelwerke Swarovski K.G., Schwaz, Austria

Continuation-in-part of Ser. No. 448,753, March 6, 1974, abandoned. This application Jan. 5, 1976, Ser. No. 646,595

Int. Cl.² C08J *5/14*

U.S. Cl. 51—296 **6 Claims**



1. A grinding wheel or rotary abrasive element comprising:

an annular, solid, integral, cured abrasive body made of inorganic abrasive material, a binder and fillers, said body having an outer annular abrasive surface and an inner annular abrasive surface, said inner abrasive surface being spaced radially inwardly from said outer abrasive surface and defining a center bore through said body; and

a dense and rigid cylindrical hub formed of foamed plastic material rigidly fixed within said center bore of said abrasive body, said foamed plastic of said hub being foamed into said inner abrasive surface of said center bore of said abrasive body.

4,035,162

FUSED ABRASIVE GRAINS CONSISTING ESSENTIALLY OF CORUNDUM, ZIRCONIA AND R_2O_3

Jack A. Brothers, Big Flats; Robert C. Doman, Painted Post, and Robert N. McNally, Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Continuation of Ser. No. 414,425, Nov. 9, 1973, abandoned, which is a continuation-in-part of Ser. No. 168,782, Aug. 3, 1971, abandoned. This application Nov. 3, 1975, Ser. No. 627,902

Int. Cl.² B24D *3/02;* **C09C** *1/68;* **C08J** *5/14*

U.S. Cl. 51—298 A **16 Claims**

1. A fused abrasive grain consisting essentially of

a. the crystalline phases of corundum and zirconia with an average crystallite size smaller than 300 microns and at least in part being an eutectic matrix, and

b. analytically by weight, about 44 to 91% Al_2O_3, about 5 to 50% ZrO_2, 0.1 to 12% R_2O_3 wherein R is at least one metal selected from vanadium, chromium, manganese and cobalt, the percentage of R_2O_3 is based on all R metal content calculated as R_2O_3, and the balance, if any, being incidental impurities not exceeding 2%.

4,035,163

CONDITIONING CLEANSER FOR CERAMIC SURFACES

Robert L. McLaughlin, Wilmette; Donald C. Wood, Des Plaines, and Wesley A. Kraszewski, Chicago, all of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.

Filed Jan. 13, 1975, Ser. No. 540,580

Int. Cl.² C09K *3/14*

U.S. Cl. 51—303 **18 Claims**

1. An alkaline cleaning and conditioning composition for ceramic surfaces consisting essentially of an abrasive powder mixture including from 0.1% to about 0.5% of the weight of the composition of a surfactant, at least about 50% of the weight of the composition being abrasive powder, and from 1% to 5% of the weight of the composition being a silicone oil absorbed in a water soluble absorbent, said composition having an alkaline pH in 1% water solution not in excess of pH 11.0.

4,035,164

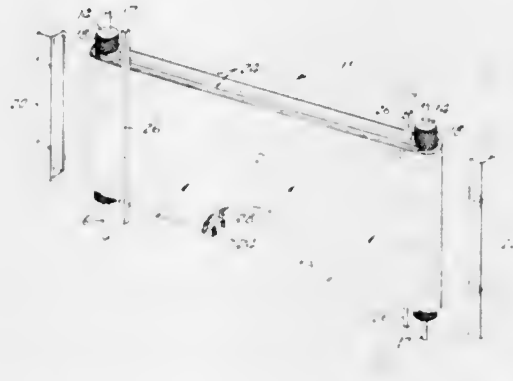
METHODS FOR REMOVING CHARGED AND NON-CHARGED PARTICLES FROM A FLUID BY EMPLOYING A PYROLLECTRIC FILTER

Allen L. Taylor, Woodbury, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Nov. 29, 1974, Ser. No. 527,950

Int. Cl.² B03C *3/64*

U.S. Cl. 55—11 **6 Claims**



1. A process for removing charged and non-charged particles from a fluid flow by attracting said particles to a separator device wherein said device comprises a separating medium formed of a poled, temperature sensitive pyroelectric material having a first surface and a second surface wherein said pyroelectric material produces electrostatic charges on said surfaces when its ambient temperature is varied, the charges produced on the first surface of said pyroelectric material being opposite in polarity to the charges produced on the second surface thereof, which process comprises the steps of:

a. varying the ambient temperature of said separating medium; and

b. passing the fluid flow within a close proximity of said separating medium so that said particles are attracted to said electrostatic charges on said pyroelectric material and removed from said fluid stream.

4,035,165

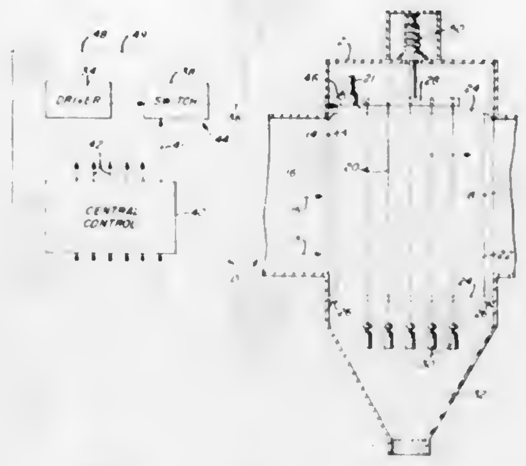
RAPPER MONITOR

William E. Archer, Huntington Beach, Calif., assignor to Wahlco, Inc., Santa Ana, Calif.

Filed Oct. 2, 1974, Ser. No. 511,194

Int. Cl.² B03C *3/76*

U.S. Cl. 55—13 **8 Claims**



6. A method of monitoring rapper operation in an electrostatic precipitator having an electrode assembly and a rapping means for dislodging dust accumulation from said electrode assembly, said rapping means including a movable hammer, comprising the steps of: sensing the actual operation of said hammer, gererating control signals in response to said sensing; and monitoring said control signals to determine whether said hammer is operating.

4,035,166

REGENERATION OF REGENERABLE AQUEOUS SCRUBBING SOLUTIONS USED FOR REMOVING ACIDIC GASES FROM GAS MIXTURES

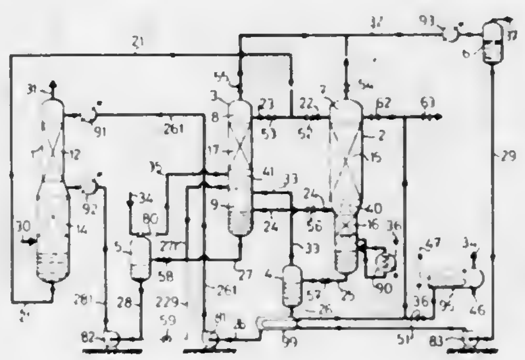
Francis Van Hecke, 183, avenue de Tervueren, B-1040 Brussels, Belgium

Filed Dec. 24, 1975, Ser. No. 644,011

Claims priority, application United Kingdom, Dec. 24, 1974, 55871/74

Int. Cl.² B01D *47/00*

U.S. Cl. 55—38 **17 Claims**



1. A process for the regeneration of regenerable aqueous scrubbing solutions which are used for the bulk removal of acidic gases, by absorption from gas mixtures containing these acidic gases, in a cyclic process in which said aqueous scrubbing solutions are regenerated in a regeneration system by stream stripping before being recycled to the absorption stage, a part of the scrubbing solutions being regenerated in a main regeneration section of the regeneration system, whereas the other part of the scrubbing solutions is regenerated in an auxiliary regeneration section of the regeneration system, the process comprising the steps of selecting the pressure in the auxiliary regeneration section independently from the pressure in the main regeneration section and of obtaining at least a part of the stripping steam required in the auxiliary regener-

ation section through flashing of the scrubbing solution of which at least a part consists of the solution stream withdrawn from said auxiliary regeneration section in a reduced pressure zone connected to the suction side of a steam-jet thermocompressor, the mixture of thermocompressor motive steam and recompressed flashed vapour being directly discharged into said auxiliary regeneration section.

4,035,167

RECOVERY OF ETHANE AND ETHYLENE FROM GASEOUS MIXTURES

Charles M. Starks, Ponca City, Okla., assignor to Continental Oil Company, Ponca City, Okla.

Filed Feb. 13, 1976, Ser. No. 657,994

Int. Cl.^{2} B01D *51/06*

U.S. Cl. 55—57 **12 Claims**

1. A method for recovering ethane and ethylene fom a gaseous mixture containing ethane and ethylene wherein said method comprises (1) contacting said gaseous mixture with a liquid phase solvent, selected from the group consisting of cyclohexene, 1-chlorobutane, and 1,1,1-trichloroethane, to absorb said ethane and ethylene from said mixture (2) desorbing by means of heating, depressurizing or a combination thereof, said ethane and ethylene.

7. A method for recovering ethane and ethylene from methane containing ethane and ethylene wherein said method comprises (1) contacting said methane with a liquid phase solvent, selected from the group consisting of cyclohexene, 1-chlorobutane, and 1,1,1-trichloroethane, to absorb said ethane and ethylene from said mixture and (2) desorbing by means of heating, depressurizing or a combination thereof said ethane and ethylene

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4,035,168

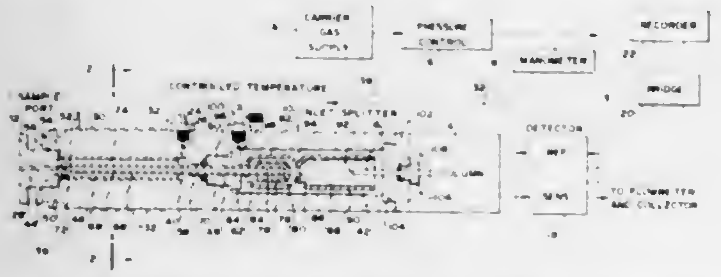
NONREACTIVE INLET SPLITTER FOR GAS CHROMATOGRAPHY AND METHOD

Walter G. Jennings, Davis, Calif., assignor to The Regents of the University of California, Berkeley, Calif.

Continuation-in-part of Ser. No. 491,304, July 24, 1974, abandoned, which is a continuation-in-part of Ser. No. 421,231, Dec. 3, 1973, abandoned. This application Mar. 31, 1976, Ser. No. 672,244

Int. Cl.^{2} B01D *15/08*

U.S. Cl. 55—67 **40 Claims**



1. In an inlet splitter for a gas chromatograph, a body having aligned injector and mixing chambers, means to heat said body and said chambers, elongate means forming an inert pathway between said injector and mixing chambers, said elongate means having an inlet in said injector chamber, and a baffled outlet opening to an expansion zone in said mixing chamber, means injecting an analysis sample into the inert pathway of said elongate means, means introducing a continuous flow of carrier gas to said inert pathway of said elongate means, said carrier gas serving to pick up, vaporize and convey injected sample through said electronic means and baffled outlet to said expansion zone, means forming a part of a gas chromatograph to withdraw a linear aliquot of intermixed sample and carrier gas from said expansion zone, and discharge means to effect removal of excess quantities of intermixed sample and carrier gas from said expansion zone and mixing chamber.

4,035,169

PROCESS FOR THE PURIFICATION OF ALUMINUM CHLORIDE

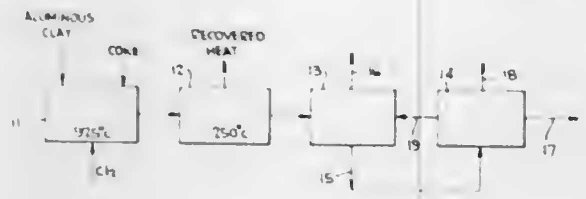
Roger Frank Sebenik, and Alfred Lippman, both of Metairie, La., assignors to Toth Aluminum, New Orleans, La.

Continuation-in-part of Ser. No. 422,846, Dec. 7, 1973, Pat. No. 3,938,969. This application Nov. 12, 1975, Ser. No. 631,316

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.^{2} B01D *47/00;* **C01F** *7/48*

U.S. Cl. 55—71 **12 Claims**



1. In a method for recovering aluminum chloride from a mixed chloride gas containing aluminum chloride and at least one chloride selected from the group consisting essentially of $FeCl_3$, $TiCl_4$ and $SiCl_4$ which comprises contacting said mixed chloride gas at atmosphereic pressure with a liquid solvent in which aluminum chloride is soluble to dissolve the aluminum chloride, and recovering the aluminum chloride from the solvent by distilling the aluminum chloride from the solvent at a pressure sufficient to condense the aluminum chloride as a liquid, the improvement comprising:

employing as the solvent an inorganic salt mixture selected from the group consisting of $NaCl—AlCl_3—FeCl_3$, $NaCl—AlCl_3—FeCl_2$, $NaCl—AlCl_3—FeCl_3—FeCl_2$, $AlCl_3—FeCl_3$, $AlCl_3—FeCl_2$, and $AlCl_3—FeCl_3—FeCl_2$.

4,035,170

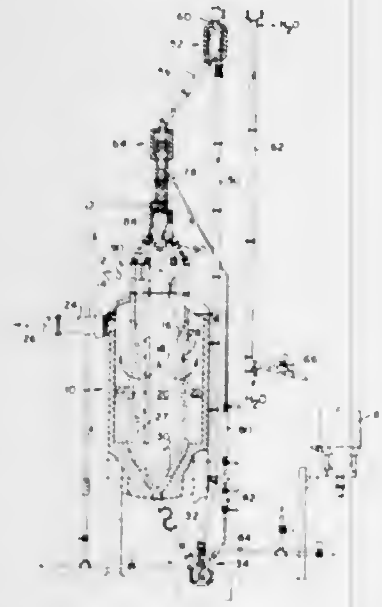
GRANULAR FILTER

Dean Everett Lear, Jr., Scott's Valley; Alan Howard Schmid, Santa Cruz, and Henry Ford Harding Wigton, Palo Alto, all of Calif., assignors to The United States of America as represented by the Administrator of Environmental Protection Agency, Washington, D.C.

Filed Jan. 8, 1976, Ser. No. 647,471

Int. Cl.^{2} B01D *46/32*

U.S. Cl. 55—267 **14 Claims**



1. A continuously regenerating granular filter adapted for operation at high temperature and pressure comprising:

a. a filter chamber adapted to operate at a positive pressure;

b. a gas inlet and a gas outlet disposed in the wall of said chamber to enable gas to be cleaned to be admitted into

the chamber and cleaned gas to be emitted from said chamber;

c. a stationary filter bed disposed vertically in said chamber and located between the gas inlet and the gas outlet, said filter bed further comprising two vertical annular walls, each containing a plurality of louvers providing an inlet and an outlet surface for permitting gas to flow therethrough in a generally horizontal direction;

d. a granular filter medium disposed in the space between the annular walls for cleaning said gas;

e. the filter bed further including gas seal inlet means and gas seal outlet means located at each vertical end of said filter bed for simultaneously enabling the filter medium to move downwardly through the filter bed and preventing a gas from leaking into or out of the filter chamber;

f. filter medium cleaning means for cleaning the filter medium disposed external to said filter chamber;

g. filter medium circulating means associated with said gas seal outlet means and adapted to circulate the filter medium from said outlet means, through the cleaning means, to the gas seal inlet means, and downwardly through the filter bed, whereby the filter bed is continuously being provided with a clean supply of filter medium; and

h. pressurized gas cleaning means in the filter chamber apart from and facing the inlet surface of the filter bed annular wall for periodically directing a gas under pressure downwardly at an angle against said inlet surface for cleaning deposits from said surface of the filter bed closest to the gas inlet, whereby said deposits are loosened from said inlet surface and fall downward where they are removed from the filter chamber through said gas seal outlet means.

4,035,171

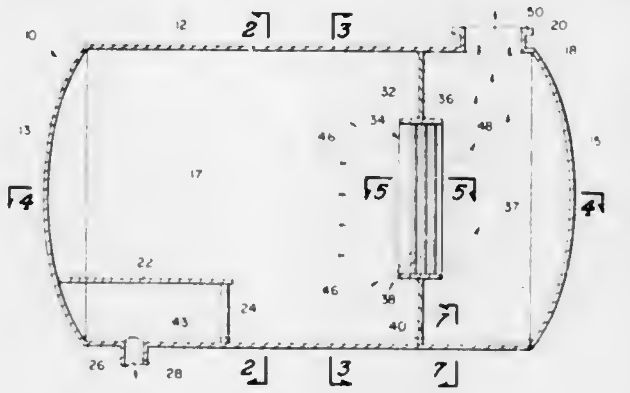
GAS LIQUID SEPARATOR FOR FLARE SYSTEMS

Robert D. Reed, and Robert E. Schwartz, both of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed Apr. 26, 1976, Ser. No. 680,094

Int. Cl.^{2} BC1D *50/00*

U.S. Cl. 55—319 **4 Claims**



1. A gas-liquid separator system providing four stages of separation, comprising;

a. a horizontal circular cylindrical walled vessel with an inlet pipe contiguous to a first end, an outlet pipe contiguous to a second end, the inlet pipe attached tangential to the wall of the vessel at the top of the vessel;

whereby the incoming gas and liquid will flow along the inner wall of the vessel toward the bottom;

b. horizontal separator plate baffle means attached on a first edge to the wall at said first end, and on a second edge to the cylindrical wall of said vessel, and having a third edge which is separated from the cylindrical wall;

whereby the liquid and liquid droplets flowing downwardly close to the inner wall will flow under the separator plate and be trapped, while the gas will flow over the plate and in a helical manner along the vessel;

c. drain means for trapped liquid in the bottom of said vessel;

d. demister means supported in a transverse wall near the second end of said vessel, said transverse wall extending across substantially the full cross section of said vessel, said demister means comprising;

1. frame means;
2. a plurality of vertical contact elements spaced apart in a plurality of separate rows attached to said frame means;
3. each contact element constructed of sheet material with its cross-section in the form of an M, with short outer legs;
4. said contact elements spaced apart in successive rows in staggered formation so that the outer legs in one row overlap the outer legs in adjacent rows;

whereby there is no straight through opening, and droplets of liquid carried by the gas must contact the vertical elements.

4,035,172

REGENERATIVE HUMIDITY AND HEAT EXCHANGE APPARATUS

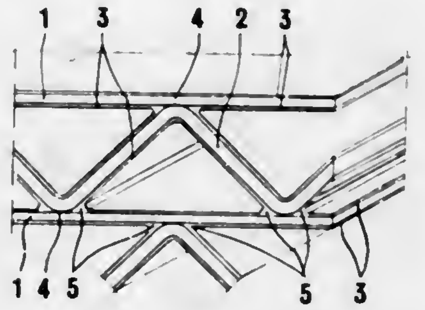
Ove Strindehag, and Erik Wrangel, both of Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Jan. 22, 1976, Ser. No. 651,588

Claims priority, application Sweden, Jan. 30, 1975, 7500986

Int. Cl.^{2} B01D *53/16*

U.S. Cl. 55—388 **4 Claims**



1. Humidity and heat exchange apparatus comprising an assembly of transfer elements for the exchange of heat and humidity between two different zones of fluid between which said transfer elements move, wherein said transfer elements consist of an interior non-hygroscopic material and a surface layer of a hygroscopic material which serves as a bonding substance cementing said elements to each other in said assembly, said hygroscopic layer comprising a true solution of a hygroscopic salt and an organic bonding agent, whereby said cementing and application of said surface layer are accomplished effectively and without requiring special heating of said surface layer to temperatures at which said bonding agent would be burned off.

4,035,173

SELECTIVELY THINNING AND FERTILIZING TIMBER FORESTS

Saburo Hashimoto, Yorba Linda, and Donald C Young, Fullerton, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

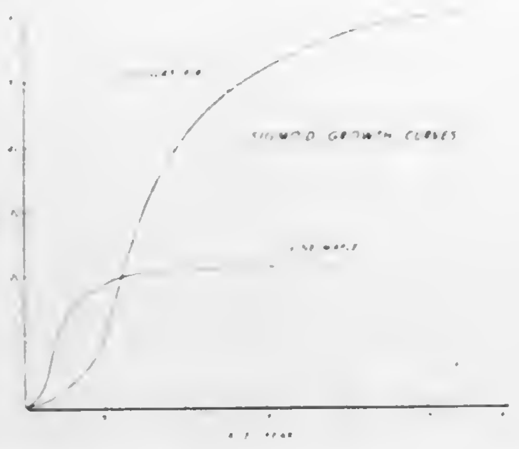
Continuation-in-part of Ser. No. 560,638, March 21, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,792

Int. Cl.^{2} C05C *9/00, 1/00*

U.S. Cl. 71—30 **11 Claims**

1. The method of simultaneously fertilizing and selectively thinning forests comprising preferred commercial timber trees of the family Pinaceae and unpreferred forest plants having a lower tolerance than said preferred trees to foliar application of the aqueous nitrogenous fertilizer hereinafter defined, which method includes the steps of reducing the growth rate

of said unpreferred plants relative to said preferred trees by applying to the foilage of all of said trees and plants an aqueous nitrogenous solution of a water-soluble nitrogen source selected from the group consisting of urea; ammonia; nitrates



of ammonia, calcium and potassium; ammonium sulfates; and combinations thereof, in an amount corresponding to at least about 12.5 weight percent elemental nitrogen at a total elemental nitrogen dosage level sufficient to reduce the growth rate of said unpreferred plants.

4,035,174

NOVEL DIBICYCLO [3.1.1] AND [2.2.1] HEPTYL AND DIBICYCLO [3.1.1] AND [2.2.1] HEPTENYL POLYAMINES AND METHODS FOR THEIR PREPARATION

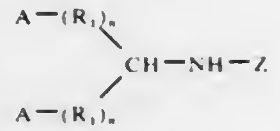
Nathaniel Grier, Englewood, N.J.; Richard A. Dybas, Center Square, Pa., and Robert A. Strelitz, Edison, N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 620,721, Oct. 9, 1975, abandoned, which is a continuation-in-part of Ser. No. 540,620, Jan. 13, 1975, abandoned. This application Mar. 26, 1976, Ser. No. 670,588

Int. Cl.² A01N *9/20;* C07C *87/16, 87/02;* C02C *5/02*

U.S. Cl. 71—67 **22 Claims**

1. A compound of the formula:

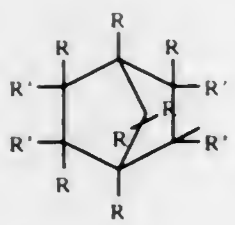


where.

each A is alike or different and is a bicyclic group of the formula:

a.

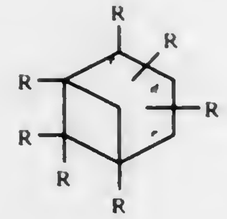
a)



or a bicyclic group of the formula:

b.

b)

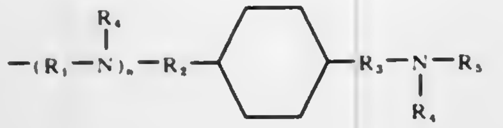


where R is alike or different and is hydrogen or C_1 to C_4 alkyl. R′ is alike or different and is hydrogen or C_1 to C_4 alkyl or R′ on adjacent carbon atoms taken together comprise an olefinic bond, and the dashed line indicates either saturation or c-, d-, e- unsaturation;

each R_1 is alike or different and is C_1 to C_4 alkylene:

each *n* is alike or different and is the integer 0 to 1;

Z is



where

R_2 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_3 is 2-hydroxy-1,3-trimethylene, or R_1 as previously defined;

R_4 is hydrogen, aminoethyl, aminopropyl, C_1 to C_4 hydroxyalkyl, aminohydroxy C_2 to C_4 alkyl, or C_2 to C_4 dihydroxyalkyl;

R_5 is hydrogen, C_1 to C_4 hydroxyalkyl or C_2 to C_4 dihydroxyalkyl, aminohydroxy C_2 to C_4 alkyl, and *n* is as previously defined, and acid addition salts thereof.

4,035,175

METHOD OF RETARDING THE GROWTH OF PLANTS USING CERTAIN OXADIAZOLYL, OXAZOLYL OR THIADIAZOLYL BENZOIC ACID DERIVATIVES

Walter G. Brouwer, Guelph; Edwin J. MacPherson, Elmira, both of Canada; Ronald B. Ames, Naugatuck, Conn.; Robert W. Neidermyer, and Charles E. Crittendon, both of Cheshire, Conn., assignors to Uniroyal Inc., New York, N.Y. and Uniroyal, Ltd., Canada

Division of Ser. No. 492,376, July 29, 1974, Pat. No. 3,947,263. This application Jan. 12, 1976, Ser. No. 648,237

Int. Cl.² A01N *5/00*

U.S. Cl. 71—76 **12 Claims**

1. A method of retarding the growth of plants comprising applying to plants, in a non-herbicidal amount effective to retard the growth of the plants, a chemical selected from the group consisting of 2-[5-(3-pyridyl)k-1,3,4-oxadiazol-2-yl]benzoic acid, 2-(5-phenyl-2-oxazolyl)benzoic acid, 2-(4-methyl-5-phenyl-2-oxazolyl)benzoic acid, 2-[5-(2,4,5-trimethyl-2-furyl)-1,3,4-oxadiazol-2-yl]benzoic acid, methyl 2-(5-phenyl-2-oxazolyl)benzoate, and 2(5-phenyl-1,3,4-thiadiazol-2-yl)benzoic acid.

4,035,176

N-(PERFLUOROACYL)-N-PHOSPHONOMETHYL GLYCINE COMPOUNDS, METHOD OF PREPARING SAME

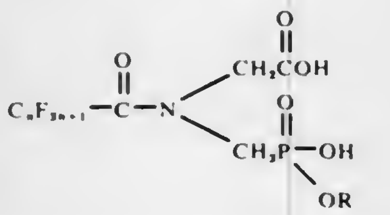
Melvin L. Rueppel, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 580,252, May 23, 1975, Pat. No. 3,970,695. This application May 3, 1976, Ser. No. 682,244

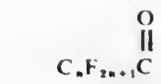
Int. Cl.² A01N *9/36;* C07F *9/02*

U.S. Cl. 71—86 **12 Claims**

1. A compound of the formula



wherein R is a member of the group consisting of H and



$$C_nF_{2n+1}\overset{O}{\overset{\|}{C}}$$

and *n* is an integer of from 1 to 4.

5. A herbicidal composition comprising a herbicidally acceptable surfactant, an inert diluent and a herbicidally effective amount of a compound of claim 1.

9. A method of controlling undesirable plants which comprises contacting said plants with a herbicidal amount of a compound of claim 1.

4,035,177

HERBICIDAL N-THIOLCARBONYL DERIVATIVES OF N-PHOSPHONOMETHYLGLYCINE

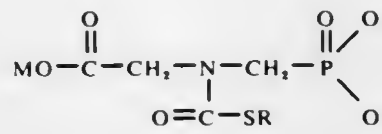
Van R. Gaertner, Ballwin, Mo., assignor to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 644,784, Dec. 29, 1975, Pat. No. 3,991,095. This application July 16, 1976, Ser. No. 705,976

Int. Cl.² A01N *9/36*

U.S. Cl. 71—87 **10 Claims**

1. A method for controlling the growth of undesired plants which comprises applying to said plants a herbicidally effective amount of compound of the formula



wherein each M is hydrogen, alkali metal, ammonium or lower alkyl ammonium, R is lower alkyl, phenyl or benzyl, and said phenyl or benzyl can contain a chlorine, nitro, methyl, methoxy or trifluoromethyl substituent.

4,035,178

HERBICIDAL 1,3-DIOXANES

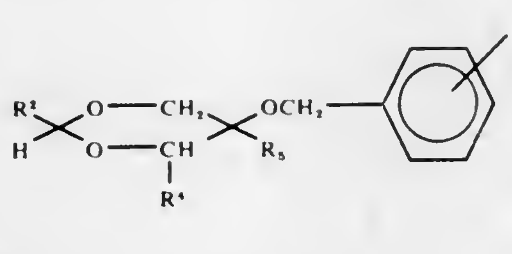
Marvin Joseph Konz, Lockport, N.Y., assignor to FMC Corporation, Philadelphia, Pa.

Filed Aug. 31, 1976, Ser. No. 719,311

Int. Cl.² A01N *9/28;* C07D *319/06*

U.S. Cl. 71—88 **13 Claims**

1. A compound of the formula:



wherein

R^2 is alkyl of 1 to 4 carbon atoms;

R^4 is alkyl of 1 to 4 carbon atoms;

R^5 is hydrogen or alkyl of 1 to 4 carbon atoms;

X is chloro, fluoro, or methyl; and

n is 0, 1 or 2; is which the benzyloxy group bears a cis-relationship to R^2.

7. An herbicidal composition comprising an herbicidally effective amount of a compound of claim 1 in admixture with an extender.

8. A method of preventing and destroying undesired plant growth which comprises applying to the locus to be protected an herbicidally effective amount of a compound of claim 1.

4,035,179

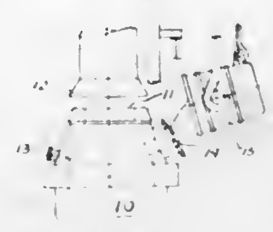
METHOD AND APPARATUS FOR CONTROLLING POLLUTION IN STEEL FURNACES

Samuel Calderon, Akron, Ohio, assignor to Calderon Automation, Inc., Cleveland, Ohio

Filed Apr. 4, 1975, Ser. No. 564,870

Int. Cl.² C21C *5/50*

U.S. Cl. 75—60 **4 Claims**



1. A method of charging a steelmaking furnace with molten metal, comprising the steps of supporting a steelmaking furnace for rotational motion about a substantially horizontal axis, supporting said furnace in an upright position with the mouth of said furnace opening generally upwardly, providing a hood for collecting fumes from said steelmaking furnace and aligning said hood with the mouth of said steelmaking furnace when said furnace is in said upright position to provide a stack effect, charging said steelmaking furnace with metal while said steelmaking furnace is in said upright position, and blowing oxygen onto the charge of metal while said steelmaking furnace is in said upright position.

4,035,180

CATALYTIC PROCESS FOR THE REDUCTION OF ALUMINUM CHLORIDE BY MANGANESE

John Christopher Terry; Roger Frank Sebenik, both of Metairie, and Ronald Wyndham, New Orleans, all of La., assignors to Toth Aluminum Corporation, New Orleans, La.

Filed Mar. 16, 1976, Ser. No. 667,384

Int. Cl.² C22B *21/02*

U.S. Cl. 75—68 R **16 Claims**

1. A process for producing aluminum or a high content aluminum alloy comprising:

reacting aluminum chloride with manganese in the presence of a catalyst selected from the group consisting of zinc, cadmium, mercury, or compounds thereof.

4,035,181

PROTECTION OF SILVER REDUCTION MATERIALS

Richard S. Fisch, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 8, 1976, Ser. No. 721,533

Int. Cl.² C22B *11/04*

U.S. Cl. 75—109 **3 Claims**

1. In the process of reducing silver ions from a silver rich solution by contacting said silver rich solution with iron, the improvement which comprises adding a water soluble material to said solution, which material acts to inhibit corrosion of said iron, said material comprising at least one selected from the group consisting of:

1. ethylene oxides having no acid free hydrogens,
2. non-aromatic hydrocarbon substituted quaternary ammonium chlorides having no acid free hydrogens,
3. phosphates having no acid free hydrogens, and
4. primary and secondary, alkylene, alkyl and alkanol amines having no acid free hydrogens

which material is further characterized by

1. being able to form a solution or dispersion in water which is stable from separation for 10 minutes, and
2. when added in a concentration of 10 g/l with steel wool to a 1M sodium or ammonium thiosulfate solution will

not allow the solution to turn dark and turbid within 30 minutes, said material being present in a 1:1 ratio with said steel wool.

4,035,182

NI-CR-FE ALLOY HAVING AN IMPROVED RESISTANCE TO STRESS CORROSION CRACKING

Masamichi Kowaka, Toyanaka, and Hisao Fujikawa, Nishinomiya, both of Japan, assignors to Sumitomo Metal Industries Ltd., Japan

Continuation-in-part of Ser. No. 390,227, Aug. 21, 1973, abandoned, which is a continuation of Ser. No. 161,290, July 9, 1971, abandoned. This application Oct. 7, 1974, Ser. No. 512,966

Claims priority, application Japan, July 14, 1970, 45-62464

Int. Cl.² C22C *38/02, 38/42*

U.S. Cl. 75—122 **4 Claims**

1. A Ni-Cr-Fe alloy being improved in resistance to stress corrosion cracking in water, water containing chlorine ion, at high temperatures and pressures, consisting essentially of, by weight; 0.03 to 0.12% of carbon; 1.5 to 4.0% of silicon; 0.1 to 3% of manganese; 25 to 45% of nickel; 24 to 35% of chromium; 0.9 to 4.0% of vandium; at least one element selected from the group consisting of titanium in an amount of at least 5 times the carbon content and up to 1% of the total composition, niobium in an amount of at least 7 times the carbon content and up to 1% of the total composition, zirconium in an amount of at least 7 times the carbon content and up to 1% of the total composition, and tungsten in an amount of at least 5 times the carbon content and up to 2% of the total composition, the total amount of any combination of the group consisting titanium, niobium, zirconium and tungsten being in the range of 0.3 to 2%; at least one element selected from the group consisting of copper and molybdenum, the total amount of copper and molybdenum being up to 4%; and the balance essentially of iron.

4,035,183

METHOD FOR MAKING ALUMINUM-CONTAINING FERROALLOY

Kiyoshi Okamoto; Shizuo Kiriyama, both of Nagano; Ichiro Obayashi, Myokokogen; Kazuaki Yamamura, Myokokogen, and Masaaki Senoo, Myokokogen, all of Japan, assignors to Chuo Denki Kogyo Co., Ltd., Japan

Filed Aug. 18, 1975, Ser. No. 605,722

Int. Cl.² C22C *33/04*

U.S. Cl. 75—129 **1 Claim**

1. A method of preparing a deoxidizer for steel, said deoxidizer consisting of an aluminum-containing silicomanganese ferroalloy wherein the amount of aluminum is from 1 to about 6% by weight and having an improved homogeneity of aluminum in said ferroalloy which process comprises charging molten ferroalloy and molten aluminum simultaneously into a ladle and blowing an inert gas through said charge from the bottom of the ladle.

4,035,184

METHOD OF PRODUCING REVERSAL COLOR IMAGES

William H. Faul, and Patrick H. Saturno, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 487,085, July 10, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,329

Int. Cl.² G03C *7/16, 5/50, 5/30*

U.S. Cl. 96—22 **6 Claims**

1. A method of producing reversal color images which comprises:

1. forming a silver image in the imagewise exposed areas of a photosensitive photographic element comprising a support having thereon at least one photosensitive silver halide emulsion layer containing a stabilized ballasted leuco dye which comprises the reaction product of a cyan color-forming coupler and an N,N-dialkyl-p-phenylenediamine having an electronegative group attached to the benzene ring, said electronegative group having the capability of deactivating the p-phenylenediamine group sufficiently to stabilize the leuco dye molecule against aerial oxidation by contacting said exposed element with a developing composition containing a developing agent selected from the group consisting of ascorbic acid, 5-amino derivatives of pyrimidine and 5-hydroxy derivatives of pyrimidine;
2. fogging the residual silver halide in said layer;
3. developing the residual silver halide in the fogged element and concurrently oxidizing the leuco dye to form a dye image with a developing composition containing a developing agent selected from the group consisting of 1-phenyl-3-pyrazolidone, 1-phenyl-4,4-dimethyl-3-pyrazolidone and 4-hydroxymethyl-4-methyl-1-phenyl-3-pyrazolidone; and,
4. removing developed silver to leave a cyan dye image in the originally unexposed areas of said layer without oxidizing the leuco dye molecules in the imagewise exposed areas of said layer.

4,035,185

BLENDED INTERNAL LATENT IMAGE EMULSIONS, ELEMENTS INCLUDING SUCH EMULSIONS AND PROCESSES FOR THEIR PREPARATION AND USE

Francis J. Evans, Rochester, and Robert E. Atwell, Spencerport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 539,474, Jan. 8, 1975, abandoned. This application Jan. 30, 1976, Ser. No. 653,799

Int. Cl.² G03C *5/54, 1/28, 5/24*

U.S. Cl. 96—29 R **20 Claims**

1. A photographic silver halide emulsion comprised of silver halide grains internally sensitized with a combination of middle chalcogen and noble metal sensitizers capable of forming on exposure an internal latent image, said emulsion being the product of blending at least two silver halide emulsions each comprised of silver halide grains internally sensitized with the same middle chalcogen and noble metal sensitizers, a first of said blended emulsions being comprised of lower contrast producing silver halide grains exhibiting a comparatively higher proportion of middle chalcogen to noble metal internal sensitization and a second of said blended emulsions being comprised of higher contrast producing silver halide grains exhibiting a comparatively lower proportion of middle chalcogen to noble metal internal sensitization, said higher and lower contrast silver halide emulsions being otherwise substantially identically internally sensitized.

4,035,186

PROCESS FOR THE DEVELOPMENT OF DIAZOTYPE MATERIALS

Allan Robert Andrew Beeber, London, England, assignor to Allan Robert Andrew Beeber and Ozalid Group Holdings Limited, both of, England

Filed Nov. 18, 1975, Ser. No. 633,090

Claims priority, application United Kingdom, Nov. 20, 1974, 50202/74

Int. Cl.² G03C *5/34*

U.S. Cl. 96—49 **5 Claims**

1. A process for the development, following imagewise exposure, of two component diazotype material in sheet form constituted by a base carrying a light-sensitive coating containing a diazonium salt, a coupler, and an acid coupling inhibitor, said process comprising, while advancing the material continuously at a rate of 1 to 20 meters per minute, first applying to the exposed light-sensitive coating a non-volatile alkaline, inorganic developer liquid selected from the group consisting of aqueous solutions of carbonates, bicarbonates, hydroxides and phosphates of alkali metals and alkaline earth metals and having a pH value of at least 10 at a coating weight of between 2.0 and 8.0 grams per square meter to effect, in the unexposed areas of the material, coupling between the diazonium salt and the coupler, then subjecting the material to heat sufficient to dry it, and finally applying to the light-sensitive coating a dilute acid solution at a coating weight of between 2.0 and 8.0 grams per square meter which contains acid which does not readily crystallize from solution, does not tend to char paper and does not impart an objectionable odor to the resulting prints, said acid solution containing sufficient acid not only to neutralize alkali retained in the material but to leave the emerging material in a substantially acid condition.

4,035,187

PROCESS FOR BLEACHING SILVER HALIDE PHOTOGRAPHIC ELEMENTS CONTAINING ANIONIC ORGANIC ACID COMPOUNDS

Rowland George Mowrey; Donald Arthur Smith, and Richard Calvin Sutton, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Division of Ser. No. 307,892, Nov. 20, 1972. This application Mar. 29, 1976, Ser. No. 671,528

Int. Cl.² G03C *5/32, 1/76*

U.S. Cl. 96—60 R **15 Claims**

1. In a photographic development process wherein a imagewise exposed photographic element, containing at least one image dye-providing layer unit containing less than 50 mg/ft², based on silver, of a silver halide emulsion and a photographic color coupler, is contacted with an aromatic primary amino silver halide developing agent to produce an image dye followed by contact with a fixing bath, the improvement wherein the photographic element as formed contains at least one equivalent for each equivalent of silver of a polymeric anionic organic acid compound having an equivalent weight of at least 70 and less than 800 and wherein said element is contacted with a cobalt (III) ion complex having a coordination number of 6 prior to contact with said fixing bath whereby substantially all of said silver in said image dye-providing layer unit will be bleached during said fixing step by the cobalt(III) ion complex.

4,035,188

N-ALKOXYETHOXYETHYLPHENYLENEDIAMINE COLOR DEVELOPING AGENTS

Kenji Yabuta; Kiyoshi Yamashita, and Kiyoshi Futaki, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills, Ltd., Tokyo, Japan

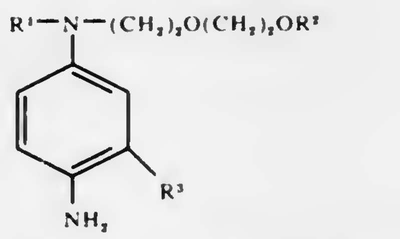
Filed Mar. 31, 1975, Ser. No. 563,458

Claims priority, application Japan, Apr. 3, 1974, 49-37600

Int. Cl.² G03C *5/30;* **C07C** *107/06, 93/14*

U.S. Cl. 96—66 R **10 Claims**

1. In a color developing solution containing a color developing agent, a preservative, a buffer and an antifogging agent the improvement comprising employing as the color developing agent a compound of the formula



wherein R¹ and R² are alkyl of 1 to 4 carbon atoms and R³ is hydrogen or methyl or a salt thereof.

4,035,189

IMAGE FORMING CURABLE RESIN COMPOSITIONS

Nobuyuki Hayashi; Asao Isobe; Katsushige Tsukada; Ken Ogawa, and Masahiro Abo, all of Hitachi, Japan, assignors to Hitachi Chemical Company, Ltd., Japan

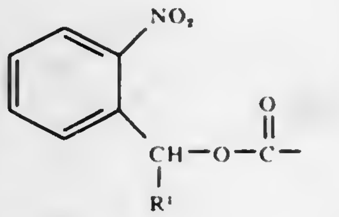
Continuation of Ser. No. 335,313, Feb. 23, 1973, abandoned. This application July 10, 1975, Ser. No. 594,870

Claims priority, application Japan, Feb. 25, 1972, 47-18940; Mar. 6, 1972, 47-22252

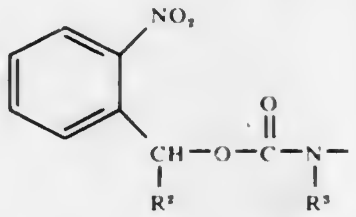
Int. Cl.² G03C *1/68;* **C08F** *8/18*

U.S. Cl. 96—115 R **11 Claims**

1. A resist image-forming curable resin composition which comprises (A) an epoxy resin prepolymer having at least two epoxy groups per molecule and (B) a compound having in the molecule at least two groups represented by formulas (I) and/or (II),



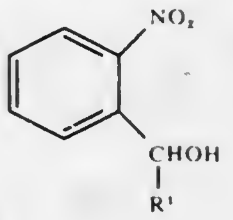
(I)



(II)

wherein R¹, R² and R³ are individually a hydrogen atom, an alkyl group or an aryl group, said compound (B) being:

a. a compound produced by the reaction of a polycarboxylic acid, polycarboxylic acid anhydride, polycarboxylic acid halide, polyamine or polyisocyanate with an alcohol represented by the formula (V):



or

(V)

b. a compound produced by polymerization of an ester of a monomeric ethylenically-unsaturated acid or an acid anhydride thereof and an alcohol of the formula (V):

the ratio of said compound (B) to said epoxy resin prepolymer (A) being in the range 0.1 to 0.8 where said range is defined by the ratio of the sum of said groups (I) and/or (II) in compound (B) expressed in equivalents to the sum of said epoxy groups in compound (A).

4,035,190

DIRECT POSITIVE SILVER HALIDE EMULSIONS CONTAINING QUATERNATED MEROCYANINE DYES

Paolo Beretta, Ferrania (Savona), and Luigi Magnani, Carcare (Savona), both of Italy, assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

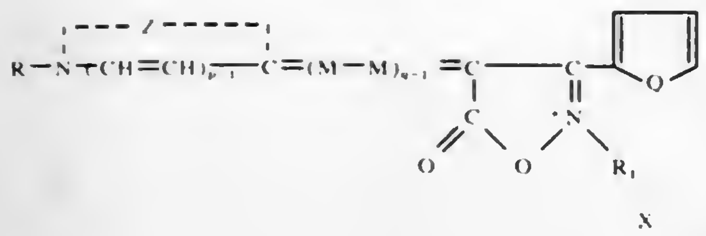
Filed Dec. 3, 1975, Ser. No. 637,290

Claims priority, application Italy, Dec. 9, 1974, 54442/74

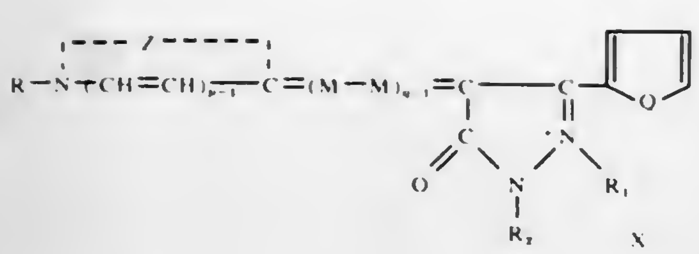
Int. Cl.² G03C *1/10*

U.S. Cl. 96—127 **7 Claims**

1. A light-sensitive direct positive silver halide emulsion characterized by having in the emulsion a sensitizing amount of at least one quaternized merocyanine dye characterized by corresponding to one of the following formulae:



[1]



[2]

wherein *p* and *q* each represents a positive integer of from 1 to 2; M represents a methine link; R and R_1 each represents an alkyl group containing from 1 to 4 carbon atoms, or a substituted alkyl group containing from 1 to 4 carbon atoms, an acyloxyalkyl group, an alkoxycarbonylalkyl group, an aryl group or a substituted aryl group, an aralkyl group, and an alkenyl group; R_2 represents an alkyl group and an aryl group; X^- represents an acid anion; Q represents O, S, NH, Z represents the nonmetallic atoms selected from C, O, S, Se, or N required to complete a heterocyclic nucleus containing from 5 to 6 atoms in the heterocyclic ring.

4,035,191

TETRAGONALLY STABILIZED ZIRCONIA CERAMIC

Herbert L. Johns, Madison, Ohio, assignor to Corning Glass Works, Corning, N.Y.

Continuation-in-part of Ser. No. 468,498, May 9, 1974, abandoned. This application Sept. 4, 1975, Ser. No. 610,120

Int. Cl.^{2} C04B *35/48*

U.S. Cl. 106—57 **10 Claims**

1. A mature, tetrastabilized zironcia fired composition consisting essentially of, by weight on the oxide basis, 0 1–5.0% ZnO and at least 0.5% of a primary stabilizer selected from 0.25% up to less than about 4% MgO, 0.25% up to less than about 4% Y_2O_3 and combinations thereof, the balance substantially being ZrO_2, said fired composition having less than 10% cubic structure and at least 5% tetragonal structure by volume at room temperature.

4,035,192

CEMENT AND AGGREGATE MIXTURE AND METHOD FOR MAKING SAME

Joseph P. Busacca, 946 E. 85th St., Brooklyn, N.Y. 11227

Filed Aug. 14, 1975, Ser. No. 604,544

Int. Cl.^{2} C04B *7/35*

U.S. Cl. 106—90 **27 Claims**

1. A method for producing a cement and aggregate mixture which comprises the steps of:

a. treating particles of rubber so that the outer surface of said particles becomes viscid;

b. mixing said treated particles with dry cement so that said cement is permanently bonded to said particles through adhesion to said viscid outer surfaces to form a cement coated aggregate; and

c. adding said cement coated aggregate to an additional quantity of cement to create a cement and aggregated mixture having a predetermined ratio of cement coated aggregate to cement by weight.

4,035,193

METHOD AND APPARATUS FOR CALCINING POWDERED MATERIAL FOR CEMENT

Shigeyoshi Miyamoto, Saeki, and Kosuke Yamashita, Hiroshima, both of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 28, 1975, Ser. No. 599,658

Claims priority, application Japan, July 31, 1974, 49-87697

Int. Cl.^{2} C04B *7/44*

U.S. Cl. 106—100 **4 Claims**

1. A method for calcining powdered cement material comprising the steps of: suspending the material in primary air; blowing into the suspension fuel in an amount in excess of that which is sufficient for complete combustion with the oxygen contained in the suspension to effect partial calcination of the material and incomplete combustion of the fuel, thereby to obtain reducing exhaust gases including the partially calcined material and a remainder of combustible gases; producing from a process of burning cement material exhaust gases which contain relatively large amounts of nitrogen oxides; mixing said reducing exhaust gases including said partially calcined material and said exhaust gases from said cement burning process to produce a mixture stream thereof; adding to said mixture stream an amount of secondary air sufficient for complete combustion of said remainder of combustible gases contained in said mixture stream thereby concluding the combustion of said remainder of combustible gases and calcining the individual material particles; and thereafter separating the calcined powdery material from the product of said calcining and concluded combustion.

4,035,194

PROCESS OF TREATING SOYBEANS TO PRODUCE SOYBEAN EXTRACT, SOYBEAN OIL, AND SOYBEAN MEAL THEREFROM

Hugo H. Grassl, 2154 Greystone, Hoffman Estates, Ill. 60172

Filed Nov. 18, 1974, Ser. No. 524,501

Int. Cl.^{2} C08L *89/00*

U.S. Cl. 106—154 R **42 Claims**

1. A method of obtaining a plurality of products from soybeans comprising the steps of adding a quantity of water to soybeans in a predetermined ratio to provide a water-soybean mixture, cooking said mixture at a temperature of about 212° to less than about 235° F. for a sufficiently long time to produce a water-soybean solution along with remaining soybeans, removing said water-soybean solution from the remaining soybeans, removing water from said water-soybean solution to produce a concentrated water-soybean solution, and extracting oil from said remaining soybeans.

4,035,195

CROSSLINKING CELLULOSE POLYMERS

Thomas J. Podlas, Newark, Del., assignor to Hercules Incorporated, Wilmington, Del.

Filed Aug. 11, 1975, Ser. No. 603,828

Int. Cl.^{2} C08L *1/26*

U.S. Cl. 106—194 **6 Claims**

1. A method of perparing a thickened aqueous brine solution which comprises providing an aqueous solution of at least about 0 025% by weight of carboxymethyl hydroxyethyl cellulose and crosslinking said carboxymethyl hydroxyethyl cellulose in solution with a polyvalent metal cation, said carboxymethyl hydroxyethyl cellulose being one wherein the carboxymethyl D.S. is between about 0.2 and 0 6 and the hydroxyethyl M.S. is between about 1.5 and 3.0, and said polyvalent metal cation being provided in the form of a salt wherein said metal cation is present in the same cationic valence state as the crosslinking species, and the mole ratio of said polyvalent metal cation to carboxyl groups being between about 0.02 and 1.

4,035,196

ABSORBENT COMPOSITION

Robert K. Remer, Evanston, Ill., assignor to Hull-Smith Chemicals, Inc., Des Plaines, Ill.

Division of Ser. No. 374,929, June 23, 1973, Pat. No. 3,883,438, which is a continuation of Ser. No. 129,602, March 30, 1971, abandoned. This application Jan. 2, 1975, Ser. No. 538,179

The portion of the term of this patent subsequent to Apr. 29, 1992, has been disclaimed.

Int. Cl.^{2} C09D *17/00*

U.S. Cl. 106—288 Q **12 Claims**

1. A pigment composition comprising a mixture of dye or dye intermedaite with an effective amount of a water insoluble precipitate produced by the reaction in alkaline aqueous medium of polyvalent metal ions, amine or amide compounds, carbon disulfide, and a major amount of water-dispersible or ammoniacal-dispersible reactive high molecular weight compound or polymer material wherein the amount of carbon disulfide is sufficient to react with substantially all of the amine or amide.

4,035,197

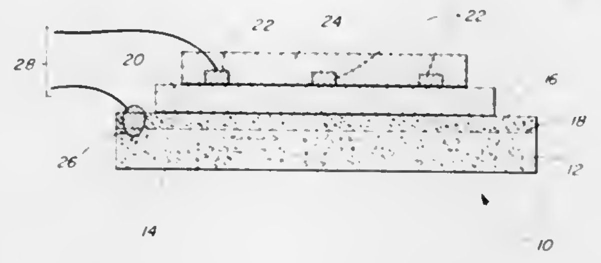
BARRIER TYPE PHOTOVOLTAIC CELLS WITH ENHANCED OPEN-CIRCUIT VOLTAGE, AND PROCESS OF MANUFACTURE

Pranab Kumar Raychaudhuri, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,866

Int. Cl.^{2} H01L *31/06*

U.S. Cl. 136—89 CD **7 Claims**



4. A process for the formation of a photovoltaic cell, the process comprising the steps of

a. forming a layer of crystalline cadmium telluride,

b. heating at least one surface of the layer in air for more than about 2 minutes and less than or equal to about 20 minutes at a temperature between about 250° C and about 350° C, or for a time less than or equal to about 2 minutes but at a temperature in centigrade degrees no lower than about 490/*a*, where *a* is the time of heating in minutes; and

c. applying a metal layer in contact with at least part of said one surface, said metal being capable of forming a barrier with cadmium telluride,

whereby a cell is produced having an open-circuit voltage which is at least about 50 millivolts greater than a similar cell processed without step (b) above.

4,035,198

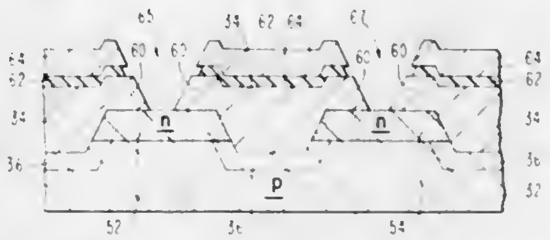
METHOD OF FABRICATING FIELD EFFECT TRANSISTORS HAVING SELF-REGISTERING ELECTRICAL CONNECTIONS BETWEEN GATE ELECTRODES AND METALLIC INTERCONNECTION LINES, AND FABRICATION OF INTEGRATED CIRCUITS CONTAINING THE TRANSISTORS

Robert Heath Dennard, Croton-on-Hudson, and Vincent Leo Rideout, Mohegan Lake, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 30, 1976, Ser. No. 701,442

Int. Cl.^{2} H01L *21/265*

U.S. Cl. 148—1.5 **25 Claims**



1. A method of fabricating a field effect transistor (FET) having self-registering electrical connections between the gate electrode and metallic interconnection line thereof comprising the steps of:

A. providing a semiconductive substrate of a first conductive type containing active impurities of a first conductive type;

B. providing an FET gate insulator on said substrate;

C. depositing and doping a layer of a conductive gate electrode material above said gate insulator;

D. deposition a nonoxidizing masking layer;

E. delineating by masking and etching predetermined regions to provide FET gate and interconnection patterns of the gate electrode material;

F. forming by diffusion or ion implantation FET doped silicon source and drain regions of second conductivity type opposite to first conductivity type of said substrate, the boundaries of said source and drain regions being determined by the edges of said predetermined gate patterns provided in step (E) so that said source and drain regions are self-aligned with respect to the edges of said gate electrode;

G. forming a dielectric insulation layer over said source and drain regions and on the sides of said gate;

H. removing the nonoxidizing layer by etching;

I. deposition a thick layer of insulation;

J. delineating and etching predetermined access holes through said thick insulation layer over said gate electrode and over said source and drain regions;

K. delineating and etching open contact holes to the source and drain regions;

L. depositing and delineating a predetermined, metallic-type, high-electrical conductivity, interconnection line pattern that makes electrical connection to the gate electrodes and to source and drain regions.

4,035,199

PROCESS FOR THERMAL GRADIENT ZONE MELTING UTILIZING A GUARD RING RADIATION COATING

Thomas R. Anthony, and Harvey E. Cline, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

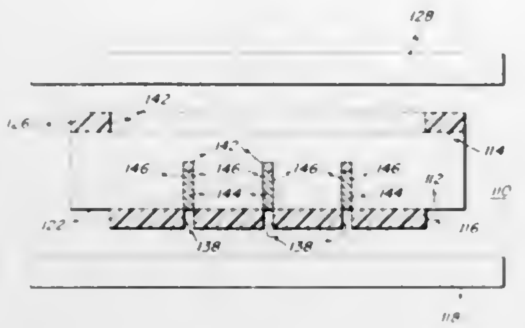
Filed Aug. 30, 1976, Ser. No. 718,976

Int. Cl.^{2} H01L *21/24*

U.S. Cl. 148—1.5 **14 Claims**

1. An improvement in the processing of a body of semiconductor material by thermal gradient zone melting comprising the steps of:

a. selecting a body of semiconductor material having a preferred crystal structure, a preferred type of conductivity, a preferred level of resistivity, two major opposed surfaces being, respectively, the top and bottom surfaces of the body, at least one of the major surfaces having a preferred planar crystal orientation which is one selected from the group consisting of (**100**), (**110**) and (**111**), and a vertical axis substantially aligned with a first preferred crystal axis of the material of the body;



b. forming a layer of a material suitable for absorbing or for re-radiating a predetermined range of wavelength of the most intense portion of the radiation spectrum impinging thereupon on at least one of the two major opposed surfaces, the layer having a predetermined thickness, t, expressed by the following general equation:

$$t = \frac{(2n-1)\lambda}{4N}$$

wherein

n = any positive integer greater than zero,
λ = the wavelength in vacuum of the most intense portion of the radiation spectrum impinging upon the layer of material, and
N = the index of refraction of the material;

c. shaping the first layer of material to conform to a particular configuration and to cover a predetermined surface area of the major surface of the body on which it is disposed;
d. exposing the processed body to a source of radiant energy;
e. absorbing the predetermined range of wavelength of the most intense portion of the radiation spectrum in the first layer, and
f. increasing the heat flow lines through a predetermined portion of the material of the body to enhance the migration of a metal-rich semiconductor material therethrough by thermal gradient zone melting.

4,035,200
PROCESS FOR MAKING AN OXIDE-LAYER

Jaques Hubert Valentijn, Nijmegen, Netherlands, assignor to Smit Ovens Nijmegen B.V., Nijmegen, Netherlands

Filed Aug. 11, 1975, Ser. No. 603,369

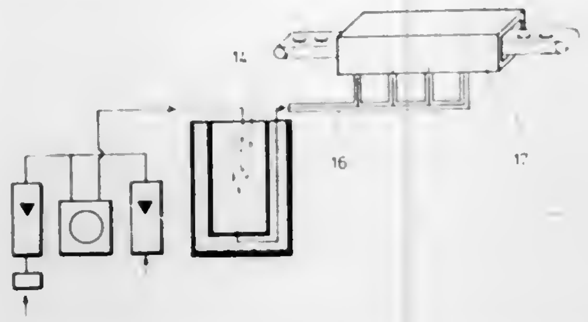
Claims priority, application Germany, Aug. 23, 1974, 2440447

Int. Cl.² C23C *11/08*

U.S. Cl. 148—6.35 **3 Claims**

1. A process of producing an oxide layer consisting predominantly of Fe_3O_4 on an iron surface in an oxidizing atmosphere and at a temperature between 500° to 600° C. whereby the oxidizing atmosphere of combustion gases is produced by understoichiometrically burnt natural fuel gas or other fuel gases producing CO when burnt, comprising the following process steps:

a. controlling the combustion of the fuel gases by cooling the combustion chamber to maintain an apparent reaction temperature of from 500° to 800°C. in the combustion chamber to form the combustion gases;
b. without cooling to remove water from said combustion gases subsequently conveying the latter into a heated blackening chamber while maintaining constant the mass of the combustion gases and maintaining the temperature substantially above the dew point of the combustion gases;
c. producing a blackened oxide layer on the iron surface in the blackening chamber by contacting the iron surface with the combustion gases; and
d. monitoring the proportion of CO in the combustion gases after burning of the gases producing CO with a sensing means and controlling the air and fuel supplies by a control means in accordance with the measured values of the CO concentration.



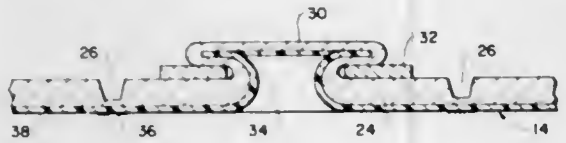
4,035,201
METHOD OF MAKING A CONTAINER INCLUDING AN ALUMINUM PANEL HAVING A PORTION REMOVABLE BY TEARING

William Albert Anderson, Pittsburgh; Arvil Burke McKee, Lower Burrell, and John Knox McBride, New Kensington, all of Pa., assignors to Aluminum Company of America, Pittsburgh, Pa.

Division of Ser. No. 591,700, June 30, 1975, Pat. No. 3,963,143. This application Mar. 15, 1976, Ser. No. 666,619

Int. Cl.² B23P *3/06;* **C22F** *1/04*

U.S. Cl. 148—11.5 A **19 Claims**



1. The method of producing improved container stock sheet comprising the steps of:

1. providing composite rolling stock composed of a core alloy consisting essentially of 0.4–3% copper, up to 0.6% magnesium and up to 1.5% manganese, balance essentially aluminum and incidental elements and impurities and a cladding layer composed of at least 99.5% aluminum and not more than 0.1% zinc;
2. rolling said stock to produce a rolled sheet product;
3. subjecting said rolling stock or said product to a thermal exposure at a temperature of at least 600° F and substantially at least the solvus temperature of said core alloy followed by relatively rapid cooling.

4,035,202
ANNEALING TREATMENT FOR CONTROLLING WARHEAD FRAGMENTATION SIZE DISTRIBUTION

George A. Hayes, China Lake, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Division of Ser. No. 231,429, March 2, 1972, Pat. No. 3,791,881. This application Oct. 23, 1973, Ser. No. 514,976

Int. Cl.² C21D *9/16*

U.S. Cl. 148—16 **1 Claim**

1. A method for controlling the size and shape of fragments produced by a steel warhead casing having a nominal composition of about 1.1% C, 1.8% Mn, .009% P, .82% Si, .015% S, .01% Al and a balance of Fe wherein the percentages are by weight, said method comprising the steps of·

a. masking the casing with a cover which leaves a gridwork of bare metal exposed;
b. subjecting said masked casing to an environment of hydrogen by utilizing the casing as a cathode in an acidic electroplating bath wherein hydrogen ions are reduced to hydrogen atoms at the surface of the steel casing some of which diffuse into the exposed steel casing;
c. removing said cover;
d. heating said casing to 1750° F plus or minus about 200° F to austenitize; and
e. oil quenching said casing at a temperature in the range of from about 250° F to 150° F.

4,035,203
METHOD FOR THE HEAT-TREATMENT OF STEEL AND FOR THE CONTROL OF SAID TREATMENT

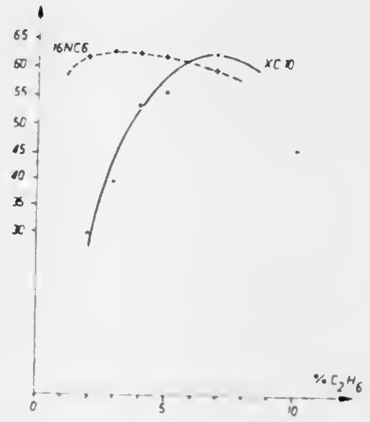
Mathurin L'Hermite, Versailles; Raymond Le Bossenec, Fontenay-le-Fleury; Pierre Godart, Plaisir, and Francois Pierrard, Versailles, all of France, assignors to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Dec. 19, 1974, Ser. No. 534,301

Claims priority, application France, Dec. 21, 1973, 73.45946; Oct. 21, 1974, 74.35315

Int. Cl.² C21D *1/48*

U.S. Cl. 148—16.5 **4 Claims**



1. A method of heat treatment of steel comprising the steps of mixing a nitrogen-containing carrier gas, ammonia and an active gas including a hydrocarbon selected from the group consisting of the compounds C_2H_4, C_2H_2, C_2H_6, C_3H_8 and CH_4, the mixture containing 0.1 to 30% by volume of ammonia, less than 30% by volume of hydrogen and between 0.2 to 30% by volume of hydrocarbon, continuously introducing the thus formed mixture into a furnace containing the steel to be heat-treated, to provide an atmosphere consisting substantially entirely of said mixture around the steel, heating the steel and the surrounding atmosphere to a temperature within the range of from 650° to 950° C, continuously withdrawing the atmosphere from said furnace, measuring the residual content of hydrocarbon in the atmosphere withdrawn from said furnace, comparing the thus measured residual hydrocarbon content with a predetermined hydrocarbon content level to thereby ascertain the hardness of the steel, and regulating the flow rate of hydrocarbon in the atmosphere introduced into the furnace as a function of said comparison to provide a residual hydrocarbon content corresponding to the desired hardness of the steel.

4,035,204
METHOD OF CARBURIZING THE INNER SURFACE OF A STEEL VALVE SEAT

Josef Hack, Leinfelden, and Bruno Schäfer, Ludwigsburg, both of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 9, 1975, Ser. No. 621,019

Claims priority, application Germany, Oct. 30, 1974, 2451536

Int. Cl.² C21D *1/26*

U.S. Cl. 148—19 **7 Claims**

1. A method of carburization hardening the steel surface of a valve seat situated in a bore of a steel valve body hardening of recesses which have a depth dimension which is including the steps of

providing a carbon yielding carburizing body (**5, 26, 29**) in form of an elongated pin-like element having a shape at least approximately matching the shape of the valve seat to be carburized having a cross section which is slighty less than the corresponding cross section of the valve seat and bore, and which has a carbon content in the region where said valve seat is to be carburized which is higher than the carbon content of the steel to be carburized in the valve seat region of said valve body, in order to yield carbon to said valve seat region steel;
locating said carburizing pin-like element (**5, 26, 29**) within valve seat and bore closely adjacent to the valve seat region steel;
and heating the valve body and the pin-like element (**5, 26, 29**) inserted within the valve seat and bore thereof to glowing or incandescence temperature.

4,035,205
AMPHOTERIC HETEROJUNCTION

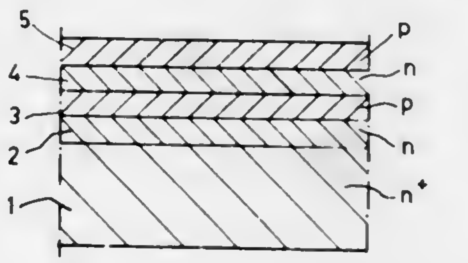
Jacques Lebailly, and Daniel Diguet, both of Caen, France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 11, 1975, Ser. No. 639,900

Claims priority, application France, Dec. 24, 1974, 74.42664

Int. Cl.² H01L *21/208*

U.S. Cl. 148—171 **8 Claims**



1. A method of manufacturing a semiconductor device comprising a p-n heterojunction, according to which method an epitaxial layer is deposited on a substrate by cooling a liquid solution, said solution comprising an amphoteric doping impurity, the composition of the said solution during cooling is modified at a temperature T_m which is lower than the transition temperature T_1, at which transition temperature during cooling a change of conductivity type of the deposit occurs and with the modification of the composition of the solution a change of the conductivity type of the deposit occurs, the composition of the solution after modification determining a new transition temperature T_2 which is lower than T_m.

4,035,206

METHOD OF MANUFACTURING A SEMICONDUCTOR DEVICE HAVING A PATTERN OF CONDUCTORS

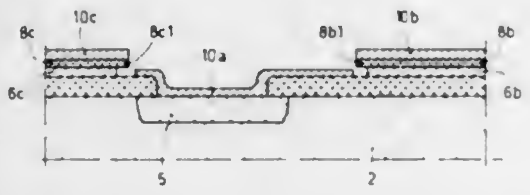
Jean Pierre Rioult, Epron, and Raymond Fabien, Douvres la Delivrande, both of France, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sept. 12, 1975, Ser. No. 612,857

Claims priority, application France, Sept. 18, 1974, 74.31521

Int. Cl.^{2} H01L *21/441*

U.S. Cl. 156—628 **7 Claims**



1. A method of manufacturing a semiconductor device with a conductor pattern comprising the steps of: (a) providing a semiconductor body having a first surface (b) providing at said first surface an auxiliary layer having at least one recess in form of the said pattern, said auxiliary layer comprising at least two sub-layers, of which sub-layers the lowermost extends between said semiconductor body and the uppermost sub-layer, said sub-layers consisting of materials differing from each other and from that of the said pattern, said auxiliary layer being of an anodically oxidizable material, and said step of providing said sub-layers including subjecting said anodically oxidizable material to an anodic oxidation treatment to form said uppermost sub-layer (c) providing a discontinuous conductive layer of the material of said pattern over said auxiliary layer and in said at least one recess, and (d) removing the part of said conductive layer present on said auxiliary layer by selective dissolution of at least a part of said auxiliary layer, with the part of the conductive layer present in said recess remaining as the pattern.

4,035,207

PROCESS FOR PRODUCING AN INTEGRATED CIRCUIT INCLUDING A J-FET AND ONE COMPLEMENTARY MIS-FET

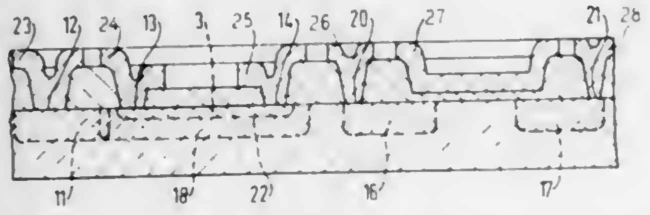
Guenther Meusburger, Munich, and Hartmut Runge, Kirchseeon, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Aug. 9, 1976, Ser. No. 712,754

Claims priority, application Germany, Aug. 22, 1975, 2537559

Int. Cl.^{2} H01L *21/225, 21/265*

U.S. Cl. 156—628 **4 Claims**



1. Process for the production of an integrated circuit with a MIS field effect transistor having a channel of a first conductivity and a complementary junction field effect transistor having a channel of a second conductivity which includes:
a. forming an insulating layer on one major surface of a semiconductor substrate of the first type conductivity;
b. forming a first window partially through said insulating layer above the region where the J-FET is to be formed;
c. implanting ions of the first conductivity type through said window into a thin region of said substrate below its surface;
d. increasing the thickness of the insulating layer at the base of said window;
e. forming second, third and fourth windows through said insulating layer;
f. forming a thin layer of doping material of the first conductivity type on said substrate at the base of each of said second, third and fourth windows;
g. heat treating the substrate at approximately **1000°** C in the presence of a reactive gas to spread by diffusion the zones of the first impurity type;
h. again covering the treated surface with an insulating layer;
i. partially reopening said first window;
j. implanting ions of the second conductivity type through said first window to form a region of the second conductivity type in the upper portion of the zone of the first conductivity type,
k. forming a fifth window partially through the insulating layer above where the channel of the MIS-FET is to be formed,
l. subjecting said first and fifth windows to an ion bombardment of the second impurity type in an amount to fix the turn-on voltage of the MIS-FET at a predetermined value;
m. forming windows through the insulating layer for the gate, source and drain electrodes of the J-FET and for the source and drain electrodes of said MIS-FET and partially through the insulation layer for gate electrode of the FET; and
n. forming electrodes in said windows.

4,035,208

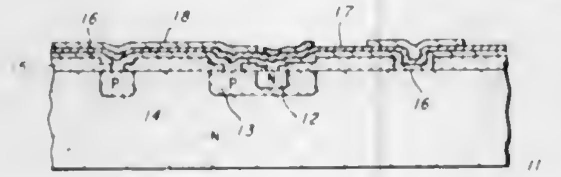
METHOD OF PATTERNING CR-PT-AU METALLIZATION FOR SILICON DEVICES

Clyde Rhea Fuller, and Barry William Battershall, both of Plano, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 502,472, Sept. 3, 1974, abandoned. This application Nov. 1, 1976, Ser. No. 737,812

Int. Cl.^{2} H01L *21/88*

U.S. Cl. 156—643 **8 Claims**



1. A method of forming a patterned platinum layer over a chromium layer which comprises the steps of:
a. forming a layer of platinum over said chromium layer,
b forming a layer of tantalum over said platinum,
c. patterning said tantalum by a plasma-vapor etch to form a mask over said platinum,
d patterning said platinum through said tantalum mask,
e. removing the remaining tantalum by a CF_4 plasmavapor etch, whereby the initial chromium layer is left intact due to the selectivity of the CF_4 plasma-vapor etch for tantalum, and
f. selectively plating gold onto the platinum.

4,035,209

METHOD OF PREVENTING DETERIORATION BY HEAT

Kenjiro Okawara; Sigeru Itakura; Teruo Matsui, and Toshio Nakajima, all of Yokohama, Japan, assignors to Tokai Metals Co., Ltd., Japan

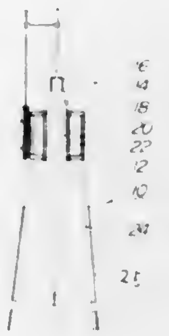
Continuation-in-part of Ser. No. 371,522, June 19, 1973, abandoned. This application July 10, 1975, Ser. No. 594,773

Claims priority, application Japan, June 20, 1972, 47-61568

Int. Cl.^{2} C23F *1/00;* **C25D** *5/44*

U.S. Cl. 156—3 **9 Claims**

1. In a method of preventing the deterioration of a heat deterioratable material from exposure to intense heat, wherein said material is protected by an aluminum foil, the improvement wherein said aluminum foil has both surfaces roughened to an extent whereby 10–40 wt.% of the original aluminum foil has been removed and wherein each roughened surface has bonded thereto a layer of fine aluminum particles less than 2 microns in thickness such that said material is protectable against heat conditions above the normal melting point of aluminum foil.



4,035,210

TREATING METHOD FOR GIVING DURABILITY TO AN OPTICAL FIBER BUNDLE

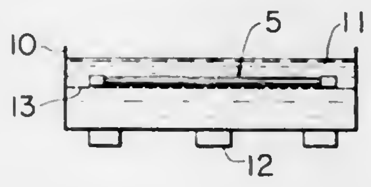
Kaoru Ohyoshi, Hachiouji, and Naoyuki Seo, Kokubunji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Mar. 28, 1975, Ser. No. 562,946

Claims priority, application Japan, Mar. 30, 1974, 49-36392

Int. Cl.^{2} C03C *15/00*

U.S. Cl. 156—645 **14 Claims**



1. A method for giving durability to an optical fiber bundle produced by bundling optical fibers respectively covered by acid-soluble glass comprising; shielding both end portions of said optical fiber bundle with shielding means made of an acid-resistant material, dissolving said acid-soluble glass at the middle portion by immersing said optical fiber bundle in acid solution while the shielded acid-soluble glass on said end portions remains intact, and immersing said optical fiber bundle in an organic solvent containing an antifriction agent, the sludge remaining between respective optical fibers thereby being removed and, at the same time, is replaced with said antifriction agent in the presence of ultrasonic oscillation applied to said organic solvent.

4,035,211

FORMING SEALED SEAMS IN MOISTURE BARRIERS FOR CABLE

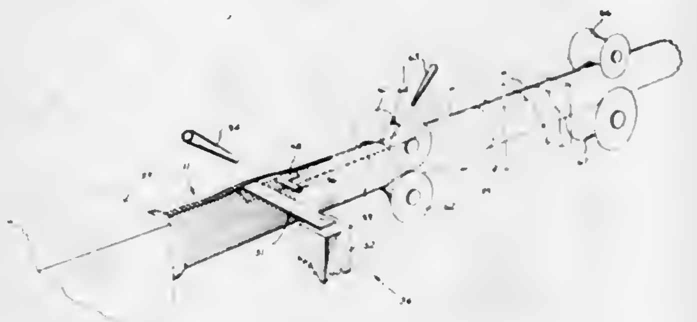
Robert George Bill, Baltimore, and Edward Louis Franke, Jr., Perry Hall, both of Md., assignors to Western Electric Company, Inc., New York, N.Y.

Continuation-in-part of Ser. No. 485,181, July 2, 1974, abandoned. This application Feb. 18, 1976, Ser. No. 659,078

Int. Cl.^{2} H01B *13/10*

U.S. Cl. 156—54 **8 Claims**

1. A method of manufacturing a cable, which includes the steps of:
advancing a cable core along a path;
applying a corrugated metallic strip around the core with at least one overlapped seam, the strip having inwardly and outwardly facing major surfaces, the inwardly facing surface facing the core, each of which major surfaces is at least partially precoated with an adhesive copolymer material, the adhesive copolymer material being positioned along each of the adjacent, mating portions of the major surfaces of the metallic strip which face each other and form the overlapped seam, the adhesive copolymer material being characterized by being capable of maintaining a definite form at ambient temperature and being capable of developing an adhesive bond with the metallic strip at a predetermined temperature above ambient temperature;
spacing apart the overlapping edge portions such that the outwardly facing surface of the innermost longitudinal edge portion of the strip in the overlapped seam is oriented substantially horizontally;
applying heat transfer convectively to the overlapped seam of the strip;
flowing molten adhesive copolymer material into engagement with the precoating on the outwardly facing surface



of the longitudinal edge portion of the innermost longitudinal portion of the strip which comprises the seam, the adhesive copolymer material flowed into engagement with the precoated adhesive copolymer material capable of developing an adhesive bond at a predetermined temperature above ambient with the precoated adhesive copolymer material on the adjacent inwardly facing surface of the outermost longitudinal edge portion of the strip which comprises the seam;
applying forces to the strip to reform the overlapped seam and to cause the molten adhesive material supported in engagement with the precoating on the innermost longitudinal edge portion to engage the precoating on the inwardly facing surface of the outermost longitudinal edge portion to seal the seam; and
cooling the overlapped seam to cooperate with the application of forces thereto to facilitate sealing the seam; while
providing support for the strip during the reforming of the seam to prevent damage to the core and to the strip.

4,035,212

PROCESS OF AND COMPOSITION FOR COVERING THE ENDS OF METAL ROLLS

David G. McRitchie, Salisbury, N.C., assignor to Carolina Rubber Hose Company, Salisbury, N.C.

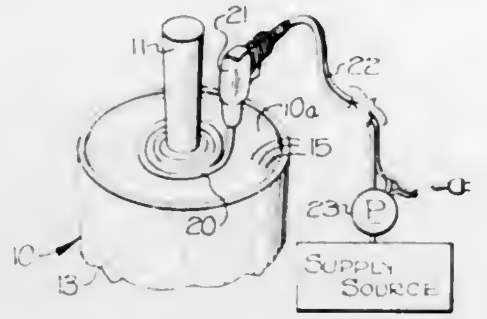
Continuation-in-part of Ser. No. 491,690, July 25, 1974, abandoned. This application July 25, 1975, Ser. No. 598,994

Int. Cl.^{2} B65H *81/06*

U.S. Cl. 156—187 **10 Claims**

1. A process of forming a hard, rubber-like covering on the circumferential and end surfaces of a cylindrical metal roll of the type utilized in the textile, paper or other industry, said method comprising the steps of:
applying a solid, cross-linkable elastomeric sheet material around the circumference of the cylindrical roll to form a covering therearound, said covering having a length greater than the length of the roll to provide an overhang at each end of the roll surrounding and enclosing the exposed end surfaces of the roll;

applying a semi-liquid elastomeric, polymeric coating composition to the end surfaces of the roll in the area surrounded and enclosed by the overhang at each end of the roll, said coating composition having a viscosity sufficient to prevent sagging from the ends of the roll prior to curing and being cross-linkable to form a hard, rubber-like material;



smoothing the semi-liquid coating on the ends of the roll to form an even, uninterrupted covering thereon;

and heating the roll to cure and cross-link the solid covering material around the circumference of the roll and the semi-liquid coating at the ends of the roll and to form a permanent seal and bond therebetween.

4,035,213

SOFT TEXTILE COATINGS RESEMBLING NAPA LEATHER

Wilhelm Thoms, Bergisch-Neukirchen; Josef Pedain, Cologne; Jürgen Grammel, Dormagen, all of Germany, and Antonio Aguado, Tarragona, Spain, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 3, 1975, Ser. No. 637,202

Claims priority, application Germany, Dec. 5, 1974, 2457387

Int. Cl.^{2} D06N *3/14;* **B32B** *27/40, 27/42, 27/12*

U.S. Cl. 156—231 **5 Claims**

1. Process for the production of textile coatings which have an exceptionally soft hand resembling that of napa leather by applying a polurethane paste which contains melamine formaldehyde resins and/or urea-formaldehyde resins as a bonding coat and another polyurethane paste as top coat to textile supports in the form of webs by the reversal process followed by evaporation of the solvent or dispersing agent and simultaneous acid catalysed cross-linking of the components of the bonding coat, characterised in that the bonding coats used are pastes with a solids content of from 30 to 70%, by weight, consisting of: 100 parts, by weight, of a polyurethane from

1. a prepolymer from
   a. dihydroxy polyesters or dihydroxy polyethers, and
   b. aliphatic and/or cycloaliphatic diisocyanates with a proportion of cycloaliphatic diisocyanates of at least 25 mol %;

the equivalent ratio of (b)/(a) being from 1.4 to 2.5; and

2. hydrazine as chain lengthening agent; and from 1 to 10 parts, by weight, of a melamine-formaldehyde resin and/or a urea-formaldehyde resin; and that self supporting sheets produced from the bonding coat pastes have microhardness (Shore A) 50 and moduli (at 100%) 15 kp/cm^2.

4,035,214

TOTAL IMAGE TRANSFER PROCESS

Laurence Verlan Shuppert, Neenah; William Duane Hanson, Appleton, and Robert Alfred Willer, Neenah, all of Wis., assignors to American Can Company, Greenwich, Conn.

Filed July 21, 1975, Ser. No. 597,534

Int. Cl.^{2} B44C *1/16;* **B32B** *1/10*

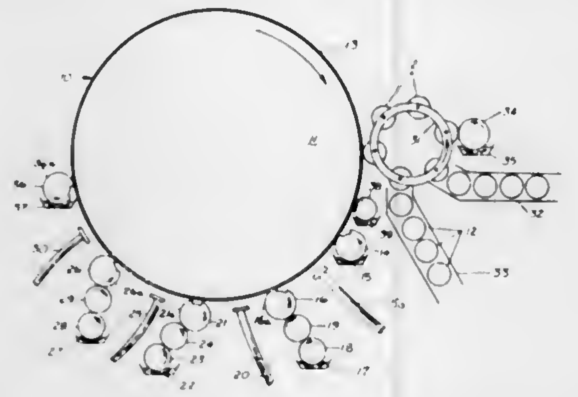
U.S. Cl. 156—240 **7 Claims**

1. A process for multicolor printing of an article by transferring multiple ink films simultaneously to a receiving surface on an article to be printed, comprising the steps of:

a. applying a substantially transparent film forming release fluid in a film onto a release surface of a continuously rotating release blanket, said release film being capable of wetting said release surface and of increasing its own cohesion after application thereof;

b. applying from an ink applying raised pattern surface of a flexographic applicator plate a first film forming flexographic ink fluid of a first color in a film defining a pattern onto said release film on said release surface, said ink fluid being capable of wetting said release film and being capable of being applied from said ink applying surface to said release film without picking said release film;

c. applying from an ink applying raised pattern surface of a flexographic applicator plate at least one additional film forming flexographic ink fluid in a film defining a pattern onto said release film and over all previously applied ink films including said first ink film, each said additional ink film being of a different color than all previously applied ink films, and each said additional ink film being capable of wetting said release film and being capable of being applied from said ink applying surface without picking said release film and said previously applied ink films;



d. applying an adhesive fluid in a film onto said release film and all previously applied ink films on said release surface, said adhesive fluid being capable of wetting said release film and said ink films and being capable of being applied without picking said release film and said ink films, said adhesive film providing adhesion by contact pressure and being capable of having greater adhesion to the receiving surface and to said ink films and said release film than the adhesion of said release film to said release surface;

e. contacting at least a portion of said adhesive film with the receiving surface to provide greater adhesion of said ink films and release film and receiving surface to said adhesive film than the adhesion of said release film to said release surface; and

f. drawing apart said release surface and the receiving surface whereby said portion of said adhesive film with said ink films and release film adhering thereto which is in contact with the receiving surface adheres intact to the receiving surface with resulting total transfer of the films on said release surface to the receiving surface.

4,035,215

PROCESS FOR MAKING SOUND INSULATION COMPONENTS

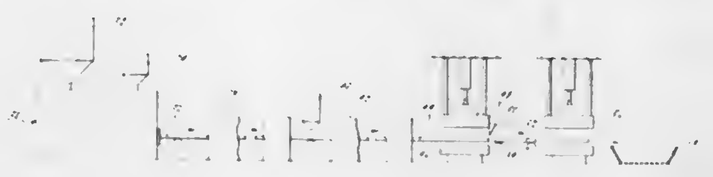
Edward G. Goldstone, Huntington Woods, Mich., assignor to Allen Industries, Inc., Troy, Mich.

Filed Apr. 5, 1976, Ser. No. 673,737

Int. Cl.^{2} B32B *31/20*

U.S. Cl. 156—245 **21 Claims**

1. A process for making a composite contoured and embossed sound insulating panel which comprises the steps of forming a fibrous pad of substantially uniform density and thickness and impregnated with a controlled amount of a heat curable thermosetting binder and a heat softenable thermoplastic binder distributed therethrough, heating the impregnated said pad to an elevated temperature for a period of time sufficient to effect at least a partial curing of said thermosetting binder and a heat softening of said thermoplastic binder to bond the fibers of said pad together into an integral mass, applying a dense liquid vinyl plastisol coating to at least one face surface of said pad, heating the coated said pad to an elevated temperature for a period of time sufficient to effect a fusion of said coating into an integral heat softened layer and a further curing of said thermosetting binder and a heat softening of said thermoplastic binder, positioning the heated said pad with said layer and said thermoplastic binder in a heat softened condition between contoured mold surfaces, cooling said contoured mold surfaces to a temperature below that at which a rigidification of said layer and said thermoplastic binder occurs, partially compressing said pad between said mold surfaces to impart a preselected contour thereto and localized embossments therein and to apply a desired surface finish to said layer and simultaneously cooling said pad to effect a rigidification of said thermoplastic binder and said layer to retain the composite pad in said preselected contour incorporating said localized embossments therein, and thereafter extracting the cooled rigidified shape-retaining said composite pad.



4,035,216

METHOD FOR BONDING EXPANDED POLYMERIC PARTS

Richard H. Immel, Osborne, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Continuation-in-part of Ser. No. 258,089, May 30, 1972, abandoned, and a continuation-in-part of Ser. No. 480,974, June 19, 1974, abandoned. This application Apr. 14, 1976, Ser. No. 676,828

Int. Cl.^{2} B32B *31/26;* **H05B** *9/04*

U.S. Cl. 156—273 **3 Claims**

1. A method for bonding molded parts of expanded polystyrene or copolymers thereof having a closed cellular structure without the use of adhesive comprising:

a. wetting at least one of the surfaces to be bonded with water containing up to about 2% of a wetting agent;

b. placing the surfaces to be bonded in abutting relationship free from relative movement;

c. passing high frequency electrical energy through said abutted surfaces for a time sufficient to vaporize said water and to effect a bond having substantial continuity along the joint between the abutting surfaces; and

d. allowing the abutted surfaces to cool for sufficient time to complete the weld.

4,035,217

METHOD OF MANUFACTURING ABSORBENT FACING MATERIALS

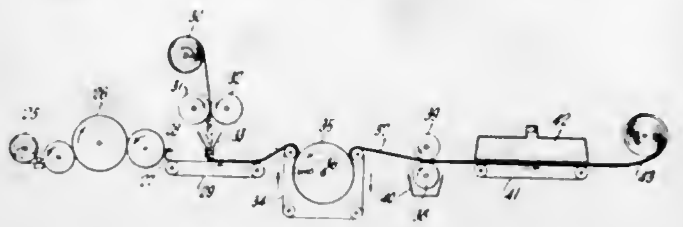
John Wilson Kennette, Somerville, and Irving Stanley Ness, Princeton, both of N.J., assignors to Johnson & Johnson, New Brunswick, N.J.

Continuation-in-part of Ser. No. 431,271, Jan. 7, 1974, abandoned, which is a division of Ser. No. 363,459, May 24, 1973, Pat. No. 3,828,783. This application June 5, 1975, Ser. No. 583,932

Int. Cl.^{2} B32B *21/10;* **A61F** *13/16;* **B32B** *5/16*

U.S. Cl. 156—279 **1 Claim**

1. The method of producing an absorbent nonwoven facing material weighing at least one ounce per square yard comprising: (a) forming a web of cellulosic, staple length textile fibers, said fibers having a length of at least ½ inch and said textile fibers comprising 10 to 30% by weight of the facing material; (b) uniformly depositing ground wood pulp on one side of the textile fiber web to form an entirely absorbent fiber-pulp laminate, said wood pulp comprising 60 to 80% by weight of the facing material; (c) confining both surfaces of the fiber-pulp laminate; (d) wetting the entire laminate with water while it is confined to saturate the laminate and produce integrity therein; (e) depositing a resin binder in an intermittent pattern to the surface of the laminate containing the staple length textile fibers, said binder comprising 5 to 25% by weight of the facing materials; and (f) drying the laminate with the binder thereon to remove the water and produce a highly absorbent stabilized facing material which is free of hydrogen bonding.



4,035,218

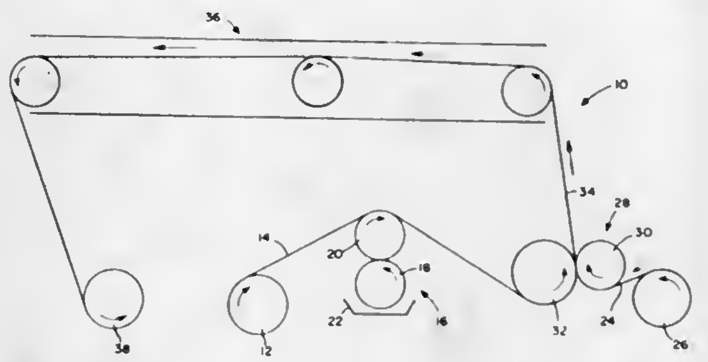
LAMINATING METHOD FOR PRODUCING PRESSURE-SENSITIVE ADHESIVE COATED SUBSTRATES HAVING A RELEASE LAYER AFFIXED THERETO

Roger E. Yount, Troy, Ohio, assignor to The Brown-Bridge Mills, Inc., Troy, Ohio

Filed Mar. 15, 1976, Ser. No. 667,188

Int. Cl.^{2} C09J *7/04*

U.S. Cl. 156—289 **9 Claims**



1. A method for producing releasable laminates having a paper substrate coated with a tacky pressure-sensitive adhesive and a release layer releasably affixed to the pressure-sensitive adhesive comprising:

a. providing a web of paper face stock,

b. providing a web of moisture sensitive or absorptive release paper having a release material coated thereon,

c. coating either said web of paper face stock or the previously coated side of said web of release paper with a water-dispersed pressure-sensitive adhesive,

d. before drying, joining the webs together with the still-wet adhesive therebetween,

e. passing the joined webs through a pressure nip to form a laminate, then

f. drying said laminate to a relative humidity of around 30–60% (Cambridge Moisture Indicator test) so as to allow for a moisture equilibration between said webs,

g. winding said laminate on a roll, and

h. conditioning said laminate for a period of time prior to further processing to allow for additional moisture equilibration between said webs, whereby there is produced a laminate having a pressure-sensitive adhesive coated substrate and a release layer thereover, said adhesive being smooth and uniform and said laminate being relatively wrinkle-free and flat.

4,035,219
BONDING OF STRUCTURES

David Charles Cumbers, Pontypool, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 569,633, April 18, 1975, abandoned. This application June 18, 1976, Ser. No. 697,587

Int. Cl.^{2} B32B *31/20*

U.S. Cl. 156—290 2 Claims

1. A method of bonding a non-woven structure comprising at least one thermoplastic material in a predetermined pattern of spaced bond-points which comprises forming a pressure nip formed by a plurality of members at least one of which is a bonding roll provided with projections on its surface, said bonding roll in co-operation with a backing roll, heating said bonding roll to a temperature below the softening point of said thermoplastic material, passing said non-woven structure through the pressure nip, compressing said web between said bonding roll and said backing roll, raising the temperature of said projections and said web to a temperature above the temperature of the remainder of said bonding roll by work done by said projections to compress said web, said bonding roll providing (i) from 50 to 1000 bond points per square inch of said web, (ii) said bond points having bases with a cross sectional area of from 1 × 10^{-5} square inch to 1 × 10^{-3} square inch, (iii) the bases of said bond points lying at a debth of from 50% to 98% of the thickness of said web, (iv) said bond points having an interface angle of from 1° to 60°, (v) said bond points occupying from about 1% to 20% of the total area of said web, simultaneously avoiding contacting said web with the surface of said bonding roll between said projections and substantially avoiding bonding between said bond points, and withdrawing said web as a bonded non-woven structure.

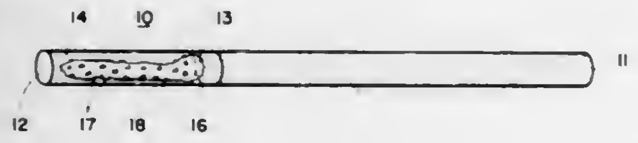
4,035,220
METHOD FOR MAKING POROUS FILTER TIP

James R. Hammersmith, Jeffersonville, Ind., assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Division of Ser. No. 404,479, Oct. 9, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,846

Int. Cl.^{2} B32B *7/14*

U.S. Cl. 156—291 6 Claims



1. A process of making a porous filter tip having a multiplicity of randomly positioned, nonporous, discrete areas between an inherently porous plug wrap and an inherently porous tipping wrap comprising

a. wrapping the inherently porous plug wrap about a rod of filter material;
b. placing on at least a first part of an applicator a first continuous film of adhesive capable of laking, said adhesive having a thickness of between about 5 to 50 microns, a viscosity of between about 5 to 14 × 10^3 centipoise, and a solids content of between about 40 to 60% by weight;
c. transferring the adhesive to the inherently porous tipping wrap whereupon laking occurs to form a multiplicity of discrete adhesive areas on the tipping paper; and
d. adhering the inherently porous tipping wrap to the inherently porous plug wrap, thereby forming a multiplicity of nonporous discrete areas between the plug wrap and tipping wrap.

4,035,221
METHOD FOR FORMING AND PRESSING FOIL AND BOARD LAMINATES

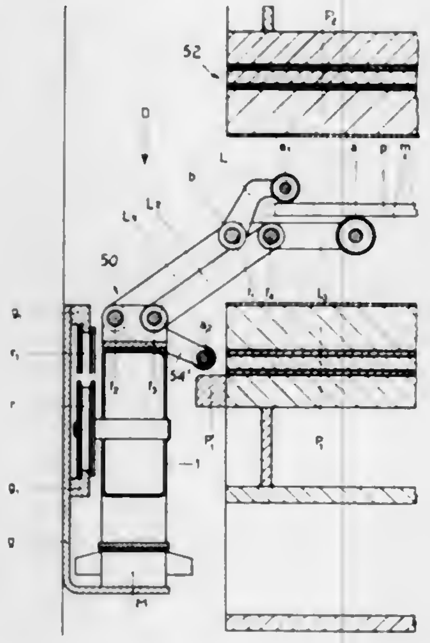
Franco Pagnoni, Monza (Milan), Italy, assignor to Fratelli Pagnoni S.p.A., Italy

Division of Ser. No. 618,115, Sept. 30, 1975, Pat. No. 4,001,074. This application Sept. 13, 1976, Ser. No. 723,185

Claims priority, application Italy, Feb. 7, 1975, 20054/75

Int. Cl.^{2} B32B *31/00;* B30B *13/00*

U.S. Cl. 156—299 2 Claims



1. A method of forming and pressing a foil, paper sheet and the like to a board made up of wood shavings, fibers and similar materials, in a double plate press having at least one first plate movable in a closing direction toward the other second plate, and using a pivotal lever having a support surface and a second pivotal lever forming a top clamping surface, comprising placing at least one foil in alignment with at least one surface of the board, moving the support surface below the board to engage and pick up the board, pivoting the second lever in a first direction to engage the clamping surface onto the board, shifting the levers with the supported and clamped board into the press between the first and second plates, rotating the second lever in an opposite second direction to unclamp the board, and moving the second plate towards the first plate of the press as the support surface is withdrawn laterally from beneath the board and from the press and applying a full pressure by effecting closing movement between said fist and second plates.

4,035,222
APPARATUS FOR PRODUCING SHRUNKEN PILFER-PROOF NECK LABELS FOR CONTAINERS

Stephen W. Amberg, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 526,124, Nov. 22, 1974. This application May 19, 1976, Ser. No. 687,957

Int. Cl.^{2} B29C *27/02*

U.S. Cl. 156—423 1 Claim

1. Apparatus for applying sleeves to containers comprising:

means for moving an elongated web of flexible sheet-like material in a longitudinal direction,

means engaging said moving web for carrying it in a feed path defined by an endless surface, said means including a vacuum means connected to said endless surface for holding the web thereon,

rotary knife means cooperating with the endless web-carrying surface for cutting the web thereon across its width and severing a sleeve blank from the web,

a turret rotatably supported on a vertical shaft,

a plural mandrel means in circular array on said turret, each mandrel means having an annular mandrel surface rotatable about an axis parallel with said shaft and movable in an orbit that is tangent with the feed path of said carrying means thereat engageable with the leading portion of a sleeve blank, said mandrel means including a vacuum means for holding said engaged leading portion on its annular surface, the peripheral dimension of said annular surface being less than the length of the sleeve blank,

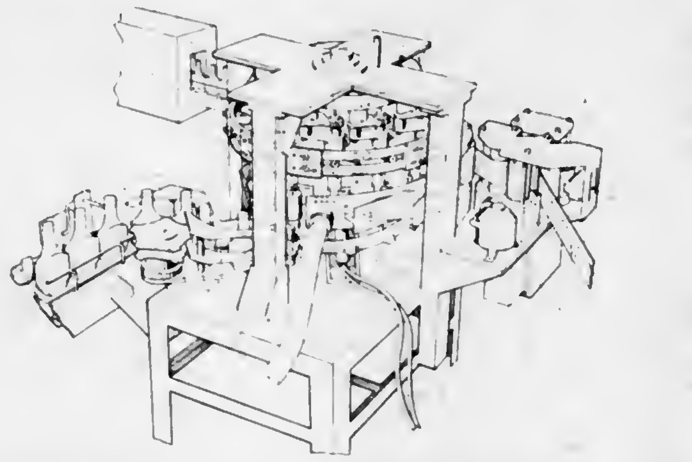
means connected to said rotatable mandrels operable for winding said sleeve blank thereon,

heater means individual to each mandrel means comprising an elongated air nozzel connected to a source of heated air and operable in response to wrapping the sleeve blank on the mandrel surface for blowing hot air onto the overlapping surfaces of the leading and trailing end portions of the sleeve blank on the mandrel, said heated end portions heat sealing one to the other on the mandrel in seam fashion, thereby forming a hollow sleeve,

pocketed wheel means connected on the turret in coaxial relation to the mandrels and rotatable about said shaft, said wheel means including plural container receiving pockets corresponding to the mandrels and in vertical registry therewith,

guide means for engaging the containers and inserting them in said pockets of the wheel means with the axis of the containers disposed vertically and with the axial end thereof adjacent the mandrel in substantial axial registry therewith, said guide means retaining the containers in said pockets for partial orbital movement with the mandrels, and

stripper means individual to each mandrel and operable for axially vertically downwardly stripping the hollow sleeve from the mandrel and telescopically encircling the said container.



4,035,223
LAMINATING TRAVELING PRESS AND METHOD

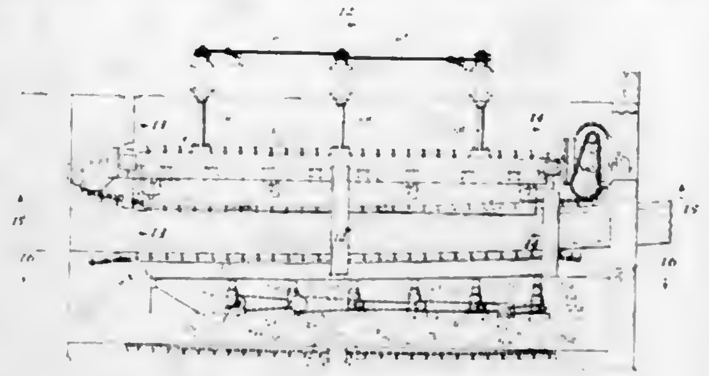
George F. Russell, 8513 - 42nd W., Tacoma, Wash. 98466

Continuation-in-part of Ser. No. 357,960, May 7, 1973, Pat. No. 3,943,025. This application Nov. 29, 1974, Ser. No. 528,217

Int. Cl.^{2} B23K *27/00*

U.S. Cl. 156—443 5 Claims

1. A laminating traveling press for laminating a pack of boards comprising upper and lower endless tread belts having an entering end and a discharge end and engageable with the upper and lower sides, respectively, of a pack of substantially horizontal boards for moving such pack of boards generally horizontally lengthwise from the entering end to the discharge end; lower belt supporting means for supporting said lower endless tread belt with its entering end lower than its discharge end and shaping it curved lengthwise concavely upward with all portions thereof at least substantially as high as its entering end for holding the pack of boards correspondingly curved lengthwise while said belts effect movement thereof through the press to produce a cambered laminated structure formed in an arc of predetermined radius; adjusting means for adjusting said lower belt supporting means to alter the degree of curvature of said lower endless tread belt effected by said lower belt supporting means; and upper belt backing means pressing said upper endless tread belt resiliently downward against the upper surface of the pack of boards into longitudinally downwardly convex shape curved complementally to the upwardly concave curvature of said lower endless tread belt, said upper belt backing means being deformable to enable said upper endless tread belt to automatically and dependently conform to the curvature of said lower endless tread belt.



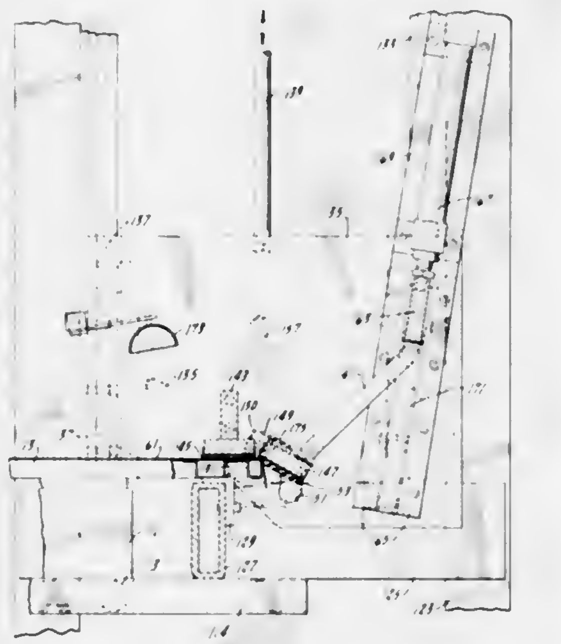
4,035,224
METHOD AND APPARATUS FOR FORMING A TOP ASSEMBLY

Clarence A. F. Anderson, Fruitport, Mich., assignor to The Shaw-Walker Company, Muskegon, Mich.

Filed Apr. 8, 1976, Ser. No. 674,985

Int. Cl.^{2} B29C *17/00*

U.S. Cl. 156—475 4 Claims



1. An apparatus for adhering a seamless laminated plastic sheet to the end and side walls and undersurface edges of a core of a top assembly for a desk, table, credenza or similar item, said apparatus including:

means for supporting a top assembly core in a predetermined location with said core having a laminated plastic sheet adhered to the top surface thereof with portions of said sheet projecting beyond the periphery of said core,

a clamping member adapted to move vertically into clamping relationship with said laminated plastic sheet to clamp said top assembly core and said laminated plastic sheet against said supporting means,

a pair of arcuate guides located adjacent opposite ends of said clamping member and movable vertically with said clamping member, a bending bar for the elongated plastic sheet mounted at its opposite ends in said guides for movement along said guides with said bar being pivotal about an axis located adjacent an elongated side thereof,

said bending bar including a flat, planar surface facing said top assembly core and positioned to press said elongated plastic sheet into contact with the top edges of said side and end walls when said bending bar is located at the upper ends of said arcuate guides and said clamping member is in its lowered clamping position, and

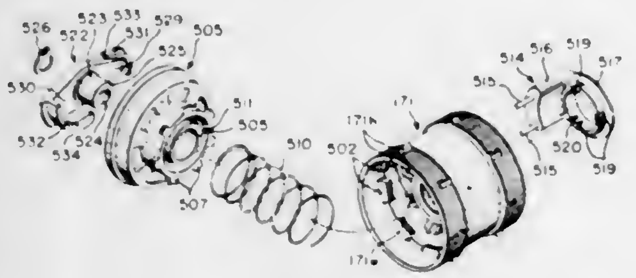
means connected to said bending bar to pivot said bending bar about said pivotal axis and to move said bending bar along said guides with said flat planar face of bending bar maintaining engagement with said elongated plastic sheet to force said plastic sheet into contact with the side and end walls and undersurfaces of said top core in a motion which is continuous from the top edges of said top and side walls through the undersurface edges of the core assembly.

4,035,225

APPARATUS FOR APPLYING PRESSURE SENSITIVE LABELS

Paul H. Hamisch, Jr., Franklin, and Donald L. Karn, Springboro, both of Ohio, assignors to Monarch Marking Systems, Inc., Dayton, Ohio

Continuation of Ser. No. 534,492, Dec. 19, 1974, abandoned.
This application Jan. 19, 1976, Ser. No. 649,945
Int. Cl.^{2} B32B *31/00*
U.[illegible] Cl. 156—540 **21 Claims**



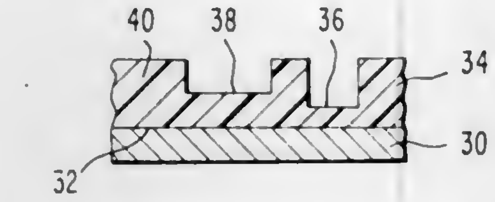
1. Label applying apparatus, comprising: means for delaminating pressure-sensitive labels from a web of supporting material, a feed wheel having teeth at its periphery engageable with the web for drawing the web about the delaminating means, means for driving the feed wheel comprising a drive wheel coaxial with the feed wheel and shiftable axially relative to the feed wheel, a plurality of first spaced-apart toothed segments secured against rotation relative to the feed wheel, a plurality of second spaced-apart toothed segments secured against rotation relative to the drive wheel, the first and second toothed segments being capable of being clutched in one axial position of the drive wheel relative to the feed wheel and being capable of being unclutched in another axial position of the drive wheel relative to the feed wheel, and means for mounting the drive and feed wheels for both axial shifting movement and rotational movement relative to each other, the size and spacing of the first and second toothed segments being such as to allow assembly of the ratchet and feed wheels when their first and second toothed segments are misaligned, but the first and second toothed segments can be clutched when rotated into alignment on the mounting means.

4,035,226

METHOD OF PREPARING PORTIONS OF A SEMICONDUCTOR WAFER SURFACE FOR FURTHER PROCESSING

Arnold Stanley Farber, and Jack Hillibrand, both of Cherry Hill, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Apr. 14, 1975, Ser. No. 567,818
Int. Cl.^{2} B29C *17/08*
U.S. Cl. 156—653 **19 Claims**



1. A method of preparing a portion of a semiconductor wafer surface comprising:

providing a layer of moldable material on said surface;

pressing a master into said layer of moldable material, said master having said portion defined in surface relief, at least a thin region of said layer remaining between said master and said semiconductor wafer surface;

separating said master from said layer of moldable material, thereby leaving an imprint of said master in said layer of moldable material, said imprint comprising a relatively thin region and a relatively thick region in said layer; and

uniformly etching said layer for a time sufficient to remove said relatively thin region but insufficient to remove said relatively thick region.

12. A method of preparing a portion of a semiconductor wafer surface comprising:

providing a layer of moldable material on said surface;

pressing a master into said layer of moldable material, said master having said portion defined in surface relief, at least a thin region of said layer remaining between said master and said semiconductor wafer surface;

separating said master from said layer of moldable material, thereby leaving an imprint of said master in said layer of moldable material, said imprint comprising a relatively thin region and a relatively thick region in said layer; and

uniformly subjecting said layer to a source of conductivity modifiers, whereby more of said conductivity modifiers penetrate said semiconductor wafer surface beneath said relatively thin region than beneath said relatively thick region.

4,035,227

METHOD FOR TREATING PLASTIC SUBSTRATES PRIOR TO PLATING

Warren R. Doty, Royal Oak, and Timothy J. Kinney, Berkley, both of Mich., assignors to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 399,674, Sept. 21, 1973, abandoned. This application May 2, 1975, Ser. No. 574,191
Int. Cl.^{2} H01B *3/18*
U.S. Cl. 156—668 **2 Claims**

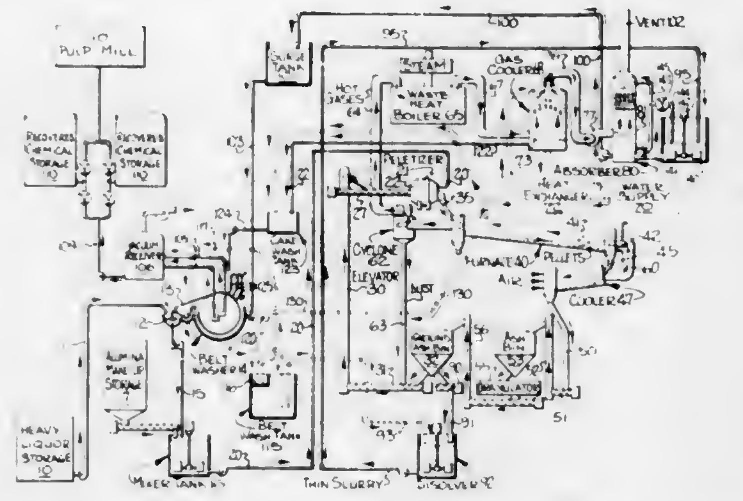
1. A method of treating polymeric plastic substrate prior to plating on a surface thereof, which comprises etching the substrate in an aqueous acid bath, activating the substrate surface by contact with an acidic tin-palladium complex activator, rinsing the activated surface with an aqueous medium and thereby forming on said surface tin palladium hydroxides, and accelerating said activated and rinsed surface with a solution comprising about 10 to 30 grams per liter of HCl, approximately ½ to 40 grams per liter of $NiCl_2 .6H_2O$ and about ¼ to 2 grams per liter of $NaHF_2$.

4,035,228

RECOVERY PROCESS AND APPARATUS FOR ALKALI METAL-CONTAINING WASTE LIQUOR

Donald R. Sheeley, and James H. Rion, both of Hartsville, S.C., assignors to Sonoco Products Company, Hartsville, S.C.

Filed Mar. 3, 1976, Ser. No. 663,612
Int. Cl.^{2} D21C *11/02, 11/12*
U.S. Cl. 162—30 R **12 Claims**



1. A continuous process for recovering the alkali metal content of alkali-metal containing waste liquor, said process being particularly suited for the recovery of sodium or potassium from the spent liquor from pulping operations, and comprising the steps of:

a. mixing concentrated alkali metal-containing waste liquor with alumina in an amount necessary to react with the alkali metal content of the liquor for the ultimate formation of an alkali metal aluminate as the reaction product, and with alkali metal aluminate furnace ash;

b. forming the mixture of waste liquor, alumina, and alkali metal aluminate furnace ash into solid pellets;

c. subjecting the solid pellets to a temperature below the fusion temperature of the alkali metal aluminate while combusting the organic content of the pellets and while reacting the alkali metal content thereof with the alumina to form alkali metal aluminate ash;

d. pulverizing the alkali metal aluminate furnace ash and recycling a portion thereof for reuse in step (a);

e. dissolving another portion of the alkali metal aluminate furnace ash in water to form a solution of alkali metal aluminate;

f. mixing the alkali metal aluminate solution with slurry to initiate limited precipitation of alumina from the solution of alkali metal aluminate, the slurry having been produced by reacting a solution of alkali metal aluminate with an acidic oxide gas,

g. reacting the thus formed mixture of slurry and alkali metal aluminate solution with an acidic oxide gas to effect additional precipitation of alumina in the form of easily filterable particles and produce a slurry of the alumina in a solution containing the alkali metal,

h. recycling a portion of the thus formed slurry for use in step (f); and

i. separating from the thus formed slurry the insoluble alumina for reuse in step (a) and the solution of alkali metal for recovery of the alkali metal content thereof.

9. An apparatus for recovering the alkali metal content of alkali metal-containing waste liquor, said apparatus being particularly suited for the recovery of sodium or potassium from the spent liquor from pulping operations, and said apparatus comprising:

means for mixing concentrated alkali metal-base spent liquor with alumina in an amount necessary to react with the alkali metal content of the liquor for the ultimate formation of an alkali metal aluminate as the reaction product;

means for forming solid pellets from the concentrated liquor and alumina mixture by mixing the same with alkali metal aluminate furnace ash;

furnace means for receiving the solid pellets and combusting and reacting the same, said furnace means operating at a temperature below the fusion temperature of the alkali metal aluminate and at a sufficiently high temperature to combust the organic portion of the pellets and react the alkali metal content thereof with alumina to form alkali metal aluminate ash;

pulverizing means for receiving the ash from said furnace means and for pulverizing the same for subsequent reuse in the treating process;

means for recycling a portion of the pulverized ash to the pellet forming means for use in the formation of solid pellets thereof;

means for receiving another portion of the pulverized furnace ash and dissolving the same in water to form a solution of alkali metal aluminate;

a mixing vessel for receiving the alkali metal aluminate solution and mixing the same with slurry to initiate limited precipitation of alumina from the alkali metal aluminate, the slurry having been produced by reacting a solution of alkali metal aluminate with an acidic oxide gas to effect precipitation of alumina;

reactor means for receiving the mixture from said mixing vessel and reacting the same with an acidic oxide gas to effect additional precipitation of alumina and produce a slurry of the alumina in the form of easily filterable particles in a solution containing the alkali metal;

means for recycling a portion of the slurry from the reactor means to said mixing vessel for being mixed with the alkali metal aluminate solution; and

means for separating from the slurry the alumina for reuse in the mixing means and the solution of alkali metal for recovery of the alkali metal content thereof.

4,035,229

PAPER STRENGTHENED WITH GLYOXAL MODIFIED POLY(β-ALANINE) RESINS

Terence W. Rave, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Division of Ser. No. 521.002, Nov. 4, 1974, abandoned. This application Jan. 28, 1976, Ser. No. 653,188
Int. Cl.^{2} D21H *3/52, 3/58*
U.S. Cl. 162—164 EP **6 Claims**

1. The process of treating paper which comprises treating the cellulose fibers of said paper with from 0.05 to 2% by weight, based on the weight of the cellulose fibers of a water-soluble dry strength and temporary wet strength resin in aqueous solution, said resin comprising the reaction product of a branched, water-soluble poly (β-alanine) having a molecular weight in the range of about 500 to about 10,000 with from about 10 to about 100 mole %, based on the amide repeating units of the poly(β-alanine) of glyoxal, said poly(β-alanine) having been prepared by the anionic polymerization of acrylamide in a suitable organic reaction medium inert to the reaction conditions in the presence of a basic catalyst.

4,035,230

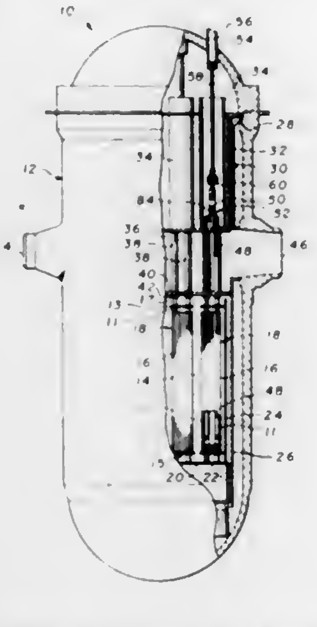
SHOCK BUFFER FOR NUCLEAR CONTROL ASSEMBLY

Frank Bevilacqua, Windsor, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.

Continuation of Ser. No. 334,185, Feb. 20, 1973, abandoned. This application Feb. 3, 1975, Ser. No. 546,410
Int. Cl.^{2} G21C *7/20*
U.S. Cl. 175—36 R **8 Claims**

1. In a liquid cooled nuclear reactor having a reactor vessel, a core region within and supported by said vessel for containing fuel therein and including first vertical passages extending downwardly thereinto; a guide structure within and supported by said vessel above said core region, said guide structure including upper and lower spaced tube sheets and a plurality

of vertically substantially continuous hollow tubes extending therebetween and affixed thereto, each tube in registry with one of said first passages to provide second vertical passages; a vertically reciprocable control element assembly comprising a yoke and a plurality of laterally spaced control elements depending from said yoke, said yoke disposed for vertical reciprocation above said upper tube sheet and each of said control element disposed for vertical reciprocation within one of said first passages and one of said second passages; and a shock buffer comprising a piston and cylinder oppositely affixed to said yoke and said upper tube sheet in vertical opposition to one another and the coolant liquid normally having free access to said cylinder and said piston acting to displace coolant liquid from said cylinder upon relative insertion thereinto.



4,035,231
EMERGENCY COOLING DEVICE FOR A NUCLEAR REACTOR

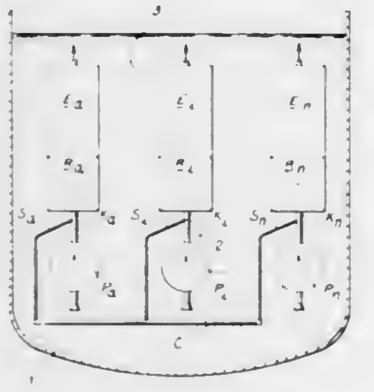
Edmond Ventre, Le Vesinet, France, assignor to Electricite de France (Service National), Paris, France

Filed Mar. 6, 1975, Ser. No. 556,183

Claims priority, application France, Mar. 12, 1974, 74.08375

Int. Cl.^{2} G21C *9/00*

U.S. Cl. 176—38 **3 Claims**



1. An emergency cooling device for a nuclear reactor in which the core is constituted by N independent modules, a heat-transporting fluid being circulated through each module M_i under the action of an associated independent pump P_i, wherein said device comprises a manifold C and N pipes S_i (i=1, 2 . . . N), each of the pipes S_i being directly connected between the manifold C and a pipe K_i which directly connects the pump P_i to the module M_i wherein the axis of the orifice of each of the pipes S_i which open into the pipes k_i is substantially parallel to the direction of flow of the fluid within the pipe K_i under the influence of the pump P_i and directed towards the downstream end of said flow.

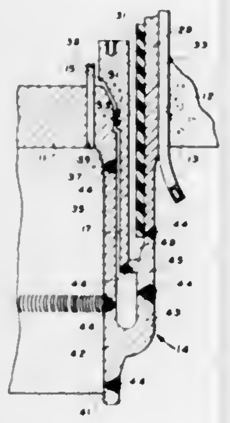
4,035,232
CLOSURE SYSTEM

Leonard J. Kube, San Diego, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed Aug. 9, 1974, Ser. No. 496,104

Int. Cl.^{2} G21C *9/00*

U.S. Cl. 176—38 **5 Claims**



1. In a gas-cooled nuclear reactor system having a pressure vessel with a metal-lined penetration therein for accommodating a heat exchanger, a closure system comprising, a tube sheet mounted transversely of the penetration aligned on the axis thereof for passing heat exchange fluid to the heat exchanger, a thermal sleeve extending from said tube sheet coaxial with the penetration, means for mounting said thermal sleeve to the pressure vessel, a failure protection cylinder and means for mounting same coaxial with said thermal sleeve between said thermal sleeve and the lining of the penetration, a restrainer ring defining an opening of lesser size than the periphery of said tube sheet, said restrainer ring being mounted to said failure protection cylinder in the penetration aligned on the axis thereof between said tube sheet and the interior of the presssure vessel to restrain movement of said tube sheet toward the interior of the pressure vessel.

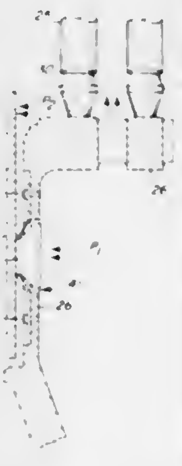
4,035,233
CHANNEL FOLLOWER LEAKAGE RESTRICTOR

Harold Eugene Williamson, and Bart Alan Smith, both of San Jose, Calif., assignors to General Electric Company, San Jose, Calif.

Filed June 18, 1975, Ser. No. 587,842

Int. Cl.^{2} G21C *3/30*

U.S. Cl. 176—78 **12 Claims**



1. In a fuel assembly comprising a plurality of fuel rods positioned in a spaced array by engagement with upper and lower tie plates, said lower tie plate having means to receive therethrough a flow of pressurized coolant, an open-ended tubular flow channel surrounding said array and said tie plates for conducting said coolant upwardly past said fuel rods, and a leakage control means positioned between said lower tie plate and said flow channel to limit the leakage of said coolant between said lower tie plate and said flow channel, the improvement wherein said leakage control means comprisies an opening in said lower tie plate and movable leakage control members positioned in the path of coolant flow through said opening from inside said lower tie plate and between said opening and said flow channel whereby the coolant pressure within said lower tie plate biases said control members toward said flow channel to limit the leakage of coolant between said lower tie plate and said flow channel.

4,035,234
PROCESS FOR THE PREPARATION OF THE KALLIKREIN-TRYPSIN INHIBITOR

Hermann Schutt, Wuppertal, Germany, assignor to Bayer Aktiengesellschaft, Germany

Filed Feb. 25, 1976, Ser. No. 661,160

Claims priority, application Germany, Mar. 5, 1975, 2509482

Int. Cl.^{2} C07G *7/026*

U.S. Cl. 195—5 **12 Claims**

1. A process for the preparation of kallikrein-trypsin inhibitor, comprising subjecting an animal organ containing the inhibitor to proteolysis by a proteoytic enzyme at a temperature of at least about 40° C, adsorbing the resulting extract on carrier-bound trypsin and dissociating the resulting trypsin-inhibitor complex into trypsin and kallikrein-tryspin inhibitor.

4,035,235
METHOD OF MAKING LIPOPHILIC STARCH DERIVATIVES

Charles N. Richards, St. Louis County, and Clifford D. Bauer, St. Louis, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

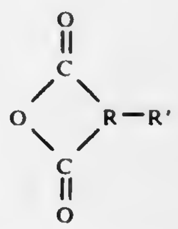
Filed Mar. 12, 1973, Ser. No. 340,165

Int. Cl.^{2} C12D *13/02;* **C08B** *31/04*

U.S. Cl. 195—31 R **4 Claims**

1. A method for producing a lipophilic derivative of starch to be used in encapsulating water-insoluble substances which comprises

a. reacting in an alkaline aqueous medium granular waxy starch and a substituted cyclic dicarboxylic anhydride having the following formula:



wherein R is a radical from the class of dimethylene and trimethylene radicals and R' is the substituent group from the class consisting of an alkyl, alkenyl, aralkyl and aralkenyl to produce a granular starch reaction product which is the acid ester of the substituted dicarboxylic acid having a degree of substitution of about 2–3%,

b. recovering the granular starch reaction product,

c. washing the granular starch reaction product of step b,

d. treating the washed granular starch reaction product with an alpha-amylase enzyme treatment which gelatinizes and depolymerizes the granular starch reaction product to produce a dispersion of the lipophilic derivative of starch in water which derivative has said degree of substitution and has a viscosity of about 125 to about 500 as measured by a Brookfield method at spindle 2 speed 20 RPM at 30% concentration and 25° C temperature.

4,035,236
PROCESS FOR PREPARING 9α-HYDROXYANDROSTENEDIONE

Merle G. Wovcha, Kalamazoo, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Filed Oct. 24, 1975, Ser. No. 625,653

Int. Cl.^{2} C07B *29/02*

U.S. Cl. 195—51 G **11 Claims**

1. A process for preparing 9α-hydroxyandrostenedione whih comprises culvating *Mycobacterium fortuitum* NRRL B-8119 in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive, in the 17-alkyl side chain.

8. A process for preparing 9α-hydroxyandrostenedione which comprises cultivating a mutant microorganism selected from the group consisting of Arthrobacter, Bacillus, Brevibacterium, Corynebacterium, Microbacterium, Protaminobacter, Serratia, and Streptomyces, said mutant being characterized by its ability to selectively degrade steroids having 17-alkyl side chains of from 2 to 10 carbon atoms, inclusive, and accumulate 9α-hydroxyandrostenedione in the fermentation beer, in an aqueous nutrient medium under aerobic conditions in the presence of a steroid containing from 2 to 10 carbon atoms, inclusive, in the 17-alkyl side chain.

4,035,237
METHOD FOR THE PREPARATION OF CHOLESTEROL OXIDASE

Prakash S. Masurekar, Webster, and Charles T. Goodhue, Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 7, 1975, Ser. No. 629,955

Int. Cl.^{2} C12D *13/10*

U.S. Cl. 195—66 R **14 Claims**

1. A method for the production of cholesterol oxidase comprising the steps of:

growing a microorganism that normally produces predominently intracellular cholesterol oxidase in a medium comprising an inducer of cholesterol oxidase and a nonionic surfactant in a concentration which is not toxic to said microorganism and which does not produce decomposition products in sufficient concentrations as to be toxic to said microorganism, said surfactant being present in a concentration of at least about 0.5 g/liter of medium, thereby producing extracellular cholesterol oxidase; and separating the cholesterol oxidase from the medium.

4,035,238
STAPHYLOCOCCUS AUREUS BROTH

Michael C. Meyer, O'Fallon, Ill., and Clifton Aldridge, Maryland Heights, Mo., assignors to McDonnell Douglas Corporation, St. Louis, Mo.

Filed May 3, 1976, Ser. No. 682,656

Int. Cl.^{2} C12K *1/10*

U.S. Cl. 195—100 **13 Claims**

1. A broth medium for the detection of *Staphylococcus aureus* comprising:

a. a nitrogen source,

b. a carbon source,

c. biological nutrient sources,

d. chemical inhibitors in an amount sufficient to inhibit growth of gram-negative organisms and yeast organisms but insufficient to inhibit *Staphylococcus aureus*, and

e. a biological indicator comprising DNA methyl green and Vitamin B-12 in sufficient quantity so that the medium turns to a bluish color in the presence of *Staphylococcus aureus*.

4,035,239
ENZYMIC ASSAY FOR ACETATE ION

Leo P. McCloskey, 339 Stanford Ave., Santa Cruz, Calif. 95062

Filed May 10, 1976, Ser. No. 684,791

Int. Cl.^{2} G01N *31/14, 33/00*

U.S. Cl. 195—103.5 R **8 Claims**

1. An enzymic assay for acetate ion in a sample fluid comprising the steps of

a. reacting the acetate ion with adenosine triphosphate in the presence of acetate kinase in an assay fluid to yield acetyl-phosphate and adenosine diphosphate,

b. reacting the acetyl-phosphate formed in step (a) in said assay fluid with Coenzyme-A in the presence of phosphotransacetylase to form acetyl-Coenzyme A and phosphate, and

c. assaying the quantity of adenosine diphosphate formed in step (a) by an assay procedure including conversion of said adenosine diphosphate to a different compound in said fluid.

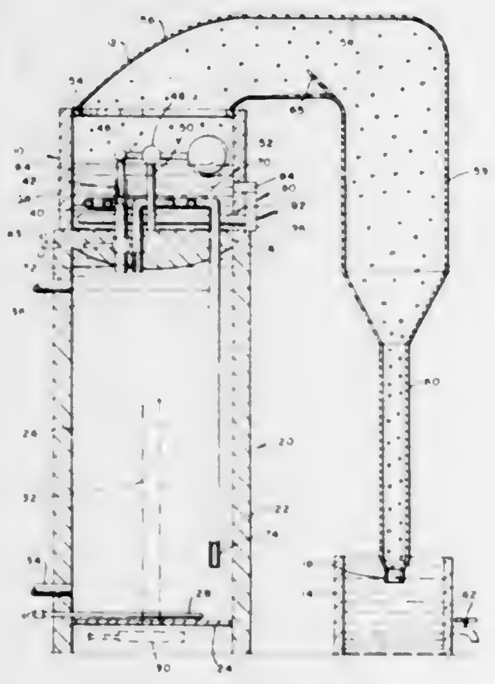
4,035,240
WATER PURIFICATION SYSTEM

Peter James McLean, 140 Talbot St., Apt. 205, St. Thomas, Ontario, Canada

Filed Mar. 13, 1975, Ser. No. 557,920

Int. Cl.^{2} B01D *3/00*

U.S. Cl. 202—167 **1 Claim**



1. The combination with an upright domestic hot water tank having means for heating water in the tank, of a water container mounted on top of the tank, a conduit from said tank to said container to carry hot water from said tank to said container, a valve for said conduit, a float connected to said valve to maintain a predetermined level of water in said container, a duct leading from said container to convey water vapor formed in said container, said duct being secured to the top of said container in sealed relation therewith, said duct having a section extending upwardly from said container which leads to a lateral section which in turn leads to a downwardly extending section having a discharge outlet at the bottom, said laterally and downwardly extending sections of said duct being at a sufficiently lower temperature than the water in said container to condense the vapor therein, a collection receptacle positioned to receive condensate from said discharge outlet, a baffle in said duct at the juncture between said laterally and downwardly extending sections to restrict the return of condensed vapor to said container, said baffle extending from the lower wall of said laterally extending section of said duct upwardly at an acute angle toward said upwardly extending section of said duct and terminating in spaced relation to the upper wall of said laterally extending section, and an open-ended pipe extending from said tank into said container and back to said tank and having an extended intermediate heat-radiating section within said container, one end of said pipe terminating in said tank near the top and the other end of said pipe terminating in said tank near the bottom to promote circulation of hot water from the tank through said pipe thereby providing the source of heat to said heat radiating section.

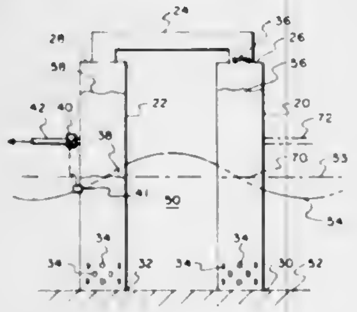
4,035,241
METHOD AND APPARATUS FOR PURIFYING A LIQUID BY PRESSURE DISTILLATION

Vincent E. Carman, 10728 NE. Halsey D-34, Portland, Oreg. 97220

Filed Feb. 9, 1976, Ser. No. 656,431

Int. Cl.^{2} B01D *3/10*

U.S. Cl. 202—205 **8 Claims**



1. An apparatus for purifying a liquid by pressure distillation comprising:

first and second upright walled enclosures;

conduit means sealingly interconnecting said first and second enclosures for permitting vapor flow therebetween;

c. pressure-sensitive one-way valve means associated with said conduit means for permitting vapor flow through said conduit means from said first enclosure to said second enclosure whenever the pressure is greater in said first enclosure than in said second enclosure, and for preventing vapor flow in the opposite direction;

d. inlet means associated with said first enclosure for permitting the introduction of a liquid thereinto;

e. means for simultaneously and alternately varying the pressure within said first and second enclosures in mutually opposite directions above and below a predetermined value such that, when said pressure within said first enclosure is above said predetermined value and said pressure within said second enclosure is below said predetermined value, said valve means is open to permit any vapor contained within said first enclosure to flow therefrom and into said second enclosure, and when said pressure within said first enclosure is below said predetermined value and said pressure within said second enclosure is above said predetermined value, said valve means is closed, said decreased pressure in said first enclosure being sufficient to cause a portion of any liquid contained therein to evaporate into a vapor, and said increased pressure in said second enclosure being sufficient to cause a portion of any vapor contained therein to condense into a liquid;

f. a flexible diaphragm mounted in said second enclosure so as to extend laterally thereacross for restraining the downward movement of said condensed liquid; and

g. automatic discharge means associated with said second enclosure and responsive to an accumulated quantity of said condensed liquid therein above said diaphragm for permitting the discharge of said condensed liquid whenever said quantity reaches a predetermined level.

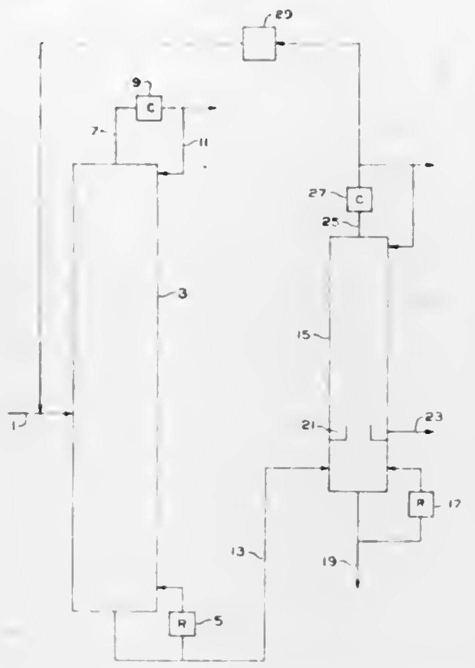
4,035,242
DISTILLATIVE PURIFICATION OF ALKANE SULFONIC ACIDS

Donald R. Brandt, Corpus Christi, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Sept. 29, 1975, Ser. No. 617,477

Int. Cl.^{2} C07C *143/02*

U.S. Cl. 203—15 **7 Claims**



1. A process for preparing lower alkane sulfonic acid having a water content of less than 2 weight percent by feeding aqueous alkane sulfonic acid having a water content greater than 10 weight percent into a first fractionating column feedline intermediate between a liquid bottoms outlet and an overhead vapor outlet thereof; operating said first column under conditions of temperature and subatmospheric pressure such that a major part of the so fed alkane sulfonic acid is not heated to above its temperature of vaporization and a bottoms product of stripped liquid alkane sulfonic acid containing more than 4 but less than 10 weight percent water is obtained; then feeding said bottoms product from said first column to the lower portion of a second fractionating column, said second column being operated under conditions of temperature and subatmospheric pressure such that the major part of alkane sulfonic acid in said bottoms produce fed thereto is vaporized with rectification and a rectified liquid alkane sulfonic acid having a water content of less than 2 weight percent collected and withdrawn as a liquid from said second column above the feedpoint of said bottoms product.

4,035,243
METHOD AND APPARATUS FOR HIGH VOLUME DISTILLATION OF LIQUIDS

Jerome Katz, P.O. Box 1544, and Sidney J. Fogel, P.O. Box 1856, both of Rochester, N.Y. 14603

Filed Apr. 28, 1976, Ser. No. 681,290

Int. Cl.^{2} B01D *3/06, 1/28*

U.S. Cl. 203—24 **68 Claims**

1. A method for high volume distillation of impure liquid comprising the steps of:

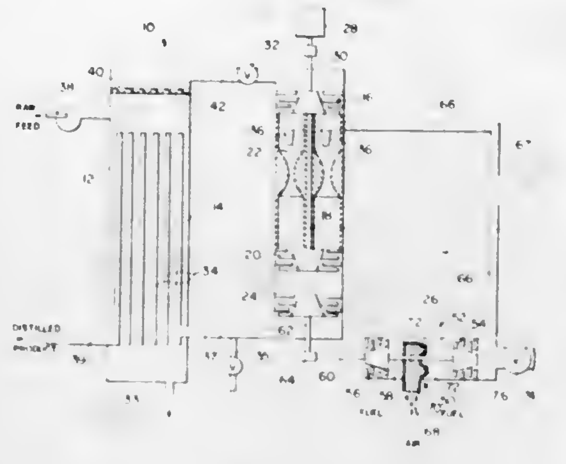
a. evaporating said impure liquid in an evaporator to form a vapor at a temperature above the freezing point and at or below the boiling point of said liquid at atmospheric pressure and at a pressure corresponding to said evaporation temperature under saturated conditions;

b. compressing said vapor adiabatically;

c. admixing said compressed vapor under substantially isobaric conditions directly with hot gases having a temperature sufficiently greater than the temperature of the compressed vapor that the resulting vapor-gas mixture temperature is greater than the temperature of the compressed vapor prior to the mixing;

d. passing said vapor-gas mixture through an expansion engine to motivate said engine and to produce shaft energy, whereby said vapor-gas mixture adiabatically expands and cools;

e. compressing said expanded vapor-gas mixture adiabatically to a predetermined pressure corresponding to a predetermined temperature differential between said compressed vapor-gas mixture and said impure liquid;



f. cooling said vapor-gas mixture in heat transfer relation with said impure liquid whereby said vapor at least partially condenses, transferring sufficient heat to said impure liquid for evaporating said liquid and to form a vapor having said temperature and pressure characteristics set forth in subparagraph (a) hereof; and

g. collecting said condensed vapor.

4,035,244
ELECTRIC RECORDING PROCESS

Eiichi Inque; Hiroshi Kokado, both of Tokyo, and Nobuhiro Miyakawa, Kobe, all of Japan, assignors to Mita Industrial Company Limited, Japan

Filed Oct. 29, 1975, Ser. No. 626,918

Claims priority, application Japan, Nov. 1, 1974, 49-125501

Int. Cl.^{2} C25D *17/10, 11/00*

U.S. Cl. 346—165 **20 Claims**

1. An electric recording process comprising applying electricity to an anode comprising a solid electrolyte, said electrolyte being a compound of a metal of Group IB of the Periodic Table and said electrolyte having an ionic conductivity of at least $1 \times 10^{-4}\ \Omega^{-1}\text{cm}^{-1}$ under application conditions, said anode contacting a recording layer containing color forming agent capable of reacting with ions of said metal of Group IB of the Periodic Table to form a visible image.

4,035,245
ELECTROPLATING DEVICE AND METHOD FOR THE PARTIAL METALIZING OF ELEMENTS IN CONTINUOUS TRANSIT

Laurent Danneels, Varsenare; Johan Helder; Jan Kuypers, both of Brugge; James Piolon, Ostende, all of Belgium, and Wolfgang Pernegger, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Dec. 1, 1975, Ser. No. 636,429

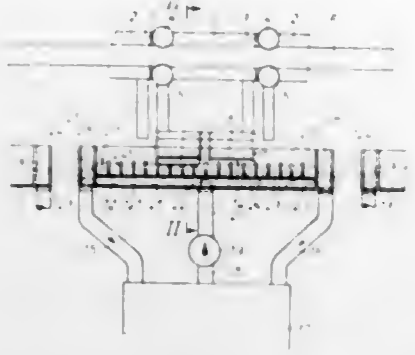
Claims priority, application Germany, Dec. 20, 1974, 2460634

Int. Cl.^{2} C25D *5/02;* **B65G** *49/00;* **C25D** *21/10*

U.S. Cl. 204—15 **11 Claims**

1. In an electroplating device for the partial coating of items in continuous motion including at least one treatment bath positioned along the path followed by the items, the treatment bath having end walls containing slot openings therethrough to pass the items at a constant level, the bath having a treatment liquid therein flowing out of the bath through the slots

and being resupplied to the bath via a circulation pump, the improvement of the treatment bath having liquid flow direction control vanes therein, the vanes effective to produce a cross-flow of the circulation treatment liquid within the bath, said cross-flow crossing the path followed by the items at least twice and in opposite directions.



4,035,246

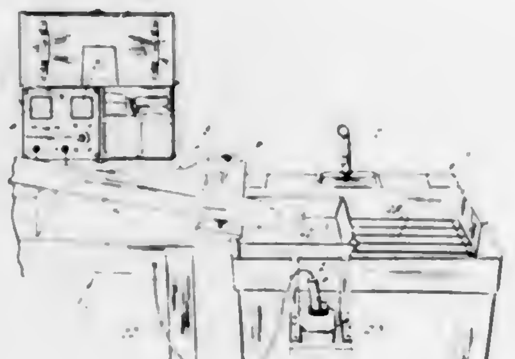
METHOD AND COMPOSITIONS FOR ELECTROPLATING COPPER AND BRASS

Felix R. Rapids, Chicago, Ill., assignor to Rapid Electroplating Process, Inc., Chicago, Ill.

Filed June 1, 1976, Ser. No. 691,880

Int. Cl.^{2} C25D *5/02, 5/06, 3/38*

U.S. Cl. 204—15 **8 Claims**



1. The method of plating a workpiece with brass or copper which comprises applying an electrolyte consisting essentially of an aqueous solution containing Rochelle salt, an alkali metal carbonate, and a surfactant to said workpiece without electrical current being applied, said electrolyte being substantially free from acids, alkalis, and cyanides, and thereafter rubbing said solution onto said workpiece while applying an electroplating current between a brass or copper anode and said workpiece.

4,035,247

METHOD OF MANUFACTURING A REFLECTING MIRROR

Toshio Enomoto, and Seiji Muto, both of Tokyo, Japan, assignors to Toyo Kokan Kabushiki Kaisha, Japan

Filed Jan. 9, 1976, Ser. No. 647,779

Claims priority, application Japan, Mar. 31, 1975, 50-38812

Int. Cl.^{2} C25D *5/36, 7/08, 5/14*

U.S. Cl. 204—19 **3 Claims**

1. A method of manufacturing a mirror, comprising buffing a surface of stainless steel sheet, of the group comprising 13-chromium steel and austenitic steel, such as 18–8 steel;

activating the buffed surface of the sheet by immersing it into a 4 to 9% solution of hydrochloric acid at room temperature, for a period of 30 seconds to 2 minutes, to remove from the buffed surface any film of oxide present thereon;

rinsing the activated sheet surface in water to remove any remaining portions of the solution;

pre-plating on the activated surface a nickel layer by immersing the sheet in a bath containing 3.6 to 36 g/l of hydrochloric acid and 150 to 300 g/l of nickel chloride, at room temperature, for a pre-plating period of 5 to 30 minutes, with an electric current at a density of 1 to 2 A/dm^2, and

plating on the pre-plated surface a bright nickel layer by immersing the sheet in a Watts bath;

whereby a mirror is produced which is characterized by high strength, workability, gloss, and brightness, by low distortion, and by strong adherence of the nickel layers to the stainless steel sheet

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4,035,248

METHOD FOR THE MANUFACTURE OF A STEEL SHEET HAVING A NI-DIFFUSED BASE LAYER WHICH IS TREATED WITH A CHROMIC ACID

Hidejiro Asano; Yashichi Oyagi, both of Kitakyushu, and Takatoshi Egawa, Nohgata, all of Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Filed June 22, 1976, Ser. No. 698,565

Claims priority, application Japan, June 23, 1975, 50-75477

Int. Cl.^{2} C25D *5/36*

U.S. Cl. 204—38 B **8 Claims**

1. A method for the manufacture of a steel sheet having a Ni-diffused base layer which is treated with a bath consisting chiefly of chromic acid, comprising (1) coating an aqueous solution containing Ni ion on a surface of steel sheet as cold rolled in the step of manufacturing a thin steel sheet, followed by drying, (2) thereafter subjecting the same to recrystallization annealing while simultaneously allowing the coated Ni compound to be reduced on the surface of the steel sheet, (3) and thereafter plating thereon a film of metallic chromium and/or hydrated chromium oxide by electrolysis using a bath consisting chiefly of a chromic acid.

4,035,249

ELECTRODE POSITION OF TIN-CONTAINING ALLOYS AND BATH THEREFOR

Walter J. Wieczerniak, Sterling Heights, Mich., assignor to Oxy Metal Industries Corporation, Warren, Mich.

Continuation-in-part of Ser. No. 585,548, June 10, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 661,480

Int. Cl.^{2} C25D *3/56, 3/60*

U.S. Cl. 204—43 S **9 Claims**

1. A method of electroplating a bright firmly adherent coating upon a substrate having a metallic layer thereon, which comprises contacting said metallic layer with an aqueous solution including therein 1/2 to 5 grams per liter of cobalt, nickel or iron ions; about 1/2 to 5 grams per liter of tin ions; and 5 to 50 grams per liter of a complexing agent selected from the group consisting of gluconate, glucoheptonate or mixtures thereof, maintaining the pH of the solution within the range of 4 to 10, electroplating said coating from said solution and controlling the thickness of said coating so that it does not substantially exceed 5 micrometers.

4,035,250

PRODUCTION OF PERFLUORO-N-HEPTANE

Harold C. Walters, and William Ves Childs, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1976, Ser. No. 666,101

Int. Cl.^{2} C25B *3/08*, **C07C** *17/38, 19/08*

U.S. Cl. 204—59 F **8 Claims**

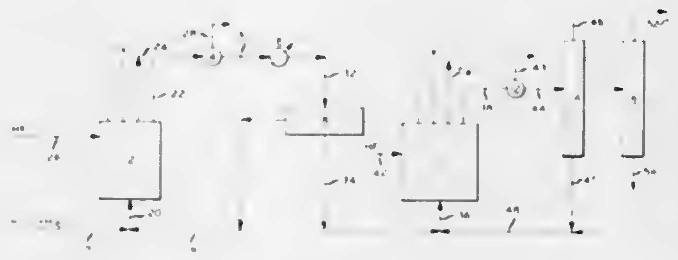
1. A process for the electrochemical fluorination of n-heptane to perfluoro-n-heptane which comprises in combination, the steps of:

a. passing n-heptane into a first electrochemical fluorination cell zone and therein fluorinating at least a portion of said n-heptane under conditions sufficient to produce a first effluent stream comprising unconverted n-heptane, partially fluorinated n-heptanes and perfluoro-n-heptane;

b. passing said first effluent stream to a cooling zone wherein said stream is cooled to a temperature sufficient to condense said n-heptane, said partially fluorinated-n-heptanes and said perfluoro-n-heptane;

c. passing the resulting condensed stream to a phase separation zone and separating therefrom a hydrocarbon-rich phase comprising n-heptane and partially fluorinated n-heptanes, and a fluorocarbon-righ phase comprising perfluoro-n-heptane, partially fluorinated n-heptanes and n-heptane;

d. passing said fluorocarbon-rich phase into a second electrochemical fluorination cell zone and therein fluorinating at least a portion of said n-heptane and said partially fluorinated n-heptanes under conditions sufficient to produce a second effluent stream comprising partially fluorinated n-heptanes, perfluoro-n-heptane and a small amount of n-heptane;



e. passing said second effluent stream to a first fractionation zone and recovering therefrom an overhead stream consisting essentially of a major amount of perfluoro-n-heptane together with a minor amount of hydrogen fluoride and a minor amount of an n-heptane/perfluoro-n-heptane azeotrope, and a bottoms stream comprising partially fluorinated n-heptanes; and

f. passing said first fractionation zone overhead stream to a second fractionation zone and recovering therefrom an overhead stream consisting essentially of said azeotrope and said hydrogen fluoride, and a bottoms product stream consisting essentially of perfluoro-n-heptane.

4,035,251

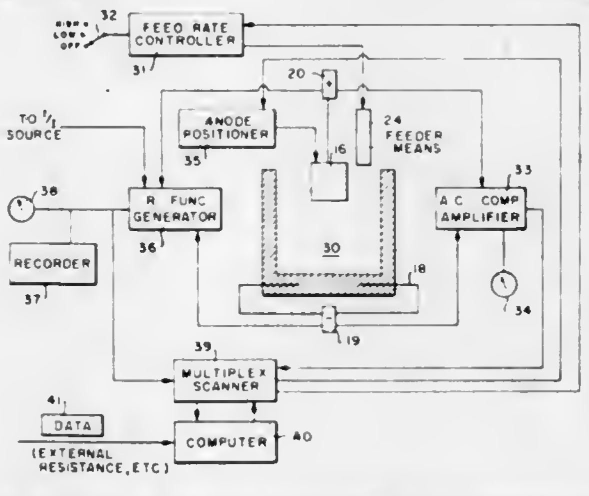
METHOD AND APPARATUS FOR REDUCTION CELL CONTROL

Harry T. Shiver, and William E. Campbell, both of Portland, Oreg., assignors to Reynolds Metals Company, Richmond, Va.

Continuation of Ser. No. 769,434, Aug. 21, 1968, Pat. No. 3,622,475, which is a continuation of Ser. No. 400,059, Sept. 29, 1964, abandoned. This application Oct. 13, 1971, Ser. No. 188,737

Int. Cl.^{2} C25C *3/06, 3/14;* **C25B** *15/08*

U.S. Cl. 204—67 **28 Claims**



1. In the process of refining aluminum from alumina in an igneous electrolysis bath in an electrolytic refining cell, the method of controlling the alumina content of said bath by signalling a feed operation to feed additional alumina into said bath prior to the occurrence of an anode effect therein comprising the steps of:

(1.) measuring by an instrumentality the operating electrical current and voltage of said electrolytic refining cell at predetermined time intervals, and responding thereto to develop signals representing the value of total pot resistance of said cell at said predetermined time intervals,

(2.) comparing by an instrumentality said signal representing the current resistance value with a signal representing the most recent previous resistance values derived from previous measurements to supply signals representing the time rate of change of said total pot resistance,

(3.) signalling by an instrumentality said feed operation when said signals representing time rate of change of said total pot resistance reach a predetermined limit.

4,035,252

PROCESS FOR PRODUCING 2-AMINOMETHYL-1-ETHYLPYRROLIDINE

Keijiro Odo, Tokyo; Eiichi Ichikawa, Yokohama; Kazuharu Tamazawa, Shiraoka, and Kozo Takahashi, Tokyo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Aug. 6, 1976, Ser. No. 712,389

Claims priority, application Japan, Aug. 11, 1975, 50-97295

Int. Cl.^{2} C25B *3/04;* **C07D** *207/00*

U.S. Cl. 204—74 **6 Claims**

1. A process for producing 2-aminomethyl-1-ethylpyrrolidine which comprises electrolytic reduction of 1-ethyl-2-nitromethylenepyrrolidine under neutral to basic condition using copper as the cathode.

4,035,253

ELECTROLYTIC OXIDATION OF PHENOL AT LEAD-THALLIUM ANODES

Glenn C. Jones, and Ronald H. Meen, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed June 1, 1976, Ser. No. 691,665

Int. Cl.^{2} C25B *3/02*

U.S. Cl. 204—78 **1 Claim**

1. In the electrochemical oxidation of phenol to hydroquinone in a sulfate-ion containing aqueous medium in an undivided cell, the improvement comprising the use of an anode of an alloy of a major proportion of lead and about 0.5 to 2 weight percent of thallium while maintaining the concentration of p-benzoquinone in the aqueous medium below about 0.05 weight percent.

4,035,254

OPERATION OF A CATION EXCHANGE MEMBRANE ELECTROLYTIC CELL FOR PRODUCING CHLORINE INCLUDING FEEDING AN OXIDIZING GAS HAVING A REGULATED MOISTURE CONTENT TO THE CATHODE

Gerhard Gritzner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Michigan

Filed May 18, 1973, Ser. No. 361,744

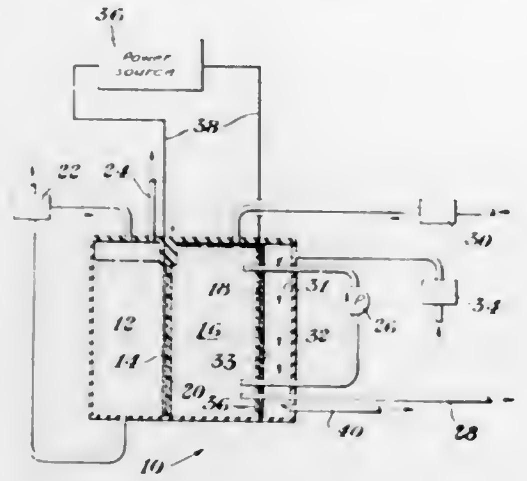
Disclosure was also published under first Trial Voluntary Protest Program on Jan. 28, 1975 or document No. B 361,744

Int. Cl. C25B *1/16*

U.S. Cl. 204—98 **10 Claims**

1. In a process to produce chlorine and an alkali metal hydroxide in an electrolytic diaphragm cell by feeding an alkali chloride brine to an anode compartment and passing alkali metal ions through the diaphragm into a cathode chamber, supplying sufficient electrical energy to an anode positioned in the anode compartment and a cathode positioned in the cathode compartment to release gaseous chlorine at the anode and form an alkali metal hydroxide in the cathode compartment and recovering the chlorine and alkali metal hydroxide, the improvement in the cell with a cation exchange

diaphragm comprising substantially simultaneously contacting different surface portions of the cathode with the catholyte and with an oxidizing gas, controlling the moisture content of the oxidizing gas, circulating the catholyte within the cathode compartment and controlling the catholyte head to maintain the catholyte upper surface level at a higher level than the anolyte upper surface level to thereby improve the electrical efficiency of the cell.



4,035,255
OPERATION OF A DIAPHRAGM ELECTROLYLYTIC CELL FOR PRODUCING CHLORINE INCLUDING FEEDING AN OXIDIZING GAS HAVING A REGULATED MOISTURE CONTENT TO THE CATHODE

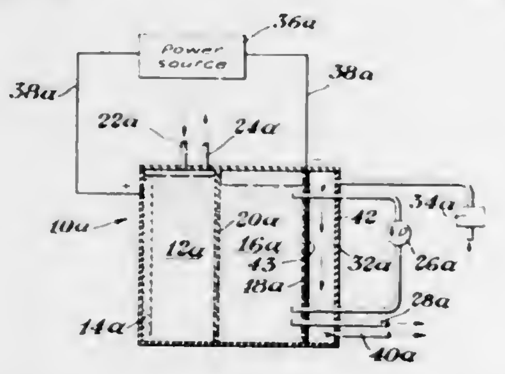
Gerhard Gritzner, Midland, Mich., assignor to The Dow Chemical Company, Midland, Michigan

Filed May 18, 1973, Ser. No. 361,743

Disclosure was also Published under first Trial Voluntary Protest Program on Jan. 28, 1975 or document No. B 361,743

Int. Cl. C25B *1/16*

U.S. Cl. 204—98 10 Claims



1. In a process to produce chlorine and an alkali metal hydroxide in an electrolytic diaphragm cell by feeding an alkali chloride brine to an anode compartment and passing alkali metal ions through the diaphragm into a cathode chamber, supplying sufficient electrical energy to an anode positioned in the anode compartment and a cathode positioned in the cathode compartment to release gaseous chlorine at the anode and form an alkali metal hydroxide in the cathode compartment and recovering the chlorine and alkali metal hydroxide, the improvement comprising substantially simultaneously contacting different surface portions of the cathode with the catholyte and with an oxidizing gas, controlling the moisture content of the oxidizing gas, and circulating the catholyte within the cathode compartment to thereby improve the electrical efficiency of the cell.

4,035,256
PROCESS FOR ELECTROLYTIC REMOVAL OF LUBRICANTS FROM STEEL STRIP

Edward C. Brendlinger, Pitcairn; Richard F. Higgs, Monroeville, and Issa J. Kharouf, Penn Hills Township, Allegheny County, all of Pa., assignors to United States Steel Corporation, Pittsburgh, Pa.

Filed Apr. 19, 1976, Ser. No. 678,341

Int. Cl.^{2} C25F *1/00, 1/06*

U.S. Cl. 204—145 R 12 Claims

1. In the electrolytic removal of lubricants from steel strip wherein said strip is electrolyzed in an alkaline electrolyte by the application of a current density within the range of 350 to 4,000 amps per square foot,

the improvement for significantly reducing the amount of power required while enhancing the degree of lubricant removal, which comprises;

at a speed of 450 to 3,000 feet per minute, passing said strip lengthwise between at least one pair of horizontally arranged electrodes in parallel spaced relation, wherein the distance between a planar surface of said strip and its respective facing electrode is at least one-fourth of an inch and no greater than 1½ inches,

applying said current for a time sufficient to provide from 30 to 300 coulombs per square foot of surface area, and flowing said electrolyte between said electrodes co-current with the direction of strip travel, at a flow velocity which is from about 50 to 100 percent of said speed of said strip, said flow velocity being at least sufficient to support said applied current density.

4,035,257
SPRAY-DRIED CALCIUM CARBONATE-CONTAINING GRANULES

Steven David Cherney, Springdale, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Sept. 27, 1974, Ser. No. 509,864

Int. Cl.^{2} E11D *7/12*

U.S. Cl. 252—160 10 Claims

1. A non-phosphate, calcium carbonate-containing, spray-dried granule, substantially free of water-soluble salts of silicates and consisting essentially of:

a. submicron calcium carbonate particles having a high effective surface area and a low degree of agglomeration; and,

b. a member selected from the group consisting of alkali metal carbonates, bicarbonates, and sesquicarbonates and mixtures thereof;

wherein the weight ratio of component (b) to the calcium carbonate is from about 1:2 to about 75:1.

4,035,258
AZEOTROPIC COMPOSITIONS

Robert E. Reusser, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 391,663, Aug. 27, 1973, Pat. No. 3,936,387, which is a continuation-in-part of Ser. No. 223,779, Feb. 4, 1972, abandoned. This application Aug. 29, 1975, Ser. No. 609,115

Int. Cl.^{2} C11D *7/50, 7/30;* **C23G** *5/02*

U.S. Cl. 252—171 2 Claims

1. The azeotrope which at substantially atmospheric pressure is characterized as about 81.2 weight per cent 1,2-dichloro-1-fluoroethane and about 18.8 weight percent ethanol.

4,035,259
METHOD FOR PREPARATION OF INORGANIC FLOCCULATING COMPOSITION

Liborio Casale, Brescia, Italy, assignor to Caffaro, S.p.A., Societa per l'Industria Chimica ed Elettrochimica, Milan, Italy

Filed Oct. 29, 1975, Ser. No. 626,846

Claims priority, application Italy, Nov. 12, 1974, 29361/74

Int. Cl.^{2} C02B *5/02, 1/20*

U.S. Cl. 252—175 2 Claims

1. A method for the preparation of a liquid flocculating composition comprising the steps of:

a. slurrying raw clay containing Al, Fe, Mg and Ca elements so as to obtain a semi-fluid slurry with a percentage of dry matters between 33% and 55% on a weight basis, the particles of the clay being of a size of not over 1 millimeter in diameter;

b. treating while stirring the clay or suspension with an inorganic acid capable of forming Al, Fe, Mg and Ca water soluble salts at a temperature up to about 90° C;

c. completing the acid attack of the clay at a temperature of about 150° C under a pressure of about 4 atmospheres;

d. progressively cooling the mixture and

e. filtrating said mixture into a solid residue and a liquid phase.

4,035,260
PROCESS FOR HYDROGENATION CATALYSTS OF IMPROVED DISTRIBUTION OF ACTIVE COMPONENTS

Joseph Lawrence Schmitt, Jr., Bethel, and Jacob Solomon Brinen, Stamford, both of Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Jan. 29, 1976, Ser. No. 653,554

Int. Cl.^{2} B01J *21/18*

U.S. Cl. 252—447 6 Claims

1. A process providing an improved distribution of active component of a hydrogenation catalyst which comprises selecting a pre-formed porous carbon support having a pore radius of at least about 25 angstrom units, a surface area provided by said pores in the range of about 300 to 700 square meters per gram, and a compacted bulk density in the range of about 0.3 to 0.8 grams per cubic centimeters, reductively depositing upon said support an amount of a platinum metal in the range from about a thousandth to about 15 percent by weight, and obtaining an increased support/intensity ratio by selecting a carbon support having an increased average pore radius.

4,035,261
WATER TREATMENT OF HYDRODESULFURIZATION CATALYST TO IMPROVE ITS MICROPOROSITY

John David Hargrove, Aldershot, and Graham Keith Hilder, Addlestone, both of England, assignors to The British Petroleum Company Limited, London, England

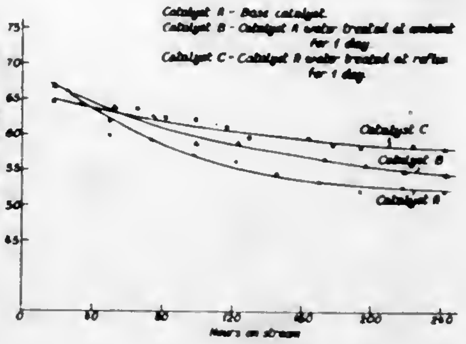
Filed Nov. 12, 1975, Ser. No. 631,459

Claims priority, application United Kingdom, Nov. 25, 1974, 50867/74

Int. Cl.^{2} B01J *29/6, 23/84*

U.S. Cl. 252—455 R 3 Claims

1. In a method for preparing a catalyst having increased micropore volume for pore diameters below 300 Angstroms and decreased micropore volume for pore diameters above 300 Angstroms, suitable for the hydrodesulphurisation of hydrocarbons, wherein said catalyst comprises from 1–10% by weight of an iron group metal compound and from 5–25% by weight of a Group VIA metal compound on a refractory support, selected from the group consisting of alumina, silica and silica-alumina and wherein said method includes the steps of impregnating the support with the iron group metal compound and the Group VIA metal compound, drying and calcining the impregnated support, the invention comprising, the step of treating the catalyst after calcination with water free from added salts, in the liquid phase, at a temperature in the range 20°–100° C and at atmospheric pressure.



4,035,262
ACROLEIN OXIDATION CATALYST

David L. Childress, Angleton; William V. Hayes, and Richard L. Poppe, both of Clute, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Apr. 19, 1976, Ser. No. 678,274

Int. Cl.^{2} B01J *21/08, 23/22, 23/26, 23/28*

U.S. Cl. 252—456 5 Claims

1. A supported catalyst suitable for oxidizing acrolein to acrylic acid which contains oxides of molybdenum, vanadium, chromium, copper and at least one of an oxide of tantalum and niobium on an inert support, wherein the atomic ratios of the metals are

$$Mo_{12}V_{3-10}Cr_{0.2-2}Cu_{1-6}M_{0.1-5}$$

wherein M is tantalum, niobium or mixtures thereof.

4,035,263
COMPOSITE CATALYST FOR CLARIFYING EXHAUST GAS CONTAINING NITROGEN OXIDES AND METHOD FOR PRODUCING THE SAME

Sumio Umemura; Hisayuki Mizuno, and Tohru Ogawa, all of Ube, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Feb. 19, 1976, Ser. No. 659,201

Claims priority, application Japan, Mar. 26, 1975, 50-35378

Int. Cl.^{2} B01J *29/10, 29/20*

U.S. Cl. 252—459 15 Claims

1. A composite catalyst for clarifying exhaust gas containing nitrogen oxides, which comprises a catalytic ingredient comprising oxides of nickel and copper in an atomic ratio of nickel to copper of 1:0.05 through 1, and a catalytic base carrying said catalytic ingredient thereon and comprising a refractory inorganic material containing at least 50% by weight of zircon therein.

5. A composite catalyst as claimed in claim 1, wherein said catalytic base comprises 70 to 90% by weight of zircon and the balance consisting of a refractory inorganic oxide material selected from the group consisting of cordierite, mullite, magnesia, silica-alumina, and mixtures of two of more of the above-mentioned materials.

4,035,264
DEHYDROGENATION CATALYSTS

Roger W. Spoerke, Akron, and Kenneth J. Frech, Tallmadge, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 508,478, Sept. 23, 1974. This application Dec. 18, 1975, Ser. No. 642,104

Int. Cl.^{2} B01J *23/22, 23/26, 23/28, 23/30*

U.S. Cl. 252—467 **4 Claims**

1. A composition of matter comprising at least one metal vanadate selected from the group of tunsten vanadate $W(VO_4)_2$, molybdenum vanadate $Mo(VO_4)_2$, and chromium vanadate $CrVO_4$, said metal vanadates being reduced by exposure to at least one reducing agent selected from the group consisting of hydrogen, ammonia, hydrazine, carbon monoxide, methane, ethane, propane and butane, at a temperature of about 400° to about 800° C., for a period of about 5 minutes to about 8 hours.

4,035,265
PAINT COMPOSITIONS

John Allen Saunders, Teddington, England, assignor to The Research Association of British, Paint, Colour & Varnish Manufacturers, Teddington, England

Continuation of Ser. No. 257,047, May 25, 1972, abandoned, which is a division of Ser. No. 28,154, April 13, 1970, Pat. No. 3,696,054. This application Jan. 15, 1976, Ser. No. 649,186

Claims priority, application United Kingdom, Apr. 18, 1969, 20041/69; Aug. 6, 1969, 39480/69

Int. Cl.^{2} H01B *1/04*

U.S. Cl. 252—510 **13 Claims**

1. An electrically conductive paint composition comprising dispersed in a hardenable binder a total of from 25 to 75 percent p.v.c. of conductive particles of which from 14 to 70 percent p.v.c. are graphite platelets which have been formed by wet grinding graphite and from 2 to 35 percent p.v.c. are colloidal size carbon particles having a particle size from 20 to 60 millimicrons as determined by electron microscopy, the weight ratio of colloidal size carbon particles to graphite platelets being from 0.1 to 0.4, the composition having a paint-like consistency and being capable of being brushed or sprayed so as to give on a surface an even film from about 0.001 to 0.005 inch thick having an electrical resistance of less than 1 ohms per square.

4,035,266
METHOD OF SYNTHESIS OF METAL CHROMITES

Vladimir Ilich Alexandrov, ulitsa Ostrovityanova, 31, kv. 281; Vladimir Grigorievich Gordon, 13 Parkovaya ulitsa, 31, korpus 1, kv. 83, both of Moscow; Ernest Nikolaevich Muraviev, ulitsa Popova, 10, kv. 36, Fryazino Moskovskoi oblasti; Vyacheslav Vasilievich Osiko, ulitsa Vavilova, 48, kv. 63, Moscow; Alexandr Mikhailovich Prokhorov, ulitsa Gubkina, 4, kv. 85, Moscow; Eduard Georgievich Spiridonov, Preobrazhensky val, 24a, kv. 1, Moscow, and Vladimir Mikhailovich Tatarintsev, Leninsky prospekt, 45, kv. 112, Moscow, all of U.S.S.R.

Filed Dec. 3, 1974, Ser. No. 529,212

Int. Cl.^{2} H01B *1/02, 1/08*

U.S. Cl. 252—512 **8 Claims**

1. A method of synthesizing refractory material of metal chromites having a melting point of 2200–2400° C and an electric resistivity of about 10 ohm.cm at 20° C which comprises the steps of:

preparing an equimolar mixture of chromium oxide and at least one oxide of a member selected from the group consisting of rare-earth metals, alkali earth metals, yttrium, scandium, titanium and iron,

adding to said mixture at least 0.05% by weight of the mixture a chromite having a composition substantially similar to the chromite being synthesized, and then,

subjecting the resulting mixture to a high frequency electric field of at least 300 KHz whereby the mixture is melted.

4,035,267
DRY SHAMPOO USING CHITIN POWDER

George C. Gleckler, and James C. Goebel, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed Aug. 30, 1976, Ser. No. 718,725

Int. Cl.^{2} C11D *7/46, 7/32*

U.S. Cl. 252—548 **5 Claims**

1. A method of cleaning hair which comprises: spraying onto said hair a sprayable powder chitin being suspended in a non-toxic volatile liquid carrier having a boiling point between about −30° and 82° C., allowing said liquid carrier to evaporate, and removing the residual powder from the hair.

4,035,268
PROCESS FOR THE CONTROL OF MERCURY CATHODE ELECTROLYSIS CELLS

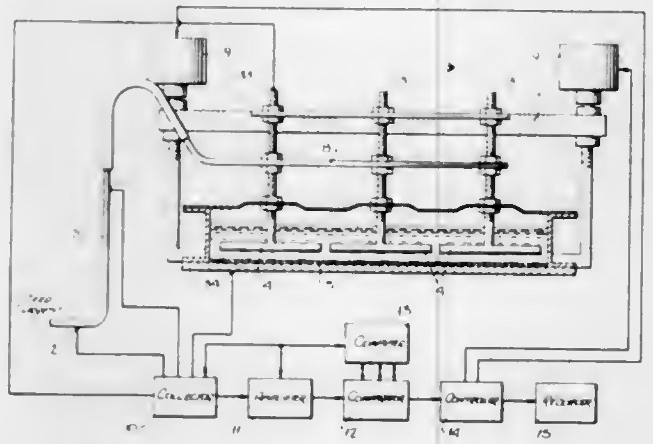
Andre Hote, Jarrie, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

Continuation of Ser. No. 505,462, Sept. 12, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,867

Claims priority, application France, Sept. 17, 1973, 73.33213

Int. Cl.^{2} C25B *1/40*

U.S. Cl. 204—99 **3 Claims**



1. A method for the adjustment and protection of plural anode assemblies in mercury cathode alkali metal chloride and alkaline earth metal chloride electrolysis cells, which method consists of the essential steps of controlling the raising and lowering of the beams carrying the anodes by

a. comparing the difference $i - \bar{i}$ for each anode assembly, where i is the current in each given anode assembly carried by a beam and $\bar{i}$ is the mean of all anode assembly currents, with a preselected upper threshold current and issuing a command to raise each beam for which the difference exceeds the upper threshold,

b. comparing the difference with a preselected lower threshold current for each given anode assembly and giving a temporised command to lower each beam for which the difference is less than the lower limit and for which at the same time the electrolysis voltage is greater than the desired voltage, the raise command taking priority over the lower command, and

c. giving a raise command to all beams when the average electrolysis voltage, V_r, becomes lower than a predetermined safe voltage, the raise command being continued until V_r is above the safe voltage.

3. A method according to claim 1 wherein the measurements and handling thereof are carried out by an electronic system coupled to a computer.

4,035,269
PROCESS FOR THE GALVANIC PURIFICATION OF THE WASTE WATERS

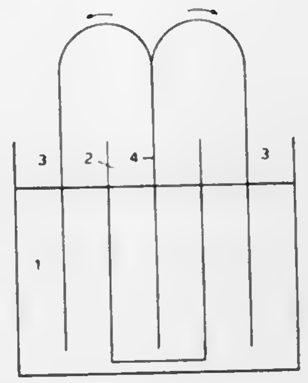
Nunzio Mastrorilli, Milan, Italy, assignor to Snam Progetti, S.p.A., San Donato Milanese, Italy

Continuation of Ser. No. 415,160, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 246,177, April 21, 1972, abandoned. This application Aug. 14, 1975, Ser. No. 604,669

Claims priority, application Italy, Apr. 23, 1971, 23549/71; May 7, 1971, 24205/71

Int. Cl.^{2} C02B *1/82*

U.S. Cl. 204—150 **4 Claims**



1. A process for the purification of waste waters by the removal of chromium therefrom without any energy supply from outside the system, said method comprising in (i) sending the liquid which is to be treated to a vessel and immersing in the liquid at a pH of less than 3.5 carbon and zinc; (ii) connecting the carbon and zinc to each other to give rise to an electric current; (iii) precipitating chromium as an hydroxide; and (iv) recovering the substantially chromium-free liquid.

4,035,270
ISOTOPE SEPARATION PROCESS

Richard K. Lyon, Fanwood, and Andrew Kaldor, Berkeley Heights, both of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Apr. 23, 1975, Ser. No. 570,877

Int. Cl.^{2} B01J *1/10*

U.S. Cl. 204—157.1 R **4 Claims**

1. A method of separating the isotopes of uranium, said method being applied to gaseous molecules of UF_6, and said method comprising subjecting said UF_6 to IR radiation at a predetermined wavelength or set of wavelengths under conditions such that at least 0.1% of either the $U^{235}F_6$ molecules or the $U^{238}F_6$ molecules absorb an energy of more than 2000 cm^{-1}, said excitation being done in less than 10^{-3} seconds, reacting said excited UF_6 with a gaseous reagent chosen from the group of atomic chlorine, bromine, and iodine, said reagent being present in at least 0.1 mole ratio to UF_6, and the contact time between the UF_6 and the said reagent being less than 10^{-3} seconds, and separating the reaction product from the unreacted UF_6.

4,035,271
METHOD OF REMOVING ACIDS FROM REACTION LIQUID OF DIMETHYL DIOXANE SYNTHESIS

Mark Semenovich Nemtsov, prospekt Gagarina, 21, kv. 8; Klavdia Mikhailovna Trenke, prospekt Rimskogo-Korsakova, 65, kv. 105; Moisei Isaakovich Ryskin, bulvar Krasnykh Zor 20, kv. 38, and Maria Mikhailovna Kiseleva, ulitsa Telmana 32, korpus 3, kv. 5, all of Leningrad, U.S.S.R.

Filed Apr. 19, 1972, Ser. No. 245,612

Int. Cl.^{2} B01D *13/02*

U.S. Cl. 204—180 P **1 Claim**

1. A method of removing a mineral acid and an organic acid from an aqueous reaction liquid in which dimethyl-dioxane has been synthesized from isobutene and formaldehyde, comprising subjecting said aqueous reaction liquid to a two-step electrodialysis in which from about 60 to 80% of the mineral acid originally present and from about 20 to 40% of the organic acid originally present are removed after the first dialysis step, and from about 90 to 95% of the mineral acid originally present and from about 70 to 80% of the organic acid originally present are removed after the completion of both steps, the concentration liquid of the first step of electrodialysis being the original formaldehyde solution; and the concentration liquid of the second step being water.

4,035,272
CATHODIC ELECTROCOATING PROCESS

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 595,448, July 14, 1975, abandoned, which is a continuation-in-part of Ser. No. 519,409, Oct. 31, 1974, Pat. No. 3,925,181. This application July 23, 1976, Ser. No. 708,106

Int. Cl.^{2} C25D *13/10*

U.S. Cl. 204—181 **8 Claims**

1. A process for electrodeposition of an electrocoating composition dispersed in an aqueous electrocoating bath onto a cathode substrate disposed within said bath for forming a curable electrodeposited coating on said cathode substrate, comprising:

cathodically electrodepositing said electrocoating composition onto said cathode substrate under cathodic electrocoating conditions, said electrocoating composition comprising: (a) a water-dispersed electrocoating polymer having at least about 5% by weight pendant mercaptan groups: and (b) at least about 5% bis-maleimide cross-linking agent by weight of said polymer; and

curing said curable electrodeposited coating on said cathode substrate, said bis-maleimide cross-linking said polymer by addition polymerization with said mercaptan groups to form a cured electrodeposited coating.

4,035,273
CATHODIC ELECTROCOATING PROCESS

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,105

Int. Cl.^{2} C25D *13/06*

U.S. Cl. 204—181 **11 Claims**

1. A process for electrodeposition of a cathodic electrocoating composition onto a cathode substrate disposed within an aqueous electrocoating bath to form a curable electrodepositing coating on said cathode substrate, which comprises:

cathodically electrodepositing said electrocoating composition dispersed in said bath onto said cathode substrate under cathodic electrocoating conditions, said electrocoating composition comprising (a) a water-dispersed electrocoating polymer having at least about 5% by weight pendant mercaptan groups, and (b) at least about 5% by weight of said polymer of an alpha-,beta-ethylenically unsaturated carbonyl cross-linking agent having at least two alpha-,beta-ethylenically unsaturated carbonyl groups; and

curing said electrodeposited coating on said cathode substrate, said cross-linking agent cross-linking said polymer to form a cured electrodeposited coating on said substrate.

4,035,274
DUAL CURE CATHODIC ELECTROCOATING

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,104

Int. Cl.^{2} C25D *13/06*

U.S. Cl. 204—181 **12 Claims**

1. A process for electrodeposition of an electrocoating

composition dispersed within an aqueous electrocoating bath onto a cathode substrate dispersed within an aqueous electrodeposited coating on said cathode substrate, which comprises:

cathodically electrodepositing said electrocoating composition onto said cathods substrate under cathodic electrocoating conditions, said electrocoating composition comprising
- a. a water-dispersed electrocoating polymer having at least about 1% by weight pendant mercaptan groups;
- a water-dispersed electrocoating polymer having at least about 1% by weight pendant tertiary amine groups, each said amine group being attached to an alpha carbon of said polymer;
- c. at least about 5% by weight of said polymers of an alpha-, beta-ethylenically unsaturated carbonyl cross-linking agent having at least two alpha-,beta-ethylenically unsaturated carbonyl groups; and
- d. at least about 0.5% ultraviolet photosensitizer by weight of said polymers,

said pendant tertiary amine groups and said pendant mercaptan groups together comprising at least about 5% by weight of both said polymers; and curing said electrodeposited coating on said cathode substrate by heating said electrodeposited coating on said cathode substrate to cross-link said polymer having pendant mercaptan groups with said cross-linking agent to partially cure said coating, followed by irradiating with ultraviolet radiation said partially cured coating to cross-link said alpha carbon of said polymer having pendant amine groups with said cross-linking agent to fully cure said coating on said cathode substrate.

4,035,275
NOVEL PIGMENT GRINDING VEHICLES

Lance C. Sturni, McKeesport, and Joseph F. Bosso, Lower Burrell, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 439,184, Feb. 4, 1974, Pat. No. 3,936,405, which is a continuation-in-part of Ser. No. 281,098, Aug. 16, 1972, abandoned. This application Nov. 12, 1975, Ser. No. 631,258

Int. Cl.² C25D *13/06*

U.S. Cl. 204—181 **4 Claims**

1. In a method of electrocoating an electrically-conductive surface serving as a cathode in an electrical circuit comprising said cathode, an anode and an electrodepositable composition, said method comprising passing electric current between said cathode and said anode in contact with said electrodepositable composition, the improvement wherein said electrodepositable composition comprises:

A. a cationic electrodepositable resin; and

B. a stable aqueous pigment paste comprising:
- 1. 2 to 50 percent by weight based on weight of (2) of a water-dispersible cationic polymer produced by reacting a 1,2-epoxy group-containing material with a material selected from the group consisting of amine salts, phosphine-acid mixtures and sulfide-acid mixtures, said cationic polymer having a ratio of final quaternary onium salt groups to initial epoxide groups greater than about 0.4 to 1; and
- 2. a pigment dispersed therein.

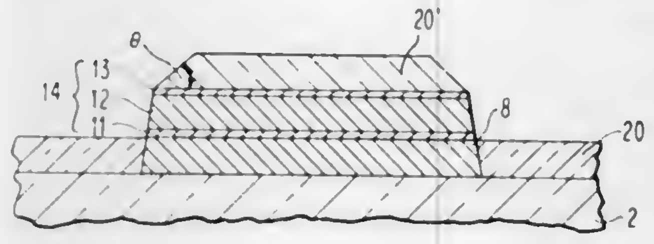
4,035,276
MAKING COPLANAR LAYERS OF THIN FILMS

Janos Havas, Hopewell Junction; John S. Lechaton, Wappingers Falls, and Joseph Skinner Logan, Poughkeepsie, all of N.Y., assignors to IBM Corporation, Armonk, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,380

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 EC **21 Claims**



1. A method for fabricating substantially coplanar thin films comprising:

forming a pattern on a substrate, said pattern including a first thin film and an expendable material disposed on said first thin film;

depositing a second thin film atop said substrate and said pattern by RF Sputtering at a bias which is sufficiently high to cause substantial reemission of said second thin film, thereby covering the exposed substrate surfaces and the expendable material, but leaving the side surfaces of said expendable material exposed;

those portions of said second thin film which are deposited atop said substrate being substantially coplanar with said first thin film;

said expendable material being etchable by an etchant which does not attack either thin film; and

etching said expendable material with said etchant, thereby removing said expendable material and that portion of the second thin film disposed thereon.

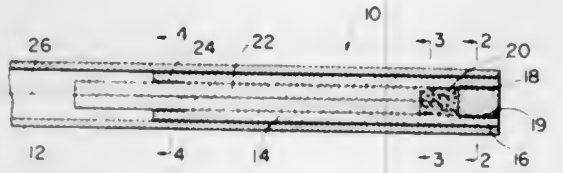
4,035,277
OXYGEN PROBE

Daniel R. Hennessy; David M. Pierre, and Horace Pops, all of Fort Wayne, Ind., assignors to Essex Group, Inc., Fort Wayne, Ind.

Filed Sept. 15, 1976, Ser. No. 723,355

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 S **5 Claims**



1. An oxygen probe of the galvanic cell type for determining the oxygen content of a high temperature molten metal comprising:

an open protective, tubular member;

a second tubular member located coaxially inside one end of said open tubular member and cemented thereto;

a solid electrolyte pellet and a reference electrode pellet axially abutting one another and located coaxially inside the end of said second tubular member, said solid electrolyte pellet being exposed to the open end of said open tubular member and further being cemented to said second tubular member;

a third tubular member located coaxially inside said second tubular member in axial abutting contact with said electrode pellet, said third tubular member being cemented to said second tubular member at the end opposite said electrode and having a greater coefficient of thermal expansion than said second tubular member so that the relative thermal expansion of said second and third tubular members increases the abutting contact between said electrode and said solid electrolyte pellet; and

means for making an electrical connection to said reference electrode.

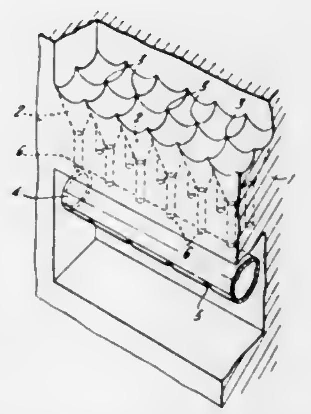
4,035,278
ELECTROLYTIC CELLS

John Arthur Elton Wilkinson, Fareham; Robert Semple Everett Leslie, Havant; David Michael Glindon, Petersfield; Kendrick Peter Haines, Havant, and Keith Baker, Portsmouth, all of England, assignors to CJB Developments Limited, London, England

Division of Ser. No. 471,144, May 17, 1974, Pat. No. 3,956,086. This application Feb. 4, 1976, Ser. No. 655,280

Int. Cl.² C25C *1/00, 1/12, 7/02*

U.S. Cl. 204—222 **12 Claims**



1. An electrolytic cell adapted to contain a fluidised bed particulate cathode and comprising
- a. a cathode compartment having, in use, an electroactive region,
- b. a counter electrode adjacent said compartment, and
- c. means for flowing upwardly through said cathode compartment an aqueous liquid electrolyte,

the cell being constructed so that within the electroactive region of said cathode compartment all internal angles between structural surfaces are of greater than 90° and so that within said electroactive region there are no surfaces of substantially horizontal disposition except that horizontal surfaces over which in use a flow of electrolyte is such as to displace particles adjacent said surfaces.

4,035,279
ELECTROLYTIC CELL

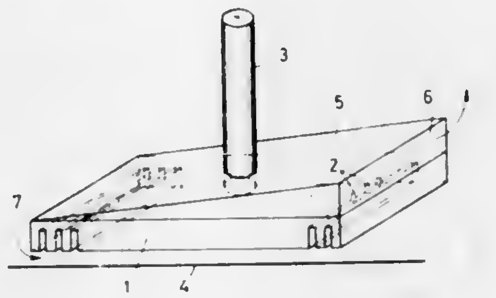
Karl Lohrberg, Heusenstamm, and Jürgen Müller, Karben, both of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Oct. 6, 1976, Ser. No. 729,934

Claims priority, application Germany, Nov. 21, 1975, 2552286

Int. Cl.² C25B *1/26, 9/00*

U.S. Cl. 204—256 **6 Claims**



1. Electrolytic cell for carrying out processes during which gas is evolved, comprising at least one hoodlike cover means disposed above one or more electrode means having an outlet opening below the electrolyte surface for the gas-electrolyte suspension and an electrolyte-recycling space positioned outside the projection of the cover means, said recycling space being free from gas-producing electrodes and being spaced a sufficient distance from said outlet opening that the backflow of gas is precluded.

4,035,280
CONTACT BAR FOR ELECTROLYTIC CELLS

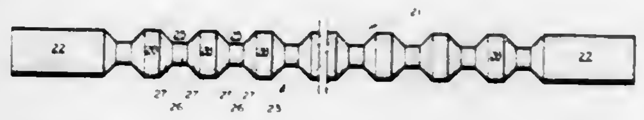
Richard Deane; Ronald N. Honey, both of Rossland, and Clifford J. Krauss, Trail, all of Canada, assignors to Cominco Ltd., Vancouver, Canada

Filed Nov. 20, 1975, Ser. No. 633,656

Claims priority, application Canada, Nov. 28, 1974, 214884

Int. Cl.² C25C *1/00, 7/02*

U.S. Cl. 204—267 **18 Claims**



1. A contact bar formed from copper for use in an electrolytic cell provided with alternating spaced anodes and cathodes, said anodes and cathodes each having a header bar, each header bar having an end extension which is provided on its underside with a notch, said contact bar being constructed to make sloping tangent contact with the notched header bars, said contact bar having
- a. cylindrical end sections and a spooled central section,
- b. the latter being created by a plurality of alternately identical grooves with center lines equally spaced along the length of said spooled central section,
- c. the grooves each comprising a cylindrical middle portion which is of substantially smaller diameter than said cylindrical end section and two oppositely disposed right frusto-conical portions facing one another on the opposite sides of said cylindrical middle portion of each groove.

4,035,281
PRODUCTION OF FUEL OIL

Wilton F. Espenscheid, Princeton, N.J., and Tsoung-Yuan Yan, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Mar. 5, 1976, Ser. No. 664,322

Int. Cl.² C10G *1/04*

U.S. Cl. 208—8 **1 Claim**

1. A process for producing No. 5 fuel oil which comprises forming a slurry by admixing comminuted coal with light FCC cycle oil and FCC main column bottoms of TCC syntower bottoms; heating said slurry at a temperature in the range between about 350° F and 850° F for a period of time sufficient to solublize substantially the said coal to form a homogeneous solution phase; separating the homogeneous solution phase from ash and other undissolved solids; and recovering the separate solution phase as No. 5 fuel oil.

4,035,282
PROCESS FOR RECOVERY OF BITUMEN FROM A BITUMINOUS FROTH

Frederick C. Stuchberry, and Alfred E. Backstrom, both of Calgary, Canada, assignors to Shell Canada Limited, Toronto, Canada and Shell Explorer Limited, Houston, Tex.

Filed Aug. 20, 1975, Ser. No. 606,158

Int. Cl.² C10G *1/04*

U.S. Cl. 208—11 LE **9 Claims**

1. In the process for recovery of bitumen from bituminous froth obtained from tar sands using the hot water separation method wherein comminuted tar sand containing bitumen is

slurried with hot water, subjected to gravity separation to isolate the bitumen in the form of a bituminous froth, made up principally of a mixture of bitumen and water containing a minor amount of mineral matter, and the bituminous froth is diluted with a liquid hydrocarbon solvent and subjected to two-stage centrifugation to recover the bitumen and hydrocarbon solvent substantially free of water and mineral matter; the improvement which comprises; staging the liquid hydrocarbon solvent dilution of the bituminous froth such that no more than about 90% of the total hydrocarbon solvent is added to the bituminous froth prior to the first centrifuging stage and the remaining hydrocarbon solvent is added prior to the second centrifuging stage.

4,035,283

HYDROCRACKING PROCESS UTILIZING GROUP VIII METAL/ALUMINA CATALYSTS ACTIVATED WITH HYDROGEN HALIDE/HALOSILANE/ORGANIC HALIDE

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 681,933, April 30, 1976, which is a division of Ser. No. 546,820, Feb. 3, 1975, Pat. No. 3,979,333. This application Sept. 7, 1976, Ser. No. 720,523

Int. Cl.^{2} C10G *13/08*; B01J *27/06*

U.S. Cl. 208—112 **8 Claims**

1. A hydrocarbon conversion process which comprises contacting a hydrocarbon under hydrocracking conditions with a catalyst produced by:

heating an alumina supported Pt, Ir, Os, Ru, Rh, or Pd metal catalyst at a temperature within the range of 500° to 1600° F.;

contacting said catalyst at said temperature of 500° to 1600° F. with a dry activating gas comprising a hydrogen halide selected from the group consisting of HC1 and HBr, a halosilane selected from the group consisting of chlorosilanes and bromosilanes, and an organic halide selected from the group consisting of organic chlorides and organic bromides; and

thereafter cooling the thus-contacted catalyst.

4,035,284

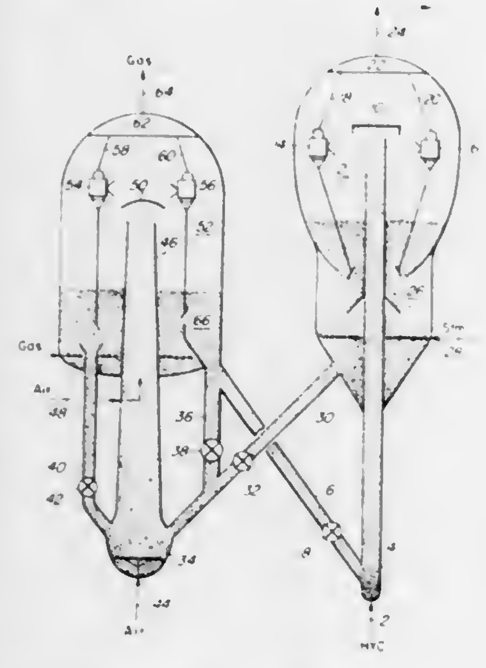
METHOD AND SYSTEM FOR REGENERATING FLUIDIZABLE CATALYST PARTICLES

Benjamin Gross, Cherry Hill, and Hartley Owen, Belle Mead, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 18, 1973, Ser. No. 380,173

Int. Cl.^{2} C10G *11/04*; B01J *8/24*

U.S. Cl. 208—120 **8 Claims**



1. In a process for converting hydrocarbons in the presence of fluidized catalyst particles followed by stripping of the catalyst particles to remove entrained hydrocarbonaceous material prior to regeneration of the catalyst particles to remove deposited carbonaceous material by burning thereby heating the catalyst particles to an elevated temperature the improvement which comprises combining hot freshly regenerated catalyst particles with deactivated catalyst particles comprising carbonaceous material in a mixing zone prior to discharge into a dense fluid bed of catalyst particles, passing a second stream of hot regenerated catalyst particles separately and directly to said dense fluid bed in an amount providing a dense bed temperature of at least 1,175° F and a ratio of regenerated catalyst particles to deactivated catalyst particles within the range of 0.5 to 1.5/1, introducing pre-heated oxygen containing gas to the lower portion of said dense fluid catalyst bed in an amount promoting the combustion of carbonaceous material and entrainment of particles of catalyst in combustion flue gases overhead into an upflowing dispersed catalyst phase, maintaining a ratio of oxygen containing regeneration gas with entrained catalyst particles in said dispersed catalyst phase sufficient to promote combustion of combustible material and provide regenerated catalyst particles at a temperature of at least 1,350° F, and recovering regenerated catalyst particles from said dispersed catalyst phase for recycle and use as above recited and for passage to said hydrocarbon conversion operation.

4,035,285

HYDROCARBON CONVERSION PROCESS

Hartley Owen, Belle Mead, and Paul B. Venuto, Cherry Hill, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed May 28, 1974, Ser. No. 473,608

Int. Cl.^{2} C10G *11/04*; C01B *29/28*; B01J *8/24*

U.S. Cl. 208—120 **14 Claims**

1. A method for cracking high boiling hydrocarbons to products including gasoline which comprises passing a hydrocarbon feed material higher boiling than gasoline in admixture with a gasiform material comprising non-hydrocarbon materials contributing non-molecular mobile hydrogen and/or carbon-hydrogen fragments at the reaction conditions employed in contact with a combination of crystalline zeolite cracking materials providing a pore size within the range of 4 to 15 Angstrom units, maintaining reaction conditions including a pressure below 100 psig and a cracking temperature within the range of 400° to 1200° F to effect reaction between formed mobile hydrogen fragments and/or carbon-hydrogen fragments with products of cracking said high boiling hydrocarbon feed and recovering products of said cracking operation contributing to the formation of and forming gasoline boiling range products.

4,035,286

OCTANE UPGRADING OF LIGHT NAPHTHA STREAMS USING A FLUOROALKANESULFONIC ACID-ANTIMONY PENTAFLUORIDE MIXTURE

David A. McCaulay, Homewood, Ill., and Thomas D. Nevitt, Valparaiso, Ind., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Dec. 20, 1972, Ser. No. 316,860

Int. Cl.^{2} C10G *35/06*

U.S. Cl. 208—134 **6 Claims**

1. A process for increasing the octane rating of a light naphtha composed primarily of substantially dearomatized C_5 or C_6 hydrocarbons or a mixture thereof and at least some methylcyclopentane or cyclohexane to reduce run-away cracking comprising:

a. intimately contacting under isomerizing conditions said light naphtha with antimony pentafluoride and at least one fluoroalkane-sulfonic acid of formula RCF_2SO_3H wherein $R = Cl, F, CF_3, CF_2Cl, CF_3CFCl, C_2F_5, C_3F_7, CF_2SO_3H$, or C_4F_9, and

b. subsequently separating said mixture of antimony pentafluoride and at least one fluoroalkanesulfonic acid from the product of step (a).

4,035,287

DESULFURIZATION OF RESIDUAL OIL

Wilton F. Espenscheid, Princeton, and Tsoung-Yuan Yan, Trenton, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Aug. 25, 1975, Ser. No. 607,159

Int. Cl.^{2} C10G *21/10*

U.S. Cl. 208—242 **12 Claims**

1. A method for desulfurization of an oil stock having a minimum sulfur content of about 2 weight percent and a minimum metals content of about 50 ppm to produce a low-sulfur, high-metals content raffinate and a high-sulfur, low-metals content extract which comprises contacting said oil stock with liquid sulfur dioxide solvent at a temperature of from about 60° F to about 212° F, a solvent/oil stock volume ratio of from about 0.25 to about 10 and a pressure higher than the vapor pressure of the solvent at the contacting temperature, and separating the low-sulfur, high-metals content raffinate from the high-sulfur, low-metals content extract.

4,035,288

FLUIDIZED BED SEED SEPARATOR

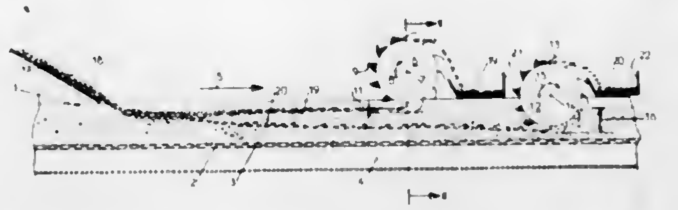
Francois Gibert, Tour n° 4, La Feuilletiere-Villars (Loire), and Gerard Champet, 16 Rue Evrard, La Talaudiere (Loire), both of France

Filed Aug. 8, 1974, Ser. No. 495,118

Claims priority, application France, Aug. 6, 1973, 73.29274

Int. Cl.^{2} B03B *5/46*

U.S. Cl. 209—466 **18 Claims**



1. A device for sorting bodies of different densities by floating said bodies in a fluidized bed of solid particles, comprising:

a diffuser including an enclosure having a horizontal porous bottom which serves to support thereon a fluidized bed constituted by a mattress of calibrated micro-balls contained within said enclosure;

at least one paddle wheel which rotates about suitable horizontal axis means disposed above said fluidized bed so as to permit the paddles of said paddle wheel to dip into said particles of said fluidized bed;

said diffuser being provided with suitable moving means to cause said diffuser to move forward in longitudinal direction to pass under said paddle wheel;

the lower paddles of said paddle wheel being constituted by a comb;

said comb having teeth which are spaced greater than the average size of said particles of said fluidized bed and smaller than the average size of the grade of said bodies to be separated.

4,035,289

PURIFYING TREATMENT FOR EFFLUENTS OF MINERAL OIL DRILLINGS

Michel Guillerme; Jaime Gratacos, both of Morlaas; Andre Sirvins, and Bernard Tramier, both of Pau, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Courbevoie, France

Filed Nov. 25, 1975, Ser. No. 635,179

Claims priority, application France, Nov. 26, 1974, 74.38681

Int. Cl.^{2} C02C *1/02*

U.S. Cl. 210—11 **7 Claims**

1. A method of purifying effluent from oil well drilling in order to degrade polysaccharide and lignosulfonates drilling adjuvants contained therein which comprises:

a. acidifying said effluent to precipitate clay contained therein;

b. separating the precipitate thus formed;

c. bringing the liquid separated from the clay to about neutral pH;

d. mixing said neutralized liquid with a bacterial culture obtained by aerobic growth of sewage or soil bacteria in an aqueous medium which contains oil well drilling additive and nutrient substances bearing only nitrogen and phosphorus exclusive of carbon;

e. adding additional nitrogen and phosphorus bearing nutrient substances necessary for bacterial growth to said mixture and allowing the resulting mixture to stand in aerobic condition until the bacteria have substantially grown and until the biochemical oxygen demand of the mixture is decreased to below a predetermined limit;

f. separating the purified liquid produced in (e) from the mixture, and recovering a fraction of the remaining bacteria mycelium; and

g. mixing the purified liquid separated in step (f) with conventional chemical flocculating agents and separating the precipitate formed thereby.

4,035,290

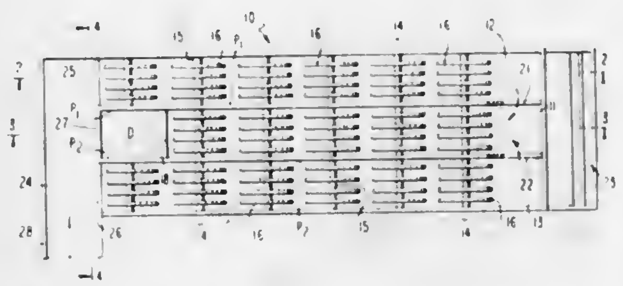
METHOD FOR THE TREATMENT OF WASTEWATER

Wilbur N. Torpey, Douglaston, N.Y., assignor to Autotrol Corporation, Milwaukee, Wis.

Continuation-in-part of Ser. No. 364,508, May 29, 1973, Pat. No. 3,905,899, which is a division of Ser. No. 306,584, Nov. 15, 1972, Pat. No. 3,776,841. This application Sept. 11, 1975, Ser. No. 612,298

Int. Cl.^{2} C02C *1/04*

U.S. Cl. 210—14 **6 Claims**



1. A method for the continuous treatment of wastewater, comprising the steps of:

providing a treatment tank having:

a horizontally disposed baffle extending longitudinally of and across said tank and separating said tank into an upper biological treatment zone and a vertically adjacent lower settling zone extending across the full tank width;

partition means extending along the length of the tank transverse to said physical means and dividing said biological treatment zone into a central bay and a left and a right secondary bay, each of said secondary bays being horizontally adjacent said central bay;

each of said primary and secondary bays including a plurality of biological contactors partially submerged in said wastewater;

said contactors being disposed parallel to the direction of wastewater flow through said primary and secondary bays;

an inlet at one end of said tank; and

an outlet at the opposite end of said tank;

introducing a first stream of wastewater into said left secondary bay at said inlet end of said tank;

introducing a second stream of wastewater into said right secondary bay at said inlet end of said tank;

creating a parallel flow of said first and second streams through the left and right secondary bays in the same direction away from said inlet end;

rotating said biological contactors in said left and right secondary bays to biologically treat said first and second steams of wastewater while flowing away from said inlet end;

horizontally directing said first and second streams into said primary bay to combine said streams;

creating a flow of said combined first and second streams through said primary bay in a direction countercurrent to the flow of said first and second streams through said left and right secondary bays and toward said inlet end;

rotating said biological contactors in said primary bay to biologically treat said combined first and second streams;

vertically directing said combined first and second streams from said primary bay to said lower settling zone at said inlet end;

creating a flow of said combined first and second streams through said lower settling zone in a direction countercurrent to the flow of said combined first and second streams in said primary bay and away from said inlet end; and

removing said combined first and second streams from said lower settling zone at said outlet end

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4,035,291

PROCESS FOR SEPARATING AQUEOUS FORMALDEHYDE MIXTURES

Robert Chiang, Ballwin, and Eli Perry, St. Louis, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 191,097, Oct. 20, 1971, Pat. No. 3,950,247, and a continuation of Ser. No. 46,801, June 16, 1970, abandoned. This application Jan. 5, 1976, Ser. No. 646,455

Int. Cl.² B01D *13/00*

U.S. Cl. 210—23 R **8 Claims**

1. Process for the separation of water from feed mixtures comprising water and formaldehyde which comprises contacting the aforesaid mixture against one side of a membrane comprising a copolymer of non-nitrogen containing monomer and a copolymerizable sulfonate-substituted monomer and withdrawing, at second side, a vaporous mixture having a higher concentration of water than the aforesaid feed mixture, with the mixture at second side being maintained at a lower chemical potential than the feed side.

4,035,292

FLUID SOLID CONTACT PROCESS AND APPARATUS

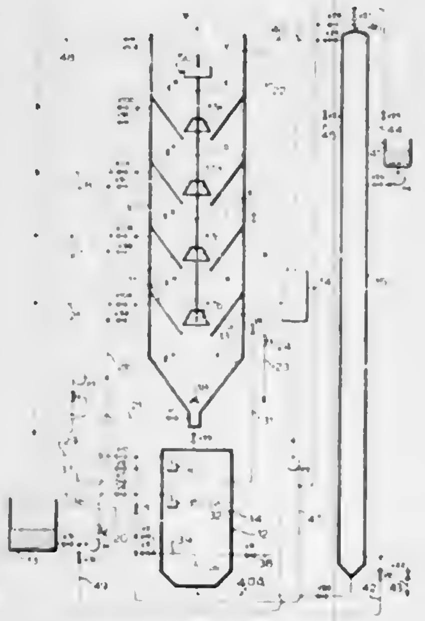
Alexander Himsley, Toronto, Canada, assignor to Himsley Engineering Limited, Toronto, Canada

Continuation-in-part of Ser. No. 399,515, Sept. 21, 1973, abandoned. This application May 12, 1975, Ser. No. 576,872

Claims priority, application Canada, Nov. 16, 1972, 156574

Int. Cl.² C01G *43/00*

U.S. Cl. 210—33 **16 Claims**



1. A continuous process for contacting fluids with solid particles comprising:

introducing untreated fluid into one end of a fixed, vertical contacting column, causing said fluid to flow vertically through a plurality of superposed contacting chambers, adjoining contacting chambers in all of the superposed chambers being separated by baffle members and each contacting chamber having openings in the top and bottom thereof through the baffle members for flow of fluid therethrough, the openings being provided with means acting in combination with the baffles to prevent solid particles passing therethrough upon cessation of fluid flow through the column, and continuously removing treated fluid from the other end of the column,

a substantially equal portion of said solid particles being located in each of said contacting chambers and said solid particles being retained in the contacting chambers in a fluidized state by maintaining the flow of fluid through the openings in the chambers such as to prevent movement of the solid particles between adjoining contacting chambers,

periodically removing solid particles substantially completely from the contacting chamber at the said one end of the column into a backwash chamber by reducing the rate of flow of untreated fluid from the said one end of the column through the contacting chamber at said one end and inducing flow of fluid into said backwash chamber, directing a flow of fluid equivalent to that induced into said backwash chamber out of said backwash chamber and back into the contacting chamber at the said one end of the column at a location adjacent the contacting chamber next in the direction of flow of fluid, and, commencing with the said contacting chamber next in the direction of flow of fluid to said contacting chamber at the said one end of the column, causing the solid particles to be transferred progressively and substantially completely through said openings from each chamber to the adjoining chamber in the direction opposite to the flow of fluid through the column by successively reducing the rate of flow of fluid through said each chamber until the solid particles in the chamber at the said other end of the column have been substantially completely removed therefrom and transferred into the adjoining contacting chamber, said baffle members being arranged to allow the substantially complete removal of solids from and to prevent accumulation of solids in any chamber, said transfer from each chamber to the adjoining chamber being affected by reducing the rate of flow of fluid within the column between said adjoining chamber and said each chamber, to allow movement of solids from said each chamber to said adjoining chamber, by providing, only during transfer of solids from said each chamber to said adjoining chamber, an external bypass for the flow of fluid from said adjoining chamber to said each chamber, while retaining the solid particles in the remaining chambers by the flow of fluid therethrough and, while continuing the flow of untreated fluid into the column and of treated fluid out of the column, and, when progressive transfer of solids through the column with resulting transfer of solid particles from the chamber at the other end of the column to its adjoining chamber has been completed, introducing a fresh substantially equal portion of solid particles into the chamber at the said other end of the column.

4,035,293

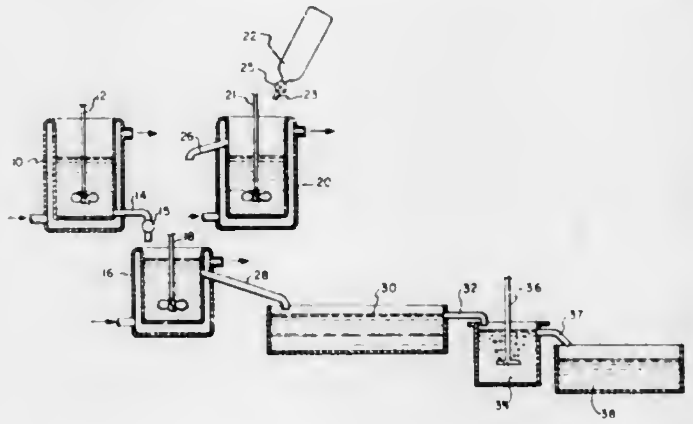
PROCESS FOR TREATING AN ACIDIC WASTE WATER STREAM

Antoine Benoit, Sint Martens Latem; Sylvain A. R. Dewaele, Evergem, and Andre Verhelst, Lokeren, all of Belgium, assignors to s.A. Texaco Belgium n.V., Brussels, Belgium

Filed July 17, 1975, Ser. No. 596,708

Int. Cl.² C02B *1/20*

U.S. Cl. 210—45 **5 Claims**



1. A continuous process for purifying an acid effluent having a pH of 1.2 to 3 said effluent being an aqueous residue resulting from a methanol distillation in a process for manufacturing mono (beta-hydroxyethyl) alkene thiophosphonate and containing phosphonic acids of general formula $C_nH_{2n+1}PO_3H_2$ where $n = 12$ to 24 and phosphoric acid in a ratio of up to 75 to 25, comprising, in combination: contacting said effluent with a slurry of 55 to 93 weight percent of a reagent of the group of calcium oxide and calcium hydroxide based on the amount of said acids present in said effluent, mixing said effluent and said slurry in a reaction zone, maintaining the resulting mixture in said zone at a temperature of between about 80° and 100° C for between 1 and 30 minutes, to raise and maintain the pH of said effluent between 8 to 12 and form a precipitate and a clear aqueous phase and then continuously separating said precipitate from said phase.

4,035,294

PRESSURE DIFFERENTIAL FILTERING DEVICE AND METHOD

Donald R. Landers, Ridgefield, Conn.; Walter Greenfield, Ardsley, and Peter D. Tukey, Tarrytown, both of N.Y., assignors to Denver Chemical Manufacturing Company, Stamford, Conn.

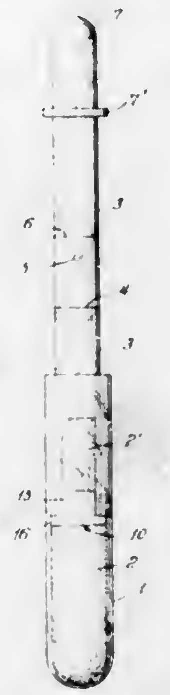
Filed May 23, 1975, Ser. No. 580,175

Int. Cl.² B01D *33/00*

U.S. Cl. 210—77 **5 Claims**

1. In a pressure differential filtering device which comprises an outer tube adapted to hold a liquid to be filtered and an inner tube having a pressure differential filter head at the end thereof adapted to be inserted into the outer tube in contact with the liquid to be filtered and to engender a pressure thereon which causes the liquid to pass through the filter head into the inner tube, the point to which the liquid rises in said inner tube being designated herein as the normal liquid level, the combination in which the inner tube has a uniform diameter throughout its length, a filter-head portion adapted to receive the liquid which passes through the filter head into the inner tube and a closed-end portion at the opposite end of the tube from the filter head, said closed-end portion being a continuation of the filter-head portion and united therewith by means of a frangible seam, and an air vent for exiting air from said inner tube, said air vent being a small hole in the wall of said inner tube but located between the filter head and said frangible seam above the normal liquid level of said inner tube, said closed-end portion being separable from said filter-head portion by breakage of said frangible seam, whereby, when the inner tube containing filtered liquid is inverted, the filtered liquid flows into the closed-end portion and the filter-head portion can then be separated therefrom, leaving the closed-end portion to serve as a tube for the further processing of the filtered liquid.

2. A method for the handling of liquids which have to be filtered prior to further processing, which comprises forcing the liquid to be filtered through a filter head into a unitary tube having a filter-head portion and a closed-end portion and a uniform diameter throughout, venting air from said unitary tube through a small hole in the wall thereof located above the level liquid rises to in said tube, inverting the tube so that the filtered liquid collects in the closed-end portion, circumferentially scoring said unitary tube at a point between said vent and said closed end located above the level liquid reaches when the tube is inverted, breaking off and removing the filter-head portion from the closed-end portion containing the filtered liquid for the said further processing.



4,035,295

FILTERING ARRANGEMENT FOR INTERNAL COMBUSTION ENGINES

Heinz Pluequet, Cologne, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Cologne, Germany

Filed May 19, 1975, Ser. No. 579,010

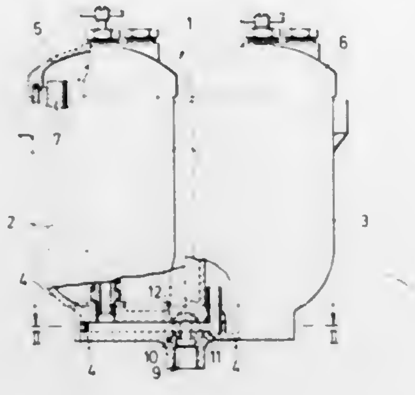
Claims priority, application Germany, May 17, 1974, 2424180

Int. Cl.² B01D *29/42*

U.S. Cl. 210—136 **4 Claims**

1. A filter arrangement for internal combustion engines, especially for filter fuel and oil, which includes: filter housing means, at least two filtering units arranged in said filter housing means, a plurality of filtering inserts respectively arranged in said filtering units for receiving the medium to be filtered between said filtering inserts and the interior of the pertaining filter housing means, said filtering arrangement being provided with an inlet connection common to all filtering units and with an outlet connection common to all filtering units, said filtering arrangement also being provided with a discharge connection communicating with the lowermost areas of the interior of said filter housing means, change-over valve means built into said inlet and outlet connections and operable selectively to place said filtering units individually and

together into and out of communication with said inlet and outlet connections and with said discharge connection, and shut-off valve means associated with said change-over valve means and operable to establish communication of the interior of said filter housing means pertaining to that filter unit which is disconnected from said outlet connection with said discharge connection, said change-over valve being designed as a rotary valve comprising a star wheel for said inlet connection and a star wheel for said outlet connection, said change-over valve being provided with a bore having an inner end communicating with said discharge connection, first and second conduit means for respectively establishing communication between said inner end of said bore with said discharge connection and between said inner end of said bore and the interior of said filter housing means, and spring-loaded check valve means respectively arranged in said first and second conduit means and continuously urged to their closing positions, said check valve means being movable by said change-over valve to its open position.



4,035,296

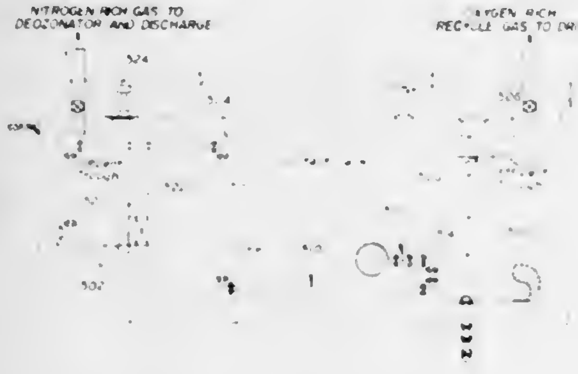
SYSTEM FOR POLLUTION SUPPRESSION

Edward T. Armstrong, Butler, N.J., assignor to TII Corporation, Lindenhurst, N.Y.

Division of Ser. No. 531,095, Dec. 9, 1974, Pat. No. 3,998,714, which is a continuation-in-part of Ser. No. 355,738, April 30, 1973, Pat. No. 3,853,764, which is a continuation-in-part of Ser. No. 100,333, Dec. 21, 1970, Pat. No. 3,730,881, which is a continuation-in-part of Ser. No. 813,382, Feb. 28, 1969, Pat. No. 3,549,528, which is a continuation-in-part of Ser. No. 362,118, April 23, 1964, abandoned. This application Sept. 24, 1975, Ser. No. 616,482

Int. Cl.^{2} C02C *1/04*

U.S. Cl. 210—151 **8 Claims**


NITROGEN RICH GAS TO DEOZONATOR AND DISCHARGE
OXYGEN RICH RECYCLE GAS TO DRIER

1. A waste treatment system for the production of low ammonia effluent comprising,

a nitrification tower having a packed bed,
a conduit for feeding secondary treatment effluent from a waste treatment system to said packed bed,
a high turbulence causing means located in said conduit for mixing said effluent,
said high turbulent causing means being a flat plate orifice, said flat plate orifice effecting a vena contracta portion in said effluent,
said vena contracta portion located in the central portion of said conduit,
said flat plate orifice having a diameter of from about 0.7 to about 0.9 conduit diameters,
a small tube aerator means for introducing oxygen into said effluent to aerate said effluent,
said small tube having a tip, said tip located in said conduit in the vicinity of said vena contracta so that said oxygen is mixed with said effluent, said small tube tip being located at about 0.25 to about 0.5 conduit diameters downstream from said flat plate orifice.

4,035,297

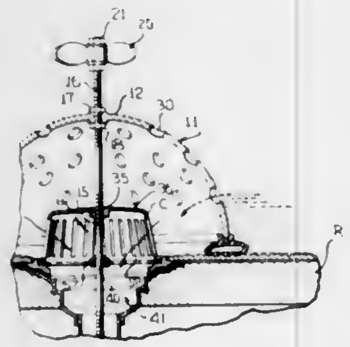
CLOSURE FOR ROOF DRAIN

Malcolm G. Aldridge, 836 Laurel Ave., Macon, Ga. 31201, and William E. Aldridge, 1522 N. 59th St., Kansas City, Kans. 66102

Filed Nov. 13, 1975, Ser. No. 631,648

Int. Cl.^{2} E03F *5/06*

U.S. Cl. 210—163 **3 Claims**



1. The combination of a roof, roof drain and closure device, said roof drain being defined by an opening in said roof for draining water therefrom, a closure device including an inverted generally cup-shaped cap, said cap having an apex portion and a peripheral skirt, said peripheral skirt having a lowermost peripheral edge portion terminating in a peripheral terminal edge, peripheral sealing means carried by said peripheral terminal edge for sealingly engaging a peripheral area of said roof outboard of said roof drain in closed position of said closure device, said peripheral skirt being devoid of aperture means from said peripheral terminal edge to a predetermined height thereabove, aperture means above said peripheral edge portion beginning at said predetermined height whereby in said closed position water will accumulate upon said roof to a height generally equal to said predetermined height, rod means connected to said apex portion, and means for connecting said rod means to said roof drain whereby upon axial motion of said rod means said peripheral sealing means will be brought into and out of contact with said perhperal area to respectively form and break a seal between the latter and said peripheral sealing means.

4,035,298

AQUARIUM FILTER

Stanley S. Cloke, and Theodore F. Keglta, both of Seattle, Wash., assignors to Con*Gor, Inc., Kent, Wash.

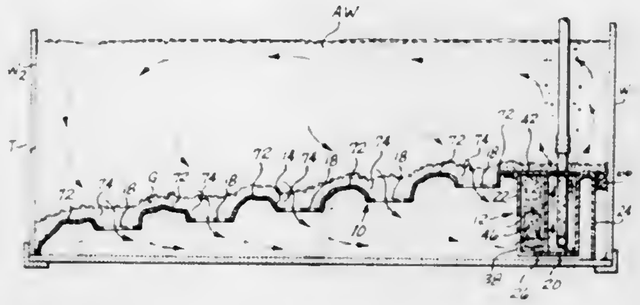
Filed Aug. 20, 1975, Ser. No. 606,027

Int. Cl.^{2} E04H *3/20*

U.S. Cl. 210—169 **13 Claims**

1. Aquarium tank filtering apparatus, comprising:

a base member insertable into an aquarium tank to be supported on the bottom of the aquarium tank, said base member including a top wall that is substantially equal in width and length dimensions to the bottom of the aquarium tank in which said base member is to be used, and means for supporting said top wall above the aquarium tank bottom, so as to form a space in the aquarium tank below said top wall, said base member including an elongated socket extending substantially along a full side thereof, and a plurality of spaced apart water passage openings in said top wall;
an elongated pump housing removably received in said elongated socket, said pump housing containing a pump chamber which extends substantially the full length of said housing, said pump chamber having inlet means for receiving water from the space below said top wall and a lid including a plurality of spaced apart outlet openings;
an elongated air discharge tube extending length-wise of said pump housing, generally along the bottom of the pump chamber, said air discharge tube including a plurality of spaced apart discharge openings; and



means for supplying air into said air discharge tube, whereby during use of said apparatus in conjunction with an aquarium tank containing water, said air will be discharged out of said discharge tube via said discharge openings, and will flow upwardly through said pump chamber and out through said outlet openings, to in use cause circulation of aquarium water from a region adjacent said outlet openings, laterally across the aquarium tank from said pump housing and over the top wall of the base member, and downwardly through the water passage openings in said top wall, into the space below said top wall, then into the pump chamber via said inlet means, and then upwardly through said pump chamber, and outwardly from said pump chamber via said outlet openings, and back into the aquarium tank space above the base member.

4,035,299

METHOD OF INITIATING A FLUID FLOW WITHIN A SIPHON TUBE BETWEEN AN AQUARIUM AND ITS ASSOCIATED FILTER TANK

Crine Vroeginday, 187 Livingston St., Clifton, N.J. 07013

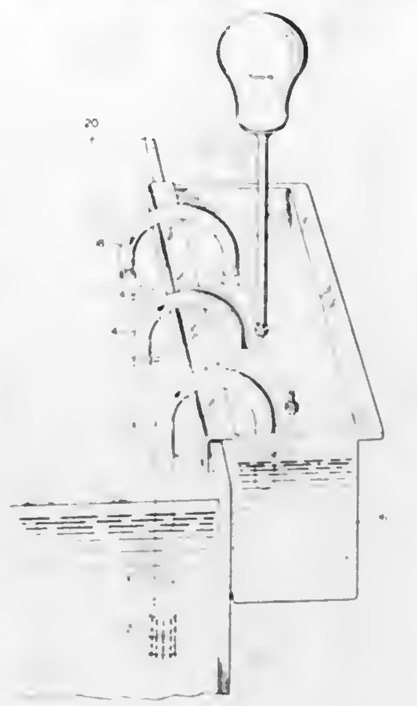
Filed May 13, 1975, Ser. No. 577,308

Int. Cl.^{2} E04H *3/20*

U.S. Cl. 210—169 **2 Claims**

1. An aquarium filter system comprising an aquarium, a filter tank associated therewith and at least one siphon tube extending therebetween, said siphon tube comprising a generally U-shaped structure possessing a first long arm extending into said aquarium, a second short arm extending into said filter tank, and a vertically extended U-bend connecting said long arm and said short arm, the improvement wherein a tube of reduced diameter is provided with one end thereof in operative connection with said siphon tube at the apex of said U-bend, said reduced diameter tube traveling partially down one side of said U-bend adjacent said short arm and terminating in an abruptly U-shaped, open ended, upwardly turned fluid trap; and a siphon bulb detachably attached to said fluid trap,

wherein compression of said siphon bulb expels air completely from said reduced diameter tube and said siphon tube, and wherein release of compression of said siphon bulb results in the expansion of said bulb and causes water to enter and fill said siphon tube, said reduced diameter tube and said fluid trap, whereby detachment of said siphon bulb from said fluid trap prevents the reentry



of air into said reduced diameter tube and said siphon tube.

4,035,300

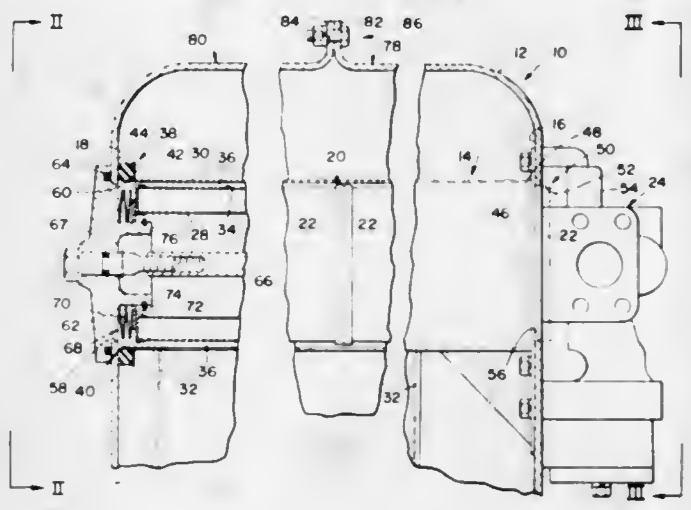
FILTER ARRANGEMENT WITH ALLOWANCES FOR MANUFACTURING TOLERANCES

Edward L. Stapleton, and John B. Waggoner, both of Joliet, Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 30, 1976, Ser. No. 718,693

Int. Cl.^{2} B01D *27/08*

U.S. Cl. 210—172 **5 Claims**



1. In a hydraulic reservoir which comprises a tank having internally thereof filter means attached longitudinally between a first and a second generally parallel side thereof, said filter means including generally tubular filter element means extending generally longitudinally between said first and second sides of said tank and means for introducing a hydraulic fluid from an exterior of said tank to an interior of said element means from adjacent said first side of said tank, an improvement comprising:

a tube within said tank surrounding said element means and extending longitudinally generally the length thereof, said tube including exit means therethrough through which said hydraulic fluid passes after passage thereof from the interior to an exterior of said element means; and
means for compressibly sealing a first end of said tube adjacent said second side of said tank.

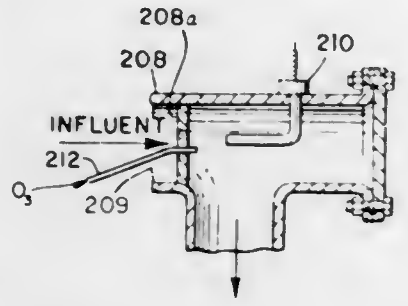
4,035,301
SYSTEM FOR POLLUTION SUPPRESSION

Edward T. Armstrong, Butler, N.J., assignor to TII Corporation, Lindenhurst, N.Y.

Division of Ser. No. 531,095, Dec. 9, 1974, Pat. No. 3,998,714, which is a continuation-in-part of Ser. No. 355,738, April 30, 1973, Pat. No. 3,853,764, which is a continuation-in-part of Ser. No. 100,333, Dec. 21, 1970, Pat. No. 3,730,881, which is a continuation-in-part of Ser. No. 813,382, Feb. 28, 1969, Pat. No. 3,549,528, which is a continuation-in-part of Ser. No. 362,118, April 23, 1964, abandoned. This application Sept. 24, 1975, Ser. No. 616,485

Int. Cl.² B01F *3/04*

U.S. Cl. 210—220 **11 Claims**



1. A surge suppression system for dampening surge pressures comprising,

a force main carrying a liquid,

a flat plate orifice, said flat plate orifice causing a downstream vena contracta portion in said liquid,

said flat plate orifice located in said main,

the diameter of said orifice ranging from about 0.7 to about 0.9 of the diameter of said main,

an injector means for introducing an amount of a gas into said main,

said injection means having a small pipe, said pipe having a tip,

said gas flowing through said pipe tip,

said pipe tip located in said vena contracta portion so that said gas is dispersed into said liquid,

said small pipe tip being located at about 0.25 to about 0.5 main diameters downstream from said flat plate orifice,

said vena contracta portion located in the central portion of said main,

and the amount of said introduced gas being in excess of that required to saturate said liquid so as to dampen surge pressures.

4,035,302
APPARATUS FOR SEPARATING OIL AND WATER

Masao Seo, and Yasu Seo, both of Chofu, Japan, assignors to Masao Seo, Chofu, Japan

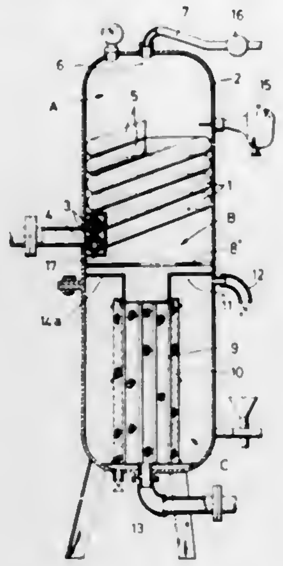
Filed July 6, 1976, Ser. No. 703,110

Claims priority, application Japan, July 16, 1975, 50-126410

Int. Cl.² B01D *21/02*

U.S. Cl. 210—304 **9 Claims**

1. Apparatus for separating oil and water comprising a vertical treating chamber, an upwardly ascending helically coiled pipe disposed in said chamber, a plurality of parallel members in said pipe defining laminar flow passages therein, said pipe having first and second open upper and lower ends, means for supplying a mixture of oil and water to be separated from outside said chamber to one of said open ends of the pipe, said other open end of the pipe being open in said chamber for discharge thereto of agglomerated oil particles formed on said parallel members and separated water still containing fine oil particles, said treating chamber defining, above said other open end of the pipe, an oil accumulating portion for the agglomerated oil particles, means communicatin with said oil accumulation portion for discharging oil particles externally from the treating chamber, a flow distribution section in said chamber below said other open end of the pipe for receiving the separated water from said pipe, distributing means at the bottom of the flow distribution section for distribution of the separated water therebelow, a fine separating section in said treating chamber below said distributing means for receiving the separated water for removal of fine oil particles from said separated water, and a cylindrical filter tube in said fine separating section including a wall constituted by a filter layer composed of a mixture of lipophilic and hydrophilic fibers through which said separated water flows such that the remaining fine oil particles in the separated water are adsorbed by the filter layer and agglomerate on one side of the filter tube and flow upwardly, means for receiving and discharging agglomerated oil particles externally of the treating chamber, and means for discharging water freed from the fine oil particles from the bottom of the fine separating section externally of the treating chamber.



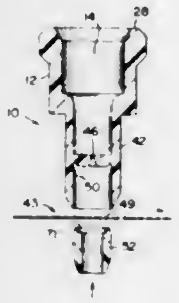
4,035,303
OPEN MESH FILTER ELEMENT

Roger K. Ufferfilge, Cary, Ill., assignor to Seaquist Valve Company, Cary, Ill.

Filed Jan. 16, 1976, Ser. No. 649,906

Int. Cl.² B01D *25/04*

U.S. Cl. 210—316 **16 Claims**



1. A valve structure of the type primarily designed for use with a sealing washer and a stem sealer having a stem internal orifice and with a fluid dispenser, said valve structure comprising: an integral valve body having a sealing surface in proximity to one end of said valve body adapted for sealing with the sealing washer; said valve body having a valve chamber defined within said valve body adjacent said sealing surface for receiving the stem sealer, said integral valve body including orifice means disposed in fluid communicating relation between said valve chamber and the exterior of the other end of said valve body; said valve body configured to at least partially define a path of fluid flow, whereby fluid within the dispenser flows along said orifice means and through said valve chamber into the stem orifice upon the stem sealer being displaced relative to the sealing washer; a filter chamber integrally formed in said valve body adjacent said other end of said valve body; filter means formed from an apertured, open mesh material fixedly secured within said filter chamber of said integral valve body and disposed in interruptive relation to said path of fluid flow upstream of said orifice means, whereby fluid passing through said valve chamber from said dispenser passes through said filter means.

4,035,304
BLOOD FILTERING BAG

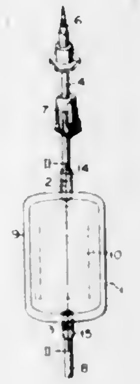
Masaharu Watanabe, Ichikawa, Japan, assignor to Terumo Corporation, Tokyo, Japan

Filed June 25, 1975, Ser. No. 590,080

Claims priority, application Japan, July 5, 1974, 49-79667[U]

Int. Cl.² A61M *5/46*

U.S. Cl. 210—317 **2 Claims**



1. A blood filtering bag comprising:

a flat bag formed of two sheets of flexible polyvinyl chloride resin, peripheral portions of the sheets being thermally fused together, forming a blood passageway between the sheets;

blood inlet and outlet provided on the bag body;

a support member of polyvinyl chloride resin thermally fused between the peripheral portions of said two sheets and having a substantial free area extending from said fused portions into the blood passageway; and

a flexible sheet-like filter formed of nylon filaments diagonally arranged in the blood passageway partitioning the same into a blood inlet side part and a blood outlet side part, the peripheral portion of the filter being thermally fused to the free area of said support member so that the filter is supported and sealed by said support member.

4,035,305
SUPPORT MEMBER CONSTRUCTION FOR SEMIPERMEABLE MEMBRANE

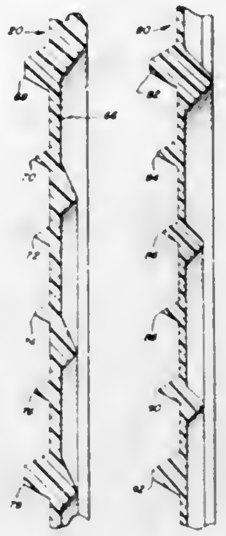
Jimmy L. Miller, Waukegan; William J. Schnell, Arlington Heights, and Ludwig Wolf, Jr., Barrington, all of Ill., assignors to Baxter Laboratories, Inc., Deerfield, Ill.

Filed Oct. 8, 1975, Ser. No. 620,542

Int. Cl.² B01D *13/00*

U.S. Cl. 210—321 B **5 Claims**

1. An elongated flexible support member for use in a coil dialyzer to support an elongated, tubularly shaped, semipermeable membrane, said support member comprising: an elongated imperforate fluid impermeable web; means on both sides of said web defining a plurality of elongated, generally parallel, membrane engaging ribs for supporting said membrane and for maintaining said membrane in spaced relation to said web, said rib means being arranged in generally angular relation to the length of said member, said ribs including a plurality of first ribs spaced from each other, and a plurality of second lower ribs, with at least one lower rib being positioned between each pair of adjacent first ribs, said first ribs and said lower ribs being arranged on at least one side of said web with at least said first ribs being configured to prevent ribs on the other side of said web from extending into spaces defined between said first ribs when said one side is positioned opposite the other side in supporting said membrane, said ribs extending from one longitudinal edge of said member to the other longitudinal edge and arranged in a generally overlapping relation so as to form a diamond-shaped pattern wherein the included angle formed by the overlapping ribs is between 60° and 140°.



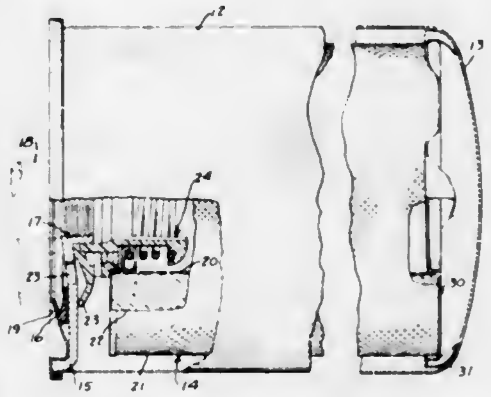
4,035,306
REMOVABLE CARTRIDGE FILTER

Gerald E. Maddocks, Cambridge, Calif., assignor to Sheller-Globe Corporation, Toledo, Ohio

Continuation of Ser. No. 589,389, June 30, 1975, abandoned. This application July 19, 1976, Ser. No. 706,747

Int. Cl.² B01D *27/06*

U.S. Cl. 210—440 **1 Claim**



1. A removable cartridge including

a filter element including

an annular filter portion through which fluid is adapted to flow, a first end member on one end of said annular filter portion closing the end of said annular filter portion and the space surrounded by said filter element at said one end, and a second end member closing the other end of said annular filter portion,

said first end member having circumferentially spaced integral spring members extending from the periphery of said first end member axially of said annular filter portion and adapted to be bent radially inwardly when said cartridge is inserted axially into a casing,

said spring members being connected to said body of said end member by interconnecting portions defining a flange which is U-shaped in longitudinal cross section with the legs of said U extending axially inwardly of said filter element and with the base of said U extending radially.

4,035,307
FABRIC CONDITIONER

Franklin Hornor Fry, Huntington Beach, Calif.; Orville Reinke, Oshkosh, Wis.; Wayne A. Marthaler, Ridgefield, Conn.; Richard K. Wylie, and Frederick C. Boye, both of Appleton, Wis., assignors to American Can Company, Greenwich, Conn.

Division of Ser. No. 430,651, Jan. 4, 1974. This application Apr. 1, 1976, Ser. No. 672,840

Int. Cl.² D06M *13/36*

U.S. Cl. 252—8.6 **12 Claims**

1. A method of conditioning fabrics which comprises commingling fabrics in a dryer with a solid fabric conditioner composition consisting essentially of a fabric conditioner adjuvant in admixture with diatomaceous earth, said composition being of sufficient hardness to exhibit a compressive strength of from about 8 to about 26 pounds per square inch, and operating said dryer for a period of time sufficient to effect application of said conditioner to said fabrics.

4,035,308
MONOALKYL BENZENE SYNTHETIC LUBRICANT

Thomas Anthony Schenach, Huntington Beach, Calif., assignor to Bray Oil Company, Los Angeles, Calif.

Filed Aug. 21, 1975, Ser. No. 606,475

Int. Cl.² C10M *1/16, 3/10, 5/08, 7/12*

U.S. Cl. 252—59 **4 Claims**

1. A synthetic hydrocarbon composition useful in the formulation of lubricants and power transmission fluids, said synthetic hydrocarbon being prepared by the addition of decene dimer to excess benzene in the presence of anhydrous aluminum chloride, and possessing the following properties:

a. A viscosity at 210° F. of from about 4 to 6 centistokes;
b. A viscosity index of about 100;
c. A flash point above 400° F.;
d. A pour point below −40°; and
e. A bromine number less than one

4. In an improved automobile crankcase lubricant suitable for low temperature conditions and comprising a major proportion of a lubricating oil base and, in amounts sufficient to achieve each additive's attendant function, conventional crankcase lubricating oil additives, the improvement wherein the lubricating oil base comprising a synthetic hydrocarbon composition with a 210° F viscosity of from about four to six centistokes, a viscosity index of about 100, a pour pont below −40°, and bromine number less than one, said hydrocarbon composition being prepared by the addition of decene dimer to excess benzene in the presence of anhydrous alunimum chloride, said decene dimer having a 100° F viscosity of between 4.5 and 6 centistokes, a bromine number above 50, and a pour point before and after hydrogenation of below −80° F, said dimer being prepared by the oligomerization of n-dencene-1 in the presence of a promoted boron trifluoride catalyst.

4,035,309
METAL-CONTAINING OXAZOLINE ADDITIVES AND LUBRICATING OILS CONTAINING SAID ADDITIVES

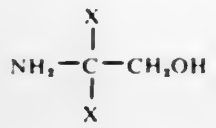
Stanley J. Brois, Wantage, England, assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 24, 1975, Ser. No. 561,202

Int. Cl.² C10M *1/10*

U.S. Cl. 252—49.7 **10 Claims**

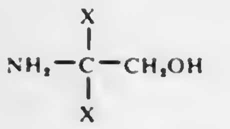
1. In a process for preparing oxazoline compounds wherein one molar equivalent of an alkenyl substituted succinic acid or alkenyl substituted succinic acid anhydride is reacted with one to two molar equivalents of a 2,2-di-substituted -2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbon atoms and represented by the formula:



$$\mathrm{NH_2{-}\overset{X}{\underset{X}{C}}{-}CH_2OH}$$

wherein X is an alkyl or hydroxy alkyl group and one of the X substituents being a hydroxyalkyl group of the structure $-(CH_2)_nOH$ wherein *n* is 1 to 3 at a temperature of from 140° to 240° C., the improvement which comprises conducting said reaction in the presence of from 0.01 to 10 wt. % based on the combined total weight of said reactants of a metal salt promotor of the class of a metal salt of a C_{1-8} hydrocarbyl carboxylic acid or metal oxide whereby said reaction time is shortened, said metal being of the class consisting of zinc, manganese, iron, cobalt and nickel.

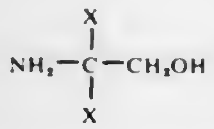
4. An oil soluble reaction product having a weight average molecular weight of from about 200 to 5000 obtained from the reaction of one molar equivalent of an alkenyl substituted succinic acid or alkenyl substituted succinic acid anhydride with from one to two molar equivalents of a 2,2-disubstituted-2-amino-1-alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbon atoms and represented by the formula:



$$\mathrm{NH_2{-}\overset{X}{\underset{X}{C}}{-}CH_2OH}$$

wherein X is an alkyl or hydroxy alkyl group and one of the X substituents being a hydroxyalkyl group of the structure $-(CH_2)_nOH$ wherein *n* is 1 to 3 at a temperature of from 140° to 240° C., said reaction product containing from about 0.01 to 6 wt. % metal of the class consisting of zinc, manganese, iron, cobalt and nickel, said metal present as a metal salt of a C_{1-8} hydrocarbyl carboxylic acid.

9. An oleaginous composition comprising a major amount of an oil of lubricating viscosity and at least a dispersant amount of an oil soluble oxazoline reaction product having a weight average molecular weight of from about 200 to 5000 obtained from the reaction of about one molar equivalent of an alkenyl substituted succinic acid or alkenyl substituted succinic anhydride reacted with from about one to two molar equivalents of a 2,2-disubstituted-2-amino-1 -alkanol having 2 to 3 hydroxy groups and containing a total of 4 to 8 carbon atoms and represented by the formula:



$$\mathrm{NH_2{-}\overset{X}{\underset{X}{C}}{-}CH_2OH}$$

wherein X is an alkyl or hydroxy alkyl group and one of the X substituents being a hydroxyalkyl group of the structure $-(CH_2)_nOH$ wherein *n* is 1 to 3 at a temperature of from 140° C. to 240° C., said reaction product containing from about 0.01 to 6 wt. % metal of the class consisting of zinc, manganese, iron, cobalt and nickel, said metal present as a metal salt of a C_{1-8} hydrocarbyl carboxylic acid.

4,035,310
YELLOW DEVELOPER

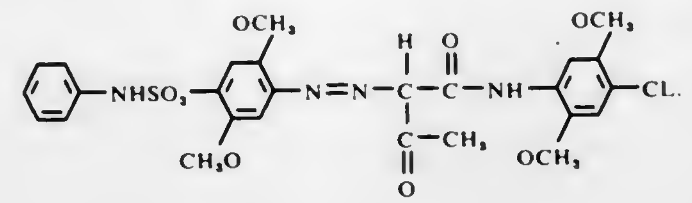
Joseph Mammino, Penfield, and Franklin Jossel, Rochester, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed July 28, 1975, Ser. No. 599,800

Int. Cl.² G03G *9/00*

U.S. Cl. 252—62.1 P **11 Claims**

1. An electrostatographic material for developing electrostatic latent images comprising a resin material and a colorant satisfying the formula:



4,035,311
ELECTRICAL INSULATING COMPOSITIONS BASED ON OLEFIN POLYMERS

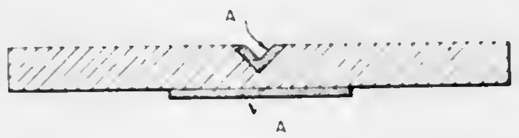
Franz Feichtmayr; Johannes Schlag, and Peter Bauer, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 23, 1976, Ser. No. 716,641

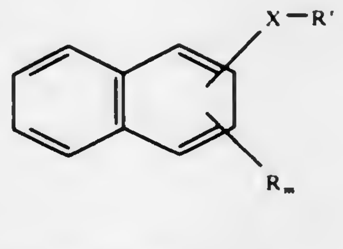
Claims priority, application Germany, Sept. 13, 1975, 2540870

Int. Cl.² H01B *3/30;* **C07C** *119/00;* **C08K** *5/29*

U.S. Cl. 252—63.2 **1 Claim**

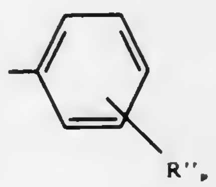


1. Electrical insulating compositions based on olefin polymers and containing thermally stable agents for increasing the long-term dielectric strength, wherein the said agent for increasing the longterm dielectric strength is a compound of the general formula



where

m denotes an integer of from 0 to 2,
X denotes a group of the formula -CH—N-,
R denotes methyl, hydroxyl, methoxy or ethoxy,
R' denotes a C_{2-8}-alkyl group, a cyclohexyl group or a group of the formula



where

p denotes an integer of from 0 to 4,
R'' denotes a C_{1-6}-alkyl group or a C_{1-6}-alkoxy group, provided that when *p* denotes an integer of from 2 to 4 the groups R'' are the same or different and the total number of carbon atoms in said groups R'' does not exceed 18.

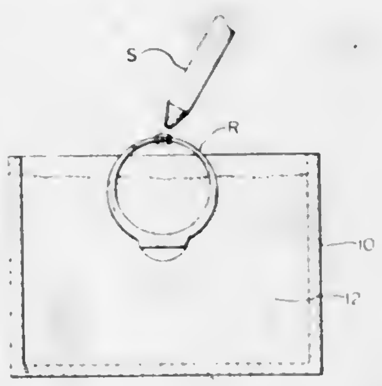
4,035,312
HEAT SHIELD COMPOSITION

Donald D. Banks, 812 Peterson St., Fort Collins, Colo. 80521

Division of Ser. No. 417,819, Nov. 21, 1973, Pat. No. 3,975,142. This application May 17, 1976, Ser. No. 687,259

Int. Cl.² C09K *5/00*

U.S. Cl. 252—70 **6 Claims**



1. A heat stable, inert composition for absorbing and dissipating heat flux, comprising the product formed by admixing about 100 parts by weight of asbestos, about 5 parts by weight of boric acid, between about 0.75 to 1 part by weight of glycerol, and between about 25 and 30 parts by weight of water, the product being of a consistency and nature particularly adapted to protect a portion of a heat-conductive article which is immersed in the composition from a heat flux applied to another, nonimmersed portion of the article.

4,035,313
MANUFACTURE OF SELF-EXTINGUISHING URETHANE GROUP-CONTAINING POLYISOCYANURATE FOAMS

Georg Falkenstein, Neustadt; Alfred Guthmann, Worms, both of Germany; John Hutchison, Trenton, Mich.; Peter Weyland, Ludwigshafen, and Gerd Blinne, Freinsheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Aug. 4, 1975, Ser. No. 601,940

Claims priority, application Germany, Aug. 9, 1974, 2438369

Int. Cl.² C08G *18/14*

U.S. Cl. 260—2.5 AN **4 Claims**

1. A process for the manufacture of a self-extinguishing urethane group containing polyisocyanurate foam, which comprises reacting, in the presence of a trimerization catalyst and optionally a urethane catalyst, an expanding agent and optionally auxiliaries and additives, an organic polyisocyanate with a polyester polyol having a molecular weight of from 800 to 3000 and hydroxyl numbers of from 140 to 35 in a ratio of hydroxyl to isocyanate groups of from 1:6 to 1:60, said polyester polyol being obtained by the condensation of an aliphatic dicarboxylic acid of from 4 to 12 carbon atoms with a mixture of a substituted or unsubstituted aliphatic dihydric alcohol of from 2 to 18 carbon atoms which may contain ether groups an N,N'-bis-(ethanol-2)-diaminooctachlorodiphenyl in a molar ratio of from 1.3:1 to 10:1.

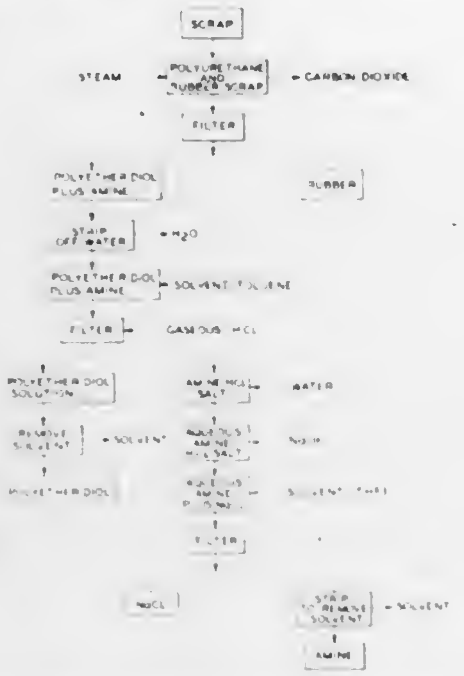
4,035,314
RECOVERY OF POLYURETHANE PREPOLYMER AND AMINE SALT

Delmar Frederick Lohr, Jr., and Edward Leo Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed June 2, 1975, Ser. No. 583,077

Int. Cl.^{2} C08J *11/04*

U.S. Cl. 260—2.3 **2 Claims**



1. The process which comprises hydrolyzing in steam a lamination of a hydrocarbon rubber and a polyurethane derived from a polyether diol and an amine, whereby the rubber is obtained as a solid, separating the rubber by physical means from the hydrolysis reaction product containing polyether diol and amine which are produced from the polyurethane , and treating said hydrolysis reaction product with gaseous hydrogen chloride and precipitating amine hydrochloride.

4,035,315
FIRE-RESISTANT STYRENE POLYMER FOAMS

Alvin R. Ingram, Murrysville, Pa., assignor to ARCO Polymers, Inc., Philadelphia, Pa.

Filed May 3, 1976, Ser. No. 682,700

Int. Cl.^{2} C08J *9/22*

U.S. Cl. 260—2.5 B **2 Claims**

1. A fire-resistant, partially foamed styrene polymer composition consisting essentially of pre-expanded styrene polymer particles of foam density 1 pound per cubic foot or less and having on the surface thereof a coating of at least 40 percent by weight, based on the weight of the coated particles, of intumescent paint solids consisting essentially of 15 to 30 percent by weight of a polymeric film-forming binder, and 85 to 70 percent by weight of a non-resinous intumescent solids consisting essentially of 30 to 80 percent by weight based on nonresinous solids of a spumific, 10 to 70 percent by weight based on weight of spumific of a carbonific, 5 to 20 percent by weight based on weight of spumific of a blowing agent, and up to 10 percent by weight based on weight of non-resinous solids of additives such as pigments, surfactants, thickeners, and the like.

4,035,316
CELL SPECIFIC, VARIABLE DENSITY, POLYMER MICROSPHERES

Shiao-Ping S. Yen; Alan Rembaum, both of Altadena, and Robert S. Molday, Pasadena, all of Calif., assignors to California Institute of Technology, Pasadena, Calif.

Filed Nov. 24, 1975, Ser. No. 634,929

Int. Cl.^{2} C08J *9/16*

U.S. Cl. 260—2.5 B **16 Claims**

1. A composition consisting essentially of a suspension of polymeric beads having an average diameter below 5 microns, having a density less than 1.15 g/cc or greater than 1.30 g/cc and comprising the cross-linked product of an ethylenically unsaturated monomer mixture including at least 10% by weight first ethylenically unsaturated monomer containing at least one substituent selected from hydroxyl, carboxyl or amino, at least 25% by weight of a second ethylenically unsaturated comonomer having a density differing from the first monomer by at least 15%, and 1–20% of a polyunsaturated cross-linking agent.

4,035,317
RAPIDLY DISSOLVING, WATER-SOLUBLE POLYMERS AND SPRAY DRYING METHOD FOR THEIR PRODUCTION

David Benedict Gershberg, Stamford, Conn., assignor to American Cyanamid Company, Stamford, Conn.

Filed June 30, 1975, Ser. No. 591,909

Int. Cl.^{2} C08J *9/00*

U.S. Cl. 260—2.5 N **25 Claims**

1. A method of recovering a free-flowing, porous and hollow water-soluble, polymer particle mixture from (A) a water-in-oil emulsion comprising

a. from about 30–90%, by weight, based on the total weight of the emulsion, of an aqueous phase comprised of
  1. from about 10–50%, by weight, same basis, of finely divided particles of a water-soluble vinyl addition polymer and
  2. from about 10–80%, by weight, same basis, of water,

b. from about 10–70%, by weight, same basis, of a liquid hydrocarbon and

c. from about 0.1–10%, by weight, same basis, of a water-in-oil emulsifying agent

which comprises spraying said water-in-oil emulsion, through one or more pressure nozzles having an orifice size of from about 0.01 to about 0.2 inch, into a gas stream at an outlet gas temperature of from about 212° F. to about the decomposition temperature of the polymer at a ratio of gas drying rate to emulsion feed rate of from about 2 to about 80 pounds of gas per minute per pound of emulsion per minute and at a dryer residence time of from about 40 seconds to about 180 seconds and recovering the resultant, free-flowing, particle mixture, (1) the particles of said particle mixture having a size no smaller than about 325 mesh, (2) at least 50% thereof having a size larger than about 120 mesh and (3) none thereof having a size larger than about 20 mesh, said mixture containing no more than about 12% of total volatiles, said particles being highly porous, hollow and having at least one opening in their walls, said walls being composed of small adhering aggregates of the same polymer composition.

4,035,318
HIGH RESILIENCE POLYURETHANE FOAM

Wilhelm J. Schnabel, Branford, and Ralph A. Colafati, III, New Haven, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Division of Ser. No. 540,048, Jan. 10, 1975, Pat. No. 3,952,043, which is a division of Ser. No. 416,043, Nov. 15, 1973, Pat. No. 3,904,666. This application Feb. 19, 1976, Ser. No. 659,302

Int. Cl.^{2} C08G *18/77*

U.S. Cl. 260—2.5 AT **9 Claims**

1. A flexible, high resilience polyurethane foam which is prepared from a reaction mixture comprising an organic polyisocyanate reactant, a polyol reactant, a foaming agent, a reaction catalyst, and, as a curing agent, addition to said organic isocyanate reactant bis(diisocyanatobenzyl)-chlorobenzene.

2. The polyurethane foam of claim 1 wherein said curing agent is comprised of said bis(diisocyanatobenzyl)-chlorobenzene and diisocyanatophenyl-chlorophenyl-methane, the weight ratio of bis(diisocyanatobenzyl)-chlorobenzene to diisocyanatophenyl-chlorophenyl-methane ranging from about 15:85 to about 60:40.

3. The polyurethane foam of claim 2 wherein said polyol is an oxypropylated, oxyethylated triol characterized by (a) a molecular weight of at least about 4,400, (b) a trifunctional alcohol nucleus, (c) polyoxypropylene chain segments attached at one end thereof to said nucleus, (d) polyoxyethylene chain segments attached at one end thereof to said polyoxypropylene chain segments, and (e) from about 7 to about 18 moles of ethylene oxide per each mole of said trifunctional alcohol.

4,035,319
NON-MIGRATORY HARDENERS

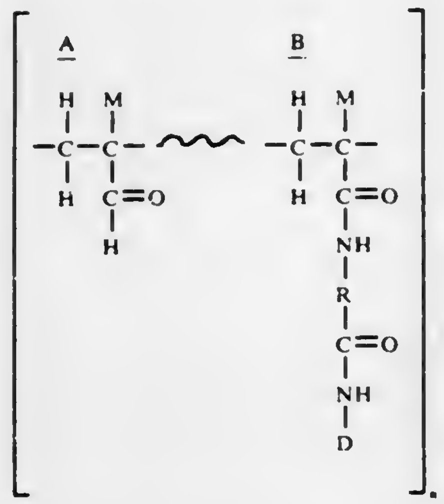
Howard C. Haas, Arlington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 185,433, Sept. 30, 1971, Pat. No. 3,762,927, which is a division of Ser. No. 862,929, Oct. 1, 1969, abandoned. This application May 2, 1973, Ser. No. 356,341

Int. Cl.^{2} C09H *7/00*

U.S. Cl. 260—8 **2 Claims**

1. A layer comprising gelatin and a copolymer as a hardener thereof which copolymer has a chain consisting of the entities A and B as defined below:



wherein: M is hydrogen or methyl;

R is an alkylene group comprising less than six carbon atoms or a substituted alkylene group comprising less than six carbon atoms;

D is hydrogen, methyl or ethyl; and

n represents the total number of A and B residues in the polymer chain and is an integer between about 25 to about 1000 and wherein the ratio of A to B entities is less than about 1:1.

4,035,320
RADIATION CURABLE COMPOSITIONS

Nelson E. Lawson, Trenton, N.J., assignor to Union Camp Corporation, Wayne, N.J.

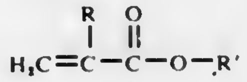
Continuation-in-part of Ser. No. 434,440, Jan. 18, 1974, abandoned, which is a continuation-in-part of Ser. No. 274,409, July 24, 1972, abandoned. This application Aug. 14, 1975, Ser. No. 604,488

Int. Cl.^{2} C09D *3/66, 3/81, 11/10*

U.S. Cl. 260—22 CB **7 Claims**

1. The polyacrylate reaction product of,

a. an equivalent excess of an acrylic compound of the formula:



$$H_2C=C(R)-C(=O)-O-R'$$

wherein R is selected from hydrogen and methyl; R' is selected from hydrogen, methyl and ethyl; and

b. a polyester polyol obtained by the condensation of
  i. an aliphatic polycarboxylic acid having a molecular weight of at least 325 and at least 19 carbon atoms, inclusive; with
  ii. an equivalent excess of an aliphatic polyol having at least two hydroxyl groups and a molecular weight of between about 60 to about 250; said reaction of (a) and (b) being under conditions wherein said acrylic compound does not polymerize.

4,035,321
PREPARATION OF ULTRAVIOLET CURABLE ACRYLATED POLYMERS

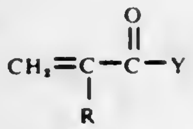
Iraj K. Shahidi, Florham Park, and John C. Trebellas, Berkeley Heights, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Mar. 24, 1975, Ser. No. 561,457

Int. Cl.^{2} C08F *263/06;* **C08L** *67/06, 67/08*

U.S. Cl. 260—22 CB **13 Claims**

1. A process for preparing an ultraviolet curable polymer having pendant acrylate or methacrylate groups which comprises co-reacting in the presence of a vinyl polymerization inhibitor and a nitrogen-oxygen sparge a polymer containing at least about two C-X moieties and having a number average molecular weight of less than about 10,000, with a monomer having the general formula



$$CH_2=C(R)-C(=O)-Y$$

wherein X is OH or COOH, R is hydrogen or methyl, and Y is OH when X is OH, and OR'OH when X is COOH, wherein R' is C_1–C_6 alkyl, utilizing as the reaction catalyst a reaction medium insoluble, essentially solid, acidic cationic exchange resin.

4,035,322

METHOD OF PREPARING CURABLE PELLETS OF POLYETHYLENE

Stanley L. Tate; Bobby A. Rowland, both of Carrollton, Ga., and Herbert M. Jacobs, Cooleenee, N.C., assignors to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 496,681, Aug. 12, 1974, abandoned. This application Apr. 10, 1975, Ser. No. 566,887

Int. Cl.^{2} C08L *91/00*

U.S. Cl. 260—23 H **8 Claims**

1. A method of preparing curable pellets of polyethylene and copolymers of polyethylene comprising the steps of:

a. fusing polymers such as polyethylene and copolymers thereof with fillers, lubricants and antitoxidants in a plasticating means until said fillers, lubricants and antioxidants are evenly dispersed throughout the polymers;

b. processing the final polymer, filler, lubricant, antioxidant mixture into pellets;

c. drying said pellets;

d. contacting and mixing said pellets with a stochiometric amount of a curing agent in an air fluid bed at a temperature below the softening point of said pellets and below the decomposition temperature of said curing agent with a continuous flow of turbulent air whereby said curing agent is coated upon and absorbed into said pellets

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4,035,323

STABILIZATION OF OLEFIN POLYMERS

Ronald D. Mathis, Taylors, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 6, 1975, Ser. No. 602,355

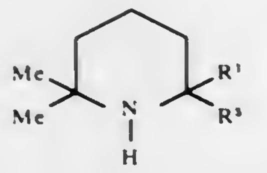
Int. Cl.^{2} C08K *5/34*

U.S. Cl. 260—23 XA **16 Claims**

1. A polyolefin composition stabilized against ultraviolet degradation comprising a normally solid polymer of an aliphatic 1-olefin having from 2 to 8 carbon atoms per molecule having incorporated therein a stabilizing amount of a stabilizing system consisting essentially of:

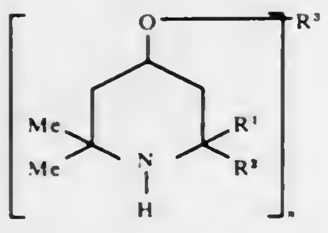
A. a piperidine derivative selected from the group consisting of

1. compounds of the formula



wherein Me is methyl, and R^1 and R^2 are individually selected from the group consisting of hydrogen and an alkyl member of 1 to 4 carbon atoms;

2. compounds of the formula

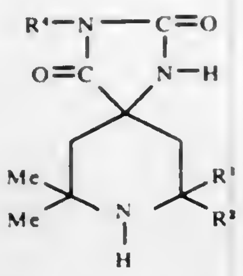


wherein Me, R^1 and R^2 are as described above, and n is an integer having a value of 1 or 2, wherein

when *n* is 1, R^3 is selected from the group consisting of hydrogen and an acyl member derived from an unsubtituted, saturated aliphatic monocarboxylic acid having from 6 to 20 carbon atoms or an unsubstituted or alkyl-substituted aromatic monocarboxylic acid having from 7 to 20 carbon atoms,

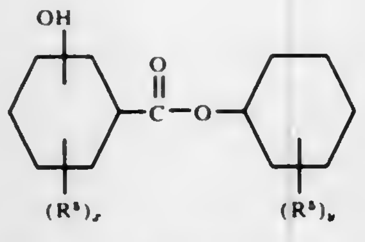
when *n* is 2, R^3 is a diacyl member derived from a saturated, unsubstituted aliphatic dicarboxylic acid having from 6 to 20 carbon atoms or an unsubstituted or alkyl-substituted aromatic dicarboxylic acid having from 8 to 20 carbon atoms; and

3. compounds of the formula



wherein Me, R^1 R^2 are as defined above and R^4 is a member selected from the group consisting of hydrogen and alkyl having from 1 to 12 carbon atoms;

B. a hydroxy-substituted phenyl benzoate represented by the formula



wherein each R^5 member is independently selected from the group consisting of halogen, an alkyl, alkoxy, cycloalkyl, cycloalkoxy, aryl or aryloxy member having up to 20 carbon atoms, x is an integer having a value of from 0 to 4 and *y* is an integer having a value of from 0 to 4.

4,035,324

SMOKE-RETARDANT CHLORINATED POLYMER COMPOSITIONS

David Francis Lawson, and Edward Leo Kay, both of Akron, Ohio, assignors to The Firestone Tire & Rubber Company, Akron, Ohio

Filed May 5, 1976, Ser. No. 683,600

Int. Cl.^{2} C08K *3/38*

U.S. Cl. 260—23 XA **7 Claims**

6. A rigid, smoke inhibited polymer composition containing:

1. 100 parts by weight of a vinyl chloride polymer having a chlorine content of 10 to 75%, based on the weight of said polymer, and
2. 5 parts by weight manganese borate, and
3. 2 parts by weight calcium stearate, and
4. 3.75 parts by weight dibutyltin bis(lauryl) mercaptide.

4,035,325

USE OF ORGANOMETALLIC SALTS AND METAL DEACTIVATORS AS FLAME RETARDANTS FOR POLYOLEFINS

Wassily W. Poppe, Lombard, and Ivor R. Fielding, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed June 16, 1975, Ser. No. 586,966

Int. Cl.^{2} C08K *5/59*

U.S. Cl. 260—23 H **14 Claims**

2. The composition comprising: *a.* a polymer selected from the group consisting of propylene and crystalline propylene dominated propylene-ethylene copolymers comprising a propylene homopolymer attached to a copolymer, *b.* a flame retardant package comprising antimony trioxide and at least one polyhalogenated organic compound, wherein the halogen is selected from the group consisting of bromine and chlorine, and *c.* an additive, in quantities sufficient to produce a measureable effect in the oxygen index for said composition to increase the efficiency of said flame retardant package, comprising a compound selected from the group consisting of a cobalt salt of an organic acid and an acetylacetonate complex thereof and a lithium salt of an organic acid and molybdenum acetylacetonate, wherein said additive is free of any water of hydration.

3. The composition of claim 2, wherein said cobalt salt of an organic acid is selected from the group consisting of cobalt stearate and cobalt naphthenate.

4,035,326

PROCESS FOR THE PRODUCTION OF FILM FORMING SYNTHETIC RESINS FOR HAIR FIXATIVES

Hans-Albrecht Meyer-Stoll, Rheinkamp-Repelen; Johannes Wöllner, Kapellen, and Hans-Heinz Schittek, Moers-Meerbeck, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 263,517, June 16, 1972, Pat. No. 3,987,010. This application Sept. 28, 1976, Ser. No. 727,483

Claims priority, application Germany, May 29, 1968, 1870518

Int. Cl.^{2} C08L *61/30;* **C08G** *16/00*

U.S. Cl. 260—29.4 R **16 Claims**

1. Process for the production of a water soluble, film-forming resin product having a molecular weight in the range of from about 700 up to about 3000 or more for a hair fixative composition, which comprises reacting a 5,5-dialkylhydantoin wherein each alkyl group thereof contains from 1 to 5 carbon atoms with aqueous formaldehyde solution in the mole ratio of from about 1.5 to about 2.5 moles of formaldehye per mole of said hydantoin, at a temperature in the range of from about 55° up to about 100° C. and a pH in the range of from about 6 up to about 11 and recovering the resulting methylolated 5,5-dialkylhydantoin from the resulting reaction products by removal of from about 50 to 100% of water, then reacting at an elevated temperature in the range of from about 70° to about 115° C. said methylolated 5,5-dialkylhydantoin in the presence of from about 0.2 to about 2.5 moles of urea per mole of said hydantoin and from about 0.1 to about 1.0 mole of a low molecular weight ketone, per mole of urea.

15. Process for the production of a water soluble, film-forming hair fixative resin having a molecular weight in the range of from about 700 up to about 3,000 or more which comprises reacting 5,5-dimethylhydantoin with aqueous formaldehyde solution in the mole ratio of from about 1.5 up to about 2.5 moles of formaldehyde per mole of said hydantoin, from about 0.2 to about 2.5 moles of urea per mole of said hydantoin, and from about 0.1 to about 1.0 mole of a low molecular weight ketone per mole of urea, at a temperature in the range of from about 55° C. up to about 100° C., and at a pH in the range of from about 6 up to about 11, and removing at least a major portion of water from the resulting reaction product.

4,035,327

PROCESS FOR THE PRODUCTION OF FILM FORMING SYNTHETIC RESINS FOR HAIR FIXATIVES

Hans-Albrecht Meyer-Stoll, Rheinkamp-Repelen; Johannes Wöllner, Kapellen, and Hans-Heinz Schittek, Moers-Meerbeck, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 263,517, June 16, 1972, Pat. No. 3,987,010. This application Sept. 28, 1976, Ser. No. 727,541

Claims priority, application Germany, May 29, 1968, 1770518

Int. Cl.^{2} C08L *61/30*

U.S. Cl. 260—29.4 R **13 Claims**

1. Process for the production of a water soluble, film-forming resin product having a molecular weight in the range of from about 700 up to about 3000 or more for a hair fixative composition, which comprises reacting a 5,5-dialkylhydantoin wherein each alkyl group thereof contains from 1 to 5 carbon atoms with aqueous formaldehyde solution in the mole ratio of from about 1.5 to about 2.5 moles of formaldehyde per mole of said hydantoin, at a temperature in the range of from about 55° C. up to about 100° C. and a pH in the range of from about 6 up to about 11 and recovering the resulting methylolated 5,5-dialkylhydantoin from the resulting reaction products by removal of from about 50 to 100% of water, then reacting at an elevated temperature in the range of from 70° C. to about 115° C. said methylolated 5,5-dialkylhydantoin in the presence of from about 0.2 to about 2.5 moles of a diamine, per mole of said hydantoin.

4,035,328

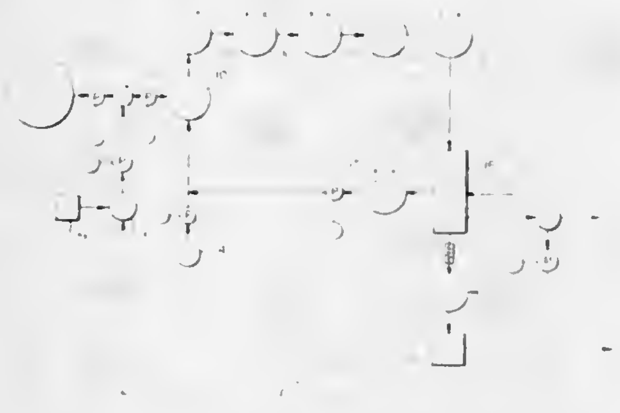
CONTINUOUS PROCESS FOR MAKING UREA FORMALDEHYDE PIGMENT

Denis K. Huang, Laurel, and Jean Holden, Wheaton, both of Md., assignors to Westvaco Corporation, New York, N.Y.

Filed July 3, 1975, Ser. No. 592,745

Int. Cl.^{2} C08L *61/20;* **C08G** *12/12, 14/02, 2/28*

U.S. Cl. 260—29.4 R **1 Claim**



1. A continuous process for manufacturing a white, bright and opaque precipitated urea formaldehyde pigment comprising:

a. supplying on a continuous basis, a urea formaldehyde resin to a plurality of serially connected reaction vessels, said resin having a water tolerance of from about 1.5 to 5.0 and a viscosity of at least about 450 cps at 50% solids, each of said reaction vessels being precharged with an aqueous acid catalyst precipitating bath containig from about 0.125 to 1.5% by volume of a strong mineral acid at a temperature of from about 20°–95° C.;

b. reacting the mixture of resin and precipitating bath in said reaction vessels at a resin to water ratio of from about 1:16 to 3:8 under agitation for a period of time of from about ½ to 5 hours incuding the time for addition of the resin to the precipitating bath to permit most of the higher molecular weight fractions of the resin to react and precipitate in the precipitating bath;

c. filtering the precipitated pigment product formed in step (b) from the precipitating bath at a temperature of from about 25° to 70° C;

d. recycling, on a continuous basis the filtrate obtained from step (c), containing the unreacted lower molecular weight fractions of the resin, back into said reaction vessels; and,

e. introducing into the recycled filtrate after each filtering step from about 0.01% to about 0.5% by weight based on the solids of the urea formaldehyde resin supplied to said reaction vessels of a flocculant material selected from the group consisting of a hydrophilic colloid having a molecular weight in the range of from about 100,000 to 100,000,000 and a functional group selected from the class consisting of hydroxyl, carboxylic, amide, amine and quaternary compounds+ and acrylamide.

4,035,329

PROCESS FOR THE CONTINUOUS PRODUCTION OF AN ETHYLENE/VINYL ACETATE COPOLYMER DISPERSION

Hubert Wiest; Josef Hanzalik; Wilhelm Lechner, and Erwin Lieb, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

Filed Nov. 19, 1975, Ser. No. 633,591

Claims priority, application Germany, Nov. 29, 1974, 2456576

Int. Cl.^{2} C08L *31/04*

U.S. Cl. 260—29.6 T **5 Claims**

1. The process for the continuous manufacture of an aqueous ethylene/vinyl acetate copolymer dispersion, which comprises continuously adding a monomer mixture of ethylene and vinyl acetate containing up to 40% by weight of the share of the vinyl acetate of an α-olefinically unsaturated monomer copolymerizable with ethylene and vinyl acetate, in an aqueous emulsion containing emulsifiers and/or protective colloids, to a confined reaction zone, together with the continuous adding of a free-radical-forming water-soluble redox catalyst system comprising a reducing agent and an oxidizing agent and from 0 to 50 ppm, based on the total monomers, of a heavy metal in the form of a heavy metal salt, maintaining said confined reaction zone at a temperature sufficient to effect polymerization and continuously withdrawing an aqueous ethylene/vinyl acetate copolymer dispersion from said confined reaction zone, the improvement which consists of (a) continuously adding said reducing agent and said oxidizing agent in a molar ratio of at least 3:1 and (b) continuously adding said monomer mixture at such a rate that the concentration of unreacted monomers at no place in said confined reaction zone exceeds 15% by weight of the total weight of the reaction mixture in the reaction zone.

4,035,330

HYDROPHILIC COPOLYMER OF N,N-DI(C_1-C_2ALKYL)ACRYLAMIDE CROSS-LINKED WITH A GLYCIDYL ESTER

Herman S. Schultz, Lexington, Mass., assignor to Itek Corporation, Lexington, Mass.

Filed Dec. 22, 1975, Ser. No. 643,212

Int. Cl.^{2} C08F *224/00;* **C08L** *37/00;* **G02C** *7/04*

U.S. Cl. 260—29.6 R **13 Claims**

1. A hydrogel formed from an aqueous solution gelled with a copolymer formed by reacting from about 20 to about 80 weight percent of an N,N-di(C_1–C_2 alkyl) acrylamide with from about 10 to about 80 weight percent of at least one C_1–C_4 alkyl acrylate and from about 2 to about 20 parts of a glycidyl ester of acrylic, methacrylic or crotonic acid.

4,035,331

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 574,497, May 5, 1975, Pat. No. 3,983,064, which is a division of Ser. No. 405,244, Oct. 10, 1973, Pat. No. 4,001,166, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 27, 1976, Ser. No. 690,828

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.^{2} C08K *5/15, 5/45*

U.S. Cl. 260—30.2 **13 Claims**

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture of the components of a rapid-setting polyurethane-forming composition free of catalytic quantities of a catalyst for urethane formation and comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C, said modifier consisting of a mixture, in any proportion, of at least two members selected, in any combination, froam the group consisting of
   1. organic phosphates, phosphites, or phosphonates,
   2. cyclic ethers,
   3. aromatic compounds or partially hydrogenated aromatic compounds, such compounds being free of ester groups and groups reactive with NCO groups,
   4. chlorinated aliphatic compounds,
   5. cyclic sulfones,
   6. organic carbonates,
   7. esters of carboxylic acids,
   8. non-hydroxyl-containing polyoxyalkylene compounds,
   9. ester-modified polyoxyalkylene compounds having an average hydroxyl equivalent weight above about 700 when such compounds contain 2 hydroxyl groups, an average hydroxyl equivalent weight, above about 500 when such compounds contain 3 or more hydroxyl groups and an average molecular weight above about 700 when such compounds contain zero or 1 hydroxyl group; and
   10. hydroxyl-containing polyoxyalkylene compounds selected from the group consisting of
      a. such compounds having one or two hydroxyl groups per molecule and an average hydroxyl equivalent weight of at least about 700,
      b. such compounds having from about 3 to about 8 hydroxyl groups per molecule and an average hydroxyl equivalent weight of at least about 500;

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C).

4,035,332

WATER-SOLUBLE SILICONE-MODIFIED RESIN COMPOSITIONS

Shiro Gomyo, and Iehiro Kodama, both of Annaka, Japan, assignors to Shin-Etsu Chemical Co.,, Tokyo, Japan

Filed Sept. 24, 1975, Ser. No. 616,210

Claims priority, application Japan, Feb. 10, 1974, 49-113430

Int. Cl.^{2} C08K *5/05, 5/06, 5/67*

U.S. Cl. 260—33.2 SB **7 Claims**

1. A water-soluble resin composition comprising

a. from 20 to 90 parts by weight of an interpolymer having an acid value of from 10 to 150 prepared by the reaction of the following reactants,
   i. a polyol selected from the group consisting of ethyleneglycol, propyleneglycol, 2,2-dimethylpropanediol, glycerine, trimethylolethane, trimethylolpropane, 1,2,6-hexanetriol, pentaerithritol, sorbitol, diglycerine, and tris(2-hydroxyethyl)isocyanurate,
   ii. a polybasic carboxylic acid or an anhydride thereof selected from the group consisting of phthalic anhydride, isophthalic acid, terephthalic acid, tetrahydrophthalic anhydride, maleic anhydride, fumaric acid, trimellitic anhydride, succinic acid, adipic acid, sebacic acid, hexahydrophthalic anhydride, and 3,6-endmethylenetetrahydrophthalic anhydride,
   iii. an organosilicon compound represented by the average unit formula

$$R^1_a(R^2O)_bSiO_{\frac{4-a-b}{2}}$$

where R_1 is a substituted or unsubstituted monovalent

hydrocarbon group selected from the group consisting of methyl ethyl, propyl butyl, vinyl, allyl, and phenyl,

R^2 is a hydrogen atom or a substituted or unsubstituted monovalent hydrocarbon group selected from the group consisting of methyl, ethyl, propyl, butyl, vinyl, allyl, and phenyl,

a is a positive number between 1 and 3 inclusive, and

b is a positive number between 0.01 and 3 inclusive with the proviso that ($a + b$) is between 1.01 and 4 inclusive;

b. from 80 to 10 parts by weight of a water-miscible organic solvent selected from the group consisting of aliphatic alcohols, glycols, monoalkyl ethers of glycols, and ketones; and

c. a basic compound selected from the group consisting of trimethylamine, triethylamine, dipropylamine, dimethylethanolamine, diethylethanolamine, triethanolamine, and ammonia in an amount sufficient to reduce the acid value of the component a) to below 5, wherein said component a) is prepared by the reaction of from 10 to 80% by weight of said reactant (iii) and from 90 to 20% by weight as total of said reactants (i) and (ii).

4,035,333

FLAME-RESISTANT RESIN COMPOSITION

Kazumasa Kamada; Ryoji Handa, and Masafumi Hongo, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Oct. 10, 1975, Ser. No. 621,393

Claims priority, application Japan, Oct. 14, 1974, 49-117851; Jan. 6, 1975, 50-4348

Int. Cl.^{2} C08K *3/24, 3/40*

U.S. Cl. 260—40 R **9 Claims**

1. A flame-resistant resin composition having an improved arc resistance, which comprises 100 parts by weight of polytetramethylene terephthalate, 3 to 50 parts by weight of a flame-retardant halogen compound, sodium antimonate or a sodium antimonate-antimony trioxide mixture containing 40% by weight or more of sodium antimonate, the weight ratio of the halogen compound to the total antimony compound being from 0.25 to 6, and 0 to 60% by weight, based on the weight of the total composition, of talc.

4,035,334

MEDICAL ADHESIVE

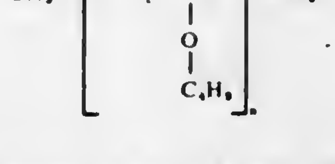
Anatoly Borisovich Davydov, ulitsa Krasny Kazanets, 19, korpus 1, kv. 283; Alla Yakovlevna Akimova, ulitsa Kosmonavta Volkova, 1, kv. 155; Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 84, all of Moscow; Nikolai Nikolaevich Trofimov, Bulvar Zhdanova, 33/22, kv. 38; Volf Samoilovich Etlis, Prospekt Lenina, 59, kv. 56, both of Dzerzhinsk Gorkovskoi oblasti; Alexandr Alexandrovich Vishnevsky, Novokuznetskaya ulitsa, 13/15, kv. 269, and Vitaly Rafailovich Belkin, Smolensky bulvar, 15, kv. 100, both of Moscow, all of U.S.S.R.

Continuation-in-part of Ser. No. 305,587, Nov. 11, 1972, abandoned. This application May 6, 1976, Ser. No. 683,941

Int. Cl.^{2} C08K *5/04*

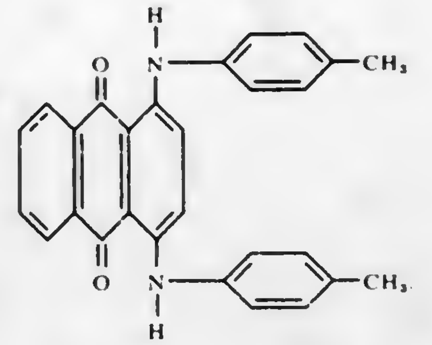
U.S. Cl. 260—42.21 **3 Claims**

1. A medical adhesive composition comprising a major proportion of 2-ethoxyethyl-α-cyanoacrylate and minor proportions of polyvinyl-n-butyl ether having the general formula,



$$CH_3-\left[CH_2-\underset{\underset{\displaystyle C_4H_9}{|}}{\underset{\displaystyle O}{\underset{|}{CH}}}\right]_n-CH_3 .$$

and having a molecular weight in a range of about 4,000 to about 10,000 and wherein *n* has a value sufficient to give a molecular weight in the recited range and as a fat-soluble, green anthraquinone dye **1,4-bis-**(p-toluidino)-anthraquinone having the formula,



4,035,335

PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

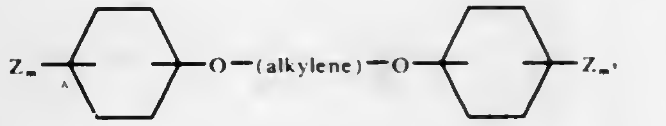
Filed Feb. 8, 1973, Ser. No. 330,843

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising an epoxy resin and a flame retardant, said flame retardant consisting of a compound having the formula



wherein (a) Z is bromine; (b) *m* and *m'* are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,035,336

CARBON BLACK PIGMENTS AND RUBBER COMPOSITIONS CONTAINING THE SAME

Merrill E. Jordan, Walpole, and William G. Burbine, Whitman, both of Mass., assignors to Cabot Corporation, Boston, Mass.

Division of Ser. No. 495,814, Aug. 8, 1974, Pat. No. 3,973,983, which is a continuation-in-part of Ser. No. 95,981, Dec. 7, 1970, abandoned. This application May 25, 1976, Ser. No. 689,741

Int. Cl.^{2} C08C *11/18*

U.S. Cl. 260—42.47 **6 Claims**

1. A composition of matter comprising a rubber selected from the group consisting of natural and synthetic rubbers and a carbon black product selected from the group consisting of carbon blacks characterized by having a total surface area of at least about 160 m^2/g, a value for the ratio of non-porous specific surface area to total surface area of the carbon black of at least 0.9, a value for the tint factor relationship of tinting strength + 0.6 (D_a), wherein D_a is apparent diameter, of less than 317, and a DBP absorption value of at least 90 cc/100 gms carbon black, wherein the carbon black product is present in amounts of from about 10 to about 250 parts by weight per 100 parts by weight of rubber.

4,035,337

SULFIDE COMPOSITIONS AS INHIBITING AGENTS FOR AMINE-INDUCED YELLOWING

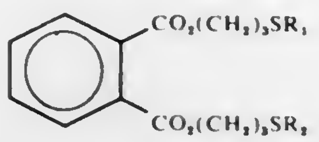
John E. Herweh, Lancaster, and James L. Work, Lampeter, both of Pa., assignors to Armstrong Cork Company, Lancaster, Pa.

Filed June 11, 1976, Ser. No. 694,995

Int. Cl.² C08K *5/37;* **C07C** *69/76;* **C08G** *63/12, 18/06*

U.S. Cl. 260—45.85 T **19 Claims**

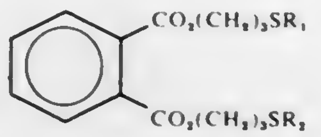
1. Compounds of the formula



wherein R_1 and R_2 may be the same or different and are aryl radical having from 6 to 12 carbon atoms, hydroxyalkylene radical having from 1 to 18 carbon atoms, carboxyalkylene radical having from 2 to 18 carbon atoms, or carboalkoxyalkylene radical having from 2 to 18 carbon atoms.

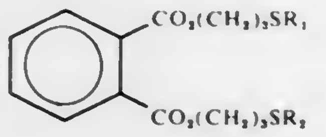
7. A polyurethane composition highly inhibited against yellowing comprising an intimate mixture of

1. a polyurethane produced from the reaction of a nonaromatic diisocyanate and an aliphatic polyol of molecular weight greater than 500; and
2. 1 to 80 parts per hundred parts of said polyurethane of a sulfur-containing phthalate of the formula



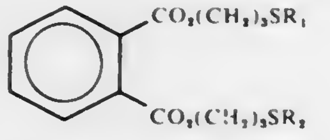
wherein R_1 and R_2 may be the same or different and are alkyl radical having from 1 to 18 carbon atoms, aryl radical having from 6 to 12 carbon atoms, alkaryl radical having from 7 to 18 carbon atoms, cycloalkyl radical having from 5 to 8 carbon atoms, hydroxyalkylene radical having from 1 to 18 carbon atoms, carboxyalkylene radical having from 2 to 18 carbon atoms and carboalkoxyalkylene radical having from 2 to 18 carbon atoms.

9. A linear, thermoplastic polyurethane composition highly inhibited against yellowing comprising the reaction product of a nonaromatic diisocyanate and a diol of the formula



wherein R_1 and R_2 may be the same or different and are hydroxyalkylene having from 1 to 18 carbon atoms, said nonaromatic diisocyanate and said diol being reacted in an NCO:OH of 1.1:1 to 4:1.

17. A flooring composition highly inhibited against traffic staining incurred by the presence of an aromatic amine, comprising a polymeric material of a vinyl halide, an antioxidant amine and an inti mate mixture of 1 to 80 parts per hundred parts of said polymeric material of an inhibiting agent of the formula



wherein R_1 and R_2 may be the same or different and are alkyl radical having from 1 to 4 carbon atoms, alkaryl radical having from 7 to 9 carbon atoms, hydroxyalkylene radical having from 1 to 4 carbon atoms, carboxyalkylene radical having from 2 to 4 carbon atoms, or carboalkoxyalkylene radical having from 2 to 8 carbon atoms.

4,035,338

METHOD OF STABILIZING OXYMETHYLENE COPOLYMERS

Takami Ishii, Chiba; Taro Suzuki, Ube; Naohisa Takikawa, Ube; Kiyoaki Tokunaga, Ube; Choji Arima, Ube, and Hiroshi Kojima, Ube, all of Japan, assignors to UBE Industries, Ltd., Japan

Filed June 17, 1975, Ser. No. 587,728

Claims priority, application Japan, June 21, 1974, 49-70156

Int. Cl.² C08G *2/36*

U.S. Cl. 260—67 FP **16 Claims**

1. A method of stabilizing oxymethylene copolymers which comprises heating an oxymethylene polymer in a hydrocarbonaceous mixed medium consisting of about 50 – 92% by weight of a hydrocarbon having 5 – 7 carbon atoms, about 6 – 48% by weight of at least one alcohol and about 2 – 20% by weight of water based on the total amount of the medium, at a temperature of from about 100° to about 170° C. in the presence of a salt selected from the group consisting of the sodium and potassium salts of ethylenediaminetetraacetic acid under the conditions of a pH value of from about 4 to about 7, and removing the stabilized oxymethylene copolymers from the reaction mixture.

4,035,339

PROCESS FOR THE PRODUCTION OF FILM FORMING SYNTHETIC RESINS FOR HAIR FIXATIVES

Hans-Albrecht Meyer-Stoll, Rheinkamp-Repelen; Johannes Wöllner, Kapellen, and Hans-Heinz Schittek, Moers-Meerbeck, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 263,517, June 16, 1972, Pat. No. 3,987,010. This application Sept. 28, 1976, Ser. No. 727,570

Claims priority, application Germany, May 29, 1968, 1770518

Int. Cl.² C08G *12/06*

U.S. Cl. 260—67.5 **6 Claims**

1. Process for the production of a water soluble, film-forming resin product having a molecular weight in the range of from about 700 up to about 3,000 or more, for a hair fixative composition which comprises reacting at an elevated temperature in the range of from about 70° C. to about 115° C. a methylolated 5,5-dialkylhydantoin wherein each alkyl group thereof contains from 1 to 5 carbon atoms, in the presence of from about 0.2 to about 1 mole of a diamine per mole of said hydantoin.

4,035,340

ACROLEIN-INDENE COPOLYMERS

Abolghassem Eskamani, North Randall, and Robert Sanitra, Stow, both of Ohio, assignors to Standard Oil Company, Cleveland, Ohio

Filed Mar. 8, 1976, Ser. No. 664,626

Int. Cl.² C08F *232/00, 236/00*

U.S. Cl. 260—73 R **4 Claims**

1. A copolymer composition resulting from the free-radical initiated copolymerization of a monomer mixture consisting of

A. from 25 to 75% by weight of a member selected from the group consisting of acrolein and methacrolein and

B. from 75 to 25% by weight of indene.

4,035,341

POLYESTER COMPOSITIONS WITH GOOD DYEING AFFINITY AND A PROCESS FOR OBTAINING SAME

Yves Vaginay, Lyon, France, assignor to Rhone-Poulenc-Textile, Paris, France

Continuation-in-part of Ser. No. 499,919, Aug. 23, 1974, abandoned, which is a continuation of Ser. No. 301,994, Oct. 30, 1972, abandoned. This application Mar. 5, 1975, Ser. No. 555,342

Claims priority, application France, Oct. 29, 1971, 71.39877

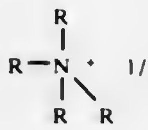
Int. Cl.² C08K *5/19*

U.S. Cl. 260—75 N **12 Claims**

1. A melt spinnable composition consisting essentially of

a polyester of at least one aromatic dicarboxylic acid or derivative thereof and at least one dihydric alcohol, and

1–10% of units with respect to the sum of the recurring units of the polymer, of a compound of the formula:



$$R_4N^+ \; 1/Y \; X^{n-} \qquad (I)$$

wherein the R's represent alkyl cycloaliphatic, or aromatic radicals, said R's being free from ester forming substituents, at least two R's being capable of forming together a ring containing or not other quaternizable nitrogen atoms and where:

X^{n-} is a stable anion of valency n of an organic acid, a mineral oxyacid or is an halide, and

Y is an integer equal to the valence of the anion.

4,035,342

COPOLYESTERS CONTAINING 2,2′,6,6′-TETRAMETHYLBIPHENYL-4,4′-DICARBOXYLATE MOIETIES

Edward E. Paschke, Glen Ellyn, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 15, 1975, Ser. No. 622,644

Int. Cl.² C08G *63/18*

U.S. Cl. 260—75 R **8 Claims**

1. A high molecular weight polyester comprising a polyhydroxy component and polycarboxylic acid component wherein said dicarboxylate component comprises terephthalate moieties and 2,2′,6,6′-tetramethylbiphenyl-4,4′-dicarboxylate moieties in a range of mole ratios of from 19:1 to 1:19.

4,035,343

FLAME RESISTANT SYNTHETIC LINEAR POLYESTERS AND SHAPED STRUCTURES MADE THEREOF

Ulrich Bollert, Hofheim/Taunus; Hans-Jerg Kleiner, Bad Soden/Taunus, and Franz Jakob, Hofheim/Taunus, all of Germany, assignors to Farbwerke Hoechst Aktiengesellschaft vormals Meister Lucius & Bruning, Frankfurt/Main, Germany

Filed Aug. 23, 1973, Ser. No. 390,738

Claims priority, application Germany, Aug. 26, 1972, 2242002

Disclosure was also published under first trial voluntary protest program or document No. B 390,738 on Jan. 28, 1975

Int. Cl. C08g *63/12*

U.S. Cl. 260—75 P **6 Claims**

1. Flame-resistant, synthetic, linear and phosphorus-containing polyesters consisting essentially of dicarboxylic acid and diol units and wherein 4 to 15 mole % of the diol units are derived from a diol of the formula

wherein R and R_1 are alkyl or cycloalkyl radicals of up to 12 carbon atoms,

R_2 and R_3 are hydrogen or an alkyl radical of 1 to 4 carbon atoms which may be substituted by hydroxyl,

R_4 is hydrogen or an alkyl radical of 1 to 4 carbon atoms,

Z is an alkyl radical of 1 to 4 carbon atoms substituted by 1 or 2 hydroxyl groups,

a is zero to 4, and

the total number of hydroxyl groups on the radicals R_2, R_3 and Z is 2.

4,035,344

PROCESS FOR PREPARING ORDERED AROMATIC COPOLYAMIDE UREA POLYMER

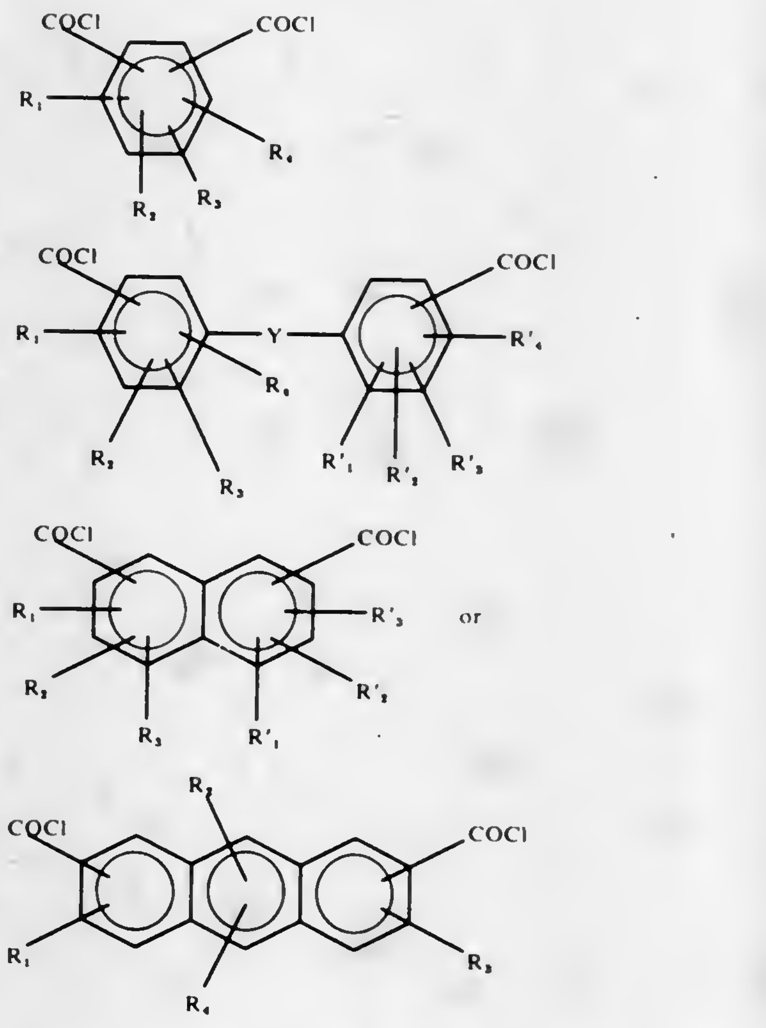
John W. Splewak, Akron, Ohio, assignor to The Firestone Tire & Rubber Company, Akron, Ohio

Division of Ser. No. 528,307, Nov. 29, 1974, Pat. No. 3,960,818. This application Feb. 12, 1976, Ser. No. 657,440

Int. Cl.² C08G *71/32, 63/62*

U.S. Cl. 260—77.5 C **3 Claims**

1. The process of producing a polymer which comprises reacting at -20° to 100° C. (1) an equivalent molecular weight of a condensate of substantially 2 molecular weights of a diaryl diamine and urea with (2) a diacid chloride of the formula



in which Y is from the class consisting of sulfonyl, oxygen, carbonyl, carbonate, sulfide, disulfide, sulfinyl, azo, $(CH_2)_n$ in which *n* may be 1 to 50 and $(CH_2)_n$ is representative of an alkylene or unsaturated moiety in which the unsaturation may be isolated or the carbon groups may be conjugated with each other and R_1, R_2, R_3 and R_4 are from the class consisting of hydrogen, alkyl, aryl, heteroalkyl, heteroaryl, alkenyl and alkynyl.

4,035,345

THERMOSETTING BIS-IMIDE COMPOSITIONS

Maurice Ducloux, Alle a Irigny, and Pierre Ledru, Lyon, both of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed June 23, 1971, Ser. No. 156,033

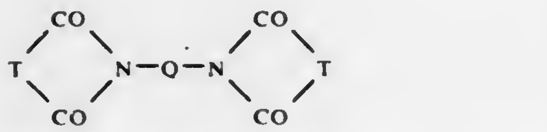
Claims priority, application France, June 26, 1970, 70.23780

The portion of the term of this patent subsequent to Jan. 23, 1990, has been disclaimed.

Int. Cl.^{2} C08G *69/26*

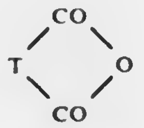
U.S. Cl. 260—78 UA **23 Claims**

1. A thermosetting composition which consists essentially of the reaction product obtained by heating between 50° and 180° C. (a) at least one N,N'-bis-imide of an unsaturated dicarboxylic acid, of general formula:



(I)

in which T represents a divalent organic radical containing a carbon-carbon double bond derived from an ethylenic dicarboxylic acid anhydride of formula:



and Q is a divalent organic radical of 2 to 30 carbon atoms, (b) at least one polyamine of general formula:

$$R\ (NH_2)_x$$

in which x is an integer from 2 to 5, and R represents an organic radical of valency x, the bis-imide being present in an amount from 0.55 to 25 mols per molar -NH_2 group of the polyamine, and (c) 5 to 60% by weight, based on the combined weight of (a) and (b) of at least one monomer possessing at least one vinyl, allyl or acrylic $CH_2{=}C<$ group and polymerisable by heat, selected from the group consisting of a vinyl ester of an acid selected from the group consisting of acetic, propionic, butyric, oxalic, malonic, succinic, adipic, sebacic, acrylic, methacrylic, phenylacrylic, crotonic, maleic, fumaric, citraconic, tetrahydrophthalic, itaconic, acetylene dicarboxylic, benzoic, phenylacetic, ortho-phthalic, terephthalic, isophthalic and trimellitic acid, an allyl ester of an acid selected from the group consisting of acetic, propionic, butyric, oxalic, malonic, succinic, adipic, sebacic, acrylic, methacrylic, phenylacrylic, crotonic, maleic, fumaric, citraconic, tetrahydrophthalic, itaconic, acetylene dicarboxylic, benzoic, phenylacetic, orthophthalic, terephthalic, isophthalic and trimellitic acid, methyl acrylate, methyl methacrylate, styrene, α-methylstyrene, para-chlorostyrene, divinylbenzene, diallylbenzene, vinyl toluene, a vinyl allyl ether, a methallyl ether, a vinyl pryidine, N-vinylpyrrolidone, allyl isocyanurate, allyl cyanurate, a silane containing a group selected from the group consisting of vinyl and allyl, a siloxane containing a group selected from the group consisting of vinyl and allyl, glycidyl acrylate, and glycidyl methacrylate.

20. The composition according to claim 1 in which component (a) is N,N'-4,4'-diphenylmethane-bis-maleimide, component (b) is 4,4'-diaminodiphenylmethane and component (c) is tri-allyl isocyanurate.

4,035,346

CONDUCTIVE N-ALKYL POLYAMIDE HAVING UNITS CONTAINING PHOSPHONIUM SULFONATE GROUPS

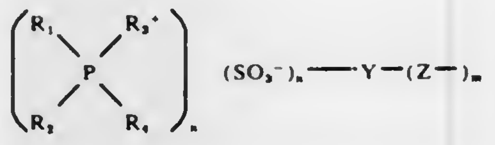
Harry Vaughn Samuelson, Wilmington, and Gurdial Singh, Hockessin, both of Del., assignors to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Division of Ser. No. 552,867, Feb. 25, 1975, Pat. No. 4,006,123, which is a continuation-in-part of Ser. No. 403,221, Oct. 3, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 735,099

Int. Cl.^{2} C08G *69/42*

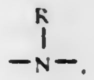
U.S. Cl. 260—78 R **3 Claims**

1. A conductive N-alkyl polyamide having a glass transition temperature measured by nuclear magnetic resonance peak ratio of less than 25° C, a log R_s of less than 10 and having units containing phosphonium sulfonate groups of the formula



$$\left(\begin{matrix} R_1 & & R_3^+ \\ & P & \\ R_2 & & R_4 \end{matrix}\right)_n (SO_3^-)_n—Y—(Z—)_m$$

where R_1, R_2, R_3 and R_4 represent monovalent hydrocarbon groups with the proviso that R_1 and R_2 may jointly represent an alkylene group, Y is a hydrocarbon group of up to 24 carbon atoms in which any unsaturation is aromatic and which may be interrupted by oxygen, sulfonamide or sulfonyl groups, Z is selected from the group consisting of



$$-\overset{\displaystyle R}{\overset{|}{N}}-,$$

$$—O— \text{ and}$$

$$-\overset{\displaystyle O}{\overset{\|}{C}}-$$

wherein R is hydrogen or an alkyl group of 1–18 carbon atoms and n and m are 1 or 2, said groups being present in an amount of from 0.01 mol % to about 50 mol % based on the total mols of dicarboxylic acid units and/or aminocarboxylic acid units in the polymer chain.

4,035,347

METHOD FOR THE PREPARATION OF DRIED LATEX POLYMER FROM AQUEOUS EMULSION

David B. Korzenski, Dunkirk, N.Y.; Barney Vallino, Jr., Homewood, and Wayne E. Zarnecki, Mokena, both of Ill., assignors to Nalco Chemical Company, Oak Brook, Ill.

Continuation-in-part of Ser. No. 504,064, Sept. 9, 1974, abandoned, which is a continuation of Ser. No. 305,206, Nov. 9, 1972, abandoned. This application Mar. 2, 1976, Ser. No. 663,010

Int. Cl.^{2} C08F *1/13, 3/90, 15/02*

U.S. Cl. 260—79.3 MU **7 Claims**

1. A method of preparing substantially dry, dust-free, readily soluble homo polymers and copolymers of a water-soluble ethylenic-unsaturated monomer comprising the steps of:

A. preparing a water-in-oil emulsion which contains dispersed therein a finely divided water-soluble vinyl addition polymer;

B. contacting said emulsion of step (A) with water for about 0.5 – 10 seconds, said water additionally containing dispersed therein from 0.1 to 10.0% by weight based on polymer of a water-soluble surfactant to provide a partially inverted emulsion;

C. casting said partially inverted emulsion of step (B) upon a surface to form a thin film;

D. heating said film of the partially inverted emulsion to provide a dry film polymer product; and

E. recovering said dry film polymer product.

4,035,348

TETRAPEPTIDES AND METHODS FOR THEIR PRODUCTION

Francis John Tinney, and Ernest D. Nicolaides, both of Ann Arbor, Mich., assignors to Parke, Davis & Company, Detroit, Mich.

Filed Mar. 1, 1976, Ser. No. 662,408

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 LH **6 Claims**

1. A tetrapeptide represented by the formula

$$A\text{-}R_1\text{-Tyr(benzyl)-Ser(benzyl)-D-Ala-}R_2$$

wherein A IS t-butoxycarbonyl, cyclohexyl-carbonyl, benzyloxycarbonyl or p-nitrobenzyloxycarbonyl; R_1 is L-His(benzyl), D-Pro, or L-Trp; Tyr(benzyl) is L-Tyr(benzyl) or D-Tyr(benzyl); Ser(benzyl) is L-Ser(benzyl) or D-Ser(benzyl) and R_2 is lower alkoxy, hydrazino, amino, lower alkylamino or di(lower alkyl)amino.

4,035,349

INHIBITING THE FORMATION OF LYSINOALANINE

John W. Finley, Martinez; John T. Snow, Berkeley, and Mendel Friedman, Moraga, all of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed June 9, 1975, Ser. No. 585,212

Int. Cl.^{2} A23J *1/14*

U.S. Cl. 260—123.5 **6 Claims**

1. In the process of treating a vegetable protein with alkali, the improvement which comprises

conducting the alkali treatment in the presence of an added compound selected from the group consisting of sulfhydryl-containing amino acids, their esters, and amides,

said compound being added in an amount sufficient to inhibit the formation of lysinoalanine.

4,035,350

PROCESS FOR THE PREPARATION OF WATER-SOLUBLE AZO DYESTUFFS BY REACTING AN AROMATIC AMINE AND A COUPLING COMPONENT WITH ALKALI METAL NITRITE OR ALKYL NITRITE IN THE ABSENCE OF ACID

Josef Landler, Hofheim, Taunus, and Erhard Worfel, Hattersheim, am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

Filed Jan. 28, 1976, Ser. No. 653,129

Claims priority, application Germany, Jan. 30, 1975, 2503714

Int. Cl.^{2} C09B *29/06, 29/10, 29/24, 29/38*

U.S. Cl. 260—152 **4 Claims**

1. In a process for the preparation of a water-soluble azo dyestuff wherein an aromatic amine is diazotized with a stoichiometric amount of an alkali metal nitrite and reacted with a stoichiometric amount of a coupling component in water or in an organic solvent which does not contain an acid or basic group, or in a mixture of such organic solvent and water, at least one of said amine or said coupling component containing a free acid group, the improvement consisting fo reacting said aromatic amine and said coupling component with said nitrite in the absence of an acid.

4,035,351

WATER-SOLUBLE MONOAZO DYESTUFF CONTAINING A PHENYLENE DIAZO COMPONENT

Ludwig Schlafer, Fischbach, Taunus, and Ernst Hoyer, Frankfurt am Main, both of Germany, assigners to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

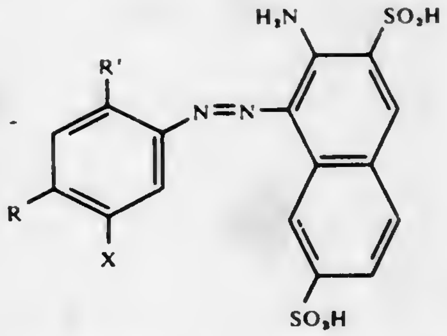
Continuation of Ser. No. 380,838, July 19, 1973, abandoned. This application May 12, 1975, Ser. No. 576,735

Claims priority, application Germany, July 22, 1972, 2236107

Int. Cl.^{2} C09B *29/06;* **D06P** *1/06, 3/24, 3/66*

U.S. Cl. 260—196 **5 Claims**

1. A water-soluble monoazo dyestuff of the formula



wherein R is alkoxy of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms, chlorine or bromine, R' is hydrogen, lower alkoxy of 1 to 4 carbon atoms, lower alkyl of 1 to 4 carbon atoms, chlorine or bromine, and X is $—SO_2—CH{=}CH_2$, $—SO_2—CH_2—CH_2OH$, $—SO_2—CH_2 – CH_2—Cl$, $—SO_2—CH_2—O—SO_3H$, $—SO_2—CH_2—CH_2—S—SO_3H$, $—SO_2—CH_2—CH_2—O—PO_3H_2$, $—SO_2—CH_2—CH_2—N\ (\text{lower alkyl})_2$ or $[—SO_2—CH_2—CH_2—N\ (\text{lower alkyl})_3[^{(+)}\ \text{halide}^{(-)}$.

4,035,352

PREPARATION OF 7-SUBSTITUTED AMINO-DESACETOXYCEPHALOSPORANIC ACID COMPOUNDS

Jan Verweij, Leiden; Hong Sheng Tan, Bleiswijk, and Hermanus Jacobus Kooreman, Delft, all of Netherlands, assignors to Gist-Brocades N.V., Delft, Netherlands

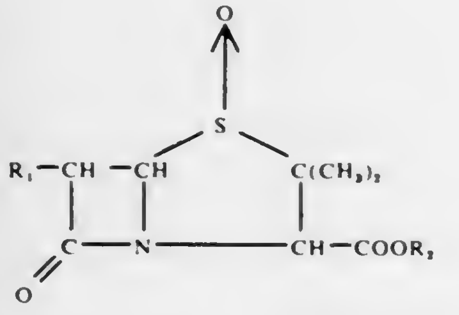
Continuation-in-part of Ser. No. 279,868, Aug. 11, 1972, abandoned. This application May 6, 1975, Ser. No. 575,024

Claims priority, application United Kingdom, Apr. 17, 1971, 38637/71; Dec. 21, 1971, 59516/71

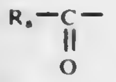
Int. Cl.² C07D *499/32*

U.S. Cl. 260—239.1 12 Claims

1. A 6-substituted aminopenicillanic acid anhydride of the formula



wherein R_1 is selected from the group consisting of benzylcarbonamide and phenoxymethylcarbonamido and R_2 is



$$R_8-\underset{\underset{O}{\|}}{C}-$$

wherein R_8 is selected from the group consisting of halogen, lower alkyl optionally substituted with halogen and aryl or R_2 is selected from the group consisting of —SOX, —COCOX and p-toluenesulfonyl wherein X is selected from the group consisting of chlorine and bromine.

4,035,353

PROCESS FOR PRODUCING HEXAMETHYLENEIMINE

Junichi Kanetaka; Takashi Shimodaira; Nobuhiko Fuga; Kuniaki Hayasi, and Tadashi Ayusawa, all of Amimachi, Japan, assignors to Mitsubishi Petrochemical Company Limited, Japan

Filed Dec. 17, 1974, Ser. No. 533,536

Claims priority, application Japan, Dec. 18, 1973, 48-141456; Dec. 18, 1973, 48-141457

Int. Cl.² C07D *295/02*

U.S. Cl. 260—239 B 12 Claims

1. A process for producing hexamethyleneimine by the catalytic hydrogenation of ε-caprolactam in the liquid phase which comprises contacting ε-caprolactam with hydrogen over a catalytic amount of a hydrogenation catalyst selected from the group consisting of: a) essentially cobalt-molybdenum and having an atomic ratio range of molybdenum/cobalt of 0.1 to 0.001/1.0; b) essentially cobatl-rhenium-molybdenum having an atomic ratio of molybdenum/cobalt and of rhenium/cobalt from 0.001 to 0.1 and up to 0.2/1.10 respectively, suspended in a solvent inert to the hydrogenation reaction at a temperature of from 100° to 350° C and under a hydrogen pressure ranging from atmospheric pressure to 200 kg/cm², thereby to cause the catalytic hydrogenation.

4,035,354

THIOAMIDES OF BETA-LACTAM ANTIBIOTICS

Ronald G. Micetich; Clinton G. Chin, and Robert B. Morin, all of Edmonton, Canada, assignors to Connlab Holdings Limited, Willowdale, Canada

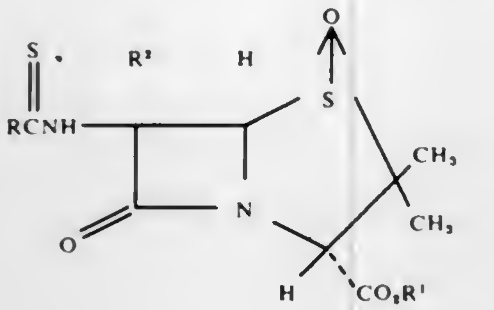
Filed Apr. 24, 1975, Ser. No. 571,426

Claims priority, application Canada, Sept. 11, 1974, 209225

Int. Cl.² C07D *499/44*

U.S. Cl. 260—239.1 14 Claims

1. A penicillin sulfoxide thioamide of the formula



wherein

R is benzyl, phenoxymethyl, 4-amino-4carboxy-1-butyl, R^3O—, R^3S—, R^3R^4N— wherein

R^3 is loweralkyl or, phenyl,

R^4 is hydrogen or R^3, and

R^1 is hydrogen or a conventional cleavable radical selected from the group consisting of $—CH_2OCH_3$, loweralkyl, 2,2,2- trichloroethyl, benzyl, p-nitrobenzyl, benzyhydryl, phenacyl or trimethylsilyl and

R^2 is hydrogen or methoxy.

4,035,355

ANAEROBICALLY CURING SILICONE COMPOSITIONS

Ronald H. Baney, and Ollie W. Marko, both of Midland, Mich., assignors to Dow Corning Corporation, Midland, Mich.

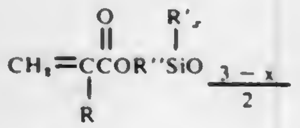
Filed Dec. 10, 1975, Ser. No. 639,545

Int. Cl.² C08G *77/04*

U.S. Cl. 260—46.5 Y 10 Claims

1. An anaerobically curing composition comprising:

a. a polyorganosiloxane, soluble in at least one common organic solvent, consisting essentially of at least two siloxane units of the formula



$$CH_2=\underset{\underset{R}{|}}{C}\overset{\overset{O}{\|}}{C}OR''\overset{\overset{R'_x}{|}}{Si}O_{\frac{3-x}{2}}$$

where R is H or CH_3, R′ is an organic radical free of aliphatic unsaturation selected from the group consisting of monovalent hydrocarbon radicals and halogenated monovalent hydrocarbon radicals, R″ is a divalent alkylene radical of from 1 to 4 inclusive carbon atoms, and x is 0, 1, or 2, any remaining siloxane units in the polyorganosiloxane having the formula

$$R'_ySiO_{\frac{4-y}{2}}$$

wherein R′ is as defined above and y is an integer from 0 to 3 inclusive, said polyorganosiloxane having a degree of functionality of from 2.2 to 5.0,

b. an effective amount of a hydroperoxy polymerization initiator, and

c. an effective amount of a storage stabilizer, said anaerobically curing composition remaining uncured in the presence of oxygen at room temperature but curing to an insoluble solid in the absence of oxygen.

4,035,356

COPOLYESTER PREPARED FROM AN ACYLOXYBENZOIC ACID AND POLYETHYLENE TEREPHTHALATE MODIFIED WITH p-HYDROXYETHOXYBENZOIC ACID

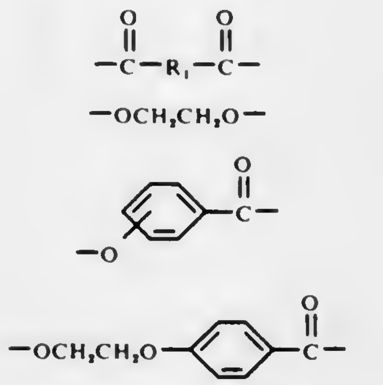
Winston J. Jackson, Jr., and Herbert F. Kuhfuss, both of Kingsport, Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed May 7, 1976, Ser. No. 684,134

Int. Cl.² C08G *63/06, 63/18, 63/46*

U.S. Cl. 260—47 C 5 Claims

1. A copolyester having an inherent viscosity of at least 0.4 consisting essentially of the following divalent radicals:



(A)

(B)

(C)

(D)

wherein

R_1 is a divalent alicyclic radical having 4 to 20 carbon atoms, a divalent aliphatic radical having 1 to 40 carbon atoms, or a divalent aromatic radical having 6 to 16 carbon atoms with the carbonyl linkages separated by at least 3 carbon atoms, with the proviso that at least 50 mole percent of R_1 is the divalent aromatic radical,

the range of radical (C) is from about 50 to about 80 mole percent, based on the total moles of (A) and (C) combined,

in radical (C) the oxygen is linked either in the meta or para position with regard to the carbonyl group,

at least 60 mole percent of radical (C) is the para isomer, and

the range of radical (D) is from about 20 to about 70 mole percent, based on the total moles of (A) and (B) combined.

4,035,357

IMPROVED POLYPHENYLENE ETHER POLYMERIZATION PROCESS USING METHYLENE CHLORIDE AS SOLVENT

Glenn Dale Cooper, Delmar, and Irwin Schraga, Guilderland, both of N.Y., assignors to General Electric Company, Pittsfield, Mass.

Filed Oct. 18, 1976, Ser. No. 733,223

Int. Cl.² C08G *65/44*

U.S. Cl. 260—47 ET 11 Claims

1. In a process for the preparation of a polyphenylene ether by an oxidative coupling reaction in the presence of a metal ion-amine complex catalyst in a reaction solution of a phenol and said catalyst, the improvement which comprises carrying out the reaction in a closed system, using methylene chloride as a solvent, at a temperature above at least about 40° C., and under an oxygen or oxygen-containing gas pressure between 25 and 300 psig.

4,035,358

PROCESS FOR THE PRODUCTION OF FILM FORMING SYNTHETIC RESINS FOR HAIR FIXATIVES

Hans-Albrecht Meyer-Stoll, Rheinkamp-Repelen; Johannes Wöllner, Kapellen, and Hans-Heinz Schittek, Moers-Meerbeck, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 263,517, June 16, 1972, Pat. No. 3,987,010. This application Sept. 28, 1976, Ser. No. 727,569

Claims priority, application Germany, May 29, 1968, 1770518

Int. Cl.² C08G *8/08*

U.S. Cl. 260—53 R 6 Claims

1. Process for the production of a water soluble, film-forming resin product having a molecular weight in the range of from about 700 up to about 3,000 or more, for a hair fixative composition which comprises reacting at an elevated temperature in the range of from about 70° C. to about 115° C. a methylolated 5,5-dialkylhydantoin wherein each alkyl group thereof contains from 1 to 5 carbon atoms, in the presence of from about 0.2 to about 2.5 moles of salicylic acid amide per mole of said hydantoin.

4,035,359

6α, β-SUBSTITUTED PENICILLIN DERIVATIVES

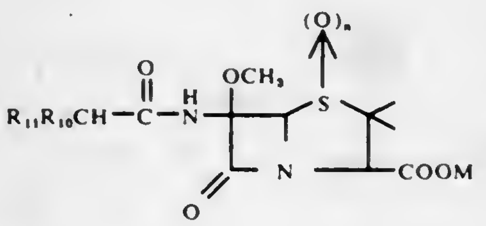
Burton G. Christensen, Scotch Plains, and Lovji D. Cama, Edison, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 495,010, Aug. 5, 1974, which is a continuation-in-part of Ser. No. 149,349, June 2, 1971, abandoned. This application July 25, 1975, Ser. No. 599,266

Int. Cl.² C07D *499/46*

U.S. Cl. 260—239.1 6 Claims

1. The compound of the formula



wherein

R_{10} is hydrogen, amino, hydroxy, or carboxy;

R_{11} is hydrogen, phenyl, phenoxy, phenylthio, thienyl, furyl, isothiazolyl, pyridyl, pyridylthio, or phenyl substituted with loweralkyl or loweralkoxy;

n is 0 or 1;

and

M is hydrogen, sodium, potassium, ammonium, lower-alkyl, haloloweralkyl, allyl, loweralkynyl, benzyl, p-methoxybenzyl, o-nitrobenzyl, or phenacyl.

4,035,360

MAGNESIUM SALTS OF 2-DESCARBOXY-2-(TETRAZOL-5-YL)-11-DESOXY-15-SUBSTITUTED-OMEGA-PENTANOPROSTAGLANDINS

Michael R. Johnson; Thomas K. Schaaf; Jasjit S. Bindra; Hans-Jurgen E. Hess, and James F. Eggler, all of New London, Conn., assignors to Pfizer Inc., New York, N.Y.

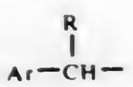
Continuation-in-part of Ser. No. 531,675, Dec. 11, 1974, Pat. No. 3,932,389. This application Dec. 22, 1975, Ser. No. 642,736

The portion of the term of this patent subsequent to Jan. 13, 1993, has been disclaimed.

Int. Cl.² C07D *257/06, 409/08, 257/04*

U.S. Cl. 260—240 R 32 Claims

1. Magnesium salts of 2-descarboxy-2-[tetrazol-5-yl]-11-desoxy-ω-pentanorprostaglandins and their C_{15} epimers having at the 15-position a hydroxy or a keto group and one substituent of the formula:



$$Ar-\overset{\overset{\displaystyle R}{|}}{C}H-$$

wherein Ar is α- or β-thienyl; 5-phenyl-α- or β-thienyl; 5-lower alkyl-α- or β-thienyl; α- or β-naphthyl; tropyl, phenyl; 3,5-dimethylphenyl; 3,4-dimethoxyphenyl; 3,4-methylenedioxyphenyl; 3,4-dichlorophenyl; and monosubstituted phenyl wherein said substituent is bromo, chloro, fluoro, trifluoromethyl, phenyl, lower alkyl, or lower alkoxy; and R is hydrogen or methyl.

4,035,361

BIS-TRIMETHYLSILYL CEFAMANDOLE AND PROCESS THEREFOR

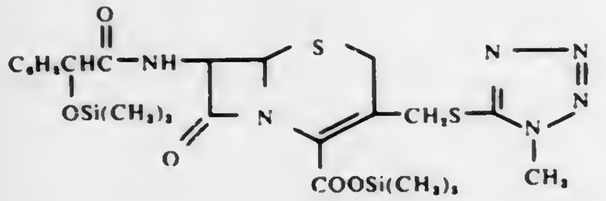
William J. Wheeler, Indianapolis, Ind., assignor to Eli Lilly and Company, Indianapolis, Ind.

Filed Mar. 17, 1976, Ser. No. 667,753

Int. Cl.² C07D *501/04*

U.S. Cl. 260—243 C **3 Claims**

1. A compound of the formula



which is trimethylsilyl 7-[D-(O-trimethylsilyl)mandelamido]-3-(1-methyl-1,2,3,4-tetrazol-5-yl)thiomethyl-3-cephem-4-carboxylate.

4,035,362

METHODS FOR PREPARING CEPHALOSPORINS

Paolo Masi; Maurizio Foglio; Giovanni Franceschi; Antonino Suarato; Gianfranco Cainelli, all of Milan, and Federico Arcamone, Nerviano (Milan), all of Italy, assignors to Societa' Farmaceutici Italia S.p.A., Milan, Italy

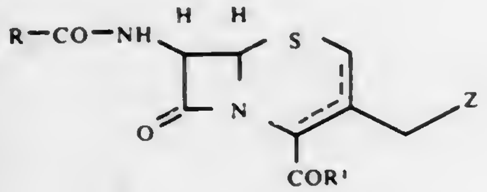
Filed Mar. 31, 1976, Ser. No. 672,527

Claims priority, application United Kingdom, Apr. 5, 1975, 14241/75

Int. Cl.² C07D *501/20*

U.S. Cl. 260—243 C **1 Claim**

1. A process for preparing cephalosporins of the structure:



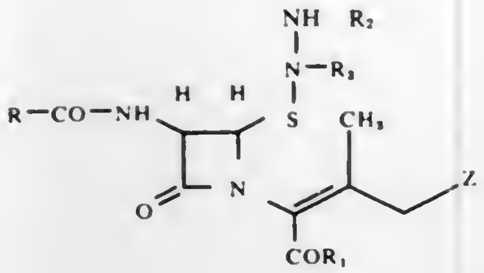
I

where R is selected from the class consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, cyano-methyl, thienyl-methyl, naphthyl-methyl, phenyl-methyl, phenoxy-methyl, phenoxy-isopropyl, pyridyl-4-thiomethyl and tetrazolyl-1-methyl;

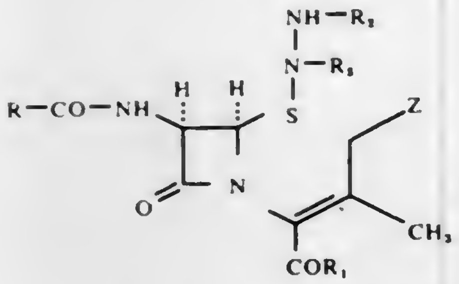
R_1 is selected from the class consisting of hydroxyl, alkoxy having from 1 to 4 carbon atoms, benzyloxy, p-methoxybenzyloxy, p-nitro-benzyloxy, benzhydryloxy, triphenylmethoxy, phenacyloxy, p-halo-phenacyloxy and trichloroethoxy;

Z is selected from the class consisting of hydrogen, hydroxyl, O—alkyl, O—CO alkyl, the alkyls having from 1 to 4 carbon atoms, and 2-mercapto-5-methyl-1,3,4-thiadiazole, wherein compounds of structure:

-continued



or



III (Z isomer)

in which R, R_1 and Z are as above defined;

R_2 and R_3 are the same or different and represent the radicals $-COOR_4$ where R_4 is a lower alkyl having from 1 to 4 carbon atoms, are dissolved in anhydrous tetrahydrofuran or anhydrous dimethylformamide and reacted at a temperature between −100° C and +120° C with n-butyl lithium, lithium, sodium or potassium triphenyl methane, lithium diisopropylamide or potassium tert-butoxide to finally give a compound of formula I that is a mixture of Δ^2 and Δ^3 cephem derivatives from which the Δ^3 cepham derivatives can be obtained.

4,035,363

1,3-BENZOXAZINE DERIVATIVES

Yoshikazu Oka, Kobe; Mitsumi Tomimoto, Kawanishi, and Sukehiro Chiba, Kobe, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

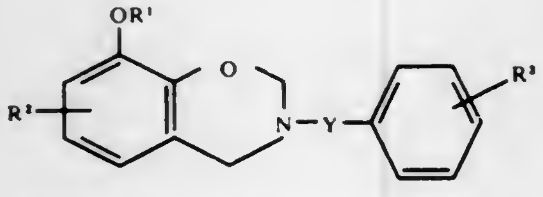
Continuation of Ser. No. 473,297, May 24, 1974, abandoned. This application Dec. 9, 1975, Ser. No. 639,461

Claims priority, application Japan, May 28, 1973, 48-59495

Int. Cl.² C07D *265/00, 273/00, 295/00*

U.S. Cl. 260—244 R **17 Claims**

1. A compound of the formula



wherein R^1 is alkyl of 1 to 4 carbon atoms; R^2 is hydrogen, alkyl of 1 to 4 carbon atoms or alkenyl of 2 of 4 carbon atoms; R^3 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen and Y is alkylene of 1 to 4 carbon atoms or its pharmaceutically acceptable salts.

4,035,364

METHYL BROMIDE THIOL METHYLATION OF MERCAPTO GROUP OF 4-AMINO-6-T.-BUTYL-3-MERCAPTO-1,2,4-TRIAZIN-5-ONE

Karlfried Dickore; Walter Merz, both of Leverkusen; Johann Dahm, Dormagen, all of Germany, and Donovan Norman Smith, Jr., Kansas City, Mo., assignors to Bayer Aktiengesellschaft, Leverkusen, Germany and Mobay Chemical Corporation, Pittsburgh, Pa.

Filed July 26, 1976, Ser. No. 708,674

Int. Cl.² C07D *253/06*

U.S. Cl. 260—248 AS **7 Claims**

1. In the process wherein 4-amino-6t.-butyl-3-mercapto-1,2,4-triazine-5-one is reacted with methyl bromide in an alkaline medium to produce a slurry of 4-amino-6t.-butyl-3-methylmercapto-1,2,4-triazine-5-one, the improvement which comprises effecting the reaction in the substantial absence of air.

4,035,365

TRIAZINEDIONES

Ian Trevor Kay, Wokingham, England, assignor to Imperial Chemical Industries Limited, London, England

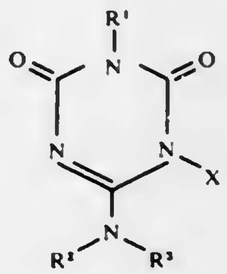
Continuation-in-part of Ser. No. 515,090, Oct. 15, 1974. This application Dec. 31, 1975, Ser. No. 645,657

Claims priority, application United Kingdom, Feb. 5, 1975, 4885/75

Int. Cl.² C07D *251/46*

U.S. Cl. 260—249.5 **6 Claims**

1. A triazine-dione compound of the formula:



wherein R^1 is an alkyl radical of 1 to 8 carbon atoms, R^2 is a carboxylic acyl radical of formula R^4.CO— wherein R^4 is (1) an alkoxycarbonyl group wherein the alkoxy group has 1 to 6 carbon atoms, (2) an alkoxy group of 1 to 6 carbon atoms, (3) an alkyl group of 1 to 6 carbon atoms, or (4) a phenyl radical, R^3 is a hydrogen atom or an alkyl radical of 1 to 6 carbon atoms, and X is a hydrogen atom, a cation selected from the group consisting of alkali metal and alkaline earth metal cations, ammonium, and primary, secondary, and tertiary amines in which the one, two, or three aliphatic radicals each contain from 1 to 6 carbon atoms, or an alkyl radical of 1 to 6 carbon atoms.

4,035,366

1-BENZAL-1,2,3,4-TETRAHYDRO-ISOQUINOLINIUM-THEOPHYLLINE-7-ACETATES

Péter Szentmiklosi; Zoltán Mészáros; Lászlo Tardos; István Hermecz; Ilona Erdelyi; Agoston Dávid; Lelle Vasvári nee Debreczy, and Ágnes Horvath, all of Budapest, Hungary, assignors to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT, Budapest, Hungary

Filed Jan. 22, 1974, Ser. No. 435,591

Claims priority, application Hungary, Jan. 25, 1973, CI 1333

Int. Cl.² C07D *473/08*

U.S. Cl. 260—253 **3 Claims**

1. 1-benzal-1,2,3,4-tetrahydro-isoquinolinium-theophylline-7-acetate.

2. 1-(3,4-dimethoxy-benzal)-6,7-dimethoxy-1,2,3,4-tetrahydro-isoquinolinium-theophylline-7-acetate.

3. 1-(3,4-diethoxy-benzal)-6,7-diethoxy-1,2,3,4-tetrahydro-isoquinolinium-theophylline-7-acetate.

4,035,367

HYDROXYALKYL-SUBSTITUTED-AMINO-QUINOLINES

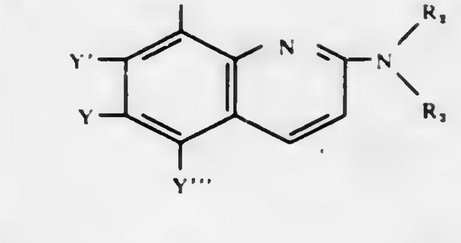
William R. Simpson, Mendham, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 504,427. Sept. 9, 1974, Pat. No. 3,957,791, which is a division of Ser. No. 291,833, Sept. 25, 1972, Pat. No. 3,856,796, which is a continuation-in-part of Ser. No. 245,308, April 19, 1972, abandoned, which is a continuation-in-part of Ser. No. 127,376, March 23, 1971, abandoned. This application Feb. 9, 1976, Ser. No. 656,246

Int. Cl.² C07D *295/08, 215/42*

U.S. Cl. 260—268 BQ **12 Claims**

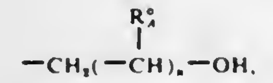
1. A compound of the formula:



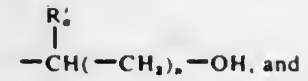
wherein

R_2 is from the group of:

a. $-CH_2(-CH_2)_n-OH$



b) $-CH_2(-\overset{\overset{\displaystyle R_o^{\circ}}{|}}{C}H)_n-OH$,



c) $-\overset{\overset{\displaystyle R_o'}{|}}{C}H(-CH_2)_n-OH$, and

d. $-CH_2(-CH_2)_x-N[CH_2(-CH_2)_y-OH]_2$

R_3 is from the group of:

e. $-CH_2(-CH_2)_n-OH$ when R_2 is a) as above defined,

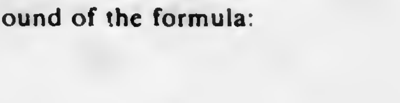
f. hydrogen,

g. lower alkyl of 1 to 4 carbon atoms,

R_o' is $-(CH_2-)_xCH_3$ or $-(CH_2-)_yOH$,

R_o° is hydrogen, $-(CH_2-)_mCH_3$ or $-(CH_2-)_yOH$, provided that one R_o° is other than hydrogen, that the sum of *n* and *m* does not exceed 7 and that the sum of *n* and *y* does not exceed 8, or

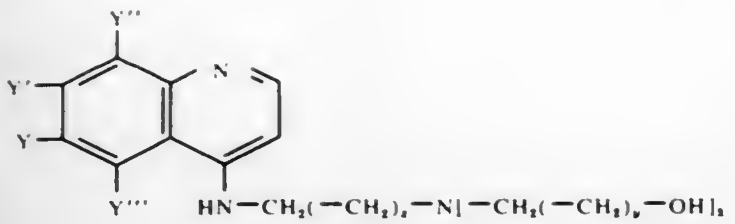
R_2 and R_3 together with the 4-amino nitrogen attached to quinoline ring form



n is 1 to 7,
m is 0 to 4,
x is 0 or 1,
y is 1 to 4,
z is 1 to 4, and

each of Y, Y', Y'' and Y''' is hydrogen, halo of atomic weight of from 18 to 80, alkoxy of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms, or Y and Y' together form methylenedioxy, provided at least 2 of Y, Y', Y'' and Y''' are hydrogen and further provided that when one of Y, Y', Y'', Y''' is halo then the others are hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

11. A compound of the formula:



wherein

y is 1 to 4,

z is 1 to 4, and

each of Y, Y', Y'' and Y''' is hydrogen, halo of atomic weight of from 18 to 80, alkoxy of 1 to 3 carbon atoms, or alkyl of 1 to 3 carbon atoms, or Y and Y' together form methylenedioxy, provided that at least 2 of Y, Y', Y'' and Y''' are hydrogen and further provided that when one of Y, Y', Y'' and Y''' is halo then the others are hydrogen, or a pharmaceutically acceptable acid addition salt thereof.

4,035,368
SUBSTITUTED 3-(1H-TETRAZOL-5-YL)-QUINOLINE COMPOUNDS

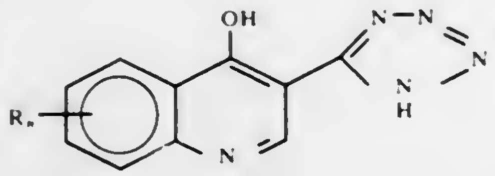
Edward H. Erickson, Woodbury, Minn., assignor to Riker Laboratories, Inc., Northridge, Calif.

Filed Apr. 2, 1975, Ser. No. 564,557

Int. Cl.² C07D *401/04*

U.S. Cl. 260—288 CE **5 Claims**

1. A compound of the formula



wherein R is halogen, lower alkyl, lower alkoxy, lower alkylthio, lower alkylsulfinyl, lower alkylsulfonyl, trifluoromethyl or lower alkylsulfonamido and *n* is zero, one or two.

4,035,369
1-BENZAZOLYLALKYL-4-SUBSTITUTED-PIPERIDINES

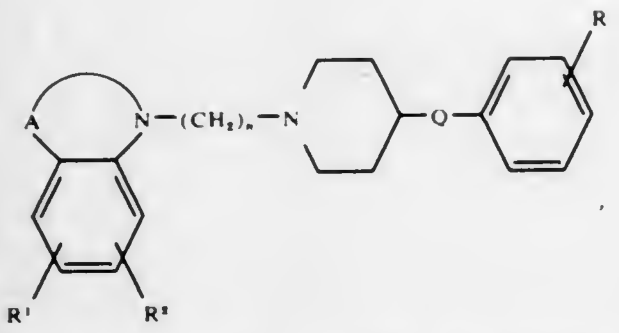
Jan Vandenberk, Beerse; Ludo E. J. Kennis, Vosselaar; Marcel J. M. C. Van der Aa, Vosselaar, and Albert H. M. Th. Van Heertum, Vosselaar, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 620,727, Oct. 8, 1975, abandoned. This application Aug. 10, 1976, Ser. No. 713,309

Int. Cl.² C07D *401/06*

U.S. Cl. 260—293.6 **7 Claims**

1. A chemical compound selected from the group consisting of a piperidine derivative having the formula:



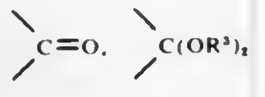
and the pharmaceutically acceptable acid addition salts thereof, wherein:

R is a member selected from the group consisting of hydrogen and halo;

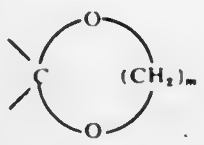
R¹ and R² are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

n is an integer of from 2 to 4 inclusive;

Q is a member selected from the group consisting of

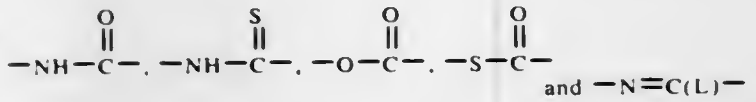


and



wherein R³ is lower alkyl and *m* is an integer of from 2 to 3 inclusive; and

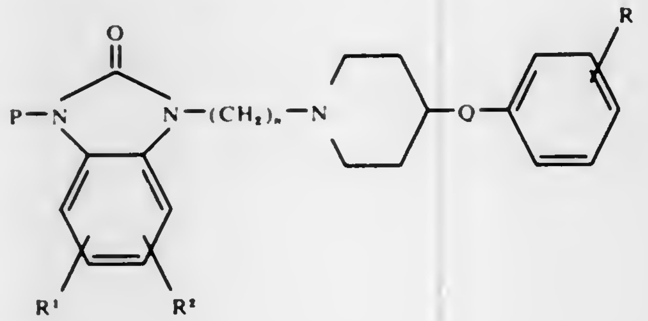
A is a bivalent radical selected from the group consisting of



$$-NH-\overset{O}{\overset{\|}{C}}-,\ -NH-\overset{S}{\overset{\|}{C}}-,\ -O-\overset{O}{\overset{\|}{C}}-,\ -S-\overset{O}{\overset{\|}{C}}-\ \text{and}\ -N{=}C(L)-$$

wherein L is selected from the group consisting of hydrogen, lower alkylthio, cyclohexyl and phenylmethyl, said bivalent radical being attached to the benzene nucleus by its heteroatom.

6. A chemical compound having the formula



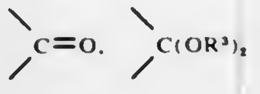
wherein:

R is a member selected from the group consisting of hydrogen and halo;

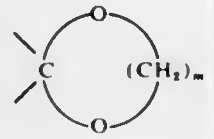
R¹ and R² are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

n is an integer of from 2 to 4 inclusive;

Q is a member selected from the group consisting of

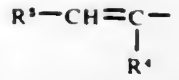


and



wherein R³ is lower alkyl and *m* is an integer of from 2 to 3 inclusive; and

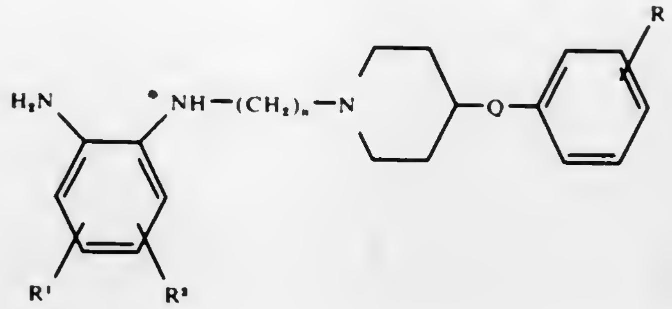
P is a member selected from the group consisting of lower alkyloxycarbonyl and a substituted ethenyl radical having the formula:



$$R^5-CH{=}\underset{R^4}{\underset{|}{C}}-$$

wherein R⁴ is lower alkyl and R⁵ is selected from the group consisting of hydrogen, lower alkyl and phenyl.

7. A chemical compound having the formula:



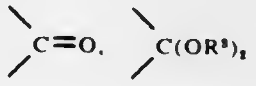
wherein:

R is a member selected from the group consisting of hydrogen and halo;

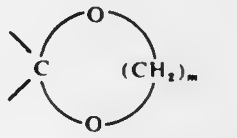
R¹ and R² are each independently selected from the group consisting of hydrogen, halo, lower alkyl and trifluoromethyl;

n is an integer of from 2 to 4 inclusive; and

Q is a member selected from the group consisting of



and



wherein R³ is lower alkyl and *m* is an integer of from 2 to 3 inclusive.

4,035,370
ALKALOID ESTERS

Csaba Lörincz; Egon Karpati; Laszlo Szporny; Kalman Szasz, and Lajos Kisfaludy, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

Continuation of Ser. No. 296,569, Oct. 11, 1972, abandoned. This application Dec. 29, 1975, Ser. No. 645,244

Claims priority, application Hungary, Nov. 3, 1971, RI 454

Int. Cl.² C07D *459/00*

U.S. Cl. 260—293.53 **1 Claim**

1. Apovincaminic acid ethyl ester.

4,035,371
PROPIONIC ACID DERIVATIVES

Max Fernand Robba, Paris, and Denise Jeanne Claude Duval, Yvelines, both of France, assignors to Innothera, Arcueil, France

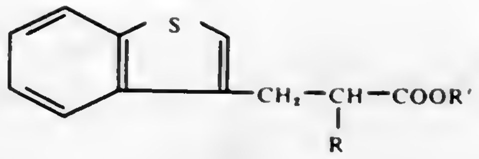
Division of Ser. No. 489,545, July 18, 1974, which is a division of Ser. No. 150,747, June 7, 1971, Pat. No. 3,865,842. This application Jan. 22, 1976, Ser. No. 651,223

Claims priority, application France, June 12, 1970, 70.21679

Int. Cl.² C07D *409/12*

U.S. Cl. 260—293.57 **6 Claims**

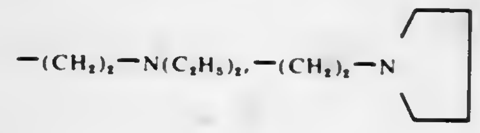
1. A *β*[benzo (b) thienyl-3] propionic acid derivative of the formula:

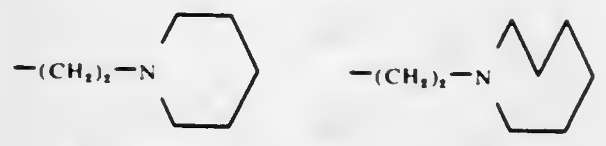


wherein R is selected from the group consisting of phenyl, benzyl, and thenyl; and

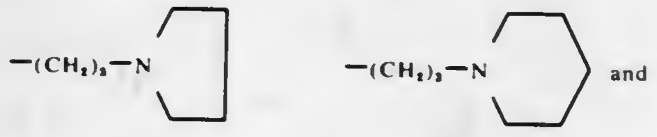
R' is selected from the group consisting of

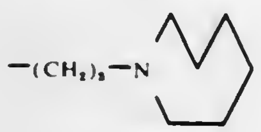
$-(CH_2)_2-N(CH_3)_2$,





$-(CH_2)_3-N(CH_3)_2, -(CH_2)_3-N(C_2H_5)_2,$





4,035,372
4-{[4-(DIPHENYLMETHYL)-1-PIPERIDINYL]METHYL}-BENZENAMINES

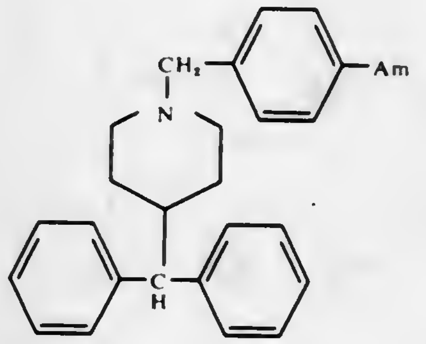
James R. Deason; Robert W. Hamilton, both of Wilmette; Harman S. Lowrie, and Kurt J. Rorig, both of Glenview, all of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Aug. 13, 1976, Ser. No. 714,429

Int. Cl.² C07D *211/14*

U.S. Cl. 260—293.77 **6 Claims**

1. A compound of the formula



in which Am represents $-NH_2$, $-NHCOC_nH_{2n+1}$, or $-N(C_nH_{2n+1})_2$ wherein *n* represents a positive integer less than 8.

4,035,373

PREPARATION OF PIPERIDINYL-ALKYL-BENZAMIDES

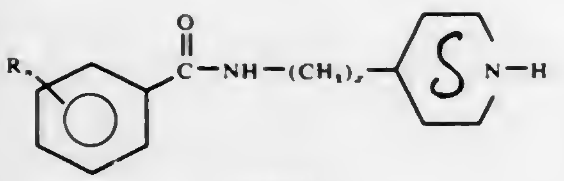
William D. Roll, Toledo, Ohio, assignor to The University of Toledo, Toledo, Ohio

Filed Feb. 23, 1976, Ser. No. 660,652

Int. Cl.² C07D *211/36*

U.S. Cl. 260—293.77 **5 Claims**

1. Piperidinyl-alkyl-benzamides having the general formula



Formula I

wherein R is hydrogen, an alkyl group having from 1 to 4 carbon atoms, an alkoxy group having from 1 to 4 carbon atoms, halo, amino, hydroxy or, where R is meta, trifluoromethyl, *n* is 1, 2 or 3 when R is methoxy, but is otherwise 1, and *x* is 1, 2 or 3, with the proviso that when *n* is 1, R in the meta position is trifluoromethyl or hydrogen, and physiologically acceptable salts thereof.

4,035,374

IMIDAZOLYL ALKYLAMINOPYRIDONE AND PYRIDINETHIONE COMPOUNDS

Graham John Durant, Welwyn Garden City; John Colin Emmett, Codicote, and Charon Robin Ganellin, Welwyn Garden City, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

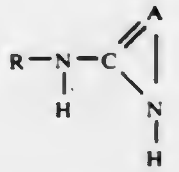
Division of Ser. No. 463,647, April 24, 1974, Pat. No. 3,932,644. This application Oct. 6, 1975, Ser. No. 619,724

Claims priority, application United Kingdom, May 3, 1973, 21063/73; July 26, 1973, 35551/73

Int. Cl.² C07D *213/74*

U.S. Cl. 260—294.8 G **5 Claims**

1. A compound of the formula:



wherein A taken together with the nitrogen and carbon atom shown forms a pyridine ring, said ring having a keto or thione group and optionally substituted by one or two lower alkyl, phenyl or benzyl groups, provided that if two of the optional substituents are present at least one is lower alkyl; R is a grouping of the formula:

Het—$CH_2Z(CH_2)_n$—

wherein Het is an imidazole ring, said ring being optionally substituted by lower alkyl, amino, hydroxy or halogen; Z is sulphur or a methylene group and *n* is 2 or 3 or a pharmaceutically acceptable acid addition salt thereof.

4,035,375

N-SUBSTITUTED AMINO PYRIDINES AND DERIVATIVES THEREOF

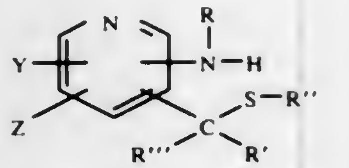
Paul G. Gassman, and Gordon D. Gruetzmacher, both of Columbus, Ohio, assignors to The Ohio State University Research Foundation, Columbus, Ohio

Division of Ser. No. 553,602, Feb. 27, 1975, Pat. No. 3,985,756, which is a division of Ser. No. 327,294, Jan. 29, 1973, Pat. No. 3,894,034. This application May 14, 1976, Ser. No. 686,330

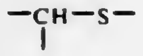
Int. Cl.² C07D *213/38, 417/06*

U.S. Cl. 260—294.8 G **5 Claims**

1. A compound of the formula:



wherein R is hydrogen or hydrocarbon radical free of aliphatic unsaturation containing from 1 to 8 carbon atoms; the —N(R)H group is in a position ortho, meta or para to the pyridine ring nitrogen; wherein one of Y and Z is hydrogen, halogen, nitro, cyano, amino, lower-alkylamino, lower-alkyl, lower-alkyloxy, lower-alkanoyloxy, a carbonyloxy-lower alkyl or carbonyloxy-phenyl; and wherein the other one of Y and Z is hydrogen, or wherein both Y and Z are simultaneously halogen, or wherein one of Y and Z is lower-alkoxy and the other one of Y and Z is halogen; R′ is hydrogen, lower-alkyl or phenyl; R″, taken separately, is lower-alkyl or phenyl; R‴, taken separately, is hydrogen, lower-alkyl or phenyl; no more than two of R′, R″, and R‴ being lower-alkyl at any one time, no more than two of R′, R″, and R‴ being phenyl at any one time; and wherein R″ and R‴, when taken together with the



$$-\underset{|}{C}H-S-$$

moiety denote a ring containing 3 to 5 methylene carbon atoms and the hydrocarbon-S-hydrocarbyl thio-ether group is attached ortho to the N(-R)H group.

4,035,376

AROYL-SUBSTITUTED PHENYLACETIC ACID DERIVATIVES

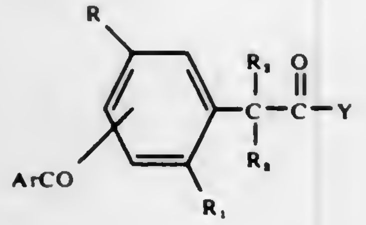
Paul Adriaan Jan Janssen, Vosselaar (Turnhout); Georges Henri Paul Van Daele, Turnhout, and Jozef Martin Boey, Wilrijk (Antwerp), all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Continuation-in-part of Ser. No. 395,877, Sept. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 300,079, Oct. 24, 1972, abandoned. This application Oct. 8, 1975, Ser. No. 620,906

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295 R **24 Claims**

1. An aroyl substituted α-R_2-α-R_3-phenylacetic acid derivative having the formula:



wherein:

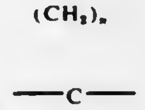
ArCO is an aroyl substituent the Ar function of which is a

member selected from the group consisting of 2-thienyl, 5-loweralkyl-2-thienyl, 5-halo-2-thienyl, 2-naphthyl and 3-pyridyl, said ArCO being in the meta- or para-position relative to the acetic acid function;

either of R and R_1 is hydrogen, the other being a member selected from the group consisting of hydrogen, halo and loweralkyl, provided that, when said R is halo or loweralkyl, then said ArCO is in the aforementioned para-position, and when said R_1 is halo or loweralkyl, then said ArCO is in the aforementioned meta-position, and further provided that when said R or R_1 is halo, then said Ar is a member selected from the group consisting of 2-thienyl, 5-loweralkyl-2-thienyl and 5-halo-2-thienyl;

either of R_2 and R_3 is a member selected from the group consisting of hydrogen, allyl and loweralkyl, the other being a member selected from the group consisting of hydrogen and loweralkyl, provided that, when either of said R_2 and R_3 is allyl, the other is hydrogen, and when either of said R_2 and R_3 is loweralkyl, the other is a member selected from the group consisting of hydrogen and loweralkyl;

R_2 and R_3 taken together, is an alkylene bridge attached to the α-carbon of the acetic acid function:



$$\overset{(CH_2)_n}{-C-}$$

wherein *n* is an integer from 2 to 5;

Y is a member selected from the group consisting of hydroxy, alkoxy having from 1 to 8 carbon atoms and diloweralkylamino-loweralkyloxy; and

wherein loweralkyl as above employed is a radical having from 1 to 5 carbon atoms.

4,035,377

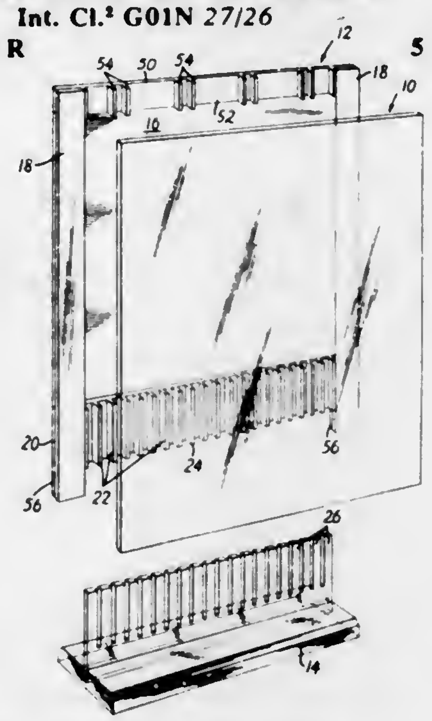
SLAB GEL ELECTROPHORESIS APPARATUS

Bruce A. Detroy, Huntington Station, N.Y., assignor to Cold Spring Harbor Laboratory, Cold Spring Harbor, N.Y.

Filed June 23, 1975, Ser. No. 589,464

Int. Cl.² G01N *27/26*

U.S. Cl. 204—299 R **5 Claims**



1. Vertical slab gel electrophoresis apparatus which is particularly useful with agarose gel, the apparatus comprising: upper and lower oppositely extending tanks; a vertical support plate forming an inner wall of each tank and supporting the tanks in stepped relation, at least part of the top edge of the inner wall of the upper tank which is formed by the support plate being lower than other top edges of the upper tank; an electrode in each tank; a substantially rigid plastic plate with one side adjacent the support plate; strip members along opposite side edges of the other side of the plastic plate; a rigid glass plate clamped to the plastic plate and spaced therefrom by the strip members for forming a substantially open-ended chamber between the plates for receiving the slab of gel; parallel partitions extending from the plastic plate across the chamber and down the plastic plate from the top edge thereof to the gel for forming wells, the portion of the top edge of the plastic plate having the partitions being intermediate the lower edge part of the inner wall of the upper tank formed by the support plate and the top edges of the other walls of the upper tank, and the top edge of the glass plate being higher than the top edge of the plastic plate; means for clamping said plates together; and means removably holding the plastic plate against the support plate for reinforcing the rigidity thereof with the support plate and for sealing the plastic plate to the support plate, whereby the gel may be formed in the chamber while the chamber is inverted with teeth of a comb between the partitions and before the rigidity of the plastic plate is reinforced by its sealing contact with the support plate, the chamber then turned upright, the comb removed and the rigidity of the plastic plate reinforced by contact with the support plate to keep the gel from slipping so that samples may be placed in the wells formed between the partitions at the top of the gel and the tanks filled with an electrolytic buffer solution which flows over said inner wall and intermediate plate edges from the upper tank to the wells for the electrophoretic assay of the samples.

4,035,378

PROCESS FOR THE PRODUCTION OF 1,3,4-THIADIAZOL-5(4H)-ONYL DITHIOPHOSPHORIC ACID ESTERS

Sebastian Stäubli, Magden; Lothar Schiener, Bettingen, and Kurt Rüfenacht, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

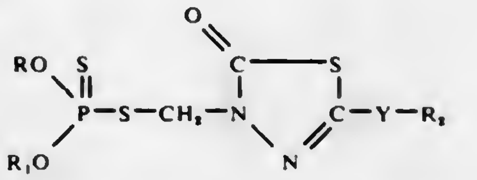
Continuation-in-part of Ser. No. 499,881, Aug. 23, 1974, abandoned, which is a continuation of Ser. No. 650,190, June 30, 1967, abandoned. This application Nov. 3, 1975, Ser. No. 627,998

Claims priority, application Switzerland, July 5, 1966, 9760/66

Int. Cl.² C07D *285/12*

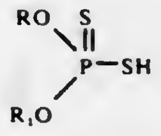
U.S. Cl. 260—302 E **13 Claims**

1. A process for the production of a 1,3,4-thiadiazol-5-(4H)-onyl-(4)-methyl dithiophosphoric acid ester of the formula

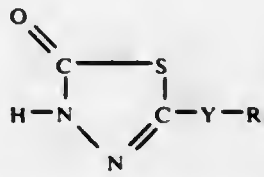


wherein each of R, R_1 and R_2 represents methyl or ethyl and Y represents oxygen or sulphur, comprising

condensing a thiophosphoric acid of the formula



or an alkali metal or ammonium salt thereof, with a thiadiazole of the formula



and with formaldehyde in an aqueous medium comprising sulphuric acid in concentration of from about 60 to 98%, the amount of sulphuric acid being at least 0.7 mol per mol of free thiophosphoric acid if free thiophosphoric acid is used or at least 1.7 mol per mol of thiophosphoric acid salt if a salt is used,

and maintaining the temperature of the reaction mixture in the range of about 15° to 60° C.

4,035,379

PROCESS FOR THE PRODUCTION OF 2-AMINO-BENZOTHIAZOLES

Rudolf Fuchs, Lausanne, Switzerland, assignor to Lonza Ltd., Gampel, Valais, Switzerland

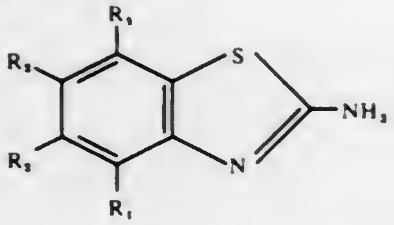
Filed Jan. 22, 1976, Ser. No. 651,299

Claims priority, application Switzerland, Jan. 22, 1975, 758/75

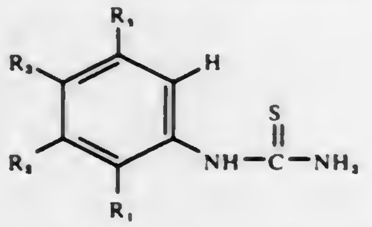
Int. Cl.^{2} C07D ***277/82***

U.S. Cl. 260—305 **14 Claims**

1. A process for the production of a salt of a 2-amino-benzothiazole having the formula:



wherein R_1, R_2, R_3 and R_4 are the same or different and are hydrogen, halogen, alkyl having 1 to 10 carbon atoms or alkoxy having 1 to 10 carbon atoms, which comprises (a) adding a phenylthiourea having the formula:



wherein R_1, R_2, R_3 and R_4 are defined as above, to a cyclization agent in the absence of a solvent and allowing said phenylthiourea to cyclize to form said 2-amino-benzothiazole in salt form, said cyclization step (a) being conducted for between 1 and 10 hours at a temperature between 30° and 100° C., said cyclization agent being a halogen, a sulfur halide, a sulfoxy halide, SbI_5, SbF_f or $SbCl_5$, and said cyclization agent being present in an amount which is at least 6 times it stoichiometric amount, and (b) filtering said salt of said 2-amino-benzothiazole out of the reaction mixture of step (a).

6. A process as described in claim 1 wherein said salt of said 2-amino-benzothiazole, after step (b) is purified and placed in the free compound form.

4,035,380

CERTAIN BENZAZOL-2-YLTHIO COMPOUNDS

Richard Peter, and Walter Jenny, both of Basel, Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

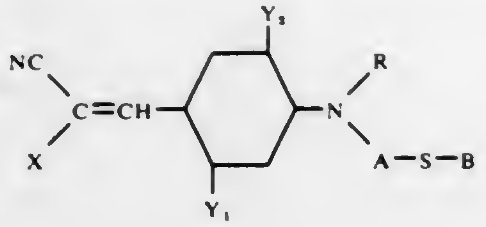
Continuation-in-part of Ser. No. 662,313, Aug. 22, 1967, abandoned. This application July 14, 1970, Ser. No. 54,849

Claims priority, application Switzerland, Aug. 29, 1966, 12485/66

Int. Cl.^{2} C07D ***277/74***

U.S. Cl. 260—306.6 R **4 Claims**

1. A water insoluble styryl dyestuff of the formula



in which X represents a cyano, carbalkoxy containing up to 3 carbon atoms or phenylsulphone group, Y_1 and Y_2 each represents a hydrogen atom, methyl or methoxy group, R represents C_1 to C_4 alkyl, phenylalkyl containing up to 8 carbon atoms, cyanoethyl, alkoxyalkyl containing up to 6 carbon atoms, or fatty acid acyloxyalkyl group up to 3 carbon atoms, or a radical of the formula —A—S—B, and A represents alkylene group containing up to 3 carbon atoms that may be substituted by a fatty acid acyloxy containing up to 2 carbon atoms or a benzoyloxy group and B represents either a benzthiazolyl radical which may be substituted by chlorine, methyl, methoxy, ethoxy or a benzoxazolyl-2- or benzoimidazolyl-2.

4,035,381

ANTIBACTERIAL AGENTS

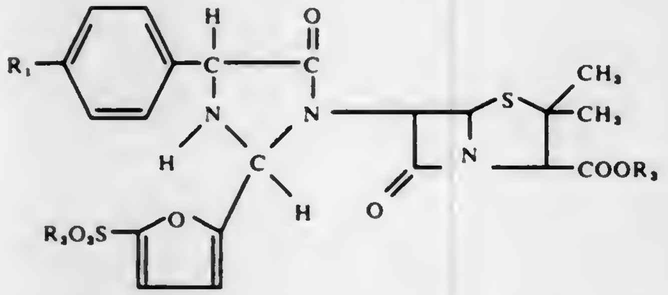
Murray Arthur Kaplan, Syracuse; William Joseph Gottstein, Fayetteville, and Alphonse P. Granatek, Baldwinsville, all of N.Y., assignors to Bristol-Myers Company, New York, N.Y.

Filed Oct. 26, 1976, Ser. No. 735,552

Int. Cl.^{2} C07D ***499/80***

U.S. Cl. 260—306.7 C **7 Claims**

1. A compound having the formula



wherein R_1 is hydrogen or hydroxyl and R_2 and R_3 are alike or different and are each sodium or potassium.

4,035,382

O-ALKYL-O-[5- METHYL-7-HALO-BENZISOXAZOL (3)YL]-THIONO-(THIOL)-PHOSPHORIC (PHOSPHONIC) ACID ESTERS AND ESTER AMIDES

Walter Lorenz, Wuppertal; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

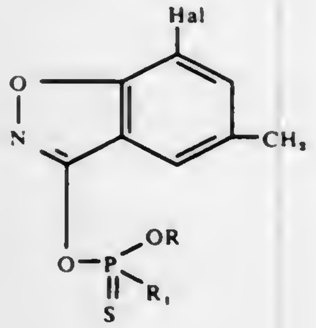
Filed July 10, 1974, Ser. No. 487,337

Claims priority, application Germany, July 19, 1973, 2336720

Int. Cl.^{2} C07D ***261/20***

U.S. Cl. 260—307 DA **7 Claims**

1. An O-alkyl-O-[5-methyl-7-halo-benzisoxazol-(3)yl]-thiono-(thiol)-phosphoric(phosphonic) acid ester or ester-amide of the formula



in which

R is alkyl of 1 to 6 carbon atoms,

R_1 is alkyl, alkoxy, alkylmercapto or alkylamino each of 1 to 6 carbon atoms, or phenyl, and

Hal is halogen.

4,035,383

EUTECTIC PROCESS FOR PREPARING POLYCHLORO COPPER PHTHALOCYANINE

Ronald Lancelot Sweet, Westfield, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 6, 1975, Ser. No. 619,970

Int. Cl.^{2} C09B ***47/10***

U.S. Cl. 260—314.5 **7 Claims**

1. In a eutectic process for preparing polychloro copper phthalocyanine by (i) chlorinating copper phthalocyanine in a reaction medium of molten inorganic metal halide to form said polychloro copper phthalocyanine and (ii) contacting said reaction medium with an aqueous medium to precipitate said polychloro copper phthalocyanine,

the improvement comprising contacting said polychloro copper phthalocyanine after the completion of the chlorination with a reducing agent in an amount sufficient to substantially prevent the formation of tetrachlorophthalimide.

4,035,384

BASIC DYESTUFFS

Gilbert Victor Henri Kremer, Eaubonne, France, assignor to Produits Chimiques Ugine Kuhlmann, Paris, France

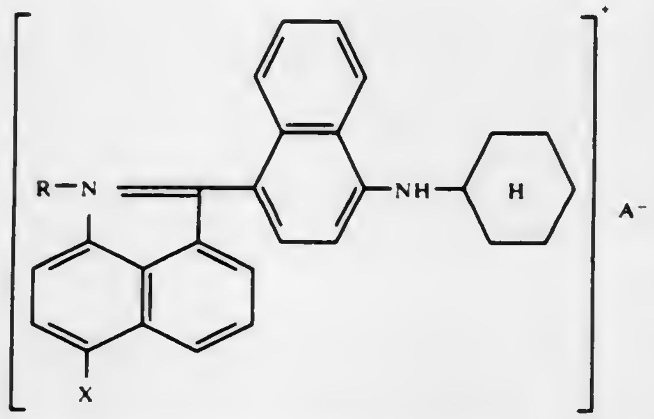
Filed Sept. 24, 1975, Ser. No. 616,214

Claims priority, application France, Oct. 7, 1974, 74.33623

Int. Cl.^{2} C07D ***209/90***

U.S. Cl. 260—326.9 **2 Claims**

1. A dyestuff of the formula:



in which R represents a member selected from the group consisting of methyl and ethyl, X is hydrogen or bromine and A represents a monovalent anion which does not impart any coloring function to said dyestuff.

4,035,385

SUBSTITUTED DIBENZO [B,F]THIEPINS AND DIBENZ[B,F]OXEPINS

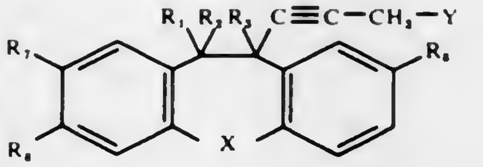
Jean-Pierre Kaplan, Le Plessis Robinson, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 613,680, Sept. 15, 1975, Pat. No. 4,005,105, which is a division of Ser. No. 500,770, Aug. 26, 1974, Pat. No. 3,928,383, which is a continuation-in-part of Ser. No. 380,653, July 12, 1973, abandoned. This application Aug. 13, 1976, Ser. No. 714,166

Int. Cl.^{2} C07D ***337/14***

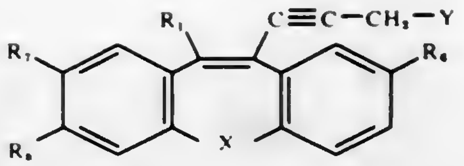
U.S. Cl. 260—327 B **2 Claims**

1. A compound selected from compounds of the formula



-continued

and



wherein X is oxygen or sulfur; R_1 R_2, independently, are hydrogen or lower alkyl; R_3 is hydrogen; R_6 is lower alkyl, lower alkyl-sulfonyl, hydroxy, lower alkoxy, lower alkylthio, di-(lower alkyl)-sulfamoyl, halogen, trifuoromethyl, nitro, amino or di-(lower alkyl)-amino; and R_7 and R_8, independently, are hydrogen, lower alkyl-sulfonyl, hydroxy, lower alkyl, lower alkoxy, lower alkylthio, di-(lower alkyl)-sulfamoyl, halogen, trifluoromethyl, nitro, amino or di-(lower alkyl)-amino and Y is a leaving group selected from the group consisting of halogen, lower alkyl-sulfonyloxy, phenyl-sulfonyloxy and p-tolyl-sulfonyloxy.

4,035,386

PROPYNYLAMINE-SUBSTITUTED DIBENZO[B,F]THIEPINS AND DIBENZ[B,F]OXEPINS

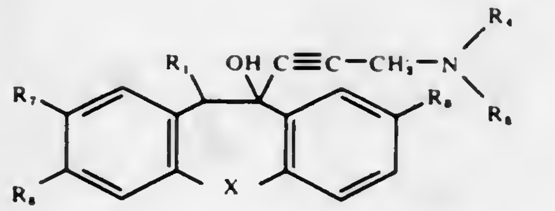
Jean-Pierre Kaplan, Le Plessis Robinson, France, and Emilio Kyburz, Reinach, Switzerland, assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 613,680, Sept. 15, 1975, Pat. No. 4,005,105, which is a division of Ser. No. 500,770, Aug. 26, 1974, Pat. No. 3,928,383, which is a continuation-in-part of Ser. No. 380,653, July 12, 1973, abandoned. This application Aug. 13, 1976, Ser. No. 714,165

Int. Cl.^{2} C07D ***337/14***

U.S. Cl. 260—327 B **4 Claims**

1. A compound of the formula



wherein X is oxygen or sulfur; R_1 is hydrogen or lower alkyl, R_4 and R_5, independently, are hydrogen, lower alkyl, hydroxy-lower alkyl, alkanoyloxy-lower alkyl, wherein the alkanoyloxy group contains 2 to 18 carbon atoms, or, when taken together, are a saturated 5- or 6-membered heterocyclic ring selected from the group consisting of pyrrolidino, piperazino, piperidino, morpholino, thiomorpholino, methyl-piperidino, N′-lower alkyl-piperazino, N′-hydroxy-lower alkyl-piperazino, and N′-alkanoyloxy-lower alkyl-piperazino, wherein the alkanoyloxy group contains 2 to 18 carbon atoms, R_6 is lower alkyl, lower alkyl-sulfonyl, hydroxy, lower alkoxy, lower alkylthio, di-(lower alkyl)-sulfamoyl, halogen, trifluoromethyl, nitro, amino or di-(lower alkyl) -amino; and R_7 and R_8, independently, are hydrogen, lower alkyl-sulfonyl, hydroxy, lower alkyl, lower alkoxy, lower alkylthio, di-(lower alkyl)-sulfamoyl, halogen, trifluoromethyl, nitro, amino or di-(lower alkyl)-amino

or an addition salt thereof.

4,035,387

1,3-DITHIOL-2-YLIDENE MALONIC ESTERS

Kuniaki Taninaka, Ibaragi; Akira Hirano, Itami, and Hitoshi Kurono, Amagasaki, all of Japan, assignors to Nihon Nohyaku Co. Ltd., Tokyo, Japan

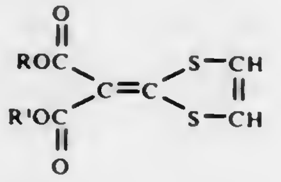
Filed Oct. 16, 1975, Ser. No. 623,084

Claims priority, application Japan, Oct. 18, 1974, 49-119436; Oct. 22, 1974, 49-121007; Oct. 22, 1974, 49-121008

Int. Cl.² C07D *339/06*

U.S. Cl. 260—327 M **9 Claims**

1. A 1,3-dithiol-2-ylidene malonate derivative represented by the general formula (1),



(1)

wherein R and R¹, which may be same or different, are individually an alkyl group having 1 to 4 carbon atoms.

4,035,388

PROCESS FOR PREPARING PERFLUORO-ALKOXY-PROPIONIC ACID FLUORIDES

Thomas Martini, Neuenhain, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

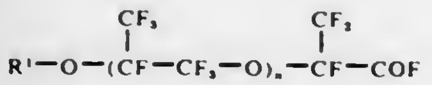
Filed Dec. 22, 1975, Ser. No. 643,124

Claims priority, application Germany, Dec. 24, 1974, 2461445

Int. Cl.² C07D *319/12;* **C07C** *51/58*

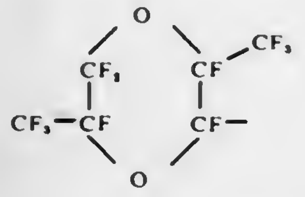
U.S. Cl. 260—340.6 **9 Claims**

1. A process for preparing perfluoro-α-alkoxypropionic acid fluorides of the general formula



$$R^1-O-(\underset{|}{\overset{CF_3}{CF}}-CF_2-O)_n-\overset{CF_3}{\underset{|}{CF}}-COF \qquad I$$

wherein R¹ stands for a perfluoroalkyl radical having from 1 to 9 carbon atoms or for the radical



and wherein *n* is 0, 1 or 2, which comprises that perfluorocarbonyl compounds of the general formula

$R^2 - {}^{CO} - {}^{R^3}$ II,

wherein

R^2 represents fluorine or $R_F{}^2$,

R^3 represents fluorine or $R_F{}^3$ or (R^2 being fluorine) also $R_F{}^3 - OC_F(CF)_3)-$,

$R_F{}^2$ and $R_F{}^3$ represent identical or different perfluoroalkyl radicals having from 1 to 4 carbon atoms or

R^2 and R^3 combined with the CO group give the compound perfluoro-2-oxo-3,6-dimethyl-1,4-dioxane,

are reacted with hexafluoropropene epoxide in the presence of tris-dimethylamine-difluoro-phosphorane in an aprotic polar solvent, at a temperature of −50° to −10° C.

4,035,389

PRODUCTION OF 2,2-DISUBSTITUTED PROPIOLACTONES

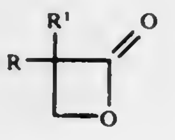
Jerry D. Holmes, Longview, Tex., assignor to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 609,881, Sept. 2, 1975, which is a division of Ser. No. 491,092, July 23, 1974, Pat. No. 3,931,237, which is a continuation-in-part of Ser. No. 394,370, Sept. 4, 1973, abandoned. This application Jan. 12, 1976, Ser. No. 648,080

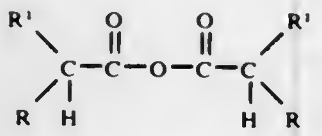
Int. Cl.² C07D *305/12*

U.S. Cl. 260—343.9 **30 Claims**

1. A process for producing a 2,2-disubstituted propiolactone having the formula



which comprises reacting an isoanhydride having the formula



wherein R and R¹ individually may be straight- or branched-chain alkyl, aryl or aralkyl having 1 to 10 carbon atoms, with formaldehyde or a formaldehyde yielding material at a temperature of from about 190° C. to about 400° C., in the presence of a catalyst consisting of the acid treated metal oxide-silica gel complex which results from: (1) heating the calcined residue of a mixture of silica gel and a water-soluble salt of a metal selected from the group consisting of tantalum, titanium, niobium and zirconium to a temperature of from about 650° C. to about 1000° C. in the presence of water vapor, and (2) soaking the product of step (1) in a mineral acid.

17. A process for producing pivalolactone which comprises reacting isobutyric anhydride and formaldehyde at a temperature of from about 190° C. to about 400° C. in the presence of a catalyst consisting of the acid treated metal oxide-silica gel complex which results from; (1) heating the calcined residue of a mixture of silica gel and a water-soluble salt of a metal selected from the group consisting of tantalum, titanium, niobium and zirconium to a temperature of from about 650° C. to about 1000° C. in the presence of vapor and (2) soaking the product of step (1) in a mineral acid.

4,035,390

THIAZOLE DERIVATIVES

John Pomfret Verge, Henley-on-Thames, and Martin Charles Neville, Tadley, both of England, assignors to Lilly Industries, Ltd., London, England

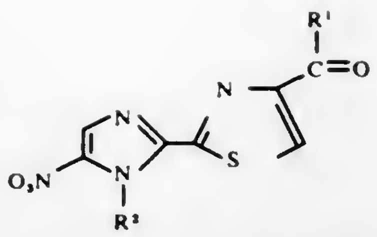
Division of Ser. No. 542,989, Jan. 22, 1975, Pat. No. 3,989,690, which is a continuation-in-part of Ser. No. 398,726, Sept. 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 259,186, June 7, 1972, abandoned. This application Aug. 9, 1976, Ser. No. 713,009

Claims priority, application United Kingdom, June 19, 1971, 28882/71

Int. Cl.² C07D *417/00*

U.S. Cl. 260—302 H **6 Claims**

1. Compound of the formula:



wherein R¹ represents hydrogen or C_{1-4} alkyl and R³ represents C_{1-4} alkyl or C_{2-4} alk-l-enyl.

4,035,391

PHTHALIDE AND NAPHTHALIDE DERIVATIVES

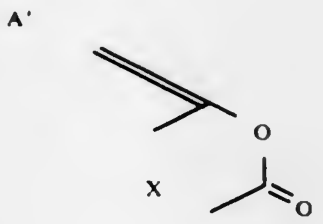
Alan L. Borror, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 446,732, Feb. 28, 1974, Pat. No. 3,914,807, which is a continuation-in-part of Ser. No. 108,662, Jan. 21, 1971, abandoned. This application Sept. 29, 1975, Ser. No. 617,272

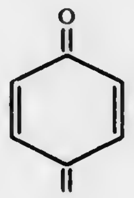
Int. Cl.² C07D *307/77, 307/88, 311/78*

U.S. Cl. 260—343.2 R **10 Claims**

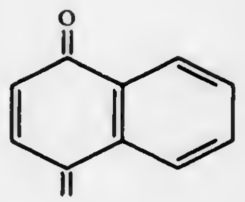
1. A compound of the formula



wherein A' is a radical selected from



and



; and

X represents the atom necessary to complete a ring-closing moiety selected from a phthalide and a naphthalide.

4,035,392

PROSTANOIC ACID INTERMEDIATE

Carmelo Gandolfi; Gianfederico Doria, both of Milan, and Pietro Gaio, Lamon (Belluno), Italy, assignors to Carlo Erba S.p.A., Milan, Italy

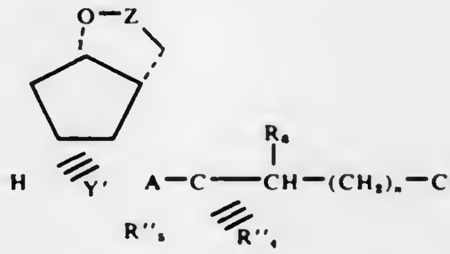
Division of Ser. No. 346,249, March 30, 1973, Pat. No. 3,935,254. This application Feb. 5, 1975, Ser. No. 547,247

Claims priority, application Italy, Apr. 13, 1972, 23063/72; Apr. 28, 1972, 23662/72

Int. Cl.² C07D *307/93*

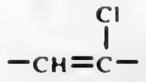
U.S. Cl. 260—343.3 R **1 Claim**

1. A compound of the formula



and the racemates thereof,
wherein

A is



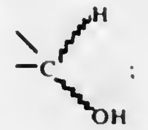
$$-CH=\overset{Cl}{\overset{|}{C}}-$$

or - C ≡ C-;

R_6 is a hydrogen atom or a $C_1 - C_4$ alkyl group;

n is 3 or 4;

Z is >C = O or

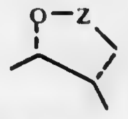


;

Y' is a hydroxy group or an aliphatic, aromatic, or cycloaliphatic carboxylic acyloxy group or a protecting group bound to the ring by an etheral oxygen atom;

one of R''_4 and R''_5 is a hydroxy group or protecting group bound to the chain by an etheral oxygen atom and the other of R''_4 and R''_5 is a hydrogen atom, or R'_4 and R''_4 and R''_5 taken together, form an oxo group, wherein the protecting group is a

1-alkoxycycloalkoxy group, a 2-Oxa-cycloalkoxy group where the cycloalkyl moiety optionally contains an addition ring oxygen atom, a 1-alkoxy-alkyloxy group, a sylyl ether group or an enol ether group; and wherein the



ring is in the transconfiguration
with respect to the aliphatic side chain.

4,035,393

CHROMOGENIC DERIVATIVES OF BIS-1,1-DISUBSTITUTED ETHYLENE AND A PROCESS FOR PREPARING THEM

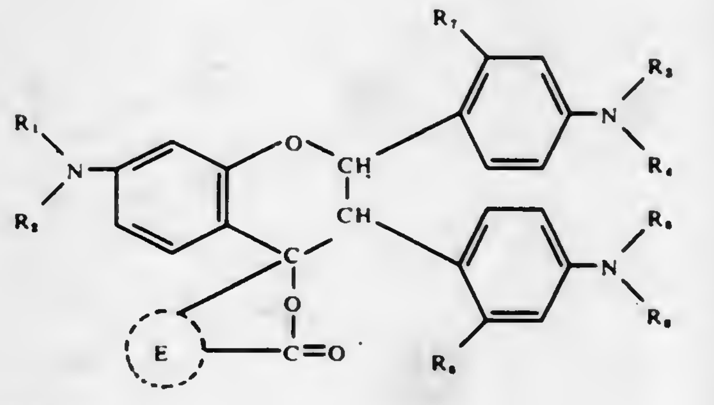
Sheldon Farber, Appleton, Wis., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 10, 1975, Ser. No. 566,847

Int. Cl.² C07D *407/04, 403/04*

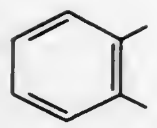
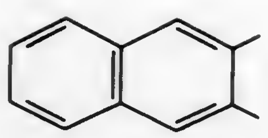
U.S. Cl. 260—343.3 R **6 Claims**

1. A compound represented by the formula:

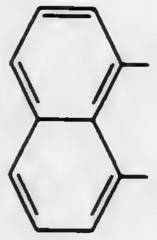


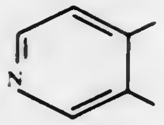
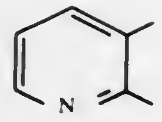
wherein

E is:

 and  ;

unsubstituted and alkyl-, chloro-, dichloro-, trichloro-, tetrachloro-, bromo-, dibromo-, tribromo-, tetrabromo-, nitro-, and dialkylamino-substituted,

 , unsubstituted

and nitro-substituted;  ,  .

R_1, R_2, R_3, R_4, R_5, and R_6 are: hydrogen, alkyl, phenyl, benzyl, and cyclohexyl, but both of R_1 and R_2 or R_3 and R_4 or R_5 and R_6 are not phenyl;

R_7 and R_8 are: hydrogen, alkyl, alkoxy, halo, dialkylamino, monoalkylamino and amino and

each alkyl has less than seven carbon atoms.

4,035,394

5-PHENYL-2-FURANYL-OXO OR-HYDROXY ALKANOIC ACIDS AND ETHYL ESTERS AS GASTRIC ACID ANTISECRETORY AGENTS

Stanford S. Pelosi, Jr., and Marvin M. Goldenberg, both of Norwich, N.Y., assignors to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Feb. 24, 1976, Ser. No. 660,832

Int. Cl.² C07D *307/54*

U.S. Cl. 260—347.3 **7 Claims**

1. A compound having gastric acid antisecretory activity selected from the group consisting of:

A. Ethyl 3-[5-(4-nitrophenyl)-2-furanyl]-3-hydroxy-propanoate

B. 4-[5-(4-chlorophenyl)-2-furanyl]-4-hydroxy butanoic acid

C. 3-[5-(2-chlorophenyl)-2-furanyl]-3-hydropropanoic acid

D. 4-[5-(4-chlorophenyl)-2-furanyl]-4-oxo-butanoic acid

E. 3-[5-(2,4-dichlorophenyl)-2-furanyl]-3-hydropropanoic acid

F. Ethyl 3-[5-(4-chlorophenyl)-2-furanyl]-3-oxopropanoate

4,035,395

PROCESS FOR THE PREPARATION OF KETONES

Hermann Stetter, and Heinrich Kuhlmann, both of Aachen-Laurensberg, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

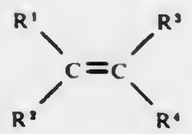
Filed July 24, 1975, Ser. No. 598,605

Claims priority, application Germany, Aug. 2, 1974, 2437219

Int. Cl.² C07D *307/46;* **C07C** *49/00*

U.S. Cl. 260—347.5 **18 Claims**

1. Process for the preparation of a ketone comprising reacting an unsaturated compound of the formula



wherein

R^1, R^2 and R^3 are identical or different and represent hydrogen or an optionally substituted C_{1-12} aliphatic, C_{3-18} cycloaliphatic, C_{6-16} araliphatic with C_{1-6} in the aliphatic moiety, phenyl, naphthyl or heterocyclic radical or a carboxylic acid ester group,

R^4 represents the nitrile radical, or the group $-CO-R^5$ or $-CO-O-R^5$

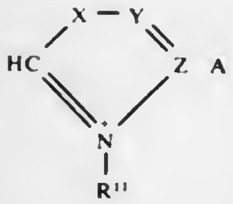
wherein

R^5 denotes an optionally substituted aliphatic, araliphatic, aromatic or heterocyclic radical

or wherein

it is also possible for any of R^1 and R^2 or R^3, R^2 and R^4, and R^3 and R^4 to be bonded to one another directly, with formation of a carbocyclic or heterocyclic ring,

with an aldehyde in the presence of a weak base other than cyanide and, as catalyst, a quaternary ammonium salt of the formula



wherein

X represents oxygen, sulphur, selenium or the $-NR^{12}-$ group,

Y and Z are identical or different and each represents an optionally substituted carbon atom or nitrogen atom,

R^{11} and R^{12} are identical or different and each represents a C_1 and C_{12} aliphatic radical, a C_5 to C_{12} cycloaliphatic radical, a C_6 to C_{12} araliphatic radical which contains up to 6 carbon atoms in the aliphatic part, a C_6 to C_{10} aromatic radical or a 5-membered ring which in addition to the carbon atoms contains an oxygen and/or a sulphur atom, and

A represents an acid radical other than cyanide.

4,035,396

PROCESS FOR PREPARING ALKYLANTHRAQUINONE

James Milano, Erial, N.J., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 565,852, April 7, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 666,056

Int. Cl.² C07C *49/68*

U.S. Cl. 260—369 **3 Claims**

1. In a process for preparing alkylanthraquinone comprising heating alkylbenzoylbenzoic acid in the presence of oleum, the improvement comprising

i. forming a solution of one part of alkylbenzoylbenzoic acid in at least five parts by weight of trichlorobenzene, said alkyl group having 4 or 5 carbon atoms, and

ii. reacting the solution of (i) with at least four parts of oleum per part of alkylbenzoylbenzoic acid at a temperature from 85° to 95° C, thereby forming alkylanthraquinone in solution, with said alkyl group having 4 or 5 carbon atoms.

4,035,397

POLYFLUORO ACID ANTHRAQUINONE DYESTUFFS THEIR PREPARATION AND THEIR USE

Jacques Pierre Edmond Pechméze, Paris; Philippe Jean-Marie Touratier, Deuil La Barre, and Louis Antoine Cabut, Nogent sur Oise, Creil, all of France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

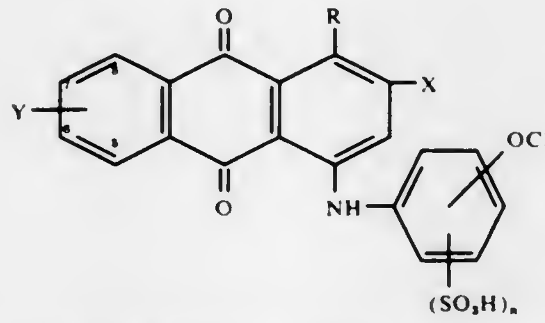
Filed July 11, 1974, Ser. No. 487,683

Claims priority, application France, July 17, 1973, 73.26112

Int. Cl.² C09B *1/52*

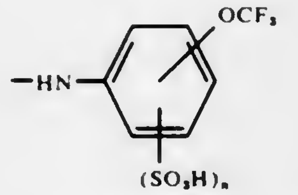
U.S. Cl. 260—373 **3 Claims**

1. Dyestuffs of the formula:



(I)

in which R represents a hydroxy amino, alkylamino or cycloalkylamino group, or a residue of the formula:



(II)

n is equal to 0 or 1, X represents a hydrogen or halogen atom, a sulponic group or an alkyl residue containing 1 to 4 carbon atoms, Y represents a hydrogen atom or sulphonic group in position 5, 6, 7 or 8 at least one of the symbols X and Y representing a sulphonic group if *n* is equal to 0.

4,035,398

ANTHRAQUINONE DYESTUFFS

Friedrich Wilhelm Kröck, Leverkusen; Rudolf Braden, Odenthal-Scheuren; Rütger Neeff, Leverkusen, and Volker Hederich, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

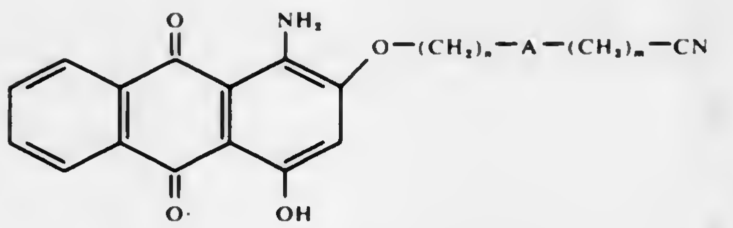
Filed Nov. 11, 1975, Ser. No. 630,778

Claims priority, application Germany, Nov. 15, 1974, 2454327

Int. Cl.² C09B *1/50*

U.S. Cl. 260—380 **10 Claims**

1. Anthraquinone dyestuff which is water-insoluble and has the formula



wherein

A is cycloalkylene or cycloalkylene substituted by chlorine C_1–C_3-alkyl or cyano; and

n and *m* are numbers from 0 to 4.

4,035,399

PROCESS FOR THE PREPARATION OF 1,4-NAPHTHOQUINONE

Yoshio Yokoyama, Tokyo; Junzo Yoshikawa, and Harutoshi Ota, both of Ichikawa, all of Japan, assignors to Nihon Joryu Kogyo Co., Ltd., Ichikawa, Japan

Continuation-in-part of Ser. No. 550,043, Feb. 14, 1975, abandoned. This application Apr. 30, 1976, Ser. No. 681,920

Claims priority, application Japan, Feb. 18, 1974, 49-18523

Int. Cl.² C07C *49/66*

U.S. Cl. 260—396 R **13 Claims**

1. In a process for preparing 1,4-naphthoquinone by vapor phase oxidation of naphthalene wherein naphthalene is oxidized in the vapor phase at a temperature of 420° C to 480° C by means of a molecular oxygen containing gas in the presence of a solid catalyst consisting essentially of an inert carrier supporting thereon a catalytic substance mixture consisting essentially of vanadium pentoxide, an alkali metal sulfate, an alkali metal pyrosulfate and optionally, an oxide of a metal selected from the group consisting of tungsten, titanium, zirconium, tantalum, cesium, molybdenum, chromium, niobium, nickel, aluminum, iron and silver or iron sulfate, the improvement comprising supplying sulfur or a sulfur compound capable of yielding sulfur trioxide into the raw material feed so as to maintain the equilibrium between the alkali metal sulfate and the alkali metal pyrosulfate and keep the proportion thereof constant and maintaining the concentration of sulfur trioxide, reduced to the weight of elemental sulfur, in the reaction system at 0.8 to 1.8% by weight based on the weight of naphthalene.

4,035,400

PREPARATION OF OMEGA-NITROALKANOIC ACIDS

Mahmoud S. Kablaoui, Wappingers Falls, and Richard F. Love, Fishkill, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Filed June 23, 1975, Ser. No. 589,325

Int. Cl.² C08H *17/36*

U.S. Cl. 260—404 **15 Claims**

1. A method of preparing an omega-nitroalkanoic acid in the substantial absence of by-product formation which comprises contacting an ammonium salt of a cyclic alpha-nitroketone in an aqueous medium at a temperature of about 50° to 100° C.

10. A method of preparing an omega-nitroalkanoic acid in the substantial absence of by-product formation which comprises (a) contacting a Group IIA metal salt of a cyclic alpha-nitroketone in an aqueous medium at a temperature of about 50° to 100° C. and (b) subsequently acidifying the product of (a) with a mineral acid, formic acid or acetic acid thereby forming said omega-nitroalkanoic acid.

4,035,401

INTERMEDIATES FOR PHOTOGRAPHIC DYES

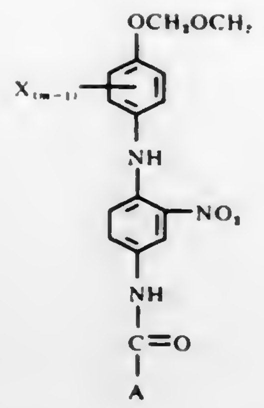
Paul S. Huyffer, Lynnfield, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 22,114, March 30, 1970, Pat. No. 3,925,347, which is a continuation of Ser. No. 655,306, July 24, 1967, abandoned. This application Aug. 22, 1972, Ser. No. 282,872

Int. Cl.² C09F *5/00, 7/00;* **C11C** *3/00;* **C09B** *29/38*

U.S. Cl. 260—404.5 **4 Claims**

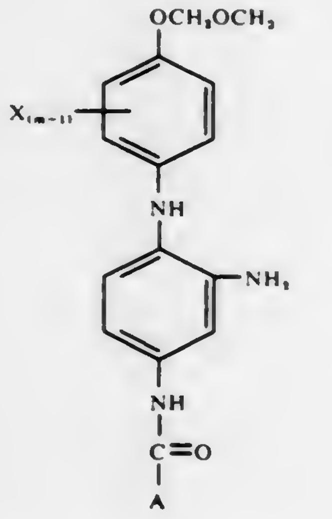
1. A compound of the formula:



wherein:

X is methyl, methoxy, hydroxy, amino, chloro or carboxy;
m is a positive integer from 1 to 2; and
A is alkyl having from 9–17 carbon atoms.

3. A compound of the formula



wherein:

X is methyl, methoxy, hydroxy, amino, chloro or carboxy;
m is a positive integer from 1 to 2; and
A is alkyl having from 9–17 carbon atoms.

4,035,402
DEWAXING PROCESS FOR VEGETABLE OILS

Leon Levine, Wayzata, Minn., assignor to The Procter & Gamble Company, Cincinnati, Ohio

Continuation-in-part of Ser. No. 559,625, March 17, 1975, abandoned, which is a continuation of Ser. No. 345,607, March 28, 1973, abandoned. This application Sept. 30, 1975, Ser. No. 618,092

Int. Cl.² C11B *3/06*

U.S. Cl. 260—425 **14 Claims**

1. A process for dewaxing vegetable oils comprising the steps of:

a. providing a vegetable oil prerefined until analysis of said oil shows less than 0.1% soap and less than 0.1% free fatty acid content, said oil being chilled to a temperature of less than about 60° F;
b. holding said refined oil at said temperature for longer than one hour;
c. mixing said refined vegetable oil of step (b) with an aqueous alkaline solution;
d. agitating in a low shear-high circulation manner the mixture of step (c) for at least ½ hour, to uniformly disperse the alkaline solution without forming an inseparable emulsion; and
e. separating the agitated mixture to provide a wax-containing water phase and a dewaxed oil.

4,035,403
ORGANOTIN BORATES

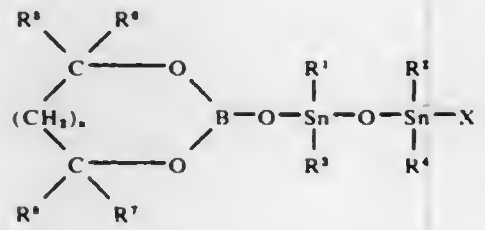
Robert George Gough, Fairfield, and Francis Joseph Buescher, Cincinnati, both of Ohio, assignors to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed June 1, 1976, Ser. No. 691,315

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **25 Claims**

1. A compound having the following general formula



wherein:

R^1, R^2, R^3 and R^4 are the same or different and are selected from the group consisting of aryl, aralkyl, alkaryl or C_1 to C_8 alkyl groups,
R^5 and R^7 are hydrogen or C_1 to C_4 alkyl groups,
R^6 and R^8 are C_1 to C_4 alkyl groups,
X is chlorine or bromine and
n is 0, 1 or 2.

4,035,404
CYANOFORMAMIDYL ISOCYANATES AND SYNTHESIS THEREOF

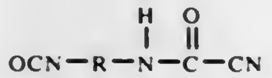
Tad L. Patton, Baytown, Tex., assignor to Exxon Research and Engineering Company, Linden, N.J.

Division of Ser. No. 76,590, Sept. 29, 1970, Pat. No. 3,684,773, which is a continuation-in-part of Ser. Nos. 685,281, Nov. 24, 1967, abandoned, and Ser. No. 685,311, Nov. 24, 1967, Pat. No. 3,591,562. This application June 8, 1972, Ser. No. 261,124

Int. Cl.² C07C *119/042, 119/045, 119/048*

U.S. Cl. 260—453 AR **10 Claims**

1. Compositions of matter having the following formula:



$$OCN-R-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-CN$$

where:

R is an organic moiety which is aliphatic, alicyclic, aromatic, mixtures thereof and functionally substituted derivatives thereof, said derivatives being free of functional groups capable of reacting with hydrogen cyanide or isocyanate groups.

8. A process for producing a cyanoformamidyl isocyanate which comprises: reacting 1 mole of hydrogen cyanide with 1 mole of a diisocyanate having the formula:

OCN—R—NCO

where

R is the organic moiety of the diisocyanate which may be aliphatic, alicyclic, aromatic, or mixtures thereof and functionally substituted derivatives thereof, said derivatives being free of functional groups capable of reacting with hydrogen cyanide or isocyanate groups,

in a solvent at a temperature between −10° to 35° C in the presence of a suitable catalyst selected from the group consisting of dibutyl tin diacetate; dibutyl tin bis(isooctylmaleate); 2-picoline; quinoline; lutidine; N,N-dimethylaniline; N,N-diethylaniline and pyridine.

4,035,405
NOVEL SYNTHESIS FOR PREPARING THE HYDROCHLORIDE SALT OF SELECTED CATECHOLAMINE DERIVATIVES

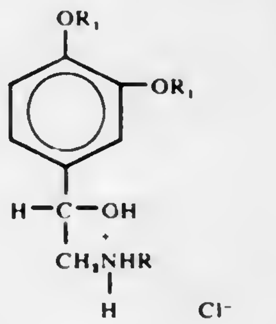
Nicolae S. Bodor, Lawrence, Kans., and Sun-Shine Yuan, Watertown, Mass., assignors to Interx Research Corporation, Lawrence, Kans.

Filed July 9, 1976, Ser. No. 703,943

Int. Cl.² C07C *67/14*

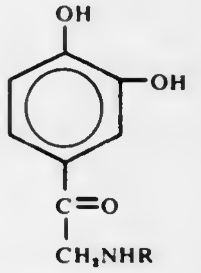
U.S. Cl. 260—479 R **15 Claims**

1. A method for preparing a compound of the formula:

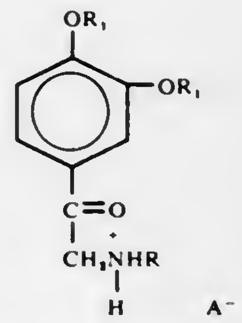


which comprises the steps of:

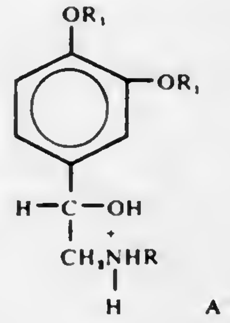
A. reacting, in the presence of an inert organic solvent, a compound having the formula:



with an acid designated as HA and an acylating agent designated as R_1Cl to thus obtain a compound having the formula:



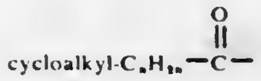
B. subjecting, in the presence of a C_1–C_5 alkanol, the compound obtained from step (A) to hydrogenation in the presence of a catalytic amount of a conventional hydrogenation catalyst or an effective amount of a conventional ketone reducing agent to obtain a compound having the formula:



C. reacting the compound obtained from step (B) with CsCl and an ROH alcohol to thus obtain the final compound; and

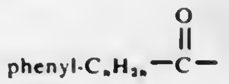
D. separating the final compound thus obtained in step (C) from the reaction mixture,

wherein R represents a straight or branched C_1–C_5 alkyl group; wherein R_1 represents an acyl member which is alkanoyl having 1–22 carbon atoms, alkenoyl having one or two double bonds and having 4–22 carbon atoms,



$$\text{cycloalkyl-}C_nH_{2n}-\overset{O}{\overset{\|}{C}}-$$

having a total of 4–10 carbon atoms of which 3–7 are ring carbon atoms in cycloalkyl and wherein *n* is zero, one, or two, phenoxyacetyl, naphthalenecarbonyl, pyridinecarbonyl,



$$\text{phenyl-}C_nH_{2n}-\overset{O}{\overset{\|}{C}}-$$

wherein *n* is zero, one or two and phenyl is unsubstituted or is substituted by 1–3 alkyl having 1–4 carbon atoms, alkoxy having 1–4 carbon atoms, halo, trifluoromelthyl, dialkylamino having 2–8 carbon atoms, or alkanoylamino having 1–6 carbon atom groups; and wherein A represents a ClO_4^- anion, a CF_3COO^-anion or a R_1–SO_3^- anion, wherein R_1 is defined as above.

4,035,406
4-ALKYL-4-NAPHTHYL-BUTANES

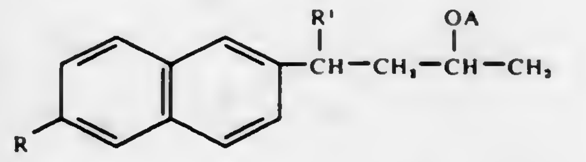
Paul L. Anderson, Dover, N.J., and Darryl A. Brittain, New York, N.Y., assignors to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 390,034, Aug. 20, 1973, Pat. No. 3,943,257. This application Oct. 29, 1975, Ser. No. 626,783

Int. Cl.² C07C *69/72, 69/02, 43/20*

U.S. Cl. 260—483 **6 Claims**

1. A compound of the formula



wherein

R is alkoxy having from 1 to 4 carbon atoms;
R^1 is alkyl having from 1 to 3 carbon atoms; and
A is a hydrogen atom, alkanoyl having from 2 to 4 carbon atoms, or acetoacetyl.

4,035,407
3,4,5-TRICHLORO-N,N-DI(LOWERALKYL)-2-THIOMETHYLTHIOCYANATO)BENZENE-SULFONAMIDES

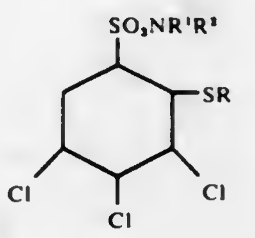
Christian T. Goralski; R. Garth Pews, both of Midland, and George A. Burk, Bay City, all of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Dec. 29, 1975, Ser. No. 645,060

Int. Cl.² C07C *161/02*

U.S. Cl. 260—454 **3 Claims**

1. A compound corresponding to the formula



wherein R represents methylenethiocyanate; and each of R^1 and R^2 represents loweralkyl of 1 to 4 carbon atoms.

4,035,408
PROCESS FOR HYDROFORMYLATION OF ALLYL ACETATE OR 1-PROPENYL ACETATE

William E. Smith, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Division of Ser. No. 548,216, Feb. 10, 1975, Pat. No. 3,941,851, which is a division of Ser. No. 371,929, June 20, 1973, Pat. No. 3,880,913. This application Nov. 17, 1975, Ser. No. 632,482

Int. Cl.² C07C *67/28*

U.S. Cl. 260—491 **3 Claims**

1. In the process of hydroformylating allyl acetate or a mixture of allyl acetate and 1-propenyl acetate under hydroformylating conditions in the presence of a cobalt hydroformylating catalyst to produce a mixture comprising 4-acetoxybutyraldehyde, as the predominant product, and its two isomers, 2-acetoxybutyraldehyde nd 3-acetoxy-2-methylpropionaldehyde, the improvement wherein at least some of the 4-acetoxybutyraldehyde is separated from the mixture containing its two isomers and the mixture containing the isomers is dehydroformylated at a temperature in the range of 120°-250° C. in a non-oxidizing atmosphere in the presence of a catalyst selected from the group consisting of a Group VIII noble metal and mixtures thereof or a Group VIII noble metal and mixtures thereof on an essentially neutral support to produce feedstock which is recycled to the hydroformylation step.

4,035,409
HYDROCARBYL AMINE SUBSTITUTED PROPIONIC ESTER

William M. Cummings, Fishkill, N.Y., assignor to Texaco Inc., New York, N.Y.

Division of Ser. No. 533,909, Dec. 18, 1974, Pat. No. 3,926,578. This application June 9, 1975, Ser. No. 585,016

Int. Cl.² C07C *101/18*

U.S. Cl. 260—479 S **4 Claims**

1. A hydrocarbylamine substituted propionic ester represented by the formula:

$$RR'NCH_2CH_2COOR''$$

in which R is an aliphatic hydrocarbon radical having from 16 to 18 carbon atoms, R' is hydrogen and R'' is an alkyl substituted phenyl radical having from 14 to 20 carbon atoms.

4,035,410
CATALYSTS AND PROCESSES FOR THE PREPARATION OF UNSATURATED NITRILES

Jacques Marion, and Christian Pralus, both of Lyon, France, assignors to Produits Chimiques Ugine Kuhlmann, Paris, France

Filed Mar. 25, 1975, Ser. No. 561,700

Claims priority, application France, Mar. 28, 1974, 74.10754

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **6 Claims**

1. A process for producing acrylonitrile or methacrylonitrile which comprises reacting, respectively, propylene or isobutene, ammonia, and oxygen in the presence of a catalyst to produce the corresponding nitrile, the catalyst consisting essentially of oxides of antimony and of tin in combination with one or more other polyvalent metal oxides and oxides of one or more alkali metals according to the formula

$$Sb_aSn_b(Me_c)m(A_d)_nOe$$

wherein Me is a polyvalent metal and is iron, copper, tungsten, cobalt, nickel, titanium, uranium, manganese, thorium, cerium, or aluminum, A is an alkali metal, *a* is from 1 to 10, *b* is from 1 to 10 *c* is from 0.01 to 5, *d* is from 0.01 to 5, *m* and *n* are integers and are one or more, and *e* is the number of oxygen atoms in combination with the metallic elements, the catalyst being prepared by intimate mixing of the oxides, by separate precipitation or by coprecipitation beginning with salts or soluble compounds of the constituent elements, by separate or simultaneous thermal decomposition of compounds convertible to the oxides upon heating, or by a combination thereof and being subjected to a heat treatment at a temperature of from about 550° C to about 1000° C under an oxygen-containing gas.

4,035,411
ORGANOSILANE COMPOUNDS

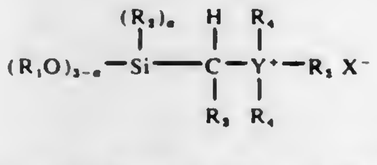
David C. Heckert, Oxford, and David M. Watt, Jr., Cincinnati, both of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Apr. 22, 1975, Ser. No. 570,537

Int. Cl.² C07F *7/10, 7/18*

U.S. Cl. 260—448.8 R **13 Claims**

1. An organosilane having the formula



$$(R_1O)_{3-a}-\overset{(R_2)_a}{Si}-\underset{R_3}{\overset{H}{C}}-\underset{R_4}{\overset{R_4}{Y^+}}-R_5\ X^-$$

or siloxane oligomers thereof, wherein R_1 is an alkyl group containing 1 to 4 carbon atoms,

$$(CH_3)_3Si \text{ or } Z(OC_xH_{2x})_m$$

where *x* is 2 to 4, *m* is 1 to 20, Z is hydrogen, an alkyl group containing 1 to 18 carbons or an acyl group containing 1 to 4 carbon atoms; *a* is 0 to 2; R_2 is an alkyl group containing 1 to 18 carbon atoms; R_3 is an alkyl group containing 1 to 18 carbon atoms; R_4 is an alkyl, aryl or arylalkyl group containing 1 to 12 carbon atoms, a carboxy-substituted alkyl group containing 1 to 4 carbon atoms,

$$(C_xH_{2x}O)_mZ$$

where *x*, *m*, and Z are as defined above, or oxygen provided only one R_4 is oxygen and that when R_4 is oxygen, there is no X^-; R_5 is an alkyl, aryl or arylalkyl group containing 1 to 22 carbon atoms; X is halide; and Y is nitrogen, phosphorus or sulfur.

4,035,412
METHYLENE PHOSPHONATES OF POLY-DIEPOXIDIZED POLYALKYLENE POLYAMINES

Patrick M. Quinlan, Webster Groves, Mo., assignor to Petrolite Corporation, St. Louis, Mo.

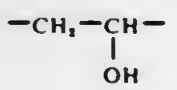
Filed May 28, 1971, Ser. No. 148,216

Int. Cl.² C07C *9/38*

U.S. Cl. 260—502.5 **5 Claims**

1. Methylene phosphonates of poly-diepoxidized polyalkylene polyamines having

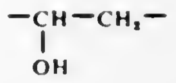
1. nitrogen-bonded methylene phosphonate units of the formula $-CH_2PO(OM)_2$ where M is alkali metal, alkaline earth metal, hydrogen, amine-derived ammonium or ammonium,
2. at least one unit of the formula



$$-CH_2-\underset{OH}{CH}-$$

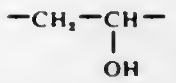
and

3. at least one unit of the formula



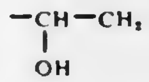
$$-\underset{OH}{CH}-CH_2-$$

the $-CH_2-$ of the



$$-CH_2-\underset{OH}{CH}-$$

unit (2) being bonded to one terminal nitrogen of the polyalkylene polyamine and the $-CH_2-$ of the



$$-\underset{OH}{CH}-CH_2$$

unit (3) being bonded to the other terminal nitrogen of the polyalkylene polyamine, the poly-diepoxidized polyalkylene polyamine being the reaction product of polyalkylene polyamine and diepoxide.

4,035,413
ALIPHATICALLY SUBSTITUTED ARYL-CHALCOGE-NO-HYDROCARBON DERIVATIVES

Georges Haas, Oberwil; Roland Jaques, Allschwil; Alberto Rossi, Oberwil, and Martin Ruegg, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 409,192, Oct. 24, 1973, Pat. No. 3,933,835. This application Aug. 18, 1975, Ser. No. 605,570

Int. Cl.² C07C *143/24*

U.S. Cl. 260—505 R **5 Claims**

1. A compound of the formula

$$R_1 - Ph - X - alk - R_2$$

wherein R_1 is adamantyl, Ph is unsubstituted phenylene, or phenylene substituted by nitro, lower alkyl, lower alkoxy, halogen or trifluoromethyl, X is oxy, alk is alkylene with 1 to 10 carbon atoms which may be branched in the α-position with respect to R_2, and R_2 is sulpho, or a therapeutically acceptable salt thereof.

4,035,414
PROSTANOIC ACID DERIVATIVES

Carmelo Gandolfi; Gianfederico Doria, both of Milan, and Pietro Gaio, Lamon, Belluno, all of Italy, assignors to Carlo Erba S.P.A., Milan, Italy

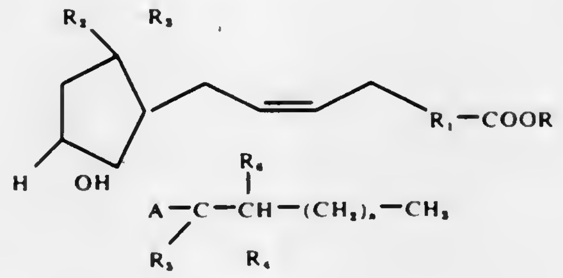
Division of Ser. No. 346,249, March 30, 1973, Pat. No. 3,935,254. This application Nov. 13, 1975, Ser. No. 631,656

Claims priority, application Italy, Apr. 13, 1972, 23063/72; Apr. 28, 1972, 23662/72

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D **22 Claims**

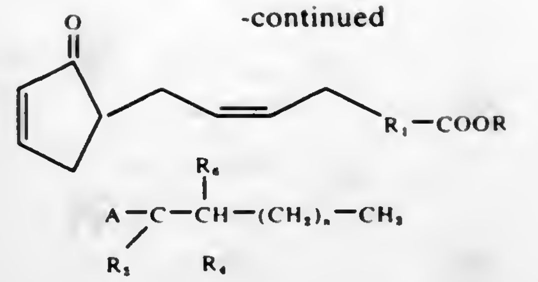
1. Compounds having general formulas (1)



(1)

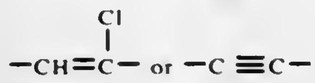
and (11)

-continued



(11)

and the racemates thereof,
wherein R is a hydrogen atom, a pharmaceutically acceptable cation or a C_{1-18} alkyl group or a trichloroethyl group; R_1 is $-CH_2CH_2-$, $-OCH_2-$, $-SCH_2-$, $-CH{=}CH-$ or $-C\quad C-$; one of R_2 and R_3 is a hydrogen atom and the other is a hydroxy group or R_2 and R_3 together form an oxo group; A is



$$-CH{=}\overset{Cl}{C}- \text{ or } -C\equiv C-,$$

one of R_4 and R_5 is a hydrogen atom and the other is a hydroxy group; R_6 is a hydrogen atom or a C_{1-4} alkyl group; *n* is 3 or 4; and wherein the chains bound to the carbon atoms in the 8-position and in the 12-position have the trans-configuration.

4,035,415
OMEGA-NOR-CYCLOALKYL-13,14-DEHYDRO-PROSTAGLANDINS

Carmelo Gandolfi; Renato Pellegata; Roberto Ceserani, and Maria M. Usardi, all of Milan, Italy, assignors to Carlo Erba, S.p.A., Milan, Italy

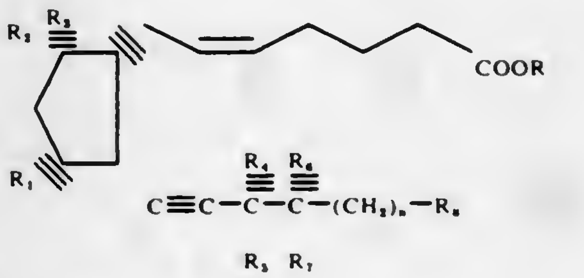
Filed Aug. 8, 1975, Ser. No. 603,015

Claims priority, application Italy, Sept. 25, 1974, 27654/74

Int. Cl.² C07C *177/00*

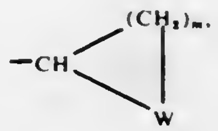
U.S. Cl. 260—514 D **5 Claims**

1. An optically active or racemic prostaglandin of the formula:



(1)

wherein
- R is a hydrogen atom, a C_1-C_{12} alkyl group or a cation of a pharmaceutically acceptable base;
- R_1 is hydroxy;
- R_2 is hydrogen and R_3 is hydroxy, a lower alkanoyloxy group or a benzoyloxy group;
- one of R_4 and R_5 is hydroxy and the other is hydrogen;
- R_6 and R_7 are independently hydrogen or C_1-C_4 alkyl;
- *n* is zero, 1, 2 or 3;
- R_8 is the radical



wherein m is 1, 2, 3, 4 or 5 and W is $-CH_2-$, or R_8 is 2-bicyclo[2,2,2]-octyl or 4-t.butyl-cyclohexyl.

4,035,416

PROCESS FOR MAKING PHENOXYALKANOIC ACIDS

Harry F. Brust, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed Nov. 2, 1972, Ser. No. 303,004

Int. Cl.² C07C *51/00*

U.S. Cl. 260—521 H **5 Claims**

1. In the process of making an α-phenoxyalkanoic acid by reacting an alkali metal phenate with a haloalkanoic acid, the improvement of simultaneously contacting at a temperature of at least about 80° C.

- a. a substantially anhydrous solution or dispersion of an alkali metal phenate in about one-half to 2 molar equivalents of the corresponding phenol with
- b. about 0.2 to one molar equivalent, based on the phenate, of an α-haloalkanoic acid and
- c. about one to 1.5 molar equivalents, based on the haloalkanoic acid, of alkali metal hydroxide

at a temperature and pressure such that water is continuously or intermittently removed from the reaction mixture during the reaction at a rate such that the water content of the mixture does not exceed about 10 percent during the reaction.

4,035,417

PROCESS FOR PRODUCING ACRYLIC ACID OR METHACRYLIC ACID

Shoichi Izawa; Isao Ono; Tetuo Iikuni, and Kiyoto Nishida, all of Yamaguchi, Japan, assignors to Rohm and Haas Company, Philadelphia, Pa.

Division of Ser. No. 381,335, July 20, 1973, Pat. No. 3,959,182, which is a continuation-in-part of Ser. No. 851,429, Aug. 19, 1969, abandoned. This application Nov. 6, 1974, Ser. No. 522,251

Claims priority, application Japan, Mar. 30, 1966, 41-19772

Int. Cl.² C07C *51/32*

U.S. Cl. 260—530 N **18 Claims**

1. In a process for producing acrylic acid or methacrylic acid by the vapor phase catalytic air oxidation of acrolein or methacrolein, respectively, wherein the catalyst used is prepared from an admixture containing water-soluble vanadium and molybdenum compounds and an organic reducing agent having intramolecular oxygen, nitrogen or both, which organic reducing agent is at least one substance selected from the group consisting of carboxylic acids, alcohols, amines and esters and has a boiling point of 150° C or more at the pressure utilized for calcining the catalyst and is watersoluble or forms an aquasol or an aquagel in the presence of water, the improvement wherein the admixture of molybdenum compounds, vanadium compounds and reducing agent is calcined at a temperature in the range of 330° C to 430° C, and the amount of reducing agent is at least 5 percent by weight based on the combined weight of the molybdenum and vanadium oxides resulting from calcination.

4,035,418

PROCESS FOR PRODUCING UNSATURATED ALDEHYDES AND UNSATURATED CARBOXYLIC ACIDS

Kazuya Okada; Hideo Matsuzawa; Hiromichi Ishii, and Masao Kobayashi, all of Otake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Mar. 3, 1976, Ser. No. 663,365

Claims priority, application Japan, Mar. 12, 1975, 50-30313; Mar. 31, 1975, 50-39452; July 4, 1975, 50-82982

Int. Cl.² C07C *45/16, 51/24*

U.S. Cl. 260—531 R **5 Claims**

1. In a process for catalytically oxidizing t-butyl alcohol in the gas phase with molecular oxygen at a temperature of 200° to 450° C to the corresponding aldehyde, and acid, the improvement comprising:

oxidizing said t-butyl alcohol over a calcined catalyst consisting essentially of:

$$Mo_a\,Sb_b\,Bi_c\,Fe_d\,Ni_e\,Co_f\,Sn_g\,X_h\,Y_i\,O_j$$

wherein X is at least one metal selected from the group consisting of potassium, rubidium, cesium and thallium, and Y is at least one metal selected from the group consisting of selenium, tellurium, gallium, vanadium, ruthenium, zinc, niobium, magnesium, chromium, manganese, cadmium and tantalum; wherein the subscripts a to *J* are the atomic ratios of each component and a is 12, $b = 0.2$ to 20, $c = 0.2$ to 12, $d = 0.2$ to 12, $e = 0.2$ to 12, $f = 0$ to 20, $g = 0$ to 20, $h = 0.01$ to 4, $i = 0.01$ to 4, and j is a value determined by the valencies of the elements in the catalyst, and when Y is at least one metal selected from the group consisting of chromium, manganese and cadmium, f is 0.

4,035,419

PROCESS FOR THE PREPARATION OF MALIC ACID CRYSTALS

Shozo Sumikawa, 2-9, Kyowa-cho, Hofu; Shinichiro Sakaguchi, 2212-34, Ikuma-cho, and Tomoo Okiura, 2273, Ikuwa-cho, both of Yokkaichi, all of Japan

Filed Feb. 17, 1976, Ser. No. 658,296

Int. Cl.² C07C *59/12*

U.S. Cl. 260—535 P **1 Claim**

1. In the process for recovering crystals of malic acid from a reaction mixture obtained by reacting an aqueous solution of maleic acid or fumaric acid separately or together with heating, the improvement which comprises the steps of:

- A. cooling the reaction mixture at a temperature of 10° to 40° C,
- B. separating resulting solid matters from the mixture,
- C. concentrating the resulting liquid,
- D. cooling the concentrate having a concentration of 65–80% by weight at a temperature of about 20°–45° C at the lower weight percent and about 65°–75° C at the higher weight percent at a temperature in the shaded range in the attached FIG. 2,
- E. separating resulting solid matters from the thus treated liquid and
- F. separating crystallized malic acid from the resulting liquid at 19° to 21° C.

4,035,420

SUBSTITUTED UREIDO ALKYLENE PHENOXY PROPANOLAMINES

Peder Bernhard Berntsson, Vastra Frolunda; Arne Elof Brändström, Goteborg N; Enar Ingemar Carlsson, Kungsbacka; Stig Ake Ingemar Carlsson, Molnlycke; Lars Ek, Kungsbacka; Gustav Benny Roger Samuelsson, Pixbo; Sven Erik Sjostrand, Kungsbacka; Gert Christer Strandlund, Molndal, and Bengt Arne Hjalmar Ablad, Goteborg C, all of Sweden, assignors to Aktiebolaget Hassle, Molndal, Sweden

Division of Ser. No. 376,947, July 6, 1973, Pat. No. 3,930,016. This application Oct. 2, 1975, Ser. No. 618,754

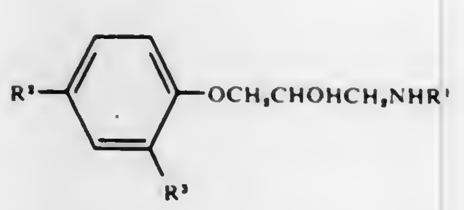
Claims priority, application Sweden, July 6, 1972, 8927/72

Int. Cl.² C07C *127/17;* A61K *31/17*

U.S. Cl. 260—553 A **15 Claims**

1. An amine of the formula I

(I)



wherein R¹ is lower alkyl or hydroxy lower alkyl, R² is carbamoylamino lower alkyl, mono lower alkyl carbamoylamino lower alkyl, di-lower alkyl carbamoylamino lower alkyl, carbamoylamino lower alkoxy, mono lower alkyl carbamoylamino lower alkoxy, di-lower alkyl carbamoylamino lower alkoxy, and R³ is hydrogen, halogen, lower alkyl, lower alkenyl, lower alkinyl, lower alkoxymethyl, lower alkoxy, lower alkenyloxy, lower alkinyloxy, lower alkylthio, lower alkenylthio, lower alkinylthio or lower acyl; or an addition salt of said compound I with a pharmaceutically acceptable nontoxic acid.

4,035,421

N-(3,4,-DICHLOROPHENYL)-2-PHENYLETHENESULFONAMIDE

Harry R. Snyder, Jr., Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,612

Int. Cl.² C07C *143/79;* A61K *31/18*

U.S. Cl. 260—556 AR **1 Claim**

1. N-(3,4-dichlorophenyl)-2-phenylethenesulfonamide.

4,035,422

2,6-DIMETHYL-4-SUBSTITUTED AMINO PHENOL COUPLERS

Grégoire Kalopissis, Neuilly-sur-Seine; Andrée Bugaut, Boulogne-sur-Seine, both of France, and Hubert Gaston-Breton, Tokyo, Japan, assignors to L'Oreal, Paris, France

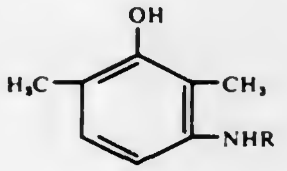
Continuation-in-part of Ser. No. 302,406, Oct. 31, 1972, abandoned, which is a division of Ser. No. 848,329, Aug. 7, 1969, Pat. No. 3,712,790. This application Nov. 19, 1975, Ser. No. 633,394

Claims priority, application Luxembourg, Aug. 14, 1968, 56722

Int. Cl.² C07C *103/29, 103/38, 91/44, 91/30*

U.S. Cl. 260—559 A **2 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of lower alkyl having 1–6 carbon atoms, hydroxyalkyl having 1–6 carbon atoms, acetyl, propionyl, amino alkyl wherein the alkyl moiety has 1–6 carbon atoms, N-dialkylated amino alkyl wherein each of the alkyl moieties has 1–6 carbon atoms and carbamyl methyl.

4,035,423

PROCESS FOR THE PREPARATION OF 3,4-DIALKOXYANILINES

Jean-Jacques Gallay, Magden; Ernst Aufderhaar, Kaiseraugst, and Peter Labuhn, Birsfelden, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 484,048, June 28, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,818

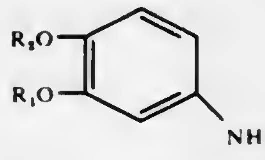
Claims priority, application Switzerland, July 3, 1973, 9669/73

Int. Cl.² C07C *93/14*

U.S. Cl. 260—571 **10 Claims**

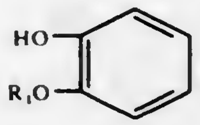
1. A process for the production of 3,4dialkoxyanilines of formula I

(I)



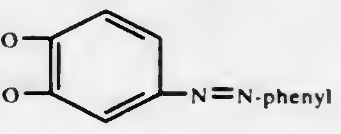
wherein (a) R_1 and R_2 are different from each other and each of R_1 and R_2 represents a member of the group consisting of C_1–C_{20}-alkyl and C_3–C_6-cycloalkyl-C_1-C_4-alkyl or (b) R_1 represents C_1–C_4 alkyl and R_2 represents C_8–C_{10} alkyl, which comprises reacting pyrocatechol with a reactive ester of an alcohol derived from the group R_1, to form the corresponding pyrocatechol monoether of formula II

(II)



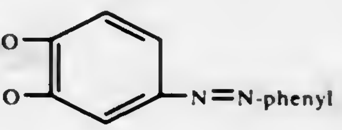
coupling this pyrocatechol monoether with a phenyl diazonium salt to give an azobenzene of formula III

(III)



relating this azobenzene with a reactive ester of an alcohol derived from the group R_2, to form a 3,4-dialkoxyazobenzene of formula IV

(IV)



and then reductively splitting this 3,4-dialkoxy azobenzene to a 3,4-dialkoxyaniline of formula I.

4,035,424

METHOD OF PREPARING SYMMETRICAL DIARYLSULPHIDES

Eleonora Nikolaevna Deryagina, ulitsa Lermontova, 313a, kv. 32; Mikhail Grigorievich Voronkov, ulitsa Lermontova, 315, kv. 32; Anatoly Samuilovich Nakhmanovich, ulitsa Rossiiskaya, 6, kv. 26, and Ljudmila Gerasimovna Klochkova, ulitsa Lermontova, 100, kv. 12, all of Irkutsk, U.S.S.R.

Filed Apr. 4, 1975, Ser. No. 565,098

Int. Cl.² C07C *148/00*

U.S. Cl. 260—609 E **7 Claims**

1. A method of preparing a symmetrical diarylsulphide which consists of passing an aromatic thiol through a reaction zone, heating said reaction zone in the absence of a catalyst to a temperature of about from 500° C to 600° C to convert said thiol into a symmetrical diarylsulphide, and isolating said diarylsulphide.

4,035,425

SYNTHESIS OF VITAMIN A, INTERMEDIATES AND CONVERSION THEREOF TO VITAMIN A

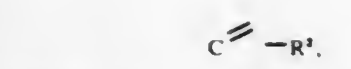
William Oroshnik, Plainfield, N.J., assignor to SCM Corporation, New York, N.Y.

Division of Ser. No. 353,215, April 23, 1973, Pat. No. 3,949,006, which is a continuation-in-part of Ser. No. 246,939, April 24, 1972, abandoned. This application Apr. 10, 1975, Ser. No. 566,981

Int. Cl.² C07C *29/00*

U.S. Cl. 260—617 A **3 Claims**

1. A process for synthesizing Vitamin A which comprises contacting with a strong basic medium under elimination conditions substituted 9.12-dihydroretinol in which an OR group is attached to the number 9 carbon atoms, R being a lower alkyl or lower alkenyl up to 5 carbon atoms, phenyl or aralkyl of up to 10 carbon atoms, and in which an OR¹ group is attached to the number 15 carbon atoms, R¹ being hydrogen or



R^2 being a lower alkyl up to 5 carbon atoms, phenyl, substituted phenyl up to 10 carbon atoms or aralkyl up to 10 carbon atoms thereby inducing an elimination of OR and hydrogen and rearranging the sites of unsaturation to form the Vitamin A structure in which the formation of retro-Vitamin A is suppressed.

4,035,426
DIARYLCYCLOBUTANES

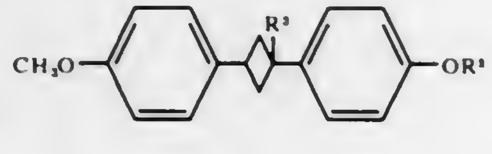
John E. Lawson; Ronnie D. Dennis, and Robert F. Majewski, all of Evansville, Ind., assignors to Mead Johnson & Company, Evansville, Ind.

Division of Ser. No. 444,071, Feb. 20, 1974, Pat. No. 3,939,196. This application Dec. 4, 1975, Ser. No. 637,609

Int. Cl.² C07C *39/17, 43/20*

U.S. Cl. 260—613 R **5 Claims**

1. A compound having the structural formula



wherein

R^2 is methyl, benzyl, or tert.-butyl, and
R^3 is hydrogen or hydroxyl.

4,035,427
α-T-BUTYL-P-XYLENE-α-α'-DIOLS AND HYPOLIPIDEMIC COMPOSITIONS CONTAINING SAME

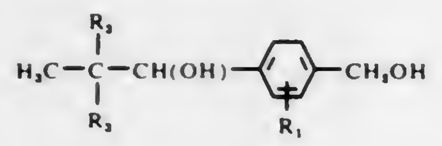
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Aug. 25, 1975, Ser. No. 607,457

Int. Cl.² C07C *33/06, 33/10;* **A61K** *31/045*

U.S. Cl. 260—618 R **4 Claims**

1. A compound of the formula:



where

R_1 is hydrogen or halo having an atomic weight of about 19 to 80 and
R_2 and R_3 are each independently methyl or ethyl.

4. A hypolipidemic composition comprising as the active ingredient a hypolipidemic amount of a compound according to claim 1 in combination with a pharmaceutically acceptable carrier or excipient.

4,035,428
PROCESS FOR PRODUCTION OF ORTHOPHENYLPHENOL

Norman A. Fishel, Olivette, and David E. Gross, St. Charles, both of Mo., assignors to Monsanto Company, St. Louis, Mo.

Filed Aug. 8, 1975, Ser. No. 603,064

Int. Cl.² C07C *37/00*

U.S. Cl. 260—620 **14 Claims**

1. A process for producing orthophenylphenol which comprises; (a) contacting phenol under dehydration and dehydrogenation conditions with a dehydration-dehydrogenation catalyst; (b) separating the resultant dehydration-dehydrogenation mixture to remove an essentially dibenzofuran stream; (c) recycling a major portion of the unconverted phenol to the dehydration-dehydrogenation step; (d) commingling the essentially dibenzofuran stream with hydrogen; (e) subjecting the resulting dibenzofuran-hydrogen mixture to hydrogenolysis by contact with a hydrogenolysis catalyst under hydrogenolysis conditions; (f) separating the resultant hydrogenolysis mixture to yield an essentially orthophenylphenol stream; and (g) recycling a major portion of the unconverted dibenzofuran to the hydrogenolysis step.

8. A process for producing orthophenylphenol which comprises: (a) contacting diphenyl ether under dehydrogenation conditions with a dehydrogenation catalyst; (b) fractionating the resultant dehydrogenation mixture to separate an essentially dibenzofuran stream; (c) recycling a major portion of the unconverted diphenyl ether to the dehydrogenation step; (d) commingling the essentially dibenzofuran stream with hydrogen; (e) subjecting the resulting dibenzofuran-hydrogen mixture to hydrogenolysis by contact with a hydrogenolysis catalyst under hydrogenolysis conditions; (f) separating resultant hydrogenolysis mixture to yield an essentially orthophenylphenol stream; and (g) recycling a major portion of the unconverted dibenzofuran to the hydrogenolysis step.

4,035,429
METHOD OF PRODUCING 2,3-DICHLORBUTADIENE-1,3

Norair Gareginovich Karapetian, ulitsa Barekamutian, 2, kv. 50; Gurgen Mambreevich Mkrian, ulitsa Moskovian, 28, kv. 91; Oganes Avetisovich Tonoian, ulitsa Moskovian, 28, kv. 161; Mikhail Eremovich Selimian, ulitsa Teriana, 2"b", kv. 58; Nargiz Akopovna Papazian, ulitsa Moskovian, 28, kv. 91; Rima Azarapetovna Kazarian, ulitsa Kalinina, 15/8; Anatoly Ivanovich Petrov, 3 uchastok, 7, kv. 59; Armen Alexandrovich Bakhtamian, ulitsa Moskovian, 28, kv. 98, and Smbat Mirakovich Mirakian, ulitsa Shakhverdiana, 23, kv. 12, all of Erevan, U.S.S.R.

Filed Feb. 3, 1972, Ser. No. 223,289

Int. Cl.² C07C *21/20*

U.S. Cl. 260—655 **2 Claims**

1. A method of producing 2,3-dichlorobutadiene-1,3 comprising dehydrohalogenation of 2,3,4-trichlorobutene-1 with liquid ammonia in the presence of a polymerization inhibitor at a molar ratio of 2,3,4-trichlorobutene-1 to ammonia of 1:1–15 respectively at a temperature within the range of from −35° to +20° C under a pressure of 1–8 atm.

4,035,430
CONVERSION OF METHANOL TO GASOLINE PRODUCT

Francis G. Dwyer, West Chester, Pa.; Francis V. Hanson, Pitman, N.J., and Albert B. Schwartz, Philadelphia, Pa., assignors to Mobil Oil Corporation, New York, N.Y.

Filed July 26, 1976, Ser. No. 708,955

Int. Cl.² C07C *1/20*

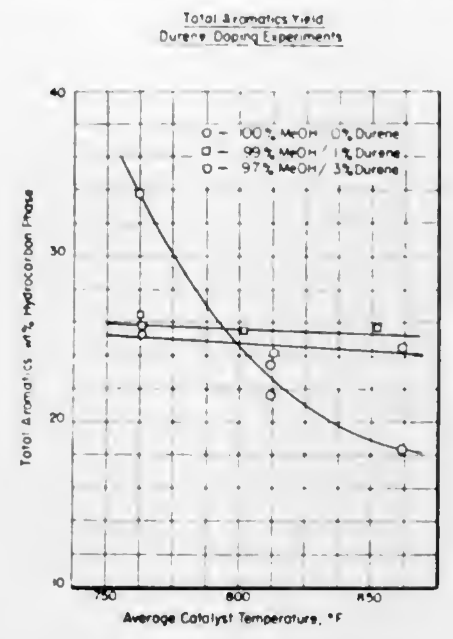
U.S. Cl. 260—668 R **11 Claims**

1. In a method for converting methanol to gasoline boiling products in a plurality of sequentially arranged catalyst beds which comprises,

effecting a catalytic restructuring of the methanol feed to an ether rich product in at least one catalyst contact zone under selected temperature conditions,

effecting a catalytic restructuring of the ether rich product to form aromatics and isoparaffins boiling in the gasoline boiling range in at least one other catalyst contact zone employing a crystalline zeolite of the class represented by ZSM-5 crystalline zeolite, the improvement comprising

effecting control of the exothermic temperature rise in any one bed of crystalline zeolite catalyst not to exceed about 50° F. by employing with the ether rich feed one or a combination of heat dissipating materials selected from the group consisting of C_5 and lower boiling hydrocarbons, a cooled methanol stream alone or in combination with a water free cool ether product fraction or a cool durene rich product fraction of the process.



4,035,431
ALKYLENE-LINKED AROMATIC COMPOUNDS

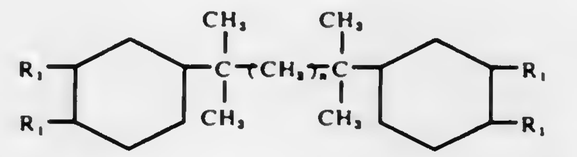
Larry F. Charbonneau, Rochester, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Sept. 26, 1975, Ser. No. 616,958

Int. Cl.² C07C *15/12*

U.S. Cl. 260—668 C **2 Claims**

1. An alkylene-linked aromatic hydrocarbon compound which may readily be oxidized and dehydrated to form the corresponding dianhydride, said aromatic having the following structural formula:



wherein R_1 is selected from the class consisting of $-CH_3$, $-CH_2CH_3$, $CH_3-CH-CH_3$ and *n* may vary from 3 to 18.

4,035,432
PROCESS FOR THE PRODUCTION OF FILM FORMING SYNTHETIC RESINS FOR HAIR FIXATIVES

Hans-Albrecht Meyer-Stoll, Rheinkamp-Repelen; Johannes Wollner, Kapellen, and Hans-Heinz Schittek, Moers-Meerbeck, all of Germany, assignors to Deutsche Texaco Aktiengesellschaft, Hamburg, Germany

Division of Ser. No. 263,517, June 16, 1972, Pat. No. 3,987,010. This application Sept. 28, 1976, Ser. No. 727,568

Claims priority, application Germany, May 29, 1968, 1770518

Int. Cl.² C08G *12/36*

U.S. Cl. 260—67.5 **7 Claims**

1. Process for the production of a water soluble, film-forming resin product having a molecular weight in the range of from about 700 up to about 3,000 or more, for a hair fixative composition which comprises reacting at an elevated temperature in the range of from about 70° C. to about 115° C. a methylolated 5,5-dialkylhydantoin wherein each alkyl group thereof contains from 1 to 5 carbon atoms, in the presence of from about 0.2 to about 2.5 moles of a mixture of urea and a diamine, per mole of said hydantoin.

4,035,433
SELECTIVE OXIDATION OF ACETYLENES

Lewis E. Drehman, and Thomas Davis, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed July 13, 1976, Ser. No. 704,884

Int. Cl.² C07C *7/02*

U.S. Cl. 260—681.5 R **7 Claims**

1. A process for the selective removal of acetylenic contaminants or impurities present in hydrocarbon streams which comprises contacting oxygen and a hydrocarbon-containing mixture contaminated with acetylenic compounds with a catalyst consisting essentially of copper, chromium, and oxygen in which the atomic ratio of copper to chromium varies from about 0.3:1 to about 1:1 under oxidation conditions including a temperature and a mole ratio of oxygen to hydrocarbon sufficient to selectively remove a substantial portion of said acetylenic compounds present in said mixture.

4,035,434
GRAPHITE INTERCALATION

Paul G. Rodewald, Rocky Hill, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 532,146, Dec. 12, 1974, Pat. No. 3,962,133. This application Sept. 2, 1975, Ser. No. 609,334

Int. Cl.² C07C *3/18*

U.S. Cl. 260—683.15 B **10 Claims**

1. A process for polymerization of a polymerizable organic compound which comprises contacting the same at a temperature between about −20° C. and about 100° C., a pressure between about atmospheric and about 10 atmospheres at a liquid hourly space velocity between about 0.5 and about 1000 with a catalyst consisting essentially of graphite having intercalated in the lattice thereof between about 5 and about 50 weight percent of a Lewis acid fluoride having a boiling point below 300° C. of an element of Group II, IIIA, IV, V or VIB of the Periodic Table.

4,035,435
ADHERENCE OF TEXTILE FIBERS TO UNSATURATED POLYMERS

Georges Rouzier, Clermont-Ferrand, France, assignor to Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie, France

Division of Ser. No. 576,130, May 9, 1975, which is a continuation of Ser. No. 397,608, Sept. 14, 1973, abandoned, which is a division of Ser. No. 241,815, April 6, 1972, Pat. No. 3,817,890, which is a continuation-in-part of Ser. No. 802,268, Feb. 25, 1969, abandoned. This application Sept. 13, 1976, Ser. No. 722,711

Claims priority, application France, Feb. 26, 1968, 68.141324

Int. Cl.² C08G *8/04;* **C08L** *61/06*

U.S. Cl. 260—838 **1 Claim**

1. A blend of resorcinol-phenolic-formaldehyde precondensate products, the major part of said products having at least on methylolated terminal resorcinol nucleus and having a molecular weight in the general range of from about 500 to about 800 and being soluble or dispersible in water and fusible at a temperature below 200° C.; said blend of resorcinol-phenolic-formaldehyde precondensate products having been prepared by methylolating in an alkaline aqueous alcoholic soda or potash reaction medium at a temperature from about 30° to about 40° C. for from about 30 to about 60 minutes a blend of resorcinol-phenolic condensation products with from about 1 to about 2 mols of formaldehyde per mol of the resorcinol used in preparing said blend of resorcinol-phenolic condensation products; said blend of resorcinol-phenolic condensation products being the condensation products of resorcinol and at least one phenol selected from the group consisting of

1. monocyclic or polycyclic para-substituted phenols having active methylene groups on two terminal ortho positions,

2. monocyclic phenols having one active methylene group on an ortho or para position and at least two substituents, and
3. condensation products of monocyclic phenols having at least two substituents with monocyclic or polycyclic para-substituted phenols having active methylene groups on two terminal ortho positions,

the proportion of said monocyclic phenols having one active methylene group and two substituents or of said monocyclic phenols having two substituents being less than 50% of the total amount of phenols; the major part of said resorcinol-phenolic condensation products having at least one terminal resorcinol nucleus attached to a phenol nucleus through one of said active methylene groups, the other terminal nucleus of said resorcinol-phenolic condensation products being a resorcinol nucleus or a phenol nucleus with at least two substituents, and being soluble or dispersible in isopropyl alcohol; said blend of resorcinol-phenolic condensation products having been prepared by condensing in the presence of an acid catalyst at a temperature from about 70° to about 200° C. for from about 1 hour to about 24 hours a stoichiometric excess of resorcinol with said phenol while removing the water of condensation.

4,035,436
ADHESIVE COMPOSITIONS FOR METALS

Takashi Matsubara; Yoshihito Uramoto, and Daizo Matsuoka, all of Nagoya, Japan, assignors to Toagosei Chemical Industry Co., Ltd., Tokyo, Japan

Filed Nov. 12, 1975, Ser. No. 631,249

Claims priority, application Japan, Nov. 12, 1974, 49-129519; Nov. 22, 1974, 49-133525

Int. Cl.² C08L *77/00*

U.S. Cl. 260—857 TW **11 Claims**

1. A polyamide adhesive composition for metal bonding comprising an 11-aminoundecanoic acid polycondensate, a 12-aminododecanoic acid polycondensate and a hexamethylenediamine-1,12-dodecanoic diacid polycondensate, wherein said composition consists essentially of:

a. 100 parts by weight of a mixture of a crystalline 11-aminoundecanoic acid polycondensate and a crystalline 12-aminododecanoic acid polycondensate in a weight ratio of 95 : 5 to 5 : 95; and
b. 2 to 40 parts by weight of a crystalline hexamethylenediamine-1,12-dodecanoic diacid polycondensate, optionally with conventional additives.

4,035,437
POLYAMIDE RESIN COMPOSITIONS

Anthony B. Conciatori, Chatham, and Robert W. Stackman, Morristown, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Division of Ser. No. 558,873, March 17, 1975, abandoned. This application Mar. 2, 1976, Ser. No. 663,136

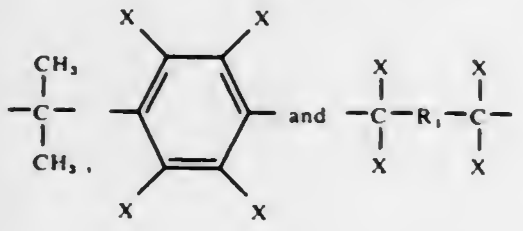
Int. Cl.² C08L *75/00*

U.S. Cl. 260—857 TW **3 Claims**

1. A polyamide block copolymer consisting essentially of a recurring combination of prepolymer residues corresponding to the formula:

$$-HN-R-NH-OC-A-CO-_{n}(HN-R-NH-OC-A-CO)_{n}$$

wherein the two prepolymer residues represented in the formula are different from each other, and wherein R is a divalent organic radical containing between one and about 20 carbon atoms; A is selected from the radicals



in which R_1 is a single bond or a divalent organic radical containing between one and about 12 carbon atoms, and X is selected from methyl and chlorine; and n is an integer between 3 and 20.

4,035,438
IMPACT RESISTANT POLYMER MIXTURES

Werner Nielinger; Rolf Dhein; Kurt Schneider, and Peter Tacke, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 29, 1975, Ser. No. 581,753

Claims priority, application Germany, June 1, 1974, 2426671

Int. Cl.² C08L *77/02*

U.S. Cl. 260—857 G **6 Claims**

1. Homogeneous polymer mixtures with improved impact strength consisting of

a. 3 to 30% by weight of a polyethylene having a molecular weight below 100,000 and a melt index of above 15 g/10 min,
b. a graft polymer of 0.3 to 5% by weight of an ethylene/acrylic acid copolymer or ethylene/methacrylic acid copolymer as graft substrate and grafted polymerised units of ϵ-caprolactam, and
c. a poly-ϵ-caprolactam, in which the quantities of grafted and ungrafted polycaprolactam amount is 65 to 96.7% by weight.

4,035,439
LOW-SHRINK THERMOSETTING POLYESTERS

Donald R. Stevenson, Dover, Ohio, assignor to SCM Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,447

Int. Cl.² C08L *75/00*

U.S. Cl. 260—859 R **3 Claims**

1. A stabilized, low-shrink molding resin composition for thickening with Group II metal oxides, hydroxides, or alkoxides, the resin composition being a stabilized resin emulsion mixture comprising by weight a mixture of at least 25% of a dicyclopentadiene terminated ethylenically unsaturated polyester polymer containing dicyclopentadiene esterified with carboxylic acid and said polymer containing between about 0.1 to 0.4 moles of dicyclopentadiene per 1 mole or dicarboxylic acid, about 5% to 20% of acid functional thermoplastic having an acid number of at least about 0.4, and about 40% to 58% of an ethylenically unsaturated monomer, the improvement comprising·

said thermoplastic being a polycaprolactone-polyurethane linear polymer having a molecular weight between about 10,000 and 40,000 and being predominantly a caprolactone esterified with excess equivalents of glycol having 2 to 6 carbon atoms to produce a polycaprolactone polymer having a hydroxyl value of between about 50 to 215, said polycaprolactone polymer being reacted with diisocyanate to form said polycaprolactone-polyurethane linear polymer.

4,035,440
BLEND OF THERMOPLASTIC POLYURETHANE ELASTOMER WITH CHLORINATED POLYETHYLENE

Som Nath Khanna, and Mitchell Borr, both of Guelph, Canada, assignors to Uniroyal, Ltd., Canada

Filed Mar. 29, 1973, Ser. No. 345,922

Claims priority, application Canada, Mar. 19, 1973, 166375

Int. Cl.² C08L *75/00*

U.S. Cl. 260—859 R **1 Claim**

1. A method of making a shaped article comprising the steps of blending

a. from 10 to 90% by weight of a high molecular weight thermoplastic polyuethane elastomer devoid of ethylenic unsaturation and free —NCO groups having a 350° F. melt flow index of from 0 to 100 which is a reaction product of polytetramethylene ether glycol, butanediol-1,4 and diphenylmethane-p,p'-diisocyanate, and
b. correspondingly from 90 to 10% by weight of an elastomeric chlorinated polyethylene having a glass transition temperature of −30° C. to −20° C. and a chlorine content of 25–50% by weight,

the resulting blend being capable of being reprocessed and forming the resulting blend into a shaped article using a thermoplastic processing technique.

4,035,441
POLYESTER FILAMENT HAVING EXCELLENT ANTISTATIC PROPERTIES AND PROCESS FOR PREPARING THE SAME

Tadakazu Endo; Masanori Takeuchi; Tuneo Hanada; Kiyoshi Nakagawa; Hideo Komatsu, and Itaru Nakamura, all of Mishima, Japan, assignors to Toray Industries, Inc., Japan

Filed June 24, 1974, Ser. No. 482,463

Claims priority, application Japan, Feb. 6, 1974, 49-14537; June 26, 1973, 48:71285; Feb. 6, 1974, 49-14536

Int. Cl.² C08G *39/08*

U.S. Cl. 260—860 **18 Claims**

1. A polyester filament having excellent antistatic properties which comprises a composition of (1) a polyester selected from one group consisting of polyethylene terephthalate, polytetramethylene terephthalate, polyethylene-2, 6-napthalene dicarboxylate, poly-1, 4-cyclohexanedimethylene terephthalate poly [ethylene-1, 2-bis (phenoxy) ethane-p, p'-dicarboxylate] and poly-p-ethylene oxybenzoate, and (2) a polyether-polyester block copolymer consisting of polyalkylene glycol and polyester wherein at least 40 mol % of the polyester segment of said polyether-polyester block copolymer comprises polyester constituents synthesized from at least one member selected from the group consisting of:

A. an aliphatic or alicyclic oxycarboxylic acid having at least 2 carbon atoms and ester-forming derivatives thereof,
B. an aliphatic or alicyclic dicarboxylic acid having at least 3 carbon atoms and ester-forming derivatives thereof,
C. an aromatic dicarboxylic acid or oxycarboxylic acid having a group ether-linked with an aromatic ring having a carboxyl group and ester-forming derivatives thereof,
D. an aromatic dicarboxylic acid or oxycarboxylic acid having a substituent group at the orthoposition toward a carboxyl group and ester-forming derivatives thereof, and
E. an aliphatic or alicyclic glycol having at least 3 carbon atoms,

wherein said polyester filament includes 0.01–5.0% of said polyalkylene glycol by weight of said polyester filament, and has a specific resistance less than 10^{11} Ω.cm and said polyether-polyester block copolymer is dispersed as fine striae along the filament axis, at least one of said striae being substantially endless.

4,035,442
POLYESTER FILAMENTS FLAME RETARDED WITH END-CAPPED POLY(M-PHENYLENE CYCLOHEXYLPHOSPHONATE)

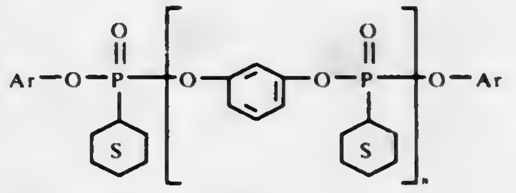
William P. Dunworth, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 20, 1976, Ser. No. 688,478

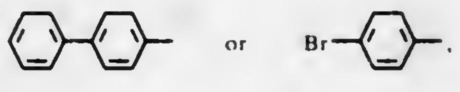
Int. Cl.² C08L *67/00;* **D01F** *1/02*

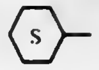
U.S. Cl. 260—860 **4 Claims**

1. In the process of producing polyester textile filaments by pumping molten ethylene terephthalate polymer to a spinning pack and extruding the molten polymer to form filaments, the improvement for preparing flame retardant filaments which comprises melting and mixing with the molten polymer a polyphosphonate compound represented by the formula,



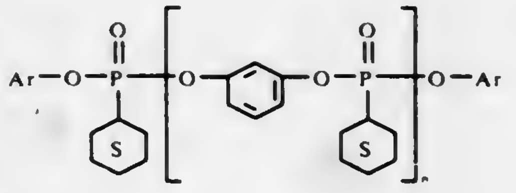
wherein Ar is



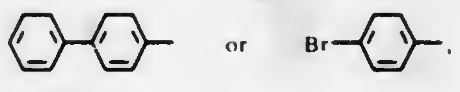


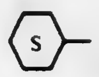
represents cyclohexyl, and *n* is an integer between 1 and 20, forwarding the resulting melt blend to the spinning pack and extruding the melt blend into filaments, an amount of polyphosphonate compound being added which provides 0.1 to 2 percent phosphorus by weight in the filaments.

4. Flame retardant polyester articles containing about 1 to 16 percent by weight of a polyphosphonate compound represented by the formula,



wherein Ar is





represents cyclohexyl, and *n* is an integer from 5 to 15.

4,035,443

POLYVINYL CHLORIDE RESIN COMPOSITION HAVING TRANSPARENCY, HIGH GLOSS, IMPACT AND WEATHER RESISTANCE

Fumio Ide; Kazuo Kishida, and Jinpee Kobayashi, all of Ohtake, Japan, assignors to Mitsubishi Rayon Co., Ltd., Tokyo, Japan

Filed Dec. 24, 1975, Ser. No. 644,421

Claims priority, application Japan, Dec. 27, 1974, 50-148851

Int. Cl.^{2} A43B *13/04;* **C08L** *51/06;* **C08F** *6/24*

U.S. Cl. 260—876 R **5 Claims**

1. A transparent vinyl chloride resin composition excellent in surface gloss and resistant to weathering and impact, comprising 97 to 60 parts by weight of a vinyl chloride polymer and 3 to 40 parts by weight of a graft copolymer (B) obtained by emulsion-polymerizing a mixture of an aromatic vinyl monomer and a polyfunctional crosslinking agent having at least one allyl group, then polymerizing, in the presence of the resulting polymer latex, a mixture of an alkyl acrylate having 2 to 10 carbon atoms in the alkyl group and a polyfunctional crosslinking agent having at least one allyl group to form an acrylic elastomer (A) in the first stage, the proportions of said alkyl acrylate and said aromatic vinyl monomer being 50 to 70 % by weight and 50 to 30 % by weight, respectively, and the amount of said crosslinking agent used being 0.1 to 5 parts by weight in total per 100 parts by weight of the sum of said alkyl acrylate and said aromatic vinyl monomer; and graft-polymerizing, in the presence of the resulting acrylic elastomer (A), first methyl methacrylate and subsequently an aromatic vinyl monomer in the second stage, the proportions of said methyl methacrylate and said aromatic vinyl monomer being 30 to 80 % by weight and 70 to 20 % by weight, respectively, and the total amount of said methyl methacrylate and said aromatic vinyl monomer used being 70 to 20 parts by weight per 30 to 80 parts by weight of said acrylic elastomer (A).

4,035,444

TWO-STEP POLYMERIZATION PROCESS AND PRODUCT THEREOF

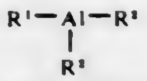
Hsun-kuang Yang, Northfield, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 30, 1975, Ser. No. 627,090

Int. Cl.^{2} C08F *297/08, 297/06*

U.S. Cl. 260—878 B **12 Claims**

1. A product of a process comprising (A) polymerizing ethylene monomer in the presence of a catalyst comprising (1) at least one organoaluminum compound and (2) at least one titanium tetrahalide and (B) thereafter polymerizing isoprene monomer in the presence of the step (A) reaction mixture, there being no substantial amount of unreacted ethylene present in the reaction mixture when isoprene is added thereto, said organoaluminum compound having the formula



$$R^1-\underset{\displaystyle R^3}{\underset{|}{Al}}-R^2$$

wherein R^1 is an alkyl group containing from 1 to 12 carbon atoms, a cycloalkyl group containing from 4 to 12 carbon atoms, or an aryl, alkaryl or aralkyl group containing from 6 to 14 carbon atoms, R^2 and R^3 are hydrogen, halogen or the same as R^1, the molar ratio of said organoaluminum compound of said titanium tetrahalide is from about 0.6/1 to about 2/1, from about 0.1 millimole to about 50 millimoles of said catalyst is used per mole of total monomer, and said product contains polymerized therein about 0.05 to about 2.2 weight percent ethylene.

4,035,445

HYDROTREATING OF RECYCLED BLOCK COPOLYMER SOLVENT

Herman J. Baumgartner, Cypress, Calif., assignor to Shell Oil Company, Houston, Tex.

Continuation of Ser. No. 497,010, Aug. 8, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 642,031

Int. Cl.^{2} C08F *6/10*

U.S. Cl. 260—880 B **3 Claims**

1. In the process for preparation of a block copolymer wherein a first monomer of the group consisting of monoalkenyl arenes and conjugated dienes is polymerized in a polymerizer in an inert saturated hydrocarbon solution whereby a first polymer block is formed with a lithium based initiator and thereafter a second monomer of said group is block polymerized therewith after which the block copolymer is separated from the solvent, the separated solvent having a temperature between about 150° and 300° F and being contaminated with up to 10,000 **parts per million of impurities reactive with the lithium initiator selected from the group consisting of acetylenes, conjugated dienes, esters, halogenated hydrocarbons and mixtures thereof, and recycling the recovered solvent to the polymerizer for the synthesis of additional quantities of the block copolymer; the improvement comprising hydrotreating the contaminated solvent at about its separation temperature prior to recyle utilizing a heterogeneous nickel/molybdenum hydrogenation catalyst, a weight hourly space velocity greater than about** 0.25 and a pressure sufficient to maintain the solvent in an essentially liquid state, whereby the contaminates are reduced to less than about 10 parts per million.

4,035,446

POLYCHLOROPRENE SOL-GEL BLENDS

Edwin F. Hoff, Jr., Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Filed Aug. 16, 1974, Ser. No. 498,067

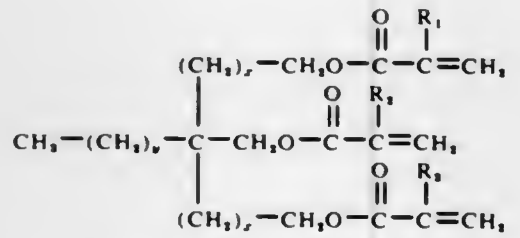
Int. Cl.^{2} C08L *11/00*

U.S. Cl. 260—890 **25 Claims**

1. A polychloroprene sol-gel elastomer composition comprising an intimate mixture of:

a benzene-soluble polymer prepared by polymerizing polymerizable monomer comprising chloroprene to a monomer conversion at which benzene-soluble polymer is obtained in aqueous emulsion containing the chloroprene and a sulfur containing chain-transfer agent, and

a benzene-insoluble polymer prepared by polymerizing polymerizable monomer comprising at least 50 percent polychloroprene having present in the polymerization system from about 0.5 to 20 weight percent, based on total monomers of a crosslinking agent consisting of a triester having the general formula:



wherein *x* is 0 or an integer of from 1 to 4, *y* is 0 or an integer of from 1 to 4, and R$_1$, R$_2$ and R$_3$ represent hydrogen or an alkyl radical with from 1 to 4 carbon atoms wherein said chain transfer agent is an alkyl mercaptan said alkyl group having 1 to 18 carbon atoms.

4,035,447

FIRE RESISTANT POLYMER COMPOSITION

Satoshi Tonoki, Kobe; Yoshio Iki, Osaka, and Takashi Sakauchi, Kobe, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Sept. 2, 1975, Ser. No. 609,481

Claims priority, application Japan, Sept. 13, 1974, 49-106311; Jan. 28, 1975, 50-12254; July 24, 1975, 50-90822

Int. Cl.^{2} C08L *27/00*

U.S. Cl. 260—890 **11 Claims**

1. A fire resistant composition comprising

A. 99.9 to 50 parts by weight of a copolymer consisting essentially of 90 to 10 weight percent nuclear halogenated aromatic vinyl compound, 10 to 90 weight percent cyanized vinyl compound and 0 to 30 weight percent one or more monomers copolymerizable therewith;

B. 0 to 20 parts by weight of a rubber like polymer selected from the group consisting of polybutadiene, styrene-butadiene copolymer, acrylonitrile-butadiene copolymer and mixtures thereof; and

C. 0.1 to 30 parts by weight of a member selected from the group consisting of iron compounds, cobalt compounds, nickel compounds, tin compounds, and mixtures thereof.

4,035,448

ORGANIC COMPOUNDS

Horst Mayerhoefer, Oberwil; Wolfgang Mueller, Neuallschwil; Urs Sollberger, Fullinsdorf, and Rainer Wolf, Allschwil, all of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

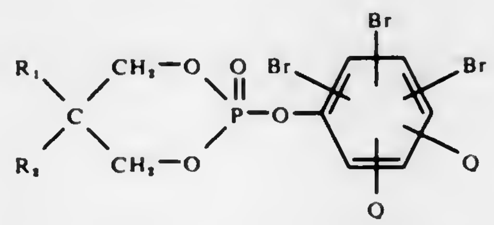
Division of Ser. No. 364,629, May 29, 1973, Pat. No. 3,890,409. This application Apr. 7, 1975, Ser. No. 565,708

Claims priority, application Switzerland, June 1, 1972, 8117/72; June 14, 1972, 8898/72

Int. Cl.^{2} C07F *9/15;* **C08K** *5/52*

U.S. Cl. 260—937 **8 Claims**

1. A compound of the formula



wherein R$_1$ and R$_2$ are each, independently, hydrogen or alkyl of 1 to 5 carbon atoms,

and each Q is, independently, hydrogen, methyl, chlorine or bromine.

4,035,449

PROCESS FOR THE PRODUCTION OF S-ALKYL PHOSPHORO DIHALOGENIDODITHIOATE

Ara Zakaryan, Shawnee Mission, Kans., assignor to Mobay Chemical Corporation, Pittsburgh, Pa.

Filed Oct. 23, 1975, Ser. No. 625,345

Int. Cl.^{2} C07F *9/20*

U.S. Cl. 260—972 **9 Claims**

1. A process for the production of S-alkyl phosphorodihaogenidodithioate comprising

a. reacting a mercaptan with the formula RSH, wherein R is a straight chained or branched C_1–C_{15} alkyl optionally substituted with halogen, alkoxy or alkylthio or cycloalkyl with 5 or 6 ring carbons, with sufficient PX_3 wherein X is Cl, Br or I to convert substantially all of the mercaptan to mono-, di- or tri-substituted trivalent phosphorous thioesters,

b. reacting the thioesters and any excess phosphorous trihalide from step (a) with sufficient sulfur in the presence of a sulfurization catalyst to sulfurate any phosphorous trihalide present and to convert substantially all of the trivalent thioesters to penta-valent compounds,

c. reacting the penta-valent di- and tri-substituted thioesters with sufficient PSX_3 to convert them to monosubstituted penta-valent thioesters,

d. recycling the residue of di- and trisubstituted thioesters left after reaction with PSX_3 to the sulfurization reaction.

4,035,450

DEVICE FOR MAKING BALL-SHAPED METAL OXIDE PARTICLES AND METAL CARBIDE PARTICLES

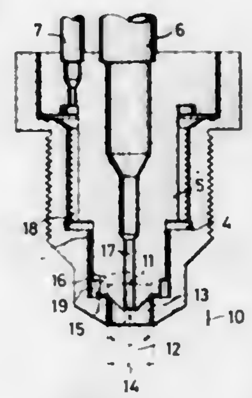
Hans Langen, Julich, and Paul Naefe, Aachen, both of Germany, assignors to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Filed Dec. 23, 1974, Ser. No. 536,872

Claims priority, application Germany, Dec. 21, 1973, 2363827

Int. Cl.^{2} B05B *7/06*

U.S. Cl. 261—76 **4 Claims**



1. A device for use in connection with the preparation of ball-shaped particles of metal oxides, and of metal carbides, especially of particles of fuel and breeder substances for core reactors, which includes in combination: a container for receiving an aqueous ammonia solution and an organic phase thereabove, an injection tube leading from the outside of said container into the upper portion of said container for introducing thereinto an aqueous solution of metal salts in the organic phase in the form of droplets, having an undisturbed flow therewith, a mantle passage associated with said injection tube and surrounding same for introducing said organic phase into said container, the cross section of said mantle passage increasing within the range of the mouth of said injection tube, and said injection tube leading into said container at a distance of from **0.5** to **2mm** ahead of the end of said mantle passage when viewed from the interior of said container and the outer diameter of said injection tube having an outer diameter steadily decreasing toward the mouth of said injection tube, the cross sectional increase of said mantle passage being so designed that the organic phase with droplets flows into said cross sectional increase of said mantle at an angle with regard to the axis of said injection tube while being uniformly distributed over the circumference.

4,035,451

CARTRIDGE FORMING PART OF A SYSTEM FOR INDUCING AIR FLOW PAST A PRODUCT CAPABLE OF BEING VAPORIZED

Dominick Tringali, Columbia, S.C., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.

Filed July 23, 1976, Ser. No. 707,954

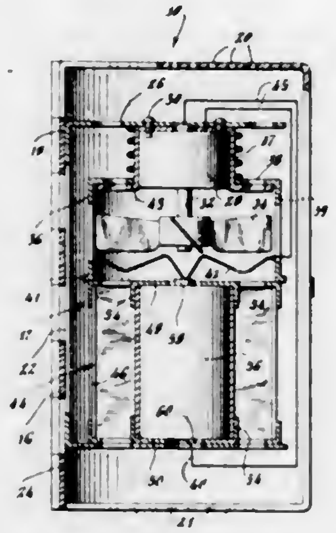
Int. Cl.^{2} A61L *9/00*

U.S. Cl. 261—101 **7 Claims**

1. In a system including an apparatus for inducing air flow past a product capable of being vaporized to release the product in vapor form into the environment, the apparatus including a housing defining a cartridge receiving cavity, fan means mounted in the housing to induce air flow through the car-

tridge receiving cavity and out of the housing, elecrically powered motor means for driving the fan means, and contact means electrically connected to the motor means mounted in the housing for contacting and electrically connecting a supply of electrical power to the motor means; a self-contained replaceable and disposable cartridge adapted to cooperate with the apparatus, said cartridge comprising:

A. a hollow apertured container shaped and sized to be received in the cartridge receiving cavity;
B. a support of strip material, mounted in said container, having a convoluted configuration;



C. a quantity of a product, which is capable of being vaporized, carried by said support of strip material; and
D. a battery mounted in said container and equipped with terminals which are exposed by the container and are located to make electrical contact with the contact means when said container is received in the cartridge receiving cavity whereby, when so received, said battery powers the motor means to drive the fan means and induce air flow past said support and, thus, said product.

4,035,452
METHOD OF MAKING NUCLEAR FUEL BODIES

Dwight E. Davis, Escondido, and David F. Leary, San Diego, both of Calif., assignors to General Atomic Company, San Diego, Calif.
Filed Jan. 21, 1975, Ser. No. 542,714
Int. Cl.² G21C *21/02*
U.S. Cl. 264—.5 **9 Claims**

1. A method of making nuclear fuel bodies which method comprises

providing particulate graphite having a particle size not greater than about 1500 microns,
impregnating said graphite with a polymerizable organic resin in liquid form,
treating said impregnated particles with a hot aqueous acid solution to pre-cure said impregnated resin and to remove excess resin from the surfaces of said graphite particles,
heating said treated particles to polymerize said impregnant,
blending said impregnated particles with particulate nuclear fuel and
forming a nuclear fuel body by joining said blend of particles into a cohesive mass using a carbonaceous binder.

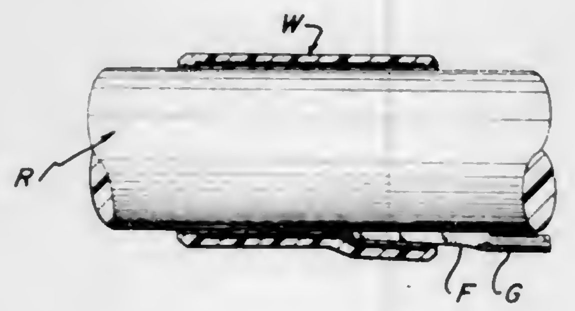
4,035,453
DENTAL IMPRESSION MATERIALS

Paul Hittmair; Wolfgang Hechtl; Eckhart Louis, and Ernst Wohlfarth, all of Burghausen, Germany, assignors to Wacker-Chemie GmbH, Munich, Germany
Division of Ser. No. 473,452, May 28, 1974, Pat. No. 3,950,300, which is a division of Ser. No. 405,338, Oct. 11, 1973, abandoned. This application Nov. 6, 1975, Ser. No. 629,344
Int. Cl.² A61C *13/00*
U.S. Cl. 264—16 **32 Claims**

1. A method of making a dental impression which comprises (1) applying to a tooth of which an impression is to be taken, an impression material which is obtained by mixing (a) a diorganopolysiloxane containing triorganosiloxy terminal units, each of which contains at least one vinyl group, and having a viscosity of from 500 to 300,000 cP at 25° C. with (b) an organopolysiloxane free of aliphatic multiple bonds and having at least three Si-bonded hydrogen atoms per molecule and having from 0.01 to 1.7 percent by weight of Si-bonded hydrogen atoms in which the silicon valences not satisfied by hydrogen atoms or siloxane oxygen atoms are satisfied by unsubstituted and substituted monovalent hydrocarbon radicals free of aliphatic multiple bonds and in which at least 50 percent of the hydrocarbon radicals bonded to silicon atoms carrying hydrogen atoms are methyl radicals, said organopolysiloxane (b) being present in an amount so that a total of 0.75 to 5 gram atoms of Si-bonded hydrogen is present per gram molecule of vinyl group and (c) a catalyst which is capable of promoting the addition of Si-bonded hydrogen to vinyl groups at room temperature, said catalyst is selected from the group consisting of platinum, platinum compounds, platinum complexes, cobalt carbonyls and manganese carbonyls (2) allowing the material to harden and thereafter (3) removing the resultant impression from the tooth.

4,035,454
MANUFACTURE AND APPLICATION OF ROD WRAPS TO A FISHING ROD

Gerald B. Klein, 13451 Stuart Court, Broomfield, Colo. 80020
Continuation of Ser. No. 516,034, Oct. 18, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 675,822
Int. Cl.² B29C *27/20*
U.S. Cl. 264—28 **3 Claims**

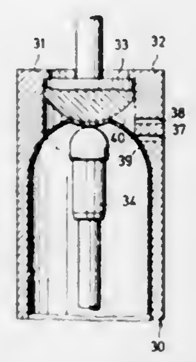


1. A fastening method for securely attaching a line guide or other relatively rigid fishing rod implement to a flexible fishing rod with a sleeve-like rod wrap having an inside diameter at normal room temperature less than the diameter of the rod and being formed of a strong, tough resilient polymer material having characteristics similar to nylon which exhibits the properties of being capable of being elastically stretched at normal room temperature, fixed in its stretched state by lowering the temperature thereof below normal room temperature whereby the elasticity is temporarily lost, and subsequently returned towards its original unstretched state by being allowed to warm toward normal room temperature without requiring the application of additional heat thereto such that the elasticity thereof is regained, said fastening method comprising the steps of: radially expanding the rod wrap and elastically stretching same to increase its inside diameter to a diameter greater than the diameter of the rod;

lowering the temperature of the expanded rod wrap sufficiently to cause the rod wrap to lose its elasticity and remain in a fixed and expanded state by applying a cooling medium to the expanded wrap;
thereafter removing the cooling medium and, before the rod wrap warms sufficiently to regain its elasticity, physically placing the rod wrap about the rod and at least a portion of the rod implement to be attached thereto, whereby the rod wrap, as it warms toward normal room temperature and regains elasticity, will contract and tightly grip the rod and the rod implement in a tensioned conditions to secure the rod implement to the rod.

4,035,455
METHOD FOR BLOW MOLDING A HOLLOW PLASTIC ARTICLE HAVING A CONCAVE BASE

Otto Rosenkranz, and Karl-Heinrich Seifert, both of Hamburg, Germany, assignors to Heindenreich & Harbeck, Germany
Continuation of Ser. No. 345,072, March 26, 1973, abandoned. This application Sept. 16, 1975, Ser. No. 614,058
Claims priority, application Germany, May 8, 1972, 2222535
Int. Cl.² B29C *17/07*
U.S. Cl. 264—40.3 **3 Claims**



1. The method of blow molding a synthetic plastic hollow body having concave base in a mold having an elongated cavity and a convex movable die selectively movable into the cavity to form the concave base, comprising the steps of placing a heated hollow blank of synthetic plastic within the mold cavity, introducing compressed gas into said heated blank, inflating said blank within said cavity, venting the cavity through an aperture adjacent said die, covering the aperture with the blank during inflation of the blank to terminate venting of the cavity, moving the die into the cavity into engagement with the inflated blank to form a concave base thereon in response to an increase in pressure in the mold after venting is terminated, and cooling the shaped blank.

4,035,456
PROCESS FOR THE MANUFACTURING A CURED EXPANDED NON-CRACKING DIMENSIONALLY STABLE UREA FORMALDEHYDE PRODUCT

Donald Arthur Hubbard, Cambridge, and Kenneth Atkinson, Stockton-on-Tees, both of England, assignors to Imperial Chemical Industries Limited, Millbank, England
Filed Oct. 29, 1974, Ser. No. 518,966
Claims priority, application United Kingdom, Nov. 5, 1973, 51225/73
Int. Cl.² B29D *27/00*
U.S. Cl. 264—41 **3 Claims**

1. A process for manufacturing a molded product which comprises the step of heating substantially dry, uncured urea formaldehyde resin powder, which powder contains up to 8% volatile materials, to a molding temperature above 180° C but below the decompositon temperature of the resin, in a mold under light restraining pressure of between 5 and 500 psi so as to produce a cured expanded non-cracking and dimensionally stable molded product, wherein the powder is heated to said temperature by a rapid initial heating whereby the temperature at the end of one minute is greater than 45° C.

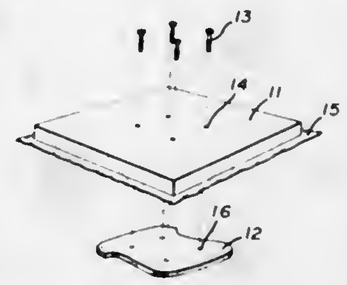
4,035,457
NONBIODEGRADABLE POLYMERS

Robert E. Kesting, Irvine, Calif., assignor to Chemical Systems Incorporated, Irvine, Calif.
Filed May 1, 1975, Ser. No. 573,783
Int. Cl.² B29D *27/04, 7/02*
U.S. Cl. 264—41 **8 Claims**

1. The method of forming membranes comprising the steps of reacting cellulose acetate with an acyl chloride selected from the group consisting of chloro-acetyl chloride, β-chloropropionyl chloride, Γ-chloro-butynyl chloride and Γ-chlorovaleryl chloride and with a pyridinium based tertiary amine to form a cellulose acetate-chloroacylate quaternary ammonium salt, forming a membrane casting solution of the cellulose acetate-chloroacylate quaternary ammonium salt in a solvent therefor mixed with a non-solvent liquid therefor, and casting the solution to form an asymmetric membrane by the phase inversion process.

4,035,458
METHOD OF MAKING A COMPOSITE RIGID FOAMED CHAIR SEAT OR THE LIKE

Richard J. Lyman, Oconomowoc, Wis., assignor to United States Gypsum Company, Chicago, Ill.
Filed May 29, 1975, Ser. No. 582,033
Int. Cl.² B29D *27/04*
U.S. Cl. 264—46.4 **8 Claims**



1. A method for making composite rigid foamed article such as a chair seat or the like, said method comprising:

a. attaching a rigid insert to the first half of a mold with a sheet of air permeable material sandwiched therebetween, said rigid insert being of the general shape of, but smaller than, the article to be produced in order to allow the forming of a resin material around the insert without the insert showing on the finished side of the design and with the design providing for maximum strength contribution from the insert, and said rigid insert and said first half of the mold having said sheet of air permeable material extending from between them outward past the edges of the first half of the mold said sheet of air permeable material having a sufficiently porous structure to allow a gas to pass therethrough even when the material is under compression;
b. introducing a liquid foamable resin reaction mixture into the cavity of a second half of a mold said mixture being capable of foaming and curing to form a rigid supporting form, and said cavity being of the shape of the article being produced;
c. placing the two mold halves together with the air permeable material extending from the cavity of the mold to the exterior thereof thereby forming a passage way for reaction gases to leave the mold;
d. permitting said liquid foamable resin reaction to foam and cure and form a rigid hard cellular structure throughout while expanding around the sides of the rigid insert while at the same time preventing the resin from binding

to the air permeable material, and while allowing expansion and reaction gases to pass from the mold by passing through the passageway created by the air permeable material; and

e. removing the finished article from the mold.

4,035,459
PROCESS FOR SPINNING DRY-FIBER CELLULOSE ACETATE HOLLOW FIBER MEMBRANES

Robert E. Kesting, Irvine, Calif., assignor to Chemical Systems, Inc., Santa Ana, Calif.

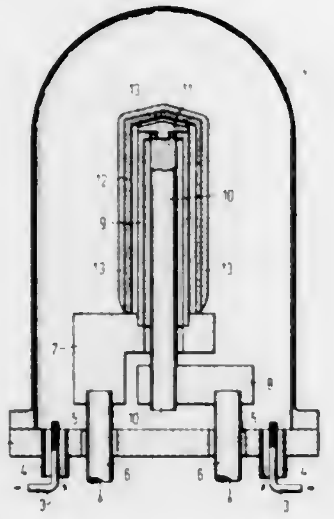
Filed May 1, 1975, Ser. No. 573,732
Int. Cl.² B05D *3/00;* **D02G** *3/22*
U.S. Cl. 264—49 **9 Claims**

1. A dry phase inversion process for forming asymmetric wet-dry reversible hollow fiber membranes comprising extruding a polymer containing spinning solution in the form of a hollow fiber into an evaporation promoting gas phase to thereby form a membrane wall by the dry phase inversion process without liquid bath coagulation of the external membrane wall with a coagulating bath and injecting into the hollow passage therein a non-solvent for the polymer to thereby form the interior of the membrane by the wet phase inversion process.

4,035,460
SHAPED BODIES AND PRODUCTION OF SEMICONDUCTOR MATERIAL

Wolfgang Dietze, Munich; Andreas Kasper, Garching-Hochbrueck, and Ulrich Rucha, Munich, all of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation of Ser. No. 356,056, April 30, 1973, abandoned. This application May 21, 1975, Ser. No. 579,607
Claims priority, application Germany, May 16, 1972, 2223868
Int. Cl.² B01J *17/30, 17/32*
U.S. Cl. 264—81 **3 Claims**



1. In a method for selectively controlling the physical characteristics of hollow members of semiconductor material, in the production of hollow members of silicon with walls of nonuniform thickness, in which a hollow carrier member, or graphite, on which the hollow member is to be formed, is heated by radiation from a heating element, of graphite, disposed in the interior of the hollow carrier member with the heating element having an external surface disposed in spaced relation with respect to the internal surface of the hollow carrier member, and the heating element in turn being heated by the passage of a direct current therethrough, the combination of the steps of

a. heating said heating element to a temperature at least 200° C. higher than the maximum depositing temperature of the semiconductor material involved,

b. so selecting the respective parameters of wall thickness of the carrier member and spacing selected opposing portions of the internal surface of the carrier member and the external surface of the heating element at different distances to correspondingly vary the temperatures of the corresponding portions of the external surface of the carrier member, to thereby selectively control the temperatures at the external surface of the carrier member and correspondingly selectively control the physical characteristics and/or configuration of the semiconductor material deposited on the external surface of the carrier member,

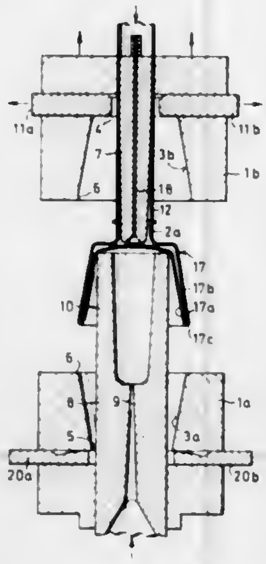
c. supplying gaseous semiconductor material compound, in the presence of hydrogen, to the carrier member, with decomposition and deposition on the external carrier wall taking place in dependence upon the parameter selection, and

d. removing the carrier member from the hollow member so formed by heating in an oxygen-rich atmosphere.

4,035,461
METHOD OF MAKING AN EXTRAVERTABLE-WALL CONTAINER

Herbert Korth, Hamburg, Germany, assignor to Krauss-Maffei Aktiengesellschaft, Munich, Germany

Filed Feb. 11, 1975, Ser. No. 549,000
Int. Cl.² B29C *17/07*
U.S. Cl. 264—89 **3 Claims**



1. A method of making a container comprising the steps of:

enclosing a blowing mandrel in a blow mold having a first half surrounding said mandrel at a location spaced from an end thereof and defining a cup-shaped cavity widening away from said location, said mold having a second half formed with a cup-shaped cavity geometrically similar to the cup-shaped cavity of said first half and widening in the direction thereof, said cup-shaped cavities adjoining to produce a molding cavity having the configuration of a container to be formed;

advancing an injection nozzle through said second half to surround said mandrel and define an elongated injection cavity therewith;

injecting a thermoplastic synthetic-resin material into said injection cavity through said nozzle to form a closed end parison around said mandrel;

withdrawing said nozzle from said molding cavity through a wall of said second half and closing said wall;

blowing said parison through said mandrel to expand said parison against the walls of said molding cavity, thereby forming a container conforming to the configuration of said molding cavity and having a first cup portion lying in the cup-shaped cavity of said first half and a second cup portion lying in the cup-shaped cavity of said second half;

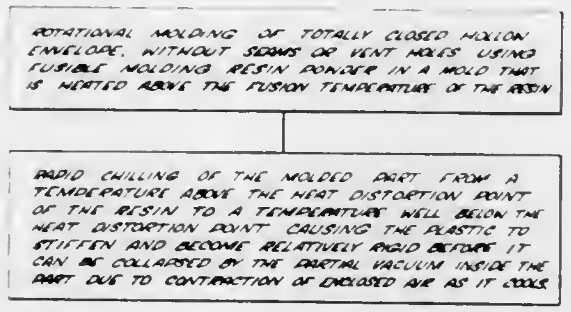
separating said first and second halves of said mold to release said container from said molding cavity; and

axially displacing said first cup portion toward said nozzle and advancing said nozzle toward said mandrel to entrain the bottom of said second cup portion into said first cup portion and introvert said second cup portion within said first cup portion.

4,035,462
MOLDED THERMOPLASTIC ARTICLE AND METHOD OF MAKING SAME

Noel W. Lane, Jr., 2106 Windmill View Road, El Cajon, Calif. 92020

Filed Jan. 8, 1973, Ser. No. 321,758
Int. Cl.² B29C *25/00, 5/04*
U.S. Cl. 264—89 **1 Claim**


ROTATIONAL MOLDING OF TOTALLY CLOSED HOLLOW ENVELOPE, WITHOUT SEAMS OR VENT HOLES USING FUSIBLE MOLDING RESIN POWDER IN A MOLD THAT IS HEATED ABOVE THE FUSION TEMPERATURE OF THE RESIN
RAPID CHILLING OF THE MOLDED PART FROM A TEMPERATURE ABOVE THE HEAT DISTORTION POINT OF THE RESIN TO A TEMPERATURE WELL BELOW THE HEAT DISTORTION POINT CAUSING THE PLASTIC TO STIFFEN AND BECOME RELATIVELY RIGID BEFORE IT CAN BE COLLAPSED BY THE PARTIAL VACUUM INSIDE THE PART DUE TO CONTRACTION OF ENCLOSED AIR AS IT COOLS

1. The method of making a completely closed, thin-walled, hollow envelope of thermoplastic resin material, in which the molded part has a continuous, uninterrupted surface without a vent hole, said method comprising the steps of:

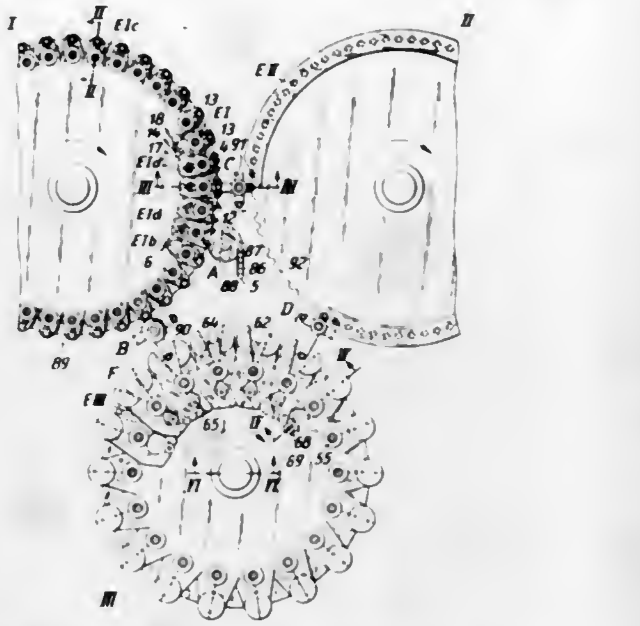
1. loading fusible resin particles into a hollow mold and rotationally molding said part while heating the mold to a temperature above the fusion point of the resin;
2. cooling the mold and molded part sufficiently to allow the part to be removed from the mold, while allowing the unvented part to collapse partially as the air inside cools and contracts;
3. reheating the partially collapsed molded part to a temperature only slightly above the distortion point of the resin, so that the air inside the part is heated and expanded until the pressure differential between the inside and the outside is substantially reduced, and elastic memory of the heat-softened resin causes the molded part to return to the uncollapsed form that it had at the time the resin solidified during the rotational molding step;
4. abruptly chilling said part to solidify and stiffen the plastic resin in said uncollapsed form before the air inside the part has had time to cool and contract.

4,035,463
METHOD OF MAKING HOLLOW ARTICLES, ESPECIALLY BOTTLES, OF THERMOPLASTICS

Otto Rosenkranz, and Karl-Heinrich Seifert, both of Hamburg, Germany, assignors to Heidenreich & Harbeck, Germany

Continuation of Ser. No. 389,122, Aug. 17, 1973, abandoned, which is a continuation of Ser. No. 113,197, Feb. 8, 1971, abandoned, which is a division of Ser. No. 752,302, Aug. 13, 1968, Pat. No. 3,599,280. This application May 19, 1975, Ser. No. 587,005
Claims priority, application France, Jan. 16, 1968, 68.136177
Int. Cl.² B29C *17/07*
U.S. Cl. 264—94 **7 Claims**

1. In a method of making a blow container, the steps of exteriorly gripping a tubular thermoplastic blank intermediate its two ends with holding jaws which are mounted on the periphery of a first rotary wheel, rotating the wheel and thereby conveying the gripped blank with exposed ends along a circumferential path including heating means, during the rotation of the first wheel (a) inserting a mandrel into the blank, (b) heating only the ends of the blank to a forming temperature and then (c) deforming one heated end of the blank to form a neck for the container and forming the other heated end into a closed end portion, thereafter transferring the mandrel and the thus formed blank from the first rotary wheel to a second rotary wheel, rotating the second wheel to convey the mandrel and blank along a heated circumferential path to bring the entire blank to a blowable temperature,

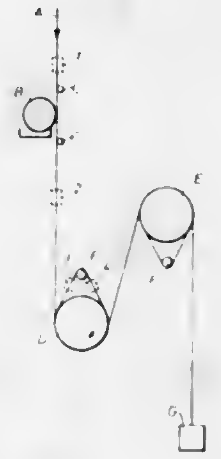


transferring the blowable blank and mandrel from the second rotary wheel to a third rotary wheel, enclosing the blowable blank in a sectional blow mold mounted on the periphery of the third rotary wheel, and blowing the blank to the configuration of a blown container as the blow mold is conveyed by the third wheel along a circumferential path.

4,035,464
PROCESS FOR THE PRODUCTION OF POLYAMIDE-6 FILAMENT YARNS

Harry Kubitzek; Georg Hinrichsen, both of Dormagen, and Wolfgang Giessler, Straberg, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed July 11, 1975, Ser. No. 595,031
Claims priority, application Germany, July 20, 1974, 2435009
Int. Cl.² D02G *1/20*
U.S. Cl. 264—103 **3 Claims**

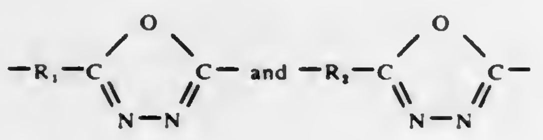


1. A process for the continuous production of stretched and twisted polyamide-6 filament yarns from polyamide-6 melts by extruding the melt through spinnerets, cooling the filaments by blowing are onto them in the spinning duct, wetting the bundle of filaments with an aqueous preparation and running off the filament yarn with a take-off unit around which the filament yarn passes at least once, followed by direct stretching with a stretching unit and winding into package form, wherein, before stretching, the filament yarn is interlaced in such a way that it has a hook-drop value of at most 200 mm

and wherein the filament yarn is treated after stretching at temperature above 110° C.

4,035,465
DRAWING POLYOXADIAZOLES FILAMENTS
Donald Lithgow Brydon, Harrogate, England, assignor to Imperial Chemical Industries Limited, London, England
Filed Sept. 5, 1975, Ser. No. 610,843
Claims priority, application United Kingdom, Sept. 17, 1974, 40421/74; Sept. 17, 1974, 40422/74; Dec. 11, 1974, 53544/74
Int. Cl.² D01D *5/12*
U.S. Cl. 264—210 F **10 Claims**

1. A method for the production of a drawn filament of poly-phenylene-1,3,4-oxadiazole having as characteristic units

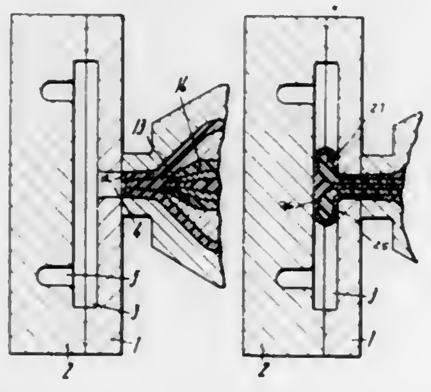


in which
R_1 is a p-phenylene radical and
R_2 is a m-phenylene radical,

the ratio of R_1 radicals to R_2 radicals being in the range 100/0 to 10/90, and at least some of the R_1 and/or R_2 radicals being bromine substituted in a position ortho to the heterocyclic ring, which comprises:

1. extruding a solution of the polymer in oleum or sulphuric acid into a stream by forcing the solution through a shaped orifice into a gaseous medium,
2. directing the stream for a short distance through the gaseous medium and into an aqueous coagulant for forming the filament of the polymer;
3. withdrawing the thus-formed filament from the aqueous coagulant,
4. passing the filament through a washing stage,
5. drying the filament,
6. and drawing the filament at least 6 times its length while heating it to a temperature of at least 350° C.

4,035,466
METHOD FOR CENTRAL INJECTION MOLDING
Erhard Langecker, Hohbuschener Weg 5, D-5882 Meinerzhagen 1, Germany
Continuation-in-part of Ser. No. 399,960, Sept. 24, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 640,443
Claims priority, application Germany, Sept. 27, 1972, 2247995
Int. Cl.² B28B *1/124*
U.S. Cl. 264--328 **3 Claims**



1. In a method for the central injection molding of plastic bodies of the type comprising a filling component of any suitable thermoplastic material, and of a cover layer which encloses said filling component and comprises another thermoplastic material, the thermoplastic materials must be compatible and have substantially the same viscosity, the improvement which comprises injecting into a mold through a nozzle the plastic forming the cover layer in the form of a central strand of material;

injecting into the mold in the form of an annular strand of the same material;
the annular strand encircling the first central strand at some distance to define an annular space;
injecting the filling component plastic into the mold through the annular space between the cover layer strands; and
interrupting the feed of the filling component plastic before completing the injection step in such a manner, where all the plastics come together, that the sprue of the injection molded body, as well as the plug remaining in the nozzle, consists only of cover layer plastic.

4,035,467
METHOD OF INJECTION MOLDING A THERMOSET POLYURETHANE ARTICLE
Gregory A. Campbell, Romeo; Howard W. Cox, and William C. Meluch, both of Birmingham, all of Mich., assignors to General Motors Corporation, Detroit, Mich.
Filed Nov. 21, 1975, Ser. No. 634,167
Int. Cl.² B29G *3/00*
U.S. Cl. 264—329 **2 Claims**

1. A method of forming a cross-linked polyurethane article in an injection molding machine comprising the steps of:

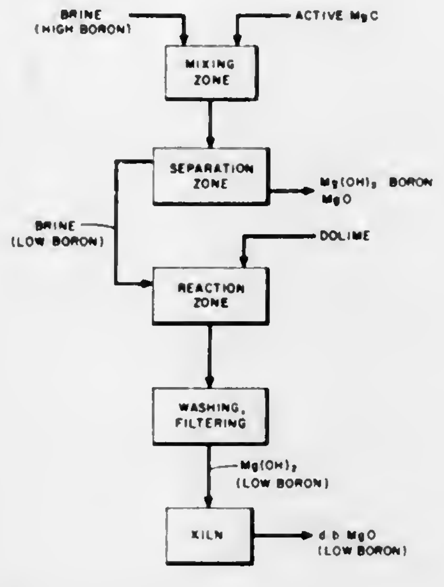
a. forming a room temperature storage stable dispersion comprising a liquid polyoxyalkylene triol, 1,3-bis-(3-isocyanatotolyl) urea and a catalyst which urea at about room temperature is insoluble in and therefore non-reactive with the triol;
b. feeding said dispersion into the barrel of the molding machine;
c. simultaneously moving said dispersion through the barrel and heating the dispersion therealong to a temperature at which the urea dissolves in the triol and initiates a polyurethane forming polymerization reaction between the isocyanate functionalities on the urea and the hydroxyl functionalities on the triol;
d. injecting the heated dispersion into the cavity of a mold to form the shape of said article; and
e. maintaining the heated and reacting dispersion in the mold until reaction has at least reached that point at which the article is substantially self-sustaining.

4,035,468
URANIUM DIOXIDE PROCESS
William J. S. Craigen; Tadeusz W. Zawidzki, both of Ottawa; Bruce C. Smart, and Frank W. Melvanin, both of Port Hope, all of Canada, assignors to Eldorado Nuclear Limited, Canada
Filed Feb. 26, 1976, Ser. No. 661,819
Claims priority, application Canada, Mar. 4, 1975, 221214
Int. Cl.² C01G *43/00*
U.S. Cl. 423—15 **23 Claims**

1. Process for the preparation of fine particle size uranium dioxide from a uranium trioxide feed comprising the following steps:

a. reacting solid uranium trioxide with aqueous ammonium nitrate to form an insoluble ammonium uranate;
b. neutralizing the thus formed slurry with ammonium hydroxide to precipitate out as an insoluble ammonium uranate the remaining dissolved uranium;
c. recovering the thus formed precipitates in a dry state, and
d. reducing the dried precipitate to uranium dioxide.

4,035,469
PRETREATMENT OF BRINE FOR BORON REMOVAL
Alvin Richmond, and John Francis Bent, both of Baltimore, Md., assignors to Martin Marietta Corporation, Bethesda, Md.
Filed Dec. 5, 1975, Ser. No. 638,143
Int. Cl.² C01F *5/08*, *5/30*
U.S. Cl. 423—164 **16 Claims**



8. A process for removing boron contaminants from a magnesium halide-containing brine comprising:

a. contacting the boron contaminated, magnesium halide-containing brine with finely divided active magnesia, which has been formed by light or soft burn calcination of magnesia at a temperature of less than 2700° F and which is in an amount of from about 0.1% to about 10% by weight based upon the weight of the untreated brine, said brine being at a temperature in the range of from about 32° F to the boiling point of the mixture of the brine and the activated magnesia, to precipitate boron-containing magnesium hydrate containing at least about 75% by weight of the total boron content of the untreated brine;
b. separating said precipitated boron-containing magnesium hydrate from the remainder of said brine, whereby the boron content of the brine is reduced while not materially reducing the magnesium halide content of the brine; and
c. recovering said low boron content brine for further processing.

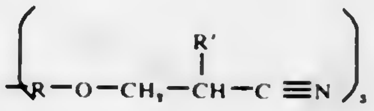
4,035,470
PROCESS FOR REMOVING SULFUR OXIDES AND/OR NITROGEN OXIDES FROM WASTE GAS
Teizo Senjo, Machida, and Makio Kobayashi, Toyonaka, both of Japan, assignors to Fuji Kasui Engineering Co., Ltd., Tokyo and Sumitomo Metal Industries, Ltd., Osaka, both of, Japan
Filed July 10, 1975, Ser. No. 594,754
Claims priority, application Japan, Nov. 2, 1974, 49-126957; Nov. 25, 1974, 49-134362
Int. Cl.² C01B *21/00*, *17/00*
U.S. Cl. 423—235 **22 Claims**

10. In a process for removing sulfur oxides and nitrogen oxides from a waste gas containing the same and oxygen comprising the steps of adding chlorine dioxide or ozone to the gas whereby nitrogen monoxide contained in the waste gas is converted into nitrogen dioxide and/or nitrogen trioxide and, then, contacting the gas with an aqueous scrubbing solution of the sulfite of at least one selected from the group consisting of alkali metals and ammonium in a scrubber; the improvement wherein

a. said scrubbing solution contains at least one oxidation retardant selected from the group consisting of the sulfide, polysulfide or thiosulfate of alkali metals or ammonium and thiourea in an amount of at least 0.03 mol/l in the scrubbing solution, whereby said oxidation retardant substantially prevents oxidation reaction of the sulfite with oxygen contained in the waste gas such that it is available for reducing nitrogen oxides,
b. the pH of said scrubbing solution is at least 5, and
c. said scrubbing solution further contains either one or both of the copper and iron ions in an amount of at least 0.003 mol/l in the scrubbing solution.

4,035,471
HYDROGEN PEROXIDE STABILIZATION WITH CYANOALKYL ETHERS OF TRIALKANOLAMINES
Walker Albert Strong, Wadsworth, Ohio, assignor to PPG Industries, Inc., Pittsburgh, Pa.
Filed June 10, 1976, Ser. No. 694,502
Int. Cl.² C01B *15/02*
U.S. Cl. 423—272 **8 Claims**

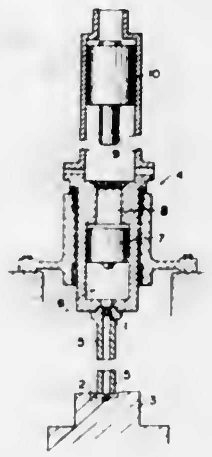
1. A stabilized aqueous hydrogen peroxide solution having between about 3 and 90 weight percent hydrogen peroxide, having dissolved therein a minor stabilizing concentration of a cyanoalkyl ether represented by the general formula



$$N\left(R-O-CH_2-\overset{\displaystyle R'}{\overset{|}{CH}}-C\equiv N\right)_3$$

wherein each R independently is a lower alkylene group having 1 to 4 carbons and each R′ independently or methyl.

4,035,472
PROCESS FOR PRODUCING DIAMOND
Hiroshi Tominaga, Yokohama, Japan, assignor to Tokyo Sharyo Seizo Kabushiki Kaisha, Yokohama, Japan
Continuation-in-part of Ser. No. 398,459, Sept. 18, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,472
Claims priority, application Japan, Sept. 18, 1972, 47-93492
Int. Cl.² C01B *31/06*
U.S. Cl. 423—446 **17 Claims**



1. A process for the production of diamond powder comprising the steps of preparing a mixture of graphite and a non-metallic material which is semi-transparent to infra-red radiation and has a sonic wave propagation veocity higher than that of graphite, the optical characteristics of said non-metallic material being such that infra-red radiation is absorbed in the interior of particles of said material, said graphite and non-metallic material being in powder form, and projecting a solid body against said mixture, said solid body having a velocity immediately prior to collision with said powder mixture intermediate the sonic wave propagation velocities of graphite and said non-metallic material, said solid body having sufficient mass and kinetic energy at said velocity to raise the

temperature of the graphite to the range in which diamond is the stable form of carbon.

4,035,473

METHOD OF REMOVING ACETYLENE FROM ANHYDROUS-HYDROGEN CHLORIDE

German R. Urioste; David E. Busby, both of Lake Jackson; Garnet E. McConchie, Clute, and Jimmy D. Orr, Freeport, all of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 592,971, July 3, 1975, abandoned. This application July 16, 1976, Ser. No. 706,094

Int. Cl.² B01D *53/34*

U.S. Cl. 423—488 **7 Claims**

1. A method for reducing the acetylene content of anhydrous hydrogen chloride containing trace amounts of acetylene which comprises heating to a temperature of about 300° C to about 500° C said anhydrous hydrogen chloride in the presence of oxygen for a contact time of from about 0.05 to about 5.0 seconds to convert said acetylene to chlorinated derivatives thereof, said oxygen being present in a molar excess based on the acetylene.

4,035,474

CBA FOR CLAUS TAIL GAS CLEANUP

Lorenz V. Kunkel, Naperville, Ill.; John W. Palm, Tulsa, Okla.; Luther E. Petty, Darien, Ill., and Howard Grekel, Houston, Tex., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Filed Mar. 1, 1976, Ser. No. 662,402

Int. Cl.² C01B *17/04*

U.S. Cl. 423—574 R **17 Claims**

1. In a process for catalytic conversion of a gaseous stream containing hydrogen sulfide wherein said stream is subjected to an oxidation step to produce a reaction mixture in which hydrogen sulfide and sulfur dioxide are present in a molar ratio of about 2:1 and wherein the sulfur content of said reaction mixture is substantially reduced by first passing said mixture through a series of at least two Claus reactors with associated liquid sulfur condensers, and then passing the resulting Claus effluent through a CBA cleanup step involving at least two interchangeable CBA reactors wherein said Claus effluent at all times passes through at least one of said CBA reactors being sufficiently regenerated to further convert and condense the sulfur for a time sufficiently to allow said other interchangeable CBA reactor to be regenerated by thermal removal of deposited sulfur followed by cooling of the sulfur-denuded CBA reactor, the improvement comprising:

a. maintaining the reaction conditions of a lead Claus reactor such that the effluent temperature of said reactor is from 600° to 800° F, thus promoting hydrolysis of COS and CS_2;

b. diverting, periodically, a stream of said 600° to 800° F effluent of said lead Claus reactor to the CBA reactor having deposited sulfur on the catalyst bed of said CBA reactor, thereby vaporizing and removing said deposited sulfur and regenerating said CBA catalyst bed;

c. returning the effluent of said CBA reactor being regenerated during said period of regeneration to a point downstream from said lead Claus reactor and downstream from where said stream is diverted but upstream to a subsequent second Claus reactor; and

d. cooling the sulfur-denuded CBA reactor before returning it to the cleanup mode for further removal of sulfur from the effluent of said Claus reactors.

4,035,475

ISOTOPE EXCHANGE PROCESS

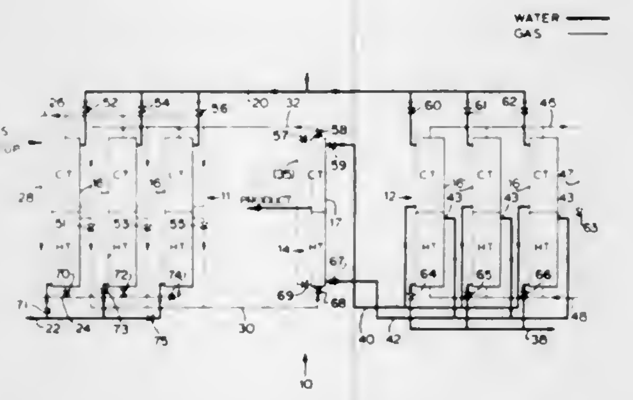
Reginald D. Richardson, Islington, Canada, assignor to Canadian General Electric Company Limited, Toronto, Canada

Continuation-in-part of Ser. No. 305,971, Nov. 13, 1972, abandoned, which is a continuation-in-part of Ser. No. 20,941, March 19, 1970, abandoned. This application July 8, 1974, Ser. No. 486,693

Claims priority, application Canada, Apr. 8, 1969, 47920

Int. Cl.² C01B *5/02*

U.S. Cl. 423—580 **5 Claims**



1. The method of operating a multi-stage deuterium isotope enrichment plant to obtain water product enriched in deuterium, the plant having hydrogen sulfide gas and water passing in counter-flow isotopic exchange through a plurality of units, each said unit having a hot zone portion and a cold zone portion units, the plant including a first stage set of units and at least one second stage unit having an output of deuterium enriched water, including the steps of; producing only gaseous fluid, containing isotope enriched gas in a plurality of said first stage set of units arranged in mutual parallel flow relation and having an original output flow capacity of deuterium enriched gas matched to the capacity of said second stage when operating in an unbalanced input condition; passing said gaseous fluid from adjacent the top of said first stage hot zone portions to the bottom of said second stage hot zone portions in cascade flow relation with the second stage; producing isotope enriched water having an initial enrichment in at least one additional first stage unit having an output flow of enriched water in a range up to a flow-equivalent to the isotopic content of said gas flow; connecting said additional first stage unit in liquid circulating relation only with said second stage from adjacent the bottom of said additional first stage cold zone portion to the top of said second stage cold zone portion to pass initially enriched water in cascade flow relation to the second stage to effectively increase the input of deuterium enrichment passing thereto, and to enhance enrichment balance and operational symmetry within said second stage whereby an improved utilization of said second stage is achieved and plant total output of enriched water product is effectively increased in relation to the flow capacity of the plant second stage.

4,035,476

PROCESS FOR THE PREPARATION OF AGGLOMERATED VANADIUM OXIDES

Bernard Ilmaier, and Wolfgang Mayer, both of Treibach, Austria, assignors to Treibacher Chemische Werke Aktiengesellschaft, Treibach, Austria .

Filed Feb. 17, 1976, Ser. No. 658,474

Claims priority, application Austria, Feb. 21, 1975, 1359/75

Int. Cl.² C01G *31/00*

U.S. Cl. 423—592 **9 Claims**

1. A process for the preparation of agglomerated vanadium oxides of the formula V_2O_x, wherein x has a value of 3.8 to 4.6, comprising the steps of thermally decomposing ammonium polyvanadate in a reaction zone at temperatures from about 600° C to 900° C to obtain reaction products including

solid decomposition products and reducing gases, the ammonium polyvanadate containing, by weight, 48 – 51% V, 5.2 – 5.9% NH_3 and 0.1 – 0.5% Na_2O, and permitting the solid decomposition products to react with the reducing gases, the reducing gases displacing the ambient atmosphere in the reaction zone.

4,035,477

PRESSURIZED FOAMING SHAVING COMPOSITION AND METHOD OF MAKING THE SAME

Warren R. Schubert, Somerset, and Louis J. Literate, Iselin, both of N.J., assignors to Colgate-Palmolive Company, New York, N.Y.

Continuation of Ser. No. 300,578, Oct. 25, 1972, abandoned. This application Mar. 19, 1975, Ser. No. 559,969

Int. Cl.² A61K *7/06*

U.S. Cl. 424—47 **13 Claims**

1. A pressurized foaming shaving composition in a valved container that is adapted to maintain the composition under pressure and dispense it when desired, upon opening of the valve thereof, which comprises water, an anionic surface active foaming agent, a foam stabilizer, 1 to 5 percent of a mixture of higher fatty acid triglycerides of acids of 16 to 18 carbon atoms, including 25 to 40 parts of stearic acid, 35 to 50 parts of oleic acid and 20 to 30 parts of palmitic acid in which the proportion of saturated fatty acid groups to unsaturated fatty acid groups is about one or more, and an organic liquefied gas propellant to pressurize the composition in the container and to aid in discharging it therefrom.

4,035,478

CLEAR, WATER-WHITE HAIR CONDITIONING COMPOSITION

Patricia Mullen, Flushing, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

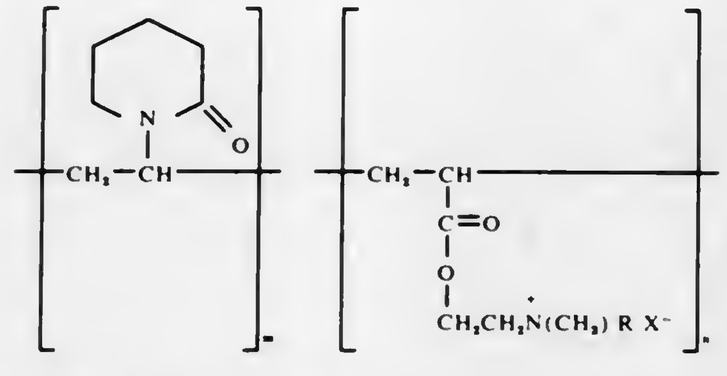
Filed Mar. 8, 1976, Ser. No. 664,469

Int. Cl.² A61K *7/08*

U.S. Cl. 424—70 **5 Claims**

1. A clear, water-white hair rinse composition comprising an essentially aqueous solution of

1. from about 0.2 to 0.6 percent a vinylpyrrolidone copolymer having the structure: 0.6



where *m* is 70–90 mole percent, *n* is 10–30mole percent, R is methyl or ethyl and X is $CH_3SO_4^-$ or $C_2H_5SO_4^-$and

2. from about 0.2 to 0.6 percent oleyldimethylbenzylammonium chloride, based on the weight of said composition.

4,035,479

DELAYED AND SUSTAINED UREA RELEASE COMPOSITIONS

Henry H. George, Jr., Berkeley Heights; Sol J. Barer, Clark, and Charles L. Smart, Berkeley Heights, all of N.J., assignors to Celanese Corporation, New York, N.Y.

Filed Nov. 14, 1975, Ser. No. 631,806

Int. Cl.² A61K *31/74, 31/78, 31/17*

U.S. Cl. 424—78 **5 Claims**

1. In feed supplement rations for ruminants comprising an association product of a minor proportion of urea and a major proportion of carboxy vinyl polymer, the improvement which consists of incorporating with said association product a minor effective proportion of an alpha olefin polymer, whereby urea release rates are extended.

4,035,480

MICROBIOCIDAL MIXTURES OF POLYMERIC QUATERNARY AMMONIUM COMPOUNDS

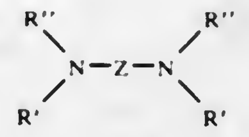
Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 486,960, July 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 425,931, Dec. 18, 1973, Pat. No. 3,874,870. This application Mar. 15, 1976, Ser. No. 666,789

Int. Cl.² A61K *31/74;* **A01N** *9/00, 9/22*

U.S. Cl. 424—78 **8 Claims**

1. A mixture of at least two polymeric quaternary ammonium compounds, each of which is a condensation product of 1,4-dihalo-2-butene and a difunctional tertiary amine of the type



wherein Z consists of one to three alkylene groups of a total of 2 to 10 carbon atoms, each alkylene group containing 0 to 2 double bonds and 0 to 2 hydroxy substituents; and wherein R′ and R″ may be either the same or different and may be either (a) primary or secondary alkyls having from 1 to 20 carbon atoms with a total sum in both R′ and R″ of no greater than 36 carbon atoms, (b) hydroxy or dihydroxy derivatives of the aforesaid primary or secondary alkyls, (c) benzyl, (d) alkylbenzyl, or (e) combined with N to form a heterocyclic moiety selected from the group consisting of N-piperidino, N-pyrolidino, N-morpholino, and N-homopiperidino, said condensation products being formed by mixing the butene and the amine, with agitation, at a temperature of between about 50° C to about 70° C and then agitating the mixture at a temperature at least as high as the temperature maintained during the initial mixing until the reaction is complete, the butene and amine being in a molar proportion of between about 3:2 and about 2:3.

4,035,481

ANTIBIOTIC A-28086 AND PROCESS FOR PRODUCTION THEREOF

David H. Berg, Greenfield; Robert L. Hamill, Greenwood, and Marvin M. Hoehn, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

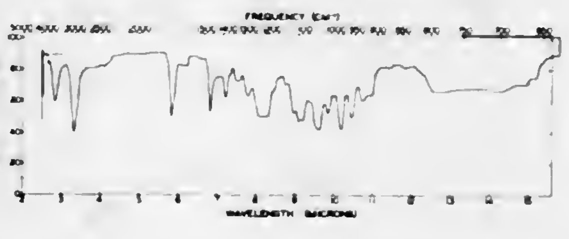
Division of Ser. No. 569,740, April 21, 1975, which is a continuation-in-part of Ser. No. 477,954, June 10, 1974, abandoned. This application May 10, 1976, Ser. No. 685,033

Int. Cl.² A61K *35/00*

U.S. Cl. 424—122 **4 Claims**

INFRARED ABSORPTION SPECTRUM OF ANTIBIOTIC

A-28086 FACTOR A



1. A method of preventing or treating coccidiosis in poultry

which comprises administering to poultry an effective anticoccidial amount of a composition comprising a physiologically-acceptable carrier and a compound selected from the group consisting of antibiotic A-28086 factor A which is a white crystalline compound when crystallized from acetone-water; which is soluble in lower alcohols, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; but which is only slightly soluble in hexane; and is insoluble in water; which melts at about 98°–100° C., resolidifies, and remelts at about 195°–200° C. and which has:

a. a molecular weight of 764, as determined by mass spectrometry;

b. an approximate elemental composition of 66.69 percent carbon, 9.85 percent hydrogen, and 23.10 percent oxygen;

c. an empirical formula of $C_{43}H_{72}O_{11}$, as determined by mass spectrometry;

d. a specific rotation of −54° (c=0.2, methanol) when determined at 25° C.;

e. an infrared absorption spectrum in chloroform with the following distinguishable absorption maxima: 2.85, 3.34, 5.83, 6.82, 7.22, 7.53 (weak), 7.78 (weak), 8.75 (strong), 8.95 (strong), 9.15, 9.50 (strong), 9.55 (strong), 9.60, 9.85, 10.15, 10.45, and 10.70 (weak) microns;

f. in its ultraviolet spectrum in ethanol only end absorption below 220 mμ;

g. a nuclear magnetic resonance spectrum in deuterochloroform with the following characteristics: δ6.01, 4.21, 4.11, 3.99, 3.89, 3.80, 3.67, 3.65, 3.57, 3.55, 2.83, 2.76, 2.74, 2.68, 2.66, 2.58, 2.56, 2.30, 2.22, 2.17, 2.10, 2.05, 1.96, 1.90, 1.85, 1.70, 1.62, 1.60, 1.47, 1.39, 1.31, 1.25, 1.18, 0.95, 0.93, 0.90, 0.88, 0.85, 0.77, 0.75, 0.73, 0.68, and 0.66 ppm;

h. a titratable group with a pK_a value of 7.9 in 80% aqueous dimethylformamide;

i. a characteristic X-ray powder diffraction pattern (Cu^{++} radiation, 1.5405 λ, nickel filter) having the following interplanar spacings in angstroms (d):

d	Relative Intensity
12.00	100
10.10	50
9.25	90
8.00	40
7.50	15
6.92	90
6.40	40
5.98	05
5.68	15
5.20	40
4.98	40
4.62	40
4.21	20
3.48	10

j. an R_f value of 0.24 on thin-layer chromatography over silica gel in a benzene-ethyl acetate (3:2) solvent system, using *Bacillus subtilis* ATCC 6633 as the detection organism;

k. the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as detection organism:

R_f Value	Solvent System
0.11	Water saturated with methyl isobutyl ketone (MIBK)
0.41	Water saturated with MIBK plus 2% p-toluenesulfonic acid and 1% piperidine
0.54	Water:methanol:acetone (12.3.1)-adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.48	1% MIBK, 0.5% NH_4OH in water
0.15	17.4 g K_2HPO_4, 30 ml ethanol per liter of water
0.24	Benzene saturated with water
0 24	Water
0.75	Water:MIBK:ethyl acetate (98:1:1)

l. an acid function capable of forming salts and ester derivatives; and

m. at least one hydroxyl group capable of esterification;

A-28086 factor A acetyl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone and benzene; is only slightly soluble in hexane; and is insoluble in water; which melts at about 100°–103° C.; and which has:

a'. a molecular weight of about 807;

b'. an elemental composition of 67.67 percent carbon, 8.71 percent hydrogen, and 23.13 percent oxygen;

c'. an empirical formula of $C_{45}H_{74}O_{12}$;

d'. an infrared spectrum in chloroform with the following observable absorption maxima: 2.85, 3.36, 3.38 (strong), 5.80, 6.83, 7.25, 7.52 (strong), 7.60 (weak), 7.80 (strong), 8.45 (strong), 8.80 (strong), 8.95 (strong), 9.10 (strong), 9.20, 9.63, 9.80 (strong), 10.12 (weak), 10.25 (weak), and 10.50 microns;

e'. an ultraviolet spectrum showing only end absorption;

f'. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

g'. a titratable group with a pK_a value of 8.5 in 80% aqueous dimethylformamide;

h'. an acid function capable of forming salts and ester derivatives;

A-28086 factor A propionyl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about 96°–98° C.; and which has:

a''. a molecular weight of about 821;

b''. an elemental composition of 66.06 percent carbon, 9.17 percent hydrogen, and 23.41 percent oxygen;

c''. an empirical formula of $C_{46}H_{76}O_{12}$;

d''. an infrared absorption spectrum in chloroform with the following observable absorption maxima: 2.85, 3.33, 3.38 (strong), 3.45 (strong), 5.75 (strong), 5.82, 6.81, 7.22, 7.30 (strong), 7.50 (weak), 7.60 (weak), 7.80, 8.43, 8.75 (strong), 8.90, 9.05, 9.15 (strong), 9.50 (strong), 9.63, 9.83 (weak), 10.05 (strong), 10.13, 10.20 (strong), 10.45, and 10.68 microns;

e''. an ultraviolet spectrum showing only end absorption;

f''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

g''. an acid function capable of forming salts and ester derivatives;

A-28086 factor A butyryl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts about 96°–98° C.; and which has:

a'''. a molecular weight of about 835;

b'''. an approximate elemental composition of 67.60 percent carbon, 9.41 percent hydrogen, and 22.99 percent oxygen;

c'''. an empirical formula of $C_{47}H_{78}O_{12}$;

d'''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.89, 3.40, 3.45, 3.51, 5.85, 5.92 (strong), 5.97 (strong), 6.90, 7.30, 7.84 (weak), 8.55, 8.85 (weak), 9.01 (strong), 9.26, 9.76, 9.95, 10.31, and 10.64 microns;

e'''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

f'''. an acid function capable of forming salts and ester derivatives;

A-28086 factor A valeryl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about 173°–175° C.; and which has:

a''''. a molecular weight of about 849;

b''''. an approximate elemental composition of 67.89 percent carbon; 9.50 percent hydrogen and 22.61 percent oxygen;

c''''. an empirical formula of $C_{48}H_{80}O_{12}$;

d''''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.90, 3.40, 3.45, 3.51, 5.87, 5.92 (strong), 5.99 (strong), 6.91, 7.30, 7.69 (weak), 7.87 (weak), 8.16, 8.58, 8.85 (weak), 9.26, 9.76, 10.00 (weak), 10.31, and 10.64 microns;

e''''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

f''''. an acid function capable of forming salts and ester derivatives;

A-28086 factor A caproyl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about 163°–167° C.; and which has:

a'''''. a molecular weight of about 863;

b'''''. an approximate elemental composition of 68.18 percent carbon; 9.58 percent hydrogen; and 22.24 percent oxygen;

c'''''. an empirical formula of $C_{49}H_{82}O_{12}$;

d'''''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.90, 3.40, 3.45, 3.51, 5.87, 5.92 (strong), 5.97 (strong), 6.90, 7.30, 7.66 (weak), 7.84 (weak), 8.16, 8.58, 8.85 (weak), 9.05 (strong), 9.17, 9.72, 9.95, 10.29, and 10.62 microns;

e'''''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;

f'''''. an acid function capable of forming salts and ester derivatives;

the pharmaceutically-acceptable salts of A-28086 factor A; antibiotic A-28086 factor B, a white crystalline compound when crystallized from acetone-water, which is soluble in lower alcohols, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone and benzene; but which is only slightly soluble in hexane and is insoluble in water; and which has:

a. a melting point of about 150°–153° C.;

b. a molecular weight of 762, as determined by high resolution mass spectrometry;

c. an empirical formula of $C_{43}H_{70}O_{11}$, as determined by high-resolution mass spectrometry;

d. an infrared absorption spectrum in chloroform with the following distinguishable absorption maxima: 2.82, 3.30, 5.77, 5.85, 6.80, 7.20, 7.50 (weak), 7.72 (weak), 7.80 (weak), 8.57 (strong), 8.68, 8.90 (strong), 9.10, 9.50, 9.83 (strong), 9.90, 10.10, 10.17 (strong), 10.43 (weak), 10.80 (weak), 11.20 (weak), 11.35 (weak), 11.73 (weak), and 12.03 (weak) microns;

e. an observed absorption maximum in ethanol in its ultaviolet spectrum at 220 mμ ($E_{1cm}^{1\%}$ =137.5, ϵ=10.477);

f. a nuclear magnetic resonance spectrum in deuterochloroform with the following characteristics: δ7.20, 7.09, 6.26, 6.15, 4.19, 4.12, 4.05, 3.95, 3.89, 3.78, 3.62, 3.59, 3.52, 3.48, 2.81, 2.73, 2.63, 2.54, 2.52, 1.99, 1.91, 1.84, 1.71, 1.67, 1.64, 1.55, 1.43, 1.33, 1.18, 1.11, 0.96, 0.94, 0.90, 0.87, 0.84, 0.77, 0.74, and 0.68 ppm;

g. an R_f value of 0.42 on thin-layer chromatography over silica gel in benzene-ethyl acetate (3:2), using *Bacillus subtilis* ATCC 6633 as the detection organism;

h. the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as the detection organism:

R_f Value	Solvent System
0.16	Water saturated with MIBK plus 2% p-toluenesulfonic acid and 1% piperidine
0.46	Water:methanol:acetone (12:3:1)-adjusted to pH 10 5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.36	1% MIBK, 0.5% NH_4OH in water
0.51	Benzene saturated with water
0.11	Water
0.61	Water:MIBK:ethyl acetate (98 1:1)

i. an acid function capable of forming salts and ester derivatives;

j. two ketone moieties; and

k. at least one hydroxyl moiety;

and the pharmaceutically-acceptable salts of A-28086 factor B.

4,035,482

RODENTICIDE CONTAINING QUININE SALTS

Percy L. Royster, Jr., 731 Georgia Ave., Brooklyn, N.Y. 11207

Filed May 21, 1971, Ser. No. 145,920

Int. Cl.^{2} A01N *13/00*

U.S. Cl. 424—134 **5 Claims**

1. A poison composition comprising an edible bait, 1 to 20 wt.% of a arsenic poison, and 1 to 10 wt.% of a quinine salt.

4,035,483

ANTISEPTIC AND NON-TOXIC SUBSTANCE AND A METHOD OF MAKING THE SAME

John Bunyan, Seafield House, 19 The Beach, Walmer, Kent, England

Continuation-in-part of Ser. No. 364,313, May 29, 1973, abandoned. This application Aug. 6, 1975, Ser. No. 602,410

Int. Cl.^{2} A61K *33/20, 37/00*

U.S. Cl. 424—149 **30 Claims**

1. A surgically active antiseptic composition, effective in controlling or preventing infection in wounds, and comprising a surgically active antiseptic concentration of the reaction product obtained by mixing together a protein and a substantially stoichiometric amount of an aqueous solution of a hypochlorite.

4,035,484

CALCIUM HYPOCHLORITE COMPOSITIONS

John P. Faust, Hamden, and Henry R. Cramer, Naugatuck, both of Conn., assignors to Olin Corporation, New Haven, Conn.

Filed Mar. 22, 1976, Ser. No. 669,419

Int. Cl.^{2} C09K *3/00;* **C01B** *11/06;* **C02B** *3/06*

U.S. Cl. 424—149 **8 Claims**

1. A coherent solid composition comprising calcium hypochlorite and a hydrazide of a monocarboxylic acid containing from about 10 to about 24 carbon atoms.

4,035,485
POLYPEPTIDES

Harold Gregory, Macclesfield, and Beryl Margaret Preston, Knutsford, both of England, assignors to Imperial Chemical Industries Limited, London, England

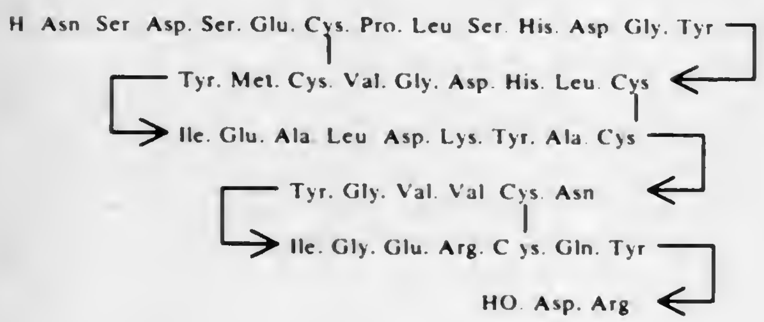
Filed Aug. 18, 1975, Ser. No. 605,298

Claims priority, application United Kingdom, Sept. 11, 1974, 39600/74

Int. Cl.² A61K *37/00*

U.S. Cl. 424—177 **5 Claims**

1. The polypeptide of the formula:


H Asn Ser Asp. Ser. Glu. Cys. Pro. Leu Ser. His. Asp Gly. Tyr
Tyr. Met. Cys. Val. Gly. Asp. His. Leu. Cys
Ile. Glu. Ala Leu Asp. Lys. Tyr. Ala Cys
Tyr. Gly. Val. Val Cys. Asn
Ile. Gly. Glu. Arg. C ys. Gln. Tyr
HO Asp. Arg

or its reduction product in which the cystine residues are reduced in cysteine residues.

5. A method of inhibiting the secretion of acidic gastric juice in warm blooded animals which comprises administering to said animal an effective amount of a polypeptide or reduction product as claimed in claim 1.

4,035,486
MEDICAMENT

Henri Laborit, Paris, France, assignor to Centre d'Etudes Experimentales et Clinques de Physio Biologie, de Pharmacologie et d'Eutonologie, C.E.P.B.E.P.E., France

Filed Dec. 11, 1975, Ser. No. 639,790

Claims priority, application United Kingdom, Dec. 18, 1974, 54582/74

Int. Cl.² A61K *37/26*

U.S. Cl. 424—178 **2 Claims**

1. In an injectable medicament for regulating glucose metabolism in an animal with a compound selected from the group comprising acetylcholine and insulin, the improvement comprising the addition of a quantity of guanosine sufficient to increase the activity of said compound on the utilization of glucose by said animal.

4,035,487
PESTICIDAL 2-PHENYL-1,2,3-TRIAZOLYL-(4) AND-TRIAZOX-(1)-YL-(4) PHOSPHATE AND THIOSPHOSPHATE ESTERS

Beat Boehner, Binningen; Dag Dawes, Pratteln; Haukur Kristinsson, Bottmingen, and Willy Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

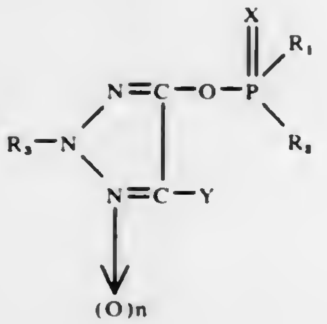
Continuation-in-part of Ser. No. 501,393, Aug. 28, 1974, abandoned. This application Mar. 3, 1975, Ser. No. 555,009

Claims priority, application Switzerland, July 24, 1974, 10210/74; Sept. 10, 1973, 12961/73

Int. Cl.² C07D *249/06;* **A01N** *9/36*

U.S. Cl. 424—200 **32 Claims**

1. A compound of the formula



wherein

R_1 represents methyl, ethyl, methoxy, ethoxy, C_3-C_5-alkylthio, methylamino or dimethylamino,

R_2 represents methoxy, ethoxy or dimethylamino,

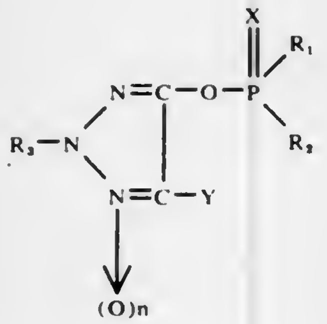
R_3 represents unsubstituted phenyl, or phenyl mono- to trisubstituted by fluorine, chlorine and/or bromine, or monosubstituted by methyl, methoxy or trifluoromethyl,

Y represents hydrogen, chlorine or bromine,

n represents the numbers 0 or 1, and

X represents oxygen or sulphur.

26. An insecticidal, acaricidal and nematocidal composition containing (1) as active component an effective amount of a compound of the formula



wherein

R_1 represents methyl, ethyl, methoxy, ethoxy, C_3–C_5 alkylthio, methylamine or dimethylamino,

R_2 represents methoxy, ethoxy or dimethylamino,

R_3 represents unsubstituted phenyl, or phenyl mono- to tri-substituted by fluorine, chlorine and/or bromine, or monosubstituted by methyl, methoxy or trifluoromethyl,

Y represents hydrogen, chlorine or bromine,

n represents the numbers 0 or 1, and

X represents oxygen or sulphur, and (2) a carrier.

4,035,488
INSECTICIDAL AND ACARICIDAL SUBSTITUTED PHENYL THIOPHOSPHORIC ACID ESTERS

Jozef Drabek, Allschwil, and Denis Varsanyi, Arlesheim, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

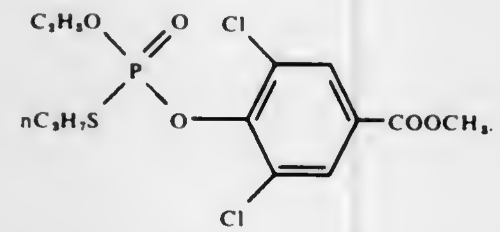
Division of Ser. No. 488,591, July 15, 1974, Pat. No. 3,867,525, which is a division of Ser. No. 292,218, Sept. 25, 1972, Pat. No. 3,839,509. This application Dec. 16, 1974, Ser. No. 532,978

Claims priority, application Switzerland, Sept. 30, 1971, 14208/71; July 27, 1972, 11229/72

Int. Cl.² A01N *9/36*

U.S. Cl. 424—212 **3 Claims**

1. A method for combatting insects or acarids which comprises applying thereto an insecticidally or acaricidally effective amount of the compound of the formula



4,035,489
DIVALENT METAL SALTS OF O,S-DIALKYL-N-ALKANOYLPHOSPHOROAMIDOTHIOATES

Roy B. Flay, Concord, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Aug. 16, 1976, Ser. No. 714,463

Int. Cl.² A01N *9/36;* **C07C** *9/24*

U.S. Cl. 424—217 **15 Claims**

1. Divalent calcium or barium salt of O, S-dialky-N-alkanoylphosphoroamidothioate wherein the O-alkyl and S-alkyl have 1 to 6 carbon atoms and the alky of the N-alkanoyl group has 1 to 18 **carbon atoms.**

6. A mehtod of controlling insects which comprises applying to a solid insects, their environment or hosts an insecticidally effective amount of the salt of claim 1.

4,035,490
INSECTICIDE COMPOSITIONS

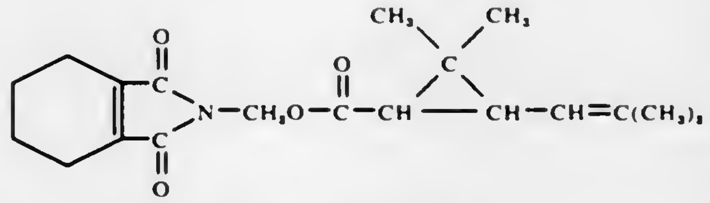
Leland S. Pitt, San Jose, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Aug. 18, 1975, Ser. No. 605,692

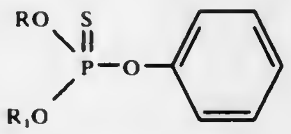
Int. Cl.² A01N *9/02, 9/22, 9/36*

U.S. Cl. 424—225 **8 Claims**

4. A process of controlling insects comprising applying to the insects or habitat thereof an insecticidally effective amount of a composition comprising: (a)



and (b) a compound having the formula



wherein R and R_1 are methyl or ethyl in a weight ratio of (a):(b) of 1:0.1 – 1:10.

4,035,491
PHARMACEUTICAL COMPOSITION HAVING SYNERGISTIC ANALGESIC ACTIVITY AND CONTAINING AZIDOMORPHINE OR AZIDOCODEINE

Jozsef Knoll; Zsuzsanna Fürst; Zoltan Meszaros; Gäbor Nagy; Agoston Dävid, all of Budapest; Rezsö Bognar, Debrecen; Sändor Makleit, Debrecen, and Gyula Välovics, Tiszavasvari, all of Hungary, assignors to Chinoin Pharmaceutical and Chemical Works Ltd., Budapest, Hungary

Continuation-in-part of Ser. No. 536,402, Dec. 26, 1974, Pat. No. 3,969,519. This application June 29, 1976, Ser. No. 700,782

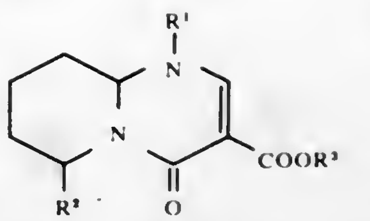
Claims priority, application Hungary, Dec. 29, 1973, 22511432

The portion of the term of this patent subsequent to July 13, 1993, has been disclaimed.

Int. Cl.² A61K *31/655, 31/505, 31/485*

U.S. Cl. 424—226 **7 Claims**

1. A pharmaceutical composition of synergistic analgesic effect which comprises an effective amount of 6-desoxy-6-azido-14-hydroxy-7,8-dihydro-morphine or codeine or an analgesically effective salt thereof and an effective amount of a compound of the formula



wherein R¹ and R² are lower alkyl and R³ is hydrogen or lower alkyl, and the dotted lines represent hydrogenated or unsaturated bonds or an analgesically effective salt or quaternary compound thereof.

4,035,492
ORAL TREATMENT OF SEBORRHEA WITH CYSTEAMINE DERIVATIVES

Gregoire Kalopissis, and Georges Mandussos, both of Paris, France, assignors to L'Oreal, Paris, France

Division of Ser. No. 468,595, May 9, 1974, Pat. No. 3,950,542, which is a division of Ser. No. 140,956, May 6, 1971, Pat. No. 3,821,405, which is a continuation-in-part of Ser. Nos. 706,652, Feb. 19, 1968, Pat. No. 3,629,452, and Ser. No. 801,154, Feb. 20, 1969, abandoned. This application Jan. 29, 1976, Ser. No. 653,526

Claims priority, application Luxembourg, Feb. 21, 1967, 53029; Feb. 20, 1968, 55522; Apr. 23, 1971, 63056; Apr. 23, 1971, 63057

Int. Cl.² A61K *31/19, 31/205*

U.S. Cl. 424—230 **1 Claim**

1. A method for treating a scalp, characterized by an excessive secretion of sebum, to improve the condition thereof by reducing said excessive secretion of sebum comprising orally administering to a human being having a scalp so characterized a therapeutic composition comprising an ingestible carrier admixed with a non-toxic acitive compound selected from the group consisting of:

2-phenylthio ethylamine dihydrogen phosphate,
2-p-t-butylphenylthio ethylamine trichloracetate,
2-p-methoxyphenylthio ethylamine ditartrate,
2tolylthio ethylamine hydrobromide,
2-(1-biphenyl thio) ethylamine hydrochloride,
2-benzylthio 2-methyl propylamine hydrochloride,
2-benzylthio propylamine lactate,
2-o-aminophenylthio ethylamine succinate,
2-(2-naphthyl methylthio) ethylamine hydrochloride,
2-(2-naphthyl methylthio) ethylamine disuccinate,
2-o-chlorobenzylthio ethylamine hydrochloride,
2-p-chlorobenzylthio ethylamine glycolate,
2-o-fluorobenzylthio ethylamine hydrochloride,
2-β-phenylethylthio ethylamine glutamate,
2-diphenylmethylthio ethylamine hydrochloride,
2,4-dichloro 2-benzylthio ethylamine aspartate
2-o-methoxy benzylthio ethylamine hydrochloride,
2-p-ethoxybenzylthio ethylamine hydrochloride,
2-p-bromobenzylthio ethylamine succinate,
2-(3,4-dimethoxy benzylthio) ethylamine malate,
2-(3,4,5-trimethoxy benzylthio) ethylamine hydrocinnamate,
2-p-methoxy benzylthio ethylamine salicylate,
2-o-methylbenzylthio ethylamine phenylacetate,
2-p-phenoxybenzylthio ethylamine hydrochloride,
2-benzylthio ethylamine panthothenate,
2-p-nitrobenzylthio ethylamine crotonate,
2-(1-naphthyl thio) ethylamine hydrochloride,
2-benzylthio propylamine and
2-benzylthio 2-methyl propylamine,

said active compound being present in an amount ranging from 0.75 to 3 percent by weight of said composition and said composition being administered at a rate of 1.5–5 mg/kg/day based on the weight of the human being.

4,035,493
RODENTICIDE

Hector F. DeLuca; Heinrich K. Schnoes; John W. Suttie, and Helen Frank, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed June 9, 1975, Ser. No. 584,900

Int. Cl.^{2} A01N *9/00*

U.S. Cl. 424—236 **6 Claims**

4. A method for controlling rat and mice populations which comprises making available to such populations, in amounts sufficient to effect control, a rodenticide food bait comprising edible material acceptable to rodents and, as the essential rodenticidal ingredient, a compound selected from the group consisting of 1α-hydroxycholecalciferol, 1α-hydroxyergocalciferol and 1,25-dihydroxycholecalciferol.

4,035,494
BIS-P-PIVALOYL BENZYLAMINES

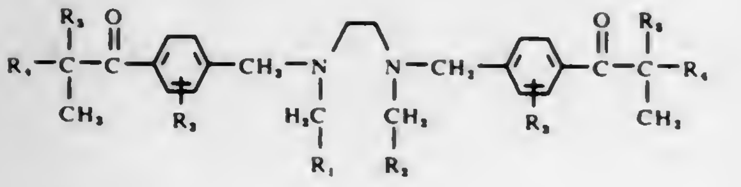
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., East Hanover, N.J.

Filed Oct. 20, 1975, Ser. No. 623,752

Int. Cl.^{2} C07D *243/08;* **A61K** *31/55*

U.S. Cl. 424—244 **5 Claims**

1. A compound of the formula



where

R$_1$ and R$_2$ together represent methylene, and

R$_3$ represents hydrogen or halo having an atomic weight of about 19 to 36, and

R$_4$ and R$_5$ each independently represent lower alkyl having 1 to 2 carbon atoms,

or a pharmaceutically acceptable salt thereof.

4. A pharmaceutical composition comprising an amount of a compound of claim 1 effective in the treatment of lipidemia and a pharmaceutically acceptable diluent or carrier therefor.

4,035,495
PYRROLOBENZOXAZINES, PYRROLOBENZOTHIAZINES AND PROCESS THEREFOR

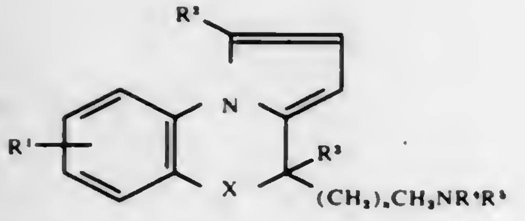
Ivo Jirkovsky, Montreal, and Leslie G. Humber, Dollard des Ormeaux, both of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Filed Feb. 10, 1975, Ser. No. 548,318

Int. Cl.^{2} A61K *31/54, 31/535;* **C07D** *265/28, 279/16*

U.S. Cl. 424—246 **30 Claims**

1. A compound of the formula 1



1

in which R^1 is hydrogen, lower alkyl, halogen, lower alkoxy or nitro; R^2 is hydrogen, halogen, nitro, lower alkanoyl, trifluoroacetyl or CH$_2$NR^{4}R^5 in which R^4 and R^5 are the same or different selected from the group consisting of hydrogen and lower alkyl, or R^4 and R^5 together with the nitrogen atom to which they are joined from a heterocyclic amine radical selected from the group consisting of 1-pyrrolidinyl, piperidino, morpholino, 1-piperazinyl and 4-(lower alkyl)-1-piperazinyl; R^3 is lower alkyl; R^4 and R^5 are as defined herein; X is oxy or thio; and n is an integer from zero to two; and the acid addition salts thereof with pharmaceutically acceptable acids.

27. A method of treating hypertension in warm-blooded animals, comprising: administering to said animals an effective antihypertensive amount of the compound of formula 1 of claim 1.

4,035,496
METHODS OF COMBATTING NEMATODES USING CERTAIN DERIVATIVES OF 1,3,5-OXATHIAZINE

Claudio Giordano; Mario Ferraris, both of Novara, and Elena Barsuglia, S. Donato Milanese (Milan), all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

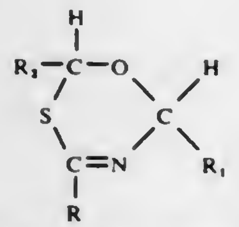
Filed July 18, 1975, Ser. No. 597,094

Claims priority, application Italy, July 19, 1974, 25367/74

Int. Cl.^{2} A01N *9/12*

U.S. Cl. 424—246 **6 Claims**

1. A method of combatting nematodes infesting soil which consists of applying, to the soil to be treated, a composition the essential nematodocidal constituent of which is a nematodocidally effective amount of at least one 1,3,5-oxathiazine of the general formula:



(I)

in which R represents phenyl, phenyl substituted at position 4 by halogen, lower alkyl or methoxy, or phenyl substituted at positions 3-4 by halogen or lower alkyl and R$_1$ and R$_2$, which may be the same or different, represent hydrogen or methyl, which essential constituent has an LD$_{50}$ in the rat greater than 300 mg/kg.

4,035,497
BUTANOIC AND BUTENOIC ACID MORPHOLIDES

Maurice Ward Gittos, Slough, and David Anthony Amey, Luton, both of England, assignors to Aspro-Nicholas Limited, Slough, England

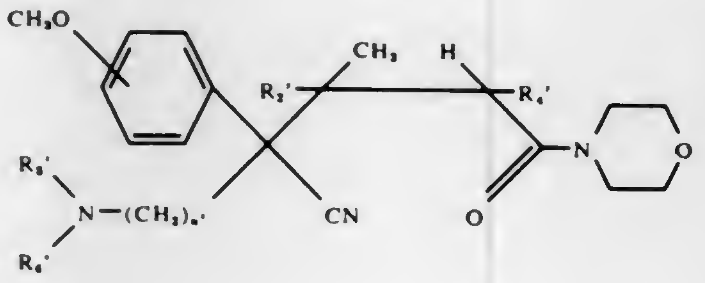
Division of Ser. No. 531,556, Dec. 11, 1974, Pat. No. 3,998,965, which is a continuation-in-part of Ser. No. 425,876, Dec. 18, 1973, Pat. No. 3,963,729. This application Apr. 22, 1976, Ser. No. 679,165

Claims priority, application United Kingdom, Dec. 28, 1972, 59761/72; Dec. 15, 1973, 58202/73

Int. Cl.^{2} A61K *31/535;* **C07D** *295/16*

U.S. Cl. 424—248.56 **5 Claims**

1. Amides and pharmaceutically acceptable acid addition salts of the formula



wherein

n' represents 2 or 3;

R$_2$' and R$_4$' independently represent hydrogen or methyl; and

R$_5$' and R$_6$' independently represent methyl or ethyl.

5. A pharmaceutical composition in dosage unit form containing an antidepressant effective amount of a compound of claim 1, and a pharmaceutically acceptable carrier.

4,035,498
PHARMACEUTICALLY ACTIVE COMPOUNDS AND THE PREPARATION THEREOF

Roland Yves Mauvernay, Riom; Norbert Busch, Loubeyrat; Jacques Moleyre, Mozac; Jacques Simond, Chamalieres, and André Monteil, Gérzat, all of France, assignors to Centre Europeen de Recherches Mauvernay, Riom, France

Filed Sept. 29, 1975, Ser. No. 617,576

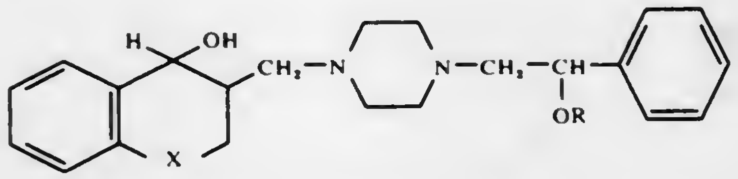
Claims priority, application France, Sept. 30, 1974, 74.32806

Int. Cl.^{2} C07D *405/06, 295/08;* **A61K** *31/495*

U.S. Cl. 424—250 **7 Claims**

1. A compound selected from the group consisting of those of the formula:

(I)



and pharmaceutically acceptable acid addition salts thereof, in which R represents a methyl or ethyl group and X represents an oxygen atom or a group —(CH$_2$)$_n$— in which *n* is 0 or 1.

6. A pharmaceutical composition consisting essentially of a compound as claimed in claim 1 in association with a pharmaceutical carrier or diluent.

4,035,499
IMIDAZO (1,2-b) ISOQUINOLINE DERIVATIVES

Ronald Frederick Cookson, and David Peter Nowotnik, both of Reading, England, assignors to Aspro-Nicholas Limited, Slough, England

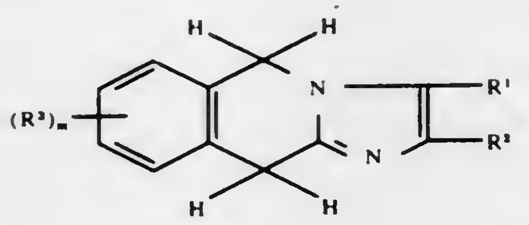
Filed Oct. 31, 1975, Ser. No. 627,906

Claims priority, application United Kingdom, Nov. 5, 1974, 47801/74

Int. Cl.^{2} C07D *471/04;* **A61K** *31/47*

U.S. Cl. 424—258 **13 Claims**

1. A pharmaceutical dosage unit composition consisting essentially of an analgesic, anti-inflammatory, or anti-pyretic effective amount of a 5,10-dihydro-imidazo (1,2*b*) isoquinoline of the formula



wherein

R^1 and R^2 independently represent phenyl, phenyl mono substituted by methylenedioxy, C$_1$–C$_4$ alkyl, NH$_2$, C$_1$–C$_4$ -alkylamino, di(C$_1$–C$_4$ alkyl)amino, halogen, trifluoromethyl, C$_1$–C$_4$ alkanoylamino or C$_1$–C$_4$ alkoxy; hydrogen or the group R^3 provided that at least one of R^1 and R^2 is phenyl or one of said substituted phenyls,

m represents 0 or an integer up to 4,

R^3 represents alkyl, alkoxy, halogen, halogenalkyl, hydroxy, hydroxyalkyl, alkylthio, alkylsulphinyl, alkylsulphonyl, NH$_2$, alkylamino, dialkylamino, alkanoylamino, nitro, alkylsulphonamido or sulphamoyl,

wherein each alkyl moiety has 1 to 6 carbon atoms or a pharmacologically acceptable nontoxic acid addition salt thereof, and a pharmaceutically acceptable carrier therefore.

4,035,500
METHOD OF DEPOSITING A METAL ON A SURFACE OF A SUBSTRATE

Robert Vincent Dafter, Jr., Ewing Township, Mercer County, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed June 4, 1976, Ser. No. 692,712

Int. Cl.^{2} B05D *3/500*

U.S. Cl. 427—261 **6 Claims**

1. A method of depositing a metal on a surface of a substrate, which comprises:

a. forming a dielectric coat, containing an activating metal species selected from the group consisting of (a^1) a noble metal, (b^1) a salt of said nobel metal and (c^1) a mixture of (a^1) and (b^1), in an amount sufficient to provide adequate catalytic nucleating sites available for the production of a uniform and continuous electroless metal deposit on the surface; and

b. treating said coat with a reviving agent selected from the group consisting of chromic acid and ceric ammonium nitrate to render said coat catalytic in an electroless metal deposition.

4,035,501
N-LYSERGYL-AMINO-PYRIDINES

Hartmut Hauth, Riehen, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

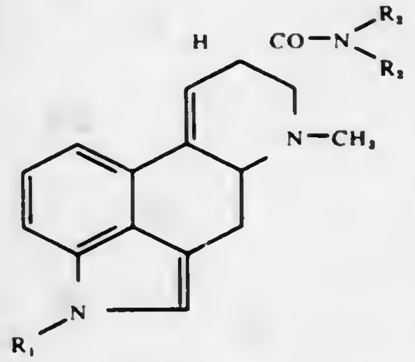
Continuation-in-part of Ser. No. 530,214, Dec. 6, 1974, abandoned, which is a continuation of Ser. No. 311,796, Dec. 4, 1972, abandoned. This application June 23, 1975, Ser. No. 589,372

Claims priority, application Switzerland, Dec. 10, 1971, 18051/71; Dec. 10, 1971, 18052/71

Int. Cl.^{2} C07D *457/06;* **A61K** *31/48*

U.S. Cl. 424—261 **18 Claims**

1. A compound of the formula:



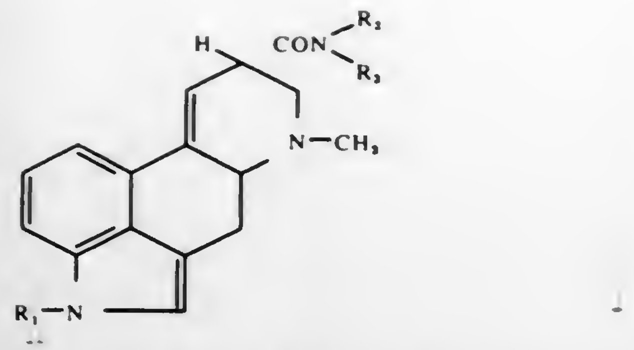
wherein R$_1$ is alkyl of 1 to 4 carbon atoms,

R$_2$ is hydrogen or alkyl of 1 to 4 carbon atoms, and

R$_3$ is 3-pyridyl, or 3-pyridyl mono- or di substituted by alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, hydroxy, halogen of atomic number 9 to 53, amino, or monoalkylamino or dialkylamino, each alkyl substituent having 1 to 4 carbon atoms,

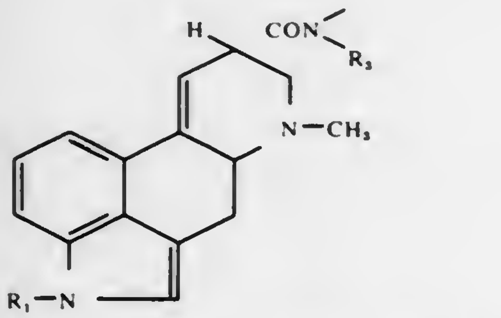
in free base or acid addition salt form.

13. A method of increasing sodium output in the urine flow of animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of the formula:



where R_1, R_2, and R_3 are as defined in claim 1
or a pharmaceutically acceptable acid addition salt thereof.

18. A method of treating migraine in animals which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of the formula:



where R_1, R_2, and R_3 are as defined in claim 1
or a pharmaceutically acceptable acid addition salt thereof.

4,035,502
ACYLAMINOPENICILLANIC ACIDS AND PROCESS FOR PREPARING THEM

Manfred Schorr, Frankfurt am Main; Elmar Schrinner, Wiesbaden, and Wilfried Schmitt, Kelkheim, Taunus, all of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

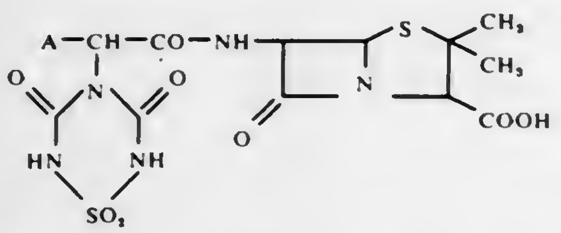
Filed Dec. 3, 1975, Ser. No. 637,116

Claims priority, application Germany, Dec. 5, 1974, 2457464

Int. Cl.^{2} C07D *499/76;* A61K *31/43*

U.S. Cl. 424—271 **12 Claims**

1. An acylaminopenicillanic acid of the formula



wherein A is phenyl; hydroxyphenyl; alkylphenyl, said alkyl being of from 1 to 4 carbon atoms; alkoxyphenyl, said alkoxy being of from 1 to 4 carbon atoms; halophenyl; dihydrophenyl; a conventional aromatic monocyclic heterocycle attached to the —CH of the acetyl group of a 6-acetylamino moiety attached to a penicillin ring; or said aromatic monocyclic heterocycle substituted by alkyl of from 1 to 4 carbon atoms, hydroxyl, or alkoxy of from 1 to 4 carbon atoms; or a nontoxic salt thereof.

4,035,503
XANTHENE AND THIOXANTHENE DERIVATIVES, COMPOSITIONS THEREOF AND A METHOD OF PREPARATION THEREOF

Georg Ujvari, Nykobing, and Peter Bregnedal Hansen, Horsholm, both of Denmark, assignors to Kefalas A/S, Denmark

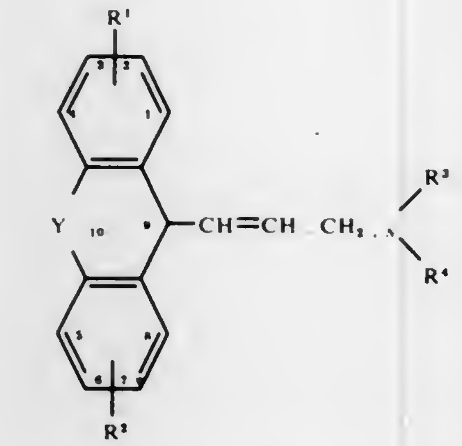
Division of Ser. No. 525,967, Nov. 21, 1974, Pat. No. 3,951,961. This application Mar. 1, 1976, Ser. No. 662,603

Claims priority, application United Kingdom, Nov. 30, 1973, 55759/73

Int. Cl.^{2} C07D *311/90*

U.S. Cl. 424—275 **32 Claims**

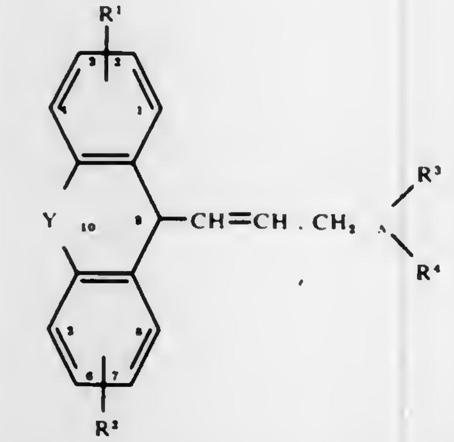
1. A compound selected from the group consisting of (1) a compound of the following formula:



wherein Y is selected from the group consisting of sulphur and oxygen, R^1 is selected from the group consisting of hydrogen, chlorine, trifluoromethyl and dimethylsulfamoyl, R^2 is selected from the group consisting of hydrogen and fluorine, and R^3 and R^4 each is selected from the group consisting of hydrogen and methyl provided that R^3 and R^4 may not both represent hydrogen, and (2) a non-toxic acid addition salt thereof.

6. A pharmaceutical composition in unit dosage form, useful as a tranquilizer or neuroleptic and for the treatment of psychoses, comprising a major quantity of a pharmaceutical carrier and as an active ingredient a pharmaceutically effective does of a compound as defined in claim 1.

21. Method of treating a living animal body in need of tranquilization or treatment for psychoses, comprising the step of administering to the said living animal body an effective tranquilizing or neuroleptic amount of a compond selected from the group consisting of (1) a compound of the following formula:



I

wherein Y is selected from the group consisting of sulphur and oxygen, R^1 is selected from the group consisting of hydrogen, chlorine, trifluoromethyl and dimethylsulfamoyl, R^2 is selected from the group consisting of hydrogen and fluorine, and R^3 and R^4 each is selected from the group consisting of hydrogen and methyl, provided that R^3 and R^4 may not both represent hydrogen, and (2) a non-toxic acid addition salt thereof.

4,035,504
METHOD FOR TREATING CHOLESTEROLEMIA BY ADMINISTERING RESORCYLIC ACID LACTONE DERIVATIVES

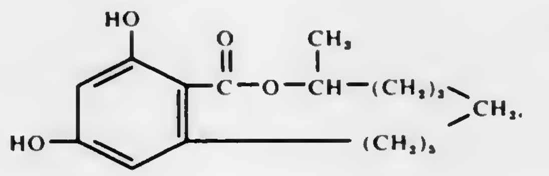
Phil H. Hidy, Terre Haute, and Robert S. Baldwin, Montezuma, both of Ind., assignors to IMC Chemical Group, Inc., Terre Haute, Ind.

Division of Ser. No. 576,639, May 12, 1975, Pat. No. 3,965,275, which is a continuation of Ser. No. 441,150, Feb. 11, 1974, abandoned, which is a continuation of Ser. No. 289,456, Sept. 15, 1972, abandoned, which is a continuation of Ser. No. 28,913, April 15, 1970, abandoned, which is a continuation-in-part of Ser. No. 512,199, Dec. 7, 1965, abandoned. This application Mar. 2, 1976, Ser. No. 663,149

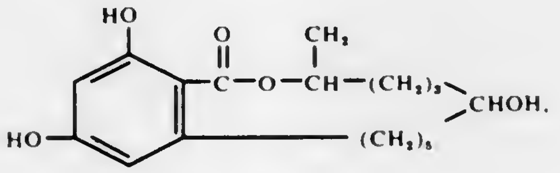
Int. Cl.^{2} A61K *31/365*

U.S. Cl. 424—279 **5 Claims**

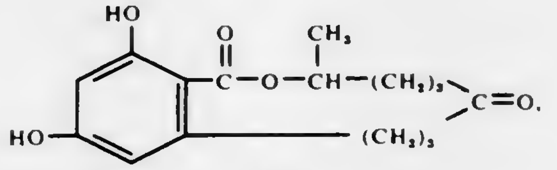
1. A method of treating cholesterolemia in a human having cholesterolemia which comprises internally administering to said human an amount sufficient to alleviate said cholesterolemia of a compound having the formula:



I

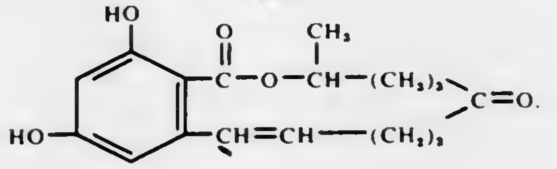


II



III

and

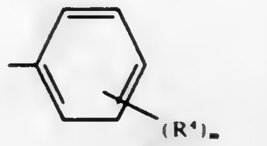


IV

wherein

R^1 and R^2 are independently selected from the group consisting of hydrogen, halogen, alkyl of up to 6 carbon atoms and alkoxy of up to 6 carbon atoms, and

R^3 is an aryl group of the formula



where

m is 1 or 2, and

each R^4 is independently selected from the group consisting of halogen alkyl of 2–12 carbon atoms, alkoxy of 2–12 carbon atoms, cyclohexyl, benzyl, phenyl, halogenophenyl, phenoxy and halogenophenoxy, provided that R^3 contains not more than 3 halogen atoms.

4,035,505
4-HYDROXYCOUMARIN COMPOUNDS USEFUL AS ANTICOAGULANT RODENTICIDES

Malcolm Ronald Hadler, Tapporley, England, and Roy Stanley Shadbolt, deceased, late of Westminster Park, England (by Elizabeth Godsmark Shadbolt, administratix), assignors to Ward Blenkinsop and Company Limited, Wembley, England

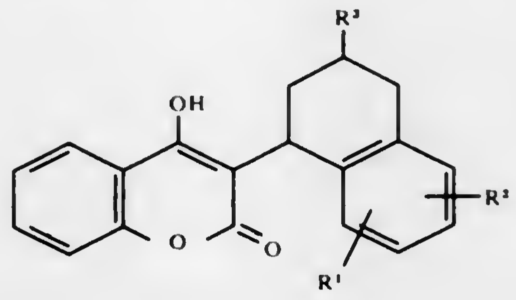
Division of Ser. No. 473,161, May 22, 1974, Pat. No. 3,957,824. This application Jan. 20, 1976, Ser. No. 650,720

Claims priority, application United Kingdom, May 23, 1973, 24685/73; May 25, 1973, 25264/73; Mar. 1, 1974, 9450/74

Int. Cl.^{2} A01N *9/28*

U.S. Cl. 424—281 **14 Claims**

1. A rodenticidal composition comprising a carrier in combination with, as active ingredient, a rodenticidally effective amount of a compound of the formula



4,035,506
FLUOROCARBON DERMAL PROTECTIVE COMPOSITIONS

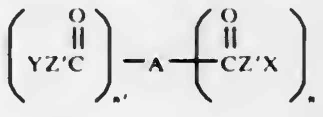
Anthony James Lucas, Oakdale, and Peter John Degen, Woodbury Township, Washington County both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed July 26, 1974, Ser. No. 492,200

Int. Cl.^{2} A61K *31/255*

U.S. Cl. 424—303 **8 Claims**

1. In a dermal protective composition comprising a pharmaceutical extending medium and a protective amount of a fluorocarbon-containing active ingredient, the improvement comprising employing as said active ingredient a substantive dermally non-irritating compound of the formula



$$\left(YZ'\overset{O}{\overset{\|}{C}}\right)_{e'}-A-\left(\overset{O}{\overset{\|}{C}}Z'X\right)_{n}$$

wherein

A is a polyvalent saturated or unsaturated, aliphatic or cycloaliphatic organic radical containing 8 to 108 carbon atoms;

Z' is —NH— or —O—;

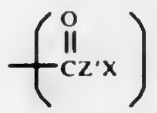
X is $-(W)_dR_f$ where W is a bridging group free of isocyanate or isocyanate reactive groups, *d* is a zero or one, and R_f is a fluorinated, saturated, monovalent, aliphatic radical containing 3 to 20 carbon atoms in which the carbon atoms of the chain are substituted only by fluorine, chlorine or hydrogen atoms with no more than one hydrogen or chlorine atom for every two carbon atoms and the terminal carbon atom is perfluorinated, and in which a divalent oxygen or trivalent nitrogen atom, bonded only to carbon atoms can be present in the skeletal chain;

Y is —H, M^{e+}, or R^1 where R' is an aliphatic, cycloaliphatic or aromatic radical containing 1 to 24 carbon atoms;

M^{e+} is a pharmaceutically acceptable organic or inorganic cation and

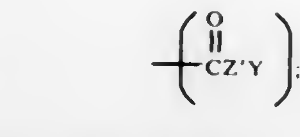
e is one, two or three;

n is an integer from 1 to 10 designating the same or different



$$\left(\overset{O}{\overset{\|}{C}}Z'X\right)$$

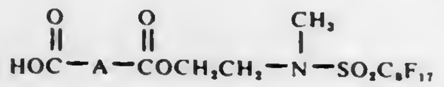
n' is zero or an integer from 1 to 9 designating the same or different



$$-\left(\overset{\overset{O}{\|}}{C}Z'Y\right);$$

n+*n'* = 2 − 10; said compound containing from 1 to 60 percent by weight of fluorine.

5. In a dermal protective composition comprising a pharmaceutical extending medium and a protective amount of a fluorocarbon-containing active ingredient, the improvement comprising employing as said active ingredient a substantive, dermally non-irritating compound of the formula



$$HO\overset{\overset{O}{\|}}{C}-A-\overset{\overset{O}{\|}}{C}OCH_2CH_2-\overset{\overset{CH_3}{|}}{N}-SO_2C_8F_{17}$$

where A contains 34 carbon atoms and is the aliphatic portion of polymerized 18-carbon fatty acids.

4,035,507
NOVEL, TRANSIENT PRO-DRUG FORMS OF L-DOPA TO TREAT PARKINSON'S DISEASE

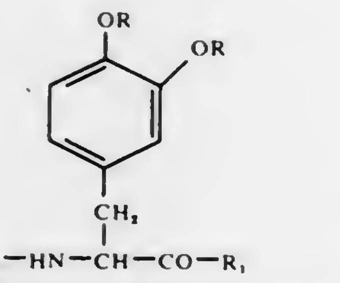
Nicolae S. Bodor; Kenneth B. Sloan, both of Lawrence, Kans., and Anwar A. Hussain, Lexington, Ky., assignors to Interx Research Corporation, Lawrence, Kans.

Division of Ser. No. 569,009, April 17, 1975, Pat. No. 3,998,799, which is a continuation-in-part of Ser. No. 412,419, Nov. 2, 1973, Pat. No. 3,891,696. This application July 23, 1976, Ser. No. 708,285

Int. Cl.² A61K *31/22, 31/24, 31/195*

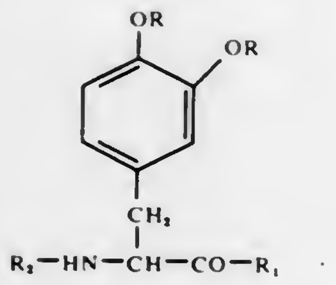
U.S. Cl. 424—311 **109 Claims**

1. A method for treating Parkinson's Disease in warm-blooded animals which comprises orally administering to a warm-blooded animal afflicted with Parkinson's Disease, an anti-Parkinsonism effective amount of a compound having the formula:



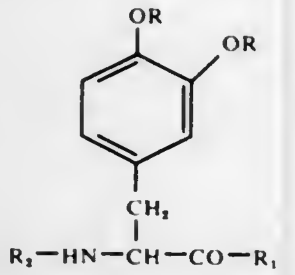
(I)

wherein R represents a hydrogen atom, an acyl group and a $-CO-R_3$ group, wherein R_3 represents the residue of any N,N-C_1–C_2 dialkylamino acid or a C_4–C_6 cycloalkylamino acid; wherein R_1 represents a member selected from the group consisting of a hydroxyl group and a —OM group, wherein M is a member selected from the group consisting of an alkali metal and an ammonium ion; and wherein R_2 represents a $-CO\text{-}R_3$ group, wherein R_3 represents the residue of any N,N-(C_1–C_2)dialkylamino acid or a C_4–C_6-cycloalkylamino acid;



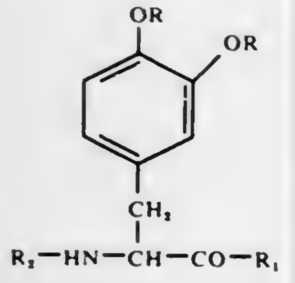
(II)

wherein R represents an acyl group; wherein R_2 represents a hydrogen atom; and wherein R_1 represents a $-NHCH(R_4)COOR_5$ group, wherein R_4 represents the residue of any naturally occurring protein amino acid, and wherein R_5 represents a member selected from the group consisting of a hydrogen atom, a C_1–C_5 alkyl group, and a C_1–C_5 alkylaryl group, and the HX salts thereof, wherein X is a conventional pharmaceutically acceptable acid addition salt anion;



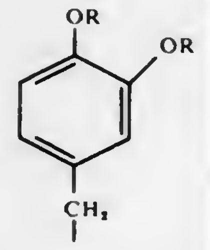
(III)

wherein R represents an acyl group; wherein R_1 represents a member selected from the group consisting of a hydroxyl group, a $-OCH_3$ group, a $-OC_2H_5$ group, a $-OC_3H_7$ group, a $-OC_4H_9$ group, and a $-OCH_2-C_6H_5$ group; and wherein R_2 represents an $NH_2CH(R_6)CO-$ group, wherein R_6 represents the residue of any naturally occurring protein amino acid, and the HX salts thereof, wherein X is defined as above;



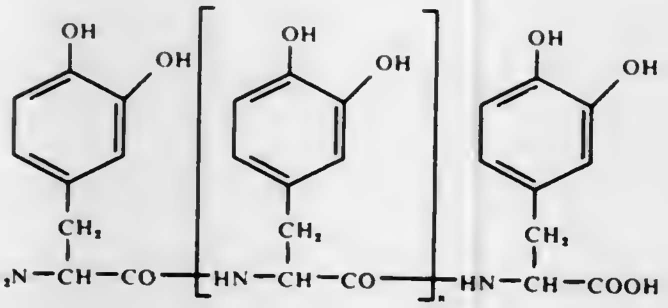
(IV)

wherein R represents a member selected from the group consisting of an acyl group; wherein R_1 represents a member selected from the group consisting of a hydroxyl group, a $-OCH_3$ group, a $-OC_2H_5$ group, a $-OC_3H_7$ group, a $-OC_4H_9$ group, and a $-OCH_2\text{-}C_6H_5$ group; and wherein R_2 represents an $NH_2\text{-}CH(R_7)\text{-}CO-$ group, wherein R_7 represents the residue of a 3,4-L-diacylphenylalanine group having the formula:

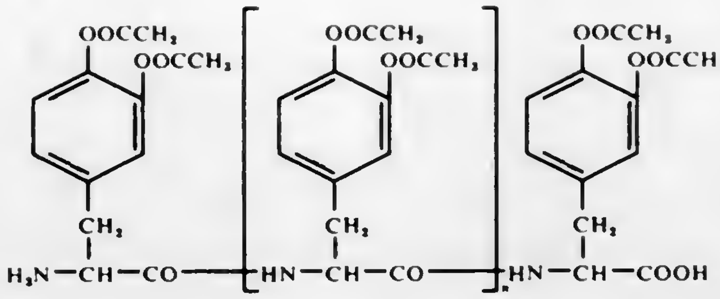


wherein R is defined as above, and the HX salts thereof, wherein X is as defined above; and

(V-A)



(V-B)



wherein *n* represents an integer of from 2 to 50 with respect to formula (V-A), and wherein *n* represents an integer of from 1 to 50 with respect to formula (V-B).

4,035,508
BIS-SUBSTITUTED BENZYL METHANAMINES

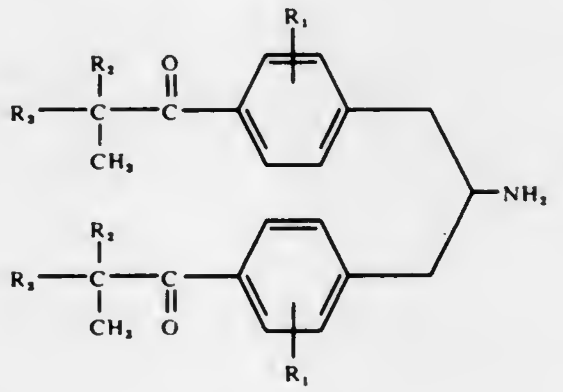
Jeffrey Nadelson, Lake Parsippany, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed Dec. 18, 1975, Ser. No. 642,190

Int. Cl.² A01N *9/20, 9/24;* **C07C** *87/28*

U.S. Cl. 424—316 **6 Claims**

1. A compound of the formula



where

R_1 represents hydrogen, halo having an atomic weight of about 19 to 36, and

R_2 and R_3 each independently represent lower alkyl having 1 to 2 carbon atoms, or a pharmaceutically acceptable acid addition salt thereof.

5. A pharmaceutical composition for use in the treatment of lipidemia comprising an effective amount of a compound of claim 1 and a pharmaceutically acceptable diluent or carrier therefor.

4,035,509
METHODS AND COMPOSITIONS FOR THE USE OF 2-CARBOXY-5-OXO-5H-DIBENZO[A,D]CYCLOHEPTENES, SALTS AND ESTERS THEREOF

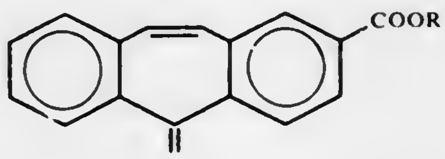
Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 463,212, April 22, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 564,001

Int. Cl.² A61K *31/19, 31/205, 31/235*

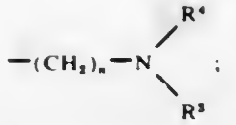
U.S. Cl. 424—317 **6 Claims**

1. A composition for inhibiting reaginic antigen-antibody reactions in mammals susceptible thereto comprising a pharmaceutically acceptable non-toxic excipient and an effective amount of a compound represented by the formula:



(I)

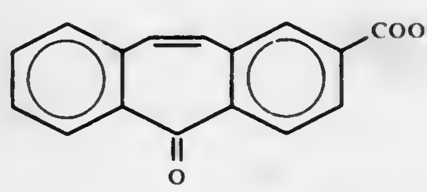
wherein R′ is hydrogen, alkyl having 1 to 12 carbon atoms, or



$$-(CH_2)_n-N\begin{matrix}\diagup R^4\\ \diagdown R^5\end{matrix};$$

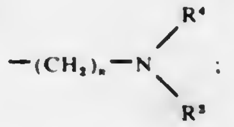
n is an interger from 2 through 4, inclusive; R^4 and R^5 are independently lower alkyl having 1 to 6 carbon atoms; or a pharmaceutically acceptable salt thereof.

4. A method of inhibiting reagenic antigen-antibody reactions in mammals susceptible thereto which comprises administering to a mammal in need thereof an effective amount of a compound represented by the formula:



(I)

where R′ is hydrogen, alkyl having 1 to 12 carbon atoms, or



$$-(CH_2)_n-N\begin{matrix}\diagup R^4\\ \diagdown R^5\end{matrix};$$

n is an integer from 2 through 4, inclusive; R^4 and R^5 are independently lower alkyl having 1 to 6 carbon atoms; or a pharmaceutically acceptable salt thereof.

4,035,510
TREATMENT OF ACNE UTILIZING N-METHYLDIETHANOLAMINE

Eugene J. Van Scott, 1138 Sewell Lane, Rydal, Pa. 19046, and Ruey J. Yu, 4400 Dexter St., Philadelphia, Pa. 19128

Filed Sept. 15, 1976, Ser. No. 723,326

Int. Cl.² A61K *31/13*

U.S. Cl. 424—325 **5 Claims**

1. A method for treating acne vulgaris in humans having skin affected thereby without irritating the skin comprising:

administering topically to the affected skin a therapeutically effective amount of a composition comprising N-methyldiethanolamine in a pharmacologically acceptable vehicle, on a daily basis to promote improvement of the skin without irritation thereto and to prevent recurrence of acne lesions.

4,035,511
PROCESS FOR PROMOTING ANALGESIA

Rita B. Messing, Irvine, Calif., and Loy D. Lytle, Concord, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed May 6, 1976, Ser. No. 683,983

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **2 Claims**

1. The process for producing analgesia or reducing hyperalgesia in an animal which comprises administering 3-(p-trifluoromethylphenoxy)-N-methyl-3-phenylpropylamine to an animal requiring such in an amount effective to produce analgesia or reduce hyperalgesia.

4,035,512
AMINOTETRALOLS

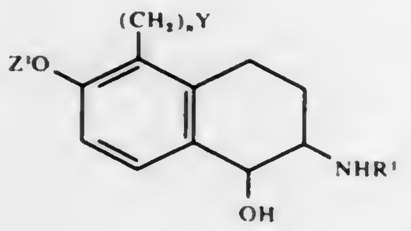
Hirosada Sugihara, Osaka; Masazumi Watanabe, Takatsuki; Michio Motohashi, Kobe; Masao Nishikawa, Nagaokakyo, and Yasushi Sanno, Ikeda, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed June 12, 1975, Ser. No. 586,282

Int. Cl.^{2} A61K *31/13, 31/205, 31/24;* **C07C** *91/42*

U.S. Cl. 424—330 **49 Claims**

1. A compound selected from the group consisting of compounds of the formula



wherein R^1 is (1) hydrogen, (2) alkyl of up to 6 carbon atoms, (3) alkenyl of up to 6 carbon atoms, (4) alkynyl of up to 6 carbon atoms,

said alkyl, alkenyl and alkynyl groups being unsubstituted or substituted by at least one of (a) cycloalkyl of 3–7 carbon atoms, (b) cycloalkenyl of 3–7 carbon atoms, (c) cycloalkylidene of 3–6 carbon atoms, (d) phenyl, (e) naphthyl, (f) hydroxyl, (g) alkoxy of 1–4 carbon atoms, (h) phenoxy, (i) naphthoxy, (j) halogen, (k) acetyl, (l) propionyl, (m) butyryl, (n) benzoyl, (o) unsubstituted amino and (p) nitro,

said cycloalkyl, cycloalkenyl, phenyl and naphthyl groups being unsubstituted or substituted by at least one of (a) alkyl of 1–4 carbon atoms, (b) hydroxyl, (c) alkoxy of 1–4 carbon atoms and (d) halogen, (5) cycloalkyl of 3–7 carbon atoms, (6) cycloalkenyl of 3–7 carbon atoms, (7) phenyl, or (8) naphthyl,

said last referred to cycloalkyl, cycloalkenyl, phenyl and naphthyl groups being unsubstituted or substituted or substituted by at least one of (a) alkyl of 1–4 carbn atoms, (b) hydroxyl, (c) alkoxy of 1–4 carbon atoms and (d) halogen,

OZ^1 is unprotected hydroxyl or protected hydroxyl,

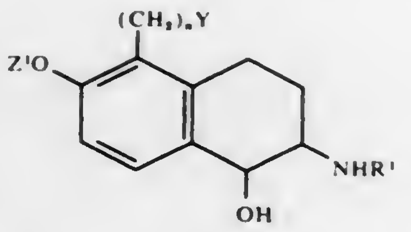
Y is (1) hydrogen, (2) unprotected hydroxyl, (3) protected hydroxyl, (4)unsubstituted amino, (5) monoalkylamino of not more than 3 carbon atoms, (6) dialkylamino of not more than 3 carbon atoms in each alkyl group, (7) nitro or (8) halogen,

n is zero, 1 or 2, with the proviso that when Y is hydrogen, uprotected hydroxyl or protected hydroxyl *n* is 1 or 2,

and physiologically acceptable salts thereof.

48. A pharmaceutical composition which comprises

A. as active ingredient, at least one compound selected from the group consisting of compounds of the formula



wherein R^1 is (1) hydrogen, (2) alkyl of up to 6 carbon atoms, (3) alkenyl of up to 6 carbon atoms, (4) alkynyl of up to 6 carbon atoms,

said alkyl, alkenyl and alkynyl groups being unsubstituted or substituted by at least one of (a) cycloalkyl of 3–7 carbon atoms, (b) cycloalkenyl of 3–7 carbon atoms, (c) cycloalkylidene of 3–6 carbon atoms, (d) phenyl, (e) naphthyl, (f) hydroxyl, (g) alkoxy of 1–4 carbon atoms, (h) phenoxy, (i) naphthoxy, (j) halogen, (k) acetyl, (l) propionyl, (m) butyryl, (n) benzoyl, (o) unsubstituted amino and (p) nitro,

said cycloalkyl, cycloalkenyl, phenyl and naphthyl groups being unsubstituted or substituted by at least one of (a) alkyl of 1–4 carbon atoms, (b) hydroxyl, (c) alkoxy of 1–4 carbon atoms and (d) halogen, (5) cycloalkyl of 3–7 carbon atoms, (6) cycloalkenyl of 3–7 carbon atoms, (7) phenyl, or (8) naphthyl,

said last referred to cycloalkyl, cycloalkenyl, phenyl and naphthyl groups being unsubstituted or substituted by at least one of (a) alkyl of 1–4 carbon atoms, (b) hydroxyl, (c) alkoxy of 1–4 carbon atoms and (d) halogen,

OZ^1 is unprotected hydroxyl or protected hydroxyl,

Y is (1) hydrogen, (2) unprotected hydroxyl, (3) protected hydroxyl, (4) unsubstituted amino, (5) monoalkylamino of not more than 3 carbon atoms, (6) dialkylamino of not more than 3 carbon atoms in each alkyl group, (7) nitro or (8) halogen,

n is zero, 1 or 2, with the proviso that when Y is hydrogen, unprotected hydroxyl or protected hydroxyl *n* is 1 or 2,

and physiologically acceptable salts thereof, and

B. a pharmaceutically acceptable carrier therefor.

4,035,513
WATER-IN-OIL EMULSIFIER COMPOSITIONS

Yoshimaru Kumano, Yokohama, Japan, assignor to Shiseido Co., Ltd., Tokyo, Japan

Filed Oct. 20, 1975, Ser. No. 624,015

Claims priority, application Japan, Oct. 19, 1974, 49-120554

Int. Cl.^{2} A61K *7/48*

U.S. Cl. 424—359 **15 Claims**

1. A water-in-oil emulsifier composition consisting essentially of:

A. a partial ester of a polyhydric alcohol having 3 to 6 hydroxyl groups in the molecule and a fatty acid having 16 to 18 carbon atoms, which partial ester is in the liquid state at room temperature; and

B. an aqueous solution containing at least one amino acid or salt thereof, said acid or salt having a solubility in water greater than 20g per 100 ml of water at 25° C and being between 5 and 9 in their inorganic-organic balance, said aqueous solution having a concentration of 0.1 to 40% by weight of said acid or salt;

the mixing ratio of component (B) to component (A) being from 1:1 to 1:46 by weight.

4,035,514
WATER WASHABLE PETROLATUM COMPOSITIONS

Ronald Ivey Davis, Wilmington, Del., assignor to ICI United States Inc., Wilmington, Del.

Filed Feb. 17, 1976, Ser. No. 658,833

Int. Cl.^{2} A61K *9/06;* **C09D** *3/00;* **C10M** *5/12*

U.S. Cl. 424—365 **4 Claims**

1. A water washable petrolatum composition comprising 70–90 percent petrolatum, 1–5 percent cetyl alcohol, 1–4 percent lanolin or lanolin alcohols and 10–20 percent of ethoxylated sorbitol oleic acid esters selected from the group consisting of 40 dendro sorbitol septaoleate and 40 dendro sorbitol hexaoleate.

4,035,515
PRODUCTION OF ALCOHOL FROM CEREAL GRAINS

Newton T. Cunningham, 1324 Garfield Ave., Wyomissing, Pa. 19610

Filed Dec. 4, 1975, Ser. No. 637,865

Int. Cl.^{2} C12C *11/00;* **C12G** *3/00*

U.S. Cl. 426—14 **3 Claims**

1. A continuous process for producing ethyl alcohol from cereal grains, said process consisting essentially of the steps of cutting and breaking said grain into small fragments to improve its wetting characteristics; wetting said small grain fragments by continuously forming a water slurry of the small grain fragments by mixing said grain with water at a temperature in the range of about 120° to 140° F; retaining said slurry for a period of not greater than about 2 to 3 minutes; cooking said wetted grain by continuously heating a flow of said grain slurry at a temperature above said temperature range for said wetting and not more than about 190° F to form a gelled mash thereof by passing an electric current through said grain-slurry at a current density of less than the electrical equivalent of 4.0 amperes at 120 Volts per square inch of electrode and maintaining said cooking of said grain slurry for a period of about 30 to 60 seconds to thereby prevent any form of hydrolysis of starch before enzymatic hydrolysis by malt occurs, and to form a gel of said starch; continuously recovering the gelled mash; adding malt to the sald gelled-mash; fermenting said mash with yeast and recovering alcohol therefrom.

4,035,516
PROCESS FOR MODIFYING FEEDING MATERIAL

Hans Gustav Jungvid, Veddige, Sweden, assignor to Astra Nutrition Aktiebolag, Molndal, Sweden

Filed Oct. 7, 1974, Ser. No. 512,946

Claims priority, application Sweden, Oct. 8, 1973, 7313637

Int. Cl.^{2} A23K *1/00*

U.S. Cl. 426—18 **7 Claims**

1. A method of modifying a feed mixture which comprises about 30–70% by weight of carbohydrate sources selected from the group consisting of corn, barley, wheat, rye, oats, soya beans, peas and beans, said carbohydrate sources forming substantially all of the carbohydrate material present in the modified feed mixture, said mixture further comprising proteins, fats, minerals and vitamins to provide a complete modified feed mixture for an animal, the method comprising fermenting all carbohydrate material present in the complete feed mixture with spore-forming hay bacteria for about 20–40 minutes.

4,035,517
PROCESS FOR TREATING THE RESIDUE FROM THE DISTILLATION OF WHITE WINE

Jean Magny; Charles Montant; Pierre Raynaud, all of Toulouse; Charles Gontier, Colomiers, and Jacques Dardenne, Toulouse, all of France, assignors to E. Remy Martin & Co., Cognac, France

Continuation-in-part of Ser. No. 503,679, Sept. 6, 1974, abandoned. This application July 8, 1975, Ser. No. 593,983

Claims priority, application France, Sept. 6, 1973, 73.32213

Int. Cl.^{2} A23L *1/28*

U.S. Cl. 426—31 **7 Claims**

1. Process for the treatment of residues from the distillation of white wines to produce protein feed which comprises the steps of dividing the residues into a sludge containing the wine making yeast and a clarified medium, cooling the clarified medium from which the yeasts have been removed until its temperature is between 20° and 25° C, innoculating said medium with a preculture produced by innoculating a like medium with a suspension containing a culture of a microorganism selected from the genus Penicillium, permitting said micro-organisms to develop in the medium while adjusting said medium to a pH of 1.5–5, separating and recovering the biomass produced from the culture medium, and treating the collected liquid after separation of the biomass to further purify it and recover the bio-synthesized molecules which it contains.

4,035,518
METHOD FOR OBTAINING AFLATOXIN-FREE FOOD PRODUCTS

Julian Y. Carmona, 279 Guevara Avenue, San Juan, Rizal, and Marcelo P. Marasigan, 6-Legaspi Street, Philamlife Homes, Quezon City, both of Philippines

Filed Oct. 6, 1975, Ser. No. 619,763

Claims priority, application Philippines, Jan. 15, 1975, 16720

Int. Cl.^{2} A01K *43/00*

U.S. Cl. 426—231 **30 Claims**

1. A method for separating a particulate food product from whole seed grains and whole or spit kernel nuts which is substantially free from aflatoxin comprising:

placing said particulate food product in an aqueous solution containing an alkaline, water-soluble, food compatible aflatoxin agent for a period of time sufficient for said aflatoxin-contaminated food particles to undergo a sharp, visually discernible change in color from almost white to deep dark brown, said aqueous solution being maintained at a temperature of about 180°–213° F;

removing said particulate food product from said aqueous solution; and,

separating the aflatoxin-contaminated food particles from the uncontaminated food particles.

4,035,519
PROCESS FOR PREPARATION OF EMULSIFIED WHEAT GLUTEN

Maher M. Abou-Guendia, Winnipeg, Canada, assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed May 22, 1975, Ser. No. 580,004

Int. Cl.^{2} A21D *2/16;* **A23J** *3/00*

U.S. Cl. 426—653 **10 Claims**

1. A process of preparing emulsified gluten comprising mixing water and gluten to form an aqueous mixture having at least about 45 to 65% water and 55 to 35% gluten, and uniformly dispersing into said aqueous mixture which is at a temperature of from about 45° to about 60° C, about 10 to 40% of melted hydrophilic or lipophilic emulsifier, said emulsifier being at a temperature less than that which will destroy the vitality of the gluten, said temperature being high enough to avoid immediate crystallization while facilitating easy mixing, the amount of said emulsifier being based on the total dry weight of the gluten and emulsifier.

4,035,520
IMAGING SYSTEMS

Joseph H. Moriconi, and Louis H. Burrows, Jr., both of Rochester, N.Y., assignors to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 315,958, Dec. 18, 1972, Pat. No. 3,916,065. This application Apr. 18, 1975, Ser. No. 569,342

Int. Cl.^{2} G03G *13/08, 9/02*

U.S. Cl. 427—19 **6 Claims**

1. An electrostatographic imaging process comprising the steps of providing an electrostatographic imaging member having a recording surface, forming an electrostatic latent image on said recording surface, and contacting said electrostatic latent image with a developer mixture comprising finely-divided toner particles electrostatically clinging to the surface of carrier particles having an average particle diameter of between about 50 microns and about 1,000 microns, said carrier particles consisting essentially of a metallic core coated with a thermoset crosslinked acrylic resin to form an adherent durable film of said resin on said core, said acrylic resin consisting essentially of esters of acrylic and methacrylic acids selected from the group consisting of a hydroxyl-functional resin crosslinked with nitrogen resins, a carboxyl-containing polymer crosslinked with epoxy resins, and a carboxyl-containing polymer which has been cured with melamine-formaldehyde resins, whereby at least a portion of said finely-

divided toner particles are attracted to and deposited on said recording surface in conformance with said electrostatic latent image.

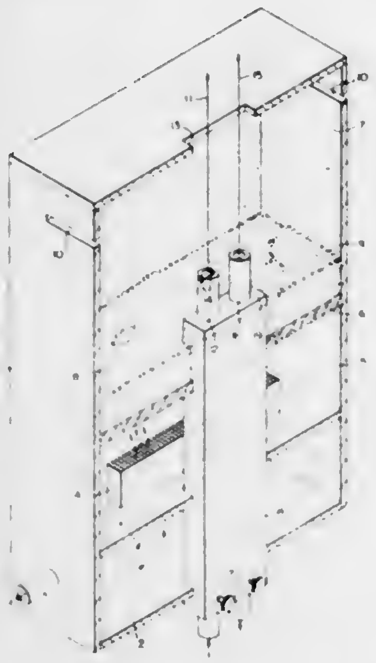
4,035,521
BUILD CONTROL FOR FLUIDIZED BED WIRE COATING

Dean C. Westervelt, Acme, Pa., and Robert E. Pierce, Abingdon, Va., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Division of Ser. No. 553,201, Feb. 26, 1975, Pat. No. 4,011,832. This application Aug. 10, 1976, Ser. No. 713,174

Int. Cl.² B05B *5/02*

U.S. Cl. 427—32 15 Claims



1. A method of controlling the build of an aerated powder on an elongated member which passes through said powder comprising at least partially shielding said elongated member from said aerated powder only on a portion of an outside cross-sectional perimeter of said elongated member, said shielding being without contact to said elongated member.

4,035,522
X-RAY LITHOGRAPHY MASK

Michael Hatzakis, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Continuation of Ser. No. 489,853, July 19, 1974, abandoned. This application Apr. 6, 1976, Ser. No. 674,191

Int. Cl.² B05D *3/06*

U.S. Cl. 427—43 5 Claims

1. In a method for making a mask of varying thickness for use with X-ray lithography to provide multilevel devices using a single exposure of X-rays comprising the steps of:

a. depositing a thin metal layer on the surface of a substrate, said layer and said substrate both being highly transparent to X-rays,
b. adherently applying a uniformly thick layer of electron-sensitive resist on the surface of said thin metal layer,
c. exposing an electron beam on preselected regions of said resist, in a single exposure step to a plurality of different selected areas of exposure having predetermined variable lengths of time the electron beam dwells on a selected area yielding variable densities of exposure to said electron beam,
d. developing all such exposed regions for the same time period until only the region of resist having had the greatest density of exposure is completely removed to provide a first opened region exposing a first portion of said surface of said thin metal layer but the other exposed regions of resist are only partially removed according to their densities of exposure, leaving the surface of said thin metal layer thereunder covered,
e. depositing a first layer of X-ray absorbing material into said first opened region onto said first portion and not where said resist remains,
f. developing said resist again until that region of said resist having had the second greatest density of exposure is removed to provide a second opening region exposing a second portion of said surface of said thin metal layer, but the other exposed regions of resist that have had a lesser density of exposure remain partially, leaving the portions of said thin metal layer thereunder covered by resist,
g. depositing a second layer of X-ray absorbing material into both said first and second opened regions onto said first and second portions to add an equal thickness of material on both said portions yielding a greater thickness of X-ray absorbing material on said first portion than on said second portion, and
h. repeating steps (d) and (e) in consecutive order until all exposed resist regions are opened and a mask is produced that includes deposits of X-ray absorbing material of varying thickness on each of said portions and is accordingly differentially absorbent of an X-ray beam at said different regions of said mask.

4,035,523
PROCESS FOR PRODUCING IMPROVED COATING COMPOSITIONS

Georgios (Georg) Pampouchidis, 31, Obere Teichstrasse, A-8010 Graz, Austria

Filed May 7, 1976, Ser. No. 684,193

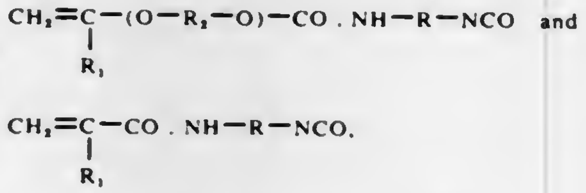
Claims priority, application Austria, May 7, 1975, 3521/75

Int. Cl.² B05D *3/06;* **C08F** *8/00*

U.S. Cl. 427—44 10 Claims

1. Process for producing improved coating compositions curable by electron beams whereby

a. about 1 mole of a non-aromatic cyclic dicarboxylic acid anhydride is reacted at from about 80° – 90° C. with from about 1 mole of a monohydroxyalkyl(meth)acrylate having from about 2 to 12 C-atoms in the alkyl radical, until substantially the acid value of the semiester is reached,
b. the semiester of (a) is reacted at from about 90° – 100° C. with a diepoxide until an acid value of below about 5 mg KOH/g is obtained, and
c. the reaction product of (b) is reacted at from about 70° – 80° C. with from about 5 – 90 mole percent calculated on the hydroxy groups present with at least one unsaturated monoisoyanate of the general formula selected from the group consisting of



$$CH_2{=}\underset{\displaystyle R_1}{\underset{|}{C}}{-}(O{-}R_2{-}O){-}CO\,.\,NH{-}R{-}NCO \quad \text{and}$$

$$CH_2{=}\underset{\displaystyle R_1}{\underset{|}{C}}{-}CO\,.\,NH{-}R{-}NCO.$$

wherein R is an aromatic, aliphatic or cycloaliphatic radical, R_1 is hydrogen or CH_3, and R_2 is a straight chain or branched hydrocarbon radical having from about 2 to 12 C-atoms, until an isocyanate value of substantially zero is obtained.

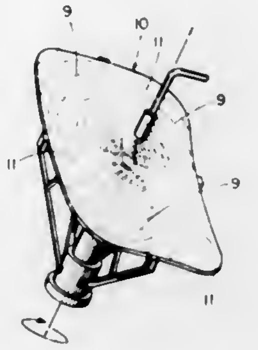
4,035,524
PROCESS FOR COATING A PHOSPHOR SLURRY ON THE INNER SURFACE OF A COLOR CATHODE RAY TUBE FACEPLATE

Kenneth L. Fritsch, Wheaton, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Apr. 1, 1976, Ser. No. 672,817

Int. Cl.² B05D *5/06, 3/12*

U.S. Cl. 427—68 21 Claims



1. A process for forming on an inner viewing surface of a color cathode ray tube having a flangeless faceplate a coating of an aqueous slurry composed of a photosensitized organic binder and a suspension of phosphor particles, said process comprising:

applying an aqueous pre-wet to the inner surface of the faceplate;
while said surface is still wet, applying a phosphor slurry to the pre-wetted inner surface of the faceplate; and
suffusing said slurry across said surface to form a coating thereon,
whereby as a result of said pre-wetting of said faceplate surface, the occurrence of radially oriented non-coated areas on said surface is eliminated and the phosphor sedimentation rate is enhanced.

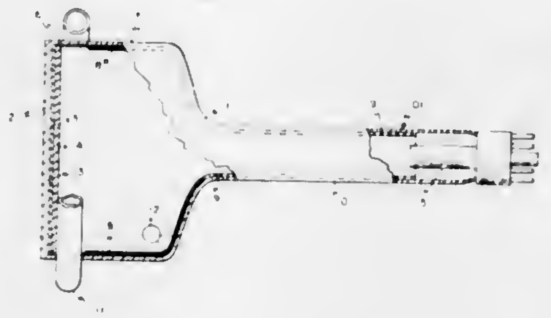
4,035,525
CATHODE RAY TUBE EMPLOYING FACEPLATE-DEPOSITED CATHODOCHROMIC MATERIAL AND ELECTRON BEAM ERASE

Lee T. Todd, Jr., Lexington, Ky., assignor to Massachusetts Institute of Technology, Cambridge, Mass.

Division of Ser. No. 457,111, April 1, 1974, Pat. No. 3,968,394. This application Feb. 11, 1976, Ser. No. 657,111

Int. Cl.² F21V *9/00;* **G03C** *5/02;* **H01J** *29/28*

U.S. Cl. 427—73 4 Claims



1. A process for preparing a cathodochromic screen material $Si_6O_{24} \cdot 2NaX$, wherein X is chosen from the group consisting essentially of chlorine, bromine, OH and iodine and mixtures thereof, that comprises, subjecting the material to low temperature anneal in air to reduce the threshold to the order of about 1 joule/cm², said low temperature being about 200° to 600° C for about 4 hours to 5 minutes, respectively. consisting of sensitized $Na_6Al_6Si_6O_{24} \cdot 2NaX$, wherein X is chosen from the group consisting essentially of chlorine, bromine, OH and iodine and mixtures thereof, that comprises, subjecting the material to low temperature anneal in air to reduce the threshold to the order of about 1 joule/cm², said low temperature being about 200° to 600° C for about 4 hours to 5 minutes, respectively.

4. A method of forming a cathode ray tube image screen and faceplate sandwich structure, that comprises: depositing upon the inner surface of the faceplate a transparent conductive coating to serve as an anode, depositing upon the conductive coating a layer of unsensitized particles which are insulating in nature; and depositing upon the layer of unsensitized particles a sensitized cathodochromic screen material whose threshold has been reduced to about 1 joule/cm² by low temperature anneal in air, the layer of unsensitized particles acting as a thermal buffer layer between the image screen and faceplate.

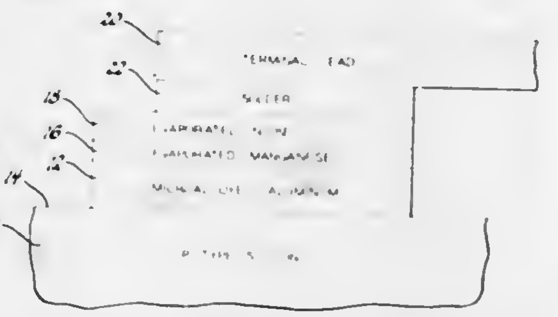
4,035,526
EVAPORATED SOLDERABLE MULTILAYER CONTACT FOR SILICON SEMICONDUCTOR

Mark L. Konantz, Indianapolis, and Ronald K. Leisure, Kokomo, both of Ind., assignors to General Motors Corporation, Detroit, Mich.

Division of Ser. No. 605,979, Aug. 20, 1975, Pat. No. 3,990,094. This application June 1, 1976, Ser. No. 691,338

Int. Cl.² B44D *1/14, 1/18*

U.S. Cl. 427—90 2 Claims



1. A method of forming an improved solderable multilayer electrode on a silicon body comprising the steps of:

vacuum depositing an aluminum layer at least about 3000 angstroms thick onto a surface of a silicon body,
heating said silicon body and said aluminum layer to shallowly alloy said aluminum layer with the silicon of said body at their interface and reduce electrical resistance between said layer and said body,
thereafter evaporating onto said alloyed aluminum layer a continuous film of manganese having an average thickness of at least about 800 angstroms, and
evaporating nickel onto said manganese film to form a nickel layer at least about 3000 angstroms thick.

4,035,527
METHOD OF PROVIDING A PHOTOTROPIC LAYER ON A CARRIER

Emil W. Deeg, Woodstock, Conn., assignor to American Optical Corporation, Southbridge, Mass.

Filed Nov. 29, 1974, Ser. No. 527,987

Int. Cl.² G02B *5/23;* **B05D** *5/06*

U.S. Cl. 427—169 4 Claims

1. That method of rendering at least one major surface of an optical or ophthalmic organic or inorganic lens phototropic comprised of the steps:

a. preparing a clean lens surface to be treated;
b. preparing a liquid temporary-carrier of a stable solution of a mixture of silicon containing metal organic compound and a metal organic compound containing boron and phosphorous with nitric acid and copper nitrate and silver nitrate, said mixture being pyrolyzable to form a glassy matrix comprising SiO_2, P_2O_5, and B_2O_3 and mixtures thereof for the phototropic material to be placed on the lens;
c. exposing the said clean lens surface to said temporary-

carrier and phototropic-layer-forming material under conditions capable of depositing a thin, hard, scratch-resistant glass layer over said lens surface, said layer having substantially uniformly distributed therewith color centers which, when subjected to ultraviolet or shortwave visible light exhibit reversible absorption thereof.

4,035,528
COATING SUBSTRATE WITH POLYOLEFIN/POLYCARBONAMIDE POWDER COMPOSITIONS

Wassily Poppe, Lombard, and Ivor R. Fielding, Naperville, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 483,923, June 28, 1974, Pat. No. 3,968,280. This application Dec. 4, 1975, Ser. No. 637,528

Int. Cl.^{2} B05D *3/02, 3/08*

U.S. Cl. 427—195 **5 Claims**

1. The method of forming a substrate bearing a layer comprising from about 25 to 90 parts by weight of a polyolefin and from about 75 to 10 parts by weight of a polycarbonamide of a dicarboxylic acid having at least 18 carbon atoms, which comprises applying a composition comprising from about 25 to 90 parts by weight of polyolefin particles and from about 75 to 10 parts by weight of particles of a polycarbonamide of a dicarboxylic acid having at least 18 carbon atoms to a substrate and fusing the polymer particles by heat at a temperature of about 190° to 230° C.

4,035,529
COATING THE BACK OF A TEXTILE FLOOR COVERING WITH A POLYURETHANE FOAM

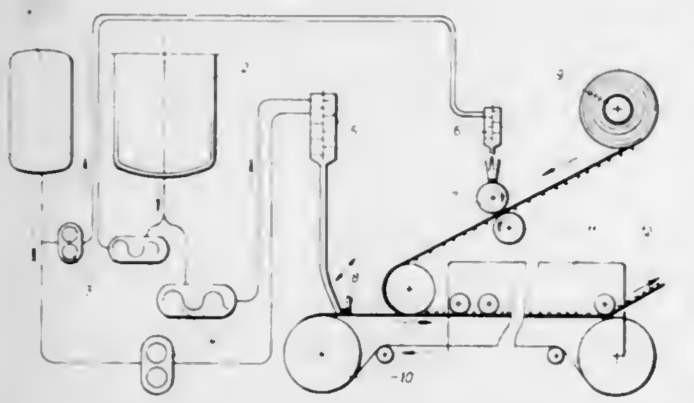
Ernst Meisert, Leverkusen; Klaus Recker, Cologne; Gerhard Grögler, Leverkusen; Cornelius Muhlhausen, Gladenbach, and Gerd Reinecke, Schildgen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 7, 1975, Ser. No. 602,943

Claims priority, application Germany, Aug. 22, 1974, 2440271

Int. Cl.^{2} B05D *5/00, 3/02*

U.S. Cl. 427—244 **4 Claims**



1. A process for coating the back of a textile floor covering with a polyurethane foam comprising:

a. applying a reacting foamable or reacting prefoamed mixture of a polyol and a polyisocyanate directly to the back of said textile floor covering, the NCO to OH equivalent ratio in said reacting foamable or reacting prefoamed mixture being from 1.5:1 to 3.5:1;

b. applying to said reacting foamable or reacting prefoamed mixture before said reacting foamable or reacting prefoamed mixture has fully reacted a second reacting foamable or reacting prefoamed mixture of a polyol and a polyisocyanate, the NCO to OH equivalent ratio in said second mixture being from 0.95:1 to 1.25:1; and

c. allowing the composite material of step (b) to harden, thereby forming said foam coating.

4,035,530
METHOD OF INHIBITING SULFIDATION AND MODIFYING DEPOSITS

Stephen H. Stoldt, Dover, N.J., assignor to Apollo Chemical Corporation, Whippany, N.J.

Filed May 7, 1976, Ser. No. 684,391

Int. Cl.^{2} C23C *11/04, 11/08*

U.S. Cl. 427—252 **10 Claims**

1. A method of inhibiting hot sulfidation corrosion of a metal surface and rendering any deposit thereon more readily removable, comprising the step of applying to such metal surface, including any such deposit thereon, an inhibitor-modifier selected from the group consisting of

1. a mixture of chromium and manganese, said mixture containing chromium and manganese in a molar ratio of at least 1:1,
2. the combustion product of a solution containing a soluble chromium compound and a soluble manganese compound, said solution containing chromium and manganese in a molar ratio of at least 1:1,
3. a combination of said mixture and said combustion product.

4,035,531
PROCESS FOR WARP SIZING AND HYDROPHILIC FINISHING OF POLYESTER FILAMENTS AND FABRIC

John C. Lark, St. Charles, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed May 30, 1975, Ser. No. 582,356

Int. Cl.^{2} B05D *3/02*

U.S. Cl. 427—390 R **10 Claims**

1. A process of warp sizing textile filaments which comprises the steps of (1) coating said textile filament with an aqueous solution of a water-soluble polyester reaction product consisting essentially of a dihydric alcohol having two to six carbon atoms and an aromatic polycarboxylic acid compound having three, four or five carboxy groups and (2) drying said polyester on said textile filaments, the said alcohol and said acid compound being reacted in a mole ratio where the ratio of acid to alcohol is greater than unity, wherein the acid number of said reaction product is within the range of from 160 to 320 grams of KOH per gram of said product.

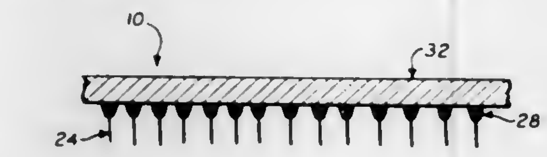
4,035,532
TRANSFER FLOCKING AND LAMINATES OBTAINED THEREFROM

Razmic S. Gregorian, Aiken, S.C., and Hans R. Hoernle, Augusta, Ga., assignors to United Merchants and Manufacturers, Inc., New York, N.Y.

Filed Nov. 11, 1975, Ser. No. 630,799

Int. Cl.^{2} B05D *1/14, 1/16;* **B32B** *33/00*

U.S. Cl. 428—90 **14 Claims**



1. An air permeable laminate comprising:

a. a substrate backing layer;

b. a facing layer of flock fibers; and

c. an adhesive binder interlayer securing the flock fibers to the substrate, a major portion of the binder being present substantially at the tips of the flock fibers and at the corresponding point of contact on the substrate layer to which the flock fibers are secured.

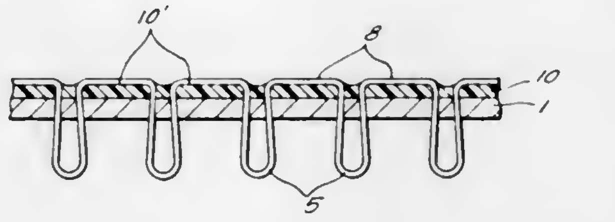
4,035,533
TUFTED CARPET WITH MELTABLE-FILM PRIMARY-BACKING COMPONENT

Philip Wayne Chambley, Rome, Ga., assignor to Champion International Corporation, Stamford, Conn.

Filed June 1, 1976, Ser. No. 691,371

Int. Cl.^{2} B32B *33/00*

U.S. Cl. 428—95 **10 Claims**



1. A tufted pile carpet, comprising a primary backing layer having a front side and a rear side; a thermally meltable film layer of synthetic plastic material on said rear side; and pile-forming yarn tufted from said rear side through both of said layers to form a pile at said front side and loops at said rear side, said film layer being melted subsequent to tufting of said yarn through said layers so as to bond said loops firmly to said rear side of said primary backing layer.

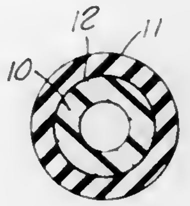
4,035,534
HEAT-SHRINKABLE LAMINATE

David D. Nyberg, Sunnyvale, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Sept. 1, 1972, Ser. No. 285,567

Int. Cl.^{2} F16L *9/14;* **B32B** *31/00;* **H02G** *15/02;* **B29C** *27/00*

U.S. Cl. 428—36 **6 Claims**



1. A heat recoverable tubular member having at least one surface which is elastomeric material comprising, in combination: an inner tube, a co-axial outer tube, means forming a bond between the outer surface of the inner tube and the inner surface of the outer tube, one of the tubes being formed of a heat recoverable cross-linked thermoplastic polymer which maintains the elastomeric material in a stretched configuration, the other tube being formed of elastomeric material, the bonded tubes being held in the heat recoverable state by the tube formed of the thermoplastic polymer, prior to the application of heat whereby the tube of elastomeric material is maintained in a stretched condition until application of sufficient heat to the heat recoverable polymer to allow recovery of the heat recoverable polymeric tube thus resulting in recovery of the elastomeric tube to a smaller diameter.

4,035,535
SOUND ATTENUATING STRUCTURE

Maurice Ian Taylor, Allestree, England, assignor to Rolls-Royce (1971) Limited, London, England

Filed Feb. 2, 1976, Ser. No. 654,706

Claims priority, application United Kingdom, Feb. 14, 1975, 06316/75

Int. Cl.^{2} B32B *3/12*

U.S. Cl. 428—116 **7 Claims**

1. A sound attenuating sandwich structure comprising:

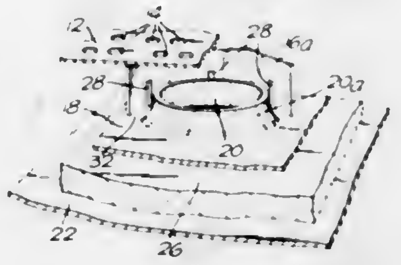
a first perforate sheet member having a plurality of perforations of predetermined size therein;

a second perforate sheet member spaced from said first perforate sheet member and having a lesser plurality of perforations therein than the plurality of perforations of said first sheet member, each of the perforations of said second sheet member being greater in size than the perforations of said first sheet member, and each of the perforations of said second sheet member being defined by a flanged wall extending toward and terminating short of said first sheet member;

a spaced cell honeycomb layer disposed between said first and second sheet members, said honeycomb layer having a plurality of walls defining cells of the same, each of said cells of said honeycomb layer being disposed about a plurality of perforations of said first sheet member and only one perforation of said second sheet member, and the walls of each cell defining with said flanged wall of each perforation of said second sheet member a moat extending about the same, and apertures in the walls of each cell for providing communication between adjacent cells, the apertures in the walls of said cells being at least partially coextensive with the moats about the perforations in said second sheet member;

an impervious backing sheet member spaced from said second sheet member in a direction away from said first sheet member; and

a layer of bulk sound absorber material disposed between said second sheet member and said impervious backing sheet member.



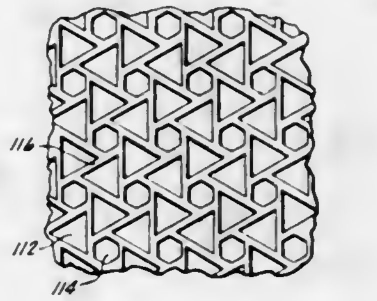
4,035,536
SANDWICH PANEL CORE

Hadley F. Morrison, Downey, Calif., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Mar. 3, 1975, Ser. No. 554,615

Int. Cl.^{2} B32B *3/12*

U.S. Cl. 428—118 **6 Claims**



1. A flat sandwich panel core deformed from a single flat sheet of material, said core having channel-shaped ribs in a repetitive pattern of triangles and hexagons, each hexagon having six equilateral triangles positioned therearound, and wherein each side of the hexagon is extended to a side of another hexagon, forming a triangle leg inbetween, said triangle leg being longer than the side of the hexagon.

4,035,537

THERMAL INSULATING INTERLINING IN WEB FORM FOR TEXTILES

Klaus Heckel, Weinheim, and Friedemann Klaffke, Gorxheim, both of Germany, assignors to Firma Carl Freudenberg, Weinheim, Germany

Filed Apr. 29, 1976, Ser. No. 681,635

Claims priority, application Germany, May 5, 1975, 7514101[U]

Int. Cl.² B32B *3/26*

U.S. Cl. 428—155 **4 Claims**

1. In a thermal insulating and flotational interlining material for textile fabrics comprising a foam sheet-laminated to an extensible textile sheet material, the improvement wherein said foam sheet is a closed-pore, cross-linked foamed polyolefin provided with an arrangement of slits rendering it extensible in at least one direction common with said sheet material, whereby said interlining material is extensible.

4,035,538

CORE BLOCK FOR PLYWOOD AND METHOD AND APPARATUS FOR FORMING SAME

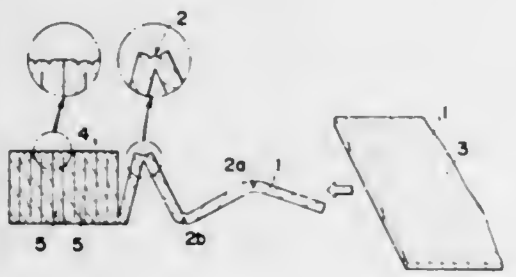
Sachio Maekawa, Aichi, and Tadashi Aizawa, Nagoya, both of Japan, assignors to Hashimoto Denki Co., Ltd., Japan

Filed Nov. 12, 1975, Ser. No. 631,464

Claims priority, application Japan, Nov. 26, 1974, 49-135118; Feb. 17, 1975, 50-18786; Feb. 17, 1975, 50-18787

Int. Cl.² B32B *3/28, 31/18*

U.S. Cl. 428—155 **1 Claim**



1. A plywood core block comprising a single thin flat wood sheet having slits therein extending in the direction of the grain thereof, said slits being substantially equally spaced and defining therebetween wood portions, said slits being alternately formed in oposite surfaces of said sheet, each of said slits having a depth equal to from one-half to two-thirds the thickness of said sheet, said sheet being folded at said slits in a zig-zag manner, with adjacent of said sheet portions adhered together by adhesive in close side-by-side contact, thus forming an integral and rigid core block, the heights of all of the thus folded sheet portions being equal.

4,035,539

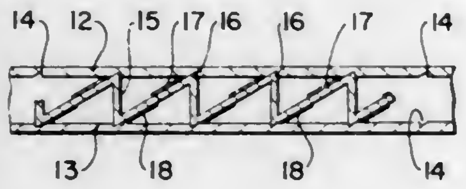
STRUCTURAL PANEL

Sergius N. Ferris Luboshez, 3530 Pinetree Terrace, Falls Church, Va. 22041

Filed May 12, 1976, Ser. No. 685,520

Int. Cl.² B32B *3/12, 3/28*

U.S. Cl. 428—178 **16 Claims**



1. A structural unit comprising:

a first sheet of radiation transmitting material, at least part of which is translucent;

a second sheet of radiation transmitting material, at least part of which is translucent and part of which is radiation reflective;

said second sheet being corrugated to present at one face alternate corrugation crests and valleys with the bottoms of the valleys at each of its faces being the crests at the opposite of its faces;

said second sheet being disposed with said one face facing toward said first sheet and with said crests juxtaposed against said first sheet; and

a third sheet of radiation transmitting material, at least part of which is translucent, disposed with one face facing said opposite face of the second sheet and juxtaposed against the crests of the corrugations at said opposite face of the second sheet;

at least portions of said crests at said one face being fixedly bonded to said first sheet so as to form therewith a rigid trussed structure; and

at least portions of said crests of said opposite face of the second sheet being fixedly bonded to said third sheet so that the three sheets form a rigid trussed panel.

4,035,540

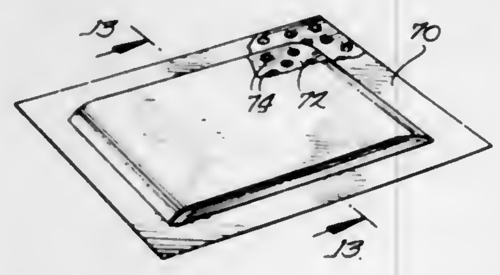
NON-WOVEN FABRICS BONDED WITH PH SENSITIVE FILM-FORMING SILANE CROSSLINKED ACRYLATE INTERPOLYMERS

Robert J. Gander, Whitehouse, N.J., assignor to Johnson & Johnson, New Brunswick, N.J.

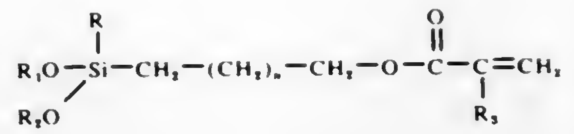
Division of Ser. No. 505,414, Sept. 12, 1974, Pat. No. 3,951,893, which is a continuation-in-part of Ser. No. 90,539, Nov. 18, 1970, abandoned. This application Dec. 29, 1975, Ser. No. 645,046

Int. Cl.² B32B *7/14;* **A61F** *13/16*

U.S. Cl. 428—198 **7 Claims**



1. A non-woven fabric dispersible in aqueous media having a pH substantially outside the range of about 4.5 to about 8.5 comprising a web of overlapping, intersecting fibers bonded together with a film-forming polymeric composition having water-barrier properties at neutral pH's in the range of between about 4.5 and about 8.5 and solubilizable at a pH substantially outside said neutral pH range, said composition comprising a silane-crosslinked interpolymer of about 0.5 to 5 parts by weight of a first monomer selected from the group consisting of the alkyl acrylates wherein the alkyl group has from one to eight carbon atoms, and about 1 part by weight of a second monomer selected from the group consisting of acrylic acid, methacrylic acid, fumaric acid, maleic acid, maleic anhydride, itaconic acid, dimethylaminoethyl acrylate, dimethylaminoethyl methacrylate, diethylaminoethyl acrylate, diethylaminoethyl methacrylate, tert.-butylaminoethyl acrylate and tert.-butylaminoethyl methacrylate, and about 0.9 to 1.5% by weight, based on the combined weight of said first and second monomers, of a crosslinking monomer selected from the group consisting of the silane monomers having the structural formula:



$$R_1O-\overset{\overset{\displaystyle R}{|}}{\underset{\underset{\displaystyle R_2O}{/}}{Si}}-CH_2-(CH_2)_n-CH_2-O-\overset{\overset{\displaystyle O}{\|}}{C}-\underset{\underset{\displaystyle R_3}{|}}{C}=CH_2$$

wherein:

R is selected from the group consisting of $CH_3—$, $CH_3CH_2—$, $CH_3O—$ and $CH_3CH_2O—$;

R_1 and R_2 are each selected from the group consisting of $CH_3—$ and $CH_3CH_2—$;

R_3 is selected from the group consisting of $H—$, $CH_3—$ and $CH_3CH_2—$;

and *n* is 0 or a positive integer not greater than 8.

4,035,541

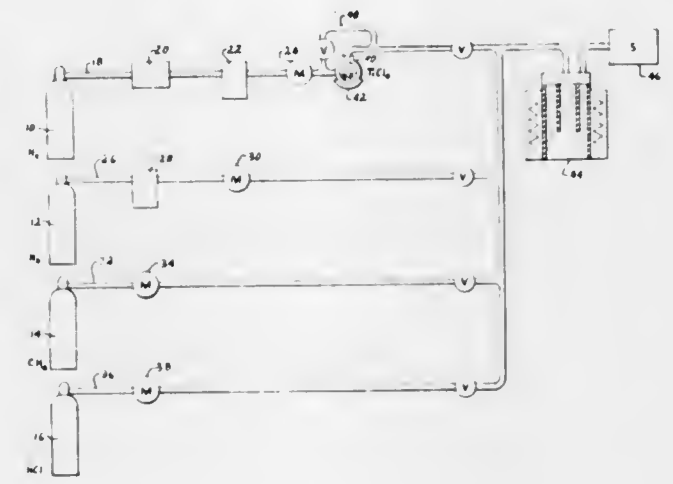
SINTERED CEMENTED CARBIDE BODY COATED WITH THREE LAYERS

Emlyn N. Smith, Ligonier, and Louis F. Pochet, Latrobe, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Filed Nov. 17, 1975, Ser. No. 632,608

Int. Cl.² B32B *15/04;* **C23C** *11/08, 11/18*

U.S. Cl. 428—217 **9 Claims**



1. A coated cemented carbide product comprising: a sintered cemented metal carbide substrate; a first coating firmly and adherently bonded to said substrate and an eta phase in said substrate immediately beneath said first coating, said first coating comprising a carbide of a metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, niobium and tantalum; a second coating bonded onto said first coating and comprising a carbo-nitride of said selected metal; a third coating bonded on said second coating and comprising a nitride of said selected metal.

4,035,542

FLAME RETARDANT FIBER BLEND CONTAINING FIBERS WHICH IF PRESENT APART FROM THE ADMIXTURE UNDERGO BURNING

Arnold J. Rosenthal, Whippany; Alex S. Forschirm, Lake Hiawatha, both of N.J., and Bruce P. Barnes, Charlotte, N.C., assignors to Celanese Corporation, New York, N.Y.

Filed May 16, 1974, Ser. No. 470,420

Int. Cl.² D03D *25/00*

U.S. Cl. 428—224 **56 Claims**

1. A flame retardant admixture of fibers comprising:

a. discrete fibers which if present apart from said admixture undergo burning when subjected to a methane diffusion flame in an oxygen-containing gaseous atmosphere having an oxygen content selected from within the range of about 20 to 40 percent by volume, and

b. discrete fibers of a synthetic aromatic polymer containing chlorine, bromine, or mixtures thereof chemically bound to an aromatic ring having a chlorine and/or bromine content of about 25 to 50 percent by weight based upon the weight of said aromatic polymer and the inherent ability to render said admixture as a whole non-burning when subjected to said flame in said oxygen-containing gaseous atmosphere of the same oxygen content.

4,035,543

LAMINATE SUITABLE AS HYDROCARBON RESISTANT POND LINER

Homer L. Draper, and Duane W. Gagle, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 1, 1975, Ser. No. 573,487

Int. Cl.² B32B *7/00*

U.S. Cl. 428—245 **9 Claims**

1. A pond liner comprising strips of laminate, said laminate comprising polyethylene film having a thickness of about 10 to about 50 mils and a density of about 0.905 to about 0.925 heat bonded to polypropylene fiber having a weight of about 100 g/m² to about 250 g/m² chosen from (1) woven fabric and (2) needle-punched non-woven batt with said non-woven batt heat fused on at least one side, wherein said strips of laminate are sealed with a liquid-tight seam.

4,035,544

ASPHALT ROOFING AND METHOD OF MAKING SAME

Hajime Iwasaki, and Yasuo Tomita, both of Tokyo, Japan, assignors to Mitsuboshi Sangyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 11, 1975, Ser. No. 612,565

Claims priority, application Japan, Sept. 12, 1974, 49-104327

Int. Cl.² B32B *11/02*

U.S. Cl. 428—291 **5 Claims**

1. In a method of producing an asphalt roofing including:

preparing a bulky non-woven fabric having substantial thickness made of filaments of synthetic fibers randomly intertwined with each other, and

continuously feeding said non-woven fabric through a bath of molten asphalt, whereby said fabric is progressively saturated with asphalt while it is continuously moving through said molten asphalt,

the improvements comprising:

maintaining a temperature gradient in said bath of molten asphalt with a lower temperature near the surface to a higher temperature at the bottom thereof; and

feeding said non-woven fabric downward along a vertical path to the bottom of said bath and then upward along an inclined path toward the atmosphere, whereby said non-woven fabric moving through said molten asphalt bath is first preheated and an asphalt film formed on both surfaces thereof as it first enters said bath; said films are progressively fluidized and the air contained in said fabric is gradually moved upward within said fabric itself as said fabric moves vertically downward through said asphalt bath; said asphalt films, successively fluidized as said fabric moves through said bath, progressively penetrate into said fabric from which the air has moved upward until said asphalt completely penetrates to the center of said fabric; and finally, said completely asphalt-penetrated fabric is gradually cooled and formed with asphalt films on both surfaces thereof as it comes out of said bath into the atmosphere, thereby forming a bulky asphalt roofing completely saturated with asphalt.

4,035,545
HEAT-RESISTANT POROUS STRUCTURAL MATERIAL

Albert Bonevich Ivanov, ulitsa Miklukho-Maklaya, 43, kv. 17; Jury Leonidovich Krasulin, ulitsa Angarskaya, 65, kv. 123, and Lev Kimovich Gordienko, Kutuzovsky prospekt, 18, kv. 48, all of Moscow, U.S.S.R.

Filed June 21, 1976, Ser. No. 697,730
Int. Cl.^{2} B32B *5/16, 15/00*
U.S. Cl. 428—328 **5 Claims**

1. A heat-resistant porous structural material, comprising 50–75 volume percent of microspheres of high-melting point oxides with a melting point in excess of 1700° C, said microspheres being 10–200 mu in diameter and being sintered directly with each other so that the diameter of contact of said microspheres amounts to 0.2–0.5 of said microsphere diameter.

4,035,546
STRIPPABLE ANTI-FOULING COVERING FOR MARINE STRUCTURES

Emile Ruppert, Jr., 880 Caldwell Ave., Union, N.J. 07083

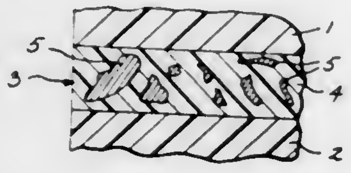
Filed Feb. 4, 1976, Ser. No. 654,993
Int. Cl.^{2} B32B *7/02;* **C03C** *17/00*
U.S. Cl. 428—332 **9 Claims**

1. A strippable covering for the protection of marine structures from fouling in contact with water which consists essentially of a sheet-like, water-insoluble base prepared from a synthetic, thermoplastic, polymeric material selected from the group consisting of polyvinyl acetate, polyvinyl chloride and polyethylene, ranging in thickness from 4 to 8 mils said base coated on one side thereof with a water insoluble, pressure-sensitive acrylic adhesive material comprising homopolymers ad copolymers of acrylic acid and acrylic acid esters, ranging in thickness from about 0.5 **to about** 2 mils, said base coated on the opposite side thereof with an anti-foulant composition comprising a film- forming component in an amount ranging from about 11 to about 17% by weight, said film-forming component comprising wood rosing and polyvinyl chloride, a pigment component in an amount of about 52% by weight, said pigment component comprised of metal oxide salts having anti-foulant activity in an amount of 98% of said pigment component, an extender component present in about 32% by weight, said extender component comprising aromatic hydrocarbons and ketones, and a plasticizer component present in an amount of about 2% by weight, wherein all percentages by weight are determined with reference to said anti-foulant composition, and wherein said anti-foulant composition is provided in a thickness, when dry of about 2 mils.

4,035,547
BONDING ELEMENT HAVING SEPARATE HEATING AND AGITATING PARTICLES

William C. Heller, Jr., Milwaukee, Wis., and Alfred F. Leatherman, Columbus, Ohio, assignors to William C. Heller, Milwaukee, Wis.

Division of Ser. No. 445,983, Feb. 26, 1974, Pat. No. 3,941,641. This application Dec. 4, 1975, Ser. No. 637,753
Int. Cl.^{2} B32B *5/16, 27/00*
U.S. Cl. 428—329 **6 Claims**



1. In a bonding element having a surface for fusion bonding to another surface, both of said surfaces being heat softenable, the improvement comprising a plurality of different first and second particles dispersed throughout the heat softenable material of the element, said first particles responding to a high-frequency magnetic field above the audio-frequency range to generate heat for raising of the surface to a bonding temperature and second particles different than said first particles and responding to a second magnetic field in the audio-frequency range to move in response to said second magnetic field and thereby establish agitation of the surface at such bonding temperature.

4,035,548
LAMINATED ARTICLES PREPARED FROM TRANSPARENT, NON-BLOOMING POLY(LACTONE-URETHANE) INTERLAYERS

Wen-Hsuan Chang, Gibsonia, and Vernon G. Ammons, Glenshaw, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 639,724, Dec. 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 474,645, May 30, 1974, abandoned. This application Sept. 30, 1976, Ser. No. 728,371
Int. Cl.^{2} C08G *18/64;* **B32B** *27/40*
U.S. Cl. 428—412 **9 Claims**

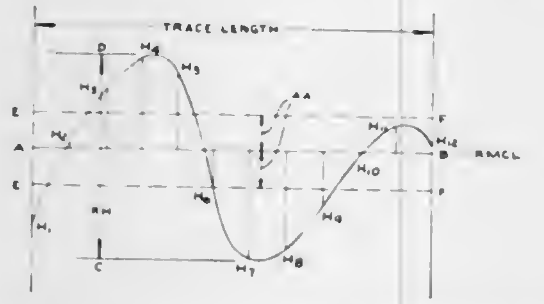
1. An energy-absorbing laminate comprising at least one rigid transparent sheet laminated to a flexible non-blooming layer of a polyurethane comprising the polymerizate of:

A. an organic polyisocyanate,
B. a polylactone polyol having a hydroxyl number within the range of 62 to 140 inclusive formed from polymerizing an unsubstituted lactone having 6 to 8 carbon atoms with an organic polyhydroxyl-containing compound selected from the class consisting of:
    1. aliphatic diols free of alkyl substitution and oxyalkylated products of these diols,
    2. a hydroxyl-terminated polyester having a hydroxyl number below 600 formed from an organic polycarboxylic acid containing from 3 to 10 carbon atoms and aliphatic diols free of alkyl substitution and oxyalkylated products of these diols,
C. a compound containing at least two active hydrogens per molecule reactive with the isocyanate group having a molecular weight less than 250 selected from the class consisting of aliphatic diols free of alkyl substitution, aliphatic triols and mixtures thereof.

4,035,549
INTERLAYER FOR LAMINATED SAFETY GLASS

George A. Kennar, East Longmeadow, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed May 19, 1975, Ser. No. 578,710
Int. Cl.^{2} B32B *27/40;* **B22D** *11/126*
U.S. Cl. 428—409 **9 Claims**



1. An interlayer for laminated safety glass wherein at least one surface of the interlayer is characterized by having:

A. an Arithmetic Average roughness in the range of from 12 to 18 × 10^{-5} inches as calculated around a roughness mean centerline drawn through the peaks and valleys on the surface of the interlayer;
B. a Roughness Height in the range of from 48 × 10^{-5} to 72 × 10^{-5} inches; wherein at a distance of 0.4 mil or less from the mean centerline going in the direction to the center of the interlayer there are substantially no valleys on the surface of the interlayer.

6. A plasticized polyvinyl butyral interlayer for laminated safety glass wherein the polyvinyl butyral contains from 9 to 25 percent by weight of hydroxyl groups calculated as polyvinyl alcohol and 0 to 3 percent by weight of acetate groups calculated as polyvinyl acetate wherein at least one surface of the interlayer is characterized by having: ,

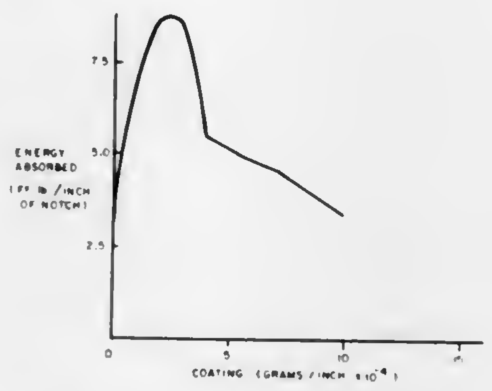
A. an Arithmetic Average roughness in the range of from 12 to 18 × 10^{-5} inches as calculated around a roughness mean centerline drawn through the peaks and valleys on the surface of the interlayer;
B. a Roughness Height in the range of from 48 × 10^{-5} to 72 × 10^{-5} inches;

wherein at a distance of 0.4 mil or less from the mean centerline going in the direction to the center of the interlayer there are substantially no valleys on the surface of the interlayer.

4,035,550
FIBER REINFORCED COMPOSITE OF HIGH FRACTURE TOUGHNESS

Nam P. Suh, Sudbury; Terence J. Jones, Medford, and Nak-Ho Sung, Needham, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Dec. 23, 1974, Ser, No. 535,358
Int. Cl.^{2} B32B *9/00;* **D02G** *3/00*
U.S. Cl. 428—339 **21 Claims**



1. An article of manufacture comprising a solid plastic composite having fibers dispersed therethrough, a portion at least of said fibers being coated with a fluid having a viscosity of at least 25 CPS, said coating being of a thickness sufficient to increase the impact resistance of said plastic composite and said fluid being substantially immiscible and nonreactive with the plastic of said matrix, curing agents for said plastic and the material of said fibers.

13. A method for substantially increasing the impact strength of a fiber reinforced plastic composite, said method comprising coating at least a portion of said fibers with a fluid prior to their incorporation into the plastic matrix of said composition, said coating being of a thickness sufficient to increase the impact resistance of said plastic composite and said fluid having a viscosity of at least 25 CPS and being substantially immiscible and non-reactive with the plastic of said composite, curing agents for said plastic and the material of said fibers.

4,035,551
ELECTROLYTE RESERVOIR FOR A FUEL CELL

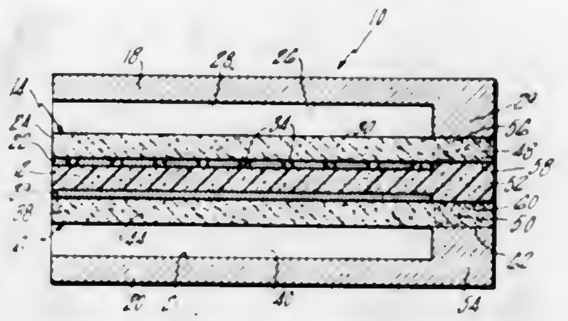
Paul E. Grevstad, West Hartford, Conn., assignor to United Technologies Corporation, Hartford, Conn.

Filed Sept. 1, 1976, Ser. No. 719,877
Int. Cl.^{2} H01M *8/02*
U.S. Cl. 429—44 **13 Claims**

1. In a fuel cell comprising an electrolyte retaining matrix, an anode catalyst layer in contact with one side of said matrix and a cathode catalyst layer in contact with the other side of said matrix, each of said catalyst layers including both hydrophilic and hydrophobic pores, the improvement comprising:

a reservoir layer in intimate contact with essentially the entire non-matrix facing side of at least one of said catalyst layers, said reservoir layer being continuous, porous, totally hydrophilic to the electrolyte, and essentially free from catalyst, said reservoir layer having a range of pore sizes randomly distributed throughout with substantially no pores smaller than the largest pores of said matrix and having the characteristic that during cell operation it is simultaneously partially filled with electrolyte and gas porous; and

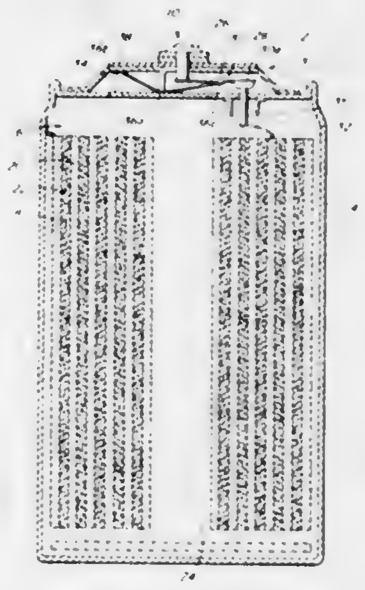
means defining a reactant gas space adjacent the non-catalyst facing side of said reservoir layer.



4,035,552
ELECTROCHEMICAL CELL

James Epstein, Sharon, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Filed July 23, 1976, Ser. No. 708,141
Int. Cl.^{2} H01M *10/34*
U.S. Cl. 429—58 **6 Claims**



1. An electrochemical cell comprising:

a hermetically sealed housing having an outwardly deformable wall section;

an electrochemical system disposed within the housing and including a pair of electrodes respectively forming an anode and a cathode, and an electrolyte in contact therewith;

a cover assembly affixed to the housing, at least a portion of which serves as a first terminal associated with one of the electrodes;

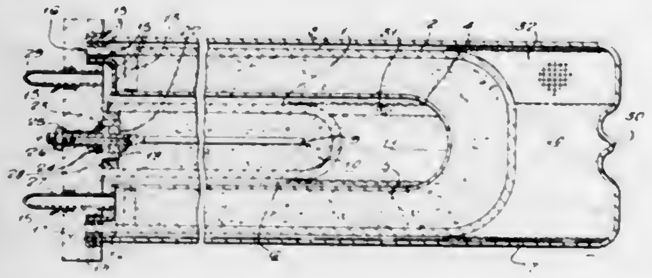
a second terminal associated with the second electrode; and

a normally closed thermal switch disposed between the cover assembly and the housing and electrically connected between one of the electrodes and its associated terminal, the switch being arranged to open-circuit the internal electrical circuit of the cell when the cell temper-

ature exceeds a pre-selected level to interrupt cell discharge,
the switch being responsive to the wall section deformation to open-circuit the internal electrical circuit of the cell to prevent cell discharge when the internal cell pressure exceeds a pre-determined level.

4,035,553
SODIUM-SULFUR ELECTRIC BATTERIES WITH CERAMIC SPACER IN SULFUR COMPARTMENT

Leslie Samuel Evans, Upper Basildon, and John Richard Harbar, Grove near Wantage, both of England, assignors to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, England
Continuation-in-part of Ser. No. 591,322, June 30, 1975. This application July 6, 1976, Ser. No. 702,726
Claims priority, application United Kingdom, Dec. 30, 1975, 53225/75
Int. Cl.² H01M *4/36*
U.S. Cl. 429—104 **9 Claims**

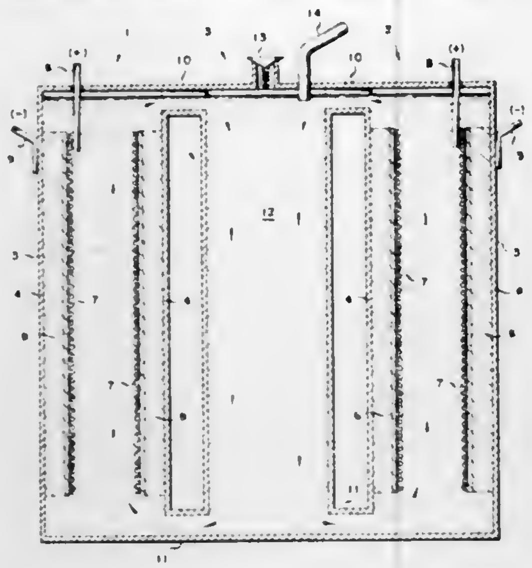


1. An electric cell comprising a solid electrolyte of blind-ended tubular form providing a compartment inside said solid electrolyte containing liquid sulphur impregnated in a graphite felt and bounding on the outside thereof a compartment containing liquid sodium, a ceramic support member of annular form joined to the solid electrolyte at the open end thereof by glass sealing means, a metallic closure member closing said liquid sulphur compartment and providing one of the terminals of the cell, a current collecting means of rod-like external form electrically connected to the closure member and supported therefrom and extending lengthwise along the liquid sulphur compartment, and a ceramic spacer means of annular form disposed concentrically in the liquid sulphur compartment adjacent to the glass sealing means and that portion of the solid electrolyte adjacent to the glass sealing means and extending beyond a portion of the solid electrolyte bounded on its other side by the extremities of the glass sealing means in the liquid sodium compartment.

4,035,554
SELF PUMPING ELECTROCHEMICAL CELL

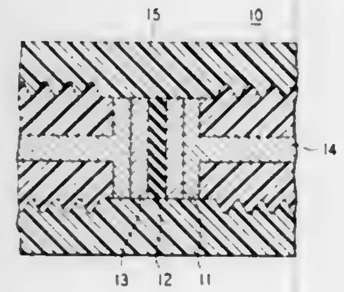
Harry J. Halberstadt, Los Altos, and Leroy S. Rowley, San Jose, both of Calif., assignors to Lockheed Missiles & Space Company, Inc., Sunnyvale, Calif.
Continuation of Ser. No. 494,929, Aug. 5, 1974, abandoned. This application Jan. 16, 1976, Ser. No. 649,591
Int. Cl.² H01M *6/04*
U.S. Cl. 429—80 **2 Claims**

1. A self-pumping reactive metal anode-aqueous electrolyte electrochemical cell consisting essentially of a vertical hollow tubular casing, a reactive anode bonded to the interior surface of said casing, said anode naturally forming on its surface a protective insulating film in the presence of water, an expandable coiled metal open-mesh screen cathode positioned within the interior of said tubular casing and contacting said insulating film over substantially all of the anode surface facing said cathode, said cathode pressing continuously against said insulating film during operation of said cell, and an aqueous electrolyte flowing through and filling the interior cavity of said hollow tubular casing, said electrolyte flow from the bottom to the top of said cell being caused solely by evolved heat and gas generated during the operation of said cell.



4,035,555
RECHARGEABLE NONAQUEOUS BATTERIES

Donald Winslow Murphy, Warren, and Forrest Allen Trumbore, Summit, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 4, 1976, Ser. No. 682,837
Int. Cl.² H01M *10/36*
U.S. Cl. 429—194 **9 Claims**

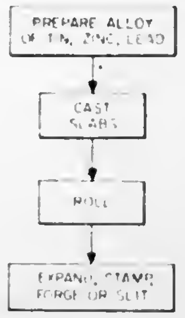


1. A nonaqueous secondary battery comprising a negative electrode, an electrolyte and a positive electrode in which the positive electrode contains as active material a substance which consists essentially of at least ninety weight percent niobium tetraselenide.

4,035,556
LEAD BASE ALLOY FOR USE IN A STORAGE BATTERY GRID

Joseph C. Duddy, Trevose, and Edward R. Hein, Doylestown, both of Pa., assignors to ESB Incorporated, Philadelphia, Pa.
Continuation of Ser. No. 135,922, April 21, 1971. This application Apr. 7, 1972, Ser. No. 241,914
Int. Cl.² H01M *4/66*
U.S. Cl. 429—245 **2 Claims**

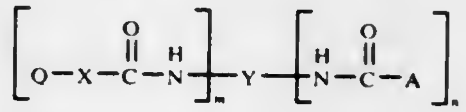
1. A lead base alloy for use in a storage battery grid comprising essentially from about 0.5 to 2% zinc, about 0.5% to about 2% tin, the balance lead and having a hardness when tested in a superficial hardness tester with a steel penetration ball 0.500 inch in diameter and a major load of 15 kilograms of at least 50.



4,035,557
POLYMERIC MATERIALS WITH SILANE END GROUPS

Frank N. Jones, Louisville, Ky., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Continuation-in-part of Ser. No. 329,156, Feb. 2, 1973, abandoned, which is a continuation-in-part of Ser. No. 133,424, April 12, 1971, abandoned, which is a continuation-in-part of Ser. No. 39,533, May 21, 1970, abandoned. This application Oct. 14, 1975, Ser. No. 622,430
Int. Cl.² C08F *20/18*
U.S. Cl. 526—14 **8 Claims**

1. A polymeric material represented by the structure



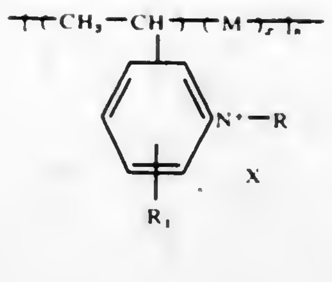
$$\left[Q-X-\overset{O}{\overset{\|}{C}}-\overset{H}{N}\right]_m-Y-\left[\overset{H}{N}-\overset{O}{\overset{\|}{C}}-A\right]_n$$

where
Q is a resinous polymeric or copolymeric segment of
  a. an ester of acrylic acid or methacrylic acid with an alkanol of 1–18 carbon atoms;
  b. styrene or acrylonitrile;
  c. a vinyl ester whose ester moiety contains 2–18 carbon atoms; or
  d. a vinyl ether;
X is the residue of a chain transfer agent;
Y is the residue of a di-, tri-, or tetraisocyanate radical after removal of isocyanate groups;
A is the residue of a mercapto-, hydroxy- or aminoalkyl alkoxy silane radical; and
m and *n* are 1, 2 or 3, the total not exceeding 4, provided that when *n* is 2 or 3, only one of A need be as defined.

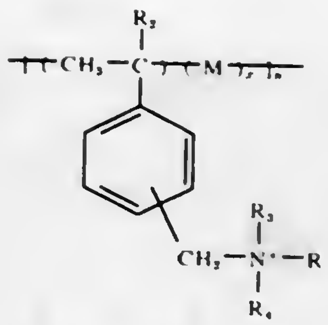
4,035,558
PROCESS FOR PRODUCING ORGANIC-INORGANIC POLYION COMPLEX

Toru Seita, and Akihiko Shimizu, both of Shin-nanyo, Japan assignors to Toyo Soda Manufacturing Co., Ltd., Yamaguchi, Japan
Filed Aug. 12, 1976, Ser. No. 713,648
Claims priority, application Japan, Aug. 20, 1975, 50-100228
Int. Cl.² C08F *8/00*
U.S. Cl. 526—29 **10 Claims**

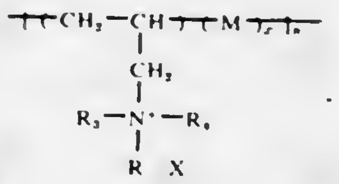
1. In a process for producing an organic-inorganic polyion complex by reacting a polycation polymer with an alkali silicate in the presence of a solvent, the improvement comprising:
reacting said silicate with a polycation polymer having repeating units selected from the group consisting of:



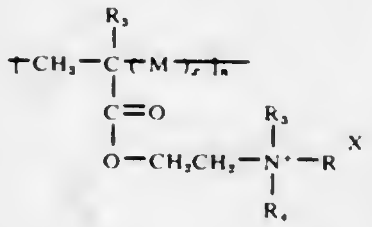
(I)



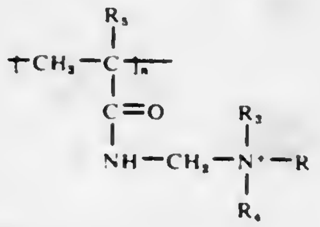
(II)

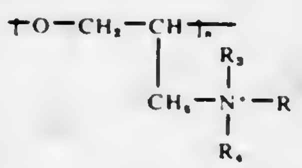


(III)



(IV)



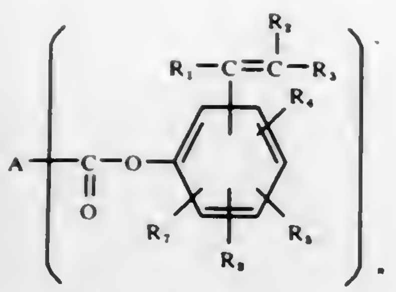


wherein R represents a $C_{1\text{-}10}$ hydrocarbon group, an alkylol group, benzyl or phenylalkyl; R_1 represents hydrogen or a $C_{1\text{-}4}$ hydrocarbon group; R_2 represents hydrogen or a $C_{1\text{-}2}$ alkyl group; R_3 and R_4 can be the same or different and each represents a $C_{1\text{-}6}$ hydrocarbon group; R_5 represents hydrogen or methyl; X represents halogen or hydroxyl; M represents a vinyl monomer; *x* represents 0 or an integer of less than 40,000 and *n* represents an integer from 10 to 50,000.

4,035,559
NOVEL AROMATIC POLYVINYL COMPOUNDS

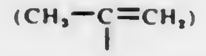
Yoshikazu Fujii, Shiga; Shuichi Kanagawa, Osaka, and Kazuhiko Hata, Ibaraki, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan
Filed June 7, 1976, Ser. No. 693,695
Claims priority, application Japan, June 5, 1975, 50-68449; June 18, 1975, 50-74808
Int. Cl.² C07C *69/83*
U.S. Cl. 526—56 **28 Claims**

1. A compound of the formula (I),



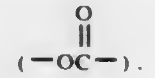
(1)

wherein R_1, R_2, R_3, R_4, R_5, R_6 and R_7 are individually a hydrogen atom or a C_1–C_{20} alkyl group, A is a hydrocarbon residue, and n is an integer of 2 or 3, provided that when R_1 is a methyl group and each of R_2, R_3, R_4, R_5, R_6 and R_7 is a hydrogen atom, the isopropenyl group



$$(CH_3{-}\underset{|}{C}{=}CH_2)$$

is located at o- or m-position to the oxycarbonyl group



$$(-O\overset{\overset{\displaystyle O}{\|}}{C}-).$$

4,035,560

METHOD OF POLYMERIZING OLEFINS IN A FLUIDIZED BED

Francois Caumartin, and Laszlo Havas, both of Martigues, France, assignors to Naphtachimie, Paris, France

Filed May 24, 1976, Ser. No. 689,599

Claims priority, application France, May 27, 1975, 75.16515

Int. Cl.² C08F *2/34, 4/02, 4/60, 10/00*

U.S. Cl. 526—124 **11 Claims**

1. A method of producing polymers having a molecular weight generally greater than 50,000 by polymerization of olefins having the formula $CH_2=CHR$, in which R is a hydrogen atom or an alkyl radical having from 1 to 8 atoms, in which polymerization the polymer in the course of formation is maintained in a fluidized state by an upward stream of a gaseous mixture containing the olefin or olefins to be polymerized in the presence of a catalytic system formed of a catalyst component in the form of a solid comprising at least one compound of a transition metal from the sub-groups IVa, Va and VIa of the periodic table, and a co-catalyst component formed of at least one organo-metallic compound of a metal of groups II and III of the periodic table, said latter compound being liquid under polymerization conditions and of low volatility, the improvement comprising introducing to co-catalyst component separate and apart from the catalyst component into the polymerization reaction vessel on a carrier formed of an inert porous powder impregnated with co-catalyst.

4,035,561

METHOD OF POLYMERIZING

Raymond E. Hoff, Palatine, and Mitsuzo Shida, Barrington, both of Ill., assignors to Chemplex Company, Rolling Meadows, Ill.

Continuation-in-part of Ser. No. 517,544, Oct. 24, 1974, Pat. No. 3,986,983. This application Mar. 1, 1976, Ser. No. 662,863

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—130 **6 Claims**

1. The method of polymerizing a monomer charge comprising 1-olefins of 2–8 carbon atoms or a copolymerizable mixture of one of these with C_2–C_{20} olefins which comprises contacting said charge under polymerizing conditions with a catalyst prepared by dispersing on a dry, finely divided, difficultly reducible, inorganic oxide support a reaction product prepared by reacting pinacol with a chromium compound in a molar ratio of 2–4 pinacol to 1 chromium compound, said chromium compound being of the class consisting of chromium tetra-tertiary-butoxide, ditertiary-butyl chromate, ammonium chromate and ammonium dichromate, the reaction product being fixed to said support and the resulting catalyst activated by heating to a final activation temperature of about 400°–1100° C. in a nonoxidizing atmosphere, said reaction product being present in an amount of about 0.001–10 wt.% and said support being present in an amount of about 99.999–90 wt.%.

4,035,562

HETEROGENEOUS ANIONIC POLYMERIZATION PROCESS

Ilia Rashkov, 29 Pelo Pelovsky Street, Sofia 3, Bulgaria; Jean Gole, La Bruyere, Messimy, 69510 Thurins, France; Daniel Guerard, Parc de Libremont B1, rue Pasteur, 54220 Malzeville, France; Albert Herold, 6 rue Ernest Albert, 54520 Laxou, France; Gerard Merle, Parc de la Camille, 5 rue Frederic Jomard, 69600 Oullins, France; Ivan Martinov Panayotov, 78, Paoune Grozdanov Street, Sofia, Bulgaria; Jean-Pierre Pascault, 40 rue Chateau Gaillard, 69100 Villeurbanne, France; Quang Tho Pham, 5 rue Laennec; Christian Pillot, 17 rue Mistral, both of 69300 Caluire, France, and Robert Salle, 83 rue Philippe Fabia, 69008 Lyon, France

Filed June 14, 1976, Ser. No. 695,837

Claims priority, application Bulgaria, June 14, 1975, 30292

Int. Cl.² C08F *4/02, 4/08, 36/06, 36/08*

U.S. Cl. 526—173 **12 Claims**

1. A heterogeneous anionic polymerization process, wherein a reaction medium is formed and comprises firstly at least one monomer having a conjugated diene structure, secondly at least one catalyst comprising a carbon with a graphitic structure and at least one element inserted in the latter, that is lithium, and thirdly an aromatic hydrocarbon.

4,035,563

METHOD OF SUSPENSION POLYMERIZING VINYL CHLORIDE WITH SALTS OF NITROUS ACIDS AND POLYVALENT METAL SALTS

Hiromitsu Tachibana; Toshiaki Sasaki; Toshiaki Sugita, all of Takasago, and Kazuo Saito, Nishinomiya, all of Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Mar. 12, 1975, Ser. No. 557,830

Claims priority, application Japan, Mar. 26, 1974, 49-34142; June 20, 1974, 49-70923

Int. Cl.² C08F *1/00, 1/80*

U.S. Cl. 526—199 **6 Claims**

1. A method of suspension polymerizing vinyl chloride or a monomer mixture comprising a major portion of vinyl chloride, in an aqueous medium, in the presence of components consisting essentially of an oil soluble polymerization initiator, suspension stabilizing agent, and 0.005 to 50 ppm of a nitrite selected from the group consisting of sodium nitrite, potassium nitrite, calcium nitrite, and ammonium nitrite and 10 to 1000 ppm of a water soluble metallic salt selected from the group consisting of aluminum sulphate, aluminum chloride, stannic chloride, titanium trichloride, titanium tetrachloride and antimony pentachloride, said ppm being based on the amount of said aqueous medium.

4,035,564

POLYMERIZATION PROCESS FOR PRODUCING POLYCHLOROPRENE PARTICLES

Alexander A. Bibeau, Webster, N.Y., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 258,006, May 30, 1972, abandoned. This application Jan. 3, 1974, Ser. No. 430,436

Int. Cl.² C08F *2/00, 4/00, 34/00, 134/00*

U.S. Cl. 526—225 **20 Claims**

1. A polymerization process for producing large particles of chloroprene polymer having a weight average particle diameter in the range of from 0.15 to 2.0 microns and a monodisperse particle size distribution which process comprises:

1. forming a polymerization medium by admixing water, a redox catalyst system comprising radicals of sulfate and sulfite, an activating metal ion, and optionally an emulsifying agent;
2. allowing interaction of the materials in the polymerization medium to occur for a period of time ranging between 10 minutes and three hours, and thereafter;
3. dispersing a chloroprene monomer formulation in the polymerization medium;
4. dispersing into the polymerization medium
   a. a compound providing additional sulfate radical; and
   b. an emulsifying agent in the polymerization medium provided that polymerization of the monomer to polymer has begun before adding the emulsifying agent;
5. polymerization the monomer formulation at a temperature in the range of from 30° to 80° C. until at least a major portion of the chloroprene monomer formulation has been converted to an aqueous dispersion of chloroprene polymer particles;

wherein the ratio of water to chloroprene monomer formulation is in the range of from 60 to 600 parts by weight of water to 100 parts by weight of monomer; wherein the total amount of emulsifying agent used is in the range of from 0.15 to 0.50 percent by weight based on the weight of the monomer; wherein the total amount of sulfate radical used is in the range of from 0.01 to 0.10% by weight based on the weight of the monomer; and wherein the total amount of sulfite radical used is in the range of from 0.01 to 1.5% by weight based on the weight of the monomer.

4,035,565

FLUOROPOLYMER CONTAINING A SMALL AMOUNT OF BROMINE-CONTAINING OLEFIN UNITS

David Apotheker, and Paul Joseph Krusic, both of Wilmington, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Mar. 27, 1975, Ser. No. 562,648

Int. Cl.² C08F *214/16*

U.S. Cl. 526—249 **12 Claims**

1. As a novel fluoropolymer, a copolymer whose interpolymerized units consist essentially of

a. up to 3 mole %, based on the total moles of components (a) and (b), of units derived from a compound selected from the group: bromotrifluoroethylene and 4-bromo-3,3,4,4-tetrafluorobutene-1, with the proviso that enough of such units are present to provide at least 0.05 weight % bromine in the copolymer, and

b. enough units derived from component (b-1), (b-2) or (b-3) as follows to make up the remainder of the copolymer:

b-1. tetrafluoroethylene and a perfluoroalkyl perfluorovinyl ether wherein the alkyl group contains 1–5 carbon atoms,

b-2. about 45–65 mole % of tetrafluoroethylene, about 20–55 mole % of a C_2–C_4 olefinic hydrocarbon and from 0 to about 30 mole % vinylidene fluoride, or

b-3. vinylidene fluoride, at least one fluorine-containing olefin copolymerizable therewith, and optionally said perfluoroalkyl perfluorovinyl ether, said olefin being a compound which contains 2–7 carbon atoms, contains no bromine atom, and contains at least as many fluorine atoms as carbon atoms.

4,035,566

N-TRIFLUOROACETYLADRIAMYCIN-14-ALKANOATES AND THERAPEUTIC COMPOSITIONS CONTAINING SAME

Mervyn Israel, Needham, and Edward J. Modest, Newton Centre, both of Mass., assignors to Sidney Farber Cancer Institute, Inc., Boston, Mass.

Filed Sept. 25, 1975, Ser. No. 616,565

Int. Cl.² C07H *15/20*

U.S. Cl. 536—4 **9 Claims**

1. N-trifluoroacetyladriamycin-14-alkanoates in which the alkanoate portion of the molecule contains from 4 to 10 carbon atoms.

4,035,567

PROCESS FOR PRODUCING THE METHYL ESTER OF AMPHOTERICIN B

Frank Sipos, Princeton, N.J., assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Oct. 21, 1975, Ser. No. 624,508

Int. Cl.² C07H *17/08*

U.S. Cl. 536—4 **4 Claims**

1. A process for preparing the methyl ester of amphotericin B, which comprises mixing amphotericin B with hexamehylphosphoric triamide, wherein the hexamethylphosphoric triamide is employed in a weight ratio to the amphotericin B of within the range of from about 7:1 to about 12:1 and thereafter adding aqueous ammonia to the above mixture until dissolution of the amphotericin B occurs and the mixture has a pH of above 10, and esterifying the amphotericin B in solution with diazomethane to form the methyl ester of amphotericin B.

4,035,568

DERIVATIVES OF POLYENE MACROLIDE ANTIBIOTICS

Carl P. Schaffner, Trenton, and Witold Mechlinski, New Brunswick, both of N.J., assignors to Rutgers Research and Educational Foundation, New Brunswick, N.J.

Division of Ser. No. 152,460, June 7, 1971, Pat. No. 3,945,993. This application Dec. 3, 1975, Ser. No. 637,090

Int. Cl.² C07H *17/08*

U.S. Cl. 536—17 **5 Claims**

1. A process of making a selected alkyl ester, wherein the alkyl group has one to three carbon atoms, of an amphoteric, polyene, macrolide antibiotic which has a macrolide ring including an uninterrupted series of 4 to 7 conjugated double bonds and which has substituents on said ring that are respectively a carboxyl group, and an amino glycoside moiety in which the amino group is primary ($-NH_2$) and which has the composition $-(C_6H_{12}O_4N)$, said process consisting in reacting said antibiotic with a reagent selected from the group consisting of diazomethane, diazoethane and diazopropane to esterify said carboxyl group in a liquid which comprises tetrahydrofurane for dissolving the selected ester and in which the ester is produced in solution.

4,035,569

PREPARATION OF CELLULOSE NITRITE

Richard G. Schweiger, 161 Viewpoint Circle, Ventura, Calif. 93003

Continuation of Ser. No. 487,196, July 10, 1974, abandoned, which is a continuation-in-part of Ser. No. 298,580, Oct. 18, 1972, abandoned, which is a continuation-in-part of Ser. No. 40,442, March 25, 1970, Pat. No. 3,702,843. This application Mar. 23, 1976, Ser. No. 669,483

Claims priority, application Canada, June 5, 1972, 143874; Germany, Apr. 28, 1971, 2120964; Dec. 30, 1971, 2120964

Int. Cl.² C08B *5/00*

U.S. Cl. 536—32 **10 Claims**

1. A process for preparing a nitrite ester of cellulose, said process comprising:

reacting cellulose which contains from aout 4 to about 12 percent by weight of water with dinitrogentetroxide or nitrosyl chloride in the presence of a swelling or solubilizing solvent for the resulting cellulose nitrite and a proton acceptor;

said water being substantially uniformly distributed throughout the cellulose reactant;

said reaction being carried out at a reaction temperature below about 50° C., and

said solvent being present in an amount sufficient to provide at least about three parts by weight of solvent for each part of cellulose.

10. A nitrite ester of cellulose having a degree of substitution of less than about 2.0.

4,035,570

METHOD AND CATALYST FOR THE PRODUCTION OF HIGH TRANS-POLYALKADIENE

George A. Moczygemba, and Floyd E. Naylor, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Jan. 23, 1975, Ser. No. 543,497

Int. Cl.² C08F *4/66, 36/08*

U.S. Cl. 526—142 **11 Claims**

1. A process for the production of a non-resilient polyisoprene with a high content of trans-configuration, which comprises polymerizing isoprene under polymerization conditions in the presence of a polymerization catalyst obtained by admixing

a. a metal hydride selected from the group consisting of $LiAlH_4$, $NaBH_4$, and $LiBH_4$,

b. a titanium tetrahalide compound selected from the group consisting of $TiCl_4$ and $TiBr_4$ in a mole ratio of 1/1 to 6/1 of metal hydride/titanium tetrachloride,

c. methyl iodide in a mole ratio of 1/0.5 to 1/50 of metal hydride/methyl iodide, and

d. an ether selected from the group consisting of diethyl ether and di-n-butyl ether, under the further provision that the polymerization is carried out with a metal hydride concentration of 0.5 to 20 mhm and an ether concentration of 1 to 30 phm.

4,035,571

FIRE RETARDANT COPOLYMERS

Robert H. Brunner, Yonkers, and Paul Kraft, Spring Valley, both of N.Y., assignors to Stauffer Chemical Company, Westport, Conn.

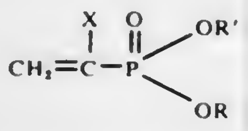
Continuation of Ser. No. 477,874, June 10, 1974, abandoned. This application Sept. 24, 1975, Ser. No. 616,453

Int. Cl.² C08F *220/12, 220/68, 230/02*

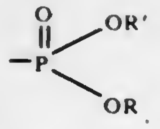
U.S. Cl. 526—275 **11 Claims**

1. A fire retardant, solid copolymer consisting of:

1. about 5 to 85% by weight of a bis(hydrocarbyl) vinylphosphonate having the formula:



wherein X is selected from the group consisting of hydrogen, halogen, cyano, aryl, C_1–C_{18} alkyl, alkenyl, cycloalkyl, cycloalkenyl, and



wherein R and R' are hydrocarbyl and hydrocarbyl groups with substituents which do not interfere with the polymerization of said vinylphosphonate, said hydrocarbyl groups and substituted hydrocarbyl groups either consisting of or consisting essentially of hydrogen and carbon and containing up to about 18 carbon atoms inclusive with the proviso that R and R' may be the same, different or conjoint;

2. about 10 to 85% by weight of a monomer selected from the group consisting of vinyl aryl compounds, and C_{1-20} alkyl esters of acrylic and methacrylic acid, said monomer containing one ethylenically unsaturated bond and being copolymerizable with the vinylphosphonate; and
3. about 2 to 50% by weight of a monomer selected from the group consisting of acrylic and methacrylic acid.

4,035,572

METHOD OF MAKING CHEWING GUM BASE

Marcella C. Stubits, St. Louis, and James Teng, St. Louis County, both of Mo., assignors to Anheuser-Busch, Incorporated, St. Louis, Mo.

Filed May 9, 1975, Ser. No. 576,170

Int. Cl.² C08B *31/16*

U.S. Cl. 536—108 **13 Claims**

1. A method of preparing a hydroxypropyl starch acetate suitable for use as a chewing gum base ingredient comprising the steps of:

A. suspending starch in toluene,

B. adding alkali to the starch suspension of A,

C. reacting the starch with propylene oxide and subsequently with acetic anhydride to produce hydroxypropyl starch acetate,

D. neutralizing the reaction mixture to form an emulsion containing the hydroxypropyl starch acetate gum,

E. washing the emulsified gum with water until the gum coagulates as a salt-free toluene solvated latex mass,

F. separating the emulsion containing the toluene solvated gum from the water, and

G. reducing the solvent and water remaining in the gum to an acceptable concentration level.

ELECTRICAL

4,035,573

ELECTRON BEAM HEATING APPARATUS HAVING MEANS FOR SWEEPING THE BEAM SPOT

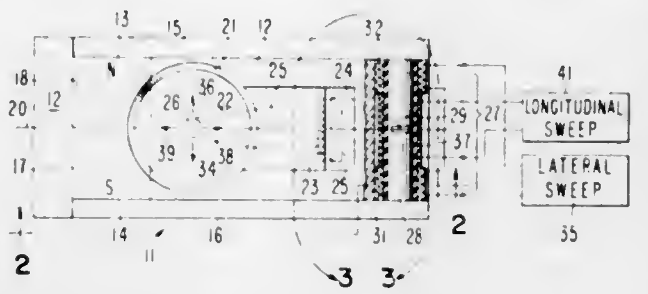
Sergio Negri, Turin, Italy, assignor to Varian Associates, Inc., Palo Alto, Calif.

Filed Apr. 26, 1976, Ser. No. 680,009

Claims priority, application Italy, Apr. 29, 1975, 22825/75

Int. Cl.² H01J *37/305*

U.S. Cl. 13—31 **7 Claims**



1. In an electron beam heating apparatus:

electron gun means for forming and projecting a beam of electrons over a predetermined arcuate beam path to a target material for heating thereof;

magnetic beam focus means having a pair of main pole piece structures on opposite sides of the arcuate beam path for producing a beam focusing main magnetic field having a substantial vector component at right angles to midplane between the pole piece structure to produce bending of the beam into the arcuate beam path;

a main source of magnetomotive force is magnetically coupled between said pair of pole piece structures for energizing said main pole piece structures with magnetic potentials of opposite sign; and

sweeping means operatively associated with said magnetic beam focus means for sweeping the beam spot over the target material, said sweeping means including, a unitary auxiliary magnetically permeable structure magnetically coupled between and extending between said pair of main pole piece structures and having a gap of relatively high magnetic reluctance centrally disposed thereof, electrical coil means magnetically coupled to said auxiliary magnetically permeable structure for energizing said auxiliary magnetic structure in magnetic flux bucking relation so that the opposite ends of said structure adjacent opposite poles of said pair of main pole pieces are energized with component magnetic poles of like sign and the central region is energized with magnetic potential of opposite sign to that of the ends, whereby the main beam focus transverse magnetic field is skewed to produce lateral deflection of the beam spot on the target.

4,035,574

MIXED PHASE EVAPORATION SOURCE

Kurt D. Kennedy, Berkeley, Calif., assignor to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed Oct. 11, 1974, Ser. No. 514,201

Int. Cl.² H05B *7/00*

U.S. Cl. 13—31 **25 Claims**

1. Apparatus for vaporizing a material to establish a vapor flow thereof comprising:

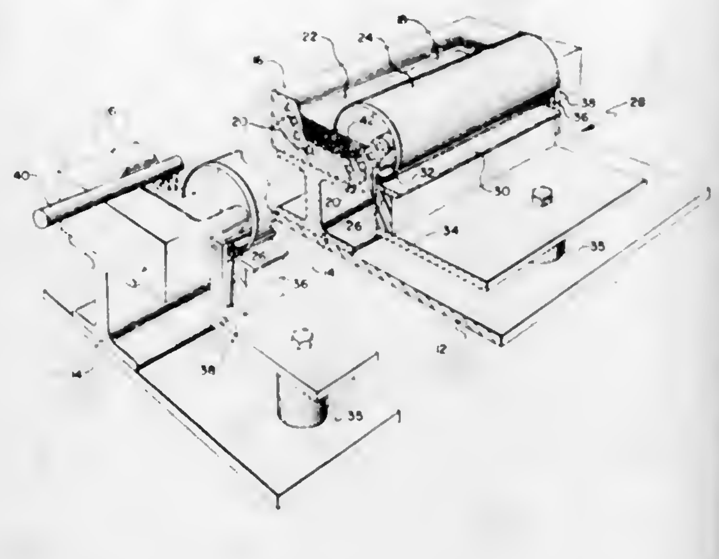
a container for the material to be evaporated;

a melt within said container and comprising:

a mixture of said material to be evaporated; and

a porous mass;

means for heating said melt in a region to liquify said material to be evaporated in an area surrounding said region and to evaporate said material from a portion of the liquified region;



the porous mass providing a convection current impedance to the liquified material.

4,035,575

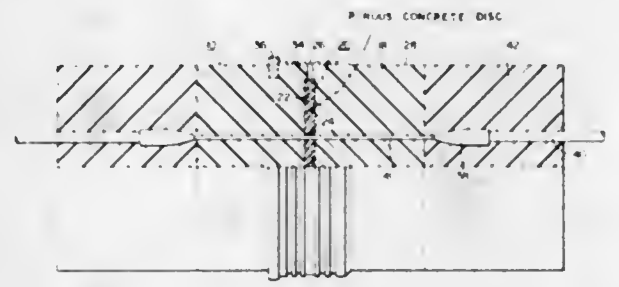
UNITARY RESINOUS PENETRATION ASSEMBLY

Renzo L. Korner, Horseheads, N.Y.; James F. Quirk, Pittsburgh, Pa.; Robert J. Colegrove, Horseheads, and David Green, Corning, both of N.Y., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 22, 1974, Ser. No. 526,290

Int. Cl.² G21C *13/02;* **H01B** *17/26*

U.S. Cl. 174—11 R **3 Claims**



1. An electrical penetration module for sealingly passing an electrical conductor through a containment wall comprising a right circular cylindrical unitary body of chemically stable, radioactive resistant, gas impervious compressive setting epoxy resin potting material disposed about a porous, concrete disc-like spacer leak monitoring means, with at least one electrical conductor extending longitudinally through the disc-like spacer and the cylindrical body about the spacer, which conductor is compressively sealed to the cylindrical body along a substantial portion of the body length, with an aperture channel provided in the cylindrical body from the embedded spacer to the exterior surface of the cylindrical body, with O-ring receiving grooves formed in the exterior surface of the cylindrical body on either side of the aperture channel for sealably mounting the module, and a metallic clamping ring embedded in the exterior surface of the cylindrical body extending about the cylindrical body on the outboard side of the leak monitoring means and the O-ring receiving grooves.

4,035,576
ELECTRICAL CIRCUIT PANEL WITH CONDUCTIVE BRIDGE PLATE OVER A NON-SOLDERABLE SURFACE AREA

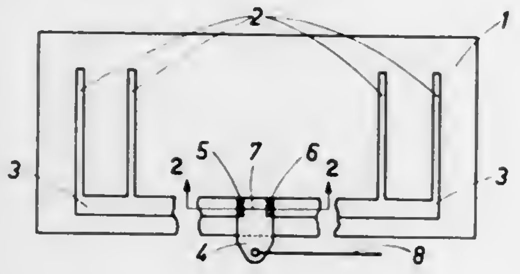
Jean Henry, Wezembeek-Oppem, Belgium, assignor to Splintex Belge, Brussels, Belgium

Filed Apr. 7, 1975, Ser. No. 565,700

Claims priority, application Luxembourg, Apr. 26, 1974, 69945

Int. Cl.² H05K *1/00*

U.S. Cl. 174—68.5 **14 Claims**



2. An electrical circuit panel comprising
an electrical conductor formed by an electrically conductive coating or coatings on a support,
said conductor having a discontinuity formed therein which exposes an underlying non-solderable surface area of said support,
an electrically conductive bridge plate in electrically conductive engagement with said conductive coating, said bridge plate being soldered to said conductor in facing relationship to said support at two distinct spaced positions along said plate, said positions being on opposite sides of said discontinuity, and
a bridge plate portion between said two positions, and a lead wire in electrically conductive engagement with said portion.

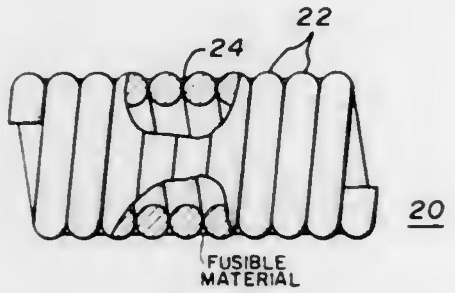
4,035,577
TUBULAR FERRULE

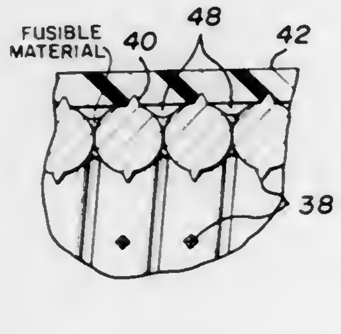
Donald E. Loeber, Closter, N.J., assignor to Thomas & Betts Corporation, Elizabeth, N.J.

Filed June 4, 1973, Ser. No. 366,747

Int. Cl.² H01R *5/10*

U.S. Cl. 174—84 C **2 Claims**





1. A tubular ferrule comprising: a helical coil of wire formed from electrically conducting material and wound so that each of the turns of said coil directly abuts an adjacent turn, said coil having an inner surface and an outer surface, said inner surface of said coil being defined by at least a portion of the inner surface of each of said turns, and said outer surface of said coil being defined by at least a portion of the outer surface of each of said turns; a plurality of spaced, generally sharp protrusions extending generally radially inwardly towards the interior of said coil from said inner surface of each of said turns for engagement with a conductor to be inserted within said ferrule; and bonding means joining adjacent turns together to form a substantially tubular structure, said bonding means joining said turns together adjacent said inner and said outer surface of said coil, said ferrule further comprising a plurality of spaced, generally sharp protrusions extending generally radially outwardly from said outer surface of each of said turns.

2. A tubular ferrule as defined in claim 1 further comprising a sleeve formed from electrically insulative material, and intimately disposed over said coil of wire, said outwardly extending protrusions engaging the inner surface of said sleeve to restrict the removal of said sleeve from said coil.

4,035,578
HIGH VOLTAGE ELECTRICAL INSULATORS

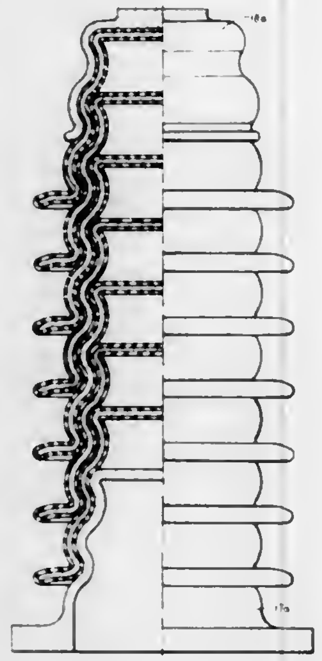
Geoffrey Thomas Glasson, 56 Waterhouse Avenue, St. Ives, N.S.W. 2073, Australia

Continuation of Ser. No. 537,953, Jan. 2, 1975, abandoned. This application Sept. 2, 1976, Ser. No. 720,046

Claims priority, application Australia, Jan. 8, 1974, 6182/74

Int. Cl.² H01B *17/02, 17/60, 17/62*

U.S. Cl. 174—178 **8 Claims**



8. A high voltage electrical insulator consisting of a plurality of coaxially nested interlocking metal shell-like elements, each having an overall taper from one end to the other and fitting closely within or about an adjacent element, a layer of insulating material being interposed between adjacent elements, the elements being formed with corrugations having a substantially uniform spacing in the axial direction the externally convex portions of the corrugations in each element increasing in size in going in an axial direction from the smaller end to the larger, the externally concave portions thereof correspondingly decreasing in size, the radial extent of each corrugation being greater than the thickness of insulation along portions where the elements overlap, and each element other than the elements at each end of the insulator having a portion along its length that interlocks with an adjacent exteriorly overlapping element and also interlocks with an adjacent interiorly overlapping element whereby there is a direct transfer of mechanical forces across each element.

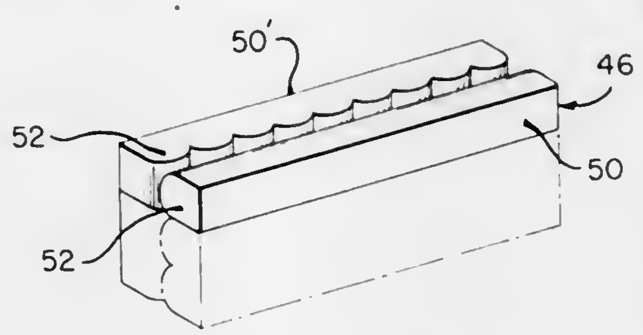
4,035,579
PULSE-CODE MODULATED VIDEO REPRODUCER UTILIZING LINEAR ARRAYED LENSES

Donald L. Roberts, San Diego, Calif., assignor to NCR Corporation, Dayton, Ohio

Filed Aug. 1, 1975, Ser. No. 601,241

Int. Cl.² H04N *5/84*

U.S. Cl. 358—130 **2 Claims**



1. A video playback system, comprising:
a storage medium having discrete indicia recorded thereon representative of a video-display signal, said indicia forming a plurality of linearly ordered fields of data on said medium;
a source of illumination;
means for directing said illumination to a line of said plurality of linearly ordered data fields in succession to project an image of said indicia;
means for magnifying said image, said magnifying means including an optical array having at least two unitary elements forming a multiplicity of lenslets each formed of a substrate having cylindroidal corrugations on one face thereof, said faces brought together with said corrugations mutually perpendicular to form at each intersection thereof one of said multiplicity of lenslets, each of said lenslets corresponding with a different one of the data fields in said line of linearly ordered data fields;
means for receiving each of said magnified images in succession and including means for detecting said indicia;
means for converting said detected indicia to said video-display signal; and
means for utilizing said video-display signal.

4,035,580
SWITCHING ARRANGEMENT FOR TRANSMITTING SYNCHRONOUSLY AND ASYNCHRONOUSLY OCCURRING DATA

Georg Dieter, Konigsdorf, and Harald Franke, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

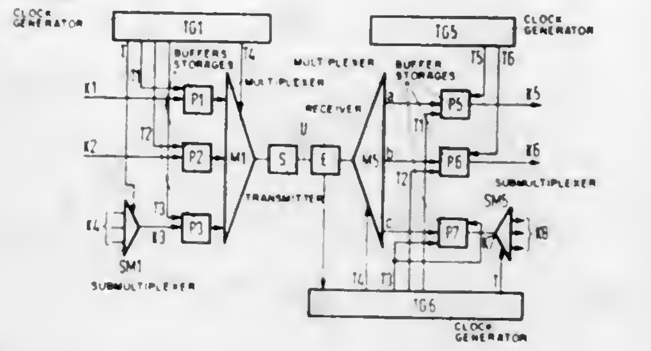
Filed May 5, 1976, Ser. No. 683,274

Claims priority, application Germany, May 9, 1975, 2520835

Int. Cl.² H04L *5/00;* **H04J** *3/16*

U.S. Cl. 178—50 **2 Claims**

1. Apparatus for transmitting synchronously and asynchronously occuring data, comprising:
send-side multiplexer means having at least two inputs, at least one of which is connected to receive synchronous data, and an output coupled to a transmission link,
receive-side multiplexer means having an input coupled to the transmission link and at least two outputs,
first and second autonomous clock generators connected, respectively, to said send-side and receive-side multiplexer means for timing the operations of the multiplexer means,
send-side submultiplexer means having inputs connected to receive asynchronous data and an output coupled to an input of said send-side multiplexer means for emitting thereto the asynchronous data in synchronized form under the control of a first clock signal from said first clock generator, and



receive-side submultiplexer means having an input connected to receive the asynchronous data in synchronized form from said receive-side multiplexer means and under the control of a second clock signal from said second generator for emitting the asynchronous data in asynchronous form to receive-side subscribers.

4,035,581
CODE WORD DETECTING METHOD

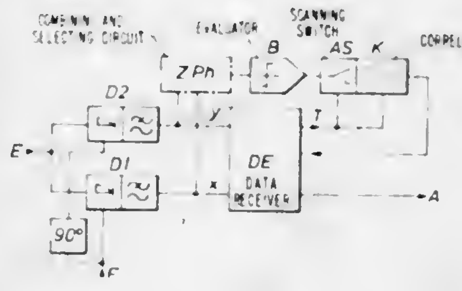
Wilhelm Milcz, Weissach im Tal; Wolfgang Steinert, Backnang, both of Germany, and Bo Ekström, Stockholm, Sweden, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Apr. 8, 1976, Ser. No. 674,944

Claims priority, application Germany, Apr. 8, 1975, 2515298

Int. Cl.² H04L *27/22*

U.S. Cl. 178—67 **18 Claims**



7. A method for detecting a predetermined code word contained in received signals in a transmission system which operates with four-phase or four-phase difference modulation at the transmitter and coherent demodulation at the receiver and in which successive signal increments are transmitted and received during successive clock periods, the code word being transmitted only as signals in two phases which are 180° apart, and the received signals being divided into orthogonal voltage components during demodulation, said method comprising: forming a representation of the algebraic sum and a representation of the algebraic difference of the orthogonal voltage components of a received signal increment; determining which of the sum and difference has the larger absolute magnitude value; and evaluating a received signal increment in accordance with the algebraic sign of that one of the sum and difference which has such larger absolute value.

4,035,582

TREMOLO EFFECT PRODUCING SYSTEM

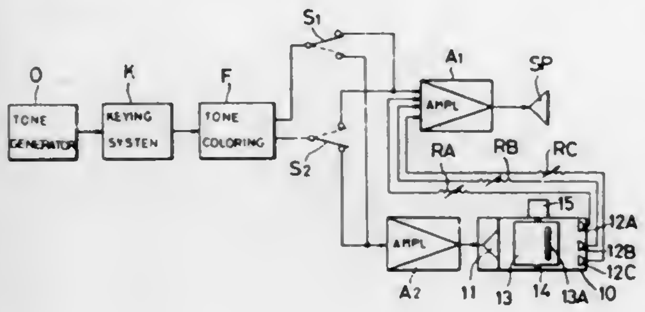
Shimaji Okamoto, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Division of Ser. No. 365,518, May 31, 1973, abandoned. This application June 19, 1975, Ser. No. 588,650

Claims priority, application Japan, June 12, 1972, 47-58414; June 29, 1972, 47-65193; June 29, 1972, 47-65194; July 1, 1972, 47-66000

Int. Cl.^{2} G10H *1/04*

U.S. Cl. 179—1 J **6 Claims**



1. An improved tremolo effect producing system capable of being positioned within the carbinet of an organ comprising:

- means for generating a plurality of tone signals,
- means for gating selected tone signals,
- tone coloring means for converting said gated tone signals to instrumental tones having intricate selective frequency characteristics,
- means for coupling at least a portion of said instrumental tones to a power amplifier,
- means for coupling at least a portion of said instrumental tone signals to an electroacoustical transducer, said electroacoustical transducer being positioned within a small enclosure,
- a plurality of low-power acousto-electrical transducers disposed in different positions opposite to said electroacoustical transducer in said small enclosure for converting the sound waves generated by said electroacoustical transducer to electrical signals,
- at least one relatively small rotational sound shielding member positioned in said enclosure, said member being rotated to periodically vary the sound waves transmitted in said small enclosure,
- means for rotating said sound shielding member,
- means connected to said plurality of acoustoelectrical transducers for coupling said electrical signals to said power amplifier,
- means for summing said electrical signals with said at least a portion of said instrumental tone signal, and
- means for converting said summed signals to high power sound waves.

4,035,583

METHOD TO APPLY AND DISCONNECT A 16 KHz SIGNAL TO A TELEPHONE LINE WITHOUT PRODUCING CLICKS

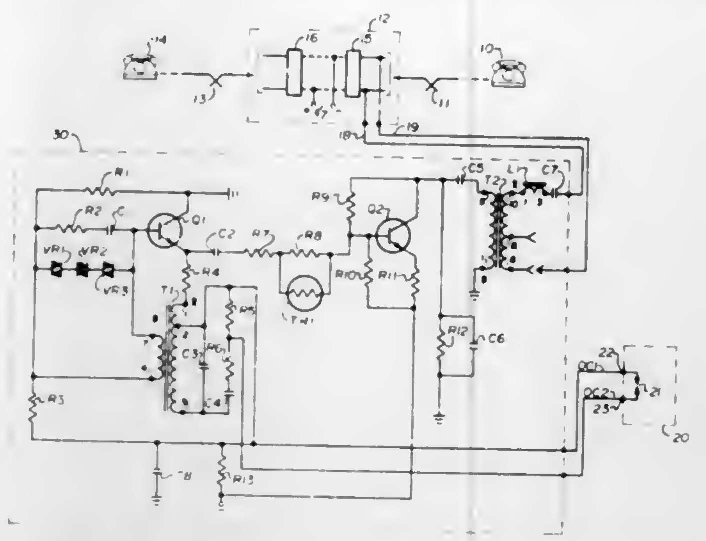
Vernon F. Weber, Elmhurst, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 3, 1976, Ser. No. 682,875

Int. Cl.^{2} H04M *15/12*

U.S. Cl. 179—7.1 R **5 Claims**

1. A signal generator for applying a tone to a communication line comprising: an oscillator means for producing a sinusoidal voltage wave of a predetermined frequency and a frequency selective filter between said oscillator and said line, said oscillator means including a resonant circuit, a series resistance and capacitance shunting said resonant circuit, and means to vary the resistance of said shunt to cause said oscillator to start and cease oscillation as said shunt resistance is increased or decreased.



4,035,584

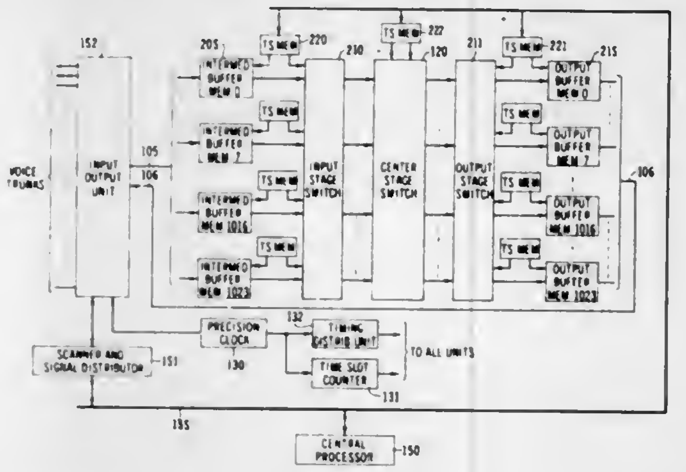
SPACE DIVISION NETWORK FOR TIME-DIVISION SWITCHING SYSTEMS

John Walter Lurtz, Naperville, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 8, 1975, Ser. No. 638,627

Int. Cl.^{2} H04J *3/00*

U.S. Cl. 179—15 AT **12 Claims**



1. A switching network for completing time-division communication paths comprising:

- a plurality fo serially connected space division network stages each having input and output terminals wherein one of said serially connected network stages is a first stage and another of said serially connected network stages is a last state;
- connecting means for directly connecting the output terminals of each of said space division network stages, except said last stage, to the input terminals of a succeeding one of said space division network stages whereby said network stages are serially connected; and
- control means for establishing communication paths between the respective input and output terminals of each of said serially connected network stages in time slots of fixed duration, said control means being operative to first establish a communication path between the input and output terminals of said first network stage and to establish communication paths between the input and output terminals of each succeeding network stage within one of said time slots of fixed duration after establishing a path through the immediately preceding one of said serially connected network stages, said control means thereby completing communication paths through successive space division network stages in sequence and overlapped in time.

4,035,585

DEMODULATOR CIRCUIT IN MULTIPLEX STEREO AND MONOPHONIC RECEIVER

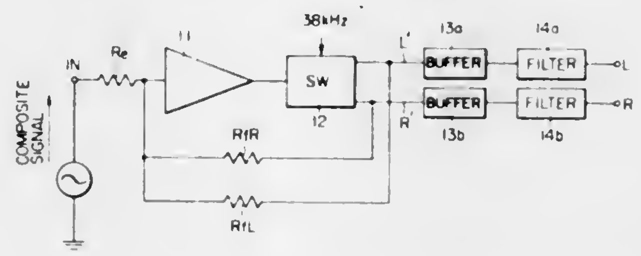
Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation-in-part of Ser. No. 294,174, Oct. 2, 1972. This application Mar. 8, 1976, Ser. No. 664,942

Claims priority, application Japan, Sept. 30, 1971, 46-76530; Germany, Sept. 30, 1972, 2248176

Int. Cl.^{2} H04H *5/00*

U.S. Cl. 179—15 BT **7 Claims**



1. In a receiver for the reception of multiplex stereophonic and monophonic programs in an FM broadcase band, a demodulator circuitry of the averaging detection type designed for performing averaging detection of a stereophonic composite signal or the amplified monophonic signal and for switching, during the stereophonic reception, the amplified stereophonic composite signal in response to a subcarrier signal regenerated from a pilot signal component contained in said stereophonic composite signal to extract, into the alternately time-shared form, the two left and right stereophonic signal components contained is said stereophonic composite signal on said two left and right output channels of this switching circuit, and for producing, during the monophonic reception, said monophonic signal simultaneously and continuously on said two output channesl of the switching circuit;

- buffer circuits connected to said two output channels of the switching circuit, respectively;
- filter circuits connected to the outputs of said buffer circuits, respectively, for averaging only during the reception of the stereophonic composite signal the two extracted stereophonic signal components thereby converting these signal components into two left and right continuous stereophonic audio signals;
- means for defining two negative feedback paths leading from said two left and right output channels of the switching circuit to the intput of the voltage amplifier; and
- an input impedance element connected to the input of said voltage amplifier,
- whereby, during the reception of a stereophonic composite signal, the two left and right output signals of the switching circuit are alternately applied to said two negative feedback paths in a time-shared manner, and, during the reception of a monophonic signal, the continuous monophonic left and right signals appearing at the two output channels of the switching circuit are applied to said two negative feedback paths simultaneously and continuously, thereby the amplification factor observed between the input of said impedance element and the two outputs of said switching circuit at the time of the reception of the monophonic signal is substantially one half of the amplification factor observed at the time of the reception of the stereophonic composite signal,
- whereby the feedback impedance at the monaural reception is one half the feedback impedance at the stereophonic reception so that the monophonic audio signals appearing at the outputs of the two filter circuits have substantially the same amplitude levels as those of the left and right continuous stereophonic audio signals obtained through the averaging actions of the two filters.

4,035,586

CURRENT SUPPLY SYSTEM FOR TERMINAL DEVICES

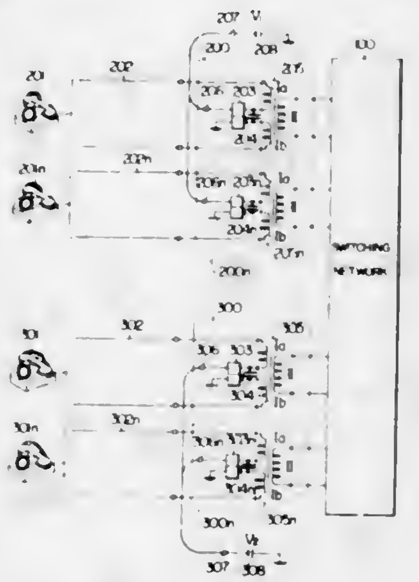
Hirotoshi Shirasu, Yokohama; Hidetaka Yamashita, Kamakura; Tatsumasa Oonuma, Yokohama, and Takeshi Fukuhara, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 24, 1976, Ser. No. 660,780

Claims priority, application Japan, Feb. 26, 1975, 50-22898

Int. Cl.^{2} H04Q *1/28*

U.S. Cl. 179--16 F **3 Claims**



1. A current supply system for terminal devices comprising a plurality of line circuits each connected to a separate terminal device through a separated line, said line circuits being divided into a plurality of line circuit groups in accordance with the line impedance connected to the line circuit, a plurality of separate power sources of different voltage value associated with the line circuit groups in accordance with the impedance thereof, and means for connecting each one of the line circuits included in each respective line circuit group in common to the respective power source associated therewith.

4,035,587

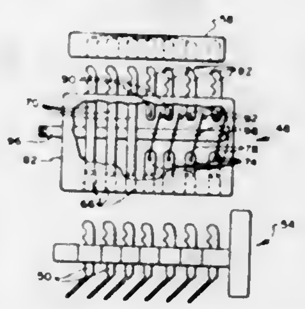
WIRE TERMINATION BLOCK SWITCHING ARRANGEMENT

Brent Hawkley Undhjem, 2210 E. 3300 South, Salt Lake City, Utah 84109; Lorin Mark Graehl, 7146 S. 2155 East, Salt Lake City, Utah 84121, and Andy James Bavelas, 1719 N. Main, Centerville, Utah 84014

Filed Nov. 24, 1975, Ser. No. 634,501

Int. Cl.^{2} H04Q *1/02*

U.S. Cl. 179—98 **5 Claims**



1. In a telephone switching office, a system for coupling telephone connector switch output leads either to subscriber lines or to call intercept apparatus, the switching office including a plurality of number terminal blocks, each including a plurality of groups of terminal posts, the lower ends of certain

posts of a group being connected to certain connector switch output leads identified with particular subscriber numbers and the lower ends of certain other posts of a group being connected to the call intercept apparatus, and a plurality of group terminal blocks, each including a plurality of groups terminal posts, the lower ends of some of such posts of a group being connected to subscriber lines, the improvement comprising

- a plurality of switching tools, each including
  - a housing having a plurality of recesses therein for receiving the upper ends of a group of number terminal block terminal posts to enable mounting the switching tool on the posts,
  - a first group of terminal posts extending from the housing to enable mounting an intercept tool thereon,
  - a second group of terminal posts extending from the housing,
  - means for electrically coupling certain terminal posts of a number terminal block on which the switching tool is mounted to certain of the switching tool terminal posts of the first group, and
  - means for alternatively coupling certain other terminal posts of a number terminal block on which the switching tool is mounted either to certain other switching tool terminal posts of the first group or to the switching tool terminal posts of the second group, and
- means for coupling selected ones of the second group terminal posts of the switching tools to the upper ends of selected ones of the terminal posts of the group terminal blocks.

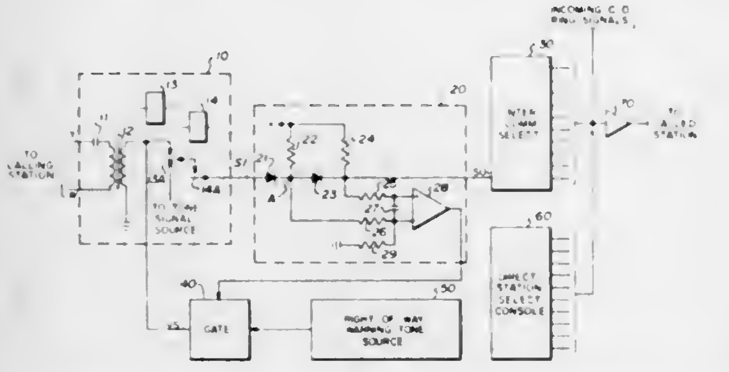
4,035,588
RIGHT-OF-WAY CONTROL CIRCUIT FOR KEY TELEPHONE INTERCOMMUNICATION SYSTEM

Richard A. Marshall, Durham, N.C., and James W. Smith, Edmonds, Wash., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed May 28, 1976, Ser. No. 691,107

Int. Cl.² H04M ***1/72***

U.S. Cl. 179—99 **7 Claims**


TO CALLING STATION
INCOMING C.O. RNG. SIGNALS
TO CALLED STATION
GATE
RIGHT OF WAY WARNING TONE SOURCE
DIRECT STATION SELECT CONSOLE
10
20
30
40
50
60

1. In a telephone system, a calling station, a called station including an associated amplifier circuit, selector means, selectively operable by said calling station to establish circuit connections to said amplifier, first signalling means including a tone signal source and circuit connections to said calling station, and a right-of-way circuit comprising: first gating means including a first terminal connected to said first signalling means and a second terminal connected to said selector means; said first gating means initially operated in response to connection to said tone signal source included in said first signalling means, to connect a signal circuit path from said tone signal source through said first signalling means to said called station amplifier through said selector means; as least one second signalling means connectible to said called station amplifier and to said first gating means second terminal through said selector means; and said first gating means further operated in response to connection of said second signalling means, to block said signal circuit path between said first signalling means and said called station amplifer.

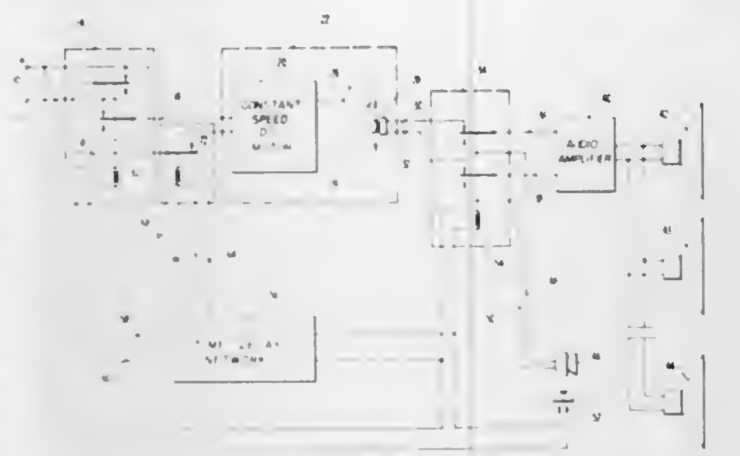
4,035,589
ENTERTAINMENT AND PUBLIC ADDRESS SYSTEM WITH REPLAY OF ENTERTAINMENT PROGRAM AFTER A PUBLIC ADDRESS INTERRUPTION

Harry G. Parke, Brooklyn, N.Y., assignor to Marine Electric Corporation, Brooklyn, N.Y.

Filed Dec. 29, 1975, Ser. No. 644,442

Int. Cl.² G11B ***15/20***

U.S. Cl. 179—100.1 C **4 Claims**



1. An entertainment and public address system comprising:

an amplifier;

at least one speaker connected to an output of said amplifier;

first and second sources of audio input signals, said first source including a recorder having a reversible drive adapted to be connected to a source of operating potential;

switching means having first and second positions for alternately coupling said first and second audio input sources, respectively, to said amplifier; and

rewind means connected to said switch means and said recorder for rewinding said recorder a preselected amount in response to actuation of said switching means to said second position, said rewind means including:

- interrupt means connected to said drive for selectively interrupting the supply of operating potential to said drive; and
- a time delay network connected to said interrupt means and said drive for reversing said drive in response to actuation of said switching means to said second position and for actuating said interrupt means to preselected time after actuation of said switching means to said second position whereby said recorder is rewound by said preselected amount whenever said second audio input source is connected to said amplifier.

4,035,590
APPARATUS FOR ELECTROMECHANICAL RECORDING OF SHORT WAVELENGTH MODULATION IN A METAL MASTER

Jerome Barth Halter, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

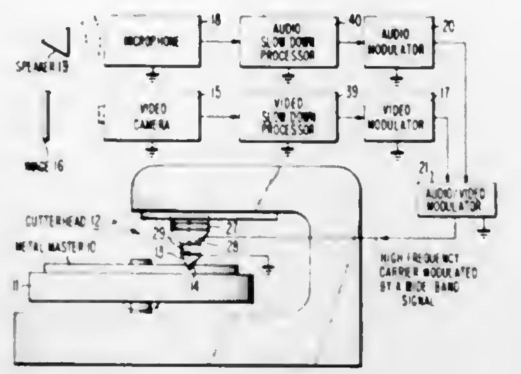
Division of Ser. No. 591,968, June 30, 1975. This application Mar. 22, 1976, Ser. No. 668,981

Int. Cl.² H04R ***17/04*****; H01V** ***7/00***

U.S. Cl. 179—100.41 P **11 Claims**

1. A cutterhead for cutting a groove in a metal master having an information track constituting short wavelength modulation of groove depth comprising:

1. a pedestal;
2. an unheated cutting stylus;
3. a piezoelectric element rigidly mounted directly between the pedestal and the cutting stylus by means of bonding materials forming a structure having all external surfaces disposed anti-parallel to each other;
4. means for energizing the piezoelectric element in accordance with a relatively high frequency signal in order to effect short wavelength modulation of groove depth in the metal master wherein the quiescent groove depth and the peak-to-peak dimension of the groove modulation are less than one micrometer; and



5. means for mounting the pedestal in a manner that effects placement of the cutting stylus in operating relationship with the metal master during recording.

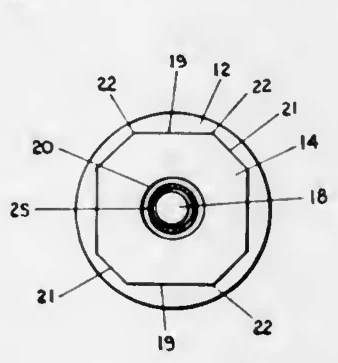
4,035,591
ELECTROACOUSTIC TRANSDUCERS

Gordon S. Carbonneau, Grand Rapids, Mich., assignor to Carbonneau Industries, Inc., Grand Rapids, Mich.

Filed Mar. 12, 1976, Ser. No. 666,191

Int. Cl.² H04R ***9/02***

U.S. Cl. 179—119 R **11 Claims**



1. In an electroacoustical transducer having an annular permanent magnet with a center aperture, a pole piece positioned in the aperture, a voice coil surrounding the pole piece, a diaphragm operatively connected to the pole piece, a front flux plate with a center aperture aligned with the aperture of the magnet, a back flux plate attached to the pole piece, the improvement comprising:

- at least one of said flux plates having opposite parallel faces, one of which is completely flush with the annular magnet and said one flux plate having at least five sides substantially perpendicular to and between the faces, each side having an inner edge abutting the annular magnet, an outer edge substantially parallel to the inner edge, and two edges in common with adjacent sides; and
- the inner face edges of the one flux plate being contained within the area bounded by the outer diameter of the annular magnet.

4,035,592
SUBSCRIBER MONITORING UNIT FOR ELECTRONIC TELEPHONE EXCHANGES

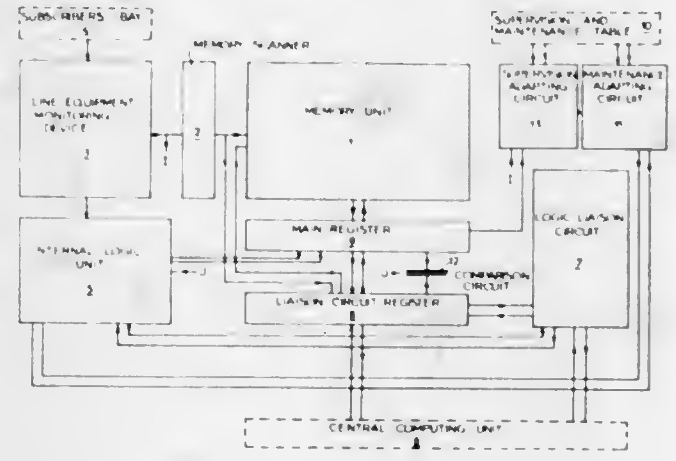
Michel Baudoin, Saint-Prix, France, assignor to Societe Francaise des Telephones Ericsson, Colombes, France

Continuation-in-part of Ser. No. 511,377, Oct. 2, 1974, abandoned, which is a continuation-in-part of Ser. No. 431,655, Jan. 8, 1974, abandoned, which is a continuation of Ser. No. 206,275, Dec. 9, 1971, abandoned. This application July 27, 1976, Ser. No. 709,091

Claims priority, application France, Dec. 10, 1970, 70.44603

Int. Cl.² H04M ***3/22***

U.S. Cl. 179—175.2 C **4 Claims**



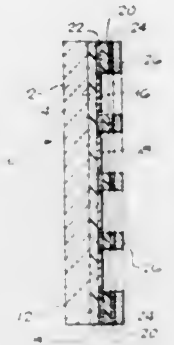
1. A peripheral equipment for monitoring relays in the line equipments of subscriber's telephone sets of a subscriber's bay in an electronic telephone exchange having at least one such peripheral equipment and at least one central computing unit and a supervision and maintenance table to which said peripheral equipment is connected, comprising

- a subscriber line equipment monitoring means connected to the subscriber's bay to sense the positions of the relays in the line equipment of subscriber's sets and detect the lifting of a receiver on a subscriber's set;
- a memory means connected to a main register and including one area per subscriber's set and connected to said central computing unit;
- an internal logic unit to activate said register connected to said memory means upon receiving information from said monitoring means connected to said monitoring means;
- a scanner for analyzing said memory means connected to said memory means and to said monitoring means;
- a liaison circuit logic means associated to a liaison circuit register, to receive information from said internal logic unit connected to the central computing unit for processing of said information and connected for receipt of signals from the central computing unit and connected for detection of said signals by said internal logic unit and said monitoring means;
- a maintenance calling circuit connected between the supervision and maintenance table and said internal logic unit;
- and a supervision adapting circuit to validate information of said register sent to said supervision and maintenance table connected between the supervision and maintenance table and between said main register and said scanner.

4,035,593

FLEXIBLE PRESSURE SENSITIVE SWITCH ACTUATOR MODULE ADAPTABLE TO A KEYBOARD SURFACE HAVING FIXED CONTACT ARRAY

James P. Riniker, Sparta, Wis., assignor to Northern Engraving Company, Inc., Sparta, Wis.
Filed Oct. 9, 1975, Ser. No. 620,955
Int. Cl.^{2} H01H *13/00, 9/00*
U.S. Cl. 200—5 A **1 Claim**



1. A unitary, self-biasing, flexible switching element constructed for mounting on a flat surface, said element comprising:

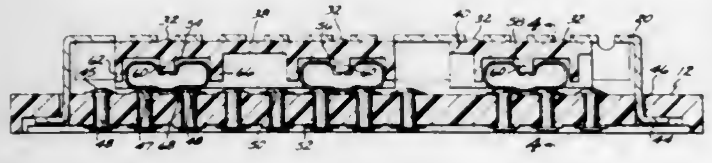
1. a substantially planar, transparent, flexible and electrically non-conductive substrate;
2. ink layer means formed directly on said substrate;
3. a plurality of discrete, spaced and electrically conductive contact area means carried on the side of said ink layer means opposite the substrate; and
4. insulating and bonding means bonded to the same side of said ink layer means as the contact area means and in surrounding relationship with each of said contact area means for cooperation in electrically insulating said contact area means from each other and for bonding said switching element to a surface, said insulating and bonding means including:
   - a. a central, flexible, and non-conductive layer,
   - b. a pair of adhesive layers, one on each side of said central layer, one of said adhesive layers for bonding to said ink layer means and the other of said adhesive layers for bonding to a flat surface, and
   - c. a plurality of apertures of substantially the same size and shape as each of the contact area means formed in the insulating and bonding means so that the contact area means are exposed by the apertures;

said ink layer means including indicia aligned with and in overlying relationship to each of said contact area means for indicating a circuit that will be closed by flexing said substrate from an initial non-conducting position to a second contacting position, and opened by releasing the substrate and permitting it to move from said contacting position to said non-contacting position.

4,035,594

SLIDE SWITCH

Richard W. McKinney, Lakewood, and Allen L. Teichert, Placentia, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Feb. 4, 1976, Ser. No. 655,089
Int. Cl.^{2} H01H *15/06*
U.S. Cl. 200—16 D **4 Claims**



1. A slide switch assembly comprising:

an elongate housing of a base plate and a surmounted channel member defining a track with elongated slot means in one wall thereof;

a plurality of arcuate-surface, contact poles disposed within said housing in a longitudinal row along said base plate;

a contact carrier slidably received in said track, bearing lever means projecting through said slot means and having a longitudinal receptacle cavity facing said contact poles and an abutment rib transversing said cavity and of lesser height than the cavity walls;

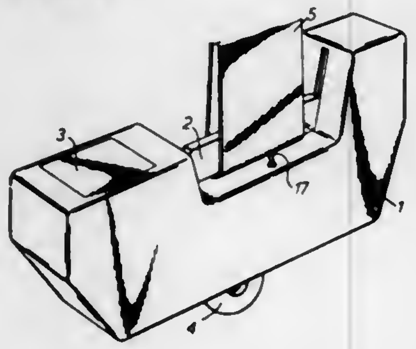
detent means comprising a plurality of transverse slots along the wall of said housing opposite said row of contact poles and cooperative external rib means on the opposing surface of said carrier; and

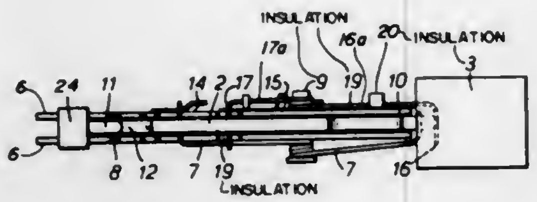
a leaf spring contact member having a central, outward bow on its undersurface to provide an arcuate protrusion thereon, distal reverse bends, superior return legs and terminal bends to provide central, superior inset lips; said contact member seated in said receptable cavity of said carrier with said central inset lips bearing against said abutment rib in fulcrumed support thereon and biasing said external rib means towards said transverse slots of said detent means, with the arcuate protrusion of said member seated between selected pairs of said contact poles and the undersurface of said contact member bridging between said pairs of contact poles.

4,035,595

ELECTRICAL SWITCH FOR SAFETY BELT LOCKING DEVICES

Ulf Tolfsen, Gralum, Norway, assignor to Loyd's Industri A/S, Fredrikstad, Norway
Filed Nov. 17, 1975, Ser. No. 632,800
Int. Cl.^{2} H01H *27/00;* **A44B** *11/00;* **A62B** *35/00*
U.S. Cl. 200—61.58 B **3 Claims**





1. In a locking device for releasably securing one end of a safety belt, having a main support structure of two parallel plates, a locking bar pivotably mounted on a locking bar pivot pin between the plates to engage one end of the safety belt in the locking device, a locking arm pivotably mounted between the plates to hold the locking bar in the locked position, a release bar pivotably mounted between the plates on a release pivot pin for releasing the locking bar from the locked position, and a spring that causes the locking bar to normally remain in the fully open position when it has been released from the locked position, the improvement wherein an electrical switch comprises:

an insulating plate mounted to one of the structural plates;

two electrical terminals, the first terminal being mounted to said insulating plate, the second terminal being mounted to one of said structural plates;

a wire mounted on said insulating plate connected to said first terminal;

a first contact formed at one end of said wire, said first contact making electrical contact with the locking bar when the locking bar is in the locked position; and

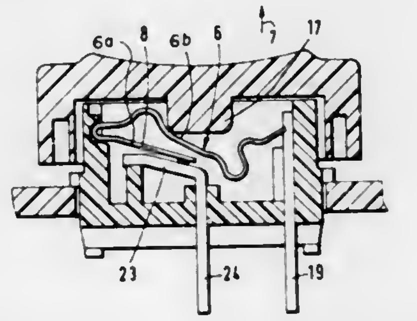
a second contact formed at the other end of said wire, said second contact making electrical contact with the locking bar when the locking bar is in the fully open position;

whereby said electrical switch is closed when the locking bar is in the locked position through a closed electrical circuit through said first terminal, said wire, said first contact, the locking bar, the locking bar pivot pin, the structural plate, and said second terminal; and said electrical switch is closed when the locking bar is in the fully open position through a closed electrical circuit through said first terminal, said wire, said second contact, the locking bar, the locking bar first pin, the structural plate, and said second tenminal; and said electrical switch is open when the locking bar engages an insulating safety belt in the locked position, the safety belt breaking the electrical contact between the locking bar and said first contact.

4,035,596

ELECTRICAL SWITCH CONSTRUCTION

Erich Marquardt; Werner Storz, both of Rietheim, and Kuno Futterknecht, Liptingen, all of Germany, assignors to J. & J. Marquardt, Germany
Filed Mar. 8, 1976, Ser. No. 664,422
Claims priority, application Germany, Mar. 13, 1975, 2510902
Int. Cl.^{2} H01H *13/64, 3/12*
U.S. Cl. 200—159 A **7 Claims**

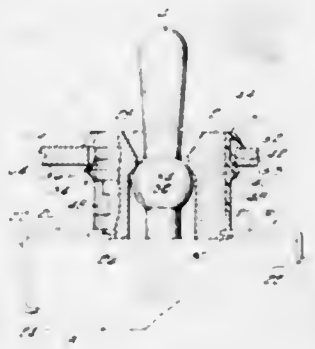


1. A switch construction comprising a dielectric housing, first and second contact terminals arranged at spaced locations in said housing, said first contact terminal having a spring contact member bearing a receiving recess, a spring contact member having a lower contact arm portion overlying said second contact terminal and being engageable with said second contact terminal for completing a circuit between said first and second contact terminals, said spring contact member having an upper actuation arm portion having an end engaged in said first contact terminal bearing receiving recess, said spring contact member having a curved bearing portion interconnecting said lower contact arm portion with said upper actuation arm portion, said housing having a housing recess, said curved bearing portion being engaged in said housing recess, said spring member having a substantially straight intermediate portion and with an upwardly bulging art adjacent one end of said intermediate portion which is adjacent to said housing recess and a downwardly bulging part adjacent the opposite end of said intermediate portion which is adjacent to said first contact terminal, and an dielectric actuation member engaged on said dielectric housing and connected thereto for limited upward and downward movement thereon and having an extension portion engaged with said spring member intermediate portion and being biased into an uppermost end position by said spring member, said actuation member being movable downwardly to cause said extension portion to bear against the intermediate portion and deflect it so that the downwardly bulging portion forms a radius of pivotal movement thereof, said curved bearing portion of said spring contact member permitting pivotal movement of said spring member and said lower contact arm portion downwardly toward said contact portion of said second contact terminal into engagement therewith.

4,035,597

SNAP-IN MEANS FOR MOUNTING ELECTRICAL DEVICES OR THE LIKE IN A SUPPORT PANEL APERTURE

Leonardus J. Josemans, Smithfield, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.
Filed Nov. 26, 1975, Ser. No. 635,689
Int. Cl.^{2} H0JH *19/04*
U.S. Cl. 200—296 **10 Claims**



1. A snap-in mounting means for a device adapting the device to be mounted from the back of and through a hole in a support panel to secure the device on the panel so that part of the device is accessible from the front of the panel comprising

an elongated bushing carrying the accessible part of the device, said bushing including an outer end portion adapted to be inserted through the panel mounting hole and including a recess in the outer surface thereof, and

a snap-in member having a complementary locking portion and snapping snugly into said bushing recess, and snap-in member including a resilient locking flange which flares radially outwardly and downwardly from the outer end of said bushing towards the device and terminates in an inner edge, said locking flange having a cross section intermediate its ends approximating, but less than, the dimension of the panel mounting hole and being radially compressible and expandable with respect to said bushing, said snap-in member further including a radially extending, generally annular ridge having a bearing surface which is axially spaced from said locking flange inner edge at a distance approximating the thickness of the panel and is adapted to engage the back side rim of the panel mounting hole,

whereby, as said bushing and said snap-in member are pressed into the panel mounting hole for mounting the device, said locking flange is compressed radially inwardly to permit passage thereof through the panel mounting hole and thereafter expands to its normally flared position where said inner edge engages the front side of the panel and cooperates with said ridge bearing surface to hold the device on the panel.

4,035,598

APPARATUS FOR THERMALLY TREATING POLYMERIC WORKPIECES WITH MICROWAVE ENERGY

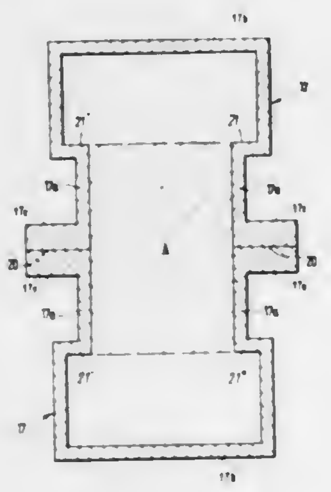
Cornelis Johannes Maria Van Amsterdam, Viersen, Germany, assignor to Johannes Menschner Maschinenfabrik GmbH & Co. KG., Dulken, Germany

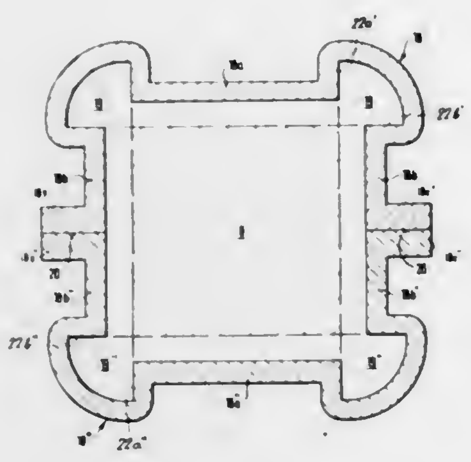
Continuation-in-part of Ser. No. 516,974, Oct. 22, 1974, abandoned, which is a continuation of Ser. No. 385,440, Aug. 3, 1973, Pat. No. 3,843,861, which is a continuation of Ser. No. 140,057, May 4, 1971, abandoned. This application July 17, 1975, Ser. No. 596,856

The portion of the term of this patent subsequent to Oct. 22, 1991, has been disclaimed.

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 A 6 Claims





1. An apparatus for the thermal treatment of elongate polymeric workpieces, comprising:

a waveguide with a conductive peripheral wall structure of four-sided cross-section forming a treatment zone between mutually perpendicular first and second pairs of opposite wall surfaces, said first pair of wall surfaces being stepped to form two flat, inwardly projecting parallel cheeks integral with said wall structure extending symmetrically over the length of said treatment zone and having a width less than the spacing of said second pair of wall surfaces, said wall structure being split into two symmetrical halves along a median parting plane, perpendicular to the faces of said cheeks, for enabling separation of said halves from each other;

feed means for passing said workpieces through said treatment zone; and

energizing means for propagating mirowave energy through said waveguide.

4,035,599

CONTROL SYSTEM FOR NON-RESONANT MICROWAVE DRYERS

Satish C. Kashyap, Hazeldean, and Walter Wyslouzil, Ottawa, both of Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Filed Feb. 23, 1976, Ser. No. 660,443

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 B 6 Claims

1. A control system for a microwave dryer having an applicator for applying microwave energy to a load transported through said applicator and a controlled microwave source for feeding the applicator comprising:

first means for monitoring the input power to said applicator and providing an output signal P_{in_1};

second means for monitoring the output power from said applicator and providing an output signal P_{out_1}; and

third means connected between said first and second means and said microwave source to control the input power to said applicator as a function of change in the input power P_{in_1} and in efficiency η_1, where

$$\eta_1 = 1 - P_{out_1} / P_{in_1}$$

4,035,600

APPARATUS FOR CRUCIBLE-FREE ZONE PROCESSING OF A SEMICONDUCTOR ROD

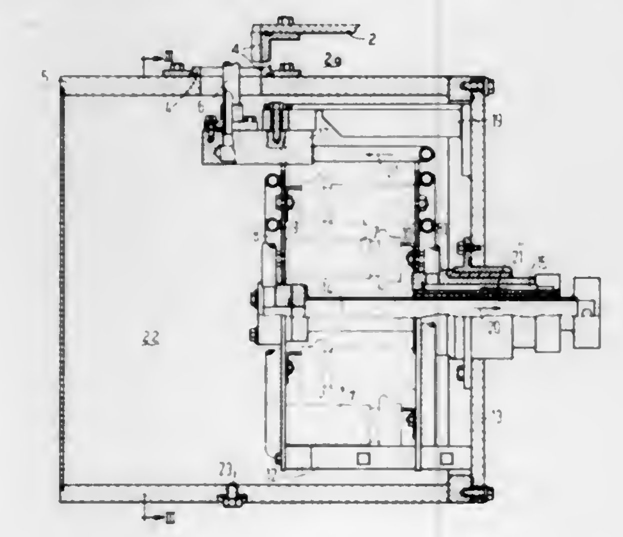
Wolfgang Keller, Munich, and Hans Stut, Grobenzell, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 16, 1975, Ser. No. 596,519

Claims priority, application Germany, July 16, 1974, 2434136

Int. Cl.² H05B *5/02*

U.S. Cl. 219—10.57 3 Claims



1. An apparatus for crucible-free zone processing of a semiconductor rod comprising:

an operable processing housing having a hollow gas impermeable chamber therein;

a hollow support tube attached at one end thereof to an inner wall of said housing providing gas-impermeable access between said chamber and the exterior of said housing;

a capacitor container attached to a second end of said support tube within said chamber, said container having a hollow fluid-impermeable chamber therein; said fluid-impermeable chamber being filled with a low viscosity dielectric cooling fluid;

a plurality of ceramic capacitors positioned within said fluid-impermeable chamber of the capacitor container;

a pair spaced-apart support plates mounted within said fluid-impermeable chamber and spaced from the container walls;

said ceramic capacitor being parallelly arranged between said support plates and being electrically connected thereto;

a first pair of hollow conduit means extending through said support tube about said capacitors and in contact with said support plates, said first pair of conduit means having one end thereof extending outside said processing housing into operational contact with an electrical current source and with a hydraulic circuit having a heat-exchange fluid flowing therein for simultaneously directing said electrical current and said heat-exchange fluid to said ceramic capacitors;

a second pair of hollow conduit means having one end extending out from said fluid-impermeable chamber of the capacitor container and having the other end operationally connected to a second end of said first pair of hollow conduit means; and

an annular induction heating coil having a fluid passage therein, said fluid passage being serially connected to the second end of said second pair of hollow conduit means.

4,035,601

ELECTRICAL CIRCUIT ARRANGEMENTS RESPONSIVE TO SERIAL DIGITAL SIGNALS FORMING MULTI-BYTE DATA-WORDS

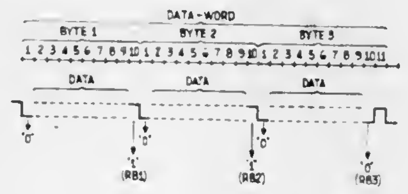
Charles Allan Isaacs, Wirral, England, assignor to Plessey Handel und Investments A.G., Zug, Switzerland

Filed June 17, 1975, Ser. No. 587,695

Claims priority, application United Kingdom, June 18, 1974, 26885/74

Int. Cl.² H04L *7/00*

U.S. Cl. 178—69.1 4 Claims



1. In or for use in a digital-data transmission system, a signalling response circuit for incoming signals having a signalling format of the kind referred to and characterised in that it includes (i) register means for the storing of the data content of each byte of a received data-word, (ii) control logic means for producing, preparatory to reception of each byte of the data-word, either a first condition indicating that the byte currently expected is other than the last byte of a data-word or a second condition indicating that the byte expected is the last byte of a data-word and producing control signals connected to said register means, (iii) detector means for extracting from said incoming signals, pulses having time appearances appropriate to a synchronising-pulse sequence, (iv) a comparison device operative under control of each aforesaid extracted pulse and the prevailing said first or second condition to assess the presence or absence of a synchronisation error in relation to any currently received byte of a data-word and to produce a first or second output signal appropriate to said presence and absence respectively, said output signal being applied to said control logic means to cause said control logic means to produce either said first or second condition and said control signals.

4,035,602

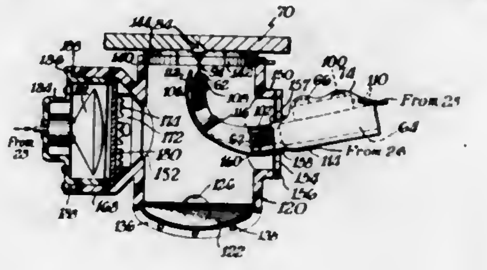
APPARATUS FOR UNDERWATER ARC WELDING

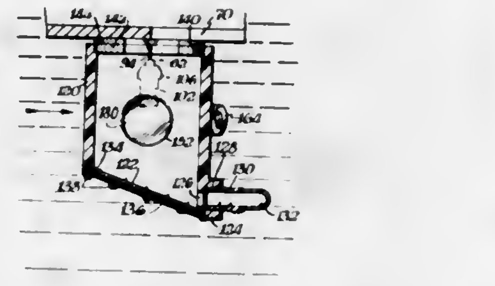
Ernest H. Berghof, 5408 Sailfish St., Orlando, Fla. 32809

Continuation of Ser. No. 175,220, Aug. 26, 1971, which is a division of Ser. No. 886,245, Nov. 13, 1969, Pat. No. 3,632,950, which is a continuation-in-part of Ser. No. 701,700, Jan. 30, 1968, abandoned. This application Oct. 11, 1974, Ser. No. 514,114

Int. Cl.² B23K *9/16, 9/32;* **B63C** *11/00*

U.S. Cl. 219—72 33 Claims





1. Apparatus for use under a body of water for arc welding comprising:

a housing defining a chamber and having a welding opening and a welding gun opening,

means for movably introducing at least a portion of a welding gun through said welding gun opening into the chamber in a position to carry out a welding operation on a workpiece located outside of said chamber contiguous said welding opening,

means for introducing a gas under pressure into said chamber thereby to purge the chamber of water, and

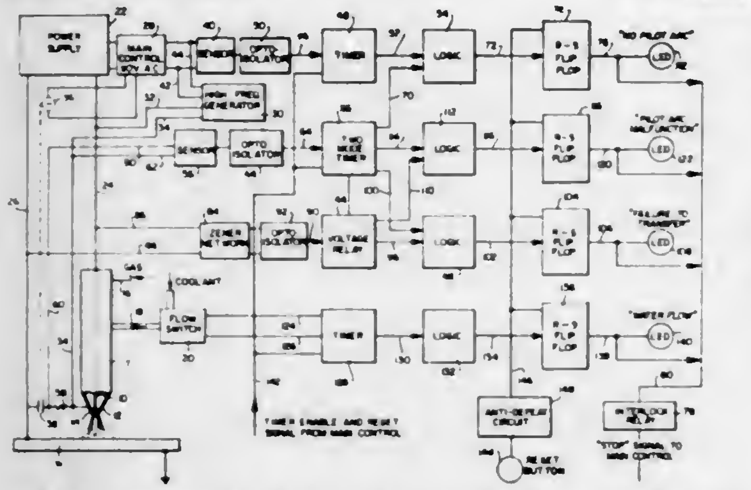
outlet means in said housing to facilitate purging said chamber of water, said outlet means being rotatable to said housing, said outlet means being so configured and oriented relative to said housing that the adjustment of said outlet means by rotation affords a control of the amount gas discharged through it and thereby the gas pressure in said chamber.

4,035,603
FAULT DETECTOR SYSTEM FOR STARTING PLASMA ARC WORKING APPARATUS
Robert C. Fernicola, Florence, S.C., assignor to Union Carbide Corporation

Filed Mar. 31, 1976, Ser. No. 672,478

Int. Cl.^{2} B23K *9/10*

U.S. Cl. 219—121 P **9 Claims**



1. In combination: a plasma arc working apparatus including a torch having an electrode, a DC power supply connected in series between said electrode and the workpiece, means for igniting a pilot arc in close proximity to said electrode, said pilot arc ignition means including a high frequency pilot arc current source having an input, and a control circuit including means for extinguishing said pilot arc, wherein said apparatus is started by applying an input signal from said control circuit to said pilot arc current source whereupon pilot arc current flows in circuit with said pilot arc ignition means to ignite the pilot arc and whereupon said pilot arc transfers the main arc between said electrode and workpiece thereby establishing an arc voltage; and a fault detector system for monitoring key parameters in the starting operation of said apparatus and for automatically stopping the starting operation upon detection of a fault or malfunction, said system comprising, in combination:

sensing means for separately sensing the input signal to said pilot arc current source, the flow of pilot arc current and said arc voltage as key starting parameters, said sensing means being adapted to produce separate output signals representing the presence of said key parameters;

timer circuit means adapted to receive output signal from said sensing means and to produce a first output signal representing the presence of said input signal to said pilot arc current source, a second output signal representing said pilot arc current and a third output signal representing the pilot arc, said timer circuit means being adapted to set the duration of said first, second and third output signals to first, second and third predetermined time periods respectively;

a first logic circuit adapted to receive said first output signal from said timer circuit means and a signal from said sensing means representing the presence of said pilot arc current, and to produce an output signal when said sensing means signal fails to occur within said first predetermined time period indicating that said pilot arc has failed to ignite;

a second logic circuit adapted to receive said second output signal from said timer circuit means and a signal from said sensing means representing the presence of said arc voltage and to produce an output signal when said sensing means signal fails to occur within said second predetermined time period indicating that the main arc has fail to transfer:

a third logic circuit adapted to receive said third output signal from timer circuit means and a signal from said sensing means representing said pilot arc current and to produce an output signal when the duration of said sensing means signal exceeds said third predetermined tine period indicating that said pilot arc has failed to extinguish; and

means adapted to receive said first, second and third output signals from said logic circuits and to produce output signals receivable by said control circuit for stopping the starting operation of said apparatus.

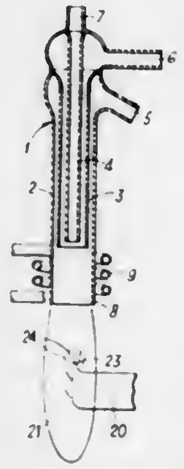
4,035,604
METHODS AND APPARATUS FOR FINISHING ARTICLES
Abdou Hanna Meleka, Bristol; Herbert Hilary Hall Watson, Abingdon, and Eric Stanley Hotston, Wantage, all of England, assignors to Rolls-Royce (1971) Limited, London, England

Continuation-in-part of Ser. No. 431,779, Jan. 8, 1974, abandoned. This application July 21, 1975, Ser. No. 597,335

Claims priority, application United Kingdom, Jan. 17, 1973, 02522/73

Int. Cl.^{2} B23K *9/00*

U.S. Cl. 219—121 P **10 Claims**



1. A method of removing a burr from an electrically conductive article with a plasma generator comprising the steps of energizing a gas into a plasma at a temperature between 5000° K and 50,000° K with the plasma generator, controlling the rate of gas flow through the plasma generator to limit the jet momentum to a value allowing selective destruction of the burrs, exposing the article to the plasma substantially to avoid arcing between the article and the plasma generator and allowing the recombination of ions present within the plasma at the burr whereby the temperature of the burr is elevated relative to the body of the article and utilizing means capable of exothermic reaction with the burr at the said elevated temperature.

4,035,605
NARROW GROOVE WELDING METHOD, AND WELDING APPARATUS FOR PRACTICING THE METHOD
Yasuo Taniguchi, and Shinichi Konishi, both of Kawagoe, Japan, assignors to Denyo Kabushiki Kaisha, Japan

Filed Aug. 19, 1975, Ser. No. 605,823

Claims priority, application Japan, Mar. 19, 1975, 50-33298; Mar. 27, 1975, 50-41057[U]

Int. Cl.^{2} B23K *9/00*

U.S. Cl. 219—126 **10 Claims**

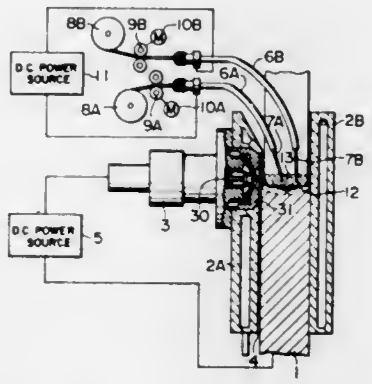
1. A narrow groove welding apparatus for butt-welding metal plates, the plates having edges, front and rear surfaces and being formed with a relatively narrow welding groove defined by the edges of the metal plates for forming a welding space, comprising:

a. front and rear holding member adapted to slidably hold the front and rear surfaces of the metal plates;

b. a non-consumable electrode torch fixedly provided on said front holding member for generating a plasma arc to melt the edges of the mtal plates;

c. an electrically insulating plate provided on said front holding member for the latter to be in contact with the front surface of the metal plates through said electrically insulating plate for electrically insulating said non-consumable electrode torch and said front holding member from the metal plates to be welded;

d. a plurality of consumable electrodes which are fed into said welding space in a direction opposite to a welding direction;



e. a first electric power source connected between said non-consumable electrode torch and the metal plates for generating an arc to melt the edges of the metal plates in the welding space;

f. a second electric power source connected between at least two of said plurality of consumable electrodes for generating arcs therebetween to melt the latter; and

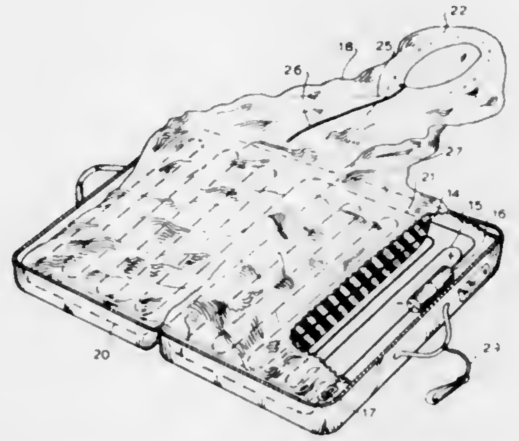
g. means for moving said front and rear holding member, said non-consumable electrode torch, and said plurality of consumable electrodes along the welding groove.

4,035,606
PORTABLE CUSHION APPARATUS
Thomas H. Browder, 7168 Forest City Road, Apt. No. 102, Orlando, Fla. 32810

Filed Mar. 8, 1976, Ser. No. 664,552

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—211 **4 Claims**



1. A portable heated cushion and garment apparatus comprising in combination:

a foldable carrying case having a pair of connected halves;

a cushion means attached inside of each half of said carrying case;

a poncho raincoat having a headcovering with a drawstring therein, said raincoat attached to the inside of said foldable carrying case and said foldable carrying case having a folded position for enclosing said raincoat in said carrying case while forming additional cushioning and an unfolded position for partially covering a user in inclement weather whereby a portable cushioning and weather-shielding garment may be easily transported and stored;

a battery-powered electrical heating element mounted in both halves of said carrying case cushion means; and

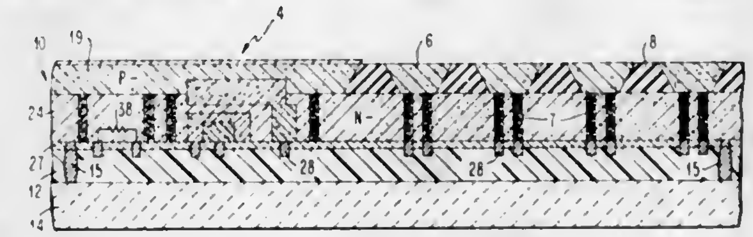
connecting means for connecting said foldable carrying case around the waist of a user wearing said raincoat whereby said user can be warmed whether seated or standing.

4,035,607
INTEGRATED HEATER ELEMENT ARRAY
Leon L. Wu, Hopewell Junction, N.Y., assignor to IBM Corporation, Armonk, N.Y.

Division of Ser. No. 501,567, Aug. 29, 1974, Pat. No. 3,953,264. This application Mar. 19, 1976, Ser. No. 634,695

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—216 **9 Claims**



1. A semiconductor thermal printing device including a semiconductor substrate and a plurality of spaced semiconductor heating elements formed on a major surface of said semiconductor substrate and having common coplanar faces in electrical and thermal isolation from each other, the improvement wherein:

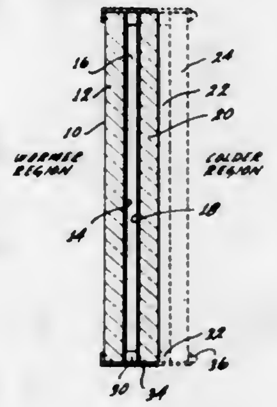
the area of the face of said heating elements opposite said semiconductor substrate is larger than the area of the face adjacent said substrate.

4,035,608
MULTI-PANE WINDOW STRUCTURE
Michael Eban Stromquist, Studio City, and James Joseph Heaney, Glendale, both of Calif., assignors to Anthony's Manufacturing Company, Inc., San Fernando, Calif.

Filed Nov. 17, 1975, Ser. No. 632,365

Int. Cl.^{2} H05B *1/00*

U.S. Cl. 219—218 **9 Claims**



1. In an insulative multi-pane window structure interposable between a colder region and a warmer region to permit vision therebetween, of the type having at least a first pane having a surface exposed in use to humidity-hearing air in the warmer region and a second pane opposite and spaced apart from the first pane, and having electrical heating means on the first pane for heating the first pane by electrical resistance heating, the improvement comprising:

a substantialiy transparent, electrically inactive infrared reflective coating on the second pane.

4,035,609

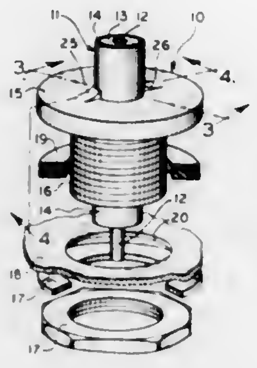
ELECTRIC HEATING ELEMENT ASSEMBLY WITH SOLDERLESS BULKHEAD FITTING AND METHOD OF ASSEMBLY

Alan D. Vogel, Laurel, Md., assignor to Electro-Therm, Inc., Laurel, Md.

Filed Apr. 3, 1975, Ser. No. 564,938

Int. Cl.² H05B *1/00*; F24H *1/00*

U.S. Cl. 219—335 **18 Claims**



1. An electric heating element assembly for mounting through an aperture in a bulkhead, said assembly comprising, in combination:

a sheathed electrical heating element,

a fitting including a radial flange portion having a diameter greater than said bulkhead aperture,

a sleeve portion integrally adjacent and concentric with said flange portion and having an outer diameter smaller than said bulkhead aperture and a length greater than the thickness of said bulkhead,

fastener receiving means on said sleeve portion for engaging a fastener for drawing said flange portion into engagement with the bulkhead,

said flange and sleeve portions including an axially-extending aperture through which said sheathed heating element is extended, and

a circumferential portion of the wall of said axially-extending aperture being deformed out-of-round to decrease the cross-sectional area of said aperture and establish a solderless mechanically-rigid locked-rotation liquid-seal with the sheath of said heating element.

4,035,610

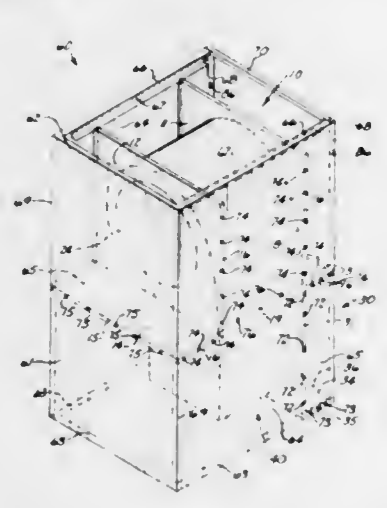
FURNACE CABINET HAVING INTEGRAL HEATER AND BLOWER ASSEMBLIES

James E. Roth, Festus, Mo., assignor to Intertherm, Inc., St. Louis, Mo.

Filed Dec. 8, 1975, Ser. No. 638,340

Int. Cl.² F24H *3/02*

U.S. Cl. 219—366 **5 Claims**



1. An internally stabilized air delivery appliance cabinet, comprising

a rear wall, and right and left side walls having aft edges secured thereto and having forward edges,

said walls, having, at one of their common extremities, edges defining three edges of a cabinet air inlet, together with

a blower scroll assembly located in said cabinet and positioned aft of said forward edges, the blower scroll assembly having

a flanged-edge forward scroll panel extending between the said side walls substantially parallel to said rear wall and commencing spacedly from such cabinet air inlet, said forward scroll panel having a forward-extending flanged-edge part at its extremity remote from such cabinet air inlet and extending to the forward edge of the cabinet side walls, all said flanged-edge parts being secured to said side walls,

a parallel rear scroll panel similarly secured to the said side walls having a flanged-edge part at its extremity remote from such cabinet air inlet and extending rearward to a flanged aft edge secured to the rear wall,

circular scroll openings through said forward and rear scroll panels, whereby a motor-driven centrifugal blower may be accommodated therebetween and its motor may be accommodated at the opening of said forward panel,

a scroll-shaped wall mounted about said aligned openings and connecting said forward and rear scroll panels and having between said scroll panels an outlet in a horizontal plane coincident with the forward and rearward flanged-edge parts of said scroll panels,

whereby the space between said rear wall and rear scroll panel above its rearward extending flanged-edge part may serve, together with the space thereabove, as a rear air inlet chamber portion, together further with

a forward door element covering that portion of the cabinet defined substantially by the forward edges of said left and right sidewalls extending from that extremity at which such cabinet air inlet is located to the forward-extending flanged-edge part of said forward scroll panel,

whereby, on its affixation, to complete an air inlet chamber portion forward of said forward scroll panel and on its removal to give access to such motor-driven blower.

4,035,611

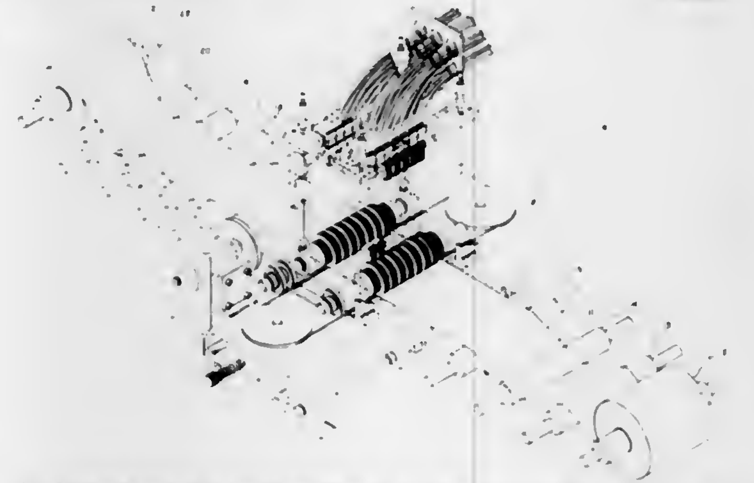
APPARATUS FOR ELECTRICALLY PERFORATING MOVING PAPER WEBS

Richard Hugo Martin, and William F. Owens, Jr., both of Pisgah Forest, N.C., assignors to Olin Corporation, Pisgah Forest, N.C.

Filed June 1, 1976, Ser. No. 691,624

Int. Cl.² H05B *7/18*

U.S. Cl. 219—384 **7 Claims**



1. Apparatus for perforating a moving web of material by electric discharge comprising:

a. support means;

b. charged circular electrodes comprising a plurality of thin discs of equal diameter rotatably mounted on said support means and aligned axially in spaced relationship to each other, said discs electrically insulated from each other and from said support means;

c. means for rotating said discs on their axis;

d. a narrow ground electrode member mounted on said support means adapted to move at right angles to the direction of rotation of said discs and spaced parallel and in close proximity to the rims of said discs to provide a gap between the rims of said discs and said member;

means for moving said ground electrode member;

f. means for advancing a web through said gap;

g. means for supporting said web as it passes through said gap and for continuously collecting and removing particulate materials produced during perforating comprising a member having a flat surface in contact with said web, a guide slot for said ground electrode, a recess in said surface immediately adjacent said slot, and means for removing particulate materials that collect in said recess; and

h. a pulsed high voltage power source connected to each of said discs providing intermittent charges to said discs and concomitant arcs across the gap between said discs and said ground electrode member whereby a moving web of material is perforated as it passes through said gap.

4,035,612

CIRCUIT FOR DETECTING TROUBLE IN ELECTRIC LINES CONNECTING RELATIVELY MOVABLE CIRCUITS

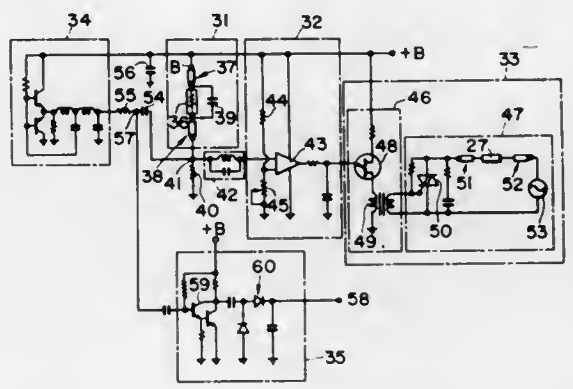
Tutomu Ishiguro, and Yukio Katano, both of Kawaguchi, Japan, assignors to Kabushiki Kaisha KIP, Japan

Filed June 27, 1975, Ser. No. 590,808

Claims priority, application Japan, July 18, 1974, 49-82427

Int. Cl.² H05B *1/02*

U.S. Cl. 219—469 **3 Claims**



1. A circuit for controlling the temperature of a heating roller in an electrophotographic copying machine comprising a temperature detecting element fixed to the heating roller, a sliding contact electrically connecting said temperature detecting element to a stationary circuit, a high frequency oscillator having its output connected to said sliding contact, a capacitor in circuit with said sliding contact for passing the output signal of said oscillator to ground through said sliding contact, and a signal generator connected to the output of said high frequency oscillator for producing a signal indicating imperfect operation of said sliding contact.

4,035,613

CYLINDRICAL CERAMIC HEATING DEVICE

Nobukazu Sagawa; Yasuo Uchikado, both of Kokubu; Yoshiteru Hamano, Kyoto; Ryoichi Sugimoto, Kyoto, and Sakae Mori, Kyoto, all of Japan, assignors to Kyoto Ceramic Co., Ltd., Kyoto, Japan

Filed Jan. 8, 1976, Ser. No. 647,356

Int. Cl.² H05B *3/10*

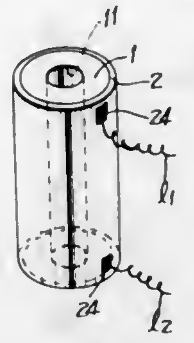
U.S. Cl. 219—552 **8 Claims**

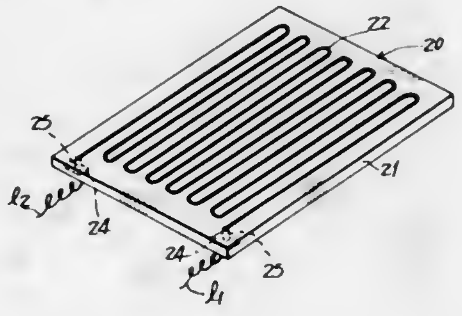
1. A cylindrical ceramic heating device comprising:

a burnt cylindrical support core of heat resistant ceramics;

at least one burnt heater element made of heat resistant ceramics disposed around said support core in contact with the periphery of said support core, said element comprising a burnt sheet of heat resistant ceramics;

a heat-generating electrical resistor pattern formed from a resistive paste and fired on said ceramic sheet, said pattern being hermetically sealed between said sheet and said core; and





a pair of exposed terminals disposed on said sheet, said terminals being connected to said pattern and adapted to be coupled to power leads such that electrical power is applied to said pattern; said support core being a hollow cylinder and the hollow thereof being adapted to form a means to connect with a cylindrical article to to heated.

4,035,614

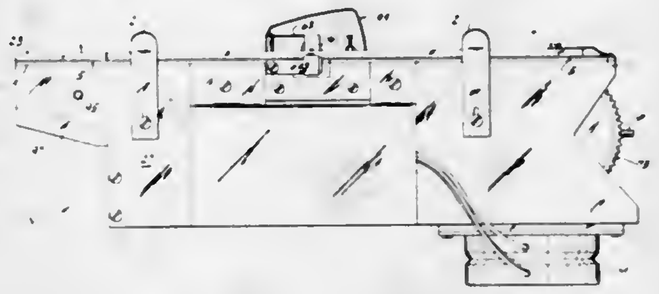
CARD VALIDATING APPARATUS

Joseph R. Frattarola, Westford; Peter W. Ford, Winchester, both of Mass., and James P. Santagata, Pittsford, N.Y., assignors to UMC Industries, Inc., Stamford, Conn.

Filed Mar. 25, 1976, Ser. No. 670,391

Int. Cl.² G06K *5/00*, *7/08*; G07F *7/02*

U.S. Cl. 235—61.7 B **57 Claims**



1. Apparatus for validating a card having positioned thereon a plurality of redundant encoded blocks of data readable by moving the card past a reader comprising:

a reader for sensing each block of data on the card and for supplying an electrical signal representative thereof;

means responsive to the electrical signal from the reader for storing the data from each block as it is sensed;

means for comparing the stored set of data from each block with a preselected set of data; and

means for supplying an indication of card validity if a stored set of data and the preselected set of data are identical.

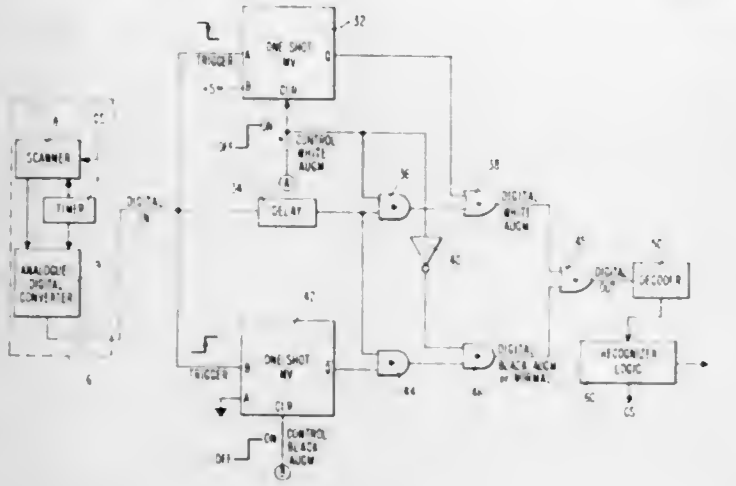
4,035,615
SYSTEM FOR ACCEPTING WIDE RANGES OF UNIVERSAL PRODUCT CODE SYSTEM

Donald T. Best, Lafayette Hill, and Juan M. Gottschalk, Elkins Park, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 20, 1976, Ser. No. 688,511

Int. Cl.² G06K *7/10*; **G08C** *9/06*; **G06K** *9/18*; **H03K** *9/08*

U.S. Cl. 235—61.11 E **7 Claims**



1. Scanning apparatus comprising:

a. means for scanning a symbol comprising bars and spaces and for generating signals corresponding to said bars and spaces,

b. means coupled to said scanning means for processing said signals, and

c. means included in said processing means for widening said signals representing said spaces and narrowing said signals representing said bars and,

d. means included in said processing means for narrowing the signals representing said spaces and widening the signals representing said bars.

4,035,616
DEVICE FOR THE JOINT EVALUATION OF SEVERAL CYCLIC PROCESSES

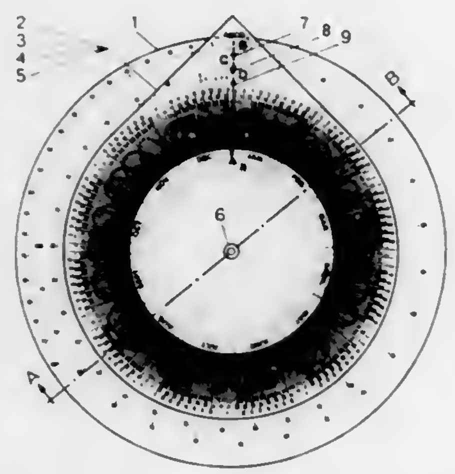
Fritz Artur Piringer, Graf Starhemberggasse 13, Stiege 10/15, A-1040 Vienna, Austria

Filed Mar. 18, 1975, Ser. No. 559,470

Claims priority, application Austria, Mar. 18, 1974, 2187/74

Int. Cl.² G06C *27/00*

U.S. Cl. 235—78 RC **4 Claims**



1. A device for the joint evaluation of several cyclic processes using a plurality of transparent disc members superposed over each other and a base member, all members movable about a common axis, the improvement comprising

a. an opaque round ground element carrying several year scales of different length, each of said year scales subdivided into intervals from 0 to 100 years, said year scales proceeding from a joint zero line in two directions,

b. a first transparent element carrying an opaque date scale for one year, said date scale co-acting with said joint zero line of said ground element,

c. a second transparent element coordinated to the first year scale of said ground element and having a setting mark co-acting only with said first year scale and further carrying consecutive cycles drawn as a continuous curve,

d. a third transparent element coordinated to the second year scale of said ground element and having a setting mark co-acting only with said second year scale and further carrying consecutive cycles drawn as a continuous curve,

e. a fourth transparent element coordinated to the third year scale of said ground element and having a setting mark co-acting only with said third year scale and further carrying consecutive cycles drawn as a continuous curve,

f. means for securing together all of the said elements for movement about a common axis.

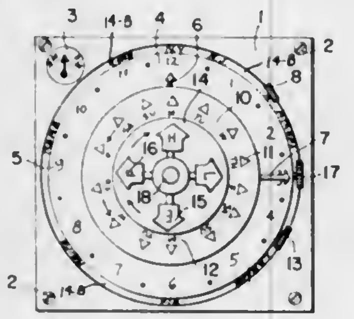
4,035,617
TIDE AND TIME CALCULATING DEVICE

Philip M. Banner, 28 Oxford Road, Massapequa, N.Y. 11758

Continuation-in-part of Ser. No. 243,001, April 11, 1972, Pat. No. 3,825,181. This application June 13, 1974, Ser. No. 479,248

Int. Cl.² G06C *3/00*; **G04B** *19/26*

U.S. Cl. 235—88 N **6 Claims**



1. A tide time indicating device of the character described showing the precalculable relationship between tide, time, date and place comprising a base having a clock face disc with hour and minute numerals thereon, hands for hour, minute and seconds displaying time at every moment connected to a motor drive means therefore a clock motor driver tide disc comprising marks corresponding to different tide phases and being set apart from each other through distances which correspond on said clock face disc to the times elapsing between said time phases, and a clock motor driver calendar disc comprising a predetermined sequence of regularly staggered marks at approximately 50 minutes apart corresponding to successive days, the space between two consecutive marks of said calendar disc at least corresponding on said time disc to the mean interval between the times when the same tide phase occurs at the same place on two consecutive days, a comparative rotatable secondary tide disc comprising marks corresponding to different earth places, the distance between any two ones of these marks corresponding on the time scale to the time interval between the times at which the same tide phases occur at the earth places to which said pair of marks correspond, each of said discs the clock face dics, tide disc, calendar disc and comparative secondary tide disc are coaxially mounted upon said base, also having an AM PM disc rotatably affixed upon said base turned by said drive means and all of the said discs being rotatably associated with said base each having setting crowns mounted upon said base for manual adjustment of said discs.

4,035,618
MONITOR FOR KNITTING MACHINES

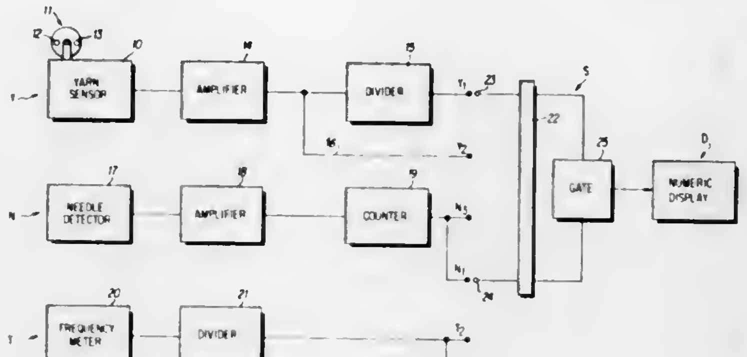
Maurice Laurent, Tassin La Demi-Lune, France, assignor to Rhone-Poulenc-Textile, Paris, France

Filed Jan. 26, 1976, Ser. No. 652,246

Claims priority, application France, Jan. 28, 1975, 75.02999

Int. Cl.² G07C *3/10*

U.S. Cl. 235—92 PD **5 Claims**



1. A portable monitor unit for knitting machines including; yarn sensor means for emitting a fixed number of pulses per unit of length of yarn,

a needle detector circuit including a stroboscopic element for sensing a needle of the knitting machine and a counter for counting cycles of the needle and emitting pulses according to the cycle count,

a frequency meter,

a numerical display unit and switch means, including gate means, for selectively supplying pulses to said numerical display unit from a selected one of said yarn sensor means and said needle detector circuit for an interval determined by the gate means according to a selected one of said counter of the needle detector circuit and said frequency meter.

4,035,619
ANALOG COMPUTER, PARTICULARLY FOR AN IGNITION SYSTEM FOR INTERNAL COMBUSTION ENGINE

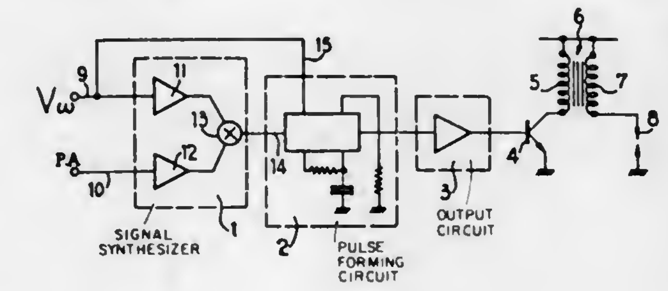
Jean M. Cholet, Villeneuve-Loubet, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed June 9, 1975, Ser. No. 585,167

Claims priority, application France, June 11, 1974, 74.20177

Int. Cl.² G06F *15/50*; **F02P** *5/04*

U.S. Cl. 235—150.2 **17 Claims**



1. An analog computer, suitable for providing control signals in an internal combustion engine, said computer comprising in combination:

a. signal synthesizer circuit means for generating a continuous ignition advance angle signal as a function of engine rotation speed over a predetermined speed range and of air intake pressure in accordance with a predetermined response characteristic, said synthesizer means comprising transconductance amplifier stages for generating signals corresponding with respective segments of said response characteristic and means for summing outputs from said amplifier stages to generate said continuous signal; and

b. circuit means for controlling the instant of commencement of a control signal output from said computer with respect to a reference time, as a function of the instantaneous speed of engine rotation and of the instantaneous value of said ignition advance angle signal.

4,035,620
BUMPLESS CONTROL TRANSFER

James W. Hobbs, and Dexter E. Smith, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 25, 1975, Ser. No. 607,419

Int. Cl.² G05B *7/00*

U.S. Cl. 235—151.1 **12 Claims**

1. A method for transferring control of a process parameter from control in response to a local set point signal to control in response to an automatic set point signal not directly compatible with said local set point signal, said method comprising:

establishing a process parameter signal compatible with said automatic set point signal and responsive to the condition of said process parameter;

substituting control in response to an aligning set point signal compatible with said automatic set point signal for control in response to said local set point signal for control of said process parameter, said aligning set point signal being generated in response to a comparison of the value of a fixed signal representative of the value of said process parameter signal immediately prior to substitution of said aligning set point signal with the value of said process parameter signal following said substitution of said aligning set point signal;

maintaining said automatic control set point signal equal to said aligning set point signal when said process parameter is being controlled in response to said aligning set point signal;

maintaining control in response to said aligning set point signal for a period of time sufficient to permit said aligning set point signal to at least substantially reach a stable steady-state condition; and

substituting said automatic control set point signal for said aligning set point signal for control of said process parameter to implement automatic control of said process parameter.

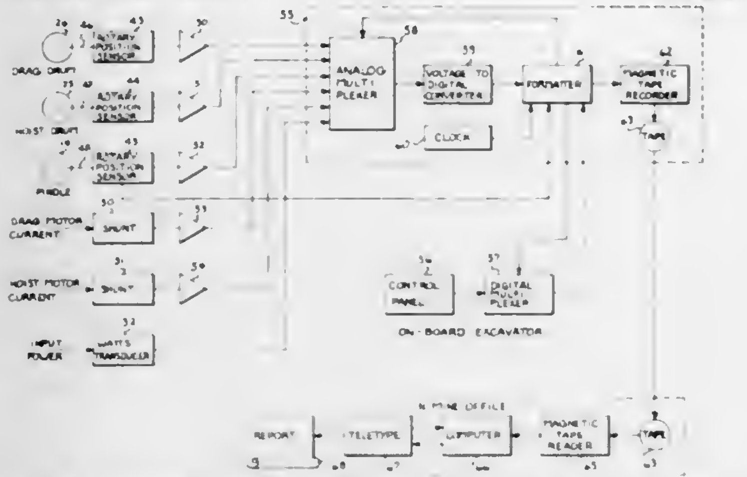
4,035,621
EXCAVATOR DATA LOGGING SYSTEM

Kenneth A. Kemp, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 421,148, Dec. 3, 1973, abandoned. This application July 14, 1975, Ser. No. 595,924

Int. Cl.² G06F *15/20*

U.S. Cl. 235—151.3 **4 Claims**



1. A system for analyzing the performance of a power operated excavator having a lower frame member and a boom rotatable with respect to the lower frame member, a bucket controlled by means of a motor driven drag cable and a motor driven hoist cable, the system comprising:

a. drag sensor means for generating a signal representative of the drag cable length;
b. hoist sensor means for generating a signal representative of the hoist cable length;
c. swing angle sensor means for generating a signal representative of the angle of the boom relative to the lower frame member;
d. first shunt means in circuit with the drag motor for generating a signal proportional to the drag motor current;
e. second shunt means in circuit with the hoist motor for generating a signal proportional to the hoist motor current;
f. memory means for storing the sensor and shunt means signals;
g. a multi-switch control panel for generating codes identifying excavator delay or special excavator activities, the excavator, and its time period of operation, said memory means being operably connected to said control panel for storing the identifying codes;
h. a computer including computer means for accessing instructions that control the computer; to scan said memory means and compare the sensor and shunt signals and said codes stored therein with certain of said instructions to analyze the recorded data, to generate indicia of selected operating cycles performed by the excavator during said time period of operation, and to calculate certain end-of-time-period parameters; and
i. means for transferring said analyzed data and parameters to a print-out that is readable by an operator to classify the activity of the excavator during said time period.

4,035,622
APPARATUS FOR MEASURING THE CARDIAC CAPACITY

Wladimir Obermajer, 1 villa Leandre, 75018 Paris, France

Filed Nov. 18, 1975, Ser. No. 632,908

Claims priority, application France, Nov. 20, 1974, 74.38101

Int. Cl.² G06F *15/42;* **A61B** *5/02*

U.S. Cl. 235—151.3 **3 Claims**

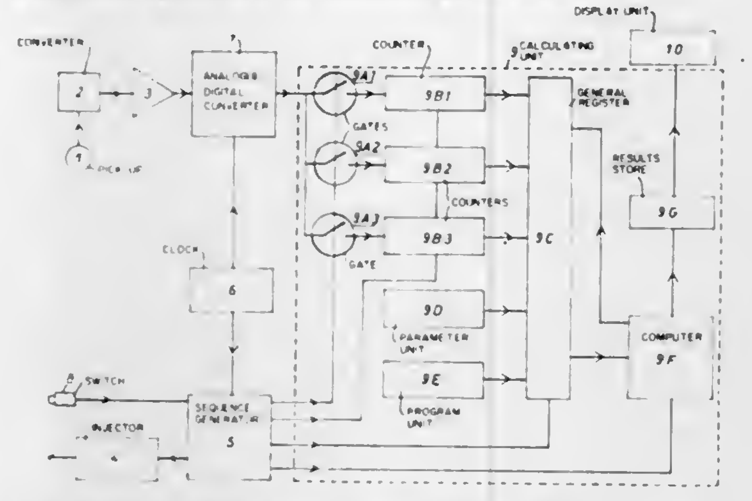
1. An apparatus for measuring the caridac blood capacity or cardiac stasis V of a heart at each beat comprising:

an injector, adapted to be fitted by catheterization, for injecting an indicator above the heart, forming an indicator concentration in the blood;

a pickup, adapted to be fitted by catheterization, for providing an electrical signal Δt variable with respect to time and indicative of the indicator concentration in the blood;

means for measuring the quantity Δ_m corresponding to the indicator concentration in the blood at a time t_m which represents the end of a sequence;

a sequence generator for controlling said injector;



a clock for controlling said sequence generator;

an analogue-digital converter which is responsive to said clock and said pickup; and

a calculating unit, responsive to said sequence generator and said analogue-digital converter, for calculating the integrals

$$S = \int_{0}^{\infty} \Delta(t)dt \text{ and } S' = \int_{t_m}^{\infty} \Delta(t)dt$$

and the ratios

$$\frac{S'}{\Delta_m} \text{ and } \frac{S'}{\Delta_m \cdot S}.$$

4,035,623
SECURITY CARDS

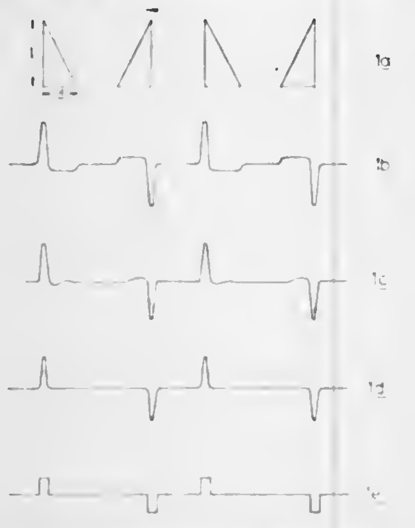
Robert W. Eastell, Bristol; John Harrison, and Allan Sharples, both of Basingstoke, all of England, assignors to McCorquodale & Company Limited, Basingstoke, England

Filed Mar. 2, 1976, Ser. No. 663,065

Claims priority, application United Kingdom, Mar. 6, 1975, 9327/75; Dec. 3, 1975, 49574/75

Int. Cl.² G06K *7/14, 19/06;* **G01N** *21/30*

U.S. Cl. 235—61.11 D **21 Claims**



1. A method of recording security data on a record medium comprising forming a first magnetic character which when scanned in a given direction by a magnetic pick-up head having a sensing gap of preselected dimensions generates a characteristic signal exceeding a first threshold level in a positive direction but not exceeding a second, lower threshold level in a negative direction, forming a second magnetic character which when scanned in the said given direction by a magnetic pick-up head having a sensing gap of preselected dimensions generates a characteristic signal exceeding the said second, lower threshold level in a negative direction but not exceeding the said first threshold level in a positive direction, and depositing a sequence of the magnetic characters on the record medium, the characters having a configuration and density distribution so that each character has a sharp magnetic flux increase at one point in the scanning direction to produce a characteristic signal of predetermined polarity when scanned by said pick-up head and gradual flux change for the remainder thereof to avoid a corresponding signal of opposing polarity when scanned by said pick-up head.

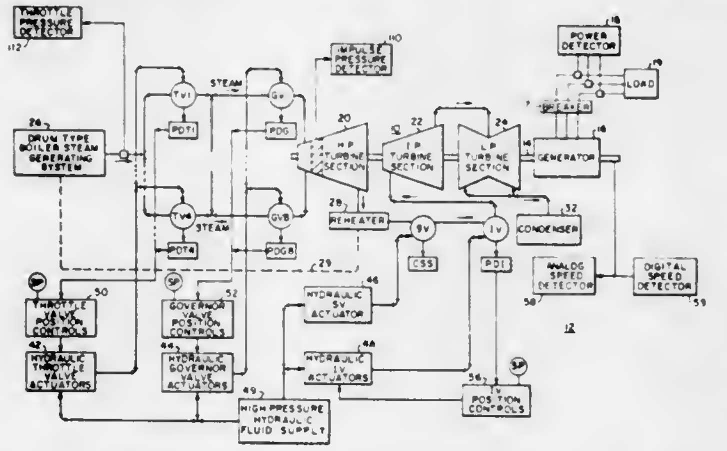
4,035,624
SYSTEM FOR OPERATING A STEAM TURBINE WITH IMPROVED SPEED CHANNEL FAILURE DETECTION

Francesco Lardi, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 247,597, April 26, 1972, abandoned. This application Oct. 16, 1973, Ser. No. 407,011

Int. Cl.² H02P *9/04;* **G05B** *15/00;* **F01D** *17/02;* **G06F** *15/06*

U.S. Cl. 235—151.21 **12 Claims**



1. An electric power generating system having a steam turbine, a steam generator for supplying steam to the turbine, an electric generator rotatable by said turbine and adapted to be connected to an electrical load, said system comprising:

valve means for controlling the flow of steam from the steam generator to the turbine to control the operation of the turbine;

means to generate an electrical signal representative of steam flow demand;

valve actuating means governed by the steam flow demand signal to control the operation of the valve means;

speed sensing means for sensing at least the magnitude of the turbine speed, said speed sensing means including means to generate at least first, second, and third independent electrical signals representative of turbine speed;

calculating means governed by the generated speed signals to at times control the steam flow demand signal in accordance with the selected first or second speed signal, said calculating means including sequence controlling means having the following components:

a. means for comparing said first, second, and third speed signals,
b. means governed by the comparison means to determine whether said first, second, and third speed signals differ from each other by a predetermined magnitude,
c. selection means governed by the determining means to select the first speed signal in response to a first condition where said first and second signals differ from each other by an amount less than said predetermined magnitude, or where said first signal differs from the third signal by an amount less than said predetermined magnitude while the second and third signals differ from each other by at least said predetermined magnitude, and to select the second speed signal in response to a second condition where the second and third signals differ from each other by an amount less than said predetermined magnitude while the first and second signals differ from each other by at least said predetermined magnitude; and
d. means to switch to the selected speed signal in response to a change between the first condition and the second condition.

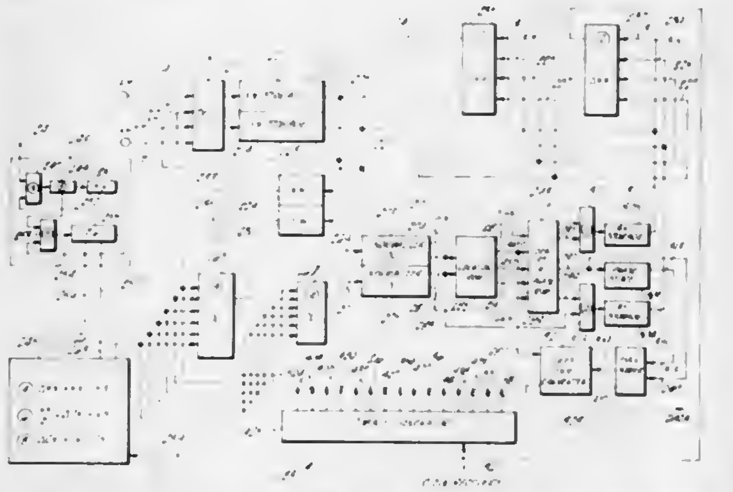
4,035,625
METHOD AND APPARATUS FOR PERFORMING BINARY EQUALIZATION IN VOICE-BAND PHASE-MODULATION MODEMS

Ran-Fun Chiu, Miami; James Bryon Sherman, North Miami, and Judson Truman Gilbert, Hialeah, all of Fla., assignors to Milgo Electronic Corporation, Miami, Fla.

Filed July 31, 1975, Ser. No. 600,729

Int. Cl.² H04B *3/14*

U.S. Cl. 235—152 **33 Claims**



1. A method for correcting the envelope delay and amplitude distortion characteristic of voice-band transmission channels on signals propagated therethrough, comprising:

converting a received symbol into its corresponding binary X and binary Y components;

equalizing the binary X and binary Y components of the received symbol according to previously defined equalization constants;

generating the difference between the equalized components of said received symbol and the ideal binary X and binary Y components of said symbol; and

utilizing said difference and the binary X and binary Y components of the received symbol to modify the equalization constants.

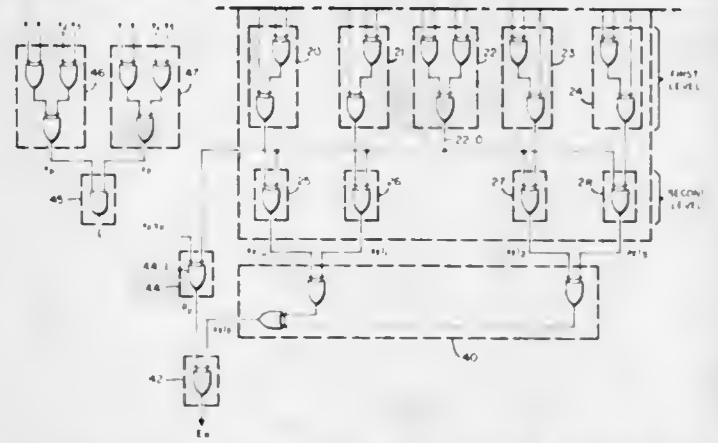
4,035,626
PARITY PREDICT NETWORK FOR M-LEVEL N'TH POWER GALOIS ARITHMETIC GATE

Bruce Arnold Christensen, Minneapolis, Minn., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 29, 1976, Ser. No. 671,884

Int. Cl.² G06F *11/10*

U.S. Cl. 235—153 BB **16 Claims**



1. A method of constructing a parity predict network for a two-level, N'th power, Galois multiplication gate, which multiplication gate is comprised of:

a matrix array of n, X input lines $x_0, \ldots x_{n-1}$ and n, Y input lines $y_0, \ldots y_{n-1}$ for forming the n^2 intersections x_0y_0, x_0y_1,

. . . $x_{n-1}y_{n-2}$, $x_{n-1}y_{n-1}$, said matrix array including n^2, two-input AND gates, a separate one having its two inputs coupled across the X input line and the Y input line of an associated one of said n^2 intersections;
a plurality of first level parity trees;
n, output, second level parity trees;
means intercoupling said n^2 AND gates, said plurality of first level parity trees and said n, output, second level parity trees for generating as the outputs of said n, output, second level parity trees, the Galois multiplication resultant

$$G(XY) = (xy)_0, \ldots \quad (xy)_{n-1},$$

of the Galois input on said n, X input lines of

$$G(X) = x_0, \ldots x_{n-1},$$

and of the Galois input on said n, Y input lines of

$$G(Y) = y_0, \ldots y_{n-1};$$

said method comprising:
coupling the two inputs

$$X_p = x_0 \ldots \quad x_{n-1},$$

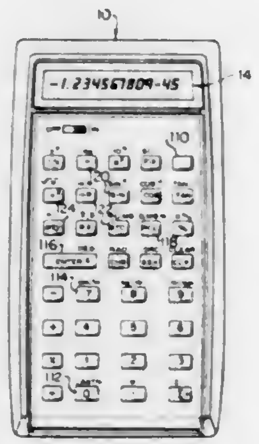
which is the parity of the Galois input on said n, X input lines, and

$$Y_p = y_0 \quad y_{n-1},$$

which is the parity of the Galois input on said n, Y input lines as two separate inputs to a parity predict AND gate;
coupling only the outputs of said first level parity trees that are inputs to an even number of said n, output, second level parity trees as inputs to a parity predict tree; and,
coupling the output of said parity predict AND gate as an input to said parity predict parity tree for generating the parity predict P_p as an output therefrom.

4,035,627
SCIENTIFIC CALCULATOR

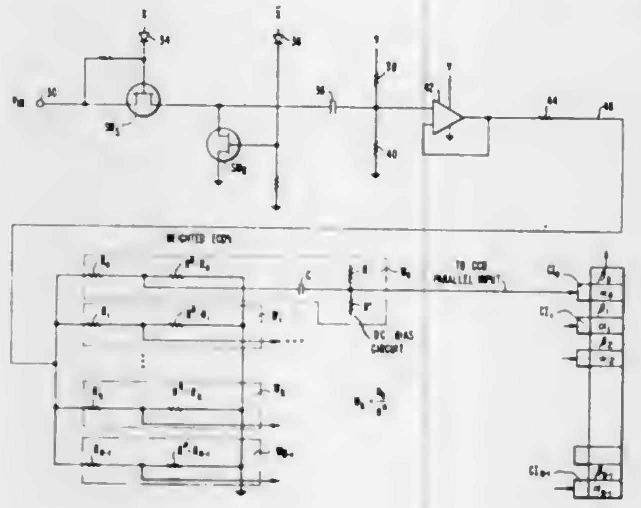
Peter D. Dickinson, Monte Sereno; Thomas E. Osborne, San Francisco; France Rode, and Allen J. Baum, both of Los Altos, all of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.
Division of Ser. No. 364,570, May 29, 1973, abandoned. This application Apr. 8, 1975, Ser. No. 566,142
Int. Cl.² G04B *47/00*; G06F *15/20*
U.S. Cl. 235—156 33 Claims



1. An electronic calculator having a calculator mode and a time-calculating mode for use as a realtime time-keeping device, comprising:
an input unit, including a plurality of manually operable keys, for initiating the modes of operation of the calculator;
a memory unit for storing microinstructions;
a plurality of storage registers for storing a plurality of numbers representing progressively larger units of time;
a processing unit, coupled to the input unit, memory unit and storage registers, responsive in the time-calculating mode to a preselected total number of microinstructions executed per smallest unit of time being calculated by the processing unit for repetitively incrementing the number representing the smallest unit of time, that number being zeroed when it exceeds a selected value, and, following each such zeroing of that number, incrementing the numbers representing each remaining progressively larger unit of time when the number representing the largest preceding unit of time relative thereto is zeroed, said lastmentioned numbers being zeroed when they exceed selected values, unless the number being incremented represents the largest unit of time, that number being reset to unity when it exceeds a selected value; and
an output display unit coupled to the processing unit for displaying the incremental values of the numbers representing units of time.

4,035,628
ANALOG TRANSVERSAL FILTERING AND CORRELATION WITH PROGRESSIVE SUMMATION OF ANALOG SIGNALS

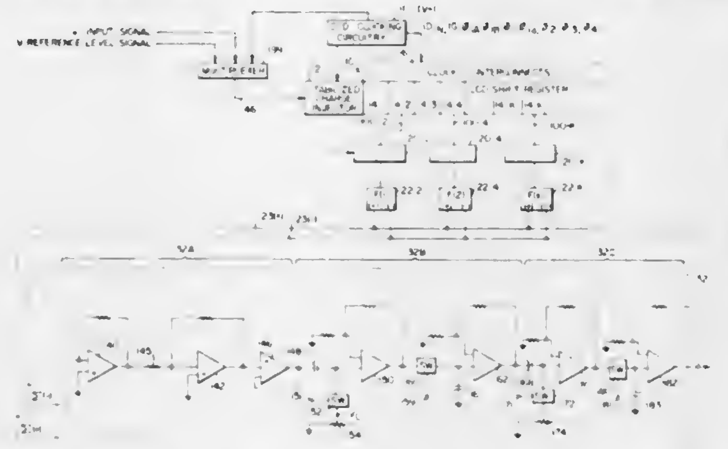
Donald Ross Lampe, Ellicott City, and Marvin Hart White, Laurel, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Oct. 24, 1975, Ser. No. 625,691
Int. Cl.² H03K *5/159*; G11C *11/40*
U.S. Cl. 235—193 20 Claims



1. A system for progressive summation of analog signals, comprising:
a charge transfer device having a plurality of successive stages, and means for shifting charge packets through said plurality of successive stages at a predetermined cyclic shift rate,
a plurality of charge injecting means respectively associated with at least selected ones of said plurality of successive stages, each said charge injecting means injecting a charge packet into a respectively corresponding selected one of said plurality of successive stages of said charge transfer device,
a plurality of signal processing means respectively associated with said plurality of injecting means,
means for supplying an input signal,
means for sampling said input signal and supplying said sampled input signal simultaneously and in parallel to each of said signal processing means in time sequence with said cyclic shift rate of charge packets through said stages of said charge transfer device,
said signal processing means simultaneously receiving said input signal sample in parallel and processing same, each thereof supplying a respective, processed signal sample to said respectively associated charge injector means, and
each of said plurality of charge injector means injecting a charge packet corresponding to said respective, processed signal sample from said processing means, into the respectively associated stage of said charge transfer device,
each of said selected stages of said charge transfer device receiving said injected charge packet simultaneously with the shifting thereinto of a charge packet from a preceding stage of said charge transfer device and summing said injected and shifted charge packets to produce a summation charge packet for shifting to the next successive stage of said charge transfer device, and
means for sensing a potential induced by each said summation charge packet from the last of said selected stages of said charge transfer device and producing a corresponding summation signal output sample corresponding thereto.

4,035,629
EXTENDED CORRELATED DOUBLE SAMPLING FOR CHARGE TRANSFER DEVICES

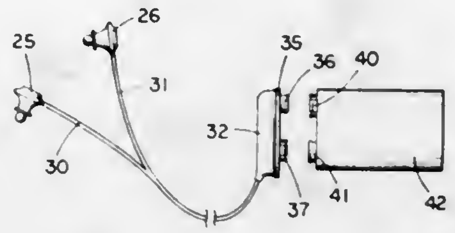
Donald R. Lampe, Ellicott City; Marvin H. White, Laurel, and James H. Mims, Linthicum Heights, all of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 507,115, Sept. 17, 1974. This application Oct. 24, 1975, Ser. No. 625,694
Int. Cl.² H03K *5/159*; G11C *11/40*
U.S. Cl. 235—193 26 Claims



1. A system for correction of errors in the output signals from a charge transfer device having a plurality of successive stages through which charge packets, respectively corresponding to analog signal samples, injected into said device are propagated at a preselected shift cycle rate, comprising:
a source of an input signal and of a reference level signal,
means for selectively and sequentially sampling said reference level and input signals in a prescribed sequence and at said shift cycle rate, means responsive to said sequence of reference and signal samples for injecting corresponding charge packets into said charge transfer device at an input stage thereof at said shift cycle rate and thus corresponding to the rate of shifting of charge packets to successive stages of said charge transfer device,
means for sampling, at said shift cycle rate, an output potential at an output stage of said charge transfer device produced by propagation of a charge packet to said output stage, and producing an output sample indicative of said output potential, said output samples including in said prescribed sequence, reference level and signal output samples,
analog circuit means for selectively responding to the reference and signal output samples of said prescribed sequence for determining the difference in value therebetween and producing an output indicative of the difference as the output signal from the charge transfer device.

4,035,630
ARTICLE OF JEWELRY

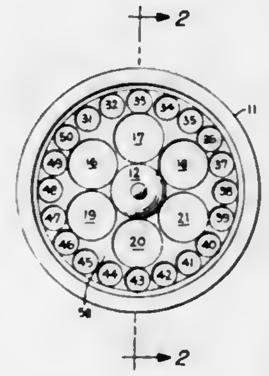
John G. Burke, 4516 E. 46th St., Indianapolis, Ind. 46226
Filed June 26, 1975, Ser. No. 590,601
Int. Cl.² F21V *33/00*
U.S. Cl. 240—6.4 W 2 Claims



1. A decorative article for wearing on the clothing comprising:
a. a pair of light emitting diodes connected electrically to one another with the cathode of one diode connected to the anode of the other diode and the anode of the one diode connected to the cathode of the other diode;
b. a button for display on the clothing, said light emitting diodes being mounted for display on said button;
c. a pair of pins attached to and projecting from said button for mounting said button on the clothing, one of said pins being electrically connected to the cathode of the one diode and the other of said pins being electrically connected to the anode of the one diode;
d. a pair of conductive, female fastener members both adapted to receive and to electrically connect with either of said pins for attaching said button to the clothing, said fastener members being separate from one another and capable of being moved toward and away from one another;
e. a pair of flexible, insulated electrical wires, each of said wires being electrically connected to a respective one of said female fasteners; and
f. means for providing an electrical signal to said pair of wires for transmission of the signal through said female fastener members and said pins to said light emitting diodes, which signal causes a first of said members to have a positive voltage relative to a second of said members and then causes the second of said members to have a positive voltage relative to the first of said members.

4,035,631
PROJECTOR LAMP REFLECTOR

Harold R. Day, Jr., Chagrin Falls, Ohio, assignor to General Electric Company, Schenectady, N.Y.
Filed Dec. 15, 1975, Ser. No. 640,901
Int. Cl.² F21V *7/02*
U.S. Cl. 240—41.35 C 8 Claims



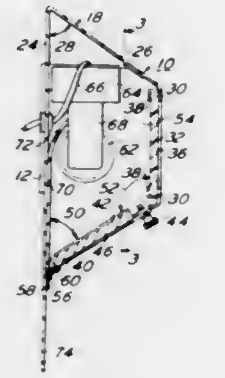
1. A projector lamp unit comprising a concave reflector and

a light source at a focus point of said reflector, and reflector having a first set of concave reflecting areas arranged to project a first set of light beams of given size from said light source to form a first tightly packed mosiac pattern at a plane, and said reflector having a second set of concave reflecting areas arranged to project a second set of light beams of given size from said light source to form a second tightly packed mosaic pattern superimposed on said first mosaic pattern.

4,035,632
FIXTURE SYSTEM

Robert R. Rayman, 922 Courtney Road, Baltimore, Md. 21227

Filed Apr. 29, 1975, Ser. No. 572,725
Int. Cl.² H05B *33/02;* **E05B** *17/00*
U.S. Cl. 240—51.11 R **18 Claims**



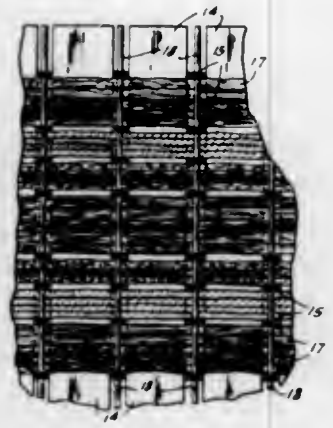
1. A light fixture system comprising:
a. a housing having mounted means for mounting to an external wall of an edifice, said housing including at least a pair of openings formed through a frontal portion of said housing;
b. lamp means within said housing for emitting light through each of said openings;
c. a first frontally directed window member being translucent and having indicia formed thereon and covering one of said housing openings, said first window member being releasably mounted to said frontal portion internal said housing; and,
d. a second substantially downwardly directed window member being substantially transparent and covering the other of said housing openings, said second window member being releasably mounted to said frontal portion internal said housing, said housing having a rear wall section passing in a substantially vertical planar direction below said second window member being adapted to have indicia formed thereon.

4,035,633
LAMP SHADE AND METHOD

Victor N. Grumbeck, Bristol, Wis., assignor to Beauti-Vue Products Corporation, Bristol, Wis.

Filed Dec. 24, 1975, Ser. No. 644,076
Int. Cl.² F21V *1/00*
U.S. Cl. 240—108 R **11 Claims**

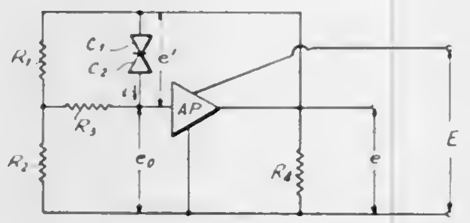
1. A lamp shade adapted to be mounted on a frustoconical frame, the lamp shade comprising:
a tubular body of an original generally cylindrical inside diameter substantially the same as the smallest diameter of the frustoconical frame;
said body comprising generally vertically extending slats;
generally horizontally extending strands connecting the slats in the tubular body;
the strands being disposed successively from adjacent to the top of the tubular body to adjacent the lower end of the tubular body; and
said strands being horizontally elastic so that the tubular body can be applied to the frustoconical frame by axially slipping the tubular body onto the frame from the smallest diameter end of the frame all the way to the largest diameter of the frame and the tubular body can expand due to the resilience of the strands whereby to conform to the frustoconical shape of the frame and cause the slats to grip the frame and thereby retain the expanded body frictionally on the frame.



4,035,634
LIGHT RECEPTOR DEVICE

Saburo Numata, Ohmiya, Japan, assignor to Fuji Shashin Koki Kabushiki Kaisha, Ohmiya, Japan

Filed Oct. 31, 1975, Ser. No. 627,916
Int. Cl.² H01J *39/12*
U.S. Cl. 250—209 **3 Claims**

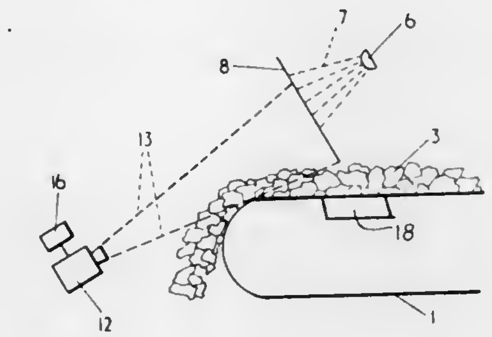


1. A light receptor device for cameras having automatic exposure regulators therein, to cover a high illuminance rage in the regulator, the device comprising, in combination: a pair of serially connected photocells having substantially the same characteristics, included in an electrical circuit that also includes an amplifier; said photocells being directly connected in opposed relation, and constituting a single photosensitive unit that is being illuminated such that the respective electromotive forces, temperature dependencies and other specific characteristics of said photocells counteract each other; no voltage being generated by said photosensitive unit, but an external electric voltage being applied across its terminals; said photocells each having individual voltage-current characteristics defined by separate curves that have substantially rectilinear and adjoining non-rectilinear portions and do not traverse the point of origin; only the non-rectilinear portion of a combined voltage-current characteristics of said photosensitive unit being used in combination with an external load, constituting a curve that traverses the point of origin; to obtain a desirable illuminance-output characteristic required for the operation of the automatic exposure regulator; wherein the illuminance-output characteristic of the combined curve diverges from a proportional, substantially rectilinear relation between power and illumination intensity, the latter approaching a flat curve portion in the high illuminance range, in the absence of the usual steep increase of the power in that range.

4,035,635
METHOD OF AND APPARATUS FOR MEASUREMENT OF FLOW OF PARTICULATE MATERIAL BY SENSING THE SHADOW PROFILE

Roy Crosland, Rolleston-on-Dove, and Andrew Howard Donaldson Park, Burton-on-Trent, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Mar. 11, 1976, Ser. No. 665,761
Claims priority, application United Kingdom, Mar. 14, 1975, 10714/75
Int. Cl.² H01J *39/12;* **G01N** *21/26*
U.S. Cl. 250—223 R **10 Claims**

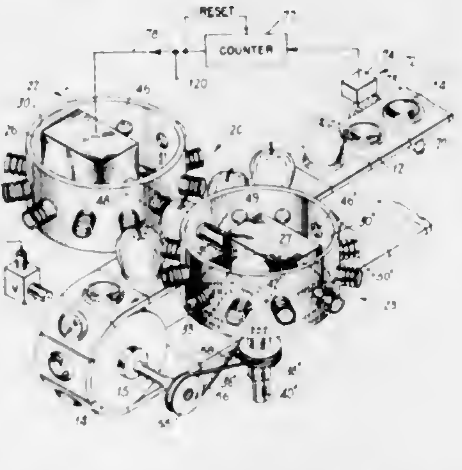


5. Apparatus for carrying out the method for measuring volume of flow of particulate material comprising a light beam source for directing a light beam towards the flow of particulate material as it abruptly changes direction such that a portion of the light beam is interrupted by the flow of material, a sensor for sensing the shadow profile formed by the material currently interrupting the light beam and for deriving a signal indicative of the shadow profile, and a monitor for receiving the derived signal to determine the volume of flow.

4,035,636
APPARATUS FOR MEASURING THE INTERNAL QUALITY OF PRODUCE

Torsten Nils Tengsater, Takoma Park, Md., assignor to AMF Incorporated, White Plains, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,500
Int. Cl.² G01D *21/04;* **G06M** *7/00;* **H01J** *39/12*
U.S. Cl. 250—223 R **13 Claims**

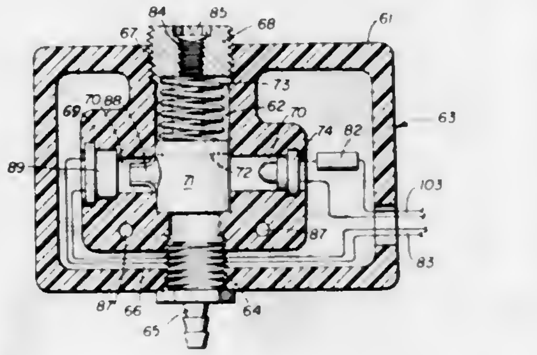


1. In apparatus for internally inspecting articles uniformly spaced on a moving conveyor that moves past an inspection position, the combination comprising
first and second rotatable members disposed on opposite sides of the conveyor at said inspection position,
said members being rotatable about respective axes that are transverse to the direction of movement of the conveyor,
said rotatable members each having an outer wall with a surface that extends parallel to said transverse axes,
a plurality of tubular light shields that are yieldable or at least partially collapsible in their axial directions equiangularly disposed about and extending outwardly from the wall of each member,
means for rotating said members in synchronism with the movement of said articles past the inspection position so that each time an article of produce is at said inspection position a tubular member of each rotating member is aligned with an article along a light beam path that extends through the article and through the walls of both members,
said tubular light shields being of sufficient lengths so that each one, when aligned with an article at the inspection position, yieldably engages its outer end with a moving article,
means for directing light along said light beam path and through a pair of light shields that are aligned with an article at the inspection position,
means for receiving light transmitted along the light beam path and through a pair of aligned light shields and article.

4,035,637
FLUID ACTUATED LIGHT SWITCH

Ronald A. Lenhart, Lakewood, and Timothy W. Rickard, Golden, both of Colo., assignors to Zot Manufacturing Company, Lakewood, Colo.

Filed Dec. 23, 1975, Ser. No. 643,712
Int. Cl.² G01D *5/34*
U.S. Cl. 250—231 P **7 Claims**



1. A swich providing an output electrical signal for use in fluid systems to indicate pressure variances in said system comprising a body providing a main bore and an intersecting light transmitting cross bore therein, a piston of size and conformation corresponding to the size and conformation of said main bore reciprocally received in said main bore for movement therealong to alternate positions of light blocking interference and non-interference with respect to said cross bore, photocell resistor light sensitive means in said cross bore at one side of said main bore for providing a changed output electrical signal when exposed to light transmitting through said cross bore to said light sensitive means, a light source in said cross bore at the opposite side of said main bore for directing light along said cross bore and toward said light sensitive means for the actuation thereof, means for introducing fluid system pressure influences to at least one side of said piston, and electric circuit means connected to said light sensitive means whereby changed output electric signals are transmitted from said switch as the piston is moved to interfering and non-interfering positions by pressure changes in said fluid system.

4,035,638
ISOTOPE SEPARATION

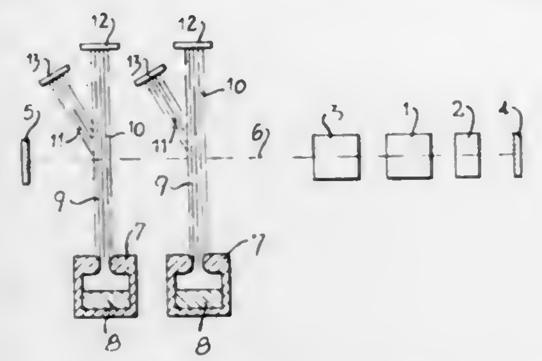
Abraham Szöke, 22 Harakafot Street, Kfar Shmaryahu, and Isaiah Nebenzahl, 10 Nachshon Street, Haifa, both of Israel

Filed Mar. 28, 1975, Ser. No. 563,139

Claims priority, application Israel, Mar. 29, 1974, 44529

Int. Cl.^{2} G01N *27/28*; H01J *39/34*

U.S. Cl. 250—251 **17 Claims**



14. A device for the separation of an isotopic species out of a mixture of isotopic species, comprising in combination a means for generating at least one narrow atomic or molecular beam, means for irradiating these beams by means of a controlled pulsed radiation of desired wave-length, means for reflecting said pulsed radiation back and forth in a direction substantially perpendicular to the direction motion of said beams and means for collecting the separated desired isotopic species.

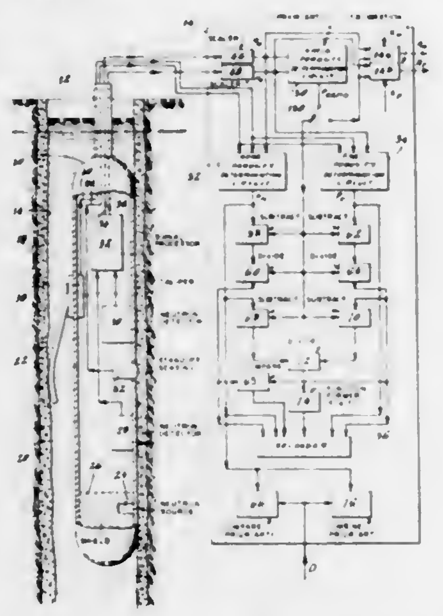
4,035,639
NEUTRON LOGGING OF FORMATION POROSITY

Yves Boutemy, La Clairte-Le Gratz, France, and Christian M. Clavier, Ridgefield, Conn., assignors to Schlumberger Technology Corporation, New York, N.Y.

Continuation of Ser. No. 585,740, June 10, 1975, abandoned. This application Mar. 29, 1976, Ser. No. 671,904

Int. Cl. G01v *5/00*

U.S. Cl. 250—264 **13 Claims**



1. A method for determining characteristics of an earth formation surrounding a borehole, comprising the steps of:

producing a measurement of the neutron population in said formation at a given spacing from a neutron source; and

converting said measurement into a signal which is related to the formation porosity in accordance with the relationship:

$$N = A[P+\alpha(1-P)]^{-x}\,{}^{r}+$$

where N is the measured neutron population; A is the neutron population measured in fresh water; P is the porosity; α is an empirically derived coefficient for which the variation of log N as a function of log $[P+\alpha(1-P)]$ is represented by a substantially straight line; and x is a coefficient representing the slope of this straight line.

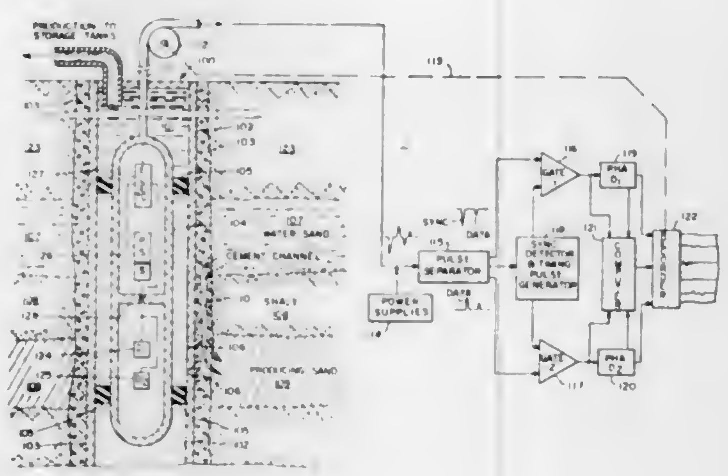
4,035,640
BEHIND CASING WATER FLOW DETECTION USING PULSED NEUTRON OXYGEN ACTIVATION

Dan M. Arnold; Hans J. Paap, and Harold E. Peelman, all of Houston, Tex., assignors to Texaco Inc., New York, N.Y.

Filed Nov. 3, 1975, Ser. No. 628,168

Int. Cl. G01v *5/00*

U.S. Cl. 250—266 **36 Claims**



1. A method for locating and determining the linear flow rate and direction of undesired water migration behind casing in a cased well borehole producing well fluid through casing perforations, comprising the steps of:

a. locating a well tool having a pulsed source of high energy neutrons having sufficient energy to cause the nuclear reaction O^{16} (n,p) N^{16} and at least two gamma ray detectors longitudinally spaced from said source and each other to a position adjacent above or below the perforations;

b. repetitively irradiating the borehole environs with bursts of high energy neutrons from said source;

c. detecting, substantially in the time between said bursts of neutrons, gamma rays primarily caused by the decay of the unstable isotope nitrogen 16 and generating signals representative thereof; and

d. combining said signals according to a predetermined relationship to derive an indication of the direction and linear flow rate of any elemental oxygen nuclei comprising undesired fluid flow in a preferred direction behind the well casing at said adjacent position.

4,035,641
LIQUID OXYGEN COMPATIBLE BIODEGRADABLE DYE PENETRANT COMPOSITIONS AND METHOD OF DYE

Orlando G. Molina, Westminster, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed July 21, 1976, Ser. No. 707,160

Int. Cl.^{2} G01N *21/16*

U.S. Cl. 250—302 **48 Claims**

30. A method for detecting cracks and flaws in the surface of an object which comprises applying to said surface a biodegradable liquid dye penetrant composition comprising (1) a biodegradable nonionic surfactant which consists essentially of an oxyalkylated aliphatic alcohol or mixtures thereof, (2) a small amount of a dye soluble in said surfactant and (3) a major proportion of a nonhalogenated organic solvent having a boiling point below about 260° F at atmospheric pressure and being a solvent for said surfactant and said dye, permitting said solvent to evaporate, removing excess dye penetrant composition from said cracks and flaws in said surface, the remaining dye penetrant residue being rendered non-reactive to liquid oxygen upon evaporation of said solvent, and viewing the surface of said object under lighting conditions to obtain colored traces from the dye in said cracks and flaws.

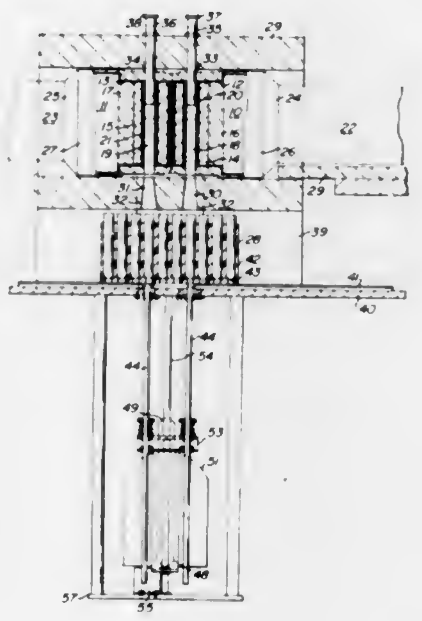
4,035,642
GAMMA COUNTER APPARATUS

Edgar G. Johnson, Jr., and Byron E. Sturgis, both of Huntsville, Ala., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Aug. 20, 1976, Ser. No. 716,313

Int. Cl.^{2} G01T *1/00*

U.S. Cl. 250—328 **4 Claims**



1. A gamma activity counter apparatus for use in automated radioimmunoassay systems which comprises

a scintillator counter comprising two photomultiplier tube assemblies, each assembly having a scintillator crystal having a sample receiving zone extending vertically therethrough and a photomultiplier tube, the tube being in light-transmissive relation with the scintillator crystal and each crystal being in gamma-transmissive relation with the sample receiving zone therein; a lead radiation shield encasing said photomultiplier tube assemblies, said assemblies being removbly contained within said shield and being so positioned therein that each assembly abuts upon the other, and having bores extending through the radiation shield in alignment with, and communicating with the sample receiving zones;

means for lifting into said sample receiving zones a pair of sample carriers for a carrier holder disposed directly beneath and in alignment with said sample receiving zones and for lowering the pair of sample carriers; and

means for incrementally and continually advancing said holders into position beneath and in alignment with said sample receiving zones, such that each incremental advance moves the holder the distance of two sample carrier spaces, where for each counting period, for any series of an even number of sample carriers, the first and the last in the series are lifted into said scintillator counter for simultaneous gamma activity counting.

4,035,643
INFRARED GAS ANALYSIS

Joseph J. Barrett, Morris Plains, N.J., assignor to Allied Chemical Corporation, Morris Township, N.J.

Continuation-in-part of Ser. No. 478,543, June 11, 1974, Pat. No. 3,939,348. This application Jan. 8, 1976, Ser. No. 647,388

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.^{2} G01J *3/28*

U.S. Cl. 250—339 **20 Claims**

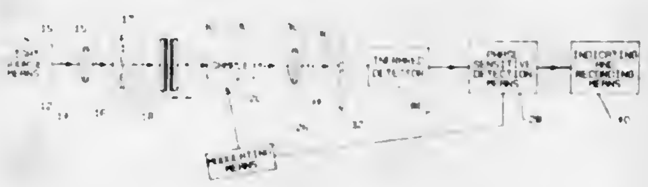
1. Apparatus for detecting and quantitatively measuring a molecular species of gaseous material in a sample to be analyzed, comprising:

a. light source means for generating incoherent infrared radiation;

b. light conditioning means for collecting, collimating and transmitting said light;

c. primary filtering means adapted to receive said light and selectively transmit light having a frequency range in the region of an absorption band for the molecular species to be detected;

d. secondary filtering means adapted to receive said filtered light and transmit light having a plurality of discrete frequencies forming a plurality of fringes which provide a detectable signal, said secondary filtering means having interference producing means for providing a plurality of transmission windows regularly spaced in frequency, the frequency spacing between adjacent windows being adjusted to equal substantially the product of the frequency difference between adjacent spectral lines of the absorption spectrum for the molecular species to be detected and the factor n/n,, where n and n' are integers and n does not equal n' and scanning means for causing the transmission peaks for adjacent n'th orders to coincide substantially with the spectral lines of said absorption spectrum, whereby said detectable signal has an intensity substantially equal to the sum of said fringes;


INFRARED DETECTOR
PHASE SENSITIVE DETECTION MEANS
INDICATING AND RECORDING MEANS

e. means for transmitting said detectable signal through said gaseous material, whereby the intensity of said detectable signal changes in proportion to the concentration of said molecular species;

f. signal conditioning means for converting to measurable form said intensity change; and

g. detecting means for indicating the magnitude of said intensity change.

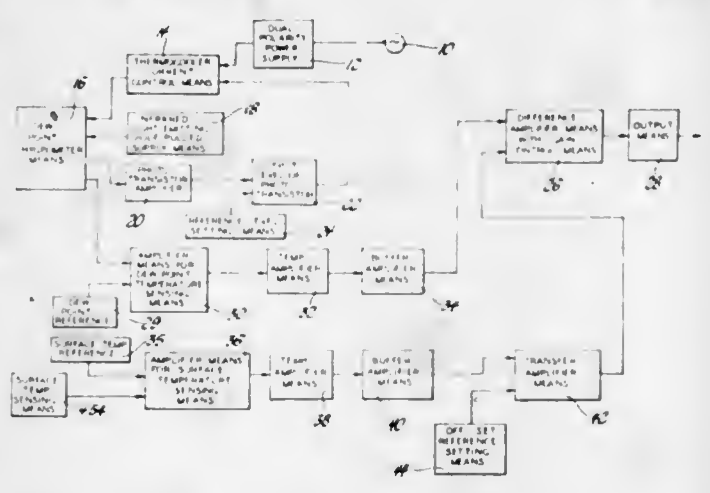
4,035,644
ATMOSPHERIC CONDITION DETECTING AND INDICATING APPARATUS AND METHOD

Michael F. Clemochowski, 35523 Dunston Drive, Sterling Heights, Mich. 48077

Filed July 1, 1975, Ser. No. 592,335

Int. Cl.^{2} G01J *1/00*

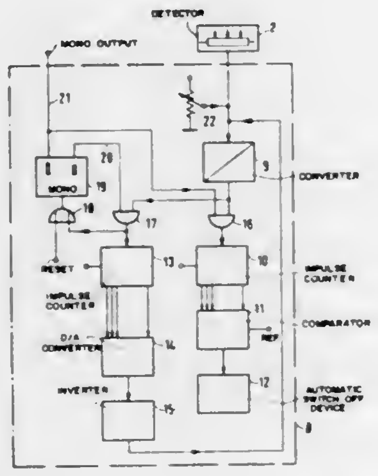
U.S. Cl. 250—340 **22 Claims**



1. Apparatus for determining the dew point temperature of a vaporized liquid carried within a gas atmosphere, comprising a test surface to be situated within said gas atmosphere, first means for controllably varying the temperature of said test surface, said first means being effective during a first phase of operation for cooling said test surface sufficiently to cause said vaporized liquid within said gas atmosphere to come out of suspension and precipitate as a dew upon said cooled test surface, said first means being effective during a second phase of operation for heating said test surface as to thereby vaporize from said test surface any formation thereon of said dew, second means for continually sensing the temperature of said test surface and effective for continually producing a temperature output signal in response thereto, and indicating means responsive to the formation of said dew upon said cooled test surface, said indicating means being effective upon sensing the said formation of said dew to terminate said first phase of operation and further cooling of said test surface and to initiate said second phase of operation and thereby heat said test surface and remove said formation of said dew therefrom, said indicating means being effective to cyclically initiate said first phase of operation upon the absence of said formation of said dew and being effective to initiate said second phase of operation upon the occurrence of said formation of said dew to thereby generally substantially stabilize the magnitude of the then existing temperature of said test surface thereby resulting in said stabilized magnitude of temperature being said dew point temperature, said indicating means comprising photo-optic means, a light source effective for directing a beam of light against said test surface at an angle as to have said beam of light reflect from said test surface and impinge upon said photo-optic means during both said first and second phase of operation, said beam of light being the only source of actuating light energy conveyed to said photo-optic means.

4,035,645
RADIATION MONITOR FOR AN IRRADIATION INSTALLATION

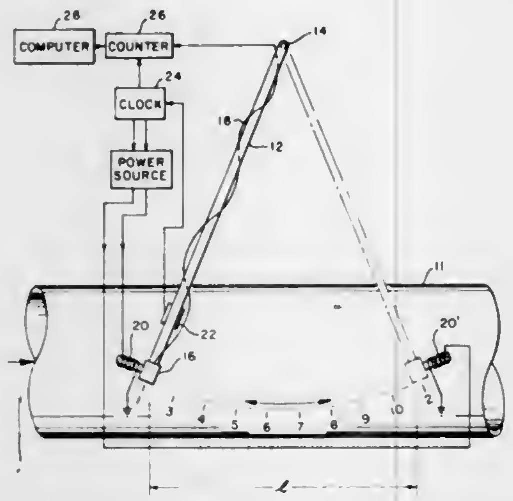
Rudolf Meyer, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Jan. 22, 1976, Ser. No. 651,281
Claims priority, application Germany, July 28, 1975, 2533698
Int. Cl.² G01T *1/42*
U.S. Cl. 250—355 **3 Claims**



1. In a radiation monitor for an irradiation installation for the presetting of a radiation dosage which is to be applied and the limiting thereof to a preset reference value, including a radiation detector exposed to the radiation of said irradiation installation; a dose rate frequency converter connected to said radiation detector; a first impulse counter connected to an output of said dose rate frequency converter; a presettable digital comparator connected to the output of said first impulse counter; and automatic switch-off means for said installation controllable by said digital comparator responsive to reaching of said preset reference value, the improvement comprising: a second impulse counter having a digital analog converter connected to the output thereof for the drift correction of the electronic components of said installation and being connected to the output of said dose rate frequency converter; and a polarity inverter connected to the output of said digital analog converter, said digital analog converter output being connected across said polarity inverter to the input of said dose rate frequency converter.

4,035,646
FLOW MONITORING SYSTEM

Raymond John Krisst, West Hartford, Conn., assignor to Combustion Engineering, Inc., Windsor, Conn.
Filed Aug. 14, 1975, Ser. No. 604,755
Int. Cl.² G01F *1/00*
U.S. Cl. 250—356 **12 Claims**



1. An apparatus for monitoring the flow of a radioactive fluid along a fluid flow path within a conduit, said apparatus comprising:

a. a radiation detector eternal to the conduit;

b. means operativey connected to said detector for repetitiously moving said radiation detector from a first position along the flow path of said fluid to a second position along the flow path of said fluid and returning said radiation detector to said first position;

c. means connected to said radiation detector for generating first and second signals proportional to the intensity of the radiation reaching said radiation detector at said first and second positions; and

d. means connected to said signal generating means for computing the rate of flow of said radioactive fluid from the magnitude of said first and second signals.

4,035,647
RADIOGRAPHY

Godfrey Newbold Hounsfield, Newark, and David John Gibbons, Uxbridge, both of England, assignors to E M I Limited, Hayes, England
Division of Ser. No. 358,980, May 10, 1973, Pat. No. 3,881,110. This application June 20, 1974, Ser. No. 481,443
Claims priority, application United Kingdom, May 17, 1972, 23064/72
Int. Cl.² G01T *1/20*
U.S. Cl. 250—366 **8 Claims**

1. Medical diagnostic apparatus for examining a slice of the body of a patient to produce a representation of the variation of an X-radiation response characteristic of said slice, the apparatus comprising:

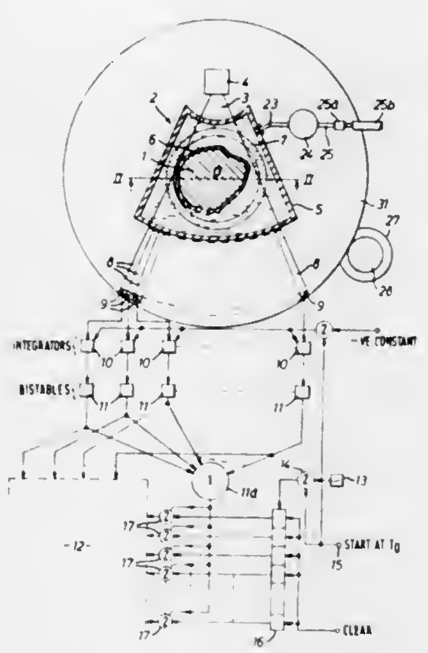
a source of X-radiation for generating a fan-shaped swath of radiation;

a support on which said source is supported;

a futher support to position the patient so that said swath of radiation will be propagated through said slice of the body;

a plurality of detectors for receiving radiation after propagation through said slice, said detectors being arranged with respect to each other to receive radiation along narrow beam paths angularly displaced across substantially the whole of said fan-shaped swath of radiation and said detectors being disposed so that radiation propagated through the slice along any two adjacent beam paths is received by different detectors;

means for rotating at least said source continuously through a substantial angle about an axis intersecting said slice to cause said swath to assume successive different angular positions relative to the body;

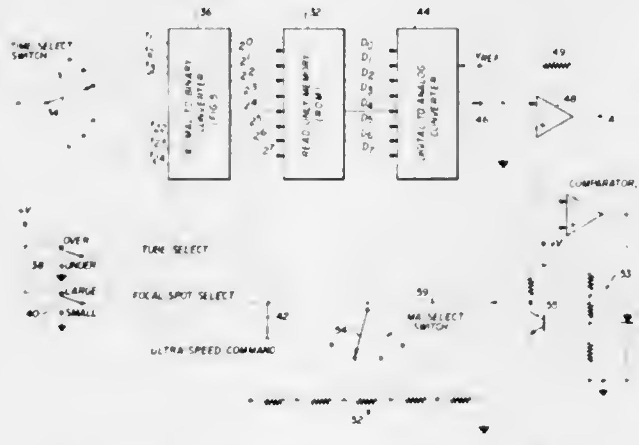


means for sensing radiation received by said detectors during successive increments of said continuous rotation of said source, said means generating respective electrical output signals relating to the radiation propagated to the detectors along said narrow beam paths angularly displaced across said swath during said successive increments of continuous rotation; and

means responsive to said electrical output signals for producing said representation of the variation of an X-radiation response characteristic of said slice.

4,035,648
X-RAY TUBE PROTECTION CIRCUIT

Ambalal T. Patel, Baltimore, Md., assignor to CGR Medical Corporation, Baltimore, Md.
Filed Sept. 2, 1976, Ser. No. 720,058
Int. Cl.² H05G *1/30*
U.S. Cl. 250—402 **10 Claims**



1. In X-ray tube anode protective circuitry including circuit means being operated by the output of comparator circuit means which compares selected values of an analog voltage representative of maximum allowable power obtained from X-ray tube rating chart curves with an analog voltage representative of desired power and accordingly controls further operation of an X-ray exposure depending upon whether or not preselected operating parameters are outside of the ratings of the X-ray tube, the improvement comprising:

a digital memory having selectively addressed memory locations programmed with binary information at said locations corresponding to maximum allowable power for specific operating parameters obtained from predetermined tube rating chart curves;

memory address means coupled to said memory and being operable to address a predetermined memory location in response to at least one selected operating parameter, said memory becoming operative thereby to output a multibit binary digital output signal representative of the maximum allowable power for said at least one selected operating parameter;

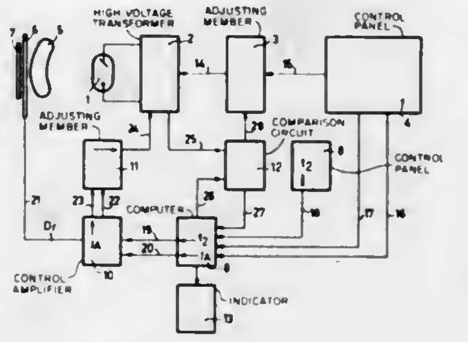
digital to analog converter means coupled to said memory and being responsive to said binary digital output signal to generate an analog maximum signal therefrom;

means providing an analog signal representative of a desired operating power; and

means coupling said two analog signals to said comparator circuit means.

4,035,649
X-RAY GENERATOR FOR A TOMOGRAPHY APPARATUS

Heinz Mester, Hamburg, Germany, assignor to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 512,842, Oct. 7, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,699
Claims priority, application Germany, Oct. 8, 1973, 2350391
Int. Cl.² H05G *1/30*
U.S. Cl. 250—409 **1 Claim**



1. An improved x-ray generator for tomography apparatus of the type having

means for automatically establishing an initial tube current for the x-ray tube and for automatically setting the exposure period,

a radiation detector for measuring the intensity of radiation reaching the film, and

control means responsive to the measured intensity and the set exposure period for automatically adjusting the current of the x-ray tube to an adjusted current which more optimally exposes the film, the current of the x-ray tube being adjusted during an initial time period t_1 of the exposure period,

the improvement comprising

means for integrating the difference between the initial tube current and the actual tube current during an initial time period t_1' of the exposure period, t_1' being less than t_1; and

means responsive to the integrated difference, when the integrated difference exceeds a predetermined threshold, for automatically correcting the established initial tube current to a corrected value for the next exposure which more closely approximates te adjusted current and which reduces the integrated difference during the next exposure.

4,035,650
DENTAL X-RAY DIAGNOSTIC INSTALLATION

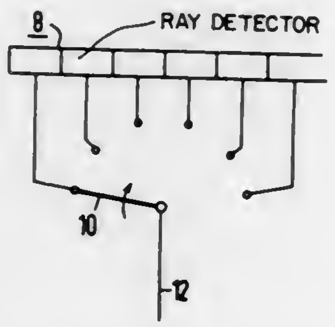
Kurt Franke, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Sept. 4, 1975, Ser. No. 610,257

Claims priority, application Germany, Sept. 12, 1974, 2443681

Int. Cl.² G03B *41/16*

U.S. Cl. 250—413 **2 Claims**



1. In a dental X-ray diagnostic installation including an X-ray generator and a film retaining pouch adapted to be placed on the face of a patient, the improvement comprising:
ray detector means having a plurality of measuring areas arranged in a row and mounted on and carried by the pouch for delivering an electrical output signal conforming to the intensity of X-radiation impinged on each of said measuring areas;
each of said measuring areas having an effective area, approximating the size of a local tooth area to be X-rayed;
switch means for selecting one of said measuring areas of the ray detector; and
control means electrically interconnecting said generator through the switch means to a selected one of the measuring areas of said ray detector means and effective to discontinue operation of said generator upon receipt of a predetermined electrical output signal from said one of said measuring areas of said ray detector means corresponding to an X-ray exposure sensed by the detector means on the pouch for attaining an optimum degree of darkening of the film contained within the pouch immediately adjacent said one measuring area.

4,035,651
RADIOGRAPHY DEVICE WITH CIRCUITRY TO CORRECT FOR PHOTODETECTOR SENSITIVITY

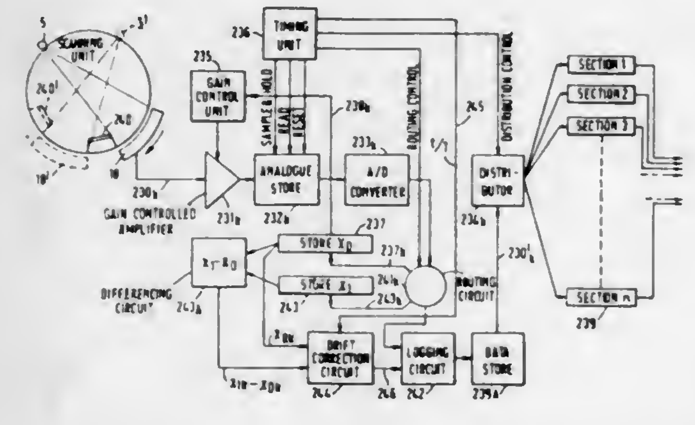
Christopher Archibald Gordon LeMay, Osterley, England, assignor to E M I Limited, Hayes, England

Filed Jan. 23, 1975, Ser. No. 543,364

Claims priority, application United Kingdom, Jan. 31, 1974, 4563/74

Int. Cl.² G01N *23/04*

U.S. Cl. 250--445 T **17 Claims**



7. A method of examining a body by means of penetrating radiation such as X- or γ- radiation including the steps of irradiating a region of the body by means of a fan shaped spread of radiation, determining the intensity of said radiation after passage through the body, orbiting a source of said radiation and a plurality of detectors about a common axis in and substantially perpendicular to the plane of said fan of radiation, exposing said detectors to further radiation in at least two positions, separated by a predetermined interval, in said orbital movement, processing data representing the intensity of said radiation to derive a reconstruction of the distribution of the absorption of radiation within a part of the body and utilising further data provided by said detectors relating to said further radiation to correct said first mentioned data for errors caused by sensitivity variations in said detectors.

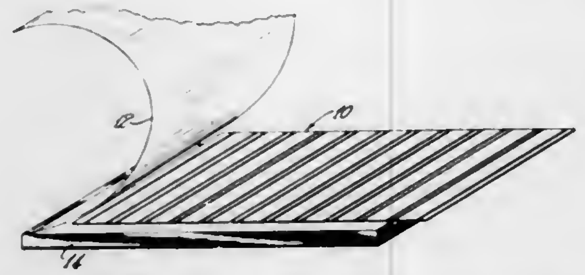
4,035,652
LUMINESCENT BACKING SHEET FOR WRITING IN THE DARK

Becky J. Schroeder, 2317 Valleybrook Drive, Toledo, Ohio 43615

Continuation of Ser. No. 567,391, April 11, 1975, which is a continuation-in-part of Ser. No. 498,705, Aug. 19, 1974, Pat. No. 3,879,611, which is a continuation-in-part of Ser. No. 428,339, Dec. 26, 1973, Pat. No. 3,832,556, which is a continuation of Ser. No. 288,148, Sept. 11, 1972, abandoned. This application June 21, 1976, Ser. No. 697,924

Int. Cl.² H01J *1/62*

U.S. Cl. 250—462 **8 Claims**



1. A backing sheet for guiding the application of written matter on writing sheets in darkness comprising:
a sheet having associated therewith a set of luminescent regions with a set of non-luminescent regions located therebetween which combination in the dark provides a guide for application of intelligible matter to writing sheets placed over the backing sheet,
one of said sets of regions being raised above the other an amount sufficient to provide feeling guides spaced for application of written material therebetween which guides can be felt through writing sheets placed thereover in addition to providing visible guides in the dark for guiding the application of written matter on said writing sheets.

4,035,653
X-RAY IDENTIFICATION TAG

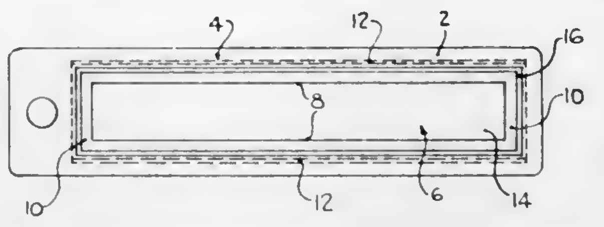
Robert Karasko, 54 Lenox Ave., Yardville, N.J. 08620

Continuation-in-part of Ser. No. 431,756, Jan. 8, 1974, abandoned, and a continuation-in-part of Ser. No. 484,057, June 28, 1974, which is a continuation-in-part of said Ser. No. 431,756. This application Apr. 9, 1976, Ser. No. 675,427

Int. Cl.² H05G *1/28*

U.S. Cl. 250—475 **2 Claims**

1. An X-ray identification tag comprising a plastic body having reinforcing means which is relatively transparent to X-rays embedded therein, said reinforcing means defining an opening through which X-rays may pass, X-ray opaque material positioned within said opening and secured to said plastic body to define passages therethrough being relatively transparent to X-rays to define any pre-chosen symbol, said passage including a minimum width point intermediate between the upper and lower surfaces of said opague material, said passage being tapered to widen in both the upward and downward directions from said minimum width point to form symbols when used with non-vertical X-rays.



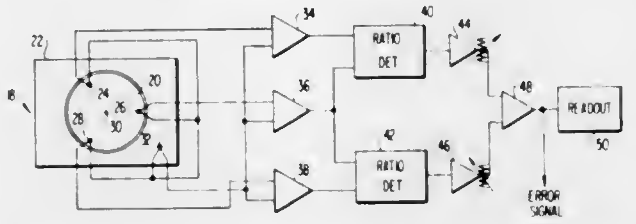
4,035,654
OPTICAL ALIGNMENT SENSOR

Frank J. Elmer, 308 Highway 71, Spring Lake Heights, N.J. 07762

Filed Jan. 12, 1976, Ser. No. 648,351

Int. Cl.² G01M *21/00*

U.S. Cl. 250—491 **13 Claims**



1. The method for determining accurate alignment of an optical beam in an optical system including an optical element, which system and optical element have a common optical axis, comprising the steps of:
1. projecting said optical beam through the element of said system along the optical axis for producing a temperature distribution within said element resulting from slight absorption of energy from the transmitted optical beam.
2. detecting at spaced regions of said element the temperature existing at each of said regions,
3. detecting a reference temperature at a region thermally coupled to said optical element,
4. combining the electrical signals derived from said detection for deriving an indication representative of said beam position,
5. repeating steps (2) to (4) when said optical beam has become displaced from said optical axis, and
6. determining the amount of said optical beam displacement as a function of the relative indications obtained in steps (4) and (5).

4,035,655
METHOD AND A DEVICE FOR IMPLANTATION OF PARTICLES INTO A SUBSTRATE

Georges Guernet, Meylan, and Georges Lefeuvre, Eybens, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

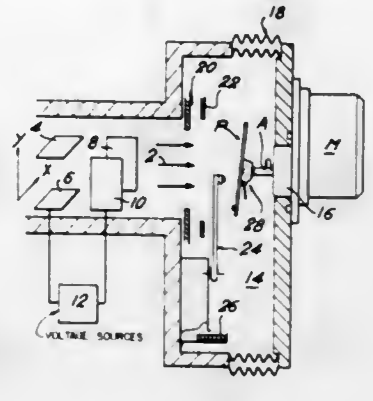
Filed Jan. 19, 1976, Ser. No. 649,994

Claims priority, application France, Jan. 22, 1975, 75.01942

Int. Cl.² B05C *11/00*

U.S. Cl. 250—492 A **7 Claims**

1. A method of implantation and especially ion implantation in which a beam of particles and especially an ion beam is directed onto a target in order to carry out an ion implantation into said target, said beam of particles being swept in two perpendicular directions, wherein said target is subjected to a double movement of rotation about two axes substantially parallel to the direction of the particle beam so that all the points of the target describe an epicycloid and are subjected to implantation by said particle beam.



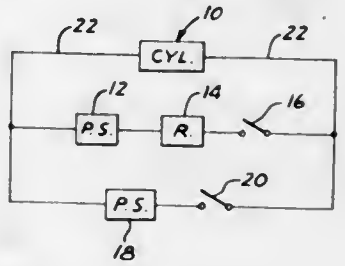
4,035,656
METHOD AND APPARATUS FOR USE IN APPROACHING THERMONUCLEAR TEMPERATURES USING TURBULENT THERMAL INSULATION

Tihiro Ohkawa, La Jolla, Calif., assignor to General Atomic Company, San Diego, Calif.

Filed May 27, 1975, Ser. No. 581,148

Int. Cl.² G21G *4/02*

U.S. Cl. 250—500 **21 Claims**



10. A method of thermally insulating a plasma for a predetermined period of time using electron turbulence for the purpose of producing neutrons, comprising the steps of:
firing a first power supply across the ends of a hollow hydrogen cylinder, said cylinder having a predetermined inside diameter and length and containing hydrogen gas at a predetermined pressure within the range of about one and about three atmospheres, the firing causing an electric current to flow through said cylinder and vaporize the same and produce a plasma; and,
firing a second power supply across said plasma to inject an electron beam therein.

4,035,657
OZONE GENERATOR

Curt William Carlson, Atlanta, Ga., assignor to Murray J. Guy, Stamford, Conn. and Richard E. Higginbotham, Atlanta, Ga., part interest to each

Filed Dec. 24, 1975, Ser. No. 644,306

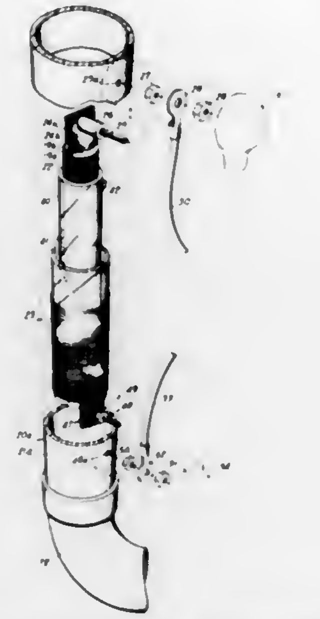
Int. Cl.² C01B *13/11*

U.S. Cl. 250—533 **20 Claims**

1. An ozone generator comprising:
a. a source of electrical potential;
b. an air pump;
c. elongated passageway means defining a passageway having an entrance and exit;
d. means for delivering air from said pump to the entrance of said passageway;
e. a plurality of grid assemblies disposed in serial spaced relationship within said passageway, each of said grid assemblies having an inner grid, and outer grid, and die-

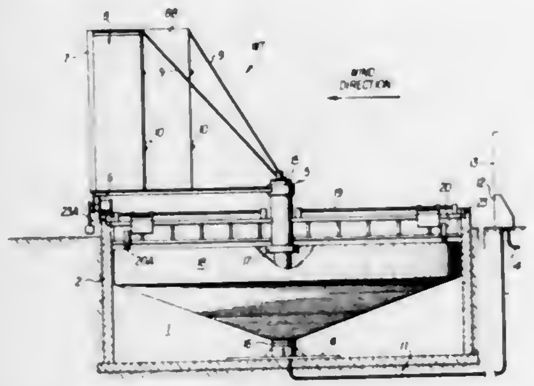
lectric means spacing said inner grid and said outer grid apart; and

f. a plurality of electrically conducting hanger means projecting through the side of said passageway, one grid from each of said assemblies being electrically connected through one of said hanger means to one side of said source and the other grid of each of said assemblies being electrically connected through another of said hanger means to the other side of said source.



4,035,658
HIGH POWER WIND TURBINE WITH KINETIC ACCUMULATOR

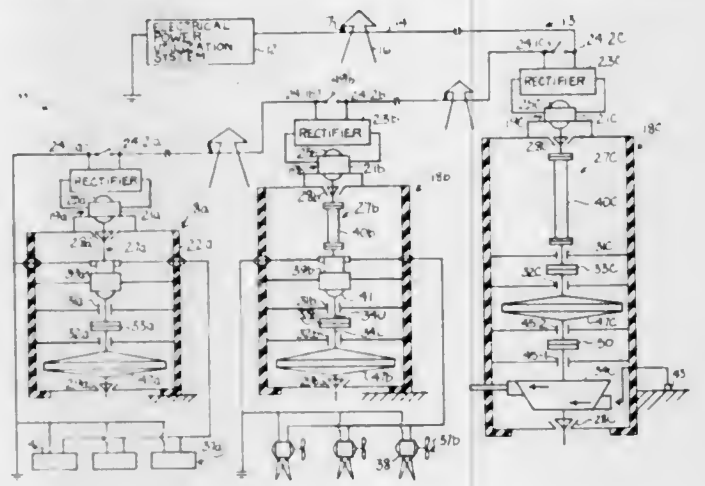
Richard E. Diggs, P.O. Box 776, Carthage, Mo. 64836
Filed May 13, 1975, Ser. No. 576,984
Int. Cl.² F03D *9/00;* **H02P** *9/04*
U.S. Cl. 290—55 **32 Claims**



1. A high power wind turbine with kinetic accumulator comprising:
a circular wall,
a wind turbine movably mounted to the circular wall so that it can be moved to face the wind,
a non-linear generator connected to the wind turbine to generate electrical power over an output line,
a fly wheel,
a drive wheel disposed in contact with the fly wheel to drive the fly wheel,
a reversible non-linear motor connected to the drive wheel, to drive the drive wheel or to be driven by the drive wheel,
means connecting the non-linear generator to the reversible motor to rotate the drive wheel to rotate the fly wheel to store energy therein when the non-linear generator generates excess electrical power,
the rotating fly wheel to the extent it has stored energy therein rotating the drive wheel to drive the reversible motor to generate electrical power over the ouput line when the non-linear generator does not generate sufficient electrical power.

4,035,659
ELECTRICAL POWER-GENERATION APPARATUS WITH ROTARY VOLTAGE TRANSFORMER AND INTEGRATED INERTIAL ENERGY STORAGE

Morris R. Jeppson, P.O. Box 4943, Carmel, Calif. 93921
Filed Oct. 20, 1975, Ser. No. 623,975
Int. Cl.² H02K *17/44*
U.S. Cl. 307—84 **17 Claims**

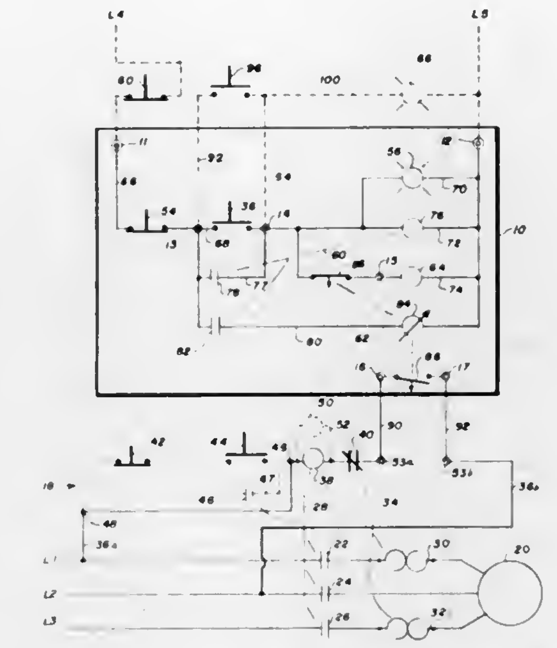


1. An electrical power production station for connection to a high-voltage power transmission line comprising:
a generator support structure formed at least in part of electrically insulative material to establish a highvoltage region which is spaced apart from any grounded electrically conductive element,
at least one electrical power generator disposed on said insulative support structure at said high-voltage region, all portions of said generator being electrically isolated from ground by said support structure,
a drive motor adapted for operation from an energy source near said station,
drive shaft means extending to said high-voltage region for coupling said drive motor to said power generator, said drive shaft means being formed at least in part of electrically insulative material to maintain said electrical isolation of said power generator from ground while transmitting driving energy to power generator in kinetic form, and
inertial energy storage means mechanically coupled to said drive motor and to said drive shaft means.

4,035,660
CONTROL DEVICE

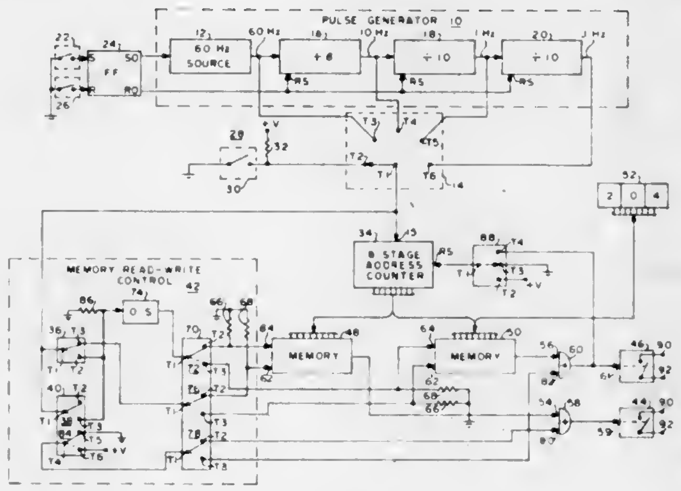
Stacy G. Fletcher, Jr., New Holland, Pa., assignor to Aggregates Equipment, Inc., Leola, Pa.
Filed June 24, 1975, Ser. No. 589,944
Int. Cl.² H01H *7/00*
U.S. Cl. 307—141 **12 Claims**

1. A control device interconnectable with the starter circuit of industrial machinery or the like and operable to initiate actuation of an alarm prior to permitting current flow through said starter circuit; said device comprising:
a housing provided with a plurality of terminals two of which are interconnectable with the starter circuit of industrial machinery or the like;
means to switch said control device from an off mode to an on mode;
means mounted within the housing operable to initially permit current flow through an alarm circuit when said control device is initially switched to its on mode;
normally open contact means mounted with the housing and extending between said two terminal, said normally open contact means prohibiting current flow through said starter circuit when said control device is initially switched to its on mode; and
means mounted within the housing operable to subsequently prohibit current flow through said alarm circuit and to permit current flow through said starter circuit at the completion of a preset time period.



4,035,661
ELECTRONIC TIMER

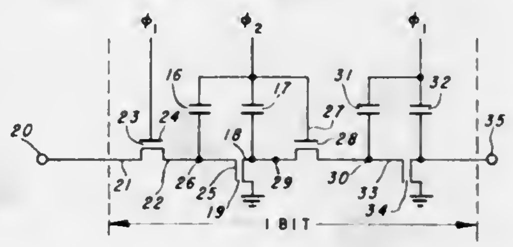
Gerald L. Carlson, Birmingham, Ala., assignor to University of Alabama in Birmingham, Birmingham, Ala.
Continuation of Ser. No. 483,547, June 27, 1974, abandoned. This application Apr. 15, 1976, Ser. No. 677,229
Int. Cl.² H01H *7/00*
U.S. Cl. 307—141 **10 Claims**



1. An electronic timer comprising:
pulse generating means for providing at a selected rate a train of evenly spaced, in time, pulses;
memory means comprising:
a plurality of storage locations accessible at an even rate in a fixed order of succession,
loading means responsive to input pulses for serially loading, in the order of said succession, data bits in at least any two said storage locations, and
readout means coupled to said storage locations and responsive to evenly spaced, in time, pulses from said pulse generating means for successively accessing, one storage location per pulse, in said fixed order of succession and providing pulse outputs from those of said storage locations in which data bits are stored, said pulse outputs thus being spaced in time in accordance with the position in sequence of the storage locations in which data bits are stored, and in accordance with the rate of said input pulses;
address means coupled to said memory means and responsive to said train of pulses from said pulse generating means for referencing the position in said memory means of at least one of said locations of said memory means; and
actuating means responsive to an output of said readout means for controlling work.

4,035,662
CAPACITIVE MEANS FOR CONTROLLING THRESHOLD VOLTAGES IN INSULATED GATE FIELD EFFECT TRANSISTOR CIRCUITS

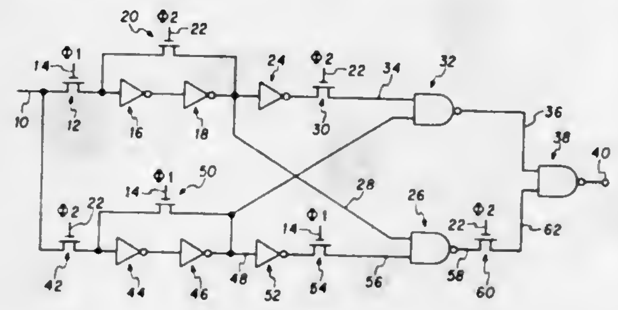
Chang - Kiang Kuo, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Division of Ser. No. 85,879, Nov. 2, 1970, abandoned. This application May 27, 1975, Ser. No. 581,006
Int. Cl.² H03K *19/08;* **G11C** *19/28;* **H03K** *17/04, 17/60*
U.S. Cl. 307—205 **3 Claims**



1. A method for reducing the effect of excessive threshold voltages in field effect transistor logic circuits having a multiphase voltage supply, said method comprising the steps of:
a. coupling one side of a capacitor to the gate of a field effect transistor in said circuit,
b. providing low level data signals to the gate of said field effect transistor, at least some of said data signals having a magnitude less than the threshold voltage of said transistor, and
c. coupling the other side of said capacitor to said multiphase voltage supply and clocking the other side of said capacitor with said data, whereby the combined effect of said data signals and said multiphase voltage supply coupled through said capacitor cause said field effect transistor to change state.

4,035,663
TWO PHASE CLOCK SYNCHRONIZING METHOD AND APPARATUS

Kevin C. Stodola, Plano, Tex., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Sept. 1, 1976, Ser. No. 719,486
Int. Cl.² H03K *19/08, 1/17, 5/13*
U.S. Cl. 307—208 **3 Claims**



3. Apparatus for providing a synchronized output pulse

train of a given frequency from a lower frequency incoming unsynchronized train of pulses comprising, in combination:
- first means for supplying a reference clock signal having full cycles each comprising first and second half-cycles;
- means for supplying an incoming signal comprising a train of pulses to be synchronized;
- first detection means for commencing an output whenever, between the end of the first half cycle and the end of the second half-cycle, the logic level of said incoming signal changes with respect to its logic level at the end of the previous second half-cycle;
- logic circuit means for continuing the output to the end of the first half-cycle following the commencement of said output;
- second detection means for commencing an output at the beginning of a second half-cycle whenever, between the end of the previous second half-cycle and the end of a present first half-cycle, the logic level of said incoming signal changes with respect to its logic level in the previous second half-cycle; and
- logic circuit means for continuing the output for a full cycle following the commencement of said output as generated by said second detection means.

4,035,664
CURRENT HOGGING INJECTION LOGIC

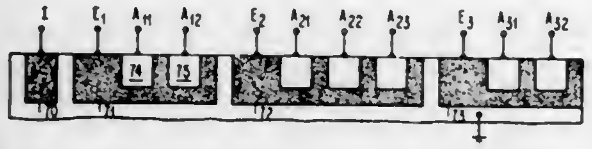
Horst H. Berger, Sindelfingen, and Siegfried K. Wiedmann, Stuttgart, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 15, 1975, Ser. No. 613,658

Claims priority, application Germany, Mar. 5, 1975, 2509530

Int. Cl.² H01L *27/04*; **H03K** *19/08, 19/36*

U.S. Cl. 307—215 **25 Claims**



1. A monolithically integrated binary logic circuit for receiving first, second and third binary inputs respectively designated as x, y and z and providing a first logical binary output of x, a second logical binary output of $x \cdot y$, and a third logical binary output of $x \cdot y \cdot 2$, said logic circuit comprising:
- first, second and third transistors of a first conductivity type, said first, second and third transistors each having an emitter, base and collector;
- fourth, fifth and sixth transistors of a second conductivity type, said second conductivity type being opposite to said first conductivity type, said fourth, fifth and sixth transistors each having an emitter, base and collector;
- a first input terminal for receiving a first binary input designated as x and directly connected to said collector of said first transistor, said emitter of said second transistor and said base of said fourth transistor;
- a second input terminal for receiving a second binary input designated as y and directly connected to said collector of said second transistor, said emitter of said third transistor and said base of said fifth transistor;
- a third input terminal for receiving a third binary input designated as z and directly connected to said collector of said third transistor and said base of said sixth transistor;
- current source means connected to said emitter of said first transistor;
- first connection means connecting in common said base of said first transistor, said base of said second transistor, said base of said third transistor, said emitter of said fourth transistor, said emitter of said fifth transistor, and said emitter of said sixth transistor;
- second connection means connecting said first connection means to a source of reference potential;
- a first output terminal connected to said collector of said fourth transistor, said first output terminal providing the logical binary output of x in response to the binary input x being impressed on said first input terminal;
- a second output terminal connected to said collector of said fifth transistor, said second output terminal providing the logical binary output of $x \cdot y$ in response to binary inputs of x and y respectively being impressed on said first and second input terminals;
- and a third output terminal connected to said collector of said sixth transistor, said third output terminal providing the logical binary output $x \cdot y \cdot z$ in response to binary inputs of x, y and z respectively being impressed on said first, second and third input terminals.

4,035,665
CHARGE-COUPLED DEVICE COMPRISING SEMICONDUCTORS HAVING DIFFERENT FORBIDDEN BAND WIDTHS

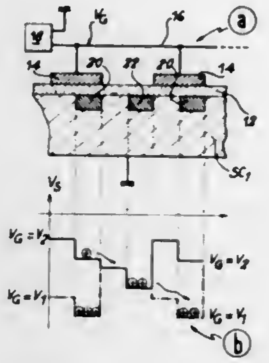
Joseph Borel, Echirolles; Jacques Lacour, Grenoble, and Gerard Merckel, Sassenage, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation-in-part of Ser. No. 541,615, Jan. 16, 1975, abandoned. This application July 8, 1976, Ser. No. 703,545

Claims priority, application France, Jan. 24, 1974, 74.02410

Int. Cl.² G11C *19/28*; **H01L** *29/78, 29/161*

U.S. Cl. 307—221 D **12 Claims**



1. A charge-coupled device comprising a substrate constituted by a first doped semiconductor, an array of metallic electrodes disposed in succession along an axis and isolated from said substrate by means of a thin insulating layer, means for injecting minority carriers beneath at least the first electrode, which defines the upstream end of said device, means for detecting the presence of charges beneath at least the last electrode, which defines the downstream end of said device, a voltage source and at least one control line for bringing the electrodes to cyclically varying potentials of suitable value, means for creating asymmetrical potential wells in a plurality of surface zones of the substrate having a downstream end and an upstream end for ensuring unidirectionality of transfer of said carriers, said means being constituted by regions each localized within said substrate at one extremity of each said zones and formed by a second semiconductor having a forbidden band width which is different from that of the first semiconductor, one of the two semiconductors which has the smaller forbidden band width being located at said downstream end of each zone.

4,035,666
ANALOGUE SHIFT REGISTER CORRELATORS

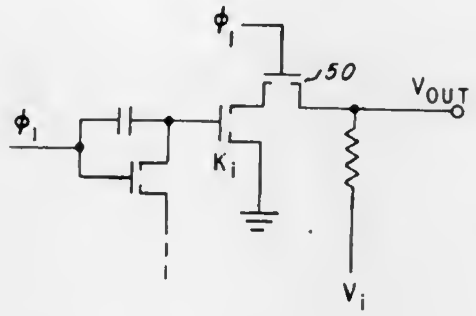
Dean Robert Collins, and Lewis T. Clairborne, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 196,043, Nov. 5, 1971, Pat. No. 3,946,247. This application Oct. 8, 1975, Ser. No. 620,673

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.

Int. Cl.² H03K *21/00, 23/08, 23/14, 23/22*

U.S. Cl. 307—221 D **3 Claims**



1. A charge transfer device correlator comprising:
- a. a semiconductor substrate;
- b. a charge transfer device shift register having a plurality of successive stages defined adjacent one surface of said substrate, each said stage including a plurality of electrodes disposed on an insulating layer on said substrate surface;
- c. means for applying clocking pulses to said electrodes for entering data samples into and propagating said data samples along said shift register; and
- d. data sampling and amplitude weighting means for simultaneously detecting the data samples stored at each of said plurality of stages to produce a detected signal and for amplitude weighting said detected signals in a preselected manner, said data sampling and amplitude weighting means including a plurality of insulated gate field effect transistor respectively disposed adjacent said substrate surface adjacent a corresponding stage of said shift register, the gate electrodes of said plurality of transistors respectively connected to the corresponding stage of said shift register for detecting said data sample stored at that stage, each of said plurality of transistors defining a predetermined gain for weighting the amplitude of the detected signal produced by that transistor, source electrodes of each of said plurality of transistors commonly connected to the circuit ground; signal summation means; and insulated gate field effect transistor gating means connecting the drain electrodes of said first plurality of transistors to said signal summation means for transferring detected and weighted signals to said summation means in reponse to gating signals received by said transistor gating means.

4,035,667
INPUT CIRCUIT FOR INSERTING CHARGE PACKETS INTO A CHARGE-TRANSFER-DEVICE

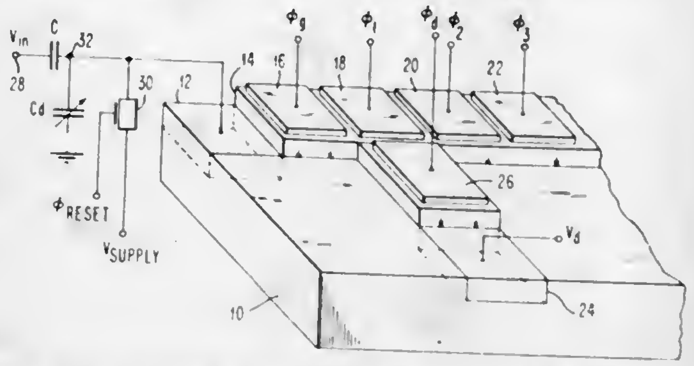
Lawrence Griffith Heller, Brewster, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 2, 1975, Ser. No. 636,862

Int. Cl.² G11C *19/28*; **H01L** *29/78*

U.S. Cl. 307—221 D **4 Claims**

1. An input circuit for entering quantities of electrical charge carriers into a solid-state charge-transfer-device of the type having a semiconductor substrate and a plurality of charge transfer means for moving quantities of electrical charge carriers in a controlled manner across said substrate, said input circuit comprising:
- a source diffusion means located on said semiconductor substrate and producing an inherent depletion capacitance Cd,
- an input lead connected to said source diffusion means,
- a capacitor C connected in series with said input lead,
- an active device connected between a supply voltage and said input lead, said active device being controlled by a source of reset signal to couple said supply voltage to said source diffusion to raise the potential of said source diffusion to equal a predetermined first precharge potential



- means for providing an input voltage ΔV which is applied and coupled through said capacitor C to said input lead to vary the potential of said source diffusion for producing and inserting into said charge-transfer-device a quantity of charge carriers Q directly proportional to said capacitor C and said input voltage ΔV and independent of said depletion capacitance C_d,
- and an electrical charge drain means located on said semiconductor substrate to remove charge carriers produced by said diffusion when said source diffusion is equal to said predetermined first precharge potential.

4,035,668
INPUT-INTERRUPTION TYPE DELAYED TURN-OFF CONTROL TIMER

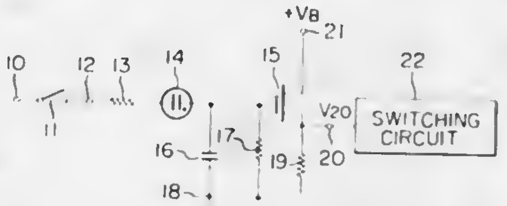
Shunji Minami, Katano, and Shunzo Oka, Hirakata, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 17, 1976, Ser. No. 667,641

Claims priority, application Japan, Mar. 20, 1975, 50-34159; Mar. 20, 1975, 50-38278

Int. Cl.² H03K *17/56, 5/13*

U.S. Cl. 307—293 **5 Claims**



1. An input-interruption timer comprising
- a. an input resistor with one end connected to an input terminal,
- b. an input-interruption switching element with one end connected to the other end of said input resistor,
- c. a MOS field-effect transistor with its gate connected to the other end of said switching element,
- d. a parallel circuit consisting of a nonpolarized electrolytic capacitor and a discharge resistor and connected between the gateof said field-effect transistor and circuit ground,
- e. a switching circuit means connected to the output terminal of said field-effect transistor for producing an on and off switching signal in response to the rise and fall of output signal level from said field-effect transistor,
- f. said field-effect transistor, said switching element and said parallel circuit being embedded or potted in a molded plastic insulation, and
- g. said discharge resistor comprising means for providing the sole discharge path for said capacitor.

4,035,669
OPERATION-DELAYED SWITCHING CIRCUIT

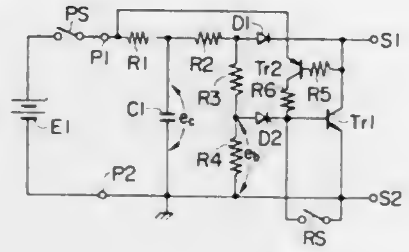
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Nov. 18, 1975, Ser. No. 632,897

Claims priority, application Japan, Dec. 25, 1974, 49-3740; Dec. 25, 1974, 49-3741; Dec. 25, 1974, 49-3742; Dec. 25, 1974, 49-3743

Int. Cl.² H03K *5/13, 17/56*

U.S. Cl. 307—293 **6 Claims**



1. An operation-delayed switching circuit comprising:

a power source line having a DC voltage source connected thereto;

a time constant circuit connected to the power source line and including at least a capacitor;

a discharge line connected in parallel with the capacitor of said time constant circuit and including a switch element having a control terminal and inserted in series therein, for discharging the electric charge of said capacitor;

a control signal generating circuit connected to said time constant circuit including a voltae divider circuit having an output terminal connected in parallel with said capacitor and a diode connected in series between said output terminal and said control terminal, said diode having a polarity as it reverse biased by a holding voltage applied to said control terminal for generating a DC voltage varying in value in accordance with the terminal voltage of said capacitor, said DC voltage serving as a control signal applied to said control terminal of said switch element for controlling the conduction of this switch element; and

a self-sustaining circuit of said switch element and connected to said control terminal of the switch element and continuously applying to said control terminal said holding voltage for sustaining the conduction of said switch element after said switch element is rendered conductive.

4,035,670
TRANSISTOR STORED CHARGE CONTROL USING A RECOMBINATION LAYER DIODE

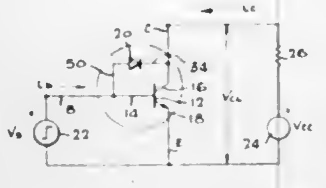
Leonard F. Roman, North Hollywood, Calif., assignor to California Linear Circuits, Inc., La Mirada, Calif.

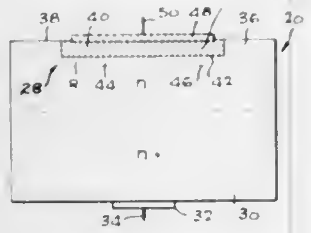
Filed Dec. 24, 1975, Ser. No. 644,117

Int. Cl.² H01L *29/90;* **H03K** *3/33, 17/60, 19/08*

U.S. Cl. 307—300 **10 Claims**

1. As a circuit element, the combination of a junction transistor and a recombination layer diode forward connected between the base and collector of said transistor, said diode having a forward turn-on voltage that is lower than the forward base-to-emitter voltage of said transistor so that when said transistor is turned on, said diode will be forward biased before the base-collector junction of said transistor so as to prevent saturation of said transistor, the reverse recovery time of said diode being very short compared with the turn-off time of said transistor, so that connection of said diode will not increase the turn-off time of said transistor, said recombination layer diode comprising a shallow, relatively heavily doped region of one conductivity type, an adjacent relatively lightly doped region of opposite conductivity type, and a thin recombination layer between said shallow and said adjacent regions, of dopant concentration intermediate that of said shallow and said adjacent regions.





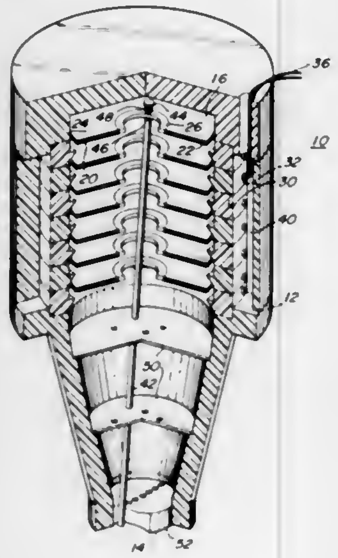
4,035,671
PIEZOELECTRIC WIRE MATRIX PRINTER HEAD

Hugo Willy Schafft, Des Plaines, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Feb. 17, 1976, Ser. No. 658,443

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.6 **13 Claims**



1. Apparatus comprising:

a housing means provided with an opening;

a plurality of bimorph benders, each bender having a major surface adapted for flexing in response to an applied electrical signal, and each blender being provided with a central opening through said major surface;

means for stackably mounting the benders in the housing such that each bender is adapted to independently flex and for aligning the central openings to form a central cavity;

a plurality of driven members;

means for coupling each driven member to one of the bimorph benders for inducing driven member movement therewith in response to the flexing thereof; and

means for routing the driven members through the central cavity for activation out the housing opening.

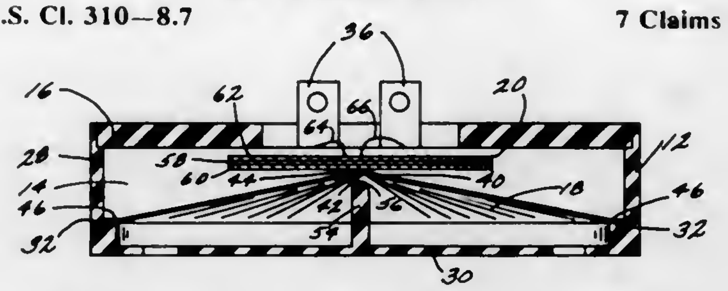
4,035,672
ACOUSTIC TRANSDUCER WITH A DUAL PURPOSE PIEZOELECTRIC ELEMENT

Wayne A. Beaverson, and James N. Hufford, both of Elkhart, Ind., assignors to CTS Corporation, Elkhart, Ind.

Filed Feb. 6, 1975, Ser. No. 547,388

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.7 **7 Claims**



1. In an acoustic transducer, the combination of a housing defining a cavity, a diaphragm disposed within the cavity, the diaphragm defining a cone having a base and an apex section provided with an inner surface and an outer surface, a portion of the housing being deformed into engagement with the base and securing the diaphragm to the housing, a post secured to the housing and extending inwardly from the base toward the apex section, one end of the post being disposed adjacent the inner surface, and an oscillator circuit connected to the diaphragm, the oscillator circuit comprising a piezoelectric element having a first and a second conductor and a piezoelectric material disposed between the first and second conductors, the piezoelectric element being secured to the outer surface of the apex section, the piezoelectric element adapted to a dual function by firstly developing acoustic energy and transferring such energy to the diaphragm and secondly functioning as an electronic component in the oscillator circuit by operating as a frequency determining capacitor in such circuit, a resistor connected to the first conductor and a unijunction transistor having an emitter and a first and a second base electrode, the emitter being connected to the junction between the resistor and the first conductor of th piezoelectric element, the first base electrode being connected to the other end of the resistor and the second base electrode being connected to the second conductor of the piezoelectric element whereby an operating potential applied across the resistor and the piezoelectric element charges the piezoelectric element to a sufficiently high voltage level to bias the transistor into conduction.

4,035,673
HERMETICALLY SEALED MOUNT FOR A PIEZOELECTRIC TUNING FORK

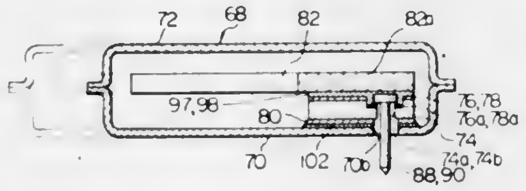
Fujio Ishida, Kokubunji, and Haruo Suda, Tokorozawa, both of Japan, assignors to Citizen Watch Co. Limited, Tokyo, Japan

Filed Dec. 18, 1975, Ser. No. 642,210

Claims priority, application Japan, Dec. 24, 1974, 49-147683[U]; June 23, 1975, 50-086787[U]; July 8, 1975, 50-094304[U]; Oct. 21, 1975, 50-142540[U]; Nov. 5, 1975, 50-132671; Nov. 8, 1975, 50-151913[U]

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.9 **26 Claims**



1. A mechanical vibrator for a timepiece comprising:

a ceramic substrate having at least on bore formed therein and including at least one first metal layer formed on one surface of said substrate, and a second metal layer formed on another surface of said substrate over a substantially larger area thereof;

at least one lead pin passing through the bore of said ceramic substrate and having one end electrically connected to said first metal layer while said bore is hermetically sealed;

a piezoelectric vibrating element including an end portion and exciting electrodes terminating at said end portion on one surface thereof for exciting said vibrating element, said one surface of said end portion of said vibrating element being secured to said one surface of said substrate to electrically interconnect one of said exciting electrodes with said first metal layer; and

an evacuated metal housing having at least one bore through which another end of said lead pin projects outwardly of said metal housing and accommodating said vibrating element and said substrate, said second metal layer of said substrate being rigidly, hermetically secured to an inner wall of said metal housing.

4,035,674
QUARTZ CRYSTAL VIBRATOR

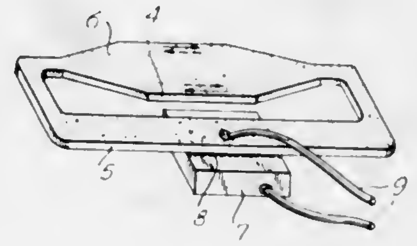
Kikuo Oguchi; Ogata Toshiaki, and Eishi Momosaki, all of Suwa, Japan, assignors to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Nov. 7, 1975, Ser. No. 629,951

Claims priority, application Japan, Nov. 9, 1974, 49-129111

Int. Cl.² H01L *41/04*

U.S. Cl. 310—9.5 **6 Claims**



1. An essentially planar shear-mode quartz crystal vibrator, said vibrator being a Y-cut vibrator, the plane of said vibrator being rotated around the X-axis by 50° - 60° from the XZ plane, said vibrator having a support portion and a vibrator portion having ends, said support portion and said vibrator portion being integral with each other and joined to each other at the ends of said vibrator portion, said vibrator portion having a central section which is substantially wider than the ends thereof and than said support portion, said vibrator having front and back surfaces and an integral film of inert metal on said front surfaces of said vibrator portion and said support portion and a second integral film of inert metal on said back surfaces of said vibrator portion and said support portion for external connection, said vibrator being essentially free of stresses which could cause distortion.

4,035,675
CAPACITIVE TAP WEIGHTED SURFACE ACOUSTIC WAVE TRANSDUCERS

Donald C. Malocha, Urbana, and Bill J. Hunsinger, Mahomet, both of Ill., assignors to University of Illinois Foundation, Urbana, Ill.

Filed Apr. 8, 1976, Ser. No. 675,134

Int. Cl.² H01L *41/04;* **H03H** *9/30*

U.S. Cl. 310—9.8 **17 Claims**

1. A transducer for a surface acoustic wave device comprising:

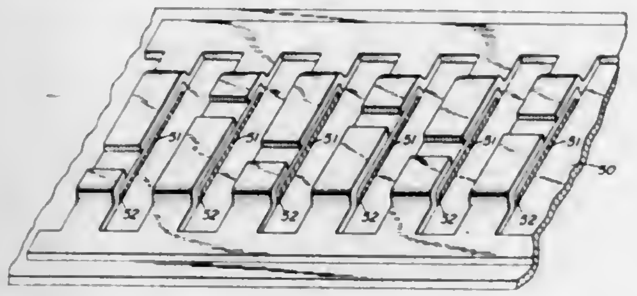
an acoustic wave propagating substrate;

first and second spaced elongated conductive fingers disposed on said substrate;

a layer of dielectric material formed over said first and second fingers;

a first electrode formed on the dielectric layer above said first finger, said first electrode being proportioned to oppose a predetermined portion of said first finger;

a second electrode formed on the dielectric layer above said first finger, said second electrode being spaced from said first electrode and being proportioned to oppose another predetermined portion of said first finger;



a third electrode formed on the dielectric layer above said second finger, said third electrode being proportioned to oppose a predetermined portion of said second finger;

a fourth electrode formed on the dielectric layer above said second finger, said fourth electrode being proportioned to oppose another predetermined portion of said second finger;

a plurality of input/output terminals; and

means for coupling said input/output terminals to said electrodes.

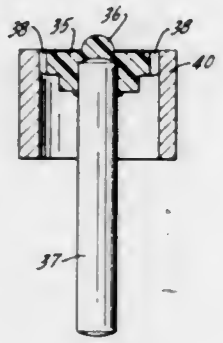
4,035,676
SMALL ELECTRIC MOTORS

Gerald L. Adair, Woodstock, Ill., assignor to Original Equipment Motors Inc., Crystal Lake, Ill.

Filed June 18, 1975, Ser. No. 588,011

Int. Cl.² H02K *15/00*

U.S. Cl. 310—42 **2 Claims**



1. A rotor assembly for a subfractional dynamoelectric machine, comprising:

a rotor shaft;

a rotor hub, affixed to the rotor shaft, the hub having a periphery formed of deformable and shearable non-metallic plastic material and affording a plurality of spaced teeth projecting radially outwardly thereof to a substantially uniform diameter from the axis of the shaft;

and a cylindrical permanent magnet rotor, magnetized to afford a plurality of magnetic poles angularly displaced around the cylinder periphery,

the rotor cylinder being formed of a permanent magnet material substantially harder than said material of the hub teeth and having an inner diameter smaller than the diameter of the hub teeth,

the inside diamter of the rotor cylinder being frictionally press fitted over the hub teeth which are thereby bent proportional to rotor eccentricity with the periphery of the cylinder co-axial relative to the rotor shaft .

4,035,677
ROTOR OF A MICRO MOTOR

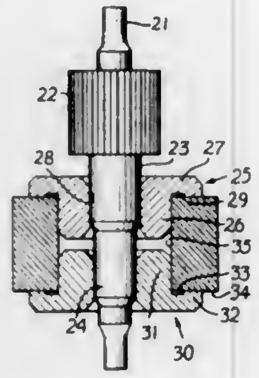
Takaji Kusayama, Kashiwa, and Katsuji Aoki, Funabashi, both of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

Filed Oct. 21, 1975, Ser. No. 624,468

Claims priority, application Japan, Oct. 21, 1974, 49-121267

Int. Cl.² H02K *15/00*

U.S. Cl. 310—42 **7 Claims**



1. A rotor structure of a micro motor for use with timepieces and the like comprising: a rotor shaft; an upper bush and lower bush connected to said rotor shaft and extending in axially spaced relationship therealong, each bush comprising a cylindrical portion having a hole in the center thereof through which extends said rotor shaft, a flange portion connected to said cylindrical portion at the end thereof remote from the other bush, and means rendering said flange portion resilient to a certain degree with respect to the axial direction of said rotor shaft; and a magnet having a hole therein disposed around the cylindrical portions of both said upper and lower bushes and being resiliently clamped at opposite ends between the flange portions of said upper and lower bushes thereby fixing said magnet relative to said rotor shaft by the resiliency of said flange portions and without use of adhesive.

4,035,678
COOLANT CIRCULATION SYSTEM FOR THE ROTOR OF AN ELECTRIC MACHINE HAVING A SUPERCONDUCTIVE EXCITATION WINDING

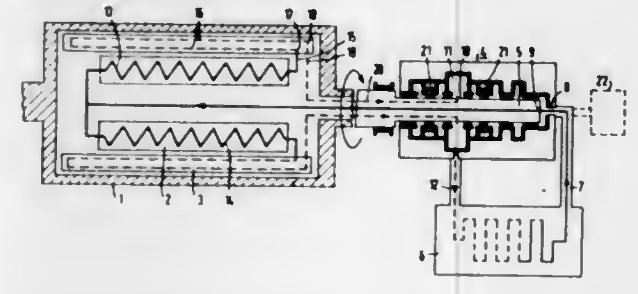
Dietrich Lambrecht, and Erich Weghaupt, both of Mulheim (Ruhr), Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

Filed Aug. 26, 1975, Ser. No. 607,901

Claims priority, application Germany, Sept. 4, 1974, 2442277

Int. Cl.² H02K *9/00*

U.S. Cl. 310—52 **3 Claims**



1. Coolant circulation system for the rotor of an electric machine having a superconductive excitation winding and carried by a rotary shaft comprising a radially outer cold shield surrounding the superconductive excitation winding, a coolant junction head surrounding the shaft at an end thereof adjacent the excitation winding, said coolant junction head having an inlet communicating with an axial bore formed in the shaft, means for refrigerating a coolant, means for conducting liquid coolant from said refrigerating means through said coolant junction head to said shaft bore, means defining a collection chamber surrounding the shaft and communicating with bore means formed in the shaft for discharging the coolant from the shaft, first cooling channels located in the radially inwardly disposed excitation winding and communicating with said shaft bore, and second cooling channels located in said radially outwardly disposed refrigerating shield, said first and second cooling channels being serially connected and being successively traversible by the same coolant conducted to said shaft bore, said coolant flowing through said shaft bore and said serially connected cooling channels changing to the gaseous phase and discharging from said second channel at a pressure higher than said liquid coolant entering said shaft bore, said machine rotor forming a cold gas compressor for said refrigerating means and is connected thereto through said coolant junction head.

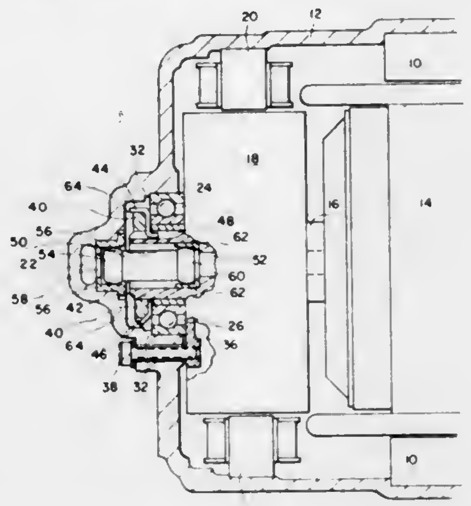
4,035,679
COOLANT TRANSFER TUBE FOR DYNAMOELECTRIC MACHINES

James Stuart Schmohe, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Nov. 26, 1975, Ser. No. 635,498

Int. Cl.² H02K *1/32*

U.S. Cl. 310—61 **8 Claims**



1. In a rotating dynamoelectric machine having a rotor shaft with an internal passageway wherein coolant is transferred from the housing to the internal passage in the rotor shaft, a transfer tube assembly comprising:

a coolant trasfer tube including a journal on each end;

a first bearing, located in the machine housing in a bearing relation with the journal on one end of said transfer tube, configured to permit the transfer of coolant from the housing to one end of said transfer tube wherein said transfer tube is free to rotate with respect to the housing and forms a substantially liquid-tight seal in combination with said transfer tube journal; and

a second bearing, located in the interior of the rotor shaft in a bearing relation with the journal on the other end of said transfer tube, configured to permit the transfer of coolant from said transfer tube to the rotor shaft internal passageway wherein said transfer tube is free to rotate with respect to the shaft, and forms a substantially liquid-tight seal in combination with said transfer tube bearing surface.

4,035,680
VARIABLE RELUCTANCE MOTOR

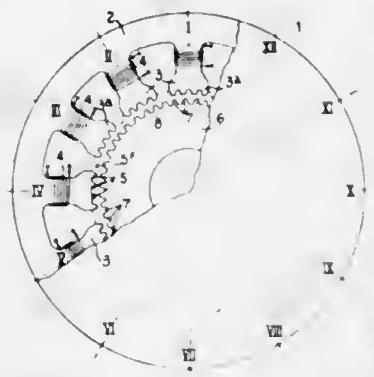
Claude Robert Maeder, Nancy, France, assignor to Pont-A-Mousson S.A., Nancy, France

Filed May 10, 1976, Ser. No. 684,825

Claims priority, application France, June 17, 1975, 75.18841

Int. Cl.² H02K *17/42*

U.S. Cl. 310—168 **19 Claims**



1. A motor device comprising in combination a source of polyphase current and a motor of the variable reluctance type, the motor comprising a fixed element and a moving element, a first of which elements carries toothed studs and windings mounted on the toothed studs and the second of which elements is constituted by a mass of magnetic material on which second element there are formed teeth capable of effecting a relative movement with respect to the teeth of the first element, the number of teeth of the first element being different from the number of teeth of the second element so that said teeth are capable of modifying the reluctance of the magnetic circuits that they constitute respectively with said studs, in order to produce a relative movement of the two elements when the windings are supplied with a poly-phase current, wherein the number of teeth of the two elements satisfies the following relation:

$$Z_I - Z_{II} = sk$$

in which:

Z_I = number of teeth of the first element including fictive teeth which may be assumed to be located between the studs;

Z_{II} = number of teeth of the second element;

s = number of studs per phase of the supply;

k = a submultiple of the number of phases of said supply, at the most equal to one third of the number of phases.

4,035,681
POLYGONAL LENS

John M. Savage, Jr., 8118 W. 83rd St., Playa del Rey, Calif. 90291

Filed Dec. 22, 1975, Ser. No. 643,158

Int. Cl.² H01J *5/16*

U.S. Cl. 313—110 **14 Claims**

1. For combination with a light emitting diode, a lens cap comprising

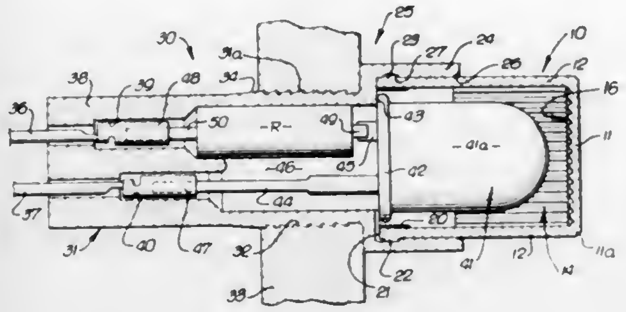
a. an end wall and a side wall defining a skirt integral with said end wall,

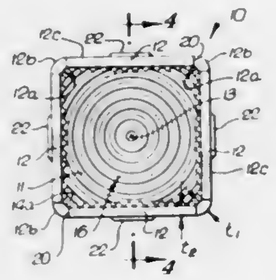
b. the skirt being polygonal and defining interior corners,

c. the skirt interior surface defining serrations extending lengthwise toward said end wall, the serrations having roots,

d. the skirt side wall thickness at the corners being substantially the same as the skirt side wall thickness between said corners and at the serration roots, said corners being free of said serrations,

e. said end wall having an interior surface defining radially spaced serrations which extend circularly about an axis defined by the skirt, said end wall serrations extending as circular arcs having progressively diminishing length, proximate said corners.





4,035,682

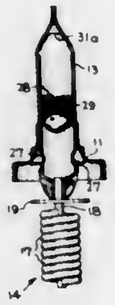
UNIVERSAL BURNING ALKALI METAL VAPOR LAMP WITH AMALGAM STORAGE IN EXHAUST TUBULATION

Stanley F. Bubar, Chagrin Falls, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed Aug. 26, 1976, Ser. No. 718,062

Int. Cl.^{2} H01J *61/22, 61/28, 61/30*

U.S. Cl. 313—174 **5 Claims**



1. An alkali metal vapor lamp comprising a tubular elongated envelope of light-transmitting ceramic material, said envelope having a pair of electrodes sealed into opposite ends, one end of said envelope having a metal exhaust tubulation sealed thereto, an ionizable medium including alkali metal sealed within said envelope in a quantity exceeding that vaporized during normal operation of said lamp, said exhaust tubulation having a vent opening into the interior of said envelope and being sealed off at its outer end, the heat balance in said envelope making the sealed end of said tubulation the cold spot of said envelope, and an obstruction means in said tubulation interposed between said vent and the sealed end and located at a place within said tubulation which is appreciably higher in temperature than said sealed end, said obstruction means restricting the passage between the vent and the sealed end to a multiplicity of capillary openings.

4,035,683

HIGH VOLTAGE ELECTRIC SWITCH WITH TRIGGER ELECTRODES INTEGRAL WITH MAIN DISCHARGE ELECTRODES

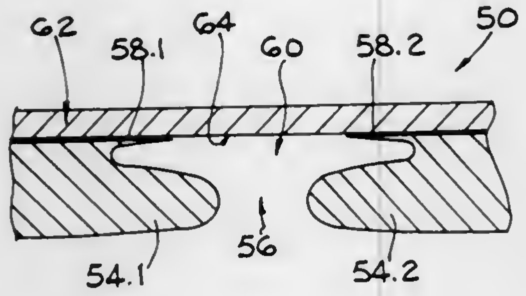
Victor Haim Hasson, and Hubertus Michael von Bergmann, both of Pretoria, Transvaal, South Africa, assignors to The South African Inventions Development Corporation, Pretoria, Transvaal, South Africa

Filed June 2, 1976, Ser. No. 692,084

Claims priority, application South Africa, June 3, 1975, 75/3564

Int. Cl.^{2} H01J *17/04, 17/20, 17/30*

U.S. Cl. 313—184 **10 Claims**



1. A high voltage electric switch which includes:
- a housing defining a chamber and adapted to contain an electrically insulating gas;
- two spaced-apart main electrodes housed within the chamber, and defining between them a breakdown gap;
- connecting means for connecting the electrodes in an electrical circuit, and
- trigger means in close proximity to the gap, and comprising two trigger electrodes, each being directly electrically connected to different ones of the main electrodes, the geometry of the electrodes being such that the breakdown voltage between the trigger electrodes is less than the breakdown voltage between the main electrodes,
- the trigger means being adapted to generate electrically electromagnetic radiation which irradiates a substantial portion of the insulating gas in the breakdown gap, the radiation being of a sufficiently high intensity to cause substantial photoelectric emission of electrons in the gas and thus breakdown of the gas and an electrical discharge between the main electrodes.

4,035,684

STABILIZED PLASMATRON

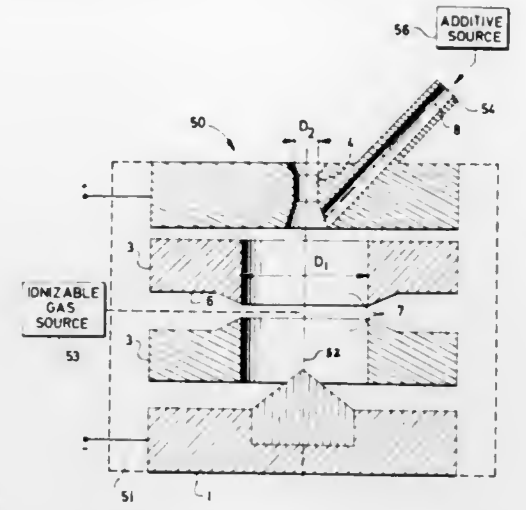
Vratislav Svoboda, and Imrich Kleinmann, both of Prague, Czechoslovakia, assignors to Ustav pro vyzkum, vyrobu a vyuziti radiosotopu, Prague, Czechoslovakia

Filed Feb. 23, 1976, Ser. No. 660,773

Int. Cl.^{2} H05H *1/00*

U.S. Cl. 313—231.4 **2 Claims**

1. In a plasmatron for mixing a liquid, gaseous, aerosol or powdered sample with a plasma stream, the plasmatron comprising, in combination, a cathode, an anode axially spaced from the cathode in a forward direction and having an outlet nozzle extending axially therethrough for ejecting a plasma stream, means for applying a potential across the anode and the cathode to establish an arc discharge therebetween, at least one hollow plasma stabilization plate interposed in the space between the anode and the cathode, means for introducing a gas to be ionized into the space between the anode and cathode occupied by the stabilization plate to produce a plasma stream, and means defining at least one common passage for introducing any of the liquid, gaseous, aerosol or powdered samples into the plasma stream, the common passage extending obliquely in an inward and rearward direction through the anode and terminating in the nozzle for mixing the additive with the plasma stream within the nozzle.



4,035,685

SOLID CATHODE CAP FOR AN X-RAY TUBE

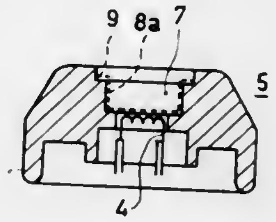
Heinz-Jurgen Jacob, Norderstedt, Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 562,902

Claims priority, application Germany, Apr. 11, 1974, 2417820

Int. Cl.^{2} H01J *1/14, 19/06*

U.S. Cl. 313—346 R **4 Claims**



1. A cathode for an X-ray tube comprising means for emitting an electron beam and a cap of ceramic material surrounding said emitting means and having an open part surrounding an exit portion of said beam, the surface of said open part of said cap being provided with a conductive layer, said open part having a step and said conductive layer terminating on said step.

4,035,686

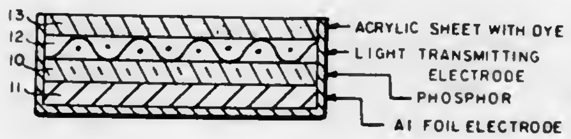
NARROW EMISSION SPECTRUM LAMP USING ELECTROLUMINESCENT AND PHOTOLUMINESCENT MATERIALS

Gordon R. Fleming, Hanover, N.H., assignor to Atkins & Merrill, Incorporated, Lebanon, N.H.

Filed Feb. 13, 1976, Ser. No. 657,978

Int. Cl.^{2} H05B *33/02, 33/14*

U.S. Cl. 313—503 **14 Claims**



1. A lamp assembly comprising electroluminescent means including a layer of electroluminescent material disposed between a light-reflective electrode and a light-transmitting electrode for emitting light over a first pre-determinable range of the visible spectrum;
- first pre-selected fluorescent means positioned in responsive relation to said electroluminescent material for absorbing light emitted by said electroluminescent means over a first portion of said first pre-determinable range and for emitting said absorbed light over a second pre-determinable range which is narrower than said first pre-determinable range; and
- further means positioned in responsive relation to said electroluminescent material for absorbing light over another portion of said first pre-determinable range;
- whereby substantially all of the light emitted by said lamp assembly lies within said second narrower predeterminable range.

4,035,687

TRAVELING WAVE TUBE HAVING A HELIX DELAY LINE

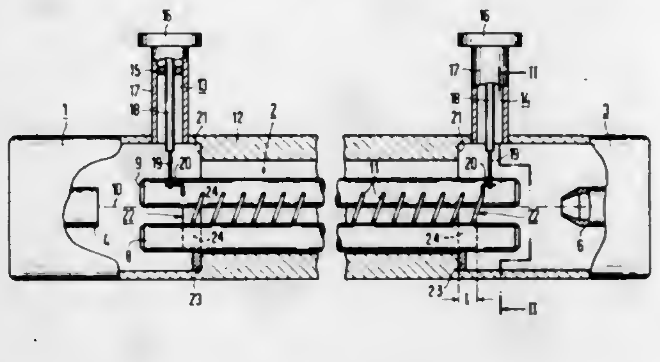
Franz Gross, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Mar. 31, 1976, Ser. No. 672,312

Claims priority, application Germany, Apr. 15, 1975, 2516428

Int. Cl.^{2} H01J *25/34*

U.S. Cl. 315—3.5 **25 Claims**



1. In a traveling wave tube of the type having a helical delay line supported by a plurality of dielectric rods within a metallic sleeve and having coupling conductors connected to respective ends of the delay line to supply and discharge HF energy, respectively, the improvement therein comprising:
- means for providing a low reflection transition between the delay line and at least one of the coupling conductors, including, in the area of at least one of the ends of the delay line, a metallic matching component comprising an arm connected to the metallic sleeve and projections extending from said arm and extending between the support rods and in close proximity to the delay line, said projections spaced a distance *s* from the delay line in accordance with the range relationship

$$0.02\ \lambda_g < s < 0.15\ \lambda_g$$

and extending a distance *l* in the direction of the axis of the delay line in accordance with the range relationship

$$0.1\ \lambda_g < l < 0.3\ \lambda_g$$

where λ_g is the short wave length of the delay line.

4,035,688
ELECTRONIC TUNABLE MICROWAVE DEVICE

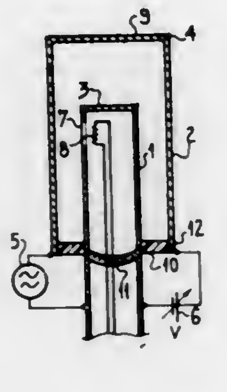
Georges Mourier, Paris, France, assignor to Thomson-CSF, Paris, France

Filed Mar. 16, 1976, Ser. No. 667,463

Claims priority, application France, Mar. 21, 1975, 75.08942

Int. Cl.² H01J *7/46, 19/80*

U.S. Cl. 315—39 **10 Claims**



1. A microwave device of electronically variable impedance comprising, in a vacuum enclosure:

a multipactor device having two coaxial electrodes defining between them a multipactor space when a high frequency electromagnetic energy is applied there between and adapted to emit secondary electrons with a coefficient δ greater than unity (δ>1), the inner electrode being closed at one of its ends by an electrical conducting wall, and the external electrode extending away from this closed end in such a way that said multipactor space comprises a region of uniform high frequency electric field and a further region of non uniform high frequency electric field, thus providing in said further region an area of longitudinal drift for the electrons of the multipactor device such that, electrons of the discharge are moved away from the region of uniform electric field towards the further region; and

means for applying between said two electrodes a control voltage for varying the impedance of the device.

4,035,689
PANEL-TYPE DISPLAY DEVICE

James A. Ogle, Neshanic Station, and George E. Holz, North Plainfield, both of N.J., assignors to Burroughs Corporation, Detroit, Mich.

Division of Ser. No. 487,955, July 12, 1974, which is a continuation of Ser. No. 255,133, May 19, 1972, abandoned, which is a continuation of Ser. No. 850,984, Aug. 18, 1969, abandoned, which is a continuation-in-part of Ser. No. 828,793, May 28, 1969, abandoned. This application Oct. 22, 1975, Ser. No. 624,532

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.² H05B *37/00*

U.S. Cl. 315—169 TV **9 Claims**

1. A gas discharge display panel comprising

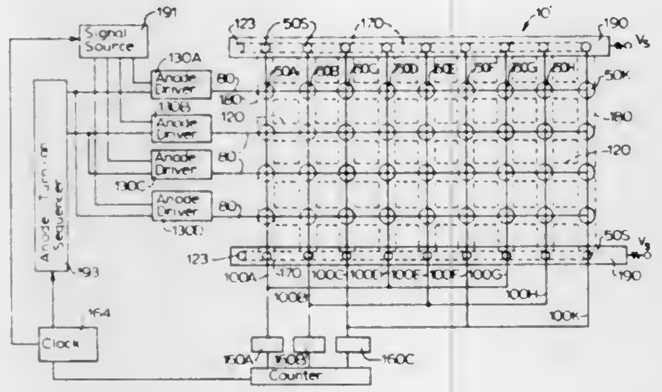
an envelope containing an ionizable gas and having a viewing window through which glow discharges within said envelope may be viewed,

a succession of priming cells including a first cell, a last cell, and intermediate cells, each such cell being in glow discharge priming relation to the next and substantially hidden from view through said viewing window,

first electrode means for continually and repetitively scanning said succession of priming cells to cause each priming cell in the succession to exhibit priming glow discharge wherein excited particles are generated, by establishing a priming glow discharge within each of said priming cells, one after the other beginning with the first and continuing to the last, each such priming cell after the first being scanned to establish a priming glow discharge in it while it is being primed by the priming glow discharge of the next preceding cell,

reset cell adjacent to said first priming cell of said succession of priming cells and positioned to supply excited particles therefor,

second electrode means coupled to said reset cell for insuring that said reset cell exhibit glow discharge and generate excited particles before said first priming cell is energized by said first electrode means,



a plurality of display cells, at least one of which is disposed adjacent each of said priming cells, to be primed by glow discharge in the priming cell, and

third electrode means adjacent said display cells for applying data signals simultaneously to display cells adjacent different ones of said priming cells to establish a glow discharge in selective ones of said display cells, in response to the data signals applied, only when their corresponding priming cells are being scanned,

the glow discharge in said display cells being visible through said viewing window.

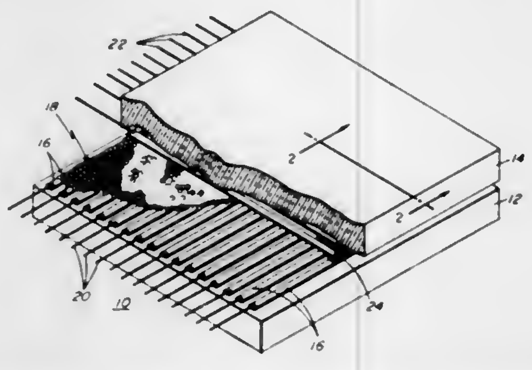
4,035,690
PLASMA PANEL DISPLAY DEVICE INCLUDING SPHEROIDAL GLASS SHELLS

Frederick W. Roeber, Concord, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 25, 1974, Ser. No. 518,029

Int. Cl.² H01J *61/30;* **H05B** *41/00*

U.S. Cl. 315—169 TV **10 Claims**



1. A plasma panel display device comprising in combination:

first and second transparent plates;

first and second sets of conductive electrodes, said first and second sets of electrodes being disposed on said first and second transparent plates respectively; and

a plurality of means for encapsulating a plasma forming gas, said encapsulating means being disposed between said transparent plates, said first and second sets of electrodes being adjacent to said encapsulating means, and each of said encapsulating means comprising a substantially spheroidal glass shell having a diameter in the range of 10 to 200 microns, the spacing between adjacent portions of said first and second sets of electrodes being determined by the diameter of said spheres.

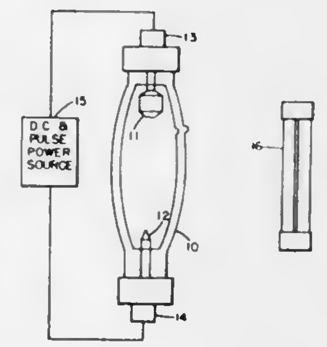
4,035,691
PULSED LASER EXCITATION SOURCE

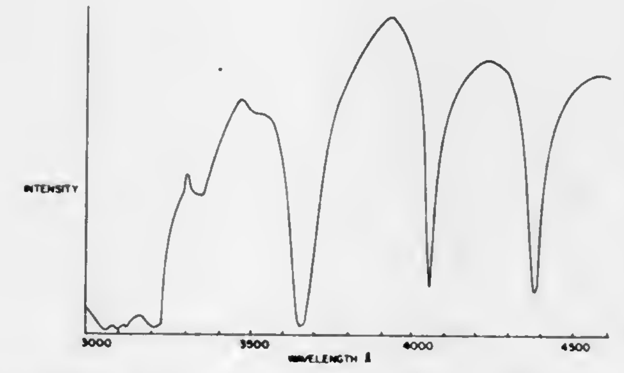
Daniel E. Altman; Glidden J. Barstow, and Myer Geller, all of San Diego, Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 4, 1975, Ser. No. 601,760

Int. Cl.² H05B *41/30*

U.S. Cl. 315—246 **3 Claims**





1. A high intensity pulsed light source producing its principal light energy output substantially within the 3600A to 4300A spectral region comprising:

a sealed envelope of material substantially transparent to light energy within said spectral region;

electrically conductive electrodes communicating with the interior of said envelope, forming a gap therebetween and having external terminals;

xenon gas contained within said envelope in an amount sufficient to produce at least one atomosphere of pressure in its unheated state;

mercury contained within said envelope in an amount sufficient to develop a vapor pressure of not less than one atmosphere upon said envelope being heated to its operative temperature; and

a source of pulsed electrical power connected to said terminals and operative at a duty cycle of the order of 2×10^{-5} with a pulse rise time of substantially less than one-half microsecond for producing repetitive current flow through said gap having a minimum peak amplitude of 3000 amperes, and maintaining said envelope and its contents at an operative temperature of not less than 500°C.

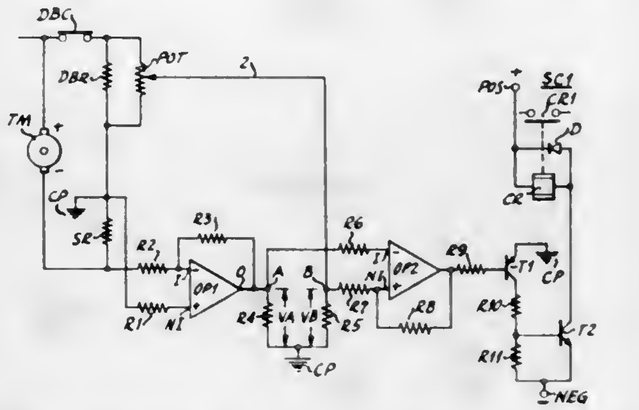
4,035,692
RESISTOR PROTECTION SYSTEMS

William R. Luy, Colgate, and Merle R. Swinehart, Brookfield, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Nov. 20, 1975, Ser. No. 633,921

Int. Cl.² H02H *7/085*

U.S. Cl. 361—103 **17 Claims**



1. A resistor temperature monitoring system for providing an output control signal when the resistor temperature rises above ambient temperature comprising:

means for deriving a temperature monitoring voltage proportional to the current in and the resistivity of the resistor being monitored;

means for deriving a low-power, control voltage proportional to the current in the resistor being monitored;

means for amplifying said low power control voltage;

means for adjusting said system so that said amplified control voltage bears a predetermined initial ratio to said temperature monitoring voltage when the resistor being monitored is at ambient temperature from which said ratio changes as the temperature of the resistor rises until such ratio reaches a tripping value at the maximum safe temperature of the resistor;

output means;

control means operable by said voltages prior to reaching said tripping value for providing a variable operating signal;

and means responsive to said operating signal for operating said output means.

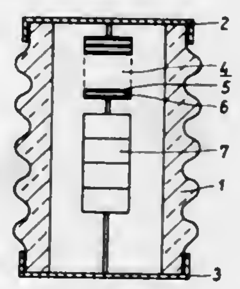
4,035,693
SURGE VOLTAGE ARRESTER WITH SPARK GAPS AND VOLTAGE-DEPENDENT RESISTORS

Gunther Luxa; Klaus Reichelt, and Rudolf Pratsch, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 485,085, July 2, 1974, abandoned. This application Sept. 26, 1974, Ser. No. 509,538

Int. Cl.² H02H *3/22*

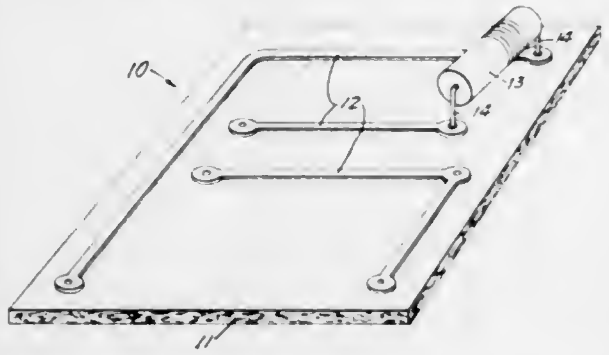
U.S. Cl. 361—120 **7 Claims**



1. In a surge voltage arrester for conducting a discharge current between to locations, the arrester having a plurality of voltage-dependent resistors and a plurality of spark gap structures; said resistors and said spark gap structures conjointly

defining a series circuit connectable between the two locations, said resistors being made of a semiconductor material having a voltage-dependent exponent α said exponent α having a value of at least 10, wherein the improvement comprises each of said spark gap structures being made up of two electrodes conjointly defining a spark gap therebetween, said electrodes being configured so as to conjointly define a substantially uniform electrostatic field in the gap corresponding thereto.

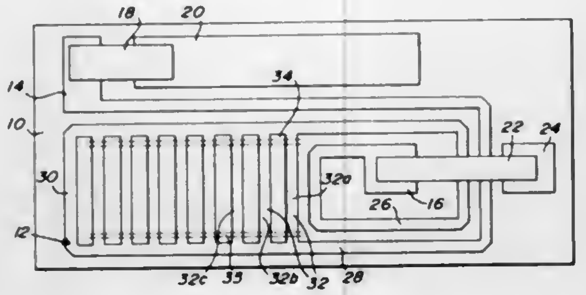
4,035,694
METAL-CLAD DIELECTRIC SHEETING
Robert W. Barton, Cottage Grove, and Gaylord L. Groff, North St. Paul, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.
Continuation-in-part of Ser. No. 431,392, Jan. 7, 1974, abandoned. This application May 14, 1975, Ser. No. 577,444
Int. Cl.² H05K *1/04*
U.S. Cl. 317—101 C **16 Claims**



1. Metal-clad dielectric sheeting useful in the manufacture of printed circuitry comprising a nonwoven web and an electrically conductive metallic layer adhered to at least one side of the web; said web comprising at least 10 pounds per ream of a fiber blend that comprises high-tensile-strength and heat-resistant discontinuous fibers compacted and held together with a matrix of film-forming polymeric binder material that accounts for 5 to 75 weight-percent of the web; substantially all of said fibers having a softening point above 450° F; at least 5 weight-percent of the fibers resisting distortion when exposed for 10 seconds to a molten solder bath heated to 500° F, at least 30 weight-percent of the fibers exhibiting a tensile elongation of at least 20 percent and a tenacity of at least 3.5 grams/denier, and at least 40 weight-percent of the fibers exhibiting a moisture regain of less than about 3 weight-percent; and the polymeric binder material being solid and non-tacky at room temperature, at least initially softening and flowing slightly under the heat and pressure of the compacting operation, and in film form being foldable upon itself without cracking and resisting distortion when heated for 10 seconds on a molten solder bath heated to 500° ; and the metal-clad dielectric sheeting exhibiting no more than a 2 mil/inch change in dimensions upon etch-removal of part or all of the electrically conductive layer, and exhibiting no more than a 10 mil/inch change in dimensions and substantially no blistering when exposed for 10 seconds to a molten solder bath heated to 450° F.

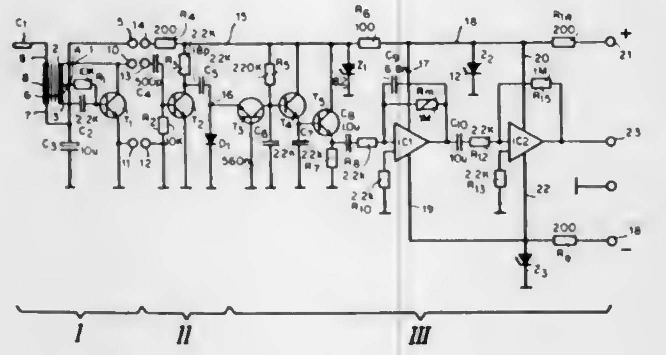
4,035,695
MICROELECTRONIC VARIABLE INDUCTOR
William J. Knutson, Tamarac, and Daniel M. Smith, Coral Springs, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Aug. 5, 1974, Ser. No. 492,295
Int. Cl.² H05K *1/04*
U.S. Cl. 361—400 **5 Claims**

1. A microelectronic circuit including in combination:
a ceramic substrate forming an insulating support;
conductor means on one side of said support having a predetermined pattern with a portion thereof forming an inductor having a plurality of parallel branches;
an electronic component connected to said conductor means and cooperating therewith to provide an operative circuit,



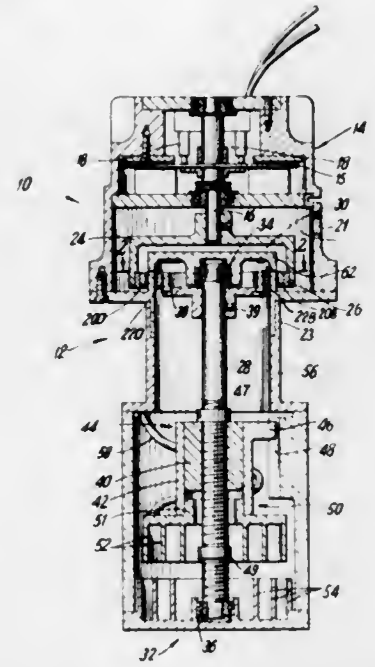
said plurality of parallel branches of said inductor being designed to be selectively severed by laser beam so as to avoid substantial heating of said substrate support while being effective to change the value of said inductor and in turn the circuit operation.

4,035,696
APPARATUS FOR MONITORING MACHINE PARTS SUBJECT TO WEAR
Gerhard Kessler, Reudern, and Peter Fuchs, Ebingen, both of Germany, assignors to Texmaco H.G. Kessler GmbH, Reudern, Germany
Filed May 8, 1975, Ser. No. 575,980
Claims priority, application Germany, May 14, 1974, 2423330; Feb. 27, 1975, 2508477
Int. Cl.² H01H *47/12*
U.S. Cl. 361—203 **11 Claims**



1. An apparatus for monitoring moving machine components, comprising
a high-frequency oscillator circuit including a frequency determining element, the latter constituting an open capacitor connected in said oscillator circuit and having a capacitor face,
said moving machine components to be monitored constituting means for interacting capacitively at least intermittently with said capacitor face of said open capacitor,
said oscillator circuit including means for providing a considerable change in operating oscillating frequency thereof as a result of a very small capacitance change of said open capacitor interacting with the moving machine components to be monitored, the change in oscillating frequency constituting a control signal,
a high-frequency amplifier and signal limiter circuit operatively connected to an output of said oscillator circuit operatively receiving said control signal, and a signal evaluating circuit operatively connected therewith.

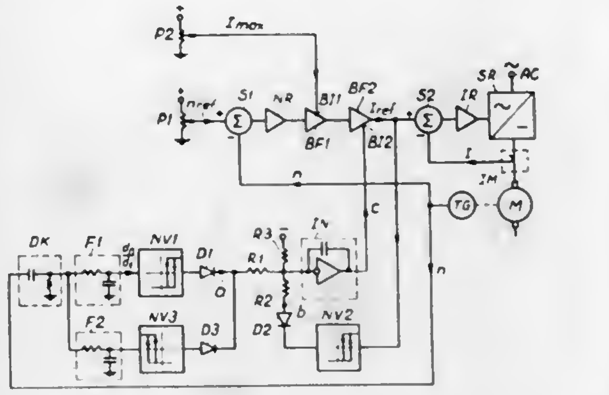
4,035,697
MOTOR DRIVEN MAGNETICALLY COUPLED VARIABLE CAPACITOR
Frank Arnold, Jr., Locust Valley, N.Y., assignor to Photocircuits Division of Kollmorgen Corporation, Hartford, Conn.
Filed Sept. 23, 1975, Ser. No. 615,994
Int. Cl.² H01G *5/14*
U.S. Cl. 361—289 **18 Claims**



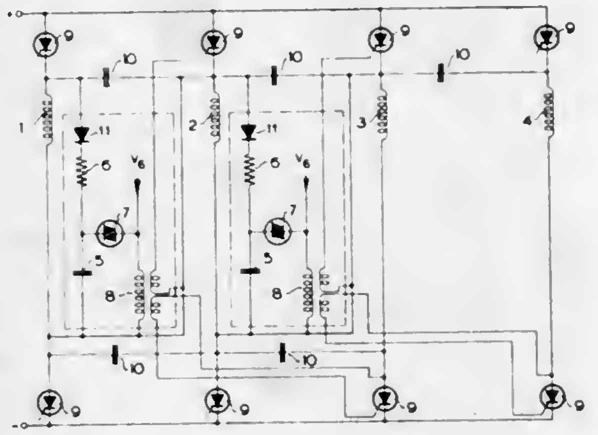
1. A motor driven variable capacitor, comprising:
a capacitor housing;
follower magnet means arranged within said capacitor housing and fixedly coupled to a rotatable shaft;
follower magnet drive means magnetically coupled to said follower magnet means for rotating the same;
a plurality of stationary capacitive elements fixedly coupled to said capacitor housing;
a plurality of movable capacitive elements mechanically coupled to said rotatable shaft for axial movement therealong in response to rotation of said rotatable shaft by said follower magnet, said movable capacitive elements coacting with said stationary capacitive elements to vary the capacitance of the variable capacitor in response to activation of said follower magnet drive means; and
insulating anti-rotation means for coupling said movable capacitive elements to said rotatable shaft for translating rotational movement of said rotatable shaft into linear movement of said movable capacitive elements, said insulating anti-rotation means includes threaded drive nut mounted on said rotatable shaft, said rotatable shaft being threaded to receive said threaded drive nut, an insulating collar concentrically affixed to said threaded drive nut and fixedly coupled to said movable capacitive elements, said insulating collar having a tab coupled thereto, and stop means fixedly coupled to said capacitor housing for engagement by said tab to prevent rotation of said threaded drive nut and translate the rotational movement of said rotatable shaft into linear movement of said threaded drive nut and thus said movable capacitive elements.

4,035,698
MEANS FOR COUNTERACTING SLIPPING AND SKIDDING IN A MOTOR-DRIVEN RAIL-VEHICLE
Bo Söderberg, Vasteras, Sweden, assignor to ASEA Aktiebolog, Sweden
Filed Oct. 18, 1973, Ser. No. 407,505
Claims priority, application Sweden, Apr. 6, 1973, 7304860
Int. Cl.² B61C *15/12*
U.S. Cl. 318—52 **4 Claims**

1. In a motor-driven rail vehicle having a driving wheel driven by a driving motor, an acceleration-sensing member for sensing the angular acceleration of the driving wheel and a torque-controlling member for controlling the torque of the motor, means connecting the acceleration-sensing member to the torque-controlling member including means responsive to an acceleration, the absolute value of which exceeds a predetermined first value, to reduce the torque rapidly and, to the decrease of the absolute value of the acceleration to a predetermined second value, to increase the torque, the torque-controlling member including means to carry out said reduction of the torque at a predetermined rate, to continue to reduce the torque at a lower rate, when a predetermined low, first torque value has been reached, until the absolute value of the acceleration has decreased to said second value, and thereafter to increase the torque.



4,035,699
BRUSHLESS DIRECT CURRENT MACHINE AND METHOD OF CONTROLLING THE SAME
Walter Schade, Alter Postweg 28,, 427 Dorsten, Germany
Continuation of Ser. No. 166,430, Nov. 10, 1971. This application Jan. 22, 1974, Ser. No. 435,583
Int. Cl.² H02K *29/00*
U.S. Cl. 318—138 **1 Claim**



1. A brushless direct-current machine having a rotor comprising: a plurality of at least four stationary coil windings connected in a loop; a plurality of switching means at least equal in number to said plurality of stationary coil windings for sequentially connecting said coil windings to a source of direct-current electrical energy; quenching means responsive to the energization of at least one of said switching means for connecting a next coil winding to said source of direct-current electrical energy to sequentially quench the energized switching means; and a plurality of substantially identical timing networks independent of any mechanical connection to the rotor to which a common voltage is applied for cyclically activating each of said switching means at a cycle speed dependent upon the magnitude of the applied voltage, said windings comprising at least double-parallel coil windings insulated from one another.

4,035,700
ELECTRONIC CONTROL APPARATUS

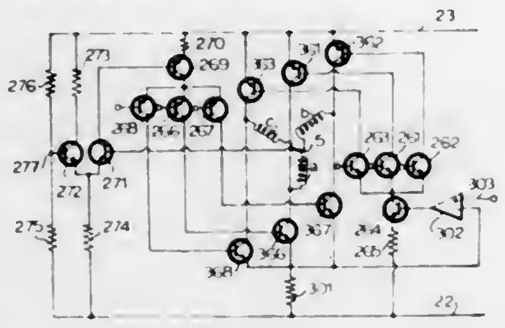
Itaru Kawasaki, Minoo; Kouichi Yamaguchi, Hirakata; Yoshiaki Igarashi, Neyagawa, and Kazutsugu Kobayashi, Takatsuki, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Dec. 12, 1975, Ser. No. 640,265

Claims priority, application Japan, Dec. 20, 1974, 49-147074

Int. Cl.² H02K *29/00*

U.S. Cl. 318—138 **7 Claims**



1. An electronic control apparatus for controlling currents supplied to star-connected multiphase loads, comprising:
- a plurality of first switching means;
- a plurality of second switching means, one terminal of each of the loads opposite to the common terminal of the star-connection being connected to a corresponding one of said plurality of first switching means and to a corresponding one of said plurality of second switching means;
- a reference signal source for generating a reference signal;
- a voltage detector coupled to said common terminal of said star-connection for detecting the voltage of said common terminal;
- a first comparator coupled to said voltage detector and said reference signal source for providing an output signal equal to the difference between the output of said voltage detector and said reference signal source;
- a first feedback amplifier coupled to said first comparator for amplifying said output signal of said first comparator;
- load current supplying means coupled to said first switching means for supplying a current to said multiphase loads according to a command signal through said first switching means;
- feedback current draining means coupled to said first feedback amplifier and said second switching means; and
- a timing signal generator coupled to said plurality of first switching means and said plurality of second switching means for selectively switching said plurality of first switching means and said plurality of second switching means,
- whereby said feedback current draining means drains the current through said second switching means from said multiphase loads so as to keep the voltage at said common terminal of the star-connection constant or substantially constant regardless of the mode of said timing signal generator.

4,035,701
METHOD OF STEPWISE SPEED CONTROL AND THREE-PHASE SQUIRREL-CAGE MOTOR

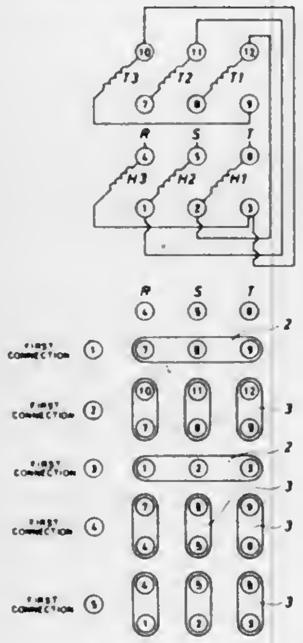
Axel Jensen, Bjerringbro, Denmark, assignor to Grundfor A/S, Bjerringbro, Denmark

Filed Mar. 27, 1975, Ser. No. 562,456

Int. Cl.² H02P *1/32*

U.S. Cl. 318—226 **1 Claim**

1. A method of stepwise speed control in a three-phase squirrel-cage motor having three-phase stator coils including two sets of windings in mixed connections, such as substantially equal main windings and substantially equal additional windings, the latter being so mounted that their magnetic fields are in phase with those of the corresponding main windings, comprising the steps of: gradually increasing the rotational speed of the motor by consecutive operational modes, by first connecting in star said additional windings, and serially connecting said main windings to the resulting star circuit, to attain a single star-series connection, wherein the terminals of said additional windings that are opposite to those serially connected to said corresponding main windings are at a common point (FIG. 1); then connecting in delta said additional winding, and connecting said main windings to the resulting delta circuit, the latter being constituted between said serially connected terminals of the additional windings (FIG.2); connecting the main windings in a single star circuit, wherein one terminal of all said windings is at a common pint (FIG. 3); connecting in series said main and said additional windings of each phase, and connecting in delta the resulting series branches, to attain a delta - series connection (FIG. 4); and finally connecting in delta said main windings, and connecting said additional windings to the resulting delta circuit (FIG. 5).



4,035,702
ELECTRONIC GARAGE DOOR OPENER SAFETY DEVICE

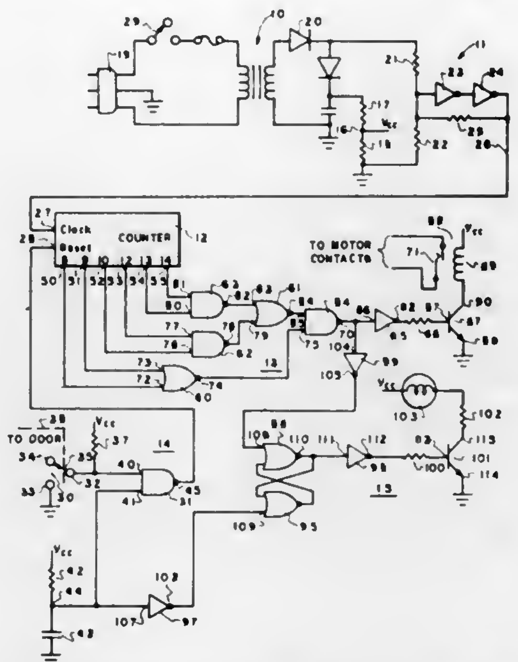
Malvin P. Pettersen, Cicero, and Richard G. Merrell, Darien, both of Ill., assignors to Malvin P. Pettersen, Cicero, Ill.

Filed Aug. 27, 1975, Ser. No. 608,160

Int. Cl.² H02P *1/22*

U.S. Cl. 318—285 **21 Claims**

14. A safety device for use in a door opening and closing system of the type which includes an impulse actuated reversible motor which opens and closes the door, for automatically actuating the motor for closing the door should the door be inadvertantly opened or accidentally remained open, said safety device comprising:
- a detector coupled to the door for providing a first signal when the door is open and for providing a second signal when the door is closed;
- a source of clock pulses;
- a counter coupled to said detector and to said source of clock pulses for keeping time responsive to said first signal; and
- a logic circuit coupled to said counter and to the motor for providing the motor with one impulse for actuating the motor to close the door a preselected period of time after the door is open responsive to said counter.



4,035,703
CURRENT CIRCUIT ARRANGEMENT FOR REDUCING THE SWITCH-ON POWER DISSIPATION OF A POWER TRANSISTOR

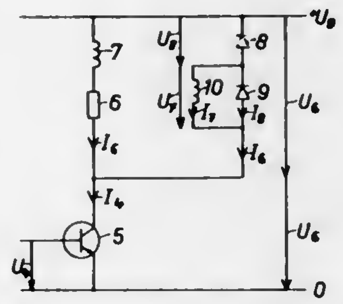
Kurt Hablützel, Wiesendangen, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Dec. 11, 1975, Ser. No. 639,714

Claims priority, application Switzerland, Dec. 20, 1974, 17059/74

Int. Cl.² H02D *5/16*

U.S. Cl. 318—345 B **9 Claims**



1. A current circuit arrangement for reducing the switch-on power dissipation of a power transistor which intermittently switches a direct current voltage to an ohmic-inductive load, said arrangement comprising
- a voltage limiting diode disposed in parallel to the load, said diode being biased in a blocking condition with said transistor in a conducting state and in a conducting condition with said transistor in a reverse-biased state;
- a non-linear resistance member connected in series with said voltage limiting diode, said member including at least one additional diode; and
- a low ohmic reactance member connected in parallel with said resistance member, said reactance member having a voltage time area sufficiently large to have the reactance limit the current after a repeated switch-on of said transistor until said voltage limiting diode takes up a reverse voltage and sufficiently small to have the voltage across said reactance member upon switching off said transistor diminish to a value lower than the forward voltage drop of said non-linear resistance member before said transistor is again switched on.

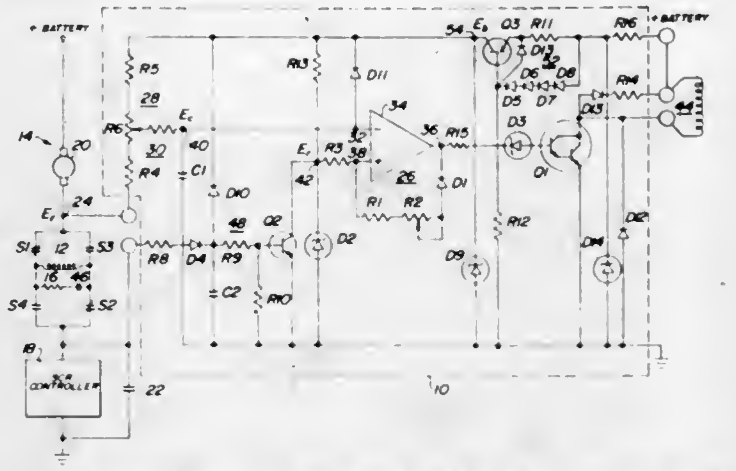
4,035,704
FIELD WEAKENING SENSOR CIRCUIT

Robert A. York, Mechanicsburg, Pa., assignor to Flight Systems, Inc., Mechanicsburg, Pa.

Filed Sept. 5, 1975, Ser. No. 610,814

Int. Cl.² H02P *7/00*

U.S. Cl. 318—358 **16 Claims**



1. Apparatus for controlling the speed of an electric motor by sensing the field voltage across the field winding of the electric motor, comprising:
- comparator means for comparing said field voltage to a reference voltage and for generating a first signal in response to said field voltage falling below a first predetermined value, said comparator means also for generating a second signal in response to said field voltage rising above a second predetermined value;
- means responsive to said first and second signals for connecting a field weakening resistor in parallel with the field winding of the electric motor whose speed is being controlled in response to said comparator means generating said first signal, said means responsive also for disconnecting said field weakening resistor in response to said comparator means generating said second signal.

4,035,705
FAIL-SAFE DUAL CHANNEL AUTOMATIC PILOT WITH MANEUVER LIMITING

Harry Miller, Scottsdale, Ariz., assignor to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 17, 1975, Ser. No. 558,582

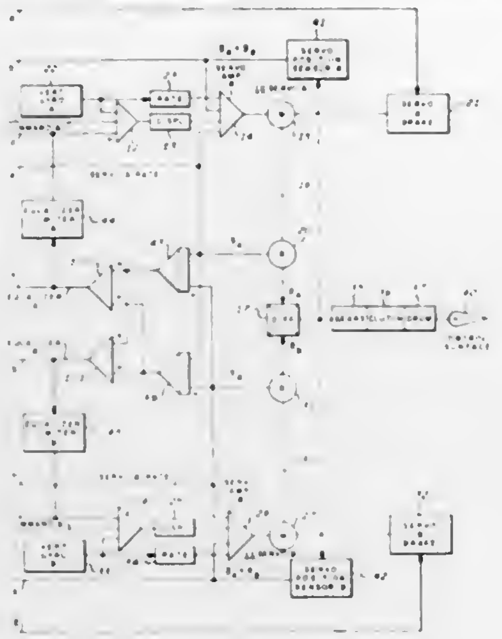
Int. Cl.² G05B *9/03*

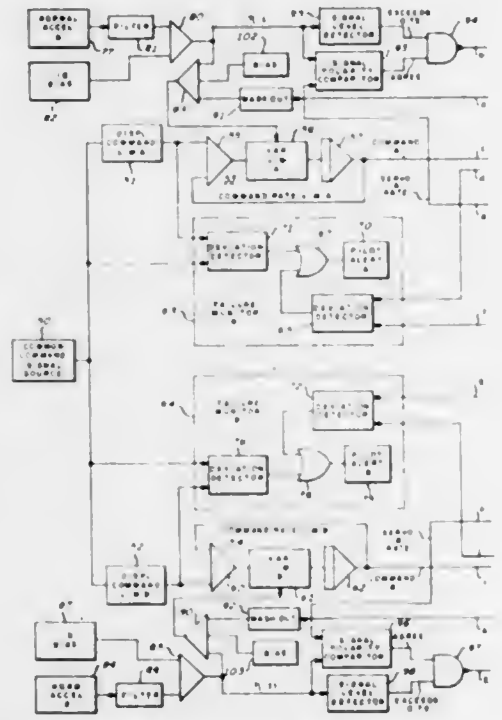
U.S. Cl. 318—564 **33 Claims**

1. A control system for controlling the movement of the pitch attitude control surface of an aircraft comprising
- a common command signal source,
- first and second substantially identical servo channels coupled to said common command signal source for providing first and second servo outputs respectively in response to said common command signal,
- summing means responsive to said first and second servo outputs and coupled between said first and second servo channels and said pitch attitude control surface for controlling the movement thereof in accordance with the algebraic sum of said first and second servo outputs,
- feedback means responsive to said first and second servo outputs for providing feedback signals to said first and second servo channels,
- whereby movement of said pitch attitude control surface caused by a failure in one said servo channel tends to be compensated by movement of the output of the other said servo channel to minimize undesired maneuvers of said aircraft,
- first and second limiter means coupled between said common command signal source and said first and second servo channels respectively for limiting said common command signal in each said channel to minimize undesired maneuvers of said craft when a failure occurs in said common command signal source,

said first and second limiter means each comprising rate limiter means for limiting the rate of change of said command signal applied to said first and second servo channels respectively, thereby limiting the rate of change of attitude of said craft in response to said command signal, and

first and second normal accelerometer means for providing respective incremental load factor signals representative of the incremental load factor on said aircraft.





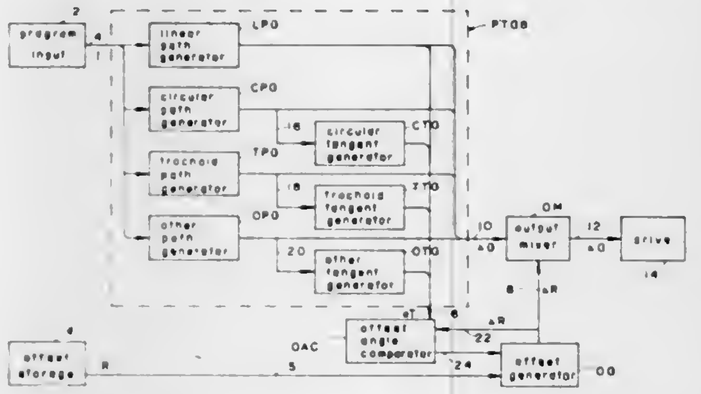
4,035,706

OFFSET PATH GENERATING SYSTEM PARTICULARLY USEFUL FOR NUMERICAL CONTROL MACHINES

Hymie Cutler, 16230 Santa Rosa, Detroit, Mich. 48221
Continuation-in-part of Ser. No. 382,862, July 26, 1973, Pat. No. 3,875,382. This application Mar. 27, 1975, Ser. No. 562,771
Int. Cl.² G05B *19/24*
U.S. Cl. 318—572 **22 Claims**

1. Apparatus for generating drive-pluses for producing an offset path of motion offset from a programmed path of motion by a prescribed magnitude, comprising:

A. data input means for inputting data specifying the programmed path of motion and the prescribed offset magnitude;
B. a programmed path generator generating program axes-pluses defining the programmed path of motion specified by the input data;
C. an offset generator generating offset axes-pulses defining an offset vector of a magnitude equal to said prescribed offset magnitude;
D. an output mixer algebraically combining the program axes-pulses and the offset axes-pulses and outputting same as the drive axes-pulses for producing said offset path of motion;
E. and offset control means including: (i) a slope discontinuity control effective to control the offset path upon the inputting of a first programmed path of motion followed by a second programmed path of motion having a discontinuity in slope from the first programmed path of motion,



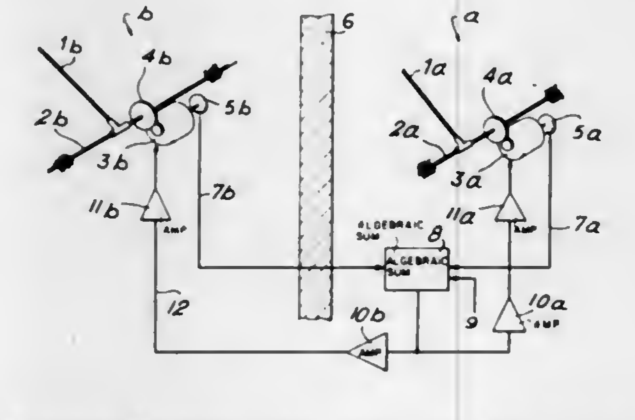
said slope-discontinuity control being effective, upon generation of the axes-pulses for the completion of the first programmed path of motion;

a. to disable the programmed path generator from supplying to the output mixer the program axes-pulses defining the second programmed path of motion;
b. to enable the offset generator to supply to the output mixer sufficient offset axes-pulses to rotate the offset vector until it is at a predetermined angle related to the second programmed path of motion and at the prescribed offset magnitude therefrom;
c. and then to re-enable the programmed path generator to supply to the output mixer the program axes-pulses defining the second programmed path of motion.

4,035,707

REVERSIBLE MECHANICAL REMOTE-CONTROL DEVICE

Guy Debrie, Massy; Michel Petit, La Celle St-Cloud, and Jean Vertut, Issy-les-Moulineaux, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France
Filed June 12, 1975, Ser. No. 586,230
Claims priority, application France, June 19, 1974, 74.21356
Int. Cl.² G05B *11/01*
U.S. Cl. 318—628 **7 Claims**

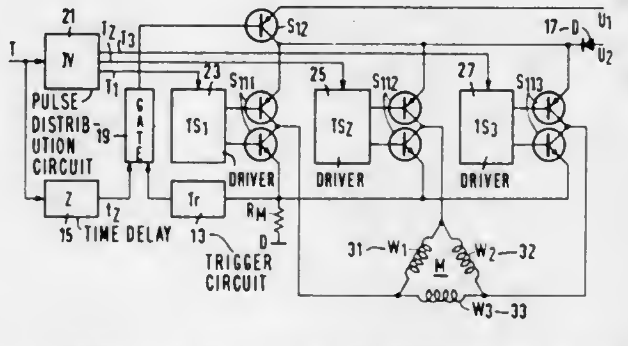


1. A device for the remote control of a first mechanical assembly in displacements and in efforts, the first mechanical assembly being actuated by a first motor having a respective shaft, the device comprising a second mechanical assembly actuated by a second motor having a respective shaft, first and second displacement detectors, each detector being associated with a respective one of the motors, each detector being capable of delivering a series of pulses each time the shaft associated with its corresponding motor rotates by a predetermined number of steps, the shaft rotation producing a displacement of its associated mechanical assembly, the sign of the pulses being dependent on the direction of rotation of the respective motor, the signs of the pulses delivered by each detector being opposite when the motors rotate in the same direction, a first summing device provided with a first and second input and one output, and two amplifying circuits, one amplifying circuit controlling the torque of the first motor, the other amplifying circuit controlling the torque of the second motor, each series of pulses driving an input of a counter which is mounted in parallel with a storage device, an output of the storage device which is associated with the first mechanical assembly being connected to a multiplexer which is in turn connected to a demultiplexer, an output of the demultiplexer driving one of the inputs of the first summing device, the other input of the first summing device being connected to the output of the storage device which is associated with the second mechanical assembly, the output of the first summing device driving a second summing device, the output of the second summing device being connected to the two amplifying circuits, the device including a first clock circuit for sequentially initiating the transfer of the contents of the storage device of the first mechanical assembly into the multiplexer and resetting the associated counter to zero, and a second clock circuit for sequentially initiating the transfer of the contents of the storage device which is associated with the second mechanical assembly and resetting the associated counter to zero.

4,035,708

STEPPING MOTOR CONTROL CIRCUIT

Ulrich Schaff, Erlangen, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Filed Mar. 24, 1975, Ser. No. 561,343
Claims priority, application Germany, Mar. 26, 1974, 2414602
Int. Cl.² H02K *37/00*
U.S. Cl. 318—696 **8 Claims**

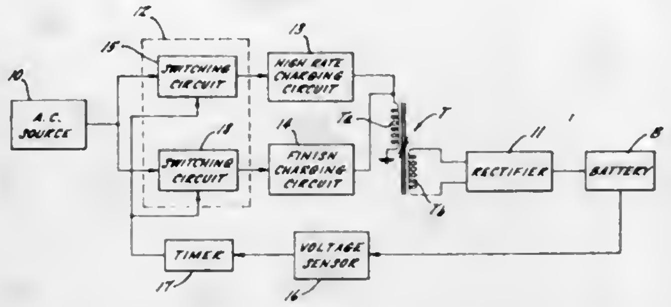


1. In a stepping motor circuit arrangement in which an on-off regulator responsive to timing pulses is used to supply an overvoltage to the motor windings to obtain a steep current rise, the on-off regulator including a trigger circuit having an input proportional to sensed current through the motor windings and having an output which switches the overvoltage on and off so as to maintain an average nominal current through the winding, the improvement comprising means to detect the absence of timing pulses and to develop an output indicative thereof and means coupled to said output reduce the current in the motor winding to the value necessary for holding.

4,035,709

BATTERY CHARGING SYSTEM

Gene J. Seider, Bloomington, and Michael C. Freund, Mendota Heights, both of Minn., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Apr. 30, 1975, Ser. No. 573,080
Int. Cl.² H02J *7/04*
U.S. Cl. 320—23 **8 Claims**



1. A battery charging system for charging a battery from a conventional a-c power source, said system comprising the combination of

a. a leakage reactance transformer connected between the power source and the battery for reducing the voltage of the power source for application to the battery,
b. means in circuit with the transformer for initially charging the battery at relatively high current levels to achieve a relatively high charging rate,
c. means for automatically connecting an additional impedance, external of the transformer, in circuit with the transformer after a first predetermined time interval following the charging of the battery to a predetermined voltage, whereby the charging current is sharply reduced and the charging of the battery is completed at relatively low current levels which vary over a very narrow range,
d. and means for terminating the charging of the battery at the end of a second predetermined time period following the sharp reduction in the charging current.

8. A method of charging a battery from a conventional a-c power source, said method comprising the steps of

a. connecting a leakage reactance transformer between the a-c power source and the battery to initially charge the battery at relatively high current levels to achieve a relatively high charge rate,
b. connecting an additional impedance, external of the transformer, in circuit with the transformer after a first predetermined time interval following the charging of the battery to a predetermined voltage to sharply reduce the charging current and completing the charging of the battery at relatively low current levels which vary over a very narrow range,
c. and terminating the charging of the battery at the end of a second predetermined time period following the sharp reduction of the charging current.

4,035,710

PULSE WIDTH MODULATED VOLTAGE REGULATOR-CONVERTER/POWER CONVERTER HAVING MEANS FOR IMPROVING THE STATIC STABILITY CHARACTERISTICS THEREOF

James Maurice Joyce, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Oct. 20, 1975, Ser. No. 624,203
Int. Cl.² H02M *3/335*
U.S. Cl. 363—37 **3 Claims**

1. A pulse width modulated voltage regulator-converter/-power converter for regulating and converting a bulk voltage to a stepped down regulated output voltage thereby eliminating instability effects over a wide range of static load conditions comprising, in combination:

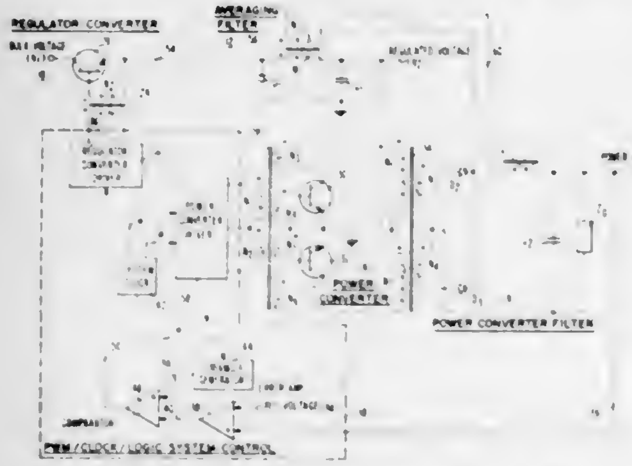
control means being responsive to a ripple voltage on said regulated output voltage for generating an amplified pulse width modulated control voltage at a first output, and for generating first and second amplified clock pulses in synchronism therewith at second outputs;

regulator means having a first input connected to said bulk voltage and a second input connected to said first output of said control means for providing a switched voltage at its output substantially equal in amplitude to said bulk voltage and in response to said amplified pulse width modulated control voltage;

averaging filter means connected to said output of said regulator means being responsive to said switched voltage of said regulator means for providing a filtered regulated voltage at a first output, and for providing a feedforward voltage in phase with said switched voltage of said regulator means at second outputs;

said averaging filter means being comprised of a transinductor having a primary and a secondary winding, said primary winding having one end connected to said output of said regulator means and the other end connected to a shunt capacitor to ground, the inductance of said primary winding cooperating with said shunt capacitor providing, thereby, said filtered regulated voltage at said first output of said averaging filter, and said second winding providing said "feedforward" voltage to said second outputs;

said averaging filter being further comprised of a flyback diode means having a cathode connected to said output of said regulator means and an anode connected to ground for clamping voltage transients;



converter means configurated in a current mode push-pull circuit having a first input connected to said first output of said averaging filter means, and second inputs connected to said second outputs of said control means providing at its outputs, alternately, stepped down switched regulated voltages in synchronism with said switched voltage of said regulator means, and in response to said amplified clock pulses and said filtered regulated voltage;

full wave rectification means connected to said outputs of said converter means for rectifying said stepped down switched regulated voltages of said converter means, the output of said rectification means being connected to one of said second outputs of said averaging filter means; and

converter filter means having a series inductor and a shunt capacitor to ground, one end of said series inductor being connected to the other one of said second outputs of said averaging filter means for filtering said output voltage of said rectification means, and for filtering said feedforward voltage providing, thereby, at a load, said ripple voltage corresponding substantially to said feedforward voltage, and said filtered regulated output voltage corresponding substantially to said stepped down switched regulated voltages, said ripple voltage being in phase with said switched voltage of said regulator means providing thereby stable closed loop load regulation.

4,035,711

ROTARY FREQUENCY-CHANGER

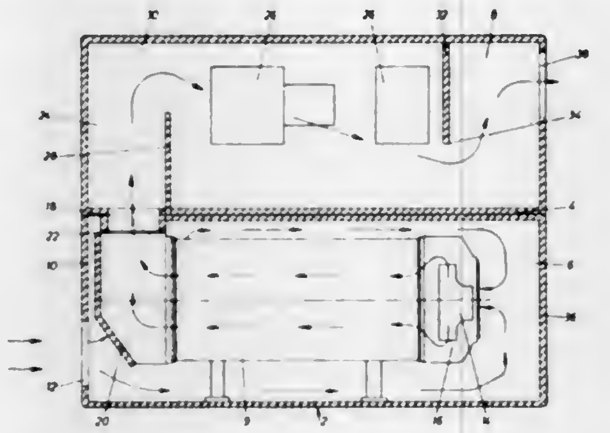
Hans Piller, Osterode, Harz, Germany

Filed July 21, 1975, Ser. No. 597,647

Claims priority, application Germany, July 26, 1974, 2435974; June 26, 1975, 2528436

Int. Cl.² H02M *7/00*

U.S. Cl. 363—157 **13 Claims**



1. Apparatus for producing ventilation and soundproofing for a frequency-changer, comprising a housing having a first chamber and a second chamber separated from said first chamber by an insulated wall, a rotary frequency converter mounted in said first chamber and having a rotatable shaft on which a fan rotor is mounted for rotation therewith, said fan directing a flow of air through said converter in a first direction, an air passage formed in said insulated separating wall and providing communication between the converter and second chamber wherein air directed through said converter is forced through said air passage and into said second chamber for movememt therethrough in a second direction that is opposite to movement of the air through said converter in said first direction, means for controlling operation of said converter located in at least one of said compartments for exposure to the circulating air, and baffles located in said second chamber adjacent to the ends thereof and extending in a direction that is perpendicular to the longitudinal axis thereof, said baffles cooperating with the adjacent walls of said second chamber to define air passages therebetween through which the air is directed.

4,035,712

ELECTRICAL GENERATING APPARATUS

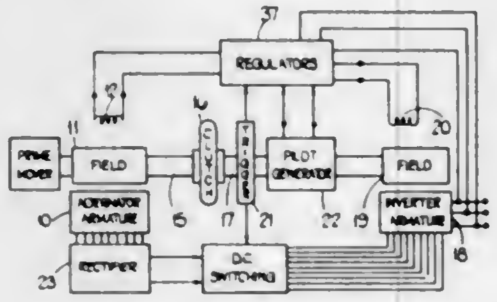
Christopher John Yarrow, Bradford; Ronald Johnson, Leeds, and James Patrick Doyle, Shipley, all of England, assignors to Lucas Industries Limited, England

Filed Mar. 5, 1976, Ser. No. 664,339

Claims priority, application United Kingdom, Mar. 6, 1975, 9290/75

Int. Cl.² H02M *5/32*; H02P *9/42*

U.S. Cl. 322—24 **8 Claims**



1. An electrical generating apparatus comprising an alternator having an armature winding and a field winding, a rectifier for producing d.c. from the armature output of the alternator at a voltage determined by the alternator speed and the alternator field current, a rotary inverter including an armature winding, an independently rotatable field winding and switching means connecting the output of the rectifier to the armature winding in synchronism with the rotation of the inverter field winding, the inverter armature winding providing an a.c. output of amplitude and frequency dependent on the d.c. voltage and the speed of rotation of the inverter field winding, and control means for the field windings of the alternator and the inverter controlling the alternator field current in accordance with the frequency of the a.c. output of the inverter and the inverter field current in accordance with the amplitude of the a.c. output of the inverter.

4,035,713

AUTOMATIC VOLTAGE REGULATING SYSTEM IN BRUSHLESS GENERATOR

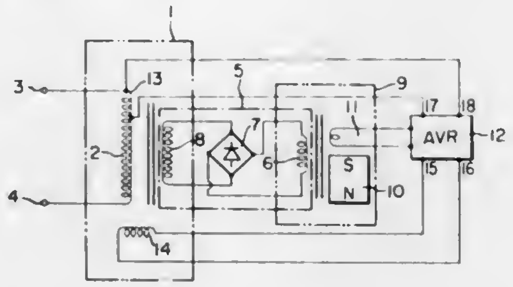
Takato Kawamoto; Tsutomu Katauchi; Eizi Narumi, all of Tokyo, and Katsutoshi Tagami, Asaka, all of Japan, assignors to Sawafuji Electric Company, Ltd. and Honda Giken Kogyo Kabushiki Kaisha, both of Tokyo, Japan

Filed Mar. 16, 1976, Ser. No. 667,393

Claims priority, application Japan, Mar. 28, 1975, 50-37464

Int. Cl.² H02P *9/14*

U.S. Cl. 322—28 **8 Claims**



1. An automatic voltage regulating system in a brushless generator comprising a permanent magnet provided on the stator side and constituting a field of an exciter generator portion, an exciter generating coil provided on the rotor side, a rectifier for rectifying a voltage induced in the exciter generating coil, a field coil of the main generator provided on the rotor side and excited by the rectifier output, and an armature coil of the main generator provided on the stator side, wherein a permanent magnet and a control coil are provided in the exciter field, and an automatic voltage regulator portion is is provided for detecting the output voltage of the main generator and supplying a controlling current to the control coil so that fluctuations of the output voltage of the main generator is absorbed through the control of the control coil, wherein an auxiliary coil whose electrical angle is 90° apart from that of the armature coil of the main generator is provided to supply a voltage induced in the auxiliary coil to the automatic voltage regulator portion as a power source.

4,035,714

ALTERNATING CURRENT GENERATOR

Suguru Sato, Ohbu, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Mar. 18, 1975, Ser. No. 559,599

Claims priority, application Japan, Mar. 20, 1974, 49-31653; Apr. 11, 1974, 49-41209

Int. Cl.² H02P *9/10*

U.S. Cl. 322—28 **11 Claims**

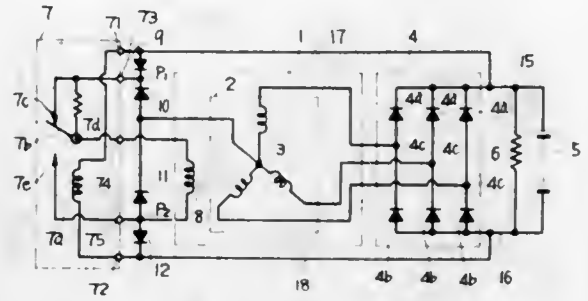
1. An electrical system comprising; a polyphase alternating current generator having a field winding and a three-phase Y-connected output winding;

a three-phase full-wave bridge rectifier having direct current output terminals and AC input terminals connected with said output winding;

a battery; a power supply circuit connecting said battery across said direct current output terminals;

voltage regulating means including a field control device and voltage responsive means coupled to said field control device;

means connecting said voltage responsive means across said battery;



a pair of diodes providing field current supply terminals and having an input terminal connected with a neutral point of said Y-connected output winding;

a field circuit including in series said field control device and said field winding; and

field current supply circuit means separated from said power supply circuit for connecting said field circuit across said field current supply terminals for supplyong power from said neutral point only to said field winding.

4,035,715

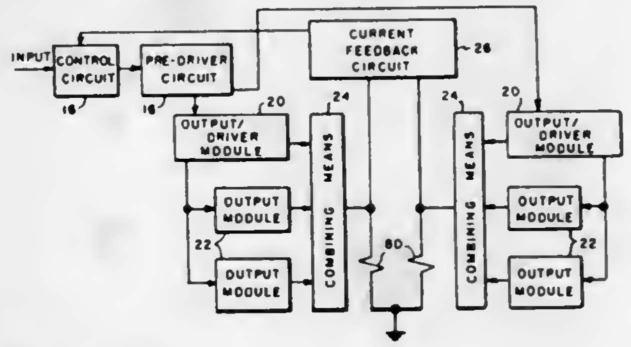
CURRENT MONITORING OF A MODULAR POWER CONTROLLER

Kenneth R. Wyman, and Gerard A. Gallagher, both of Pittsburgh, Pa., assignors to Contraves-Goerz Corporation, Pittsburgh, Pa.

Filed Nov. 5, 1975, Ser. No. 628,848

Int. Cl.² H02P *5/16*

U.S. Cl. 323—4 **23 Claims**



8. A power processor comprising:

an input;

control circuit means connected to said input for controlling operation of the power processor;

an output section connected in a bridge configuration;

a pair of current sampling resistors one being connected in each of the bridge near a common point; and,

current feedback means for feeding a signal from said output section to said control circuit means comprising a first amplifier having an input connected to one of said pair of current sampling resistors, a second amplifier having an input connected to the other of said pair of said sampling resistors, and a third amplifier fed by said first amplifier and said second amplifier providing a current feedback signal.

4,035,716

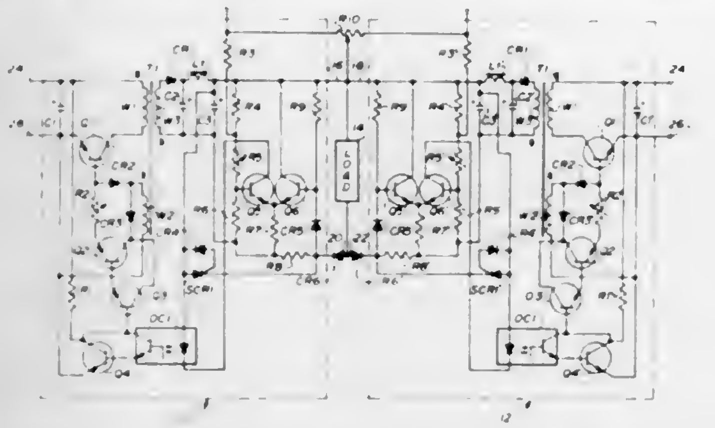
SUPER COMPENSATED VOLTAGE CONTROL OF REDUNDANT D.C. POWER SUPPLIES

Homer F. Hutchinson, Wheaton, Ill., assignor to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Mar. 31, 1976, Ser. No. 672,101

Int. Cl.² G05F *1/64*

U.S. Cl. 323—20 **2 Claims**



1. A direct current potential regulated power supply system to which a load can be attached comprising: first and second D.C. power supplies for parallel connection to the load; each of said supplies including voltage regulating means and a first and second load lead to which the load conductors can be attached; a first diode means connected in said second load lead of each of said supplies so that the diode is biased into conduction when voltage is applied to the load through the load conductors, a control circuit for each of said supplies for sensing the output voltage and for regulating the voltages of each of said supplies comprising a differential amplifier including a first transistor having a base, an emitter, and a collector connected to said first load lead, a first resistor and a zener diode in series connected between said first and said second load lead before said first diode means, said first transistor base connected between said first resistor and zener diode, a second resistor, a variable resistor and a third resistor in series connected between said first load lead and said second load lead, a second transistor having an emitter, a base connected between said variable resistor and said third resistor, and a collector connected to said voltage regulating means, said emitters of said first and second transistors connected together and via a fourth resistor to said second load lead, and a fifth resistor connected in series in said second load lead before said first diode means to sense an increase in output current to cause an increase in output voltage, and further including a potentiometer having a first and a second end terminal connected respectively between said second resistor and said variable resistor of said first and second power supply, and a tap terminal connected to said first load lead to increase the output of one of said supplies while decreasing the output of the other dependent upon the position of said tap along said potentiometer.

4,035,717

ELECTRICAL TRANSFORMER UTILIZING A NO LOAD TAP CHANGER

Edward F. Guidosh, Hubbard, Ohio, assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 15, 1976, Ser. No. 732,635

Int. Cl.² H02P *13/06;* H01H *21/78;* G05F *1/14*

U.S. Cl. 323—43.5 R **5 Claims**

5. An electrical transformer, comprising:

a sealed enclosure;

primary and secondary windings in inductive relation with a three-phase magnetic core disposed within said enclosure;

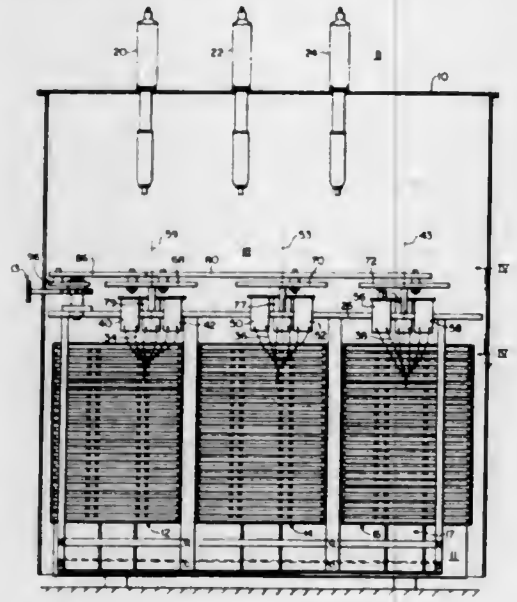
one of said windings in each phase of the transformer having a plurality of taps at which different voltages are provided;

first, second and third contact sets, each including a plurality of stationary contacts; said stationary contacts being positioned in an arcuate pattern and attached to an insulating member, with all of said stationary contacts being aligned substantially in the same plane; said stationary contacts connected to respective taps in each phase of said transformer;

first, second and third movable contacts adapted for making electrical connection with respective stationary contacts of said first, second and third contact sets;

first, second and third operating members with said first, second and third movable contacts affixed thereto, respectively; said operating members being pivotable around the axis of rotation of each contact set, respectively, to rotate said first, second and third movable contacts through sequential engagement with successive stationary contacts of said first, second and third contact sets;

said first operating member generally forming an oblong surface with one lobe portion;



a connecting member attached to said first, second and third operating members in spaced relation from the axis of rotation of each operating member thereby causing rotation of said operating members upon linear movement of said connecting member;

a drive member affixed to said first operating member, near the periphery of said lobe portion of said first operating member, such that linear movement of said drive member will cause arcuate motion of said first operating member;

means for moving said drive member including a worm, worm gear and a link; said worm gear and link secured to a common shaft such that both members rotate together upon movement of said worm; and said worm coupled to a shaft operative from outside of the transformer enclosure; said link suitably connected to said drive member such that rotation of said link will cause linear movement of said drive member.

4,035,718

ENCLOSED NUCLEAR-MAGNETISM LOGGING TOOL WITH COMPENSATED COIL-ISOLATING SYSTEM

Richard N. Chandler, Houston, Tex., assignor to Schlumberger Technology Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,725

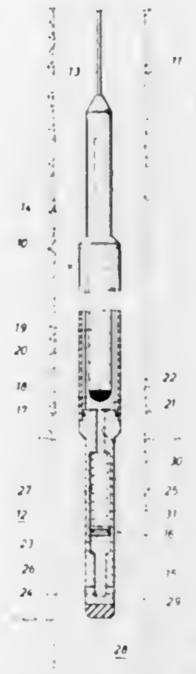
Int. Cl.² G01N *27/00*

U.S. Cl. 324—.5 G **10 Claims**

1. A nuclear-magnetism logging tool adapted to be lowered into a borehole penetrating earth formations and comprising:

means including electrical coil means operable for momentarily applying an electromagnetic field to such earth formations for temporarily polarizing the nuclei of hydrogenous connate fluids therein and, at a selected time thereafter, detecting at least one measurement signal induced in said coil means in response to the free precession of such nuclei following removal of said polarizing field; and

means isolating said electrical coil means and including non-magnetic body means defining a fluid-tight space enclosing said electrical coil means and containing a hydrogenous oil having a homogenous suspension of colloidial ferromagnetic particles dispersed therein at a selected concentration sufficient for effecting a controlled decay of noise signals induced in said coil means in response to the free precession of hydrogenous nuclei in said hydrogenous oil following removal of said polarizing field, said controlled decay at a rate sufficient to attenuate said noise signals by said selected time to an amplitude no greater than that of said measurement signal.



4,035,719

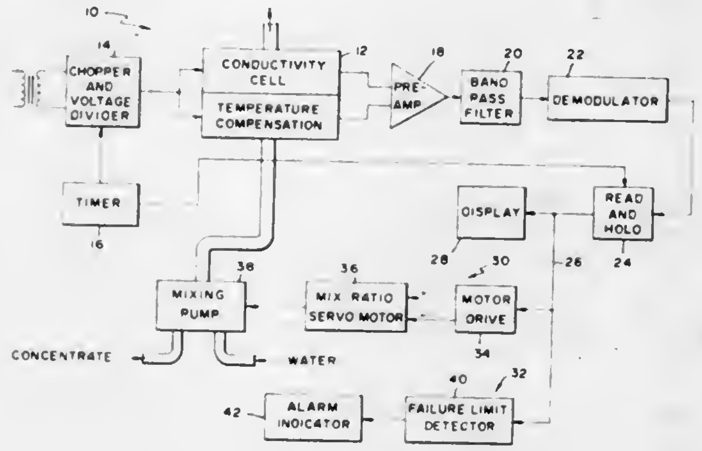
CONDUCTIVITY CELL

Robert L. Anderson, Boulder, Colo., assignor to Halbert Fischel, Encino, Calif.

Filed July 28, 1975, Ser. No. 599,691

Int. Cl.² G01N *27/42*

U.S. Cl. 324—30 R **18 Claims**



1. A system for measuring the conductivity of a solution comprising:

a fluid conduit system comprising first, second and third elongated, conductive, tubular electrode chambers each having a diameter providing at least a minimum cross-sectional area and a length greater than the diameter, first and second nonconductive tubular chambers serially connected between the first and second, and second and third electrode chambers respectively to provide a continuous fluid path between the first and third electrode chambers, the first and second chambers each having a diameter providing a cross-sectional area less than the minimum cross-sectional area, and a length greater than 10 times the diameter; and

circuit means coupled to said conductive electrode chambers for measuring conductance of a fluid within the fluid conduit system.

4,035,720

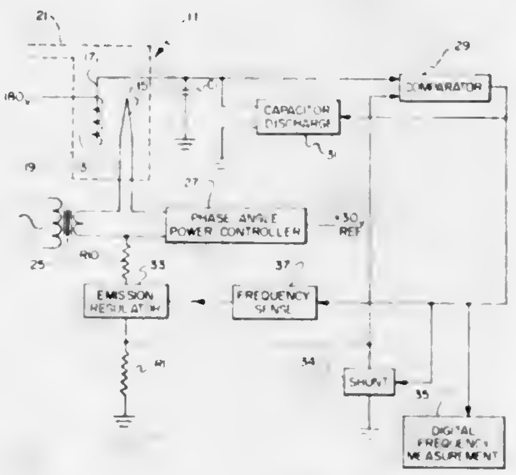
ION GAUGE SYSTEM

Philip C. Harvey, 6 Elmbrook Circle, Bedford, Mass. 01730

Filed Dec. 31, 1975, Ser. No. 645,789

Int. Cl.² G01N *27/00;* G01K *7/00*

U.S. Cl. 324—33 **6 Claims**



1. An ion gauge comprising:

an ion gauge;

means for energizing said gauge, including the inducing of an emission current therein, to generate an ion current which varies as a function of the gas pressure at said gauge;

a capacitor;

means for charging said capacitor as a function of said ion current;

detector controlled means for discharging said capacitor back to a controlled voltage when the capacitor voltage reaches a preselectable threshold level;

means for sensing the value of the emission current; means for varying said threshold level as a function of the value of said emission current, the frequency of operation of said discharging means being thereby a function of the ratio of said ion current to said emission current; and

means for counting the operations of said discharging means over a preselectable time interval, the count so obtained being proportional to the pressure at said gauge.

4,035,721

SYSTEM AND METHOD USING MAGNETIC TAPE FOR TESTING OF SMALL CYLINDRICAL PARTS

Donald E. Lorenzi, Des Plaines; Kenneth W. Schroeder, Arlington Heights, and Richard C. Sabielny, McHenry, all of Ill., assignors to Magnaflux Corporation, Chicago, Ill.

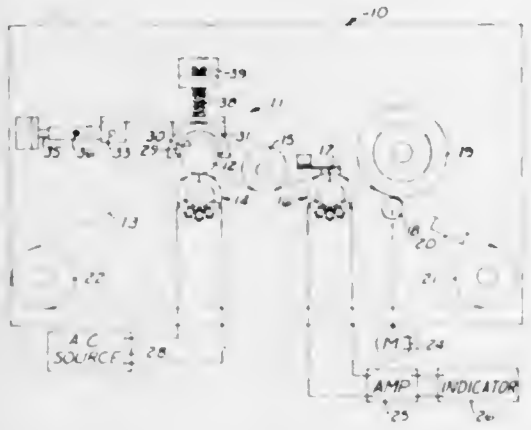
Filed Apr. 9, 1975, Ser. No. 566,420

Int. Cl.² G01R *33/12*

U.S. Cl. 324—37 **5 Claims**

1. In a system for testing small metal parts having outer cylindrical surfaces, part support and journalling means for journalling a part for free rotation about a first axis coincident with the axis of the cylindrical surface thereof, pressure applying means in spaced relation to said first axis for engaging one surface of a magnetic tape to press the opposite surface of the tape into engagement with said cylindrical surface of said part,

tape guide and drive means including an idler roller and a drive capstan journalled on axes in spaced parallel relation to each other and to said first axis for engagement with portions of the tape spaced longitudinally in opposite directions from the portion of the tape engaged with said cylindrical surface of the part, a pinch roller for pressing the tape into frictional engagement with said capstan, and means for driving said capstan to move the tape longitudinally from said idler roller thence between said pressure appplying means and said cylindrical surface of the part and thence between said capstan and said pinch roller, said pressure applying means being in slidable engagement with said one surface of the tape to permit longitudinal movement of the tape relative thereto while being operative to press said opposite surface of the tape into firm frictional engagement with said cylindrical surface of the part to drivably rotate the part about said first axis solely from frictional engagement with the tape and to operate during each revolution of the part to transfer a magnetic flux pattern at said outer cylindrical surface of the part to a segment of said tape having a length equal to the circumference of said cylindrical surface, said pressure-applying means comprising engagement means engaging said one surface of the magnetic tape, spring means acting between said part support and journalling means and said engagement means for exerting a squeezing force on the tape between said engagement means and said cylindrical surface of the part to obtain intimate non-skid frictional engagement between the tape and said cylindrical surface of the part, and magnetic biasing means associated with engagement means for applying a magnetic biasing field to the portion of said tape engaged with said cylindrical surface of the part, said magnetic biasing means comprising a magnetic head also forming said engagement means and having a narrow gap extending transversely relative to the direction of movement of the tape with the width of said gap and the thickness of the tape being small enough to confine the magnetic biasing field to the area of interengagement between the tape and said cylindrical surface of the part and to minimize the field applied to the tape alone as it leaves said area of interengagement to thereby minimize erasure of information recorded on the tape.



4,035,722
MULTIPROBE HEAD FOR CHECKING ELECTRICAL PARAMETERS OF SEMICONDUCTOR INSTRUMENTS AND MICROCIRCUITS

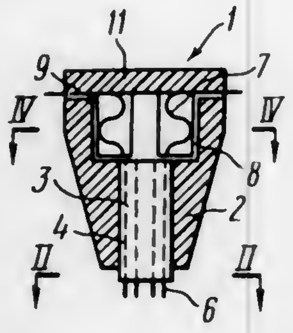
Anatoly Leonidovich Ryabov, Schelkovskoe shosse, 12, korpus 2, kv. 14; Viktor Egorovich Lukyanchikov, Sakhalinskaya ulitsa, 4, kv. 142, and Alexei Pavlovich Khutarev, ulitsa Chernyshevskogo, 25, kv. 11, all of Moscow, U.S.S.R.

Filed Mar. 17, 1975, Ser. No. 559,363

Int. Cl.² G01R *1/06, 31/02*

U.S. Cl. 324—158 P **5 Claims**

1. A multiprobe head for checking electrical parameters of semiconductor instruments and microcircuits having contact elements, comprising: a casing; a probe holder constructed as a monolithic glass block secured in said casing with its butt end facing the contact elements; a group of longitudinal capillary channels in said probe holder, the distances therebetween corresponding to the distances between said contact elements; a group of probes disposed in said capillary channels and adapted for axial movement, said probes coming into contact with said contact elements in the course of checking electrical parameters of semiconductor instruments and microcircuits; a lead connected to each probe; an end face of said probe holder directed towards the inside of said casing; each lead having a loop arranged above said end face of said probe holder for developing a force for keeping said probe in contact with said contact element, said capillary channels having a length sufficient for providing guidance to said probes.



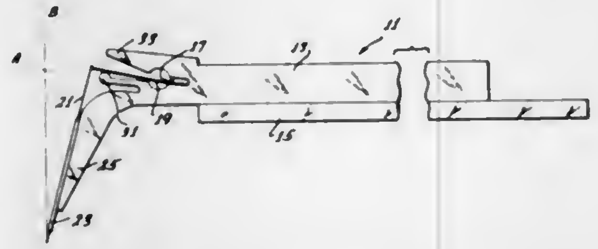
4,035,723
PROBE ARM

Joseph Kvaternik, Belmont, Calif., assignor to Xynetics, Inc., Santa Clara, Calif.

Filed Oct. 16, 1975, Ser. No. 622,813

Int. Cl.² G01R *1/06, 31/02*

U.S. Cl. 324—158 P **16 Claims**



1. A probe for testing a circuit pad, comprising
a probe arm,
a leaf spring,
means for fixing said leaf spring to said probe arm for flexure of the leaf spring relative to the probe arm,
means included in the probe arm for preloading a predetermined biasing force in said leaf spring to obtain the flexure of the leaf spring only after the predetermined biasing force on the leaf spring has been exceeded,
hollow guide means disposed on said probe arm and extending along a predetermined angle relative thereto, and
probe tip means extending through said guide means in loose relationship to the guide means and fixed to said leaf spring for providing an initial flexure of the probe tip within the guide means as the probe arm is moved toward the circuit pad and for providing movement of the probe tip in a first direction relative to the circuit pad in accordance with such flexure until the predetermined biasing force has been exceeded on the spring by the engagement between the circuit pad and the probe tip means and for then exerting a force on the spring to produce a movement of the spring and the probe tip means relative to the guide means to provide for movement of the probe tip relative to the circuit pad in a second direction opposite to the first direction.

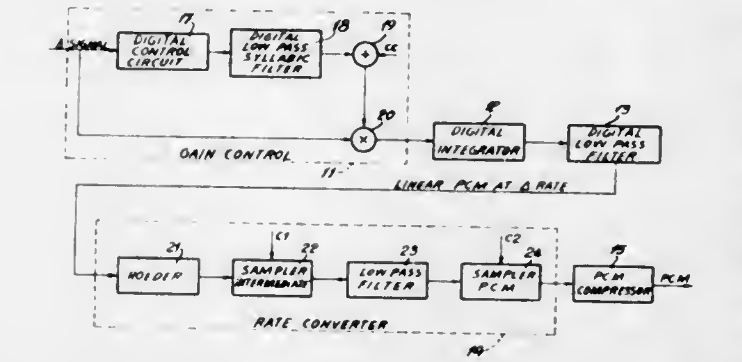
4,035,724
DIGITAL CONVERTER FROM CONTINUOUS VARIABLE SLOPE DELTA MODULATION TO PULSE CODE MODULATION

Hubert Stephenne, Rock Forest; Michel Villeret, and Pierre A. Deschenes, both of Sherbrooke, all of Canada, assignors to Universite de Sherbrooke, Sherbrooke, Canada

Filed May 8, 1974, Ser. No. 468,091

Int. Cl.² H03K *13/24*

U.S. Cl. 325—38 B **10 Claims**



1. A digital converter for converting a delta modulation signal being at a delta rate into a pulse code modulation (PMC) signal flowing at a PCM rate, comprising
- a. a first conversion means receiving said delta signal for converting the code of said delta signal into an intermediate code, the signal of said intermediate code being at a rate corresponding to said delta rate;
- b. a second conversion means connected to said first conversion means for converting the rate of said intermediate code signal into the rate of said PCM signal;
- c. a third conversion means fed with said intermediate code signal at said PCM rate for converting said intermediate code into the code of said PCM signal, said third conversion means comprising a pulse code modulation compressor.

4,035,725
AUTOMATIC PASSBAND EQUALIZER FOR DATA TRANSMISSION SYSTEMS

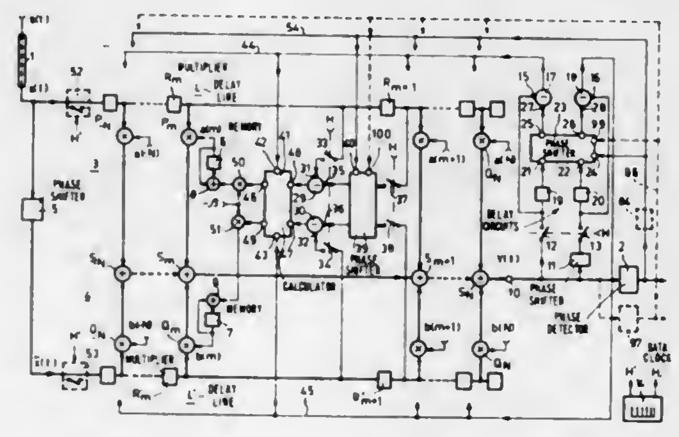
Loic Bernard Yves Guidoux, Le Plessis-Robinson, France, assignor to Telecommunications Radioelectriques et Telephoniques T.R.T., Paris, France

Filed Dec. 18, 1975, Ser. No. 642,079

Claims priority, application France, Dec. 20, 1974, 74.42251

Int. Cl.² H03H *7/36*

U.S. Cl. 325—42 **13 Claims**



1. An automatic equalizer for equalizing passband signals at the input of a receiver in a system for transmitting data signals by means of phase modulation of a carrier at a fixed clock rate, the equalizer including two adjustable filters with means for storing filter coefficients, which filters process the in-phase and quadrature-phase components of the passband signal respectively, and means for combining output signals from the two filters to produce an equalizer output signal, comprising: means for forming in-phase and quadrature-phase components of the equalizer output signal; sampler means for sampling each of said components of the equalizer output signal at the clock rate; delay circuits for delaying each of said sampled components over one clock period; a first phase shifting circuit receiving each of said delayed sampled components for producing in a signal, whose in-phase and quadrature-phase components are constituted by these delayed sampled components, a phase shift equal to the sum of each phase jump corresponding with the transmitted data signals and being derived from a phase detector included in the receiver and the phase rotation of the carrier during one clock period, the first phase shifting circuit outputting at least one of the in-phase and quadrature-phase components of the phase-shifted signal; at least one first difference circuit for forming a difference signal between one of said sampled components of the equalizer output signal and a corresponding component of the phase-shifted signal at the first phase shifting circuit output, and further comprising in association with each pair of corresponding filter coefficients of the two filters; sampler means for sampling each of the in-phase and quadrature-phase components of the passband signal corresponding with said pair of filter coefficients at the clock rate; means including delay circuits for producing sampled in-phase and quadrature-phase components of this passband signal delayed over one clock period; a second phase shifting circuit receiving each of said delayed sampled components of this passband signal for producing in a signal, whose in-phase and quadrature-phase components are constituted by these delayed sampled components, a phase shift equal to the phase shift produced by the first phase shifting circuit, the second phase shifting circuit outputting the in-phase and quadrature-phase components of the phase-shifted signal; a pair of second difference circuits for forming difference signals between corresponding components of this passband signal and the phase-shifted signal at the second phase shifting circuit output; a calculator circuit for calculating changes in said pair of filter coefficients in the form of at least one combination of products between the difference signals from the first difference circuit and the pair of second difference circuits; and means for combining the calculated changes with said pair of filter coefficients to a pair of new filter coefficients and storing this pair of new filter coefficients in the filter coefficient storing means.

4,035,726
METHOD OF CONTROLLING AND/OR IMPROVING HIGH-LATITUDE AND OTHER COMMUNICATIONS OR RADIO WAVE SURVEILLANCE SYSTEMS BY PARTIAL CONTROL OF RADIO WAVE ET AL.

Neil M. Brice, deceased, late of King Ferry, N.Y., and Marilyn J. Brice, executrix, R.R. No. 1, King Ferry, N.Y. 13081

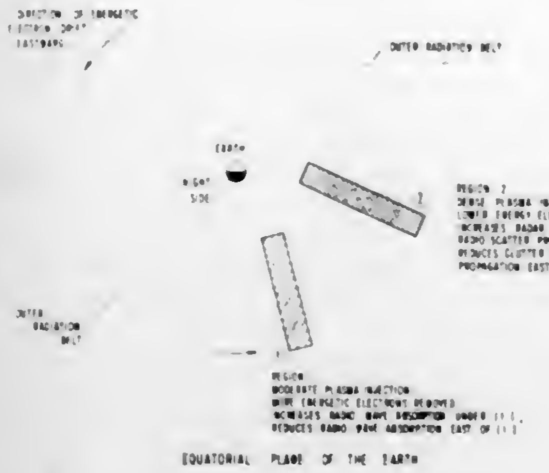
Continuation-in-part of Ser. No. 173,610, Aug. 20, 1971. This application Aug. 23, 1971, Ser. No. 174,049

Int. Cl.² H04G *1/10*

U.S. Cl. 325—65 **13 Claims**

1. The method of controlling a radio wave communication system in a high latitude ionospheric medium which comprises placing a source of cold plasma into the magnetospheric medium, and injecting said cold plasma from said source into the

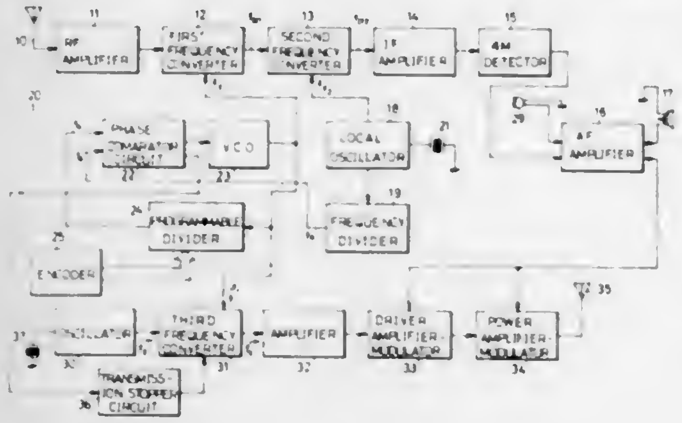
magnetospheric medium at a time including prior to the initiation of said radio wave communication in said ionosphere to



form a substantially non-reflective radio wave ionospheric medium.

4,035,727
MULTICHANNEL RADIO TRANSMITTER WITH MEANS TO PREVENT ABNORMAL WAVE RADIATION

Masaharu Ishii, Tokyo, Japan, assignor to Shinto Denki Co., Ltd., Tokyo, Japan
Filed Dec. 22, 1975, Ser. No. 643,476
Claims priority, application Japan, Apr. 9, 1975, 50-43027
Int. Cl.² H04B *1/04*
U.S. Cl. 325—184 **2 Claims**



1. A multichannel transmitter comprising:

a. means for producing a reference frequency signal;

b. a phase-locked loop frequency synthesizer including a phase comparator for comparing the phases between the reference frequency signal and a signal produced by said frequency synthesizer;

c. a crystal oscillator for producing a constant frequency signal;

d. a frequency converter connected to said frequency synthesizer and said crystal oscillator for producing a carrier signal of a desired transmitting frequency by combining the output signal from said frequency synthesizer and the constant frequency signal from said crystal oscillator, said frequency converter including a frequency converting transistor;

e. transmission stopper means comprising:

  1. sensing means connected to the output of said phase comparator and adapted to be actuated when the output signal from said frequency synthesizer is not locked to the reference frequency signal; and

  2. inhibiting means including an inhibiting transistor having a base connected to the output of said sensing means and an emitter-collector circuit connected to said frequency converting transistor, said inhibiting transistor being adapted to become conductive upon actuation of said sensing means for causing nonconduction of said frequency converting transistor and thus for inhibiting the signal production of said frequency converter;

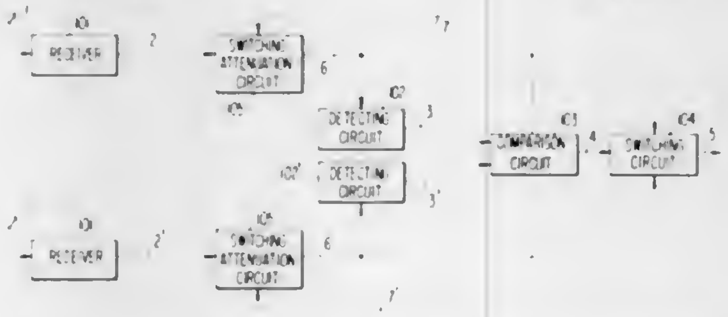
f. means for amplifying the carrier signal produced by said frequency converter;

g. means for modulating the amplified carrier signal with intelligence to be transmitted; and

h. means for radiating the modulated carrier signal into space as electromagnetic waves.

4,035,728
DIVERSITY RECEIVING SYSTEM

Yujiro Ishikawa, and Kyo Kinoshita, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan
Filed Jan. 5, 1976, Ser. No. 646,687
Claims priority, application Japan, Jan. 9, 1975, 50-5082
Int. Cl.² H04B *7/08*
U.S. Cl. 325—304 **3 Claims**



1. A diversity receiving system having a hysteresis switching characteristic comprising:

first and second signal receiver portions supplied with at least one radio frequency signal for producing a pair of received signals;

level detection means for providing a pair of voltages representative of the levels of said received signals;

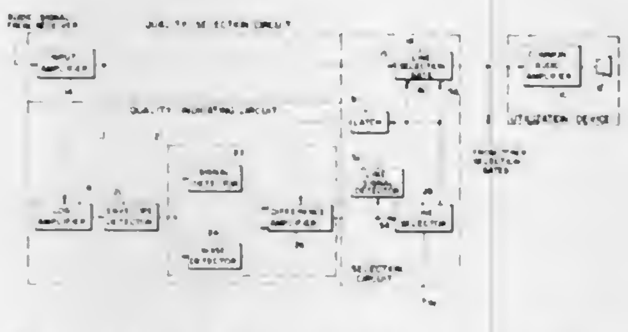
means for comparing the outputs of said level detection means to determine which one is at a higher level;

switching means responsive to said comparing means for selectively leading the higher level one of said received signals to an output terminal of said receiving system; and

means responsive to said comparing means for relatively raising the level of the higher level one of said received signals with respect to the lower level one which has not been led to said output terminal.

4,035,729
AUDIO SIGNAL QUALITY INDICATING CIRCUIT

Fred G. Perry, Lynchburg, Va., assignor to General Electric Company, Lynchburg, Va.
Filed May 21, 1976, Ser. No. 688,792
Int. Cl.² H04B *7/08, 1/16*
U.S. Cl. 325—304 **6 Claims**



1. A circuit for giving an indication of the quality of an audio signal received from a signal transmission path, said circuit comprising:

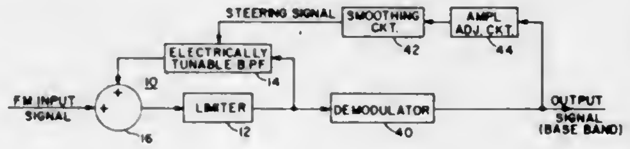
a. log amplifier means for monitoring the audio signal and producing a logarithmic signal having an amplitude which varies as the log of the amplitude of the audio signal;

b. detector means for receiving the logarithmic signal and producing an envelope signal corresponding to the envelope of the peak amplitude excursions of the logarithmic signal, said envelope signal having maximum excursions representing signal content of the audio signal and having minimum excursions representing noise content of the audio signal; and

c. indicating means for receiving the envelope signal and producing a quality signal having a magnitude representative of the difference between the amplitude of the maximum excursions and the amplitude of the minimum excursions of the envelope signal, said magnitude being a logarithmic representation of the signal-to-noise ratio of the audio signal.

4,035,730
FM NOISE THRESHOLD EXTENSION DEMODULATOR APPARATUS

Lorimer Clayton, Stone Mountain, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.
Filed Mar. 31, 1976, Ser. No. 672,190
Int. Cl.² H03D *3/00*
U.S. Cl. 325—348 **9 Claims**



1. For use in apparatus for demodulating FM signals having a frequency demodulator circuit for providing output signals corresponding to the frequency of said FM signals, noise threshold extension circuitry which comprises

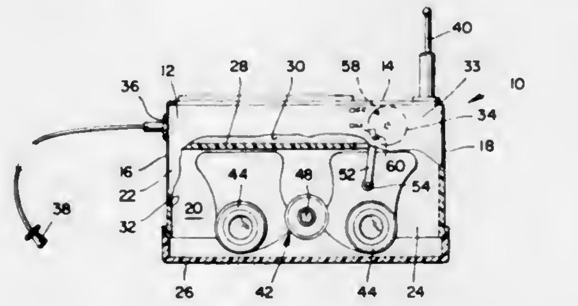
a. an amplitude limiter, said limiter being connected to the input of said demodulator circuit,

b. a tunable bandpass filter connected in regenerative feedback relationship across said limiter, and

c. means responsive to said demodulator circuit output signals for generating and applying to said bandpass filter a steering signal for varying the tuning of said bandpass filter to track the frequency modulation of said FM signals without following the noise therein.

4,035,731
COMBINED BINOCULAR RADIO UNIT

Warren Dixon, 6434 S. King Drive, Chicago, Ill. 60637
Filed Jan. 21, 1976, Ser. No. 651,064
Int. Cl.² H04B *1/08*
U.S. Cl. 325—361 **5 Claims**



1. A combined binocular-radio unit comprising:

a. a housing;

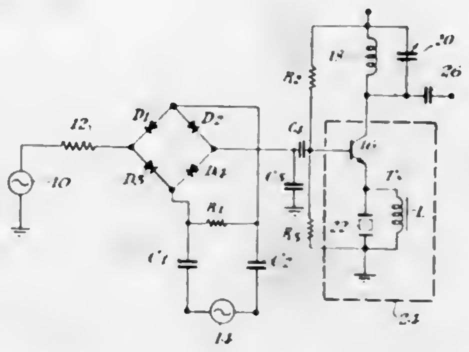
b. radio receiving means disposed within said housing;

c. binocular means pivotally affixed within said housing and being extensible outside said housing; and

d. activating means affixed to said binocular means to turn on and off said radio receiving means when said binocular means are extended and retracted in cooperation with said housing.

4,035,732
HIGH DYNAMIC RANGE RECEIVER FRONT END MIXER REQUIRING LOW LOCAL OSCILLATOR INJECTION POWER

Dieter R. Lohrmann, Lanham, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Continuation of Ser. No. 511,860, Oct. 3, 1974, abandoned. This application Mar. 15, 1976, Ser. No. 666,832
Int. Cl.² H03D *7/14*
U.S. Cl. 325—446 **3 Claims**



1. A high dynamic receiver front end for a radio frequency receiver requiring relatively low local oscillator injection power comprising:

a RF signal receiving means;

a diode bridge RF signal mixing means connected at an input junction to said RF signal receiving means, said bridge having an input junction, an output junction, and a pair of intermediate junctions;

resistance means coupled across said intermediate bridge junctions;

local oscillator coupled across said bridge, said diodes arranged having a pair of diodes in each of said bridge branches having anodes disposed across one of said intermediate junctions and a second pair of diodes connected to said second intermediate junction havig their cathodes coupled to the second intermediate junction;

capacitive means connected to the output junction of said bridge; and

an IF amplification means coupled to the output junction of said bridge, said IF amplification means including a frequency selecting means for selecting a predetermined frequency received from said bridge output junction.

4,035,733
PULSE SIGNAL CONDITIONING CIRCUIT

Robert S. Morrow, Columbus, and Lloyd D. Penn, Johnstown, both of Ohio, assignors to IRD Mechanalysis, Inc., Columbus, Ohio
Continuation-in-part of Ser. No. 637,751, Dec. 4, 1975, which is a division of Ser. No. 420,594, Nov. 30, 1973, Pat. No. 3,938,394. This application Mar. 30, 1976, Ser. No. 672,013
Int. Cl.² H03K *5/08*
U.S. Cl. 328—34 **1 Claim**

1. Means for providing a clean sharp pulse signal of constant voltage from an input signal containing a series of repetitive pulses along with unwanted noise signal components; including

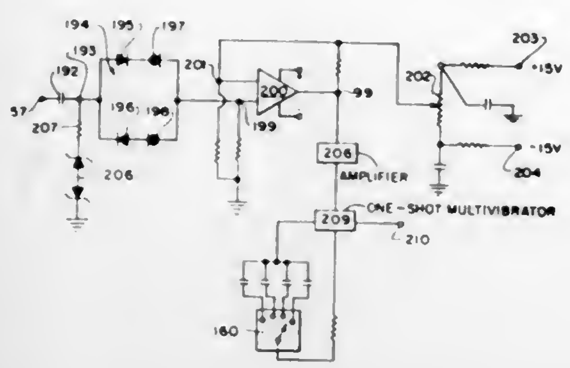
a parallel network having an input terminal and an output terminal and consisting of:

  a first channel including a constant current diode and a steering diode connected to pass electrical signals from the said input terminal to the said output terminal;

  a second channel including a constant current diode and a steering diode connected to deliver signals from the output terminal to the input terminal;

a comparator circuit connected to deliver a single pulse signal in response to applied inputs exceeding a pre-established threshold value;

means connecting the said output terminal to the input of said comparator circuit;



a multi-vibrator connected to deliver in response to a pulse input, a constant voltage signal for a pre-established duration which is a minor fraction of the pulse-to-pulse spacing of the said input signal;

means connecting the comparator circuit output to the input of the said multi-vibrator.

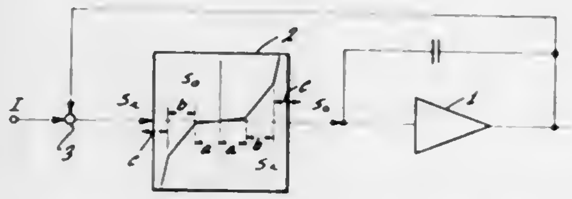
4,035,734
NOISE SUPPRESSION IN MEASURING SIGNALS
Paul Flormann, Heiligenhaus; Egon Hinneman, Kettwig; Bernhard Mengelkamp, and Arno Elsner, both of Heiligenhaus, all of Germany, assignors to Hartman & Braun Aktiengesellschaft, Frankfurt am Main, Germany

Filed Nov. 7, 1975, Ser. No. 630,019

Claims priority, application Germany, Oct. 12, 1974, 2448779

Int. Cl.² H04B *3/02*

U.S. Cl. 328—167 **2 Claims**



1. A circuit for suppressing electrical noise superimposed on a measuring signal, comprising:

an integrating amplifier producing an integrated output signal;

a difference forming circuit connected to receive the measuring signal and the integrated output signal and to produce a difference signal equal to their difference;

a threshold device connected to said difference forming circuit for receiving as an output the difference signal, said threshold device having three gain ranges for each polarity of input signal including a substantially zero gain range for input signals of magnitude less than a first threshold level *a*, an intermediate gain range for signals of magnitude greater than *a* but less than a second threshold level *b*, and a high gain range for signals of magnitude greater than *b*, said threshold device connected to said integrating amplifier so that the output of said threshold device is the input to said integrating amplifier; and,

a noise sensing circuit including a high-pass filter and a rectifier, connected to receive the measuring signal as an input and to produce therefrom an output signal representing the magnitude of the noise, said noise sensing circuit connected to said threshold device for controlling at least one of the threshold levels *a* and *b* in response to the output signal of said noise sensing circuit.

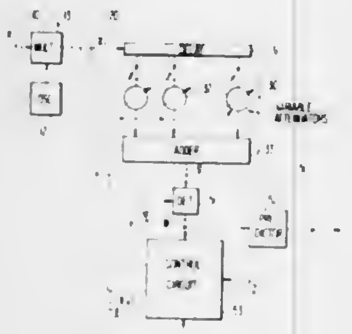
4,035,735
DEMODULATOR COMPRISING A PHASE SHIFT CIRCUIT FOR CONTROLLING OUTPUTS OF AN AUTOMATIC EQUALIZER
Fumio Akashi, and Yoichi Sato, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Jan. 8, 1976, Ser. No. 647,543

Claims priority, application Japan, Jan. 8, 1975, 50-4788

Int. Cl.² H03D *1/06*

U.S. Cl. 329—50 **9 Claims**



1. A demodulator responsive to baseband signals recovered by a coherent detector from quadrature amplitude modulated signals sent thereto through a transmission line, said baseband signals comprising complex signal pairs representative of a sequence of complex communication codes at regularly spaced instants, said demodulator comprising, for demodulating said baseband signals into predicted values of said communication codes;

delay mans for delaying said basehand signal pairs, said delay means having a plurality of tap means for simultaneously deriving from the delayed baseband signal pairs a plurality of successively delayed complex signal pairs;

a plurality of variable attenuator means responsive to attenuation control signal pairs for attenuating the respective delayed complex signal pairs by attenuation factors controlled by the respective attenuation control signal pairs to produce amplitude-adjusted signal pairs;

adder means for summing up said amplitude-adjusted signal pairs to produce a pair of complex sum signals at each of said instants;

phase shift means responsive to a phase control signal pair for phase-shifting said complex sum signal pair depending on said phase control signal pair to produce a pair of phase-controlled complex sum signals;

predicting means responsive to said phase-controlled complex sum signal pair for producing a pair of complex value signals predictive of that pair of said communication codes which is comprised by said baseband signals;

first control means responsive to said phase-controlled complex sum signal pair and said complex value signal pair for producing the phase control signal pair for use by said phase shift means; and

second control means responsive to said phase control signal pair, said phase-controlled complex sum signal pair, said complex value signal pair and said delayed complex signal pairs for producing the attenuation control signal pairs for use by said variable attenuator means;

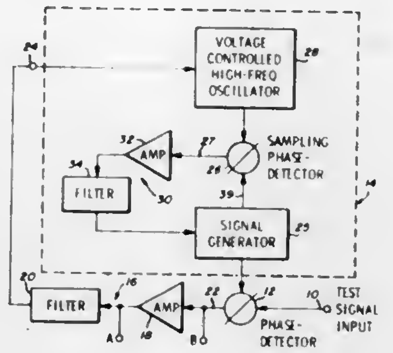
said predicted values being given by the complex value signal pairs successively produced for said instants.

4,035,736
FM DISCRIMINATOR HAVING LOW NOISE CHARACTERISTICS
Drew R. Lance, Saratoga, and John E. Altstatt, Palo Alto, both of Calif., assignors to California Microwave, Inc., Sunnyvale, Calif.

Filed Feb. 9, 1976, Ser. No. 656,534

Int. Cl.² H03D *3/00*

U.S. Cl. 329—122 **10 Claims**



1. In a discriminator including a voltage-controlled reference source for generating a reference signal, a detector for comparing the phase of an input test signal to the phase of the reference signal and for generating an error signal commensurate with any difference therebetween, and a feed-back circuit for coupling the error signal to the control input of the reference source, an improved reference source comprising:

voltage-controlled signal generating means responsive to a control signal and operative to generate a reference signal of a first frequency;

first voltage-controlled oscillator means responsive to the error signal and operative to develop a stabilizing signal having a second frequency which is at least an order of magnitude greater than said first frequency;

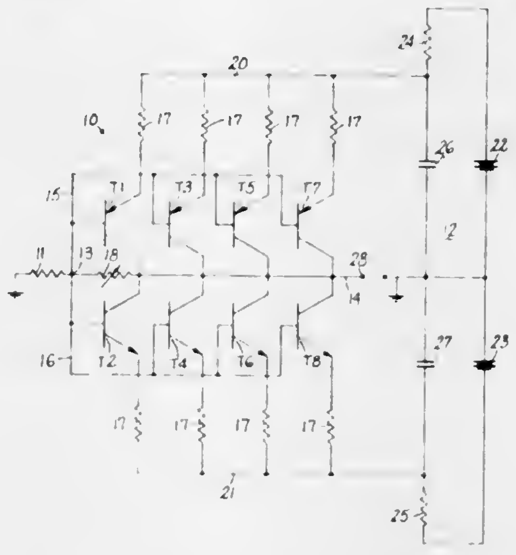
phase detector means for comparing the phase of said reference signal to the phase of said stabilizing signal and for developing an error signal commensurate with any difference therebetween; and

feed-back circuit means for coupling said error signal to said signal-generating means for causing the phase of said reference signal to follow the phase of said stabilizing signal.

4,035,737
LOW NOISE AMPLIFIER
John J. Curl, c/o Ihem, 1820 Montreaux-Vaude, Switzerland Continuation of Ser. No. 499,608, Aug. 22, 1974, abandoned. This application Mar. 5, 1976, Ser. No. 664,108

Int. Cl.² H03F *3/18*

U.S. Cl. 330—13 **2 Claims**



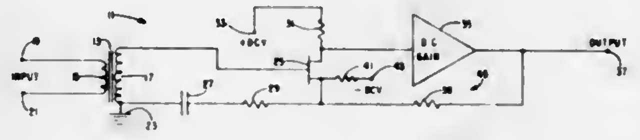
1. An amplifier arranged to accept an input signal from a low impedance source such as a moving coil phono cartridge and provide an amplified output signal, comprising, a plurality of first and second transistors, each of said transistors having base, collector and emitter electrodes, and having a low base input resistance, each of said first and second transistors being of complementary types connected in push-pull arrangement with the collectors thereof connected to a common output terminal, an input terminal adapted to receive the output of the cartridge, means connecting said input terminal directly to the base electrodes of each of said first and second transistors with no intermediate resistance, a resistance in the emitter circuit of each transistor, said resistances being of the same value, first means connecting the emitter resistances of each of said first transistors, second means connecting the emitter resistances of each of said second transistors, and means connecting a power source across said first and second means.

4,035,738
LOW NOISE AMPLIFIER
Philip J. Anzalone, Mount Ephraim, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 17, 1976, Ser. No. 687,287

Int. Cl.² H03F *1/38*

U.S. Cl. 330—26 **5 Claims**



4. A low noise, low frequency amplifier comprising in combination:

a voltage step-up input transformer having a primary winding and a secondary winding;

a field effect transistor having source, drain, and gate connections, said gate connection being connected only to a first end of said secondary, winding, said source connection being connected through resistance means to a negative voltage potential, and said drain connection being connected through resistance means to a positive voltage potential;

a substantially linear direct current amplifier having an input connection and an output connection, said input connection being coupled to said drain connection of said field effect transistor so as to be responsive to changes in current flow therethrough to provide corresponding changes in voltage at said output connection; and

a feedback network coupled to said output connection and operative to provide both direct current and alternating current negative feedback to said source connection of said field effect transistor;

said feedback network comprising a first feedback resistor connected to said output connection, a second feedback resistor connected in series with said first feedback resistor, the junction between said first and second feedback resistors being coupled to said source connection, and a capacitor connected in series between said second feedback resistor and ground, whereby said second feedback resistor is effectively open circuited for direct current and substantially all of the direct current component of the output signal at said output connection is applied via said first feedback resistor to said source connection as direct current negative feedback, while for the alternating current component of said output signal said first and second feedback resistors comprise a voltage divider so a predetermined fraction of said alternating current component is applied to said source connection of said field effect transistor.

4,035,739

SIGNAL DYNAMIC COMPRESSION AND EXPANSION CIRCUITS

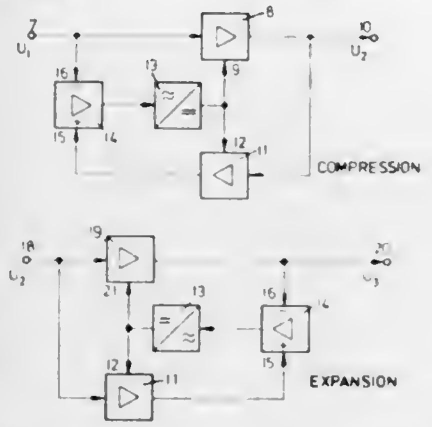
Gerhard Dickopp, and Ernst Schröder, both of Hannover, Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed June 15, 1976, Ser. No. 696,422

Claims priority, application Germany, June 28, 1975, 2529012

Int. Cl.² H03G *7/00*

U.S. Cl. 330—129 **8 Claims**



1. In a circuit for the automatic dynamic compression or expansion of a signal between its input and its output, the circuit presenting a useful signal path connected between its input and its output and containing a first variable gain member which is electronically controllable for varying the transmission factor between the circuit input and output, the circuit also presenting a branch path connected to the useful signal path and containing a second variable gain member which is electronically controllable for varying the transmission factor exhibited by said branch path, and a control voltage generator having an input and arranged to generate a control voltage proportional to the signal at its input, and means applying the control voltage to the first and second variable gain members, for regulating the transmission factor of the useful signal path and for effecting a counterregulation of the transmission factor of said branch path, relative to the transmission factor variation imparted to said useful signal path, the improvement comprising:

means defining a combining circuit having a first input connected to receive the output signal from said second variable gain member and a second input connected to receive a signal proportional to a signal at a point in said useful signal path, and having an output connected to said input of said control voltage generator for supplying thereto a signal which is a function of the difference between the signals at said first and second inputs of said combining circuit.

4,035,740

DYESTUFF LASER

Fritz Peter Schäfer, Goettingen; Horst Harnisch, Cologne, and Roderich Raue, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

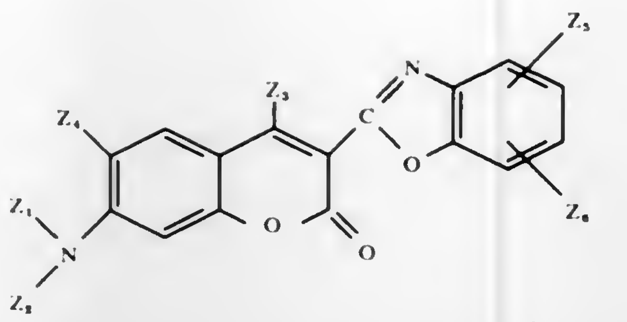
Filed Mar. 10, 1975, Ser. No. 557,081

Claims priority, application Germany, Mar. 13, 1974, 2411969

Int. Cl.² H03F *1/22;* **C09K** *11/00*

U.S. Cl. 331—94.5 L **2 Claims**

1. Dyestuff laser consisting of a reservoir containing a laser dyestuff solution and a pump light source connected thereto, which is capable of exciting the dyestuff solution to produce an emission, characterised in that the dyestuff solution contains a dyestuff of the general formula



wherein

Z_1 and Z_2 represent C_1–C_4-alkyl radicals which can also be substituted by hydroxyl, chlorine, C_1–C_4-alkoxy, nitrile or phenyl,

Z_3 represents hydrogen or a phenyl radical substituted by an o-carboxyl or C_1–C_3-alkoxycarbonyl radical,

Z_4 represents hydrogen or methyl,

Z_5 represents hydrogen, C_1–C_5-alkyl, chlorine, C_1–C_3-alkylsulphonyl, benzylsulphonyl, nitrile, sulpho, optionally mono- or di-C_1–C_4-alkyl-substituted carbamoyl or sulphamoyl, phenyl, cyclohexyl, phenyl-C_1–C_3-alkyl or C_1–C_4-alkoxy radicals or, together with

Z_6, the remaining members of a fused benzo, cyclohexano or cyclopentano radical, and

Z_6 represents hydrogen, chlorine or C_1–C_4-alkyl.

4,035,741

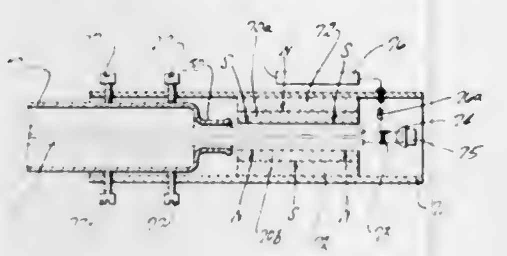
MAGNETIC POLARIZATION OF TUBULAR LASER

Michael D. Crisp, Sylvania, and James A. Ringlien, Maumee, both of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Continuation-in-part of Ser. No. 550,077, Feb. 14, 1975. This application Feb. 9, 1976, Ser. No. 656,468

Int. Cl.² H01S *3/10*

U.S. Cl. 331—94.5 G **4 Claims**



1. In a process for manufacturing a tubular gaseous laser device having a gas lasing capillary, the improvement which comprises:

a. applying a substantially uniform permanent magnetic field to at least a portion of the capillary so as to polarize the light being emitted from the capillary; and

b. rotating the laser device with respect to the magnetic field until the laser device is so oriented with respect to the magnetic field that a maximum extinction ratio is obtained for polarized light being emitted by the laser device.

4,035,742

DEVICE FOR OPTICAL PUMPING SOLID STATE LASERS

Gerhard Schiffner, Neuried, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

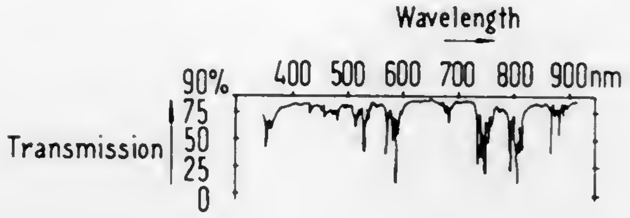
Filed Mar. 4, 1976, Ser. No. 663,742

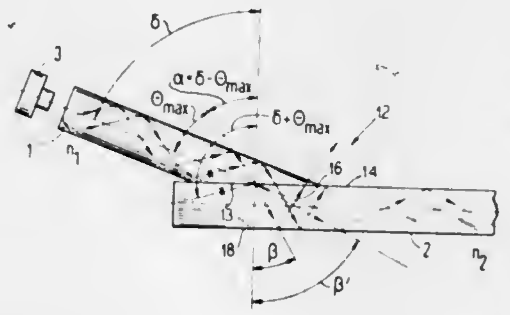
Claims priority, application Germany, Mar. 7, 1975, 2510030

Int. Cl.² H01S *3/091*

U.S. Cl. 331—94.5 P **4 Claims**

1. In a pumping arrangement for optically pumping a solid state laser, said arrangement comprising a laser rod, and at least one pumping light source having nearly point form with the improvement comprising a light waveguide arranged between each pumping light source and the laser rod, each light waveguide having an optical axis extending at an angle δ to a normal of the surface of the laser rod with the angle δ having a relationship of





$$2 \arcsin(1/n_1) \leq \delta < \pi/2,$$

wherein n_1 is the index of refraction of the light waveguide.

4,035,743

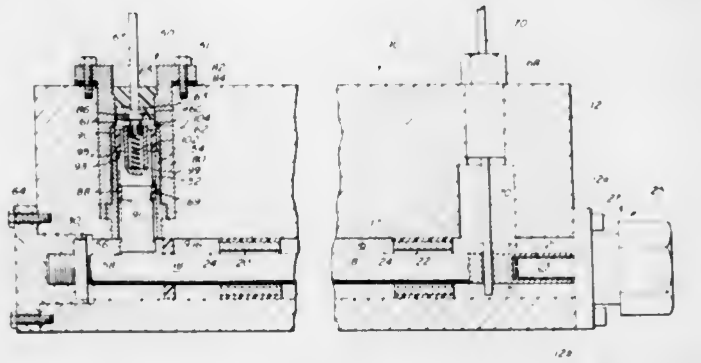
RADIO FREQUENCY OSCILLATOR

James N. Lind; Sherwood A. McOwen, Jr., and Toshikazu Tsukii, all of Santa Barbara, Calif., assignors to Raytheon Company, Lexington, Mass.

Filed July 23, 1976, Ser. No. 708,244

Int. Cl.² H03B *7/14*

U.S. Cl. 331—101 **4 Claims**



1. In a radio frequency oscillator having an inner conductor surrounded by an outer conductor, an improved varactor mounting structure comprising: a hollow conductive housing mounted to the outer conductor; a conductive rod disposed within the hollow conductive housing to form a transmission line, a first end of such conductive rod being disposed adjacent a portion of the inner conductor, such adjacent portion of the inner conductor and such end of the conductive rod forming a coupling capacitor; a varactor having one electrode thereof mounted to the second end of such conductive rod, such transmission line serially connecting the varactor and the coupling capacitor, the length of the conductive rod between the electrode of the varactor and the first end of such rod being λ/2 where λ is the nominal operating wavelength of the oscillator; and a conductive wire connected between the housing and the conductive rod, such wire being coupled to such rod at a point λ/4 from the first end of such rod.

4,035,744

SAWTOOTH WAVE OSCILLATOR CIRCUIT

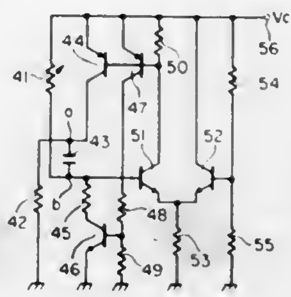
Firokazu Fukaya, and Katsuhiro Takagi, both of Tokyo, Japan, assignors to Nippon Electric Company, Ltd., Tokyo, Japan

Filed Aug. 24, 1976, Ser. No. 717,198

Claims priority, application Japan, Aug. 28, 1975, 50-104386

Int. Cl.² H03K *4/50*

U.S. Cl. 331—111 **3 Claims**



1. An oscillator circuit comprising a differential amplifier having first and second input terminals and an output terminal; means for applying a reference potential to the second input terminal of said amplifier; first and second switching means driven concurrently into an on or off state by the output of said amplifier; charge storing means having one end connected to said first switching means, the other end of said charge storing means being connected to said second switching means and to said first input terminal of said differential amplifier in a positive feedback fashion; means for discharging a charge stored in said charge storing means; and a power source connected across the series circuit of said first switching means, said charge storing means and said second switching means.

4,035,745

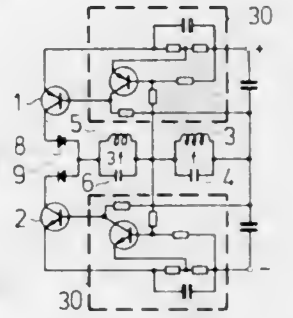
CIRCUIT FOR THE PRODUCTION OF AN OPEN ALTERNATING MAGNETIC FIELD

Hans-Peter Doetsch, Altdrossenfeld uber Bayreuth, and Klaus Thiele, Oberailsfeld uber Bayreuth, both of Germany, assignors to Sachs-Systemtechnik GmbH, Schweinfurt, Germany

Filed May 13, 1976, Ser. No. 686,258

Int. Cl.² H03B *5/12*

U.S. Cl. 331—114 **10 Claims**



1. In a circuit for the production of an open magnetic field of the type comprising a generator with at least two transistors connected in push-pull, each transistor having base, emitter and collector terminals, the output of said generator being connected to resonant circuits having coils which simultaneously act as the induction coil of the open magnetic field, the improvement comprising a first resonant circuit having a coil tuned to a fundamental frequency by means of a parallel capacitance and a second resonant circuit connected in series with the first resonant circuit and having a coil which is tuned to the third harmonic of the fundamental frequency by means of a second parallel capacitance, whereby the two coils are

constructed and arranged in such a manner that the fundamental frequency tuned resonant circuit and the third harmonic wave tuned resonant circuit are not mutually attenuating and additional means for supplying a suitably square voltage wave obtained through addition of the two resonance voltages produced, in suitable time relation to the collector current terminals of said generator.

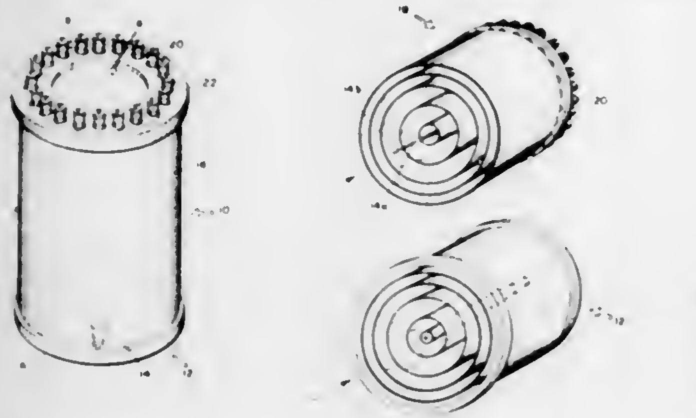
4,035,746
CONCENTRIC BROADBAND POWER COMBINER OR DIVIDER

Martin Bryan Covington, Jr., Baltimore County, Md., assignor to The Bendix Corporation, Southfield, Mich.

Filed Sept. 7, 1976, Ser. No. 720,877

Int. Cl.² H01P *5/12*

U.S. Cl. 333—6 **6 Claims**



1. A transmission line structure comprised of a first set of concentric cylinders and a second set of concentric cylinders arranged to be relatively colinear with one another so as to form a cylindrical structure having first and second opposed end plates, said first set of concentric cylinders being electrically attached at first ends thereof to said first plate and said second set of concentric cylinders being electrically attached at first ends thereof to said second plate, the cylinders of said first set being interleaved with the cylinders of said second set, the inner and outer of said cylinders being of such size to extend the entire longitudinal length of said structure and the other cylinders being of shorter longitudinal length, a first coaxial electrical connector having a center conductor connected to said inner cylinder and an outer conductor connected to said first plate and a plurality of second coaxial electrical connectors having inner conductors connected to said second plate and outer conductors connected to said outer cylinder.

4,035,747
ADJUSTABLE ATTENUATION EQUALIZER

Martin Hindermayr, Aying, and Georg Koerner, Hohenkirchen, both of Germany, assignors to Wilhelm Ruf KG, Munich, Germany

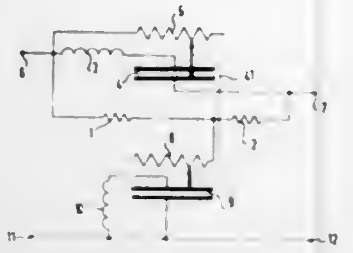
Filed Jan. 17, 1975, Ser. No. 541,757

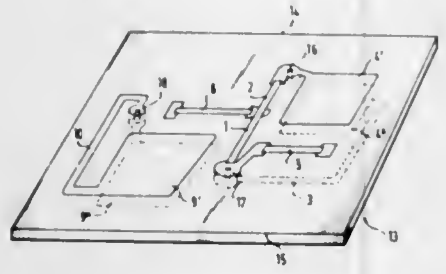
Claims priority, application Germany, Jan. 29, 1974, 2404079

Int. Cl.² H03H *7/16*

U.S. Cl. 333—28 R **22 Claims**

1. Attenuation equalization in the circuit of an adjustable four-terminal network for correcting the frequency-related attenuation curve of cables comprising a bridged T circuit containing ohmic resistances and having two fixed ohmic resistors in series with one another, bridged by a bridging impedance, the bridging impedance provided by a series-resonant circuit having an inductance, a condenser and a first variable parallel resistor having a resistive track, said attenuation equalizer having a shunt impedance transverse to said bridging impedance formed of a parallel-resonant circuit, parallel thereto having an inductance and a condenser in series with a second variable resistor having a resistive track, said variable resistors being traversed by a common traversing means, said fixed resistors, said variable resistors, said inductances, said condensers being mounted on a single support of insulating material, and the plates of the condensers are disposed parallel and in lateral spaced relationship to the corresponding variable resistors of the bridging impedance and shunt impedance such that they serve simultaneously as wiper tracks for the common traversing means of the variable resistors.





4,035,748
COAXIAL IMPEDANCE TRANSDUCER PAD

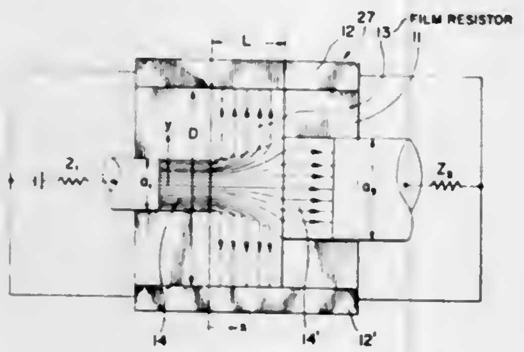
Keijiro Kusaka, Machida, and Yasushi Otomo, Miyagi, both of Japan, assignors to Bunker Ramo Corporation, Oak Brook, Ill.

Filed Sept. 24, 1975, Ser. No. 616,219

Claims priority, application Japan, Sept. 26, 1974, 49-109963

Int. Cl.² H01P *5/08*

U.S. Cl. 333—33 **6 Claims**



1. An impedance matching device comprising:
a rectangular insulative substrate;
a first conductive strip carried along one edge of said substrate;
a second conductive strip insulated from said first conductive strip and carried along an edge of said substrate opposite said one edge;
a film resistor deposited on said substrate extending between said conductive strips;
an input third conductive strip on said substrate between and insulated from said first and second conductive strips and connected to said film resistor, said input third conductive strip having a predetermined dimension in the direction transverse to said first and second conductive strips; and
an output fourth conductive strip on said substrate between and insulated from said first and second conductive strips and disposed on the side of said film resistor opposite said input third conductive strip and connected to said film resistor, said fourth output conductive strip having a predetermined dimension in a direction transverse to said first and second conductive strips that is different from the corresponding predetermined dimension of said input third conductive strip to define an exponential impedance curve in said film resistor between the connections thereto of said third and fourth conductive strips.

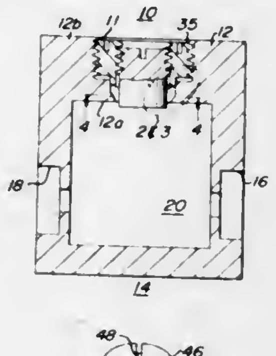
4,035,749
MICROWAVE TUNING SCREW ASSEMBLY HAVING POSITIVE SHORTING

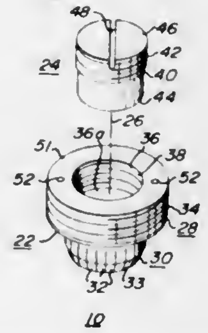
Mahlon W. Slocum, Middletown, and Henri Pachana, Neptune City, both of N.J., assignors to Harvard Industries, Inc., Farmingdale, N.J.

Filed Apr. 6, 1976, Ser. No. 674,108

Int. Cl.² H01P *1/28, 7/06*

U.S. Cl. 333—83 R **13 Claims**





7. A microwave tuning screw assembly mounted in an opening in a cavity or waveguide and having positive shorting at an inner wall surface of said cavity or waveguide comprising
chuck means having a major portion thereof disposed in said opening and having elastically deformable fingers within said opening,
a tuning screw section received within said fingers, and
means for deforming said fingers towards said tuning screw section thereby to provide positive shorting from said inner wall surface through said chuck means to said tuning screw section.

4,035,750
ELECTROPHOTOGRAPHIC APPARATUS HAVING IMPROVED PHOTOCONDUCTOR REGENERATIVE STRUCTURE AND PROCEDURE

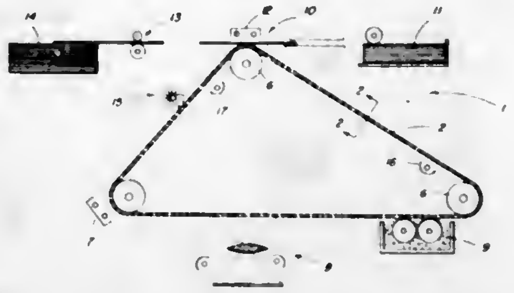
William J. Staudenmayer, Pittsford; Curtis L. Stephens, and John R. Thompson, both of Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1975, Ser. No. 621,913

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **13 Claims**

9. An improved electrophotographic apparatus of the type having primary charging, exposure, development and transfer stations for repetitively producing copies on a reusable imaging member which includes an organic photoconductive layer and substantially transparent underlying conductive layer, and in which a negative and positive bias are developed respectively on the front and rear surface of said photoconductive layer surfaces during its use, said apparatus including a device for regenerating the electrophotosensitive properties of said photoconductive layer which comprises:
an energizable source of radiation having a substantial portion of its spectral content of wavelengths highly absorbed by said photoconductive layer and having at least 25% of its incident energy on the surface of the photoconductive layer at wavelengths to which the imaging member's net optical density is no less than about 50% of the maximum net optical density of said imaging member, said source being constructed and located for directing such radiation through said conductive layer onto the rear positively biased surface of said photoconductive layer at a position along its operative travel path from said development station to said primary charging station.



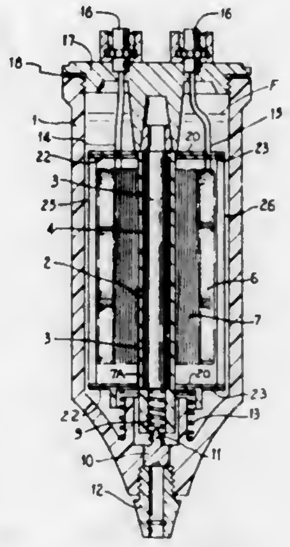
4,035,751
DEVICE FOR INDUCING AN ELECTRICAL VOLTAGE

Ainslie Walthew, 178 Ayres Road, Old Trafford, Manchester, England (M16 9QB)

Filed May 27, 1975, Ser. No. 580,673

Int. Cl.² H01F *27/08, 27/24*

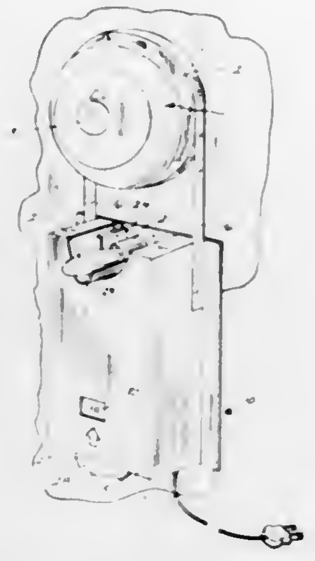
U.S. Cl. 336—60 **23 Claims**



1. An ignition coil for a spark ignition internal combustion engine comprising a housing, an open linear core disposed in said housing, primary and secondary inductance windings wound round said core, said core having a first part responsive to higher frequencies and a second part responsive to very low frequencies, said second part of said core having an axial length not exceeding the axial length of the first part of said core but exceeding the axial length of the primary and secondary inductance windings wound round the core, at least one of said parts of said core being a ferrite, and a body of oil in said housing in which said core and windings are immersed, said housing having a vacuum maintained therein.

4,035,752
ENERGY SAVING CONTROL

James R. Anderson, Minneapolis, Minn., assignor to Research, Incorporated, Minneapolis, Minn.
Continuation-in-part of Ser. No. 428,062, Dec. 26, 1973, abandoned. This application June 30, 1975, Ser. No. 592,041
Int. Cl.² H01H *37/16*
U.S. Cl. 337—107 9 Claims

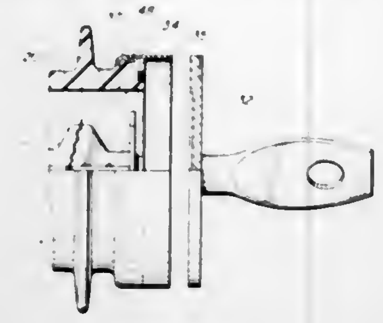


1. An attachment for use with an existing thermostat control to conserve energy by altering thermostatically controlled building temperatures without changing the setting of the control during preselected time period including a housing, a radiant energy source mounted in said housing and being separate from the thermostat control, means to permit positioning said radiant energy source adjacent to an existing thermostat control without substantially normally blocking radiant energy transmission to the thermostat, said radiant energy source providing sufficient radiant energy when energized to elevate the temperature of an adjacent thermostat control above the ambient temperature of the building portion controlled by the thermostat control, and timer control means separate from the thermostat control to control energization of said radiant energy source whereby said radiant energy source is controlled by said timer independently of room temperature to respond in a preselected manner during preselected period of time, wherein said timer control means includes a timer motor, a timer cam and a timer cam controlled switch mounted on said housing adjacent said timer cam and having a movable switch control element, a drive hub driven by said timer motor, said timer cam comprising a disc driven by said hub and having an edge portion controlling movement of said switch control element, said disc being made of plastic material manually cuttable with shears at least adjacent its edge portion to form cam shapes at its edge portion to cause movement of said switch control element between on and off positions.

4,035,753
CURRENT LIMITING FUSE CONSTRUCTION

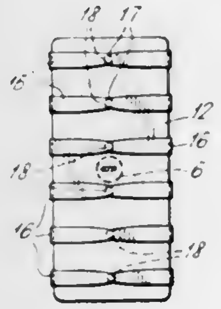
Conrad M. Reeder, Chicago, Ill., assignor to S & C Electric Company, Chicago, Ill.
Filed July 23, 1976, Ser. No. 708,149
Int. Cl.² H01H *85/02*
U.S. Cl. 337—186 13 Claims

1. In a high voltage fuse including a current responsive fusible element, and, first and second conductive terminals respectively electrically connected to opposite ends of the fusible element; an improvement comprising:
molded hollow fuse body surrounding the fusible element;
end sealing means for closing at least one open end of said fuse body comprising:
  a metallic flange member mounted to the at least one open end of said fuse body by molding when said fuse body is molded, said flange member having an extended edge extending beyond the at least one open end of said fuse body;
  a metallic end plate dimensioned to fit over the at least one open end of said fuse body so that an edge thereof is adjacent said flange member, said end plate being held over the at least one open end of said fuse body by said extended edge of said flange member being folded over the edge of said end plate.



4,035,754
FUSE BOX, PARTICULARLY FOR MOTOR VEHICLES

Helmut Kleinböhl, Goddelau, Germany, assignor to General Motors Corporation, Detroit, Mich.
Filed May 24, 1976, Ser. No. 689,572
Claims priority, application Germany, June 6, 1975, 2525241
Int. Cl.² H01H *85/30;* B60Q *1/26*
U.S. Cl. 337—206 3 Claims

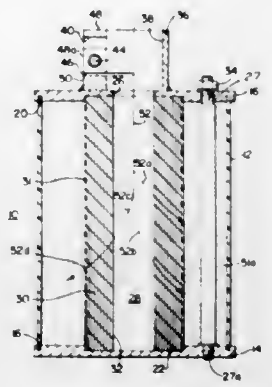


1. A fuse box for a motor vehicle providing an illuminated indication of a melted fuse comprising
a support plate mounted on the vehicle, a plurality of apertures through the support plate,
illumination means on a first side of the plate for providing light to the apertures,
a plurality of meltable fuse elements on the plate, the fuse elements normally covering each of the apertures respectively to block the light through the apertures, whereby a lighted aperture is exposed when its corresponding fuse element melts to provide at the second side of the plate an illuminated indication of the fuse melted condition.

4,035,755
NON-VENTING EXPULSION FUSE

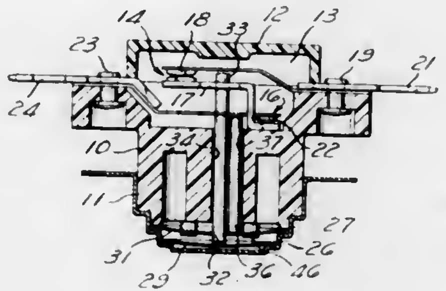
Frank L. Cameron, North Huntingdon, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Sept. 16, 1975, Ser. No. 613,836
Int. Cl.² H01H *85/38*
U.S. Cl. 337—280 16 Claims

1. Expulsion fuse apparatus, comprising:
a. gas expulsion fuse means which exits gas from an exhaust port as the result of a fusing operation;
b. container means disposed adjacent said exhaust port of said gas expulsion fuse means, said container means having an opening therein for receiving expelled gas from said expulsion fuse means;
c. condenser means disposed within said container means for receiving said gas and for cooling and condensing said gas;
d. rupturable sheath means disposed around said condenser means for separating said condenser means from the remaining internal portion of said container means, said sheath means being ruptured at a predetermined gas pressure; and
e. energy absorbing means disposed in said remaining internal portion of said container means, said expelled gas if not sufficiently cooled by said condenser means rupturing said sheath means and thus escaping into the region of said energy absorbing means, the energy of said gas thus being further absorbed to reduce the pressure of said gas, said remaining internal portion of said container means containing said pressure-reduced gas therein.



4,035,756
TWO TEMPERATURE THERMOSTAT

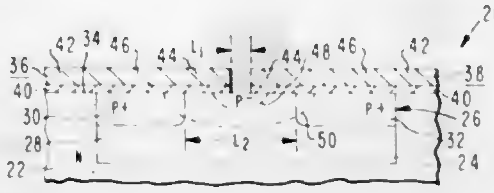
Donald J. Schmitt, Mansfield, Ohio, assignor to Therm-O-Disc Incorporated, Mansfield, Ohio
Filed Jan. 26, 1976, Ser. No. 652,233
Int. Cl.² H01H *37/52*
U.S. Cl. 337—370 4 Claims



1. A thermostat comprising a body assembly including a body member and disc retainer member, said retainer member providing inner and outer generally concentric disc seats with said inner seat larger than said outer seat, a pair of switches in said body assembly, an outer bimetal snap disc seated in said outer seat, first motion transmitting means operable to operate one of said switches in response to movement of said outer disc, an inner bimetal snap disc seated in said inner seat, second motion transmitting means operable to operate the other of said switches in response to movement of said inner disc, said body member providing first abutment surfaces operable to engage said inner disc and retain it in said inner seat and second abutment surfaces operable to engage said outer disc and retain it in said outer seat.

4,035,757
SEMICONDUCTOR DEVICE RESISTORS HAVING SELECTED TEMPERATURE COEFFICIENTS

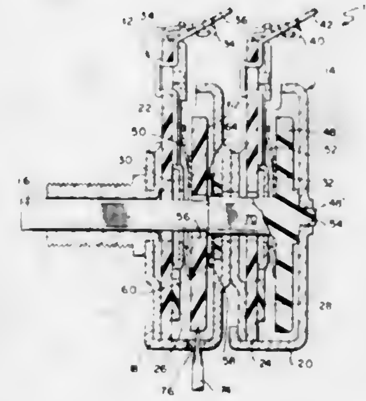
Willem Gerard Einthoven, Belle Mead, and William Cordt Simpson, Middlesex, both of N.J., assignors to RCA Corporation, New York, N.Y.
Filed Nov. 24, 1975, Ser. No. 634,490
Int. Cl.² H01C *7/04*
U.S. Cl. 338—25 7 Claims



1. A semiconductor device comprising:
a body of semiconductor material having a surface and having a one type conductivity; and
two conductors in spaced apart relation making electrical contact with said body at said surface, each of said conductors include a distal portion and a proximal portion, at least each said proximal portion having a contact resistance with said semiconductor material which has a negative temperature coefficient.

4,035,758
ADJUSTABLE VARIABLE RESISTANCE CONTROL SYSTEM

Alfred A. Panke, Frankfort, Ind., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.
Filed Mar. 15, 1976, Ser. No. 667,088
Int. Cl.² H01C *10/16*
U.S. Cl. 338—132 2 Claims



1. In a control system wherein first and second rotors are carried by a shaft and wherein electrical contact means are carried by said first and second rotors electrically bridging first and second resistance and collector paths, the improvement characterized by a system permitting adjustment of said first and second rotors with respect to each other comprising:
a. said first rotor fixedly carried by said shaft,
b. said second rotor loosely carried by said shaft, and
c. barb means coupled to said shaft and engaging a face of said second rotor and providing an interference fit therewith.

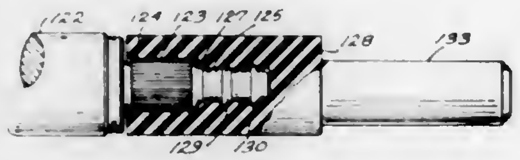
4,035,759
ELECTRICAL CONTROL HAVING AN INSULATED SHAFT EXTENSION

John D. Van Benthuysen, Elkhart, Ind., assignor to CTS Corporation, Elkhart, Ind.

Division of Ser. No. 342,862, March 19, 1973, Pat. No. 3,902,152, which is a continuation-in-part of Ser. No. 859,074, Sept. 18, 1969, abandoned. This application Aug. 21, 1975, Ser. No. 606,461

Int. Cl.² H01C *10/32*

U.S. Cl. 338—162 **4 Claims**



1. An electrical control comprising a base, a resistance path secured to the base, a driver of insulating material, a contactor constrained to move with the driver for making wiping contact with the resistance path, a metal shaft extending from said driver, said metal shaft being provided with a first reduced diameter portion and a second reduced diameter portion, a first peripheral lip extending outwardly from the second reduced diameter portion and having a diameter greater than the diameter of the second reduced diameter portion, an insulated shaft extension of resilient plastic material telescopically secured to the first and second reduced diameter portions, said insulated shaft extension comprising a first hollow portion having a diameter slightly smaller than the first reduced diameter portion and a second hollow portion inwardly of and communicating with the first hollow portion and having a diameter less than the diameter of the first hollow portion, the diameter of the second hollow portion being less than the diameter of the peripheral lip, said peripheral lip biting directly into the wall of the second hollow portion thereby maintaining the insulated shaft extension mechanically anchored to said metal shaft.

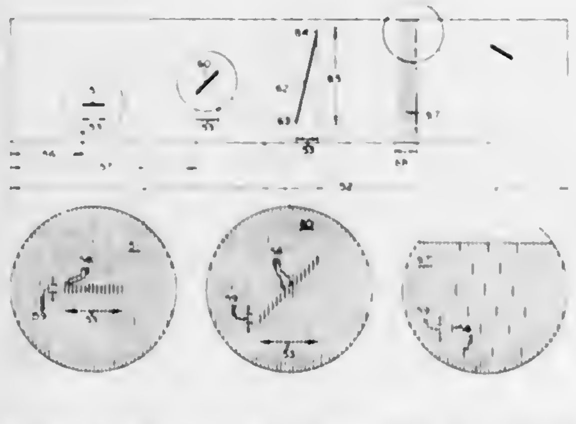
4,035,760
OBJECT DETECTING SYSTEM

George F. Asbury, San Diego, Calif.; Earl J. Kohn, Washington, D.C., and James R. Richards, Cheverly, Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 18, 1951, Ser. No. 247,186

Int. Cl.² G01S *9/66, 9/44*

U.S. Cl. 340—3 D **16 Claims**



1. A system for detecting the movement of a remote object comprising transmitting means for illuminating said remote object with a signal of wave energy, receiving means for recovering an echo reflected by said object, signal display means responsive to said echo to provide a separate visual display of each cycle of said reflected echo, and frequency comparing means responsive to a difference in frequency between the wave energy of said received echo and the wave energy of said transmitted signal to vary the orientation of said visual indication from a reference orientation, whereby a variation in said orientation will provide an instantaneous indication of a doppler effect on said transmitted wave energy.

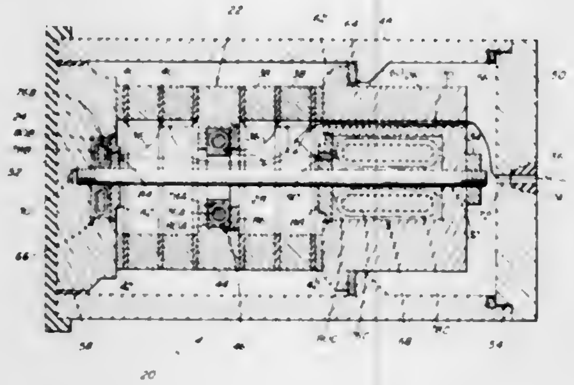
4,035,761
SONAR TRANSDUCER HAVING INERTIAL INDUCTOR

Stanley L. Ehrlich, Middletown, R.I., assignor to Raytheon Company, Lexington, Mass.

Filed Oct. 20, 1975, Ser. No. 624,198

Int. Cl.² H04B *13/00*

U.S. Cl. 340—10 **4 Claims**



1. A sonar transducer comprising:
a transducer unit;
a front member and a rear member positioned at opposite ends of said transducer unit;
means for rigidly supporting said front member and said rear member and said transducer unit in mechanical contact with each other to provide a mechanically resonant system;
an inductor having inductance for tuning the capacitance of said transducer unit;
means for rigidly mounting said inductor to one of said members, the mass of said inductor plus the mass of said member to which said inductor is mounted being selected to provide a desired resonance frequency through a mechanical resonance, said member to which said inductor is mounted having a void, said inductor being nested in said void; and wherein
said inductor has the form of a toroid.

4,035,762
POSITION SENSING READOUT

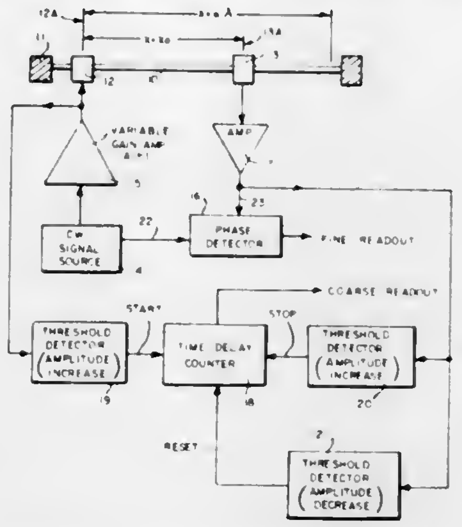
Jacques R. Chamuel, Allston, Mass., assignor to The Charles Stark Draper Laboratory, Inc., Cambridge, Mass.

Filed Nov. 4, 1974, Ser. No. 520,742

Int. Cl.² G01S *3/80*

U.S. Cl. 340—16 R **45 Claims**

1. A position determining apparatus comprising at least one delay element having magnetic properties and capable of establishing continuous elastic wave signals in the delay element;
at least one transducer means coupled to said delay element at a reference position;
means for activating said at least one transducer means to produce electromagnetic fields associated with at least one continuous elastic wave signal which travels in said delay element;
at least one electromagnetic transducer means positioned adjacent but not enclosing said delay element and electromagnetically coupled to said delay element at said position to be determined relative to said reference position, said at least one transducer means being capable of moving in its entirety in the same direction or in a substantially orthogonal direction relative to the direction of said traveling continuous elastic wave **signals, said at least** one electromagnetic transducer means detecting the presence of electromagnetic fields associated with said travelling continuous elastic wave signal as it travels past said position to produce a detected continuous wave signal;
means responsive to said detected continuous wave signal and to said activated continuous wave input signal for determining the position of said at least one electromagnetic transducer relative to said reference position, said position determining means including
means for comparing the phase of said detected continuous wave signal as detected at said position to be determined with the phase of said activated continuous wave input signal at said reference position; and
means for substantially reducing reflections of travelling elastic waves in said delay element.



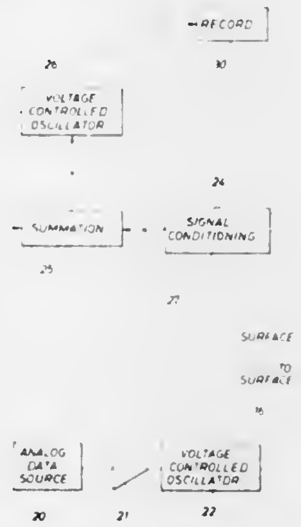
4,035,763
WIRELINE TOOL FOR MEASURING BOTTOM-HOLE PRESSURE IN PUMPING WELLS

Christopher S. Cowles, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 12, 1976, Ser. No. 685,821

Int. Cl.² G01V *1/40*

U.S. Cl. 340—18 FM **6 Claims**



1. A data transmission system for use in transmitting data from a data source located in a well to the surface, said system comprising:
a first voltage-controlled oscillator, said first oscillator being located in said well and the data source being coupled to said oscillator to control the frequency of the oscillator;
a single-conductor cable, said oscillator being coupled to said cable;
a second voltage-controlled oscillator, said second voltage-controlled oscillator being located at the surface; and
a frequency-phase detecting circuit located at the surface, both said second oscillator and said cable being coupled to said frequency-phase detector, said frequency-phase detector being disposed to detect the difference in frequency and phase between said first and second oscillators and convert said difference to an analog voltage signal, said analog voltage signal being used to control said second oscillator to match the frequency and phase of said second oscillator with the frequency and phase of said first oscillator.

4,035,764
COMBINATION METER FOR AUTOMOBILE

Hiroshi Fujinami, Okazaki, and Hiroaki Yamaguchi, Anjo, both of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed Apr. 21, 1975, Ser. No. 569,748

Claims priority, application Japan, May 16, 1974, 49-56291[U]

Int. Cl.² G08B *19/00*

U.S. Cl. 340—52 F **4 Claims**

1. A combination meter for an automobile comprising:
a first group of indicators responsive to an output signal indicative of the closure of a key switch for simultaneously starting the indication operation of all said indicators;
an oscillator for producing an oscillation signal;
a counter connected to said oscillator for producing at least one command signal when the number of oscillations of said oscillation signal exceeds a predetermined number; and
indicator means connected to said counter for starting the indication operation thereof in response to said command signal.

4,035,765
THEFT ALARM FOR VEHICLE CARRIED RADIO EQUIPMENT

Lance E. Wenner, Lenexa, and John R. Brassfield, Prairie Village, both of Kans., assignors to Able Manufacturing Co., Inc.

Filed June 14, 1976, Ser. No. 695,647

Int. Cl.² B60R *25/10;* **G08B** *13/22*

U.S. Cl. 340—63 **3 Claims**

1. For use in combination with:
a vehicle having an electrically conductive chassis providing a local, electrical, ground reference;
an electrical direct current power source carried by said vehicle and having a pair of power terminals of which one is electrically connected with said ground reference;

electrically actuatable horn means carried by said vehicle and having a pair of energizing terminals of which one is electrically connected with said ground reference;

radio equipment means normally carried by said vehicle and having a ground terminal normally electrically connected with said ground reference when said equipment means is being carried by said vehicle, and a pair of antenna terminals of which one is electrically connected with said ground terminal of said equipment means; and

antenna means carried by said vehicle and having a pair of connection terminals of which one is electrically connected with said ground reference;

apparatus for operatively coupling said antenna terminals of said equipment with said connection terminals of said antenna means and for providing a theft alarm to protect said equipment means against unauthorized removal from said vehicle by providing an alram indication whenever said ground terminal of said equipment means is electrically disconnected from said ground reference, said apparatus including:

- first cable means having a pair of electrical conductors respectively releasably electrically connected adjacent one end of said first cable means with said antenna terminals of said equipment means;
- second cable means having a pair of electrical conductors respectively electrically connected adjacent one end of said second cable means with said connection terminals of said antenna means;
- a relay having a coil provided with a pair of operating terminals of which one is electrically connected with the other of said power terminals and the other of which is electrically coupled with one of said conductors of said first cable means,

said relay including a switch which is open when said coil is energized and closed when said coil is deenergized and having a pair of switch terminals of which one is electrically connected with said other power terminal and the other of which is electrically connected with the other of said energizing terminals of said horn means;

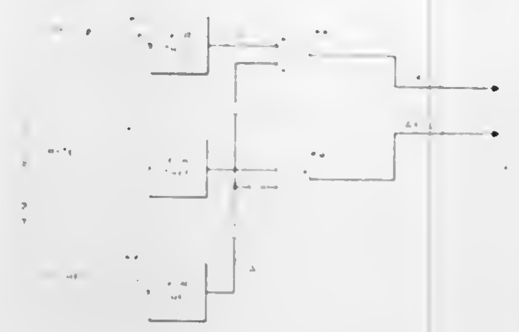
first electrical coupling means adjacent the other ends of said first and second cable means for electrically coupling the other conductor of said first cable means with one conductor of said second cable means; and

second electrical coupling means adjacent the other ends of said first and second cable means comprising a capacitor interconnected between said one conductor of said first cable means and the other conductor of said second cable means for electrically intercoupling said cables for radio frequency signals while maintaining direct current isolation between said other operating terminal of said coil and said other conductor of said second cable means,

whereby said one conductor of said first cable means is employed both as a part of the radio frequency signal transmission line between said equipment means and said antenna means and as a part of the alarm controlling circuit without impairment of either function thereof by the other.

4,035,766
ERROR-CHECKING SCHEME

William B. Barker, Maynard, Mass., assignor to Bolt, Beranek and Newman, Inc., Cambridge, Mass.
Filed Aug. 1, 1975, Ser. No. 601,145
Int. Cl.² G06F *11/10*; G11C *29/00*; H04L *1/10*
U.S. Cl. 340—146.1 AG 5 Claims



1. In a digital data processing system having sub-components which source and receive digital data comprising at least one binary word and in which the data source or destination is designated by a binary address; the improvement comprising means for generating a parity signal, which means employs a logical array equivalent to:

- means for generating a parity bit A corresponding to the binary address;
- means for generating a parity bit D corresponding to at least a portion of the data word;
- means for generating and sourcing a parity bit AXD corresponding to the XOR product of A and D and also a second parity signal equivalent to AXD2 where A is the binary complement of A and D2 is a parity bit corresponding to at least part of the data word, whereby a sub-component receiving the sourced data can detect the most common errors in either address or data.

4,035,767
ERROR CORRECTION CODE AND APPARATUS FOR THE CORRECTION OF DIFFERENTIALLY ENCODED QUADRATURE PHASE SHIFT KEYED DATA (DQPSK)

Chin Long Chen, Wappingers Falls, and Robert A. Rutledge, Poughkeepsie, both of N.Y., assignors to IBM Corporation, Armonk, N.Y.
Filed Mar. 1, 1976, Ser. No. 662,493
Int. Cl.² G06F *11/12*
U.S. Cl. 340—146.1 AQ 3 Claims

1. In error correction apparatus for correcting errors in binary information that has been transmitted using apparatus encoding and decoding the data as differentially encoded qradrature phase shift keyed data and using an (mn_0, mk_0) convolutional code with the truncated parity check matrix: ps

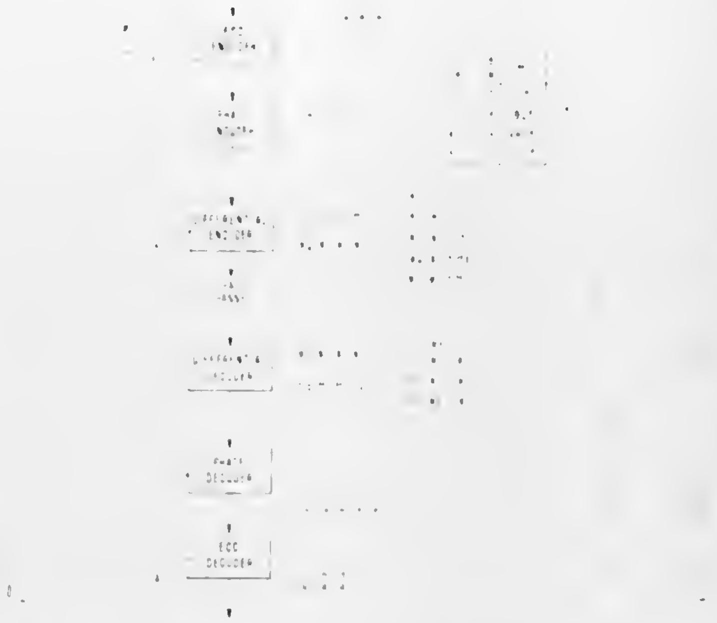
$$H = (D, TD, T^2D, \ldots, T^{m-1}D)$$

where D is an $(n_0-K_0)m \times n_0$ binary matrix and T is the shift matrix defined by

$$T_{ij} = \begin{cases} 1 \text{ if } i-j = n_0-k_0, \\ 0 \text{ otherwise} \end{cases}$$

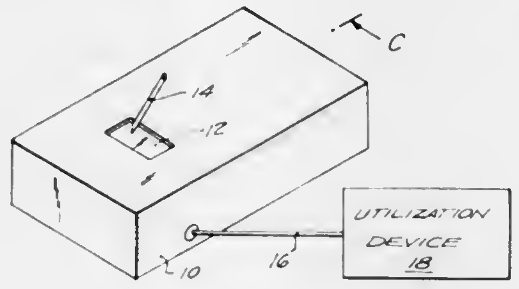
where $m(i_j)$ is a submatrix of H deleting all rows in which the i^{th} bit is zero, the i_jth column of $M(i_j)$ has a weight for and every other column of $M(i_j)$ has weight zero or one, the improvement comprising:

- first shift register means, coupled to the input of apparatus for encoding the data as differentially encoded quadrature phase shift keyed data, for dividing a sequence of said data bits into a plurality of sets and generating parity bits for each set of the binary information bits in the sequence in accordance with the submatrix (Mi_j) where the EXclusive OR columns i, $i+1$, $i+2$, $i+3$ of $M(i_j)$ has a weight zero or one if $i_j < i$ or $i_j > i+3$, and the EXclusive OR of columns i, $i+1$, $i+2$, $i+3$ of $M(i_j)$ has weight three or four if $i_j - i = 0$, 1, 2 or 3;
- second shift register means, at the output of the apparatus decoding differentially encoded quadrature phase shift keyed data, for dividing a sequence of decoded data bits into a number of sets including the information bits and parity bits of encoded sets, and;
- third shift register means, coupled to the output of the second shift register means, for receiving said generated syndromes of the sequence and the data bits of the sequences to correct said data bits.



4,035,768
PERSONAL IDENTIFICATION APPARATUS

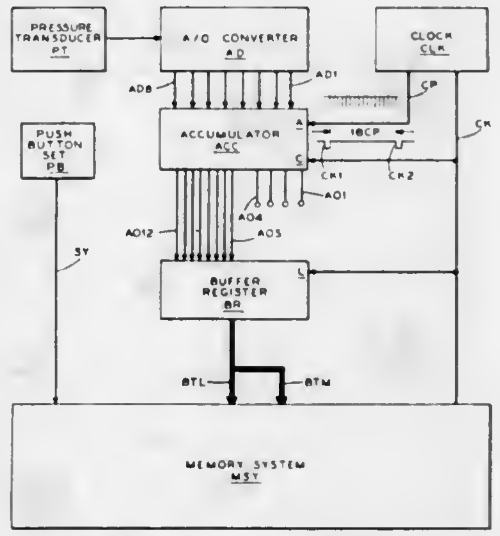
Austin G. Boldridge, Jr., Freehold, N.J., and Robert W. Freund, Brooklyn, N.Y., assignors to Veripen, Inc., New York, N.Y.
Filed May 3, 1976, Ser. No. 682,396
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 SY 2 Claims



1. Personal identification verifier apparatus comprising a first planar conductor element, a second planar conductor element parallel to and opposite said first planar conductor element, a sheet of dielectric material disposed in the space between said first and second planar conductor elements, said sheet having a thickness which is less than the spacing between said planar conductor elements whereby there is an air gap between said planar conductor elements, a lamina of elastomeric material fixed on a portion of the surface of said second planar conductor element remote from said first planar element to provide a writing surface, a housing enclosing said first and second planar conductor elements, said housing being provided with an opening opposite said lamina of elastomeric material, a visual record medium spanning said first planar conductor element and overlying said lamina, a stylus adapted to be gripped by the person whose identification is to be verified for writing on the portion of the record medium opposite said lamina, and a utilization means connected to said first and second planar conductor elements and responsive to the changes in electrical capacitance as the thickness of the air gap changes in response to forces exerted on said second planar conductor element via said lamina and said record medium by said stylus when a person writes on said record medium.

4,035,769
METHOD AND APPARATUS FOR RECORDING A SIGNATURE

Jacob Sternberg, New York, and Robert W. Freund, Brooklyn, both of N.Y., assignors to Veripen, Inc., New York, N.Y.
Division of Ser. No. 481,138, June 20, 1974, Pat. No. 3,959,769. This application Oct. 14, 1975, Ser. No. 621,662
The portion of the term of this patent subsequent to May 25, 1993, has been disclaimed.
Int. Cl.² G06K *9/00*
U.S. Cl. 340—146.3 SY 9 Claims



1. Method of recording a signature comprising the steps of generating an analog electrical signal having a variable property which represents the continuously variable pressure between a stylus and a writing surface exerted by a subject when signing a signature, periodically sampling the analog electrical signal, and converting the average magnitude of the variable property of the analog electrical signal occuring during each sampling period to a coded combination of bits defining the number representing said average magnitude and storing said coded combinations of bits.

4,035,770
SWITCHING SYSTEM FOR USE WITH COMPUTER DATA LOOP TERMINALS AND METHOD OF OPERATING SAME

Susan Lillie Sarle, 24 Cherry Lane, Chatham, N.J. 07928
Filed Feb. 11, 1976, Ser. No. 657,039
Int. Cl.² H04Q *1/20*, *1/52*; G06F *3/04*
U.S. Cl. 340—147 R 17 Claims

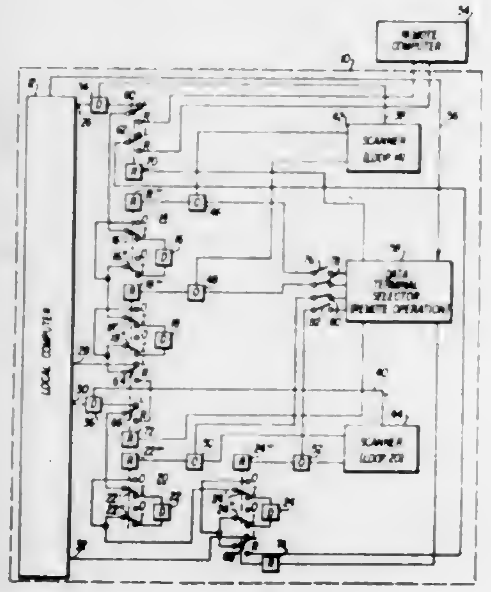
1. A switching system for use with a plurality of data terminals connected in series in a loop, the ends of which are connected to a first computer or the like so that said first computer communicates with said data terminals, said system comprising

- a plurality of switching means each having at least an input terminal, a first output terminal and a second output terminal;
- said loop being arranged in a plurality of subloops respectively corresponding to said plurality of data terminals where the data terminals are respectively disposed at the ends of said subloops remote from said first computer and

the other ends of said subloops are disposed at a single location and where each subloop includes at least one input wire extending from said single location to the input of the data terminal associated with the subloop and at least one output wire extending from the output of said associated data terminal to said single location;

means for operating each said switching means from a first position to a second position or vice versa;

said plurality of switching means being disposed at said single location and associated with said plurality of subloops so that for each subloop there is a first and second of said switching means where the first switching means is associated with the input wire for the subloop and the second switching means is associated with the output wire for the subloop so that in response to each switching means being in its said first position, the input terminals thereof are respectively connected to their associated first output terminals and in response to each switchimg means being in its said second position the said last-mentioned input terminals are respectively connected to their associated second output terminals;



the first output terminal of each first switching means being connected to the input wire of its associated subloop and the first output terminal of each second switching means being connected to the output wire of its associated subloop so that the data terminal of the subloop is connected into said loop in response to its associated switching means being in its said first position;

the input terminal of each first switching means being connected to the input terminal of the second switching means associated with the subloop immediately prior to the subloop containing said last mentioned first switching means to complete the connection from subloop to thereby form said loop;

a shorting wire connected from the second output terminal of each first switching means to the input terminal of each second switching means so that any data terminal and its associated input and output wires may be simultaneously removed completely from said loop by operating its associated switchimg means to its said second position while substantially at the same time the open circuit introduced in the loop by the removal of the data terminal and its associated input and output wires is shorted out.

4,035,771
PROCESS FOR THE REMOTE TRANSMISSION AND INDICATION OF ELECTRICAL MEASURED VALUES IN ELECTROLYSIS CELLS

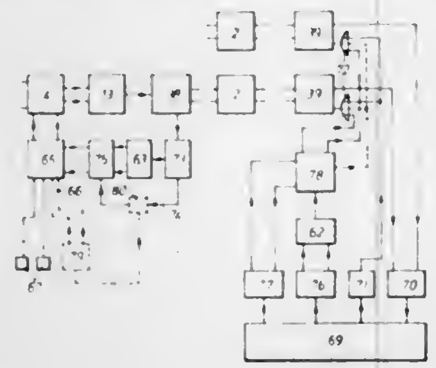
Walter Büsing, Bergisch Gladbach; Hans Richert; Martin Weist, both of Leverkusen, and Eberhard Zirngiebl, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Feb. 11, 1974, Ser. No. 441,592

Claims priority, application Germany, Feb. 27, 1973, 2309611

Int. Cl.^{2} G01N *27/42;* H04Q *9/00*

U.S. Cl. 340—151 **19 Claims**



1. A process for the remote transmission and indication of measured values of a plurality of check point of an electrolysis cell, comprising (a) the steps of sequentially interrogating, at a sampling facility, the measured value of each of said check points by stepping a first electronic pulse counter through a multiplexer connected to the pulse counter, said pulse counter driven by a series of address pulses uniquely representative of each of said check points, (b) sequentially transmitting all of said measured values in the form of an analog current signal over a single two wire path to a separate monitoring facility, and by providing in the two wire path a direct current separating transformer, (c) sequentially distributing to a respective indicator each of said measured values received by said monitoring facility by stepping a second electronic pulse counter through a second multiplexer connected thereto, said second pulse counter driven by said series of address pulses, (d) and providing said series of address pulses of opposite polarity of the measured value siganl from a common pulse generating source at said monitoring means to said first counter over the same single two wire path, the monitoring facility and the sampling facitity each being connected to the signal wires by a signal routing unit discriminating between the operational states of address pulse transmission and measured value transmission by virtue of the polarity of the transmitted signal, said monitoring facility thereby alternately receiving data from said sampling facility and sending addressing data to said sampling facility over a maximum of two signal wires, irrespective of the number of check points on each cell monitored.

4,035,772
UTILITY METER READING SYSTEM

Takeshi Abe, and Keishin Tsuchiya, both of Tokyo, Japan, assignors to Ricoh Co., Ltd., Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,973

Claims priority, application Japan, Oct. 3, 1974, 49-114010

Int. Cl.^{2} H04Q *11/00*

U.S. Cl. 340—151 **5 Claims**

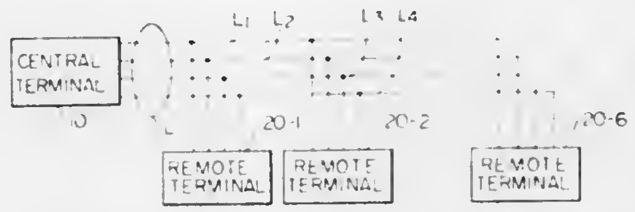
1. A utility meter reading system comprising:

a remote terminal having a plurality of storage means respectively connected to utility meters and adapted to store meter readings of the utility meters therein, each of the storage means respectively having a predetermined number of meter reading storage elements for storing the meter readings and a code storage element for storing a code;

a central terminal;

communication link means connecting the central terminal to the remote terminal;

the central terminal being operative to transmit storage means selection signals to sequentially energize the storage means and storage element selection signals to sequentially actuate the storage elements of an energized storage means, whereby the central terminal is operative to sequentially actuate the meter reading and code storage elements of the remote terminal to transmit the meter readings and the code to the central terminal;



decoder means adapted to receive the storage means and storage element selection signals, the decoder means having outputs connected to enable inputs of the storage elements of the storage means; and

code setting means for reversibly setting the codes into the code storage elements of the storage means, said code setting means comprising a receptacle having terminals connected to the code storage elements and a connection member detachably insertable into the receptacle, the connection member being adapted to connect desired terminals of the receptacle together and thereby set the codes into the code storage elements.

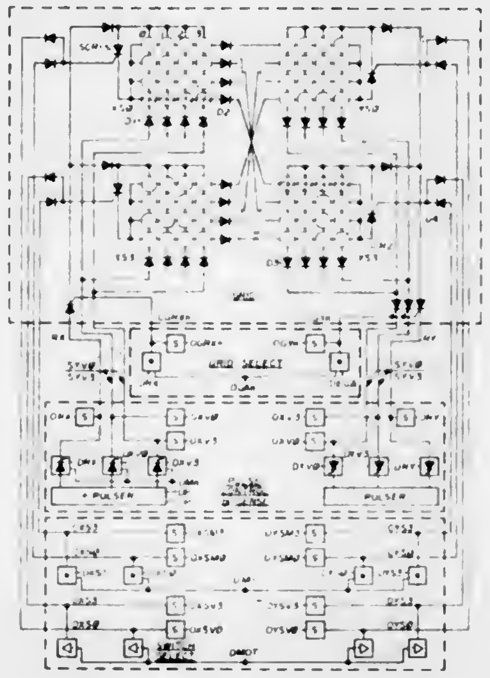
4,035,773
CONTROL OF LEAKAGE CURRENTS IN A SWITCHING MATRIX

Otto J. Kohout, Addison, and Gerald M. Rinaldi, Mundelein, both of Ill., assignors to GTE Automatic Electric Laboratories Incorporated, Northlake, Ill.

Filed Nov. 22, 1976, Ser. No. 744,077

Int. Cl.^{2} H04M *3/00*

U.S. Cl. 340—166 S **5 Claims**



1. In a crosspoint matrix arrangement for a space-divided communication switching network that includes a plurality of arrays of crosspoint connections having input terminals and output terminals, said arrays of crosspoints including a four by four matrix arrangement of four input terminal connections, four output terminal connections and 16 interior crosspoints, said matrix arrangement comprising a first plurality of said arrays, said arrays being associated in first and second space-divided switching stages for said first order switching means, a predetermined number of said arrays corresponding to the number of input terminal connections for each of said arrays providing a space-related grouping of said arrays within said first stage, each of said arrays within a selected space-related grouping of said first stage having an output terminal thereof connected to an input terminal of each of said arrays within an associated one of said identical space-related groups of said second stage array, respectively, a plurality of said space-related groupings provided in each of said first order switching means, said plurality thereof being equal in number to the number of input terminal connections of said first stage; each of said crosspoints including a first and a second inductive winding means, said first winding means of each abscissa order of four of said crosspoints of each said array connected in a first series path, said second winding means of each ordinate order of four of said crosspoints of each said array connected in a second series path, an individual one of a plurality of first switch means associated with each array, one terminal of each said series ordinate order paths in each array connected in common to a first terminal of said associated first switch means, one terminal of each said series abscissa order paths in each array connected in common to a second terminal of said associated first switch means, a second terminal of each said series ordinate paths of said arrays of said first switching stages individually connected to a corresponding array second terminal of each series ordinate path of said second switching stages, a first plurality of operate current pulse means, a second terminal of each said corresponding series abscissa paths of said first switching stage arrays connected together and to a corresponding first operate curent pulse means, a second plurality of operate current pulse sinks, a second terminal of each said corresponding series abscissa paths of said second switching stage arrays connected together and to a corresponding second operate current pulse sink, first means operated to selectively enable a particular one of said first plurality of operate pulse means and a particular one of said second plurality of operate current pulse sinks, second means to selectively enable a particular one of said plurality of first switch means associated with said first switching stages and a particular one associated with said second switching stages to thereby complete a current path through said first and said second winding means in a crosspoint in said corresponding arrays between selected current pulse means and said current pulse sink, to operate said selected crosspoints, and sensing means connected to each of said operate current pulse sinks, operated to produce an output upon sensing a completed current path through selected crosspoints.

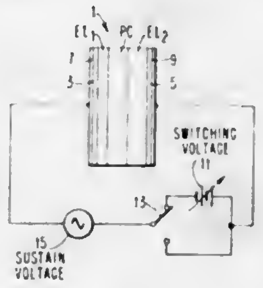
4,035,774
BISTABLE ELECTROLUMINESCENT MEMORY AND DISPLAY DEVICE

Ifay Fay Chang, Mahopac, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,262

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—166 EL **20 Claims**



1. An electroluminescent memory element, comprising;
a first layer of electroluminescent material;

a layer of photoconductive material having an excitation band within the emission band of said first layer of electroluminescent material and positioned adjacent thereto;

a second layer of electroluminescent material having an emission band outside the excitation band of said layer of photoconductive material and positioned adjacent said layer of photoconductive material and said first layer of electroluminescent materal to form a plurality of layers; and

means to apply voltage potential across said plurality of layers so that the memory element formed thereby may be caused to operate in either of two stable memory states.

4,035,775

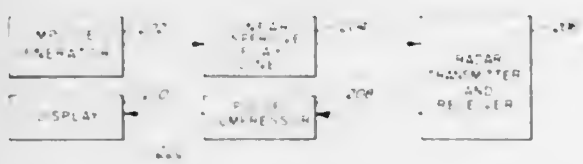
TEMPERATURE COMPENSATED ACOUSTIC SURFACE WAVE DEVICE

Manfred B. Schulz, Sudbury, and Melvin G. Holland, Lexington, both of Mass., assignors to Raytheon Company, Lexington, Mass.

Division of Ser. No. 492,791, July 29, 1974, Pat. No. 3,952,268, which is a division of Ser. No. 359,801, May 14, 1973, Pat. No. 3,931,420, which is a division of Ser. No. 185,601, Oct. 1, 1971, Pat. No. 3,786,373. This application Nov. 24, 1975, Ser. No. 634,948

Int. Cl.² G01S *7/28*

U.S. Cl. 343—17.2 PC **6 Claims**



1. A pulse compression radar system comprising:

means for generating an expanded pulse including a linearly dispersive delay line;

means for transmitting said expanded pulse;

means for receiving echoes from said transmitted pulse;

means for compressing said received pulse; and

wherein said linearly dispersive delay line and said means for compressing said transmitted pulse include a temperature compensated surface wave delay line in which the temperature coefficient of delay is minimized, said temperature compensated surface wave delay line comprising:

means for generating a predetermined waveform including a surface wave device comprised of at least an interdigital electrode array disposed on the surface of a substrate for launching a surface wave on said substrate, said means including a piezoelectric overlay film deposited on said electrode array and upon at least a portion of said substrate;

means for coupling said generated waveform to a matched filter comprised of an interdigital array interposed between a substrate and piezoelectric overlay film, the thickness of said overlay film being such that the temperature coefficient of delay of surface waves upon said substrate is minimized for surface waves of at least a predetermined wavelength; and

means for detecting the output of said matched filter.

4,035,776

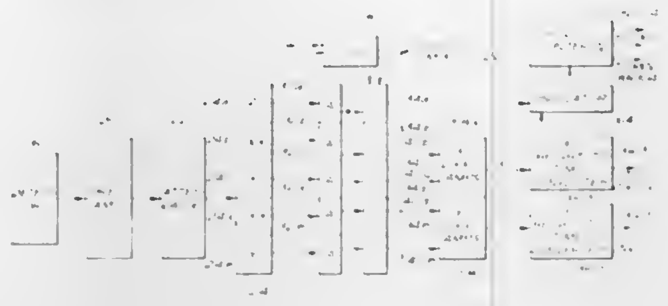
DATA DERANDOMIZER FOR RADIATION IMAGING DETECTION SYSTEMS AND METHOD OF OPERATION

Edward J. Socha, Trumbull, and Paul C. Talmadge, Ansonia, both of Conn., assignors to Picker Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 179,872, Sept. 13, 1971, abandoned. This application Sept. 6, 1974, Ser. No. 503,880

Int. Cl.² G06F *3/05*

U.S. Cl. 364—900 **21 Claims**



1. A data derandomizer circuit for a radiation scintillation imaging system, the system including detector circuitry for producing data signals each representing the location of a single randomly occurring radiation stimulus event emanating from a subject, each data signal produced substantially contemporaneously with the radiation stimulus event which it represents, said system also including an imaging apparatus responsive to the data signals for producing an image of the stimuli events represented by the data signals and a continuously operable processing apparatus connected between the detector circuitry and the imaging apparatus for processing said data signals for receipt by said imaging apparatus, said processing apparatus being able to accept an individual data signal only during one of a plurality of predetermined substantially equal and adjacent time slots, said data derandomizer being connected between said detector circuitry and said processing apparatus, said data derandomizer comprising:

a. a stacking circuit having a plurality of storage units for each unit being capable of receiving and storing only one of said plurality of said data signals, each storage unit corresponding to one of a sequence of different higher and lower priority levels ordered in accordance with the time order of occurrence of said data signals,

b. means for inserting said data signals as they occur into the lowest priority level storage unit, and

c. inventory control circuitry connected between said stacking circuit and said processing apparatus and comprising:

  i. a circuit for advancing each data signal stored in a storage unit and representing a single radiation stimulus event to the next higher priority level storage unit whenever said next higher priority level storage unit is not occupied by another data signal, and

  ii. a transfer synchronization circuit for transmitting a data signal present in the highest priority of the storage units to said processing apparatus in synchronism with the occurrance of the first of said time slots to occur after the appearance of said data signal in said highest priority level storage unit

whereby a plurality of said data signals each representing a single radiation stimulus event and having a time spacing less than the duration of a time slot can be stored and subsequently individually presented to the processing apparatus as rapidly as possible consistant with synchronism with the occurrence of the time slots to reduce loss of data signals which would otherwise occur because of the inability of the processing apparatus to accept all such data signals as rapidly as they occur.

4,035,777

DATA PROCESSING SYSTEM INCLUDING PARALLEL BUS TRANSFER CONTROL PORT

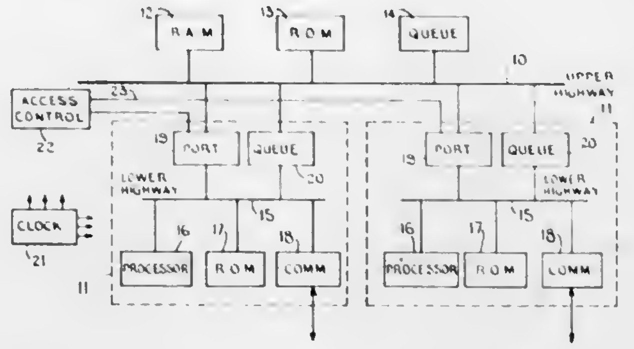
Derek Vidion Moreton, 15 Church Road, Alsager, Cheshire, England

Filed Dec. 12, 1974, Ser. No. 532,057

Claims priority, application United Kingdom, Dec. 14, 1973, 59311/73

Int. Cl.² G06F *13/00, 15/16*

U.S. Cl. 364—200 **4 Claims**



1. A data processing system comprising addressable storage units connected to each of first and second highways including control signal lines and address and data lines with each said unit capable of providing an address accepted response signal on the highway to which it is connected to indicate that the unit has responded to its address, wherein the improvement comprises a Port Unit comprising:

a. an address and data communication path connectable between the first and second highways

b. a storage means in said path for temporarily storing address and data information applied to the address and data lines of the first highway;

c. gate means normally interupting transfer of the content of the storage means to the second highway;

d. a first control circuit for controlling the operational state of the gate means, the circuit being so responsive to said address accepted response signals that if a said response signal is not received within a predetermined time interval from the application of the address to the first highway the control circuit causes the gate means to open the data communication path, to allow transfer of the content of the storage means to the addressed unit connected to the second highway; and

e. a second control circuit for decoding signals applied to the first highway control lines, and for producing an output which is applied to the first control circuit to initiate the operation thereof.

4,035,778

APPARATUS FOR ASSIGNING SPACE IN A WORKING MEMORY AS A FUNCTION OF THE HISTORY OF USAGE

Mohamed Zein El-Aeiden Ghanem, Ossining, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,411

Int. Cl.² G11C *9/06*

U.S. Cl. 364—200 **4 Claims**

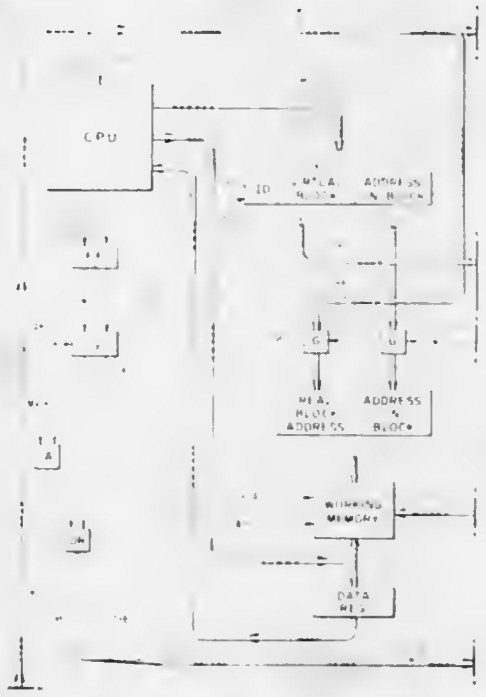
1. In a data procesing system having a working memory and a backup store, in which a plurality of different classes of information, each consisting of a plurality of blocks, are all stored in the backup store, and a lesser number of blocks of each class are stored in the working memory through which all accesses are effected, means for allocating space in said memory among the plurality of classes competing for space therein in accordance with the relativity of stored block and class weighting criteria and an overall weighting norm, all of which are periodically updated as a function of the history of accesses to said working memory comprising;

sequencing means operative to provide a succession of signals for controlling the sequencing of the operation of a plurality of instrumentalities;

means responsive to the accessing of said working memory and operative under control of said sequencing means to derive and store for each block in working memory a reference number, the magnitude of which manifests the number of memory accesses since each respective block was last accessed;

means responsive to the failure to find a sought block in said working memory and operative under control of said sequencing means to derive and store a set of weighting parameters for that class to which the missing block belongs, the said set being a predetermined function of the reference numbers of the blocks belonging to that class;

means under control of said sequencing means, following completion of the derivation and storage of the class weighting parameters, to extract from storage the prior computed overall norm weighting value, the prior computed class weighting criteria, and the number of classes in said working storage, and computing and storing as a predetermined function of these and said set of weighting parameters for the class, an updated overall weighting norm;



means under control of said sequencing means for comparing said overall norm weighting value with each set of stored class weighting parameters, and selecting the value most nearly equal to said norm and choosing as a numerical designator for each class the ordinal position in the set of the thus-selected value, and storing the selected value and numerical designator as weighting criteria for each class; and

means under control of said sequencing means for comparing the numerical designator for each class with the reference value of all blocks of the corresponding class and marking those blocks for replacement whose reference number exceeds the corresponding designator value.

4,035,779

SUPERVISOR ADDRESS KEY CONTROL SYSTEM

Richard Eugene Birney; Michael Ian Davis; Robert Allen Hood; Thomas Stephen McDermott, and Larry Edward Wise, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,985

Int. Cl.² G06F *13/00*

U.S. Cl. 364—200 **6 Claims**

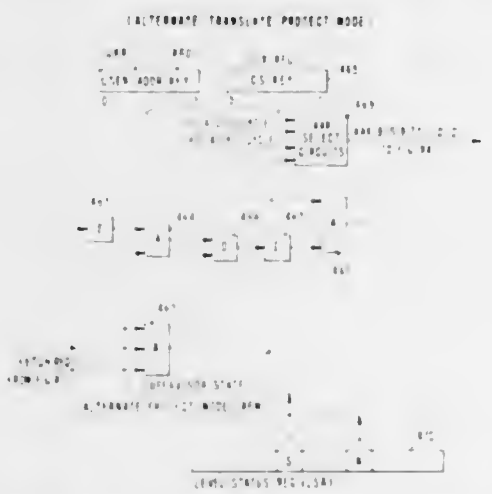
1. A supervisor addressability control system for controlling

the quantity of limited addressability available to a supervisor and to a user in a main memory, comprising

a status register having a first bit position providing a supervisor state signal for indicating whether the system is in supervisor state or not, and a second bit position providing an alternate protect mode (APM) signal indicating whether the system is in the alternate protect mode or not,

a user address key register (UKR) for containing an address key that makes available to a processor a user's addressability in the main memory which may contain the user's programs and data,

supervisor/user addressability switching AND gate means having inputs receiving the supervisor state signal, the APM signal, and an instruction fetch signal provided by the processor, an output of the switching AND gate means being enabled when the APM mode, supervisor state, and instruction fetch input signals all exist simultaneously, the output being disabled when any input signal is not activated,



key-providing AND gate means having one input connected to the output of the UKR, and another input connected to an inverted output of the switching AND gate means,

whereby the output state of the key-providing AND gate means provides the supervisor address key while the switching AND gate means is disabled so that an instruction must be fetched within the supervisor addressability, and provides the user address key while the switching AND gate means is enabled which occurs while the supervisor is not fetching an instruction so that an executing supervisor instruction can access operand(s) within the user addressability.

4,035,780
PRIORITY INTERRUPT LOGIC CIRCUITS

Lawrence J. Kristick, Phoenix; Knute S. Crawford, and Jaime Calle, both of Glendale, all of Ariz., assignors to Honeywell Information Systems, Inc., Waltham, Mass.

Filed May 21, 1976, Ser. No. 688,668

Int. Cl.² G06F *9/18*

U.S. Cl. 364—900 **25 Claims**

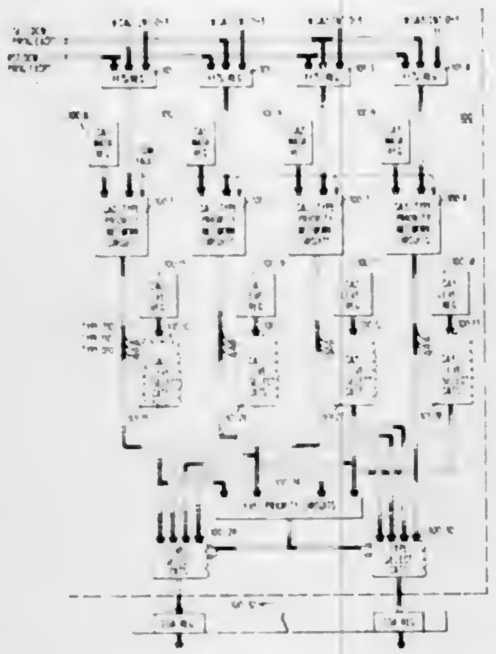
1. Priority interrupt apparatus comprising:

register means for storing sets of coded signals representative of priority interrupt levels assigned to a number of different types of events;

a number of fixed priority logic means, each connected to receive a plurality of input event signals representative of said different types of events, each said fixed priority logic means being operative in response to more than one event signal to generate coded signals identifying the type of event signal having the highest priority in accordance with a predetermined fixed priority based on event type;

a number of level selector means, each being connected to receive a plurality of sets of interrupt level signals from said register means and said type signals from a different one of said number of fixed priority logic means, each said selector means being conditioned by said type signals to apply one of said sets designated by said type signals as an output;

comparator circuit means having a plurality of groups of input terminals, each group connected to one of said selector means and a plurality of output terminals, said comparator circuit means generating result output signals at said plurality of output terminals indicative of the relative magnitudes of pairs of said sets of signals applied to said groups of input terminals; and



output circuit means coupled to receive said result output signals, said output circuit means including means for logically combining said result output signals to generate output signals for designating the source of interrupt level signals of the highest priority event.

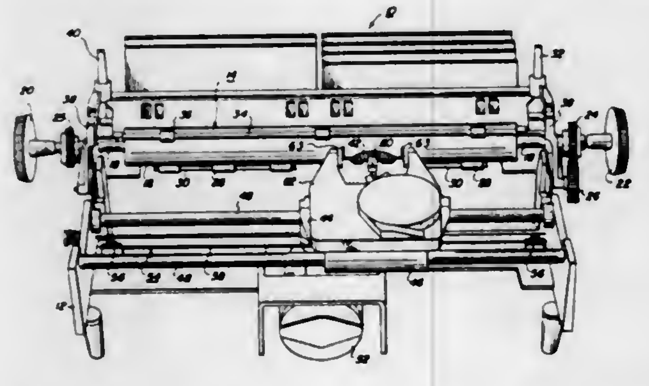
4,035,781
SIGNAL PRIORITY LOGIC FOR SERIAL PRINTER

Louis H. Chang, San Jose, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,936

Int. Cl.² G06F *1/04, 3/12;* **B41J** *9/00*

U.S. Cl. 364—900 **15 Claims**



1. In a serial printer comprising a carriage movable along a predetermined path, a print member rotatably mounted to said carriage and including a plurality of character elements, first drive means coupled to said print member for rotating said print member to a desired rotational position, second drive means coupled to said carriage for moving said carriage to a desired position along said path, and control apparatus coupled to said first drive means for controlling the direction and speed of rotation of said print member and coupled to said second drive means for controlling the direction and speed of rotation of said carriage, said control apparatus comprising:

first means for receiving and storing a first signal indicative of said desired rotational position of said print member;

second means for receiving and storing a second signal indicative of said desired position of said carriage along said path;

means coupled to said first and second means for receiving and storing for generating a third signal if said first signal was received before said second signal; and

means coupled to said means for generating and responsive to said third signal for controlling said first drive means to rotate said print member to said desired rotational position before controlling said second drive means to move said carriage to said desired position along said path.

4,035,782
CHARGE COUPLED DEVICE CIRCUIT FOR USE WITH A SEMICONDUCTOR STORAGE UNIT OR A SEMICONDUCTOR LOGICAL UNIT

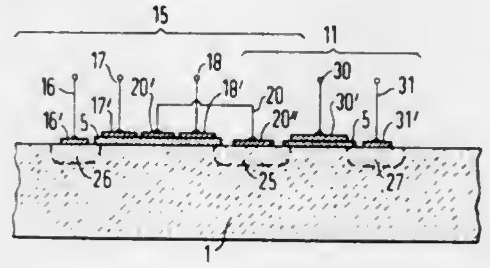
Karl Goser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed June 25, 1975, Ser. No. 590,275

Claims priority, application Germany, June 27, 1974, 2430947

Int. Cl.² G11C *11/44*

U.S. Cl. 340—173 CA **5 Claims**



1. A logic circuit comprising:

a voltage supply line;

a reference line;

first and second voltage pulse lines for receiving respective voltage pulse trains whose pulses are of predetermined amplitude; and

a storage element and a load element connected in series between said supply and reference lines,

said storage element including a zone which is subject of charge leakage in a predetermined logic state which effects a potential at said zone which varies as a function of the charge leaked, and a first conduction electrode carried on said zone;

said load element comprising a charge device including a substrate, a second conduction electrode connected to said supply line and first, second and third aligned control electrodes, said first and third control electrodes connected to said first and second voltage pulse lines, respectively, and said second control electrode connected to said first conduction electrode whereby the portion of charge flow between the substrate regions corresponding to said second and third control electrodes compensates charge lost through leakage.

4,035,783
ANALOG DELAY CIRCUIT

Clifford Earl Mathewson, 18624 Vintage, Northridge, Calif. 91324

Filed Nov. 12, 1975, Ser. No. 631,079

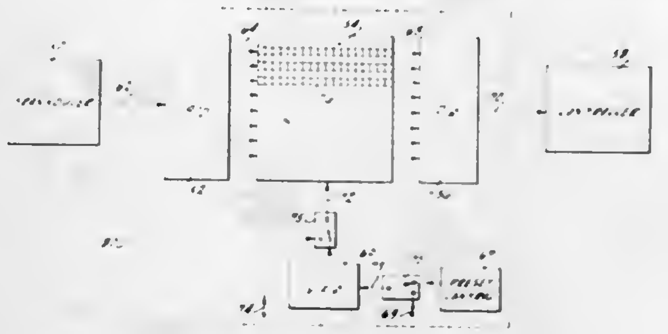
Int. Cl.² G11C *13/00*

U.S. Cl. 340—173 R **5 Claims**

1. An apparatus for automatically comparing time varied characteristics in a dynamic system, comprising in combination:

at least one first transducer means for sensing a first characteristic of the system at a first point in time, and for producing an analog electrical signal corresponding to the first characteristic;

digital delay circuit means for receiving the analog signal, for holding the signal for a preselected time period and for producing a true, relative to the received analog signal, output analog signal, said delay circuit means including at least an analog-to-digital real time signal converter, digital signal memory storage having an externally responsive information release, a variable frequency oscillator for generating stepping signals, delay interval selecting means for controlling the variable frequency oscillator, and a digital-to-analog real time signal converter;



second transducer means for sensing a second characteristic of the system at a second point in time not coincidental with the first point, and for producing an analog electrical signal corresponding to the second characteristic;

comparator means for receiving the delay circuit means output analog signal and the second transducer means analog signal, for comparing the two signals and producing an electrical control signal responsive to the comparison; and

means responsive to the electrical control signal for manipulating functions of the dynamic system.

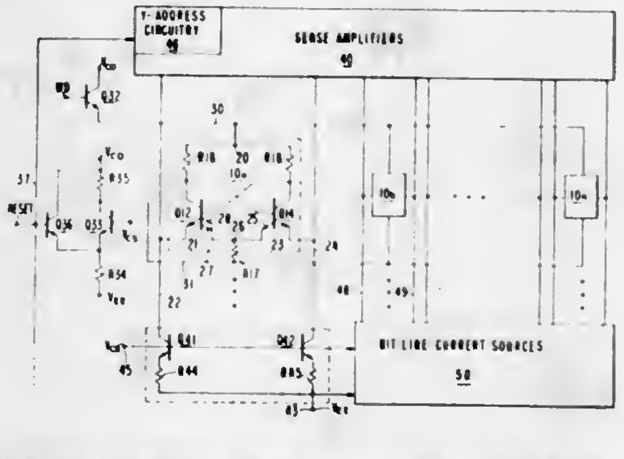
4,035,784
ASYMMETRICAL MEMORY CELL ARRANGEMENT

George W. Brown, San Jose, Calif., assignor to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Filed Dec. 22, 1975, Ser. No. 642,956

Int. Cl.² G11C *11/40*

U.S. Cl. 340—173 R **7 Claims**



7. A semiconductor memory structure comprising:

a. a semiconductor substrate of a first conductivity type;

b. a pair of base regions formed in said substrate from a semiconductor material of the same conductivity type as, but of a higher concentration than, said substrate;

c. a pair of collector regions being formed from a semiconductor material opposite to said base regions;

d. a first pair of equal size emitter regions formed in a first of said pair of base regions, said first pair of emitter regions being formed from a semiconductor material opposite to said base regions; and,

e. a second pair of emitter regions formed in a second of said pair of base regions, a first of said second pair of emitter regions being formed larger than the second of said second pair of emitter regions, said second pair of emitter regions being formed from a semiconductor material opposite to said base regions, such that information is written into and a latent bit pattern is simultaneously stored in the momory cell structure without the use of an externally generated and directed stimuli to distinguish between reading and writing modes of operation of the memory cell.

4,035,785
BUBBLE DOMAIN SENSOR-ERROR DETECTOR

Mark Howard Kryder, Yorktown Heights, N.Y., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 31, 1975, Ser. No. 645,739

Int. Cl.² G11C *11/14, 19/00*

U.S. Cl. 340—174 TF **13 Claims**

1. An apparatus for detection of magnetic bubble domains in a magnetic medium, comprising:

a first thick sensor element comprised of a magnetic material disposed in flux coupling proximity to a first bubble domain data pattern following a path in said magnetic medium in response to the application of cycles of a drive field and a first associated thick dummy sensor element comprised of a magnetic material also disposed in flux coupling proximity to said first bubble domain data pattern as it continues along said path,

a second thick sensor element comprised of a magnetic material disposed in flux coupling proximity to a second bubble domain data pattern following a second path in said magnetic medium in response to the application of said cycles of drive field and a second associated thick dummy sensor element comprised of a magnetic material also disposed in flux coupling proximity of said second bubble domain data pattern as it continues along said path in said magnetic medium,

said first and second sensor elements and said first and second dummy sensor elements being arranged in an electrical bridge circuit, said apparatus detecting said data bubble domains during each cycle of said drive field.

4,035,786
OPERATION STATE MONITORING APPARATUS

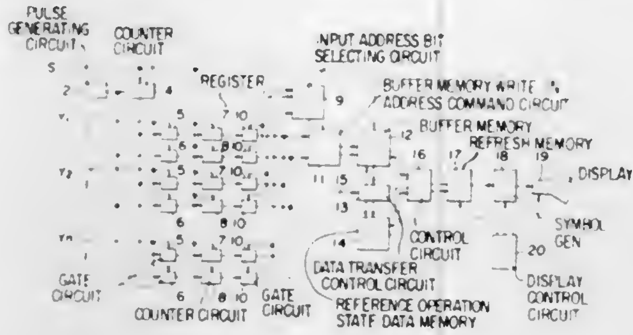
Nobuharu Yamauchi; Masaji Matsumura, and Katsuhide Morimoto, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 27, 1975, Ser. No. 562,869

Claims priority, application Japan, Mar. 28, 1974, 49-34500

Int. Cl.² G01D *7/12;* **G06K** *15/20*

U.S. Cl. 340—213 Q **5 Claims**



1. An operation state monitoring apparatus comprising:

a counter device for counting a duration of at least one of the ON state or the OFF state of input signals which are independent for each of the operation states of a controlled object;

a memory device for memorizing a duration from the operation initiating reference time when the input signal is switched from the ON state to the OFF state or from the OFF state to the ON state;

a reference operation state data memory for previously setting the reference operation state of said controlled object;

means for generating a signal signifying agreement or disagreement of the actual operation state data given by the data of said counter device and said memory device with the reference operation state data given from said reference operation state memory; and

means for setting desirable data selected from the actual operation state data in said reference operation state data memory as the reference operation state data.

4,035,787
FOOD TEMPERATURE RESPONSIVE CONTROL APPARATUS

Richard E. Hornung, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.

Filed Oct. 21, 1975, Ser. No. 624,336

Int. Cl.² G08B *19/00, 29/00*

U.S. Cl. 340—228 R **12 Claims**

1. Food temperature responsive control apparatus comprising:

a. means for sensing the internal temperature of food being cooked in an oven, said sensing means including a sensing circuit having a temperature sensing thermistor;

b. first signal-producing means connected to said sensing circuit for producing a first signal when the temperature sensed by said thermistor exceeds a preset temperature, and additionally when an electrically short-circuited conditions exists in said sensing circuit, the short-circuited condition effectively short circuiting the terminals of said thermistor;

c. output switching means capable of being placed in first and second conditions;

d. second signal-producing means for producing a second signal to place said output switching means in the second condition when the temperature apparently sensed by said thermistor falls outside an expected range of sensed temperatures when an electrically open-circuited condition exists in said sensing circuit;

e. third signal-producing means for producing a third signal to place said output switching means in the second condition in response to continuation of the first signal for a predetermined length of time; and

f. latching means for maintaining said output switching means in the second condition once said output switching means has been placed in the second condition.

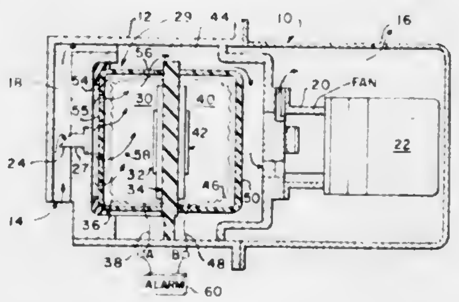
4,035,788
INCIPIENT FIRE DETECTOR

Laurence Gibson Barr, Mission Viejo, Calif., assignor to Celesco Industries Inc., Costa Mesa, Calif.

Filed Jan. 15, 1976, Ser. No. 649,344

Int. Cl.² G08B *17/10*

U.S. Cl. 340—237 S **4 Claims**



1. An incipient fire detector comprisng:

a. fluid flow path means for channeling fluid containing particulates generated by incipient fire conditions;

b. means for aerodynamically diverting and collecting from the fluid in said flow path means fluid containing unfiltered particulates having a size less than 5 microns and rejecting substantially all particulates having a size above 5 microns;

c. a flow-through ionization particulate detector having means for directing said diverted fluid through said particulate detector and back into said flow path means;

d. means for generating fluid flow at a controlled rate through said fluid flow path means and through said particulate detector via said directing means; and

e. means for providing an output from said ionization particulate detector to permit processing the number of particulates in said diverted fluid sensed by said ionization particulate detector as an indication of an incipient fire condition.

4,035,789
LIQUID LEVEL SENSING SYSTEM

Sigeyuki Akita, and Junji Kitagawa, both of Okazaki, Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed May 27, 1975, Ser. No. 580,754

Claims priority, application Japan, June 3, 1974, 49-62691

Int. Cl.² G08B *21/00*

U.S. Cl. 340—244 R **5 Claims**

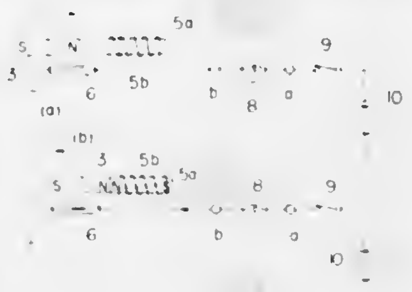
1. A liquid level sensing system comprising:

a permanent magnet on which the viscosity resistance of a liquid to be measured acts;

electromagnetic means for causing said permanent magnet to set up a self-vibration; and

a magnetic flux change detector for detecting the variations of magnetic flux caused by the vibrations of said permanent magnet, whereby in accordance with the variations of said viscosity resistance acting on said permanent magnet caused by the variations of the level of said liquid, said permanent magnet is caused to set up or stop a self-vibration and thereby to detect the level of said liquid,

wherein said electromagnetic means is fixedly mounted in a housing, said permanent magnet is displaceably mounted in said housing relative to said electromagnetic means, and said magnetic flux change detector is fixedly mounted in said housing to detect the positions of said permanent magnet,



wherein said electromagnetic means include a coil wound into a cylindrical form and an iron core inserted into said coil in the axial direction thereof, and said iron core is magnetized by the energization of said coil to repel said permanent magnet, and

wherein said magnetic flux change detector is connected in series with said coil, whereby the supply of current to said coil is switched on and off in response to the positions of said permanent magnet.

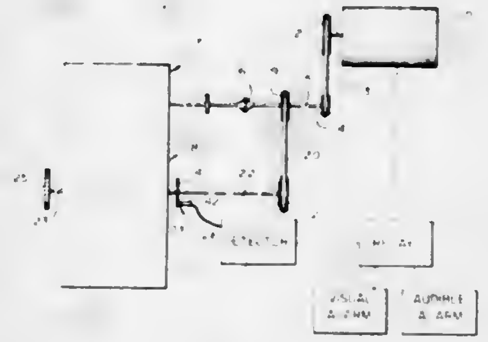
4,035,790
MONITORING DEVICE FOR FIBER CUTTER

Harold Farmer, Griffith, Ind., assignor to United States Gypsum Company, Chicago, Ill.

Filed Feb. 4, 1976, Ser. No. 655,308

Int. Cl.² G08B *21/00*

U.S. Cl. 340—267 R **20 Claims**

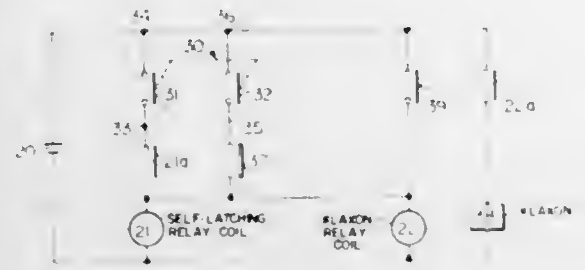


1. A monitoring device adapted for use in combination with a cutting apparatus designed for cutting long fiber roving strands into short cut fibers, said monitoring device comprising a frame, a plurality of rotatably mounted assemblies, each of said assemblies comprising a shaft rotatably mounted in said frame, and long fiber strand-engaging means mounted on said shaft, said frame having inlet and outlet for said cut fibers, means for rotating said rotatably mounted assemblies, said rotatably mounted assemblies being arranged when rotated to permit cut fibers to pass therethrough but to engage and become entangled with long fiber roving strands which pass into said monitoring device as a result of a malfunction of said

cutting apparatus, thereby causing said rotatably mounted assemblies to stop rotating, and means for the detecting discontinuation of rotation of said rotatably mounted assemblies.

4,035,791
DOOR ALARM CONTROLLED BY OPERATION OF DOOR LOCK

Eizo Katayama, 11-6, Motohama, Nagahama, Shiga, Japan
Filed May 16, 1975, Ser. No. 578,344
Int. Cl.² G08B *13/08*; **B60R** *25/10*
U.S. Cl. 340—274 R **2 Claims**



1. A burglar alarm device comprising:

a door lock attachable to a door, said door lock including a cylinder and a rotary axle extending through said cylinder;

a switch positioned to be closed by a locking operation of said door lock;

a door switch positioned to be closed by an opening operation of said door;

a self-latching electric circuit means connected to said switches for maintaining a conducting state caused by a closing operation of said door switch when said first-mentioned switch is closed;

an alarm connected to and controlled by said circuit means; and

said first-mentioned switch comprising a switch box fixed to the outer surface of said cylinder of said door lock, said switch box having therein a semi-circular recess, a slide slidably movably positioned within said recess in said switch box, said slider having therein a groove, means for moving said slider within said recess in said switch box upon locking and unlocking movement of said door lock, said moving means comprising a projection having a first end fixed to said rotary axle of said door lock and a second end extending into said groove in said slider, said projection extending through said cylinder, a two-part first conductor and a second conductor facing said first conductor, one of said conductors being on the inside of said switch box, and the other of said conductors being on said slider, whereby a locking operation of said door lock causes said second conductor to bridge the two parts of said first conductor, thus closing said first-mentioned switch.

4,035,792
CASH REGISTER SECURITY SYSTEM

Robert L. Price, 2323 Elden, Apt. 26, Costa Mesa, Calif. 92627, and Edward R. Davenport, Jr., 324 Pirate Road, Newport Beach, Calif. 92663
Filed June 25, 1976, Ser. No. 699,948
Int. Cl.² G08B *13/02*
U.S. Cl. 340—277 **10 Claims**

1. A security system for a cash register having at least two drawers and a drawer opening mechanism comprising:

a first latch normally adapted to engage and hold within a cash register a false drawer thereby securing the false drawer within the cash register;

release means connected to said first latch for releasing said first latch from engaging and holding the false drawer from within the cash register;

a second latch adapted to engage and hold within the cash register a cash drawer, said second latch normally being in disengagement with the cash drawer;

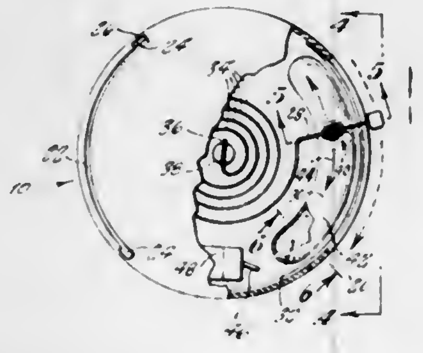
locking means connected to said second latch for locking said second latch in engagement with the cash drawer and holding the cash drawer within the cash register;

an alarm circuit connected to said release means and said locking means for activating said release means and said locking means, respectively; and

an alarm switch means for operating said alarm circuit whereby when the alarm switch is operated only the false drawer may be ejected from the cash register.

4,035,793
SIGNALING INTERVAL TIMER

Vincent M. Jennings, 25 Fairmount Ave., Hackensack, N.J. 07601
Filed June 11, 1976, Ser. No. 695,256
Int. Cl.² G04F *1/08*; **H01H** *47/18*
U.S. Cl. 340—309.1 **7 Claims**



1. A signaling interval timer comprising:

a hollow unitary housing having an elongated slot in a peripheral edge thereof;

a sealed flexible hollow elongated bag fixedly secured within said housing adjacent said elongated slot, said elongated bay being filled with a viscous liquid;

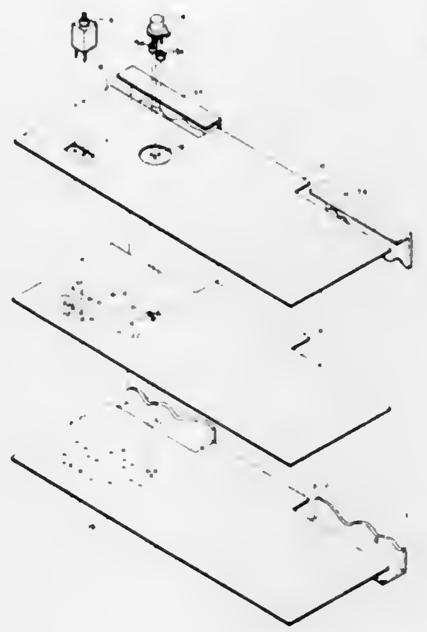
a spiral coil spring mounted within said housing having the outer free end thereof extending generally radially outwardly to thereby form an arm adapted to slide within said slot arm section adapted to slidably cooperate with and frictionally move across a surface of said elongated bag and exert a predetermined pressure thereon;

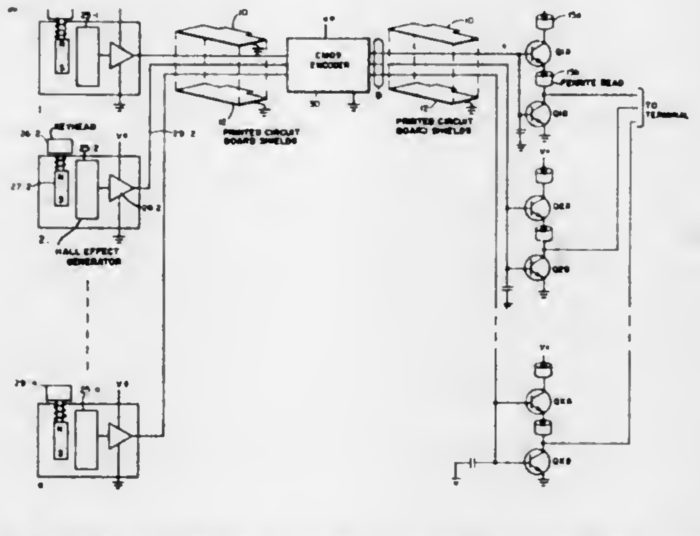
pressure regulating means for varying the pressure said arm exerts against said elongated bag;

and signal means for providing an audible signal when said arm moves to a predetermined position along said path.

4,035,794
RADIATION SUPPRESSED KEYBOARD

Daniel J. Norton, Hudson, and Rupert J. Cooke, Amherst, both of N.H., assignors to Harris Corporation, Cleveland, Ohio
Filed Nov. 19, 1975, Ser. No. 633,303
Int. Cl.² G08C *25/00*
U.S. Cl. 340—365 E **6 Claims**





1. A data processing terminal keyboard in which spurious information bearing electromagnetic radiation is suppressed comprising

a first printed circuit board having printed circuit paths thereon,

at least one keyswitch with said keyswitch generating low level switching signals having few transients upon being actuated,

means for encoding said keyswitch signals, said encoding means being connected to said keyswitch via first printed circuit paths on said first board,

means for amplifying encoded keyswitch signals output from said encoding means and applying said amplified signals to output leads for application to other equipment in said data processing terminal, said amplifying means being connected to said encoding means via second printed circuit paths on said first board,

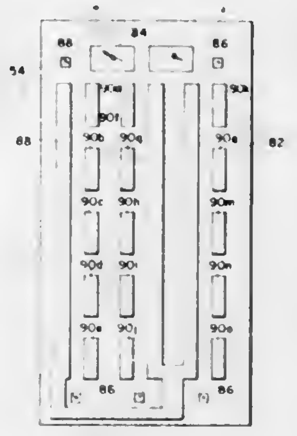
a second printed circuit board placed parallel to the top of said first board said second board having its conductive circuit path material electrically grounded to shield said first board and minimize said radiation caused by said switching signals and said encoded keyswitch signals on said first and said second printed circuit paths radiating from said keyboard, the conductive circuit path material on said second board being electrically insulated from said printed circuit paths on said first board,

a third printed circuit board placed parallel to the bottom of said first board said third board having its conductive circuit path material electrically grounded to shield said first board and minimize said radiation caused by said switching signals and said encoded keyswitch signals on said first and said second printed circuit paths radiating from said keyboard, the conductive circuit path material on said third board being electrically insulated from said printed circuit paths on said first boards, said first board being sandwiched between said second and said third boards, and

beads having inductive properties and each bead having a hole therethrough with selected ones of the leads of said amplifying means passing through the hole in ones of said beads to suppress generation of said radiation.

4,035,795
TOUCH KEYBOARD SYSTEM FOR DIGITAL LOGIC CONTROL

Robert D. Fosnough, and David F. Bennett, both of Logansport, Ind., assignors to Essex International, Inc., Fort Wayne, Ind.
Division of Ser. No. 561,277, March 24, 1975, Pat. No. 4,011,428. This application Apr. 20, 1976, Ser. No. 678,570
Int. Cl.² G08C *1/00*
U.S. Cl. 340—365 C **2 Claims**



1. A touch keyboard system for use with a digital logic control, which comprises:

a touch plate comprised of a dielectric substrate having a plurality of pairs of serially connected capacitances formed thereon, each said pair of serially connected capacitances comprising a first electrically conductive coating on a first side of said substrate and second and third spaced apart electrically conductive coatings on the second side of said substrate coextensive with said first coating;

an oscillating input signal applied to said third electrically conductive coatings;

a semiconductor switch having input, output and control terminals for each pair of serially connected capacitances, the input terminal of each semiconductor switch being electrically connected to said second electrically conductive coating of each said pair of serially connected capacitances, the output terminals of said semiconductor switches being connected together;

scanning means connected to the control terminals of said semiconductor switches for sequentially turning on said semiconductor switches;

detecting circuit means connected to the output terminals of said semiconductor switches for detecting the absence of said oscillating input signal;

said oscillating input signal normally being applied to said detecting circuit means through said serially connected capacitances and said semiconductor switches;

said first electrically conductive coatings being user touchable to couple the body capacitance of the user to ground so that the level of said oscillating input at said detecting circuit means is substantially reduced when touched; and

latch circuit means connected with said scanning circuit means and said detecting circuit means for storing a binary number therein which is indicative of the electrically conductive coating touched.

4,035,796
DEVICE FOR REDUCING UNDESIRED ENERGY CONSUMPTION IN A ROOM PROVIDED WITH HEATING AND/OR AIR CONDITIONING MEANS

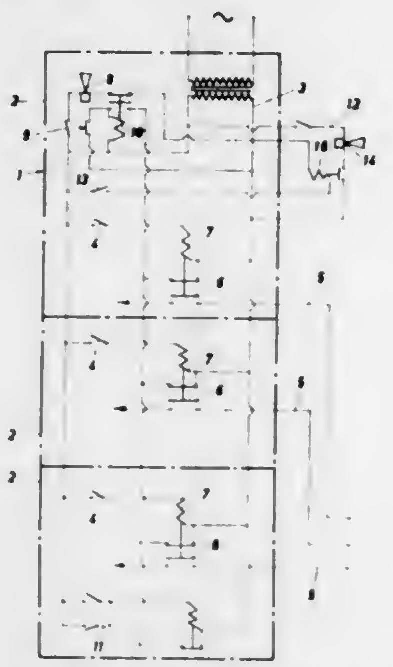
Sven Hedly, Stamsjovagen 10A, Lerum, Sweden (443 00), and Lars Winhammar, Tappvagen 3, Saltsjo-Boo, Sweden (132 00)

Filed Aug. 4, 1975, Ser. No. 601,410

Claims priority, application Sweden, Aug. 6, 1974, 7410081

Int. Cl.^{2} G08B *19/00*

U.S. Cl. 340—417 **6 Claims**



1. A device for reducing undesired energy consumption in a room provided with heating and/or air conditioning means, characterized by an electric control circuit (3) arranged in the room and provided with a number of contacts (4; 16) located at closable openings in the room and adapted to be influenced by the position of closure elements arranged in said openings, in such a manner that the contacts when the openings are closed will allow energy supply to the said heating or air conditioning means, while being adapted to break said energy supply when one or more of said closure elements is opened, said contacts when breaking said energy supply further being adapted to close an alarm activating circuit provided with an alarm activating switch (9; 21) and arranged to activate an alarm apparatus (8; 20) in said alarm circuit provided the alarm activating switch is closed.

4,035,797
POLARIZED RADAR SYSTEM FOR PROVIDING TARGET IDENTIFICATION AND DISCRIMINATION

Louis L. Nagy, Warren, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1975, Ser. No. 631,851

Int. Cl.^{2} G015 *9/42*

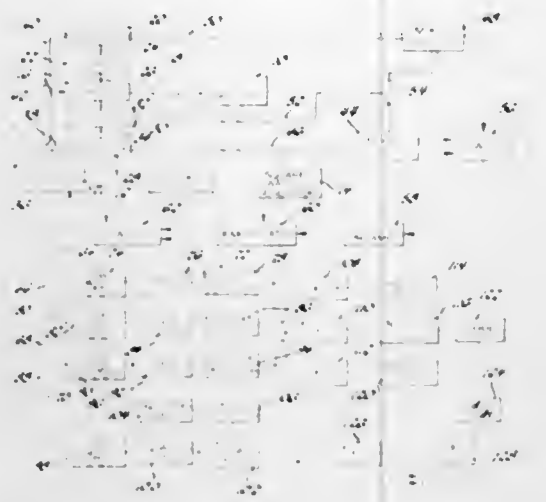
U.S. Cl. 343—5 SA **3 Claims**

1. A polarized automotive radar system for providing target identification and descrimination, comprising:

means effective to transmit polarized RF signals toward a target;

means effective to receive RF signals reflected from the target and being separately responsive to two orthogonally polarized received RF signals;

means responsive to the received orthogonally polarized RF signals and effective to generate an electrical signal representing the ratio of the magnitude of the two received orthogonally polarized RF signals; and



means effective to differentiate the electrical signal with respective time, whereby the magnitude of the differentiated electric signal during range variations between the radar system and the target provides information relating to target identification and discrimination.

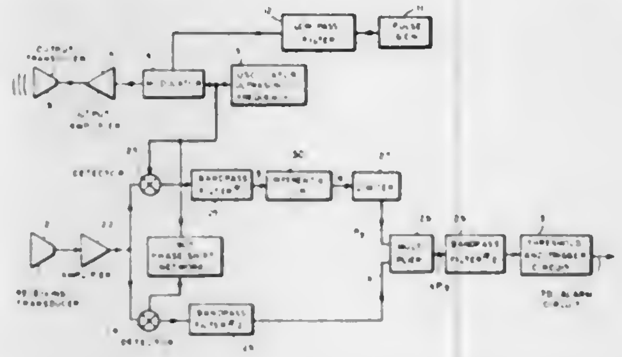
4,035,798
ULTRASONIC INTRUSION DETECTION SYSTEM

Kenneth R. Hackett, Boulder, Colo., assignor to Pittway Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 455,260, March 27, 1974, Pat. No. 3,942,178. This application Jan. 26, 1976, Ser. No. 652,049

Int. Cl.^{2} G01S *9/42, 9/66;* G08B *13/00*

U.S. Cl. 343—5 PD **12 Claims**



1. The method of detecting moving target echos in the presence of interference comprising the steps of radiating modulated carrier energy and receiving echo return energy, hetrodyning carrier and received energy signals to produce separate quadrature beat frequency signals, differentiating and amplitude limiting one of said beat frequency signals, multiplying the differentiated and limited signal and the other beat frequency signal to obtain the four quadrant product of the signals multiplied, selecting a modulation component from said product and integrating said modulation component.

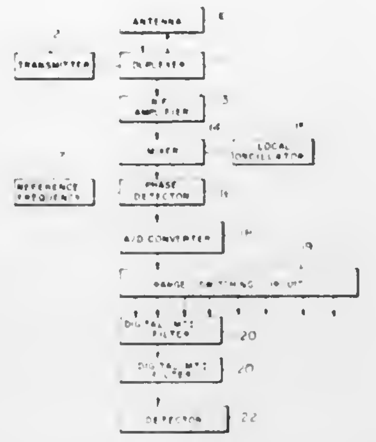
4,035,799
DIGITAL MEAN CLUTTER DOPPLER COMPENSATION SYSTEM

James K. Hsiao, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Nov. 4, 1975, Ser. No. 628,631

Int. Cl.^{2} G01S *9/42*

U.S. Cl. 343—7.7 **10 Claims**



5. In a moving target indicating radar having a filter system for suppressing clutter returns, an improved filter system for suppressing a plurality of clutter types occurring simultaneously in the radar returns comprising:

first digital filter means for detecting a first clutter type from the radar returns and providing a notch at the mean-clutter-doppler frequency of said first clutter type to provide filtered radar returns; and

at least one second digital filter means, coupled to receive the filtered radar returns from said first digital filter means, for detecting a different clutter type from said filtered radar returns and providing a notch at the mean-clutter-doppler frequency of said different clutter type to further filter said radar returns.

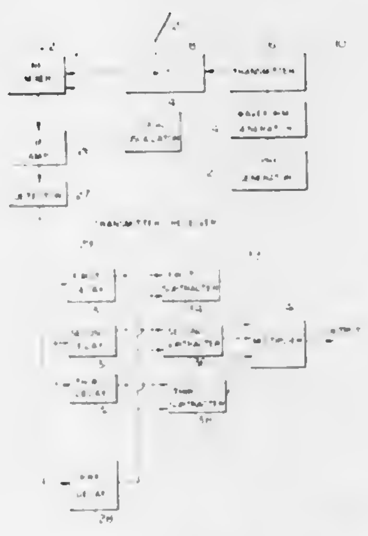
4,035,800
SHORT-PULSE NON-COHERENT MTI

Bernard L. Lewis, Oxon Hill, Md., and Ben H. Cantrell, Springfield, Va., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 23, 1976, Ser. No. 725,770

Int. Cl.^{2} G01S *9/42*

U.S. Cl. 343—7.7 **4 Claims**



1. In a non-coherent, non-doppler, MTI system including a transmitter/receiver for transmitting and receiving short pulses, means providing a broadened cancellation notch comprising:

prf delay means, receiving the output of said transmitter/receiver, for delaying a first target-return pulse received from said transmitter/receiver by one prf period;

delay bank means, including at least two delay circuits with each said delay circuit receiving a sample of a second target-return pulse from said transmitter/receiver for delaying each sample of said second target-return pulse by a different amount;

subtracter bank means, including at least two subtracters, each receiving a different one of the outputs of said delay circuits of said delay bank and each additionally receiving the output of said prf delay means, for separately subtracting the outputs of said delay circuits from the output of said delay means; and

multiplier means for receiving the outputs of said subtracters and for multiplying them together to obtain said broadened cancellation notch.

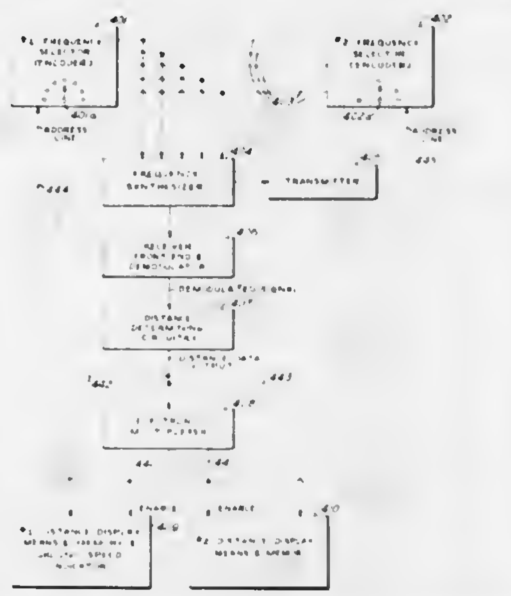
4,035,801
MULTIPLE RANGING DME

Wayne L. Miller, Stanhope, N.J., assignor to The Cessna Aircraft Company, Wichita, Kans.

Filed Jan. 6, 1976, Ser. No. 646,817

Int. Cl.^{2} G01S *9/04*

U.S. Cl. 343—12 R **20 Claims**



1. A system for time multiplexing a DME transmitter-receiver between a plurality of channels corresponding to different ground stations comprising,

a DME transmitter-receiver,

a plurality of channel selection means, each one comprising a means for selecting a channel,

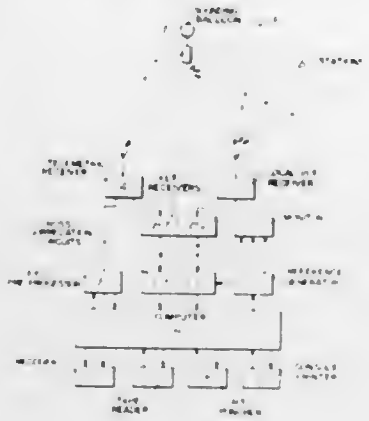
a plurality of display-memory means equal in number to said plurality of channel selection means, each selection means having a display-memory means corresponding thereto,

multiplexing means for causing said DME to be time shared between the channels selected by said selection means, and for causing distance data output by said DME while operating on each of said channels to be displayed on and stored in the display-memory means corresponding to the channel selection means which selected the channel.

4,035,802

METHOD AND APPARATUS FOR WIND MEASUREMENT

Ove Jagermalm, Erakuja 6 B 27, 01670 Vantaa, Finland, and Keijo Luukkonen, Etuniementie 6 B, 02240 Friisila, Finland
Continuation-in-part of Ser. No. 458,050, April 4, 1974, abandoned. This application Jan. 27, 1976, Ser. No. 652,824
Claims priority, application Finland, Apr. 5, 1973, 731059
Int. Cl.^{2} G01S *1/30*
U.S. Cl. 343—105 R **18 Claims**

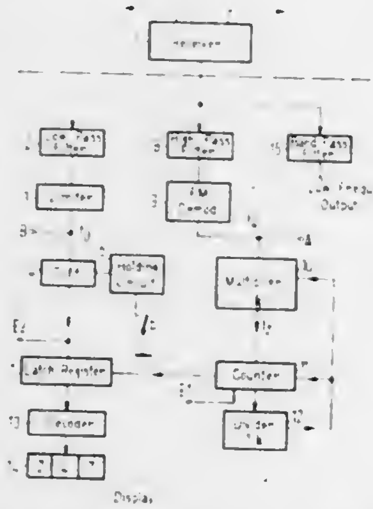


18. In combination, a wind measuring apparatus utilizing a VLF radio navigation system comprising at least three transmitting stations for sending out VLF signals, a sounding device positioned for receiving the VLF signals from the transmitting stations and retransmitting them by means of a telemetric link, a ground observation station for measuring phases of the VLF signal transmissions, said ground observation station including receiving means for receiving said VLF signals from said sounding device, limiting means coupled to said receiving means for amplitude limiting the VLF signals, signal generating means for generating a reference signal having the same frequency as the VLF signal, and polar cross correlation means for forming a cross correlation function between said amplitude-limited VLF signals and said reference signal, wherein the phase angles of said cross correlation functions are representative of the position of the sounding device.

4,035,803

CIRCUIT ARRANGEMENT FOR DETERMINING THE DISTANCE TO A VOR TRANSMITTER STATION

Walter Freter, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed May 5, 1975, Ser. No. 574,702
Claims priority, application Germany, Feb. 21, 1975, 2507525
Int. Cl.^{2} G01S *1/44*
U.S. Cl. 343—106 R **8 Claims**



1. A circuit arrangement for determining the flight time of an aircraft from a VOR transmitter, said circuit arrangement connected with a VOR receiver which determines angular information of the VOR transmitter perpendicular to the radial position line extending from the transmitter with an accuracy of α degrees from one bearing shift to the next, comprising:

a first counter, including a units location, counting in steps of α and including a tap for a count of α at said units location;

a pulse generator operable to produce counting pulses at a predetermined pulsing frequency of somewhat less than 1 Hz;

a latch register connected between said tap and said pulse generator and operable to deliver a measurement signal to said first counter for a time beginning with a change at said units location representing a bearing shift and ending with the next change at said units location representing the following bearing shift;

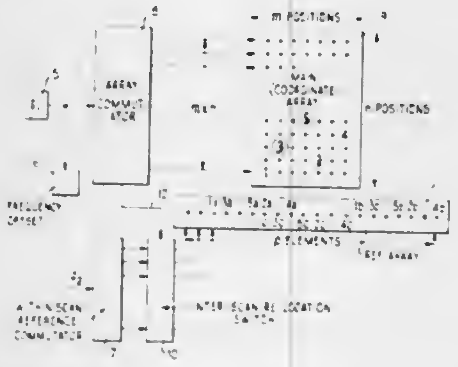
a second counter connected to said pulse generator to receive said counting pulses; and

display means connected to said second counter and calibrated in minutes for displaying the count to a pilot in order to indicate the flight time to the VOR transmitter at the air speed employed in the measuring operation.

4,035,804

SIMULATED DOPPLER NAVIGATIONAL SYSTEM WITH SECOND ORDER DIVERSITY

Francis G. Overbury, Cuffley, England, assignor to International Standard Electric Corporation, New York, N.Y.
Filed July 8, 1976, Ser. No. 703,316
Claims priority, application United Kingdom, July 10, 1975, 29040/75
Int. Cl.^{2} G01S *1/40*
U.S. Cl. 343—106 D **6 Claims**



1. Radio direction finding apparatus for navigational angle determination comprising:

a first antenna array having a plurality of separately excitable first elements arranged in a two-dimensional pattern in n positions in the coordinate of measurement of said navigational angle and m coordinate positions orthogonal thereto, said first elements lying in a first array plane and occupying at least a portion of the element positions thereby defined, where q is the product of m and n;

a second antenna array having a plurality of separately excitable second elements p, where $p > m$ arranged in a line substantially parallel to a line of said m element positions;

first means for energizing said first elements in a program in which the energized element during each successive element dwell time is advanced in said n coordinate position linearly as a function of time, the m position of said element energized at any time being simultaneously controlled as to m position according to a pseudo-random program;

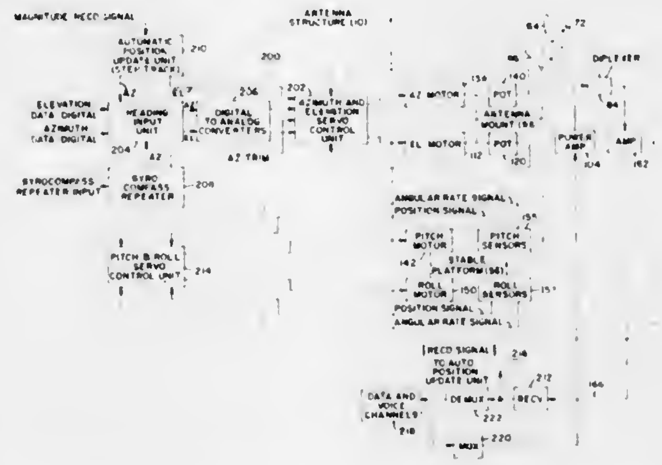
second means for successively energizing a contiguous group of said second elements comprising the same number of said second elements as are energized in each scan cycle within said first array, said energization of said second elements being effected according to a program whereby the lateral spacing between the first array element and the second array element remains constant throughout each of said scan cycles;

and third means operatively associated with said second means for varying the location of said contiguous group elements among said p elements of said second array which are energized by said second means for each successive scan cycle, said location remaining constant during each scan cycle.

4,035,805

SATELLITE TRACKING ANTENNA SYSTEM

Joseph Graham Mobley, Tucker, Ga., assignor to Scientific-Atlanta, Inc., Atlanta, Ga.
Filed July 23, 1975, Ser. No. 598,492
Int. Cl.^{2} G01S *5/02*
U.S. Cl. 343—117 R **26 Claims**



1. For maritime use on a ship or the like which is adapted to roll, pitch and change heading and having compass means providing outputs representing the heading of said ship in azimuth, a system for providing communication with an orbiting transmitting station carried by a satellite, which system comprises

a directional antenna adapted to point in the direction of said satellite for maintaining communication therewith,

a platform angularly movable in pitch and roll, said antenna being rotatably mounted on said platform for movement in azimuth and in elevation to be pointed in the direction of said satellite,

means for counteracting the roll and pitch motion and movement of said platform out of level position for maintaining said platform stable,

means responsive to said compass means outputs for generating a multi-bit digital signal representing said compass means outputs,

heading input means responsive to data signals representing the position of said satellite in elevation and in azimuth and to said digital signal representing said compass mens outputs for providing digital azimuth control signals and elevation control signals,

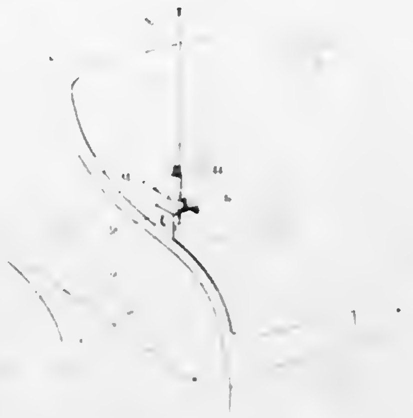
means included in said heading input means for repetitively comparing said digital signal representing said compass means outputs with said data signals representing the position of said satellite in azimuth and for repetitively providing further digital signals representing the heading of said ship with respect to said satellite, and

means operated by said control signals for moving said antenna in the direction of said satellite.

4,035,806

ANTENNA MOUNTING BRACKET FOLDABLE INTO AUTOMOBILE TRUNK

Truman W. Powell, P.O. Box 535, Zephryhills, Fla. 33599
Filed Aug. 24, 1976, Ser. No. 717,321
Int. Cl.^{2} H01Q *1/32*
U.S. Cl. 343—715 **7 Claims**



1. A bracket for mounting an antenna on a vehicle including a trunk lid for closing an opening providing access to the interior of the vehicle, comprising:

base means for fixed attachment to the underside of said trunk lid adjacent the opening;

antenna support means movably connected to said base means for folding between an exposed position extending through the vehicle opening to support an antenna for use outside the vehicle, and a storage position inside the vehicle to conceal a supported antenna when not in use;

an antenna assembly fixedly attached to the distal end of said antenna support means; and

means for attachment to the underside of said trunk lid for engaging and holding said antenna when said antenna support means is in said storage position.

4,035,807

INTEGRATED MICROWAVE PHASE SHIFTER AND RADIATOR MODULE

Raymond Tang, Fullerton, and Richard W. Burns, Orange, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed Dec. 23, 1974, Ser. No. 535,604
Int. Cl.^{2} H01Q *3/26*
U.S. Cl. 343—742 **19 Claims**

1. A composite integrated phase shifting and radiator structure for receiving, phase shifting and radiating microwave signals in a predetermined direction, including in combination:

a. a dielectric substrate having spaced-apart major surfaces and an opening therethrough extending between said surfaces,

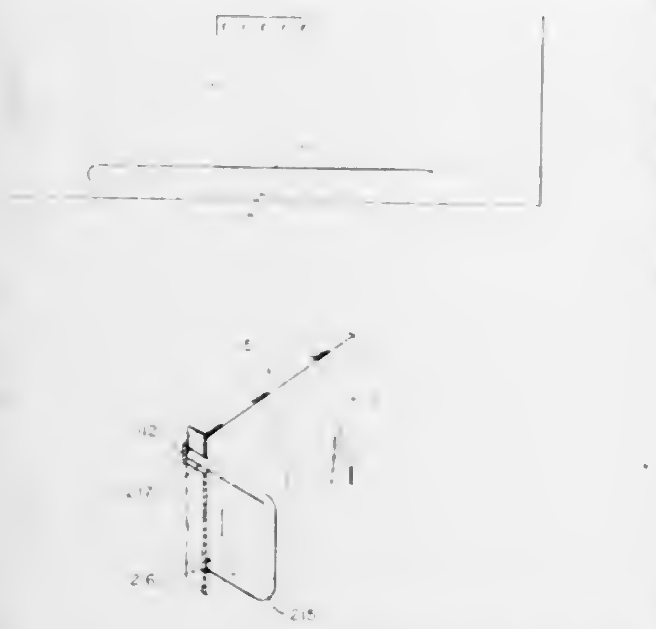
b. a plurality of microstrip phase shifters of predetermined configuration on one surface of said substrate for receiving microwave signals and altering the phase thereof, said phase shifters configured to provide different shifts in phase of an RF signal and disposed at predetermined spaced locations on said one surface of said substrate, said phase shifters further connected to an RF input port and connected via a plurality of microstrip bias lines, respectively, to a corresponding plurality of DC bias terminals,

c. said microstrip phase shifters, said microstrip bias lines, said DC bias terminals and said RF input port being substantially coplanar, thereby facilitating the connection of RF and bias signals to a single plane of said phase shifting and radiator structure,

d. a ground plane on the other surface of said substrate for providing the normal function of confining signals propagated in said dielectric substrate to the regions thereof beneath said microstrip phase shifters and connecting circuitry,

e. said ground plane having a slot therein of predetermined configuration, and

f. a conductor extending through said opening in said substrate and between an output port of said microstrip phase shifters and said slot for conducting current from said microstrip phase shifters to said ground plane to thereby set up a radiating electromagnetic field across said slot, whereby said ground plane provides the normal signal confining function for said substrate and additionally provides the output signal radiating function for said structure, thereby enabling said phase shifting and signal radiating functions of said structure to be accomplished using lightweight components which may be fabricated in a thin-layered substantially two-dimensional structure and with a high packaging density.



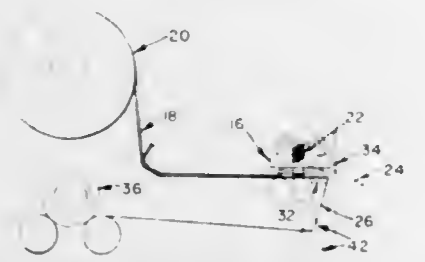
4,035,808
LABEL PRINTER

Edward C. Karp, Belvidere, Ill., assignor to Sanitary Scale Company, Belvidere, Ill.

Filed Apr. 30, 1976, Ser. No. 682,083

Int. Cl.² G01D *9/00;* **G01G** *23/38;* **B32B** *31/00*

U.S. Cl. 346—9 **7 Claims**



1. In an apparatus for weighing, computing the cost value and printing a label which includes a computer tape weighing scale having means for weighing an article and an associated electronic computer means for computing the value of the article according to a unit value per unit of weight and operable, upon demand, to add the value of a number of successive article values when a plurality of articles are weighed on the scale and the value of each of said articles computed and an electrical means for connecting the computer to a printed record producing mechanism, the combination of a tape printing apparatus connected by said electrical connecting means to said scale computer means which printing apparatus comprises a printing head responsive to operations of said scale computer means and operable for printing in successive transverse lines on a tape information supplied by the computer, and a tape supply means including a means for feeding a continuous tape to the printing head in predetermined timed relation to the operation of the printing head, means for indexing the printed tape in variable lengths according to the lines of printing thereon to position the printed portion of the tape at a tear off station adjacent the printing head, and means at said tear off station enabling printed portions of variable length to be separated from the tape.

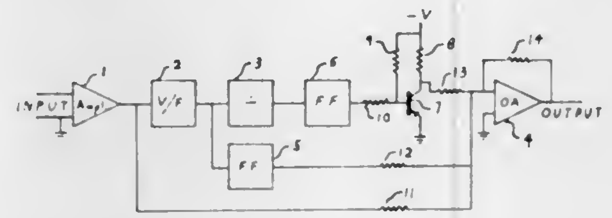
4,035,809
ELECTRONIC INTEGRATOR FOR CHART RECORDER

John Kenneth Jacobsen, 568 Lillian Drive, Madeira Beach, Fla. 33708

Filed Dec. 29, 1975, Ser. No. 643,723

Int. Cl.² G01D *9/28, 9/00;* **G06G** *7/18*

U.S. Cl. 346—62 **3 Claims**



1. An electronic integrator system wherein a series of spikes generated by an electrical pulse generator whose output frequency or repetition rate is proportional to the electrical input signal are electrically added to the same input signal, the resulting combined signal comprising a curve with spikes is displayed ona single pen chart recording instrument and the area under the curve is measured by counting the spikes superimposed on the curve.

4,035,810
MAGNETIC INTERPOSITIVE METHOD WITH ELECTROSTATIC IMAGING

Daniel F. Blossey, Rochester, and Stephen F. Pond, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 1, 1976, Ser. No. 662,675

Int. Cl.² G03G *19/00;* **G11B** *5/027*

U.S. Cl. 346—74.1 **15 Claims**

1. An improved magnetic interpositive imaging method, comprising the steps of;

a. creating an electrostatic latent image in a photocondutive member comprising photocondutive material dispersed in a binder;

b. developing by touchdown development said electrostatic latent image with toner comprising from about 10% to about 60% by volume hard magnetic material;

c. fixing said toner to said photoconductive binder;

d. magnetizing said fixed toner to a spatial magnetization frequency of from about 4 to about 60 cycles per millimeter; and

e. transferring the magnetic signal from said magnetized, fixed toner by thermoremanent transfer magnetization to a magnetizable recording medium.

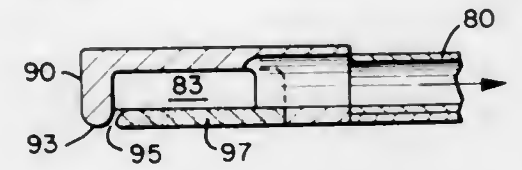
4,035,811
INK JET RECORDER AND CATCHER THEREFOR

Suresh C. Paranjpe, Xenia, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Filed July 12, 1976, Ser. No. 704,568

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **4 Claims**



1. In an ink jet recorder for printing on a moving web, said recorder comprising means for generating a stream of selectively charged ink drops, means for generating a drop deflecting field for deflecting the charged drops in said drop stream into a deflected trajectory and for allowing the uncharged drops in said drop stream to pass in an undeflected trajectory, and means for catching the drops in said deflected trajectory including a central cavity and means for maintaining a partial vacuum in said central cavity, the improvement in said means for catching comprising:

a flat drop catching surface positioned parallel to said undeflected trajectory, a curved surface along the bottom edge of said drop catching surface, and means defining an upwardly extending ink ingesting slot in the bottom of said catcher communicating with said cavity such that drops strike said catching surface, run down said catching surface and onto said curved surface, and upwardly therefrom into said slot, whereby the height of said surface is minimized and the trajectory of said undeflected drops is substantially unaffected by ingestion of ink into said means for catching.

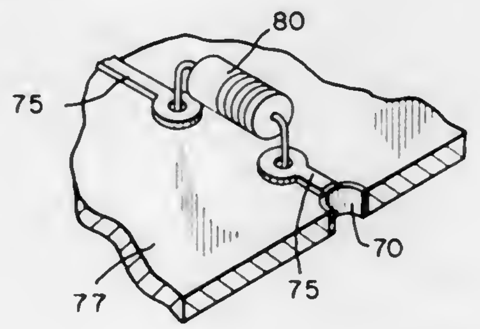
4,035,812
INK JET RECORDER AND CHARGE RING PLATE THEREFOR WITH REDUCED DEPLATING CURRENT

Bertram Van Breemen, Dayton, and John A. Robertson, Chillicothe, both of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Filed July 12, 1976, Ser. No. 704,569

Int. Cl.² G01D *15/18*

U.S. Cl. 346—75 **15 Claims**



1. In an ink recorder for printing on a moving web comprising means for forming a plurality of streams of ink drops directed toward said moving web, a plurality of charge inducing means, each of said charge inducing means associated with and positioned adjacent a respective one of said plurality of streams of ink drops, means for selectively providing a charging potential to each of said charge inducing means, means for providing an electric field through which said streams of drops pass for deflecting the charged drops in a set of deflected trajectories and for permitting the uncharged drops to pass in a set of undeflected trajectories, and catcher means, positioned in one of said set of trajectories such that the drops therein are not deposited upon said web,

the improvement in which each of said charge inducing means comprises:

current limiting means including a substantial resistance for preventing a substantial deplating current from flowing between said charge inducing means.

4,035,813
EXPOSURE CONTROL SYSTEM FOR SELECTIVELY DETERMINING EXPOSURE INTERVAL

George D. Whiteside, Lexington, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 3, 1975, Ser. No. 619,381

Int. Cl.² G03B *7/14, 15/03*

U.S. Cl. 354—27 **20 Claims**

2. A photographic camera comprising:

a housing;

an objective lens mounted on said housing;

means within said housing for receiving a source of electrical energy;

means operatively associated with said housing for receiving a source of artificial illumination, said receiving means including electrical terminals for electrically communicating with the source of artificial illumination;

means within said housing for defining a film exposure plane;

a blade assembly mounted and arranged within said housing for displacement from an initial closed arrangement wherein said blade assembly precludes scene light from impinging on said exposure plane to a second arrangement wherein said blade assembly defines a maximum aperture through which scene light is permitted to impinge on said exposure plane and then to a final closed arrangement wherein said blade assembly again precludes scene light from impinging on said exposure plane, such a displacement of said blade assembly serving to define an exposure interval during which scene light is incident upon said film exposure plane;

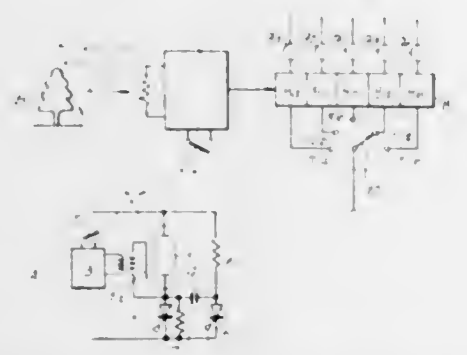
scene light detecting means energizable by the source of electrical energy for providing an output signal in correspondence to the amount of scene light detected subsequent to the commencement of an exposure interval; and

means, at least in part energizable by the source of electrical energy, for initiating the displacement of said blade assembly from its said initial closed arrangement towards its said second arrangement thereby commencing a particular exposure program defined by a plurality of exposure parameters, for initiating the electrical energization of said terminals after the expiration of a predetermined time delay following the initiation of the displacement of said blade assembly towards its said second arrangement to effect the firing of the source of artificial illumination and then, responsive to said output signal of said scene light detecting means reaching a first predetermined value, for effecting the displacement of said blade assembly into its said final closed arrangement, and further, responsive to said output signal of said scene light detecting means reaching a second predetermined value less than said first predetermined value prior to the expiration of said predetermined time delay, for

1. immediately initiating the electrical energization of said terminals whereby said source of illumination is fired prior to the lapse of said predetermined time delay under such conditions, and
2. additionally changing the value of said output signal required to effect the displacement of said blade assembly into its said final closed arrangement from said first predetermined value to another predetermined value under such conditions.

4,035,814
ELECTRONIC FLASH APPARATUS CONTROLLED BY A DIGITAL MEMORY SYSTEM

Tsukumo Nobusawa, Minami Oizumi, Japan, assignor to Asahi Kogaku Kogyo Kabushiki Kaisha, Japan
Filed Aug. 28, 1975, Ser. No. 608,729
Claims priority, application Japan, Sept. 2, 1974, 49-99925; Sept. 12, 1974, 49-105242; Dec. 21, 1974, 49-147013; June 27, 1975, 50-79436
Int. Cl.^{2} G03B *7/16*
U.S. Cl. 354—33 **20 Claims**



1. In an electronic flash apparatus, flash means for providing flash illumination, oscillator means for providing pulses during operation of said flash means, counting means operatively connected with said oscillator means for counting said pulses, terminating means operatively connected with said counting means for selectively terminating operation thereof according to one or more parameters such as film speed, diaphragm aperture, and the like, and flash control means operatively connected with said flash means for controlling the extent of flash illumination provided thereby, said counting means and said terminating means forming a pair of means one of which is operatively connected with said flash control means for operating the latter, said oscillator means including a photosensitive means for responding to light, including flash illumination provided by said flash means, for providing in response to the intensity of the light received by said photosensitive means pulses the frequency of which is directly proportional to said intensity.

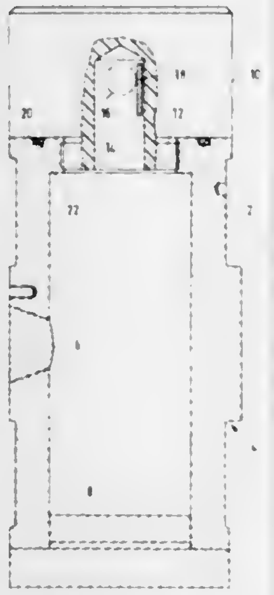
4,035,815
DISPLAY UNIT FOR LUMINOUS DATA OF A SINGLE LENS REFLEX CAMERA

Akira Takahashi, Tokyo, Japan, assignor to Ricoh Co., Ltd., Tokyo, Japan
Filed Jan. 25, 1974, Ser. No. 436,639
Claims priority, application Japan, Jan. 29, 1973, 48-12269
Int. Cl.^{2} G03B *17/20*
U.S. Cl. 354—53 **10 Claims**

1. A display system for object illumination data in a single lens reflex camera of the type comprising a taking lens for passing an image of an object being photographed into the camera; a movable reflecting mirror for reflecting said image after passage by said taking lens; a focussing screen located at a position conjugate to a photographic film disposed within the camera and on which said image is focussed; a finder for said focussing screen; and a light receiving element disposed within the light path of said finder for effecting photometry of the focussed image on said focussing screen, wherein the improvement comprises a memory circuit means for storing illumination data obtained by the light-receiving element; means for producing an end-of-photometry signal; means for conducting said signal to cut off the storage of said data in said memory circuit means; and a light-emitting display means disposed within the light path of the finder for displaying an indication of the production of an end-of-photometry signal when said signal is produced.

4,035,816
HOUSING ASSEMBLY FOR AN UNDERWATER CAMERA WITH A FLASH DEVICE

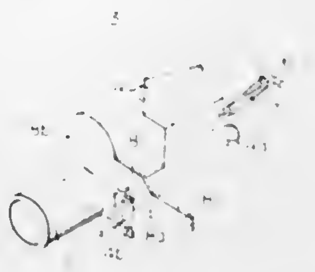
Helmut Winnacker, Burgdorf, Germany, assignor to Preussag Aktiengesellschaft, Germany
Filed July 12, 1976, Ser. No. 704,406
Claims priority, application Germany, July 17, 1975, 2531938
Int. Cl.^{2} G03B *17/08*
U.S. Cl. 354—64 **10 Claims**



1. An improved housing assembly for an underwater camera having a flash device which includes a flash lamp, the improved housing assembly comprising: a hollow cylindrical pressure housing having a cylindrical shell; a window formed in the cylindrical shell for the objective of the underwater camera; and a pressure tight head which is made of transparent material, which is connected with and closes an end of the cylindrical shell and in which the flash lamp is disposed.

4,035,817
REMOTE CONTROLLED CAMERA

Yozo Iida, Komae; Shigeo Akasaka, Kodaira, and Yasuhito Kawahara, Tokyo, all of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan
Filed Feb. 3, 1976, Ser. No. 654,767
Claims priority, application Japan, Feb. 12, 1975, 50-18567[U]
Int. Cl.^{2} G03B *13/02*
U.S. Cl. 354—219 **3 Claims**

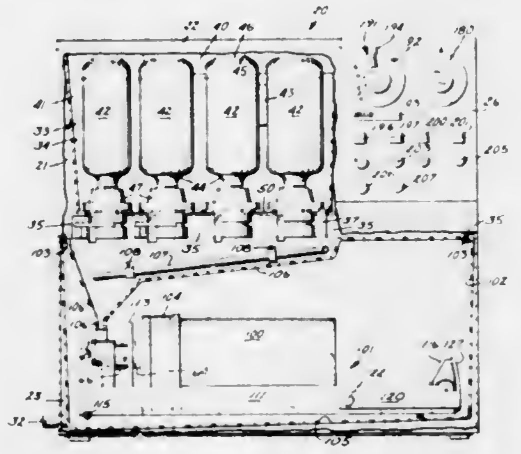


1. A remote controlled camera, wherein a signal receiver to actuate the camera is detachably mounted thereon at the time of its receiving a remote control signal, which comprises in combination:

- a camera body;
- means (3) provided on said camera body for mounting the 7, 8, 9) provided in said camera body for intersecting a light path of incident light extending from an eye-piece of said camera to a view finder optical system upon mounting of said signal receiver onto said camera body by means of said mounting means.

4,035,818
COLOR PRINT OR FILM PROCESSOR

Roger A. King, Minneapolis, Minn., assignor to The King Concept Corporation, Minneapolis, Minn.
Filed Dec. 11, 1974, Ser. No. 531,535
Int. Cl.^{2} G03D *3/08*
U.S. Cl. 354—323 **3 Claims**



1. In automatic photographic developing apparatus, in combination:

- a cradle tiltable about a first axis;
- a cylindrical developing drum;
- means in said cradle, including a drive roller, for supporting said drum on its side and causing rotation of said drum about a second axis orthogonal with said first axis;
- reversible drive means connected to said driven roller for causing rotation thereof in first and second opposite senses;
- and cradle tilting means operatively connected to said drive means and operable to tilt said cradle only when driven in a first sense.

4,035,819
METHOD OF MAKING A ZINC SULPHIDE CERAMIC BODY AND A ZINC SULPHIDE CERAMIC BODY MADE THEREBY

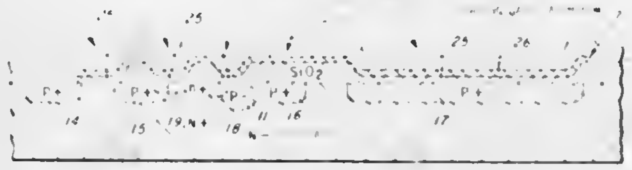
Tsuneharu Nitta, Katano; Shigeru Hayakawa; Yukio Kasahara, both of Hirakata, and Ziro Terada, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan
Filed Oct. 15, 1974, Ser. No. 515,103
Claims priority, application Japan, Oct. 19, 1973, 48-118166; Nov. 13, 1973, 48-127999
Int. Cl.^{2} H01L *29/12*
U.S. Cl. 357—10 **2 Claims**

1. A method of making a junction ceramic body comprising a ceramic material having a layer consisting essentially of a zinc oxide ceramic body and a further layer consisting essentially of a corresponding sulphide ceramic body comprising: mixing a starting oxide material; pressure-compacting the thus mixed material; sintering the thus pressure-compacted material; and sulphurizing the surface layer of the thus sintered oxide material in a carbon disulphide atmosphere at a temperature in the range of 400° to 1000° C so as to make said surface layer a sulphide, said oxide material consisting essentially of zinc oxide and from 0.01 atomic % to 6.0 atomic % of at least one oxide of a metal selected from the group consisting of aluminum, magnesium, nickel, cobalt, cadmium, lead, indium, bismuth, antimony, titanium, zirconium, silicon, tin, niobium tantalum, tungsten and rare earth metals.

2. A junction ceramic body made by the method of claim 5.

4,035,820
ADJUSTMENT OF AVALANCHE VOLTAGE IN DIFMOS MEMORY DEVICES BY CONTROL OF IMPURITY DOPING

Walter Theodore Matzen, Richardson, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.
Filed Dec. 29, 1975, Ser. No. 644,983
Int. Cl.^{2} H01L *29/78, 27/02, 29/90, 29/34*
U.S. Cl. 357—23 **5 Claims**



1. A semiconductor memory device having a monocrystalline semiconductor substrate of one conductivity type, an electrically isolated floating gate conductor overlying said substrate electron injection means in said substrate at least partially underlying said gate, hole injection means in said substrate spaced from said electron injector means and at least partially underlying said gate, and means for sensing the presence or absence of charge on said gate, wherein said electron injection means comprises an n+/p+ junction having a peak dopant concentration no greater than about $2 \times 10^{17}\ cm^{-3}$ on the n+ side, said n+ region having an implanted dopant profile, whereby peak dopant concentration is located beneath the semiconductor surface.

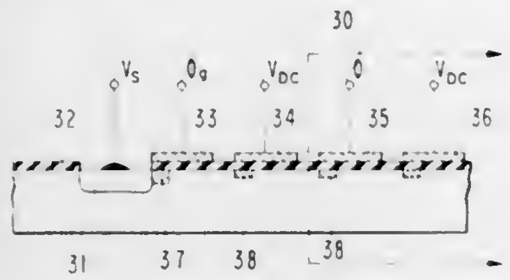
4,035,821
DEVICE FOR INTRODUCING CHARGE

Kamleshwar C. Gunsagar, Campbell, and Gilbert F. Amelio, Saratoga, both of Calif., assignors to Fairchild Camera and Instrument Corporation, Mountain View, Calif.

Continuation of Ser. No. 492,650, July 29, 1974, abandoned. This application Jan. 29, 1976, Ser. No. 653,677

Int. Cl.² H01L *29/78*

U.S. Cl. 357—24 **12 Claims**



1. In a charge-coupled semiconductor storage array including a semiconductor substrate of one conductivity type with a line of charge storage elements for receiving and transferring electrical charge, each element including an electrode on a major surface of said substrate and spaced therefrom by an insulating layer, a device for introducing a predetermined amount of charge to said line of charge storage elements comprising:

a buffer charge storage element fabricated adjacent a first charge storage element and including

a gate electrode on said major surface and spaced therefrom by an insulating layer and controlled by a logic pulse, the level of said pulse determining whether charge is to be introduced to said line of charge storage elements, and

a barrier region of said one conductivity type in said substrate with a net dopant concentration greater than said substrate, said barrier region being disposed beneath a portion of said gate electrode of said buffer charge storage element and adjacent to precharge means whereby said barrier region provides a potential barrier which determines the amount of saturating charge which may flow from precharge means and be retained by said buffer charge storage means; and

precharge means including a region of said opposite conductivity type in said substrate adjacent said buffer charge storage element for supplying a saturating charge to said buffer charge storage element.

4,035,822
PRESSURE SENSITIVE FIELD EFFECT DEVICE

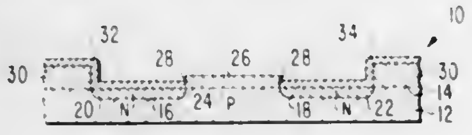
David Herman Raphael Vilkomerson, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 14, 1975, Ser. No. 558,470

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.² H01L *29/78, 29/84*

U.S. Cl. 357—26 **3 Claims**



1. A pressure sensitive field effect device which is a part of a semiconductor integrated circuit which comprises:

a first region and a second region in a body of semiconductor material, adjacent to a surface of said body and separated therein by a channel region, said channel region having an insulating layer disposed thereover;

nonconductive, resilient, compressible means disposed on said insulating layer in continuous contact therewith over at least said channel region, said means being a layer of an elastomer; and

a gate electrode on said nonconductive, resilient, compressible means over said channel region.

4,035,823
STRESS SENSOR APPARATUS

James F. Marshall, St. Paul, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Division of Ser. No. 619,866, Oct. 6, 1975. This application Sept. 29, 1976, Ser. No. 727,733

Int. Cl.² H01L *29/84, 29/96;* **B01J** *17/00;* **H01L** *5/00*

U.S. Cl. 357—26 **15 Claims**

1. A semiconductor material stress sensor having structural portions including substantially a diaphragm and a constraint for constraining said diaphragm at peripheral portions thereof, said stress sensor comprising:

a layer of semiconductor material of a first conductivity type except in selected regions thereof including a first selected region located at least in part in said diaphragm to serve as a piezoresistor, said first selected region being of a second conductivity type due substantially to a first dopant therein where said first selected region has therein a region of maximum concentration of said first dopant wherein a concentration of said first dopant occurs exceeding by at least a factor five that concentration occurring at a first boundary portion of a boundary defining said first selected region, said first boundary portion occurring at that part of said boundary having on one side thereof said maximum first dopant concentration region and having directly opposed on an opposite side thereof a first surface portion of said layer located in said diaphragm.

4,035,824
SEMICONDUCTOR DEVICE STABILIZED BY AN INSULATING LAYER FORMED ON A SEMICONDUCTOR REGION HAVING A LOW IMPURITY CONCENTRATION

Kunizo Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Apr. 11, 1975, Ser. No. 567,274

Claims priority, application Japan, Apr. 18, 1974, 49-43790

Int. Cl.² H01L *29/72, 29/40, 27/02, 29/00*

U.S. Cl. 357—34 **7 Claims**

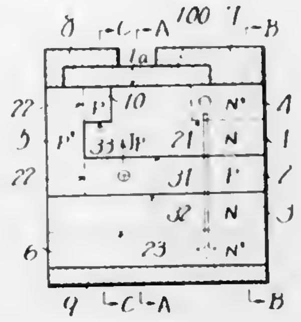
1. A bipolar-type semiconductor device stabilized by an insulating layer formed on a semiconductor region having a low impurity concentration comprising:

a first semiconductor region of one conductivity type consisting of a lightly doped region on one side and a heavily doped region on the other side and a junction between said lightly and heavily doped regions extending to the surface of the device;

a second semiconductor region of the opposite conductivity type forming a first PN junction with said lightly doped region on said side;

a third semiconductor region of said one conductivity type forming a second PN junction with said second region;

an insulating layer covering at least the surface of said junction between lightly doped and heavily doped regions in said first region; and



first, second and third electrodes contacting said first, second and third regions, respectively, in which said first electrode extends toward said second electrode on said insulating layer and covers an entire portion of said heavily doped region, and at least a part of said lightly doped region together with the said surface of the junction between lightly doped and heavily doped regions in said first region.

4,035,825
THYRISTOR WITH BRANCHED BASE

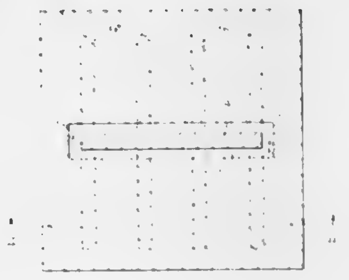
Fritz Kirschner, Lohhof, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

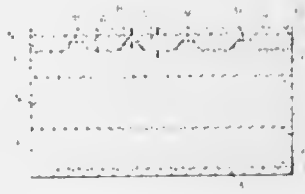
Filed Nov. 28, 1975, Ser. No. 636,283

Claims priority, application Germany, Dec. 3, 1974, 2457106

Int. Cl.² H01L *29/74*

U.S. Cl. 357—38 **5 Claims**





1. A thyristor device comprising a body of semiconductor material and electrical conductor means;

said body of semiconductor material comprising at least one emitter zone disposed along a major surface of said body, a base zone disposed in said body adjacent to and in PN junction forming relationship with said emitter zone, said base zone having a first portion under said emitter zone and a second portion emerging at said major surface;

said electrical conductor means comprising an emitter electrode affixed to said emitter zone at said major surface, a base electrode affixed to said second portion of said base zone at said major surface;

a plurality of branches in said first portion of said base zone, said branches having a common origin in said second portion of said base zone under said base electrode, said emitter zone having portions of a first thickness above said branches, said emitter zone having portions of a second thickness separating said branches, said second thickness exceeding said first thickness, said base zone having a doping concentration increasing uniformly in a direction toward said major surface.

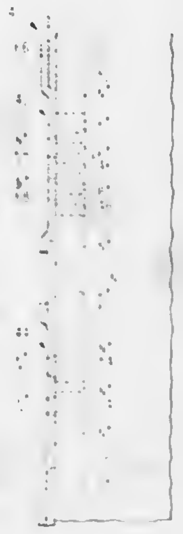
4,035,826
REDUCTION OF PARASITIC BIPOLAR EFFECTS IN INTEGRATED CIRCUITS EMPLOYING INSULATED GATE FIELD EFFECT TRANSISTORS VIA THE USE OF LOW RESISTANCE SUBSTRATE CONTACTS EXTENDING THROUGH SOURCE REGION

George Ira Morton, Belle Mead, and Robert Charles Heuner, Bound Brook, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Feb. 23, 1976, Ser. No. 660,348

Int. Cl.² H01L *27/02, 29/78;* **H03K** *3/353*

U.S. Cl. 357—42 **10 Claims**



1. An integrated circuit device comprising:

a. a body of semiconductor material predominantly of one conductivity type;

b. a pair of spaced regions each having a conductivity type opposite that of said body, each of said regions extending into said body from a surface thereof;

c. an insulating region on the surface of said body extending at least between said pair of spaced regions;

d. a conductive gate overlying said insulating region, said gate extending over said insulating region at least between said pair of spaced regions;

e. at least one contact region extending through a portion of one of said spaced regions into said body, said contact region being completely surrounded by said spaced region at said surface, and providing a low resistivity contact to said body from the surface of said device.

4,035,827
THERMALLY BALLASTED SEMICONDUCTOR DEVICE

Carl Franklin Wheatley, Jr., Somerset, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,484

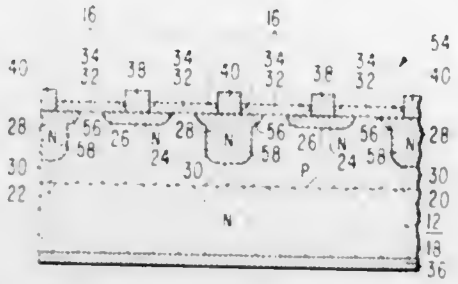
Int. Cl.² H01L *27/10*

U.S. Cl. 357—45 **6 Claims**

1. A semiconductor device comprising:

a body of semiconductor material containing a plurality of cells, each said cell containing a transistor having associated therewith an emitter region having a one type conductivity, a base region of a second conductivity, a base-emitter PN junction having a voltage temperature coefficient associated therewith therebetween, and a collector region of said one type conductivity, said collector region being spaced apart from said emitter region by said base region, said emitter and collector regions of each said cell being connected in parallel relation with said emitter and collector regions of each other said cell; and

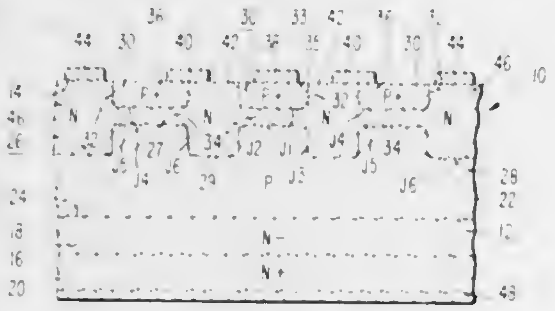
means, integrally within each of said cells, responsive to temperature increases of said base region for increasing the resistance between an electrode means and said base region, said electrode means electrically contacting said responsive means, each said responsive means being a diode having a positive voltage temperature coefficient with respect to the absolute value of said voltage temperature coefficient of said base-emitter PNjunction.



4,035,828
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Willem Gerard Einthoven, Belle Mead, N.J.; Anthony Joseph Caravaggio, Wilkes Barre, Pa., and Albert Alexander Todd, Piscataway, N.J., assignors to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,577
Int. Cl.² H01L *27/04*
U.S. Cl. 357—47 **7 Claims**

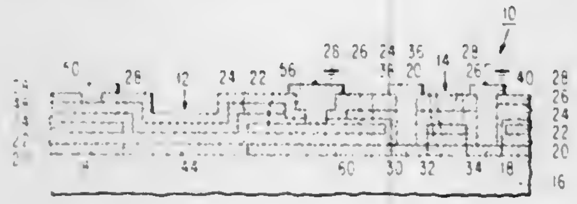


1. A semiconductor device comprising:
a body of semiconductor material having a surface and having a first region of a one type conductivity therein;
a second region of semiconductor material having a second type conductivity and forming a first PN junction with said first region;
a third region of semiconductor material having said one type conductivity adjacent said surface and forming a second PN junction with said second region, said third region being spaced apart from said first region by said second region;
a plurality of fourth regions adjacent said surface, having said second type conductivity, within said third region and forming a plurality of third PN junctions therewith, a portion of said third region, comparatively thinner than the remainder thereof, being between each of said fourth regions and said second region, said comparatively thinner portion of said third region being about 2 μm thick and having an average impurity concentration on the order of about 10^{15} atoms/cm^3;
means defining a first electrode contacting a first member of said plurality of fourth regions; and
means defining an interconneciton electrode connecting a second member of said plurality of fourth regions to a first surface portion of said third region adjacent said surface between said first member and said second member.

4,035,829
SEMICONDUCTOR DEVICE AND METHOD OF ELECTRICALLY ISOLATING CIRCUIT COMPONENTS THEREON

Alfred Charles Ipri, Princeton, N.J., and John Carl Sarace, Mission Viejo, Calif., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 540,443, Jan. 13, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,823
Int. Cl.² H01L *29/78, 27/12*
U.S. Cl. 357—49 **11 Claims**

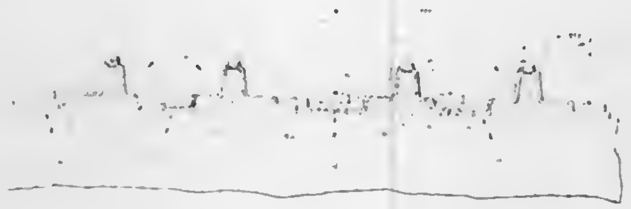


1. A semiconductor device comprising:
an insulating substrate,
a layer of semiconductor material of one type conductivity on said insulating substrate,
two circuit components, each having an active region of said one type conductivity separated from the other by only semiconductor material of said one type conductivity, formed in said layer of semiconductor material,
a layer of electrically insulating material over said layer of semiconductor material and between said active regions,
a layer of electrically conductive material over said layer of insulating material, and
means to bias said layer of conductive material with respect to said layer of semiconductor material to form a depletion region in said layer of semiconductor material opposite to said layer of conductive material and between said active regions, said biasing means comprising means for electrically connecting said layer of electrically conductive material to said layer of semiconductive material opposite thereto.

4,035,830
COMPOSITE SEMICONDUCTOR CIRCUIT AND METHOD OF MANUFACTURE

Chung K. Kim, Lexington, Mass., assignor to Raytheon Company, Lexington, Mass.

Division of Ser. No. 465,213, April 29, 1974, abandoned. This application Nov. 17, 1975, Ser. No. 632,324
Int. Cl.² H01L *23/48, 39/02, 23/02*
U.S. Cl. 357—67 **12 Claims**

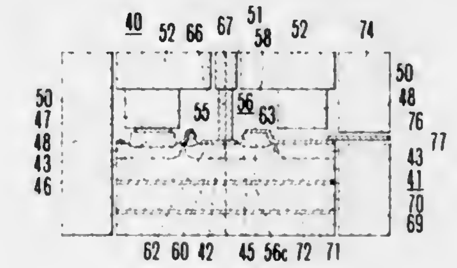


1. In combination:
a support substrate having a predetermined thermal coefficient of expansion;
a plurality of separate semiconductor elements comprising semiconductor material, said semiconductor material having a different thermal coefficient of expansion from said substrate; and
a thermally conductive layer, a first surface of said thermally conductive layer being bonded to said semiconductor material of said semiconductor elements and a second surface of said thermally conductive layer being bonded to said substrate, said thermally conductive layer being continuous between said semiconductor material of said semiconductor elements and said substrate, and said thermally conductive layer having a plasticity which deforms under a stress below the tensile stress limit of said semiconductor material.

4,035,831
RADIAL EMITTER PRESSURE CONTACT TYPE SEMICONDUCTOR DEVICES

Shuzo Saeki, Yokohama, Japan, assignor to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Jan. 2, 1976, Ser. No. 645,960
Claims priority, application Japan, Apr. 17, 1975, 50-45807; Apr. 17, 1975, 50-45812
Int. Cl.² H01L *23/42, 23/44, 23/46, 27/02*
U.S. Cl. 357—79 **9 Claims**

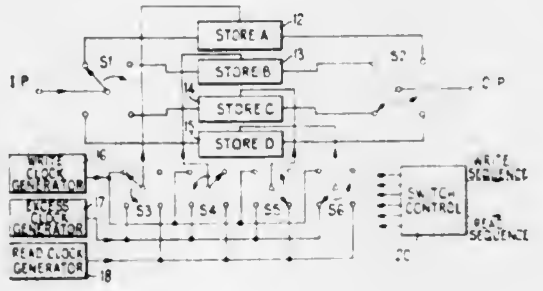


1. A pressure contact type contact type semiconductor device comprising a semiconductor substrate, an emitter region having a plurality of portions protruding from one surface of said semiconductor substrate and extending substantially in the radial direction from a position spaced a definite distance from one point on said surface, a base region formed on said semiconductor substrate to surround said protruding portions of said emitter region, emitter electrodes provided on respective protruding portions of said emitter region, a base electrode provided on said base region, a collector electrode mounted on the other surface of said semiconductor substrate, and an electroconductive plate member commonly urged against said emitter electrode, said emitter, collector and base regions constituting a pressure type transistor.

4,035,832
DIGITAL SHIFT REGISTERS FOR VIDEO STORAGE

Anthony Donald Stalley, Fleet, and John Albert Coffey, Newbury, both of England, assignors to Quantel Limited, England

Filed Aug. 18, 1975, Ser. No. 605,356
Claims priority, application United Kingdom, Aug. 20, 1974, 36565/74
Int. Cl.² H04N *5/04*
U.S. Cl. 358—8 **13 Claims**

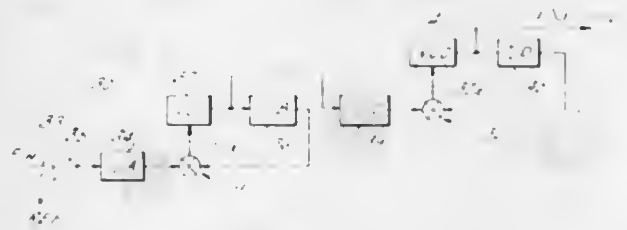


1. A method of storing digital video information to provide timing correction therefor, comprising:
a. applying said information in the form of coded pulses to an input of at least one store by means of a predetermined number of write in clock pulses occurring at a non-uniform rate in dependance on timing errors present on the incoming video signal,
b. shifting said information within said store by additional clock pulses after writing in said information, the number of additional pulses being a predetermined number equal to the difference between the total store length and the number of write in clock pulses used to enter the coded pulses, and
c. reading out said digital information from said store at a uniform rate on application of read out pulses to said store.

4,035,833
METHOD AND APPARATUS FOR ADJUSTING THE OUTPUT FREQUENCY OF A FREQUENCY SOURCE TO A VERY HIGH DEGREE OF PRECISION

Leonard F. Shepard, Dover, Del., assignor to ILC Data Device Corporation, Bohemia, N.Y.

Filed Dec. 1, 1975, Ser. No. 636,813
Int. Cl.² H04N *9/62*
U.S. Cl. 358—10 **24 Claims**



1. Means for adjusting the output frequency of a signal of frequency f_{in} in accordance with a predetermined offset value (OFF) wherein said offset is related to a value X such that OFF $+ 1 \times 10^{-11} > x^2 >$ OFF $- 1 \times 10^{-11}$ said first means comprising means for dividing the frequency of said input by x;
a first voltage controlled oscillator having a control input;
means for dividing the frequency of the output of said first osciliator by $x - 1$;
means responsive to the difference in the frequency of the outputs of said first and second dividing means for generating a control signal representing said difference;
said first oscillator control input being responsive to said control signal to adjust the output frequency f_{x1} of said first oscillator to bring the value $f_{x1}/(x-1)$ towards equality with the value f_{in}/x;
third divider means for dividing the frequency of the output of said first oscillator by x;
second voltage controlled oscillator means having a control input;
fourth divider means for dividing the output frequency f_{x2} of said second oscillator means by $x + 1$;
means responsive to the difference in frequency of said third and fourth divider means outputs for generating a second control signal;
said second oscillator control input being responsive to said second control signal to bring said value $f_{x2}/x+1$ into equality with the value f_{x1}/x whereby the frequency f_{x2} of the output of said second oscillator is shifted from the frequency f_{in} of said input signal by said predetermined offset to a high degree of resolution.

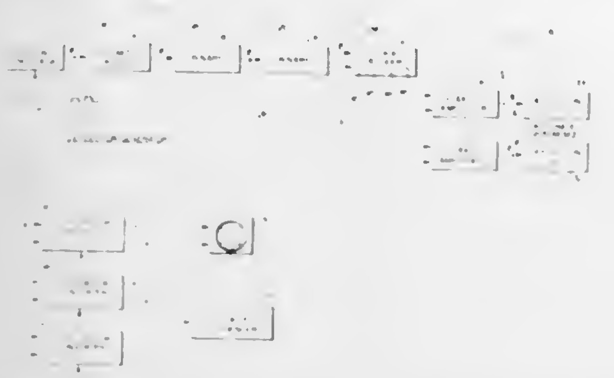
4,035,834
BEAM LANDING INDICATOR FOR COLOR CATHODE RAY TUBE

Anthony M. Drury, Oak Park, Ill., assignor to Matsushita Electric Corporation of America, Franklin Park, Ill.

Filed Apr. 12, 1976, Ser. No. 676,050

Int. Cl.² H04N *9/62*

U.S. Cl. 358—10 **8 Claims**



1. A beam landing indicator system for a color cathode ray tube including in combination:

first means for creating an auxiliary magnetic field for deflecting the electron beam in the cathode ray tube;

second means coupled with said first means for changing said magnetic field according to a predetermined pattern;

light sensing means located to sense light emitted from phosphors of one color from the cathode ray tube; and

an oscilloscope, the deflection coils of which are coupled in circuit with said second means and said light sensing means for producing a vector indication of the beam landing adjustment of the color cathode ray tube.

4,035,835
SYSTEM FOR AUTOMATIC CORRECTION OF THE COLOR BALANCE BETWEEN THE PRIMARY SIGNALS OF A COLOR SIGNAL SOURCE

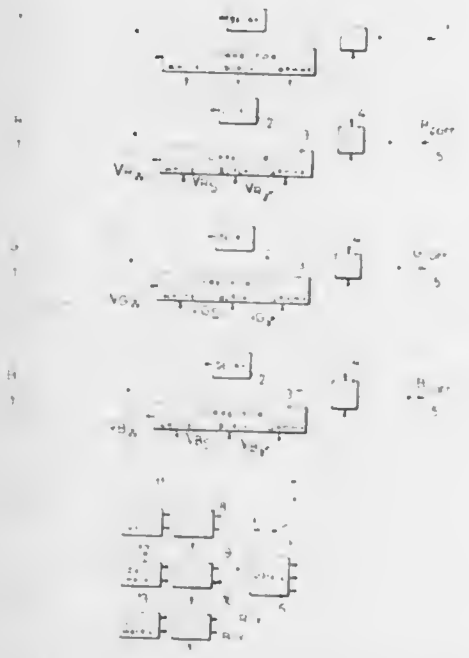
Dieter Poetsch, Ober Ramstadt, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Continuation-in-part of Ser. No. 620,409, Oct. 7, 1975. This application Sept. 24, 1976, Ser. No. 726,143

Claims priority, application Germany, Sept. 11, 1974, 2448505; Sept. 27, 1975, 2543218

Int. Cl.² H04N *9/535*

U.S. Cl. 358—29 **21 Claims**



1. A system for automatic correction of the balance between the primary color singals of color video signal source, comprising:

A. a primary color signal channel for each of a plurality of primary colors,

B. a signal-corrector means in each signal channel for receiving the corresponding primary color signal and responsive to control signals for generating corresponding correction signals.

C. adder means in each signal channel for additively combining the corresponding primary color signal and the corresponding correction signal to generate a corresponding corrected signal for each primary color, and

D. a color corrector responsive to the corrected signals for all of the plurality of primary colors for generating said control signals, the color corrector comprising level-detection means for determining when a prespecified luminosity level occurs in the color video signal and when simultaneously the chroma-saturation of the color video signal is below a predetermined chroma-saturation threshold for recognizing the chromaticity present at that moment in the color video signal, and means responsive to the chromaticity thus recognized for deriving and storing said control signals, whereby the control signals cause aberrations in color balance in the color video signal to be reduced.

4,035,836
PRISM OPTICAL SYSTEM FOR A COLOR TELEVISION CAMERA

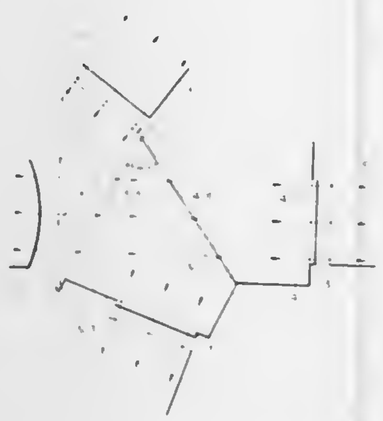
Yoshimori Miyaji; Hirokazu Fujiki; Tamotsu Nishizawa, all of Tokyo, and Naotake Morita, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Feb. 6, 1976, Ser. No. 656,078

Claims priority, application Japan, Feb. 10, 1975, 50-17250

Int. Cl.² H04N *9/04;* **G02B** *5/00, 27/00*

U.S. Cl. 358—55 **15 Claims**



1. A prism optical system for a color television camera for splitting a light beam into a plurality of color light components, said system having a non-reflecting optical axis and comprising:

a. a first prism having a light beam input surface and two light beam output surfaces;

b. a first dichroic layer mounted on one of the light beam output surfaces of said first prism, said first dichroic layer and said light beam output surface of said first prism forming an angle of less than 30° with a plane perpendicular to the non-reflecting optical axis and reflecting at least a green light component, said light beam input surface of said first prism totally reflecting at least a green light component to give forth the same outside the prism optical system through the other light beam output surface of said first prism;

c. a second prism having a light beam input surface which is fitted with said first dichroic layer and two light beam output surfaces;

d. a second dichroic layer mounted on one of the light beam output surfaces of said second prism, said second dichroic layer and said output surface of said second prism forming an angle of less than 45° with a plane perpendicular to the non-reflecting optical axis and reflecting any light components other than the green light component in such a manner that the other light components are given forth outside the prism optical system through the other light beam output surface of said second prism; and

e. a third prism having a light beam input surface which is fitted with said second dichroic layer and a light beam output surface.

4,035,837
PROCESS AND ARRANGEMENT FOR FACSIMILE CODING

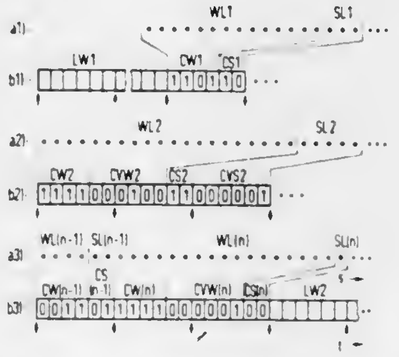
Alexander Starck, Munich, and Wolfgang Postl, Hoehenrain, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Oct. 22, 1975, Ser. No. 624,717

Claims priority, application Germany, Dec. 9, 1974, 2458118

Int. Cl.² H04N *1/46*

U.S. Cl. 358—78 **14 Claims**



1. In a process for facsimile coding in which items of information contained on a two-color original are scanned line-by-line for the purpose of transmission, in which the lengths of sequences of a first of the colors are represented by first code words consisting of a given first number of binary characters, and the lengths of sequences of the second color are represented by second code words consisting of a second number of binary characters, and in which the first and second code words are followed by third code words when the binary characters are not sufficient for coding the corresponding sequences, the improvement therein comprising the step of:

generating a number of binary characters for the third code words which is equal to the sum of the number of binary characters of the first code words and the number of binary characters of the second code words.

4,035,838
CABLE DISTRIBUTION SYSTEM FOR WIDE-BAND MESSAGE SIGNALS

Giovanpietro Bassani, and Giuseppe Scozzari, both of Milan, Italy, assignors to Societa Italiana Telecomunicazioni Siemens S.p.A., Milan, Italy

Filed Mar. 16, 1976, Ser. No. 667,295

Claims priority, application Italy, Mar. 17, 1975, 21314/75

Int. Cl.² H04N *7/10*

U.S. Cl. 358—86 **9 Claims**

1. A system for the selective channeling of a plurality of wide-band messages, arriving simultaneously over separate transmission paths at a distribution center, to any of several receiving stations served by said center, comprising:

a plurality of switching matrices at said center respectively assigned to said receiving stations, said transmission paths being connected in parallel to all said matrices;

a control unit for each of said matrices at said center;

a local line extending from each receiving station to the associated control unit;

selector means at each receiving station including a source of carrier wave having an elevated frequency above the band of messages and circuitry for modulating said carrier wave with message-identifying pulse trains and transmitting the modulated carrier wave to the associated control unit via the respective local line; and

demodulating means in said control unit connected to said local line for translating said pulse trains into signals for switching the assigned matric to connect said local line to the transmission path carrying the selected message;

said selector means comprising a pulse generator, a keyboard with self-locking keys whose actuation automatically releases a previously actuated key thereof, and signal-generating means responsive to actuation of any of said keys for activating said pulse generator to start the emission of a pulse train;

said circuitry including a pulse counter connected to said pulse generator for stepping by said pulse train, a modulator connected to said source and to said pulse generator for amplitude-modulating said carrier wave with said pulse train, and emission-stopping means jointly controlled by said pulse counter and by said keyboard for terminating said pulse train upon the attainment of a pulse count corresponding to an actuated key.

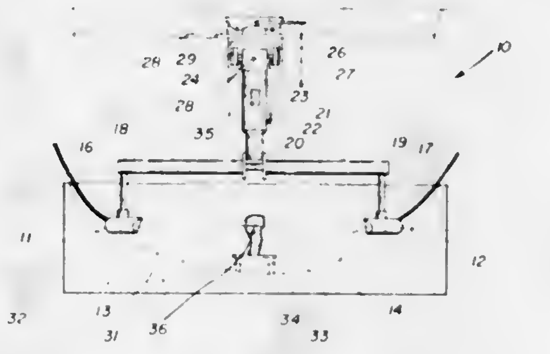
4,035,839
ULTRASONIC IMAGING

Reginald C. Eggleton, and Francis J. Fry, both of Indianapolis, Ind., assignors to Indianapolis Center For Advanced Research, Inc., Indianapolis, Ind.

Filed Jan. 8, 1976, Ser. No. 647,419

Int. Cl.² H04N *5/30*

U.S. Cl. 358—112 **9 Claims**



1. Ultrasonic imaging apparatus comprising:

ultrasonic transducer means for transmitting a beam of ultrasonic energy toward a target and for receiving a portion of said energy after it has impinged upon said target;

scan means for producing relative motion between the ultrasonic transducer means and the target;

source means for energizing the ultrasonic transducer means to emit random frequency non-coherent ultrasound; and

display means for displaying at positions corresponding to the relative motion produced by said scan means the relative intensities of a wide bandwidth of ultrasound received by the ultrasonic transducer means.

4,035,840
TELEVISION DISPLAY APPARATUS HAVING A VIDEO AMPLIFIER

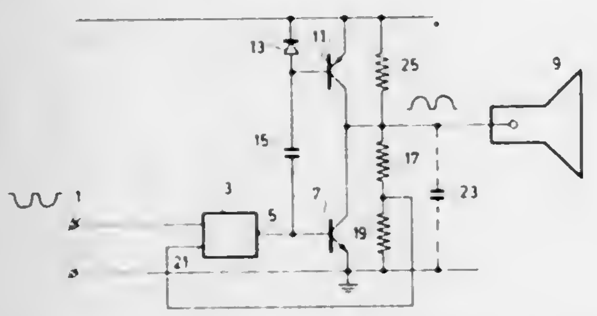
Dirk Johan Adriaan Teuling, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Nov. 19, 1975, Ser. No. 633,285

Claims priority, application Netherlands, Dec. 18, 1974, 7416481

Int. Cl.^{2} H04N *5/14;* **H03F** *3/183*

U.S. Cl. 358—184 **7 Claims**



1. A video output stage for a television display tube having a control electrode, said stage comprising a video amplifier comprising a pair of active elements including output electrodes having a high output impedance and control electrodes, said output electrodes being coupled to one another and adapted to be coupled to said control electrode of said picture display tube, a first capacitor means for applying a signal of high video frequencies only to one of said element control electrodes, the elements comprising a complementary pair of transistors which are coupled in series and have emitter, base, and collector electrodes, said last two recited electrodes being said control and output electrodes respectively, said collectors being adapted to be coupled to the control electrode of the picture display tube, the base of one of the transistors being controlled by said capacitor, a first diode means coupled to said capacitor controlled base and to a potential source for providing that in the absence of a signal substantially no direct current flows through this transistor, the polarity of the diode being that after a possible change in the charge of the capacitor due to a signal jump which has rendered the base-emitter junction of the transistor conductive the said change in charge can be cancelled by an opposite signal jump which renders the diode conductive, the quiescent state of the other transistor being also substantially currentless, and a voltage feedback means from an output of the amplifier to an input.

4,035,841
TELEVISION PICTURE CENTERING CONTROL

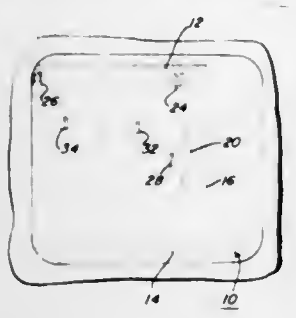
Daniel W. Micek, Norridge, Ill., assignor to Universal Research Laboratories, Inc., Elk Grove Village, Ill.

Filed Sept. 26, 1975, Ser. No. 617,240

Int. Cl.^{2} H04N *5/68*

U.S. Cl. 358—242 **10 Claims**

1. A centering control circuit for a cathode ray tube display in which a synchronizing signal is provided for synchronizing the cathode ray tube raster scanning, which centering control circuit enables an operator to set the entire picture displayed on the cathode ray tube for placement in a desired location on the cathode ray tube by manual adjustment, comprising means for receiving a reference signal corresponding to a fixed point on the display; and manually variable means for providing a shifted synchronizing signal having a shift that is variable to place said fixed point at a desired location on the cathode ray tube, whereby the entire picture displayed on the cathode ray tube is placed in a desired location on the cathode ray tube.



4,035,842
RECORDED VIDEO SIGNAL REPRODUCING APPARATUS CAPABLE OF REPRODUCING STOP MOTION STILL PICTURES

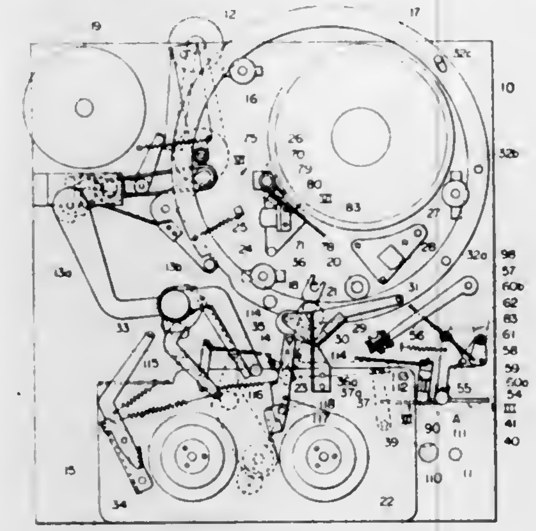
Yoshikazu Terao, and Katsuhisa Muto, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Yokohama, Japan

Filed Aug. 26, 1975, Ser. No. 607,755

Claims priority, application Japan, Aug. 27, 1974, 49-98082; Aug. 27, 1974, 49-98083; Aug. 27, 1974, 49-102656[U]; Aug. 27, 1974, 49-102657[U]; Aug. 27, 1974, 49-102658[U]

Int. Cl.^{2} H04M *5/78;* **G11B** *15/66*

U.S. Cl. 360—10 **8 Claims**



1. A stop motion video signal reproducing apparatus comprising:

a guide drum means having a cylindrical surface and including at least one rotating video head;

a tape cassette containing a tape wound upon a tape supply roll and a tape take-up roll with a portion extending between the two rolls, said tape having video signals recorded thereon;

automatic loading means for automatically withdrawing the portion of the recording tape extending between said rolls out of the cassette and loading the same in a predetermined helical tape traveling path in the apparatus, said helical path having a pitch angle of inclination with respect to said guide drum, wrapping a part of the tape around the cylindrical surface of the guide drum and over a specific angular extent thereof;

driving means for causing the tape thus loaded in the predetermined tape traveling path to travel;

stop motion means for stopping the driving means and thereby stopping the travel of the tape, and means for adjusting the pitch angle of inclination of said helical path;

displacing means operating while the tape travel is stopped in order to change the length of the tape in the tape traveling path, thereby to cause a forward longitudinal displacement of the part of the tape which is in wrapping contact with the guide drum; and

control means for actuating the displacing means in the tape displacing operation in a manner such that the rotating head scans tracks which are recorded on the tape, while the tape is stopped, thereby to afford desirable reproduction of a stop motion still picture.

4,035,843
MAGNETIC RECORDING SYSTEM

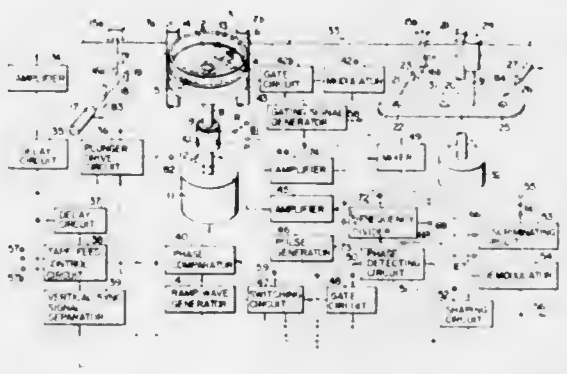
Hirozo Tanimura, 168, Hishiyanishi, Higashi-Osaka, Osaka, Japan

Filed July 15, 1975, Ser. No. 596,076

Claims priority, application Japan, July 17, 1974, 49-82359

Int. Cl.^{2} G11B *5/50;* **H04M** *5/78*

U.S. Cl. 360—35 **9 Claims**



1. In a magnetic recording system for extracting desired fields from a continuous video signal containing sync signals and recording said fields sequentially field-by-field on a magnetic tape, comprising:

a rotary magnetic head assembly including a drum and a plurality of rotary magnetic heads;

a motor for rotating said magnetic heads;

rotational phase detection means for detecting the rotational phase of said rotary magnetic heads and generating a rotational phase signal corresponding thereto;

intermittent magnetic tape drive means for intermittently moving a predetermined length of said magnetic tape around the outer periphery of said drum in a selected direction, said magnetic tape being held stationary during recording;

video signal recording circuit means for extracting a desired field from said video signal to be recorded and coupling said field to one of said rotary magnetic heads;

video signal reproducing means for reproducing the video signal recorded on said magnetic tape, said signal being extracted from said tape by a magnetic head other than said one head used for recording said video signal on said tape;

pulse generating means coupled to said video signal reproducing means for generating a pulse at the instant the reproduced video signal at the output of said video signal reproducing means vanishes;

tape drive control means having inputs coupled to said pulse generating means and said rotational phase detection means and an output coupled to said intermittent magnetic tape drive means, the output of said tape drive control means controlling said magnetic tape drive means to stop said magnetic tape when the non-recorded portion thereof arrives at a predetermined recording position on the outer periphery of said drum; and

magnetic head motor control means having inputs coupled to said pulse generating means and said rotational phase detection means and an output coupled to said motor for rotating said magnetic heads; said motor control means coupling a phase error signal to said motor for controlling the rotation of said motor.

DESIGN PATENTS

GRANTED JULY 12, 1977

ERRATA

For CLASS	See PATENT NO.
014–011	245,020
014–011	245,021
014–028	245,022
064–011 B	245,024
014–043	245,025
015–138	245,026
031–022	245,023
014–005	245,037
014–005	245,038
024–028	245,040

DESIGNS

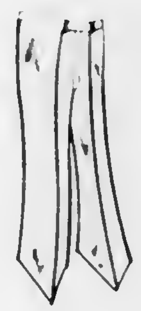
JULY 12, 1977

244,966

PANTS

Charles Avrich, 55 Devon Avenue, Montreal, Quebec, Canada
Filed Oct. 17, 1974, Ser. No. 515,686
Term of patent 14 years
Int. Cl. D2—*02*

U.S. Cl. D2—28

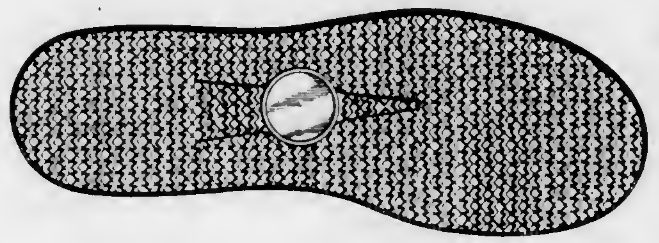


244,967

SHOE SOLE

Joseph P. Famolare, Jr., Florence, Italy, assignor to Famolare, Inc., New York, N.Y.
Filed June 30, 1975, Ser. No. 591,767
Term of patent 14 years
Int. Cl. D2—*04*

U.S. Cl. D2—320

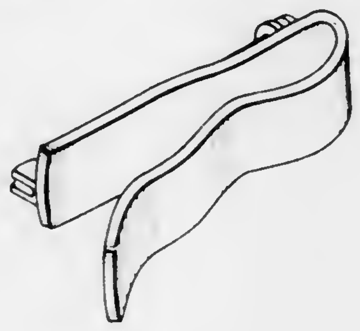


244,968

SHOULDER BAG STRAP HOLDER

James H. Fowble, 2301 Broadway No. 301, San Francisco, Calif. 94115
Filed Jan. 8, 1976, Ser. No. 647,428
Term of patent 14 years
Int. Cl.^{2} D2—*07*

U.S. Cl. D2—401

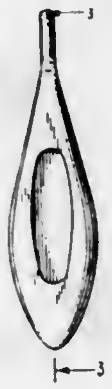


244,969

PENDANT PULL FOR A SLIDE FASTENER

Edwin Leon Lombard, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.
Filed Aug. 7, 1975, Ser. No. 602,797
Term of patent 14 years
Int. Cl. D2—*07*

U.S. Cl. D2—415

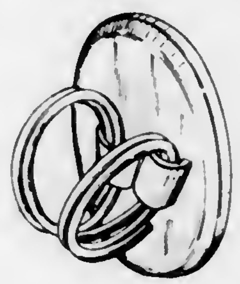


244,970

SCARF LOOP

Florence Weiner, 277 W. End Ave., New York, N.Y. 10023
Filed Dec. 29, 1975, Ser. No. 645,021
Term of patent 14 years
Int. Cl. D2—*07*

U.S. Cl. D2—448



244,971
STAND FOR POTTED PLANTS

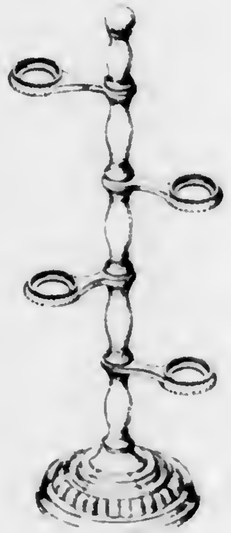
Charles P. Naumoff, R.D. No. 3, Export, Pa. 15632; Dominick Loscalzo, 157-32 20th Ave., Whitestone, N.Y. 11357, and Howard Ward Michaelson, 4 Whitfield Lane, Coram, N.Y. 11727

Filed Nov. 26, 1975, Ser. No. 635,691

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—24



244,972
EASY CHAIR

Karl Lübke, Rheda, Germany, assignor to Lübke KG, Rheda, Germany

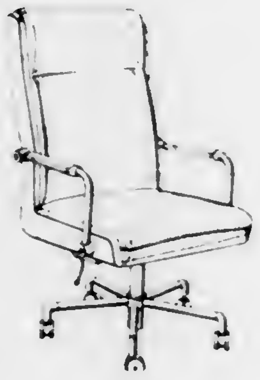
Filed Sept. 19, 1975, Ser. No. 614,779

Claims priority, application Germany, Apr. 23, 1975, 772

Term of patent 14 years

Int. Cl. D6—*01*

U.S. Cl. D6—31



244,973
OTTOMAN

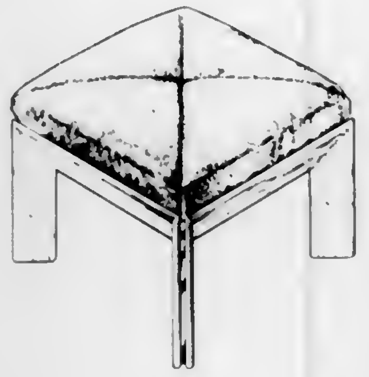
Jules M. Heumann, South San Francisco, Calif., assignor to Metropolitan Furniture Manufacturing Company

Division of Ser. No. 595,564, July 14, 1975. This application Sept. 22, 1976, Ser. No. 725,660

Term of patent 14 years

Int. Cl.^{2} D6—*01*

U.S. Cl. D6—36



244,974
SETTEE

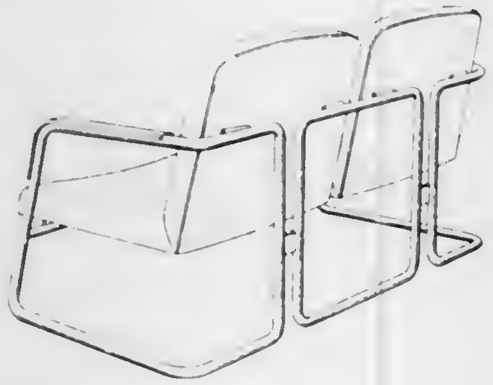
Karl Hummitzsch, Cambridge, Canada, assignor to Interroyal Corporation Limited

Filed Sept. 22, 1975, Ser. No. 615,374

Term of patent 14 years

Int. Cl.^{2} D6—*01*

U.S. Cl. D6—63



244,975
FOLDABLE CHAIR

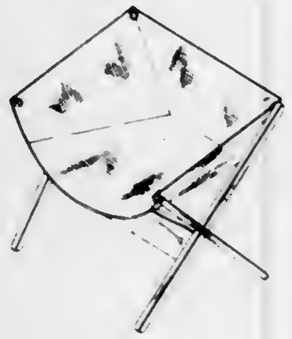
Ned Steinberger, 69 Gold St., Brooklyn, N.Y. 11201

Filed Dec. 3, 1975, Ser. No. 633,603

Term of patent 14 years

Int. Cl.^{2} D6—*01*

U.S. Cl. D6—67



244,976
ARMCHAIR

Giorgio Rinaldi, Via Tombelle, 9, Saonara (Padova), Italy

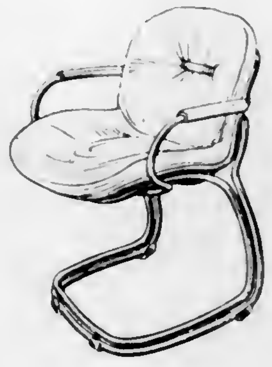
Filed Jan. 26, 1976, Ser. No. 652,279

Claims priority, application Italy, July 28, 1975, 61418/75

Term of patent 7 years

Int. Cl. D6—*01*

U.S. Cl. D6—67



244,977
CHAIR

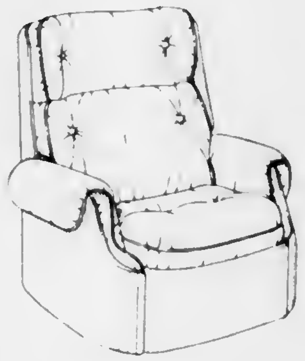
Patrick Waldron, Mount Prospect, Ill., assignor to Futurian Corporation, Amsterdam, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,752

Term of patent 14 years

Int. Cl.^{2} D6—*01*

U.S. Cl. D6—71



244,978
CHAIR

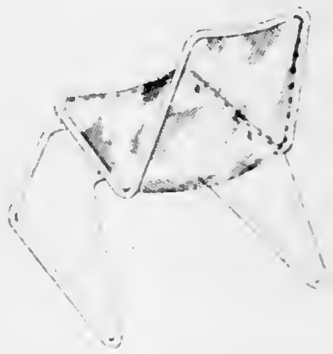
Norman Polsky; James L. Gerner; Norman J. Heying; Edgar M. Lieberman, and Frank Burnett, all of c/o Fixtures Manufacturing Corporation, 1642 Crystal, Kansas City, Mo. 64126

Filed Apr. 12, 1976, Ser. No. 675,698

Term of patent 14 years

Int. Cl.^{2} D6—*01*

U.S. Cl. D6—77



244,979
BELT RACK

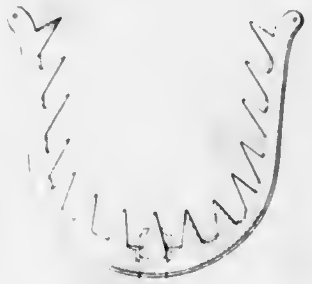
Marcia M. Gitlitz, 2400 Hudson Territory P.O. Box 1084, Fort Lee, N.J. 07024

Filed June 28, 1976, Ser. No. 700,605

Term of patent 7 years

Int. Cl.^{2} D6—*04*

U.S. Cl. D6—118



244,980
HOUSING FOR A DISPLAY UNIT

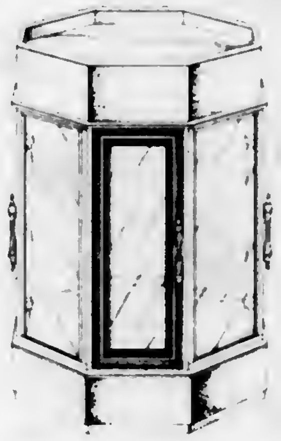
James H. Kippenbrock, and Wanda P. Kippenbrock, both of 1220 Flamingo Lane, Garland, Tex. 75042

Filed Aug. 19, 1974, Ser. No. 498,270

Term of patent 14 years

Int. Cl. D6—*04*; D20—*02*

U.S. Cl. D6—146



244,981

ILLUMINATED SHOWCASE FOR ARTIFICIAL SOFT PRETZELS OR THE LIKE

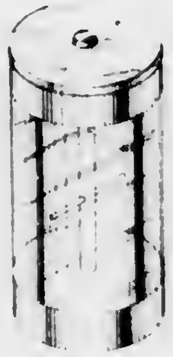
Charles K. Austin, Wheat Ridge, Colo., assignor to King Pretzel Corporation, Lakewood, Colo.

Filed Feb. 18, 1976, Ser. No. 659,098

Term of patent 14 years

Int. Cl.^{2} D20—*02*

U.S. Cl. D6—146



244,982

COLLAPSIBLE SHELF UNIT

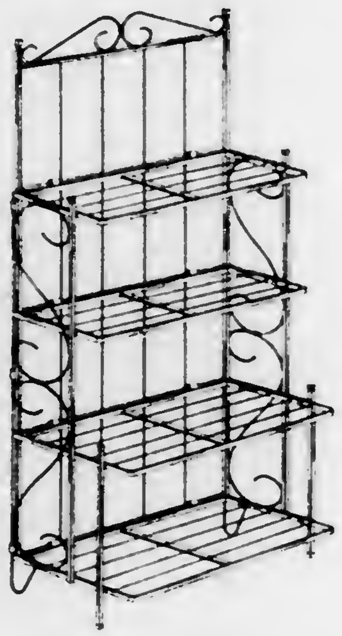
James Parra, 4329 Raynol, Los Angeles, Calif. 90032

Filed Nov. 7, 1975, Ser. No. 629,753

Term of patent 14 years

Int. Cl.^{2} D6—*04*

U.S. Cl. D6—186



244,983

SUPPORT STAND PRIMARILY FOR PHONOGRAPH RECORDS AND STEREO COMPONENTS

Yoshiaki Iida, Katano; Takashi Hiraoka, Hirakata, and Sakae Nakamoto, Kobe, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

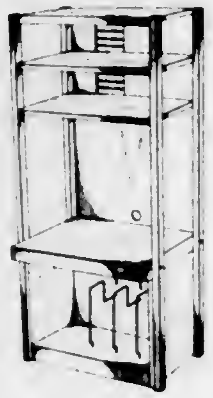
Filed Mar. 2, 1976, Ser. No. 663,029

Claims priority, application Japan, Sept. 3, 1975, 50-36004

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—186



244,984

COASTER

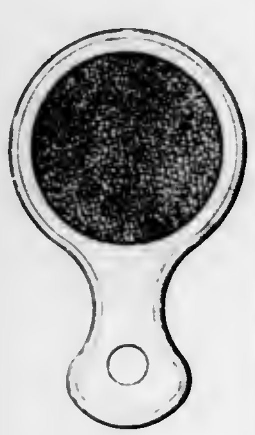
Julie Pomerantz, 230 Fifth Ave., New York, N.Y. 10001

Filed June 30, 1975, Ser. No. 591,598

Term of patent 14 years

Int. Cl. D7—*06*

U.S. Cl. D7—45



244,985

CAMP STOVE

William Albert Folke, Upplands Vasby, Sweden, assignor to Aktiebolaget Optimus, Upplands Vasby, Sweden

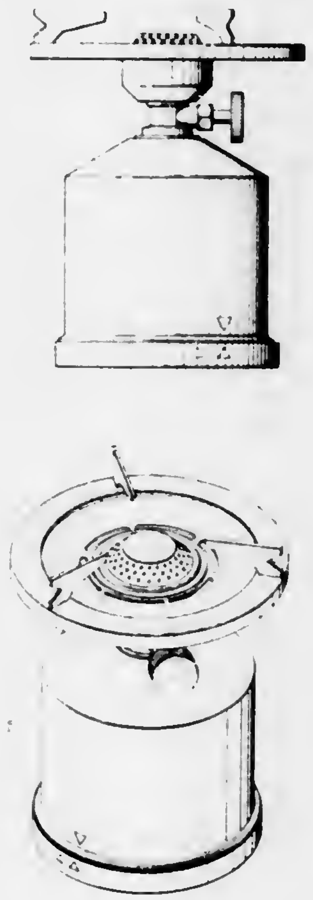
Filed Mar. 4, 1975, Ser. No. 555,252

Claims priority, application Sweden, Sept. 4, 1974, 1407/74

Term of patent 14 years

Int. Cl. D7—*04*

U.S. Cl. D7—110



244,986

GARDEN TOOL HANDLE

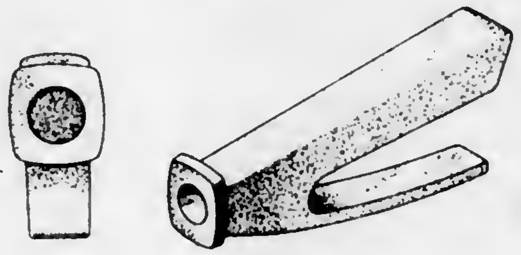
Mike Vosbikian, Hainesport, N.J., assignor to Hardward & Industrial Tool Co., Inc., Philadelphia, Pa.

Filed Aug. 7, 1975, Ser. No. 602,563

Term of patent 14 years

Int. Cl. D8—*01*

U.S. Cl. D8—1



244,987

MULTIPURPOSE TOOL

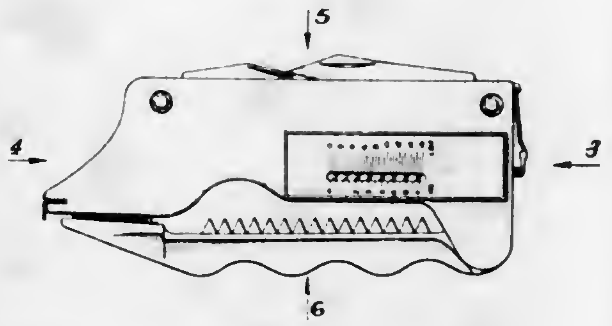
Bernard R. Lavitch, 4945 Havenhurst, Encino, Calif. 91316

Filed Apr. 30, 1976, Ser. No. 682,084

Term of patent 14 years

Int. Cl. D8—*03*

U.S. Cl. D8—99



244,988

LUGGAGE CARRIER

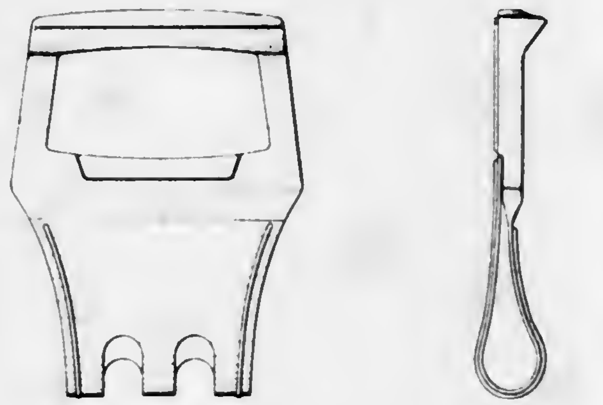
Robert D. Riedle, Okemos, Mich., assignor to Third Arm Inc., Vandalia, Ill.

Filed July 28, 1975, Ser. No. 600,360

Term of patent 14 years

Int. Cl. D8—*06*

U.S. Cl. D8—319



244,989

DUAL WHEEL CASTER

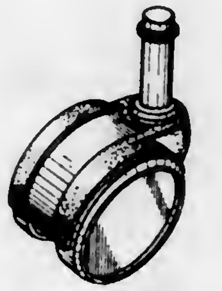
Donald C. Crescenzi, Branford, Conn., assignor to Stewart-Warner Corporation, Chicago, Ill.

Filed Nov. 17, 1975, Ser. No. 632,409

Term of patent 14 years

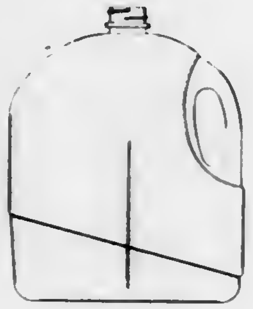
Int. Cl. D6—*06*

U.S. Cl. D8—375



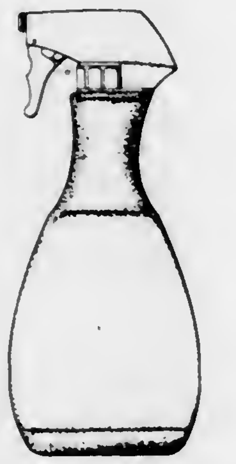
244,990
JUG

Victor F. Anderson, Wenonah, N.J., assignor to Bercon Packaging, Incorporated, Berwick, Pa.
Filed Dec. 15, 1975, Ser. No. 640,598
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—40



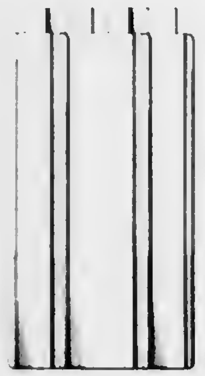
244,991
SPRAY BOTTLE

R. L. Weckman, Perrysburg, Ohio; Kevin O'Brien, Westport, Conn., and Roger Vanderlaan, Walnut Creek, Calif., assignors to The Clorox Company, Oakland, Calif.
Filed Sept. 15, 1975, Ser. No. 613,457
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—63



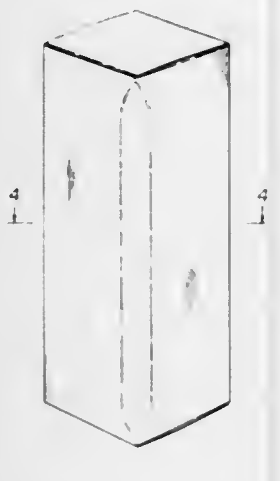
244,992
COMBINED PACKAGING CONTAINER AND TOY CONSTRUCTION BLOCK

Germaine Van der Veken, Vrijheidslaan 171, 1080 Brussel, Belgium
Filed May 15, 1975, Ser. No. 577,907
Claims priority, application Belgium, Mar. 26, 1975, 50182
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—167



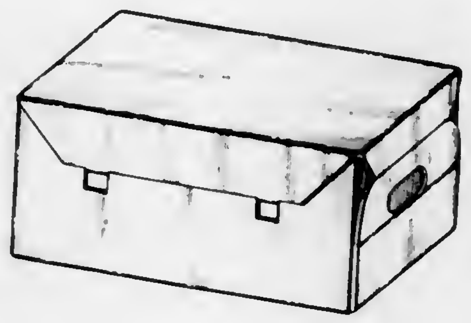
244,993
CARTON

John Stewart Drysdale, New York, N.Y., assignor to Helena Rubinstein, Inc., New York, N.Y.
Filed May 21, 1975, Ser. No. 579,619
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—222



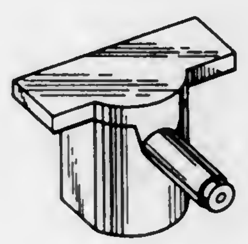
244,994
PAPERBOARD BOX OR THE LIKE

Thomas L. Flanagan, Killingworth, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.
Filed Nov. 28, 1975, Ser. No. 636,256
Term of patent 14 years
Int. Cl.² D9—*02*
U.S. Cl. D9—224



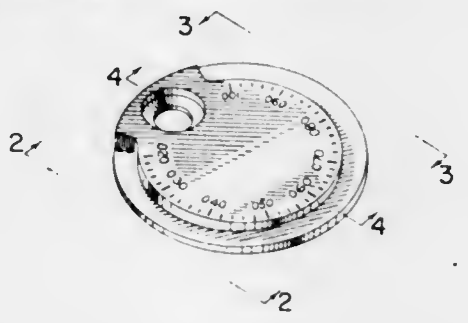
244,995
AEROSOL SPRAY ACTUATOR BUTTON

William E. Sullivan, Columbia, S.C., assignor to The Risdon Manufacturing Company, Naugatuck, Conn.
Filed Mar. 3, 1976, Ser. No. 663,619
Term of patent 14 years
Int. Cl. D9—*07*
U.S. Cl. D9—258



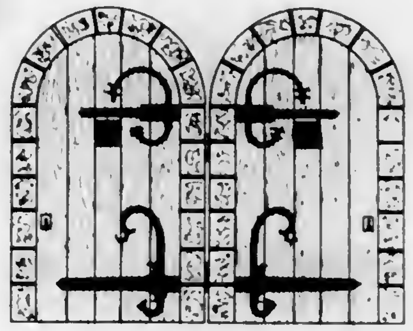
244,996
SPARK PLUG GAPPER

George G. Martin, 1743 Walnut Road, Kent, Ohio 44240
Filed Mar. 4, 1976, Ser. No. 663,827
Term of patent 14 years
Int. Cl. D10—*04*
U.S. Cl. D10—64



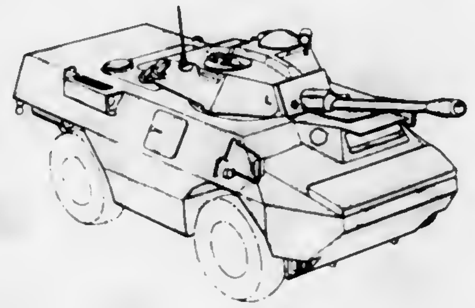
244,997
FOLDABLE RELIGIOUS TABLET

Caesar R. Siclare, 6531 SW. 56th St., Davie, Fla. 33314
Filed Jan. 12, 1976, Ser. No. 648,122
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—122



244,998
COMBINED ARMOURED VEHICLE BODY AND GUN-TURRET

Jacques Longeau, Suresnes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipments Mecaniques Saviem, Suresnes, France
Filed Oct. 8, 1975, Ser. No. 620,774
Claims priority, application France, Apr. 10, 1975, 75.73779
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



244,999
COMBINED ARMOURED VEHICLE BODY AND GUN-TURRET

Jacques Longeau, Suresnes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipments Mecaniques Saviem, Suresnes, France

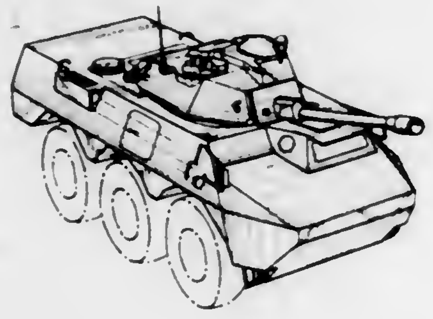
Filed Oct. 8, 1975, Ser. No. 620,775

Claims priority, application France, Apr. 10, 1975, 75.73781

Term of patent 14 years

Int. Cl. D12—*13*

U.S. Cl. D12—12



245,000
ARMOURED VEHICLE BODY

Jacques Longeau, Suresnes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Equipments Mecaniques Saviem, Suresnes, France

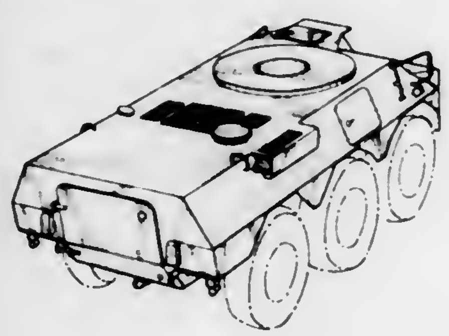
Filed Oct. 8, 1975, Ser. No. 620,782

Claims priority, application France, Apr. 10, 1975, 75.73784

Term of patent 14 years

Int. Cl. D12—*13*

U.S. Cl. D12—12



245,001
MOTORCYCLE

Makoto Hori, Wako; Koichi Arima, Tokyo, and Tetsuro Kataoka, Shiki, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

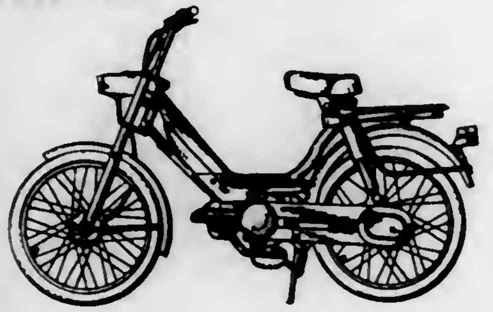
Filed Apr. 1, 1976, Ser. No. 672,832

Claims priority, application Japan, Oct. 7, 1975, 50-40608

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—110



245,002
BICYCLE

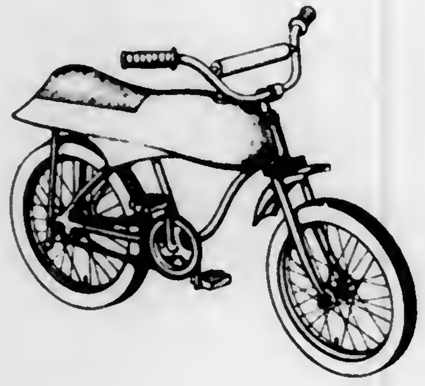
D. Lee Carpenter, and James E. Cotter, both of Dayton, Ohio, assignors to The Huffman Manufacturing Company

Filed Jan. 29, 1976, Ser. No. 653,539

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—111



245,003
MOTORCYCLE ACCESSORY HOUSING

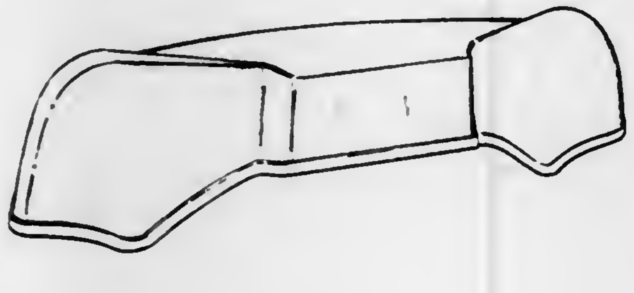
David J. Fritts, and Faye B. Fritts, both of 3422 Caracas Drive, Mesquite, Tex. 75149

Filed Mar. 8, 1976, Ser. No. 664,640

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—114



245,004
AUTOMATIC POSITIONING SYSTEM DATA PROCESSOR

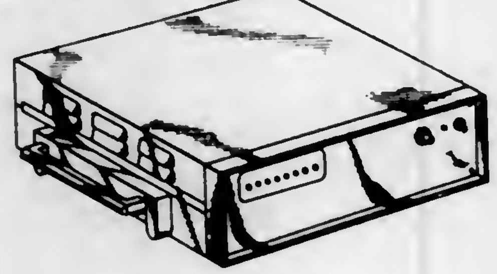
Larry J. Fox, and Gil T. Doe, both of Scottsdale, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Filed June 14, 1976, Ser. No. 695,601

Term of patent 14 years

Int. Cl.^{2} D14—*02*

U.S. Cl. D14—45



245,005
COMPRESSOR

Alan Carter, Tenbury Wells, England, assignor to The Hydrovane Compressor Company, England

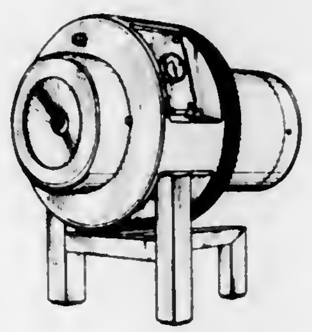
Filed July 23, 1975, Ser. No. 598,290

Claims priority, application United Kingdom, Feb. 10, 1975, 969801/75

Term of patent 14 years

Int. Cl.^{2} D15—*02*

U.S. Cl. D15—9



245,006
SLURRY DISPENSING APPARATUS

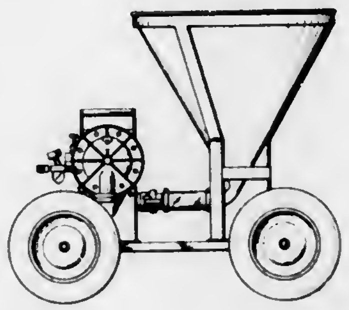
Ernest E. Mills, R.R. No. 1, Straughn, Ind. 47387

Filed Dec. 18, 1975, Ser. No. 642,005

Term of patent 14 years

Int. Cl.^{2} D15—*04*

U.S. Cl. D15—19



245,007
AUTOMATIC CHUCKING MACHINE

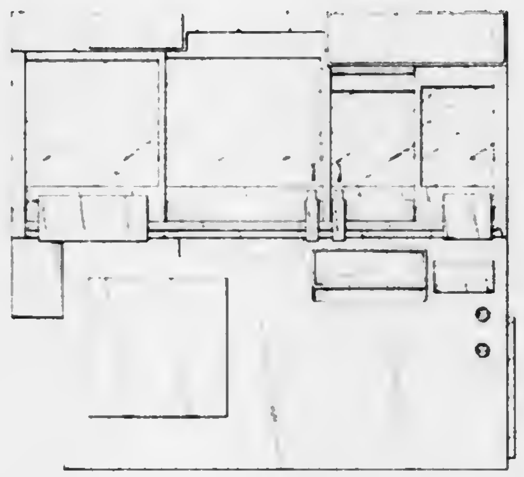
Henry L. Cunningham, Horseheads, N.Y., assignor to Hardinge Brothers, Inc., Elmira, N.Y.

Filed Dec. 19, 1975, Ser. No. 642,531

Term of patent 14 years

Int. Cl.^{2} D15—*09*

U.S. Cl. D15—122



245,008
ICE CUBE TRAY

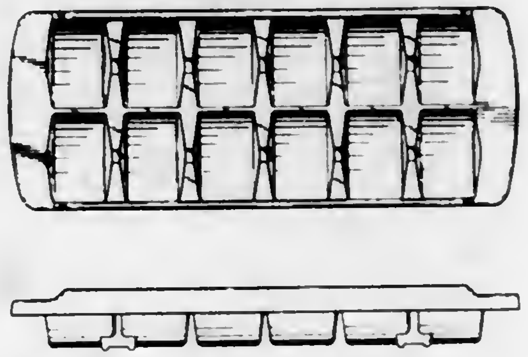
Michael G. LaLonde, 37 Lutsch Ave., Apt. 5, Leamington, Ontario, Canada

Filed June 4, 1976, Ser. No. 693,205

Term of patent 14 years

Int. Cl. D15—*07*

U.S. Cl. D15—90



245,009
POTTER'S WHEEL

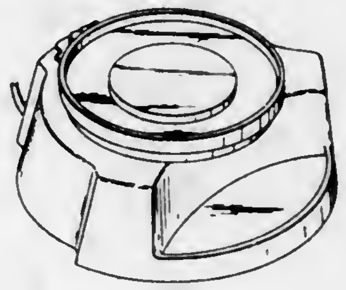
John W. Ebstein, Roslyn Heights, N.Y., assignor to Gabriel Industries, Inc., New York, N.Y.

Filed May 3, 1976, Ser. No. 682,942

Term of patent 14 years

Int. Cl. D19—*06*

U.S. Cl. D19—35

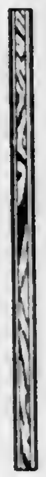


245,010
SPINDLE COVER

Jay E. Bajorek, 470 Allen Drive, Wadsworth, Ohio 44281, and Albert L. Newman, 1452 Westdover Road, Cleveland Heights, Ohio 44118

Filed May 17, 1976, Ser. No. 687,315
Term of patent 14 years
Int. Cl. D25—*01*

U.S. Cl. D25—77

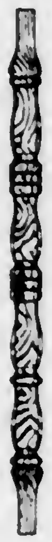


245,011
SPINDLE COVER

Jay E. Bajorek, 470 Allen Drive, Wadsworth, Ohio 44281, and Albert L. Newman, 1452 Westdover Road, Cleveland Heights, Ohio 44118

Filed May 17, 1976, Ser. No. 687,316
Term of patent 14 years
Int. Cl. D25—*01*

U.S. Cl. D25—77

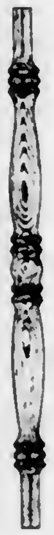


245,012
SPINDLE COVER

Jay E. Bajorek, 470 Allen Drive, Wadsworth, Ohio 44281, and Albert L. Newman, 1452 Westdover Road, Cleveland Heights, Ohio 44118

Filed May 17, 1976, Ser. No. 687,317
Term of patent 14 years
Int. Cl. D25—*01*

U.S. Cl. D25—77

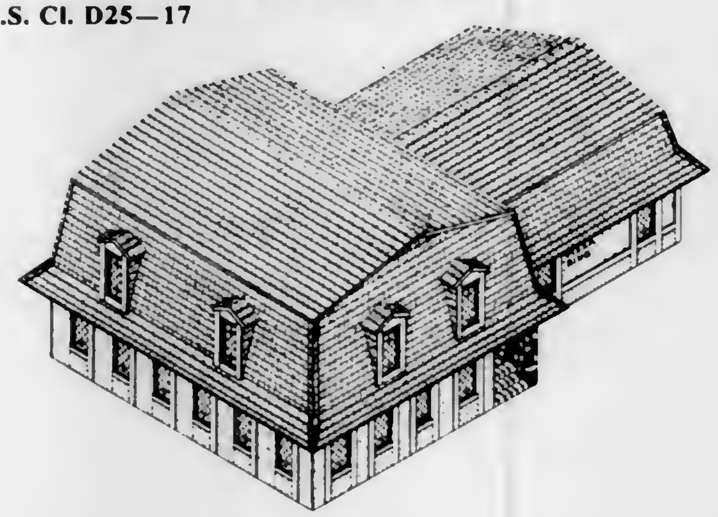


245,013
BUILDING

Joe Albert McHarg, Jr., Smyrna, Ga., assignor to Pizza Ring Enterprises, Chamblee, Ga.

Filed Sept. 29, 1975, Ser. No. 617,644
Term of patent 14 years
Int. Cl. D25—*03*

U.S. Cl. D25—17

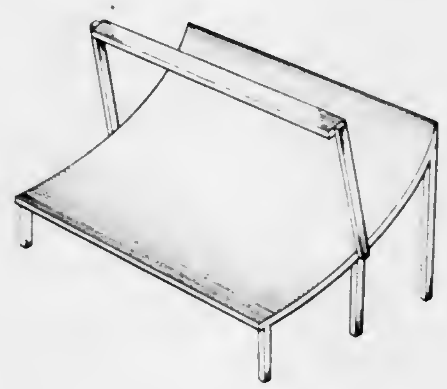


245,014
COMBINED SUPPORTED REFLECTOR AND ARM-SUPPORTED SUSPENDED BEAM, USEFUL FOR SOLAR BUILDINGS AND THE LIKE

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Mar. 27, 1975, Ser. No. 562,758
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D25—56

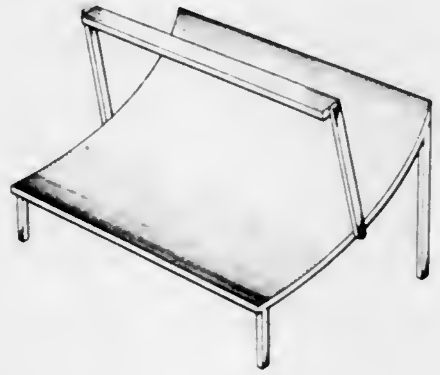


245,015
COMBINED SUPPORTED REFLECTOR AND ARM-SUPPORTED BEAM, USEFUL FOR SOLAR BUILDINGS AND THE LIKE

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Mar. 27, 1975, Ser. No. 562,759
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D25—56

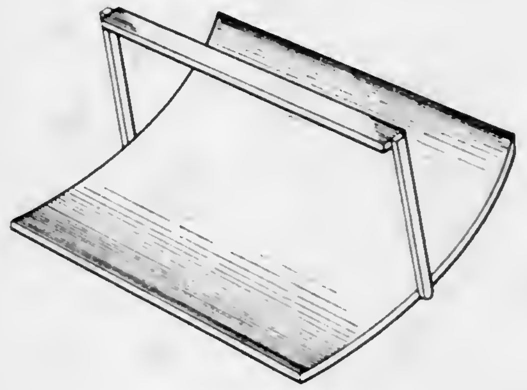


245,016
COMBINED REFLECTOR AND ARM-SUPPORTED BEAM, USEFUL FOR SOLAR BUILDING AND THE LIKE

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.

Filed Mar. 27, 1975, Ser. No. 562,760
Term of patent 14 years
Int. Cl.^{2} D25—*02*

U.S. Cl. D25—56

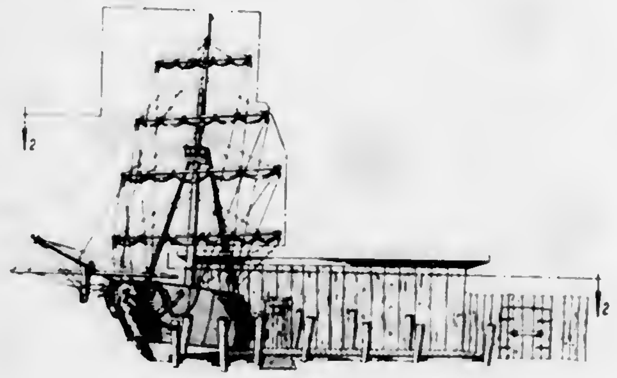


245,017
STORE FRONT

Jack F. Macione, 4813 Lake Bradford Lane, Virginia Beach, Va. 23455

Filed Aug. 28, 1973, Ser. No. 392,227
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D25—59

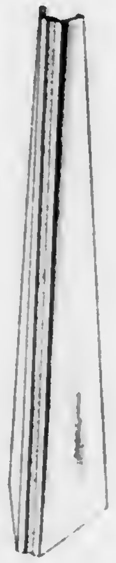


245,018

UPRIGHT FOR AN OVERGROUND SWIMMING POOL

Richard Harris, Pomona, N.Y., assignor to Westrock Industries Inc., Nanuet, N.Y.

Filed June 25, 1975, Ser. No. 590,137
Term of patent 14 years
Int. Cl. D25—*99*
U.S. Cl. D25—61

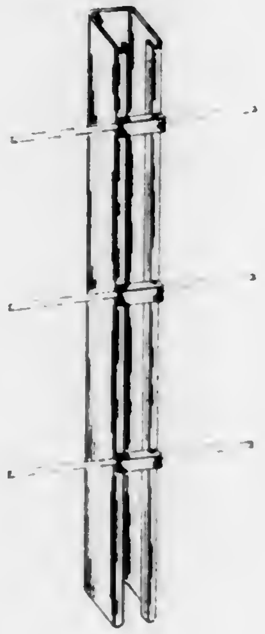


245,019

FENCE POST

Robert H. Ashworth, Penn Hills Township, Allegheny County, Pa., assignor to United States Steel Corporation

Filed May 31, 1974, Ser. No. 475,083
Term of patent 14 years
Int. Cl. D25—*01*
U.S. Cl. D25—77

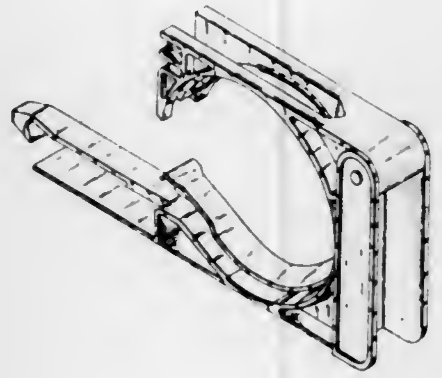


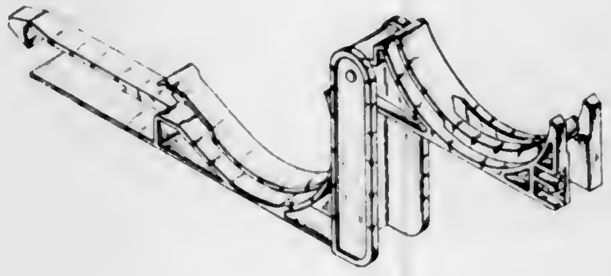
245,020

FILM MAGAZINE OR THE LIKE

Bruce Everett Crayton; Kenwood Francis Block, both of Rochester, and Richard Joseph Olson, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1975, Ser. No. 604,984
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D14—11



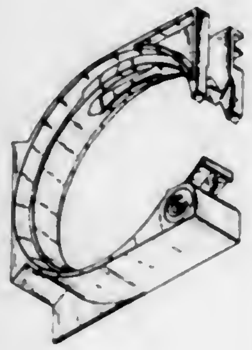


245,021

FILM MAGAZINE OR THE LIKE

Bruce Everett Crayton, Rochester; Ronald Alfred Phillips, Pittsford, and Kenwood Francis Block, Rochester, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Aug. 15, 1975, Ser. No. 604,985
Term of patent 14 years
Int. Cl. D16—*05*
U.S. Cl. D14—11

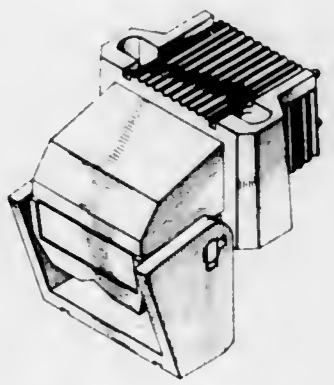


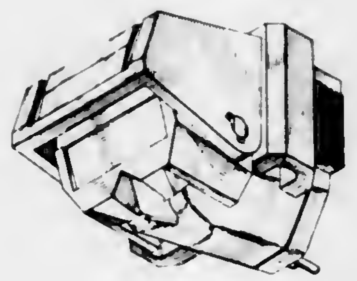
245,022

PHONOGRAPH CARTRIDGE

James P. Thomsen, Mount Prospect, Ill., assignor to Shure Brothers Incorporated, Ill.

Filed May 26, 1976, Ser. No. 690,014
Term of patent 14 years
Int. Cl. D14—*01*
U.S. Cl. D14—28



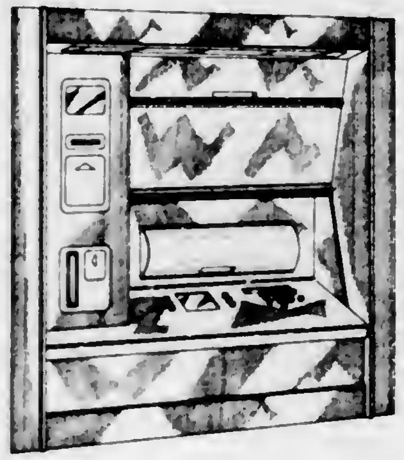


245,023

FRONT COVER FOR A BANKING MACHINE TERMINAL OR SIMILAR ARTICLE

Thomas L. Hermann, Springfield, Ohio, assignor to NCR Corporation, Dayton, Ohio

Division of Ser. No. 420,928, Dec. 3, 1973, Pat. No. Des. 238,429. This application Oct. 17, 1975, Ser. No. 623,297
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D31—22

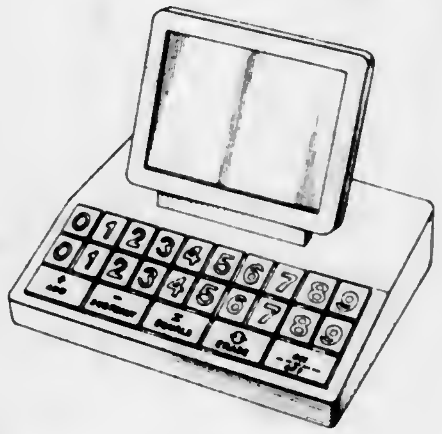


245,024

ELECTRONIC DESK CALCULATOR WITH BLACKBOARD DISPLAY

Robert Genin, Bay Harbor Islands, Fla., assignor to Jardine Industries, Inc., Hong Kong

Filed Jan. 29, 1976, Ser. No. 653,581
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 B

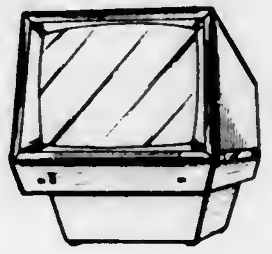


245,025

DISPLAY MODULE

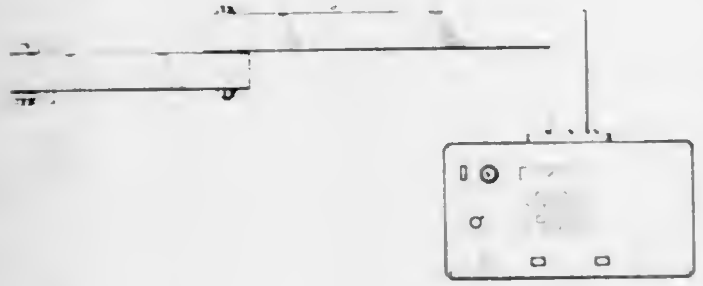
David Rolfe Smith, Hillsboro, and Richard Ellwood Hansen, Portland, both of Oreg., assignors to Tektronix, Inc.

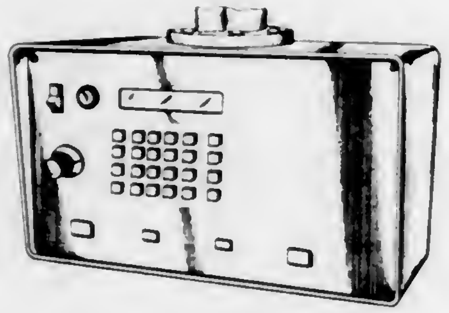
Filed Apr. 5, 1976, Ser. No. 673,779
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—43



245,026
DIGITAL CONTROL PENDANT ASSEMBLY FOR MACHINE TOOLS

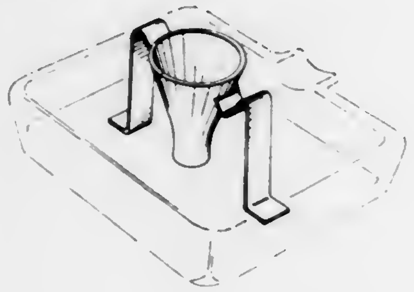
Gerald V. Roch, and James P. Wiles, both of Indianapolis, Ind., assignors to Hurco Manufacturing Company, Inc., Indianapolis, Ind.
Filed Mar. 14, 1975, Ser. No. 558,214
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D15—138





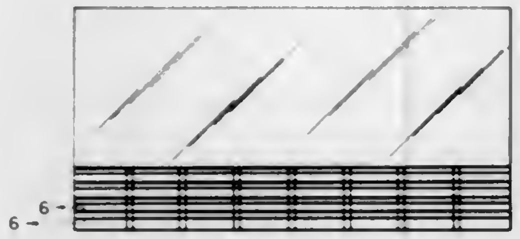
245,027
ASHTRAY MOUNTED CIGARETTE SNUFFER

Arthur A. Fisher, 4712 E. Indian School Road, Phoenix, Ariz. 85018
Filed Apr. 26, 1976, Ser. No. 680,502
Term of patent 14 years
Int. Cl. D27—*99*
U.S. Cl. D27—9



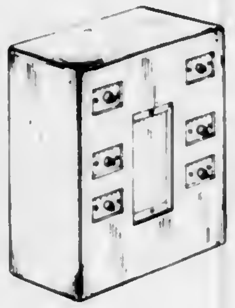
245,028
AQUARIUM COVER

Daniel Frederick Groth, 14 Brookdale Drive, Wilbraham, Mass. 01095
Filed Nov. 16, 1976, Ser. No. 742,501
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—12



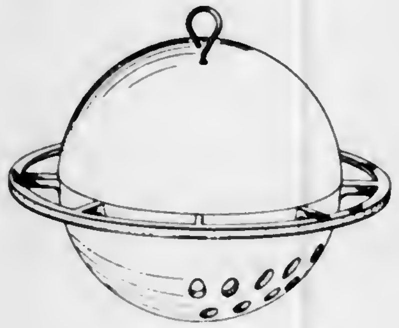
245,029
ANIMAL WATERER

Bueal F. Hedstrom, Rte. 3, Denison, Iowa 51422
Filed July 6, 1976, Ser. No. 702,515
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—13



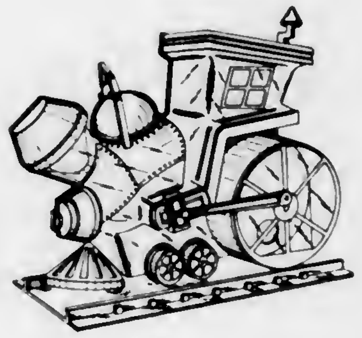
245,030
SUET FEEDER FOR BIRDS

Kenneth L. Fiedler, 150 Graham St., Austin, Minn. 55912
Filed Mar. 29, 1976, Ser. No. 671,337
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



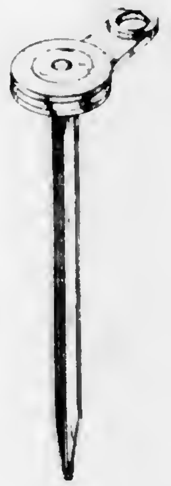
245,031
ANIMATED CAGE FOR SMALL ANIMALS

Dennis H. Merino, 2844 King Edward Drive, El Dorado Hills, Calif. 95630
Filed Nov. 10, 1975, Ser. No. 630,402
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—42



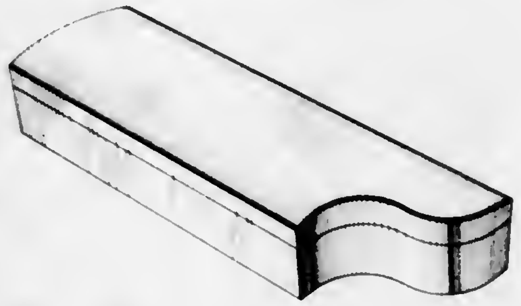
245,032
TETHER

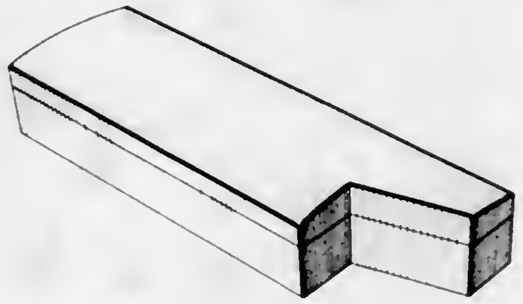
Gary J. Hoffmann, 5964 Sheridan Blvd., Arvada, Colo. 80003
Filed June 24, 1976, Ser. No. 699,515
Term of patent 14 years
Int. Cl. D30—*09*
U.S. Cl. D30—44



245,033
CASKET

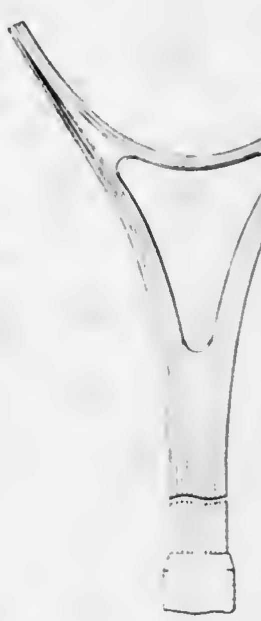
Louis Moses Bini, 19 Sycamore Drive, Old Bridge, N.J. 08857
Filed June 23, 1975, Ser. No. 589,460
Term of patent 14 years
Int. Cl. D3—*01*
U.S. Cl. D31—1





245,034
TENNIS RACKET

Charles L. Segal; Michael G. Anderson, and David N. Vincent, all of San Diego, Calif., assignors to Groves-Kelco, Inc., Minneapolis, Minn.
Filed June 27, 1975, Ser. No. 590,829
Term of patent 14 years
Int. Cl. D21—*02*
U.S. Cl. D34—5 ST



245,035
GOLF PUTTING AID

Peter James Gordon, 6, The Barons, Twickenham, Middlesex, England

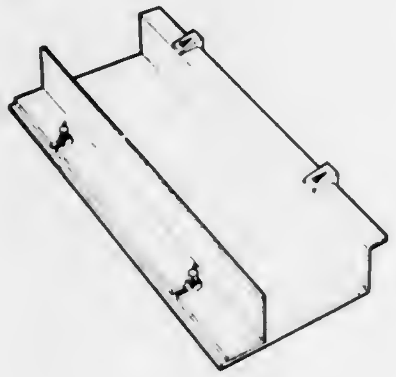
Filed Dec. 23, 1975, Ser. No. 643,675

Claims priority, application United Kingdom, June 24, 1975, 971611/75

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D34—5 CB



245,036
KNIGHT CHESS PIECE

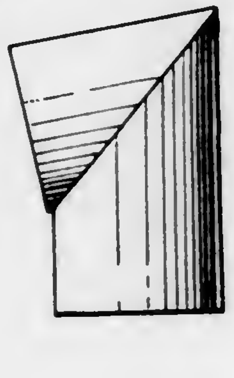
Robert R. Hollendonner, 5 Cranbrook Road, Trenton, N.J. 08698

Division of Ser. No. 301,098, Oct. 26, 1972. This application Feb. 26, 1976, Ser. No. 658,655

Term of patent 14 years

Int. Cl. D21—*01*

U.S. Cl. D34—5 CH



245,037
COMBINED RADIO RECEIVER AND CASSETTE TAPE RECORDER

Takemi Ebata, Kyoto; Iwao Nakajima, Katano, and Sinzi Makino, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Kadoma, Japan

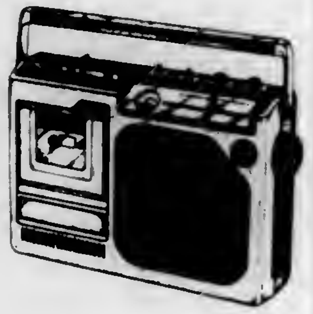
Filed Dec. 9, 1975, Ser. No. 639,172

Claims priority, application Japan, June 20, 1975, 50-25222

Term of patent 14 years

Int. Cl. D14—*03, 01*

U.S. Cl. D14—5



245,038
COMBINED RADIO RECEIVER AND CASSETTE TAPE RECORDER

Takemi Ebata, Kyoto, and Yoichi Hisano, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kodama, Japan

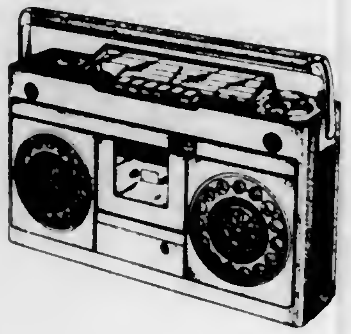
Filed Dec. 11, 1975, Ser. No. 639,815

Claims priority, application Japan, June 20, 1975, 50-25225

Term of patent 14 years

Int. Cl. D14—*03, 01*

U.S. Cl. D56—4 B



245,039
SOAP BAR

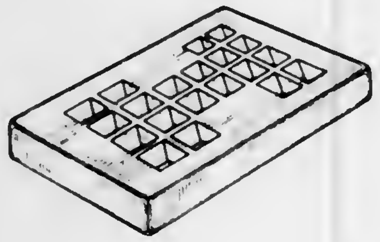
David J. Morrison, 1402 S. 78th St., Omaha, Nebr. 68127

Filed May 19, 1975, Ser. No. 578,376

Term of patent 14 years

Int. Cl. D28—*02*

U.S. Cl. D73—1 A



245,040
SURGICAL LANCET

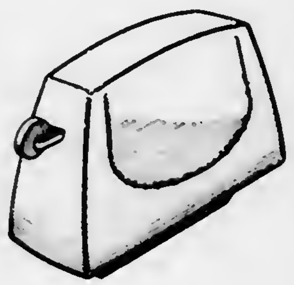
Michael D. Thomas, Arab, Ala., assignor to Ryder International Corporation, Schaumberg, Ill.

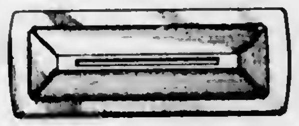
Filed Feb. 25, 1976, Ser. No. 661,403

Term of patent 14 years

Int. Cl. D24—*02, 04*

U.S. Cl. D24—28





245,041
SKI CARRIER

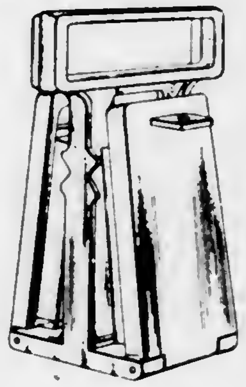
Calvin J. Covell, Los Angeles, Calif., assignor to Covell Enterprises

Filed July 24, 1975, Ser. No. 598,884

Term of patent 14 years

Int. Cl. D21—*02*

U.S. Cl. D87—1 R



245,042
EMBOSSED PLASTIC SHEET MATERIAL

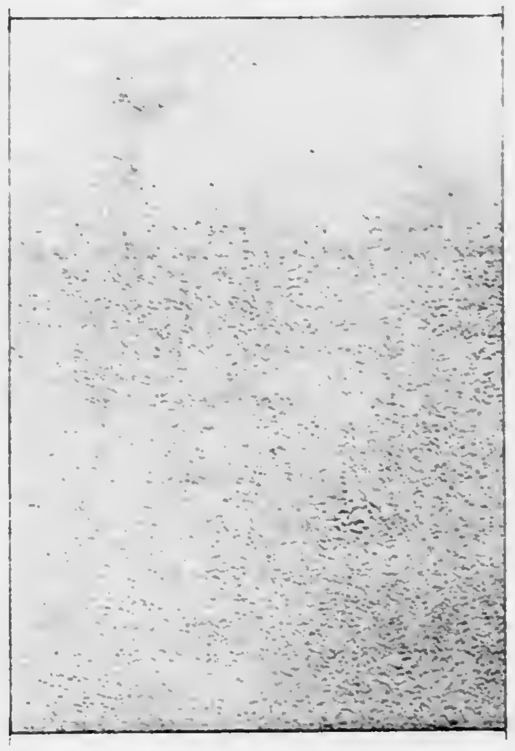
Sara Reid Plumb, Long Valley, N.J., assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed July 16, 1975, Ser. No. 596,491

Term of patent 14 years

Int. Cl. D5—*06*

U.S. Cl. D87—3 G



245,043
DRY SHAVER OR SIMILAR ARTICLE

Aloysius Jacobus Maria Beeren, Nuenen, and Michael Thomas Jankowski, Boornbergum, both of Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

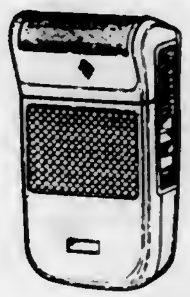
Filed Dec. 4, 1974, Ser. No. 529,290

Claims priority, application Switzerland, June 10, 1974, 58864/74

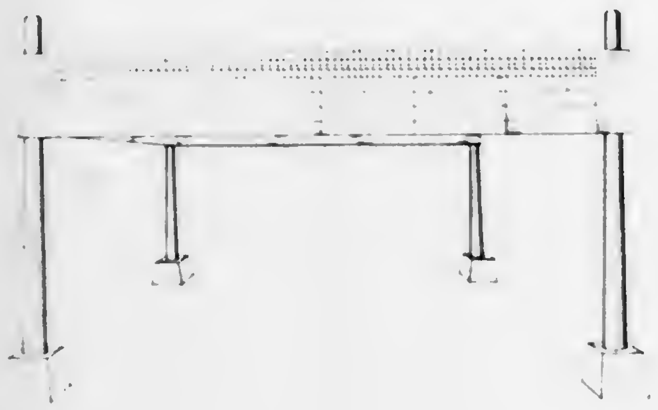
Term of patent 14 years

Int. Cl. D28—*03*

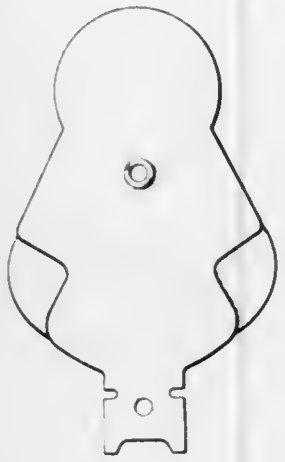
U.S. Cl. D28—51



245,044
DIRECTIONAL LIGHTING SYSTEM
Dorothy F. Pollack, 6026 Declaration Circle, Citrus Heights, Calif. 95610
Filed Apr. 22, 1974, Ser. No. 463,053
Term of patent 3½ years
Int. Cl. D10—*06*
U.S. Cl. D96—12 H



245,045
OSCILLATING DISPLAY DEVICE
Edward J. Donahue, 21 Vineyard Ave., East Providence, R.I. 02914
Filed July 12, 1976, Ser. No. 704,131
Term of patent 14 years
Int. Cl. D20—*03*
U.S. Cl. D96—12 R



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TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JULY, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A. B. Dick Company: *See—*
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- A/S Pusnes Mekaniske Verksted: *See—*
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- AB Karlstadplattan: *See—*
  - Eriksson, Erik Gustav Lennart, 4,035,120, Cl. 425-81.000.
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- Abex Corporation: *See—*
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  - Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Gustav Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 4,035,420, Cl. 260-553.00A.
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- Abo, Masahiro: *See—*
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  - Thoma, Wilhelm; Pedain, Josef; Grammel, Jurgen, and Aguado, Antonio, 4,035,213, Cl. 156-231.000.
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- Aisin Seiki Co.: *See—*
  - Kondo, Toshio; Moir, Yoshinori, and Kizaki, Kirou, 4,034,857, Cl 188-73.300.
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  - Davydov, Anatoly Borisovich; Akimova, Alla Yakovlevna; Korshak, Vasily Vladimirovich; Trofimov, Nikolai Nikolaevich; Etlis, Volf Samoilovich; Vishnevsky, Alexandr Alexandrovich, and Belkin, Vitaly Rafailovich, 4,035,334, Cl. 260-42.210.
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  - Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Gustav Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 4,035,420, Cl. 260-553.00A.
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- Aldridge, Malcolm G., and Aldridge, William E. Closure for roof drain. 4,035,297, Cl. 210-163.000.
- Aldridge, William E.: *See—*
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- Alexandrov, Vladimir Ilich, Gordon, Vladimir Grigorievich, Muraviev, Ernest Nikolaevich; Osiko, Vyacheslav Vasilievich; Prokhorov, Alexandr Mikhailovich; Spiridonov, Eduard Georgievich; and Tatarintsev, Vladimir Mikhailovich. Method of synthesis of metal chromites. 4,035,266, Cl. 252-512.000.
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  - Lenzi, Giuliano; and Rogora, Edoardo, 4,034,721, Cl. 123-32.0EB
- Allen Industries, Inc.: *See—*
  - Goldstone, Edward G., 4,035,215, Cl. 156-245.000.
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  - Barrett, Joseph J., 4,035,643, Cl. 250-339.000.
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  - Reil, Wilhelm; and Trabitzsch, Jorg, 4,034,537, Cl. 53-28.000.
- Altstatt, John E.: *See—*
  - Lance, Drew R.; and Altstatt, John E., 4,035,736, Cl. 329-122.000.
- Aluminum Company of America: *See—*
  - Anderson, William Albert; McKee, Arvil Burke; and McBride, John Knox, 4,035,201, Cl. 148-11.50A.
- Alza Corporation: *See—*
  - Glover, Frederick Flagg, 4,034,757, Cl. 128-260.000.
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  - Theeuwes, Felix, 4,034,758, Cl. 128-260.000.
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  - Grimes, George R., 4,034,969, Cl. 266-82.000.
- Amberg, Stephen W., to Owens-Illinois, Inc. Apparatus for producing shrunken pilfer-proof neck labels for containers. 4,035,222, Cl. 156-423.000

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- American Biltrite Inc.: *See—*
  - Guyer, Nathan E., 4,034,617, Cl. 74-231.00J.
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  - Fry, Franklin Hornor; Reinke, Orville; Marthaler, Wayne A.; Wylie, Richard K.; and Boye, Frederick C., 4,035,307, Cl. 252-8.600.
  - Shuppert, Laurence Verlan; Hanson, William Duane; and Willer, Robert Alfred, 4,035,214, Cl. 156-240.000.
- American Cyanamid Company: *See—*
  - Gershberg, David Benedict, 4,035,317, Cl. 260-2.50N.
  - Gleckler, George C.; and Goebel, James C., 4,035,267, Cl. 252-548.000.
  - Mullen, Patricia, 4,035,478, Cl. 424-70.000.
  - Schmitt, Joseph Lawrence, Jr.; and Brinen, Jacob Solomon, 4,035,260, Cl. 252-447.000.
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- Ames, Ronald B.: *See—*
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- AMF Incorporated: *See—*
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- Amirsakis, Filitsa. Self contained disposable diaper. 4,034,760, Cl. 128-287.000.
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- AMP Incorporated: *See—*
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  - Patton, George Allen; and Tucci, John James, 4,034,470, Cl. 29-629.000.
  - Volinskie, Robert, 4,035,050, Cl. 339-99.00R.
- Amsted Industries Incorporated: *See—*
  - Neumann, Otto Walter; and Korpics, Frank Joseph, 4,034,681, Cl. 105-225.000.
- Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,035,335, Cl. 260-45.75R.
- Anderson, Arthur F. Axial piston motor. 4,034,653, Cl. 91-501.000.
- Anderson, Clarence A. F., to Shaw-Walker Company, The. Method and apparatus for forming a top assembly. 4,035,224, Cl. 156-475.000.
- Anderson, James R., to Research, Incorporated. Energy saving control. 4,035,752, Cl. 337-107.000.
- Anderson, Paul L.; and Brittain, Darryl A., to Sandoz, Inc. 4-alkyl-4-naphthyl-butanes. 4,035,406, Cl. 260-483.000.
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- Andrews, John S., to H. H. Robertson Company. Silencer for ventilation ducts. 4,034,826, Cl. 181-36.00B.
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  - Stromquist, Michael Eban; and Heaney, James Joseph, 4,035,608, Cl. 219-218.000.
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  - Cookson, Ronald Frederick; and Nowotnik, David Peter, 4,035,499, Cl. 424-258.000.
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  - Karapetian, Norair Gareginovich; Mkrian, Gurgen Mambreevich; Tonoian, Oganes Avetisovich; Selimian, Mikhail Eremovich; Papazian, Nargiz Akopovna; Kazarian, Rima Azarapetovna; Petrov, Anatoly Ivanovich; Bakhtamian, Armen Alexandrovich; and Mirakian, Smbat Mirakovich, 4,035,429, Cl. 260-655.000.
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- Balinski, Henry A., to United States Gypsum Company. Ceiling system. 4,034,531, Cl. 52-484.000.
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- Banks, Donald D. Heat shield composition. 4,035,312, Cl. 252-70.000.
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  - Falkenstein, Georg, Guthmann, Alfred; Hutchison, John; Weyland, Peter; and Blinne, Gerd, 4,035,313, Cl. 260-2.5AN.
  - Feichtmayr, Franz, Schlag, Johannes; and Bauer, Peter, 4,035,311, Cl. 252-63.200.
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  - Shevakin, Jury Fedorovich; Bashilov, Pavel Vasilievich; Dobkin, Igor Iosifovich; Temkin, Mikhail Iosifovich; Kuznetsov, Lev Borisovich; Kotov, Vitaly Vyacheslavovich; Seidaliev, Fikrat Seidaliogly; Donskoi, Efim Moiseevich; Belkin, Valentin Vasilievich; and Prutkin, Evgeny Fedorovich, 4,034,590, Cl. 72-280.000.
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  - Busing, Walter; Richert, Hans; Weist, Martin; and Zirngiebl, Eberhard, 4,035,771, Cl. 340-151.000.
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  - Gipp, Roland; Berenstecher, Otto; and Renziehausen, Horst, 4,035,145, Cl. 8-74.000.
  - Krock, Friedrich Wilhelm; Braden, Rudolf; Neeff, Rutger; and Hederich, Volker, 4,035,398, Cl. 260-380.000.
  - Kubitzek, Harry; Hinrichsen, Georg; and Giessler, Wolfgang, 4,035,464, Cl. 264-103.000.
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Borror, Alan L., to Polaroid Corporation, Phthalide and naphthalide derivatives. 4,035,391, Cl. 260-343.20R.
Boryakov, Viktor Fedorovich: *See—*
Akunov, Viktor Ivanovich; Blinov, Ivan Timofeevich; Boryakov, Viktor Fedorovich; Zavadsky, Georgy Vladimirovich; Klimenko, Grigory Afanasievich; Krykhtin, Grigory Stepanovich; Ferens, Nikolai Ippolitovich; Checkik, Alexandr Lvovich; and Shanin, Vadim Petrovich, 4,034,919, Cl. 241-39.000.
Bosch-Siemens Hausgerate GmbH: *See—*
Farber, Karlheinz; Mayer, Rolf; and Rupp, Alexander, 4,034,422, Cl. 4-187.00R.
Bosso, Joseph F.: *See—*
Sturni, Lance C.; and Bosso, Joseph F., 4,035,275, Cl. 204-181.000.
Boussageon, Pierre, to Societe Generale pour l'Emballage. Manufacture of receptacles. 4,034,657, Cl. 93-39.300.
Boutemy, Yves; and Clavier, Christian M., to Schlumberger Technology Corporation. Neutron logging of formation porosity. 4,035,639, Cl. 250-264.000.
Bowers, Robert H. Machine for providing ball ends on musical instrument strings. 4,034,456, Cl. 29-788.000.
Boye, Frederick C.: *See—*
Fry, Franklin Hornor; Reinke, Orville, Marthaler, Wayne A., Wylie, Richard K.; and Boye, Frederick C., 4,035,307, Cl. 252-8.600.
Braden, Rudolf: *See—*
Krock, Friedrich Wilhelm; Braden, Rudolf; Neeff, Rutger; and Hederich, Volker, 4,035,398, Cl. 260-380.000.
Bradley, Richard S., to Arts-Way Manufacturing Co. Bale feeder device. 4,034,920, Cl. 241-101.700.
Braginetz, Paul A., to Philip Morris Incorporated. Dispenser for razor blade cartridges. 4,034,892, Cl. 221-64.000.
Brandestini, Marco: *See—*
Leeb, Dietmar; and Brandestini, Marco, 4,034,603, Cl. 73-79.000.
Brandstrom, Arne Elof: *See—*
Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Gustav Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 4,035,420, Cl 260-553.00A.
Brandt, Donald R., to PPG Industries, Inc. Distillative purification of alkane sulfonic acids. 4,035,242, Cl. 203-15.000.
Brassfield, John R.: *See—*
Wenner, Lance E.; and Brassfield, John R., 4,035,765, Cl. 340-63.000.
Bray Oil Company: *See—*
Schenach, Thomas Anthony, 4,035,308, Cl. 252-59.000.
Breck, Louis William, Jr. Apparatus and method for forming belt loops. 4,034,690, Cl. 112-121.270.
Breen, Kenneth J. Drive-on vehicle leveling device. 4,034,961, Cl. 254-94.000.
Brendlinger, Edward C.; Higgs, Richard F., and Kharouf, Issa J., to United States Steel Corporation. Process for electrolytic removal of lubricants from steel strip. 4,035,256, Cl. 204-145.00R.
Brenner, Mortimer Wilkes; and Laufer, Louis, to Schwarz Services International Ltd. Binding of antimicrobial compounds to a hydroxyl containing substrate with cyanuric chloride. 4,035,146, Cl. 8-94.210.
Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Wheeled toy 4,034,502, Cl. 46-202.000.
Breslow, Jeffrey D.; and Jaworski, Eugene, to Marvin Glass & Associates. Time-controlled tiltable ball game. 4,034,985, Cl. 273-110.000.
Breuer, Oswald: *See—*
Hermann, Martin; Breuer, Oswald; and Hauschopp, Alois, 4,035,025, Cl. 299-34.000.
Breznock, John F.; Melrose, Richard E.; and Miller, Richard N., to Clorox Company, The. Aerosol drain opener device. 4,034,427, Cl. 4-255.000.
Brice, Marilyn J., executrix: *See—*
Brice, Neil M., deceased; and Brice, Marilyn J., executrix, 4,035,726, Cl. 325-65.000.
Brice, Neil M., deceased; and Brice, Marilyn J., executrix. Method of controlling and/or improving high-latitude and other communications or radio wave surveillance systems by partial control of radio wave et al. 4,035,726, Cl. 325-65 000
Brinen, Jacob Solomon: *See—*
Schmitt, Joseph Lawrence, Jr., and Brinen, Jacob Solomon, 4,035,260, Cl. 252-447.000.
Briscoe, Harry H. Heat recovery system. 4,034,482, Cl. 34-35.000.
Bristol-Myers Company: *See—*
Kaplan, Murray Arthur; Gottstein, William Joseph; and Granatek, Alphonse P., 4,035,381, Cl. 260-306 70C.
British Petroleum Company Limited, The: *See—*
Hargrove, John David, and Hilder, Graham Keith, 4,035,261, Cl. 252-455.00R
Brittain, Darryl A.: *See—*
Anderson, Paul L.; and Brittain, Darryl A., 4,035,406, Cl. 260-483.000.
Brois, Stanley J., to Exxon Research and Engineering Company. Metal-containing oxazoline additives and lubricating oils containing said additives. 4,035,309, Cl. 252-49.700.
Brooks, Alden W., to Dayco Corporation. Endless power transmission belt. 4,034,615, Cl. 74-229.000.
Brother Kogyo Kabushiki Kaisha. *See—*
Sasaki, Tosio, 4,034,691, Cl. 112-258.000
Brothers, Jack A.; Doman, Robert C.; and McNally, Robert N., to Corning Glass Works. Fused abrasive grains consisting essentially of corundum, zirconia and R_2O_3. 4,035,162, Cl. 51-298.00A.
Broughton, Glover F.: *See—*
Tardiff, Armand L.; Broughton, Glover F.; Delorey, David R.; and Pearson, Bangt R., 4,034,893, Cl. 221-171.000.
Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W.; and Crittendon, Charles E., to Uniroyal Inc.; and Uniroyal, Ltd. Method of retarding the growth of plants using certain oxadiazolyl, oxazolyl or thiadiazolyl benzoic acid derivatives. 4,035,175, Cl. 71-76.000.
Browder, Thomas H. Portable cushion apparatus. 4,035,606, Cl. 219-211.000.
Brown, Albert E.: *See—*
Newman, Douglas A.; Brown, Albert E.; and Schlotzhauer, Allan T., 4,034,843, Cl. 197-172.000.
Brown-Bridge Mills, Inc., The: *See—*
Yount, Roger E., 4,035,218, Cl. 156-289.000.
Brown, George W., to Fairchild Camera and Instrument Corporation Asymmetrical memory cell arrangement. 4,035,784, Cl. 340-173.00R.
Brown, Merle S., to Jet Spray Cooler, Inc. High density liquid dispenser. 4,034,897, Cl. 222-146.00C.
Brown & Williamson Tobacco Corporation: *See—*
Hammersmith, James R., 4,035,220, Cl. 156-291.000.
Rowland, Wallace Loyd, Jr., 4,034,868, Cl. 214-8.50G.
Sanford, Robert A., 4,034,766, Cl. 131-140.00P.
Brownell, Roy D., to Caterpillar Tractor Co. Vehicle seat structure. 4,034,948, Cl. 248-372.000.
Brunner, Robert H.; and Kraft, Paul, to Stauffer Chemical Company. Fire retardant copolymers. 4,035,571, Cl. 526-275.000.
Brunner, Russell K.: *See—*
Halfhill, Martin O.; and Brunner, Russell K., 4,034,613, Cl. 74-25.000.
Brust, Harry F., to Dow Chemical Company, The. Process for making phenoxyalkanoic acids. 4,035,416, Cl. 260-521.00H.
Brydon, Donald Lithgow, to Imperial Chemical Industries Limited. Drawing polyoxadiazoles filaments. 4,035,465, Cl. 264-210.00F.
Bubar, Stanley F., to General Electric Company. Universal burning alkali metal vapor lamp with amalgam storage in exhaust tubulation. 4,035,682, Cl. 313-174.000.
Bucher, Robert, to Sulzer Brothers Limited. Connecting member for securing pull elements to lifting wires of a jacquard machine. 4,034,782, Cl. 139-85.000.
Buckwitz, Richard J., to General Signal Corporation. Multiple purpose instrument housing. 4,034,612, Cl. 73-431.000.
Budlong, John E. Auxiliary bathtub for invalids. 4,034,424, Cl. 4-173.00R.
Bueb, Michael; Rellensmann, Wolfgang; and Ruuprecht, Lothar, to Bayer Aktiengesellschaft. Process for the production of stretch-textured yarns with improved properties. 4,034,548, Cl. 57-157.0TS.
Buescher, Francis Joseph: *See—*
Gough, Robert George; and Buescher, Francis Joseph, 4,035,403, Cl. 260-429.700.
Buffkin, William R.; and McCrory, William W., to United States of America, Navy Diving helmet breech ring connection. 4,034,416, Cl. 2-2.10R.
Bugaut, Andree: *See—*
Kalopissis, Gregoire; Bugaut, Andree; and Gaston-Breton, Hubert, 4,035,422, Cl. 260-559.00A.

Bunker Ramo Corporation: *See—*

Kusaka, Keijiro; and Otomo, Yasushi, 4,035,748, Cl. 333-33.000.

Resch, Alois Ruppert, 4,034,449, Cl. 29-33.00M.

Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., to Texaco Inc. Fluidized cracking catalyst regeneration apparatus. 4,035,153, Cl. 23-288.00B.

Bunting Magnetics Company: *See—*

Burgis, William J.; and Stewart, Gregory P., 4,034,846, Cl. 198-422.000.

Bunyan, John. Antiseptic and non-toxic substance and a method of making the same. 4,035,483, Cl. 424-149.000.

Bunzel, Eckard: *See—*

Hatzenbichler, Ernst; and Bunzel, Eckard, 4,035,142, Cl. 432-249.000.

Burbine, William G.: *See—*

Jordan, Merrill E.; and Burbine, William G., 4,035,336, Cl. 260-42.470.

Burgis, William J.; and Stewart, Gregory P., to Bunting Magnetics Company. Method and apparatus for providing automatic stacking of manufactured parts. 4,034,846, Cl. 198-422.000.

Burk, George A.: *See—*

Goralski, Christian T.; Pews, R. Garth; and Burk, George A., 4,035,407, Cl. 260-454.000.

Burke, John G. Article of jewelry. 4,035,630, Cl. 240-6.40W.

Burlington Industries, Inc.: *See—*

Walker, Robert H., 4,034,545, Cl. 57-34.00R.

Burns, Richard W.: *See—*

Tang, Raymond; and Burns, Richard W., 4,035,807, Cl. 343-742.000.

Burroughs Corporation: *See—*

Ogle, James A.; and Holz, George E., 4,035,689, Cl. 315-169.0TV.

Burrows, Louis H., Jr.: *See—*

Moriconi, Joseph H.; and Burrows, Louis H., Jr., 4,035,520, Cl. 427-19.000.

Bursk, William M., to Pease Company. Weather stripping construction for metal covered door. 4,034,511, Cl. 49-488.000.

Busacca, Joseph P. Cement and aggregate mixture and method for making same. 4,035,192, Cl. 106-90.000.

Busby, David E.: *See—*

Urioste, German R.; Busby, David E.; McConchie, Garnet E.; and Orr, Jimmy D., 4,035,473, Cl. 423-488.000.

Busch, Norbert: *See—*

Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; Simond, Jacques; and Monteil, Andre, 4,035,498, Cl. 424-250.000.

Buse, Frederic, to Ingersoll-Rand Company. Self-priming centrifugal pump. 4,035,104, Cl. 417-202.000.

Busing, Walter; Richert, Hans; Weist, Martin; and Zirngiebl, Eberhard, to Bayer Aktiengesellschaft. Process for the remote transmission and indication of electrical measured values in electrolysis cells. 4,035,771, Cl. 340-151.000.

C. F. Associates: *See—*

Cohen, Bernard, 4,034,496, Cl. 40-152.000.

C. van der Lely N. V.: *See—*

van der Lely, Ary, 4,034,687, Cl. 111-13.000.

Cabot Corporation: *See—*

Jordan, Merrill E.; and Burbine, William G., 4,035,336, Cl. 260-42.470.

Cabut, Louis Antoine: *See—*

Pechmeze, Jacques Pierre Edmond; Touratier, Philippe Jean-Marie; and Cabut, Louis Antoine, 4,035,397, Cl. 260-373.000.

Cade, John Weldon: *See—*

Hoesterey, Howard Frederick; and Cade, John Weldon, 4,034,949, Cl. 244-3.160.

Caffaro, S.p.A., Societa per l'Industria Chimica ed Elettrochimica. *See—*

Casale, Liborio, 4,035,259, Cl. 252-175.000.

Cainelli, Gianfranco: *See—*

Masi, Paolo; Foglio, Maurizio; Franceschi, Giovanni; Suarato, Antonino; Cainelli, Gianfranco; and Arcamone, Federico, 4,035,362, Cl. 260-243.00C.

Calderon Automation, Inc.: *See—*

Calderon, Samuel, 4,035,179, Cl. 75-60.000.

Calderon, Samuel, to Calderon Automation, Inc. Method and apparatus for controlling pollution in steel furnaces. 4,035,179, Cl. 75-60.000.

Caldwell, Donald B., to Minnesota Mining and Manufacturing Company. Sound-damped saw blade. 4,034,639, Cl. 83-835.000.

California Almond Orchards: *See—*

McFarland, Jay J.; and Saunders, Bertram E., 4,034,665, Cl. 99-574.000.

California Institute of Technology: *See—*

Yen, Shiao-Ping S.; Rembaum, Alan; and Molday, Robert S., 4,035,316, Cl. 260-2.50B.

California Linear Circuits, Inc.: *See—*

Roman, Leonard F., 4,035,670, Cl. 307-300.000.

California Microwave, Inc.: *See—*

Lance, Drew R.; and Altstatt, John E., 4,035,736, Cl. 329-122.000.

Calle, Jaime: *See—*

Kristick, Lawrence J.; Crawford, Knute S.; and Calle, Jaime, 4,035,780, Cl. 364-900.000.

Calspan Corporation: *See—*

Schneider, Clayton J., Jr., 4,034,673, Cl. 102-56.0SC.

Cam Gears Limited: *See—*

Adams, Frederick John, 4,034,825, Cl. 180-143.000.

Cama, Lovji D.: *See—*

Christensen, Burton G.; and Cama, Lovji D., 4,035,359, Cl. 260-239.100.

Cameron, Frank L., to Westinghouse Electric Corporation. Non-venting expulsion fuse. 4,035,755, Cl. 337-280.000.

Campbell, Gregory A.; Cox, Howard W.; and Meluch, William C., to General Motors Corporation. Method of injection molding a thermoset polyurethane article. 4,035,467, Cl. 264-329.000.

Campbell, William E.: *See—*

Shiver, Harry T.; and Campbell, William E., 4,035,251, Cl 204-67.000.

Can-Gard Protective Wear Ltd.: *See—*

Ellis, William G., 4,034,417, Cl. 2-81.000.

Canadian Fishing Company Limited, The: *See—*

MacKenzie, Gilbert Alexander, 4,034,442, Cl. 17-55.000.

Canadian General Electric Company Limited: *See—*

Richardson, Reginald D., 4,035,475, Cl. 423-580.000.

Canadian Patents and Development Limited: *See—*

Kashyap, Satish C.; and Wyslouzil, Walter, 4,035,599, Cl. 219-10.55B.

Canon Kabushiki Kaisha: *See—*

Taguchi, Shinji, 4,035,160, Cl. 51-295.000.

Cantrell, Ben H.: *See—*

Lewis, Bernard L.; and Cantrell, Ben H., 4,035,800, Cl. 343-7.700.

Caravaggio, Anthony Joseph: *See—*

Einthoven, Willem Gerard; Caravaggio, Anthony Joseph; and Todd, Albert Alexander, 4,035,828, Cl. 357-47.000.

Carbonneau, Gordon S., to Carbonneau Industries, Inc. Electroacoustic transducers. 4,035,591, Cl. 179-119.00R.

Carbonneau Industries, Inc.: *See—*

Carbonneau, Gordon S., 4,035,591, Cl. 179-119.00R.

Carden, Jesse, Jr.: *See—*

Adams, Guy Emery; and Carden, Jesse, Jr., 4,034,741, Cl. 128-1.00C.

Cargile, William P. Method and apparatus for testing shock absorbers and the like. 4,034,596, Cl. 73-11.000.

Carl Freudenberg, Firma: *See—*

Heckel, Klaus; and Klaffke, Friedemann, 4,035,537, Cl. 428-155.000.

Carlisle, Edward F., to Carlisle, Margaret Mary. Apparatus for dispensing and holding tissue rolls. 4,034,924, Cl. 242-55.300.

Carlisle, Margaret Mary: *See—*

Carlisle, Edward F., 4,034,924, Cl. 242-55.300.

Carlo Erba S.p.A.: *See—*

Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, 4,035,392, Cl. 260-343.30R.

Gandolfi, Carmelo; Doria, Gianfederico; and Gaio, Pietro, 4,035,414, Cl. 260-514.00D.

Gandolfi, Carmelo; Pellegata, Renato; Ceserani, Roberto; and Usardi, Maria M., 4,035,415, Cl. 260-514.00D.

Carlomagno, William Dominac; and Diaz, Stephen Hunter, to Raychem Corporation. Marker sleeve installation. 4,034,450, Cl. 29-33.00E.

Carlson, Carl E.; and Delgrosso, Eugene J., to United Technologies Corporation. Diffusion bonding utilizing eutectic fugitive liquid phase. 4,034,906, Cl. 228-194.000.

Carlson, Curt William, to Guy, Murray J.; and Higginbotham, Richard E., part interest to each. Ozone generator. 4,035,657, Cl. 250-533.000.

Carlson, Gerald L., to University of Alabama in Birmingham. Electronic timer. 4,035,661, Cl. 307-141.000.

Carlsson, Carl Goran Herbert. *See—*

Pihl, Lars Wilhelm; Johansen, Lars Bjarne; Carlsson, Carl Goran Herbert; and Mollerstedt, Karl Allan Bonde, 4,034,421, Cl. 4-10.000.

Carlsson, Enar Ingemar: *See—*

Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Gustav Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ahlad, Bengt Arne Hjalmar, 4,035,420, Cl. 260-553.00A.

Carlsson, Stig Ake Ingemar: *See—*

Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar; Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Gustav Benny Roger; Sjostrand, Sven Erik; Strandlund, Gert Christer; and Ablad, Bengt Arne Hjalmar, 4,035,420, Cl. 260-553.00A.

Carman, Vincent E. Method and apparatus for purifying a liquid by pressure distillation. 4,035,241, Cl. 202-205.000.

Carmona, Julian Y.; and Marasigan, Marcelo P. Method for obtaining aflatoxin-free food products. 4,035,518, Cl. 426-231.000.

Carolina Rubber Hose Company: *See—*

McRitchie, David G., 4,035,212, Cl. 156-187.000.

Carrier Corporation: *See—*

Harvey, Samuel E.; Liberman, Harvey W.; and Voorhees, Steven C., 4,034,649, Cl. 91-412.000.

Carson, Norman Harold; Cirne, Raul; and Zahn, Horst, to Black and Decker Manufacturing Company, The. Workbench and foldable leg assembly therefor. 4,034,684, Cl. 108-127.000.

Carter, Alvie. Method and device for catching and packaging live fish. 4,034,710, Cl. 119-3.000.

Cartwright, Vern W.; and Veach, Carlos W. Hot stamping machine with rotatable head. 4,034,667, Cl. 101-27.000.

Casale, Liborio, to Caffaro, S.p.A., Societa per l'Industria Chimica ed Elettrochimica. Method for preparation of inorganic flocculating composition. 4,035,259, Cl. 252-175.000.

Cassano, James R.: *See—*

Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,034,869, Cl. 214-16.40R.

Cassella Farbwerke Mainkur Aktiengesellschaft: *See—*

Heinrich, Ernst; Ribka, Joachim; and Valentin, Joachim, 4,035,143, Cl. 8-4.000.

Castelli, Antonio: *See—*

Erbele, Kurt; and Castelli, Antonio, 4,035,018, Cl. 297-180.000.

Castelli KG: *See—*

Erbele, Kurt; and Castelli, Antonio, 4,035,018, Cl. 297-180.000.

Caterpillar Tractor Co.: *See—*

Bailey, John M., 4,034,917, Cl. 239-453.000.

Boggs, Roger L.; Reinsma, Harold L.; and Gobble, Glenn R., 4,034,798, Cl. 164-281.00R.

Boggs, Roger L.; Groff, Eugene R.; and Wright, Paul L., 4,035,036, Cl. 305-57.000.

Brownell, Roy D., 4,034,948, Cl. 248-372.000.

Deck, James R., 4,034,622, Cl. 74-501.00R.

Dezelan, Joseph E., 4,034,815, Cl. 172-809.000.

Durand, James C., 4,034,698, Cl. 116-114.00Z.

Groff, Eugene R.; Heinold, Lloyd K.; and Reinsma, Harold L., 4,034,618, Cl. 74-243.00R.

Heinold, Lloyd K.; and Shaffer, Walter M., 4,034,881, Cl. 214-730.000.

Huebner, Robert J., 4,034,652, Cl. 91-499.000.

Johnson, Howard L.; and Ruseff, Walter Z., 4,034,564, Cl. 60-445.000.

Ricca, John S., 4,035,016, Cl. 296-28.00C.

Richter, Clifford L., 4,034,914, Cl. 239-96.000.

Ritter, Arthur J., Jr., 4,034,621, Cl. 74-424.000.

Stapleton, Edward L.; and Waggoner, John B., 4,035,300, Cl. 210-172.000.

Starling, James G., 4,034,834, Cl. 192-85.0AA.

Stedman, Robert N., 4,034,822, Cl. 180-51.000.

Stedman, Robert N., 4,034,855, Cl. 187-9.00E.

Yancey, John W., 4,034,876, Cl. 214-152.000.

Caumartin, Francois; and Havas, Laszlo, to Naphtachimie. Method of polymerizing olefins in a fluidized bed. 4,035,560, Cl. 526-124.000.

Cavanaugh, John Daniel. Soap saving device. 4,035,122, Cl. 425-84.000.

Cecil, Eugene F., deceased (by Cecil, Leona, administratrix), to United States Gypsum Company. Door frame structure having quick mounting hinge means. 4,034,514, Cl. 49-504.000.

Cecil, Leona, administratrix: *See—*

Cecil, Eugene F., deceased, 4,034,514, Cl. 49-504.000.

Celanese Corporation: *See—*

Conciatori, Anthony B.; and Stackman, Robert W., 4,035,437, Cl. 260-857.0TW.

George, Henry H., Jr.; Barer, Sol J.; and Smart, Charles L., 4,035,479, Cl. 424-78.000.

Rosenthal, Arnold J.; Forschirm, Alex S.; and Barnes, Bruce P., 4,035,542, Cl. 428-224.000.

Shahidi, Iraj K.; and Trebellas, John C., 4,035,321, Cl. 260-22.0CB.

Celesco Industries Inc.: *See—*

Barr, Laurence Gibson, 4,035,788, Cl. 340-237.00S.

Centre d'Etudes Experimentales et Clinques de Physio Biologie, de Pharmacologie et d'Eutonologie, C.E.P.B.E.P.E.: *See—*

Laborit, Henri, 4,035,486, Cl. 424-178.000.

Centre Europeen de Recherches Mauvernay: *See—*

Mauvernay, Roland Yves; Busch, Norbert; Moleyre, Jacques; Simond, Jacques; and Monteil, Andre, 4,035,498, Cl. 424-250.000.

Centre Technique de l'Industrie des Papiers, Cartons et Celluloses: *See—*

Sangenis, Solange; Guiroy, Gilbert; and Quere, Jean, 4,035,147, Cl. 8-116.400.

Cerkanowicz, Anthony E., to Photochem Industries, Inc. Control of the initiation of combustion and control of combustion. 4,034,557, Cl. 60-39.060.

Cerkanowicz, Anthony E., to Photochem Industries, Inc. Control of the initiation of combustion and control of combustion. 4,035,131, Cl. 431-6.000.

Cerola, Joseph J.: *See—*

Jenn, Louis J.; Field, Thomas R.; and Cerola, Joseph J., 4,034,663, Cl. 99-446.000.

Cervinka, Anthony G. Mold for boot. 4,034,953, Cl. 249-117.000.

Ceserani, Roberto: *See—*

Gandolfi, Carmelo; Pellegata, Renato; Ceserani, Roberto; and Usardi, Maria M., 4,035,415, Cl. 260-514.00D.

Cessna Aircraft Company, The: *See—*

Miller, Wayne L., 4,035,801, Cl. 343-12.00R.

CGR Medical Corporation: *See—*

Patel, Ambalal T., 4,035,648, Cl. 250-402.000.

Challenger, Clarence William. Device for automatic raising of fish traps, crayfish pots, nets and the like. 4,034,693, Cl. 114-16.00E.

Chambley, Philip Wayne, to Champion International Corporation. Tufted carpet with meltable-film primary-backing component. 4,035,533, Cl. 428-95.000.

Champet, Gerard: *See—*

Gibert, Francois; and Champet, Gerard, 4,035,288, Cl. 209-466.000.

Champion International Corporation: *See—*

Chambley, Philip Wayne, 4,035,533, Cl. 428-95.000.

Chamuel, Jacques R., to Charles Stark Draper Laboratory, Inc., The. Position sensing readout. 4,035,762, Cl. 340-16.00R.

Chandler, Richard N., to Schlumberger Technology Corporation. Enclosed nuclear-magnetism logging tool with compensated coil-isolating system. 4,035,718, Cl. 324-.50G.

Chang, Ifay Fay, to International Business Machines Corporation. Bistable electroluminescent memory and display device. 4,035,774, Cl. 340-166.0EL.

Chang, Louis H., to Xerox Corporation. Signal priority logic for serial printer. 4,035,781, Cl. 364-900.000.

Chang, Wen-Hsuan; and Ammons, Vernon G., to PPG Industries, Inc. Laminated articles prepared from transparent, non-blooming poly(-lactone-urethane) interlayers. 4,035,548, Cl. 428-412.000.

Charbonneau, Larry F., to General Motors Corporation. Alkylene-linked aromatic compounds. 4,035,431, Cl. 260-668.00C.

Charles Stark Draper Laboratory, Inc., The: *See—*

Chamuel, Jacques R., 4,035,762, Cl. 340-16.00R.

Checkik, Alexandr Lvovich: *See—*

Akunov, Viktor Ivanovich; Blinov, Ivan Timofeevich; Boryakov, Viktor Fedorovich, Zavadsky, Georgy Vladimirovich; Klimenko, Grigory Afanasievich; Krykhtin, Grigory Stepanovich; Ferens, Nikolai Ippolitovich; Checkik, Alexandr Lvovich; and Shanin, Vadim Petrovich, 4,034,919, Cl. 241-39.000.

Chemical Systems Incorporated: *See—*

Kesting, Robert E., 4,035,457, Cl. 264-41.000.

Kesting, Robert E., 4,035,459, Cl. 264-49.000.

Chemplex Company: *See—*

Hoff, Raymond E.; and Shida, Mitsuzo, 4,035,561, Cl. 526-130.000.

Chen, Chin Long; and Rutledge, Robert A., to International Business Machines Corporation. Error correction code and apparatus for the correction of differentially encoded quadrature phase shift keyed data (DQPSK). 4,035,767, Cl. 340-146.1AQ.

Chen, Karl K.; Patel, Hiralal V.; Frank, Irving G.; and Pistoor, Donald, to Weatherhead Company, The. Crimping machine with automatic hinge open pushers. 4,034,592, Cl. 72-402.000.

Cherney, Steven David, to Procter & Gamble Company, The. Spray-dried calcium carbonate-containing granules. 4,035,257, Cl. 252-160.000.

Chesner, Francis R.: *See—*

Weatherell, James W.; and Chesner, Francis R., 4,034,517, Cl. 51-92.00R.

Chevron Research Company: *See—*

Flay, Roy B., 4,035,489, Cl. 424-217.000.

Fredriksson, Oke A., 4,034,597, Cl. 73-29.000.

Chiang, Robert; and Perry, Eli, to Monsanto Company. Process for separating aqueous formaldehyde mixtures. 4,035,291, Cl. 210-23.00R.

Chiba, Sukehiro: *See—*

Oka, Yoshikazu; Tomimoto, Mitsumi; and Chiba, Sukehiro, 4,035,363, Cl. 260-244.00R.

Childress, David L.; Hayes, William V.; and Poppe, Richard L., to Dow Chemical Company, The. Acrolein oxidation catalyst. 4,035,262, Cl. 252-456.000.

Childs, William Ves: *See—*

Walters, Harold C.; and Childs, William Ves, 4,035,250, Cl. 204-59.00F.

Chin, Clinton G.: *See—*

Micetich, Ronald G.; Chin, Clinton G.; and Morin, Robert B., 4,035,354, Cl. 260-239.100.

Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT: *See—*

Szentmiklosi, Peter; Meszaros, Zoltan; Tardos, Laszlo; Hermecz, Istvan; Erdelyi, Ilona; David, Agoston; Vasvari nee Debreczy, Lelle; and Horvath, Agnes, 4,035,366, Cl. 260-253.000.

Chinoin Pharmaceutical and Chemical Works Ltd.: *See—*

Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Nagy, Gabor; David, Agoston; Bognar, Rezso; Makleit, Sandor; and Valovics, Gyula, 4,035,491, Cl. 424-226.000.

Chiu, Ran-Fun; Sherman, James Bryon; and Gilbert, Judson Truman, to Milgo Electronic Corporation. Method and apparatus for performing binary equalization in voice-band phase-modulation modems. 4,035,625, Cl. 235-152.000.

Cholet, Jean M., to Texas Instruments Incorporated. Analog computer, particularly for an ignition system for internal combustion engine. 4,035,619, Cl. 235-150.200.

Chore-Time Equipment, Inc.: *See—*

Marttila, Raymond W.; and McFarren, David L., 4,034,898, Cl. 222-228.000.

Christensen, Bruce Arnold, to Sperry Rand Corporation. Parity predict network for M-level N'th power galois arithmetic gate. 4,035,626, Cl. 235-153.0BB.

Christensen, Burton G.; and Cama, Lovji D., to Merck & Co., Inc. 6α, β-Substituted penicillin derivatives. 4,035,359, Cl. 260-239.100.

Chuo Denki Kogyo Co., Ltd.: *See—*

Okamoto, Kiyoshi; Kiriyama, Shizuo; Obayashi, Ichiro; Yamamura, Kazuaki; and Senoo, Masaaki, 4,035,183, Cl. 75-129.000.

Chute, Richard, to Eaton Corporation. Centrifugal flow gas turbine engine with annular combustor. 4,034,560, Cl. 60-39.080.

Ciba-Geigy AG: *See—*

Peter, Richard; and Jenny, Walter, 4,035,380, Cl. 260-306.60R.

Ciba-Geigy Corporation: *See—*

Boehner, Beat; Dawes, Dag; Kristinsson, Haukur; and Meyer, Willy, 4,035,487, Cl. 424-200.000.

Drabek, Jozef; and Varsanyi, Denis, 4,035,488, Cl. 424-212.000.

Gallay, Jean-Jacques; Aufderhaar, Ernst; and Labuhn, Peter, 4,035,423, Cl. 260-571.000.

Haas, Georges, Jaques, Roland; Rossi, Alberto; and Ruegg, Martin, 4,035,413, Cl. 260-505.00R.

  - Staubli, Sebastian, Schiener, Lothar; and Rufenacht, Kurt, 4,035,378, Cl. 260-302.00E.
- Ciemochowski, Michael F. Atmospheric condition detecting and indicating apparatus and method. 4,035,644, Cl. 250-340.000.
- Cincinnati Milacron, Inc.: *See—*
  - Gough, Robert George; and Buescher, Francis Joseph, 4,035,403, Cl. 260-429.700.
- Cirne, Raul: *See—*
  - Carson, Norman Harold; Cirne, Raul; and Zahn, Horst, 4,034,684, Cl. 108-127 000.
- Citizen Watch Co. Limited: *See—*
  - Ishida, Fujio; and Suda, Haruo, 4,035,673, Cl. 310-8.900.
- CJB Developments Limited: *See—*
  - Wilkinson, John Arthur Elton; Leslie, Robert Semple Everett, Glindon, David Michael; Haines, Kendrick Peter; and Baker, Keith, 4,035,278, Cl. 204-222.000.
- Clair Mfg. Co., Inc.: *See—*
  - Weatherell, James W.; and Chesner, Francis R., 4,034,517, Cl. 51-92.00R.
- Clairborne, Lewis T.: *See—*
  - Collins, Dean Robert; and Clairborne, Lewis T., 4,035,666, Cl. 307-221.00D.
- Clarke-Gravely Corporation: *See—*
  - Block, Thomas S., 4,034,434, Cl. 15-79.00R.
- Clarkson, Robert J., to Uniroyal Inc. Method and apparatus for producing plied yarn and product thereof. 4,034,544, Cl. 57-34.0HS.
- Clavier, Christian M.: *See—*
  - Boutemy, Yves; and Clavier, Christian M., 4,035,639, Cl. 250-264.000.
- Clayton, Lorimer, to Scientific-Atlanta, Inc FM noise threshold extension demodulator apparatus. 4,035,730, Cl. 325-348.000.
- Cline, Harvey E.: *See—*
  - Anthony, Thomas R.; and Cline, Harvey E., 4,035,199, Cl. 148-1.500.
- Cloke, Stanley S.; and Kogita, Theodore F., to Con•Gor, Inc Aquarium filter. 4,035,298, Cl. 210-169 000.
- Clorox Company, The: *See—*
  - Breznock, John F.; Melrose, Richard E.; and Miller, Richard N., 4,034,427, Cl. 4-255.000.
- Clum, David N.; and Holt, Fletcher O., to Heater Technology, Inc. Multi-section heat exchanger means. 4,034,717, Cl. 122-359.000.
- Clyburn, Charles W.: *See—*
  - Piaget, Robert E.; and Clyburn, Charles W., 4,035,048, Cl. 339-91.00R.
- Clymer, Henry F.; and Kaltenhaugh, John J., to Lone Star Gas Company. Low point control system. 4,034,774, Cl. 137-111.000.
- Coal Industry (Patents) Limited: *See—*
  - Crosland, Roy; and Park, Andrew Howard Donaldson, 4,035,635, Cl. 250-223.00R.
- Coates, David; and Gray, George William, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the. Biphenyl derivative compounds and liquid crystal materials and devices containing such compounds. 4,035,056, Cl. 350-160.0LC.
- Cockrell, Clifford McDonald, to Freeport Minerals Company. Apparatus and process for hydraulic mining. 4,035,023, Cl. 299-17.000.
- Cody, David L., to Symons Corporation. Concrete formwork including I-beam support. 4,034,957, Cl. 249-189.000.
- Coffey, John Albert: *See—*
  - Stalley, Anthony Donald; and Coffey, John Albert, 4,035,832, Cl. 358-8.000.
- Cohen, Bernard, to C. F. Associates. Modular picture holder. 4,034,496, Cl. 40-152.000.
- Colafati, Ralph A., III: *See—*
  - Schnabel, Wilhelm J., and Colafati, Ralph A., III, 4,035,318, Cl. 260-2.5AT.
- Cold Spring Harbor Laboratory: *See—*
  - Detroy, Bruce A., 4,035,377, Cl. 204-299.00R.
- Colegrove, Robert J.: *See—*
  - Korner, Renzo L.; Quirk, James F.; Colegrove, Robert J.; and Green, David, 4,035,575, Cl. 174-11.00R
- Colgate-Palmolive Company: *See—*
  - Schubert, Warren R.; and Literate, Louis J., 4,035,477, Cl. 424-47.000.
- Colley, Eric: *See—*
  - Pugh, Stuart; and Colley, Eric, 4,034,875, Cl. 214-141.000.
- Collins, Cager K., to International Harvester Company. Hose supporting linkage. 4,034,874, Cl. 214-140.000.
- Collins, Cecil A.: *See—*
  - Fisher, Robert C.; and Collins, Cecil A., 4,034,931, Cl. 242-107.40D.
- Collins, Dean Robert; and Clairborne, Lewis T., to Texas Instruments Incorporated. Analogue shift register correlators. 4,035,666, Cl. 307-221.00D.
- Collins, William C., to Outboard Marine Corporation. Injector for soil treating liquids. 4,034,686, Cl. 111-7.000.
- Colt Industries Operating Corporation: *See—*
  - Corrette, Richard H., 4,034,586, Cl. 72-88.000.
- Columbia Ribbon and Carbon Manufacturing Co., Inc.: *See—*
  - Newman, Douglas A.; Brown, Albert E.; and Schlotzhauer, Allan T., 4,034,843, Cl. 197-172.000.
- Columbiana Foundry Company: *See—*
  - Way, Lewis A.; and Williams, Robert C., 4,034,588, Cl. 72-209.000.
- Com-Dor Supply Limited: *See—*
  - Huelsekopf, Alfred George, 4,034,510, Cl. 49-419.000.
- Combustion Engineering, Inc.: *See—*
  - Bevilacqua, Frank, 4,035,230, Cl. 175-36.00R.
  - Krisst, Raymond John, 4,035,646, Cl. 250-356.000.
- COMCORPS Communication Corporations Inc.: *See—*
  - Whatley, Thomas; and Drennen, William, Jr., 4,035,067, Cl. 352-85.000.
- Cominco Ltd.: *See—*
  - Deane, Richard; Honey, Ronald N.; and Krauss, Clifford J., 4,035,280, Cl. 204-267.000.
- Commercial Ventures, Ltd.: *See—*
  - Mecham, Lorrie E., 4,034,891, Cl. 220-339.000.
- Commissariat a l'Energie Atomique. *See—*
  - Borel, Joseph; Lacour, Jacques; and Merckel, Gerard, 4,035,665, Cl. 307-221.00D
  - Debrie, Guy; Petit, Michel; and Vertut, Jean, 4,035,707, Cl. 318-628.000.
  - Guernet, Georges, and Lefeuvre, Georges, 4,035,655, Cl. 250-492.00A
- Compagnie Generale des Etablissements Michelin, raison sociale Michelin & Cie: *See—*
  - Rouzier, Georges, 4,035,435, Cl. 260-838.000.
- Con•Gor, Inc.: *See—*
  - Cloke, Stanley S.; and Kogita, Theodore F., 4,035,298, Cl. 210-169.000.
- Conciatori, Anthony B.; and Stackman, Robert W., to Celanese Corporation. Polyamide resin compositions. 4,035,437, Cl. 260-857.0TW.
- Concrete Pipe Consultants, Inc.: *See—*
  - James, Kenneth E., 4,035,003, Cl. 285-55.000.
- Connel, Allan A. Gas anesthesia machine. 4,034,753, Cl. 128-188.000.
- Connlab Holdings Limited: *See—*
  - Micetich, Ronald G.; Chin, Clinton G.; and Morin, Robert B., 4,035,354, Cl. 260-239.100.
- Conrader, Charles E. Valve positioning tool. 4,034,457, Cl. 29-213.00R.
- Consolidated Foods Corporation: *See—*
  - Ferris, William E., deceased; Hennessy, Gail, executrix; Doumas, John; and McCarter, Harry, 4,035,123, Cl. 425-129.00R.
- Conti, Paolo, to Billi, S.p.A. Tights. 4,034,578, Cl. 66-49.000.
- Continental Field Machining Co., Inc.: *See—*
  - Schulz, Siegfried, 4,034,631, Cl. 82-2.00R.
- Continental Gummi-Werke Aktiengesellschaft: *See—*
  - Johannsen, Peter; Peter, Julius; and Mauk, Gerhard, 4,034,790, Cl. 152-352.00R.
- Continental Oil Company: *See—*
  - Sparlin, Derry D.; and Crumb, Robert E., 4,034,811, Cl. 166-295.000.
  - Starks, Charles M., 4,035,167, Cl. 55-57.000.
- Contraves-Goerz Corporation: *See—*
  - Wyman, Kenneth R.; and Gallagher, Gerard A., 4,035,715, Cl. 323-4.000.
- Cooke, Rupert J.: *See—*
  - Norton, Daniel J.; and Cooke, Rupert J., 4,035,794, Cl. 340-365.00E.
- Cookson, Ronald Frederick; and Nowotnik, David Peter, to Aspro-Nicholas Limited. Imidazo (1,2-B) isoquinoline derivatives. 4,035,499, Cl. 424-258.000.
- Cooper, Glenn Dale; and Schraga, Irwin, to General Electric Company. Improved polyphenylene ether polymerization process using methylene chloride as solvent. 4,035,357, Cl. 260-47.0ET.
- Cooper, Lonnie D.: *See—*
  - Fisher, David R.; Willis, Don C.; John, Frederick W.; Powers, James R.; Doyle, James M.; Cooper, Lonnie D.; and Rich, Dennis C., 4,034,491, Cl. 40-33.000.
- Corning Glass Works: *See—*
  - Brothers, Jack A.; Doman, Robert C.; and McNally, Robert N., 4,035,162, Cl. 51-298.00A.
  - Johns, Herbert L., 4,035,191, Cl. 106-57.000.
- Corrette, Richard H., to Colt Industries Operating Corporation. Thread rolling die and method of thread rolling. 4,034,586, Cl. 72-88.000.
- Cosens, G. Ronald; and Drew, Richard J., to Electro Medical Systems, Inc. Vas cautery apparatus. 4,034,762, Cl. 128-303.170.
- Cover, William S.; Haller, Jacob S.; and Quigley, James R., to TRW Inc. Wire termination apparatus. 4,034,472, Cl. 29-749.000.
- Covington, Martin Bryan, Jr., to Bendix Corporation, The. Concentric broadband power combiner or divider. 4,035,746, Cl. 333-6.000.
- Cowles, Christopher S., to Shell Oil Company. Wireline tool for measuring bottom-hole pressure in pumping wells. 4,035,763, Cl. 340-18.0FM.
- Cowman, Charles D., Jr.; and Shepherd, John P. G., to Minnesota Mining and Manufacturing Company. Light concentrator having an anticlastic reflective surface. 4,035,064, Cl. 350-293.000.
- Cox, Howard W.: *See—*
  - Campbell, Gregory A.; Cox, Howard W.; and Meluch, William C., 4,035,467, Cl. 264-329.000.
- Coxhill, Major, to Allis-Chalmers Corporation. Gyratory crusher with bushing assembly between inner eccentric antifriction bearing. 4,034,922, Cl. 241-213.000.
- Craigen, William J. S.; Zawidzki, Tadeusz W.; Smart, Bruce C.; and Melvanin, Frank W., to Eldorado Nuclear Limited. Uranium dioxide process. 4,035,468, Cl. 423-15.000.
- Cramer, Henry R.: *See—*
  - Faust, John P.; and Cramer, Henry R., 4,035,484, Cl. 424-149.000.

- Crawford, Knute S.: *See—*
  - Kristick, Lawrence J.; Crawford, Knute S.; and Calle, Jaime, 4,035,780, Cl. 364-900.000.
- Crawford, William C., and Davis, Jackie L., to Wm. T. Burnett & Co., Incorporated. Lacrosse stick. 4,034,984, Cl. 273-96.00D.
- Crisp, Michael D.; and Ringlien, James A., to Owens-Illinois, Inc. Magnetic polarization of tubular laser. 4,035,741, Cl. 331-94.50G.
- Crittendon, Charles E.: *See—*
  - Brouwer, Walter G.; MacPherson, Edwin J.; Ames, Ronald B.; Neidermyer, Robert W., and Crittendon, Charles E., 4,035,175, Cl. 71-76.000.
- Cronen, Peter J., Sr. Toroidal rotary engine. 4,035,111, Cl. 418-38 000.
- Crosland, Roy; and Park, Andrew Howard Donaldson, to Coal Industry (Patents) Limited. Method of and apparatus for measurement of flow of particulate material by sensing the shadow profile. 4,035,635, Cl. 250-223.00R.
- Cross Company, The: *See—*
  - Shelton, Conway D., 4,034,465, Cl. 29-568.000.
- Crumb, Robert E.: *See—*
  - Sparlin, Derry D.; and Crumb, Robert E., 4,034,811, Cl 166-295.000.
- Csokasy, Louis R.; and Robb, Neil E., to Excel Industries, Incorporated. Closure counter-balance. 4,034,438, Cl. 16-85.000.
- CTS Corporation. *See—*
  - Beaverson, Wayne A.; and Hufford, James N., 4,035,672, Cl. 310-8.700.
  - Van Benthuysen, John D., 4,035,759, Cl. 338-162.000.
- Cudmore, Eric W. Device for loading and carrying boats on top of vehicles. 4,034,879, Cl. 214-450.000.
- Culbertson, Michael, and Keller, James E., to Saturn Manufacturing, Inc. Drive arrangement for rotary shredding apparatus. 4,034,918, Cl. 241-36.000.
- Cumbers, David Charles, to Imperial Chemical Industries Limited. Bonding of structures. 4,035,219, Cl. 156-290.000.
- Cummings, William M., to Texaco Inc. Hydrocarbyl amine substituted propionic ester. 4,035,409, Cl. 260-479.00S.
- Cunningham, Newton T. Production of alcohol from cereal grains. 4,035,515, Cl. 426-14.000.
- Cunningham, Robert E., to United States of America, National Aeronautics and Space Administration. Hydrostatic bearing support 4,035,037, Cl. 308-5.00R.
- Curl, John J. Low noise amplifier. 4,035,737, Cl. 330-13.000.
- Curtin, Hoyt S. Pipe coupling. 4,035,002, Cl. 285-31.000.
- Curtiss, Walter W., Jr., to Goodyear Tire & Rubber Company, The. Pneumatic tire having a removable tread ring. 4,034,789, Cl. 152-187.000.
- Cutler-Hammer, Inc.: *See—*
  - Josemans, Leonardus J., 4,035,597, Cl. 200-296.000.
  - Luy, William R.; and Swinehart, Merle R., 4,035,692, Cl 361-103.000.
- Cutler, Hymie. Offset path generating system particularly useful for numerical control machines. 4,035,706, Cl. 318-572.000.
- Czelusniak, Paul Anthony, Jr., to Fieldcrest Mills, Inc. Pile fabric forming apparatus having cooperating pairs of pile wires. 4,034,781, Cl. 139-46.000.
- Czerny, Thomas; von Dohren, Hans; Losch, Lothar, Winsel, August; and Ziegler, Kurt, deceased (by Ziegler, Rosemary, heiress), to Varta Batterie Aktiengesellschaft. Powder-and-gas vibrating reactor. 4,035,151, Cl. 23-252.00R.
- D. L. Auld Co., The. *See—*
  - Fielder, William A.; Wilson, Harold E.; and Waugh, Robert E., 4,034,708, Cl. 118-642.000.
- Dafter, Robert Vincent, Jr., to Western Electric Company, Inc. Method of depositing a metal on a surface of a substrate. 4,035,500, Cl. 427-261.000.
- Dahlin, Gunnar, to Automatindustrier i Gavle AB Thread milling apparatus. 4,034,646, Cl. 90-11.640.
- Dahm, Johann: *See—*
  - Dickore, Karlfried; Merz, Walter; Dahm, Johann; and Smith, Donovan Norman, Jr., 4,035,364, Cl. 260-248.0AS.
- Daimler-Benz Aktiengesellschaft: *See—*
  - Saufferer, Helmut; and Willmann, Karl, 4,034,728, Cl. 123-119.00E.
- Dainippon Printing Co., Ltd: *See—*
  - Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 4,035,060, Cl. 350-160.0LC.
- Dana Corporation: *See—*
  - Sink, William H.; and Flotow, Richard A., 4,034,836, Cl. 192-99.00A.
- Daniel Woodhead, Inc.: *See—*
  - Trevithick, Tony, 4,035,045, Cl. 339-14.00R.
- Danley, Jon G.; and Meisner, Arthur L. Shadow clock. 4,034,549, Cl. 58-50.00R.
- Danneels, Laurent; Helder, Johan; Kuypers, Jan; Piolon, James; and Pernegger, Wolfgang, to Siemens Aktiengesellschaft. Electroplating device and method for the partial metalizing of elements in continuous transit. 4,035,245, Cl. 204-15.000.
- Dantlgraber, Jorg, to G. L. Rexroth GmbH Variable-output pump control arrangement. 4,035,105, Cl. 417-220 000.
- Daoust, Donald: *See—*
  - Forward, Daniel; Woolley, George Carr, and Daoust, Donald, 4,034,995, Cl 280-11 230
- Dardenne, Jacques. *See—*
  - Magny, Jean, Montant, Charles, Raynaud, Pierre, Gontier, Charles, and Dardenne, Jacques, 4,035,517, Cl. 426-31.000.
- Dash, Glen R.; Agans, David J.; and Szakacs, Gabor L., to Massachusetts Institute of Technology. Electronic games 4,034,983, Cl. 273-85.00R.
- Daume, Eduard, to Werkzeugmaschinenfabrik Oerlikon-Buhrle AG Inhibitor coating for solid rocket propellent charge. 4,034,676, Cl. 102-103 000
- Davenport, Edward R., Jr.: *See—*
  - Price, Robert L., and Davenport, Edward R., Jr., 4,035,792, Cl. 340-277 000
- David, Agoston *See—*
  - Knoll, Jozsef, Furst, Zsuzsanna, Meszaros, Zoltan, Nagy, Gabor; David, Agoston, Bognar, Rezso, Makleit, Sandor; and Valovics, Gyula, 4,035,491, Cl 424-226.000
  - Szentmiklosi, Peter, Meszaros, Zoltan, Tardos, Laszlo, Hermecz, Istvan, Erdelyi, Ilona; David, Agoston, Vasvari nee Debreczy, Lelle; and Horvath, Agnes, 4,035,366, Cl 260-253 000
- Davidson, Charles. Wrist watch 4,034,552, Cl. 58-88 00R
- Davidson, James R; Hanson, William J, and Wilson, Stephen K., to Xerox Corporation. Particle dispenser 4,034,701, Cl 118-7 000
- Davis, Dwight E., and Leary, David F, to General Atomic Company Method of making nuclear fuel bodies 4,035,452, Cl 264- 500.
- Davis, Jackie L. *See—*
  - Crawford, William C.; and Davis, Jackie L., 4,034,984, Cl 273-96 00D
- Davis, Michael Ian *See—*
  - Birney, Richard Eugene, Davis, Michael Ian, Hood, Robert Allen, McDermott, Thomas Stephen, and Wise, Larry Edward, 4,035,779, Cl 364-200.000
- Davis, Ronald Ivey, to ICI United States Inc Water washable petrolatum compositions 4,035,514, Cl 424-365 000
- Davis, Thomas: *See—*
  - Drehman, Lewis E., and Davis, Thomas, 4,035,433, Cl 260-681.50R.
- Davydov, Anatoly Borisovich, Akimova, Alla Yakovlevna, Korshak, Vasily Vladimirovich, Trofimov, Nikolai Nikolaevich, Ftlis, Volf Samoilovich, Vishnevsky, Alexandr Alexandrovich, and Belkin, Vitaly Rafailovich Medical adhesive. 4,035,334, Cl 260-42 210
- Dawes, Dag *See—*
  - Boehner, Beat, Dawes, Dag, Kristinsson, Haukur, and Meyer, Willy, 4,035,487, Cl 424-200 000.
- Day, Harold R., Jr., to General Electric Company Projector lamp reflector. 4,035,631, Cl. 240-41.35C.
- Dayco Corporation. *See—*
  - Brooks, Alden W., 4,034,615, Cl. 74-229 000.
- Deak, Tibor E.; and Magnus, Leroy D, to Doric Foods, Corporation System and method for storing, handling and orienting bottles and the like. 4,034,844, Cl. 198-400.000
- Deane, Richard, Honey, Ronald N., and Krauss, Clifford J, to Cominco Ltd. Contact bar for electrolytic cells. 4,035,280, Cl. 204-267 000.
- Deason, James R., Hamilton, Robert W., Lowrie, Harman S, and Rorig, Kurt J., to G. D. Searle & Co. 4- [4-(Diphenylmethyl)-1-piperidinyl]methyl benzenamines. 4,035,372, Cl. 260-293 770.
- Debrie, Guy; Petit, Michel; and Vertut, Jean, to Commissariat a l'Energie Atomique. Reversible mechanical remote-control device 4,035,707, Cl 318-628 000
- Decher, Reiner; Fromm, Eugene Howard, and Tegeler, David Charles, to Boeing Company, The Apparatus for determining characteristics of turbo-powered airplane engine simulators. 4,034,604, Cl 73-147.000.
- Deck, James R., to Caterpillar Tractor Co Infinitely adjustable cable controlled apparatus and method 4,034,622, Cl. 74-501.00R.
- Dedolph, Richard R., to Gravi-Mechanics Co. Potted plant assembly with growing plant therein. 4,034,507, Cl. 47-66.000
- Dedolph, Richard R., to Gravi-Mechanics Co. Polymerized soil with growing plant and method of making and package therefor and hanger and plaque incorporating the same. 4,034,508, Cl. 47-84.000.
- Deeg, Emil W., to American Optical Corporation Method of providing a phototropic layer on a carrier. 4,035,527, Cl. 427-169.000.
- Deetz, David R., Fisk, Bernard C, and Donohue, James M., to Xerox Corporation. Programmable controller for controlling reproduction machines. 4,035,072, Cl. 355-14.000.
- Degen, Peter John: *See—*
  - Lucas, Anthony James; and Degen, Peter John, 4,035,506, Cl. 424-303.000
- Delgrosso, Eugene J.. *See—*
  - Carlson, Carl E., and Delgrosso, Eugene J., 4,034,906, Cl. 228-194.000.
  - Galasso, Francis S., Delgrosso, Eugene J., and Kuntz, Urban E., 4,034,454, Cl. 428-576.000.
- Delorey, David R.. *See—*
  - Tardiff, Armand L., Broughton, Glover F., Delorey, David R, and Pearson, Bangt R., 4,034,893, Cl. 221-171.000.
- DeLuca, Hector F, Schnoes, Heinrich K.; Suttie, John W., and Frank, Helen, to Wisconsin Alumni Research Foundation. Rodenticide. 4,035,493, Cl. 424-236 000.
- Del Vecchio, George, to Xerox Corporation. Duplex reproduction machine. 4,035,073, Cl. 355-24.000.
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DeRees, Delbert Duane, to American Motors Corporation. Window regulator. 4,034,509, Cl. 49-353.000.

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- McLaughlin, Robert L.; Wood, Donald C.; and Kraszewski, Wesley A., 4,035,163, Cl. 51-303.000.

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- Ford, William R.; and Hall, Everett R., 4,034,458, Cl. 29-259.000.

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- Carlomagno, William Dominac; and Diaz, Stephen Hunter, 4,034,450, Cl. 29-33.00E.

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- Deetz, David R.; Fisk, Bernard C.; and Donohue, James M., 4,035,072, Cl. 355-14.000.

Donskoi, Efim Moiseevich. *See—*
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- Gandolfi, Carmelo, Doria, Gianfederico; and Gaio, Pietro, 4,035,392, Cl. 260-343.30R.
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- Deak, Tibor E.; and Magnus, Leroy D., 4,034,844, Cl. 198-400.000.

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- Radice, John G., 4,034,484, Cl. 35-11.000.

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- Ferris, William E., deceased; Hennessy, Gail, executrix; Doumas, John; and McCarter, Harry, 4,035,123, Cl. 425-129.00R.

Dow Chemical Company, The: *See—*
- Brust, Harry F., 4,035,416, Cl. 260-521.00H.
- Childress, David L.; Hayes, William V.; and Poppe, Richard L., 4,035,262, Cl. 252-456.000.
- Göralski, Christian T.; Pews, R. Garth; and Burk, George A., 4,035,407, Cl. 260-454.000.
- Olstowski, Franciszek, 4,035,331, Cl. 260-30.200.
- Urioste, German R.; Busby, David E.; McConchie, Garnet E.; and Orr, Jimmy D., 4,035,473, Cl. 423-488.000.

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- Baney, Ronald H.; and Marko, Ollie W., 4,035,355, Cl. 260-46.50Y.

Doyle, James M.: *See—*
- Fisher, David R.; Willis, Don C.; John, Frederick W.; Powers, James R.; Doyle, James M.; Cooper, Lonnie D.; and Rich, Dennis C., 4,034,491, Cl. 40-33.000.

Doyle, James Patrick: *See—*
- Yarrow, Christopher John; Johnson, Ronald; and Doyle, James Patrick, 4,035,712, Cl. 322-24.000.

Drabek, Jozef; and Varsanyi, Denis, to Ciba-Geigy Corporation. Insecticidal and acaricidal substituted phenyl thiophosphoric acid esters. 4,035,488, Cl. 424-212.000.

Draper, Homer L.; and Gagle, Duane W., to Phillips Petroleum Company. Laminate suitable as hydrocarbon resistant pond liner. 4,035,543, Cl. 428-245.000.

Drath, Edwin H.; and Schlosser, Paul. Pump for fluent, and especially heavy and abrasive materials. 4,035,109, Cl. 417-403.000.

Dreher, Karl: *See—*
- Gotze, Christian; Fleck, Adolf; Dreher, Karl; and Heidrich, Gunther, 4,035,076, Cl. 355-72.000.

Drehman, Lewis E.; and Davis, Thomas, to Phillips Petroleum Company. Selective oxidation of acetylenes. 4,035,433, Cl. 260-681.50R.

Dreissen, Hubert H.: *See—*
- Fontein, Freerk J.; and Dreissen, Hubert H., 4,034,861, Cl. 209-10.000.

Drennen, William, Jr.: *See—*
- Whatley, Thomas; and Drennen, William, Jr., 4,035,067, Cl. 352-85.000.

Drew, Richard J.: *See—*
- Cosens, G. Ronald; and Drew, Richard J., 4,034,762, Cl. 128-303.170.

Drostholm, Frede Hilmar; Jensen, Harry; and Willadsen, Per, to Frede Hilmar Drostholm. Brick press and associated equipment for making bricks. 4,035,128, Cl. 425-259.000.

Drum, Perry B., to McCrary Saw & Tool Company. Circular saw having reduced noise. 4,034,638, Cl. 83-835.000.

Drury, Anthony M., to Matsushita Electric Corporation of America. Beam landing indicator for color cathode ray tube. 4,035,834, Cl. 358-10.000.

Duch, Bernard P. Device for introducing a substance, particularly a pulverulent substance, from a chamber having a pressure P1, into a chamber having a pressure P2 higher than P1. 4,034,870, Cl. 214-17.0CB.

Ducloux, Maurice; and Ledru, Pierre, to Rhone-Poulenc S.A. Thermosetting bis-imide compositions. 4,035,345, Cl. 260-78.0UA.

Duddy, Joseph C.; and Hein, Edward R., to ESB Incorporated. Lead base alloy for use in a storage battery grid. 4,035,556, Cl. 429-245.000.

Dula-Werke Dustmann & Co.: *See—*
- Dustmann, Heinrich, 4,034,535, Cl. 52-727.000.

Duncan, Lloyd P. Pulsation system. 4,034,712, Cl. 119-14.360.

Dunworth, William P., to Du Pont de Nemours, E. I., and Company. Polyester filaments flame retarded with end-capped poly(m-phenylene cyclohexylphosphonate). 4,035,442, Cl. 260-860.000.

Du Pont de Nemours, E. I., and Company: *See—*
- Apotheker, David; and Krusic, Paul Joseph, 4,035,565, Cl. 526-249.000.
- Dunworth, William P., 4,035,442, Cl. 260-860.000.
- Jones, Frank N., 4,035,557, Cl. 526-14.000.
- Milano, James, 4,035,396, Cl. 260-369.000.
- Samuelson, Harry Vaughn; and Singh, Gurdial, 4,035,346, Cl. 260-78.00R.
- Sweet, Ronald Lancelot, 4,035,383, Cl. 260-314.500.
- Woo, Lecon; and McGhee, John D., 4,034,602, Cl. 73-67.200

Durand, James C., to Caterpillar Tractor Co. Maximum temperature-indicator. 4,034,698, Cl. 116-114.00Z.

Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, to Smith Kline & French Laboratories Limited. Imidazolyl alkylaminopyridone and pyridinethione compounds. 4,035,374, Cl. 260-294.80G.

Durie, Brian G. M.; and Salmon, Sydney E., to University Patents, Inc. Method of high speed scintillation autoradiography. 4,035,155, Cl. 23-230.300.

Durotech Co.: *See—*
- Kesten, Stanley Frank; and Liska, Miroslav, 4,035,107, Cl. 417-310.000.

Dustmann, Heinrich, to Dula-Werke Dustmann & Co. Building set for a base construction of a pillar casing. 4,034,535, Cl. 52-727.000.

Duval, Denise Jeanne Claude: *See—*
- Robba, Max Fernand; and Duval, Denise Jeanne Claude, 4,035,371, Cl. 260-293.570.

Dwyer, Francis G.; Hanson, Francis V.; and Schwartz, Albert B., to Mobil Oil Corporation. Conversion of methanol to gasoline product. 4,035,430, Cl. 260-668.00R.

Dybas, Richard A.: *See—*
- Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., 4,035,174, Cl. 71-67.000.

Dynapac, Inc.: *See—*
- Blackett, Ned K., Jr., 4,034,648, Cl. 91-229.000.

Dynapac Maskin AB: *See—*
- Fors, Torsten; and Norrman, Martin, 4,034,614, Cl. 74-61.000.

E M I Limited: *See—*
- Hounsfield, Godfrey Newbold; and Gibbons, David John, 4,035,647, Cl. 250-366.000.
- LeMay, Christopher Archibald Gordon, 4,035,651, Cl. 250-445.00T.

E. R. Squibb & Sons, Inc.: *See—*
- Sipos, Frank, 4,035,567, Cl. 536-4.000.

E. Remy Martin & Co.: *See—*
- Magny, Jean; Montant, Charles; Raynaud, Pierre; Gontier, Charles; and Dardenne, Jacques, 4,035,517, Cl. 426-31.000

Eagle Clamp Co., Ltd.: *See—*
- Tsuyama, Yoshizo, 4,034,971, Cl. 269-249.000.

Eastell, Robert W.; Harrison, John; and Sharples, Allan, to McCorquodale & Company Limited. Security cards. 4,035,623, Cl. 235-61.11D.

Eastman Kodak Company: *See—*
- Evans, Francis J.; and Atwell, Robert E., 4,035,185, Cl. 96-29.00R.
- Faul, William H.; and Saturno, Patrick H., 4,035,184, Cl. 96-22.000.
- Holmes, Jerry D., 4,035,389, Cl. 260-343.900.
- Jackson, Winston J., Jr.; and Kuhfuss, Herbert F., 4,035,356, Cl. 260-47.00C.
- Jones, Glenn C.; and Meen, Ronald H., 4,035,253, Cl. 204-78.000.
- Masurekar, Prakash S.; and Goodhue, Charles T., 4,035,237, Cl. 195-66.00R.
- Mowrey, Rowland George; Smith, Donald Arthur; and Sutton, Richard Calvin, 4,035,187, Cl. 96-60.00R.
- Raychaudhuri, Pranab Kumar, 4,035,197, Cl. 136-89.0CD.
- Staudenmayer, William J.; Stephens, Curtis L.; and Thompson, John R., 4,035,750, Cl. 355-3.00R.

Eaton Corporation: *See—*
- Chute, Richard, 4,034,560, Cl. 60-39.080.
- McDermott, Hugh L., 4,035,113, Cl. 418-61.00B.
- McNamara, Thomas V.; and Richards, Elmer A., 4,034,620, Cl. 74-410.000.
- Moran, Thomas M., 4,034,944, Cl. 248-56.000.

Ebner, Emanuel C., Jr., to Graphic Systems, Inc. Input cassette 4,034,929, Cl 242-71.100.

Eckels, Robert E. Linear explosive. 4,034,672, Cl. 102-23.000.

Economy, George C. Attachment for shopping cart. 4,034,539, Cl. 40-308.000.

Edming, J. Walter. Router bit. 4,034,452, Cl. 29-103.00A.

Edwards, Neil K.: *See—*
- Atherton, Harry D.; Edwards, Neil K., and Perlstein, Paul H., 4,034,740, Cl. 128-1.00B.

EF & EF Industries, Inc.: *See—*
- Hughes, Thomas J., Jr., 4,035,095, Cl. 403-282.000.

Egawa, Takatoshi: *See—*
- Asano, Hidejiro; Oyagi, Yashichi; and Egawa, Takatoshi, 4,035,248, Cl. 204-38.00B.

Eggler, James F.: *See—*
- Johnson, Michael R.; Schaaf, Thomas K.; Bindra, Jasjit S.; Hess, Hans-Jurgen E., and Eggler, James F., 4,035,360, Cl. 260-240.00R.

Eggleton, Reginald C.; and Fry, Francis J., to Indianapolis Center For Advanced Research, Inc. Ultrasonic imaging. 4,035,839, Cl. 358-112.000.

Egi, Mario. Automatic coffee-making apparatus. 4,034,660, Cl. 99-289.00R

Ehrlich, Stanley L., to Raytheon Company. Sonar transducer having inertial inductor. 4,035,761, Cl 340-10.000.

Eickmann, Karl. Fluid-operated radial piston devices. 4,034,651, Cl. 91-488.000.

Einthoven, Willem Gerard, and Simpson, William Cordt, to RCA Corporation. Semiconductor device resistors having selected temperature coefficients. 4,035,757, Cl 338-25.000.

Einthoven, Willem Gerard; Caravaggio, Anthony Joseph, and Todd, Albert Alexander, to RCA Corporation. Semiconductor integrated circuit device. 4,035,828, Cl 357-47.000.

Ek, Lars: *See—*
- Berntsson, Peder Bernhard; Brandstrom, Arne Elof; Carlsson, Enar Ingemar, Carlsson, Stig Ake Ingemar; Ek, Lars; Samuelsson, Gustav Benny Roger; Sjostrand, Sven Erik, Strandlund, Gert Christer, and Ablad, Bengt Arne Hjalmar, 4,035,420, Cl. 260-553.00A.

Ekstrom, Bo: *See—*
- Milcz, Wilhelm, Steinert, Wolfgang; and Ekstrom, Bo, 4,035,581, Cl. 178-67.000.

Elco Industries, Inc.: *See—*
- Melone, Robert R., 4,034,788, Cl. 151-37.000.

Eldorado Nuclear Limited: *See—*
- Craigen, William J. S.; Zawidzki, Tadeusz W.; Smart, Bruce C.; and Melvanin, Frank W., 4,035,468, Cl. 423-15.000.

Electricite de France (Service National): *See—*
- Ventre, Edmond, 4,035,231, Cl. 176-38.000.

Electro Medical Systems, Inc.: *See—*
- Cosens, G. Ronald; and Drew, Richard J., 4,034,762, Cl 128-303.170.

Electro-Therm, Inc.: *See—*
- Vogel, Alan D., 4,035,609, Cl. 219-335.000.

Elfab Corporation: *See—*
- Ammon, John Preston, 4,035,047, Cl. 339-17.00C.

Eli Lilly and Company. *See—*
- Berg, David H.; Hamill, Robert L., and Hoehn, Marvin M., 4,035,481, Cl. 424-122.000.
- Wheeler, William J., 4,035,361, Cl. 260-243.00C.

Elkaim, Henri. Composite article formed by superposed shapes of two members. 4,034,573, Cl. 63-31.000.

Elliott, Eldon G. Apparatus for handling magnetically attractive material. 4,034,848, Cl. 198-570.000.

Ellis, Eugene. Hot water bottle with ear warming projections. 4,034,787, Cl. 150-2.100.

Ellis, William G., to Can-Gard Protective Wear Ltd. Protective garments. 4,034,417, Cl 2-81.000.

Elmer, Frank J. Optical alignment sensor 4,035,654, Cl 250-491.000.

Elmore, Fredies M.: *See—*
- Rose, Clarence W.; and Elmore, Fredies M., 4,034,828, Cl. 182-5.000.

Elsner, Arno: *See—*
- Flormann, Paul; Hinneman, Egon; Mengelkamp, Bernhard; and Elsner, Arno, 4,035,734, Cl. 328-167.000.

Emerson Electric Co.: *See—*
- Baysinger, Robert L.; and Newport, Harry E., Jr., 4,034,911, Cl. 236-20.00R.

Emhart Industries, Inc.: *See—*
- Morris, Herbert R., and Henry, James, 4,034,572, Cl. 62-256.000
- Raudat, John L.; and Rydell, Adam Z., 4,034,656, Cl 93-37.00R

Emmett, John Colin: *See—*
- Durant, Graham John; Emmett, John Colin; and Ganellin, Charon Robin, 4,035,374, Cl. 260-294.80G.

Endo, Tadakazu; Takeuchi, Masanori; Hanada, Tuneo; Nakagawa, Kiyoshi, Komatsu, Hideo, and Nakamura, Itaru, to Toray Industries, Inc. Polyester filament having excellent antistatic properties and process for preparing the same. 4,035,441, Cl. 260-860.000.

Eneroth, Jan-Mats: *See—*
- Bahri, Marcel Selim, deceased, Bahri, Elin, heir and legal successor; Bahri, heir and legal successor; by Kristin; and Eneroth, Jan-Mats, 4,034,862, Cl. 209-11.000.

Engdahl, Arnold Bernard, Jr., to Federal Paper Board Company, Inc. Berry basket and method of making same. 4,034,907, Cl. 229-32.000.

Enomoto, Toshio; and Muto, Seiji, to Toyo Kokan Kabushiki Kaisha. Method of manufacturing a reflecting mirror. 4,035,247, Cl. 204-19.000.

Eparco SA.: *See—*
- Bavaveas, Payanotis, 4,035,090, Cl. 401-25.000.

Epstein, Irving, to Washington Chain & Supply, Inc. Releasable hook. 4,034,992, Cl. 294-83.00R.

Epstein, James, to GTE Laboratories Incorporated. Electrochemical cell. 4,035,552, Cl. 429-58.000.

Erbele, Kurt; and Castelli, Antonio, to Castelli KG. Device for distributing conditioned air. 4,035,018, Cl. 297-180.000.

- Erdelyi, Ilona *See—*
  - Szentmiklosi, Peter; Meszaros, Zoltan; Tardos, Laszlo; Hermecz, Istvan, Erdelyi, Ilona, David, Agoston; Vasvari nee Debreczy, Lelle, and Horvath, Agnes, 4,035,366, Cl. 260-253.000.
- Erickson, Edward H., to Riker Laboratories, Inc. Substituted 3-(1H-tetrazol-5-yl)-quinoline compounds. 4,035,368, Cl. 260-288.0CE.
- Eriksson, Erik Gustav Lennart, to AB Karlstadplattan. Apparatus for making sawdust chipboard. 4,035,120, Cl. 425-81.000.
- Eriksson, Sven Willner; Lovung, Bengt Gustaf; Salomonsson, Hans Manne A., and Sandlin, Rolf Hilding, to AB Bofors. Device for damping the tipping and yawing oscillations of the guidance system of a flying vehicle. 4,034,936, Cl. 244-3.150.
- Ernst, Arnold E. Disc scraping apparatus. 4,034,688, Cl. 111-87.000.
- Ernst, Richard John. *See—*
  - Williams, Elbert Eugene, Jr.; and Ernst, Richard John, 4,034,641, Cl. 85-41.000.
- ESB Incorporated: *See—*
  - Duddy, Joseph C., and Hein, Edward R., 4,035,556, Cl. 429-245.000.
- Escamilla, Mauricio Guillermo. Programmable manually playable piano. 4,034,640, Cl. 84-478.000.
- Eshghy, Siavash, to Rockwell International Corporation. Balanced plug valve. 4,034,776, Cl. 137-246.220.
- Eskamani, Abolghassem; and Sanitra, Robert, to Standard Oil Company. Acrolein-indene copolymers. 4,035,340, Cl. 260-73.00R
- Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Production of fuel oil. 4,035,281, Cl. 208-8.000.
- Espenscheid, Wilton F.; and Yan, Tsoung-Yuan, to Mobil Oil Corporation. Desulfurization of residual oil. 4,035,287, Cl. 208-242.000.
- Essex Group, Inc.: *See—*
  - Hennessy, Daniel R., Pierre, David M.; and Pops, Horace, 4,035,277, Cl. 204-195.00S.
- Essex International, Inc.: *See—*
  - Fosnough, Robert D.; and Bennett, David F., 4,035,795, Cl. 340-365.00C.
- Etablissements Giraudon S.A.: *See—*
  - Tillon, Georges, 4,034,579, Cl. 66-85.00R.
- Ethicon, Inc.: *See—*
  - Mandel, Harvey B., and Schuler, Michael, 4,034,850, Cl. 206-63.300.
- Ethyl Corporation: *See—*
  - Hafele, Robert X., 4,034,900, Cl. 222-321.000.
- Etlis, Volf Samoilovich: *See—*
  - Davydov, Anatoly Borisovich; Akimova, Alla Yakovlevna; Korshak, Vasily Vladimirovich; Trofimov, Nikolai Nikolaevich; Etlis, Volf Samoilovich, Vishnevsky, Alexandr Alexandrovich; and Belkin, Vitaly Rafailovich, 4,035,334, Cl. 260-42.210.
- Evans, Francis J., and Atwell, Robert E., to Eastman Kodak Company. Blended internal latent image emulsions, elements including such emulsions and processes for their preparation and use. 4,035,185, Cl. 96-29.00R
- Evans, Leslie Samuel; and Harbar, John Richard, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Industry in Her Britannic Majesty's Government of the. Sodium-sulfur electric batteries with ceramic spacer in sulfur compartment. 4,035,553, Cl. 429-104.000.
- Excel Industries, Incorporated. *See—*
  - Csokasy, Louis R.; and Robb, Neil E., 4,034,438, Cl. 16-85.000.
- Exclusive Envelope Corporation. *See—*
  - Rogers, Arthur M., 4,034,910, Cl. 229-68.00R.
- Exxon Production Research Company: *See—*
  - Van Burkleo, Glenn G., 4,034,732, Cl. 123-198.0DC.
- Exxon Research and Engineering Company: *See—*
  - Brois, Stanley J., 4,035,309, Cl. 252-49.700
  - Lyon, Richard K., and Kaldor, Andrew, 4,035,270, Cl. 204-157.10R.
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  - Brown, George W., 4,035,784, Cl. 340-173.00R.
  - Gunsagar, Kamleshwar C.; and Amelio, Gilbert F., 4,035,821, Cl. 357-24.000.
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- Farber, Sheldon, to NCR Corporation. Chromogenic derivatives of bis-1,1-disubstituted ethylene and a process for preparing them. 4,035,393, Cl. 260-343.30R.
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- Farmer, Harold, to United States Gypsum Company. Monitoring device for fiber cutter. 4,035,790, Cl. 340-267.00R.
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  - Engdahl, Arnold Bernard, Jr., 4,034,907, Cl. 229-32.000.
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  - Sperling, Klaus-Richard, 4,035,079, Cl. 356-85.000.
- Feichtmayr, Franz; Schlag, Johannes, and Bauer, Peter, to BASF Aktiengesellschaft. Electrical insulating compositions based on olefin polymers. 4,035,311, Cl. 252-63.200.
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  - Honegger, Werner, 4,034,845, Cl. 198-418.000.
- Ferch, Alois. Methods for imparting a grooved surface to cable drum shells. 4,034,932, Cl. 242-117.000.
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  - Lohr, Delmar Frederick, Jr., and Kay, Edward Leo, 4,035,314, Cl. 260-2.300.
  - Spiewak, John W., 4,035,344, Cl. 260-77.50C.
- Fisch, Richard S., to Minnesota Mining and Manufacturing Company. Protection of silver reduction materials. 4,035,181, Cl. 75-109.000.
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  - Umbaugh, Raymond E.; and Fisher, Gene Alan, 4,034,714, Cl. 119-14.180.
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  - Konz, Marvin Joseph, 4,035,178, Cl. 71-88.000.
- Fogel, Sidney J.: *See—*
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- Foglio, Maurizio: *See—*
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- Fomenko, Nikolai Dmitrievich: *See—*
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- Ford, Peter W.: *See—*
  - Frattarola, Joseph R.; Ford, Peter W.; and Santagata, James P., 4,035,614, Cl. 235-61.70B.
- Ford, William R.; and Hall, Everett R., to Diamond International Corporation. Bearing extracting tool. 4,034,458, Cl. 29-259.000.
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- Forrer, Homer W., to Mead Corporation, The. Article carrier. 4,034,852, Cl. 206-141.000.
- Fors, Torsten; and Norrman, Martin, to Dynapac Maskin AB. Apparatus for generating vibrations. 4,034,614, Cl. 74-61.000.
- Forsberg, John R., to Helene Curtis Industries, Inc. Single station spray system. 4,034,916, Cl. 239-373.000.
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- Fosnough, Robert D.; and Bennett, David F., to Essex International, Inc. Touch keyboard system for digital logic control. 4,035,795, Cl. 340-365.00C.
- Fox, Anthony. Electric hand trucks. 4,034,878, Cl. 214-374.000.
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- Frank, Earl E., to Abex Corporation. Railroad classification yards. 4,034,677, Cl. 104-26.00R.
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- Franke, Edward Louis, Jr.: *See—*
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- Frattarola, Joseph R.; Ford, Peter W., and Santagata, James P., to UMC Industries, Inc. Card validating apparatus. 4,035,614, Cl. 235-61.70B.
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- Freeman, Gerald C., to Pitney-Bowes, Inc. Postage meter setting mechanism. 4,034,669, Cl. 101-91.000
- Freeman, James F. Welder's square supporting assembly. 4,034,943, Cl. 248-1.000.
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- Galer, Herbert W., to United States Steel Corporation. Plastic lids and pails. 4,034,886, Cl. 220-72.000.
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- Geiger, Mario Theodore, to American Hospital Supply Corporation. Method and apparatus for determining coagulation times. 4,034,601, Cl. 73-64.100.
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  - Hornung, Richard E., 4,035,787, Cl. 340-228.00R.
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  - Lewis, Carl B., 4,034,832, Cl. 191-86.000.
  - Osborne, Robert N., 4,034,599, Cl. 73-40.700.
  - Perry, Fred G., 4,035,729, Cl. 325-304.000.
  - Smith, William E., 4,035,408, Cl. 260-491.000.
  - Williamson, Harold Eugene, and Smith, Bart Alan, 4,035,233, Cl. 176-78.000.
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  - Abou-Guendia, Maher M., 4,035,519, Cl. 426-653.000.
- General Motors Corporation: *See—*
  - Akeel, A. Hadi Kobaisi Abu; and Jackson, Richard C., 4,034,970, Cl. 266-216.000.
  - Ayres, John A.; and Holl, William H., 4,034,730, Cl. 123-139.0AV.
  - Ball, Frank W.; and Mutty, Paul R., 4,034,784, Cl. 141-348.000.
  - Campbell, Gregory A.; Cox, Howard W.; and Meluch, William C., 4,035,467, Cl. 264-329.000.
  - Charbonneau, Larry F., 4,035,431, Cl. 260-668.00C.
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  - Falge, John H., 4,034,726, Cl. 123-117.00A.
  - Griffin, Henry W.; and Nichter, Thomas J., 4,035,017, Cl. 296-93.000.
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  - Konantz, Mark L.; and Leisure, Ronald K., 4,035,526, Cl. 427-90.000.
  - Krug, Robert C., 4,035,021, Cl. 297-369.000.
  - Nagy, Louis L., 4,035,797, Cl. 343-5.0SA.
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  - Buckwitz, Richard J., 4,034,612, Cl. 73-431.000.
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  - Riester, Hans, 4,035,157, Cl. 23-277.00C.
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- Gergely, Alex S., to Philip Morris Incorporated. Jam prevention unit for extrusion process. 4,035,125, Cl. 425-141.000.
- Gersamia, Eduard Galaktionovich: *See—*
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- Giacone, Felice, to Ing. C. Olivetti & C., S.p.A. Arrangement for driving a printing head along a printing line. 4,034,842, Cl. 197-82.000.
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- Gibert, Francois; and Champet, Gerard. Fluidized bed seed separator. 4,035,288, Cl. 209-466.000.
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- Ginder, Daniel L. Castor assembly. 4,034,436, Cl. 16-18.00A.
- Giordano, Claudio, Ferraris, Mario; and Barsuglia, Elena, to Montedison Fibre S.p.A. Methods of combatting nematodes using certain derivatives of 1,3,5-oxathiazine. 4,035,496, Cl. 424-246.000
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  - Rath, Heinrich Bernhard, 4,034,858, Cl. 188-73.300.
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  - Verweij, Jan, Tan, Hong Sheng; and Kooreman, Hermanus Jacobus, 4,035,352, Cl. 260-239.100.
- Gittos, Maurice Ward; and Amey, David Anthony, to Aspro-Nicholas Limited. Butanoic and butenoic acid morpholides. 4,035,497, Cl. 424-248.560.
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  - O'Rourke, John Black; and Stopp, Peter Gordon, 4,035,042, Cl. 308-160.000.
- Glasson, Geoffrey Thomas. High voltage electrical insulators. 4,035,578, Cl. 174-178.000.
- Gleckler, George C.; and Goebel, James C., to American Cyanamid Company. Dry shampoo using chitin powder. 4,035,267, Cl. 252-548.000.
- Glenn, Robert G., to Westinghouse Electric Corporation. Gas turbine nozzle vane adjusting mechanism. 4,035,101, Cl. 415-160.000.
- Glindon, David Michael: *See—*
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- Glover, Frederick Flagg, to Alza Corporation. Dispenser for pharmaceuticals having patient compliance monitor apparatus. 4,034,757, Cl. 128-260.000.
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  - Boggs, Roger L.; Reinsma, Harold L.; and Gobble, Glenn R., 4,034,798, Cl. 164-281.00R.
- Godart, Pierre: *See—*
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- Godet, Sidney, to International Telephone and Telegraph Corporation. Magnetic orientation and damping device for space vehicles. 4,034,941, Cl. 244-166.000.
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  - Kollmann, Harry; and Goetsch, Roland H., 4,034,447, Cl. 27-2.000.
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  - Hammes, Theo; Kuhne, Wilhelm; Gohlke, Gerhard; and Maus, Udo Hermann, 4,034,889, Cl. 220-306.000.
- Gold, Donald B. Furniture construction. 4,035,020, Cl. 297-258.000.
- Goldberg, Paul: *See—*
  - Ames, Allan E.; Kniazzeh, Alfredo G.; and Goldberg, Paul, 4,034,598, Cl. 73-40.000.
- Goldberg, Paul R., to Smith Kline Instruments, Inc. Ultrasonic scanning system with video recorder. 4,034,744, Cl. 128-2.00V.
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  - Pelosi, Stanford S., Jr.; and Goldenberg, Marvin M., 4,035,394, Cl. 260-347.300.
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  - Magny, Jean; Montant, Charles; Raynaud, Pierre; Gontier, Charles; and Dardenne, Jacques, 4,035,517, Cl. 426-31.000.
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  - Masurekar, Prakash S.; and Goodhue, Charles T., 4,035,237, Cl. 195-66.00R.
- Goodyear Tire & Rubber Company, The: *See—*
  - Beres, Arthur W.; Dernbach, Helmut; and Raymondi, Richard A., 4,035,119, Cl. 425-46.000.
  - Curtiss, Walter W., Jr., 4,034,789, Cl. 152-187.000.
  - Spoerke, Roger W.; and Frech, Kenneth J., 4,035,264, Cl. 252-467.000.
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  - Pavlov, Alexandr Mikhailovich, Pyatibrat, Alexandr Lukich; Fomenko, Nikolai Dmitrievich; Gorbachev, Nikolai Alexeevich; and Zotov, Viktor Loginovich, 4,034,800, Cl. 164-288.000.
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  - Ivanov, Albert Bonevich, Krasulin, Jury Leonidovich; and Gordienko, Lev Kimovich, 4,035,545, Cl. 428-328.000.
- Gordon, Vladimir Grigorievich. *See—*
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- Gotoh, Akiyoshi, Mizokawa, Takumi; Sawada, Yukio; and Katsuki, Taichi, to Kobe Steel Ltd. Temperature balancing method for reversing heat exchangers. 4,034,420, Cl. 165-1.000.
- Gottschalk, Juan M.: *See—*
  - Best, Donald T.; and Gottschalk, Juan M., 4,035,615, Cl. 235-61.11E.
- Gottstein, William Joseph. *See—*
  - Kaplan, Murray Arthur, Gottstein, William Joseph; and Granatek, Alphonse P., 4,035,381, Cl. 260-306.70C
- Gotze, Christian, Fleck, Adolf; Dreher, Karl; and Heidrich, Gunther, to AGFA-Gevaert Aktiengesellschaft. Photographic copying machine. 4,035,076, Cl. 355-72.000
- Gough, Robert George; and Buescher, Francis Joseph, to Cincinnati Milacron, Inc. Organotin borates. 4,035,403, Cl. 260-429.700.
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  - Seider, Gene J.; and Freund, Michael C., 4,035,709, Cl. 320-23.000.
- Grabathy, Jeannette. Vacuum cleaner accessory. 4,034,435, Cl. 15-398.000.
- Graehl, Lorin Mark: *See—*
  - Undhjem, Brent Hawkley, Graehl, Lorin Mark; and Bavelas, Andy James, 4,035,587, Cl. 179-98.000.
- Grammel, Jurgen. *See—*
  - Thoma, Wilhelm; Pedain, Josef, Grammel, Jurgen; and Aguado, Antonio, 4,035,213, Cl. 156-231.000.
- Granatek, Alphonse P.: *See—*
  - Kaplan, Murray Arthur; Gottstein, William Joseph, and Granatek, Alphonse P., 4,035,381, Cl. 260-306.70C.
- Graphic Systems, Inc.. *See—*
  - Ebner, Emanuel C., Jr., 4,034,929, Cl. 242-71.100.
- Grassl, Hugo H. Process of treating soybeans to produce soybean extract, soybean oil, and soybean meal therefrom. 4,035,194, Cl. 106-154.00R.
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  - Keijer, Jan Tonnis, 4,034,645, Cl. 90-4.000.
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  - Guillerme, Michel; Gratacos, Jaime, Sirvins, Andre; and Tramier, Bernard, 4,035,289, Cl. 210-11.000.
- Gravi-Mechanics Co.: *See—*
  - Dedolph, Richard R., 4,034,507, Cl. 47-66.000.
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- Gray, George William: *See—*
  - Coates, David; and Gray, George William, 4,035,056, Cl. 350-160.0LC.
- Green, David: *See—*
  - Korner, Renzo L.; Quirk, James F.; Colegrove, Robert J.; and Green, David, 4,035,575, Cl. 174-11.00R.
- Green, David Lee, to Pacer Systems Inc. Maneuver margin presenting. 4,034,605, Cl. 73-178.00H.
- Green, Harold A.; Merianos, John J., and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Microbiocidal mixtures of polymeric quaternary ammonium compounds. 4,035,480, Cl. 424-78.000.
- Greenfield, Walter: *See—*
  - Landers, Donald R., Greenfield, Walter; and Tukey, Peter D., 4,035,294, Cl. 210-77.000.
- Greenwood, James R.; Miller, Philip M.; and Whitacre, Thomas S., to Airco, Inc. Automated pulmonary function testing apparatus. 4,034,743, Cl. 128-2.080.
- Gregorian, Razmic S.; and Hoernle, Hans R., to United Merchants and Manufacturers, Inc. Transfer flocking and laminates obtained therefrom. 4,035,532, Cl. 428-90.000.
- Gregory, Harold; and Preston, Beryl Margaret, to Imperial Chemical Industries Limited. Polypeptides. 4,035,485, Cl. 424-177.000.
- Grekel, Howard: *See—*
  - Kunkel, Lorenz V.; Palm, John W.; Petty, Luther E.; and Grekel, Howard, 4,035,474, Cl. 423-574.00R.
- Grevstad, Paul E., to United Technologies Corporation. Electrolyte reservoir for a fuel cell. 4,035,551, Cl. 429-44.000.
- Grier, Nathaniel; Dybas, Richard A.; and Strelitz, Robert A., to Merck & Co., Inc. Novel dibicyclo [3.1.1] and [2.2.1] heptyl and dibicyclo [3.1.1] and [2.2.1] heptenyl polyamines and methods for their preparation. 4,035,174, Cl. 71-67.000.
- Griffin, Henry W.; and Nichter, Thomas J., to General Motors Corporation. Window reveal molding. 4,035,017, Cl. 296-93.000.
- Griffin, Herman Clyde. Quick release, self centering, power transfer assembly. 4,035,098, Cl. 403-356.000
- Grillo, Doris. Line engaging garment hanger. 4,034,902, Cl. 223-85.000.
- Grimes, George R., to Amax, Inc. Oxidation roasting of ore. 4,034,969, Cl. 266-82.000.

Gritzner, Gerhard. Operation of a cation exchange membrane electrolytic cell for producing chlorine including feeding an oxidizing gas having a regulated moisture content to the cathode. 4,035,254, Cl. 204-98.000.

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Groff, Eugene R.: *See—*
Boggs, Roger L.; Groff, Eugene R.; and Wright, Paul L., 4,035,036, Cl. 305-57.000.

Groff, Gaylord L.: *See—*
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Gross, David E.: *See—*
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Gross, Franz, to Siemens Aktiengesellschaft. Traveling wave tube having a helix delay line. 4,035,687, Cl. 315-3.500.

Grothaus, Joseph V.: *See—*
Gebler, Kenneth A.; Ferrara, John M., and Grothaus, Joseph V., 4,034,794, Cl. 164-72.000.

Gruett, Donald G., to Oil-Rite Corporation. Oiler assembly. 4,034,831, Cl. 184-81.000.

Gruetzmacher, Gordon D.: *See—*
Gassman, Paul G.; and Gruetzmacher, Gordon D., 4,035,375, Cl. 260-294.80G.

Grumbeck, Victor N., to Beauti-Vue Products Corporation. Lamp shade and method. 4,035,633, Cl. 240-108.00R.

Grundfor A/S: *See—*
Jensen, Axel, 4,035,701, Cl. 318-226.000.

GTE Automatic Electric Laboratories Incorporated. *See—*
Hutchinson, Homer F., 4,035,716, Cl. 323-20.000.
Kohout, Otto J.; and Rinaldi, Gerald M., 4,035,773, Cl. 340-166.00S.
Marshall, Richard A.; and Smith, James W., 4,035,588, Cl 179-99.000.
Weber, Vernon F., 4,035,583, Cl. 179-7.10R.

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Epstein, James, 4,035,552, Cl. 429-58.000.

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Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,035,562, Cl. 526-173.000.

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Guidosh, Edward F., to Westinghouse Electric Corporation. Electrical transformer utilizing a no load tap changer. 4,035,717, Cl. 323-43.50R.

Guidoux, Loic Bernard Yves, to Telecommunications Radioelectriques et Telephoniques T.R.T. Automatic passband equalizer for data transmission systems. 4,035,725, Cl. 325-42.000.

Guier, William C. Dual elevators. 4,035,012, Cl. 294-90.000.

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Guiroy, Gilbert: *See—*
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Gustairs, John A. Mixer. 4,034,967, Cl. 259-6.000.

Gutfraind, Luis Feferbaum: *See—*
Bizinover, David; and Gutfraind, Luis Feferbaum, 4,034,682, Cl. 108-107.000.

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Falkenstein, Georg; Guthmann, Alfred; Hutchison, John; Weyland, Peter; and Blinne, Gerd, 4,035,313, Cl. 260-2.5AN.

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Guy, Rodney J., to Western Electric Company, Inc. Adjustable molded hood assembly for a cable connector plug. 4,035,051, Cl. 339-103.00R.

Guyer, Nathan E., to American Biltrite Inc. Stepped belting splice. 4,034,617, Cl. 74-231.00J.

Guyton, William Cecil. Coated dental textile material and method of preparing and using the same. 4,034,771, Cl. 132-91.000.

Guzy, D. James: *See—*
Akers, Clifford B.; Applequist, Roy A.; Applequist, James E.; and Guzy, D. James, 4,034,819, Cl. 177-210.00C.

H. H. Robertson Company: *See—*
Andrews, John S., 4,034,826, Cl. 181-36.00B

H. R. Electronics Company: *See—*
Lee, Larry D., 4,034,839, Cl. 194-10.000.

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Haas, Howard C., to Polaroid Corporation. Non-migratory hardeners. 4,035,319, Cl. 260-8.000.

Habermehl, Fred M., III: *See—*
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Hackbarth, Eugene R.; and Ward, Harry M., III, to Outboard Marine Corporation. Rotary engine cooling and exhaust system. 4,035,112, Cl. 418-60.000.

Hackett, Kenneth R., to Pittway Corporation. Ultrasonic intrusion detection system. 4,035,798, Cl. 343-5.0PD.

Hadany, Israel, to International Product Development, Ltd. Clock with moving colored display. 4,034,554, Cl. 58-125.00B.

Hadler, Malcolm Ronald; and Shadbolt, Roy Stanley, deceased (by Shadbolt, Elizabeth Godsmark, administratix), to Ward Blenkinsop and Company Limited. 4-Hydroxycoumarin compounds useful as anticoagulant rodenticides. 4,035,505, Cl. 424-281.000.

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Hafele, Robert X., to Ethyl Corporation. Spray pump assembly. 4,034,900, Cl. 222-321.000.

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Haidacher, Wilheim: *See—*
Geissler, Ernst; Haidacher, Wilheim; and Ofer, Heinrich, 4,035,161, Cl. 51-296.000.

Haines, Kendrick Peter: *See—*
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Houskamp, Robert W.; and Hainsworth, Thomas E., 4,034,823, Cl. 180-98.000.

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Haller, Jacob S.: *See—*
Cover, William S.; Haller, Jacob S.; and Quigley, James R., 4,034,472, Cl. 29-749.000.

Halter, Jerome Barth, to RCA Corporation. Apparatus for electromechanical recording of short wavelength modulation in a metal master. 4,035,590, Cl. 179-100.41P.

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Hamano, Yoshiteru: *See—*
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Hamill, Robert L.: *See—*
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Hamilton Company: *See—*
Schultz, Harold R., 4,034,755, Cl. 128-216.000.

Hamilton, Joel A.: *See—*
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Hamilton, Robert W.: *See—*
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Hamlin, Thomas J.: *See—*
Stange, Klaus K.; Smith, Richard E.; Hamlin, Thomas J.; and Cassano, James R., 4,034,869, Cl. 214-16.40R.

Hammann, Ingeborg: *See—*
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Hammersmith, James R., to Brown & Williamson Tobacco Corporation. Method for making porous filter tip. 4,035,220, Cl. 156-291.000.

Hammes, Theo, Kuhne, Wilhelm; Gohlke, Gerhard; and Maus, Udo Hermann, to Mauser Kommanditgesellschaft. Plastic container-cover assembly. 4,034,889, Cl. 220-306.000

Hammond, Thomas J., to Xerox Corporation. Apparatus and method for optical generation of a structured charge-discharge pattern on a photoreceptor. 4,035,070, Cl 355-3.00R

Hamparian, Nshan, to General Motors Corporation. Insulated, high efficiency, low heat rejection, engine cylinder head. 4,034,723, Cl 123-41.760.

Hams, Kenneth A., to Bell & Howell Company. Automated in-line mailing system. 4,034,973, Cl 270-21.000

Hanada, Nobuyoshi. *See—*
Kawashita, Hiroshi, Sakano, Takeshi, and Hanada, Nobuyoshi, 4,035,010, Cl. 294-81.00R.

Hanada, Tuneo. *See—*
Endo, Tadakazu, Takeuchi, Masanori, Hanada, Tuneo, Nakagawa, Kiyoshi, Komatsu, Hideo, and Nakamura, Itaru, 4,035,441, Cl 260-860.000.

Handa, Ryoji: *See—*
Kamada, Kazumasa; Handa, Ryoji, and Hongo, Masafumi, 4,035,333, Cl. 260-40.00R.

Hansen, Edwin S., to Rice Barton Corporation. Apparatus for coating webs. 4,034,707, Cl. 118-407.000.

Hansen, Lowell D., to Sundstrand Corporation. Vane pump. 4,035,115, Cl. 418-183.000.

Hansen, Peter Bregnedal: *See—*
Ujvari, Georg, and Hansen, Peter Bregnedal, 4,035,503, Cl. 424-275.000.

Hanson, Francis V.: *See—*
Dwyer, Francis G.; Hanson, Francis V., and Schwartz, Albert B., 4,035,430, Cl. 260-668.00R.

Hanson, William Duane: *See—*
Shuppert, Laurence Verlan; Hanson, William Duane, and Willer, Robert Alfred, 4,035,214, Cl. 156-240.000.

Hanson, William J.: *See—*
Davidson, James R., Hanson, William J.; and Wilson, Stephen K., 4,034,701, Cl. 118-7.000.

Hanzalik, Josef: *See—*
Wiest, Hubert; Hanzalik, Josef, Lechner, Wilhelm; and Lieb, Erwin, 4,035,329, Cl. 260-29.60T

Hara, Ryoichi; and Yajima, Masamichi, to Furukawa Electric Co., Ltd., The. Reel mounting means for a wire take up apparatus. 4,034,933, Cl. 242-129.800.

Harada, Isamu: *See—*
Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro, Suzuki, Takeo, Nishiue, Yoshihiro, Tadokoro, Katsumasa, Fukagawa, Toshimasa; Harada, Isamu, Misawa, Akira, and Watanabe, Kazuo, 4,035,060, Cl. 350-160.0LC.

Harbar, John Richard: *See—*
Evans, Leslie Samuel; and Harbar, John Richard, 4,035,553, Cl 429-104.000.

Hardt, Walter. Automatic protection device for a roller blind against unauthorized raising. 4,035,008, Cl. 292-227.000.

Hardwick, Charles W.; Smith, Ann Hardwick; and Smith, Kinnaman Browning. Bath tub lift chair apparatus. 4,034,426, Cl. 4-185.00L.

Hardwick, John Gordon, to Imperial Metal Industries (Kynock) Limited. Filament winding machines. 4,034,934, Cl 242-158.00B.

Hargrove, John David; and Hilder, Graham Keith, to British Petroleum Company Limited, The. Water treatment of hydrodesulfurization catalyst to improve its microporosity. 4,035,261, Cl. 252-455.00R

Haring, Robert C. Wheel supporting towing sling attachment. 4,034,873, Cl. 214-86.00A

Harnisch, Horst: *See—*
Schafer, Fritz Peter; Harnisch, Horst; and Raue, Roderich, 4,035,740, Cl. 331-94.50L.

Harris Corporation: *See—*
Maopolski, Bernard John, 4,034,974, Cl. 270-55.000.
Norton, Daniel J.; and Cooke, Rupert J., 4,035,794, Cl 340-365.00E.

Harris, Jesse W.: *See—*
Lutich, Louis L., and Harris, Jesse W., 4,034,816, Cl. 173-15.000

Harrison, Ernest R., Jr.: *See—*
Leerskov, Arthur E., Jr.; Thomson, John T., Jr., Wilem, Frank J., Jr.; Harrison, Ernest R., Jr.; and Banas, Edward C., Jr., 4,034,827, Cl. 181-120.000.

Harrison, John. *See—*
Eastell, Robert W.; Harrison, John, and Sharples, Allan, 4,035,623, Cl. 235-61.11D

Harrison, John D., and Jervis, James E., to Raychem Corporation. Heat recoverable metallic coupling. 4,035,007, Cl. 285-381.000

Hart, Wallace F.: *See—*
Reed, Robert D., and Hart, Wallace F., 4,034,803, Cl 165-103.000

Hartman & Braun Aktiengesellschaft: *See—*
Flormann, Paul; Hinneman, Egon; Mengelkamp, Bernhard, and Elsner, Arno, 4,035,734, Cl. 328-167.000.

Harvard Industries, Inc.: *See—*
Slocum, Mahlon W., and Pachana, Henri, 4,035,749, Cl 333-83.00R.

Harvey, Philip C. Ion gauge system. 4,035,720, Cl. 324-33.000

Harvey, Samuel E.; Liberman, Harvey W., and Voorhees, Steven C., to Carrier Corporation. Automatic self-leveling forks. 4,034,649, Cl 91-412.000.

Hasegawa, Ichiro. *See—*
Omachi, Yoshio, Hasegawa, Ichiro, and Watanabe, Hiroshi, 4,034,729, Cl 123-122.00G

Hashimoto Denki Co., Ltd. *See—*
Maekawa, Sachio, and Aizawa, Tadashi, 4,035,538, Cl. 428-155.000

Hashimoto, Kametaro, Ushitani, Kenji, Serino, Youichi; Suganuma, Tetsuya, Mitani, Seishu, and Imanishi, Kunizou, to Toyota Jidosha Kogyo Kabushiki Kaisha. Iron-base sintered alloy for valve seat. 4,035,159, Cl 75-246.000

Hashimoto, Saburo, and Young, Donald C, to Union Oil Company of California. Selectively thinning and fertilizing timber forests. 4,035,173, Cl 71-30.000

Hashizume, Hiroshi, to Murata Kikai Kabushiki Kaisha. False twisting spindle of fluid jet driving type. 4,034,546, Cl. 57-77.450.

Hassell, John R. Juice extractor. 4,034,664, Cl 99-511.000

Hasson, Victor Haim, and von Bergmann, Hubertus Michael, to South African Inventions Development Corporation, The. High voltage electric switch with trigger electrodes integral with main discharge electrodes. 4,035,683, Cl 313-184.000

Hata, Kazuhiko: *See—*
Fujii, Yoshikazu, Kanagawa, Shuichi, and Hata, Kazuhiko, 4,035,559, Cl 526-56.000

Hatzakis, Michael, to International Business Machines Corporation. X-ray lithography mask. 4,035,522, Cl 427-43.000

Hatzenbichler, Ernst, and Bunzel, Eckard, to "OFU" Ofenbau-Union GmbH. Continuous heating furnace for elongated metal ingots. 4,035,142, Cl. 432-249.000

Hauschopp, Alois: *See—*
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Hauth, Hartmut, to Sandoz Ltd. N-lysergyl-amino-pyridines. 4,035,501, Cl. 424-261.000

Havas, Janos; Lechaton, John S., and Logan, Joseph Skinner, to International Business Machines Corporation. Making coplanar layers of thin films. 4,035,276, Cl 204-192.0EC

Havas, Laszlo. *See—*
Caumartin, Francois, and Havas, Laszlo, 4,035,560, Cl 526-124.000.

Hayakawa, Shigeru: *See—*
Nitta, Tsuneharu, Hayakawa, Shigeru; Kasahara, Yukio, and Terada, Ziro, 4,035,819, Cl 357-10.000.

Hayashi, Nobuyuki, Isobe, Asao, Tsukada, Katsushige, Ogawa, Ken, and Abo, Masahiro, to Hitachi Chemical Company, Ltd. Image forming curable resin compositions. 4,035,189, Cl 96-115.00R

Hayasi, Kuniaki: *See—*
Kanetaka, Junichi, Shimodaira, Takashi, Fuga, Nobuhiko, Hayasi, Kuniaki, and Ayusawa, Tadashi, 4,035,353, Cl 260-239.00H

Hayes, George A., to United States of America, Navy. Annealing treatment for controlling warhead fragmentation size distribution. 4,035,202, Cl. 148-16.000

Hayes, Thomas Edward, to Johnson Controls, Inc. Method and control arrangement for a heating system including solar and fuel-fired heating apparatus. 4,034,912, Cl 237-1.00A

Hayes, William V.: *See—*
Childress, David L., Hayes, William V., and Poppe, Richard L., 4,035,262, Cl 252-456.000

Heaney, James Joseph: *See—*
Stromquist, Michael Eban, and Heaney, James Joseph, 4,035,608, Cl. 219-218.000

Heater Technology, Inc.: *See—*
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Hebert, Gerald P.: *See—*
McGinn, Ferdinand M., and Hebert, Gerald P., 4,034,806, Cl 166-117.500.

Hechtl, Wolfgang: *See—*
Hittmair, Paul, Hechtl, Wolfgang, Louis, Eckhart, and Wohlfarth, Ernst, 4,035,453, Cl. 264-16.000

Heckel, Klaus, and Klaffke, Friedemann, to Carl Freudenberg, Firma. Thermal insulating interlining in web form for textiles. 4,035,537, Cl 428-155.000.

Heckert, David C., and Watt, David M., Jr., to Procter & Gamble Company, The. Organosilane compounds. 4,035,411, Cl 260-448.80R

Hederich, Volker: *See—*
Krock, Friedrich Wilhelm, Braden, Rudolf, Neeff, Rutger, and Hederich, Volker, 4,035,398, Cl 260-380.000.

Hedly, Sven, and Winhammar, Lars. Device for reducing undesired energy consumption in a room provided with heating and/or air conditioning means. 4,035,796, Cl 340-417.000.

Heidenreich & Harbeck: *See—*
Rosenkranz, Otto, and Seifert, Karl-Heinrich, 4,035,463, Cl 264-94.000.

Heidrich, Gunther: *See—*
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Heil-Quaker Corporation: *See—*
Anderson, Richard M., McGill, Robert S., III; and Ramsey, Robert W., 4,034,570, Cl. 62-158.000.

Hein, Edward R.: *See—*
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Heindenreich & Harbeck: *See—*
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Heinold, Lloyd K.; and Shaffer, Walter M., to Caterpillar Tractor Co. Outrigger and frame support member. 4,034,881, Cl. 214-730.000.

- Heinold, Lloyd K.: *See*—
  - Groff, Eugene R.; Heinold, Lloyd K.; and Reinsma, Harold L., 4,034,618, Cl. 74-243.00R.
- Heinrich, Ernst; Ribka, Joachim; and Valentin, Joachim, to Cassella Farbwerke Mainkur Aktiengesellschaft. Water-insoluble azo dyestuffs. 4,035,143, Cl. 8-4.000.
- Helder, Johan: *See*—
  - Danneels, Laurent; Helder, Johan; Kuypers, Jan; Piolon, James; and Pernegger, Wolfgang, 4,035,245, Cl. 204-15.000.
- Helene Curtis Industries, Inc.: *See*—
  - Forsberg, John R., 4,034,916, Cl. 239-373.000.
- Heller, Lawrence Griffith, to International Business Machines Corporation. Input circuit for inserting charge packets into a charge-transfer-device. 4,035,667, Cl. 307-221.00D.
- Heller, William C.: *See*—
  - Heller, William C., Jr.; and Leatherman, Alfred F., 4,035,547, Cl. 428-329.000.
- Heller, William C., Jr.; and Leatherman, Alfred F., to Heller, William C. Bonding element having separate heating and agitating particles. 4,035,547, Cl. 428-329.000.
- Hellermann Cassettes Limited: *See*—
  - Leshik, Edward Alexander, 4,034,927, Cl. 242-56.00R.
- Hengesbach, Robert W. Ball and socket connector and combination thereof with spray gun. 4,035,004, Cl. 285-166.000.
- Henke, Theodore T.; and Wagner, George J., Jr., to United States Steel Corporation. Mechanism for adjusting a guide roll-rack. 4,034,799, Cl. 164-282.000.
- Hennes, Heinrich; and Sommer, Walter, to Fried. Krupp Gesellschaft mit beschrankter Haftung. Installation for making cans of metal. 4,034,692, Cl. 113-7.00R.
- Hennessy, Daniel R.; Pierre, David M.; and Pops, Horace, to Essex Group, Inc. Oxygen probe. 4,035,277, Cl. 204-195.00S.
- Hennessy, Gail, executrix: *See*—
  - Ferris, William E., deceased; Hennessy, Gail, executrix; Doumas, John; and McCarter, Harry, 4,035,123, Cl. 425-129.00R.
- Henry, James: *See*—
  - Morris, Herbert R.; and Henry, James, 4,034,572, Cl. 62-256.000.
- Henry, Jean, to Splintex Belge. Electrical circuit panel with conductive bridge plate over a non-solderable surface area. 4,035,576, Cl. 174-68.500.
- Hentges, Guy, to Hilti Aktiengesellschaft. Method for repairing iron molds. 4,034,462, Cl. 29-401.00D.
- Herbenar, Edward J., to TRW Inc. Ball and socket joint. 4,035,094, Cl. 403-144.000.
- Hercules Incorporated: *See*—
  - Podlas, Thomas J., 4,035,195, Cl. 106-194.000.
  - Rave, Terence W., 4,035,229, Cl. 162-164.0EP.
- Hermann, Martin; Breuer, Oswald; and Hauschopp, Alois, to Gewerkschaft Eisenhutte Westfalia. Mineral winning ploughs. 4,035,025, Cl. 299-34.000.
- Hermecz, Istvan: *See*—
  - Szentmiklosi, Peter; Meszaros, Zoltan; Tardos, Laszlo; Hermecz, Istvan; Erdelyi, Ilona; David, Agoston; Vasvari nee Debreczy, Lelle; and Horvath, Agnes, 4,035,366, Cl. 260-253.000.
- Herold, Albert: *See*—
  - Rashkov, Ilia; Gole, Jean; Guerard, Daniel; Herold, Albert; Merle, Gerard; Panayotov, Ivan Martinov; Pascault, Jean-Pierre; Pham, Quang Tho; Pillot, Christian; and Salle, Robert, 4,035,562, Cl. 526-173.000.
- Hertel, Hasso, to Hoechst Aktiengesellschaft. Dyeing preparations containing boric acid for preparing water-insoluble azo dyestuffs on fiber. 4,035,144, Cl. 8-44.000.
- Herweh, John E.; and Work, James L., to Armstrong Cork Company. Sulfide compositions as inhibiting agents for amine-induced yellowing. 4,035,337, Cl. 260-45.85T.
- Hess, Hans-Jurgen E.: *See*—
  - Johnson, Michael R.; Schaaf, Thomas K.; Bindra, Jasjit S.; Hess, Hans-Jurgen E.; and Eggler, James F., 4,035,360, Cl. 260-240.00R.
- Hesston Corporation: *See*—
  - Voth, Harold William; and White, Allen Andrew, 4,034,543, Cl. 56-341.000.
- Hetke, Adolf, to Ford Motor Company. Method of aluminum cylinder head valve seat coating transplant. 4,034,464, Cl. 29-527.600.
- Heuner, Robert Charles: *See*—
  - Morton, George Ira; and Heuner, Robert Charles, 4,035,826, Cl. 357-42.000.
- Hewlett-Packard Company: *See*—
  - Dickinson, Peter D.; Osborne, Thomas E.; Rode, France; and Baum, Allen J., 4,035,627, Cl. 235-156.000.
- Hi-Hard Rolls, Inc.: *See*—
  - Vinarcsik, Joseph E.; and Jachim, John A., 4,034,837, Cl. 193-37.000.
- Hickox, Richard Malcolm: *See*—
  - Biddle, Joseph Montgomery; and Hickox, Richard Malcolm, 4,034,610, Cl. 73-398.0AR.
- Hidy, Phil H.; and Baldwin, Robert S., to IMC Chemical Group, Inc. Method for treating cholesterolemia by administering resorcylic acid lactone derivatives. 4,035,504, Cl. 424-279.000.
- Higginbotham, Richard E.: *See*—
  - Carlson, Curt William, 4,035,657, Cl. 250-533.000.
- Higgs, Richard F.: *See*—
  - Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 4,035,256, Cl. 204-145.00R.
- Higuchi, Takeru; and Leeper, Harold M., to Alza Corporation. Osmotically driven fluid dispenser. 4,034,756, Cl. 128-260.000.
- Hilder, Graham Keith: *See*—
  - Hargrove, John David; and Hilder, Graham Keith, 4,035,261, Cl. 252-455.00R.
- Hilibrand, Jack: *See*—
  - Farber, Arnold Stanley; and Hilibrand, Jack, 4,035,226, Cl. 156-653.000.
- Hilti Aktiengesellschaft: *See*—
  - Hentges, Guy, 4,034,462, Cl. 29-401.00D.
- Himsley, Alexander, to Himsley Engineering Limited. Fluid solid contact process and apparatus. 4,035,292, Cl. 210-33.000.
- Himsley Engineering Limited: *See*—
  - Himsley, Alexander, 4,035,292, Cl. 210-33.000.
- Hinchcliffe, John Crossley; and Hold, Peter, to USM Corporation. Controlled deflection roll assembly. 4,035,038, Cl. 308-9.000.
- Hindermayr, Martin; and Koerner, Georg, to Wilhelm Ruf KG. Adjustable attenuation equalizer. 4,035,747, Cl. 333-28.00R.
- Hinneman, Egon: *See*—
  - Flormann, Paul; Hinneman, Egon; Mengelkamp, Bernhard; and Elsner, Arno, 4,035,734, Cl. 328-167.000.
- Hinrichsen, Georg: *See*—
  - Kubitzek, Harry; Hinrichsen, Georg; and Giessler, Wolfgang, 4,035,464, Cl. 264-103.000.
- Hintzen, Peter; and Willenbacher, Erich, to Pfaff Industriemaschinen GmbH. Device for manufacturing braided openings in cuts of articles of clothing. 4,034,689, Cl. 112-68.000.
- Hirai, Hayami: *See*—
  - Tsuda, Shinichi; Nakajo, Yoshio; Tagawa, Kenkichi; Hirai, Hayami; and Takagi, Shunji, 4,035,140, Cl. 432-60.000.
- Hirano, Akira: *See*—
  - Taninaka, Kuniaki; Hirano, Akira; and Kurono, Hitoshi, 4,035,387, Cl. 260-327.00M.
- Hirao, Yoichiro: *See*—
  - Tsunoda, Ichiro; Takeuchi, Satoshi; Hirao, Yoichiro; Suzuki, Takeo; Nishiue, Yoshihiro; Tadokoro, Katsumasa; Fukagawa, Toshimasa; Harada, Isamu; Misawa, Akira; and Watanabe, Kazuo, 4,035,060, Cl. 350-160.0LC.
- Hitachi Chemical Company, Ltd.: *See*—
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- Hitachi, Ltd.: *See*—
  - Miyakawa, Nobuaki, 4,034,722, Cl. 123-32.0EB.
  - Okada, Tsugihiro; and Yokozawa, Norio, 4,035,033, Cl. 303-109.000.
  - Shirasu, Hirotoshi; Yamashita, Hidetaka; Oonuma, Tatsumasa; and Fukuhara, Takeshi, 4,035,586, Cl. 179-16.00F.
  - Tomita, Syuuji; Miura, Yosihiro; and Kubota, Akito, 4,034,453, Cl. 29-157.30C.
- Hitomi, Nobuteru: *See*—
  - Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 4,034,576, Cl. 64-21.000.
- Hittmair, Paul; Hechtl, Wolfgang; Louis, Eckhart; and Wohlfarth, Ernst, to Wacker-Chemie GmbH. Dental impression materials. 4,035,453, Cl. 264-16.000.
- Hobbs, James W.; and Smith, Dexter E., to Phillips Petroleum Company. Bumpless control transfer. 4,035,620, Cl. 235-151.100.
- Hobo, Nobuhito: *See*—
  - Ito, Osamu; Hobo, Nobuhito; Tsuzuki, Yoshihiko; and Iyoda, Michio, 4,034,725, Cl. 123-102.000.
- Hock, Franz: *See*—
  - Morgner, Friedrich Wilhelm; and Hock, Franz, 4,035,030, Cl. 302-37.000.
- Hoechst Aktiengesellschaft: *See*—
  - Hertel, Hasso, 4,035,144, Cl. 8-44.000.
  - Jahn, Helmut, 4,034,977, Cl. 271-174.000.
  - Landler, Josef; and Worfel, Erhard, 4,035,350, Cl. 260-152.000.
  - Martini, Thomas, 4,035,388, Cl. 260-340.600.
  - Schlafer, Ludwig; and Hoyer, Ernst, 4,035,351, Cl. 260-196.000.
  - Schorr, Manfred; Schrinner, Elmar; and Schmitt, Wilfried, 4,035,502, Cl. 424-271.000.
- Hoehn, Marvin M.: *See*—
  - Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,035,481, Cl. 424-122.000.
- Hoelzel, Charles B.: *See*—
  - Rainer, Norman B.; Hoelzel, Charles B.; and Hopkins, William C., 4,034,764, Cl. 131-2.000.
- Hoernle, Hans R.: *See*—
  - Gregorian, Razmic S.; and Hoernle, Hans R., 4,035,532, Cl. 428-90.000.
- Hoesch Aktiengesellschaft: *See*—
  - Juditzki, Franz, 4,034,904, Cl. 226-1.000.
- Hoesterey, Howard Frederick; and Cade, John Weldon, to Philco Corporation. Optical apparatus. 4,034,949, Cl. 244-3.160.
- Hoff, Edwin F., Jr., to Petro-Tex Chemical Corporation. Polychloroprene sol-gel blends. 4,035,446, Cl. 260-890.000.
- Hoff, Raymond E.; and Shida, Mitsuzo, to Chemplex Company. Method of polymerizing. 4,035,561, Cl. 526-130.000.
- Hoffman, Paul J. Step stool. 4,034,829, Cl. 182-106.000.
- Hoffmann-La Roche Inc.: *See*—
  - Kaplan, Jean-Pierre; and Kyburz, Emilio, 4,035,385, Cl. 260-327.00B.
  - Kaplan, Jean-Pierre; and Kyburz, Emilio, 4,035,386, Cl. 260-327.00B.
- Hoglund, Nils O., to Hoglund Tri-Ordinate Corporation. Support for milling cutter. 4,034,647, Cl. 90-20.500.
- Hoglund Tri-Ordinate Corporation: *See*—
  - Hoglund, Nils O., 4,034,647, Cl. 90-20.500.

- Hokuetsu Kogyo Co., Ltd.: *See*—
  - Sato, Goro, 4,035,114, Cl. 418-84.000.
- Hold, Peter: *See*—
  - Hinchcliffe, John Crossley; and Hold, Peter, 4,035,038, Cl. 308-9.000.
- Holden, Jean: *See*—
  - Huang, Denis K.; and Holden, Jean, 4,035,328, Cl. 260-29.40R.
- Holder, Otis W., to Oakdale Knitting Company. Boot sock with stay-up cuff and method. 4,034,580, Cl. 66-172.00E.
- Holl, William H.: *See*—
  - Ayres, John A.; and Holl, William H., 4,034,730, Cl. 123-139.0AV.
- Holland, Melvin G.: *See*—
  - Schulz, Manfred B.; and Holland, Melvin G., 4,035,775, Cl. 343-17.2PC.
- Holleis, Gunter: *See*—
  - Loibl, Lorenz, Scheurecker, Werner; Kagerhuber, Franz; Scheinecker, Alois; and Holleis, Gunter, 4,034,796, Cl. 164-282.000.
- Holloway, Carl C., to Phillips Petroleum Company. Oil recovery. 4,034,810, Cl. 166-274.000.
- Holmes, Jerry D., to Eastman Kodak Company. Production of 2,2-disubstituted propiolactones. 4,035,389, Cl. 260-343.900.
- Holt, Fletcher O.: *See*—
  - Clum, David N.; and Holt, Fletcher O., 4,034,717, Cl. 122-359.000.
- Holz, George E.: *See*—
  - Ogle, James A.; and Holz, George E., 4,035,689, Cl. 315-169.0TV.
- Honda Giken Kogyo Kabushiki Kaisha: *See*—
  - Kawamoto, Takato; Katauchi, Tsutomu; Narumi, Eizi; and Tagami, Katsutoshi, 4,035,713, Cl. 322-28.000.
  - Sakurai, Yoshitoshi; Okura, Takao; and Irimajiri, Shoichiro, 4,034,561, Cl. 60-282.000.
  - Taguchi, Eiji; and Kimura, Kenji, 4,034,562, Cl. 60-282.000.
- Honegger, Werner, to Ferag AG. Apparatus for stacking printed products continuously arriving from conveyor means, especially products arriving in an imbricated formation. 4,034,845, Cl. 198-418.000.
- Honey, Ronald N.: *See*—
  - Deane, Richard; Honey, Ronald N.; and Krauss, Clifford J., 4,035,280, Cl. 204-267.000.
- Honeywell Inc.: *See*—
  - Bassett, William W.; and Johnson, Eugene D., 4,034,700, Cl. 118-2.000.
  - Jacobsz, Roelof F., 4,035,135, Cl. 431-29.000.
  - Marshall, James F., 4,035,823, Cl. 357-26.000.
- Honeywell Information Systems, Inc.: *See*—
  - Kristick, Lawrence J.; Crawford, Knute S.; and Calle, Jaime, 4,035,780, Cl. 364-900.000.
- Hongo, Masafumi: *See*—
  - Kamada, Kazumasa; Handa, Ryoji; and Hongo, Masafumi, 4,035,333, Cl. 260-40.00R.
- Hood, Robert Allen: *See*—
  - Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; McDermott, Thomas Stephen; and Wise, Larry Edward, 4,035,779, Cl. 364-200.000.
- Hooper, David K. Composite railroad tie. 4,034,913, Cl. 238-98.000.
- Hopkins, William C.: *See*—
  - Rainer, Norman B.; Hoelzel, Charles B.; and Hopkins, William C., 4,034,764, Cl. 131-2.000.
- Horling, James E., to United States of America, Navy. Particulate sampling probe. 4,034,611, Cl. 73-421.50R.
- Hornung, Richard E., to General Electric Company. Food temperature responsive control apparatus. 4,035,787, Cl. 340-228.00R.
- Horvath, Agnes: *See*—
  - Szentmiklosi, Peter; Meszaros, Zoltan; Tardos, Laszlo; Hermecz, Istvan; Erdelyi, Ilona; David, Agoston; Vasvari nee Debreczy, Lelle; and Horvath, Agnes, 4,035,366, Cl. 260-253.000.
- Horvath, David J.: *See*—
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  - Roberts, Roy Daniel, 4,034,419, Cl. 3-26.000.
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- Hsiao, James K., to United States of America, Navy. Digital mean clutter doppler compensation system. 4,035,799, Cl. 343-7.700.
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- Huelsekopf, Alfred George, to Com-Dor Supply Limited. Window construction. 4,034,510, Cl. 49-419.000.
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- Hughes, John F., Jr. Heated snow shovel. 4,034,489, Cl. 37-16.000.
- Hughes, Thomas J., Jr., to EF & EF Industries, Inc. Split attachment. 4,035,095, Cl. 403-282.000.
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  - Remer, Robert K., 4,035,196, Cl. 106-288.00Q.
- Hulle, Robert M.; Ferrero, John; and Pannullo, Gerard, to Trans-Cal Industries, Inc. Method of forming an optical grating. 4,034,460, Cl. 29-418.000.
- Humber, Leslie G.: *See*—
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  - Malocha, Donald C.; and Hunsinger, Bill J., 4,035,675, Cl. 310-9.800.
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  - Senften, David A., 4,034,479, Cl. 33-203.150.
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  - Bodor, Nicolae S.; Sloan, Kenneth B.; and Hussain, Anwar A., 4,035,507, Cl. 424-311.000.
- Husted, Royce Hill, to Saroy Engineering. Propulsion cleat for a power-driven ski. 4,035,035, Cl. 305-13.000.
- Hutchinson, Homer F., to GTE Automatic Electric Laboratories Incorporated. Super compensated voltage control of redundant D.C. power supplies. 4,035,716, Cl. 323-20.000.
- Hutchison, John. *See*—
  - Falkenstein, Georg; Guthmann, Alfred; Hutchison, John; Weyland, Peter; and Blinne, Gerd, 4,035,313, Cl. 260-2.5AN.
- Huyffer, Paul S., to Polaroid Corporation. Intermediates for photographic dyes. 4,035,401, Cl. 260-404.500.
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  - Piaget, Robert E.; and Clyburn, Charles W., 4,035,048, Cl. 339-91.00R.
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- ICI United States Inc.: *See*—
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  - Kollmann, Harry; and Goetsch, Roland H., 4,034,447, Cl. 27-2.000.
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  - Pihl, Lars Wilhelm; Johansen, Lars Bjarne; Carlsson, Carl Goran Herbert; and Mollerstedt, Karl Allan Bonde, 4,034,421, Cl. 4-10.000.
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  - Kawasaki, Itaru; Yamaguchi, Kouichi; Igarashi, Yoshiaki; and Kobayashi, Kazutsugu, 4,035,700, Cl. 318-138.000.
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- ILC Data Device Corporation: *See*—
  - Shepard, Leonard F., 4,035,833, Cl. 358-10.000.
- Illinois Tool Works Inc.: *See*—
  - Reinwall, Ernest William, Jr., 4,034,532, Cl. 52-520.000.
  - Williams, Elbert Eugene, Jr.; and Ernst, Richard John, 4,034,641, Cl. 85-41.000.
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- IMC Chemical Group, Inc.: *See*—
  - Hidy, Phil H.; and Baldwin, Robert S., 4,035,504, Cl. 424-279.000.
- Immel, Richard H., to ARCO Polymers, Inc. Method for bonding expanded polymeric parts. 4,035,216, Cl. 156-273.000.
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  - Brydon, Donald Lithgow, 4,035,465, Cl. 264-210.00F.
  - Cumbers, David Charles, 4,035,219, Cl. 156-290.000.
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  - Kay, Ian Trevor, 4,035,365, Cl. 260-249.500.
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  - Hardwick, John Gordon, 4,034,934, Cl. 242-158.00B.
- Indianapolis Center For Advanced Research, Inc.: *See*—
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  - Hupp, Gerhard; and Mader, Helmut, 4,034,644, Cl. 89-33.0BA.
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  - Giacone, Felice, 4,034,842, Cl. 197-82.000.
- Ingersoll-Rand Company: *See*—
  - Buse, Frederic, 4,035,104, Cl. 417-202.000.
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  - Robba, Max Fernand; and Duval, Denise Jeanne Claude, 4,035,371, Cl. 260-293.570.
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  - Taylor, John Ludlum, 4,034,534, Cl. 52-668.000.
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  - Lundblad, Leif, 4,034,976, Cl. 271-10.000.
- International Business Machines Corporation: *See*—
  - Agnew, Mark Charles; Reidenbach, John Ralph; and Rigotti, James Michael, 4,034,975, Cl. 271-10.000.
  - Berger, Horst H.; and Wiedmann, Siegfried K., 4,035,664, Cl 307-215.000.
  - Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; McDermott, Thomas Stephen; and Wise, Larry Edward, 4,035,779, Cl. 364-200.000.
  - Chang, Ifay Fay, 4,035,774, Cl. 340-166.0EL.
  - Chen, Chin Long; and Rutledge, Robert A., 4,035,767, Cl. 340-146.1AQ.
  - Dennard, Robert Heath; and Rideout, Vincent Leo, 4,035,198, Cl. 148-1.500.
  - Ghanem, Mohamed Zein El-Aeiden, 4,035,778, Cl. 364-200.000.
  - Hatzakis, Michael, 4,035,522, Cl. 427-43.000.
  - Havas, Janos; Lechaton, John S.; and Logan, Joseph Skinner, 4,035,276, Cl. 204-192.0EC.
  - Heller, Lawrence Griffith, 4,035,667, Cl. 307-221.00D.
  - Joyce, James Maurice, 4,035,710, Cl. 363-37.000.
  - Koopman, Nicholas George, 4,034,468, Cl. 29-628.000.
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  - Kryder, Mark Howard, 4,035,785, Cl. 340-174.0TF.
  - Wu, Leon L., 4,035,607, Cl. 219-216.000.
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  - Collins, Cager K., 4,034,874, Cl. 214-140.000.
  - Orth, Harold R., 4,034,563, Cl. 60-422.000.
- International Paper Company: *See*—
  - Hung, John Hui-hsiung, 4,034,751, Cl. 128-156.000.
  - May, Edwin A., 4,034,473, Cl. 30-181.000.
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  - Hadany, Israel, 4,034,554, Cl. 58-125.00B.
- International Standard Electric Corporation: *See*—
  - Feucht, Ulrich; and Michler, Martin, 4,034,942, Cl. 246-4.000.
  - Overbury, Francis G., 4,035,804, Cl. 343-106.00D.
- International Telephone and Telegraph Corporation: *See*—
  - Godet, Sidney, 4,034,941, Cl. 244-166.000.
- Intertherm, Inc.: *See*—
  - Roth, James E., 4,035,610, Cl. 219-366.000.
- Interx Research Corporation: *See*—
  - Bodor, Nicolae S.; and Yuan, Sun-Shine, 4,035,405, Cl. 260-479.00R.
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  - Morrow, Robert S.; and Penn, Lloyd D., 4,035,733, Cl. 328-34.000.
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- Ishiguro, Tutomu; and Katano, Yukio, to Kabushiki Kaisha KIP. Circuit for detecting trouble in electric lines connecting relatively movable circuits. 4,035,612, Cl. 219-469.000.
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  - Okada, Kazuya; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,035,418, Cl. 260-531.00R.
- Ishii, Masaharu, to Shinto Denki Co., Ltd. Multichannel radio transmitter with means to prevent abnormal wave radiation. 4,035,727, Cl. 325-184.000.
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- Ishikawa, Yujiro; and Kinoshita, Kyo, to Nippon Electric Company, Ltd. Diversity receiving system. 4,035,728, Cl. 325-304.000.
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  - Kawashita, Hiroshi; Sakano, Takeshi; and Hanada, Nobuyoshi, 4,035,010, Cl. 294-81.00R.
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  - Schultz, Herman S., 4,035,330, Cl. 260-29.60R.
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  - Tucek, Frank J., 4,034,785, Cl. 144-2.00Z.
- J. & J. Marquardt: *See*—
  - Marquardt, Erich; Storz, Werner; and Futterknecht, Kuno, 4,035,596, Cl. 200-159.00A.
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  - Vinarcsik, Joseph E.; and Jachim, John A., 4,034,837, Cl. 193-37.000.
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- Jackson, Richard C.: *See*—
  - Akeel, A. Hadi Kobaisi Abu; and Jackson, Richard C., 4,034,970, Cl. 266-216.000.
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- Jacobs, Herbert M.: *See*—
  - Tate, Stanley L.; Rowland, Bobby A.; and Jacobs, Herbert M., 4,035,322, Cl. 260-23.00H.
- Jacobs, Stanley A. Container and locking lid. 4,035,009, Cl. 292-246.000.
- Jacobsen, John Kenneth. Electronic integrator for chart recorder. 4,035,809, Cl. 346-62.000.
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  - Jacuzzi, Roy A., 4,034,428, Cl. 4-287.000.
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  - Lansmich, Karl-Otto, 4,034,905, Cl. 226-195.000.
- Jager, David A. Motorcycle rack for a tow truck. 4,034,872, Cl. 214-86.00A.
- Jagermalm, Ove; and Luukkonen, Keijo. Method and apparatus for wind measurement. 4,035,802, Cl. 343-105.00R.
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- Jalasjaa, Bert (Pertti) Olavi. Log cabin construction. 4,034,527, Cl. 52-233.000.
- James, Kenneth E., to Concrete Pipe Consultants, Inc. Pipe joint for large diameter flexible pipes. 4,035,003, Cl. 285-55.000.
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  - Janssen, Paul Adriaan Jan; Van Daele, Georges Henri Paul; and Boey, Jozef Martin, 4,035,376, Cl. 260-295.00R.
  - Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,035,369, Cl. 260-293.600.
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  - Haas, Georges; Jaques, Roland; Rossi, Alberto; and Ruegg, Martin, 4,035,413, Cl. 260-505.00R.
- Jarva, Inc.: *See*—
  - Fink, Trevor, 4,035,024, Cl. 299-31.000.
- Jaworski, Eugene: *See*—
  - Breslow, Jeffrey D.; and Jaworski, Eugene, 4,034,502, Cl. 46-202.000.
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- Jeddeloh Bros. Sweed Mills, Inc.: *See*—
  - Larson, Charles L., 4,034,964, Cl. 259-4.00R.
- Jenkins, Andrew H.; and Wachs, John J., to United States of America, Army. High energy laser beam sampling meter. 4,035,088, Cl. 356-218.000.
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  - Jenn, Louis J.; Field, Thomas R.; and Cerola, Joseph J., 4,034,663, Cl. 99-446.000.
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- Jensen, Harry: *See*—
  - Drostholm, Frede Hilmar; Jensen, Harry; and Willadsen, Per, 4,035,128, Cl. 425-259.000.
- Jeppson, Morris R. Electrical power-generation apparatus with rotary voltage transformer and integrated inertial energy storage. 4,035,659, Cl. 307-84.000.
- Jersey Nuclear-Avco Isotopes, Inc.: *See*—
  - Kennedy, Kurt D., 4,035,574, Cl. 13-31.000.
- Jervis, James E.: *See*—
  - Harrison, John D.; and Jervis, James E., 4,035,007, Cl. 285-381.000.
- Jet Spray Cooler, Inc.: *See*—
  - Brown, Merle S., 4,034,897, Cl. 222-146.00C.
- Jeter, John Doise, to Texas Dynamatics, Inc. Roller clutch. 4,034,833, Cl. 192-45.000.
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  - Peterson, Warren J., 4,034,972, Cl. 269-324.000.
- Johannes Menschner Maschinenfabrik GmbH & Co. KG.: *See*—
  - Van Amsterdam, Cornelis Johannes Maria, 4,035,598, Cl. 219-10.55A.
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  - Fisher, David R.; Willis, Don C.; John, Frederick W.; Powers, James R.; Doyle, James M.; Cooper, Lonnie D.; and Rich, Dennis C., 4,034,491, Cl. 40-33.000.
- John Thomas Batts, Inc.: *See*—
  - Batts, John H.; and Garrison, Judd F., 4,034,865, Cl. 211-118.000.
  - Batts, John H., 4,034,903, Cl. 223-96.000.
- John Zink Company: *See*—
  - Reed, Robert D.; and Hart, Wallace F., 4,034,803, Cl. 165-103.000.
  - Reed, Robert D.; and Schwartz, Robert E., 4,035,171, Cl. 55-319.000.
  - Scott, Gerald W.; and McGill, Eugene C., 4,035,158, Cl. 23-278.000.
- Johns, Herbert L., to Corning Glass Works. Tetragonally stabilized zirconia ceramic. 4,035,191, Cl. 106-57.000.
- Johnson Controls, Inc.: *See*—
  - Hayes, Thomas Edward, 4,034,912, Cl. 237-1.00A.
  - Matthews, Russell Byron, 4,035,134, Cl. 431-21.000.
- Johnson, Edgar G., Jr.; and Sturgis, Byron E., to Rohm and Haas Company. Gamma counter apparatus. 4,035,642, Cl. 250-328.000.
- Johnson, Eugene D.: *See*—
  - Bassett, William W.; and Johnson, Eugene D., 4,034,700, Cl. 118-2.000.
- Johnson, Howard L.; and Ruseff, Walter Z., to Caterpillar Tractor Co. Piston pump assembly having load responsive controls. 4,034,564, Cl. 60-445.000.
- Johnson & Johnson: *See*—
  - Gander, Robert J., 4,035,540, Cl. 428-198.000.
  - Kennette, John Wilson; and Ness, Irving Stanley, 4,035,217, Cl. 156-279.000.
  - Tritsch, Ludwig, 4,034,752, Cl. 128-184.000.
- Johnson, Michael R.; Schaaf, Thomas K.; Bindra, Jasjit S.; Hess, Hans-Jurgen E.; and Eggler, James F., to Pfizer Inc. Magnesium salts of 2-descarboxy-2-(tetrazol-5-yl)-11-desoxy-15-substituted-omega-pentanoprostaglandins. 4,035,360, Cl. 260-240.00R.
- Johnson, Robert J. Apparatus and method for determining tooth mobility. 4,034,476, Cl. 32-66.000.
- Johnson, Ronald: *See*—
  - Yarrow, Christopher John; Johnson, Ronald; and Doyle, James Patrick, 4,035,712, Cl. 322-24.000.
- Johnston, Wilmer D.: *See*—
  - Scott, Paul R.; Johnston, Wilmer D.; and Kyrish, Jerome L., 4,035,149, Cl. 21-60.50R.
- Jolley, Jack: *See*—
  - United States of America, National Aeronautics and Space Administration; Argoud, Maurice J.; Jolley, Jack; and Walker, Walter L., 4,035,065, Cl. 350-310.000.
- Jones, Frank N., to Du Pont de Nemours, E. I., and Company. Polymeric materials with silane end groups. 4,035,557, Cl. 526-14.000.
- Jones, Glenn C.; and Meen, Ronald H., to Eastman Kodak Company. Electrolytic oxidation of phenol at lead-thallium anodes. 4,035,253, Cl. 204-78.000.
- Jones, Henry B.: *See*—
  - Bunn, Dorrance P., Jr.; Williams, Dale; Jones, Henry B.; and MacLean, John P., 4,035,153, Cl. 23-288.00B.
- Jones, Robert L.: *See*—
  - DeVincent, Patsy; Jones, Robert L.; and Rose, Michael P., 4,035,005, Cl. 285-319.000.
- Jones, Terence J.: *See*—
  - Suh, Nam P.; Jones, Terence J.; and Sung, Nak-Ho, 4,035,550, Cl 428-339.000.
- Jordan, Merrill E.; and Burbine, William G., to Cabot Corporation. Carbon black pigments and rubber compositions containing the same. 4,035,336, Cl. 260-42.470.
- Jorgensen, Adam A., to Stromberg-Carlson Corporation. Adapter for mounting printed circuit cards. 4,034,871, Cl. 211-41.000.
- Josemans, Leonardus J., to Cutler-Hammer, Inc. Snap-in means for mounting electrical devices or the like in a support panel aperture. 4,035,597, Cl. 200-296.000.
- Jossel, Franklin: *See*—
  - Mammino, Joseph; and Jossel, Franklin, 4,035,310, Cl. 252-62.10P.
- Joyce, Albert W. Water-walking apparatus. 4,034,430, Cl. 9-310.00D.
- Joyce, James Maurice, to International Business Machines Corporation. Pulse width modulated voltage regulator-converter/power converter having means for improving the static stability characteristics thereof. 4,035,710, Cl. 363-37.000.
- Joyce, Patrick J. Non fibrous cigarette filter. 4,034,768, Cl. 131-269.000.
- Juditzki, Franz, to Hoesch Aktiengesellschaft. Twin-belt transport system. 4,034,904, Cl. 226-1.000.

Jungkind, Roland, to Marker, Hannes. Heel tightener for safety skibindings. 4,035,001, Cl. 280-626.000.

Jungvid, Hans Gustav, to Astra Nutrition Aktiebolag. Process for modifying feeding material. 4,035,516, Cl. 426-18.000.

Justin Huppe, Firma: *See—*

Fromme, Klaus; and Walther, Bernd, 4,034,524, Cl. 52-122.000.

Kablaoui, Mahmoud S.; and Love, Richard F., to Texaco Inc. Preparation of omega-nitroalkanoic acids. 4,035,400, Cl. 260-404.000.

Kabushiki Kaisha Daini Seikosha: *See—*

Akagawa, Minoru, 4,034,867, Cl. 214-1.0BB.

Kusayama, Takaji; and Aoki, Katsuji, 4,035,677, Cl. 310-42.000.

Kabushiki Kaisha KIP: *See—*

Ishiguro, Tutomu; and Katano, Yukio, 4,035,612, Cl. 219-469.000.

Kabushiki Kaisha Kitai Tekkosho: *See—*

Kitai, Toshio, 4,034,695, Cl. 114-268.000.

Kabushiki Kaisha Komatsu Seisakusho: *See—*

Omachi, Yoshio; Hasegawa, Ichiro; and Watanabe, Hiroshi, 4,034,729, Cl. 123-122.00G.

Suketomo, Toshitaka; and Ichimura, Masaaki, 4,034,566, Cl. 60-548.000.

Kabushiki Kaisha Suwa Seikosha: *See—*

Kouchi, Akihiko; Takeda, Shuji; and Takeshita, Hiroshi, 4,034,550, Cl. 58-50.00R.

Oguchi, Kikuo; Toshiaki, Ogata; and Momosaki, Eishi, 4,035,674, Cl. 310-9.500.

Ushiyama, Yoshito, 4,034,551, Cl. 58-85.500.

Kagerhuber, Franz: *See—*

Loibl, Lorenz; Scheurecker, Werner; Kagerhuber, Franz; Scheinecker, Alois; and Holleis, Gunter, 4,034,796, Cl. 164-282.000.

Kaldor, Andrew: *See—*

Lyon, Richard K.; and Kaldor, Andrew, 4,035,270, Cl. 204-157.10R.

Kalopissis, Gregoire; Bugaut, Andree; and Gaston-Breton, Hubert, to L'Oreal. 2,6-Dimethyl-4-substituted amino phenol couplers. 4,035,422, Cl. 260-559.00A.

Kalopissis, Gregoire; and Mandussos, Georges, to L'Oreal. Oral treatment of seburrhea with cysteamine derivatives. 4,035,492, Cl. 424-230.000.

Kaltenbaugh, John J.: *See—*

Clymer, Henry F.; and Kaltenbaugh, John J., 4,034,774, Cl. 137-111.000.

Kamada, Kazumasa; Handa, Ryoji; and Hongo, Masafumi, to Mitsubishi Rayon Co., Ltd. Flame-resistant resin composition. 4,035,333, Cl. 260-40.00R.

Kanagawa, Shuichi: *See—*

Fujii, Yoshikazu; Kanagawa, Shuichi; and Hata, Kazuhiko, 4,035,559, Cl. 526-56.000.

Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*

Tachibana, Hiromitsu; Sasaki, Toshiaki; Sugita, Toshiaki; and Saito, Kazuo, 4,035,563, Cl. 526-199.000.

Tonoki, Satoshi; Iki, Yoshio; and Sakauchi, Takashi, 4,035,447, Cl. 260-890.000.

Kanetaka, Junichi; Shimodaira, Takashi; Fuga, Nobuhiko; Hayasi, Kuniaki; and Ayusawa, Tadashi, to Mitsubishi Petrochemical Company Limited. Process for producing hexamethyleneimine. 4,035,353, Cl. 260-239.00B.

Kapaan, Hendrikus Jan: *See—*

Johansson, Carl Eric; van Nederveen, Hans Bertil; and Kapaan, Hendrikus Jan, 4,035,039, Cl. 308-8.200.

Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Substituted dibenzo [b,f]thiepins and dibenz[b,f]oxepins. 4,035,385, Cl. 260-327.00B.

Kaplan, Jean-Pierre; and Kyburz, Emilio, to Hoffmann-La Roche Inc. Propynylamine-substituted dibenzo[b,f]thiepins and dibenz[b,f]oxepins. 4,035,386, Cl. 260-327.00B.

Kaplan, Murray Arthur; Gottstein, William Joseph; and Granatek, Alphonse P., to Bristol-Myers Company. Antibacterial agents. 4,035,381, Cl. 260-306.70C.

Karapetian, Norair Gareginovich; Mkrian, Gurgen Mambreevich; Tonoian, Oganes Avetisovich; Selimian, Mikhail Eremovich; Papazian, Nargiz Akopovna; Kazarian, Rima Azarapetovna; Petrov, Anatoly Ivanovich; Bakhtamian, Armen Alexandrovich; and Mirakian, Smbat Mirakovich. Method of producing 2,3-dichlorbutadiene-1,3. 4,035,429, Cl. 260-655.000.

Karasko, Robert. X-ray identification tag. 4,035,653, Cl. 250-475.000.

Karl Mayer Textilmaschinenfabrik GmbH: *See—*

Oppolzer, Johann, 4,034,582, Cl. 66-207.000.

Karn, Donald L.: *See—*

Hamisch, Paul H., Jr.; and Karn, Donald L., 4,035,225, Cl. 156-540.000.

Karp, Edward C., to Sanitary Scale Company. Label printer. 4,035,808, Cl. 346-9.000.

Karpati, Egon: *See—*

Lorincz, Csaba; Karpati, Egon; Szporny, Laszlo; Szasz, Kalman; and Kisfaludy, Lajos, 4,035,370, Cl. 260-293.530.

Karppo, Jukka Seppo; and Aaltonen, Matti Akseli, to Oy Nokia AB. Continuous curing device for longitudinally extended products. 4,035,129, Cl. 425-445.000.

Kasahara, Tomio; and Makita, Tomotaro, to Mitsubishi Petrochemical Company Limited; and Yuka Badische Co., Ltd. Hydroponic method using a porous foam plate, and a container used therewith. 4,034,506, Cl. 47-64.000.

Kasahara, Yukio: *See—*

Nitta, Tsuneharu; Hayakawa, Shigeru; Kasahara, Yukio; and Terada, Ziro, 4,035,819, Cl. 357-10.000.

Kashihara, Jyunji: *See—*

Ohta, Ryozo; Kashihara, Jyunji; Sakaguchi, Masayuki; Nakamoto, Toshio; Yamamoto, Ikuo; and Shibata, Michio, 4,034,994, Cl. 277-207.00A.

Kashyap, Satish C.; and Wyslouzil, Walter, to Canadian Patents and Development Limited. Control system for non-resonant microwave dryers. 4,035,599, Cl. 219-10.55B.

Kasper, Andreas: *See—*

Dietze, Wolfgang; Kasper, Andreas; and Rucha, Ulrich, 4,034,705, Cl. 118-49.100.

Dietze, Wolfgang; Kasper, Andreas; and Rucha, Ulrich, 4,035,460, Cl. 264-81.000.

Katano, Yukio: *See—*

Ishiguro, Tutomu; and Katano, Yukio, 4,035,612, Cl. 219-469.000.

Katauchi, Tsutomu: *See—*

Kawamoto, Takato; Katauchi, Tsutomu; Narumi, Eizi; and Tagami, Katsutoshi, 4,035,713, Cl. 322-28.000.

Katayama, Eizo. Door alarm controlled by operation of door lock. 4,035,791, Cl. 340-274.00R.

Katayose, Shinji: *See—*

Hamada, Mitsuharu; Sugiyama, Hiroshi; Uchiyama, Hiromichi; and Katayose, Shinji, 4,034,680, Cl. 104-140.000.

Katsuki, Taichi: *See—*

Gotoh, Akiyoshi; Mizokawa, Takumi; Sawada, Yukio; and Katsuki, Taichi, 4,034,420, Cl. 165-1.000.

Katz, Jerome; and Fogel, Sidney J. Method and apparatus for high volume distillation of liquids. 4,035,243, Cl. 203-24.000.

Kawahara, Yasuhito: *See—*

Iida, Yozo; Akasaka, Shigeo; and Kawahara, Yasuhito, 4,035,817, Cl. 354-219.000.

Kawamoto, Takato; Katauchi, Tsutomu; Narumi, Eizi; and Tagami, Katsutoshi, to Sawafuji Electric Company, Ltd.; and Honda Giken Kogyo Kabushiki Kaisha. Automatic voltage regulating system in brushless generator. 4,035,713, Cl. 322-28.000.

Kawasaki, Itaru; Yamaguchi, Kouichi; Igarashi, Yoshiaki; and Kobayashi, Kazutsugu, to Matsushita Electric Industrial Co., Ltd. Electronic control apparatus. 4,035,700, Cl. 318-138.000.

Kawashita, Hiroshi; Sakano, Takeshi; and Hanada, Nobuyoshi, to Ishikawajima-Harima Jukogyo Kabushiki Kaisha. Device for gripping and lifting T-shaped structural member. 4,035,010, Cl. 294-81.00R.

Kawecki Berylco Industries, Inc.: *See—*

Scherbner, Paul J., 4,034,954, Cl. 249-135.000.

Kay, Edward Leo: *See—*

Lawson, David Francis; and Kay, Edward Leo, 4,035,324, Cl. 260-23.0XA.

Lohr, Delmar Frederick, Jr.; and Kay, Edward Leo, 4,035,314, Cl. 260-2.300.

Kay, Ian Trevor, to Imperial Chemical Industries Limited. Triazinediones. 4,035,365, Cl. 260-249.500.

Kazarian, Rima Azarapetovna: *See—*

Karapetian, Norair Gareginovich; Mkrian, Gurgen Mambreevich; Tonoian, Oganes Avetisovich; Selimian, Mikhail Eremovich; Papazian, Nargiz Akopovna; Kazarian, Rima Azarapetovna; Petrov, Anatoly Ivanovich; Bakhtamian, Armen Alexandrovich; and Mirakian, Smbat Mirakovich, 4,035,429, Cl. 260-655.000.

Keairns, Dale L.: *See—*

Yang, Wen-ching; Vidt, Edward J.; and Keairns, Dale L., 4,035,152, Cl. 23-284.000.

Keeler, Robert A.: *See—*

Tyson, George F.; Keeler, Robert A.; and Myers, Raymond L., 4,034,864, Cl. 211-50.000.

Kefalas A/S: *See—*

Ujvari, Georg; and Hansen, Peter Bregnedal, 4,035,503, Cl. 424-275.000.

Keijer, Jan Tonnis, to Grasso's Koninklijke Machinefabrieken N.V. Method for manufacturing a gear-wheel for a rotary displacement machine. 4,034,645, Cl. 90-4.000.

Keller, James E.: *See—*

Culbertson, Michael; and Keller, James E., 4,034,918, Cl. 241-36.000.

Keller, Wolfgang; and Stut, Hans, to Siemens Aktiengesellschaft. Apparatus for crucible-free zone processing of a semiconductor rod. 4,035,600, Cl. 219-10.570.

Kelly, George J. Game with gamepieces having position-denoting indicia thereon or thereunder. 4,034,987, Cl. 273-137.00R.

Kelsey-Hayes Company: *See—*

Bertolasi, Robert B., 4,035,032, Cl. 303-109.000.

Kemp, Kenneth A., to General Electric Company. Excavator data logging system. 4,035,621, Cl. 235-151.300.

Kenics Corporation: *See—*

Stewart, James M., 4,034,952, Cl. 249-105.000.

Kennametal Inc.: *See—*

Smith, Emlyn N.; and Pochet, Louis F., 4,035,541, Cl. 428-217.000.

Kennar, George A., to Monsanto Company. Interlayer for laminated safety glass. 4,035,549, Cl. 428-409.000.

Kennedy, Kurt D., to Jersey Nuclear-Avco Isotopes, Inc. Mixed phase evaporation source. 4,035,574, Cl. 13-31.000.

Kennette, John Wilson; and Ness, Irving Stanley, to Johnson & Johnson. Method of manufacturing absorbent facing materials. 4,035,217, Cl. 156-279.000.

Kennis, Ludo E. J.: *See—*

Vandenberk, Jan; Kennis, Ludo E. J.; Van der Aa, Marcel J. M. C.; and Van Heertum, Albert H. M. Th., 4,035,369, Cl. 260-293.600.

Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung: *See—*

Langen, Hans; and Naefe, Paul, 4,035,450, Cl. 261-76.000.

Kessler, Gerhard; and Fuchs, Peter, to Tesmaco H.G. Kessler GmbH. Apparatus for monitoring machine parts subject to wear. 4,035,696, Cl. 361-203.000.

Kesten, Stanley Frank; and Liska, Miroslav, to Durotech Co. Pump system for high pressure abrasive liquids. 4,035,107, Cl. 417-310.000.

Kesting, Robert E., to Chemical Systems Incorporated. Nonbiodegradable polymers. 4,035,457, Cl. 264-41.000.

Kesting, Robert E., to Chemical Systems, Inc. Process for spinning dry-fiber cellulose acetate hollow fiber membranes. 4,035,459, Cl. 264-49.000.

Kevlin Manufacturing Company: *See—*

Lattanzi, Ernest W., 4,035,054, Cl. 339-177.00R.

Khanna, Som Nath; and Borr, Mitchell, to Uniroyal, Ltd. Blend of thermoplastic polyurethane elastomer with chlorinated polyethylene. 4,035,440, Cl. 260-859.00R.

Kharouf, Issa J.: *See—*

Brendlinger, Edward C.; Higgs, Richard F.; and Kharouf, Issa J., 4,035,256, Cl. 204-145.00R.

Khutarev, Alexei Pavlovich: *See—*

Ryabov, Anatoly Leonidovich; Lukyanchikov, Viktor Egorovich; and Khutarev, Alesei Pavlovich, 4,035,722, Cl. 324-158.00P.

Kim, Chung K., to Raytheon Company. Composite semiconductor circuit and method of manufacture. 4,035,830, Cl. 357-67.000.

Kimura, Kenji: *See—*

Taguchi, Eiji; and Kimura, Kenji, 4,034,562, Cl. 60-282.000.

King Concept Corporation, The: *See—*

King, Roger A., 4,035,818, Cl. 354-323.000.

King, Leonard Tony, to Komax Systems, Inc. Material distributing and mixing apparatus. 4,034,965, Cl. 259-4.0AB.

King, Roger A., to King Concept Corporation, The. Color print or film processor. 4,035,818, Cl. 354-323.000.

Kinney, Timothy J.: *See—*

Doty, Warren R.; and Kinney, Timothy J., 4,035,227, Cl. 156-668.000.

Kinoshita, Kyo: *See—*

Ishikawa, Yujiro; and Kinoshita, Kyo, 4,035,728, Cl. 325-304.000.

Kiriyama, Shizuo: *See—*

Okamoto, Kiyoshi; Kiriyama, Shizuo; Obayashi, Ichiro; Yamamura, Kazuaki; and Senoo, Masaaki, 4,035,183, Cl. 75-129.000.

Kirk, Norman. Dripless spout for paint cans. 4,034,901, Cl. 222-481.500.

Kirk Optical Lens Co., Inc.: *See—*

Kirschen, Morris, 4,035,082, Cl. 356-114.000.

Kirschen, Morris, to Kirk Optical Lens Co., Inc. Method to test for chemically hardened glass lenses. 4,035,082, Cl. 356-114.000.

Kirschner, Fritz, to Siemens Aktiengesellschaft. Thyristor with branched base. 4,035,825 Cl. 357-38.000.

Kiseleva, Maria Mikhailovna *See—*

Nemtsov, Mark Semenovich; Trenke, Klavdia Mikhailovna; Ryskin, Moisei Isaakovich; and Kiseleva, Maria Mikhailovna, 4,035,271, Cl. 204-180.00P.

Kisfaludy, Lajos: *See—*

Lorincz, Csaba; Karpati, Egon; Szporny, Laszlo; Szasz, Kalman; and Kisfaludy, Lajos, 4,035,370, Cl. 260-293.530.

Kishida, Kazuo: *See—*

Ide, Fumio; Kishida, Kazuo; and Kobayashi, Jinpee, 4,035,443, Cl. 260-876.00R.

Kitagawa, Junji: *See—*

Akita, Sigeyuki; and Kitagawa, Junji, 4,035,789, Cl. 340-244.00R.

Kitai, Toshio, to Kabushiki Kaisha Kitai Tekkosho. Lumber work boat. 4,034,695, Cl. 114-268.000.

Kizaki, Kirou: *See—*

Kondo, Toshio; Moir, Yoshinori; and Kizaki, Kirou, 4,034,857, Cl. 188-73.300.

Kizu, Taisuke: *See—*

Takahashi, Koichi; Hitomi, Nobuteru; and Kizu, Taisuke, 4,034,576, Cl. 64-21.000.

Klaffke, Friedemann: *See—*

Heckel, Klaus; and Klaffke, Friedemann, 4,035,537, Cl. 428-155.000.

Klaus, Frank A.: *See—*

Kuder, Alfred W., 4,034,574, Cl. 64-7.000.

Klein, Friedrich, to J.D. Moller Optische Werke GmbH. Floor or ceiling support mounted microscope for microsurgical applications. 4,035,057, Cl. 350-85.000.

Klein, Gerald B. Manufacture and application of rod wraps to a fishing rod. 4,035,454, Cl. 264-28.000.

Klein, Norman E.; and Stewart, William H., Jr., to Milliken Research Corporation. Dyeing and printing of materials. 4,034,584, Cl. 68-205.00R.

Kleinbohl, Helmut, to General Motors Corporation. Fuse box, particularly for motor vehicles. 4,035,754, Cl. 337-206.000.

Kleiner, Hans-Jerg: *See—*

Bollert, Ulrich; Kleiner, Hans-Jerg; and Jakob, Franz, 4,035,343, Cl. 260-75.00P.

Kleinmann, Imrich: *See—*

Svoboda, Vratislav; and Kleinmann, Imrich, 4,035,684, Cl. 313-231.400.

Klimenko, Grigory Afanasievich: *See—*

Akunov, Viktor Ivanovich; Blinov, Ivan Timofeevich; Boryakov, Viktor Fedorovich; Zavadsky, Georgy Vladimirovich; Klimenko, Grigory Afanasievich; Krykhtin, Grigory Stepanovich; Ferens, Nikolai Ippolitovich; Checkik, Alexandr Lvovich; and Shanin, Vadim Petrovich, 4,034,919, Cl. 241-39.000.

Klochkova, Ljudmila Gerasimovna: *See—*

Deryagina, Eleonora Nikolaevna; Voronkov, Mikhail Grigorievich; Nakhmanovich, Anatoly Samuilovich; and Klochkova, Ljudmila Gerasimovna, 4,035,424, Cl. 260-609.00E.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See—*

Pluequet, Heinz, 4,035,295, Cl. 210-136.000.

Kloster, Kenneth D. Spring compressor tool. 4,034,960, Cl. 254-10.500.

Kloth, James Albert, to AMP Incorporated. Miniature electrical connector for parallel panel members. 4,035,046, Cl. 339-17.0CF.

Knaak, Rudiger, to Koppers-Wistra-Ofenbau GmbH. Support rail for furnaces. 4,035,141, Cl. 432-234.000.

Kniazzeh, Alfredo G.: *See—*

Ames, Allan E.; Kniazzeh, Alfredo G.; and Goldberg, Paul, 4,034,598, Cl. 73-40.000.

Knoll, Jozsef; Furst, Zsuzsanna; Meszaros, Zoltan; Nagy, Gabor; David, Agoston; Bognar, Rezso; Makleit, Sandor; and Valovics, Gyula, to Chinoin Pharmaceutical and Chemical Works Ltd. Pharmaceutical composition having synergistic analgesic activity and containing azidomorphine or azidocodeine. 4,035,491, Cl. 424-226.000.

Knutson, William J.; and Smith, Daniel M., to Motorola, Inc. Microelectronic variable inductor. 4,035,695, Cl. 361-400.000.

Kobayashi, Jinpee: *See—*

Ide, Fumio; Kishida, Kazuo; and Kobayashi, Jinpee, 4,035,443, Cl. 260-876.00R.

Kobayashi, Kazutsugu: *See—*

Kawasaki, Itaru; Yamaguchi, Kouichi; Igarashi, Yoshiaki; and Kobayashi, Kazutsugu, 4,035,700, Cl. 318-138.000.

Kobayashi, Makio: *See—*

Senjo, Teizo; and Kobayashi, Makio, 4,035,470, Cl. 423-235.000.

Kobayashi, Masao: *See—*

Okada, Kazuya; Matsuzawa, Hideo; Ishii, Hiromichi; and Kobayashi, Masao, 4,035,418, Cl. 260-531.00R.

Kobayashi, Shigelu: *See—*

Mukai, Osamu; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Kobayashi, Shigelu; and Shibuya, Masakuni, 4,034,830, Cl. 184-27.00R.

Kobayashi, Yoichi: *See—*

Okura, Tomoyuki; Tatsumi, Takashi; Watanabe, Hitoshi; Murayama, Hiroaki; and Kobayashi, Yoichi, 4,034,793, Cl. 164-63.000.

Kobe Steel Ltd.: *See—*

Gotoh, Akiyoshi; Mizokawa, Takumi; Sawada, Yukio; and Katsuki, Taichi, 4,034,420, Cl. 165-1.000.

Nakagawa, Kazuhiko; and Fujieda, Yasuhiko, 4,035,117, Cl. 425-19.000.

Kodama, Iehiro: *See—*

Gomyo, Shiro; and Kodama, Iehiro, 4,035,332, Cl. 260-33.2SB.

Koerner, Georg: *See—*

Hindermayr, Martin; and Koerner, Georg, 4,035,747, Cl. 333-28.00R.

Kogita, Theodore F.: *See—*

Cloke, Stanley S.; and Kogita, Theodore F., 4,035,298, Cl. 210-169.000.

Kohler Co.: *See—*

Milnes, Peter M., 4,034,423, Cl. 4-41.000.

Kohn, Earl J.: *See—*

Asbury, George F.; Kohn, Earl J.; and Richards, James R., 4,035,760, Cl. 340-3.00D.

Kohne, Franz. Traverse rod for decorations, in particular for curtains. 4,034,439, Cl. 16-96.00R.

Kohout, Otto J.; and Rinaldi, Gerald M., to GTE Automatic Electric Laboratories Incorporated. Control of leakage currents in a switching matrix. 4,035,773, Cl. 340-166.00S.

Kojima, Hiroshi: *See—*

Ishii, Takami; Suzuki, Taro; Takikawa, Naohisa; Tokunaga, Kiyoaki; Arima, Choji; and Kojima, Hiroshi, 4,035,338, Cl. 260-67.0FP.

Kokado, Hiroshi: *See—*

Inque, Eiichi; Kokado, Hiroshi; and Miyakawa, Nobuhiro, 4,035,244, Cl. 346-165.000.

Kokusan Denki Co., Ltd.: *See—*

Sato, Hiroo, 4,034,731, Cl. 123-148.00E.

Kollmann, Harry; and Goetsch, Roland H., to Idra AG. Papier-mache coffin. 4,034,447, Cl. 27-2.000.

Komatsu, Hideo: *See—*

Endo, Tadakazu; Takeuchi, Masanori; Hanada, Tuneo; Nakagawa, Kiyoshi; Komatsu, Hideo; and Nakamura, Itaru, 4,035,441, Cl. 260-860.000.

Komax Systems, Inc.: *See—*

King, Leonard Tony, 4,034,965, Cl. 259-4.0AB.

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Kryder, Mark Howard, to International Business Machines Corporation. Bubble domain sensor-error detector. 4,035,785, Cl. 340-174.0TF.

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Ohta, Ryozo; Kashihara, Jyunji; Sakaguchi, Masayuki; Nakamoto, Toshio; Yamamoto, Ikuo; and Shibata, Michio, 4,034,994, Cl. 277-207.00A.

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Mukai, Osamu; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Kobayashi, Shigelu; and Shibuya, Masakuni, 4,034,830, Cl. 184-27.00R.

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Kume, Takeshi, to Suehiro Seiki Company, Ltd. Solar heat boiler. 4,034,737, Cl. 126-271.000.

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Kunkel, Lorenz V.; Palm, John W.; Petty, Luther E.; and Grekel, Howard, to Standard Oil Company (Indiana). CBA for Claus tail gas cleanup. 4,035,474, Cl. 423-574.00R.

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Galasso, Francis S.; Delgrosso, Eugene J.; and Kuntz, Urban E., 4,034,454, Cl. 428-576.000.

Kuo, Chang - Kiang, to Texas Instruments Incorporated. Capacitive means for controlling threshold voltages in insulated gate field effect transistor circuits. 4,035,662, Cl. 307-205.000.

Kupcikevicius, Vytautas; and Mika, Anton Leroy, to Union Carbide Corporation. Presizing disc with self-locking means. 4,034,441, Cl. 17-41.000.

Kureth, Richard L. Boat stabilizer. 4,034,696, Cl. 115-12.00R.

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Taninaka, Kuniaki; Hirano, Akira; and Kurono, Hitoshi, 4,035,387, Cl. 260-327.00M.

Kusaka, Keijiro; and Otomo, Yasushi, to Bunker Ramo Corporation. Coaxial impedance transducer pad. 4,035,748, Cl. 333-33.000.

Kusayama, Takaji; and Aoki, Katsuji, to Kabushiki Kaisha Daini Seikosha. Rotor of a micro motor. 4,035,677, Cl. 310-42.000.

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Danneels, Laurent; Helder, Johan; Kuypers, Jan; Piolon, James, and Pernegger, Wolfgang, 4,035,245, Cl. 204-15.000.

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Kyoto Ceramic Co., Ltd.: *See—*

Sagawa, Nobukazu, Uchikado, Yasuo; Hamano, Yoshiteru; Sugimoto, Ryoichi; and Mori, Sakae, 4,035,613, Cl. 219-552.000.

Kyrish, Jerome L.: *See—*

Scott, Paul R.; Johnston, Wilmer D., and Kyrish, Jerome L., 4,035,149, Cl. 21-60.50R.

Laborit, Henri, to Centre d'Etudes Experimentales et Clinques de Physio Biologie, de Pharmacologie et d'Eutonologie, C.E.P.B E.P.E. Medicament. 4,035,486, Cl. 424-178.000.

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Gallay, Jean-Jacques; Aufderhaar, Ernst; and Labuhn, Peter, 4,035,423, Cl. 260-571.000.

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Rorel, Joseph, Lacour, Jacques, and Merckel, Gerard, 4,035,665, Cl 307-221.00D

Lacroix, Daniel Skis 4,035,000, Cl 280-610.000

Laing, Nikolaus Axial flow pump for a pivotal rotor 4,035,108, Cl 417-365.000

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L'Hermite, Mathurin, Le Bossenec, Raymond, Godart, Pierre, and Pierrard, Francois, 4,035,203, Cl 148-16.500

Lambrecht, Dietrich, and Weghaupt, Erich, to Kraftwerk Union Aktiengesellschaft Coolant circulation system for the rotor of an electric machine having a superconductive excitation winding 4,035,678, Cl 310-52.000

Lampe, Donald R , White, Marvin H , and Mims, James H., to Westinghouse Electric Corporation Extended correlated double sampling for charge transfer devices 4,035,629, Cl 235-193.000.

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Lampus, Donald L. Rebar bolster for solid grouted walls 4,034,529, Cl 52-426.000.

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Pech, Josef, and Lapes, Frantisek, 4,034,783, Cl 139-436.000.

Larcen, Donald W Rotary burner control 4,035,133, Cl 431-12.000

Lardi, Francesco, to Westinghouse Electric Corporation System for operating a steam turbine with improved speed channel failure detection 4,035,624, Cl. 235-151.210

Lark, John C , to Standard Oil Company (Indiana) Process for warp sizing and hydrophilic finishing of polyester filaments and fabric 4,035,531, Cl 427-390.00R

Larson, Charles L , to Jeddeloh Bros Sweed Mills, Inc Fluidic mixer 4,034,964, Cl 259-4.00R

Larsson, Birger, to Stal-Laval Turbin AB Hydraulically supported thrust bearing 4,035,041, Cl 308-135.000

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Teach, Ted L , 4,034,490, Cl 37-86.000

Lattanzi, Ernest W , to Kevlin Manufacturing Company Coaxial connector 4,035,054, Cl 339-177.00R

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Brenner, Mortimer Wilkes, and Laufer, Louis, 4,035,146, Cl 8-94.210

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Uchida, Isamu, 4,034,838, Cl 194-4.00R

Laurent, Maurice, to Rhone-Poulenc-Textile Monitor for knitting machines 4,035,618, Cl 235-92.0PD

Lauterbach, William L , to United States Steel Corporation Method of providing expansion shims for hot briquette segmented rolls 4,034,461, Cl 29-428.000

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Thomsen, Wayne, 4,034,962, Cl 254-134.3FT

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Lawson, Nelson E , to Union Camp Corporation Radiation curable compositions 4,035,320, Cl 260-22.0CB

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Houskamp, Robert W , and Hainsworth, Thomas E , 4,034,823, Cl 180-98.000

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Ducloux, Maurice, and Ledru, Pierre, 4,035,345, Cl. 260-78.0UA

Lee, Larry D , to H R Electronics Company Simplified multi-price vend control circuit 4,034,839, Cl 194-10.000

Lee, Robert L Jaw movement simulation 4,034,474, Cl 32-20.000

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Leeb, Dietmar, and Brandestini, Marco, to Proceq SA Method of an apparatus for testing the hardness of materials 4,034,603, Cl. 73-79.000

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Biddle, Joseph Montgomery, and Hickox, Richard Malcolm, 4,034,610, Cl. 73-398.0AR.

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Higuchi, Takeru, and Leeper, Harold M , 4,034,756, Cl 128-260.000.

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Konantz, Mark L., and Leisure, Ronald K , 4,035,526, Cl 427-90.000

LeMay, Christopher Archibald Gordon, to E M I Limited Radiography device with circuitry to correct for photodetector sensitivity 4,035,651, Cl 250-445.00T

Lemelson, Jerome H Inflatable toy 4,034,495, Cl 40-137.000

Lenhart, Ronald A , and Rickard, Timothy W , to Zot Manufacturing Company Fluid actuated light switch 4,035,637, Cl 250-231.00P

Lenzi, Giuliano, and Rogora, Edoardo, to Alfa Romeo S p A Electrical indirect petrol injection system for Otto cycle engines 4,034,721, Cl 123-32.0EB

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Wierzbicki, Charles E , and Leonards, William R , 4,034,606, Cl 73-208.000

Leppich, Erhard, to Volkswagenwerk Aktiengesellschaft Telescoping shock absorber with plural valves. 4,034,860, Cl 188-282.000

Lermann, Peter, and Fauth, Gunter, to AGFA-Gevaert Aktiengesellschaft Film-sheet cassette 4,034,894, Cl 221-227.000

Leroy, Pierre L , to New Research and Development Lab , Inc Cervical collar 4,034,747, Cl 128-68.100

Leshik, Edward Alexander, to Hellermann Cassettes Limited Continuous loop tape cartridge 4,034,927, Cl 242-56.00R

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Wilkinson, John Arthur Elton, Leslie, Robert Semple Everett, Glindon, David Michael, Haines, Kendrick Peter, and Baker, Keith, 4,035,278, Cl 204-222.000

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Lewis, Carl B , to General Electric Company Pantograph emergency lowering system 4,034,832, Cl 191-86.000

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Hall, Floyd Van, 4,034,765, Cl 131-10.00A

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Liner Concrete Machinery Company Limited, The *See—*
Pugh, Stuart, and Colley, Eric, 4,034,875, Cl 214-141 000

Lippman, Alfred *See—*
Sebenik, Roger Frank, and Lippman, Alfred, 4,035,169, Cl 55-71 000

Liska, Miroslav *See—*
Kesten, Stanley Frank, and Liska, Miroslav, 4,035,107, Cl 417-310 000.

Literate, Louis J. *See—*
Schubert, Warren R., and Literate, Louis J., 4,035,477, Cl 424-47 000.

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Halberstadt, Harry J., and Rowley, Leroy S., 4,035,554, Cl 429-80.000.

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Clymer, Henry F; and Kaltenbaugh, John J., 4,034,774, Cl. 137-111 000

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Fuchs, Rudolf, 4,035,379, Cl 260-305.000

Loos, August W Composite cable and method of making the same 4,034,547, Cl 57-146 000.

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Kalopissis, Gregoire, Bugaut, Andree, and Gaston-Breton, Hubert, 4,035,422, Cl 260-559 00A
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Losch, Lothar *See—*
Czerny, Thomas, von Dohren, Hans, Losch, Lothar, Winsel, August, and Ziegler, Kurt, deceased, 4,035,151, Cl 23-252 00R

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Lutich, Louis L., and Harris, Jesse W Demolition tool 4,034,816, Cl 173-15 000

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Maddocks, Gerald E., to Sheller-Globe Corporation Removable cartridge filter. 4,035,306, Cl 210-440 000

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Maeda, Riichi Centrifugal blasting apparatus. 4,034,516, Cl 51-432.000

Maeder, Claude Robert, to Pont-A-Mousson S.A Variable reluctance motor 4,035,680, Cl 310-168 000.

Maekawa, Sachio, and Aizawa, Tadashi, to Hashimoto Denki Co., Ltd Core block for plywood and method and apparatus for forming same 4,035,538, Cl 428-155 000

Magherini, Dino Method for mass producing bulb sockets for miniature lamps in series on a single cable flexible electric cord 4,034,448, Cl 29-25 160

Maghon, Helmut, to Kraftwerk Union Aktiengesellschaft Gas turbine of disc-type construction 4,035,102, Cl. 416-95 000.

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Magnus, Leroy D. *See—*
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Magny, Jean, Montant, Charles, Raynaud, Pierre, Gontier, Charles, and Dardenne, Jacques, to E Remy Martin & Co Process for treating the residue from the distillation of white wine 4,035,517, Cl 426-31 000

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Majewski, Robert F *See—*
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Malocha, Donald C., and Hunsinger, Bill J., to University of Illinois Foundation Capacitive tap weighted surface acoustic wave transducers 4,035,675, Cl 310-9 800

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Marrero, Louis Quick connector electrical utility box 4,035,052, Cl 339-122 00F

Marshall, James F., to Honeywell Inc Stress sensor apparatus 4,035,823, Cl 357-26.000.

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Martig, Kenneth W., Jr., to Pro Te[illegible]ne Flow monitoring 4,034,607, Cl 73-215 000

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Massachusetts Institute of Technology *See—*
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Mathewson, Clifford Earl Analog delay circuit. 4,035,783, Cl. 340-173 00R

Mathis, Ronald D., to Phillips Petroleum Company Stabilization of olefin polymers 4,035,323, Cl 260-23 0XA

Matilainen, Waltteri, to Vaaka-Nyholm Scales, in particular shop scales 4,034,818, Cl 177-25 000

Matsubara, Takashi, Uramoto, Yoshihito, and Matsuoka, Daizo, to Toagosei Chemical Industry Co., Ltd Adhesive compositions for metals 4,035,436, Cl 260-857 01W

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Kawasaki, Itaru, Yamaguchi, Kouichi, Igarashi, Yoshiaki, and Kobayashi, Kazutsugu, 4,035,700, Cl 318-138 000
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  - Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen, McDermott, Thomas Stephen, and Wise, Larry Edward, 4,035,779, Cl 364-200.000.
- McDonald, James Anthony, Wolfe, Robert Wayne; and Bilik, Walter Theodore, to Union Carbide Corporation. Method and apparatus for producing coreless roll assemblies of separable bags. 4,034,928, Cl 242-59 000
- McDonnell Douglas Corporation: *See*—
  - Meyer, Michael C, and Aldridge, Clifton, 4,035,238, Cl 195-100 000.
  - Morrison, Hadley F., 4,035,536, Cl. 428-118.000.
- McFarland, Jay J., and Saunders, Bertram E., to California Almond Orchards Pistachio huller. 4,034,665, Cl. 99-574 000.
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- McGhee, John D . *See*—
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- McGill, Eugene C.: *See*—
  - Scott, Gerald W, and McGill, Eugene C., 4,035,158, Cl 23-278.000.
- McGill, Robert S , III. *See*—
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- McGinn, Ferdinand M , and Hebert, Gerald P , to Production Specialties, Inc Tubing side pocket mandrel. 4,034,806, Cl. 166-117 500.
- McGinniss, Vincent Daniel, to SCM Corporation Cathodic electrocoating process. 4,035,272, Cl. 204-181 000.
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- McKee, William H., to TRW Inc. Universal solderless termination system. 4,035,049, Cl 339-97.00R
- McKinney, Richard W , and Teichert, Allen L., to Robertshaw Controls Company Slide switch. 4,035,594, Cl 200-16.00D.
- McLane, Jack S. Cooking apparatus. 4,034,662, Cl. 99-445.000.
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- McMurry, Everett D , and Abercombie, Bolling A , to McMurry Oil Tools, Inc Gas lift mandrel valve mechanism 4,035,103, Cl. 417-109 000
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- McOwen, Sherwood A , Jr.. *See*—
  - Lind, James N , McOwen, Sherwood A., Jr., and Tsukii, Toshikazu, 4,035,743, Cl 331-101 000.
- McReynolds, John D Automated testing stations. 4,034,487, Cl. 35-48 00R
- McRitchie, David G , to Carolina Rubber Hose Company Process of and composition for covering the ends of metal rolls 4,035,212, Cl 156-187.000.
- McVeigh, Charles E Method and apparatus for generating power 4,034,565, Cl 60-503 000.
- Mead Corporation, The. *See*—
  - Forrer, Homer W., 4,034,852, Cl. 206-141.000.
  - Paranjpe, Suresh C., 4,035,811, Cl 346-75 000
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- Meisner, Arthur L.: *See*—
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- Meleka, Abdou Hanna, Watson, Herbert Hilary Hall, and Hotston, Eric Stanley, to Rolls-Royce (1971) Limited Methods and apparatus for finishing articles. 4,035,604, Cl 219-121 00P
- Melone, Robert R , to Elco Industries, Inc Fastener assembly 4,034,788, Cl. 151-37.000.
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- Meshberg, Philip Valve construction. 4,034,899, Cl. 222-321.000.
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  - Sepp, Gunther, and Born, Gunthard, 4,035,081, Cl 356-106.0LR.
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- Messing, Rita B.; and Lytle, Loy D., to Massachusetts Institute of Technology. Process for promoting analgesia. 4,035,511, Cl. 424-330.000
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  - Lohrberg, Karl, and Muller, Jurgen, 4,035,279, Cl. 204-256.000.
  - Scheiber, Werner; and Koppe, Herbert, 4,034,703, Cl. 118-35 000.
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- Meyer, Rudolf, to Siemens Aktiengesellschaft Radiation monitor for an irradiation installation 4,035,645, Cl 250-355.000.
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- Micek, Daniel W., to Universal Research Laboratories, Inc. Television picture centering control 4,035,841, Cl 358-242.000.
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  - Rutherford, Gary J , 4,034,540, Cl. 40-86 00A
- Midorikawa, Akira *See*—
  - Miyakawa, Seiichi, and Midorikawa, Akira, 4,035,071, Cl. 355-10 000
- Miessler, Heinz, to Vosswerk GmbH, Firma Washing machines 4,034,583, Cl 68-16 000
- Mika, Anton Leroy *See*—
  - Kupcikevicius, Vytautas, and Mika, Anton Leroy, 4,034,441, Cl 17-41 000
- Mikuni Kogyo Kabushiki Kaisha *See*—
  - Mukai, Osamu, Fukuzawa, Kokichi, Nagao, Yoshiro; Kubota, Kenichi, Kobayashi, Shigelu, and Shibuya, Masakuni, 4,034,830, Cl. 184-27 00R
- Milano, James, to Du Pont de Nemours, E I , and Company Process for preparing alkylanthraquinone 4,035,396, Cl 260-369 000
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- Miles Laboratories, Inc *See*—
  - White, Fred K., 4,034,884, Cl 220-8 000.
- Milgo Electronic Corporation *See*—
  - Chiu, Ran-Fun, Sherman, James Bryon, and Gilbert, Judson Truman, 4,035,625, Cl 235-152.000.
- Miller, Harry, to Sperry Rand Corporation Fail-safe dual channel automatic pilot with maneuver limiting. 4,035,705, Cl. 318-564 000
- Miller, Harry B , to Industriewerke Karlsruhe-Augsburg Aktiengesellschaft. Winder for yarn and the like. 4,034,923, Cl. 242-18.00A
- Miller, Jimmy L., Schnell, William J., and Wolf, Ludwig, Jr., to Baxter Laboratories, Inc. Support member construction for semipermeable membrane. 4,035,305, Cl. 210-321 00B
- Miller, John. Portable belt sander stand 4,034,522, Cl 51-166.00R
- Miller, Philip M.. *See*—
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- Miller, Richard N.. *See*—
  - Breznock, John F.; Melrose, Richard E ; and Miller, Richard N , 4,034,427, Cl. 4-255.000.
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- Miller, Wayne L., to Cessna Aircraft Company, The. Multiple ranging DME. 4,035,801, Cl. 343-12 00R.
- Milliken Research Corporation. *See*—
  - Klein, Norman E.; and Stewart, William H., Jr , 4,034,584, Cl. 68-205.00R
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  - Green, Harold A.; Merianos, John J , and Petrocci, Alfonso N , 4,035,480, Cl 424-78.000.
- Mills, Rasjad Mathematical beads. 4,034,486, Cl. 35-30.000.
- Milnes, Peter M , to Kohler Co Valve controlled flushing system 4,034,423, Cl. 4-41 000
- Milutinovich, Savo, to Savo, Inc Composite face apparatus and method 4,034,485, Cl. 35-28.000.
- Mims, James H.: *See*—
  - Lampe, Donald R ; White, Marvin H., and Mims, James H , 4,035,629, Cl. 235-193.000.
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  - Barton, Robert W , and Groff, Gaylord L , 4,035,694, Cl 361-400.000.
  - Beretta, Paolo, and Magnani, Luigi, 4,035,190, Cl 96-127.000
  - Caldwell, Donald B , 4,034,639, Cl 83-835 000
  - Cowman, Charles D., Jr , and Shepherd, John P. G , 4,035,064, Cl 350-293.000.
  - DeMaster, Robert D , 4,035,059, Cl 350-105 000
  - Fisch, Richard S., 4,035,181, Cl. 75-109.000.
  - Flor, Lawrence A , 4,035,074, Cl. 355-27.000.
  - Lucas, Anthony James, and Degen, Peter John, 4,035,506, Cl 424-303.000.
  - Sprado, Charles G , 4,035,075, Cl 355-66 000
  - Taylor, Allen L., 4,035,164, Cl. 55-11.000.
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  - Karapetian, Norair Gareginovich, Mkrian, Gurgen Mambreevich, Tonoian, Oganes Avetisovich, Selimian, Mikhail Eremovich, Papazian, Nargiz Akopovna, Kazarian, Rima Azarapetovna, Petrov, Anatoly Ivanovich, Bakhtamian, Armen Alexandrovich, and Mirakian, Smbat Mirakovich, 4,035,429, Cl 260-655 000.
- Mirtain, Henri J., to Uniroyal, S A Pneumatic tire with reinforcing belt 4,034,791, Cl 152-361 0FP
- Misawa, Akira *See*—
  - Tsunoda, Ichiro, Takeuchi, Satoshi, Hirao, Yoichiro, Suzuki, Takeo, Nishiue, Yoshihiro, Tadokoro, Katsumasa, Fukagawa, Toshimasa, Harada, Isamu, Misawa, Akira, and Watanabe, Kazuo, 4,035,060, Cl 350-160 0LC
- Mita Industrial Company Limited *See*—
  - Inque, Eiichi, Kokado, Hiroshi, and Miyakawa, Nobuhiro, 4,035,244, Cl 346-165 000
- Mitani, Seishu. *See*—
  - Hashimoto, Kametaro, Ushitani, Kenji; Serino, Youichi, Suganuma, Tetsuya, Mitani, Seishu, and Imanishi, Kunizou, 4,035,159, Cl. 75-246.000.
- Mitsubishi Belting, Ltd *See*—
  - Shirasaka, Kaname, Nakagami, Yoshihiro, Tomiyori, Takashi; Ikemoto, Masanori, and Shaura, Tsuneo, 4,034,702, Cl. 118-34 000
- Mitsubishi Denki Kabushiki Kaisha *See*—
  - Yamauchi, Nobuharu, Matsumura, Masaji, and Morimoto, Katsuhide, 4,035,786, Cl 340-213 00Q
- Mitsubishi Jukogyo Kabushiki Kaisha *See*—
  - Iijima, Katsuhiko, and Sakurai, Yoshiaki, 4,034,998, Cl. 280-461 00R
  - Miyamoto, Shigeyoshi, and Yamashita, Kosuke, 4,035,193, Cl. 106-100 000.
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  - Yabuta, Kenji, Yamashita, Kiyoshi, and Futaki, Kiyoshi, 4,035,188, Cl 96-66 00R.
- Mitsubishi Petrochemical Company Limited *See*—
  - Kanetaka, Junichi, Shimodaira, Takashi, Fuga, Nobuhiko, Hayasi, Kuniaki, and Ayusawa, Tadashi, 4,035,353, Cl 260-239 00H
  - Kasahara, Tomio, and Makita, Tomotaro, 4,034,506, Cl 47-64 000
- Mitsubishi Rayon Co , Ltd *See*—
  - Ide, Fumio, Kishida, Kazuo, and Kobayashi, Jinpee, 4,035,443, Cl. 260-876 00R
  - Kamada, Kazumasa, Handa, Ryoji, and Hongo, Masafumi, 4,035,333, Cl 260-40 00R
  - Okada, Kazuya, Matsuzawa, Hideo, Ishii, Hiromichi, and Kobayashi, Masao, 4,035,418, Cl 260-531 00R
- Mitsuboshi Sangyo Kabushiki Kaisha *See*—
  - Iwasaki, Hajime, and Tomita, Yasuo, 4,035,544, Cl 428-291 000
- Mitsui Shipbuilding and Engineering Co , Ltd *See*—
  - Okada, Masashi, and Aoki, Takeshi, 4,034,993, Cl 277 188 00A
- Miura, Yosihiro *See*—
  - Tomita, Syuuji, Miura, Yosihiro, and Kubota, Akito, 4,034,453, Cl 29-157 30C.
- Miyaji, Yoshimori, Fujiki, Hirokazu, Nishizawa, Tamotsu, and Morita, Naotake, to Tokyo Shibaura Electric Co , Ltd Prism optical system for a color television camera 4,035,836, Cl 358-55 000
- Miyakawa, Nobuaki, to Hitachi, Ltd Digital control fuel injection apparatus 4,034,722, Cl 123-32 0EB
- Miyakawa, Nobuhiro *See*—
  - Inque, Eiichi, Kokado, Hiroshi, and Miyakawa, Nobuhiro, 4,035,244, Cl 346-165 000
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- Miyamoto, Shigeyoshi, and Yamashita, Kosuke, to Mitsubishi Jukogyo Kabushiki Kaisha Method and apparatus for calcining powdered material for cement 4,035,193, Cl 106-100 000
- Miyazaki, Sadao Bearing assembly 4,035,044, Cl 308-183 000.
- Mizokawa, Takumi *See*—
  - Gotoh, Akiyoshi, Mizokawa, Takumi, Sawada, Yukio, and Katsuki, Taichi, 4,034,420, Cl 165-1 000
- Mizote, Masonori, to Nissan Motor Co , Ltd Electronic control device for an automatic power transmission 4,034,627, Cl 74-866 000
- Mizuno, Hisayuki *See*—
  - Umemura, Sumio, Mizuno, Hisayuki, and Ogawa, Tohru, 4,035,263, Cl 252-459 000.
- Mkrian, Gurgen Mambreevich *See*—
  - Karapetian, Norair Gareginovich; Mkrian, Gurgen Mambreevich, Tonoian, Oganes Avetisovich, Selimian, Mikhail Eremovich, Papazian, Nargiz Akopovna, Kazarian, Rima Azarapetovna, Petrov, Anatoly Ivanovich, Bakhtamian, Armen Alexandrovich, and Mirakian, Smbat Mirakovich, 4,035,429, Cl 260 655 000
- Mobay Chemical Corporation *See*—
  - Dickore, Karlfried, Merz, Walter, Dahm, Johann, and Smith, Donovan Norman, Jr , 4,035,364, Cl 260-248 0AS
  - Zakaryan, Ara, 4,035,449, Cl 260-972 000
- Mobil Oil Corporation *See*—
  - Dwyer, Francis G , Hanson, Francis V , and Schwartz, Albert B , 4,035,430, Cl 260-668 00R
  - Espenscheid, Wilton F , and Yan, Tsoung-Yuan, 4,035,281, Cl 208-8 000
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  - Gross, Benjamin, and Owen, Hartley, 4,035,284, Cl 208-120 000
  - Owen, Hartley, and Venuto, Paul B , 4,035,285, Cl 208-120 000
  - Rodewald, Paul G , 4,035,434, Cl 260-683 15B
- Mobley, Joseph Graham, to Scientific-Atlanta, Inc Satellite tracking antenna system 4,035,805, Cl 343-117 00R
- Moczygemba, George A , and Naylor, Floyd E., to Phillips Petroleum Company Method and catalyst for the production of high trans-polyalkadiene. 4,035,570, Cl 526-142 000
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  - Israel, Mervyn, and Modest, Edward J , 4,035,566, Cl. 536-4 000.
- Moertel, George B., to Textron, Inc. Slide fastener stringer. 4,034,444, Cl. 24-205.10C.
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  - Kondo, Toshio, Moir, Yoshinori, and Kizaki, Kirou, 4,034,857, Cl. 188-73 300.

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Molday, Robert S *See—*
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Molina, Orlando G., to Rockwell International Corporation. Liquid oxygen compatible biodegradable dye penetrant compositions and method of dye 4,035,641, Cl. 250-302.000

Molins Machine Company, Inc *See—*
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Mollerstedt, Karl Allan Bonde *See—*
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Molly, Hans. Axial piston type machine 4,034,650, Cl 91-485.000

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Monpetit, Louis, to Societe des Procedes Modernes d'Injection Sopromi Control method and apparatus for combustion motors 4,034,719, Cl. 123-32.0EB

Monsanto Company *See—*
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Chiang, Robert, and Perry, Eli, 4,035,291, Cl 210-23.00R
Fishel, Norman A., and Gross, David E., 4,035,428, Cl 260-620.000
Gaertner, Van R., 4,035,177, Cl 71-87.000
Kennar, George A., 4,035,549, Cl. 428-409.000
Rueppel, Melvin L., 4,035,176, Cl 71-86.000.

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Moosberg, Borje Sigurd, to ABU Aktiebolag. Centrifugal brake mechanism 4,034,859, Cl. 188-185.000

Moran, Thomas M., to Eaton Corporation Strain-relief bushing 4,034,944, Cl 248-56.000.

Moreton, Derek Vidion Data processing system including parallel bus transfer control port 4,035,777, Cl 364-200.000.

Morgan, Carl E., to Morgan Manufacturing Inc. Variable impact tool 4,034,594, Cl 72-457.000

Morgan Manufacturing Inc *See—*
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Morgner, Friedrich Wilhelm, and Hock, Franz, to Temafa, Textilmaschinenfabrik Meissner, Morgner & Co GmbH Device for pneumatically conveying fibers or fiber-containing materials. 4,035,030, Cl 302-37.000.

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Mori, Sakae. *See—*
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Moriconi, Joseph H., and Burrows, Louis H., Jr., to Xerox Corporation. Imaging systems. 4,035,520, Cl 427-19.000

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Morrison, Bertram L., to ACF Industries, Incorporated Valve seal retaining means. 4,034,959, Cl. 251-315.000.

Morrison, Hadley F., to McDonnell Douglas Corporation Sandwich panel core. 4,035,536, Cl. 428-118.000

Morrow, Robert S., and Penn, Lloyd D., to IRD Mechanalysis, Inc Pulse signal conditioning circuit 4,035,733, Cl 328-34.000

Morton, George Ira, and Heuner, Robert Charles, to RCA Corporation. Reduction of parasitic bipolar effects in integrated circuits employing insulated gate field effect transistors via the use of low resistance substrate contacts extending through source region. 4,035,826, Cl 357-42.000.

Morton-Norwich Products, Inc *See—*
Pelosi, Stanford S., Jr., and Goldenberg, Marvin M., 4,035,394, Cl 260-347.300
Snyder, Harry R., Jr., 4,035,421, Cl 260-556.0AR

Moser, Rabin, to Xerox Corporation Dual release agent cu-viton fuser 4,034,706, Cl 118-60.000

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Knutson, William J., and Smith, Daniel M., 4,035,695, Cl 361-400.000
Lace, Melvin Arthur, 4,034,925, Cl. 242-55.19A
Schafft, Hugo Willy, 4,035,671, Cl 310-8.600
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Motte, Roger, to Arenco-Decoufle Method and device for checking cigarettes and the like 4,034,600, Cl 73-41.000

Mourier, Georges, to Thomson-CSF Electronic tunable microwave device 4,035,688, Cl 315-39.000

Mowrey, Rowland George, Smith, Donald Arthur, and Sutton, Richard Calvin, to Eastman Kodak Company Process for bleaching silver halide photographic elements containing anionic organic acid compounds 4,035,187, Cl 96-60.00R.

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N A Taylor Co Inc *See—*
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Nadelson, Jeffrey, to Sandoz, Inc Bis-p-pivaloyl benzylamines 4,035,494, Cl 424-244.000

Nadelson, Jeffrey, to Sandoz, Inc Bis-substituted benzyl methanamines 4,035,508, Cl 424-316.000

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Nalco Chemical Company *See—*
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Phillips, Kenneth G., Bernot, Robert, and Ballweber, Edward G., 4,034,809, Cl 166-270.000

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NCR Corporation. *See—*
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Neher, Galen L *See—*
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Brouwer, Walter G., MacPherson, Edwin J., Ames, Ronald B., Neidermyer, Robert W., and Crittendon, Charles F., 4,035,175, Cl 71-76.000

Nelson, Peter H., and Untch, Karl G., to Syntex (U S A) Inc Methods and compositions for the use of 2 carboxy 5 oxo 5H dibenzo[a,d]cycloheptenes, salts and esters thereof 4,035,509, Cl 424-317.000

Nemtsov, Mark Semenovich, Trenke, Klavdia Mikhailovna, Ryskin, Moisei Isaakovich, and Kiseleva, Maria Mikhailovna Method of removing acids from reaction liquid of dimethyl dioxane synthesis 4,035,271, Cl 204-180.00P

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New York Blending Corporation *See—*
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Newman, Douglas A., Brown, Albert F., and Schiotzhauer, Allan L., to Columbia Ribbon and Carbon Manufacturing Co., Inc Split correction ribbon and method 4,034,843, Cl 197-172.000

Newport, Harry F., Jr *See—*
Baysinger, Robert L., and Newport, Harry F., Jr., 4,034,911, Cl 236-20.00R

Nichter, Thomas J *See—*
Griffin, Henry W., and Nichter, Thomas J., 4,035,017, Cl 296-93.000

Nicolaides, Ernest D *See—*
Tinney, Francis John, and Nicolaides, Ernest D., 4,035,348, Cl 260-112.5LH

Nielinger, Werner, Dhein, Rolf, Schneider, Kurt, and Tacke, Peter, to Bayer Aktiengesellschaft Impact resistant polymer mixtures 4,035,438, Cl 260-857.00G

Nihon Joryu Kogyo Co., Ltd *See—*
Yokoyama, Yoshio, Yoshikawa, Junzo, and Ota, Harutoshi, 4,035,399, Cl 260-396.00R

Nihon Nohyaku Co Ltd *See—*
Taninaka, Kuniaki, Hirano, Akira, and Kurono, Hitoshi 4,035,387, Cl 260-327.00M

Nilsson, Bengt Anders Fredrik *See—*
Lindstrom, Jan, and Nilsson, Bengt Anders Fredrik, 4,035,029, Cl 302-2.00R

Nippon Cable System Inc *See—*
Baba, Masanao, 4,034,835, Cl 192-.098

Nippon Electric Company, Ltd *See—*
Akashi, Fumio, and Sato, Yoichi, 4,035,[illegible], Cl 329-50.000
Fukaya, Hirokazu, and Takagi, Katsuhiro 4,035,743, Cl 331-111.000
Ishikawa, Yujiro, and Kinoshita, Kyo, 4,035,[illegible], Cl [illegible]-304.000
Ohyama, Sigeru, and Sekikawa, Atsuki 4,034,[illegible], Cl 197-[illegible]00R

Nippon Gakki Seizo Kabushiki Kaisha *See—*
Ogita, Minoru, 4,035,585, Cl 179-15.0BF
Okamoto, Shimaji, 4,035,582, Cl 179-1.[illegible]
Yokoyama, Kenji, 4,035,669, Cl 30[illegible]-93.000

Nippon Kogaku K K *See—*
Iida, Yozo, Akasaka, Shigeo, and Kawahara, Yasuhito 4,035,8[illegible], Cl 354-219.000
Mori, Hidetoshi, Shimamura, Teruo, and Fukami, Yoshio 4,035,087, Cl 356-205.000
Yamaguchi, Takeshi, 4,035,080, Cl 356-103.000

Nippon Pneumatic Manufacturing Co Ltd *See—*
Okada, Hiroshi, 4,034,817, Cl 173-134.000

Nippon Soken, Inc *See—*
Akita, Sigeyuki, and Kitagawa, Junji, 4,035,[illegible], Cl [illegible]-244.00R
Fujinami, Hiroshi, and Yamaguchi, Hiroaki 4,03[illegible], Cl [illegible]-52.00F
Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu and Tanaka, Taro, 4,034,720, Cl 123-32.0SP
Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu and Tanaka, Taro, 4,034,733, Cl 123-32.0SP

Nippon Steel Corporation *See—*
Asano, Hidejiro, Oyagi, Yashichi and [illegible], Takatoshi 4,035,248, Cl 204-38.00B

Nippondenso Co., Ltd *See—*
Ito, Osamu, Hobo, Nobuhito, Isezaki, [illegible] and Ikeda, Michio, 4,034,725, Cl 123-102.000
Sato, Suguru, 4,035,714, Cl 322-28.000

Nishida, Kiyoto *See—*
Izawa, Shoichi, Ono, Isao, Iikuni, [illegible] and Nishida, Kiyoto, 4,035,417, Cl 260-530.00N

Nishikawa, Masao *See—*
Sugihara, Hirosada, Watanabe, Masazumi, Motohashi, Michio, Nishikawa, Masao, and Sanno, Yasushi 4,035,512, Cl 424-330.000

Nishimura, Koichi Fingernail polishing apparatus 4,034,769, Cl 132-76.400

Nishiue, Yoshihiro *See—*
Tsunoda, Ichiro, Takeuchi, Satoshi, Hirao, Yoichiro, Suzuki, Takeo, Nishiue, Yoshihiro, Tadokoro, Katsumasa, Fukagawa, Toshimasa, Harada, Isamu, Misawa, Akira, and Watanabe, Kazuo, 4,035,060, Cl 350-160.0LC

Nishizawa, Tamotsu *See—*
Miyaji, Yoshimori, Fujiki, Hirokazu, Nishizawa, Tamotsu and Morita, Naotake, 4,035,836, Cl 358-55.000

Nissan Motor Co., Ltd *See—*
Aono, Shigeo, and Anzai, Makoto, 4,034,727, Cl 123-119.0[illegible]
Hamada, Mitsuharu, Sugiyama, Hiroshi, Uchiyama, Hiromichi and Katayose, Shinji, 4,034,680, Cl 104-140.000
Mizote, Masanori, 4,034,627, Cl 74-866.000
Takahashi, Koichi, Hitomi, Nobuteru and Kizu, Taisuke, 4,034,576, Cl 64-21.000
Udagawa, Masanori, and Suyama, Toru, 4,034,626, Cl 74-857.000

Nitta, Tsuneharu, Hayakawa, Shigeru, Kasahara, Yukio, and Terada, Ziro, to Matsushita Electric Industrial Co Ltd Method of making a zinc sulphide ceramic body and a zinc sulphide ceramic body made thereby 4,035,819, Cl 357-10.000

Nobusawa, Tsukumo, to Asahi Kogaku Kogyo Kabushiki Kaisha Electronic flash apparatus controlled by a digital memory system 4,035,814, Cl 354-33.000

Nock, John M *See—*
Forbes, Hampton L., Jr., and Nock, John M., 4,034,908, Cl 229-34.0HW

Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and

Tanaka, Taro, to Nippon Soken, Inc. Internal combustion engine 4,034,720, Cl. 123-32 0SP

- Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and Tanaka, Taro, to Nippon Soken, Inc Internal combustion engine. 4,034,733, Cl 123-32 0SP
- Nomura, Yoshihisa, to Toyota Jidosha Kogyo Kabushiki Kaisha. Check valve for braking pressure control valve unit 4,035,031, Cl 303-6 00C
- Norrman, Martin *See—*
  - Fors, Torsten, and Norrman, Martin, 4,034,614, Cl 74-61 000
- Northern Engraving Company, Inc., *See—*
  - Riniker, James P., 4,035,593, Cl 200-5 00A
- Norton, Daniel J., and Cooke, Rupert J., to Harris Corporation Radiation suppressed keyboard. 4,035,794, Cl 340-365 00E
- Nowak, Robert H., to Motch & Merryweather Machinery Company, The Method for grinding circular saw teeth to an improved metal breaking geometry 4,034,630, Cl 76-112.000
- Nowotnik, David Peter *See—*
  - Cookson, Ronald Frederick, and Nowotnik, David Peter, 4,035,4[illegible]9, Cl. 424-258.000.
- Nozadze, Gennady Pavlovich *See—*
  - Arakelov, Mikhail Alexandrovich, Gersamia, Eduard Galaktionovich, Zedgenidze, Tengiz Grigorievich, and Nozadze, Gennady Pavlovich, 4,034,455, Cl 29-736 000
- Numata, Saburo, to Fuji Shashin Koki Kabushiki Kaisha Light receptor device 4,035,634, Cl. 250-209 000
- Nuovo Pignone, S.p.A., *See—*
  - Bianchini, Pierluigi, 4,034,624, Cl 74-625 000
- Nyberg, David D., to Raychem Corporation Heat-shrinkable laminate 4,035,534, Cl 428-36.000
- O & K Orenstein & Koppel Aktiengesellschaft *See—*
  - Hahlbrock, Udo, Steinkuhler, Siegfried, Vagt, Heinz-Werner; Voss, Johann-Gustav, and Wantig, Ulrich, 4,035,022, Cl 299-8 000.
- Oakdale Knitting Company *See—*
  - Holder, Otis W., 4,034,580, Cl 66-172 00F
- Obayashi, Ichiro *See—*
  - Okamoto, Kiyoshi, Kiriyama, Shizuo, Obayashi, Ichiro, Yamamura, Kazuaki, and Senoo, Masaaki, 4,035,183, Cl. 75-129 000
- Obermajer, Wladimir Apparatus for measuring the cardiac capacity 4,035,622, Cl 235-151 300
- O'Brien, John L., Perron, Robert R., and Strong, Petér F., to Arthur D Little, Inc Process and apparatus for forming essentially spherical pellets directly from a melt 4,035,116, Cl 425-10 000
- Oce-van der Grinten N V *See—*
  - Vercoulen, Johannes C A., 4,035,077, Cl 355-75 000
- Odo, Keijiro; Ichikawa, Eiichi, Tamazawa, Kazuharu, and Takahashi, Kozo, to Yamanouchi Pharmaceutical Co., Ltd Process for producing 2-aminomethyl-1-ethylpyrrolidine 4,035,252, Cl 204-74.000.
- Ofer, Heinrich *See—*
  - Geissler, Ernst, Haidacher, Wilheim, and Ofer, Heinrich, 4,035,161, Cl. 51-296 000
- "OFU" Ofenbau-Union GmbH *See—*
  - Hatzenbichler, Ernst, and Bunzel, Eckard, 4,035,142, Cl 432-249 000
- Ogasawara, Masafumi, Yamaguchi, Nobu, and Tsuchiyama, Yoshio, to Toray Industries, Inc Melt spinning apparatus 4,035,127, Cl. 425-192.00S
- Ogawa, Ken *See—*
  - Hayashi, Nobuyuki, Isobe, Asao, Tsukada, Katsushige, Ogawa, Ken, and Abo, Masahiro, 4,035,189, Cl. 96-115 00R
- Ogawa, Tohru *See—*
  - Umemura, Sumio; Mizuno, Hisayuki, and Ogawa, Tohru, 4,035,263, Cl 252-459 000.
- Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha Demodulator circuit in multiplex stereo and monophonic receiver 4,035,585, Cl 179-15 0BT
- Ogle, James A., and Holz, George E., to Burroughs Corporation Panel-type display device. 4,035,689, Cl 315-169 0TV
- Oguchi, Kikuo, Toshiaki, Ogata, and Momosaki, Eishi, to Kabushiki Kaisha Suwa Seikosha Quartz crystal vibrator 4,035,674, Cl 310-9.500.
- Ohio State University Research Foundation, The *See—*
  - Gassman, Paul G., and Gruetzmacher, Gordon D., 4,035,375, Cl 260-294 80G
- Ohkawa, Tihiro, to General Atomic Company Method and apparatus for use in approaching thermonuclear temperatures using turbulent thermal insulation. 4,035,656, Cl 250-500 000
- Ohno, Ietatsu. Vertical grinder 4,034,515, Cl 51-7 000
- Ohta, Ryozo, Kashihara, Jyunji; Sakaguchi, Masayuki, Nakamoto, Toshio; Yamamoto, Ikuo; and Shibata, Michio, to Kubota Engineering Co, Ltd Tubular end structure of pipe 4,034,994, Cl 277-207.00A.
- Ohyama, Sigeru; and Sekikawa, Aisuke, to Nippon Electric Co., Ltd Print wire actuating device for a dot matrix printer 4,034,841, Cl 197-1.00R.
- Ohyoshi, Kaoru, and Seo, Naoyuki, to Olympus Optical Co., Ltd Treating method for giving durability to an optical fiber bundle 4,035,210, Cl. 156-645.000.
- Oil-Rite Corporation. *See—*
  - Gruett, Donald G., 4,034,831, Cl 184-81 000
- Oka, Shunzo: *See—*
  - Minami, Shunji; and Oka, Shunzo, 4,035,668, Cl 307-293.000
- Oka, Yoshikazu; Tomimoto, Mitsumi; and Chiba, Sukehiro, to Takeda Chemical Industries, Ltd 1,3 benzoxazine derivatives 4,035,363, Cl 260-244 00R
- Okada, Hiroshi, to Nippon Pneumatic Manufacturing Co., Ltd Impact tool 4,034,817, Cl 173-134 000
- Okada, Kazuya, Matsuzawa, Hideo, Ishii, Hiromichi, and Kobayashi, Masao, to Mitsubishi Rayon Co., Ltd Process for producing unsaturated aldehydes and unsaturated carboxylic acids 4,035,418, Cl 260-531 00R
- Okada, Masashi, and Aoki, Takeshi, to Mitsui Shipbuilding and Engineering Co., Ltd Sealing apparatus 4,034,993, Cl 277-188 00A
- Okada, Tsugihiro, and Yokozawa, Norio, to Hitachi, Ltd Anti-skid control system 4,035,033, Cl 303-109 000.
- Okamoto, Kiyoshi, Kiriyama, Shizuo, Obayashi, Ichiro, Yamamura, Kazuaki, and Senoo, Masaaki, to Chuo Denki Kogyo Co., Ltd Method for making aluminum-containing ferroalloy 4,035,183, Cl 75-129 000
- Okamoto, Shimaji, to Nippon Gakki Seizo Kabushiki Kaisha Tremolo effect producing system 4,035,582, Cl 179-1 00J
- Okawara, Kenjiro, Itakura, Sigeru, Matsui, Teruo, and Nakajima, Toshio, to Tokai Metals Co., Ltd Method of preventing deterioration by heat 4,035,209, Cl 156-3 000
- Okiura, Tomoo *See—*
  - Sumikawa, Shozo, Sakaguchi, Shinichiro, and Okiura, Tomoo, 4,035,419, Cl 260-535.00P.
- Okura, Takao *See—*
  - Sakurai, Yoshitoshi, Okura, Takao, and Irimajiri, Shoichiro, 4,034,561, Cl 60-282 000
- Okura, Tomoyuki, Tatsumi, Takashi, Watanabe, Hitoshi, Murayama, Hiroaki, and Kobayashi, Yoichi, to Shin-Kobe Electric Machinery Co., Ltd Process for casting a plate grid for a lead-acid storage battery 4,034,793, Cl 164-63.000
- Old Fort International, Inc *See—*
  - Balhorn, Milo G., 4,035,124, Cl 425-139 000
- Olin Corporation *See—*
  - Faust, John P., and Cramer, Henry R., 4,035,484, Cl 424-149 000
  - Martin, Richard Hugo, and Owens, William F., Jr., 4,035,611, Cl 219-384 000
  - Schnabel, Wilhelm J., and Colafati, Ralph A., III, 4,035,318, Cl 260-2 5AT
- Olinkraft, Inc *See—*
  - Sherman, Earle C., 4,034,658, Cl 93-49 00M
- Ollery, Daniel. Double rotor shear 4,034,637, Cl 83-341 000.
- Olstowski, Franciszek, to Dow Chemical Company, The Solid, rapid-setting, rigid polyurethanes 4,035,331, Cl. 260-30 200
- Olthouse, Malcolm L. *See—*
  - Borelan, Alexander P., Giffin, James T., Louden, Peter J., and Olthouse, Malcolm L., 4,034,938, Cl. 244-53 00R
- Olympus Optical Co., Ltd *See—*
  - Ikeda, Yoshitsugi, 4,035,063, Cl 350-189 000
  - Ohyoshi, Kaoru, and Seo, Naoyuki, 4,035,210, Cl 156-645.000
- Omachi, Yoshio, Hasegawa, Ichiro, and Watanabe, Hiroshi, to Kabushiki Kaisha Komatsu Seisakusho. Preheating apparatus of a diesel engine 4,034,729, Cl 123-122.00G.
- Ono, Isao *See—*
  - Izawa, Shoichi; Ono, Isao, Iikuni, Tetuo, and Nishida, Kiyoto, 4,035,417, Cl 260-530 00N
- Oonuma, Tatsumasa *See—*
  - Shirasu, Hirotoshi, Yamashita, Hidetaka, Oonuma, Tatsumasa, and Fukuhara, Takeshi, 4,035,586, Cl 179-16 00F
- Oosterling, Pieter Adriaan, and Van Staveren, Hendricus Cornelis, to Multinorm B V Wheel and axle arrangement for agricultural vehicle 4,034,997, Cl 280-81 00A
- Oppenheimer, Jess Swing training apparatus. 4,034,991, Cl. 273-186 00A
- Oppolzer, Johann, to Karl Mayer Textilmaschinenfabrik GmbH Steering compensation means for guide bars utilized in warp knitting machines having two needle beds 4,034,582, Cl 66-207.000
- Optograms, Inc *See—*
  - Von Voros, Geza, 4,034,477, Cl 33-143 00L.
- Original Equipment Motors Inc *See—*
  - Adair, Gerald L., 4,035,676, Cl 310-42 000
- Oroshnik, William, to SCM Corporation Synthesis of Vitamin A, intermediates and conversion thereof to Vitamin A. 4,035,425, Cl 260-617 00A
- O'Rourke, John Black, and Stopp, Peter Gordon, to Glacier Metal Company Limited, The Thrust bearing 4,035,042, Cl 308-160 000
- Orr, Jimmy D *See—*
  - Urioste, German R., Busby, David E., McConchie, Garnet E., and Orr, Jimmy D., 4,035,473, Cl 423-488 000
- Orth, Harold R., to International Harvester Company Load sensitive hydraulic system 4,034,563, Cl 60-422 000
- Ortiz, Enid Device for keeping bread fresh. 4,034,895, Cl 221-277 000
- Ortiz, Nilson V., to Ortiz, Nilson V., and Rollojay, Francisco R Airborne saucer like toy 4,034,500, Cl 46-86 00R
- Osborne, Robert N., to General Electric Company Device for locating defective fuel 4,034,599, Cl 73-40 700
- Osborne, Thomas E *See—*
  - Dickinson, Peter D., Osborne, Thomas E., Rode, France, and Baum, Allen J., 4,035,627, Cl 235-156 000
- Osiko, Vyacheslav Vasilievich *See—*
  - Alexandrov, Vladimir Ilich, Gordon, Vladimir Grigorievich, Muraviev, Ernest Nikolaevich, Osiko, Vyacheslav Vasilievich, Prokhorov, Alexandr Mikhailovich, Spiridonov, Eduard Georgievich, and Tatarintsev, Vladimir Mikhailovich. 4,035,266, Cl 252-512 000

- Ota, Harutoshi *See—*
  - Yokoyama, Yoshio, Yoshikawa, Junzo, and Ota, Harutoshi, 4,035,399, Cl 260-396 00R.
- Otaki, Shigeji Full-automatic machine for continuously forming horizontal split molds in so-called non-pallet and non-jacket system 4,034,795, Cl 164-173 000
- Otani, Kio *See—*
  - Manita, Takeyoshi, Seimiya, Ichiro, Otani, Kio, Furutani, Tadasuke, and Sasakura, Saburo, 4,034,996, Cl 280-80 00R
- Otis Engineering Corporation *See—*
  - Gazda, Imre I., and Pearce, Joseph L., 4,035,011, Cl 294-86 180
- Otomo, Yasushi *See—*
  - Kusaka, Keijiro, and Otomo, Yasushi, 4,035,748, Cl 333-33 000
- Outboard Marine Corporation *See—*
  - Barnhardt, Thomas L., 4,034,820, Cl 180-5 00R
  - Collins, William C., 4,034,686, Cl 111-7 000
  - Hackbarth, Eugene R., and Ward, Harry M., III, 4,035,112, Cl 418-60 000
- Overbury, Francis G., to International Standard Electric Corporation Simulated Doppler navigational system with second order diversity 4,035,804, Cl 343-106 00D
- Owen, Hartley, and Venuto, Paul B., to Mobil Oil Corporation Hydrocarbon conversion process 4,035,285, Cl. 208-120 000.
- Owen, Hartley *See—*
  - Gross, Benjamin, and Owen, Hartley, 4,035,284, Cl 208-120 000
- Owens-Illinois, Inc., *See—*
  - Amberg, Stephen W., 4,035,222, Cl 156-423 000
  - Crisp, Michael D., and Ringlien, James A., 4,035,741, Cl. 331-94.50G.
  - Mold, Donald F., and Rice, Ronald G., 4,034,805, Cl 165-165 000
- Owens, William F., Jr *See—*
  - Martin, Richard Hugo, and Owens, William F., Jr., 4,035,611, Cl 219-384 000
- Oxy Metal Industries Corporation. *See—*
  - Doty, Warren R., and Kinney, Timothy J., 4,035,227, Cl. 156-668.000.
  - Wieczerniak, Walter J., 4,035,249, Cl 204-43 00S.
- Oy Nokia AB. *See—*
  - Karppo, Jukka Seppo; and Aaltonen, Matti Akseli, 4,035,129, Cl 425-445 000
- Oyagi, Yashichi: *See—*
  - Asano, Hidejiro, Oyagi, Yashichi, and Egawa, Takatoshi, 4,035,248, Cl. 204-38.00B.
- Ozalid Group Holdings Limited. *See—*
  - Beeber, Allan Robert Andrew, 4,035,186, Cl 96-49.000.
- P R. Mallory & Co., Inc.: *See—*
  - Panke, Alfred A., 4,035,758, Cl 338-132 000.
- Paap, Hans J. *See—*
  - Arnold, Dan M., Paap, Hans J., and Peelman, Harold E., 4,035,640, Cl. 250-266 000.
- Pacer Systems Inc. *See—*
  - Green, David Lee, 4,034,605, Cl 73-178 00H.
- Pachana, Henri. *See—*
  - Slocum, Mahlon W., and Pachana, Henri, 4,035,749, Cl 333-83.00R.
- Pagnoni, Franco, to Fratelli Pagnoni S p A Method for forming and pressing foil and board laminates 4,035,221, Cl 156-299 000
- Palm, John W., *See—*
  - Kunkel, Lorenz V., Palm, John W., Petty, Luther E., and Grekel, Howard, 4,035,474, Cl 423-574 00R
- Pampouchidis, Georgios (Georg) Process for producing improved coating compositions. 4,035,523, Cl 427-44 000
- Panayotov, Ivan Martinov *See—*
  - Rashkov, Ilia, Gole, Jean, Guerard, Daniel, Herold, Albert, Merle, Gerard, Panayotov, Ivan Martinov, Pascault, Jean-Pierre, Pham, Quang Tho, Pillot, Christian, and Salle, Robert, 4,035,562, Cl 526-173 000.
- Panke, Alfred A., to P R Mallory & Co., Inc Adjustable variable resistance control system 4,035,758, Cl 338-132 000
- Pannullo, Gerard *See—*
  - Hulle, Robert M., Ferrero, John, and Pannullo, Gerard, 4,034,460, Cl 29-418 000
- Papazian, Nargiz Akopovna *See—*
  - Karapetian, Norair Gareginovich, Mkrian, Gurgen Mambreevich, Tonoian, Oganes Avetisovich, Selimian, Mikhail Eremovich, Papazian, Nargiz Akopovna, Kazarian, Rima Azarapetovna, Petrov, Anatoly Ivanovich, Bakhtamian, Armen Alexandrovich, and Mirakian, Smbat Mirakovich, 4,035,429, Cl 260-655 000
- Papuchon, Michel, to Thomson-CSF Electro-optical switch and a method of manufacturing same. 4,035,058, Cl 350-96 00C
- Parachutes Incorporated *See—*
  - Bird, Jerry, 4,034,940, Cl 244-148 000
- Paranjpe, Suresh C., to Mead Corporation, The Ink jet recorder and catcher therefor 4,035,811, Cl 346-75 000
- Paris Processing Corporation *See—*
  - Rubaschek, Nathan, and Rubinstein, Henry, 4,034,446, Cl 26-2 00R
- Park, Andrew Howard Donaldson *See—*
  - Crosland, Roy, and Park, Andrew Howard Donaldson, 4,035,635, Cl 250-223 00R
- Parke, Davis & Company *See—*
  - Tinney, Francis John, and Nicolaides, Ernest D., 4,035,348, Cl 260-112 5LH
- Parke, Harry G., to Marine Electric Corporation Entertainment and public address system with replay of entertainment program after a public address interruption. 4,035,589, Cl 179-100.10C.
- Parker, Delmer G *See—*
  - Fraser, Lawrence J., Parker, Delmer G., and Scaletta, Joseph L., 4,034,709, Cl. 118-658 000
- Pascault, Jean-Pierre *See—*
  - Rashkov, Ilia, Gole, Jean, Guerard, Daniel, Herold, Albert, Merle, Gerard, Panayotov, Ivan Martinov, Pascault, Jean-Pierre, Pham, Quang Tho, Pillot, Christian, and Salle, Robert, 4,035,562, Cl. 526-173 000.
- Paschke, Edward E., to Standard Oil Company (Indiana) Copolyesters containing 2,2',6,6' tetramethylbiphenyl-4,4' dicarboxylate moieties 4,035,342, Cl 260-75 00R
- Patel, Ambalal I., to CGR Medical Corporation X-ray tube protection circuit 4,035,648, Cl 250-402 000
- Patel, Hiralal V., to Weatherhead Company, The Crimping machine with automatic swing open pushers 4,034,593, Cl 72-402 000
- Patel, Hiralal V *See—*
  - Chen, Karl K., Patel, Hiralal V., Frank, Irving G., and Pistoor, Donald, 4,034,592, Cl 72-402 000
- Patterson, Maurice M., to Shell Oil Company Method for pump-off detection 4,034,808, Cl 166 250.000
- Patton, George Allen, and Tucci, John James, to AMP Incorporated. Method for fabricating multi-conductor tap connector 4,034,470, Cl 29-629 000
- Patton, Tad L., to Exxon Research and Engineering Company Cyanoformamidyl isocyanates and synthesis thereof 4,035,404, Cl 260-453 0AR
- Pavlov, Alexandr Mikhailovich, Pyatibrat, Alexandr Lukich, Fomenko, Nikolai Dmitrievich, Gorbachev, Nikolai Alexeevich, and Zotov, Viktor Loginovich Centrifugal plant for producing bimetallic sleeves 4,034,800, Cl 164-288 000
- Pearce, Joseph L. *See—*
  - Gazda, Imre I.; and Pearce, Joseph L., 4,035,011, Cl 294-86 180
- Pearl, David R., to Gerber Garment Technology, Inc Method and apparatus for placing a multi-ply layup of sheet material on a work table 4,034,636, Cl 83-401 000
- Pearson, Bangt R., *See—*
  - Tardiff, Armand L., Broughton, Glover F., Delorey, David R., and Pearson, Bangt R., 4,034,893, Cl 221-171 000
- Pease Company *See—*
  - Bursk, William M., 4,034,511, Cl 49-488 000
- Pech, Josef, and Lapes, Frantisek, to Vyzkumny Ustav Bavlnarsky Endless-chain systems for feeding weft threads to weft inserters. 4,034,783, Cl 139-436.000
- Pechmeze, Jacques Pierre Edmond, Touratier, Philippe Jean-Marie, and Cabut, Louis Antoine, to Produits Chimiques Ugine Kuhlmann Polyfluoro acid anthraquinone dyestuffs their preparation and their use. 4,035,397, Cl. 260-373 000
- Pedain, Josef *See—*
  - Thoma, Wilhelm, Pedain, Josef, Grammel, Jurgen, and Aguado, Antonio, 4,035,213, Cl 156-231 000
- Peelman, Harold E. *See—*
  - Arnold, Dan M., Paap, Hans J., and Peelman, Harold E., 4,035,640, Cl 250-266 000
- Pellegata, Renato *See—*
  - Gandolfi, Carmelo, Pellegata, Renato, Ceserani, Roberto, and Usardi, Maria M., 4,035,415, Cl 260-514 00D
- Pelosi, Stanford S., Jr., and Goldenberg, Marvin M., to Morton-Norwich Products, Inc 5-Phenyl-2-furanyl-oxo or-hydroxy alkanoic acids and ethyl esters as gastric acid antisecretory agents 4,035,394, Cl 260-347 300
- Penn, Lloyd D *See—*
  - Morrow, Robert S., and Penn, Lloyd D., 4,035,733, Cl 328-34 000
- Pensa, Carlo, to Massey-Ferguson Services N V Control systems for variable capacity hydraulic machines 4,034,654, Cl 91-506 000
- Pensa, Carlo, to Massey-Ferguson Services N V Control devices for reversible flow variable capacity hydraulic machines 4,035,106, Cl 417-222 000
- Perlstein, Paul H *See—*
  - Atherton, Harry D., Edwards, Neil K., and Perlstein, Paul H., 4,034,740, Cl 128-1 00B
- Pernegger, Wolfgang *See—*
  - Danneels, Laurent, Helder, Johan, Kuypers, Jan, Piolon, James, and Pernegger, Wolfgang, 4,035,245, Cl 204-15 000
- Perron, Robert R *See—*
  - O'Brien, John L., Perron, Robert R., and Strong, Peter F., 4,035,116, Cl 425-10 000
- Perry, Eli *See—*
  - Chiang, Robert, and Perry, Eli, 4,035,291, Cl 210-23 00R
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- Peter, Julius *See—*
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- Peter, Richard, and Jenny, Walter, to Ciba-Geigy AG Certain benzazol-2-ylthio compounds 4,035,380, Cl 260-306 60R
- Petersen, Paul S., to Toolmark Co Safety shield construction 4,034,633, Cl 82-34 00R.
- Peterson, Warren J., to Joerns Furniture Company Examination table 4,034,972, Cl 269-324 000
- Petit, Michel *See—*
  - Debrie, Guy, Petit, Michel, and Vertut, Jean, 4,035,707, Cl. 318-628.000

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Gergely, Alex S., 4,035,125, Cl 425-141 000
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Hobbs, James W., and Smith, Dexter E., 4,035,620, Cl 235-151 100
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Moczygemba, George A., and Naylor, Floyd E., 4,035,570, Cl 526-142 000
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Plasko, Rudolph J., Jr., to Bendix Corporation, The Air compressor cylinder head 4,035,110, Cl 417-539 000
Plaza, Mario G., and Trezise, Richard D., to Xerox Corporation Dual level ribbon cartridge. 4,034,935, Cl 242-197.000
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Borror, Alan L., 4,035,391, Cl 260-343 20R
Haas, Howard C., 4,035,319, Cl 260-8 000.
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Poppe, Richard L. *See*—
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Chang, Wen Hsuan, and Ammons, Vernon G., 4,035,548, Cl 428-412 000
Seiner, Jerome A., 4,035,085, Cl 356-179 000
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Radice, John G., to Doron Precision Systems Inc Driver training apparatus 4,034,484, Cl 35-11 000
Raider, George K Air diffusion unit and control mechanism therefor 4,034,659, Cl 98-40 00D
Rainer, Norman B., Hoelzel, Charles B., and Hopkins, William C., to Philip Morris Incorporated Smoking material and method for its preparation 4,034,764, Cl 131-2 000
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Raudat, John L., and Rydell, Adam Z., to Emhart Industries, Inc Apparatus for straightening cell-forming partitions in a carton 4,034,656, Cl 93-37 00R
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Ipri, Alfred Charles, and Sarace, John Carl, 4,035,829, Cl 357-49 000
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Jackson, Carl D., 4,034,999, Cl 280-461.00A.

Royster, Percy L., Jr Rodenticide containing quinine salts 4,035,482, Cl 424-134 000

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Ryabov, Anatoly Leonidovich, Lukyanchikov, Viktor Egorovich, and Khutarev, Alexei Pavlovich Multiprobe head for checking electrical parameters of semiconductor instruments and microcircuits 4,035,722, Cl 324-158 00P

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Simpson, William R., 4,035,367, Cl 260-268 0BQ

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Saunders, Reginald E Graffiti protection 4,034,523, Cl 52-29 000

Savage, John M., Jr Polygonal lens 4,035,681, Cl 313-110 000.

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Schroeder, Kenneth W *See*—

Lorenzi, Donald E., Schroeder, Kenneth W., and Sabielny, Richard C., 4,035,721, Cl 324-37 000

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Schuler, Michael *See*—

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Schultz, Herman S., to Itek Corporation Hydrophilic copolymer of N,N-di(C_1-C_2alkyl)acrylamide cross-linked with a glycidyl ester 4,035,330, Cl 260-29 60R

Schulz, Manfred B., and Holland, Melvin G., to Raytheon Company Temperature compensated acoustic surface wave device 4,035,775, Cl 343-17 2PC

Schulz, Siegfried, to Continental Field Machining Co., Inc Apparatus for supporting and precision turning of large rotary members 4,034,631, Cl 82-2 00R

Schutt, Hermann, to Bayer Aktiengesellschaft Process for the preparation of the kallikrein-trypsin inhibitor 4,035,234, Cl 195-5 000

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Schweiger, Richard G Preparation of cellulose nitrite 4,035,569, Cl 536-32 000

Scientific-Atlanta, Inc *See*—

Clayton, Lorimer, 4,035,730, Cl 325-348 000

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SCM Corporation *See*—

McGinniss, Vincent Daniel, 4,035,272, Cl 204-181 000

McGinniss, Vincent Daniel, 4,035,273, Cl 204-181 000

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Oroshnik, William, 4,035,428, Cl 260-617 00A

Stevenson, Donald R., 4,035,439, Cl 260-859 00R

Scott, Gerald W., and McGill, Eugene C., to John Zink Company Process and apparatus for burning hydrogen sulfide and other combustible fluid to recover sulfur 4,035,158, Cl 23-278 000

Scott, Paul R., Johnston, Wilmer D., and Kyrish, Jerome E., to Shell Oil Company Vapor barriers for liquid conservation 4,035,149, Cl 21-60 50R

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Seidaliev, Fikrat Seidalogly *See*—

Shevakin, Iury Fedorovich, Bashilov, Pavel Vasilievich, Dobkin, Igor Iosifovich, Temkin, Mikhail Iosifovich, Kuznetsov, Lev Borisovich, Kotov, Vitaly Vyacheslavovich, Seidaliev, Fikrat Seidalogly, Donskoi, Efim Moiseevich, Belkin, Valentin Vasilievich, and Prutkin, Evgeny Fedorovich, 4,034,590, Cl 72-280 000

Seider, Gene J., and Freund, Michael C., to Gould Inc Battery charging system 4,035,709, Cl 320-23 000

Seiderman, Maurice Electrochemically linking collagen fibrils to animal tissue 4,034,750, Cl 128-155 000

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Seita, Toru, and Shimizu, Akihiko, to Toyo Soda Manufacturing Co., Ltd Process for producing organic-inorganic polyion complex, 4,035,558, Cl 526-29 000

Sekiguchi, Yukichi, to Sanwa Seiki Mfg Co Ltd Antiskid device for air brakes 4,035,034, Cl 303-115 000

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Karapetian, Norair Garegmovich, Mkrtian, Gurgen Mambreevich, Tonoian, Oganes Avetisovich, Selmian, Mikhail Eremovich, Papazian, Nargiz Akopovna, Kazarian, Rima Azatapetovna, Petrov, Anatoly Ivanovich, Bakhtamian, Armen Alexandrovich, and Mirakian, Smbat Mirakovich, 4,035,429, Cl 260-655 000

Sellers, Troy V Bullet resistant retractable shield assembly 4,035,014 Cl 296-24 00R

Senften, David A., to Hunter Engineering Company Instrument for measuring angles and for determining vehicle wheel alignment characteristics 4,034,479, Cl 33-203 180

Senjo, Teizo, and Kobayashi, Makio, to Fuji Kasui Engineering Co Ltd., and Sumitomo Metal Industries, Ltd Process for removing sulfur oxides and or nitrogen oxides from waste gas 4,035,470 Cl 423-235 000

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Hadler, Malcolm Ronald, and Shadbolt, Roy Stanley, deceased, 4,035,505, Cl 424-281 000

Shadbolt Roy Stanley deceased *See*—

Hadler Malcolm Ronald, and Shadbolt Roy Stanley, deceased, 4,035,505 Cl 424-281 000

Shaffer Walter M *See*—

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- Shaw-Walker Company, The *See—*
  - Anderson, Clarence A F , 4,035,224, Cl 156-475 000
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- Shell Canada Limited: *See—*
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  - Stuchberry, Frederick C., and Backstrom, Alfred E., 4,035,282, Cl 208-11 0LE.
- Shell Oil Company. *See—*
  - Baumgartner, Herman J , 4,035,445, Cl 260-880 00B
  - Cowles, Christopher S., 4,035,763, Cl 340-18 0FM
  - Patterson, Maurice M , 4,034,808, Cl 166-250 000
  - Scott, Paul R , Johnston, Wilmer D , and Kyrish, Jerome L , 4,035,149, Cl 21-60 50R
- Sheller-Globe Corporation *See—*
  - Maddocks, Gerald E , 4,035,306, Cl 210-440 000
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- Shepard, Leonard F , to ILC Data Device Corporation Method and apparatus for adjusting the output frequency of a frequency source to a very high degree of precision 4,035,833, Cl 358-10 000
- Shepherd, John P G *See—*
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- Sheridon, Nicholas K , to Xerox Corporation Honeycomb display devices. 4,035,061, Cl 350-161 00S
- Sherlock, William Raymond Storage tank 4,034,887, Cl 220-219 000
- Sherman, Earle C , to Olinkraft, Inc , and Anheuser-Busch, Incorporated Tray feeder system 4,034,658, Cl 93-49 00M.
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- Shevakin, Jury Fedorovich, Bashilov, Pavel Vasilievich, Dobkin, Igor Iosifovich, Temkin, Mikhail Iosifovich, Kuznetsov, Lev Borisovich, Kotov, Vitaly Vyacheslavovich, Seidaliev, Fikrat Seidaliogly, Donskoi, Efim Moiseevich, Belkin, Valentin Vasilievich, and Prutkin, Evgeny Fedorovich Billet-storage device for drawbenches 4,034,590, Cl 72-280 000
- Shibata, Michio *See—*
  - Ohta, Ryozo, Kashihara, Jyunji, Sakaguchi, Masayuki, Nakamoto, Toshio, Yamamoto, Ikuo, and Shibata, Michio, 4,034,994, Cl 277-207 00A
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- Shimodaira, Takashi. *See—*
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  - Gomyo, Shiro, and Kodama, Ichiro, 4,035,332, Cl 260-33 2SB
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- Shinto Denki Co., Ltd.. *See—*
  - Ishii, Masaharu, 4,035,727, Cl 325-184 000
- Shirasaka, Kaname, Nakagami, Yoshihiro, Tomiyori, Takashi, Ikemoto, Masanori, and Shaura, Tsuneo, to Mitsubishi Belting, Ltd Apparatus for manufacturing bias fabric 4,034,702, Cl 118-34 000
- Shirasu, Hirotoshi, Yamashita, Hidetaka, Oonuma, Tatsumasa, and Fukuhara, Takeshi, to Hitachi, Ltd Current supply system for terminal devices. 4,035,586, Cl. 179-16.00F.
- Shiseido Co., Ltd.: *See—*
  - Kumano, Yoshimaru, 4,035,513, Cl 424-359 000
- Shiver, Harry T., and Campbell, William E , to Reynolds Metals Company. Method and apparatus for reduction cell control 4,035,251, Cl. 204-67.000.
- Short Brothers & Harland Limited *See—*
  - Fillery, William James, 4,034,937, Cl 244-3 210
- Shulman, Arnold R *See—*
  - United States of America, National Aeronautics and Space Administration, Lee, Sing H , and Shulman, Arnold R , 4,035,062, Cl 350-162 0SF
- Shumate, Starling E , II, to United States of America, Energy Research and Development Administration Filter type rotor for multistation photometer 4,035,156, Cl 23-259 000
- Shuppert, Laurence Verlan, Hanson, William Duane, and Willer, Robert Alfred, to American Can Company Total image transfer process 4,035,214, Cl 156-240 000
- Shushpan, Stanislav Mikhailovich *See—*
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  - Danneels, Laurent, Helder, Johan, Kuypers, Jan, Piolon, James, and Pernegger, Wolfgang, 4,035,245, Cl 204-15 000
  - Dieter, Georg, and Franke Harald, 4,035,580, Cl 178-50 000
  - Dietze, Wolfgang, Kasper, Andreas, and Rucha, Ulrich, 4,034,705, Cl 118-49 100
  - Dietze, Wolfgang, Kasper, Andreas, and Rucha, Ulrich, 4,035,460, Cl 264-83 000
  - Franke, Kurt, 4,035,650, Cl 250-413 000.
  - Freter, Walter, 4,035,803, Cl 343-106 00R
  - Goser, Karl, 4,035,782, Cl 340-173 0CA
  - Gross, Franz, 4,035,687, Cl 315-3 500
  - Keller, Wolfgang, and Stut, Hans, 4,035,600, Cl 219-10 570
  - Kirschner, Fritz, 4,035,825, Cl 357-38 000
  - Luxa, Gunther, Reichelt, Klaus, and Pratsch, Rudolf, 4,035,693, Cl 361-120 000
  - Meusburger, Guenther, and Runge, Hartmut, 4,035,207, Cl 156-628 000
  - Meyer, Rudolf, 4,035,645, Cl 250-355 000
  - Raab, Gunter, and Zeuch, Klaus, 4,035,154, Cl. 23-273 0SP
  - Sapunarow, Michail, and Bade, Wolfgang, 4,034,467, Cl 29-625 000
  - Schaff, Ulrich, 4,035,708, Cl 318-696 000
  - Schiffner, Gerhard, 4,035,742, Cl 331-94 50P
  - Starck, Alexander, and Postl, Wolfgang, 4,035,837, Cl 358-78 000
- Simmons, Gerald C *See—*
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- Sink, William H , and Flotow, Richard A , to Dana Corporation Clutch with friction reducing lever assembly 4,034,836, Cl 192-99 00A
- Sipos, Frank, to E R Squibb & Sons, Inc Process for producing the methyl ester of amphotericin B 4,035,567, Cl 536-4 000
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- Slagel, Roger D Sequencing valve 4,034,775, Cl 137-119 000
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- Slocum, Mahlon W , and Pachana, Henri, to Harvard Industries, Inc Microwave tuning screw assembly having positive shorting 4,035,749, Cl 333-83 00R
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- Smith, Emlyn N , and Pochet, Louis F , to Kennametal Inc Sintered cemented carbide body coated with three layers 4,035,541, Cl 428-217 000
- Smith, Glen R. Sheet metal working tool 4,034,595, Cl 72-458 000
- Smith, James W. *See—*
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  - Goldberg, Paul R , 4,034,744, Cl. 128-2 00V
- Smith, Lewis M. Inner spring construction for mattresses, cushions and the like 4,034,429, Cl 5-256.000.
- Smith, Marjorie Ann M Trailer 4,035,015, Cl 296-28.00R
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  - Stange, Klaus K ; Smith, Richard E., Hamlin, Thomas J , and Cassano, James R , 4,034,869, Cl. 214-16.40R.
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- Snam Progetti, S p A.. *See—*
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- Snider, Ray S Internal combustion engine with rotating chambers 4,034,718, Cl 123-8 450
- Sniderman, Ken Edward Magnetic game board and playing pieces. 4,034,980, Cl 273-131 0AD
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- Snyder, Harry R , Jr , to Morton-Norwich Products, Inc N-(3,4,-dichlorophenyl)-2-phenylethenesulfonamide 4,035,421, Cl 260-556 0AR.
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- Societa' Farmaceutici Italia S p A *See—*
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- Societa Italiana Telecomunicazioni Siemens S p A *See—*
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- Societe Nationale Elf Aquitaine (Production) *See—*
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- Sokoloski, Edward B A Gate for injection mold die channel 4,034,951, Cl 249-102 000
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  - Prince, Edgar N ; and Spector, George, 4,034,807, Cl. 166-170 000
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  - Best, Donald T , and Gottschalk, Juan M , 4,035,615, Cl 235-61 11E.
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- Spiewak, John W , to Firestone Tire & Rubber Company, The Process for preparing ordered aromatic copolyamide urea polymer 4,035,344, Cl 260-77 50C
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- Sprado, Charles G , to Minnesota Mining and Manufacturing Company Image scanning system for copy machines 4,035,075, Cl 355-66 000
- Stackman, Robert W *See—*
  - Conciatori, Anthony B , and Stackman, Robert W , 4,035,437, Cl 260-857 0TW
- Stal-Laval Turbin AB *See—*
  - Larsson, Birger, 4,035,041, Cl 308-135 000
- Stalley, Anthony Donald, and Coffey, John Albert, to Quantel Limited Digital shift registers for video storage 4,035,832, Cl 358-8 000
- Stamicarbon B V *See—*
  - Fontein, Freerk J , and Dreissen, Hubert H , 4,034,861, Cl 209-10 000
- Standard Oil Company *See—*
  - Eskamani, Abolghassem, and Sanitra, Robert, 4,035,340, Cl 260-73 00R
- Standard Oil Company (Indiana) *See—*
  - Kunkel, Lorenz V , Palm, John W , Petty, Luther E , and Grekel, Howard, 4,035,474, Cl 423-574 00R
  - Lark, John C , 4,035,531, Cl 427-390 00R
  - McCaulay, David A , and Nevitt, Thomas D , 4,035,286, Cl 208-134 000
  - Paschke, Edward E , 4,035,342, Cl 260-75 00R
  - Poppe, Wassily, and Fielding, Ivor R , 4,035,528, Cl 427-195 000
  - Poppe, Wassily W , and Fielding, Ivor R , 4,035,325, Cl 260-23 00H
- Stange, Klaus K , Smith, Richard E , Hamlin, Thomas J , and Cassano, James R , to Xerox Corporation Fluid means to load and unload a vertically movable document storage rack 4,034,869, Cl 214-16 40R
- Stapleton, Edward L , and Waggoner, John B , to Caterpillar Tractor Co Filter arrangement with allowances for manufacturing tolerances 4,035,300, Cl 210-172 000
- Starck, Alexander, and Postl, Wolfgang, to Siemens Aktiengesellschaft Process and arrangement for facsimile coding 4,035 837, Cl 358-78 000
- Starks, Charles M , to Continental Oil Company Recovery of ethane and ethylene from gaseous mixtures 4,035,167, Cl 55-57 000
- Starling, James G , to Caterpillar Tractor Co Floating pin retractors for clutch pistons 4,034,834, Cl 192-85 0AA
- Staubli, Sebastian, Schiener, Lothar, and Rufenacht, Kurt, to Ciba-Geigy Corporation Process for the production of 1,3,4-thiadiazol-5(4H)-onyl dithiophosphoric acid esters 4,035,378, Cl 260-302 00E
- Staudenmayer, William J , Stephens, Curtis L , and Thompson, John R , to Eastman Kodak Company Electrophotographic apparatus having improved photoconductor regenerative structure and procedure 4,035,750, Cl 355-3 00R

- Stauffer Chemical Company *See*—
  - Brunner, Robert H., and Kraft, Paul, 4,035,571, Cl 526-275.000
  - Pitt, Leland S., 4,035,490, Cl 424-225.000
- Stedman, Robert N., to Caterpillar Tractor Co. Hitch-steering, oscillation and differential support for a mining machine or the like 4,034,822, Cl 180-51.000
- Stedman, Robert N., to Caterpillar Tractor Co. Suspended guide rollers 4,034,855, Cl 187-9.00E.
- Steelcase, Inc *See*—
  - Tyson, George F., Keeler, Robert A., and Myers, Raymond L., 4,034,864, Cl 211-50.000
- Steinert, Wolfgang *See*—
  - Milez, Wilhelm, Steinert, Wolfgang, and Ekstrom, Bo, 4,035,581, Cl 178-67.000
- Steinkuhler, Siegfried *See*—
  - Hahlbrock, Udo, Steinkuhler, Siegfried, Vagt, Heinz-Werner, Voss, Johann-Gustav, and Wantig, Ulrich, 4,035,022, Cl 299-8.000
- Stendel, Wilhelm *See*—
  - Lorenz, Walter, Hammann, Ingeborg, and Stendel, Wilhelm, 4,035,382, Cl 260-307.0DA
- Stephenne, Hubert, Villeret, Michel, and Deschenes, Pierre A., to Universite de Sherbrooke Digital converter from continuous variable slope delta modulation to pulse code modulation 4,035,724, Cl 325-38.00B
- Stephens, Curtis L., *See*—
  - Staudenmayer, William J., Stephens, Curtis L., and Thompson, John R., 4,035,750, Cl 355-3.00R
- Stephens, Milton Lewis, to Textron, Inc Molded top stop and apparatus and method of manufacture 4,034,445, Cl 24-205.11F
- Sternberg, Jacob, and Freund, Robert W., to Veripen, Inc Method and apparatus for recording a signature. 4,035,769, Cl. 340-146.3SY
- Stetter, Hermann, and Kuhlmann, Heinrich, to Bayer Aktiengesellschaft Process for the preparation of ketones 4,035,395, Cl 260-347.500
- Stevenson, Curtis A Spool holding device 4,034,930, Cl 242-106.000
- Stevenson, Donald R., to SCM Corporation. Low-shrink thermosetting polyesters 4,035,439, Cl 260-859.00R
- Stewart, Aubrey P. Golf ball putter 4,034,989, Cl 273-164.000
- Stewart, Gregory P *See*—
  - Burgis, William J., and Stewart, Gregory P., 4,034,846, Cl 198-422.000
- Stewart, James M., to Kenics Corporation Hot plastic injection bushing 4,034,952, Cl 249-105.000
- Stewart, William H., Jr *See*—
  - Klein, Norman E., and Stewart, William H., Jr., 4,034,584, Cl 68-205.00R
- Stoddard, Harold T *See*—
  - Stoddard, Richard B., and Stoddard, Harold T., 4,034,821, Cl 180-32.000
- Stoddard, Richard B., and Stoddard, Harold T Motorcycle chain drive 4,034,821, Cl 180-32.000
- Stodola, Kevin C., to Rockwell International Corporation Two phase clock synchronizing method and apparatus 4,035,663, Cl 307-208.000
- Stoldt, Stephen H., to Apollo Chemical Corporation Method of inhibiting sulfidation and modifying deposits 4,035,530, Cl 427-252.000
- Stoltz, Andries Johannes Instrument which is sensitive to accelerations 4,034,481, Cl 33-396.000
- Stopp, Peter Gordon *See*—
  - O'Rourke, John Black, and Stopp, Peter Gordon, 4,035,042, Cl 308-160.000
- Stork Brabant B V *See*—
  - van Mil, Martinus Petrus Gerardus, 4,034,440, Cl 17-24.000
- Storz, Werner *See*—
  - Marquardt, Erich, Storz, Werner, and Futterknecht, Kuno, 4,035,596, Cl 200-159.00A
- Strandlund, Gert Christer *See*—
  - Berntsson, Peder Bernhard, Brandstrom, Arne Elof, Carlsson, Enar Ingemar, Carlsson, Stig Ake Ingemar, Ek, Lars, Samuelsson, Gustav Benny Roger, Sjostrand, Sven Erik, Strandlund, Gert Christer, and Ablad, Bengt Arne Hjalmar, 4,035,420, Cl 260-553.00A
- Straub, John C Process of compression stressing metals to increase the fatigue strength thereof 4,034,585, Cl. 72-53.000
- Strauss, Hubert M Can for containing beverages 4,034,888, Cl 220-260.000.
- Strelitz, Robert A *See*—
  - Grier, Nathaniel, Dybas, Richard A., and Strelitz, Robert A., 4,035,174, Cl 71-67.000.
- Strindehag, Ove, and Wrangel, Erik, to Aktiebolaget Svenska Flaktfabriken Regenerative humidity and heat exchange apparatus 4,035,172, Cl 55-388.000
- Stromberg-Carlson Corporation *See*—
  - Jorgensen, Adam A., 4,034,871, Cl 211-41.000
- Stromquist, Michael Eban, and Heaney, James Joseph, to Anthony's Manufacturing Company, Inc Multi-pane window structure 4,035,608, Cl 219-218.000
- Strong, Peter F.: *See*—
  - O'Brien, John L., Perron, Robert R., and Strong, Peter F., 4,035,116, Cl 425-10.000
- Strong, Walker Albert, to PPG Industries, Inc Hydrogen peroxide stabilization with cyanoalkyl ethers of trialkanolamines 4,035,471, Cl 423-272.000
- Stubits, Marcella C., and Teng, James, to Anheuser-Busch, Incorporated Method of making chewing gum base 4,035,572, Cl 536-108.000
- Stuchberry, Frederick C., and Backstrom, Alfred E., to Shell Canada Limited, and Shell Explorer Limited Process for recovery of bitumen from a bituminous froth 4,035,282, Cl 208-11.0LE
- Sturgis, Byron E *See*—
  - Johnson, Edgar G., Jr., and Sturgis, Byron E., 4,035,642, Cl 250-328.000
- Sturni, Lance C., and Bosso, Joseph F., to PPG Industries, Inc Novel pigment grinding vehicles 4,035,275, Cl 204-181.000
- Stut, Hans *See*—
  - Keller, Wolfgang, and Stut, Hans, 4,035,600, Cl 219-10.570
- Suarato, Antonino *See*—
  - Masi, Paolo, Foglio, Maurizio, Franceschi, Giovanni, Suarato, Antonino, Cainelli, Gianfranco, and Arcamone, Federico, 4,035,362, Cl 260-243.00C
- Suda, Haruo *See*—
  - Ishida, Fujio, and Suda, Haruo, 4,035,673, Cl 310-8.900
- Sudo, Shyohei Direction changing electromagnetic device for wheeled toys 4,034,504, Cl 46-254.000
- Suehiro Seiki Company, Ltd *See*—
  - Kume, Takeshi, 4,034,737, Cl 126-271.000
- Suganuma, Tetsuya *See*—
  - Hashimoto, Kametaro, Ushitani, Kenji, Serino, Youichi, Suganuma, Tetsuya, Mitani, Seishu, and Imanishi, Kunizou, 4,035,159, Cl 75-246.000
- Sugihara, Hirosada, Watanabe, Masazumi, Motohashi, Michio, Nishikawa, Masao, and Sanno, Yasushi, to Takeda Chemical Industries, Ltd Aminotetralols 4,035,512, Cl 424-330.000
- Sugimoto, Ryoichi *See*—
  - Sagawa, Nobukazu, Uchikado, Yasuo, Hamano, Yoshiteru, Sugimoto, Ryoichi, and Mori, Sakae, 4,035,613, Cl 219-552.000
- Sugita, Toshiaki *See*—
  - Tachibana, Hiromitsu, Sasaki, Toshiaki, Sugita, Toshiaki, and Saito, Kazuo, 4,035,563, Cl 526-199.000.
- Sugiyama, Hiroshi *See*—
  - Hamada, Mitsuharu, Sugiyama, Hiroshi, Uchiyama, Hiromichi, and Katayose, Shinji, 4,034,680, Cl 104-140.000
- Suh, Nam P., and Tucker, Charles L., III, to Massachusetts Institute of Technology Method and apparatus for mixing particles. 4,034,966, Cl 259-4.00R
- Suh, Nam P., Jones, Terence J., and Sung, Nak-Ho, to Massachusetts Institute of Technology Fiber reinforced composite of high fracture toughness 4,035,550, Cl. 428-339.000
- Suketomo, Toshitaka, and Ichimura, Masaaki, to Kabushiki Kaisha Komatsu Seisakusho Hydraulic boosting apparatus in braking system 4,034,566, Cl 60-548.000
- Sullivan, James M Spectacle cleaning apparatus 4,034,432, Cl. 15-21.00C
- Sulzer Brothers Limited *See*—
  - Bucher, Robert, 4,034,782, Cl 139-85.000
- Sumikawa, Shozo, Sakaguchi, Shinichiro, and Okiura, Tomoo Process for the preparation of malic acid crystals 4,035,419, Cl. 260-535.00P
- Sumitomo Chemical Company, Limited. *See*—
  - Fujii, Yoshikazu, Kanagawa, Shuichi, and Hata, Kazuhiko, 4,035,559, Cl 526-56.000
- Sumitomo Metal Industries Ltd., *See*—
  - Kowaka, Masamichi, and Fujikawa, Hisao, 4,035,182, Cl 75-122.000
  - Senjo, Teizo, and Kobayashi, Makio, 4,035,470, Cl 423-235.000
- Sumiyoshi, Masaharu *See*
  - Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and Tanaka, Taro, 4,034,720, Cl 123-32.0SP
  - Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and Tanaka, Taro, 4,034,733, Cl 123-32.0SP
- Sundstrand Corporation *See*—
  - Hansen, Lowell D., 4,035,115, Cl 418-183.000
  - Schmohe, James Stuart, 4,035,679, Cl 310-61.000
- Sung, Nak-Ho *See*—
  - Suh, Nam P., Jones, Terence J., and Sung, Nak-Ho, 4,035,550, Cl 428-339.000
- Sunworks, Inc *See*—
  - Barber, Everett M., Jr., 4,034,738, Cl 126-271.000
- Suttie, John W *See*—
  - DeLuca, Hector F., Schnoes, Heinrich K., Suttie, John W., and Frank, Helen, 4,035,493, Cl 424-236.000
- Sutton, Richard Calvin *See*—
  - Mowrey, Rowland George, Smith, Donald Arthur, and Sutton, Richard Calvin, 4,035,187, Cl 96-60.00R
- Suyama, Toru *See*—
  - Udagawa, Masanori, and Suyama, Toru, 4,034,626, Cl 74-857.000
- Suzuki, Kunizo, to Sony Corporation Semiconductor device stabilized by an insulating layer formed on a semiconductor region having a low impurity concentration 4,035,824, Cl 357-34.000
- Suzuki, Takeo *See*—
  - Tsunoda, Ichiro, Takeuchi, Satoshi, Hirao, Yoichiro, Suzuki, Takeo, Nishiue, Yoshihiro, Tadokoro, Katsumasa, Fukagawa, Toshimasa, Harada, Isamu, Misawa, Akira, and Watanabe, Kazuo, 4,035,060, Cl 350-160.0LC
- Suzuki, Taro *See*—
  - Ishii, Takami, Suzuki, Taro, Takikawa, Naohisa, Tokunaga, Kiyoaki, Arima, Choji, and Kojima, Hiroshi, 4,035,338, Cl 260-67.0FP

- Svoboda, Vratislav, and Kleinmann, Imrich, to Ustav pro vyzkum, vyrobu a vyuziti radiosotopu Stabilized plasmatron 4,035,684, Cl 313-231.400
- Swafford, Homer L., to Thorneburg Hosiery Mill, Inc Sock with plate and float pattern and method 4,034,581, Cl 66-180.000
- Sweet, Ronald Lancelot, to Du Pont de Nemours, E. I., and Company Eutectic process for preparing polychloro copper phthalocyanine 4,035,383, Cl 260-314.500
- Swinehart, Merle R *See*—
  - Luy, William R., and Swinehart, Merle R., 4,035,692, Cl 361-103.000
- Symons Corporation *See*—
  - Cody, David L., 4,034,957, Cl 249-189.000
- Syntex (U S A) Inc *See*—
  - Nelson, Peter H., and Untch, Karl G., 4,035,509, Cl 424-317.000
- Szakacs, Gabor L *See*—
  - Dash, Glen R., Agans, David J., and Szakacs, Gabor L., 4,034,983, Cl 273-85.00R
- Szasz, Kalman *See*—
  - Lorincz, Csaba, Karpati, Egon, Szporny, Laszlo, Szasz, Kalman, and Kisfaludy, Lajos, 4,035,370, Cl 260-293.530
- Szentmiklosi, Peter, Meszaros, Zoltan, Tardos, Laszlo, Hermecz, Istvan, Erdelyi, Ilona, David, Agoston, Vassari nee Debreczy, Lelle, and Horvath, Agnes, to Chinoin Gyogyszer-es Vegyeszeti Termekek Gyara RT 1-Benzal-1,2,3,4 tetrahydro-isoquinolinium-theophylline-7-acetates 4,035,366, Cl 260-253.000
- Szoke, Abraham, and Nebenzahl, Isaiah Isotope separation 4,035,638, Cl 250-251.000
- Szporny, Laszlo *See*—
  - Lorincz, Csaba, Karpati, Egon, Szporny, Laszlo, Szasz, Kalman, and Kisfaludy, Lajos, 4,035,370, Cl 260-293.530
- Tachibana, Hiromitsu, Sasaki, Toshiaki, Sugita, Toshiaki, and Saito, Kazuo, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha Method of suspension polymerizing vinyl chloride with salts of nitrous acids and polyvalent metal salts 4,035,563, Cl 526-199.000
- Tacke, Peter. *See*—
  - Nielinger, Werner, Dhein, Rolf, Schneider, Kurt, and Tacke, Peter, 4,035,438, Cl 260-857.00G
- Tadokoro, Katsumasa *See*—
  - Tsunoda, Ichiro, Takeuchi, Satoshi, Hirao, Yoichiro, Suzuki, Takeo, Nishiue, Yoshihiro, Tadokoro, Katsumasa, Fukagawa, Toshimasa, Harada, Isamu, Misawa, Akira, and Watanabe, Kazuo, 4,035,060, Cl 350-160.0LC
- Tagami, Katsutoshi *See*—
  - Kawamoto, Takato, Katauchi, Tsutomu, Narumi, Eizi, and Tagami, Katsutoshi, 4,035,713, Cl 322-28.000
- Tagawa, Kenkichi *See*—
  - Tsuda, Shinichi, Nakajo, Yoshio, Tagawa, Kenkichi, Hirai, Hayami, and Takagi, Shunji, 4,035,140, Cl 432-60.000
- Taguchi, Eiji, and Kimura, Kenji, to Honda Giken Kogyo Kabushiki Kaisha Exhaust reaction apparatus for internal combustion engine having in-line cylinders 4,034,562, Cl 60-282.000
- Taguchi, Shinji, to Canon Kabushiki Kaisha Method for manufacturing a convex or concave lapping tool 4,035,160, Cl 51-295.000
- Taintor, Oliver E Manually controlled semi-automatic step gear transmission 4,034,625, Cl 74-769.000
- Takagi, Haruyuki, Yamashita, Hisakuni, and Yufu, Korenobu, to Yokohama Rubber Co Ltd., The Granular matter feeding method and apparatus therefor 4,034,847, Cl 198-505.000
- Takagi, Katsuhiro *See*—
  - Fukaya, Firokazu, and Takagi, Katsuhiro, 4,035,744, Cl 331-111.000
- Takagi, Shunji *See*—
  - Tsuda, Shinichi, Nakajo, Yoshio, Tagawa, Kenkichi, Hirai, Hayami, and Takagi, Shunji, 4,035,140, Cl 432-60.000
- Takahashi, Akira, to Ricoh Co., Ltd Display unit for luminous data of a single lens reflex camera 4,035,815, Cl 354-53.000
- Takahashi, Koichi, Hitomi, Nobuteru, and Kizu, Taisuke, to Nissan Motor Co., Ltd Constant velocity universal joint 4,034,576, Cl 64-21.000
- Takahashi, Kozo *See*—
  - Odo, Keijiro, Ichikawa, Eiichi, Tamazawa, Kazuharu, and Takahashi, Kozo, 4,035,252, Cl 204-74.000
- Takeda Chemical Industries, Ltd *See*—
  - Oka, Yoshikazu, Tomimoto, Mitsumi, and Chiba, Sukehiro, 4,035,363, Cl 260-244.00R
  - Sugihara, Hirosada, Watanabe, Masazumi, Motohashi, Michio, Nishikawa, Masao, and Sanno, Yasushi, 4,035,512, Cl 424-330.000
- Takeda, Shuji *See*—
  - Kouchi, Akihiko, Takeda, Shuji, and Takeshita, Hiroshi, 4,034,550, Cl 58-50.00R
- Takeshita, Hiroshi *See*—
  - Kouchi, Akihiko, Takeda, Shuji, and Takeshita, Hiroshi, 4,034,550, Cl 58-50.00R
- Takeuchi, Masanori *See*—
  - Endo, Tadakazu, Takeuchi, Masanori, Hanada, Tuneo, Nakagawa, Kiyoshi, Komatsu, Hideo, and Nakamura, Itaru, 4,035,441, Cl 260-860.000
- Takeuchi, Satoshi *See*—
  - Tsunoda, Ichiro, Takeuchi, Satoshi, Hirao, Yoichiro, Suzuki, Takeo, Nishiue, Yoshihiro, Tadokoro, Katsumasa, Fukagawa, Toshimasa, Harada, Isamu, Misawa, Akira, and Watanabe, Kazuo, 4,035,060, Cl 350-160.0LC
- Takikawa, Naohisa *See*—
  - Ishii, Takami, Suzuki, Taro, Takikawa, Naohisa, Tokunaga, Kiyoaki, Arima, Choji, and Kojima, Hiroshi, 4,035,338, Cl 260-67.0FP
- Talmadge, Paul C *See*—
  - Socha, Edward J., and Talmadge, Paul C., 4,035,776, Cl 364-900.000
- Tamazawa, Kazuharu *See*—
  - Odo, Keijiro, Ichikawa, Eiichi, Tamazawa, Kazuharu, and Takahashi, Kozo, 4,035,252, Cl 204-74.000
- Tan, Hong Sheng *See*—
  - Verweij, Jan, Tan, Hong Sheng, and Kooreman, Hermanus Jacobus, 4,035,352, Cl 260-239.100
- Tanaka, Taro *See*—
  - Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and Tanaka, Taro, 4,034,720, Cl 123-32.0SP
  - Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and Tanaka, Taro, 4,034,733, Cl 123-32.0SP
- Tanaka, Yukiyasu *See*—
  - Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and Tanaka, Taro, 4,034,720, Cl 123-32.0SP
  - Noguchi, Masaaki, Sumiyoshi, Masaharu, Tanaka, Yukiyasu, and Tanaka, Taro, 4,034,733, Cl 123-32.0SP
- Tang, Raymond, and Burns, Richard W., to Hughes Aircraft Company Integrated microwave phase shifter and radiator module 4,035,807, Cl 343-742.000
- Taniguchi, Yasuo, and Konishi, Shinichi, to Denso Kabushiki Kaisha Narrow groove welding method, and welding apparatus for practicing the method 4,035,605, Cl 219-126.000
- Tanimura, Hirozo Magnetic recording system 4,035,843, Cl 360-35.000
- Taninaka, Kuniaki, Hirano, Akira, and Kurono, Hitoshi, to Nihon Nohyaku Co Ltd 1,3-Dithiol-2-ylidene malonic esters 4,035,387, Cl 260-327.00M
- Tardiff, Armand L., Broughton, Glover F., Delorey, David R., and Pearson, Bangt R., to USM Corporation Machines for sequencing diverse components with component separating and guiding surface 4,034,893, Cl 221-171.000
- Tardos, Laszlo *See*—
  - Szentmiklosi, Peter, Meszaros, Zoltan, Tardos, Laszlo, Hermecz, Istvan, Erdelyi, Ilona, David, Agoston, Vassari nee Debreczy, Lelle, and Horvath, Agnes, 4,035,366, Cl 260-253.000
- Tatarintsev, Vladimir Mikhailovich *See*—
  - Alexandrov, Vladimir Ilich, Gordon, Vladimir Grigorievich, Muraviev, Ernest Nikolaevich, Osiko, Vyacheslav Vasilievich, Prokhorov, Alexandr Mikhailovich, Spiridonov, Eduard Georgievich, and Tatarintsev, Vladimir Mikhailovich, 4,035,266, Cl 252-512.000
- Tate, Stanley L., Rowland, Hobby A., and Jacobs, Herbert M., to Southwire Company Method of preparing curable pellets of polyethylene 4,035,322, Cl 260-23.00H
- Tatsumi, Takashi *See*—
  - Okura, Tomoyuki, Tatsumi, Takashi, Watanabe, Hitoshi, Murayama, Hiroaki, and Kobayashi, Yoichi, 4,034,793, Cl 164-63.000
- Taylor, Allen L., to Minnesota Mining and Manufacturing Company Methods for removing charged and non-charged particles from a fluid by employing a pyrollectric filter 4,035,164, Cl 55-11.000
- Taylor, James H Golf grip molding machine 4,035,130, Cl 425-437.000
- Taylor, John Ludlum, to Intalite International Louvered ceiling 4,034,534, Cl 52-668.000
- Taylor, Maurice Ian, to Rolls-Royce (1971) Limited Sound attenuating structure 4,035,535, Cl 428-116.000
- Tchernev, Dimiter I Sorption system for low grade (solar) heat utilization 4,034,569, Cl 62-2.000
- Teach, Ted L., to Laserplane Corporation Automatic depth control for endless chain type trencher 4,034,490, Cl 37-86.000
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  - Decher, Reiner, Fromm, Eugene Howard, and Tegeler, David Charles, 4,034,604, Cl 73-147.000
- Teichert, Allen L *See*—
  - McKinney, Richard W., and Teichert, Allen L., 4,035,594, Cl 200-16.00D
- Tekno Detaljer AB *See*—
  - Lindstrom, Jan, and Nilsson, Bengt Anders Fredrik, 4,035,029, Cl 302-2.00R
- Telecommunications Radioelectriques et Telephoniques T R T *See*—
  - Guidoux, Loic Bernard Yves, 4,035,725, Cl 325-42.000
- Telkes, Maria, to University of Delaware, The Solar heating method and apparatus 4,034,736, Cl 126-270.000
- Temala, Textilmaschinenfabrik Meissner, Morgner & Co GmbH *See*—
  - Morgner, Friedrich Wilhelm, and Hock, Franz, 4,035,030, Cl 302-37.000
- Temkin, Mikhail Iosifovich *See*—
  - Shevakin, Jury Fedorovich, Bashilov, Pavel Vasilievich, Dobkin, Igor Iosifovich, Temkin, Mikhail Iosifovich, Kuznetsov, Lev Borisovich, Kotov, Vitaly Vyacheslavovich, Seidaliev, Fikrat Seidalioglly, Donskoi, Efim Moiseevich, Belkin, Valentin Vasilievich, and Prutkin, Evgeny Fedorovich, 4,034,590, Cl 72-280.000
- Teng, James *See*—
  - Stubits, Marcella C., and Teng, James, 4,035,572, Cl 536-108.000

- Tengsater, Torsten Nils, to AMF Incorporated Apparatus for measuring the internal quality of produce 4,035,636, Cl 250-223 00R
- Tension Structures Co *See—*
  - Huddle, Carl Frederick, 4,034,772, Cl 135-4 00R
- Terada, Ziro *See—*
  - Nitta, Tsuneharu, Hayakawa, Shigeru, Kasahara, Yukio, and Terada, Ziro, 4,035,819, Cl 357-10 000
- Terao, Yoshikazu, and Muto, Katsuhisa, to Victor Company of Japan, Limited Recorded video signal reproducing apparatus capable of reproducing stop motion still pictures 4,035,842, Cl 360-10 000
- Terry, John Christopher, Sebenik, Roger Frank, and Wyndham, Ronald, to Toth Aluminum Corporation Catalytic process for the reduction of aluminum chloride by manganese 4,035,180, Cl 75-68 00R
- Terumo Corporation *See—*
  - Watanabe, Masaharu, 4,035,304, Cl 210 317 000
- Teuling, Dirk Johan Adriaan, to U S Philips Corporation Television display apparatus having a video amplifier 4,035,840, Cl 358-184 000
- Texaco Inc *See—*
  - Arnold, Dan M , Paap, Hans J , and Peelman, Harold E , 4,035,640, Cl 250-266.000
  - Bunn, Dorrance P , Jr , Williams, Dale, Jones, Henry B , and MacLean, John P , 4,035,153, Cl 23-288 00B
  - Cummings, William M , 4,035,409, Cl 260-479 00S
  - Kablaoui, Mahmoud S , and Love, Richard F , 4,035,400, Cl 260-404 000
  - Widmyer, Richard H , 4,034,812, Cl 166-303 000
- Texas Dynamatics, Inc *See—*
  - Jeter, John Doise, 4,034,833, Cl 192-45 000
- Texas Instruments Incorporated *See—*
  - Cholet, Jean M , 4,035,619, Cl 235-150.200
  - Collins, Dean Robert, and Clairborne, Lewis I , 4,035,666, Cl 307-221 00D
  - Fuller, Clyde Rhea, and Battershall, Barry William, 4,035,208, Cl 156-643 000.
  - Kuo, Chang - Kiang, 4,035,662, Cl 307-205.000
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  - Schmitt, Donald J , 4,035,756, Cl 337-370 000
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  - Loeber, Donald E., 4,035,577, Cl 174-84 00C
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  - Mourier, Georges, 4,035,688, Cl 315-39 000
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  - Matsubara, Takashi; Uramoto, Yoshihito, and Matsuoka, Daizo, 4,035,436, Cl. 260-857 0TW
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  - Ishii, Takami, Suzuki, Taro, Takikawa, Naohisa, Tokunaga, Kiyoaki, Arima, Choji, and Kojima, Hiroshi, 4,035,338, Cl 260-67 0FP
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  - Glenn, Robert G., 4,035,101, Cl 415-160 000
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  - Wehrli, Henry A, III, and Malick, Franklin S, 4,034,856, Cl 187-29 00R
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- Wyndham, Ronald *See—*
  - Terry, John Christopher, Sebenik, Roger Frank, and Wyndham, Ronald, 4,035,180, Cl 75-68 00R
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  - Kashyap, Satish C, and Wyslouzil, Walter, 4,035,599, Cl. 219-10 55B
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  - Blossey, Daniel F, and Pond, Stephen F, 4,035,810, Cl 346-74 100
  - Chang, Louis H, 4,035,781, Cl 364-900 000
  - Davidson, James R, Hanson, William J, and Wilson, Stephen K, 4,034,701, Cl 118-7 000
  - Deetz, David R, Fisk, Bernard C, and Donohue, James M, 4,035,072, Cl 355-14 000.
  - Del Vecchio, George, 4,035,073, Cl 355-24 000
  - Fraser, Lawrence J, Parker, Delmer G, and Scaletta, Joseph L, 4,034 709, Cl 118-658 000
  - Hammond, Thomas J, 4,035,070, Cl 355-3 00R
  - Mammino, Joseph, and Jossel, Franklin, 4,035,310, Cl 252-62 10P
  - Moriconi, Joseph H, and Burrows, Louis H, Jr, 4,035,520, Cl 427-19 000
  - Moser, Rabin, 4,034,706, Cl 118-60 000
  - Plaza, Mario G, and Trezise, Richard D, 4,034,935, Cl 242-197 000
  - Rawson, Eric G, 4,035,068, Cl 353-122 000
  - Sheridon, Nicholas K, 4,035,061, Cl 350-161 00S
  - Stange, Klaus K, Smith, Richard E, Hamlin, Thomas J, and Cassano, James R, 4,034,869, Cl 214-16 40R
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  - Haerr, Raymond H, 4,034,759, Cl 128-260 000
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  - Kvaternik, Joseph, 4,035,723, Cl 324 158 00P
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- Yager, William Henry, to Bendix Corporation, The Valve seat concentricity gage 4,034,478, Cl 33-181 0AT
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  - Hara, Ryoichi, and Yajima, Masamichi, 4,034,933, Cl. 242-129 800
- Yamaguchi, Hiroaki *See—*
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  - Ohta, Ryozo, Kashihara, Jyunji, Sakaguchi, Masayuki, Nakamoto, Toshio, Yamamoto, Ikuo, and Shibata, Michio, 4,034,994, Cl. 277-207 00A
- Yamamura, Kazuaki *See—*
  - Okamoto, Kiyoshi, Kiriyama, Shizuo, Obayashi, Ichiro; Yamamura, Kazuaki, and Senoo, Masaaki, 4,035,183, Cl. 75 129 000
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  - Odo, Keijiro, Ichikawa, Eiichi, Tamazawa, Kazuharu, and Takahashi, Kozo, 4,035,252, Cl 204-74 000
- Yamashita, Hidetaka. *See—*
  - Shirasu, Hirotoshi, Yamashita, Hidetaka, Oonuma, Tatsumasa, and Fukuhara, Takeshi, 4,035,586, Cl 179-16 00F
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- Yanda, Roman L Self-defense device 4,034,497, Cl 42-1 00G
- Yang, Hsun-kuang, to B F Goodrich Company, The Two-step polymerization process and product thereof 4,035,444, Cl 260-878 00B.
- Yang, Wen-ching, Vidt, Edward J., and Kearns, Dale L, to United States of America, Energy Research and Development Administration. Distribution plate for recirculating fluidized bed 4,035,152, Cl 23-284 000
- Yano, Takashi, to Ricoh Company, Ltd Exposure and development system for electrophotography 4,035,069, Cl 355-3 00R
- Yarris, William T, to Towmotor Corporation Self-aligning wheel mounting structure 4,035,040, Cl 308-72 000
- Yarrow, Christopher John, Johnson, Ronald, and Doyle, James Patrick, to Lucas Industries Limited Electrical generating apparatus. 4,035,712, Cl 322-24 000
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- Yokoyama, Kenji, to Nippon Gakki Seizo Kabushiki Kaisha Operation-delayed switching circuit 4,035,669, Cl 307-293 000
- Yokoyama, Yoshio, Yoshikawa, Junzo, and Ota, Harutoshi, to Nihon Joryu Kogyo Co, Ltd Process for the preparation of 1,4-naphthoquinone 4 035,399, Cl 260-396 00R
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- Yu, Quin Shen, to United States Steel Corporation Remote-controlled infinitely adjustable roll stand 4,034,797, Cl 164-282 000
- Yu, Ruey J *See—*
  - Van Scott, Eugene J, and Yu, Ruey J, 4,035,510, Cl. 424-325 000
- Yuan, Sun-Shine *See—*
  - Bodor, Nicolae S, and Yuan, Sun-Shine, 4,035,405, Cl 260-479 00R

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  Craigen, William J S , Zawidzki, Tadeusz W , Smart, Bruce C , and Melvanin, Frank W , 4,035,468, Cl 423-15.000

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  Arakelov, Mikhail Alexandrovich, Gersamia, Eduard Galaktionovich, Zedgenidze, Tengiz Grigorievich, and Nozadze, Gennady Pavlovich, 4,034,455, Cl 29-736 000

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  Fritsch, Kenneth L., 4,035,524, Cl 427-68 000.

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  Busing, Walter, Richert, Hans, Weist, Martin, and Zirngiebl, Eberhard, 4,035,771, Cl 340-151.000

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  Lenhart, Ronald A , and Rickard, Timothy W., 4,035,637, Cl 250-231 00P

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B 24,017	3,914,140	Oct 21, 1975	B 287,275	3,925,141	Dec 9, 1975
B 24,018	3,914,206	Oct 21, 1975	B 287,373	3,918,568	Nov 11, 1975
B 64,868	3,914,141	Oct 21, 1975	B 288,018	3,925,239	Dec 9, 1975
B 78,331	3,914,142	Oct 21, 1975	B 288,627	3,916,179	Oct 28, 1975
B 112,422	3,913,484	Oct 21, 1975	B 288,638	3,925,132	Dec 9, 1975
B 150,560	3,913,654	Oct 21, 1975	B 289,175	3,924,309	Dec 9, 1975
B 176,995	3,915,773	Oct 28, 1975	B 289,471	3,917,184	Nov 4, 1975
B 178,475	3,944,602	Mar 16, 1976	B 289,523	3,921,166	Nov 18, 1975
B 189,772	3,925,367	Dec 9, 1975	B 289,883	3,925,063	Dec 9, 1975
B 189,773	3,925,405	Dec 9, 1975	B 290,328	3,924,838	Dec 9, 1975
B 190,679	3,925,346	Dec 9, 1975	B 291,104	3,925,007	Dec 9, 1975
B 198,810	3,916,043	Oct 28, 1975	B 291,694	3,925,339	Dec 9, 1975
B 204,161	3,924,605	Dec 9, 1975	B 292,054	3,915,877	Oct 28, 1975
B 207,272	3,914,123	Oct 21, 1975	B 292,126	3,914,465	Oct 21, 1975
B 211,786	3,914,300	Oct 21, 1975	B 292,140	3,914,340	Oct 21, 1975
B 213,211	3,925,269	Dec 9, 1975	B 292,300	3,927,167	Dec 16, 1975
B 220,683	3,914,471	Oct 21, 1975	B 292,563	3,923,653	Dec 2, 1975
B 222,188	3,914,739	Oct 21, 1975	B 293,378	3,923,725	Dec 2, 1975
B 223,621	3,925,526	Dec 9, 1975	B 293,437	3,913,414	Oct 21, 1975
B 224,323	3,925,476	Dec 9, 1975	B 294,103	3,924,396	Dec 9, 1975
B 233,383	3,925,424	Dec. 9, 1975	B 294,579	3,916,737	Nov 4, 1975
B 233,741	3,925,326	Dec 9, 1975	B 294,673	3,916,023	Oct 28, 1975
B 235,011	3,925,086	Dec 9, 1975	B 295,481	3,921,593	Nov 25, 1975
B 235,925	3,924,949	Dec. 9, 1975	B 295,674	3,916,107	Oct 28, 1975
B 236,609	3,925,187	Dec 9, 1975	B 295,860	3,923,880	Dec 2, 1975
B 237,953	3,924,051	Dec. 2, 1975	B 299,267	3,917,106	Nov 4, 1975
B 239,289	3,922,711	Nov. 25, 1975	B 300,353	3,921,734	Nov 25, 1975
B 241,433	3,923,711	Dec 2, 1975	B 302,271	3,929,130	Dec 30, 1975
B 245,194	3,919,179	Nov 11, 1975	B 302,692	3,924,598	Dec 9, 1975
B 248,916	3,920,862	Nov. 18, 1975	B 302,836	3,923,573	Dec 2, 1975
B 251,109	3,914,148	Oct. 21, 1975	B 302,998	3,928,233	Dec 23, 1975
B 251,635	3,914,149	Oct. 21, 1975	B 303,011	3,930,188	Dec 30, 1975
B 252,947	3,923,803	Dec 2, 1975	B 303,702	3,914,131	Oct 21, 1975
B 254,211	3,917,677	Nov 4, 1975	B 304,687	3,924,783	Dec 9, 1975
B 254,708	3,923,878	Dec. 2, 1975	B 305,417	3,915,882	Oct 28, 1975
B 255,756	3,923,781	Dec. 2, 1975	B 305,868	3,921,463	Nov 25, 1975
B 256,334	3,924,988	Dec 9, 1975	B 305,881	3,923,478	Dec 2, 1975
B 256,936	3,925,513	Dec. 9, 1975	B 306,655	3,924,642	Dec 9,1975
B 258,687	3,914,221	Oct 21, 1975	B 306,829	3,925,411	Dec 9, 1975
B 259,236	3,924,874	Dec 9, 1975	B 306,938	3,916,050	Oct 28, 1975
B 259,274	3,928,688	Dec 23, 1975	B 307,677	3,915,276	Oct 28, 1975
B 260,455	3,925,634	Dec. 9, 1975	B 308,661	3,924,349	Dec 9, 1975
B 260,945	3,925,250	Dec 9, 1975	B 308,892	3,919,624	Nov 11, 1975
B 261,378	3,913,468	Oct. 21, 1975	B 309,207	3,914,743	Oct 21, 1975
B 261,828	3,925,551	Dec. 9, 1975	B 309,499	3,922,002	Nov 25, 1975
B 262,241	3,925,528	Dec 9, 1975	B 309,681	3,927,374	Dec 16, 1975
B 262,287	3,921,209	Nov. 18, 1975	B 309,755	3,919,468	Nov 11, 1975
B 262,378	3,914,410	Oct 21, 1975	B 309,756	3,914,136	Oct 21, 1975
B 262,599	3,925,323	Dec 9, 1975	B 309,860	3,922,485	Nov 25, 1975
B 264,257	3,928,665	Dec 23, 1975	B 310,149	3,924,705	Dec 9, 1975
B 264,833	3,923,566	Dec 2, 1975	B 310,271	3,923,689	Dec 2, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 310,740	3,985,686	Oct 12, 1976
B 265,727	3,914,479	Oct 21, 1975	B 311,313	3,925,142	Dec 9, 1975
B 265,862	3,915,915	Oct 28, 1975	B 311,317	3,918,975	Nov 11, 1975
B 266,195	3,923,599	Dec 2, 1975	B 311,413	3,925,515	Dec 9, 1975
B 269,673	3,914,377	Oct 21, 1975	B 311,910	3,924,357	Dec 9, 1975
B 270,089	3,923,875	Dec 2, 1975	B 311,977	3,925,233	Dec 9,1975
B 271,104	3,925,400	Dec 9, 1975	B 312,139	3,925,530	Dec 9, 1975
B 274,945	3,924,992	Dec 9, 1975	B 312,477	3,923,714	Dec 2, 1975
B 275,426	3,925,168	Dec. 9, 1975	B 313,098	3,925,045	Dec 9, 1975
B 276,271	3,916,028	Oct 28, 1975	B 313,531	3,925,548	Dec 9, 1975
B 276,560	3,916,030	Oct 28, 1975	B 313,594	3,924,626	Dec 9, 1975
B 276,993	3,948,823	Apr 6, 1976	B 313,900	3,915,932	Oct 28, 1975
B 277,449	3,924,048	Dec 2, 1975	B 314,049	3,920,588	Nov 18, 1975
B 278,491	3,921,170	Nov 18, 1975	B 314,255	3,923,764	Dec 2, 1975
B 278,991	3,914,469	Oct 21, 1975	B 314,271	3,921,845	Nov 25, 1975
B 279,583	3,923,749	Dec 2, 1975	B 314,489	3,925,016	Dec 9, 1975
B 280,015	3,925,378	Dec 9, 1975	B 314,800	3,930,087	Dec 30, 1975
B 280,395	3,919,604	Nov 11, 1975	B 314,977	3,923,459	Dec 2, 1975
B 281,341	3,920,643	Nov 18, 1975	B 315,363	3,920,673	Nov 18, 1975
B 281,943	3,924,013	Dec 2, 1975	B 315,397	3,923,963	Dec 2, 1975
B 282,081	3,913,483	Oct 21, 1975	B 315,731	3,914,108	Oct 21, 1975
B 282,252	3,924,997	Dec 9, 1975	B 316,014	3,920,861	Nov 18, 1975
B 282,390	3,924,576	Dec 9,1975	B 316,239	3,913,546	Oct 21, 1975
B 282,819	3,982,932	Sep 28, 1976	B 316,422	4,016,206	Apr 19, 1977
B 283,124	3,923,512	Dec 2, 1975	B 316,917	3,925,494	Dec 9, 1975
B 283,300	3,925,011	Dec 9, 1975	B 317,080	3,925,324	Dec 9, 1975
B 284,297	3,913,722	Oct 21, 1975	B 317,347	3,923,552	Dec 2, 1975
B 284,427	3,952,812	Apr 27, 1976	B 317,624	3,925,167	Dec 9, 1975
B 285,200	3,923,680	Dec 2, 1975	B 318,122	4,026,905	May 31, 1977
B 285,796	3,914,303	Oct 21, 1975	B 318,195	3,915,699	Oct 28, 1975
B 286,499	3,914,129	Oct 21, 1975	B 318,618	3,915,365	Oct 28, 1975
B 286,614	3,924,696	Dec 9, 1975	B 318,640	3,925,186	Dec 9, 1975
B 286,913	3,928,696	Dec 23, 1975	B 318,745	3,916,571	Nov 4, 1975
B 287,164	3,914,139	Oct 21, 1975	B 319,226	3,925,082	Dec 9, 1975
B 287,270	3,924,825	Dec 9, 1975	B 319,339	3,916,056	Oct 28, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 319,402	3,919,568	Nov 11, 1975	B 345,390	3,940,343	Feb. 24, 1976
B 319,414	3,928,666	Dec 23, 1975	B 345,422	3,914,392	Oct 21, 1975
B 320,261	3,924,033	Dec 2, 1975	B 345,527	3,927,365	Dec 16, 1975
B 320,452	3,925,083	Dec 9, 1975	B 345,567	3,913,985	Oct 21, 1975
B 320,603	3,915,571	Oct 28, 1975	B 346,044	3,988,405	Oct. 26, 1976
B 321,018	3,921,623	Nov 25, 1975	B 346,145	3,913,293	Oct 21, 1975
B 321,101	3,917,163	Nov 4, 1975	B 346,210	3,916,142	Oct. 28, 1975
B 321,938	3,923,889	Dec 2, 1975	B 346,350	3,915,824	Oct 28, 1975
B 322,182	3,925,390	Dec 9, 1975	B 346,487	3,927,406	Dec. 16, 1975
B 322,239	3,920,973	Nov 18, 1975	B 346,585	3,913,820	Oct 21, 1975
B 322,564	3,914,373	Oct 21, 1975	B 346,613	3,923,545	Dec 2, 1975
B 322,621	3,920,863	Nov 18,1975	B 346,901	3,915,583	Oct 28, 1975
B 322,777	3,924,382	Dec 9, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,127	3,923,967	Dec 2, 1975	B 348,383	3,923,452	Dec 2, 1975
B 323,191	3,914,566	Oct 21, 1975	B 348,495	3,914,654	Oct. 21, 1975
B 323,203	3,916,165	Oct 28, 1975	B 348,558	3,914,109	Oct 21, 1975
B 323,568	3,920,536	Nov 18, 1975	B 349,141	3,915,363	Oct. 28, 1975
B 323,666	3,924,568	Dec 9, 1975	B 349,177	3,914,033	Oct 21, 1975
B 324,495	3,928,664	Dec 23, 1975	B 349,231	3,915,831	Oct 28, 1975
B 324,503	3,928,524	Dec 23, 1975	B 349,321	3,916,103	Oct. 28, 1975
B 324,505	3,925,294	Dec 9, 1975	B 349,948	3,914,557	Oct 21, 1975
B 324,739	3,924,990	Dec 9, 1975	B 350,025	3,927,415	Dec. 16, 1975
B 324,879	3,923,538	Dec 2, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 325,102	3,924,355	Dec 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,261	3,921,304	Nov 25,1975	B 350,245	3,914,331	Oct 21, 1975
B 326,514*	3,925,080	Dec 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,109	3,925,350	Dec 9, 1975	B 350,589	3,927,419	Dec. 16, 1975
B 327,363	3,923,504	Dec 2, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,612	3,925,620	Dec 9, 1975	B 350,843	3,915,461	Oct. 28, 1975
B 327,674	3,918,540	Nov 11, 1975	B 351,055	3,914,074	Oct 21, 1975
B 327,899	3,925,674	Dec 9, 1975	B 351,218	3,914,186	Oct 21, 1975
B 328,164	3,914,703	Oct 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,200	3,916,031	Oct 28, 1975	B 351,348	3,923,563	Dec 2, 1975
B 328,205	3,914,106	Oct 21, 1975	B 351,421	3,914,733	Oct 21, 1975
B 328,210	3,914,275	Oct 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,870	3,916,486	Nov 4, 1975	B 351,535	3,915,239	Oct. 28, 1975
B 329,115	3,924,727	Dec 9, 1975	B 351,665	3,919,701	Nov. 11, 1975
B 329,476	3,920,562	Nov 18, 1975	B 351,672	3,914,000	Oct 21, 1975
B 329,612	3,925,128	Dec 9, 1975	B 351,735	3,913,385	Oct. 21, 1975
B 329,787	3,920,688	Nov 18, 1975	B 351,863	3,914,700	Oct 21, 1975
B 329,816	3,923,947	Dec 2, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 330,536	3,925,452	Dec 9, 1975	B 351,926	3,914,133	Oct 21, 1975
B 330,828	3,913,589	Oct 21, 1975	B 351,939	3,913,480	Oct 21, 1975
B 331,417	3,914,157	Oct 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,557	3,916,577	Nov 4, 1975	B 352,934	3,913,692	Oct 21, 1975
B 331,895	3,916,403	Oct 28, 1975	B 352,950	3,922,590	Nov 25, 1975
B 332,527	3,924,017	Dec 2, 1975	B 352,965	3,921,926	Nov 25, 1975
B 332,811	3,924,359	Dec 9, 1975	B 353,317	3,916,446	Nov 4 1975
B 333,876	3,921,208	Nov 18, 1975	B 353,387	3,924,404	Dec 9, 1975
B 333,928	3,927,172	Dec 16, 1975	B 353,546	3,913,273	Oct 21, 1975
B 334,251	3,924,719	Dec 9, 1975	B 354,008	3,925,081	Dec 9, 1975
B 334,868	3,919,469	Nov 11, 1975	B 354,098	3,925,547	Dec. 9, 1975
B 334,985	3,923,912	Dec 2, 1975	B 354,145	3,927,279	Dec 16, 1975
B 335,670	3,928,686	Dec 23, 1975	B 354,296	3,914,580	Oct 21, 1975
B 335,741	3,925,615	Dec. 9, 1975	B 354,510	3,928,658	Dec 23, 1975
B 335,773	3,920,953	Nov 18, 1975	B 354,889	3,913,204	Oct 21, 1975
B 336,129	3,923,606	Dec 2, 1975	B 354,979	3,914,251	Oct 21, 1975
B 336,243	3,925,422	Dec 9, 1975	B 355,095	3,925,656	Dec. 9, 1975
B 336,345	3,925,179	Dec 9, 1975	B 355,269	3,914,561	Oct 21, 1975
B 336,652	3,914,211	Oct 21, 1975	B 355,510	3,913,704	Oct 21, 1975
B 336,902	3,918,897	Nov 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,946	3,919,425	Nov 11, 1975	B 355,876	3,925,685	Dec 9, 1975
B 336,978	3,923,968	Dec 2, 1975	B 356,032	3,928,636	Dec 23, 1975
B 337,235	3,919,386	Nov 11, 1975	B 356,253	3,925,025	Dec. 9, 1975
B 337,409	3,925,258	Dec 9, 1975	B 356,602	3,927,393	Dec 16, 1975
B 337,442	3,913,658	Oct 21, 1975	B 356,724	3,924,586	Dec 9, 1975
B 337,703	3,914,690	Oct. 21, 1975	B 357,039	3,924,406	Dec 9, 1975
B 337,787	3,923,506	Dec 2, 1975	B 357,057	3,913,738	Oct 21, 1975
B 339,059	3,924,822	Dec 9, 1975	B 357,131	3,924,453	Dec 9, 1975
B 339,218	3,925,121	Dec 9, 1975	B 357,402	3,914,180	Oct 21, 1975
B 339,699	3,933,527	Jan 20, 1976	B 357,682	3,924,973	Dec 9, 1975
B 339,838	3,930,221	Dec 30, 1975	B 357,803	3,919,470	Nov 11, 1975
B 340,212	3,922,645	Nov 25, 1975	B 358,174	3,924,958	Dec 9, 1975
B 340,833	3,925,208	Dec 9, 1975	B 358,244	3,913,411	Oct 21, 1975
B 341,579	3,913,363	Oct 21, 1975	B 358,311	3,923,561	Dec 2, 1975
B 342,084	3,928,694	Dec 23, 1975	B 358,939	3,924,713	Dec 9, 1975
B 342,423	3,925,334	Dec 9, 1975	B 359,174	3,914,117	Oct 21, 1975
B 342,886	3,923,507	Dec 2, 1975	B 359,187	3,924,525	Dec 9, 1975
B 343,136	3,919,453	Nov 11, 1975	B 359,540	3,915,235	Oct 28, 1975
B 343,240	3,925,693	Dec 9, 1975	B 359,740	3,936,212	Feb 3, 1976
B 343,506	3,916,021	Oct 28, 1975	B 359,791	3,929,430	Dec 30, 1975
B 343,577	3,921,165	Nov 18, 1975	B 359,825	3,921,344	Nov 25, 1975
B 344,203	3,928,719	Dec 23, 1975	B 359,946	3,914,132	Oct 21, 1975
B 344,479	3,924,042	Dec 2, 1975	B 359,947	3,914,653	Oct 21, 1975
B 345,060	3,916,018	Oct 28, 1975	B 360,208	3,923,750	Dec 2, 1975
B 345,384	3,916,146	Oct 28, 1975	B 360,296	3,916,720	Nov 4, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 360,719	3,915,715	Oct 28, 1975	B 382,290	3,924,717	Dec. 9, 1975
B 360,910	3,925,696	Dec 9, 1975	B 382,783	3,919,527	Nov 11, 1975
B 361,265	3,923,569	Dec 2, 1975	B 382,798	3,924,435	Dec. 9, 1975
B 361,347	3,914,642	Oct 21, 1975	B 382,840	3,922,007	Nov 25, 1975
B 361,443	3,927,405	Dec 16, 1975	B 383,465	3,927,412	Dec. 16, 1975
B 361,569	3,914,554	Oct 21, 1975	B 383,581	3,925,318	Dec 9, 1975
B 361,604	3,922,702	Nov 25, 1975	B 383,852	3,914,246	Oct 21, 1975
B 361,734	3,915,764	Oct 28, 1975	B 384,499	3,925,135	Dec 9, 1975
B 361,743	4,035,255	July 12, 1977	B 384,658	3,913,452	Oct 21, 1975
B 361,744	4,035,254	July 12, 1977	B 384,773	3,915,416	Oct 28, 1975
B 362,589	3,914,012	Oct 21, 1975	B 385,210	3,913,406	Oct. 21, 1975
B 363,205	3,923,744	Dec 2, 1975	B 386,403	3,924,895	Dec 9, 1975
B 363,337	3,928,639	Dec 23, 1975	B 386,592	3,925,305	Dec 9, 1975
B 363,457	3,922,595	Nov 25, 1975	B 387,039	3,924,510	Dec 9, 1975
B 363,674	3,929,716	Dec 30, 1975	B 387,231	3,913,701	Oct 21, 1975
B 363,892	3,913,395	Oct. 21, 1975	B 387,361	3,927,378	Dec 16, 1975
B 363,962	3,921,826	Nov 25, 1975	B 387,687	3,918,151	Nov 11, 1975
B 364,022	3,913,499	Oct 21, 1975	B 387,761	3,914,245	Oct 21, 1975
B 364,163	3,916,092	Oct 28, 1975	B 387,790	3,925,380	Dec 9, 1975
B 364,241	3,916,668	Nov. 4, 1975	B 387,818	3,918,935	Nov 11, 1975
B 364,334	3,924,670	Dec. 9, 1975	B 388,580	3,923,712	Dec 2, 1975
B 364,528	3,919,510	Nov 11, 1975	B 389,070	3,914,171	Oct 21, 1975
B 364,786	3,921,673	Nov 25, 1975	B 389,295	3,914,631	Oct 21, 1975
B 364,910	3,925,335	Dec. 9, 1975	B 389,327	3,924,504	Dec 9, 1975
B 365,371	3,988,181	Oct 26, 1976	B 389,639	3,914,626	Oct 21, 1975
B 365,490	3,918,527	Nov 11, 1975	B 389,726	3,921,010	Nov 18, 1975
B 365,834	3,914,702	Oct 21, 1975	B 389,807	3,922,623	Nov 25, 1975
B 365,841	3,925,628	Dec 9, 1975	B 389,932	3,913,268	Oct 21, 1975
B 365,855	3,917,258	Nov. 4, 1975	B 389,933	3,913,267	Oct 21, 1975
B 366,287	3,924,946	Dec 9, 1975	B 390,679	3,913,668	Oct 21, 1975
B 366,402	3,928,053	Dec. 23, 1975	B 390,732	3,913,878	Oct. 21, 1975
B 366,589	3,914,719	Oct 21, 1975	B 390,738	4,035,343	July 12, 1977
B 367,021	3,914,752	Oct. 21, 1975	B 391,184	3,914,214	Oct 21, 1975
B 367,040	3,924,775	Dec. 9, 1975	B 391,210	3,914,220	Oct 21, 1975
B 367,661	3,914,158	Oct 21, 1975	B 391,437	3,915,416	Oct 28, 1975
B 367,739	3,923,648	Dec 2, 1975	B 391,509	3,925,175	Dec 9, 1975
B 367,812	3,924,789	Dec. 9, 1975	B 391,675	3,916,017	Oct 28, 1975
B 368,081	3,924,691	Dec 9, 1975	B 392,154	3,923,809	Dec 2, 1975
B 368,387	3,924,923	Dec 9, 1975	B 392,242	3,926,636	Dec 16, 1975
B 368,392	3,913,812	Oct 21, 1975	B 392,696	3,916,175	Oct 28, 1975
B 368,397	3,914,677	Oct. 21, 1975	B 392,732	3,914,903	Oct 21, 1975
B 368,862	3,925,549	Dec. 9, 1975	B 392,753	3,916,341	Oct 28, 1975
B 369,563	3,924,449	Dec. 9, 1975	B 392,894	3,914,763	Oct 21, 1975
B 369,607	3,923,786	Dec. 2, 1975	B 393,163	3,914,535	Oct 21, 1975
B 369,997	3,913,533	Oct. 21, 1975	B 393,347	3,985,800	Oct 12, 1976
B 370,453	3,964,101	Jun 15, 1976	B 393,970	3,914,638	Oct 21, 1975
B 370,706	3,925,242	Dec. 9, 1975	B 394,088	3,914,740	Oct 21, 1975
B 371,073	3,930,135	Dec 30, 1975	B 394,188	3,924,591	Dec. 9, 1975
B 371,085	3,923,783	Dec 2, 1975	B 394,300	3,914,159	Oct 21, 1975
B 371,787	3,921,217	Nov 18, 1975	B 394,712	3,916,306	Oct 28, 1975
B 371,805	3,914,433	Oct 21, 1975	B 395,478	3,922,577	Nov 25, 1975
B 371,836	3,923,541	Dec 2, 1975	B 395,496	3,919,435	Nov 11, 1975
B 372,823	3,924,660	Dec 9, 1975	B 395,671	3,920,418	Nov 18, 1975
B 373,051	3,914,162	Oct 21, 1975	B 395,889	3,913,190	Oct 21, 1975
B 373,297	3 924,436	Dec 9, 1975	B 396,025	3,913,869	Oct 21, 1975
B 373,326	3,920,433	Nov 18, 1975	B 396,551	3,921,929	Nov 25, 1975
B 373,428	3,915,511	Oct 28, 1975	B 397,027	3,923,736	Dec 2, 1975
B 375,220	3,920,417	Nov 18, 1975	B 397,527	3,913,488	Oct 21, 1975
B 375,652	3,921,303	Nov 25, 1975	B 397,990	3,914,848	Oct 28, 1975
B 376,504	3,914,570	Oct 21, 1975	B 398,262	3,913,481	Oct 21, 1975
B 376,654	3,922,513	Nov 25, 1975	B 398,551	3,924,924	Dec 9, 1975
B 376,742	3,924,392	Dec 9, 1975	B 398,597	3,913,743	Oct 21, 1975
B 376,799	3 913,955	Oct 21, 1975	B 398,625	3,920,996	Nov 18, 1975
B 377,172	3,918,255	Nov 11, 1975	B 399,292	3,914,810	Oct 28, 1975
B 377,683	3,924,433	Dec. 9, 1975	B 399,304	3,919,567	Nov 11, 1975
B 377,833	3,913,884	Oct 21, 1975	B 399,349	3,925,694	Dec 9, 1975
B 377,869	3,917,002	Nov 4, 1975	B 399,766	3,915,667	Oct 28, 1975
B 378,621	3,923,840	Dec 2, 1975	B 400,080	3,925,163	Dec 9, 1975
B 379,038	3,923,994	Dec 2, 1975	B 400,293	3,923,719	Dec. 2, 1975
B 379,172	3,914,379	Oct 21, 1975	B 400,310	3,915,507	Oct 28, 1975
B 379,282	3,913,462	Oct 21, 1975	B 401,133	3,924,443	Dec. 9, 1975
B 379,955	3,913,157	Oct 21, 1975	B 401,992	3,924,898	Dec 9, 1975
B 380,014	3,921,915	Nov 25, 1975	B 402,065	3,925,413	Dec 9, 1975
B 380,141	3,925,161	Dec 9, 1975	B 402,555	3,914,688	Oct 21, 1975
B 380,310	3,921,048	Nov 18, 1975	B 403,140	3,913,486	Oct 21, 1975
B 380,312	3,913,953	Oct 21, 1975	B 403,355	3,913,352	Oct 21, 1975
B 380,338	3,924,873	Dec 9, 1975	B 403,990	3,914,684	Oct 21, 1975
B 380,446	3,923,836	Dec 2, 1975	B 403,996	3,916,016	Oct 28, 1975
B 380,900	3,913,307	Oct 21, 1975	B 404,290	3,924,918	Dec 9, 1975
B 380,926	3,925,095	Dec 9, 1975	B 404,437	3,915,200	Oct 28, 1975
B 381,074	3,919,583	Nov 11, 1975	B 405,136	3,915,565	Oct 28, 1975
B 381,632	3,914,732	Oct 21, 1975	B 405,137	3,915,566	Oct 28, 1975
B 381,847	3,921,152	Nov 18, 1975	B 405,160	3,924,821	Dec 9, 1975
B 382,018	3,929,742	Dec 30, 1975	B 405,248	3,926,294	Dec 16, 1975
B 382,021	3,913,212	Oct 21, 1975	B 405,305	3,922,111	Nov 25, 1975
B 382,261	3,914,991	Oct 28, 1975	B 405,360	3,913,403	Oct 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 405,495	3,924,577	Dec. 9, 1975	B 422,949	3,921,873	Nov 25, 1975
B 405,938	3,920,109	Nov 18, 1975	B 424,415	3,919,458	Nov 11, 1975
B 406,065	3,914,199	Oct 21, 1975	B 424,462	3,920,522	Nov 18, 1975
B 406,357	3,924,529	Dec. 9, 1975	B 424,572	3,924,979	Dec 9, 1975
B 406,800	3,952,708	Apr 27, 1976	B 424,748	3,924,395	Dec 9, 1975
B 407,357	3,924,614	Dec 9, 1975	B 425,035	3,914,025	Oct 21, 1975
B 407,728	3,925,240	Dec 9, 1975	B 425,345	3,922,015	Nov 25, 1975
B 407,736	3,924,463	Dec 9, 1975	B 425,470	3,923,796	Dec 2, 1975
B 408,380	3,984,172	Oct 5, 1976	B 425,539	3,916,742	Nov 4, 1975
B 408,487	3,924,046	Dec 2, 1975	B 425,541	3,914,051	Oct 21, 1975
B 408,749	3,914,116	Oct. 21, 1975	B 425,572	3,923,822	Dec 2, 1975
B 409,026	3,925,497	Dec 9, 1975	B 425,770	3,989,817	Nov 2, 1976
B 409,220	3,915,648	Oct 28, 1975	B 427,631	3,921,433	Nov 25, 1975
B 409,251	3,922,620	Nov. 25, 1975	B 428,177	3,914,624	Oct 21, 1975
B 409,657	3,927,362	Dec. 16, 1975	B 428,795	3,921,056	Nov 18, 1975
B 409,816	3,921,317	Nov. 25, 1975	B 429,442	3,923,485	Dec. 2, 1975
B 410,062	3,923,855	Dec. 2, 1975	B 430,106	3,918,941	Nov 11, 1975
B 410,168	3,914,717	Oct 21, 1975	B 430,140	3,922,084	Nov 25, 1975
B 411,145	3,914,168	Oct. 21, 1975	B 430,385	4,001,104	Jan 4, 1977
B 411,356	3,919,649	Nov. 11, 1975	B 430,798	3,918,204	Nov 11, 1975
B 411,483	3,925,196	Dec. 9, 1975	B 430,944	3,922,096	Nov. 25, 1975
B 411,633	3,914,741	Oct 21, 1975	B 432,373	3,919,670	Nov 11, 1975
B 412,516	3,927,417	Dec. 16, 1975	B 433,587	3,914,567	Oct. 21, 1975
B 412,619	3,925,292	Dec 9, 1975	B 435,343	3,919,244	Nov 11, 1975
B 412,867	3,924,587	Dec. 9, 1975	B 435,844	3,925,170	Dec. 9, 1975
B 413,006	3,914,850	Oct 28, 1975	B 437,172	3,913,251	Oct 21, 1975
B 413,546	3,924,314	Dec. 9, 1975	B 437,173	3,924,627	Dec. 9, 1975
B 414,129	3,925,484	Dec. 9, 1975	B 437,195	3,914,618	Oct. 21, 1975
B 414,288	3,925,537	Dec 9, 1975	B 437,450	3,922,479	Nov 25, 1975
B 415,113	3,915,717	Oct. 28, 1975	B 438,053	3,916,013	Oct. 28, 1975
B 415,124	3,915,944	Oct 28, 1975	B 438,706	3,925,050	Dec. 9, 1975
B 415,845	3,925,076	Dec. 9, 1975	B 439,168	3,919,676	Nov. 11, 1975
B 415,847	3,914,208	Oct. 21, 1975	B 439,669	3,921,499	Nov. 25, 1975
B 415,957	3,925,635	Dec 9, 1975	B 440,898	3,921,789	Nov. 25, 1975
B 415,977	3,927,359	Dec 16, 1975	B 441,024	3,913,629	Oct. 21, 1975
B 416,598	3,923,473	Dec 2, 1975	B 441,416	3,913,851	Oct. 21, 1975
B 416,710	3,923,746	Dec 2, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 416,832	3,924,975	Dec. 9, 1975	B 442,859	3,918,570	Nov. 11, 1975
B 416,933	3,924,968	Dec 9, 1975	B 442,919	3,925,483	Dec. 9, 1975
B 417,299	3,918,235	Nov. 11, 1975	B 444,614	3,927,996	Dec. 23, 1975
B 418,121	3,925,023	Dec 9, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 418,153	3,925,251	Dec. 9, 1975	B 445,740	3,923,612	Dec. 2, 1975
B 418,302	3,913,252	Oct 21, 1975	B 447,417	4,024,727	May 24, 1977
B 419,327	3,921,197	Nov. 18, 1975	B 448,571	3,924,760	Dec. 9, 1975
B 419,481	3,924,970	Dec. 9, 1975	B 449,647	3,916,797	Nov. 4, 1975
B 420,016	3,914,572	Oct 21, 1975	B 450,499	3,920,526	Nov. 18, 1975
B 420,148	3,927,414	Dec. 16, 1975	B 450,546	3,924,417	Dec. 9, 1975
B 420,514	3,923,929	Dec. 2, 1975	B 450,927	3,913,844	Oct. 21, 1975
B 420,568	3,925,069	Dec 9, 1975	B 455,520	3,922,543	Nov. 25, 1975
B 421,026	3,914,785	Oct 21, 1975	B 455,775	3,914,356	Oct. 21, 1975
B 421,362	3,924,817	Dec 9, 1975	B 456,346	3,914,531	Oct 21, 1975
B 421,383	3,925,047	Dec. 9, 1975	B 459,425	3,928,773	Dec. 23, 1975
B 421,797	3,914,023	Oct. 21, 1975	B 461,872	3,919,586	Nov. 11, 1975
B 422,399	3,928,656	Dec. 23, 1975	B 467,684	3,915,119	Oct 28, 1975
B 422,467	3,924,804	Dec 9, 1975	B 468,198	3,925,340	Dec. 9, 1975

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 12TH DAY OF JULY, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice)

ACF Industries, Incorporated *See*—
Estes, Ralph M., and Wynn, Robert O., Re 29,299, Cl 137-246 220
Albright & Wilson (Mfg.) Limited *See*—
Greenfield, Stanley, Jones, Iorwerth Llewelyn William, and Berry, Christopher Thomas, Re 29,304, Cl 356-85 000
Banks, Jon F., to Brown & Williamson Tobacco Corporation Deposition of vaporized flavorant on tobacco Re 29,298, Cl 131-144 000
Bender, Mark Leslie, to Hughes Tool Company Rotary percussion earth boring bit Re 29,300, Cl 175-410 000
Berry, Christopher Thomas *See*—
Greenfield, Stanley, Jones, Iorwerth Llewelyn William, and Berry, Christopher Thomas, Re 29,304, Cl 356-85 000
Brown & Williamson Tobacco Corporation *See*—
Banks, Jon F., Re 29,298, Cl 131-144 000
Burness, Donald M., and Silverman, Robert A., to Eastman Kodak Company Hydrophilic colloid silver halide emulsion hardened with a bisvinylsulfonyl compound Re 29,305, Cl 96-67 000
Danfoss A/S *See*—
De Lepeleire, Guido Amandus, Re 29,302, Cl 251-43 000
De Lepeleire, Guido Amandus, to Danfoss A/S Bag diaphragms and bag diaphragm operated air dampers Re 29,302, Cl 251-43 000
Eastman Kodak Company *See*—
Burness, Donald M., and Silverman, Robert A., Re 29,305, Cl 96-67 000
Estes, Ralph M., and Wynn, Robert O., to ACF Industries, Incorporated Self sealing gate valve Re 29,299, Cl 137-246 220
Fraser, Redmond Power, Jr., and Woodward, Elbert A., to GAF Corporation Tennis ball including needle punched fabric cover Re 29,303, Cl 273-61 00R
GAF Corporation *See*—
Fraser, Redmond Power, Jr., and Woodward, Elbert A., Re 29,303, Cl 273-61 00R
Greenfield, Stanley, Jones, Iorwerth Llewelyn William, and Berry, Christopher Thomas, to Raydne Limited, and Albright & Wilson (Mfg.) Limited Plasma light source for spectroscopic investigation Re 29,304, Cl 356-85 000
Hiller, Montague Chemical closets Re 29,297, Cl 4-115 000
Hughes Tool Company *See*—
Bender, Mark Leslie, Re 29,300, Cl 175-410 000
International Business Machines Corporation *See*—
Kong, Ning, Re 29,301, Cl 242-182 000
Jones, Iorwerth Llewelyn William *See*—
Greenfield, Stanley, Jones, Iorwerth Llewelyn William, and Berry, Christopher Thomas, Re 29,304, Cl 356-85 000
Kong, Ning, to International Business Machines Corporation Noise muffler for magnetic tape vacuum column Re 29,301, Cl 242-182 000
Raydne Limited *See*—
Greenfield, Stanley, Jones, Iorwerth Llewelyn William, and Berry, Christopher Thomas, Re 29,304, Cl 356-85 000
Silverman, Robert A. *See*—
Burness, Donald M., and Silverman, Robert A., Re 29,305, Cl 96-67 000
Woodward, Elbert A. *See*—
Fraser, Redmond Power, Jr., and Woodward, Elbert A., Re 29,303, Cl 273-61 00R
Wynn, Robert O. *See*—
Estes, Ralph M., and Wynn, Robert O., Re 29,299, Cl 137-246 220

LIST OF PLANT PATENTEES

Anderson, Frederic W., to Stribling's Nurseries, Inc Dwarf peach tree 4,075, 7-12-77, Cl 43 000
Anderson, Frederic W. Grapevine 4,077, 7-12-77, Cl 47 000
Anderson, Fredric W., to Stark Bro's Nurseries and Orchards Co Nectarine tree 4,076, 7-12-77, Cl 41 000
Nowakowski, Richard Joseph Variegated piggy back plant 4,074, 7-12-77, Cl 88 000
Stark Bro's Nurseries and Orchards Co *See*—
Anderson, Fredric W., 4,076, Cl 41 000
Stribling's Nurseries, Inc *See*—
Anderson, Frederic W., 4,075, Cl 43 000

LIST OF DESIGN PATENTEES

AAI Corporation *See*—
Barr, Irwin R., 245,014, Cl D25-56 000
Barr, Irwin R., 245,015, Cl D25-56 000
Barr, Irwin R., 245,016, Cl D25-56 000
Aktiebolaget Optimus *See*—
Folke, William Albert, 244,985, Cl D7-110 000
Anderson, Michael G. *See*—
Segal, Charles L., Anderson, Michael G., and Vincent, David N., 245,034, Cl D34-5 0ST
Anderson, Victor F., to Bercon Packaging, Incorporated Jug 244,990, 7-12-77, Cl D9-40 000
Arima, Koichi *See*—
Hori, Makoto; Arima, Koichi and Kataoka, Tetsuro, 245,001, Cl D12-110 000
Ashworth, Robert H., to United States Steel Corporation Fence post 245,019, 7-12-77, Cl D25-77 000
Austin, Charles K., to King Pretzel Corporation Illuminated showcase for artificial soft pretzels or the like 244,981, 7-12-77, Cl D6-146 000
Avrich, Charles Pants 244,966, 7-12-77, Cl D2-28 000
Bajorek, Jay F., and Newman, Albert I. Spindle cover 245,010, 7-12-77, Cl D25-77 000
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522	4,034,623
625	4,034,624
769	4,034,625
857	4,034,626
866	4,034,627
869	4,034,628

CLASS 75

60	4,035,179
68 R	4,035,180
109	4,035,181
122	4,035,182
129	4,035,183
246	4,035,159

CLASS 76

41	4,034,629
112	4,034,630

CLASS 82

2 R	4,034,631
2 5	4,034,632
34 R	4,034,633

CLASS 83

18	4,034,634
38	4,034,635
341	4,034,637
401	4,034,636
835	4,034,638
	4,034,639

CLASS 84

478	4,034,640

CLASS 85

41	4,034,641

CLASS 87

48	4,034,642
	4,034,643

CLASS 89

33 BA	4,034,644

CLASS 90

4	4,034,645
11 64	4,034,646
20 5	4,034,647

CLASS 91

229	4,034,648
412	4,034,649
485	4,034,650
488	4,034,651
499	4,034,652
501	4,034,653
506	4,034,654

CLASS 93

12 C	4,034,655
37 R	4,034,656
39 3	4,034,657
49 M	4,034,658

CLASS 96

22	4,035,184
29 R	4,035,185
49	4,035,186
60 R	4,035,187
66 R	4,035,188
67	Re 29,305
115 R	4,035,189
127	4,035,190

CLASS 98

40 D	4,034,659

CLASS 99

289 R	4,034,660
339	4,034,661
445	4,034,662
446	4,034,663
511	4,034,664
574	4,034,665

CLASS 100

231	4,034,666

CLASS 101

27	4,034,667
35	4,034,668
91	4,034,669
148	4,034,670
451	4,034,671

CLASS 102

23	4,034,672
56 SC	4,034,673
70 2 P	4,034,674
102	4,034,675
103	4,034,676

CLASS 104

26 R	4,034,677
87	4,034,678
138 R	4,034,679
140	4,034,680

CLASS 105

225	4,034,681

CLASS 106

57	4,035,191
90	4,035,192
100	4,035,193
154 R	4,035,194
194	4,035,195
288 Q	4,035,196

CLASS 108

107	4,034,682
111	4,034,683
127	4,034,684

CLASS 109

17	4,034,685

CLASS 111

7	4,034,686
13	4,034,687
87	4,034,688

CLASS 112

68	4,034,689
121 27	4,034,690
258	4,034,691

CLASS 113

7 R	4,034,692

CLASS 114

16 1	4,034,693
106	4,034,694
268	4,034,695

CLASS 115

12 R	4,034,696

CLASS 116

100	4,034,697
124 Z	4,034,698
150	4,034,699

CLASS 118

2	4,034,700
7	4,034,701
34	4,034,702
35	4,034,703
49	4,034,704
49 1	4,034,705
60	4,034,706
407	4,034,707
642	4,034,708
658	4,034,709

CLASS 119

3	4,034,710
14 02	4,034,713
14 11	4,034,711
14 18	4,034,714
14 36	4,034,712
51 5	4,034,715
82	4,034,716

CLASS 122

359	4,034,717

CLASS 123

8 45	4,034,718
32 1 B	4,034,719
	4,034,721
	4,034,722
32 SP	4,034,720
	4,034,733
41 76	4,034,723
75 B	4,034,724
102	4,034,725
117 A	4,034,726
119 F	4,034,728
119 FC	4,034,727
122 G	4,034,729
139 AV	4,034,730
148 F	4,034,731
198 DC	4,034,732

CLASS 126

110 B	4,034,734
270	4,034,735
	4,034,736
271	4,034,737
	4,034,738
271 2 A	4,034,739

CLASS 128

1 B	4,034,740
1 C	4,034,741
1 D	4,034,742
2 A	4,034,744
2 06 F	4,034,745
2 08	4,034,743
17	4,034,746
68 1	4,034,747
87 R	4,034,748
130	4,034,749
155	4,034,750
156	4,034,751
184	4,034,752
188	4,034,753
214 R	4,034,754
216	4,034,755
260	4,034,756
	4,034,757
	4,034,758
	4,034,759
287	4,034,760
303 14	4,034,761
303 17	4,034,762
335 5	4,034,763

CLASS 131

2	4,034,764
10 A	4,034,765
140 P	4,034,766
144	Re 29,298
175	4,034,767
269	4,034,768

CLASS 132

76 4	4,034,769
90	4,034,770
91	4,034,771

CLASS 135

4 R	4,034,772

CLASS 136

89 CD	4,035,197

CLASS 137

1	4,034,773
111	4,034,774
119	4,034,775
246 22	Re 29,299
	4,034,776
318	4,034,777
344	4,034,778
	4,034,779
527 8	4,034,780

CLASS 139

46	4,034,781
85	4,034,782
436	4,034,783

CLASS 141

348	4,034,784

CLASS 144

2 Z	4,034,785
288 A	4,034,786

CLASS 148

1 5	4,035,198
	4,035,199
6 35	4,035,200
11 5 A	4,035,201
16	4,035,202
16 5	4,035,203
19	4,035,204
171	4,035,205

CLASS 150

2 1	4,034,787

CLASS 151

37	4,034,788

CLASS 152

187	4,034,789
352 R	4,034,790
361 FP	4,034,791
379 1	4,034,792

CLASS 156

3	4,035,209
54	4,035,211
187	4,035,212
231	4,033,213
240	4,035,214
245	4,035,215
273	4,035,216
279	4,035,217
289	4,035,218
290	4,035,219
291	4,035,220
299	4,035,221
423	4,035,222
443	4,035,223
475	4,035,224
540	4,035,225
628	4,035,206
	4,035,207
643	4,035,208
645	4,035,210
653	4,035,226
668	4,035,227

CLASS 162

30 R	4,035,228
164 EP	4,035,229

CLASS 164

63	4,034,793
72	4,034,794
173	4,034,795
281 R	4,034,798
282	4,034,796
	4,034,797
	4,034,799
288	4,034,800

CLASS 165

1	4,034,420
48	4,034,801
55	4,034,802
103	4,034,803
148	4,034,804
165	4,034,805

CLASS 166

117 5	4,034,806
170	4,034,807
250	4,034,808
270	4,034,809
274	4,034,810
295	4,034,811
303	4,034,812

CLASS 169

26	4,034,813

CLASS 172

59	4,034,814
809	4,034,815

CLASS 173

15	4,034,816
134	4,034,817

CLASS 174

11 R	4,035,575
68 5	4,035,576
84 C	4,035,577
178	4,035,578

CLASS 175

36 R	4,035,230
410	Re 29,300

CLASS 176

38	4,035,231
	4,035,232
78	4,035,233

CLASS 177

25	4,034,818
210 C	4,034,819

CLASS 178

50	4,035,580
67	4,035,581
69 1	4,035,601

CLASS 179

1 J	4,035,582
7 1 R	4,035,583
15 AT	4,035,584
15 BT	4,035,585
16 F	4,035,586
98	4,035,587
99	4,035,588
100 1 C	4,035,589
100 41 P	4,035,590
119 R	4,035,591
175 2 C	4,035,592

CLASS 180

5 R	4,034,820
32	4,034,821
51	4,034,822
98	4,034,823
114	4,034,824
143	4,034,825

CLASS 181

36 B	4,034,826
120	4,034,827

CLASS 182

5	4,034,828
106	4,034,829

CLASS 184

27 R	4,034,830
81	4,034,831

CLASS 187

9 F	4,034,855
29 R	4,034,856

CLASS 188

73 3	4,034,857
	4,034,858
185	4,034,859
282	4,034,860

CLASS 191

86	4,034,832

CLASS 192

45	4,034,833
85 AA	4,034,834
99 A	4,034,836
098	4,034,835

CLASS 193

37	4,034,837

CLASS 194

4 R	4,034,838
10	4,034,839
65	4,034,840

CLASS 195

5	4,035,234
31 R	4,035,235
51 G	4,035,236
66 R	4,035,237
100	4,035,238
103 5 R	4,035,239

CLASS 197

1 R	4,034,841
82	4,034,842
172	4,034,843

CLASS 198

400	4,034,844
418	4,034,845
422	4,034,846
505	4,034,847
570	4,034,848

CLASS 200

5 A	4,035,593
16 D	4,035,594
61 58 B	4,035,595
159 A	4,035,596
296	4,035,597

CLASS 202

167	4,035,240
205	4,035,241

CLASS 203

15	4,035,242
24	4,035,243

CLASS 204

15	4,035,245
	4,035,246
19	4,035,247
38 B	4,035,248
43 S	4,035,249
59 F	4,035,250
67	4,035,251
74	4,035,252
78	4,035,253
98	4,035,254
	4,035,255
99	4,035,268
145 R	4,035,256
150	4,035,269
157 1 R	4,035,270
180 P	4,035,271
181	4,035,272
	4,035,273
	4,035,274
	4,035,275
192 EC	4,035,276
195 S	4,035,277
222	4,035,278
256	4,035,279
267	4,035,280
299 R	4,035,377

CLASS 206

45 15	4,034,849
63 3	4,034,850
77 1	4,034,851
141	4,034,852
278	4,034,853
370	4,034,854

CLASS 208

8	4,035,281
11 LE	4,035,282
112	4,035,283
120	4,035,284
	4,035,285
134	4,035,286
242	4,035,287

CLASS 209

10	4,034,861
11	4,034,862
166	4,034,863
466	4,035,288

CLASS 210

11	4,035,289
14	4,035,290
23 R	4,035,291
33	4,035,292
45	4,035,293
77	4,035,294
136	4,035,295
151	4,035,296
163	4,035,297
169	4,035,298
	4,035,299
172	4,035,300
220	4,035,301
304	4,035,302
316	4,035,303
317	4,035,304
321 B	4,035,305
440	4,035,306

CLASS 211

41	4,034,871
50	4,034,864
118	4,034,865
124	4,034,866

CLASS 214

1 BB	4,034,867
8 5 G	4,034,868
16 4 R	4,034,869
17 CB	4,034,870
86 A	4,034,872
	4,034,873
140	4,034,874
141	4,034,875
152	4,034,876
305	4,034,877
374	4,034,878
450	4,034,879
510	4,034,880
730	4,034,881

CLASS 215

217	4,034,882
276	4,034,883

CLASS 219

10 55 A	4,035,598
10 55 B	4,035,599
10 57	4,035,600
72	4,035,602
121 P	4,035,603
	4,035,604
126	4,035,605
211	4,035,606
216	4,035,607
218	4,035,608
335	4,035,609
366	4,035,610
384	4,035,611
469	4,035,612
552	4,035,613

CLASS 220

8	4,034,884
22	4,034,885
72	4,034,886
219	4,034,887
260	4,034,888
306	4,034,889
334	4,034,890
339	4,034,891

CLASS 221

64	4,034,892
171	4,034,893
227	4,034,894
277	4,034,895

CLASS 222

95	4,034,896
146 C	4,034,897
228	4,034,898
321	4,034,899
	4,034,900
481 5	4,034,901

CLASS 223

85	4,034,902
96	4,034,903

CLASS 226

1	4,034,904
195	4,034,905

CLASS 228

194	4,034,906

CLASS 229

32	4,034,907
34 HW	4,034,908
41 B	4,034,909
68 R	4,034,910

CLASS 235

61 11 D	4,035,623
61 11 F	4,035,615
61 7 B	4,035,614
78 RC	4,035,616
88 N	4,035,617
92 PD	4,035,618
150 2	4,035,619
151 1	4,035,620
151 21	4,035,624
151 3	4,035,621
	4,035,622
152	4,035,625
153 BB	4,035,626
156	4,035,627
193	4,035,628
	4,035,629

CLASS 236

20 R	4,034,911

CLASS 237

1 A	4,034,912

CLASS 238

98	4,034,913

CLASS 239

96	4,034,914
171	4,034,915
373	4,034,916
453	4,034,917

CLASS 240

6 4 W	4,035,630
41 35 C	4,035,631
51 11 R	4,035,632
108 R	4,035,633

CLASS 241

36	4,034,918
39	4,034,919
101 7	4,034,920
157	4,034,921
213	4,034,922

CLASS 242

18 A	4,034,923
55 19 A	4,034,925
55 3	4,034,924
55 53	4,034,926
56 R	4,034,927
59	4,034,928
71 1	4,034,929
106	4,034,930
107 4 D	4,034,931
117	4,034,932
129 8	4,034,933
158 B	4,034,934
182	Re 29,301
197	4,034,935

CLASS 244

3 15	4,034,936
3 16	4,034,949
3 21	4,034,937
53 R	4,034,938
87	4,034,939
148	4,034,940
166	4,034,941

CLASS 246

4	4,034,942

CLASS 248

1	4,034,943
56	4,034,944
103	4,034,945
183	4,034,946
349	4,034,947
372	4,034,948

CLASS 249

46	4,034,950
102	4,034,951
105	4,034,952
117	4,034,953
135	4,034,954
137	4,034,955
180	4,034,956
189	4,034,957

CLASS 250

209	4,035,634
223 R	4,035,635
	4,035,636
231 P	4,035,637
251	4,035,638
264	4,035,639
266	4,035,640
302	4,035,641
328	4,035,642
339	4,035,643
340	4,035,644
355	4,035,645
356	4,035,646
366	4,035,647
402	4,035,648
409	4,035,649
413	4,035,650
445 T	4,035,651
462	4,035,652
475	4,035,653
491	4,035,654
492 A	4,035,655
500	4,035,656
533	4,035,657

CLASS 251

28	4,034,958
43	Re 29,302
315	4,034,959

CLASS 252

8 6	4,035,307
49 7	4,035,309
59	4,035,308
62 1 P	4,035,310
63 2	4,035,311
70	4,035,312
160	4,035,257
171	4,035,258
175	4,035,259
447	4,035,260
455 R	4,035,261
456	4,035,262
459	4,035,263
467	4,035,264
510	4,035,265
512	4,035,266
548	4,035,267

CLASS 254

10 5	4,034,960
94	4,034,961
134 3 FT	4,034,962
173 B	4,034,963

CLASS 259

4 AB	4,034,965
4 R	4,034,964
	4,034,966
6	4,034,967
158	4,034,968

CLASS 260

2 3	4,035,314
2 5 AN	4,035,313
2 5 AT	4,035,318
2 5 B	4,035,315
	4,035,316
2 5 N	4,035,317
8	4,035,319
22 CB	4,035,320
	4,035,321
23 H	4,035,322
	4,035,325
23 XA	4,035,323
	4,035,324
29 4 R	4,035,326
	4,035,327
	4,035,328
29 6 R	4,035,330
29 6 T	4,035,329
30 2	4,035,331
33 2 SB	4,035,332
40 R	4,035,333
42 21	4,035,334
42 47	4,035,336
45 75 R	4,035,335
45 85 T	4,035,337
46 5 Y	4,035,355
47 C	4,035,356
47 FT	4,035,357
53 R	4,035,358
67 FP	4,035,338
67 5	4,035,339
	4,035,432
73 R	4,035,340
75 N	4,035,341
75 P	4,035,343
75 R	4,035,342
77 5 C	4,035,344
78 R	4,035,346
78 UA	4,035,345
79 3 MU	4,035,347
112 5 LH	4,035,348
123 5	4,035,349
152	4,035,350
196	4,035,351
239 B	4,035,353
239 1	4,035,352
	4,035,354
	4,035,359
240 R	4,035,360
243 C	4,035,361
	4,035,362
244 R	4,035,363
248 AS	4,035,364
249 5	4,035,365
253	4,035,366
268 BQ	4,035,367
288 CE	4,035,368
293 53	4,035,370
293 57	4,035,371
293 6	4,035,369
293 77	4,035,372
	4,035,373
294 8 G	4,035,374
	4,035,375
295 R	4,035,376
302 F	4,035,378
302 H	4,035,390
305	4,035,379
306 6 R	4,035,380
306 7 C	4,035,381
307 DA	4,035,382
314 5	4,035,383
326 9	4,035,384
327 B	4,035,385
	4,035,386
327 M	4,035,387
340 6	4,035,388
343 2 R	4,035,391
343 3 R	4,035,392
	4,035,393
343 9	4,035,389
347 3	4,035,394
347 5	4,035,395
369	4,035,396
373	4,035,397
380	4,035,398
396 R	4,035,399

404	4,035,400
404 5	4,035,401
425	4,035,402
429 7	4,035,403
448 8 R	4,035,411
453 AR	4,035,404
454	4,035,407
465 3	4,035,410
479 R	4,035,405
479 S	4,035,409
483	4,035,406
491	4,035,408
502 5	4,035,412
505 R	4,035,413
514 D	4,035,414
	4,035,415
521 H	4,035,416
530 N	4,035,417
531 R	4,035,418
535 P	4,035,419
553 A	4,035,420
556 AR	4,035,421
559 A	4,035,422
571	4,035,423
609 F	4,035,424
613 R	4,035,426
617 A	4,035,425
618 R	4,035,427
620	4,035,428
655	4,035,429
668 C	4,035,431
668 R	4,035,430
681 5 R	4,035,433
683 15 B	4,035,434
838	4,035,435
857 G	4,035,438
857 TW	4,035,436
	4,035,437
859 R	4,035,439
	4,035,440
860	4,035,441
	4,035,442
876 R	4,035,443
878 B	4,035,444
880 B	4,035,445
890	4,035,446
	4,035,447
937	4,035,448
972	4,035,449

CLASS 261

76	4,035,450
101	4,035,451

CLASS 264

5	4,035,452
16	4,035,453
28	4,035,454
40 3	4,035,455
41	4,035,456
	4,035,457
46 4	4,035,458
49	4,035,459
81	4,035,460
89	4,035,461
	4,035,462
94	4,035,463
103	4,035,464
210 F	4,035,465
328	4,035,466
329	4,035,467

CLASS 266

82	4,034,969
216	4,034,970

CLASS 269

249	4,034,971
324	4,034,972

CLASS 270

21	4,034,973
55	4,034,974

CLASS 271

10	4,034,975
	4,034,976
174	4,034,977

CLASS 273

29 A	4,034,981
30	4,034,978
54 B	4,034,979
61 R	Re 29,303
84	4,034,982
85 R	4,034,983
	4,034,990
96 D	4,034,984
110	4,034,985
131 AD	4,034,980
134 B	4,034,986
137 R	4,034,987
138 A	4,034,988
164	4,034,989
186 A	4,034,991

CLASS 277

188 A	4,034,993
207 A	4,034,994

CLASS 280

11 23	4,034,995
80 R	4,034,996
81 A	4,034,997
461 A	4,034,999
461 R	4,034,998
610	4,035,000
626	4,035,001

CLASS 285

31	4,035,002
55	4,035,003
166	4,035,004
319	4,035,005
364	4,035,006
381	4,035,007

CLASS 290

55	4,035,658

CLASS 292

227	4,035,008
246	4,035,009

CLASS 294

81 R	4,035,010
83 R	4,034,992
86 18	4,035,011
90	4,035,012

CLASS 296

1 S	4,035,013
24 R	4,035,014
28 C	4,035,016
28 R	4,035,015
93	4,035,017

CLASS 297

180	4,035,018
239	4,035,019
258	4,035,020
369	4,035,021

CLASS 299

8	4,035,022
17	4,035,023
31	4,035,024
34	4,035,025

CLASS 301

5 R	4,035,026
13 SM	4,035,028
38 R	4,035,027

CLASS 302

2 R	4,035,029
37	4,035,030

CLASS 303

6 C	4,035,031
109	4,035,032
	4,035,033
115	4,035,034

CLASS 305

13	4,035,035
57	4,035,036

CLASS 307

84	4,035,659
141	4,035,660
	4,035,661
205	4,035,662
208	4,035,663
215	4,035,664
221 D	4,035,665
	4,035,666
	4,035,667
293	4,035,668
	4,035,669
300	4,035,670

CLASS 308

5 R	4,035,037
8 2	4,035,039
9	4,035,038
72	4,035,040
135	4,035,041
160	4,035,042
174	4,035,043
183	4,035,044

CLASS 310

8 6	4,035,671
8 7	4,035,672
8 9	4,035,673
9 5	4,035,674
9 8	4,035,675
42	4,035,676
	4,035,677
52	4,035,678
61	4,035,679
168	4,035,680

CLASS 313

110	4,035,681
174	4,035,682
184	4,035,683
231 4	4,035,684
346 R	4,035,685
503	4,035,686

CLASS 315

3 5	4,035,687
39	4,035,688
169 TV	4,035,689
	4,035,690
246	4,035,691

CLASS 318

52	4,035,698
138	4,035,699
	4,035,700
226	4,035,701
285	4,035,702
345 B	4,035,703
358	4,035,704
564	4,035,705
572	4,035,706
628	4,035,707
696	4,035,708

CLASS 320

23	4,035,709

CLASS 322

24	4,035,712
28	4,035,713
	4,035,714

CLASS 323

4	4,035,715
20	4,035,716
43 5 R	4,035,717

CLASS 324

5 G	4,035,718
30 R	4,035,719
33	4,035,720
37	4,035,721
158 P	4,035,722
	4,035,723

CLASS 325

38 B	4,035,724
42	4,035,725
65	4,035,726
184	4,035,727
304	4,035,728
	4,035,729
348	4,035,730
361	4,035,731
446	4,035,732

CLASS 328

34	4,035,733
167	4,035,734

CLASS 329

50	4,035,735
122	4,035,736

CLASS 330

13	4,035,737
26	4,035,738
129	4,035,739

CLASS 331

94 5 G	4,035,741
94 5 I	4,035,740
94 5 P	4,035,742
101	4,035,743
111	4,035,744
114	4,035,745

CLASS 333

6	4,035,746
28 R	4,035,747
33	4,035,748
83 R	4,035,749

CLASS 336

60	4,035,751

CLASS 337

107	4,035,752
186	4,035,753
206	4,035,754
280	4,035,755
370	4,035,756

CLASS 338

25	4,035,757
132	4,035,758
162	4,035,759

CLASS 339

14 R	4,035,045
17 C	4,035,047
17 CF	4,035,046
91 R	4,035,048
97 R	4,035,049
99 R	4,035,050
103 R	4,035,051
122 F	4,035,052
177 F	4,035,053
177 R	4,035,054

CLASS 340

3 D	4,035,760
10	4,035,761
16 R	4,035,762
18 FM	4,035,763
52 F	4,035,764
63	4,035,765
146.1 AG	4,035,766
146 1 AQ	4,035,767
146 3 SY	4,035,768
	4,035,769
147 R	4,035,770
151	4,035,771
	4,035,772
166 LL	4,035,774
166 S	4,035,773
173 CA	4,035,782
173 R	4,035,783
	4,035,784
174 1F	4,035,785
213 Q	4,035,786
228 R	4,035,787
237 S	4,035,788
244 R	4,035,789
267 R	4,035,790
274 R	4,035,791
277	4,035,792
309 1	4,035,793
365 C	4,035,795
365 L	4,035,794
417	4,035,796

CLASS 343

5 PD	4,035,798
5 SA	4,035,797
7 7	4,035,799
	4,035,800
12 R	4,035,801
17 2 PC	4,035,775
105 R	4,035,802
106 D	4,035,804
106 R	4,035,803
117 R	4,035,805
715	4,035,806
742	4,035,807

CLASS 346

9	4,035,808
62	4,035,809
74 1	4,035,810
75	4,035,811
	4,035,812
165	4,035,244

CLASS 350

3 5	4,035,055
85	4,035,057
96 C	4,035,058
105	4,035,059
160 LC	4,035,056
	4,035,060
161 S	4,035,061
162 SF	4,035,062
189	4,035,063
293	4,035,064
310	4,035,065

CLASS 351

3	4,035,066

CLASS 352

85	4,035,067

CLASS 353

122	4,035,068

CLASS 354

27	4,035,813
33	4,035,814
53	4,035,815
64	4,035,816
219	4,035,817
323	4,035,818

CLASS 355

3 R	4,035,069
	4,035,070
	4,035,750
10	4,035,071
14	4,035,072
24	4,035,073
27	4,035,074
66	4,035,075
72	4,035,076
75	4,035,077
77	4,035,078

CLASS 356

85	Re 29,304
	4,035,079
103	4,035,080
106 LR	4,035,081
114	4,035,082
115	4,035,083
152	4,035,084
179	4,035,085
205	4,035,086
	4,035,087
218	4,035,088

CLASS 357

10	4,035,819
23	4,035,820
24	4,035,821
26	4,035,822
	4,035,823
34	4,035,824
38	4,035,825
42	4,035,826
45	4,035,827
47	4,035,828
49	4,035,829
67	4,035,830
79	4,035,831

CLASS 358

8	4,035,832
10	4,035,833
	4,035,834
29	4,035,835
55	4,035,836
78	4,035,837
86	4,035,838
112	4,035,839
130	4,035,529
184	4,035,840
242	4,035,841

CLASS 360

10	4,035,842
35	4,035,843
61	Re 29,306

CLASS 361

103	4,035,692
120	4,035,693
203	4,035,696
289	4,035,697
400	4,035,694
	4,035,695

CLASS 363

37	4,035,710
157	4,035,711

CLASS 364

200	4,035,777
	4,035,778
	4,035,779
900	4,035,776
	4,035,780
	4,035,781

CLASS 401

6	4,035,089
25	4,035,090
52	4,035,091

CLASS 403

2	4,035,092
4	4,035,093
144	4,035,094
282	4,035,095
322	4,035,096
348	4,035,097
356	4,035,098

CLASS 408

103	4,035,099
226	4,035,100

CLASS 415

160	4,035,101

CLASS 416

95	4,035,102

CLASS 417

109	4,035,103
202	4,035,104
220	4,035,105
222	4,035,106
310	4,035,107
365	4,035,108
403	4,035,109
539	4,035,110

CLASS 418

38	4,035,111
60	4,035,112
61 B	4,035,113
84	4,035,114
183	4,035,115

CLASS 423

15	4,035,468
164	4,035,469
235	4,035,470
272	4,035,471
446	4,035,472
488	4,035,473
574 R	4,035,474
580	4,035,475
592	4,035,476

CLASS 424

47	4,035,477
70	4,035,478
78	4,035,479
	4,035,480
122	4,035,481
134	4,035,482
149	4,035,483
	4,035,484
177	4,035,485
178	4,035,486
200	4,035,487
212	4,035,488
217	4,035,489
225	4,035,490
226	4,035,491
230	4,035,492
236	4,035,493
244	4,035,494
246	4,035,495
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248 56	4,035,497
250	4,035,498
258	4,035,499
261	4,035,501
271	4,035,502
275	4,035,503
279	4,035,504
281	4,035,505
303	4,035,506
311	4,035,507
316	4,035,508
317	4,035,509
325	4,035,510
330	4,035,511
	4,035,512
359	4,035,513
365	4,035,514

CLASS 425

10	4,035,116
19	4,035,117
25	4,035,118
46	4,035,119
81	4,035,120
83	4,035,121
84	4,035,122
129 R	4,035,123
139	4,035,124
141	4,035,125
157	4,035,126
192 S	4,035,127
259	4,035,128
437	4,035,130
445	4,035,129

CLASS 426

14	4,035,515
18	4,035,516
31	4,035,517
231	4,035,518
653	4,035,519

CLASS 427

19	4,035,520
32	4,035,521
43	4,035,522
44	4,035,523
68	4,035,524
73	4,035,525
90	4,035,526
169	4,035,527
195	4,035,528
244	4,035,529
252	4,035,530
261	4,035,508
390 R	4,035,531

CLASS 428

36	4,035,534
90	4,035,532
95	4,035,533
116	4,035,535
118	4,035,536
155	4,035,537
	4,035,538
178	4,035,539
198	4,035,540
217	4,035,541
224	4,035,542
245	4,035,543
291	4,035,544
328	4,035,545
329	4,035,547
332	4,035,546
339	4,035,550
409	4,035,549
412	4,035,548
576	4,034,454

CLASS 429

44	4,035,551
58	4,035,552
80	4,035,554

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194	4,035,555	21	4,035,134	14	4,035,139	14	4,035,557	173	4,035,562	4	4,035,566
245	4,035,556	29	4,035,135	60	4,035,140	29	4,035,558	199	4,035,563		4,035,567
CLASS 431		191	4,035,136	234	4,035,141	56	4,035,559	225	4,035,564	17	4,035,568
6	4,035,131	285	4,035,137	249	4,035,142	124	4,035,560	249	4,035,565	32	4,035,569
7	4,035,132	320	4,035,138			130	4,035,561	275	4,035,571	108	4,035,572

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D2	28	244,966		146	244,980		224	244,994		28	245,022			245,016		44	245,032
	320	244,967			244,981		258	244,995		43	245,025		59	245,017	D31–	1	245,033
	401	244,968		186	244,982	D10–	64	244,996		45	245,004		61	245,018		22	245,023
	415	244,969			244,983	D11—	122	244,997	D15–	9	245,005		77	245,010	D34–	5 CB	245,035
	448	244,970	D7	45	244,984	D12–	12	244,998		19	245,006			245,011		5 CH	245,036
D6	24	244,971		110	244,985			244,999		90	245,008			245,012		5 ST	245,034
	31	244,972	D8	1	244,986			245,000		122	245,007			245,019	D56–	4 B	245,038
	36	244,973		99	244,987		110	245,001		138	245,026	D27–	9	245,027	D64–	11 B	245,024
	63	244,974		319	244,988		111	245,002	D19	35	245,009	D28–	51	245,043	D73–	1 A	245,039
	67	244,975		375	244,989		114	245,003	D24–	28	245,040	D30–	12	245,028	D87	1 R	245,041
		244,976	D9	40	244,990	D14	5	245,037	D25–	17	245,013		13	245,029		3 G	245,042
	71	244,977		63	244,991		11	245,020		56	245,014		14	245,030	D96–	12 H	245,044
	77	244,978		167	244,992			245,021			245,015		42	245,031		12 R	245,045
	118	244,979		222	244,993												

CLASSIFICATION OF PLANTS

P –	41	4,076		43	4,075		47	4,077		88	4,074						

GEOGRAPHICAL INDEX OF RESIDENCE OF INVENTORS

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(First number in listing denotes location according to above key. Refer to patent number in body of the Official Gazette to obtain details as to inventor name, location, etc.)

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4 4,034,466
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4	245,004		245,032	24	245,014		245,033		245,020	42	244,969
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6	244,968		244,994		245,016		245,042	39	244,991		244,986
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	245,044		245,026								

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6	4,074		4,075		4,076		4,077				

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Suits

Notices under 35 U.S.C. 290; Patent Act of 1952

2,798,213, W. G. Rowell, CHECKING TECHNIQUE AND SYSTEM; **2,798,214,** same, **filed** Mar. 18, 1977, United States Court of Appeals, First Circuit, Mass. (Boston) Doc. 77–1133, *Scully Signal Company v. Electronics Corporation of America.* **Same, filed** Mar. 25, 1977, United States Court of Appeals, First Circuit, Mass. (Boston) Doc. 77–1144, *Scully Signal Company v. Electronics Corporation of America.*

2,798,214. (See 2,798,213.)

3,063,457, Bittner and Gnass, FOOT EXERCISER SANDALS, **filed** Mar. 21, 1977, D.C., E.D. Mo. (St. Louis) Doc. 77–301–C(1), *Scholl, Inc. v. Modern Shoe Co., H. A. Waltuch, Robert J. Gamm and Michael Mathis.* **Same, filed** Feb. 15, 1977, D.C., S.D.N.Y., Doc. 77–C–755 KTD, *Melville Corporation et ano. v. Scholl, Inc.*

3,082,292, R. W. Gore, MULTICONDUCTOR WIRING STRIP; **3,540,956,** Arnold and Gore, PRECISE CONDUCTOR CABLES, **filed** Feb. 13, 1973, D.C., N.D. Ohio (Cleveland) Doc. C73–163, *W. L. Gore & Associates, Inc. v. A.P. Inc.* Consent judgment permanently enjoining defendant from infringing or contributing to the infringement of any claim of Patent Number 3,082,292. Patent Number 3,540,956 is invalid, Dec. 23, 1976.

3,161,993, G. W. Balz, FINISHING APPARATUS AND METHOD; **3,161,997,** same, FINISHING APPARATUS AND POLISHING METHOD, **filed** May 7, 1971, D.C., N.D. Ill. (Chicago) Doc. 71c1108, *Roto-Finish Company v. Eltramatic Equipment Co.* Final judgment by consent entered Nov. 17, 1976.

3,161,997. (See 3,161,993.)

3,218,588, J. G. Badger, TELEVISION TUNER; **3,842,683,** A. A. Valdettaro, UHF TUNER ARRANGEMENT, **filed** Sept. 26, 1975, D.C., E.D. Va. (Norfolk) Doc. C/A 75–504–N, *Sarkes Tarzian, Inc. v. Misumi Electric Co., Ltd. and General Electric Company.* It is hereby stipulated that the complaint, the first amended complaint and the second amended complaint in this action insofar as they pertain to defendant Mitsumi Electric Co., Ltd. be dismissed without prejudice, Mar. 4, 1977.

3,304,636, Vlecell and Walczak, HEATING AND STEAM GENERATING SUBASSEMBLY FOR A PRESSING IRON; **3,335,507,** J. L. Vlecell, HEATING AND STEAM GENERATING SUBASSEMBLY FOR A PRESSING IRON; **3,541,306,** Barnas and Gronwick, ELECTRIC PRESSING IRON; **3,599,357,** Gronwick and Westphal, ELECTRIC PRESSING IRON; **3,691,660,** Gronwick, Illian and Westphal, ELECTRIC PRESSING IRON, **filed** Dec. 7, 1972, D.C. Del. (Wilmington) Doc. 4533, *Scovill Manufacturing Company v. Sunbeam Corporation.* Order—The complaint and amended and supplemental complaint, and the counterclaim and amended counterclaim are hereby dismissed without prejudice. This civil action is hereby terminated, Nov. 16, 1976.

3,335,507. (See 3,304,636.)

3,421,678, Thompson and Ihde, PROFILE COATED CARTON; **3,976,527,** same, METHOD OF EXTRUDING THERMOPLASTIC FILMS, **filed** Dec. 17, 1976, D.C., S.D.N.Y., Doc. 76–C–5631, *International Paper Company v. Champion International Corporation.*

3,509,833, R. L. Cook, HARD FACED CERAMIC AND PLASTIC ARMOR; **3,516,898,** same, HARD FACED PLASTIC ARMOR, **filed** Mar. 18, 1977, D.C., N.D. Ohio (Akron) Doc. C77–101A, *Goodyear Aerospace Corporation v. The United States of America.*

3,511,233, E. Holy, Jr., FOOT PROTECTOR, **filed** Dec. 17, 1976, D.C., N.D. Ga. (Atlanta) Doc. C76–2062A, *Dillon Manufacturing Company, Inc. v. Jimmie G. Reagan, doing business as Deputy-Reagan Associates and King Manufacturing Company, Inc.*

3,516,898. (See 3,509,833.)

3,540,956. (See 3,082,292.)

3,541,306. (See 3,304,636.)

3,554,618, Ditzler and Carswell, Jr. and Reisch, RAILROAD TRUCKS, **filed** Mar. 8, 1977, D.C. Calif. (San Francisco) Doc. C77–0483SW, *Sam Houston, doing business as Modern Transportation Supplies v. The Polymer Corporation.*

3,599,357. (See 3,304,636.)

3,646,007, P. Gordon, COMPLEX OF INOSINE WITH DIALKYLAMINOALKANOL; **3,728,450,** same, INOSINE DERIVATIVES; **3,857,940,** same, **filed** Dec. 7, 1976, D.C., C.D. Calif. (Los Angeles) Doc. CV76–3771–FW, *Newport Pharmaceuticals International v. Paul Gordon.*

3,675,247, J. O. Ferrell, METHOD FOR FABRICATING PANTY HOSE, **filed** Apr. 30, 1976, D.C., W.D.N.C. (Statesville) Doc. ST–C–76–14, *Tights, Inc. v. Cabarrus Hosiery Company (Arrowood Mills of N.C., Inc.).* Pursuant to the provisions of Rule 41(a)(1) of the Federal Rules of Civil Procedure, all parties hereby stipulate and agree that all claims are hereby dismissed with prejudice, May 21, 1977.

3,691,660. (See 3,304,636.)

3,728,450. (See 3,646,007.)

3,733,657, G. B. Lankton, ASSEMBLY OF ATTACHMENTS AND METHOD OF MANIPULATING THE SAME, **filed** Mar. 22, 1977, D.C., N.D. Ill. (Chicago) Doc. 77c951, *Dennison Mfg. Co. v. Tamp Corp.*

3,792,163, S. J. Fudro, EGG DECORATING DEVICE, **filed** Apr. 9, 1975, D.C., E.D.N.Y. (Brooklyn) Doc. 75C524, *Easter Unlimited, Inc. v. Spearhead Marketing Inc. and William Blanck.* Final judgment on consent granting permanent injunction, entered Aug. 11, 1975.

3,842,683. (See 3,218,518.)

3,845,734, A. L. Wilkening, FIREPLACE HOME HEATER, **filed** Mar. 18, 1977, D.C. Minn. (St. Paul) Doc. 2–77–134, *Albert L. Wilkening v. Robert S. Messer, doing business as Messer Machine and Manufacturing.*

3,857,940. (See 3,646,007.)

3,871,585, Crossman, Kenrick and Le Mieux, AIR BED; **3,887,187,** same, AIR CUSHION TABLE GAME; **3,927,885,** same, PUCK AND BAT FOR AN AIR CUSHION TABLE GAME, **filed** Oct. 14, 1976, D.C., S.D.N.Y., Doc. 76–C–4555, *Brunswick Corporation v. Munroe Games, Inc.* It is hereby stipulated that the above action be dismissed with prejudice, Mar. 16, 1977.

3,887,187. (See 3,871,585.)

3,927,885. (See 3,871,585.)

3,928,933, T. Iwamoto, HOLDING TOY, **filed** Mar. 16, 1977, D.C., C.D. Calif. (Los Angeles) Doc. CV77–987–HP, *ITI Hawaii, Inc. et al. v. Nan Ho Kim.*

3,976,527. (See 3,421,678.)

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

Re. 28,041, Re. S.N. 802,236, Filed May 31, 1977, Cl. 240/3, MULTIPLE STAGE EXTENSIBLE BOOM, Erich W. Loffler, et al., Owner of Record: *Electro Motion Pacific, Inc., Redwood City, Calif.,* Attorney or Agent: Julian Caplan, Ex. Gp.: 212

3,036,036, Re. S.N. 798,536, Filed May 19, 1977, Cl. 260/47, PHENOLPHTHALEIN-POLYCARBONATE RESINS, Joseph H. Howe, Owner of Record: *The Dow Chemical Company, Midland, Mich.,* Attorney or Agent: M. B. Lilly, et al., Ex. Gp.: 143

3,414,510, Re. S.N. 801,075, Filed May 27, 1977, Cl. 210/37 R, METHOD FOR SELECTIVELY REMOVING CHROMATES, Alfred W. Oberhofer, Owner of Record: *Nalco Chemical Company, Chicago, Ill.,* Attorney or Agent: Roy E. Hofer, et al., Ex. Gp.: 176

3,714,382, Re. S.N. 800,481, Filed May 25, 1977, Cl. 179/100.2 S, METHOD AND SYSTEM FOR BIDIRECTIONAL SEARCH AND POSITIONING MAGNETIC RECORDING TAPE USING A REEL TURN SENSOR CONTROLLED COARSE POSITIONING, John R. Sykes, Owner of Record: *Sykes Datatronics, Inc., Rochester, N.Y.,* Attorney or Agent: Martin Lukacher, Ex. Gp.: 235

3,777,466, Re. S.N. 794,237, Filed May 5, 1977, Cl. 57/58.89, METHOD OF REMOVING IMPURITIES AND SIMILAR MATTER FROM STAPLE FIBRES IN RINGLESS SPINNING AND DEVICE FOR PERFORMING SAID METHOD, Stanislav Kabele, et al., Owner of Record: *Inventors,* Attorney or Agent: Michael J. Striker, et al., Ex. Gp.: 244

3,881,458, Re. S.N. 793,953, Filed May 5, 1977, Cl. 123/128 E, IGNITION SYSTEM DEPENDENT UPON ENGINE SPEED, Herman Roozenbeek, et al., Owner of Record: *Robert Bosch GmbH, Stuttgart, Germany,* Attorney or Agent: Michael J. Striker, Ex. Gp.: 342

3,884,610, Re. S.N. 798,909, Filed May 20, 1977, Cl. 425/387 B, BLOW-MOLDING APPARATUS, Johannes S. Mehnert, Owner of Record: *Inventor,* Attorney or Agent: Norman S. Blodgett, Ex. Gp.: 322

3,886,389, Re. S.N. 799,859, Filed May 23, 1977, Cl. 313/188, DISPLAY PANEL, James A. Ogle, Owner of Record: *Burroughs Corporation, Detroit, Mich.,* Attorney or Agent: Robert A. Green, Ex. Gp.: 252

3,887,244, Re. S.N. 801,717, Filed May 31, 1977, Cl. 305/57, RESILIENT MID-PITCH LUG FOR AN ENDLESS TRACK, Glenn M. Haslett, et al., Owner of Record: *Caterpillar Tractor Co., Peoria, Ill.,* Attorney or Agent: Ralph E. Walters, et al., Ex. Gp.: 311

3,890,157, Re. S.N. 802,276, Filed May 31, 1977, Cl. 106/89, CEMENTITIOUS SYSTEMS INCORPORATING PARTICULATE ADSORBENTS, Henry Nash Babcock, Owner of Record: *Construction Products Research, Inc., Old Greenwich, Conn.,* Attorney or Agent: Alphonse R. Noë, Ex. Gp.: 115

3,916,240, Re. S.N. 791,488, Filed Apr. 27, 1977, Cl. 313/102, IMAGE INTENSIFIER TUBE DEVICE, Augustinus Joannes Cuelenaere, et al., Owner of Record: *Inventors,* Attorney or Agent: Louis E. Marn, et al., Ex. Gp.: 252

3,921,733, Re. S.N. 799,611, Filed May 23, 1977, Cl. 175/65, METHOD OF DRILLING A BOREHOLE USING GELLED POLYMERS, Richard L. Clampitt, et al., Owner of Record: *Phillips Petroleum Company, Bartlesville, Okla.,* Attorney or Agent: Donald J. Quigg, et al., Ex. Gp.: 354

3,940,422, Re. S.N. 802,486, Filed June 1, 1977, Cl. 260/340.5, AROMATIC CARBOXYLIC AMIDE DERIVATIVES, Kozaburo Harita, et al., Owner of Record: *Kissei Yakuhin Kogyo Kabushiki Kaisha (Kissei Pharmaceutical Co., Ltd.), Nagano-ken, Japan,* Attorney or Agent: George A. Depaoli, et al., Ex. Gp.: 124

3,959,565, Re. S.N. 792,716, Filed May 2, 1977, Cl. 428/432, TIN OXIDE COATING, John F. Jordan, et al., Owner of Record: *Photon Power, Inc., Wilmington, Del.,* Attorney or Agent: Edmund F. Bard, et al., Ex. Gp.: 164

3,966,269, Re. S.N. 796,784, Filed May 13, 1977, Cl. 303/37, FLUID BRAKE CONTROL SYSTEM, Eugene Douglas McEathron, Owner of Record: *General Signal Corporation, Rochester, N.Y.,* Attorney or Agent: Elliott I. Pollock, et al., Ex. Gp.: 315

3,974,125, Re. S.N. 795,663, Filed May 10, 1977, Cl. 260/40 R, HIGHER DIALKYL DIMETHYL AMMONIUM CLAY GELLING AGENTS FOR UNSATURATED POLYESTER COMPOSITIONS, Alexis A. Oswald, et al., Owner of Record: *Exxon Research and Engineering Company, Linden, N.J.,* Attorney or Agent: Robert I. Pearlman, et al., Ex. Gp.: 141

PATENT NOTICES

Certificates of Correction for the Week of July 19, 1977

Re. 29,118
Re. 29,184
D. 243,259
3,721,718
3,725,454
3,776,940
3,781,174
3,784,603
3,840,339
3,856,779
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3,928,409
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Service by Publication

Larry G. Strayer

In accordance with 37 CFR 1.47(b) (Rules of Practice in Patent Cases), notice is hereby given of the filing on November 29, 1974, of an application for patent, Serial Number 528,434, entitled Computer Control of Moving Objects Such as Aircraft Moving From One Sector to Another, on behalf of Larry G. Strayer, whose last known address is 10300 Stafford Lane, Chatsworth, California 91311. The application was made in compliance with 37 CFR 1.47(b) and 35 U.S.C. 118 by World Traffic Control Systems, Inc. without execution by the said Larry G. Strayer. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Larry G. Strayer in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents and Trademarks.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 18, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-11-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc.. Physical Processes.	8-2-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-1-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-29-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-10-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus: Plastics Working Apparatus; Plastic Block and Earthenware Apparatus: Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-20-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during June 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents........ Numbers 2,939,145 to 2,943,326, inclusive
Plant Patents........ Numbers 1,950 to 1,956, inclusive

REISSUES

JULY 19, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 29,307
MANUFACTURE OF METALLIC CONTAINERS

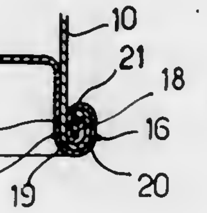
Eugène Wessely, Colombes, France, assignor to Futs Metalliques Gallay S.A., Paris, France

Original No. 3,425,381, dated Feb. 4, 1969, Ser. No. 558,352, June 17, 1966. Application for reissue June 24, 1976, Ser. No. 699,265

Claims priority, application France, June 18, 1965, 65.21391

Int. Cl.² B21D *51/32*

U.S. Cl. 113—120 R **6 Claims**



5. A process of connecting bases in the ends of metal container bodies by seaming together contiguous peripheral portions of the bases and the container body ends, comprising supporting a container body, inserting a recessed portion of a base within one end of the container body, a bent over peripheral portion of the base and a bent over peripheral portion of the container body end freely overlying each other with the base peripheral portion extending radially beyond the container end peripheral portion, moving a seaming tool radially towards the still free edges of said peripheral portions while effecting continuous rotary movement of said container body and base relative to said tool about the longitudinal axis of said container body to force said base peripheral portion alone on itself in a continuous roll-over movement around the edge of the container end peripheral portion until the outer extremity of the base peripheral portion faces said container end peripheral portion, and effecting further movement of said tool radially inwardly with respect to said base and container body progressively to roll said base peripheral portion and said container end peripheral portion together over each other during which further movement said outer extremity of said base peripheral portion is displaced relative to its position facing said container end peripheral portion and continuing said further movement until a roll-over joint between said base and container end peripheral portions is formed which consists of seven superposed alternating thicknesses of said base and container body peripheral portions.

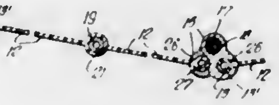
Re. 29,308
PROTECTIVE GRILLE

Robert Dagenais, Laval, Canada, assignor to Dynaflair Corporation Ltd., Pointe Claire, Canada

Original No. 3,901,302, dated Aug. 26, 1975, Ser. No. 406,896, Oct. 16, 1973. Application for reissue June 1, 1976, Ser. No. 691,403

Int. Cl.² E05D *3/00, 7/00*

U.S. Cl. 160—183 **8 Claims**



1. A foldable closure structure comprising a foldable curtain having a plurality of panel members hingeably interconnected along opposed vertical edges, hinge members secured in spaced apart relationship to each said vertical edges, said hinge members each having panel attachment means for connection to a portion of a respective vertical edge of adjacent panel members, a connecting rod pivotally interconnecting said hinge members of adjacent vertical edges along a common axis, each said hinge member having an abutment surface lying substantially parallel to said connecting rod for abutment with a portion of said vertical edge of said panel member adjacent to the panel member to which said hinge member is connected to, each said hinge member further having a circular bore therein for receiving said connecting rod, said attachment means being a through bore disposed parallel to said circular bore, and a panel receiving opening in said member extending to said through bore for slidingly receiving a portion of said vertical edge of a respective panel member in said through bore, and suspension means for suspending said curtain in a frame opening.

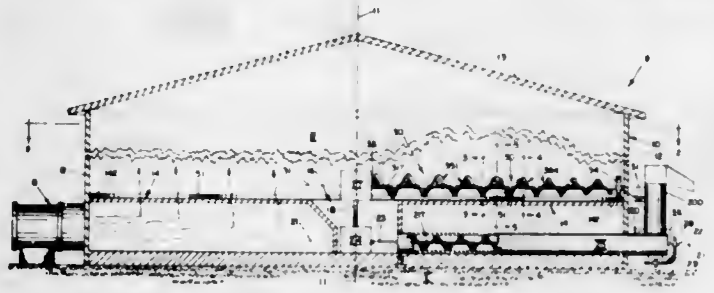
Re. 29,309
TRACTION ARRANGEMENT FOR ANGULARLY ROTATABLE SWEEP AUGER OF CIRCULATOR GRAIN BINS

William C. Patterson, 9364 North 45th St., Omaha, Nebr. 68112

Original No. 3,800,964, dated Apr. 2, 1974, Ser. No. 329,303, Feb. 5, 1973. Application for reissue Mar. 29, 1976, Ser. No. 671,250

Int. Cl.² B65G *65/46*

U.S. Cl. 214—17 DA **10 Claims**



9. In a circulator type bin for storing grain or other flowable particulate solids and including upright sidewall means surrounding an upright vertical-axis and also a substantially horizontal bin floor intersecting said vertical-axis, said storage bin also including an elongate sweep auger that axially extends along a substantially horizontal auger-axis that radiates outwardly from the bin vertical-axis and is located immediately above the bin floor, said outwardly radiating sweep auger commencing at an inward end being pivotably associated with the bin so that the sweep auger including its outward end is adapted to rotate angularly about the bin vertical-axis, said sweep auger at pitch spacings along the auger-axis comprising helical flighting having a helical external edge spaced an intra-pitch given mean-radius from the auger-axis, the plurality of helical flighting pitches including an innermost pitch, an outermost pitch, and at least four consecutive medial pitches, the elongate sweep auger being revolvable about its auger-axis whereby particulate solids stored atop the bin floor are adapted to be circulated by the auger helical flighting inwardly toward the bin vertical-axis, the improvement of traction mechanism arrangement for the sweep auger and comprising:

- *A. A cog attached to a medial pitch of the sweep auger helical flighting, said cog having a free-edge located radially externally from the helical edge a finite cog-radius, said cog at its free-edge defining a medial rim of generally spiroid contour and submergible within the stored flowable particulate solids; and*
- *B. A substantially horizontal annular roadway surrounding the bin vertical-axis and abuttably underlying the spiroid cog array medial rim whereby the axially revolvable and angu-*

larly rotatable sweep auger is stably supported above the bin floor thereby assuring that a finite spatial gap exists between the bin floor and the cog-free medial flights of the sweep auger and also providing traction as the revolving distinct cog churns through said flowable solids matrix environment.

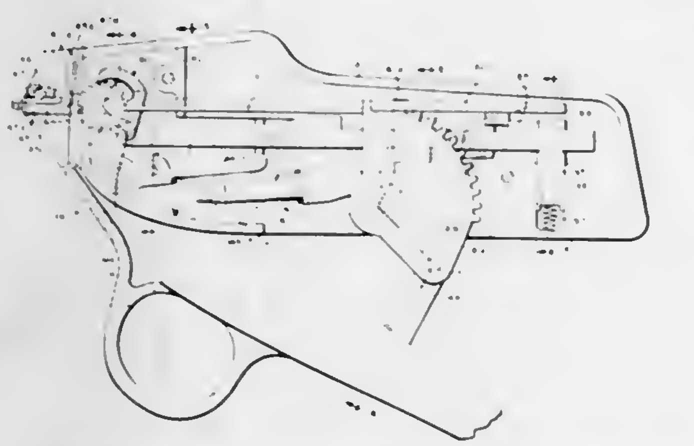
Re. 29,310
APPARATUS FOR DISPENSING FASTENERS

Arnold R. Bone, Needham, Mass., assignor to Dennison Manufacturing Company, Framingham, Mass.

Original No. 3,797,722, dated Mar. 19, 1974, Ser. No. 276,118, July 28, 1972. Continuation-in-part of Ser. No. 169,413, Aug. 5, 1971, Pat. No. 3,759,435. Application for reissue Mar. 18, 1976, Ser. No. 668,095

Int. Cl.² B25C *1/00*

U.S. Cl. 227—67 **12 Claims**



7. Apparatus for dispensing attachment members, each being formed by a filament with a head at one end and a cross bar at the other end and being moved into position for being dispensed, comprising an ejector, an indexing wheel, a pawl for operation said indexing wheel, an extension for said pawl, a slide mounted for reciprocating motion in said apparatus for engaging said extension to move said pawl discontinuously to two distinctive positions, and means for moving said slide and said ejector.

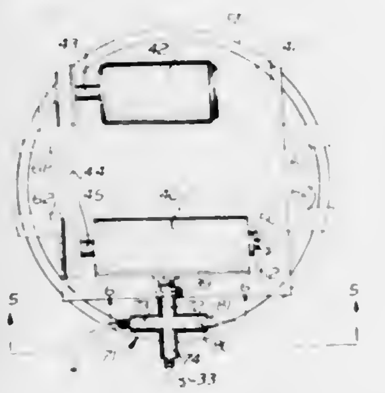
Re. 29,311
PAINTING APPARATUS

Erwin A. Ritter, 3662 Bendermeer Road, Cleveland Heights, Ohio 44118

Original No. 3,879,140, dated Apr. 22, 1975, Ser. No. 322,798, Jan. 11, 1973. Application for reissue June 1, 1976, Ser. No. 691,222

Int. Cl.² B44D *3/28*

U.S. Cl. 401—188 R **4 Claims**



3. An apparatus for use in applying a fluid to a surface comprising:

- *applicator means movable along the surface to apply the fluid directed thereto to the surface;*
- *conduit means for directing the fluid to said applicator means, said conduit means comprising a hollow handle for supporting said applicator and through which the fluid is directed to said applicator, and a flexible hose fixedly connected to said hollow handle, means fixedly connecting said flexible hose to said hollow handle to communicate fluid from said flexible hose into said hollow handle; and*
- *a telescoping handle connected to said hollow handle, means removably connecting said telescoping handle to said hollow handle to enable removal thereof from said hollow handle without disconnecting said flexible conduit therefrom, said telescoping handle including a pair of telescoping hollow tubular parts and said flexible hose extending through said telescoping tubular parts.*

Re. 29,312
GASIFICATION OF CARBONACEOUS SOLIDS

George M. Mallan, Los Angeles, and Leslie E. Compton, Claremont, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.

Original No. 3,846,096, dated Nov. 5, 1974, Ser. No. 299,157, Oct. 19, 1972. Continuation-in-part of Ser. No. 153,358, June 15, 1971, abandoned. Application for reissue Nov. 1, 1976, Ser. No. 737,279

Int. Cl.² C10J *3/16, 3/46*

U.S. Cl. 48—209 **32 Claims**

17. A process for producing gaseous hydrocarbons having from 1 to 7 carbon atoms from solid carbonaceous material comprising:

- *a. Forming a turbulent gaseous stream composed of carrier gas, water, char, and particulate carbonaceous solids, said solids having an individual maximum particle dimension of less than 1.0 inch, such that the solids and water are intimately admixed and entrained within the gaseous portion of the stream; said water being present in said stream in an amount which is at least 2.0 weight percent based upon the amount of carbonaceous solids in said stream; said carrier gas containing less than 1% by volume of oxygen;*
- *b. Heating the components of said stream to a temperature ranging from between about 1200° F. and about 2500° F. in a pyrolysis zone for a predetermined residence time so that at least a portion of said carbonaceous solids are converted to gaseous hydrocarbons, containing from 1 to 7 carbon atoms;*
- *c. Removing the product stream from the pyrolysis zone;*
- *d. Recovering the gaseous hydrocarbon products.*

Re. 29,313
PITTING CORROSION RESISTANT AUSTENITE STAINLESS STEEL

Tohru Muta; Hideo Abo, and Sakae Noguchi, all of Kitakyushu, Japan, assignors to Nippon Steel Corporation, Tokyo, Japan

Original No. 3,854,937, dated Dec. 17, 1974, Ser. No. 207,021, Dec. 13, 1971. Application for reissue Nov. 8, 1976, Ser. No. 739,542

Claims priority, application Japan, Dec. 14, 1970, 45-110594

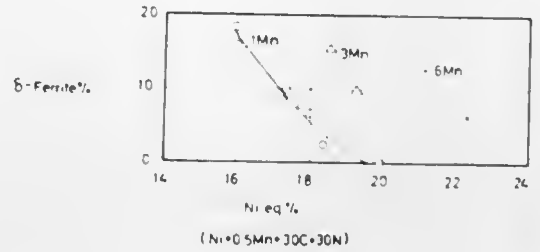
Int. Cl.² C22C *38/44, 38/58*

U.S. Cl. 75—128 A **1 Claim**

1. A pitting corrosion resistant austenite stainless steel consisting essentially of

not more than 0.08% by weight of carbon,
silicon in an amount not exceeding 4.0% by weight,

manganese in an amount not exceeding 5.0% by weight,
phosphorus in an amount not exceeding 0.04% by weight,
sulfur in an amount not exceeding 0.03% by weight,
10 to 18% by weight of nickel,
23 to 30% by weight of chromium,



0.30 to 0.45% by weight of nitrogen, and
0.1 to 4.0% by weight of molybdenum,
the balance being iron and unavoidable impurities, said steel satisfying the condition of Ni % + 30 (C % + N %) ≧ 20%.

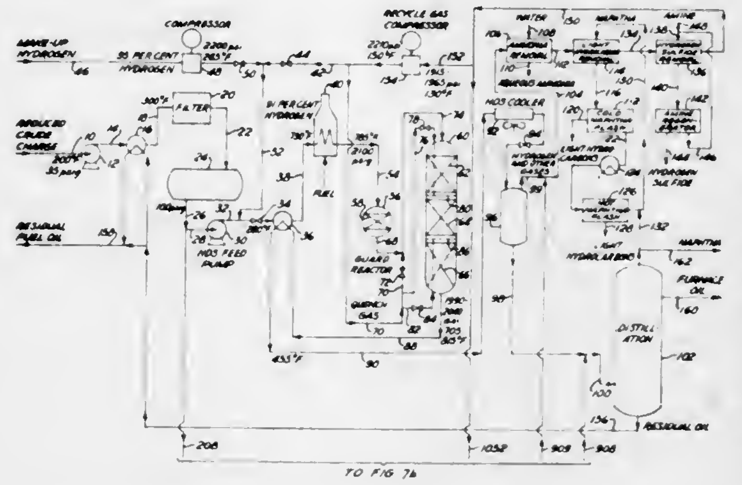
Re. 29,314
ASPHALTENE HYDRODESULFURIZATION WITH SMALL CATALYST PARTICLES IN A PARALLEL REACTOR SYSTEM

Edgar Carlson, deceased, late of Allison Park, Pa., by Gulf Research & Development Company, Pittsburgh, Pa.; Alfred M. Henke, Springdale, Pa.; William R. Lehrian, Verona, Pa.; Joel D. McKinney, Pittsburgh, Pa., and Kirk J. Metzger, Verona, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Original No. 3,563,886, dated Feb. 16, 1971, Ser. No. 770,725, Oct. 25, 1968. Application for reissue Sept. 8, 1976, Ser. No. 721,418

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **17 Claims**



1. A process for the hydrodesulfurization of a crude oil or a reduced crude oil containing the asphaltene fraction of the crude comprising passing said oil together with hydrogen through a plurality of reactors arranged in parallel, each of said reactors containing a series of compact beds of catalyst particles comprising a Group VI metal and Group VIII metal on alumina, the particles in said compact catalyst beds being between about 1/20 and 1/40 inch in diameter, [and] the hydrogen partial pressure in said plurality of compact parallel beds being [about] 1,000 to 5,000 pounds per square inch *and a throughput of at least 127 volumes of oil per volume of catalyst is continued for at least 10 days.*

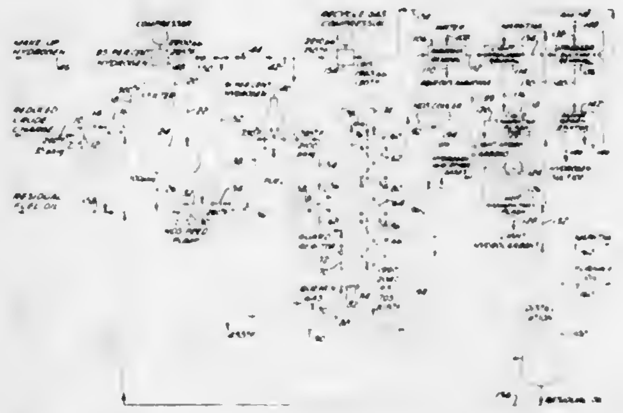
Re. 29,315
ASPHALTENE HYDRODESULFURIZATION WITH SMALL CATALYST PARTICLES UTILIZING A HYDROGEN QUENCH FOR THE REACTION

Edgar Carlson, deceased, late of Allison Park, Pa.; by Gulf Science and Technology Company, Pittsburgh, Pa.; Alfred M. Henke, Springdale, Pa.; William R. Lehrian, Pittsburgh, Pa.; Joel D. McKinney, Pittsburgh, Pa., and Kirk J. Metzger, Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Original No. 3,562,800, dated Feb. 9, 1971, Ser. No. 770,625, Oct. 25, 1968. Application for reissue Sept. 8, 1976, Ser. No. 721,419

Int. Cl.² C10G *23/02*

U.S. Cl. 208—216 **24 Claims**



1. A process for the hydrodesulfurization of a crude oil or a reduced crude containing the asphaltene fraction of the crude comprising passing a mixture of hydrogen and said oil through a compact bed of catalyst particles comprising a Group VI metal and Group VIII metal on alumina, the hydrogen partial pressure being [about] 1000 to 5000 pounds per square inch, [and] said particles in said bed being between 1/20 and 1/40 inch in diameter *and a throughput of at least 127 volumes of oil per volume of catalyst is continued for at least 10 days.*

Re. 29,316
CROSS-LINKED RESINS

Michael Bargain; André Combet, both of Lyon, and Pierre Grosjean, Sainte-Foyte-les-Lyon, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Original No. 3,562,223, dated Feb. 9, 1971, Ser. No. 743,025, July 8, 1968. Application for reissue Dec. 1, 1972, Ser. No. 311,138

Claims priority, application France, July 13, 1967, 67.114381

Int. Cl.² C08G *73/12*

U.S. Cl. 260—30.2 **21 Claims**

1. A cross-linked resin obtained by heating at 100° C. to 350° C. an unsaturated bis-imide selected from the group consisting of maleic N,N'-ethylene-bis-imide, maleic N,N'-hexamethylene-bis-imide, maleic N,N'-metaphenylene-bis-imide, maleic N,N'-paraphenylene-bis-imide, maleic N,N'-4,4'-diphenylmethane-bis-imide, maleic N,N'-4,4'-diphenylether-bis-imide, maleic N,N'-4,4'-diphenylsulphone-bis-imide, maleic N,N'-4,4'-dicyclohexylmethane-bis-imide, maleic N,N'-α,α'-4,4'-dimethylenecyclohexane-bis-imide, maleic N,N'-metaxylylene-bis-imide and maleic N,N'-4,4'-diphenylcyclohexane-bis-imide with a diamine selected from the group consisting of 4,4'-diaminodicyclohexylmethane, 1,4-diaminocyclohexane, 2,6-diaminopyridine, metaphenylenediamine, paraphenylenediamine, 4,4'-diaminadiphenylmethane, 2,2-bis-(4-aminophenyl)-propane, benzidine, 4,4'-diaminophenyl oxide, 4,4'-diaminodiphenyl sulphide, 4,4'-diaminodiphenyl-sulphone, bis-(4-aminophenyl)diphenylsilane, bis-(4-aminophenyl)methylphosphine oxide, bis-(3-aminophenyl)methylphosphine oxide, bis-(4-aminophenyl)phenylphosphine oxide, bis-(4-aminophenyl)phenylamine, 1,5-diamino-naphthalene, metaxylylenediamine, paraxylene diamine, 1,1-bis-(paraaminophenyl)phthalene, 1,1-bis-(4-aminophenyl)cyclohexane, 1,1-bis-(4-amino-3-methylphenyl)cyclohexane and hexamethylenediamine at a ratio of bis-imide to diamine of from 1.2:1 to 50:1.

PLANT PATENTS

GRANTED JULY 19, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,078
DWARF NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Stribling's Nurseries, Inc., Merced, Calif.
Filed Aug. 25, 1976, Ser. No. 717,861
Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of genetically dwarf nectarine tree, substantially as shown and described, which is of comparatively medium size, medium vigor, spreading, dense, foliated with large to medium size, lanceolate leaves having a crenate margin, flowering mid-season with large flowers, and a productive and regular bearer of early ripening, medium size, symmetrical, globose, freestone fruit having yellow skin substantially overspread with red, and yellow flesh; the variety being characterized by fruit which ripens about two weeks earlier than the Golden Prolific nectarine, and which fruit has a red exterior color brighter than said Golden Prolific nectarine and resembling the May Grand nectarine in such respect.

4,079
DWARF NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.
Filed Aug. 25, 1976, Ser. No. 717,862
Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of genetically dwarf nectarine tree, substantially as illustrated and described, which has short internodes, is comparatively large, vigorous, upright, spreading, dense, foliated with large, lanceolate leaves having a glandular, crenate margin, blooms with large, pink flowers, and a regular and very productive bearer of large, uniform, symmetrical, globose, clingstone fruit having yellow skin substantially overspread with red, and yellow flesh; the tree, because of such short internodes, being only about 30 percent as high as the Red Grand nectarine, although the fruit, in size and appearance, resembles that of the latter but with much less red around the pit.

4,080
APRICOT TREE

Frederic W. Anderson, Merced, Calif., assignor to Stark Bro's Nurseries and Orchards Co., Louisiana, Mo.
Filed Sept. 8, 1976, Ser. No. 721,541
Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—39 **1 Claim**

1. A new and distinct variety of apricot tree, substantially as illustrated and described, which is large, vigorous, spreading, with a trunk and branches of medium size and medium texture, foliated with medium size, medium thick, cordate, abruptly pointed leaves having a glandular, coarsely serrate margin, flowering from small, medium length conic buds with medium size flowers, which have white petals and reddish sepals, in bloom two to three days after the Tilton, and a regular and very productive bearer of small, uniform, symmetrical, oblong, freestone fruit having yellow skin and yellow flesh; the variety being particularly characterized by fruit having juice with a very high sugar content, and by a stone having a sweet kernel.

4,081
NECTARINE TREE

Frederic W. Anderson, Merced, Calif., assignor to Reedley Nursery, Inc., Reedley, Calif.
Filed Sept. 8, 1976, Ser. No. 721,542
Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, which is of medium size, medium vigor, spreading, foliated with large, acutely pointed, lanceolate leaves which are smooth and have a crenate margin, a regular and productive bearer of large to medium size, uniform, symmetrical, globose, freestone fruit having yellow skin substantially overspread with red, yellow flesh, and a red pit cavity with the red streaked into the flesh, and the stone having a sweet kernel; the variety being particularly characterized by fruit which resembles the pollen parent, May Grand, in its attractive red skin and juicy flesh, and resembles the seed parent, Red Free, in most other respects, but ripens about one week later than said Red Free.

PATENTS

GRANTED JULY 19, 1977

ERRATA

For CLASS	See PATENT NO.
428-576	4,035,892
091-005	4,036,106
119-051	4,036,189
188-282	4,036,319
235-61.11 E	4,036,430
235-092	4,036,431
294-005.5	4,036,454
242-201	4,036,458
415-090	4,036,584
428-608	4,036,599
428-555	4,036,600
428-663	4,036,601
428-621	4,036,602
136-089 C	4,036,645
176-087	4,036,700
250-199	4,036,762
250-214 C	4,036,763
264-256	4,036,839
358-113	4,037,048
235-069	4,037,084
250-527	4,037,112
361-020	4,037,138
361-058	4,037,139
361-056	4,037,140
361-182	4,037,141
361-433	4,037,142
340-237 S	4,037,206
364-200	4,037,207
364-900	4,037,208
364-200	4,037,209
364-900	4,037,210
364-200	4,037,211
364-200	4,037,212
364-200	4,037,213
364-200	4,037,214
364-200	4,037,215
364-900	4,037,216

PATENTS

GRANTED JULY 19, 1977

NOTE—Cross reference listings of applications published under the first and second Trial Voluntary Protest Programs are located in the back of this Issue. These entries will be in numerical order by document publication number.

GENERAL AND MECHANICAL

4,035,844

NOVEL TROUSER-LIKE ARTICLE OF CLOTHING

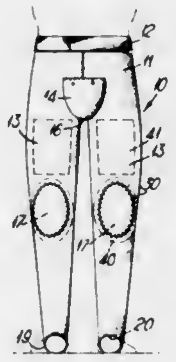
James W. Atack, 4230 Patten Cresent; Howie Triano, 6776 McMicking Street, and Peter Zoreticb, 6711 McMicking Street, all of Niagara Falls, Ontario, Canada

Filed Nov. 10, 1971, Ser. No. 197,311

Claims priority, application Canada, Apr. 27, 1971, 111457

Int. Cl.^{2} A41D *13/00*

U.S. Cl. 2—2 **19 Claims**



1. In a trouser-like article of clothing formed of a material which is elastically stretchable both in the longitudinal and transverse directions, the provision of a frontal, openable and reclosable crotch pocket on the exterior surface of the trouser, adapted, at the will of the wearer, to retain a crotch protector cup therein, and means for opening and reclosing such pocket.

4,035,845

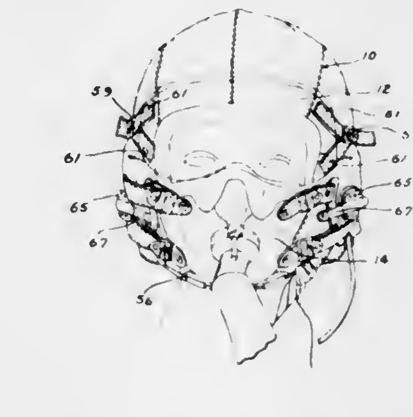
PROTECTIVE FLIGHT HELMET

John R. Hochwalt, Green County, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 16, 1976, Ser. No. 724,050

Int. Cl.^{2} A42B *3/00*

U.S. Cl. 2—6 **6 Claims**



1. A helmet for flight personnel, comprising: a rigid energy absorbing liner member, adapted to conform to the head of the wearer; a penetration resistant mid-liner member covering the energy absorbing liner member; a helmet cover over said mid-liner member; said cover being made of a substantially non-stretchable flexible material; a chin strap secured to said helmet cover; a visor member; means for supporting said visor member on said helmet cover; a pair of communication earcups; means for securing said earcups to the internal surface of said helmet cover; an impact protection pad; means for securing the impact protection pad to the helmet cover at a position adapted to be placed adjacent the nape area of the wearer.

4,035,846

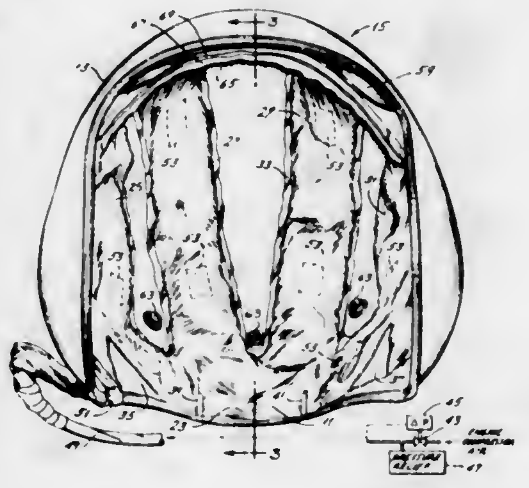
INFLATABLE PRESSURE COMPENSATED HELMET STABILIZATION SYSTEM

Craig S. Jencks, Fountainville, Pa., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 17, 1976, Ser. No. 715,039

Int. Cl.^{2} A42B *3/02*

U.S. Cl. 2—413 **5 Claims**



1. A helmet stabilization system, comprising:

a helmet shell;

a chin strap secured at each end to said shell for pressing the head of the wearer in said shell;

an inflatable member disposed within said shell for opposing the forces imposed on the head of the wearer by said chin strap;

a first plurality of fasteners releasably fastening said member to within said shell;

a source of pressurized fluid; and

pressure compensating valve means operatively connected between said source and said member for passing the pressurized fluid therethrough according to the variation from a preset value of the pressure difference between that of said member and the ambient pressure.

4,035,847

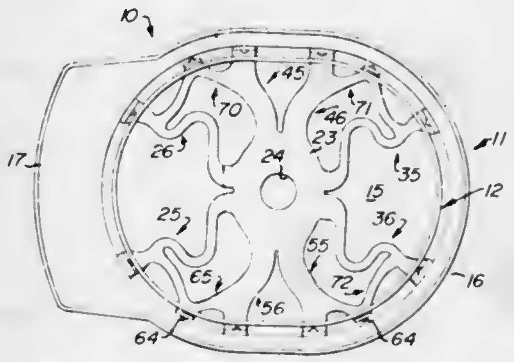
SUSPENSION FOR A HARD HAT

Jack M. Prince, West Reading, Pa., and Dai Chung Yang, Wilmington, Del., assignors to The Fibre-Metal Products Co., Concordville, Pa.

Filed July 2, 1976, Ser. No. 702,105

Int. Cl.^{2} A42B *3/02*

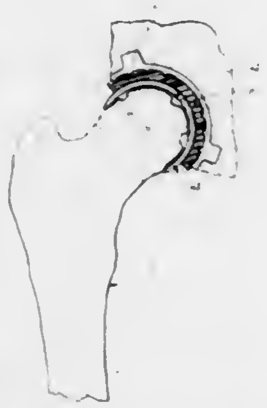
U.S. Cl. 2—416 **7 Claims**



1. A suspension for a hard hat comprising a central portion for resting on a wearer's head, a plurality of more yieldably extensile legs extending outwardly and arcuately downwardly from said central portion for connection to a hat shell, a plurality of less yieldably extensile legs extending outwardly and arcuately downwardly from said central portion in angularly spaced relation with each other and said more yieldably extensile legs for connection to the hat shell, said more yieldably extensile legs being configured for distension before said less yieldably extensile legs on relative downward shell movement for relatively gradual force transmission to a wearer's head, and a plurality of relatively flexible headband connection legs carried by said central portion and depending freely intermediate said more and less yieldably extensile legs to terminate in free ends for connection to a headband.

4,035,848
HIP CAPITULUM CAP FOR A HIP JOINT PROSTHESIS

Heinz Wagner, P.O. Box 22, Altdorf near Nurnberg, Germany (8503)
Filed Mar. 22, 1976, Ser. No. 668,962
Claims priority, application Germany, Mar. 21, 1975, 2512407
Int. Cl.^{2} A61F *1/24*
U.S. Cl. 3—1.913 **5 Claims**



1. A hip capitulum cap for a hip joint prosthesis for cement fixation to a thigh bone comprising a cap member having inner and outer surfaces and shaped substantially in the form of half a hollow sphere, at least one surface discontinuity on the inner surface of said cap member and an opening through the wall of said cap member extending between the inner and outer surfaces thereof, wherein said cap member has a vertex, said opening being a radial boring located at said vertex and being enlarged at its outer end.

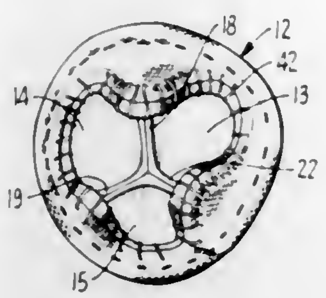
4,035,849
HEART VALVE STENT AND PROCESS FOR PREPARING A STENTED HEART VALVE PROSTHESIS

William W. Angell, San Jose, Calif., and David L. Yoon, East Lansing, Mich., assignors to William W. Angell, San Jose, Calif.
Continuation-in-part of Ser. No. 632,309, Nov. 17, 1975, Pat. No. 3,983,581, which is a continuation-in-part of Ser. No. 536,300, Jan. 20, 1975, abandoned. This application June 25, 1976, Ser. No. 699,888
Int. Cl.^{2} A61F *1/22*
U.S. Cl. 3—1.5 **17 Claims**

1. A stent for a natural tissue heart valve prosthesis comprising:

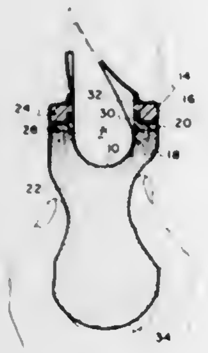
a. an annular frame comprising three ventricular struts, two of which are biased radially inwardly and the third of which is biased radially inwardly but to a lesser degree than the other two or is generally parallel to the frame axis and three ventricularly relieved portions respectively interconnecting said struts; and

b. a fabric cover covering at least the exterior surface of the frame.



4,035,850
METHOD AND APPARATUS FOR INSERTING SOFT PROSTHESIS

Thomas A. Cresswall, Saginaw, Mich., assignor to Thomas A. Cresswall, Saginaw, Mich.
Filed Oct. 7, 1976, Ser. No. 730,661
Int. Cl.^{2} A61F *1/24, 1/00;* A61B *17/00*
U.S. Cl. 3—36 **8 Claims**

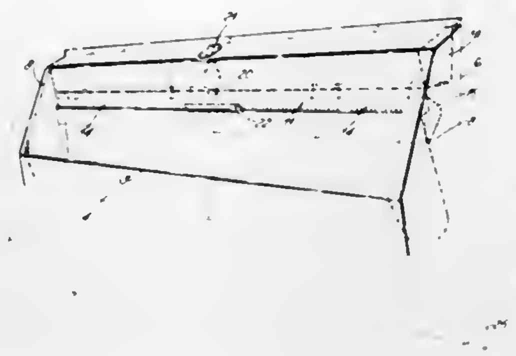


3. Apparatus for inserting a prosthesis, such as a soft, pliable mammary prosthesis or the like, into a human body via an incision comprising a first open mouthed fluid container, an open mouthed inner bag of flexible fluid impervious material received within said first container, sealing means sealing said bag to said first container around the periphery of the mouth, said bag and said first container defining an enclosed fluid chamber surrounding the exterior of said bag, and a prosthesis located within the interior of said bag and adapted to pass through the mouths of said first container and said bag when a charge of fluid contained in said chamber is compressed to evert said bag through its mouth to carry the prosthesis outwardly through the mouth of said first chamber.

4,035,851
URINALS

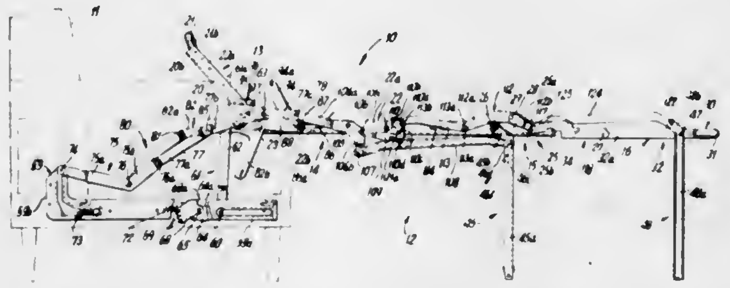
Harold G. Wyeth, Ringwood, and John L. T. B. Gmach, Fordingbridge, both of England, assignors to Ashford Marine (J. L. Gmach) Limited, Fordingbridge, England
Filed May 7, 1976, Ser. No. 684,316
Claims priority, application United Kingdom, May 8, 1975, 19497/75
Int. Cl.^{2} E03D *13/00*
U.S. Cl. 4—99 **11 Claims**

1. A urinal having a generally vertical face with a trough at its lower end, said face being formed along the upper part thereof with a shaped horizontal recess, said recess being perforated with a horizontal row of holes, a reservoir adapted for connection to a water supply and communicating with said recess through said holes such that flushing water can pass from said reservoir through said holes to said horizontal recess and thence to said face, said reservoir extending along said urinal generally to the rear of said recess, whereby water from said reservoir emerging through said holes flows over the lower surface of said recess before passing to the face of said urinal to effect flushing of said face and said trough.



4,035,852
PULL OUT SOFA BED

Izchak Cycowicz, Brooklyn, N.Y., and Glenn G. Gill, Bayonne, N.J., assignors to Mohasco Corporation, Amsterdam, N.Y.
Filed Oct. 8, 1976, Ser. No. 730,857
Int. Cl.^{2} A47C *17/14*
U.S. Cl. 5—13 **25 Claims**

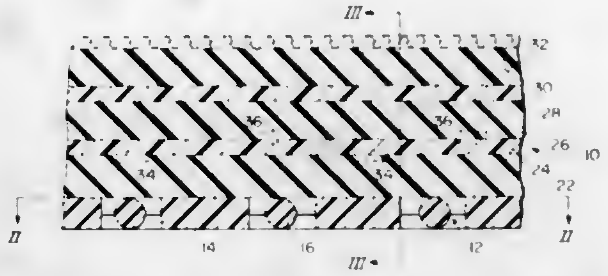


1. A folding bed comprising a chassis, a main lever pivoted to said chassis, said main lever having an arm extending upwardly from said pivot, in the open position of said bed, linkage connecting said chassis to the upwardly extending arm of said main lever, said bed having a main section, means to pivotally connect the rear end of said main section of said linkage, a central section pivoted to the forward end of said main section, a foot section pivoted to the forward end of said central section, a main bell crank pivoted to said main section and having an arm extending rearwardly, in the open position of said bed, and pivoted to said linkage, a slotted lock link pivoted to said main bell crank, said slotted lock link having a radial slot, a secondary bell crank piovted to said main bed section, a pin on said secondary bell crank, slidably received in said slot in said slotted lock link, a main lock link pivoted to said central section and having an arm projecting rearwardly, in the open position of said bed, a lock sequence link connecting said arm of said main lock link to said secondary bell crank, said main lock link having an arm extending forwardly of its pivotal connection to said central section, in the open position of said bed, and a foot section lock link connecting said forwardly extending arm of said main lock link to said foot section.

4,035,853
MATTRESS CONSTRUCTION FOR USE IN HOSPITALS AND THE LIKE

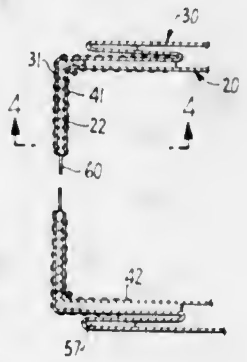
Fenton H. Platter, 609 Elwood St., Cumberland, Md. 21502
Filed Mar. 9, 1976, Ser. No. 665,183
Int. Cl.^{2} A47C *27/22;* A61G *7/02*
U.S. Cl. 5—91 **7 Claims**

1. A mattress construction for hospitals and the like comprising a plurality of separate layers of a foam material and a further layer comprising a plurality of transversely extending, alternately disposed flat members and rounded members, and means for joining said flat members and rounded members to form a flexible assembly, said flat members including a flat upper surface and said rounded members including a rounded upper surface, said flat members comprising slats and said rounded members comprising dowels, said construction including at least three separate layers of a foam material, said separate layers being separated by intermediate layers of reduced thickness, said further layer, in use, being located beneath said separate layers and being secured to the bottommost one of said three separate layers by an adhesive.



4,035,854
MATTRESS COVER

Marilynn Pardee, 1048 Pacific, San Francisco, Calif. 94133
Filed Oct. 22, 1975, Ser. No. 624,722
Int. Cl.^{2} A47G *9/00*
U.S. Cl. 5—334 C **1 Claim**



1. A mattress cover comprising a fitted sheet for snugly covering the top, side and foot and head surfaces of said mattress,

a plain sheet for covering said fitted sheet, said plain sheet being wider than said fitted sheet; and

connecting means permanently attaching an edge of said plain sheet to the edge of said fitted sheet along a C-shaped line described generally by the lower edge of said foot surface and by the lower edges of a portion of said side surfaces of said mattress adjacent said foot surface, whereby said plain sheet folds along a line extending from the end of said C-shaped line to the upper corner of the foot of said mattress, said mattress cover further comprising as elastic band in said fitted sheet extending along a portion of said C-shaped line.

4,035,855
CAMPING PACK

Sung Bong Kim, 10411 Fyfe Court, Fairfax, Va. 22030
Filed Feb. 13, 1976, Ser. No. 657,970
Int. Cl.^{2} A47G *9/00*
U.S. Cl. 5—343 **16 Claims**

1. A camping pack comprising:

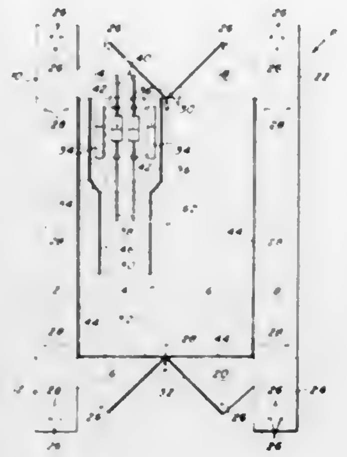
a. a tent assembly,

b. a sleeping bag assembly,

c. a carrying kit assembly,

d. each of said assemblies is being joined to each other,

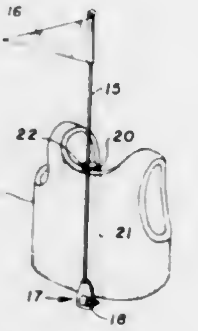
e. said assemblies forming in non-assembled position a substantially planar, sheet-like article having four panels,
f. each of said panels having at each end thereof a flap,
g. said pack including fastening means for securing said flaps and panels together into one or the other of said assemblies,



h. said four panels being rectangular and arranged in side-by-side relation there being two central panels and two outer panels and said outer panels being on either side of said central panels.
i. and said central panels comprising substantially the whole of said carrying kit assembly.

4,035,856
WATER SKI SAFETY FLAG

Gary R. Oberg, Spirit Lake, Iowa, assignor to Berkley & Company, Inc., Spirit Lake, Iowa
Filed July 29, 1976, Ser. No. 709,634
Int. Cl.² B63C *9/21*
U.S. Cl. 9—313 4 Claims



1. Visual marker means for attachment to the floatation gear of a water skier and comprising:
a. staff means having a flag member secured to the upper end thereof and attachment means secured to the lower end thereof, and adjustable belt means for releasably coupling said staff and said attachment means to the floatation gear of a water skier;
b. said attachment means comprising a staff securing buckle for retaining said staff therein, said buckle having slots formed therein for releasably and adjustably receiving the lower end of said belt means in firm engagement therewith; and
c. said adjustable belt means having a bore formed therein at the upper end thereof for receiving said staff in slidable engagement therewith, the arrangement being such that said staff and said belt means form a closed loop for the releasable coupling of said visual marker means to the floatation gear of a water skier.

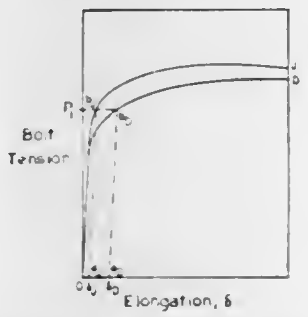
4,035,857
DIVERS BUOYANCY VEST

Ronald D. Briley, Wheeling, and Vernon G. Pedersen, Chicago, both of Ill., assignors to Dacor Corporation, Northfield, Ill.
Filed Dec. 23, 1974, Ser. No. 535,418
Int. Cl.² B63C *11/02*
U.S. Cl. 9—342 4 Claims

1. A floatation device of the type including an inflatable bladder, comprising
flexible cover means enclosing said bladder,
said cover means including a resilient section of open weave resilient fabric material for exerting a compressive force on said bladder, and
said cover means further including nonresilient means for limiting the expansion of said bladder to a predetermined extent,
said cover means also including
front and rear nonresilient flexible panel sections each having a peripheral edge portion and an edge portion surrounding a neck opening in said panel sections,
said nonresilient means includes a flexible, nonresilient gusset connected between corresponding ones of said edge portions of said panel sections and
said resilient section includes a reslient gusset connected between said corresponding ones of said edge portions externally of said non-resilient gusset.

4,035,858
PROCESS FOR THE PREUSE WORK-HARDENING OF BOLTS

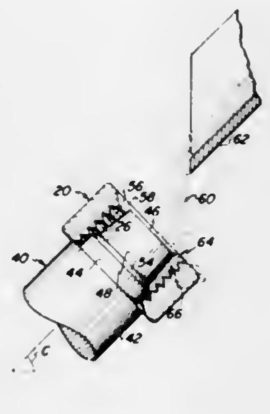
Norman C. Dahl, Lexington, Mass.
Filed Mar. 8, 1976, Ser. No. 664,574
Int. Cl.² B21K *1/44*
U.S. Cl. 10—27 H 1 Claim



1. In a method for manufacturing bolts of a given grade and size having a minimum proof load which method comprises the steps of forming blanks into bolts having heads and shanks, threading said shanks, and heat treating the formed bolts, wherein the improvement comprises work hardening each bolt by applying and subsequently removing a tensile force of uniform magnitude somewhat above the minimum proof load for the given grade and size of bolt, so that all bolts so treated will have the same yield point and the torque-rotation curve for each bolt will have a discontinuity in slope at this common yield point.

4,035,859
APPARATUS FOR MAKING SELF-LOCKING INTERNALLY THREADED FASTENERS WITH RING-LIKE LOCKING ELEMENTS

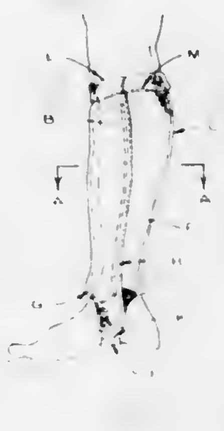
Richard S. Newnom, Tujunga, Calif., assignor to Amerace Corporation, New York, N.Y.
Division of Ser. No. 637,989, Dec. 5, 1975, Pat. No. 3,975,787, which is a continuation of Ser. No. 466,499, May 2, 1974, abandoned. This application Apr. 26, 1976, Ser. No. 680,480
Int. Cl.² B21D *53/24;* B21K *1/64*
U.S. Cl. 10—72 R 9 Claims



1. Apparatus for converting a nut having an imperforate wall providing the nut with external wrenching surfaces and an internal thread-defining surface open at both ends into a self-locking nut of the prevailing torque type in which the self-locking characteristic is derived from a patch of plastic material adhered to said thread-defining surface, said patch being of a predetermined circumferential extent which is greater than 180° and further being axially limited so as to be spaced from both axial ends of said thread-defining surface, said apparatus comprising:
a pin having a cavity-forming portion having a circumferential extent which is at least as great as said predetermined circumferential extent;
means for seating the nut, either end first, upon said pin such that the pin enters one of the open ends of the thread-defining surface so that the pin is received within the thread-defining surface of the nut with said portion of the pin and a portion of the thread-defining surface of the nut establishing a cavity having an opening at the other open end of the thread-defining surface of the nut, the cavity further having a circumferential extent at least as great as said predetermined circumferential extent;
means for thereupon inserting a quantity of powder of said plastic material through said opening into said cavity and upon a portion of the thread-defining surface of the nut, to establish an initial deposit having at least predominantly a circumferential extent which is less than 180° and which is significantly less than said predetermined circumferential extent;
means for subsequently, and while said nut remains seated upon said pin, re-distributing plastic powder within the cavity to increase the circumferential extent of the powder within the cavity to increase the circumferential extent of the powder to establish a final deposit of plastic powder substantially having said predetermined circumferential extent; and
means for thereupon heating the nut to fuse the final deposit and establish said patch.

4,035,860
PROTECTIVE GAITER

Albert Lee Fugere, 4901 - 17th Ave. S., Seattle, Wash. 98108, and Michael Joseph Kelly, 808 NE. 82nd, Seattle, Wash. 98115
Division of Ser. No. 552,551, Feb. 24, 1975, which is a continuation-in-part of Ser. No. 461,156, April 15, 1974, abandoned. This application July 9, 1976, Ser. No. 703,903
Int. Cl.² A43D *9/00*
U.S. Cl. 12—142 W 7 Claims



1. A method of manufacturing a protective gaiter, wherein said gaiter includes first and second substantially identical fabric sections, each of said fabric sections having, in outline, upper and lower edges, and two longitudinal edges extending therebetween, the lower edge of said first and second fabric sections having first and second straight edge portions and an intermediate edge portion, said intermediate edge portion being concavely shaped, said gaiter further including a third fabric section having in outline, upper and lower edges, and two longitudinal edges extending therebetween, an energy-absorbing pad, and an elastic strap having two ends, the method comprising the steps of:
aligning said first, second and third fabric sections such that their respective upper edges are adjacent each other and terminate in a common plane, and such that one of their respective longitudinal edges lie adjacent, each other and terminate in a common plane, thereby defining a first gaiter longitudinal edge;
securing together said first, second and third fabric sections along a line adjacent said first gaiter longitudinal edge;
securing together said first and second fabric sections along a line adjacent the lower edges thereof, including the step of securing one end of said elastic strip between adjacent first straight edge portions of said first and second fabric sections, and securing the other end of said elastic strip between adjacent second straight edge portions of said first and second fabric sections;
aligning the other longitudinal edge of each of said first, second and third fabric sections, thereby defining a second gaiter longitudinal edge;
securing together said first, second and third fabric sections along a line adjacent said second gaiter longitudinal edge, said first and second fabric sections, thereby defining a pocket;
inserting said protective pad into said pocket; and
securing together said first and second fabric sections along a line adjacent the upper edges thereof, thereby defining a partial gaiter upper edge and completely enclosing said protective pad in said pocket.

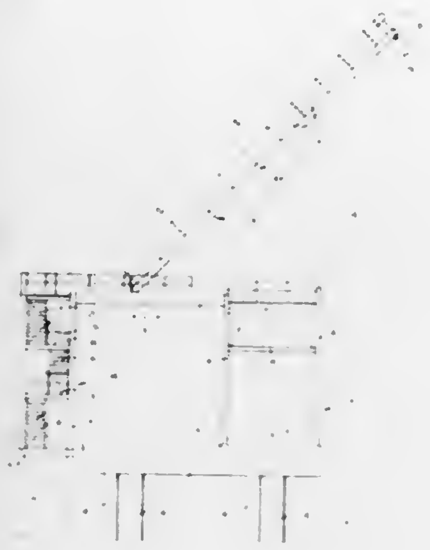
4,035,861
GANGWAY SYSTEM

George S. Edge, Fanwood, N.J., assignor to Amerada Hess Corporation, New York, N.Y.

Filed Oct. 29, 1975, Ser. No. 626,809

Int. Cl.^{2} E01D *1/00*

U.S. Cl. 14—71.1 **10 Claims**



1. A structure for providing a connecting link between a vessel and a docking area adjacent to which the vessel is adapted to be moved for loading and unloading comprising in combination:

- a movable gangway structure of selectively fixed operative length from one end of the gangway structure to the other end thereof,
- means to support one end of the gangway structure on the vessel in any position of movement of the gangway structure with respect to the vessel,
- a longitudinal gangway supporting member disposed at the docking area at a height above the mean low water level,
- carriage means disposed for movement back and forth along the longitudinal member and supporting the other end of the gangway structure on the longitudinal member in any position of movement of the gangway structure with respect to the longitudinal member and at any corresponding position of movement of the carriage means along the longitudinal member, and
- conjoint vertical and horizontal articulation connection means operatively interposed between said other end of the gangway struxture and the carriage means to preclude freely and continuously the tortional twisting of the gangway structure in any position of movement thereof with respect to the carriage means and at any corresponding position of movement of the carriage means along the longitudinal member.

4,035,862
IN-OUT AUTOMATIC VEHICLE WASHING APPARATUS

George E. Ennis, 765 Christy Road, Sharon, Pa. 16146; George Thomas Ennis, 13955 Tahiti Way, Marina Del Ray, Calif. 90291, and John W. Nugent, 72 Broadway Road, Masury, Ohio 44438

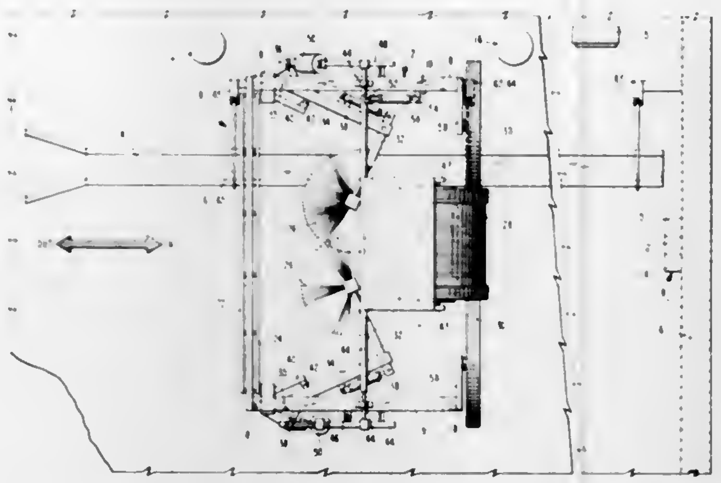
Filed June 29, 1976, Ser. No. 700,815

Int. Cl.^{2} B60S *13/06*

U.S. Cl. 15—53 AB **12 Claims**

1. An automatic vehicle washing apparatus comprising:

a. a stationary frame;
b. a plurality of brushes mounted on said frame,
c. means for rotating each said brush;
d. means for moving certain of said brushes between an operative vehicle washing position and an inoperative retracted position;
e. means for applying detergent to the vehicle;
f. means for applying rinse to the vehicle; and
g. electrical control means for controlling the operation of



said brush rotating means, said brush moving means, said detergent applying means and said rinse applying means for washing the vehicle as it passes into and through said frame in a forward direction and for rinsing the vehicle as it passes through and out of said frame in a reverse direction.

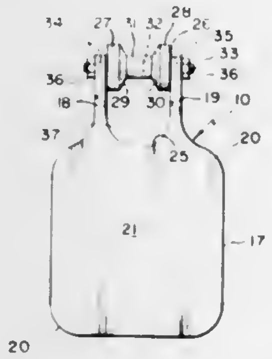
4,035,863
SWIMMING POOL BRUSH GUIDE

Albert Fischer, 4835 Oakway Drive, San Antonio, Tex. 78228

Filed Dec. 13, 1976, Ser. No. 750,010

Int. Cl.^{2} A46B *17/02;* E04H *3/20*

U.S. Cl. 15—160 **10 Claims**



1. In combination with a swimming pool brush including a long handle adapted to clean the side wall of a swimming pool, a swimming pool brush guide comprising

- a base plate,
- first and second laterally spaced and forwardly extending arms integrally formed on said base plate,
- a roller rotatably mounted intermediate said first and second arms,
- said handle of said brush adapted to be carried intermediate said arms and said roller with said brush extending downwardly,
- said brush guide adapted to be positioned adjacent said swimming pool with said roller extending at least slightly inwardly of said side wall whereby a user, standing upon said base plate, grasps said handle, forces the same outwardly against said roller, and said brush is forced inwardly against the side wall of said pool.

4,035,864
LOCKABLE CASTER, MORE PARTICULARLY SWIVEL CASTER

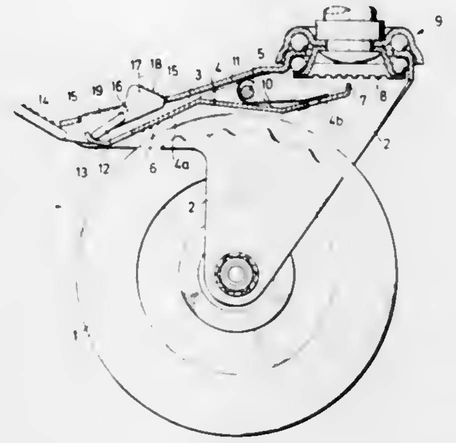
Klaus Dieter Schröder, Wermelskirchen, Rheinland, Germany, assignor to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie, Wermelskirchen, Rheinland, Germany

Filed July 15, 1975, Ser. No. 596,046

Claims priority, application Germany, Nov. 30, 1974, 7439939[U]

Int. Cl.^{2} B60B *33/00*

U.S. Cl. 16—35 R **8 Claims**



1. A lockable caster, which may be a swivel caster, having a running wheel rotatably mounted in a caster-fork and a locking device for locking the running wheel to prevent it from running and/or to prevent its caster-fork from swiveling, including locking means to engage with and lock the wheel and/or with a fixed ball bearing shell of the caster-fork to provide swivel locking, said locking device comprising an expanding toggle which is disposed in the cavity of the caster-fork, and which takes the form of a foot-operated control lever, and is pivotally mounted in a socket located in the hollow of the caster-fork below the fork back, the expanding toggle having a guide lug and the caster-fork having a guide slot, the guide lug being guided in the guide slot, the expanding toggle the guide lug and the control lever forming an unitary element pivotally mounted in said socket, characterized in that the guide slot is disposed in the rear portion of the caster-fork, and the guide lug takes the form of a resettling cam which in the locking position extends out of the guide slot to form a foot-operated cam provided for tilting the expanding toggle back into its release position.

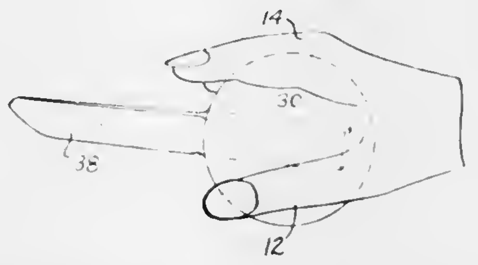
4,035,865
IMPLEMENTS USABLE BY PERSONS AFFLICTED WITH ARTHRITIS

Lucy Theresa McRae, and Brian Joseph McRae, both of 28059 Kendallwood Road, Farmington Hills, Mich. 48024

Filed Jan. 19, 1976, Ser. No. 650,127

Int. Cl.^{2} B25G *1/00*

U.S. Cl. 16—114 R **2 Claims**



1. A hand-manipulatable implement for use by persons afflicted with arthritis in their hands: said implement comprising a functioning device to be operated, and a handle to be held in the palm area of a person's hand:

- said functioning device being selected from the class comprising an eating knife, fork, toothbrush, hair comb, writing pen, pencil, medicine bottle cover, and telephone dialing aid;
- said handle being configured as a sphere having a diameter ranging between 1½ and 2 inches, whereby the sphere can be frictionally retained against the average person's palm and thumb without bending internal joints within the fingers;
- the functioning device and handle being separately formed; said spherical handle having a socket opening extending inwardly from its outer surface along a sphere radius; said functioning device having a shank adapted to extend into the defined socket to form a rigid force-transmitting connection between the functioning device and handle; the sphere being formed of a resilient material, and the socket opening being a slit that can be deformed to conform to varying shank cross sections.

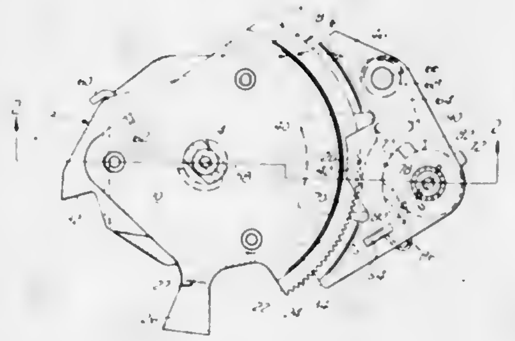
4,035,866
SEAT RECLINER HINGE ASSEMBLY

Joseph Pickles, Birmingham, Mich., assignor to Ferro Manufacturing Corporation, Detroit, Mich.

Filed Apr. 23, 1976, Ser. No. 679,756

Int. Cl.^{2} E05D *11/10*

U.S. Cl. 16—146 **18 Claims**



1. A seat recliner hinge comprising

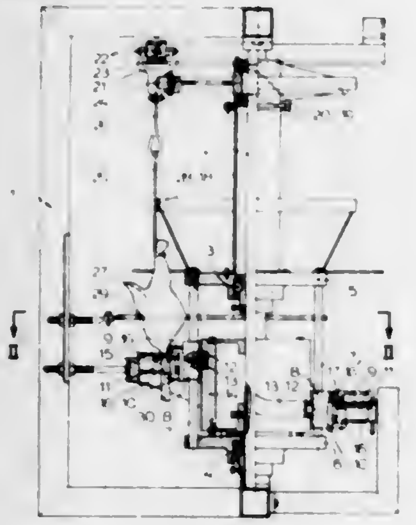
- a pair of plates, pivot means interconnecting said plates, said plates and pivot means being operable as a part of means hinging together a seat and seat back connected to said plates,
- a first one of said plates having a pair of confronting abutments thereon spaced circumferentially about the axis of said pivot means at an angular spacing to provide the intended pivotal movement of said seat back from full reclining position to a forwardly displaced loading position,
- the second one of said plates having an abutment thereon movable between the abutments on said first plate to limit pivotal movement between said plates to correspond to movement between full reclining and forwardly displaced loading positions of the seat back,
- one of said plates having an arcuate edge portion concentric with the axis of said pivot means and of an angular extent substantially corresponding to the relative pivotal movement provided between said plates, a part of said edge portion having a multiplicity of locking teeth thereon, the remainder of said edge portion having a smooth arcuate periphery,
- a locking pawl movably carried by the other of said plates and having a toothed portion,
- resilient means biasing said pawl in a direction to cause its toothed portion to bear against said arcuate edge portion,
- the smooth and toothed parts of the edge portion of said one plate and the toothed portion of said pawl being of such angular extent and location that during relative pivotal movement between said plates corresponding to move-

ment of a seat back between full forwardly displaced loading position and intermediate erect position, the teeth on the toothed end portion of said pawl engage the smooth arcuate periphery of the said edge portion, and that during relative pivotal movement between said plates corresponding to movement of the seat back between intermediate erect position and full reclining position the teeth on the toothed portion of said pawl are engageable with teeth on the toothed part of said arcuate edge portion to lock the plates against pivotal movement and so to lock a seat back connected to one of said plates in any selected intermediate reclining position.

4,035,867

APPARATUS FOR REMOVING THE NECK FROM A FOWL

Pieter Meyn, Noordeinde 72, Oostzaan, Netherlands
Filed Mar. 1, 1976, Ser. No. 662,928
Claims priority, application Netherlands, Mar. 5, 1975, 7502569
Int. Cl.² A22C *3/08*
U.S. Cl. 17—11 **4 Claims**

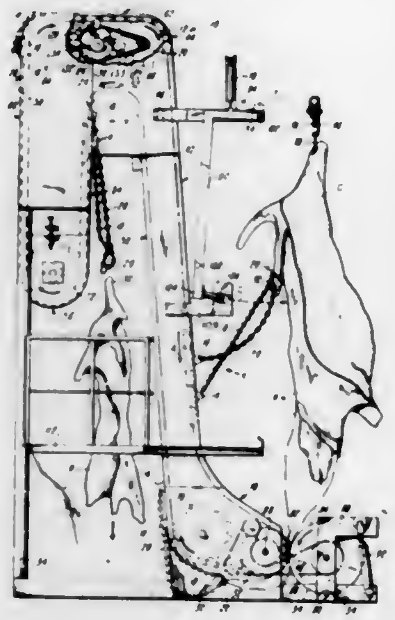


1. Apparatus for removing the neck of headless, plucked fowls hanging by the ankle joints from spaced hooks of an overhead conveyor, comprising a frame; a merry-go-round assembly on said frame including: a plurality of vertical slide bars regularly spaced about the circumference of the merry-go-round with the same spacing as the spacing of the hook of said conveyor; means for moving said slide bar along with said conveyor; a slide block reciprocably mounted on each said slide bar; means for sliding each said slide block up and down along said slide bar, each said slide block being provided with a forked clamping member laterally extending towards said conveyor, a pivotable arm connected to said clamping member for cooperating therewith the means for moving said arm towards and away from said clamping member in such manner that with the slide block in an upper position the arm is moved towards the clamping member thereby pressing the fowl's neck into said clamping member, so that the vertebrae of the neck are separated from the remaining part of the fowl's spinal column without damage to the fowl's skin; whereafter said slide block is moved downwards along said slide bar, so that said vertebrae together with the meat adhering thereto are at least partially pulled out of the skin of the neck through the opening previously provided by the removal of the fowl's head; and finally, with said slide block in a lower position, said arm is moved away from said clamping element thereby releasing the fowl; said slide blocks and said pivotable arms being provided with followers cooperating with stationary camming tracks attached to said frame, said camming tracks being so shaped that the movements of said slide blocks and said pivotable arms are executed in the desired sequential order.

4,035,868

MEANS FOR HANDLING HIDES DURING AND AFTER HIDE-PULLING OPERATION

Patrick J. Gardner, 419 E. Maple, and Hugh T. Myers, Sr., 111 Bonita, both of Ottumwa, Iowa 52501
Filed Sept. 17, 1975, Ser. No. 614,140
Int. Cl.² A22B *5/16*
U.S. Cl. 17—21 **20 Claims**



1. A device for advancing a hide during a hide pulling operation, and thereafter lifting and releasing the pulled hide, which comprises

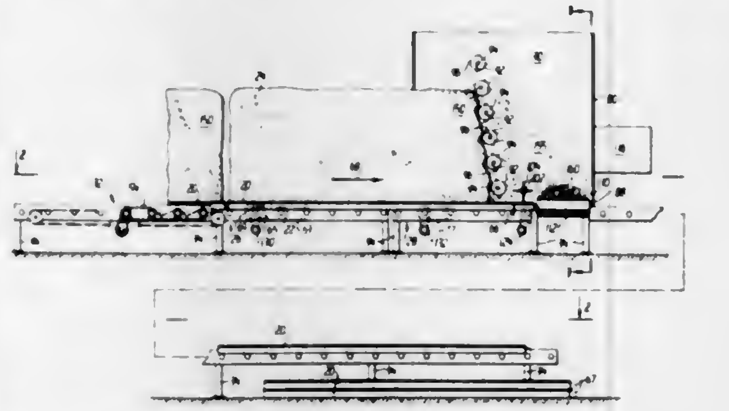
a pair of chains, one of which terminates in a hide-receptive slip loop and the other of which is secured to the slip loop and is operable to loosen same for releasing a hide engaged thereby; and

means for advancing said chains along a predetermined, closed path downwardly during the hide-pulling operation, thence upwardly for elevating the pulled hide to a position sufficient for freely suspending the hide and for thereafter actuating the other of said chains to loosen the slip loop and release the suspended hide.

4,035,869

METHOD FOR THE CONTINUOUS FEEDING OF PALLETIZED FIBER MATERIALS

Lambert H. Wilkes; Gary L. Underbrink, both of College Station, Tex., and Joseph K. Jones, Raleigh, N.C., assignors to Cotton Incorporated, New York, N.Y.
Division of Ser. No. 439,486, Feb. 6, 1974, Pat. No. 3,897,018. This application Feb. 19, 1975, Ser. No. 550,940
Int. Cl.² D01G *7/10*
U.S. Cl. 19—80 R **5 Claims**



1. A method of removing fibers from pallet means comprising the following steps:

relatively translating fiber-laden pallet means longitudinally with respect to fiber removal means;

removing the bulk of the fibers from the pallet means;

sweeping the surface of the pallet means to remove any fibers remaining after said removing step; and

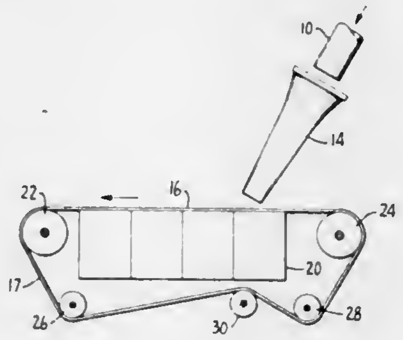
depositing the fibers from said removing and sweeping steps on a transverse conveyor for movement to subsequent processing;

wherein said removing step includes breaking up aggregated fibers before said step of depositing.

4,035,870

FIBER DISTRIBUTION AND DEPOSITING APPARATUS

Imants Reba, Vancouver, Wash.; Gerald Hugh Hogland, Estacada, Oreg., and Edward Clair Wolthausen, Vancouver, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.
Filed Dec. 24, 1975, Ser. No. 644,275
Int. Cl.² D04H *1/00*
U.S. Cl. 19—155 **8 Claims**



1. Particulate fiber distribution and depositing apparatus comprising, in combination:

a. fiber transport means for transporting gaseously-entrained fibers and including a conduit having an outlet through which said gaseously-entrained fibers are adapted to be ejected from the conduit at a high velocity;

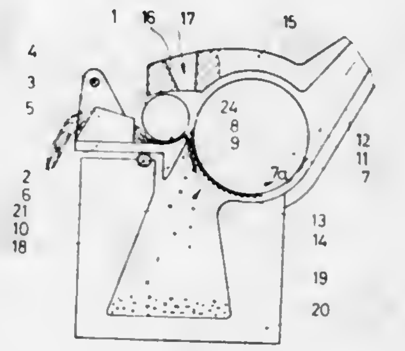
b. a forming bell adapted to receive said gaseously-entrained fibers from said fiber transport means conduit outlet and spread said fibers in a cross-machine direction, said forming bell including front and back walls the inner surfaces thereof uniformly converging and convexly curved in the direction of fiber flow along substantially the full extent of the length thereof and side walls connected to said front and back walls to define a passageway for said gaseously-entrained fibers from an inlet end defined by said walls to a substantially rectangular outlet end defined by said walls, said side walls diverging along straight lines in the direction of fiber flow, the cross-sectional area of said passageway remaining substantially constant along the length thereof, said forming bell inlet being spaced from said fiber transport means conduit outlet so that a gap is formed therebetween through which ambient air is entrained into said passageway; and

c. means defining a web-forming surface positioned adjacent to the outlet of said forming bell movable along a predetermined direction of movement and adapted to receive the fibers passing through said forming bell passageway after the fibers have been spread in a cross-machine direction by said forming bell.

4,035,871

OPENING AND CLEANING APPARATUS FOR AN OPEN END SPINNING UNIT

Fritz Stahlecker, Bad Uberkingen, Germany, assignor to Fritz Stahlecker and Hans Stahlecker, both of, Germany
Filed July 29, 1975, Ser. No. 600,053
Claims priority, application Germany, Aug. 22, 1974, 2440224
Int. Cl.² D01G *9/00*
U.S. Cl. 19—200 **12 Claims**



1. Opening and cleaning apparatus for an open-end spinning unit comprising:

a fibre supply roller,

a supply table in facing relationship to said supply roller, said supply roller and supply table being disposed to define a fibre supply path therebetween and being configured to resiliently clamp said fibre at a clamping section,

an opener roller disposed downstream of said supply roller and supply table, said opener roller including clothing for beating impurities out of fibre tufts supplied thereto by said supply roller and supply table at a fibre supply section located downstream of said clamping section in the travel direction of said fibre tufts,

said supply table including a removal edge portion at the end of said clamping section closest to said opener roller, said removal edge portion of said supply table being immediately followed by a surface which retracts from said opener roller,

a fibre guide surface in facing relationship with a peripheral portion of said opener roller, said fibre guide surface and peripheral portion defining a guide path for guiding fibres into a fibre guide channel arranged downstream of said opener roller,

and an impurity removal opening extending from immediately adjacent said removal edge portion to said fibre guide surface, said removal opening having a defining wall which merges in a transition section thereof into said fibre guide surface, said transition section being of rounded configuration to form a converging fibre inlet opening into said guide path at the side of said removal opening opposite the supply table,

said removal opening and said supply roller and supply table being geometrically configured and disposed with respect to said opener roller so that the fibre tufts are offered to said opener roller at said supply section supported only at said clamping section, and without any support across the removal opening other than said opener roller, thereby permitting impurities to be beaten out of the fibres by the clothing and to fall freely into the removal opening without rebounding from a wall or other structure.

4,035,872

METHOD OF CLOSING FABRIC SEAMS

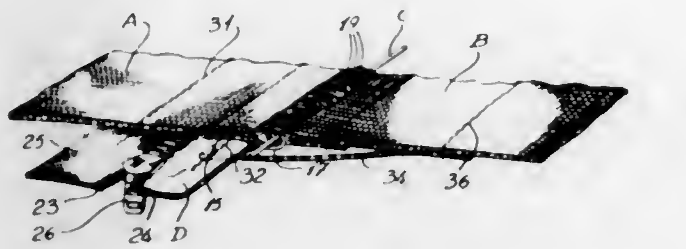
Donald George MacBean, Pierrefonds, Canada, assignor to JWI Ltd., Montreal, Canada

Filed Jan. 6, 1976, Ser. No. 646,977

Claims priority, application United Kingdom, Jan. 7, 1975, 00514/75

Int. Cl.^{2} F16G *3/00, 7/01*

U.S. Cl. 24—31 H **11 Claims**



1. In a method of drawing together into juxtaposition the ends of a wide heavy fabric, againt resistance of said ends to being drawn together, each end being provided with an array of loops spaced apart in the lateral direction of the fabric and adapted to be intermeshed and brought into register to form an elongated tubular passage for receiving an elongated holding member to form a hinge-type joint, comprising the step of,

connecting a side of a gap closing device detachably laterally along each of the respective ends with complementary progressive fastening means of the device on each side extending from one edge to the other ready to be engaged to draw the ends of the heavy fabric together in increments and thereafter retaining the increments together in a relative holding position.

4,035,873

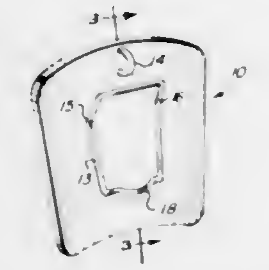
CLIP FOR RENDERING A BOLA TIE USABLE AS A PENDANT

Lee W. Epperson, 4121 W. Palo Verde Drive, Phoenix, Ariz. 85019

Filed Aug. 4, 1976, Ser. No. 711,478

Int. Cl.^{2} A41D *25/04*

U.S. Cl. 24—49 S **9 Claims**



1. A bola tie assembly which permits the bola tie ornament to be separately worn as a pendant comprising:

a bola ornament,

a first frame means mounted on the back of said ornament and having two end members raised from the back surface of said ornament to each provide a passage for at least two end portions of a cord,

a second frame means of a slightly smaller outer configuration than said first frame means arranged for a limited movement adjacent said first frame means,

said second frame means having a tab extending outwardly of one of its ends longitudinally thereof,

clamping means mounted on said second frame means for yieldably engaging and holding the two end portions of the cord a loop of which extends through the passage formed by one end of the first frame means and the ornament for surrounding the neck of a wearer of the bola tie,

said second frame means being mountable within said first frame means by moving the tab of said second frame means outwardly of said ornament through the passage formed by the other end of said first frame means and said ornament until said second frame means can be juxtapositioned to said first frame means.

4,035,874

QUICKLY ATTACHABLE BUTTON

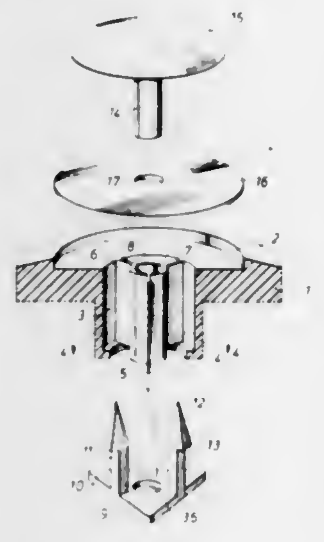
Sven Algot Joel Liljendahl, Gyllenstiernas vag 8, 175 76 Jarfalla, Sweden

Filed Apr. 20, 1976, Ser. No. 678,678

Claims priority, application Sweden, Aug. 29, 1975, 7509642

Int. Cl.^{2} A44B *1/18, 1/42*

U.S. Cl. 24—90 E **20 Claims**



1. A button which is quickly attachable to sheet material such as textile cloth comprising

a button body including a central portion defining a button base and having an uninterrupted outer wall and an integral inner wall with interspaces generally arranged around the axis of the button body and between said outer and inner walls,

said button body including openings generally aligned parallel to the button axis from the bottom of the button body into said interspaces,

an attaching means comprising a supporting plate including at least two substantially mutually parallel pins projecting from one face of said supporting plate and arranged around a center axis thereof,

said pins having pointed heads adapted to be punched through said sheet material from the side of said material opposite to the side to which the button is to be attached,

said pins being adapted to be then inserted into said openings into said interspaces between said outer and inner walls of said button body for attachment of said button body to said sheet material,

the radially inwardly facing side of the head of each of said pins adjacent to said inner wall in the assembled position being substantially smooth,

said heads of said pins each having a radial dimension as measured along a radius from the center axis of said supporting plate which is greater than the remainder of the body of the associated pin,

the radial dimension of each of said interspaces between said inner and outer walls of said button body being at least as great as said radial dimension of said pin heads,

said outer wall of said button body including at least one radially inwardly extending flange at said openings into said interspaces to restrict said openings to a radial dimension substantially less than said radial dimension of each of said pin heads so that the materials of the structure must be temporarily deformed to permit insertion of said pins into said axial openings.

4,035,875

FASTENER ARRANGEMENTS FOR JOINING OR SEPARATING MATERIAL EDGES OR SURFACES

Volkmar Kobelt, Bockeroth, Friedrichshoher Strasse 33, D-533 Konigswinter, Germany

Filed June 2, 1975, Ser. No. 582,922

Claims priority, application Germany, June 5, 1974, 2427087

Int. Cl.^{2} A44B *17/00*

U.S. Cl. 24—203 R **24 Claims**

1. A fastener arrangement for joining or separating material edges or surfaces along a distance of indeterminate length, including two cooperating fastener halves secured to the one end and the other material component to be joined or separated; each fastener half being formed of a series of elemental length portions; each elemental length portion of the one fastener half cooperating with a separate elemental length portion of the other fastener half to form an element pair therewith; the improvement wherein each element pair has a first stable position in which the elemental length portions of the element pair are in a full, mechanical interengagement with one another; each element pair has a second stable position in which the elemental length portions of the element pair are mechanically fully disengaged from one another; each element pair has an unstable position in which the elemental length portions of the element pair are in a partial mechanical interengagement with one another; the fastener halves assuming a joined state where the element pairs are in said first stable position; the fastener halves assuming a separated state where the element pairs are in said second stable position; the improvement further comprising means incorporated in at least one elemental length portion of each element pair for exerting a force on the element pair where it is in its said unstable position, said force urging the element pair into one of its said stable positions; and slideless means for effecting, in the presence of at least one element pair in said unstable position, a self-propagation, from element pair to element pair, of a transition from the one stable position of the element pair through said unstable position into the other stable position; the elemental length portions of each series being disposed sufficiently close to one another to ensure said self-propagation by interaction between adjoining elemental length portions of the same series when the cooperating elemental length portions of element pairs of the one and the other series move from said unstable position into one of said stable positions.

4,035,876

DUAL FASTENER SLIDER

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Japan

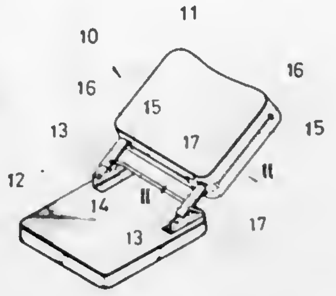
Filed Dec. 17, 1975, Ser. No. 641,765

Claims priority, application Japan, Dec. 21, 1974, 49-155899

Int. Cl.^{2} A44G *19/26, 19/00*

U.S. Cl. 24—205 R **2 Claims**

1. In a slide fastener arrangement on a covering having a peripheral opening through which a rod member extends the improvement comprising in combination: a pair of stringer tapes carrying along their confronting longitudinal edges rows of interlocking fastener elements, said longitudinal edges being spaced away from each other at a region of the stringer tapes to define intermediate the opposite ends of the stringer tapes said opening for the extension therethrough of the rod member, said rows of interlocking fastener elements being separated by said opening to provide a pair of separate paths therealong; a pair of independent sliders separate from each other and each being independently movable respectively along said paths and each slider having a front and rear end; and means for locking said sliders in respective opposite positions on the rows of fastener elements to close said opening except for a portion thereof between said sliders through which portion the rod member extends in contact with the sliders, said locking means including a pair of stop members fixedly mounted on the rows of fastener elements and positioned in close contact with the respective rear ends of the sliders to maintain the front ends of the sliders held against the opposite sides of the rod member.



4,035,877

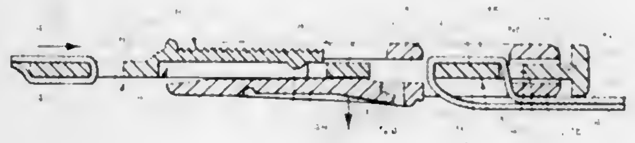
BUCKLE

Ivan F. Brownson, 16425 Otsego St., Encino, Calif. 91316, and Eric J. Brownson, 4730 Natick, Sherman Oaks, Calif. 91403

Filed Sept. 15, 1975, Ser. No. 613,048

Int. Cl.^{2} A44B *13/00, 11/10*

U.S. Cl. 24—230 SL **9 Claims**



1. A buckle for securing together two objects;

a male member connected to one of said objects and a female member connected to the other of said objects;

said male member having a first cutout;

a male flexible portion located over said first cutout and hinged to one side of said cutout for movement in said cutout;

a rigid locking bar located at another side of said cutout;

said female member having a second cutout;

a female flexible part located over said second cutout and hinged to one edge of said second cutout for movement in said second cutout;

said female flexible part having a bar engaging edge located opposite said locking bar when said members are in position to lock said buckle, said female part being moved by said flexible male portion to move said engaging edge away from said locking bar.

4,035,878

APPARATUS FOR SMOOTHING THE SURFACES OF MOVING WEBS

Joseph F. Cheatham, Sudbury, Mass., assignor to SW (Delaware), Inc., Providence, R.I.

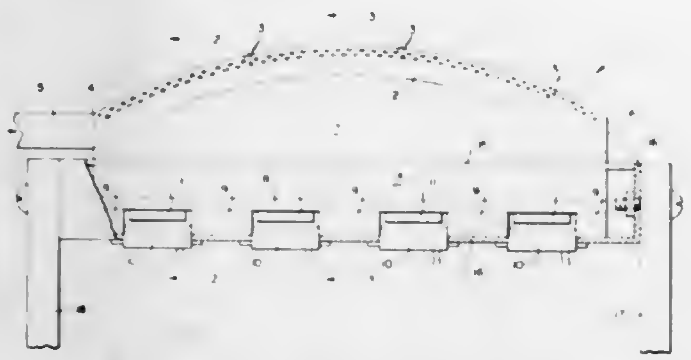
Continuation-in-part of Ser. No. 521,179, Nov. 6, 1974, abandoned, which is a continuation-in-part of Ser. No. 436,838, Jan. 28, 1974, abandoned, which is a continuation-in-part of Ser. No. 331,199, Feb. 9, 1973, abandoned. This application Apr. 21, 1975, Ser. No. 570,100

Int. Cl.^{2} D06C *3/00*

U.S. Cl. 26—87 **7 Claims**

1. Apparatus for smoothing the surface of a moving web comprising a curved hollow bar having a web-treating surface, the web-treating surface of said bar having a plurality of ports

communicating with the interior of said bar, said web-treating surface having a curvature between about 0.1% and 5% as measured by the height of the center of the bar above the ends of the bar divided by the linear distance between the bar ends, support means for said bar adapted to maintain the bar adjacent to or in contact with a moving web, means for introducing a gas at superatmosheric pressure into the interior of said bar and through said ports, means for selectively closing a portion of said ports to form a stable gas cushion between said bar and said moving web and means for oscillating said bar in a direction such that a component of oscillation is normal to the surface of said web.



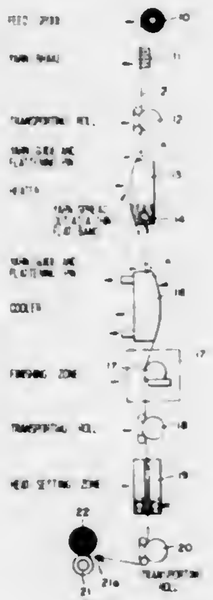
4. Apparatus for smoothing the surface of a moving web comprising a curved hollow bar, the surface of said bar having a plurality of ports communicating with the interior of said bar, said bar having a curvature as measured by the height of the center of the bar above the ends of the bar divided by the linear distance between the bar ends, support means for said bar adapted to maintain the bar adjacent to or in contact with a moving web, means for introducing a gas at superatmospheric pressure into the interior of said bar for exiting through said ports to pass between said bar and said moving web, and means for moving said bar back and forth in a direction such that a component of motion is normal to the web.

4,035,879

APPARATUS FOR PRODUCING TEXTURIZED YARNS

Heinz Schippers, Remscheid, Germany, assignor to Barmag Barmer Maschinenfabrik Aktiengesellschaft, Wuppertal, Germany

Filed Sept. 29, 1975, Ser. No. 617,985
Claims priority, application Germany, Sept. 27, 1974, 2446139
Int. Cl.² D02G *1/00*
U.S. Cl. 28—246 **11 Claims**



1. Apparatus for draw-texturizing and heat-setting a thermoplastic preoriented multifilament yarn comprising:

feed means to supply the preoriented yarn to a residual stretching stage;

at least three yarn transporting means spaced from each other and operating at adjustably different rotating speeds, the second transporting means being driven at a higher rate of speed than the first transporting means to complete the residual stretching and the third transporting means bein driven at a lower rate of speed than the second transporting means to permit heat fixing of the yarn running between said second and third transporting means under adjustable relaxation conditions;

thermal treatment means located between said first and second yarn transporting means including a yarn guiding and flattening means, a yarn contact heater arranged to heat each single filament of the running yarn along one side thereof applied to the heater and unilateral cooling means following and thermaily insulated from said yarn contact heater, said unilateral cooling means being arranged to quench each said single filament of the running yarn from its side opposite that applied to said yarn contact heater; and

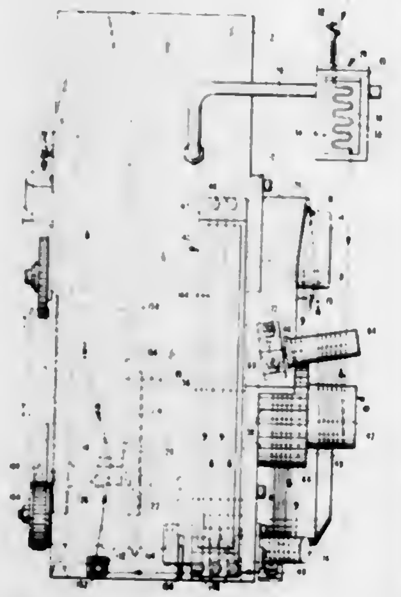
another heating means between said second and third yarn transporting means for heat-fixing the residually stretched yarn upon relaxation and self-crimping resulting from a differential shrinkage over the transverse cross-section of each individual filament.

4,035,880

APPARATUS FOR DRAWING AND CRIMPING YARN

William H. Hills, Melbourne, and Milton H. Borgman, West Eaugallie, both of Fla., assignors to Carisbrook Industries Inc., Iselin, N.J.

Filed Oct. 3, 1975, Ser. No. 619,231
Int. Cl.² D02G *1/12;* **D02J** *1/22*
U.S. Cl. 28—220 **5 Claims**



1. A yarn treating apparatus comprising:

a yarn crimper having a pair of feed rolls for moving yarn into a crimping chamber,

feed roll drive means for rotating said feed rolls at a constant rate of rotation to move yarn into said crimping chamber at a fixed linear rate,

first and second draw rolls for drawing the yarn positioned in advance of said feed rolls and spaced therefrom along the yarn path,

means for rotating said first draw roll at a first peripheral speed,

means for rotating said second draw roll at a second peripheral speed greater than said first peripheral speed, said yarn passing first around said first draw roll and then around said second draw roll whereby said yarn is drawn, said means for rotating said second draw roll comprising a variable speed drive to adjust the peripheral speed of said second draw roll to maintain the yarn between said second draw roll and said feed rolls at a constant predetermined tension, and

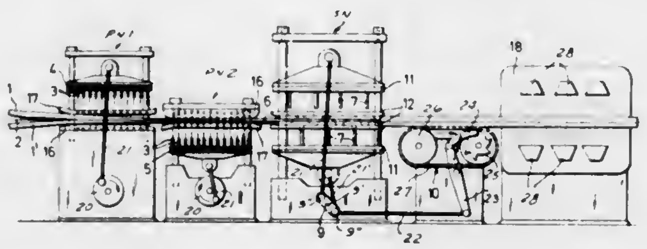
means for heating said yarn at a point between said first and second draw rolls.

4,035,881

METHOD AND APPARATUS FOR PRODUCING NON-WOVEN TEXTILE PRODUCT

Josef Zocher, Kreuzstrasse 26, 51 Aachen, Germany

Filed Mar. 10, 1975, Ser. No. 557,186
Claims priority, application Germany, Mar. 12, 1974, 2411685
Int. Cl.² D04H *18/00*
U.S. Cl. 28—111 **12 Claims**



6. Apparatus for producing a non-woven textile fabric having tufts or strands projecting from opposite faces thereof, comprising, in combination, means for transporting a web means of non-woven textile material stepwise along substantially rectilinear path; and a unit located upstream of said transporting means for forming on said web means tufts of strands projecting from opposite faces thereof, said unit comprising a pair of needle holders respectively arranged to opposite sides of and substantially parallel to said path, a plurality of needles carried by each of said needle holders and projecting therefrom normal thereto toward the other needle holder and spaced from each other in longitudinal and transverse direction of said path and each having a free end constructed to displace during penetration of the needles into said web means strands of material of the web means in a direction transverse to the longitudinal direction of the latter, the needles carried by one of the needle holders being arranged between and symmetrically with respect to the needles carried by the other of said needle holders, a guide plate for each needle holder arranged between the latter and the web means substantially parallel thereto and each formed with openings therethrough through which the needles carried by the respective needle holder project, and with cavities extending from the surface facing the web means into the guide plate, said cavities extending substantially in the direction in which said web means is transported by said transporting means and being respectively aligned with the needles carried by the other needle plate for receiving the tufts produced during penetration of said needles into said web means, and moving means connected to said needle holders for simultaneously moving the same in opposite direction along an active and a return stroke.

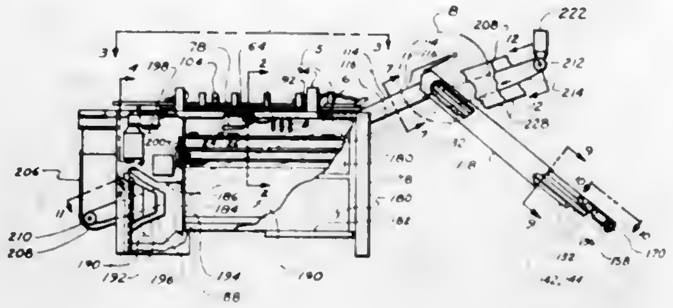
4,035,882

LOOM BOBBIN STRIPPER

Richard Ferguson, and Kenneth W. Troutman, both of Charlotte, N.C., assignors to The Terrell Machine Company, Charlotte, N.C.

Filed Oct. 18, 1976, Ser. No. 733,411
Int. Cl.² D03D *45/60*
U.S. Cl. 28—294 **17 Claims**

1. In a filling bobbin stripper incorporating means for supporting and guiding bobbins serially in a path while hanging from the heads thereof, and rotating reel means spaced below said hanging bobbins for engaging and removing waste from the depending barrels thereof, the improvement which comprises air ducts disposed immediately below the supporting means on which said bobbins are guided and adjacent the guided bobbins, said air ducts being formed to direct an air blast downwardly along said depending bobbin barrels aimed at a zone about two-thirds downwardly of the depending barrel length to entrain waste therefrom and direct said waste for engagement by said reel members.

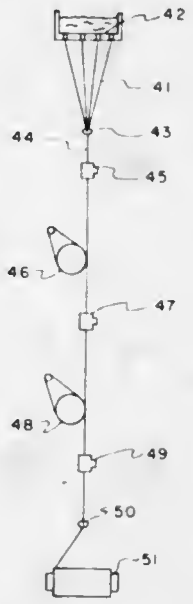


4,035,883

MULTIPURPOSE INTERMINGLING JET AND PROCESS

Norman John Bond, Pineville, N.C., assignor to Fiber Industries, Inc., Charlotte, N.C.

Filed Mar. 14, 1975, Ser. No. 558,571
Int. Cl.² D02G *1/20, 1/16*
U.S. Cl. 28—220 **7 Claims**



1. In a continuous filament-forming process for the preparation of drawn thermoplastic yarns, the improvement comprising the step of compacting as-spun yarn to coherency factors of from 5 to >1000, after solidification of said yarn, at a point where fusion and filament deformation is no longer possible, and then drawing the compacted yarn, said compacting step being conducted with an intermingling jet suitable for operation at low fluid pressures and velocities, said jet containing a substantially circular cross-section bore adapted for passage of multifilament yarn therethrough, and two fluid inlets leading into said bore, said two inlets being axially opposed and centrally disposed and perpendicular to the longitudinal axis of said bore, said bore having length-to-diameter ratio of 1:1 to 2:1, said fluid inlets having a cross-sectional area less than that of said bore.

4,035,884

PROCESS FOR THE PRODUCTION OF BULK YARNS

Hermann Lohwasser; Alfred Nogaj, and Ulrich Reinehr, all of Dormagen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 21, 1975, Ser. No. 569,931

Claims priority, application Germany, Apr. 27, 1974, 2420472

Int. Cl.^{2} D02J *1/22*

U.S. Cl. 28—281 **8 Claims**

1. In a process for the production of bulk yarns from acrylonitrile polymers by breaking tows on a conventional breaking machine, spinning the slivers thus obtained and shrinking the yarns obtained therefrom, the improvement which comprises heat drafting tows consisting of a single tow consisting of chemically different filaments or at least two chemically different tows together and thereafter passing the heated tow or tows to a breaking machine.

4,035,885

METHOD FOR PRODUCING MULTI-FIGURE LUMINESCENT DISPLAY TUBES

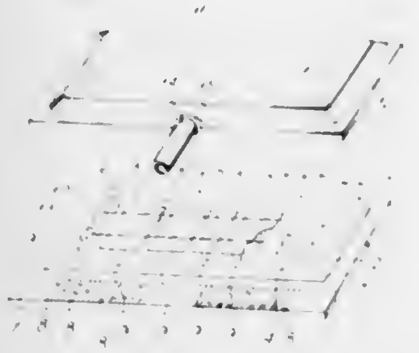
Katsuyuki Matsushita; Hideo Murayama; Kazufumi Yawata, and Masaki Kobayakawa, all of Izumi, Japan, assignors to Nippon Electric Kagoshima, Ltd., Izumi, Japan

Filed Dec. 22, 1975, Ser. No. 643,006

Claims priority, application Japan, Dec. 27, 1974, 50-1875

Int. Cl.^{2} H01J *9/02*

U.S. Cl. 29—25.14 **3 Claims**



1. A method for producing a multi-figure luminescent display tube, comprising the steps of preparing an insulator body including segment electrodes having phosphor layers applied thereon, baking the phosphor layers to control their luminous brightness, assembling parts onto the insulator body, and applying a frit glass mixed with a binder on connecting portions between the parts and the insulator body, placing the insulator body on which the parts are assembled into a baking furnace, baking the frit glass to stably fix the parts onto the insulator body, and sealing the insulator body to a container with the parts affixed to the insulator body being covered by the container, the improvement comprising removing the binder by heating the frit glass mixed with the binder applied on connecting portions between the parts and the insulator body by an infrared ray heater prior to said baking step, and wherein said baking step comprises baking the frit glass in a non-oxidizing environment in the baking furnace to stably fix the parts onto the insulator body to maintain the previously controlled luminous brightness of the phosphor layers.

4,035,886

TENSIONING DEVICE FOR CORONA-DISCHARGE ELECTRODES

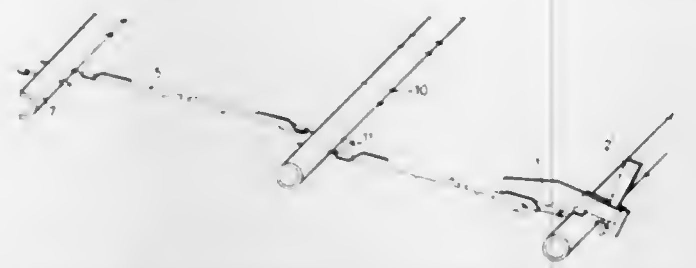
Walter Gluck, Frankfurt am Main, Germany, assignor to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Filed Sept. 24, 1976, Ser. No. 726,429

Claims priority, application Germany, Oct. 16, 1975, 2546305

Int. Cl.^{2} H01J *9/06*

U.S. Cl. 29—25.19 **5 Claims**



1. A tensioning assembly for a corona-discharge electrode, said assembly comprising:

an elongated corona-discharge electrode formed with staggered projections on one end and the other end fixed to a rigid tubular frame;

said frame having a side relative to which said one end is displaceable to tension said electrode;

two legs, one C-shaped member comprising a metal plate having a leg formed with a pair of mutually offset laterally projecting pins engaged behind respective projections of said one end of said electrode, and the other leg reaching around so that each leg is on opposite sides of said side of said frame, said other leg being formed with guide means inclined to the plane of said frame and said electrode, said other leg being further provided with an abutment confronting said side of said frame; and

a wedge received in said guide means and bearing against said side of said frame and said abutment for drawing said staggered projections toward said side thereby tensioning said electrode between its ends.

4,035,887

CUTTING TOOLS

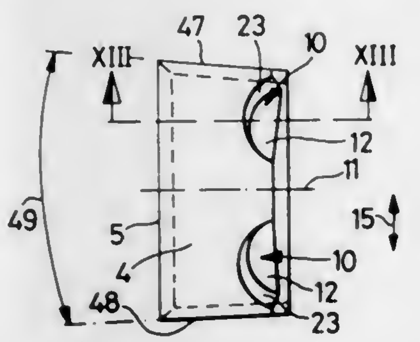
Karl Hertel, Oedenberger Strasse 29, D-8500 Nuremburg, Germany

Division of Ser. No. 620,500, Oct. 7, 1975, Pat. No. 3,986,276. This application July 29, 1976, Ser. No. 709,912

Claims priority, application Germany, July 23, 1975, 2532825

Int. Cl.^{2} B26D *1/00*

U.S. Cl. 29—95 R **5 Claims**



1. A cutting bit having a rhombus-like vertical cross sectional shape and comprising upper and lower spaced-apart faces and flank surfaces extending between said upper and lower faces, a cutting edge formed by a junction of said upper face and one of said flank surfaces, and two substantially flat bottomed recesses which open into another of said flank surfaces remote from said one flank surface, the bottom surfaces of said recesses extending inwardly from said another flank surface at an acute angle to said lower face.

4,035,888

DETACHABLE CUTTING PLATE FOR DESCALING ROUND BARS ON A CENTERLESS MACHINE

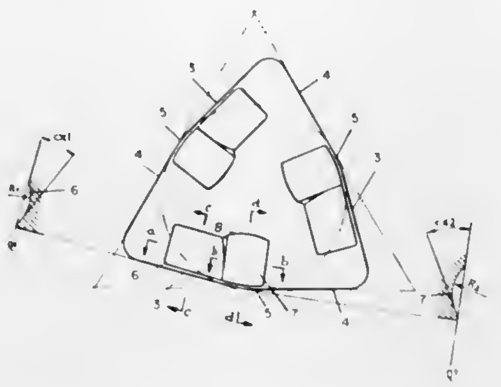
Gerard Romagnolo, Eybens, France, assignor to Ugine Carbone, Grenoble, France

Filed Aug. 6, 1976, Ser. No. 712,055

Claims priority, application France, Sept. 12, 1975, 75.28886

Int. Cl.^{2} B26D *1/00*

U.S. Cl. 29—95 R **13 Claims**



1. A detachable cutting plate of polygonal, equilateral, but not equiangular, shape designed for centerless descaling of rough-drawn or rough-rolled materials, by radial mounting on a rotary multi-tool head, and including lengths, each having a main cutting edge having a straight part and a curved part connecting the main cutting edge to a secondary planing edge, said plate characterized in that it comprises along each main cutting edge two chip-breaking surfaces consisting of separate concave grooves, generated by segments of curves respectively tangent at their lowest point to one and the same directing axis;

a. the first chip-breaking surface facing the straight part of the main cutting edge, of which the axis directing the surface is parallel with the said edge and forming a cutting angle α_1;

b. the second chip-breaking surface facing the curved part connecting the main cutting edge to the secondary planing edge and having a directing axis perpendicular to the plane bisecting the curved part and forming a cutting angle α_2.

4,035,889

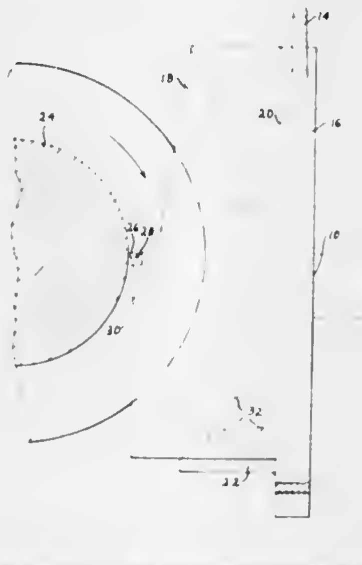
CUT OFF TOOL

James F. McCreery, Latrobe, Pa., assignor to Kennametal Inc., Latrobe, Pa.

Filed May 14, 1976, Ser. No. 686,510

Int. Cl.^{2} B26D *1/12*

U.S. Cl. 29—96 **6 Claims**



1. In a grooving and cut off tool structure; a planar support blade of substantial size having upper and lower ends and front and back edges and side faces and relatively thin in a direction perpendicular to the side faces of the blade, cutting element support means carried by said blade along the front edge for supporting a cutting element, and a rigid support member extending along and fixed to said blade adjacent the back edge thereof, said support member being concave toward said front edge of said blade when viewed in a direction perpendicular to the plane of said blade, said cutting element support means comprises a second member with a blade-like portion, a slot in said front edge of said support blade to receive said blade-like portion of said second member, an angular notch in the front edge of said blade adjacent said slot, and a laterally enlarged portion on said second member seated in said notch and including means for supportingly receiving a cutting element.

4,035,890

TOOLHOLDER

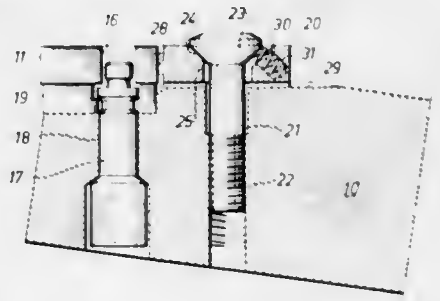
Stig-Lennart Eriksson, and Manfred Wallace Gustafsson, both of Fagersta, Sweden, assignors to Sandvik Aktiebolag, Sandviken, Sweden

Filed May 17, 1976, Ser. No. 687,199

Claims priority, application Sweden, May 20, 1975, 7505703

Int. Cl.^{2} B26D *1/00*

U.S. Cl. 29—96 **5 Claims**



1. In a copying toolholder for clamping a slender-formed copying insert **(11)** into an insert-receiving site in a fore portion of a holder shank **(10)**, there being a pin **(17)** fitted into a bore **(18)** in the holder while received in the aperture **(16)** of the insert, and there being a clamp plate **(20)** and associated actuating device **(22)** positioned for acting on an adjacent edge surface of the insert to urge said clamp plate and said insert against said pin, the improvement according to which the clamp plate is provided with a V-shaped pocket comprising two side surfaces **(26, 27)** for abutment with two converging edge surfaces of the insert, the angle between said side surfaces being less than 90°, the lower surface of said clamp plate having serrations **(29)** extending in the longitudinal direction of the fore portion of said shank adapted to cooperate with and be slidable along mating serrations on the upper surface of said fore portion of the shank upon tensioning said actuating device **(22)**.

4,035,891

METHOD OF FORGING AND PRESS-FORMING ALUMINUM WHEEL

Roger Lucas, Issoire, and Jacques Auberger, Jumeaux, both of France, assignors to FORGEAL, societe pour le Forgeage et l'Estampage des Alliages Legers, Paris, France

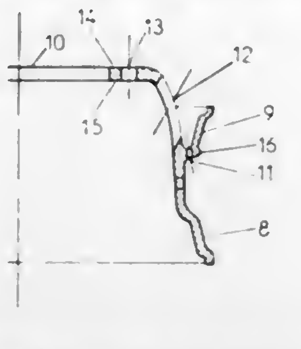
Filed June 16, 1976, Ser. No. 696,560

Claims priority, application France, July 3, 1975, 75.21774

Int. Cl.^{2} B21H *1/02;* **B21K** *1/32*

U.S. Cl. 29—159.01 **4 Claims**

4. The method of making aluminum wheels for vehicles comprising the following steps: forming the wheel disc component and the minor flange of the rim by forging from a blank substantially in the form of a cylindrical disc, forming the major flange component of the rim by press-forming from a tubular cylindrical element, assembling by welding the wheel disc component and the minor flange of the rim on the one hand and the major flange component of the rim on the other hand.



4,035,892
COMPOSITE CALCIUM CLAD MATERIAL FOR TREATING MOLTEN METALS

Tohei Ototani, and Yasuji Kataura, both of Sendai, Japan, assignors to Tohei Ototani, Sendai, Japan

Continuation-in-part of Ser. No. 374,431, June 28, 1973, abandoned. This application July 23, 1975, Ser. No. 598,477

Claims priority, application Japan, June 30, 1972, 47-65757; Dec. 27, 1972, 48-161573

Int. Cl.² B21D *49/00;* **B23K** *35/02*

U.S. Cl. 428—576 **9 Claims**

3. A composite calcium clad material for treating molten metal, said material consisting of

1. a solidified core which has been mechanically compressed and deformed, said core consisting essentially of
   - A. a material selected from the group consisting metallic calcium, calcium aluminum alloy and mixtures thereof, and
   - B. at least one element selected from the group consisting of aluminum are rare earth metals and a flux of silicates, oxides or halides of alkaline earth metals, and
2. a sheath of iron or alloy thereof in which said core is encased, the core being 10–90 percent by weight based on the composite material.

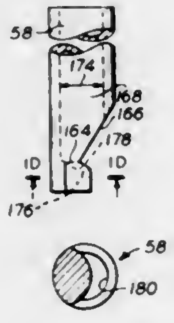
4,035,893
METHOD OF MAKING BEER DISTRIBUTING EQUIPMENT AND PRODUCT OBTAINED

David Zurit, Tenafly, N.J., and Frank Sciara, Floral Park, N.Y., assignors to Vending Components, Inc., Hackensack, N.J.

Division of Ser. No. 411,238, Oct. 31, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,552

Int. Cl.² B23P *15/00, 13/02*

U.S. Cl. 29—157 R **4 Claims**



1. The method of making a hose connecton fitting of a beer keg keg tapping apparatus which has a probe for opening a check valve in a keg fitting, which method comprises taking a length of bar stock which is separate from the apparatus with which it is to be used but equal to the length of the desired probe, said bar stock when vertically oriented with respect to its longitudinal axis having a top and bottom located at the ends of the bar stock and a front surface extending along the length of the bar stock, said front surface having an upper end and a lower end portion adjacent said top and bottom, respectively, rotating the bar stock, in a cutting machine, about an axis which is eccentric of the axis of the bar stock, cutting away a portion of material from the lower front end portion of the bar stock during such rotation to form a lower end portion of the probe located mostly on one side of the longitudinal axis of the bar stock to serve as a check valve-operating abutment at the lower end of the probe, cutting away other material from the front end of the bar stock, above said lower end portion, and at an angle to the longitudinal axis of the bar stock to form a sloping surface extending from a point on the front of the bar stock to a location adjacent to the upper end of said lower end portion, and drilling downward from the top of the bar stock until the drill breaks through said sloping surface and forms an opening through the front of the probe, stopping the drilling before the drill reaches the bottom end of said lower end portion, and inserting the upper end of the probe into the lower end of a liquid passage in the hose connection fitting and in alignment with said liquid passage.

4,035,894
AIR CONDITIONING APPARATUS AND METHOD FOR MAKING THE SAME, PARTICULARLY FOR AUTOMOTIVE VEHICLES

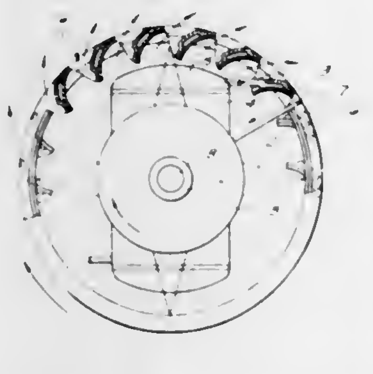
Rudolf Hintze, Lessingstrasse 32, Heusenstamm, Germany

Division of Ser. No. 469,441, May 20, 1974, Pat. No. 3,953,985, which is a continuation-in-part of Ser. No. 307,212, Nov. 16, 1972, Pat. No. 3,852,976. This application Aug. 19, 1975, Ser. No. 605,830

Claims priority, application Germany, Nov. 19, 1971, 2157380; May 20, 1974, 2325282

Int. Cl.² B23P *15/26*

U.S. Cl. 29—157.3 R **6 Claims**



1. A method of making an air conditioning apparatus, particularly for automotive vehicles, comprising the steps of providing a support having an axis of rotation; mounting on the support a compressor device for rotation about said axis; making an annular condenser device, including the step of forming a major surface of one of a pair of sheet-material members with channel-shaped depressions having a pair of transversely-spaced substantially parallel channels and also having a plurality of connecting channels which extend from one to the other of said parallel channels, the step of juxtaposing said pair of sheet-material members so as to define with one another a plurality of fluid-flow passages in which compressed cooling agent is received, and the step of bonding a major surface of the other of said sheet-material members with the major surface of said one sheet-material member in fluid-tight relationship to one another and in surface-to-surface contact intermediate said depressions, said bonding step including sealingly connecting strip-shaped portions of said members which are located between successive ones of said connecting channels with one another; and mounting said condenser device circumambiently about said compressor device on said support for joint rotation with said compressor device.

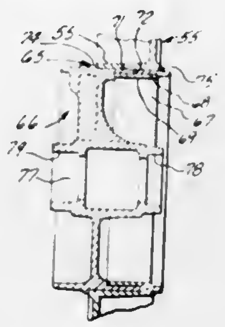
4,035,895
METHOD OF MAKING COMPOSITE MOTORCYCLE WHEEL

Thomas J. Lester, Aurora, Ohio, assignor to The Lester Tire Company, Bedford Hts., Ohio

Division of Ser. No. 648,954, Jan. 14, 1976, which is a continuation-in-part of Ser. No. 555,052, March 3, 1975, abandoned. This application Oct. 20, 1976, Ser. No. 734,242

Int. Cl.² B21K *1/34*

U.S. Cl. 29—159.03 **4 Claims**



1. A method of making a motorcycle wheel comprising the steps of providing as castings of a weldable lightweight metal including aluminum, magnesium and alloys thereof, a hub unit, and a wheel unit having a centrally open tubular portion to receive said hub unit and having a concentric rim portion integrally connected to said tubular portion by angularly spaced-apart spokes; heat treating the castings to relieve casting stresses; machine finishing the units including finishing the circular end surfaces of said tubular portion and finishing the outer surface of the hub unit and the inner surface of the tubular portion of the wheel unit to provide substantially complimentary cylindrical surfaces of which said inner surface is slightly smaller in diameter than said outer surface at ambient temperature and slightly larger in diameter at an appreciably higher than ambient temperature when the hub unit means remains at ambient temperature; inserting the hub unit into said machined inner surface with said wheel unit heated sufficiently to receive the hub unit; cooling said wheel unit to shrink-fit it on said hub unit; and welding one circular end surface of the tubular portion around an end portion of said outer surface which projects axially beyond said one end surface while rotating said shrink-fitted wheel and hub units about the axis of said inner and outer surfaces.

4,035,896
DEVICE FOR CRIMPING CONDUCTORS ONTO CONTACTS OF A CONTACT STRIP

Alois Ruppert Resch, Heilbronn, Germany, assignor to Bunker Ramo Corporation, Oak Brooks, Ill.

Filed Apr. 15, 1976, Ser. No. 677,509

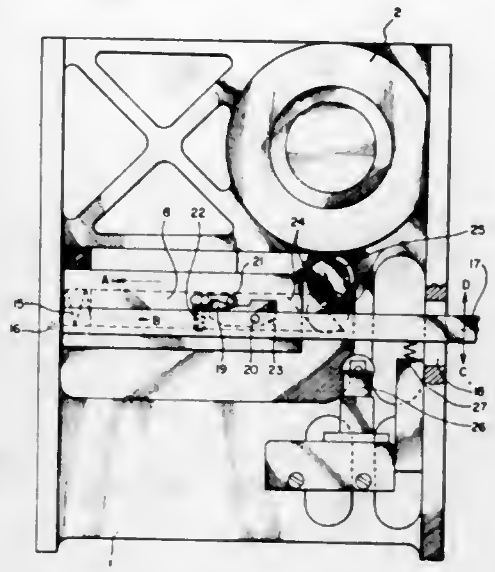
Claims priority, application Germany, Apr. 15, 1975, 2516399

Int. Cl.² H01R *43/04*

U.S. Cl. 29—753 **7 Claims**

1. Apparatus for use in a device for crimping conductors into the contact members of a contact strip, the device being of the type having a motor driven means for reciprocating two crimping jaws relative to each other and feeding means for stepwise advancing the contact strip in increments corresponding to the distance between the contacts in order to feed one contact at a time to the crimping jaws in an operational cycle, said apparatus comprising:

- an actuating member movable to a rest position, a first operational position, and a second operational position, said second operational position being reached only after passing through said first operational position;
- first means for activating said feeding means to advance said contact strip and position a contact between said crimping jaws when said actuating member is in said first operational position; and
- second means for activating said motor driven means to effect crimping action of said crimping jaws and for returning said feeding means to its initial position when said actuating member is in said second operational position.



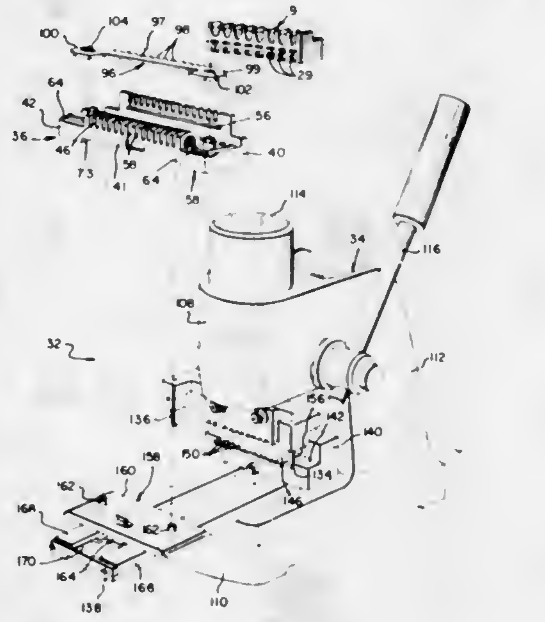
4,035,897
APPARATUS FOR CONNECTING CONDUCTORS TO CONTACT TERMINALS IN AN ELECTRICAL CONNECTOR

William Roderick Over, Harrisburg, and Ronald Carl Brehm, Carlisle, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed June 7, 1976, Ser. No. 693,655

Int. Cl.² H01R *43/04*

U.S. Cl. 29—56.6 **21 Claims**



1. Apparatus for inserting wires into the wire-receiving portions of electrical contact terminals, said terminals being contained in an insulating housing with said wire-receiving portions arranged in side-by-side relationship in a row and with said wire-receiving portions facing in a common direction, said apparatus comprising:

- a wire trimming and inserting apparatus and a fixture means, said fixture means comprising a fixture block having housing supporting surface for supporting said housing in a predetermined position, wire locating means for locating wires in side-by-side relationship in spaced relationship to said housing supporting surface with said wires in alignment with said terminals in a housing disposed on said housing supporting surface,

said trimming and inserting apparatus comprising frame means, a ram in said frame means, said ram being reciprocable along a predetermined path, said ram having a movable wire shearing member and wire inserting means thereon, a fixed shearing member on said frame means on one side of said path for cooperation with said movable shearing member,

said trimming and inserting apparatus having fixture locating means for locating said fixture block thereon at one end of said path with said fixed shearing member extending beside said row of wire-receiving portions of terminals in a housing on said housing supporting surface and with said wire-receiving portions in alignment with said wire inserting means whereby, upon placing a housing on said housing supporting surface, locating wires in said wire locating means placing said fixture block on said fixture locating means, and upon movement of said ram towards said fixture locating means said wires are trimmed and inserted into said wire-receiving portions of said terminals.

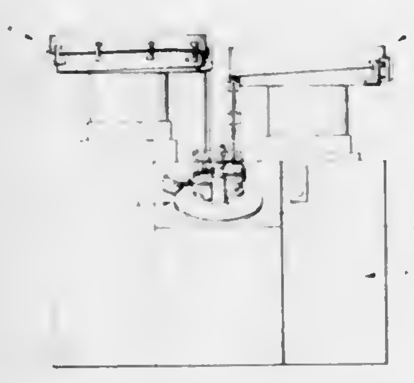
4,035,898
BLIND RIVET ASSEMBLING

Milton Bennett, Bridgewater, Mass., assignor to Philstone Nail Corporation, Canton, Mass.

Filed Sept. 4, 1975, Ser. No. 610,172

Int. Cl.^{2} B23P *19/04*

U.S. Cl. 29—788 **9 Claims**



1. A machine for assembling the pin and tubular rivet of a blind rivet assembly comprising:

a frame;

a rivet turret mounted to the frame for rotation about an axis, the rivet turret having a plurality of circumferentially equiangularly spaced rivet-receptive openings formed about its periphery, each of the openings being of a configuration to enable a pin to be passed through the rivet while the rivet is disposed in the opening;

a pin turret mounted to the frame for rotation about an axis parallel to the axis of rotation of the rivet turret and having a plurality of circumferentially and equiangularly spaced pin-receptive grooves formed about its periphery, the pin turret being located above the rivet turret and in a position in which the rivet and pin carried by said turrets may be brought into substantially axial alignment at an assembly station;

drive means for rotatable indexing of each pin and rivet turrets in unison and in angular increments to enable a succession of rivets and pins to be aligned at the assembly region;

a series of hammers mounted to the frame above the rivet turret for movement toward and away from the rivet turret, the first of said hammers being disposed above and in alignment with the assembly region, the remaining of the hammers in the series being located at each of the successive indexed positions of the rivet turret, the hammers being arranged so that the first may drive the pin into the rivet and the successive hammers may each drive the pin partly through the rivet, the last of the hammers in the series being arranged to drive the pin fully into the rivet; and

means for operating said hammers in a hammering stroke while the rivet turret is at rest at an indexed position.

4,035,899
AUTOMATIC TAPE CASSETTE-ASSEMBLING SYSTEM

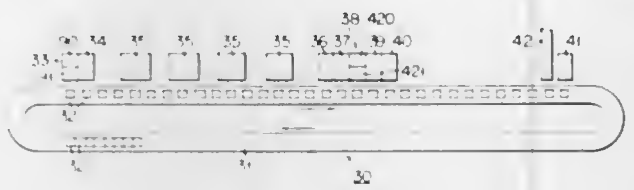
Hironobu Matsuda, Machida, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 9, 1976, Ser. No. 665,166

Claims priority, application Japan, Mar. 10, 1975, 50-28822; May 16, 1975, 50-65322; May 31, 1975, 50-73380; June 2, 1975, 50-74653; June 6, 1975, 50-76475; June 6, 1975, 50-76476

Int. Cl.^{2} B23P *19/04*

U.S. Cl. 29—773 **30 Claims**



1. A system for automatically assembling a magnetic tape cassette including first and second cassette housing halves, a pair of reel hubs received in the cassette housing halves and a magnetic tape wound about both reel hubs, which comprises at least one magnetic tape loading device for winding a magnetic tape about the reel hubs and loading the reel hubs and magnetic tape into the first cassette housing half, wherein the magnetic tape-loading device includes at least one magnetic tape takeup jig; a reel hub-fitting device for setting the reel hubs onto the jig; a magnetic tape takeup device for winding a prescribed amount of magnetic tape about the reel hubs placed on the jig; and a magnetic tape-transferring device adapted to hold the reel hubs mounted on the magnetic tape takeup jig and magnetic tape in substantially the same position as that in which both reel hubs and magnetic tape are to be finally received in the magnetic tape cassette and thereafter to transfer both reel hubs and magnetic tape into the first cassette housing half from the jig.

4,035,900
INSERT INSTALLING MACHINE

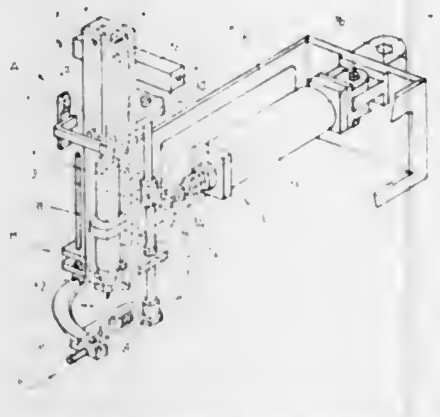
Daniel Boyko, 9/16 Barzilai St., Rishon Le Zion; David Wallach, 10 Ness Ziona St., Holon, and Mordecai Gasul, 186/24 Jerusalem Blvd., Kiriath Sharett, Holon, all of Israel

Filed Mar. 31, 1976, Ser. No. 672,548

Claims priority, application Israel, May 9, 1975, 47265; Mar. 9, 1976, 49178

Int. Cl.^{2} B23Q *7/10*

U.S. Cl. 29—795 **24 Claims**



1. Inserts installing machine of the type having a framework for supporting a vertically reciprocable, horizontally tractable installer head with a rotatable spindle onto which inserts are threaded one at a time for the installation thereof in suitable bores provided in the work and control means for reversing the rotation of the spindle on every installing cycle, said machine comprising insert holding means transferable between a first position, wherein the insert is held in axial alignment with respect to said spindle and a second position; means for transferring the said holding means from the first position to the second position after the threading of an insert on said spindle and means for feeding inserts to said holding means when in the second position, wherein said insert holding means comprises a spring-biased, insert arresting member normally engaging an insert positioned within a recessed insert supporting block, said block being mounted on an arm member journalled to said framework.

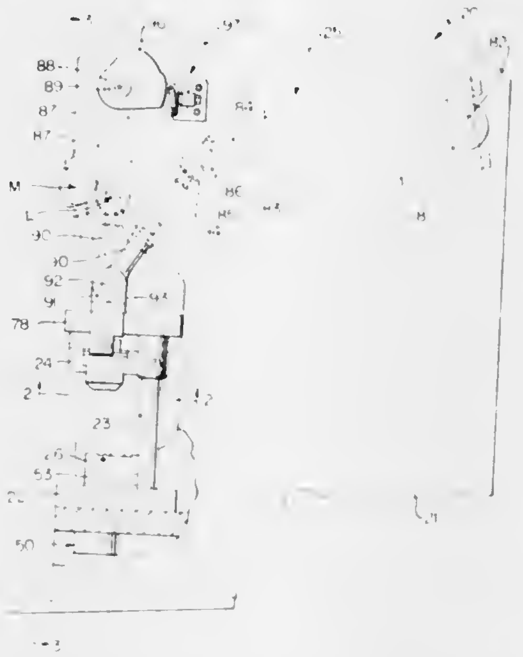
4,035,901
APPARATUS FOR JOINING TWO ABUTTING METAL MEMBERS TOGETHER AND METHOD OF MAKING SUCH APPARATUS

Joseph W. Lux, and John M. Varanelli, both of Waterbury, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Filed July 22, 1976, Ser. No. 707,780

Int. Cl.^{2} B23P *11/00*

U.S. Cl. 29—243.5 **10 Claims**



1. In an apparatus for joining two abutting metal members together by lancing and forming a part of one member through an unblanked part of the other member and thereafter staking said lanced and formed part of said one member to an adjacent surface of said other member to secure said members together in abutting relation, the improvement wherein said apparatus has a single reciprocating head having a first means that performs said lancing and forming step on a first stroke thereof and having a second means that performs said staking step on a second stroke thereof.

4,035,902
METHOD OF MANUFACTURING HOLSTER

John E. Bianchi, and Richard D. E. Nichols, both of Fallbrook, Calif., assignors to Bianchi Leather Products, Temecula, Calif.

Division of Ser. No. 492,757, July 29, 1974, Pat. No. 3,977,583. This application Apr. 23, 1976, Ser. No. 679,773

Int. Cl.^{2} B23P *11/02*

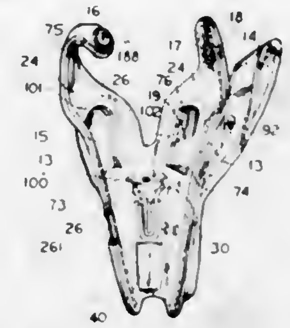
U.S. Cl. 29—446 **2 Claims**

1. A method of assembling front opening holsters comprising:

forming a body of leather like material in the shape of a pair of generally triangular intercepting sides along one edge and when closed, defining a handgun holding pocket with a front;

opening positioning a spring member on the inner face of each side of said body with one end of the spring extending along the front opening region of each side and the other end of the spring extending generally normal to the respective side of said body;

stitching a lining to the inner face of said body to cover both said spring members in the region of said front opening region, and leaving said other ends exposed;



folding said body and liner to define a handgun pocket; and

securing the said other ends of said spring members together to allow said spring members to act as a unitary member to bias said front opening to a generally closed position.

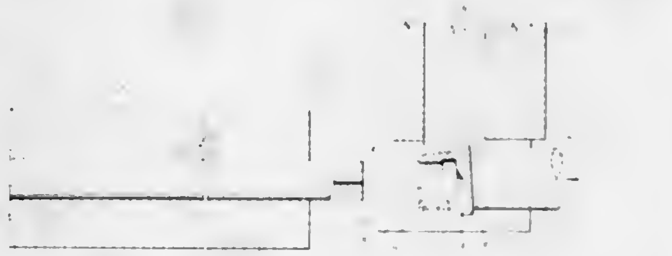
4,035,903
METHOD OF MANUFACTURING A SACRIFICIAL ANODE ROD ASSEMBLY

Lewis W. Taggart, Tulsa, Okla., assignor to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Continuation-in-part of Ser. No. 543,615, Jan. 23, 1975, abandoned. This application Apr. 28, 1976, Ser. No. 681,094

Int. Cl.^{2} B23P *3/00, 25/00*

U.S. Cl. 29—458 **6 Claims**



1. The method of making a sacrificial anode assembly for the cathodic protection of the internal surfaces of ferrous metal water-containing vessels comprising:

A. providing an anode rod member of a galvanically active metal and of a selected length and a selected substantially uniform diameter throughout its length and wherein the galvanically active metal surrounds a centrally disposed core wire;

B. providing an externally threaded elongated hollow metal cap member of a dissimilar from the galvanically active metal anode member and of a selected wall thickness, said cap member being provided with an internal recess which extends axially inwardly from an opening at one end of the cap member for a selected distance therein, said recess having a diameter slightly greater than the diameter of the anode rod member and at least one portion of said recess remote from said end of said cap member having a relatively greater diameter with respect to the remainder of said recess, said recess having at its base a centrally located cavity;

C. clamping and tightly holding the major portion of said anode rod member between a plurality of force-applying surfaces substantially conforming in shape to the external configuration of the anode rod member while allowing a minor portion of one extremity of the anode rod member to protrude a selected small amount from said force-applying surfaces;

D. applying a selected amount of an electrical contact lubricant containing metal particles to at least one of said members in the area where the members are to be joined;

E. positioning and aligning said cap member onto the anode rod member extremity which protrudes from said force-applying surfaces such that the anode rod member extremity fits snugly into said recess of said cap member and the cap member is axially aligned with the anode rod member extremity while ensuring that the engaging surfaces of said cap member and said anode rod member extremity have positioned therebetween a substantially uniform distribution of the electrical contact lubricant; and

F. applying to the cap member a sufficient force in the longitudinal direction of the anode rod member and the elongated cap member positioned thereon to metallurgically upset the galvanically active metal of the said extremity of the anode rod member to cause the galvanically active metal to flow and substantially uniformly fill the recess of the cap member, including the portion of the recess having a relatively greater diameter and effect contact between the core wire and the walls of the centrally located cavity of the recess, thereby producing a sacrificial anode assembly while establishing a tight, leakproof joint with a multiple of current-carrying bridges of metal particles between the engaging wall surfaces of said anode rod member extremity and the walls of said recess and without materially disturbing the initial wall thickness and basic configuration including the external threads of the elongated cap member.

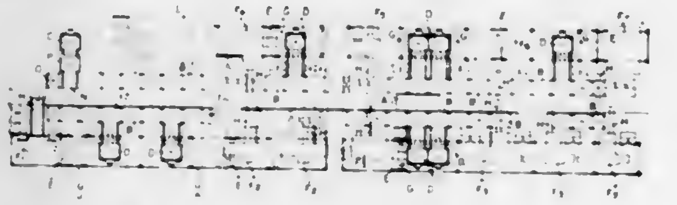
4,035,904
AUTOMATIC ARTICLE WORKING SYSTEM

Susumu Ishizaka; Taizo Kondo, both of Komatsu; Hiroshi Shoda, Kaga, and Masakatsu Sugimoto, Komatsu, all of Japan, assignors to Kabushiki Kaisha Komatsu Seisakusho, Tokyo, Japan

Filed Oct. 2, 1975, Ser. No. 618,937

Int. Cl.^{2} B23Q *7/00*; B23P *23/00*

U.S. Cl. 29—563 **7 Claims**



1. An automatic article working system which comprises:

a. a plurality of pallets for loading articles to be worked, each of said pallets conveying the articles to be worked;

b. pallet conveyor means for conveying said pallets, said conveyor means being movable along a horizontal path and in the vertical direction;

c. pallet storing means located on both sides of said path;

d. a plurality of machine tools provided adjacent to said pallet conveyor means;

e. pallet transfer and storing means provided between said machine tools and said pallet storing means for moving said pallets in and out of said pallet storing means, said pallet transfer and storing means including a rack portion to deliver the pallet to said pallet conveyor means;

f. manipulator means provided between said pallet transfer and storing means and said machine tools, said manipulator means transfering the articles to be worked on a taken-out pallet between said machine tools and said pallet, said pallet transfer and storing means further including a developing portion for moving said pallet into the range of said manipulator means; and,

g. computer means operatively connected to all of said means for controlling the operation thereof.

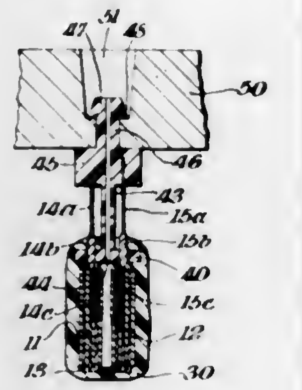
4,035,905
WET ELECTROLYTE VALVE METAL CAPACITOR WITH A FREE-FORM ENCAPSULANT

Warren J. Clement, Williamstown, Mass., assignor to Sprague Electric Company, North Adams, Mass.

Filed Mar. 8, 1976, Ser. No. 664,787

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—570 **11 Claims**



1. A method for making a wet electrolyte capacitor having a free-form encapsulant comprising:

a. connecting to an electrolytic valvemetal capacitor section, two lead wires that extend from an end of said section in the same direction;

b. threading said leads through a plastic impregnation header via two parallel holes being provided therefor in said header;

c. seating said header against said end of said section;

d. applying and curing a free-form encapsulating coating to said section to a portion of said lead wires and to said header, a third hole extending through said header outwardly from said section, said third hole extending from said section in said direction of said leads;

e. impregnating said encapsulated section by passing a wet electrolyte into said end through said third hole; and

f. sealing closed said third hole at the opposite end from said section.

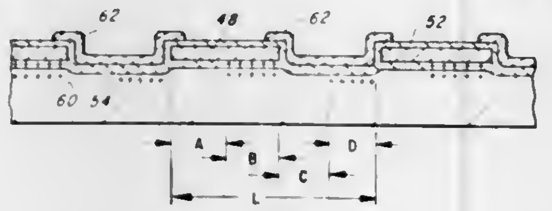
4,035,906
SILICON GATE CCD STRUCTURE

Al F. Tasch, Richardson, Tex., and Robert C. Frye, Brighton, Mass., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation of Ser. No. 598,316, July 23, 1975, abandoned. This application Nov. 1, 1976, Ser. No. 737,648

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—578 **16 Claims**



1. In a method of fabricating a charge coupled device including an elongated channel overlaid by phase electrodes extending across the channel, a first set of alternate ones of said electrodes being formed by process steps separate from the prior to process steps forming a second set comprising the intervening electrodes, said electrodes being electrically isolated from each other and from an underlying surface of a semiconductor substrate in which said channel is defined, corresponding portions of said electrodes being underlaid by modified surface potential regions in said semiconductor surface extending across said channel, the improved method of forming said modified surface potential regions under said first set of electrodes comprising the steps of:

forming a uniform thickness layer of insulating material on said surface of said semiconductor substrate;

implanting dopant ions into said insulating layer at spaced regions thereof across said channel;

forming strips of polycrystalline material over said insulating layer to define said first set of phase electrodes extending across said channel such that first portions of said strips overlie respective portions of said doped regions of the insulating layer while second portions of said strips overlie undoped regions of said insulating layer, said polycrystalline strips being formed by a process which causes no significant diffusion of said dopant material from said insulating layer into said semiconductor substrate;

removing said insulating material from between said polycrystalline strips and forming a layer of insulating material over said polycrystalline strips and between said polycrystalline strips to have said uniform thickness between said polycrystalline strips;

and during said fabrication heating said insulating material to cause significant out diffusion of said implanted dopant impurities into the surface of said semiconductor substrate to form modified surface potential regions underlying said corresponding portions and self-aligned with corresponding edges of said polycrystalline strips.

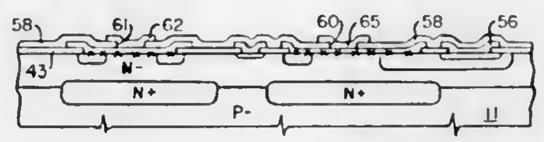
4,035,907
INTEGRATED CIRCUIT HAVING GUARD RING SCHOTTKY BARRIER DIODE AND METHOD

Richard J. Allen, and Michael A. Shields, both of Sunnyvale, Calif., assignors to Signetics Corporation, Sunnyvale, Calif.

Continuation of Ser. No. 392,110, Aug. 27, 1973, Pat. No. 3,877,050. This application Jan. 22, 1975, Ser. No. 543,130

Int. Cl.^{2} B01J *17/00*

U.S. Cl. 29—590 **1 Claim**



1. In a method for forming an integrated circuit having a Schottky barrier diode construction therein, providing a semiconductor body of one conductivity type and having a planar surface, forming a region of opposite conductivity type in said body extending to said surface and being substantially continuous to surround a region of said body of one conductivity type at said surface, providing a layer of insulating material on said surface, forming an opening in said layer of insulating material which has an edge which overlies said region of opposite conductivity type, forming a layer of metallization on said layer of insulating material and extending into said opening and making contact to said surface of said body, forming an additional layer of insulating material over said first layer of insulating material and over said first layer of metallization, forming a via of predetermined size in said second layer of insulating material and having an edge which overlies said region of one conductivity type circumscribed by said region of opposite conductivity type, sintering the semiconductor body and first metalization structure, forming a second layer of metallization on said additional layer of insulating material and extending there through and making contact with said first layer of metallization and again sintering said body to cause a predetermined additional bulk of metallization to be brought through said via of predetermined size and to extend between said body into contact with the first layer of metallization and further in contact with the one conductivity body portion positioned within the confines of the continuous region of opposite conductivity to form a Schottky barrier contact between said region of opposite conductivity and the body portion of one conductivity.

4,035,908
METHOD OF MANUFACTURING ELECTRIC MOTOR COMMUTATOR

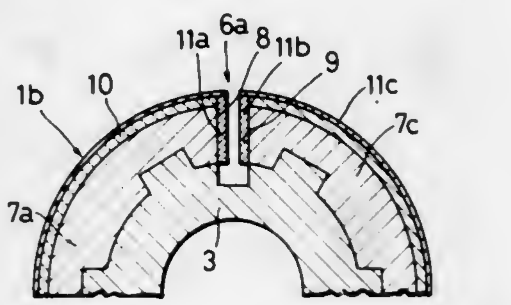
Hirohisa Ishi; Koichiro Hukui, and Norikatsu Inoue, all of Tokyo, Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Aug. 25, 1976, Ser. No. 717,589

Claims priority, application Japan, Oct. 29, 1975, 50-130202

Int. Cl.^{2} H01R *43/08*

U.S. Cl. 29—597 **9 Claims**



1. In the method of manufacturing an electric motor commutator from an assembly which includes a cylindrical insulator, and a plurality of segments of commutator metal extending about the outer circumferential surface of the insulator and being spaced apart by axially extending slots opening radially outward from the insulator between confronting surfaces of the adjacent segments; the steps of shielding the circumferential surfaces of said segments, subjecting said assembly to an oxidizing treatment with said shielding on said circumferential surfaces of the segments so that only said confronting surfaces of the segments between which said slots are defined have layers of an oxide of said commutator metal formed thereon, and then removing said shielding from said circumferential surfaces of the segments for exposing said commutator metal at said circumferential surfaces of the segments.

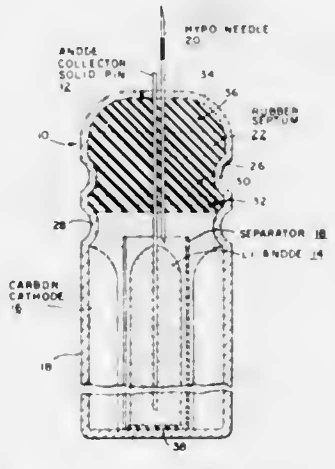
4,035,909
METHOD OF MAKING A MINIATURE CONCENTRIC BATTERY

Arabinda N. Dey, Needham, Mass., assignor to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Division of Ser. No. 314,316, Dec. 12, 1972, Pat. No. 3,945,846. This application Jan. 19, 1976, Ser. No. 649,939

Int. Cl.^{2} H01M *6/00*

U.S. Cl. 29—623.2 **5 Claims**



1. A method of making a miniature electric cell comprising the steps of inserting a cathode, an anode and a separator into a cylindrical metal container; inserting a sealing element into the open end of said container with said sealing element having

an unobstructed, hollow, tubular element extending therethrough; permanently sealing said container to said sealing element; introducing a fluid electrolyte from an electrolyte reservoir into said sealed container through said sealing element via said unobstructed, hollow, tubular element; separating said hollow tubular element from said reservoir and permanently preventing said electrolyte from escaping from said container via said tubular element.

4,035,910

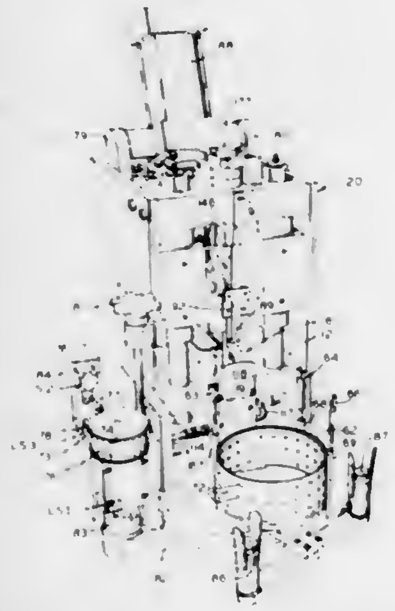
METHODS AND APPARATUS FOR USE IN MAKING ELECTRICAL INTERCONNECTIONS

Alan L. Kindig, Holland, Mich., assignor to General Electric Company, Fort Wayne, Ind.

Continuation-in-part of Ser. No. 590,707, June 26, 1975, Pat. No. 3,962,780. This application Mar. 29, 1976, Ser. No. 671,618

Int. Cl.^{2} H01R *43/04*

U.S. Cl. 29—628 **4 Claims**



1. In apparatus of the type for establishing connections at a connecting station and involving at least one lead wire extending from a stator assembly, and wherein the apparatus includes at least one pneumatic cylinder and also includes connection establishing tooling, the improvement comprising: scrap collection means disposed in the vicinity of the connecting station, said scrap collection means including a confined pathway permitting the flow of fluid therealong and interconnecting the at least one pneumatic cylinder and the scrap collection means; said scrap collection means including a venturi arrangement interconnected with the confined pathway, whereby air exhausted from the at least one pneumatic cylinder is directed into the venturi arrangement and establishes a vacuum in the vicinity of the connecting station that causes debris from the connecting station to be moved into the scrap collection means.

4,035,911

SYRINGE DESTROYER WITH NEEDLE DISPOSING CANNISTER

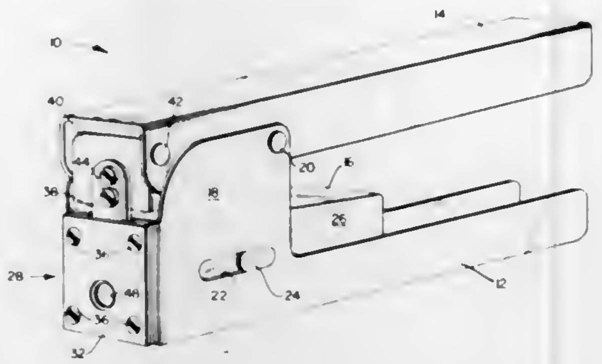
Henry W. Nethercutt, 82 Sycamore St., and Edward J. Lambiotte, 3022 Wallace Circle, Huntington, both of W. Va. 25705

Filed Aug. 23, 1976, Ser. No. 716,796

Int. Cl.^{2} B26B *13/22;* **B26D** *3/16*

U.S. Cl. 30—131 **9 Claims**

1. A hand operated device for severing a hypodermic needle and its associated hub from a syringe barrel comprising an elongate base member having opposed, upstanding side walls; a front end wall assembly joining said side walls; means defining open port means in said front end wall assembly through which the needle and associated hub of a syringe assembly are inserted for severing; reciprocating blade means for severing a needle and its hub from a syringe assembly; means mounting said blade means in said front end wall assembly for reciprocating movement therein in response to hand manipulation; means defining a severing port in said blade means, cooperating with said front end open port means whereby, in one position, said ports are alligned for insertion of the needle and hub of a syringe assembly therethrough and, upon hand manipulation of said blade means to another position, the hub and needle are severed from a syringe assembly; and removable cannister means disposed between said side walls, and having insertion port means aligned with said front end wall assembly open port means for receiving a needle and its hub during severance from a syringe assembly, said cannister means retaining said needle and hub after severance from its syringe assembly.



4,035,912

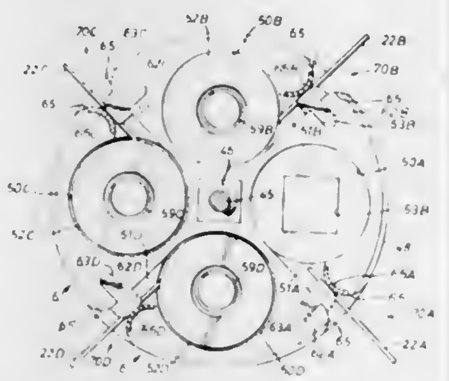
ROTARY CUTTING ASSEMBLY

George C. Ballas, and Thomas N. Geist, both of Houston, Tex., assignors to Weed Eater, Inc., Houston, Tex.

Continuation of Ser. No. 398,194, Sept. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 321,580, Jan. 8, 1973, Pat. No. 3,826,068, which is a continuation-in-part of Ser. No. 207,198, Dec. 31, 1971, Pat. No. 3,708,967. This application Nov. 19, 1975, Ser. No. 633,456

Int. Cl.^{2} B26B *27/00*

U.S. Cl. 30—276 **10 Claims**



1. Apparatus for cutting vegetation and the like, comprising
a rotatable housing member having at least one metallic bearing surface adjacent its periphery,
flexible non-metallic line means interconnected with said housing member and further having a free traveling end portion extending across said metallic bearing surface and into a cutting plane, and
driving means for revolving said housing member to bring said line means into abutting engagement with said bearing surface therein and to substantially rigidly extend said free traveling end portion of said line means radially from said housing member for cutting vegetation in the cutting plane.

4,035,913

DEVICE FOR FORMING TRIM PATTERNS IN FUR

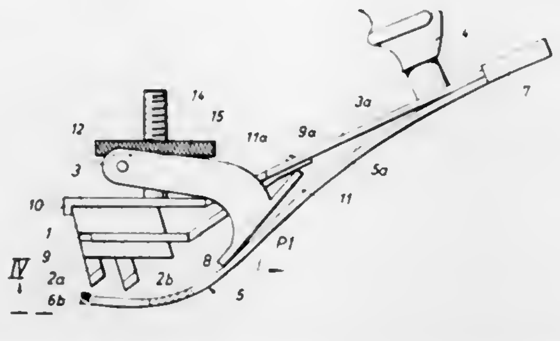
Josef Madl, Langbehnstrasse 20, D-82 Rosenheim, and Hans Schober, Hochriesstrasse 25, D-82 Rosenheim-Heiligblut, both of Germany

Filed July 23, 1975, Ser. No. 598,435

Claims priority, application Germany, Aug. 5, 1974, 2437694; Oct. 30, 1974, 2451528

Int. Cl.^{2} B26B *29/00*

U.S. Cl. 30—287 **10 Claims**



1. Apparatus for trim patterning furs comprising a group of draw-knife blades arranged on a mounting plate in spaced apart generally aligned parallel relationship at substantially equal intervals adjacent each other, and being arranged with cutting edges extending at an acute angle to the base surface of said mounting plate and including an arcuate plate concave to said mounting plate base surface and having openings formed therein and being normally disposed with the convex surface of said arcuate plate adjacent the material surface to be cut, said openings defining a pass-through opening for each knife blade, and with adjustment means for establishing a desired projecting length for said knife blades over the side of the convex surface of said arcuate plate, the apparatus being characterized in that:

a. said mounting plate having an extension portion and further having a gripping handle thereon;
b. said arcuate plate having an extension portion extending generally upwardly away from the cutting edges of said draw-knife blades with said extension portion being secured to said extension portion of said mounting plate;
c. said arcuate plate extension portion being formed of a resilient material and being normally biased toward said mounting plate;
d. said knife blade adjustment means including means for spreading said arcuate plate away from said mounting plate a certain predetermined distance for simultaneously positioning the cutting edges of said draw-knife blades at a predetermined distance from the convex side of the surface of said arcuate plate, the arrangement being such that a desired projection length of the tips of said draw-knife blades is achieved.

4,035,914

SHEAR FOIL FOR A DRY SHAVER

Friedrich Blume, deceased, late of Schwalbach, Taunus, Germany (by Edith Inge Blume, heir); Monika Ingrid Blume, heir, Schwalbach, Taunus, Germany; Friedrich Blume, heir, Schwalbach, Taunus, Germany; Werner Messinger, Kronberg, Taunus, Germany, and Josef Schiffer, Oberroden, Germany, assignors to Braun Aktiengesellschaft, Frankfurt am Main, Germany

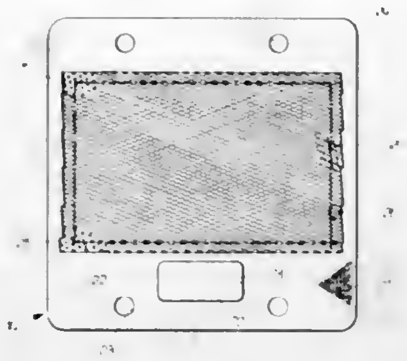
Filed Nov. 24, 1975, Ser. No. 634,406

Claims priority, application Germany, Nov. 25, 1974, 2455723

Int. Cl.^{2} B26B *19/04*

U.S. Cl. 30—346.51 **11 Claims**

1. A shear foil for a dry shaver, comprising a flexible sheet material body having a central portion provided with holes of a diameter between substantially 0.3 and 0.7 mm for passage of beard stubble therethrough, and perforate peripheral shear-foil mounting portions being lateral edges and provided from the central portion up to said edges with a continuous field of holes of a diameter smaller than at least some of those in said central portion but not less than substantially 0.02 mm, the holes in the respective portions being separated by sheet material strips and the bending resistance of said sheet-material body being substantially uniform throughout.



4,035,915

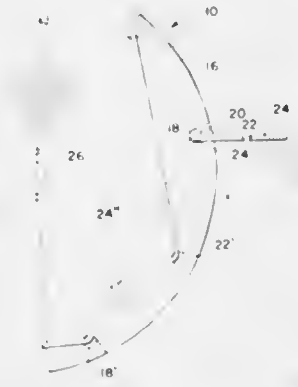
FILAMENT WOUND PERFORATE PLATE SYSTEM

Charles B. Pittinger, Jr., 79 Maybin Circle, Baltimore, Md. 21117

Filed June 17, 1975, Ser. No. 587,648

Int. Cl.^{2} B26B *27/00;* **A01D** *55/18*

U.S. Cl. 30—347 **18 Claims**



1. In an assembly for cutting grass and the like, including an operationally rotatable disk having structure defining a series of apertures circumferentially around the disk inside the circumference and a length of filament fixed to the disk with a terminal length thereof extending from one of said apertures as a cutting length of the filament and plural of the apertures engaging successive intermediate portions of the filament at intervals providing for each said successive intermediate portion of the filament in turn to become a said terminal length thereof extending as a cutting length on parting of a previous said terminal length thereof during operational rotation of said disk, the improvement comprising: the disk having structure defining means extending from said apertures to the circumference for receiving the broadside aspect of an intermediate length of the filament radially with respect to the disk into at least one aperture to the disk during assembly, and means communicating with said broadside aspect of the filament for preventing said intermediate length of the filament from passing radially with respect to the disk from said aperture on operational rotation of the disk.

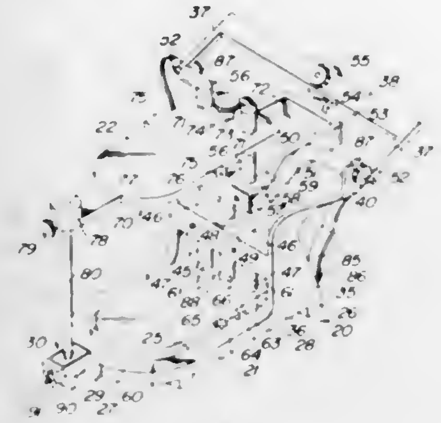
4,035,916
DENTAL APPARATUS

Melborne D. Eveland, 1006 Buena Vista Road, Forked River, N.J. 08731

Continuation-in-part of Ser. No. 470,197, May 15, 1974, Pat. No. 3,965,576. This application Jan. 8, 1976, Ser. No. 647,412

Int. Cl.² A61C *11/00*

U.S. Cl. 32—32 **19 Claims**



1. A dental articulator comprising a base adapted to rest on a supporting surface, upstanding medially open pedestal means on said base, a lower member in upwardly facing relation on said base for detachably carrying a lower dental model, lower member mounting means on a vertically intermediate region of said pedestal mounting said lower member for vertical adjustment relative to said base, journal bearing means at an upper region of said pedestal, an upper member extending generally from an upper region of said pedestal in downwardly facing relation over said lower member for detachably carrying an upper dental model, upper member mounting means rotatably carried by said bearing means for rotation about a laterally extending generally horizontal axis and mounting said upper member for adjustment transverse of said axis toward and away from said lower member and rotative movement with said upper member mounting means, and spring means on at least one side of said pedestal and operatively connected to said upper member mounting means for urging the latter about its axis for swinging movement of said upper member toward said lower member, said spring means leaving the medial pedestal region open for access therethrough to the dental models, said lower member mounting means comprising a fixed laterally extending member in the medial opening of said pedestal, lower way means depending from said fixed laterally extending member and slidably received in said lower member, and lower member holding means for selectively holding said lower member relative to said lower way means at a desired elevation.

4,035,917
REINFORCING DENTAL PIN CUTTER AND RETAINER

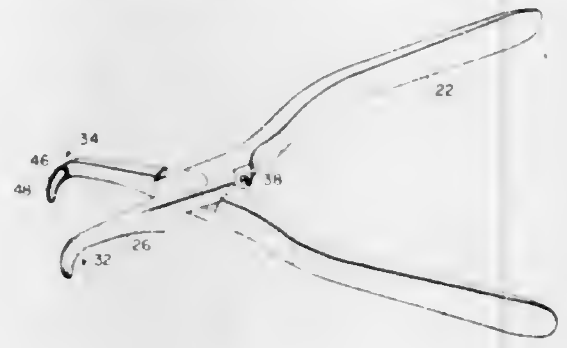
James Norman Roberts, 32206 Old Forge Lane, Farmington Hills, Mich. 48024

Filed Dec. 23, 1975, Ser. No. 643,850

Int. Cl.² A61C *3/00*

U.S. Cl. 32—40 R **12 Claims**

1. A dental instrument for cutting and severing end portions of metal wires, pins and the like, collecting severed cuttings as cut, and containing the collected cuttings for subsequent removal, said instrument being generally of a construction similar to pliers, including pivoted handle portions and cutting jaws at the ends of the pivoted handle portions, said instrument, and principally said cutting jaws, being of a shape, size, construction and configuration for coactive insertion thereof into small spaces in a human mouth wherein wire retention pins have been inserted intra-coronally in a bore in a natural tooth to aid in retentatively adhering and reinforcing tooth restoration material applied to the natural tooth being repaired, being insertable between said pins to selectively engage an end of a said pin to sever the same, or in intra-oral surgery of a type which also includes utilization of securement wire for arch bars in a procedure to immobilize a patient's jaws, where jaw fracture exists, or for cutting and trimming wire ends in orthodontic procedures, the shape, size, construction and configuration of the cutting jaws permitting insertion and engagement of the cutting jaws about said metal end portions in severely restricted areas to permit severing the wire ends, said cutting jaws each further including, on the inner side thereof, inward facing half cup recessions matable one with the other upon closure of the jaws to constitute a totally closed and sealed severed wire end retaining compartment for removal thereof from a mouth, said half cups having interacting and interengaging cutting edges formed on at least the forward free end edges of the cup recessions, said jaw ends being generally smoothly and continuously curvilinear, and being curved in a direction angled from the longitudinal axis of the handle portions at a substantial angle to the plane of opening of said arms, said recessions being formed in said curvilinear portions and of an elongated curvilinear generally oval shape corresponding to the shape of the jaw ends to facilitate the insertion and operation of the jaw ends within restricted areas of a human mouth, said instrument and the cutting and retaining action being operable in all positions of rotation of said instrument.



4,035,918
DENTAL INSTRUMENT

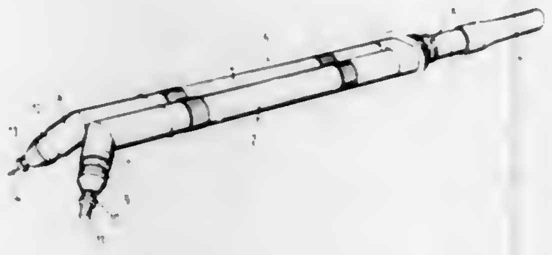
Erik François Johannes de Mul, Woerdsestraat 7, Ressen, Netherlands

Filed Dec. 23, 1975, Ser. No. 643,851

Claims priority, application Netherlands, Dec. 27, 1974, 7416952

Int. Cl.² A61C *3/08*

U.S. Cl. 32—54 **17 Claims**



1. A dental instrument for packing fillings of amalgam, including a handle with a bored head having an axially disposed bore and a first impact means which is axially reciprocable in said bore by selective contact with a driving device which is axially reciprocable within said handle, said bored head being disposed in a direction which encloses an angle with the axis of said handle, characterized in that said handle includes at least one second bored head and second impact means adapted to be axially reciprocated by said driving device, the impact direction of each said second impact means including an angle with both said axis of said handle and with the impact direction of said first impact means, said first and second impact means being each kept out of contact with said driving device by a biasing means and being separately brought into said selective contact with said driving device by exercising a compressive force on one said bored head.

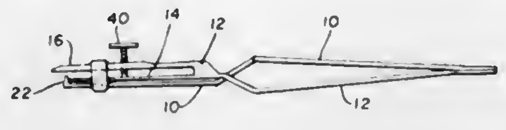
4,035,919
DIRECT BONDING BRACKET POSITIONING AND MOUNTING TOOL

Anthony J. Cusato, Closter, N.J., assignor to Dentronix, Inc., Trevose, Pa.

Filed June 4, 1976, Ser. No. 693,008

Int. Cl.² A61C *7/00*

U.S. Cl. 32—66 **10 Claims**



1. An orthodontic tool particularly for positioning and holding a direct bonding bracket as it is positioned while permitting adhering cement applied thereto to harden to secure the bracket to a tooth of a patient, said tool including: (a) a tweezer-type tool having upper and lower leg members attached at one end and as assembled there is a constructed bias so that the unconnected leg ends are movable toward and to each other; (b) an intermediate leg member carried between the upper and lower leg members and as constructed and assembled a bias is provided to urge the lower leg toward the intermediate leg, the ends of the lower leg and the intermediate leg disposed to cooperatively retain a direct bonded bracket positioned therebetween; (c) an extending jaw portion provided on the upper leg member and providing therewith a means for supporting the tool on the top of a patient's tooth as the bracket is positioned and the applied cement hardens securing the bonded bracket to the tooth; (d) a lower jaw end carried by and formed on the free end of the lower leg member, this jaw end being L-shaped and with the short portion of the L-shape extending toward the extending upper jaw, this short leg sufficient to slidably engage and enter a lower slot formed on the direct bonded bracket, and (e) adjusting means cooperatively carried by the upper and intermediate leg members whereby the intermediate leg end is positioned a selected distance from the underside of the extending upper jaw, whereby the upper and lower legs are moved by manual manipulation from each other and to open condition whereby the lower and intermediate jaw ends are sufficiently opened to place a direct bonding bracket therebetween and in a holding position whereat the legs are released to grip the bracket by the ends of the lower and intermediate legs and while gripped the adjustment means is moved as required to being the bracket to the desired position below the upper jaw.

4,035,920
DENTAL TEACHING DEVICE

Martin Saupe, Mittelbiberach, Germany, assignor to Kaltenbach & Voigt, Biberach, Rib, Germany

Filed July 8, 1976, Ser. No. 703,505

Claims priority, application Germany, July 14, 1975, 2531436

Int. Cl.² A61C *19/00*

U.S. Cl. 32—71 **11 Claims**

1. A dental teaching device comprising:

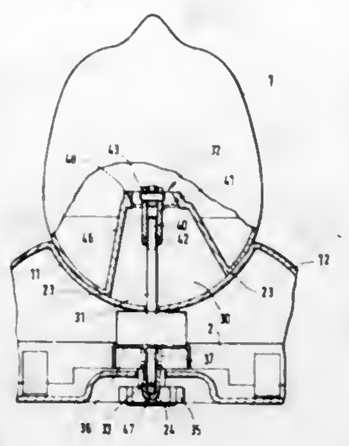
a dummy head;

a holder;

and means mounting the dummy head displaceably on the holder whereby the dummy head can be adjusted to any desired position relative to the holder;

wherein said means comprises a curved socket provided on said holder, and a curved rear portion of said dummy head, said rear portion engaging said curved socket so that adjustment of the relative position of the head on the holder can be carried out by relative sliding movement taking place between the curved socket and the curved rear portion;

and wherein the curved socket is covered by the dummy head for all relative positions of the dummy head on the holder.



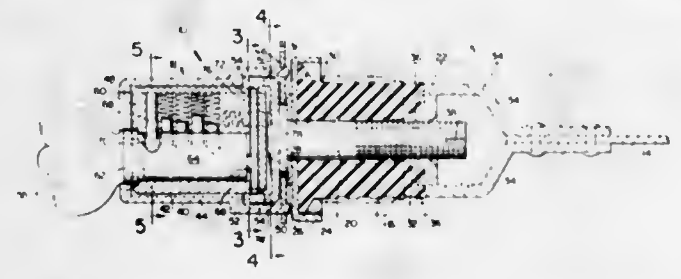
4,035,921
LOCKABLE SPOUT CLOSURE ASSEMBLY

Merton S. Williams, Terryville, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sept. 22, 1975, Ser. No. 616,168

Int. Cl.² G01F *23/04;* **B65D** *55/14*

U.S. Cl. 33—126.7 R **17 Claims**



1. A lockable closure assembly for a spout comprising a closure member, a stud supported on said closure member for axial rotation relative thereto, means for connecting said closure member to said spout in closing relation thereto in response to axial rotation of said stud relative to said closure member, and a lock assembly including a lock housing supported at its inner end on the outer end portion of said stud for coaxial rotation relative to said stud and said closure member, said housing having an aperture in its outer end, a drive member enclosed within the inner end portion of said housing and mounted in fixed position on said stud outer end portion for rotation with said stud, a key operated lock unit wholly encased within said housing inwardly of said outer end of said housing and including a body and a key plug supported for rotation in said body, said key plug having a keyway extending in a direction generally parallel to the axis of said stud and opening outwardly through the outer end of said key plug and exposed in said aperture, said key plug being rotatable between locked and unlocked positions relative to said body in response to insertion of a proper key into said keyway and rotation of proper key relative to said body, a coupling member enclosed within the inner end portion of said housing, and means for moving said coupling member radially between uncoupled and coupled positions respectively corresponding to locked and unlocked positions of said lock unit in response to rotation of said key plug, said coupling member in a coupled position connecting said drive member to said lock unit for rotation with said lock unit and relative to said closure member in response to rotation of key, said lock unit being free to rotate within said housing and relative to said drive member when said coupling member is in an uncoupled position, said housing

being at all times free to rotate about its axis and relative to said stud and said lock unit.

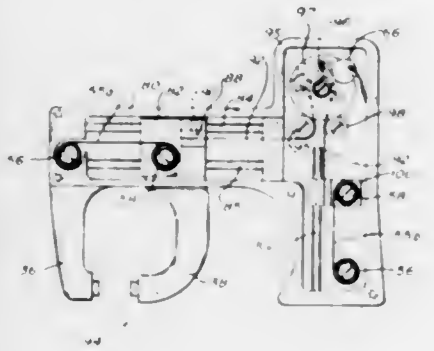
4,035,922
DIGITAL ELECTRO-OPTICAL MICROMETER AND GAGES

Geza von Voros, Glen Rock, N.J., assignor to Optograms, Inc., Oakland, N.J.

Continuation-in-part of Ser. No. 496,325, Aug. 9, 1974, abandoned, which is a continuation-in-part of Ser. No. 229,944, Feb. 28, 1972, abandoned. This application Apr. 9, 1976, Ser. No. 675,597

Int. Cl.^{2} G01B *7/02, 19/36*

U.S. Cl. 33—143 L **12 Claims**



1. A digital electro-optical measuring micrometer, in which the measurement is precisely determined and initiates electrical pulses fed to a digital readout, said micrometer including: (*a*) a U-shaped housing transportable to a point of measurement and within which all mechanically movable elements used to derive the precise measurement are carried, said housing further including a fixedly supported anvil; (*b*) a movable anvil including a movable bracket slidably carried by and on a precision guide means supported by the housing and providing for movement toward and away from the fixedly supported anvil, said guide means disposed within the housing so that the movable anvil is precisely movable along a prescribed path and distance which is at least a standard unit of measurement; (*c*) a constant force spring attached at one end of the housing and at the other end to the movable bracket so as to urge the movable anvil from the maximum open condition and toward the fixedly supported anvil and with said constant force applied at all intermediate positions therealong; (*d*) a tape of relative thinness, this tape carried for movement within the housing by rollers carried by the fixed housing and with at least one end of the tape being secured to the movable member and moved with and by the movable anvil as it is moved, this movable tape being in a driving contact with a precision gage roller carried on a rotatable shaft and with this roller and shaft beng rotated as the tape is moved thereover; means for maintaining the tape at a determined tension and for providing a corresponding rotational movement of the roller; (*e*) a rotary disc-like interrupter member carried by and on the shaft on which is mounted the precision gage roller, said interrupter member precisely rotated with the movement of the tape and in response to the movement of the movable anvil against and with the bias of the constant force spring, said interrupter member having a sequence of equally spaced radially disposed lines thereon and in which the tape is also carried in a guide path and maintained in a prescribed alignment by means of first and second idler rollers with one idler roller arranged on each side of the tape path to and from the precision gage roller to provide a wrap around this roller of at least one-quarter of the circumference of said precision gage roller; (*f*) an encoder including a directed light source and at least a pair of photosensors carried by and as a part of said encoder, each photosensor adapted to receive a narrow beam of light from said source with said beam and photosensors arranged so that the lines of the radial interrupter member interrupts the beam of light as the interrupter member is moved, said interruptions as read by the photosensor being converted to electrical pulse signals; (*g*) a dash pot having a piston connected to the movable anvil and movable in said dash pot, said piston movable by and with the movement of the movable anvil and having throttling means for establihsing the maximum rotational speed of the interrupter member and the associated movable anvil in either of the two directions of movement to prevent bounce and to establish a sufficiently slow rate of the movement of the anvil whereat and whereby each and every interruption of the beam of light is distinctly read by the photosensors to insure that each and every line on the rotating interrupter member as it interrupts the beam of light converts said interruptions to an electrical pulse signal, said pair of photosensors being optically aligned so as to produce substantially simultaneously phase-shifted waves and pulses each time a line interruption occurs and to feed this information to a discriminator circuit which ascertains from this information the direction of travel at that instant of time, and (*h*) a digital counter and read-out adapted to receive said electrical signals and convert said pulse signals to information which is fed to converting apparatus with said information corresponding to the precise linear position of the movable member.

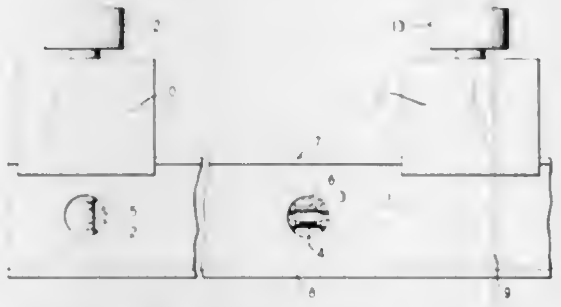
4,035,923
STAND-OFF ARRANGEMENT FOR LEVELS

Henry Florczak, 528 Imlay Place, Bound Brook, N.J. 08805

Filed Sept. 17, 1976, Ser. No. 724,305

Int. Cl.^{2} G01C *9/00*

U.S. Cl. 33—374 **4 Claims**



1. A removable stand-off arrangement for masonry levels having I beam construction comprising:

a rectangular central member having a top aperture and a bottom longitudinal slot, said central member having in-turned end sections defining said longitudinal slot,

an integral subassembly including a pair of disc-shaped end sections joined by a cylindrical spacer section, said subassembly being partially situated inside of said central member with said cylindrical spacer section within said top aperture and one of said disc-shaped end sections confined within said central member, and

a tensioning spring wrapped about said spacer section and being in touching engagement with a top surface of said last-mentioned disc-shaped end section and an interior surface of said central member when under tension.

4,035,924
FREEZE-DRYING OF SOLID, LIQUID OR PASTE-LIKE PRODUCTS

Jean-Christian Faure, Rumilly, France, assignor to Societe d'Assistance Technique pour Produits Nestle S.A., Lausanne, Switzerland

Filed Aug. 27, 1975, Ser. No. 608,054

Claims priority, application France, Sept. 11, 1974, 74.30745

Int. Cl.^{2} F26B *5/06, 13/30*

U.S. Cl. 34—5 **9 Claims**

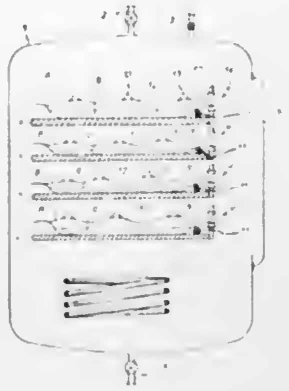
1. A process for the lyophilisation of solid, liquid and paste-like products, which comprises the steps of:

providing an elongated container of flexible material having opposed container walls and a closeable opening at one end thereof;

introducing the container into a lyophilisation apparatus;

placing the product to be lyophilised in said container;

lyophilising said product in said apparatus while holding the container walls appart thereby to maintain said container open;



on completion of lyophilisation closing the said opening in said container; and

withdrawing said closed container from said apparatus.

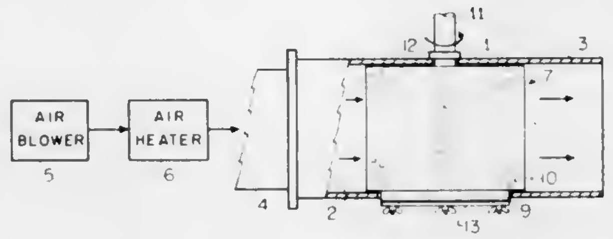
4,035,925
SYSTEM FOR TREATING PARTICULATE MATERIAL WITH GASEOUS MEDIA

George E. Brown, El Cerrito, and Daniel F. Farkas, Piedmont, both of Calif., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Continuation of Ser. No. 304,878, Nov. 8, 1972, abandoned. This application Oct. 24, 1975, Ser. No. 625,721

Int. Cl.^{2} F26B *5/08*

U.S. Cl. 34—8 **3 Claims**



1. A process for treating particulate material with a gaseous medium, which comprises

providing a mass of particulate material,

rotating the mass while restrained by a perforated cylindrical surface at a speed at least that required to establish a centrifugal acceleration of 1 g, and to hold the major portion of the mass against the surface by centrifugal force, and

forcing a single unidirectional stream of gas through the said mass, the direction of flow within said stream being everywhere normal to a unique hypothetical plane that contains the entire axis of rotation of the perforated cylindrical surface and divides the perforated cylindrical surface into as ascending half and a descending half, said unidirectional stream entering the ascending half of the perforated cylindrical surface, then in the same direction passing through the said mass, and, finally, in the same direction exiting the descending half of the perforated cylindrical surface, maintaining the velocity of said stream of gas high enough such that about 25 to 50% of the material is formed into a fluidized mass of particles in and about the ascending half of the perforated cylindrical surface and such that the particles in and about the descending half of the perforated cylindrical surface are formed into a fixed, non-fluidized mass.

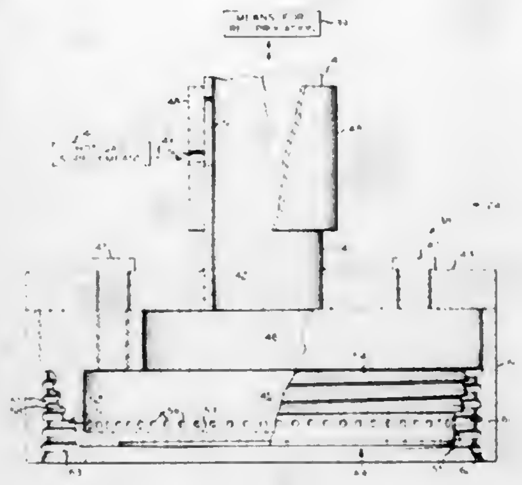
4,035,926
HEATING THE END OF A TUBULAR MEMBER

Silvio T. Farfaglia, Fulton, N.Y., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 24, 1976, Ser. No. 689,605

Int. Cl.^{2} F26B *3/00, 25/00*

U.S. Cl. 34—34 **24 Claims**



22. A method of heating the end portion of a tubular member at one end thereof which comprises directing hot gas against the inside surface of said end portion, causing said hot gas to flow along said inside surface to said end and then to flow along the outside surface of said end portion, and causing at least one of the flow of said hot gas along said inside surface and the flow of said hot gas along said outside surface to follow a spiral path.

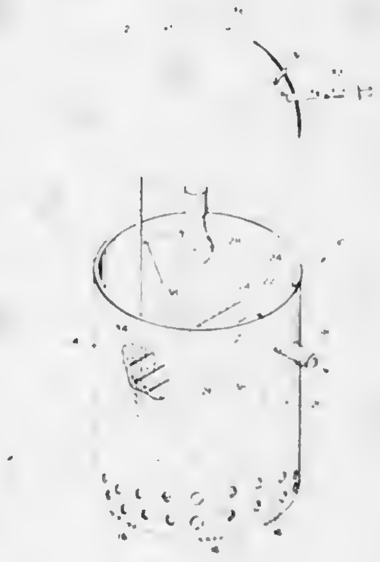
4,035,927
PORTABLE CLOTHES DRYER

Jack Spiegel, 80 Van Courtlandt Park South, Bldg. No. 7E, Bronx, N.Y. 10463

Filed Mar. 10, 1976, Ser. No. 665,778

Int. Cl.^{2} F26B *9/00*

U.S. Cl. 34—163 **8 Claims**



1. A portable dryer for drying articles of clothing comprising:

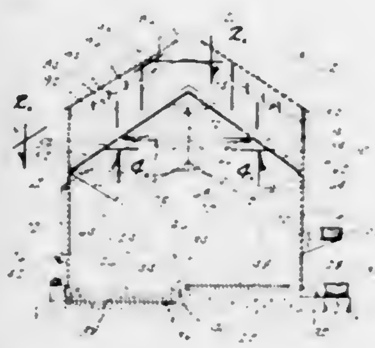
a rigid housing having a top and a bottom and formed with openings near said bottom;

a hose located near the top of said housing for securing at least one external hair dryer thereto for operatively supplying heated air into said housing;

a panel insertable into said housing, said hose being attachable to said panel; and

an electrically operable exhaust fan disposed within said housing, whereby heated air operatively received from the hair dryer in said housing and passing therethrough is expelled therefrom through said openings.

4,035,928
APPARATUS FOR DRYING GRAIN
Vernon H. Sietmann; Raymond L. Smith, both of Laurel, Iowa 50141, and Larry S. Keese, Gilman, Iowa 50106
Filed July 21, 1975, Ser. No. 597,582
Int. Cl.^{2} F26B *17/12*
U.S. Cl. 34—174 **3 Claims**



1. An apparatus for drying granular material in a grain bin having an enclosure forming wall, a roof mounted over the wall, and a base floor for the wall, the apparatus comprising:

a perforated floor mounted in the upper part of the bin, said floor being inclined and sloping downwardly from the center of the bin toward and in contacting relation with the wall whereby granular material disposed on said floor is prevented from falling onto said base floor, said floor having a plurality of spaced apart openings formed therein adjacent the lower end thereof through which the granular material can fall,

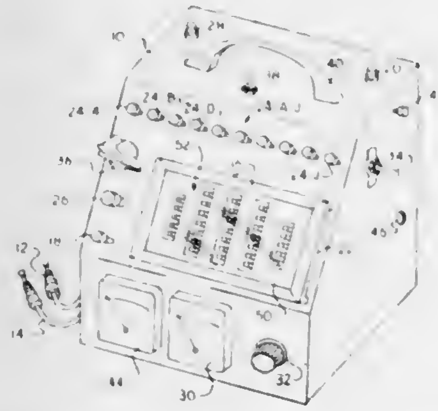
said perforated floor being free from support except at said wall,

closure means operatively mounted in said bin for selectively closing said openings to vary the rate of flow of the granular material therethrough,

and means for supplying drying air within the bin and below said floor,

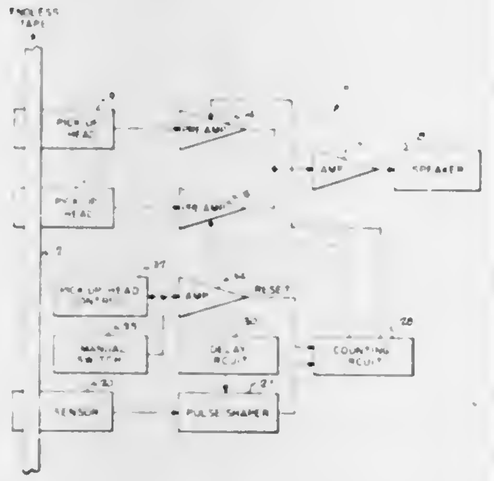
said perforated floor having a plurality of spaced apart radially extending upstanding ribs formed therein.

4,035,929
TEACHING MACHINE
James Wilson Groff, P.O. Box 38, Morgan Hill, Calif. 95037
Filed Aug. 11, 1975, Ser. No. 603,652
Int. Cl.^{2} G09B *5/06*
U.S. Cl. 35—8 A **8 Claims**



1. A portable, self-powered teaching machine for presenting audio instruction and non-multiple choice student evaluation comprising in combination: recorded sound producing means and a sound record for reproducing both audio instruction and sound producing means control signals recorded thereon; audio frequency detection and switching means to deactivate said sound producing means and sound record in response to said sound producing means control signals recorded on said sound record; audio frequency detection and switching means to deactivate said sound producing means and sound record in response to student circumvention of said sound producing means control signals by manual reduction of volume of said sound producing means; a plurality of interchangeable, coded panels displaying interrogative visual information arranged to be manually synchronized with audio instruction of said sound record, sensing means which interact with said coded panels when panels are inserted into a display area on the teaching machine's surface, thereby establishing a singular, correct student response circuit; and a plurality of student controlled switching means, each switch being identified with one or more letters of the alphabet and one or more digits, thereby allowing communication of any letter of the alphabet, A through Z, and any of the digits, 0 through 9, causing said sound producing means and sound record to be actuated by proper manipulation of said switches in response to interrogative visual information of said interchangeable panels, whereby a correct response may consist of switch manipulation to identify in the proper order the exact letters of a word, portion of a word, a numerical value, or portion of a numerical value without reference to multiple choice identification.

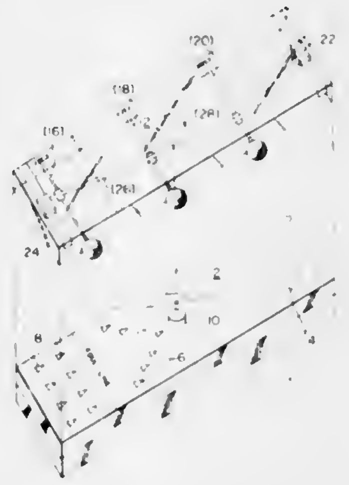
4,035,930
TIME SELECTIVE INFORMATION DISSEMINATION SYSTEM FOR USE IN SLEEP TEACHING
Edmund Baker Lambert, Colorado Springs, Colo., assignor to Creative Learning, Inc., Colorado Springs, Colo.
Continuation-in-part of Ser. No. 433,823, Jan. 16, 1974, abandoned. This application June 16, 1975, Ser. No. 587,075
Int. Cl.^{2} G09B *5/04*
U.S. Cl. 35—22 R **24 Claims**



1. A time selective information dissemination system adapted for use in sleep teaching for selectively recovering information recorded on a recording medium having a predetermined rate of medium travel, said dissemination system comprising information sensing means responsive to information recorded on a recording medium and providing electrical output signals indicative thereof; signal transmitting means connected with said information sensing means for receiving said output signals therefrom, said signal transmitting means producing an output when in an enabled state and producing no output while in an inhibited state; utilization means adapted for use with a sleeping person, said utilization means being connected with said signal transmitting means for reproducing recorded information sensed by said information sensing means while said signal transmitting means is in said enabled state; indexing means on said recording medium coextensive with the information recorded thereon; means for producing puises in response to said indexing means at a rate correlated to the medium travel rate of the recording medium; means responsive to said pulse producing means for generating a control pulse of a predetermined time period; and dissemination control means for receiving said control pulse, said dissemination control means being connected with said signal transmitting means to enable the same automatically in response to the presence of said control pulse and for inhibiting an output from said signal transmitting means in the absence of said control pulse.

23. A method of disseminating information to a person from an endless magnetic tape while said person is sleeping, said method comprising advancing the tape at a predetermined rate of speed; initially precluding information dissemination from the tape for a predetermined period of time to allow said person to fall asleep; automatically disseminating first information from the tape in audible form to the sleeping person for a predetermined shorter period of time; automatically disseminating second information in audible form from the tape to the sleeping person; and thereafter automatically precluding information dissemination for a longer period of time relative to said information dissemination so that the intervals of information dissemination and preclusion thereof conform to a predetermined time pattern.

4,035,931
INTERCHANGEABLE LANE BOWLING CALCULATOR
Charles H. Burger, P.O. Box 86, Lovingston, Va. 22949
Filed Oct. 20, 1976, Ser. No. 734,061
Int. Cl.^{2} A63B *69/00;* G09B *9/00*
U.S. Cl. 35—29 F **10 Claims**



1. An interchangeable lane bowling calculator device, comprising in combination:

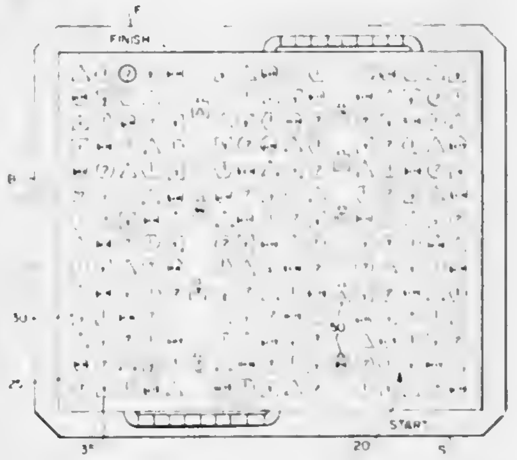
A. An elongate main frame having an upper surface, with bowling lane indicia visible upon said upper surface, said indicia including a transverse foul line, and including a plurality of lane spots and a plurality of bowling pin positions both spaced longitudinally and transversely across said upper surface, wherein said foul line, lane spots and pin positions are respectively spaced longitudinally along said upper surface, a registration pin extending upwardly from said upper surface at a longitudinal position between said lane spots and said pin positions, and;

B. A first optically transparent elongate and box-like cover assembly adapted to be placed upon said upper surface, and including a recess on the underside of said cover adapted to receive said registration pin and allow for movement of said cover both longitudinally and transversely with respect to said main frame, and;

C. A second optically transparent elongate and box-like cover assembly adapted to be placed upon said upper surface, said second cover also including a recess as defined for said first elongate cover, and;

D. An elastic member extending longitudinally within each of said first and second elongate covers, said elastic member having a means for transverse position adjustment at a plurality of points spaced along its longitudinal extent, whereby a characteristic ball curvature may be defined for each of two distinct bowling lanes by separate adjustment of the elastic member within each of said covers, and said covers may be interchanged upon said elongate main frame carrying said bowling lane indicia.

4,035,932
EDUCATIONAL GAME
Janet E. Massey, Rte. 1, Box 68, Burlington, N.C. 27215
Filed Nov. 5, 1975, Ser. No. 629,008
Int. Cl.^{2} G09B *1/04;* A63F *3/00*
U.S. Cl. 35—35 D **3 Claims**



1. An educational game comprising:

a. a playing board having thereon a designated path for progressive movement of players, said path comprising a starting point, a finish point and a plurality of successive landing areas therebetween, each landing area including therein a plurality of various landing positions arranged in a predetermined order, each of said landing positions being designated by a distinct geometric shape, said positions arranged in a row extending transversely to said designated path, said predetermined order varying in successive landing areas;

b. a plurality of question cards one of said cards being utilized during each turn of each player for determining player movement, said question cards having a question on one side and the corresponding answer, as well as directions as to movement in the event of a correct answer on the other side;

c. a playing piece for each player, said pieces being moved to one of said geometric shapes in a designated row responsive to the directions on said other side of said question cards.

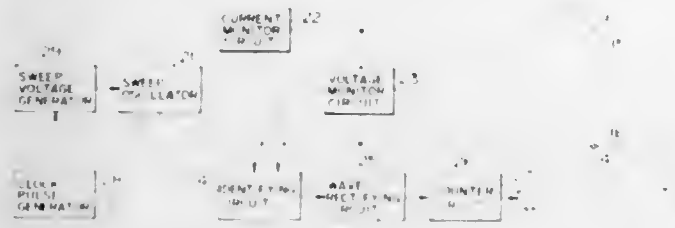
4,035,933
RESPONSE ANALYZING DEVICE
Kiyomi Abe, Noda, and Genichi Tagata, Hamamatsu, both of Japan, assignors to Pentel Kabushiki Kaisha, Japan
Filed Nov. 14, 1973, Ser. No. 415,833
Claims priority, application Japan, Apr. 12, 1973, 48-41650; June 4, 1973, 48-62691
Int. Cl.^{2} G09B *5/00*
U.S. Cl. 35—48 R **9 Claims**

1. A response analyzing device comprising:

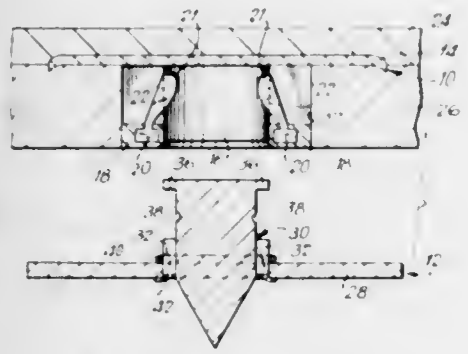
a plurality of answering devices each comprising a series resonant circuit and a selection switch in series with said resonant circuit and operable to an open and a closed condition for responding to a question, and wherein the resonance frequencies of the resonant circuits in said plurality of answering devices are mutually different;

a pair of lines electrically connecting in parallel the series combinations of the resonant circuit and selection switch in each of said plurality of answering devices; and

a master unit comprising a sweep frequency oscillator for applying an oscillatory output signal, having a frequency continuously varying over a frequency range within which the resonance frequencies of said series resonant circuits lie, to said pair of lines connecting the parallel combination of the resonant circuit and selection switch in each answering device of said plurality of answering devices, and means for detecting variations in the impedance of the parallel combination of the resonant circuits and selection switches in said answering devices across said pair of lines and which are effected by the closure of ones of said selection switches, whereby the detected impedance variations are representative of the responses made with said answering devices.



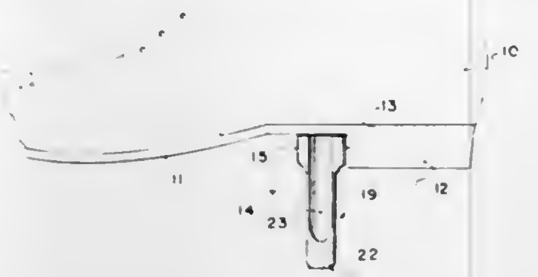
4,035,934
ASSEMBLY SPIKE FOR ATHLETIC SHOE
Andrew N. Hrivnak, 56 Ball Ave., Yonkers, N.Y. 10701
Filed Aug. 26, 1976, Ser. No. 717,578
Int. Cl.² A43C *15/00;* **A43B** *5/00*
U.S. Cl. 36—67 D **5 Claims**



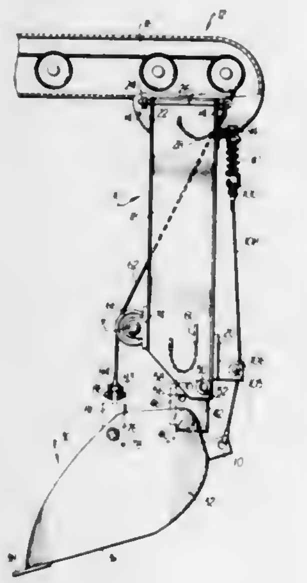
1. An athletic shoe spike construction comprising a spike receiving assembly and a spike assembly, said spike receiving assembly including a spike receiving member defining opposed side slits and a pair of opposed springs each defining a top-shoulder normally protruding into said spike receiving member through said slits and said spike assembly including a spike member defining side spike removal channels and a top flange, said spike member being insertable and removable to said spike receiving member with insertion by passing into said spike receiving member, said top flange moving said springs apart and said top flange on said top shoulders to retain said spike member is fully inserted position with respect to said spike receiving member.

4,035,935
LAWN AERATING ATTACHMENTS FOR SHOES AND BOOTS
Robert Forrest, Winnipeg, Canada, assignor to Forrest Tool & Die Limited, Winnipeg, Canada
Filed Dec. 16, 1976, Ser. No. 751,044
Int. Cl.² A43B *23/00*
U.S. Cl. 36—136 **8 Claims**

1. A lawn aerating attachment for boots and shoes which includes a sole, a heel undersurface and a vertical riser between the front of the heel undersurface and the rear of the sole; comprising in combination a cross bar securable to the sole adjacent the vertical riser, and a plug cutting tube secured at each end of the cross bar and extending downwardly therefrom, each of said tubes including an edge sharpened lower end and means to facilitate discharge of earth plugs cut by said tubes, upwardly from said tubes.



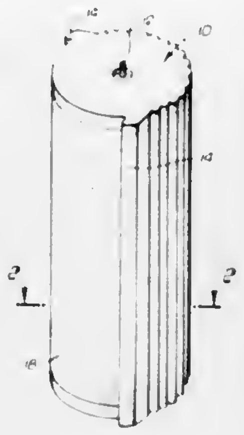
4,035,936
EXCAVATOR ATTACHMENT FOR BOOM STRUCTURE
Teddy Walter Avara, 101 McRaven St., Clinton, Miss. 39056
Filed July 1, 1976, Ser. No. 701,681
Int. Cl.² E02F *3/46*
U.S. Cl. 37—116 **18 Claims**



1. An excavating device capable of being reversably attached to the end of any conventional machine mounted boom structure having a power driven winch cable associated therewith, said device comprising:

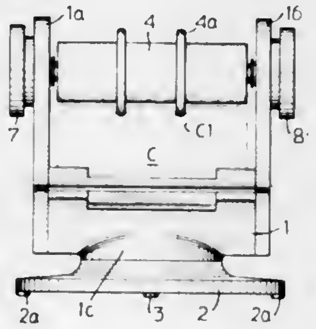
- a. first and second sets of spaced appart mounting elements, one set of each of said elements being capable of being secured to opposite sides of the end of said boom structure,
- b. a pair of spaced apart, downwardly depending bucket arms, one end of each of said arms being detachably secured between one set of said mounting elements, and
- c. bucket means pivotably mounted between the other end of said pair of spaced apart bucket arms, said bucket means being operatively connected to said winch cable such that when said bucket arms are attached to said mounting elements in a first mode, said bucket means is capable of digging away from said machine and when said bucket arms are attached to said mounting elements in a second mode, said bucket means is capable of digging toward said machine.

4,035,937
CANDLE WITH INTEGRAL CARD HOLDER
Arthur Rosenfeld, 5016 W. Jefferson Blvd., Los Angeles, Calif. 90016
Filed May 10, 1976, Ser. No. 684,554
Int. Cl.² G09F *3/18*
U.S. Cl. 40—16.4 **3 Claims**



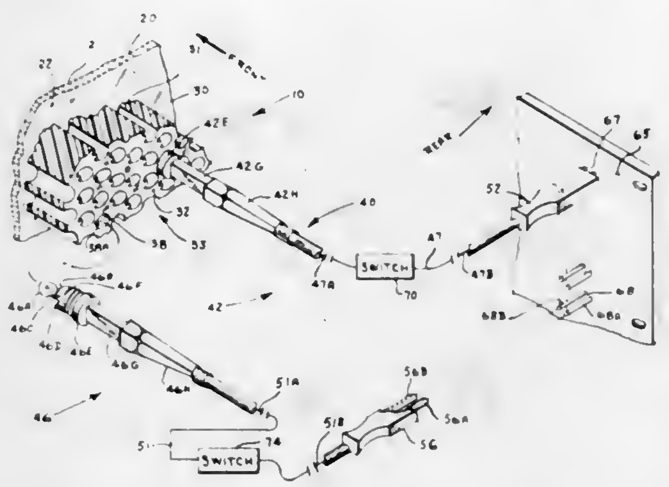
1. A candle having formed in the periphery thereof circumferentially spaced, vertical, opposed grooves which face each other circumferentially and which are respectively adapted to receive vertical edges of a card, or similar article.

4,035,938
ROTARY CARD HOLDER
Hildaur L. Neilsen, Metuchen, N.J., assignor to Rolodex Corporation, Secaucus, N.J.
Filed May 5, 1976, Ser. No. 683,316
Int. Cl.² G09F *11/02*
U.S. Cl. 40—68.6 **8 Claims**



1. A rotary card holder comprising a case having spaced upright supports with inner and outer faces, a rotor disposed between said supports and having means for holding a plurality of cards, said rotor having shaft portions extending axially from opposite ends of said rotor and rotatably supported by said supports to mount said rotor rotatably in said case, at least one of said shaft portions projecting beyond the outer face of the respective support, an annular boss on the outer face of said respective support surrounding said projecting shaft portion, a knob fixed on said projecting shaft portion for manually turning said rotor, said knob having an annular flange portion surrounding said boss, and spring means acting between said flange portion and said boss frictionally to resist rotation of said knob and rotor, whereby said rotor is frictionally retained in a position to which it has been manually turned by said knob, said spring means comprises a spring having end portions bearing on the inside of said flange portion and an intermediate portion bearing on said boss.

4,035,939
LIGHTING SYSTEM FOR SELECTIVE BACK LIGHTING
Thomas F. Dadian, Santa Paula, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Jan. 8, 1976, Ser. No. 647,527
Int. Cl.² G09F *13/04*
U.S. Cl. 40—132 D **6 Claims**



1. A lighting system for selectively back lighting preselected portions of a translucent object, comprising:

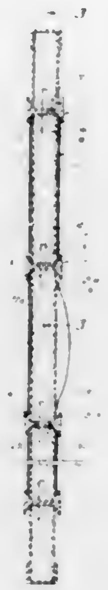
- a. means for removably holding, supporting, and displaying said translucent object, wherein said means includes a flat translucent component having a front surface, on which said translucent object is removably held, supported and displayed, and a rear surface;
- b. a core matrix having a front surface abutting said rear surface of said flat translucent component, and also having a rear surface, wherein said core matrix includes a plurality of identically configurated openings therethrough, with each said opening having a nodule therein, with each nodule being identical and also being identically situated within each opening;
- c. and, a lighting assembly disposed essentially rearward of said rear surface of said core matrix, and in operative association with said core matrix, wherein said lighting assembly includes:
  - 1. a plurality of identical lamp subassemblies, one for each said core matrix opening, with each one of said plurality of identical lamp subassemblies having an identical lamp, with each said lamp dimensioned and shaped to fit into any one of said plurality of identically configurated openings in said core matrix;
  - 2. and, means for selectively energizing any lamp of said plurality of identical lamps of said plurality of identical lamp subassemblies.

4,035,940
SIGN CONSTRUCTION
Edgar G. Mickey, and Gerald H. Nelson, both of Houston, Tex., assignors to Micknel Manufacturing Inc.
Filed Jan. 8, 1976, Ser. No. 647,426
Int. Cl.² G09F *7/08*
U.S. Cl. 40—140 **3 Claims**

1. A laminated two-face sign construction comprising:

- a. a core block of substantially rigid slightly resilient compressible foam material;
- b. thin metal sheets affixed to opposite sides of said core block and substantially covering the entire surface thereof;
- c. U-shaped channel members extending along the upper and lower edges of said core block with the core block slightly compressed and inserted into such U-shaped channel members for holding the upper and lower edges of sheet letters inserted into such channel members on either face

of the sign and between such channel member and the adjacent face of the core block with longitudinally extending grooves in the upper and lower edges of said core block to facilitate insertion of letters in said channel members.



said sign comprising at least two said core blocks joined together so as to form at least two rows of indicia on either face thereof.

4,035,941

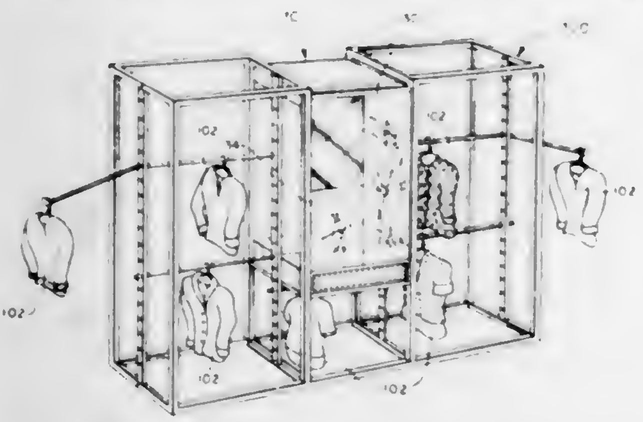
AUDIO-VISUAL DISPLAY DEVICE

John F. Deffner, Lisle, Ill., assignor to Visual Marketing Incorporated, Chicago, Ill.

Filed Nov. 26, 1975, Ser. No. 635,277

Int. Cl.² G09F *13/12*

U.S. Cl. 40—219 **9 Claims**



1. A display device for audio and visual merchandise promotion comprising:

a. a display enclosure comprising:
  1. at least first and second compartments each having an illumination means therein;
  2. at least one wall forming a side of the first and second compartments, the wall composed of a transparent mirror having the characteristic of reflecting visible light radiation when the illumination means is not activated and transmitting visible light radiation when the illumination means is activated;
  3. at least one pictorial representation of merchandise on the inside of the wall;

b. an audio means including at least one audio tape; and

c. a timer means for regulating a cyclic sequential actuation of the illumination means in each of the first and second compartments and the actuation of the audio means said time means adapted to produce a cycle including a period of activation of said illumination means wherein said transparent mirror transmits visible light and said pictorial representation is observable through said transparent mirror and a period without activation of said illumination means wherein said transparent mirror reflects visible light and said pictorial representation is not observable through said transparent mirror.

4,035,942

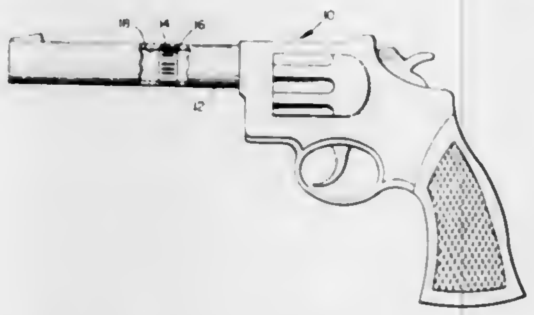
BULLET IDENTIFICATION

Sol B. Wiczer, 1000 Vermont Ave., NW., Suite 804, Washington, D.C. 20005

Filed June 30, 1976, Ser. No. 701,244

Int. Cl.² F41C *27/00, 21/00*

U.S. Cl. 42—1 A **10 Claims**



1. A system for identifying a bullet with a gun having a barrel bore through which the bullet was fired comprising mounting marking elements in said barrrel bore capable of imparting markings upon the bullet surface as it passes said elements in surface contact therewith, said marking elements being arranged to apply markings to the bullet surface as identifying insignia visibly readable on said surface to identify said bullet with corresponding identifying indicia upon the gun from which said bullet was fired.

4,035,943

RADIAL PERCUSSION ARRANGEMENT FOR FIREARMS USING SELF-PROPELLING AMMUNITION WITH PERIPHERIAL PRIMING

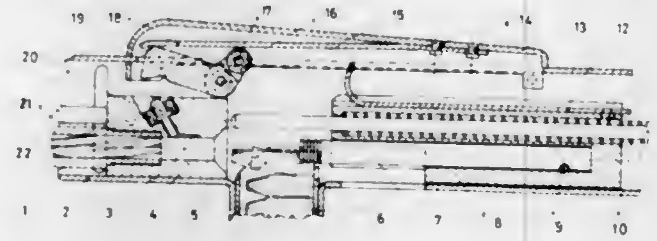
Bruno Civolani, Via Franco Bolognese, 2 Bologna, and Paolo Benelli, Via Cesare Battisti, 9 Pesaro, both of Italy

Filed Mar. 26, 1976, Ser. No. 670,989

Claims priority, application Italy, Apr. 14, 1975, 44008/75

Int. Cl.² F41C *19/00, 11/00*

U.S. Cl. 42—69 B **6 Claims**



1. A radial percussion arrangement for firearms using self-propelling projectiles with peripherial priming comprising
- a receiver including a breech unit mounted therein;
- a projectile chamber extending longitudinally within an intermediate part of said breech unit;
- a bore located within said breech unit, said bore inclined downwardly and rearwardly and in communication with said projectile chamber;
- a firing pin mounted for free sliding movement within said bore, said firing pin having an upper portion, and said firing pin further having a lower tip portion projecting into said projectile chamber when there is an absence of a projectile therein;
- a hammer pivotally mounted on said receiver, said hammer having a forward end extending on one side of said pivot and a rearward end extending on the other side of said pivot;
- a longitudinally movable bolt located rearwardly of said receiver, said bolt including a locking rod mounted thereon for contacting and introducing a projectile into said projectile chamber as said bolt is moved forwardly to contact said breech;
- a flat spring mounted on an upper portion of said bolt, said flat spring having a front end portion for contacting said rearward end of said hammer as said bolt moves forwardly, said front end portion located to be able to contact said rearward end of said hammer prior to the contact of said bolt with said breech; and
- said forward end of said hammer pivotable upon said contact of said flat spring to strike said upper portion of said firing pin and effect percussion of the projectile in said projectile chamber and move said firing pin upwardly in said bore.

4,035,944

GUN BARRELS

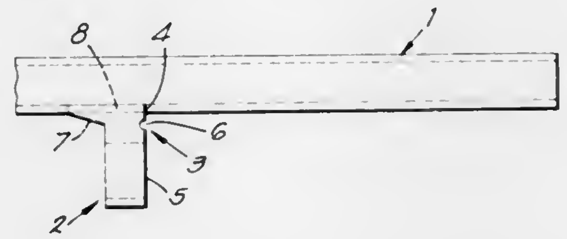
Georges A. Gevers, Liege, Belgium, assignor to Fabrique Nationale Herstal S.A. en abrege FN, Herstal, Belgium

Filed July 6, 1976, Ser. No. 702,507

Claims priority, application Belgium, Sept. 26, 1975, 254586

Int. Cl.² F41C *27/00*

U.S. Cl. 42—75 B **5 Claims**



1. In gun barrels of the type provided with a fixing and guiding ring having a base which is secured to the barrel by welding or brazing and having a surface transverse to said barrel, the improvement comprising:
- a groove extending transversely of said surface and said barrel, closely adjacent said barrel.

4,035,945

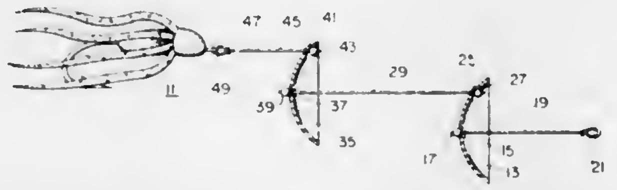
RANDOM MOTION FISH LURE APPARATUS AND METHODS

Gerald R. Newman, 78 Eventide Lane, Levittown, Pa. 19054

Filed June 22, 1976, Ser. No. 695,313

Int. Cl.² A01K *85/00*

U.S. Cl. 43—42.15 **8 Claims**



1. Motion control apparatus for interconnection between a fishing bait and a fishing line for imparting unique motion to the bait when drawn through the water, comprising in combination:
- a pair of concave discs;
- means for connecting the center of one disc to the line;
- means for connecting the other disc at its center to said one disc adjacent its edge; and,
- means for connecting a bait to said other disc adjacent its edge.

4,035,946

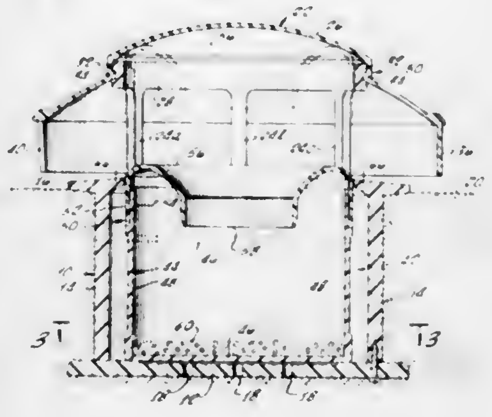
TRAP FOR SLUGS AND SNAILS

Wallace Thomas Rapp, 402 W. St. Gertrude Place, Santa Ana, Calif. 92707; Wallace A. Rapp, and Gertrude A. Rapp, both of 803 W. 10th St., Santa Ana, Calif. 92701

Continuation-in-part of Ser. No. 634,867, Nov. 24, 1975, abandoned. This application June 24, 1976, Ser. No. 699,217

Int. Cl.² A01M *25/00*

U.S. Cl. 43—131 **18 Claims**



1. A pest trap comprising
- an outer container,
- an inner buoyant container within said outer container, and
- means for providing a pest access path to the interior of said inner container.

4,035,947

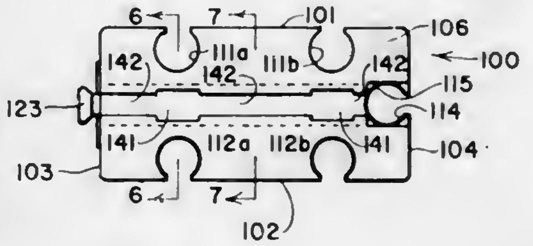
TOY CONSTRUCTION SET HAVING INTERCONNECTIBLE COMPONENTS WITH INTERFITTING FORMATIONS

David A. Burge, 3594 Glencairn Road, Shaker Heights, Ohio 44122

Filed Aug. 21, 1975, Ser. No. 606,348

Int. Cl.² A63H *33/08*

U.S. Cl. 46—25 **9 Claims**



1. A construction set including a pair of components having engageable interfitting formations configured to securely releasably connect the components when such formations are interfittingly engaged, the formation on one component including projection means projecting substantially transversely from a face on the one component and being undercut in directions extending substantially transversely of such face, the formation on the other component including recess means having two recess portions one of which is undercut and adapted to slidingly engage the undercut projection means when the components are moved relatively to slide the one recess portion parallel to such face and into sliding engagement with the undercut projection means, the other of which is configured to receive and releasably retain the undercut projection means when the components are moved relatively transversely of such face to interfittingly engage the other recess portion and the undercut projection means, the two recess portions being arranged side-by-side and being associated with a common face of the other component.

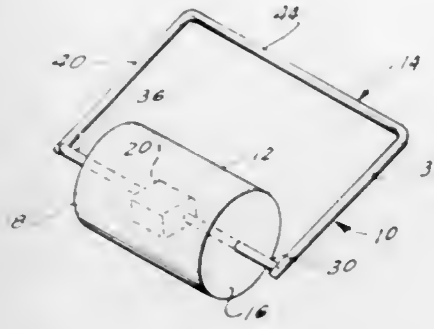
4,035,948
MUSICAL TOY

Harry Fishbein, New York, N.Y., assignor to Swisstone Corporation, New York, N.Y.

Filed June 30, 1976, Ser. No. 701,182

Int. Cl.^{2} A63H *5/00*

U.S. Cl. 46—189 **12 Claims**



1. A musical toy comprising, a hollow body; a music box movement mounted in said body for rotation therewith; said music box movement having a drive shaft and being of the "left-right music movement" type operative to produce the desired melody in either direction of rotation of the drive shaft; said drive shaft extending from said music box movement along an axis of rotation of said body and through said body; and means rigidly secured to said drive shaft for holding said shaft against rotation, whereby rotation of said body of revolution about said axis of rotation will cause said music box to rotate about the drive shaft and produce the desired melody regardless of the direction of rotation of said body.

4,035,949
INSTALLATION FOR REARING PLANTS

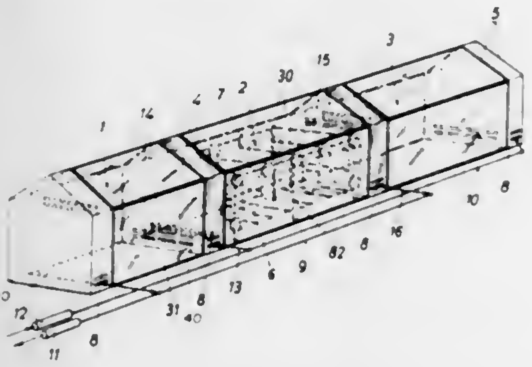
Othmar Ruthner, 150 Sieveringerstrasse, A-1190 Vienna, Austria

Filed May 6, 1975, Ser. No. 574,847

Claims priority, application Austria, May 6, 1974, 3727/74

Int. Cl.^{2} A01G *9/00*

U.S. Cl. 47—17 **4 Claims**



1. An installation for rearing plants, comprising a plurality of successive, independent culture chambers, each of said culture chambers including endless circulating support means on which plants are moved through zones in said chambers under controlled environmental conditions, each of said culture chambers being confined at each end by an end wall panel which has the same configuration as the vertical transverse section of the culture chamber, said end wall panels of each culture chamber being connected by side and roof panels which connect the peripheral edges of the end wall panels and laterally confine the culture chamber, said culture chambers further including reversing pulleys, said endless circulating support means comprising a serpentine, meandering belt having downwardly extending loops which are freely suspended from said reversing pulleys without being constrained about pulleys at their lower ends, said belt comprising two laterally spaced revolving chains interconnected by a series of spaced carriers extending transversely between said chains, said carriers serving to support the plants to be reared, and at least one manipulation chamber defining an enclosed area interposed between adjacent end wall panels of adjacent culture chambers for accommodating means to control the conditions in the culture chambers and the treatment of the plants.

4,035,950
CHANNEL-LIKE STRUCTURE FOR HORTICULTURE AND FLOWER-GROWING

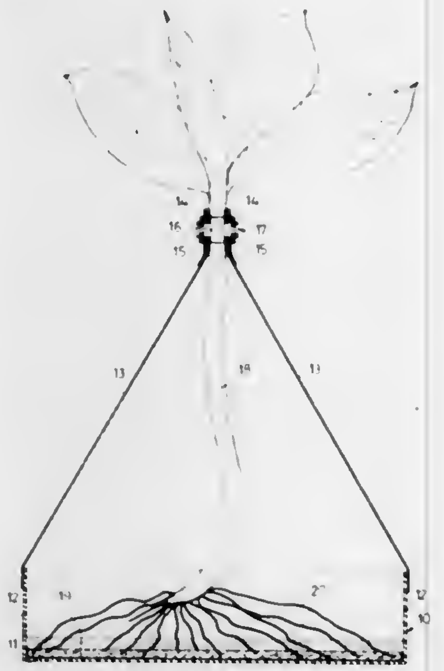
Anthony Cesar Anselm, Casa Clarita Molcote, Lugano, Switzerland

Filed Feb. 27, 1976, Ser. No. 662,046

Claims priority, application Italy, Feb. 27, 1975, 20746/75; Oct. 10, 1975, 28169/75

Int. Cl.^{2} A01G *31/00*

U.S. Cl. 47—59 **28 Claims**



1. A channel-like structure for horticulture and flower-growing, of the kind in which the plants to be grown are arranged in the interior of a tubular member so that the roots are in continuous contact with liquid nutrient solution, characterized in that said structure comprises a central core of a plastic material adapted to form in use a channel-like member, two side strips of a non-rigid plastics material having their origin, each, from an edge of the central core, said side strips having such a width as to be able to be at least partially superposed to one another in correspondence with the central line of said channel-like member, the inner surface of said central core forming the bottom wall of said structure is lined by a layer of a fibrous material.

4,035,951
CONTAINER OF STABILIZED MEDIA WITH GROWING PLANT THEREIN AND METHOD OF MAKING THE SAME

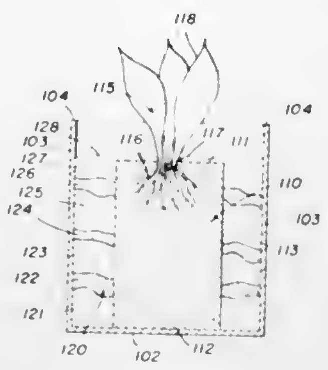
Richard R. Dedolph, Naperville, Ill., assignor to Gravi-Mechanics Co., Naperville, Ill.

Filed Aug. 11, 1975, Ser. No. 603,755

Int. Cl.^{2} A01G *9/02*

U.S. Cl. 47—66 **48 Claims**

1. A container of stabilized soil mix comprising a fluid-tight container open at the upper end thereof, a body of soil mix in said container, and a quantity of foam-forming synthetic organic plastic resin distributed throughout said body of soil mix, said quanity of synthetic organic plastic resin being reacted in situ to form an open-celled hydrophilic polymer binding said body of soil mix into a cohesive mass and to the adjacent inner surfaces of said container, said soil mix comprising at least 96% by weight of said cohesive mass.



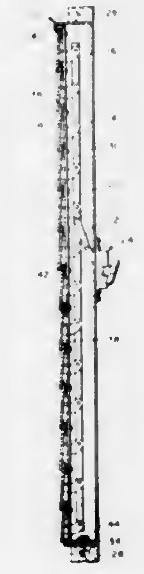
4,035,952
LOUVERED WINDOW LOCK

Bernard H. Brantner, 14255 Tyler St., Sylmar, Calif. 91342

Filed Aug. 23, 1976, Ser. No. 716,544

Int. Cl.^{2} E06B *7/086*

U.S. Cl. 49—74 **5 Claims**



1. In combination with a louvered window which consists of a plurality of overlapping glass panels, said glass panels being pivotally connected to an actuation mechanism, said actuation mechanism being manually operable to cause pivoting of said glass panels between a closed position and an open position with spaces being formed between adjacent glass panels, said louvered window having an outside surface and an inside surface, said actuation mechanism being only actuatable at said inside surface, said louvered window being mounted between an upper windowsill and a lower windowsill, a louvered window lock comprising:

an elongated bar having an upper end and a lower end, said upper end of said bar to be located directly adjacent said upper windowsill, said lower end of said bar to be located directly adjacent said lower windowsill attaching means to secure said lower end of said bar to said lower windowsill;

a plurality of brackets secured to said bar with said brackets being spaced apart, each said bracket to be in contact with the upper edge of a said glass panel with there being a separate bracket for each said glass panel, whereby with said bar secured in place upon said lower windowsill and each bracket being in contact with the upper edge of a said glass panel that it is not possible for one to remove intact any one of the glass panels.

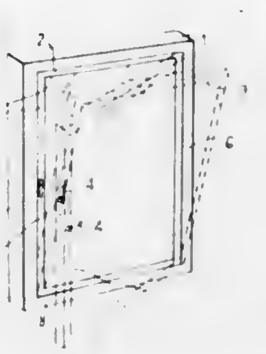
4,035,953
HINGE AND HINGE AND PIVOT ARRANGEMENT

Johannes Harald Bierlich, Oresundshoj 15, Charlottenlund, Denmark

Filed July 7, 1976, Ser. No. 703,295

Int. Cl.^{2} E05D *15/52*

U.S. Cl. 49—192 **6 Claims**



1. A hinge and pivot arrangement for a movable member, for example a window sash, and a co-operating frame, the arrangement including two hinges arranged at opposite ends of one member of the frame whereby the movable member can be hinged about said one frame member, a bolt co-operating with means for releasably connecting one of said hinges to the movable member, at least one striker plate on another member of the frame, opposite to the said one frame member, a stay pivoted at one end to said another frame member, and an operating mechanism mounted on the movable member and including an operating handle, an operating rod movable by the handle and carrying a locking member and a pin engagable in a channel in the free end of the stay and a linkage connecting the bolt and the operating rod, wherein in a first position of the operating handle, the locking member engages the striker plate thereby to secure the movable member to the frame against opening, in a second position of the operating handle, the locking member is disengaged from the striker plate and the bolt and co-operating means connect the said one of the hinges to the movable member whereby the movable member can turn about both hinges, and in a third position of the operating handle, the locking member is disengaged from the striker plate and the bolt and co-operating means disconnect the hinge from the movable member and the pin is engaged in the channel of the stay whereby the movable member can tilt within the limit imposed by the stay relative to a further member of the frame which interconnects the said opposing frame members.

4,035,954
GARAGE DOOR ASSEMBLIES

Ivar Hoff, 7080 Heimdal, Norway

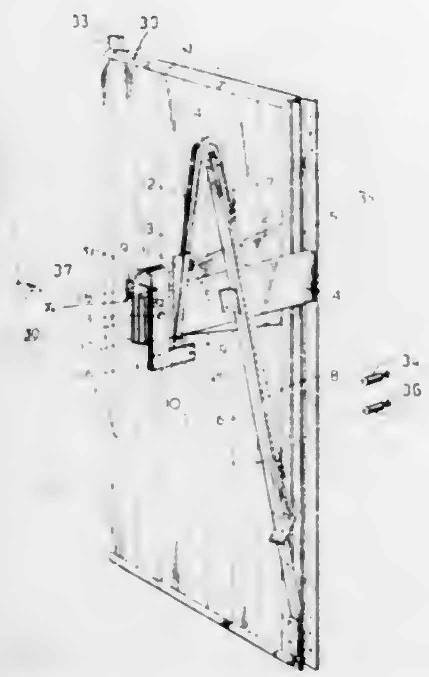
Continuation-in-part of Ser. No. 496,130, Aug. 9, 1974, abandoned. This application Feb. 25, 1976, Ser. No. 661,161

Claims priority, application Norway, Aug. 24, 1973, 733340

Int. Cl.^{2} E05D *15/40*

U.S. Cl. 49—203 **6 Claims**

2. A garage door assembly comprising in combination: a frame means for receiving a door mounted for overhead swinging movement and for providing rigid support for door suspension and opening and closing levers; a single spring element designed for extension between spaced apart points and having one end thereof secured to the frame means; a system of levers comprising at least first and second levers connected together in series, said first lever being connected to an opposite and remaining free end of said spring element, being mounted for restrained movement in one direction as restrained by a releasable locking device as well as for unrestrained pivotal movement in an opposite direction and being pivotally mounted at a location spaced from said locking device to provide pivotal support for said second lever which is itself pivotally mounted between its opposite ends; a pivotable door support member secured to said door and operatively associated with said lever system to enable said spring element to furnish torque for either opening or closing the door by



pivotally moving said levers of said system to and fro thereby altering the leverage ratio; and said releasable locking device being adapted to cooperate in its locked position with said second lever substantially to prevent pivotal movement thereof from a position in which the door is closed to a position in which the door is open or vice-versa.

4,035,955
BOOM GATE

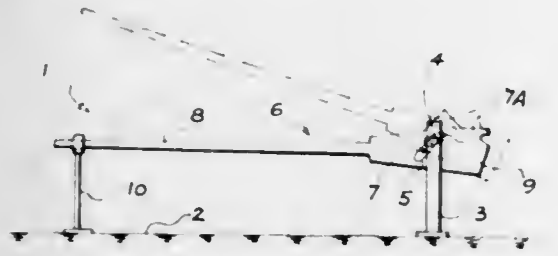
David Burnett, 29 Albion St., Surry Hills, Sydney, New South Wales 2010, Australia

Filed Mar. 14, 1975, Ser. No. 558,712

Claims priority, application Australia, Jan. 23, 1975, 0350/75

Int. Cl.² E05F *1/00*

U.S. Cl. 49—280 **9 Claims**



1. A boom gate comprising a support pillar, bearing means on said pillar, a first-class lever pivotable about said bearing means and having a first end-portion, forming a boom to be raised and lowered, and a second end-portion providing a counterweight, giving the lever a center of gravity disposed adjacent a fulcrum axis for the lever provided by said bearing means, and fulcrum displacement means operable to displace said lever lengthwise with respect to said bearing means, whereby the center of gravity is transferred from one side of the lever fulcrum axis to the other side to turn the lever by its own weight around the axis, wherein said fulcrum displacement means include a piston and cylinder unit, a source of pressure fluid, valving for connecting the pressure fluid source to said piston and cylinder unit to operate the boom gate, and latching means controlled by said boom.

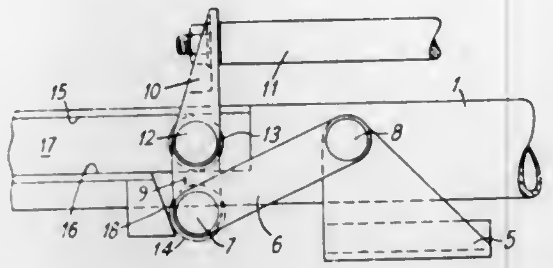
4,035,956
DRIVING AND LOCKING MECHANISMS

John Chase Newson, London, England, assignor to Westinghouse Brake & Signal Co. Ltd., England

Filed Aug. 25, 1975, Ser. No. 607,592

Int. Cl.² E05F *15/00*

U.S. Cl. 49—280 **7 Claims**



7. A driving and locking mechanism for a door operator for coupling the driving member of an actuator to a driven member in the form of a sliding door movable between open and closed positions, said mechanism comprising first and second links for coupling the driving member to the door so as to transmit movement therebetween; pivot means for mutually pivotally coupling said first and second links; and track means, including guide surfaces cooperating with guide surfaces associated with said links; for constraining said links to remain in a first, predetermined relative position over a range of movement of the driving and driven members wherein said door is driven by said driving member, said mechanism further comprising abutment means located adjacent a terminal end of said track means, and said terminal end of said track means providing freeing of the links from the constraint provided by said track means when said driving and driven members are at a location outside of said range of movement so as to enable a pivotal movement of said links away from said first predetermined relative position into a second, substantially oververtical locking position relative to a vertical reference wherein said abutment means engages said links at the location of said pivot means, thereby preventing movement of said mechanism from said locking position by a force other than that provided by said driving member.

4,035,957
ENTRY OR PASSAGE DOOR, ESPECIALLY FOR SHOWER STALLS

Heinz-Rudolf Roloff, Marseillestrasse 53, D-4156 Willich - 1, Germany

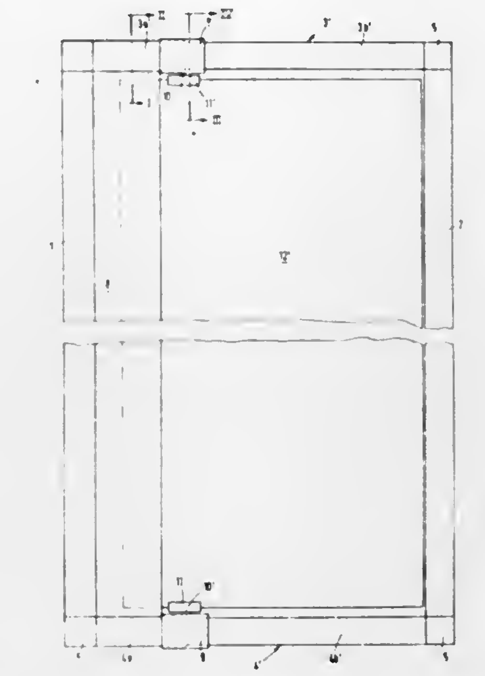
Filed Apr. 15, 1976, Ser. No. 677,126

Claims priority, application Germany, Apr. 17, 1975, 2517038

Int. Cl.² E05D *7/08*

U.S. Cl. 49—388 **13 Claims**

1. Entrance or passage door, especially for shower stalls comprising a frame of rust free material, said frame including spaced parallel vertical members and spaced parallel horizontal connecting members, said connecting members each including a pair of telescoping elements adjustable in one another for varying the width of said frame, means for locking said elements in positions, a stationary door panel mounted on one of said vertical members, a hinged door panel overlapping said stationary door panel at least slightly, and hinge means on one of said connecting elements of each of said connecting members for pivotally mounting said hinged door panel.



4,035,958
MOBILE FLOOR CLEANING AND POLISHING DEVICE

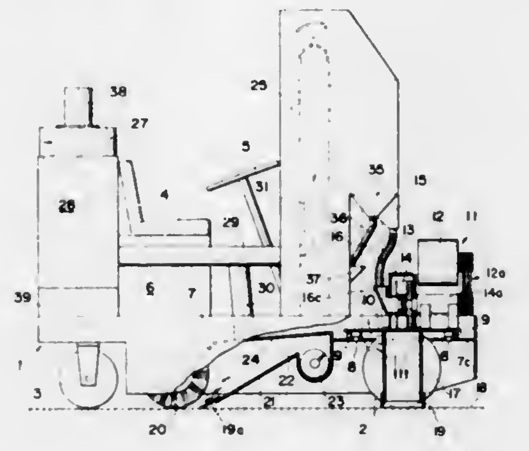
Takuji Nishio, Tokyo, Japan, assignor to Tokyo Kosei Kaken Co. Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 440,057, Feb. 6, 1974, abandoned. This application July 11, 1975, Ser. No. 595,114

Claims priority, application Japan, Mar. 30, 1973, 48-36509

Int. Cl.² B24C *3/00*

U.S. Cl. 51—425 **16 Claims**



1. In a mobile surface cleaning and polishing machine, a chassis having a longitudinal axis, ground-engaging wheels journaled to said chassis for supporting the same for translation in the direction of said axis, said chassis including a horizontal plate having a central opening therethrough, a turntable, means mounting said turntable on said plate for limited turning about a vertical axis normal to said plate, over said opening, a nozzle having a generally rectangular discharge orifice, said nozzle being fixedly mounted on said turntable to depend therefrom, with said discharge orifice closely spaced from and above a surface to be treated, a reservoir for abrasive material carried by said chassis, an impeller journaled on said turntable and rotatable to impel material from said reservoir through said nozzle, to and out of said orifice, and power means carried by said chassis, connected to rotate said impeller,

a cylindrical brush journaled on said chassis for rotation on a horizontal axis extending transversely of said chassis, and engageable with a surface being treated, rearwardly of said nozzle, an upwardly-inclined chute having an intake opening contiguous to said brush and including a channel at its top transversely of said longitudinal axis, conveyor means in said channel operating to convey to one end thereof, material impelled by said brush, elevator means cooperating with said conveyor means, to elevate accumulated material for flow by gravity into said reservoir,

a compartment mounted on said chassis and adapted to contain a filter element for dust, a blower connected to exhaust air from said compartment, a main duct conducting air from said reservoir to said compartment for filtering dust therein, and a branch duct connected between said chute and said main duct.

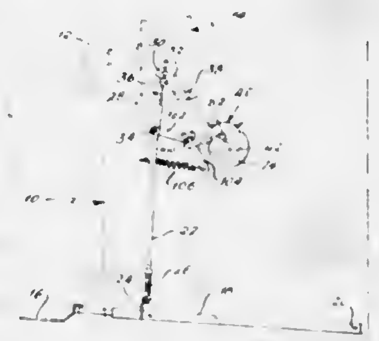
4,035,959
CAM OPERATED AUTOMATIC CONTROL FOR A HONING MACHINE

Frank E. Vanderwal, Jr., St. Louis County, Mo., assignor to Sunnen Products Company, St. Louis, Mo.

Filed Sept. 20, 1976, Ser. No. 724,586

Int. Cl.² B24B *5/08, 51/00*

U.S. Cl. 51—34 K **12 Claims**



1. In a honing machine having a mandrel with a radially movable work engaging member mounted thereon and means for radially moving said work engaging member into engagement with a cylindrical work surface to be honed, the improvement comprising cooperatively engageable cam and cam follower members one of which is operatively connected to the work engaging member for controlling the rate of radial movement thereof into engagement with the cylindrical work surface, means responsive to a predetermined relationship between the cam and cam follower members to establish a condition to maintain the work engaging member engaged with the work surface independently of the cam and cam follower members, and means responsive to a predetermined honed condition of the work surface to automtically terminate the honing operation, said last named means including means to enable the work engaging member to move out of engagement with the work surface.

4,035,960
FINISHING APPARATUS HAVING PART-ISOLATING MEANS WHICH CONFINES OR MAINTAINS CONTENTS IN INDIVIDUAL COMPARTMENTS AND IS CARRIED ALONG BY SAID CONTENTS

Gunther W. Balz, Kalamazoo, Mich., assignor to Roto-Finish Company, Kalamazoo, Mich.

Continuation of Ser. No. 414,656, Nov. 12, 1973, Pat. No. 3,981,693. This application Jan. 14, 1976, Ser. No. 649,087

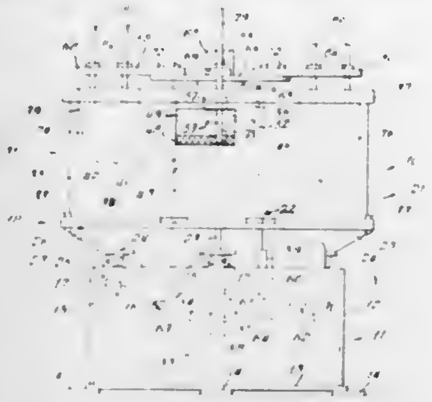
The portion of the term of this patent subsequent to Sept. 21, 1993, has been disclaimed.

Int. Cl.² B24B *31/06*

U.S. Cl. 51—163.1 **21 Claims**

1. Apparatus for treating the surface of parts or workpieces with loose finishing material while maintaining parts isolated from other parts and to prevent damage to parts as a result of

collision therebetween, having a resiliently-supported vibratory finishing chamber in which the parts are vibrated with the finishing material, characterized in that the part-isolating means comprises partitions for separating the interior of the finishing chamber into individual compartments defined by adjacent partitions, which partitions are solid and essentially correspond to the cross-section of the finishing chamber to confine and maintain both a part or parts and loose finishing material therein; means for supporting said partitions for vibration movement with said finishing chamber and means supporting said partitions for movement along said finishing chamber by the contents of said finishing chamber.



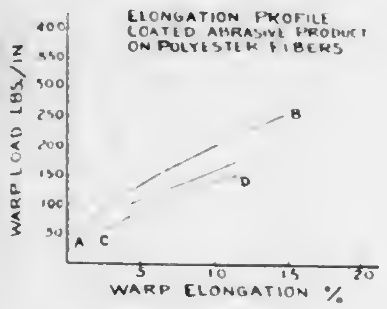
4,035,961
COATED ABRASIVE BACKING OF DIMENSIONALLY STABILIZED HEAT STRETCHED FABRIC

Raymond E. Pemrick, Schenectady, and Paul M. Cocanour, Greenwich, both of N.Y., assignors to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 491,354, July 24, 1974, abandoned. This application June 27, 1975, Ser. No. 590,989

Int. Cl.^{2} B24D *11/02*

U.S. Cl. 51—295 **5 Claims**



1. Coated abrasive material comprising a dimensionally stabilized woven heat stretched fabric backing member in which the warp and fill yarns are composed of polyester fibers, said coated abrasive material having an elongation profile in the warp direction as defined by a line within the area to the left of the line CD in FIG. 3 of the drawing, a thermoset adhesive layer on the front side of the backing member, and abrasive grains attached to the backing member by the adhesive layer, the fabric cover of the woven backing being from 80 to 97%.

4,035,962
ZIRCON SAND IMPACTING MATERIAL

Joseph W. Ayers, c/o The Ayers Company, R.D. No. 2, Bethlehem, Pa. 18017

Division of Ser. No. 413,818, Nov. 8, 1973, Pat. No. 3,939,613. This application Dec. 3, 1975, Ser. No. 637,117

Int. Cl.^{2} C09G *1/02*

U.S. Cl. 51—308 **5 Claims**

1. A material for treating hard surfaces by being continually hurled at high velocity against such surfaces, consisting essentially of a selectively sized fraction of the fine grains of a mass of refined zircon sand, said grains having rounded oblong configurations and having a specific gravity of about 4.7 and their sizes being in a range selected from the group consisting

62.5 X

of −100 to +200, −100 to +140, −140 to +200 and −200 to +325 mesh size ranges.

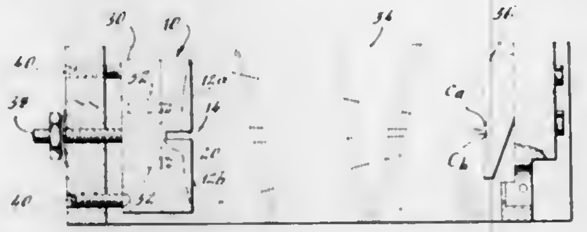
4,035,963
METHOD OF FORMING DUAL MIRRORS

Anthony C. Gilby, Darien, Conn., assignor to Wilks Scientific Corporation, South Norwalk, Conn.

Filed July 2, 1976, Ser. No. 702,214

Int. Cl.^{2} B24B *1/00*

U.S. Cl. 51—324 **5 Claims**



1. The method of forming a plurality of identical spherical mirrors having their centers of curvature separated in space which comprises: providing a blank having front and back surfaces; linearly scoring the front surface of said blank to divide said front surface into at least two surface segments; forming said front surface to a spherical shape, each of said surface segments defining a different portion of the surface of a common sphere; and bending said blank substantially solely where scored to separate in space the centers of curvature of each of said surface segments without substantially altering the spherical surface defined by either of said surface segments.

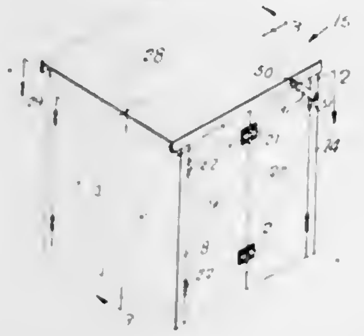
4,035,964
FOLDABLE ENCLOSURE

Kenneth J. Robinson, P.O. Box 86, Atlanta, Mich. 49709

Filed Nov. 14, 1975, Ser. No. 632,011

Int. Cl.^{2} E04B *1/344*

U.S. Cl. 52—66 **10 Claims**



1. A foldable enclosure comprising a front wall, a rear wall, respective opposite foldable side walls hinged to the side edges of said front and rear walls, each side wall comprising a plurality of vertically hinged, inwardly swingable sections, a floor member hinged to the bottom marginal portion of said rear wall and being foldable upwardly to an upright position substantially parallel to and adjacent to said rear wall, a roof member, and means swingably connecting said roof member to the opposite side edges of said rear wall so that said roof member can be at times folded to a position parallel to said rear wall with the floor member, folded side walls and front wall interposed between the roof member and said rear wall, said swingable connecting means including means for holding down said roof member when said enclosure is in its unfolded position and for exerting a clamping force between said rear wall and said roof member when said enclosure is in its folded position, and wherein said swingable connecting means comprises a pair of link bars diagonally connecting the rear portions of the side edges of the roof member to the upper portions of the side edges of the rear wall, so as to provide said holding down and clamping actions.

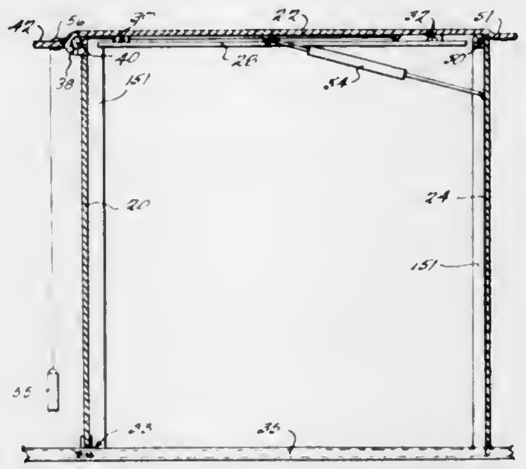
4,035,965
COLLAPSIBLE COMBINATION FENCE AND GARAGE STRUCTURE

Anne A. Ronai, 1150 Fifth Ave., Flat 15E, New York, N.Y. 10028

Continuation of Ser. No. 539,743, Jan. 9, 1975, abandoned. This application Sept. 28, 1976, Ser. No. 727,533

Int. Cl.^{2} E04B *7/16*

U.S. Cl. 52—66 **10 Claims**



1. A convertible fence/shed structure comprising:

rail means disposed in an essentially horizontal plane;

a rear wall having top and bottom edges extending transversely of said rail means and defining a vertical plane essentially perpendicular to the rail means; said rear wall being provided with means adjacent its bottom edge and engaging said rail means so that said rear wall can be moved along the length of said rail means while remaining in a plane essentially perpendicular thereto;

a roof having opposed front and rear edges extending transversely of said rail means, said roof being pivotally connected at its rear edge to the upper edge of said rear wall;

a front wall pivotally connected along the front edge of said roof, and side walls operatively connected to said roof, front wall and rear wall so that said side walls, front wall and roof can be pivoted and folded together into a vertically stacked position whereby said side and front walls and roof extend roughly parallel to said rear wall to form with said rear wall a fence which extends transversely of said rail means with the rear wall and roof constituting opposite sides of the fence and which can be positioned at any point along said rail means and said side walls, front wall and roof can be pivoted from said folded position into a position where said side walls and roof extend outwardly from and transversely to said rear wall and to each other and said front wall extends parallel to said rear wall and transversely to said roof and side walls to form an enclosed shed defined by said side walls, front and rear walls and roof.

4,035,966
STRUCTURE HAVING VERTICAL BEARER WALLS AND HORIZONTAL CEILINGS

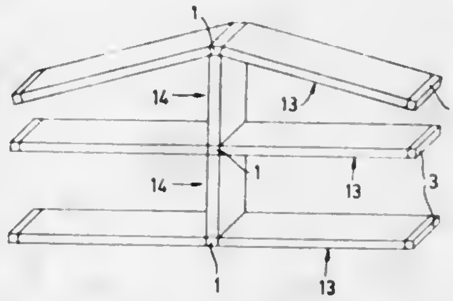
Leon Eugenie Daniel Dompas, 213 Van Rijswijcklaan, Antwerp, Belgium

Continuation of Ser. No. 515,802, Oct. 17, 1974, abandoned. This application Sept. 23, 1976, Ser. No. 725,766

Claims priority, application Germany, Oct. 18, 1973, 2352250

Int. Cl.^{2} E04B *1/06, 1/348;* E04A *21/14*

U.S. Cl. 52—73 **19 Claims**



1. A structure comprising a plurality of frame parts, each frame part being self-supporting and including interconnected vertical and horizontal strips, a nodal element at the intersection between each vertical and horizontal strip, a terminal element at each end of each vertical and horizontal strip, and at least one block in each vertical and horizontal strip having a length equal to the spacing between said nodal element and one of said terminal elements, said frame parts being arranged in alignment, tension wires for binding said frame parts together so that said aligned vertical strips form a bearing wall of the structure and said aligned horizontal strips form a ceiling of the structure, the lowermost aligned horizontal strips forming the foundation floor of the structure, pull ropes for binding together said vertical and horizontal strips of each frame part, and an anti-corrosive coating covering each rope and wire, the uppermost nodal element of said vertical strip having faces inclined at an acute angle to the vertical, so that said uppermost horizontal strips are correspondingly angled, and each horizontal strip tapering from the vertical strip which it intersects toward its free end, so that at least one of the upper and lower faces of each horizontal strip extends at an acute angle to the horizontal.

4,035,967
RAISED FLOOR PANELS

Ronald William Stanley Harvey, Welwyn, England, assignor to A. R. I. Propaflor Limited, United Kingdom

Filed Dec. 19, 1973, Ser. No. 426,057

Claims priority, application United Kingdom, Dec. 22, 1972, 59463/72; Germany, June 28, 1973, 2333005

Int. Cl.^{2} E04F *15/024*

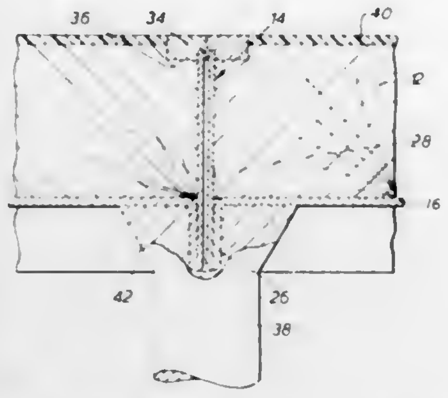
U.S. Cl. 52—126 **4 Claims**

1. A flooring panel for a raised flooring comprising:

a rectangular wooden panel having an upperface, an underface and side edges,

a fire-resisting metal pan adhered to and covering said underface and side edges of said wooden panel,

said metal pan comprising a shaped metal sheet having a flat rectangular shaped section for covering and contacting substantially all of said underface of said wooden panel, four leafs extending from said edges of said rectangular shaped section, each of said leaves comprising a first sub-section adjacent said rectangular shaped section bent downwardly at right angles from said rectangular shaped section and a second sub-section folded back on said first sub-section to form firstly with said first sub-section a downwardly projecting metal flange and secondly extending upwardly past said first sub-section by substantially the thickness of such wooden panel to form a metal cover for said side edges of said wood:n panel.



4,035,968

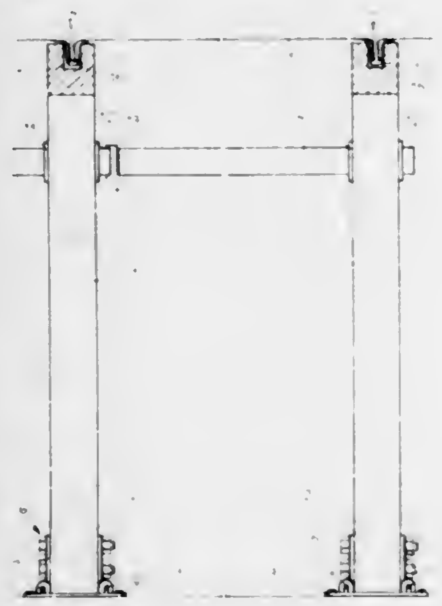
DEMOUNTABLE BUILDING

Raymond Caspar, 37, avenue de la Foret Noire, Strasbourg (Bas-Rhin), and Paul-Henri Mathis, 209, rue de la Gare, Muttersholz (Bas-Rhin), both of France

Filed Sept. 8, 1975, Ser. No. 611,335

Int. Cl.² E04B ***1/12***

U.S. Cl. 52—63 **2 Claims**



1. Demountable building structure comprising a framework formed of a plurality of arches, crossbars interconnecting the arches, and a cover comprised by a plurality of sheets of flexible weatherproof material, each said sheet having a tension cable along one edge thereof, said tension cable being secured at opposite ends adjacent the bottoms of the arches, the other edge of each sheet being fixed to a said arch and passing beyond said arch in the form of a strip having fixing holes therethrough, the edge of each sheet that has said tension cable also having, turned toward the interior, a flap, and means interconnecting said flap and said strip through said fixing holes, the portion of the sheet with the cable serving only to ensure rain tightness upon the respective arch.

4,035,969

TELESCOPIC COLUMNS OF MACHINES FOR MAKING FOUNDATIONS, AND THE TELESCOPIC COLUMNS THEREBY DERIVED

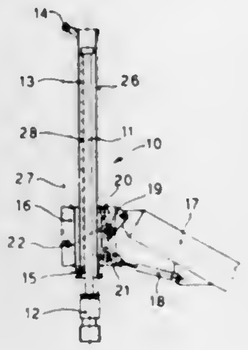
Bruno Casagrande, Viale Zancanaro, 33077 Sacile, Italy

Filed May 25, 1976, Ser. No. 690,050

Claims priority, application Italy, June 4, 1975, 83388/75

Int. Cl.² E04H ***12/34***

U.S. Cl. 52—111 **5 Claims**



1. In telescopic columns of machines for making foundations consisting of an axially immovable canoe means, a movable outer column guided by said canoe means and a movable inner column within said outer column and guided by said outer column, the improvements including in reciprocal coordination and cooperation a drive means comprising at least two guide pulleys having a proportion to each other of one to two; a chain secured to the two ends of the outer movable column and driven by the smaller of said pulleys; a chain secured to the lower part of the inner movable column and to the upper part of the axially immovable guide canoe means and driven by said larger of said pulleys; a cable connecting the upper part of the inner movable column to the lower part of the axially immovable guide canoe means and a transmission sheave solidly fixed to the lower part of the outer movable column through which passes said cable.

4,035,970

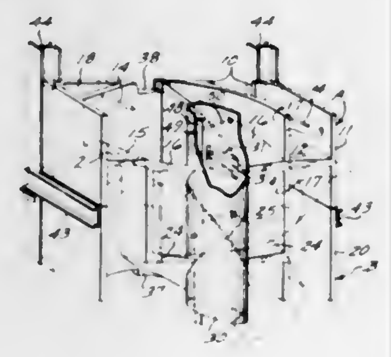
PREFABRICATED MODULAR HELICAL ESCAPE STRUCTURE FOR MULTIPLE STORY BUILDINGS

Willy H. Welcker, South San Francisco, Calif., assignor to Rudi Van Byelvelt, Pinole, Calif.

Filed Mar. 11, 1976, Ser. No. 665,950

Int. Cl.² E04F ***11/14;*** **E04H** ***14/00;*** **B65G** ***11/06***

U.S. Cl. 52—187 **7 Claims**



1. In a building having a multiple story framework generally defining a vertically oriented shaft extending downwardly past a plurality of floors of the building, a prefabricated escape structure comprising:

a plurality of substantially identical superposed sets of modules in said shaft, each of said sets including a pair of substantially identical upper modules of precast material arranged in complemental, confronting relation, and including ramp portions defining upper sections of separate first and second helical slides providing a pair of separated escape paths; each of said sets further including a pair of substantially identical lower modules of precast material arranged in complemental, confronting relation, and including ramp portions defining lower sections of said first and second slides, said lower modules being arranged below said upper modules with said ramp portions of said lower modules forming downwardly extending continuations of said ramp portions of said upper modules whereby said first and second helical slides formed by said sets of modules are continuous, all of said ramp portions being of cantilever construction, the inner, cantilevered sections of said ramp portions terminating to define a hollow core extending downwardly through said sets of modules;

boundary means attached to and supported by said cantilevered sections of said ramp portions to define a barrier between said first and second helical slides and said hollow core; and

mounting means securing said modules of each of said sets to said framework of said building whereby said framework supports said sets.

4,035,971

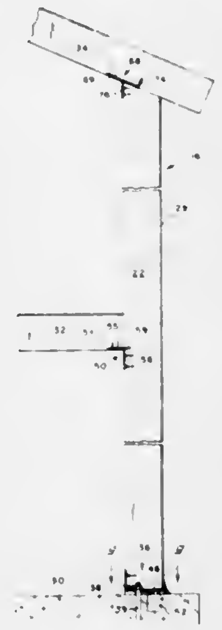
BUILDING CONSTRUCTION SYSTEM

Donald A. Hay, 7031 Persimmon Tree Road, Bethesda, Md. 20034

Filed Dec. 18, 1975, Ser. No. 642,117

Int. Cl.² E04G ***1/04***

U.S. Cl. 52—236.6 **1 Claim**



1. In a building construction of the prefabricated type, the improvement which comprises a plurality of vertically arranged exterior wall panels arranged with their sides adjacent each other, each panel having an exterior prefinished side and being formed on the inner side with a plurality of spaced-apart vertical ribs extending throughout the length of the panel, a floor supporting angle member for supporting a plurality of horizontally arranged floor panels from said ribs, each floor panel including a plurality of spaced-apart horizontal ribs on its under side, said angle member comprising a vertical flange secured to said vertical ribs and a horizontal flange secured to said horizontal ribs the ribs of the exterior wall panels and the ribs of the floor panels being provided with recesses to respectively receive the vertical and horizontal flanges of the floor supporting angle member, the depth of the recesses being such as to accommodate the respective flanges to preserve the continuity of the surfaces of said ribs, the horizontal flange of the floor supporting angle member being provided with a lateral extension and the faces of the ribs of the exterior wall panels being provided with slots for receiving said extension.

4,035,972

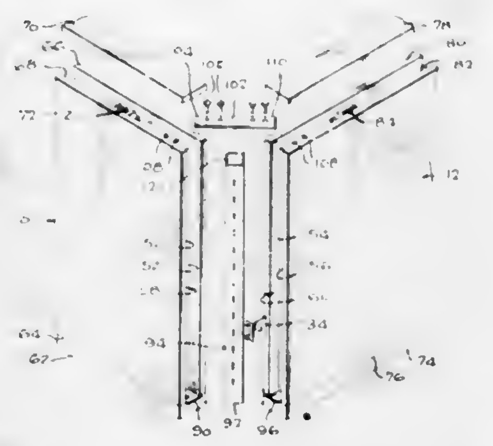
PANEL JOINING ARRANGEMENTS

Jay Timmons, 921 Via Panarama Ave., Palos Verdes Estates, Calif. 90274

Filed Feb. 23, 1976, Ser. No. 660,366

Int. Cl.² E04G ***3/08;*** **E04B** ***2/78***

U.S. Cl. 52—241 **8 Claims**



1. An arrangement for joining first and second panel members at facing portions thereof, each of the facing portions having an upper portion adjacent the top of the panel member and a lower portion adjacent the bottom of the panel member, the arrangement comprising an elongated spacing member having an upper portion thereof terminating in a top end and a lower portion thereof terminating in a bottom end having an aperture therein, the spacing member being disposed between and in contact with the facing portions of the first and second panel members along the length thereof, a bottom connecting element mounted on the first panel member adjacent the bottom thereof, the bottom connecting element extending outwardly from the lower portion of the facing portion of the first panel member and curving upwardly and extending into and engaging the aperture in the bottom end of the spacing member to hold the lower portion of the facing portion of the first panel member against the lower portion of the spacing member, an elongated top connecting element having a first portion thereof fastened to the top of the first panel member, the top connecting element extending over the top end of the spacing member and having a second portion thereof opposite the first portion secured in place on the top of the second panel member, the top connecting element holding the upper portions of the facing portions of the first and second panel members against the upper portion of the spacing member, and means holding the lower portion of the facing portion of the second panel member against the lower portion of the spacing member.

4,035,973

BISECTIONAL ARCHITECTURAL STRUCTURE

Franklin S. Sutelan, 301 E. 53rd No. 3A, New York, N.Y. 10022

Continuation of Ser. No. 507,992, Sept. 20, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,538

Int. Cl.² E04B ***1/34***

U.S. Cl. 52—263 **27 Claims**

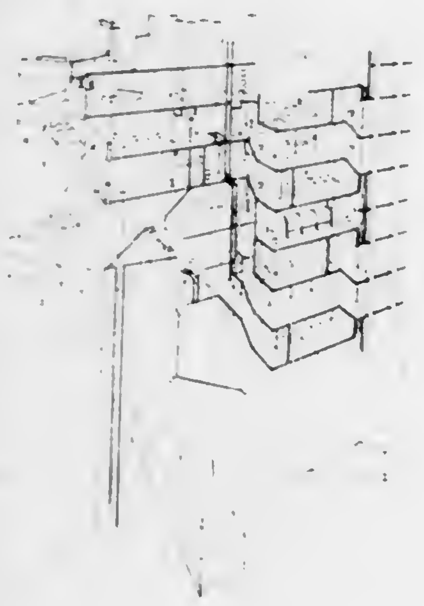
1. An architectural structure comprising a plurality of horizontal floor members, arranged one above the other, and means for supporting said floor members having a plurality of vertical supporting columns, said columns being arranged at a plurality of the points of intersection of the lines of the following grids:

1. a first square grid consisting of a first set of four parallel straight lines spaced apart a given distance **2A** in a horizontal plane and extending in a first direction, and a second set of four parallel straight lines spaced apart said given distance **2A** in said horizontal plane and extending in a second direction perpendicular to said first direction;

2. a second square grid consisting of a third set of two parallel straight lines spaced apart a given distance **2A** + **2B** in said horizontal plane and extending in said first direction, and a fourth set of two parallel straight lines spaced apart said given distance **2A** + **2B** in said horizontal plane and extending in said second direction;

the lines of said second grid being spaced outward a distance B from the innermost lines of said first grid, and wherein the distance B is greater than zero and less than the distance **2A**, but not equal to the distance A;

wherein said columns are arranged in corresponding positions in each of four quadrants defined by the medial axes of said first and second grids at the following points of intersection but at no other locations:



(a) a plurality of points at which the lines of at least one of said first grid and said second grid intersect with each other; and

(b) a plurality of points at which lines of said first grid intersect with lines of said second grid; and

wherein adjacent columns on the periphery of the columnar arrangement form a plurality of spans along lines which are both parallel and oblique to the lines of said first and said second square grid, a plurality of spans along both said parallel and oblique lines being equal to each other,

whereby said columns of said architectural structure are equidistant in a plurality of non-parallel grid systems.

4,035,974

PRESSURE TANK FOR NUCLEAR REACTORS WITH CONCRETE ENCLOSURE

Hermann Kumpf, Wendelstein, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany

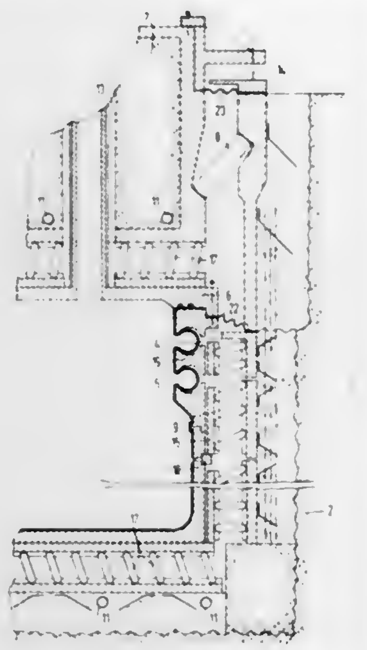
Continuation of Ser. No. 352,265, April 18, 1973. This application Oct. 21, 1974, Ser. No. 516,601

Claims priority, application Germany, Apr. 20, 1972, 2219412

Int. Cl.² G21C *13/04;* **E04B** *1/98*

U.S. Cl. 52—249 **8 Claims**

1. Cylindrical pressure tank structure for nuclear reactors comprising a prestressed concrete enclosure, a steel pressure tank for pressurized medium mounted in said concrete enclosure and supporting and insulating means disposed between the outside of said steel tank and the inside of said concrete enclosure, said steel tank in unpressurized condition and at ambient temperature having a radial and axial spacing from said concrete enclosure, said steel tank being expansible at operating condition during which it is pressurized so as to take up at least part of said radial and axial spacing and bear through said supporting and insulating means against said concrete enclosure, said supporting and insulating means comprising an inner support plate adjacent said outside of said steel tank and an outer support plate spaced from said inner support plate and disposed adjacent the inside of said pressurized concrete enclosure and a plurality of spaced articulated legs disposed between said inner and said outer support plates, said steel tank together with said supporting and insulating means being mounted in said concrete enclosure so that said steel tank is at a given maximal spacing from said concrete enclosure maintained by said spaced articulated legs, said steel tank, said inner support plate and said spaced articulated legs being shiftable together, as said pressurized operating condition during which said steel tank expands, to a predetermined limit at which said expanding steel tank together with said inner support plate and said spaced articulated legs rigidly abuts said outer support plate and said concrete enclosure and is blocked thereby from further expansion.



4,035,975

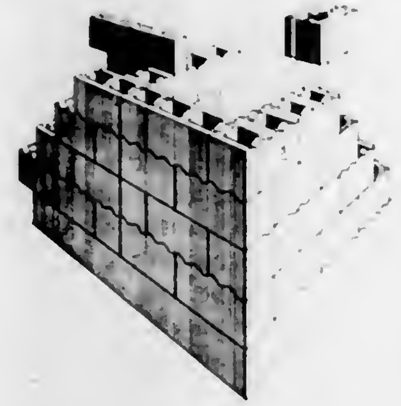
WALL OF BUILDING BLOCKS AND METHOD OF CONSTRUCTING IT

Franz Julius Gergely, Durener Str. 98, 5 Cologne 41, Germany

Continuation-in-part of Ser. No. 504,604, Sept. 9, 1974, abandoned. This application Feb. 17, 1976, Ser. No. 658,316

Int. Cl.² E04C *2/30, 1/10*

U.S. Cl. 52—284 **6 Claims**



1. A wall composed of building blocks arranged end-to-end and one above the other, each building block having the general shape of a right parallelepipedon including including front and rear sides, two ends, a top, and a bottom, said top being formed with continuous undulations each of which extends in a direction from said front side toward said rear side, said bottom being formed with continuous undulations each of which extend in a direction perpendicular to said top undulations, the contour of all said undulations being identical so that the bottom undulations of the block can mesh with the top undulations of another similar block, there being twice as many top undulations as bottom undulations on said block, each end of the block presenting a slot and a rib extending between said top and bottom, said slot and rib on each end being in positions reversed with respect to the slot and rib on the opposite end so that when two such blocks are placed end-to-end, the ribs in the two adjacent ends are accommodated by the slots in those ends, and at least some of said blocks having slots in their sides for accommodating the rib presented by the end of another block when two blocks are arranged perpendicular to each other to form a corner of the wall.

4,035,976

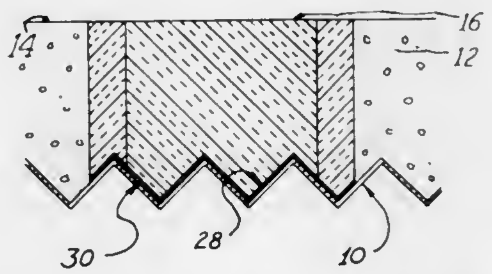
SLEEVING FORM FOR MASONRY MATERIAL

Richard W. Downey, 635 Pine St., Lapeer, Mich. 48446

Filed May 6, 1976, Ser. No. 683,845

Int. Cl.² E04G *15/04;* **E04C** *1/08*

U.S. Cl. 52—577 **8 Claims**



1. A sleeving form for forming a void in masonry material, comprising:

a. an inner core, and

b. an outer annular core coextensive with and concentric with the inner core, the inner core having a diameter substantially equal to the inner diameter of the outer core, the inner core being telescopable into and out of the outer core wherein the inner core and the outer core are formed from a friable foamed plastic material.

4,035,977

STRUCTURAL ELEMENT

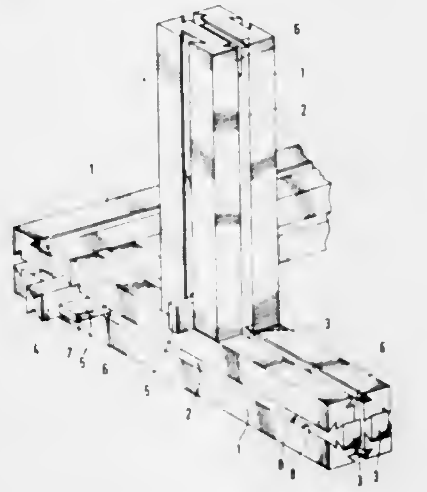
Artur Fischer, Gde. Waldachtal, Weinhalde 34, D-7241 Tumlingen, Germany

Filed Jan. 22, 1976, Ser. No. 651,398

Claims priority, application Germany, Jan. 25, 1975, 2502989

Int. Cl.² E04C *1/10;* **A63H** *33/08*

U.S. Cl. 52—586 **9 Claims**



1. A structural element, particularly for the construction of model structures, comprising a body having a periphery and a pair of spaced end portions; connecting means provided for said body for connecting a pair of structural elements with one another, said connecting means including at least one projection having outer surface portions provided at one of said end portions, and at least one groove having inner surface portions formed in said periphery and adapted to receive a projection similar to said one projection for free sliding movement of said respective surface portions relative to each other; and means for urging said respective surface portions towards each other to thereby arrest said structural elements in a selected position relative to each other, said urging means including at least one slot in said body which is open at said periphery and at an end portion of said body and which extends along a portion of said body, and a key which is adapted to be received in said one slot for displacing said respective surface portions into frictional engagement with each other when a pair of structural elements is brought into engagement, whereby variations in the manufacturing tolerance of the structural element are compensated.

4,035,978

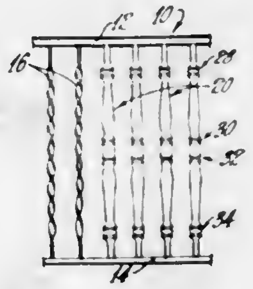
TUBULAR SPINDLE COVER

Jay E. Bajorek, Wadsworth, and Albert L. Newman, Cleveland Heights, both of Ohio, assignors to Questor Corporation, Toledo, Ohio

Filed May 17, 1976, Ser. No. 687,319

Int. Cl.² E04C *3/30, 3/34*

U.S. Cl. 52—727 **9 Claims**



1. A tubular article for enclosing a bar comprising, in combination, a pair of elongated mating hollow sections having edge configurations adapted for mating engagement in assembled relation, interengageable means on said sections for retaining the sections in mating assembled relation, said means including projections and recesses to receive the projections, said projections and recesses being dimensioned whereby the projections are snugly received in the recesses with sufficient friction to hold the sections in assembled mating relation, said sections having lengthwise-spaced portions adapted to be crushed by the bar during assembly of the sections for resisting movement of said sections relative to the bar enclosed by the sections.

4,035,979

PROFILE RAIL

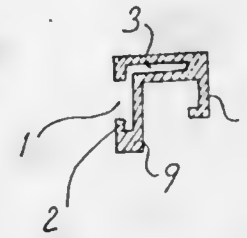
Rudolf Johan Koreska, Adalsparkvej 61, 2970 Horsholm, Denmark

Filed Mar. 10, 1975, Ser. No. 557,141

Claims priority, application Denmark, Mar. 8, 1974, 1266/74

Int. Cl.² E04C *3/30*

U.S. Cl. 52—737 **16 Claims**



1. An extruded rail comprising a body having a longitudinally extending flat side surface, an L sectioned channel ex-

tending longitudinally through the rail and having one limb parallel to said side surface and another limb extending from a junction with an end region of said one limb, at an angle to said side surface and to that side of said one limb remote from said side surface, and a longitudinal slot opening from said side surface to said one limb at a region spaced from said junction of said limbs, said side surface extending to both sides of said slot.

4,035,980

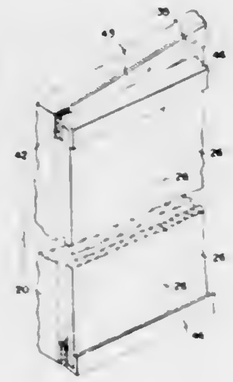
METHOD OF PANEL RE-FACING BUILDING WALLS

Harold P. Lucas, Detroit, Mich., assignor to Harold P. Lucas, Detroit, Mich.

Filed May 23, 1975, Ser. No. 580,528

Int. Cl.^{2} E04G *11/00;* **E04F** *13/00*

U.S. Cl. 52—745 **1 Claim**



1. The method of providing a new finish inner face on an existing vertical interior wall of a building or room without painting or papering it and without removing or repairing or replastering it comprising:

applying and securing elongated opposed channel members upon and along the upper and lower edges of the wall inner face at the floor and ceiling respectively;

mounting a facing panel of solid free-standing material by snugly nesting its upper and lower edges within said channels firmly holding the panel so as to snugly bear against the wall face throughout its height and throughout the rear surface of the panel;

the channels being so dimensioned in height with respect to the vertical distance between channels that the channels receive the top and bottom edges of the panels in an interlocking coaction;

hinging the channel members at their one ends to the wall on a vertical axis;

swinging said channels outwardly of the wall;

slidably inserting a series of panels edgewise into said channels at their respective tops and bottoms, aligning said panels edge to edge and swinging the channels and panels into snug registry with the wall.

4,035,981

ASEPTIC PACKAGING

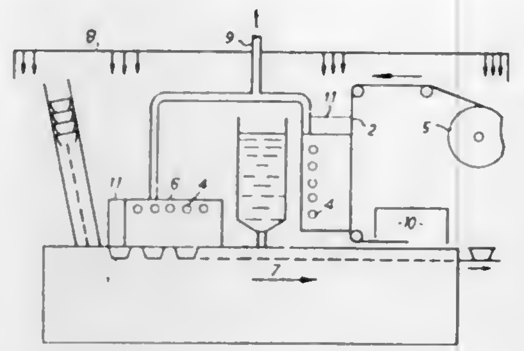
Johannes Braun, Roggwil, and Winfried Sturm, Goldach, both of Switzerland, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed Dec. 5, 1975, Ser. No. 638,175

Int. Cl.^{2} B65B *55/08*

U.S. Cl. 53—21 R **12 Claims**

1. In a method of aseptically packaging presterilized products, comprising sterilizing preformed containers of packing material coated on at least one surface thereof with a heat-sealable lacquer, said sterilization including the step of exposing at least said lacquer coated surface to dry-sterilizing radiation in an aseptic workspace, providing said pre-sterilized products in said containers and closing said containers by forming a hermetic seal between two coatings of said lacquer, the improvement which consists in using as the heat-sealable lacquer a lacquer stabilised against radiation damage occurring as a result of exposure to said dry-sterilizing radiation.



4,035,982

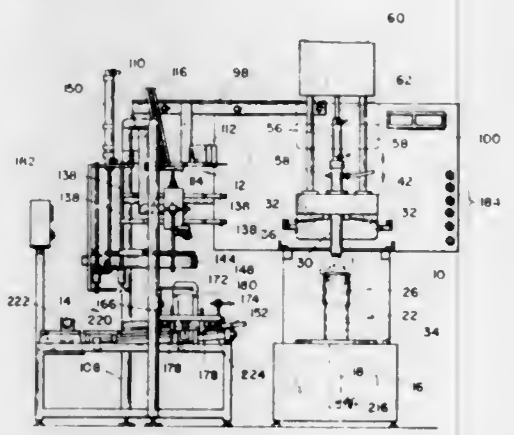
AUTOMATIC VACUUM PACKAGING MACHINE AND METHOD

Eugene H. Paules, Red Lion, Pa., assignor to ExCel Engineering, Inc., Red Lion, Pa.

Filed Oct. 29, 1976, Ser. No. 737,198

Int. Cl.^{2} B65B *31/06*

U.S. Cl. 53—22 B **31 Claims**



27. A method of receiving a plurality of similar flat objects in stacked manner into a tubular bag closed at one end comprising the steps of:

a. holding said bag in position to receive a series of said objects from a feed conveyor,

b. clamping the upper end of said bag tightly around a tubular evacuating unit including an inner slidable plunger unit and hold down rod,

c. moving said plunger unit and rod into contact with the upper end of said stack of objects in said bag,

d. applying vacuum to said plunger unit to evacuate said bag,

e. withdrawing said plunger unit a limited distance upward from said objects while said hold down rod remains in contact with said objects to form a contracted neck on the upper end of said bag,

f. withdrawing said hold down rod from said contracted neck while maintaining vacuum in said bag, and

g. transferring said bag to a clip-applying unit for application of a tight clip around said contracted neck of said bag.

4,035,983

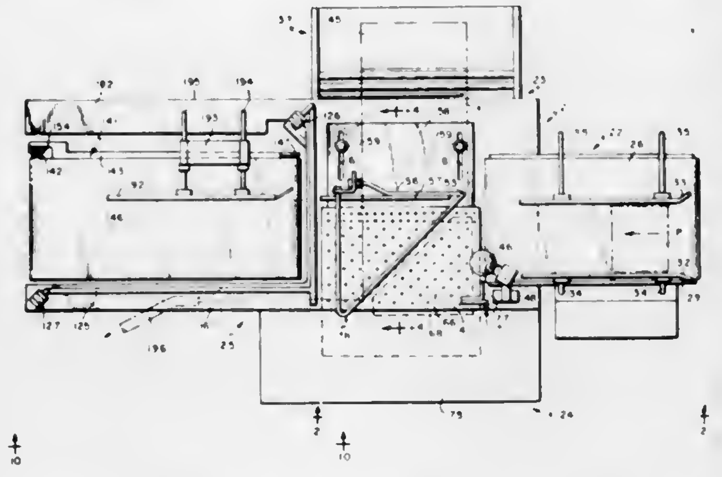
SMOOTH PRODUCT TRANSFER HIGHSPEED L-SEALER

F. Garrett Shanklin, Groton; Edward F. Hunt, Littleton, both of Mass., and Francis X. King, Jr., Nashua, N.H., assignors to Shanklin Corporation, Ayer, Mass.

Filed Sept. 29, 1975, Ser. No. 617,306

Int. Cl.^{2} B65B *9/06*

U.S. Cl. 53—28 **8 Claims**



1. The method of automatically overwrapping loose assembled groups of like items in an L-sealer having an inverting head comprising the steps of

successively supporting said groups on a substantially horizontal plane to travel in substantially a straight line successively through an infeed area, an overwrap area and a sealing area;

intermittently feeding said groups on said infeed area to be transferred one group at a time to said overwrap area;

supporting on an air film substantially the whole weight of the group in said overwrap area;

operating a cycle for engaging the trailing edge of the group of said items supported on said air film and driving the so engaged group through said inverting head to said sealing area thereby overwrapping said group;

completing an L-sealing operation on the overwrapped group of articles in said sealing area consisting essentially of the sequence of withdrawing from said sealing area the means used for engaging and driving said group, lowering the level of said sealing area by approximately half the height of said group as assembled, simultaneously forming an L-seal and returning the engaging and driving means to initial position while feeding the next of said groups on said infeed area to said overwrap area, and returning said sealing area to the level of said plane as the sealed overwrapped group is conveyed away from said sealing area.

4,035,984

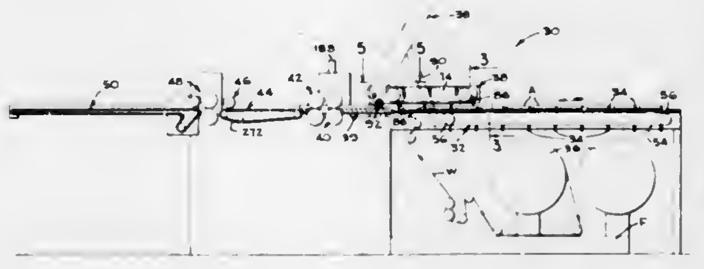
WRAPPING METHOD AND APPARATUS

Carl J. Gerlach, and Jerome Vande Castle, both of Green Bay, Wis., assignors to FMC Corporation, San Jose, Calif.

Filed Apr. 5, 1976, Ser. No. 673,499

Int. Cl.^{2} B65B *9/06*

U.S. Cl. 53—28 **18 Claims**



1. A method of packaging articles comprising the steps of moving a web of packaging material having a longitudinal intermediate portion and edge portions along a path, moving a pair of spaced articles along spaced parallel paths onto the web for movement therewith, folding the web around the articles with the longitudinal edge portions disposed between the articles, longitudinally sealing the edge portions to the intermediate portion for encompassing each article in a tube of packaging material, transversely sealing the tubes to confine the articles therein, a plurality of pairs of longitudinally and transversely spaced articles are moved onto the web to define two continuously moving rows of spaced articles, transversely severing article filled and sealed packages from the tubes, the material is longitudinally severed prior to being transversely sealed and severed, and additionally applying tube holding and separating pressure, on the sealed and severed edge and intermediate portions of a web for maintaining the entubed articles in their spaced parallel paths.

4,035,985

METHOD AND APPARATUS FOR WRAPPING GOODS IN A STRETCHABLE FILM MATERIAL

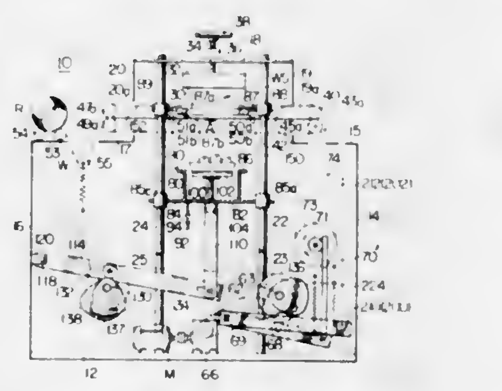
Kozo Aoyama, Tokyo; Hiroshi Iijima, Kawasaki, and Shizuo Kikuchi, Yokohama, all of Japan, assignors to Asahi-Dow Limited, Tokyo, Japan

Continuation of Ser. No. 536,293, Dec. 24, 1974, abandoned. This application Oct. 6, 1975, Ser. No. 620,195

Claims priority, application Japan, Dec. 29, 1973, 49-4150; June 21, 1974, 49-70149; June 22, 1974, 49-70818; July 2, 1974, 49-75055; July 15, 1974, 49-80214

Int. Cl.^{2} B65B *43/30*

U.S. Cl. 53—30 R **45 Claims**



1. A method of wrapping an assembly of articles on a tray in an elastic and stretchable plastics film material, comprising the steps of

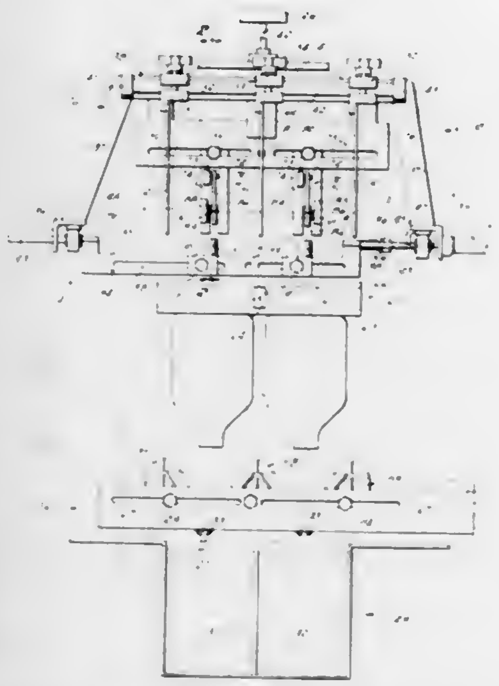
feeding a sheet of the plastics film material to a predetermined position above the assembly of articles on a tray to be wrapped and beneath a resiliently deformable bearing means,

subjecting said sheet to a differential pressure to form an upwardly stretched bubble in the central zone of said sheet while portions of said sheet adjacent at least two opposite edges thereof are held fast until the top of the bubble is engaged by said bearing means,

causing relative movement of the assembly of articles on a tray with respect to the bubbled sheet to introduce the assembly of articles on a tray into the bubble and to upwardly depress said bearing means, and positively maintaining the engagement between the top of the bubble and the upwardly depressed portion of the bearing means while tucking the edges of said sheet against the side of the assembly of articles on a tray remote from the bubble to secure said edges together.

4,035,986
UNIVERSAL HEAD AND INTERMEDIATE GRID FOR CASE PACKERS

William E. Clem, and John F. Nolan, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Filed Dec. 31, 1975, Ser. No. 645,622
Int. Cl.² B65B *57/10, 5/08*
U.S. Cl. 53—61 **10 Claims**

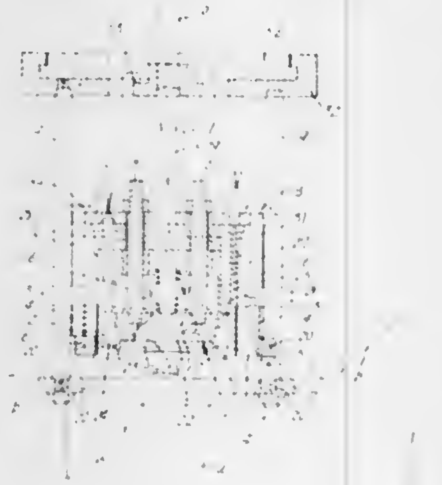


1. A head for an automatic case packer, comprising,
- a head frame and means for mounting it to the packer,
- a series of lane dividers mounted from the frame, the dividers providing a plurality of parallel lanes between them for receiving articles in single file relation,
- an end plate mounted from the frame and extending transversely across the lanes, the end plate presenting a barrier which limits the length of each lane,
- said end plate carrying a plurality of movable flags projecting into the respective lanes, each flag being positioned for engagement by an article in its lane when the article is proximate to the end plate,
- at least some of the said flags being mounted from the end plate by means for shifting them in a direction transverse to their respective lanes, in order to be aligned with the respective central planes of a particular size of article to be received in the lanes,
- each lane divider having a vertical base wall with legs upstanding from the base wall, the divider being suspended from the frame by the legs,
- said end plate extending transversely across the lanes above the base walls of the respective lane dividers,
- said end plate having lane stops mounted to it which project downwardly into the respective lanes between the base walls of the lane dividers.

4,035,987
APPARATUS FOR SEALING THE HEADS OF CONTAINERS

Tetsuo Nakazato, Sakai; Shunji Kamon, Kawanishi; Koichi Tokuda, Takarazuka, and Keisuke Honma, Itami, all of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan
Filed Jan. 23, 1976, Ser. No. 651,816
Claims priority, application Japan, Jan. 30, 1975, 50-13237
Int. Cl.² B65B *61/18, 7/28;* **B67B** *3/04*
U.S. Cl. 53—133 **6 Claims**

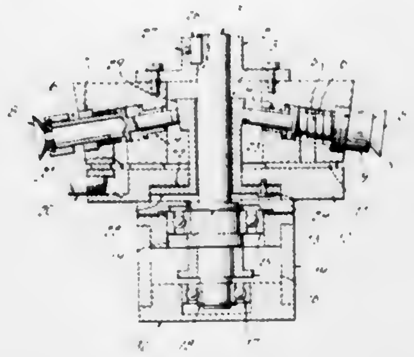
1. Apparatus for sealing the heads of containers with heat shrinkable film comprising:
- means defining a sealing location;
- means for positioning containers to be sealed at their sealing location:
- means for intermittently feeding a continuous film of heat shrinkable material past said sealing location above a container located thereat;
- cutter means disposed at said sealing location above a container positioned thereat and including a vertically movable angular punch, said punch being sized and configured to cut from said heat shrinkable film individual portions thereof each forming a sealing sheet having a shape generally similar to the shape in plan view of said container head to be sealed but being larger in size than said container head so that when placed over a container head said sealing sheets will include an overhang portion extending beyond the periphery of said container head which will hang over along a portion of the side of said container;
- means for clamping said heat shrinkable film along portions thereof surrounding said portion forming said sealing sheet, said clamped portions being, prior to cutting of said sealing sheets, contiguous with said portion of said heat shrinkable film which form said sealing sheets, said clamping means including a vertically movable upper member and a stationary lower member located to have said film passed therebetween by said feeding means and to clamp said film therebetween during cutting of said sealing sheets, said upper and lower members of said clamping means being arranged to extend about said vertically movable annular punch in close proximity thereto thereby to act as a die member for said punch when said punch is actuated to cut said sealing sheets from said film;



- holding means positioned over the head of said containers placed at said sealing location and movable downwardly into engagement with said container heads to press said sealing sheets against said head after said sealing sheets have been cut from said film;
- means operatively associated with said holding means to fold said sealing sheets along the periphery of said container head to urge said overhand portions of said sealing sheets to extend downwardly along a portion of the sides of said containers;
- means for applying hot air against said molded overhang portions of said sealing sheets to heat seal said sheets upon said container heads; and
- cooling means physically joined with said clamping means and extending therewith in proximity to the portions of said clamping means which engage said heat shrinkable film portions during cutting-out of said sealing portions therefrom, said cooling means removing from said clamping means heat energy, particularly heat energy received from said hot air applying means, in order to maintain the temperature of said clamping means at a level sufficiently low to avoid deleterious shrinkage of said portions of said film clamped in said clamping means.

4,035,988
VACUUM POCKET-OPENING TURRET

David Daniels, Jacksonville, Fla., assignor to General Foods Corporation, White Plains, N.Y.
Filed June 4, 1976, Ser. No. 693,024
Int. Cl.² B65B *1/02, 43/30*
U.S. Cl. 53—183 **3 Claims**



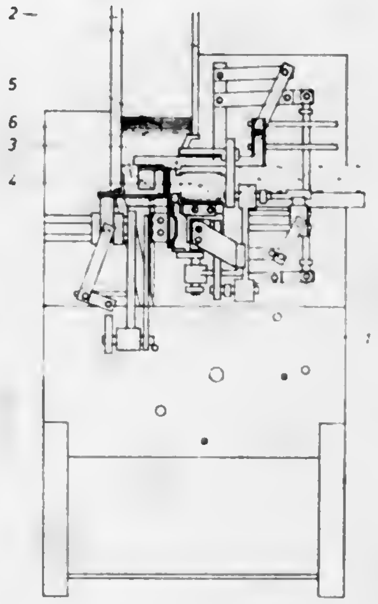
1. In an apparatus for continuously forming sealed packages including:
- a. means for feeding a strip material having a U-shaped configuration,
- b. means for forming spaced pockets along the length of the strip material leaving the top edges of the pocket sidewalls unsealed,
- c. a filling station having a rotating turret and an overhead rotating filling drum equipped with a plurality of discharge tubes, said turret provided with a plurality of circumferentially-spaced collapsible suction heads about its periphery said heads being for engagement with a first outer sidewall of said pockets, and
- d. means for sequentially collapsing said suction heads and withdrawing the pocket sidewall with which the collapsed head is engaged,

the improvement comprising, a rotating pocket-opening turret provided around its periphery with a plurality of circumferentially-spaced, spring-biased, reciprocating vacuum nozzles rotating about a stationary cam which cam has a cam face which is inclined from the vertical and which cam sequentially thrusts the vacuum nozzles out into engagement with the second outer sidewall of said pocket while said vacuum nozzle is in communication with a vacuum source and while said first sidewall is engaged with said collapsible suction head and which cam permits abrupt withdrawal of the vacuum nozzle while it is still engaged with said second sidewall in order to effect separation of the top edges of the pocket sidewalls prior to filling the pocket with a granular material and thereafter, placing the vacuum nozzle in communication with a passageway leading to the atmosphere in order to release said sidewall from the vacuum nozzle.

4,035,989
MACHINE FOR ERECTING, FILLING AND CLOSING FLAT-FOLDABLE CARTONS

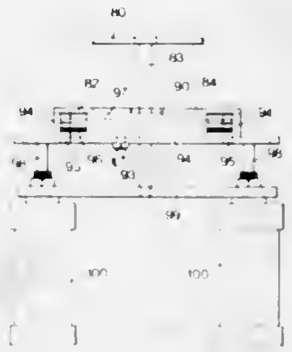
Wilhelm Schuster, Lilienstr. 11, Ettlingen-Bruchhausen, Germany (7505)
Filed Jan. 7, 1976, Ser. No. 647,092
Claims priority, application Germany, Jan. 7, 1975, 2500392
Int. Cl.² B65B *5/02, 43/28, 43/32*
U.S. Cl. 53—186 **13 Claims**

1. A machine for erecting, filling and closing a rectangular carton having hinged top, bottom and side walls which is flat-foldable for stacking before erection and which has foldable end flaps at each end for closing it, comprising a magazine having spaced walls for stacking a plurality of cartons in a flat-folded position therebetween, a support bar defining a first station located below said discharge opening, deflection means between said support bar and said magazine for deflecting a side wall of the carton upwardly so as to erect the side walls and top above the bottom and to permit the bottom to fall on said support bar, an engagement member movable to engage each carton in succession and to move it past said deflection means and deposit it on said support bar, a shifting member movable backwardly and forwardly over said support bar and being movable against a side wall of said carton to deflect it to a fully upright erected position and to hold it in an erected condition on said support bar, means adjacent said first station for filling the erected carton with a product, a movable receiving bar being positionable alongside said support bar in a position to receive the filled carton therefrom, a top enngagement bar engageable with the top of the filled carton when it is positioned on said receiving bar, said receiving bar and said top engagement bar being movable together with said carton to a second station spaced from said first station, pusher means for engaging the filled carton and moving it out of said first station onto said receiving bar and between said receiving bar and said top engagement bar and closing means at said second station for folding said foldable end flaps.



4,035,990
WRAPPING MACHINE

Harry Hallam, Coventry, England, assignor to A Campton & Sons Company Limited, Coventry, England
Filed Dec. 31, 1975, Ser. No. 645,899
Claims priority, application United Kingdom, Jan. 8, 1975, 712/75
Int. Cl.² B65B *11/06*
U.S. Cl. 53—222 **3 Claims**



1. A wrapping machine for wrapping articles in stretchable sheet material, comprising article feed means for feeding articles to a wrapping station, the article feed means including a lifting platform on which the articles are lifted into the stretchable sheet material, feed means for feeding predetermined lengths of the stretchable sheet material to the wrapping station, holding means for holding the edges of the lengths of material at the wrapping station during the wrapping operation, a wrapping mechanism for wrapping the edges of the

lengths of material under the articles at the wrapping station, and reciprocable gripping means for gripping the articles during the wrapping operation and for discharging the wrapped articles from the wrapping station, the lifting platform comprising a three part plate having a central part and lateral parts extending from opposite sides of the central part, the lateral parts being movable towards and away from one another and vertically relative to the central part during a wrapping operation.

4,035,991
DEVICE FOR MOWING AND SUBSEQUENTLY CRUSHING CROP

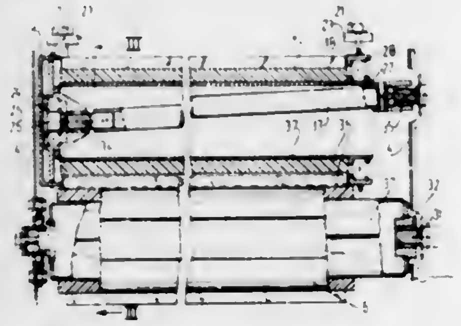
Pieter Adriaan Oosterling, and Hendricus Cornelis van Staveren, both of Nieuw-Vennep, Netherlands, assignors to Multinorm, B.V., Nieuw-Vennep, Netherlands

Filed Feb. 23, 1976, Ser. No. 660,043

Claims priority, application Netherlands, Feb. 28, 1975, 7502442

Int. Cl.^{2} A01D *73/00*

U.S. Cl. 56—1 **23 Claims**



1. A crop harvesting and conditioning device which comprises cutting means for cutting a crop and crusher means operatively associated with said cutting means for receiving the cut crop and conditioning it prior to discharge from the device, the crusher means comprising a pair of rollers at least one of which is movable with respect to the other to vary the nip therebetween, and drive means for driving said one roller, the improvement wherein:

said one roller is hollow and said drive means includes a driving shaft projecting into one end of said one roller, with clearance, and having an inner end which is drivingly connected to said one roller in spaced relation to said one end thereof.

4,035,992
HAY HARVESTING MACHINE FOR BREAKING UP THE CUT GRASS

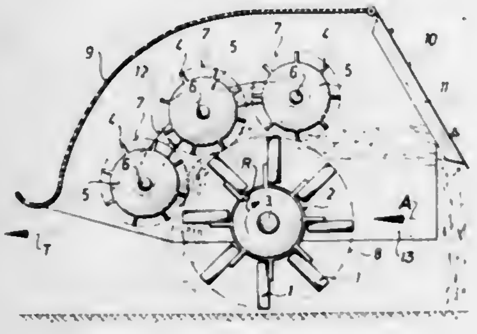
Karl Moosbrucker, Saulgau, and Hans Rauch, Kleintissen, both of Germany, assignors to Josef Bautz GmbH, Saulgau, Wurthemberg, Germany

Filed Dec. 15, 1975, Ser. No. 641,020

Claims priority, application Germany, Dec. 13, 1974, 2459007

Int. Cl.^{2} A01D *49/00*

U.S. Cl. 56—1 **10 Claims**



1. A hay harvestng machine comprising:

- a support displaceable along the ground in a predetermined direction;
- a drum rotatable on said support about a horizontal drum axis transverse to said direction;
- a plurality of angularly spaced elastic conveying members on said drum;
- a plurality of rollers freely rotatable on said support about respective roller axes generally parallel to and generally radially equispaced from said drum axis;
- and a plurality of angularly spaced beater blades on said drum is adpated to be driven for rotation about its axis in order to pick up cut crop material from the ground below the drum and throw such material against said rollers to rotationally entrain same.

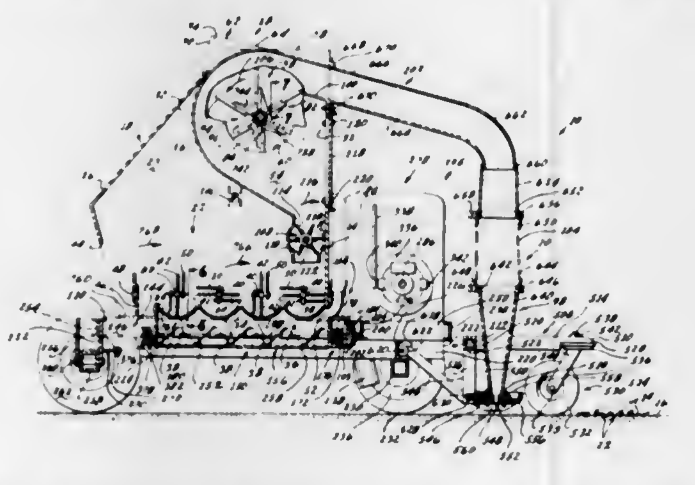
4,035,993
SEED HARVESTER

Rex D. Bell, and Robert R. Favor, both of Bowie, Tex., assignors to Bowie Industries, Inc., Bowie, Tex.

Filed Feb. 18, 1976, Ser. No. 659,008

Int. Cl.^{2} A01D *45/30*

U.S. Cl. 56—13.1 **9 Claims**



8. Apparatus for separating seeds from pine cones, pine needles and the like comprising:

- a separator having an open bottom;
- a screen mounted in said open bottom of said separator for receiving said seeds, pine cones, pine needles and the like;
- means for vibrating said screen so that said seeds will pass through said screen, said screen being a fine mesh screen having a plurality of troughs, said screen-vibrating means including a plurality of flexible fingers rotatably mounted along the long axis of each trough for cyclically striking said screen; and
- a plurality of rigid fingers positioned adjacent said flexible fingers for sweeping said separated debris out of said troughs.

4,035,994
LAWN MOWER BLADE CONTROL APPARATUS

Stephen J. Hoff, Richmond, Ind., assignor to Hoffco, Inc., Richmond, Ind.

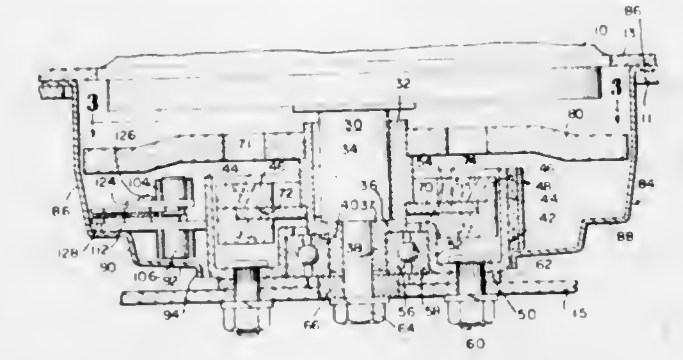
Filed May 27, 1975, Ser. No. 581,029

Int. Cl.^{2} A01D *75/20*

U.S. Cl. 56—11.3 **8 Claims**

8. In a lawn mower comprising a blade drive shaft depending below a mower deck, a blade carrier rotatably mounted on such shaft and including a drum rotatable with said carrier and adapted to be engaged by an encircling brake band, the improvement comprising

- a bowl for enclosing said drum, having a top mounting flange for mounting the bowl on the mower deck, a generally circular said wall depending from said flange, a generally flat annular platform joined to said side wall at the bottom thereof and extending inward therefrom toward said drum, and a lower wall portion extending downward and inward from the inner edge of said platform into close clearance relation with a lower portion of said blade carrier,
- a mounting plate mounted on said platform and extending arcuately about the drum,
- a brake band anchored at one end to said plate and extending therefrom about the drum substantially in excess of 180° so as to present its free end toward said mounting plate,



- a spring or the like connecting said free end to a spring anchor on said plate and acting to bias the brake band into braking engagement with the drum,
- a reaction bracket mounted on said platform, and manually operable tension means connected between the free end of the brake band and such reaction bracket and operable to retract the free end of the brake band against the spring bias to release the brake.

4,035,995
DEVICE FOR CONNECTING A CUTTER UNIT TO A FRAME OF A POWERED LAWNMOWER

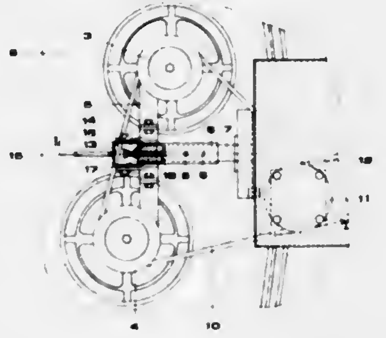
Lennart Oswald Arnblock, Vellinge, Sweden, assignor to Flymo Societe Anonyme, Zug, Switzerland

Continuation of Ser. No. 542,611, Jan. 20, 1975, abandoned. This application June 18, 1976, Ser. No. 697,467

Claims priority, application United Kingdom, Jan. 19, 1974, 2637/74

Int. Cl.^{2} A01D *35/22*

U.S. Cl. 56—11.6 **2 Claims**



1. A quick release device for removably attaching a belt driven cutter unit to an engine driven pulley mounted on a movable frame, comprising in combination, the cutter unit having at least one drive pulley for engaging the belt, a telescopically adjustable two-part rod-cylinder array having one part rigidly secured to said frame and the second part rigidly secured to said cutter unit and relatively movable between a disengaged position with said cutter unit and frame unit separated and an engaged position with the telescopic parts mated, a belt about said pulley retaining said rod and cylinder in telescoping arrangement and limiting relative axial movement of the two parts in the direction of increase of length of the telescopic parts, and locking means comprising two manually operable locking members respectively on said rod parts movable into engagement with each other for locking the parts in telescopic registration preventing axial movement of said rod parts in the direction loosening the belt about said pulleys said locking means being provided with an adjustable spacer for engaging said rod and an eccentrically mounted latch member presenting a surface engaging said spacer to restrict movement of said rod in locked position toward loosening said belt and permitting telescoping in unlocked position in the direction loosening said belt to thereby permit removal of said belt from said pulley and telescopic disengagement of said cutter from said frame.

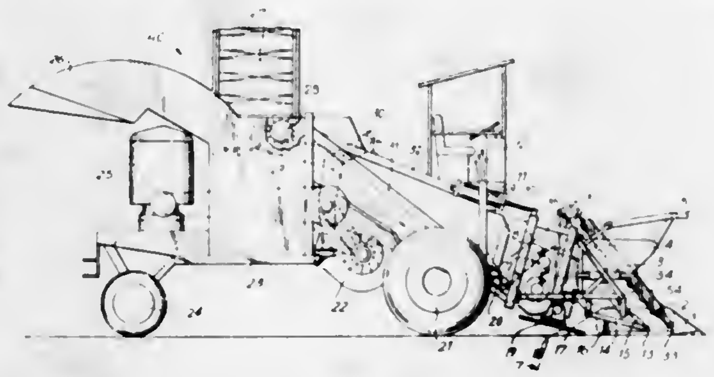
4,035,996
HARVESTER COMBINE

Carlos M. Cruz Fernandez, 7605, 55 St., Marianao; Rogelio Rodriguez Valdes, 21415, 67 Ave., La Lisa, Marianao, and Delfin Perez Alberto, 68, Perkins St., Luyano, Havana, all of Cuba

Filed May 15, 1975, Ser. No. 577,744

Int. Cl.^{2} A01D *45/10*

U.S. Cl. 56—13.9 **9 Claims**



1. A harvester combine, comprising a self-propelled vehicle having a chassis and an operator's cab mounted thereon, a frame carried by said chassis for suspension at least partially in front thereof, a nose frame carried pivotally by said frame, a pair of worm conveyors supported adjacent their upper ends by said nose frame and extending forwardly and downwardly therefrom one of said worm conveyors being positioned inwardly of one side of said chassis and the other of said worm conveyors being positioned inwardly of the other side of said chassis, a pair of lower cutter means carried by said nose frame movably relative to the ground, a skid member carried pivotally by said nose frame and supporting the lower end of each of said worm conveyors, said skid members being spring biased at the rear thereof to urge the respective forward portions of the skid members upwardly away from engagement with the ground, second cutter means carried by said nose frame above said lower cutter means and including a pair of oppositely rotatable drums each of which is provided with a knife means thereon, a longitudinally extending second conveyor means carried by said nose frame and adapted to receive the harvested crop which has been cut by said second cutter means and to convey same to a cleaning chamber, a cleaning chamber mounted on said chassis, said cleaning chamber having means associated therewith for separating the harvested cut crop from extraneous material and for separately discharging same.

4,035,997
DEVICE FOR AUTOMATIC ADJUSTMENT OF THE POSITION OF THE CUTTING PLATFORM OF A GRAIN HARVESTING MACHINE

Mihail Duca; Dan Vasiliu; Teodor Demetrescu; Ion Cimpoias; Ion Linca; Stefan Breazu; Virgil Antonescu, and Iosif Cojocaru, all of Bucharest, Romania, assignors to Institutul de Cercetari si Proiectari de Masini Agricole - ICPMA, Bucharest, Romania

Filed Sept. 8, 1975, Ser. No. 611,255

Int. Cl.^{2} A01D *75/28*

U.S. Cl. 56—209 **2 Claims**

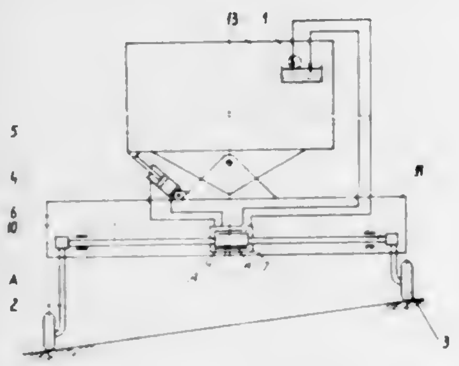
1. A device for automatically maintaining a cutting platform of a grain harvesting machine parallel to the ground, said

machine comprising a body and means mounting said platform tiltably on said body, said device comprising:

a pair of ground-engaging feelers movably mounted on opposite ends of said platform;

a differential distributor comprising a distributor housing formed with a plurality of ports, a sleeve rotatably received in said housing and provided with a pair of bores, and a plug rotatably received in said sleeve and formed with a passage;

a respective rod connecting one of said feelers with said sleeve and a respective rod connecting the other of said feelers with said plug whereby rotation of said rods and said feelers angularly displaces said sleeve and said plug relatively to one another and to said housing;



a pump connected to one of said ports for supplying hydraulic fluid thereto and a reservoir connected to another of said ports for receiving hyraulic fluid from said distributor; and

a double-action piston-and cylinder arrangement connected by said platform and said body for tilting said platform and said body for tilting said platform in response to relative angular displacement of said sleeve and said body, said double acting piston-and cylinder arrangement being connected to further ports of said housing.

4,035,998

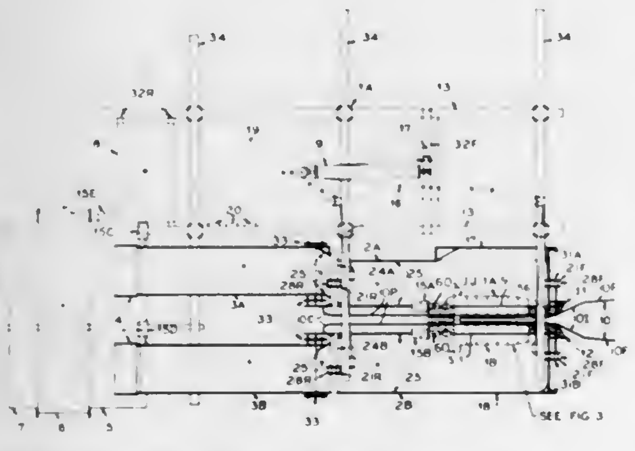
TRACTOR MOUNTED TOBACCO COMBINE FOR DEFOLIATION AND SUBSEQUENT TRANSPORTATION OF TOBACCO LEAVES

Henry Griner; Wade Griner; Tommy Sweat, and Claude Hyars, all of Patterson, Ga., assignors to G S & H Equipment Corporation, Patterson, Ga.

Filed Sept. 6, 1974, Ser. No. 503,676

Int. Cl.^{2} A01D *45/16*

U.S. Cl. 56—27.5 **8 Claims**



1. A tobacco harvesting implement comprising

a first frame assembly means for mounting same at a fixed level on a tractor,

a second frame assembly mounted for vertical movement on said first frame assembly,

a defoliation assembly mounted on said second frame assembly, said defoliation assembly being elongated in the direction of travel and including a pair of counter rotating tobacco leaf defoliators, upper and lower stalk guide means for guiding tobacco leaf-bearing stalks between said pair of counter rotating tobacco leaf defoliators, the upper stalk guide being above said counter rotating tobacco leaf defoliators and the lower stalk guide being below said counter rotating tobacco leaf defoliators,

conveyor means on said frame assemblies, said conveyor means being positioned below said defoliation assembly for receiving defoliated tobacco leaves and conveying same parallel to said direction of travel, and

kicker means for engaging defoliated tobacco leaves and operated in association with said defoliation assembly for insuring the deposit of defoliated tobacco leaves on said conveyor means.

4,035,999

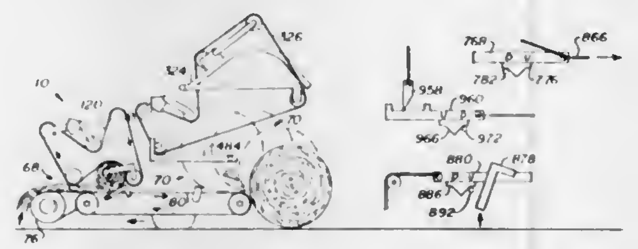
CROP MATERIAL ROLL FORMING METHOD AND MACHINE

Jack W. Crane, Rte. 2, New Holland, Pa. 17557, and Aquila D. Mast, 1316 Clayton Road, Lancaster, Pa. 17603

Filed Feb. 9, 1976, Ser. No. 656,758

Int. Cl.^{2} A01D *43/02*

U.S. Cl. 56—341 **34 Claims**



16. A crop material roll forming machine, comprising:

a-mobile frame adapted to move across a field;

means on said frame for delivering crop material to said machine;

first means on said frame for initiating formation of a roll of crop material to a first size; and

second means on said frame for completing formation of said roll to a second size greater than said first size, said first means being operable to initiate formation of another roll prior to completion of the preceding roll by said second means.

4,036,000

YARN TWISTING APPARATUS WITH SOUND AND WIND SHIELDING

Aloys Greive, Munster, Germany, assignor to Hamel GmbH Zwirnmaschinen, Munster, Germany

Filed Sept. 17, 1976, Ser. No. 724,462

Claims priority, application Germany, Sept. 18, 1975, 7529598[U]

Int. Cl.^{2} D01H *1/00;* **G10K** *11/04*

U.S. Cl. 57—1 R **18 Claims**

1. A twisting apparatus comprising:

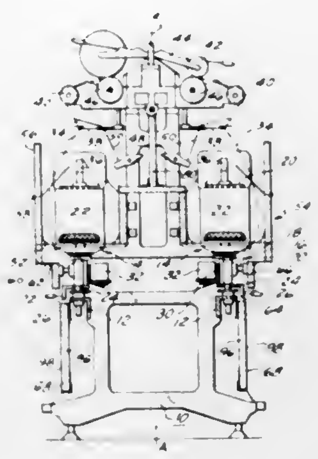
a frame;

a row of yarn twisters extending along said frame and each having a balloon-limiting cup;

a front wall panel secured to said frame extending along said twisters and having an upper edge generally level with the tops of said cups and a lower edge generally level with the bottoms of said cups;

an upper wall flap displaceable between an operational position extending upwardly from said upper edge and a service position giving access past said upper edge to said twisters; and

a lower wall flap displaceable between an operational position extending downwardly from said lower edge and a service position giving access past said lower edge to said twisters, said flaps and said front wall panel being at least partially made of sound-deadening material.



4,036,001

METHOD AND APPARATUS FOR DOFFING AND DONNING BOBBINS IN SPINNING MACHINE

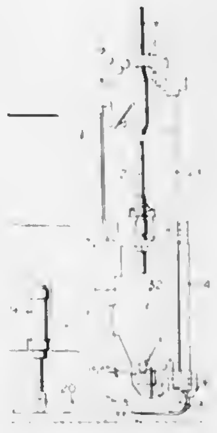
Hideo Tamai, Kariya; Takayuki Morita, Ohbu; Masanao Kobayakawa, Anjyo, and Ikuo Komura, Toyota, all of Japan, assignors to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, Kariya, Japan

Filed Mar. 25, 1976, Ser. No. 670,376

Claims priority, application Japan, Mar. 31, 1975, 50-37881; Mar. 31, 1975, 50-42094

Int. Cl.^{2} D01H *9/04, 9/18*

U.S. Cl. 57—52 **8 Claims**



1. An apparatus for removing full bobbins from a succession of spindles of a spinning machine and applying empty bobbins to the spindles from which the full bobbins have been removed, the apparatus comprising bobbin conveying means extending along the side of the spinning machine and having a succession of bobbin supporting portions thereon corresponding in pitch to the spindles; a succession of bobbin holders arranged along the side of the spinning machine and corresponding in pitch to the spindles, each holder including means for defining a space for receiving the bobbin, and means movable relative to the space for restricting the size of the space to allow the holding of the bobbin, the restricting means of the holder including upper and lower contact surfaces movable relative to the space between an inoperative position, in which the space has a size larger than the diameter of the empty bobbin, and an operative position in which the space is restricted to a size sufficient to hold both the empty and full bobbins simultaneously owing to contacts of the upper and lower contact surfaces with the empty and full bobbins; and means for moving the holders to transfer the bobbins between the spindles and the conveying means.

7. A bobbin doffing and donning method in a spinning machine including a succession of spindles, a conveyor for conveying the empty and full bobbins along the side of the spinning machine, and a succession of bobbin holders for holding and transferring the bobbins between the spindles and the conveyor, comprising the steps of:

removing each empty bobbin from the conveyor by grasping the upper end of an empty bobbin by a holder and moving the holder upwardly with the empty bobbin held at the upper end thereof;

moving the upwardly moved holder to position the empty bobbin above a corresponding full bobbin mounted on a spindle with the empty bobbin in axial alignment with the full bobbin;

releasing the empty bobbin from the holder to allow the lower end of the empty bobbin to abut against the upper end of the full bobbin;

moving the holder down along the empty bobbin until it reaches the junction where the empty and full bobbins abut and then grasping both the empty and full bobbins simultaneously;

removing the full bobbin from the spindle by moving the holder holding the empty and full bobbins up and then away from the spindle and then downwardly to adjacent the conveyor and placing only the full bobbin on the conveyor;

moving the holder upwardly along the empty bobbin and grasping the upper end of the empty bobbin with the holder; and

moving the empty bobbin above the spindle and placing the empty bobbin on the spindle.

4,036,002

DIRT REMOVAL IN SPINNING DEVICE

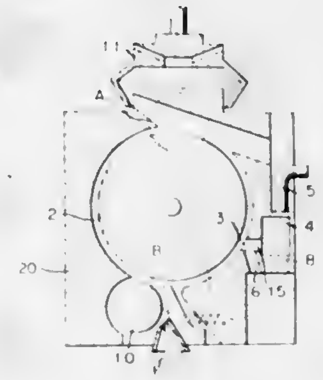
Akira Kobayashi, Ohbu, Japan, assignor to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha, Osaka, both of, Japan

Continuation-in-part of Ser. No. 518,945, Oct. 29, 1974, abandoned. This application Feb. 20, 1976, Ser. No. 659,850

Claims priority, application Japan, Nov. 1, 1973, 48-127433

Int. Cl.^{2} D01H *7/02*

U.S. Cl. 57—58.89 **3 Claims**



1. A fiber spinning device comprising:

a rotary spinning chamber;

a housing;

means cooperating with said housing for combing a sliver into individual fibers and feeding said fibers along a path to said rotary spinning chamber;

means communicating with said path for continuously removing dirt from said fibers during the operation of said combing means, said dirt removing means comprising:

  a dirt discharge opening in said housing communicating with said path;

  a dirt collection chamber positioned to receive therein dirt passing through said discharge opening;

  an air inlet and an air outlet opening into said dirt collection chamber;

  means connected to one of said air inlet and said air outlet for continuously creating an air current through said dirt collection chamber to continuously remove dirt therefrom during the operation of said combing and feeding means; and

throttling means for throttling and maintaining the speed of a portion of said air current tending to move from said dirt collection chamber to said dirt discharge opening below a value which would prevent dirt from moving from said dirt discharge opening to said dirt collection chamber, said throttling means comprising a longitudinal duct connecting said dirt discharge opening and said dirt collection chamber, said longitudinal duct having a transverse cross-sectional area substantially smaller than that of said dirt collection chamber, said cross-sectional area being substantially uniform throughout the entire length thereof; and

air supply duct means opening into said longitudinal duct adjacent said dirt discharge opening for supplying air to said path to prevent fibers from passing from said path through said dirt discharge opening.

4,036,003

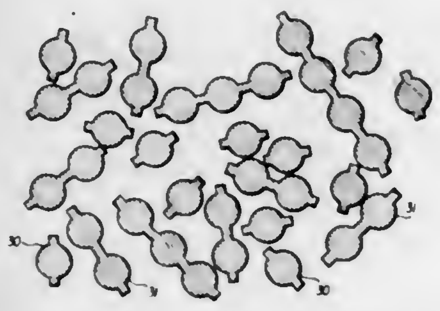
POLY(ETHYLENE TEREPHTHALATE) FIBRILLATED TAPE SEWING THREAD

F. Ray Lowder, Gastonia, and John D. Gibbon, Charlotte, both of N.C., assignors to Celanese Corporation, New York, N.Y. and Fiber Industries, Inc., Charlotte, N.C.

Filed Nov. 20, 1975, Ser. No. 633,757

Int. Cl.^{2} D02G *3/06, 3/46*

U.S. Cl. 57—140 R **5 Claims**



1. An improved fusion-resistant poly(ethylene terephthalate) yarn having a total denier of from 100 to 350 wherein the improvement comprises said yarn is a twisted single ply fibrillated tape yarn having a twist factor of from 130 to 160, wherein twist factor is defined as follows:

Twist factor = $\sqrt{\text{thread denier}}$ × twists per inch, and wherein said yarn is characterized by less than one break per 20 yards when tested for sewing performance by threading said yarn in both needle and bobbin positions in a Singer 281-1 sewing machine with a size 14 ball point needle and sewing two layers of a four ounce per square yarn 65/35 polyester/cotton blend fabric for twenty yards using a Federal stitch formation No. 301 lockstitch at 4500 stitches per minute with four ounces of tension on said yarn.

4,036,004

CLOCK WITH STRIKING MECHANISM

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Filed Mar. 29, 1976, Ser. No. 671,143

Int. Cl.^{2} G04B *21/06*

U.S. Cl. 58—9 **20 Claims**

1. In a clock having an hour hand shaft and a minute hand shaft:

striking means operable to cause a sound;

control means actuable to limit to a predetermined number the strikes made by said striking means;

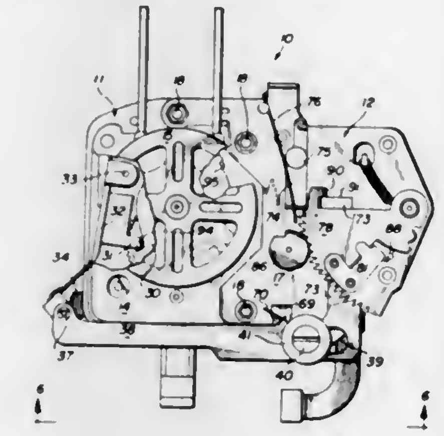
a constantly rotating gear;

a driven gear;

means mounting said driven gear for movement between a first position, in which said driven gear is in engagement with said constantly rotating gear, and a disengaged second position;

means normally urging said driven gear to said disengaged second position;

means, responsive to the minute hand shaft attaining the hour position, for moving said driven gear to its first position;



drivable means, driven by said driven gear when the latter is in its first position, for operating said striking means and for actuating said control means;

and means, operable by said control means, for returning said driven gear to its disengaged second position when said striking means has struck said predetermined number of strikes.

4,036,005

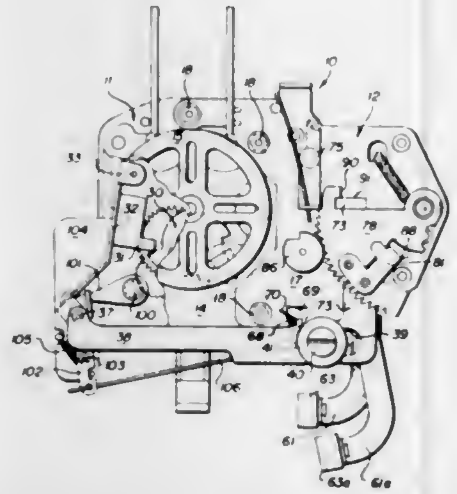
CLOCK WITH HOUR AND QUARTER HOUR STRIKING MECHANISM

Christian M. J. Jauch, Louisville, Miss., assignor to Spartus Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 671,143, March 29, 1976. This application June 18, 1976, Ser. No. 697,440

Int. Cl.^{2} G04B *21/00, 19/02*

U.S. Cl. 58—9 **15 Claims**



1. In a clock having an hour hand shaft and a minute hand shaft:

striking means operable to cause a sound;

control means actuable to limit the strikes made by said striking means to a predetermined number of strikes determined by the positions of said hour hand and minute hand shafts;

a constantly rotating gear;

a driven gear;

means mounting said driven gear for movement between a first position, in which said driven gear is in engagement with said constantly rotating gear, and a disengaged second position;

means normally urging said driven gear to said disengaged second position;

means for moving said driven gear to its first position when the minute hand shaft attains the quarter hour, half hour, three quarter hour and hour positions;

drivable means, driven by said driven gear when the latter is in its first position, for operating said striking means and for actuating said control means;

and means, operable by said control means, for returning said driven gear to its disengaged second position when said striking means has struck said predetermined number of strikes.

4,036,006

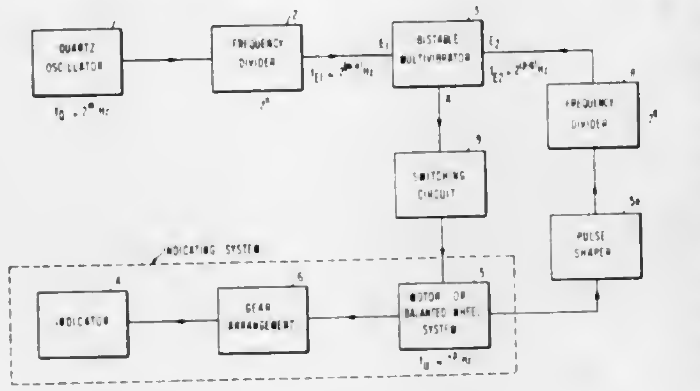
TIME-KEEPING APPARATUS

Hubert Effenberger, Neckargroningen, and Walter Seeger, Pforzheim, both of Germany, assignors to Gunther Glaser, Stuttgart and Hubert Effenberger, Neckargroningen, both of, Germany

Continuation of Ser. No. 439,904, Feb. 6, 1974, abandoned. This application Oct. 9, 1975, Ser. No. 621,083

Int. Cl.^{2} G04C *3/00*

U.S. Cl. 58—23 R **11 Claims**



1. A time-keeping apparatus comprising, in combination:

a. a time-indicating system, including electromechanical means, capable of periodic motion selectively at one of at least two non-zero operating frequencies, one of said operating frequencies being lower than said nominal frequency and another of said operating frequencies being higher than said nominal frequency;

b. pulse means, coupled to said time-indicating system for generating monitor pulses proportional in frequency to said operating frequencies of said indicating system;

c. quartz oscillator means for generating electrical pulses of a given frequency;

d. frequency divider means connected to said quartz oscillator means for generating a pulse train of nominal frequency;

e. logical control means having at least two inputs, one of said inputs being connected to receive said pulse train of nominal frequency and the other of said inputs being connected to receive said monitor pulses, and having an output the state of which depends on the states of said at least two inputs;

f. switching means, controlled by said output from said logical control means and connected to said time-indicating system, for selective electrical connection of portions of said electromechanical means to thereby cause a switch-over of the operating frequency of said electromechanical means from said one non-zero frequency to said another non-zero frequency;

whereby the relative phase difference between said pulse train at nominal frequency and said monitor pulses is compensated for.

4,036,007

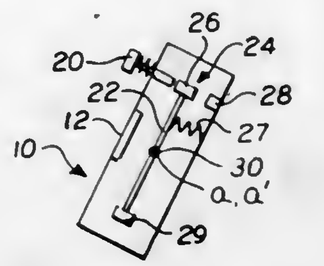
LIGHT EMITTING DIODE WATCH WITH ACCELERATION RESPONSIVE SWITCH

Edwin F. Shelley, 339 Oxford Road, New Rochelle, N.Y. 10804

Filed Aug. 13, 1975, Ser. No. 604,193

Int. Cl.^{2} G04B *19/30*

U.S. Cl. 58—50 R **9 Claims**



1. An electronic watch including means for illuminating the time display, a battery, and an electric switch that closes to energize the means for illuminating the time display when a display of time is desired, characterized by the switch being constructed and oriented so that it is momentarily closed by the angular acceleration of a manual movement of the watch with the acceleration above a predetermined value, and further characterized by the switch having its various parts balanced and oriented so as to be responsive only to angular acceleration of the watch about an axis generally parallel to the direction of extent of the forearm on which the watch is worn, and further characterized by a band by which the watch is held on the wrist of a person using the watch with a digital face of the watch having the display figures in a row extending in a direction parallel to the direction of extent of the forearm of a person by whom the watch is worn as a wrist watch, the switch being within the watch and having a fixed contact, a movable contact and an inertia element, a movable element to which the movable contact and the inertia element are connected, means supporting the movable element for movement about an axis intermediate the movable contact and the inertia element and generally parallel to the direction of extent of the forearm of a person wearing the watch as a wrist watch so that the operation of the switch is responsive only to angular acceleration about said axis.

4,036,008

ELECTRONIC TIMEPIECE

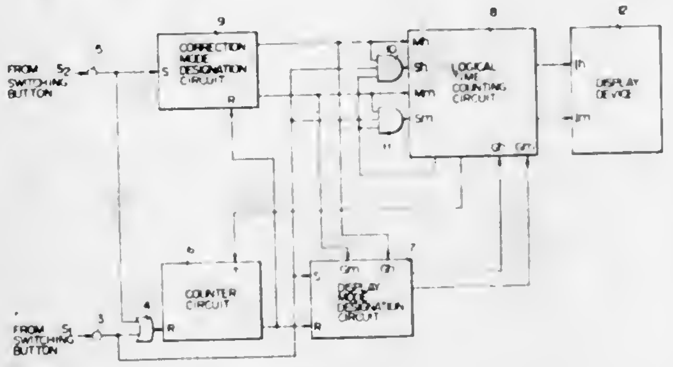
Yoshihiko Okamoto; Toshio Abe, both of Yokohama; Kazuhiro Hirose, Kawasaki; Saburo Nakajima, Kawasaki, and Hiroshi Saito, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan

Filed July 6, 1976, Ser. No. 703,009

Claims priority, application Japan, July 7, 1975, 50-83333

Int. Cl.^{2} G04B *27/00*

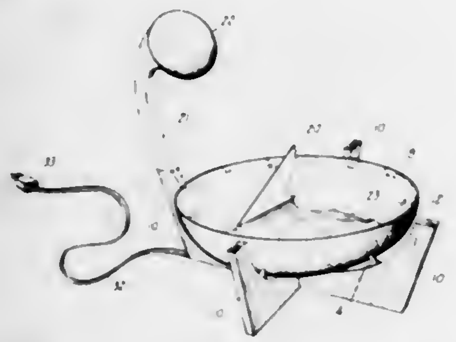
U.S. Cl. 58—85.5 **2 Claims**


9
8
5
FROM SWITCHING BUTTON
CORRECTION MODE DESIGNATION CIRCUIT
LOGICAL TIME COUNTING CIRCUIT
DISPLAY DEVICE
6
7
4
3
FROM SWITCHING BUTTON
COUNTER CIRCUIT
DISPLAY MODE DESIGNATION CIRCUIT

1. An electronic timepiece provided with a counter circuit for producing a reset signal upon counting a predetermined number of clock pulses, whereby the operation mode of the timepiece is automatically switched from a correction mode in which power is consumed for the time display to a non-display mode in which no power is consumed for the time display when the same data is displayed over a predetermined period in the correction mode.

4,036,009
HOROLOGICAL INSTRUMENT

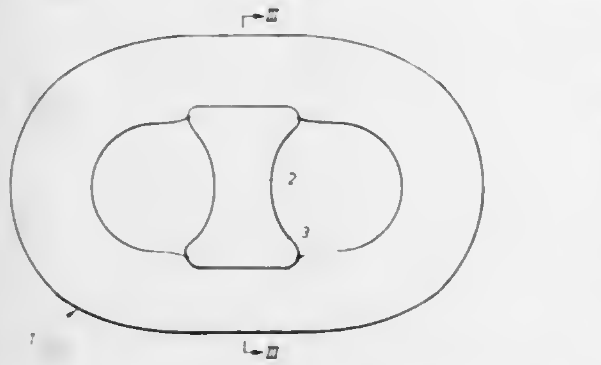
Mark J. Sampson, 1390 Piedmont Road, Atlanta, Ga. 30309
Filed May 30, 1975, Ser. No. 582,173
Int. Cl.^{2} G04B *19/06*
U.S. Cl. 58—127 R **4 Claims**



1. A horological instrument comprising a base, an electrically energizable light source rigidly mounted to said base, a dial, gnomon means for casting a shadow on said dial, and means for imparting relative movement between said electrically energizable light source and said dial which includes an electric motor mounted to said base with a motor output shaft coupled with said dial whereby the shadow is moved with respect to the dial for indicating time.

4,036,010
STUDDED CHAIN LINK

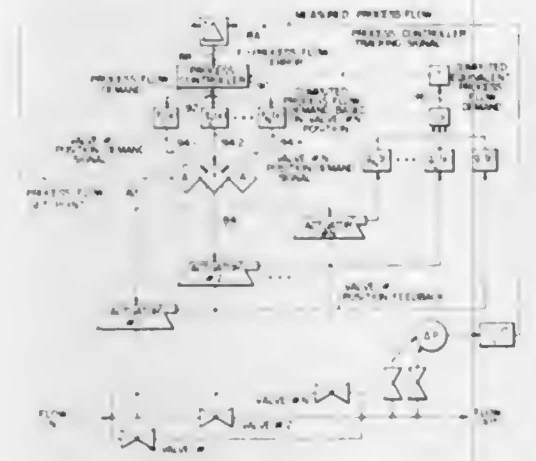
Bengt Hedman, Ljusne, Sweden, assignor to Bergvik och Ala Aktiebolag, Soderhamn, Sweden
Filed Apr. 2, 1976, Ser. No. 672,938
Claims priority, application Sweden, Apr. 10, 1975, 7504141
Int. Cl.^{2} F16G *15/12*
U.S. Cl. 59—84 **3 Claims**



1. A studded chain link comprising a stud which has been inserted between the elongated and round cross-sectional sides of a chain link blank and fixed thereto only by pressing the elongated sides of the link towards one another and towards the opposing ends of the inserted stud, the opposing ends of said stud which respectively engage the sides of said link each having a smoothly concave surface configuration in a transverse plane passing through said stud in a direction perpendicular to the direction of extension on the link sides, and said opposing ends of said stud also having a smoothly concave surface configuration which is entirely concave in a longitudinal plane passing through said stud in the direction of extension of the link sides.

4,036,011
MULTIPLE VALVE SEQUENTIAL CONTROL FOR A COMBINED CYCLE POWER PLANT

Rash B. Gupta, West Deer Township, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 28, 1976, Ser. No. 653,045
Int. Cl.^{2} F02C *7/02;* F01B *17/14*
U.S. Cl. 60—39.18 B **9 Claims**



1. A multiple sequential valve control for at least two parallel valves which regulate the flow through a single path comprising an automatic flow control which generates an automatic flow demand in response to predetermined process variables in the automatic mode, means for generating a manual flow demand, a manual/automatic station for selectively transmitting the automatic or manual flow demand, means for controlling the position of a first valve over a first range of the path flow in response to the applied flow demand in accordance with a first flow/position characterization, means for controlling the position of a second valve over a second range of the path flow in response to the applied flow demand in accordance with a second flow/position characterization, means for sensing the position of each of said valves, means for generating an equivalent flow demand for said valves from outputs of said valve position sensing means, and means for coupling the equivalent flow demand to said automatic flow control in the manual mode to track the automatic flow control output to the manual demand and thereby enable bumpless manual/automatic transfer.

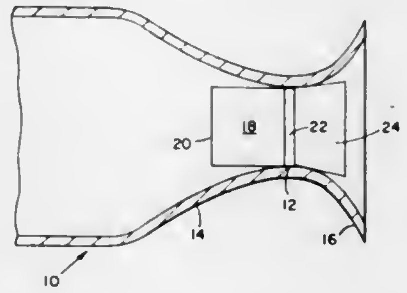
4,036,012
LASER POWERED ROCKET ENGINE USING A GASDYNAMIC WINDOW

Michael J. Monsler, Reading, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Feb. 18, 1976, Ser. No. 659,060
Int. Cl.^{2} H05H *1/24*
U.S. Cl. 60—203 **3 Claims**

1. A power system for a vehicle comprising: a nozzle having a heating chamber and an exhaust outlet; a propellant; first means for providing said propellant to said heating chamber; a gasdynamic window in said heating chamber; said gasdynamic window formed by second means which exhausts propellant at supersonic speed across said window; laser radiation being directed through said gasdynamic window to said propellant for heating said propellant; said propellant having an unseeded portion which is transparent to the laser radiation and a seeded portion which is opaque to said laser radiation; said second means directing the propellant's unseeded portion across said window; an absorption zone inside said heating chamber remote from said window; and third means for directing said seeded portion of the propellant to said absorption zone without interfering with the laser radiation until reaching the absorption zone.

4,036,013
NOISE CONTROLLABLE NOZZLE CLOSURE

Robert E. Betts, Huntsville; Lawrence B. Thorn, Madison, and Albert R. Maykut, Huntsville, all of Ala., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Division of Ser. No. 484,035, June 28, 1974, Pat. No. 3,968,646. This application Dec. 22, 1975, Ser. No. 643,562
Int. Cl.^{2} F02K *1/06. 1/24*
U.S. Cl. 60—271 **6 Claims**



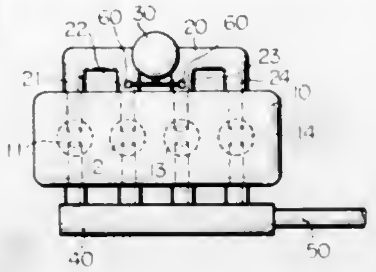
1. In a rocket motor having a nozzle including an entrance section a throat section and an exit section, closure means for controlling the opening of said nozzle responsive to ignition of said rocket motor comprising:

- a. a forward section disposed in said entrance section of said nozzle, said forward section having a cylindrical configuration, said forward section having a diameter substantially equal to the diameter of said throat;
- b. an intermediate section disposed in said throat section; and,
- c. an aft section disposed in said exit section of said nozzle,
- d. said closure member having a predetermined density and mass for controlling the change of momentum of the closure member responsive to ejection thereof from said nozzle, whereby said nozzle opening is controlled incrementally or continuously.

4,036,014
METHOD OF REDUCING EMISSION OF POLLUTANTS FROM MULTI-CYLINDER ENGINE

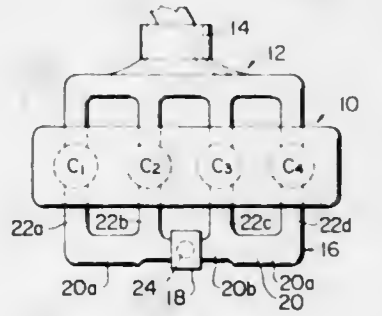
Hajime Ariga, Kamakura, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan
Continuation of Ser. No. 474,331, May 29, 1974, abandoned. This application Oct. 10, 1975, Ser. No. 618,402
Claims priority, application Japan, May 30, 1973, 48-60668
Int. Cl.^{2} F02B *75/10;* F02M *23/04*
U.S. Cl. 60—274 **8 Claims**

1. A method of reducing concentration of oxides of nitrogen (NO*x*) in exhaust gas from a multi-cylinder internal-combustion engine comprising; supplying a first air-fuel mixture having a first air/fuel ratio lower than a stoichiometric ratio to a first group of engine cylinders consisting of of about half the number of total engine cylinders, supplying a second air-fuel mixture having a second air-fuel ratio higher than said stoichiometric ratio to a second group of engine cylinders consisting of the remaining engine cylinders, and mixing the exhaust gases from said first and second groups of engine cylinders with each other, each without any pretreatment, before emission into the atmosphere, wherein said first air-fuel mixture is prepared in a carburetor and said second air-fuel mixture is prepared by introducing air into said first air-fuel mixture while said first air-fuel mixture is flowing through intake manifold branches connected with said second group of engine cylinders.



4,036,015
MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Yoshitaka Hata, Fujisawa; Giichi Shioyama, Yokosuka, and Hidehiro Minami, Yokohama, all of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed May 16, 1975, Ser. No. 578,129
Claims priority, application Japan, May 22, 1974, 49-58260
Int. Cl.^{2} F02B *75/10*
U.S. Cl. 60—282 **2 Claims**

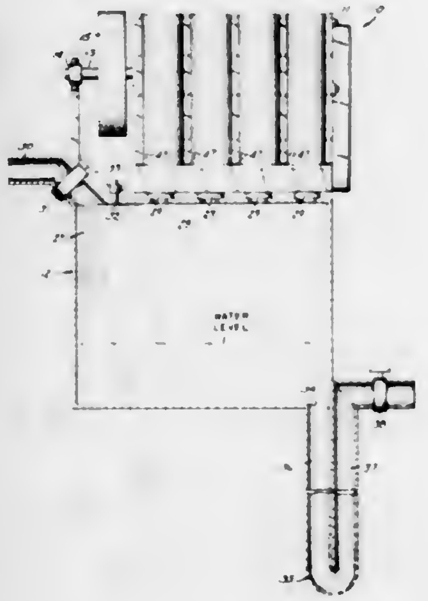


1. An in-line multi-cylinder internal combustion engine having a first group of cylinders consisting of at least half the number of total cylinders, the first group of cylinders being separated into two groups, and a second group of cylinders consisting of the remaining cylinders and being positioned between the two groups of the first group of cylinders, the engine being followed by an afterburner for burning the unburned consituents contained in the exhaust gases discharged from all the cylinders, comprising:

- an intake manifold including a first group of branch runners connected to the first group of cylinders, a second group of branch runners connected to the second group of cylinders, and a main runner having a first portion directly connecting to the first group of branch runners, the first portion being separated into two parts which have same cross-sectional area substantially throughout their lengths, and a second portion directly connected to the second group of branch runners and positioned interposed between the two parts of the first portion, the second portion having the same cross-sectional area substantially throughout its length, said last mentioned cross-sectional area being smaller than that of the first portion, the two parts of the first portion and the second portion being axially aligned, and an induction opening through which an air-fuel mixture is inducted into said intake manifold; and
- a carburetor for producing the air-fuel mixture and supplying the mixture into all the cylinders through said intake manifold, said carburetor having an air-fuel mixture induction passage which is communicated with the induc-

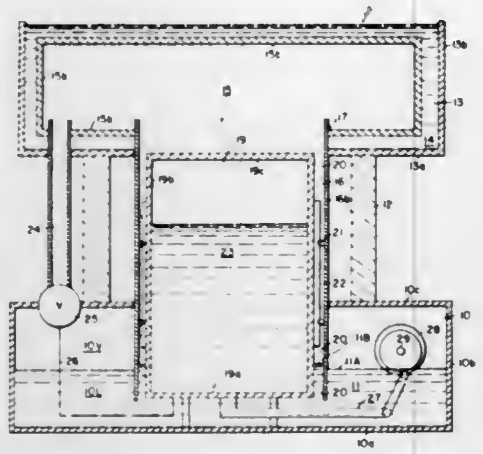
tion opening formed in the second portion of the main runner of said intake manifold.

4,036,016
VACUUM-OPERATED RECIPROCATING ENGINE
Louis Aldorfer, 144-8th Ave. S. No. 2, South Saint Paul, Minn. 55075
Continuation-in-part of Ser. No. 629,138, Nov. 5, 1975, abandoned. This application Oct. 22, 1976, Ser. No. 735,054
Int. Cl.^{2} F16D *31/02*
U.S. Cl. 60—325 9 Claims



1. A flame-free reciprocating engine which utilizes the pressure difference between a partial vacuum and ambient atmospheric pressure as a source of power, said engine comprising:
a. an engine block defining a plurality of cylinders each having an inner, low pressure end and an outer high pressure end;
b. a plurality of pistons each operating within a different one of said cylinders, each piston having a first face and a second face, said first face operating within an outer region of the respective cylinder which is maintained at atmospheric pressure and said second face operating within an inner region of the cylinder which is sealed from the ambient atmosphere, each of said pistons operating in a reciprocating manner within its respective cylinder between a first position wherein the volume of said inner region is minimized and the volume of said outer region is maximized, and a second position wherein the volume of said inner region is maximized and the volume of said outer region is minimized;
c. output means including an output shaft operatively connected to said pistons for translating the reciprocating motion of said pistons within said cylinders into rotary motion of said output shaft;
d. a flame-free vacuum means for selectively reducing the pressure within the inner region of each cylinder which is adjacent the second face of each piston to a pressure less than atmospheric pressure; and
e. means for disconnecting said vacuum means from each cylinder and for permitting the intake of a limited amount of air into the inner region of each cylinder adjacent the second face of each piston, said means operating in timed relation to the operation of said engine such that air intake into each of said inner regions is sufficient to substantially equalize the pressure on both faces of a piston to allow it to be returned to its second position from which it can be driven to its first position by means of a pressure difference across said piston.

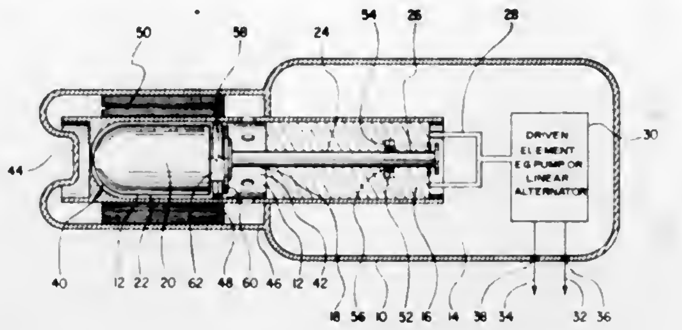
4,036,017
LOW PRESSURE ENGINE
Israel Siegel, 351 W. 71st St., New York, N.Y. 10023
Filed Jan. 19, 1976, Ser. No. 650,444
Int. Cl.^{2} F03C *1/00*
U.S. Cl. 60—497 2 Claims



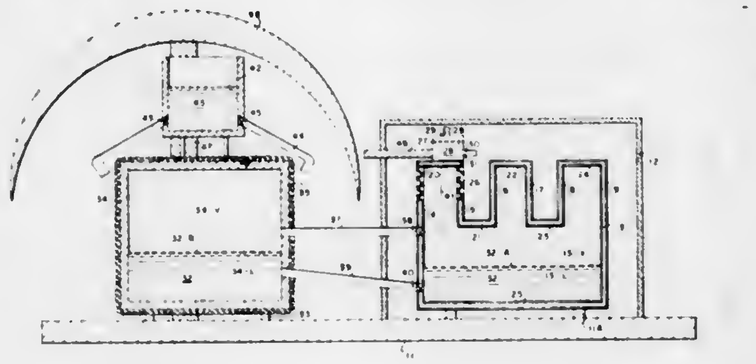
1. A low pressure engine comprising a warm chamber, adapted to keep liquid at a relatively warm temperature,
a cold chamber adapted to keep fluid at a relatively cold temperature,
a supply of activating fluid in said warm chamber having a liquid level partitioning warm chamber into a vapor chamber portion and a liquid chamber portion,
a conduit immersed in liquid portion of warm chamber said conduit opening at its other end into cold chamber,
a body in said conduit defining a relatively small interspace between body and conduit,
means for allowing the rise of a liquid in said interspace in response to vapor pressure,
a moving member responding to buoyant force exerted by said rising fluid,
means for temporary restraining of movement of said moving member until activating fluid has reached a predetermined level in interspace between conduit and body,
a vapor conducting conduit interconnecting the vapor portions of warm and cold chambers,
means for cyclic opening and closing said vapor conducting conduit to effect differences in vapor pressure between cold and warm chambers,
means for obtaining a temperature differential between cold and warm chambers,
force transmitting means operatively associated with said moving part for translating movements of moving part into useful work,
and a second high density fluid layer adapted to rise in interspace between body and conduit to increase the buoyant force per unit volume of the body.

4,036,018
SELF-STARTING, FREE PISTON STIRLING ENGINE
William T. Beale, Rte. 4, Box 275, Athens, Ohio 45701
Filed Feb. 27, 1976, Ser. No. 661,979
Int. Cl.^{2} F02G *1/04*
U.S. Cl. 60—520 14 Claims

1. A self-starting, free piston Stirling cycle engine having a housing enclosing a work space and a second space which are separated by a power piston reciprocally mounted in a cylinder and further having a displacer piston slidable in a displacer cylinder, the displacer piston having an attached displacer rod means slidably mounted to a bore means communicating between said work space and said second space, wherein the improvement comprises a first seal member sealingly slidable along one of said means and resiliently attached to the other of said means by a resilient support which permits limited, nonfrictional movement of said seal member relative to the means to which it is attached.



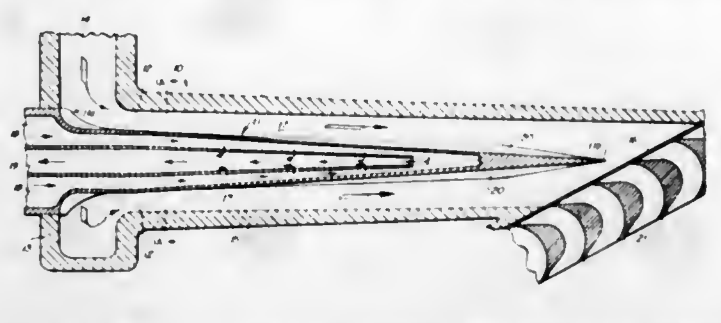
4,036,019
SOLAR DIFFERENTIAL TEMPERATURE MOTOR
Israel Siegel, 351 W. 71 St., New York, N.Y. 10023
Filed Nov. 10, 1975, Ser. No. 630,705
Int. Cl.^{2} F03G *7/04*
U.S. Cl. 60—531 1 Claim



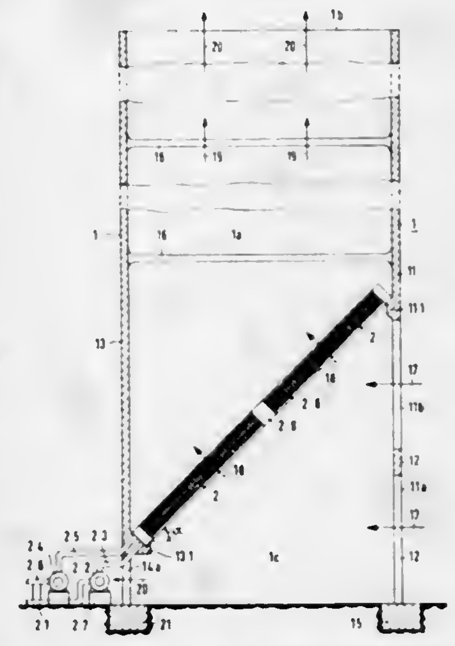
1. A power producing unit consisting of a chamber containing an evaporating fluid dividing said chamber into a liquid chamber portion and a vapor chamber portion,
a moving part responding to vapor pressure changes in the chamber,
an outlet to allow the exit of vapor from said chamber,
means to allow opening and closing of said outlet to cause vapor pressure changes in said chamber, said means operatively associated with said moving part,
an inlet to allow entrance of liquid into said chamber,
a partition dividing said liquid chamber portion from said vapor liquid portion,
means to open and close said partition, said means operatively associated with said moving part,
and means for translating movement of said moving part into useful work.

4,036,020
METHOD AND APPARATUS FOR PRODUCING A DIRECTED, HIGH-VELOCITY STREAM OF COMPRESSIBLE FLUID
Charles Stuart Bagley, 1314 Ohio Ave., Alamogordo, N. Mex. 88310
Filed Dec. 15, 1975, Ser. No. 640,872
Int. Cl.^{2} F01D *25/08*
U.S. Cl. 60—644 16 Claims

1. Apparatus for producing a directed, high-velocity stream of compressible fluid, comprising an elongate nozzle having a flow passage therethrough extending from an inlet at one end of the nozzle to an outlet at the other end thereof and having a throat therebetween located near said inlet and dividing the nozzle into a relatively short inlet portion and a relatively long discharge portion, the effective cross-sectional area of the flow passage increasing from said throat to said outlet so as to provide for expansion of fluid flowing through the discharge portion of the nozzle to and through the outlet; means for supplying a compressible fluid to the inlet at greater pressure than the atmosphere into which it is discharged, so that said fluid flows through the flow passage; and means for heating the fluid as it flows through the discharge portion of the nozzle and expands therein.



4,036,021
POWER PLANT INCLUDING A COOLING TOWER SURROUNDING THE POWER PLANT SITE
Fritz Kelp, Erlangen, Germany, assignor to Kraftwerk Union Aktiengesellschaft, Mulheim (Ruhr), Germany
Filed Apr. 9, 1975, Ser. No. 566,398
Claims priority, application Germany, Apr. 9, 1974, 2417290
Int. Cl.^{2} F28B *1/06*
U.S. Cl. 60—692 6 Claims



1. Power plant for converting primary energy into electrical energy including closed loop means for heating, pressurizing, expanding and cooling down a working fluid, which comprises:
a. an arrangement of power plant buildings located at the power plant site and including at least a central power station block;
b. a dry cooling tower having an inner wall being spaced with respect to and encompassing at least partially said arrangement and having an outer wall defining the exterior of said cooling tower and being arranged substantially in parallel relationship and spaced with respect to said inner wall, said inner and said outer wall defining a substantially annular channel having an air inlet at its lower end and an air exit at its upper end, said air inlet being formed by air inlet openings at the lower end of said outer wall, so that the cooling air entering said channel through said inlet openings flows upwardly through said channel towards said exit, said inner and said outer wall having a separate foundation erectable independently of the foundation of said arrangement;
c. heat exchanger means for cooling down the working fluid comprising cooling elements located within said channel

and being exposed to said cooling air stream, said elements being connected to inlet and outlet pipes, said inlet pipes supplying the working fluid to be cooled down from said arrangement to said elements and said outlet pipes discharging the working fluid after being cooled down from said elements to said arrangement; said air inlet openings guiding the incoming air across the surface of said cooling elements and therefrom upwardly towards said exit thereby dissipating the waste heat of said working fluid;

said inner and said outer wall being arranged substantially concentrically to a center point of said site and having a distance r_1, r_2, respectively, from said center point and a distance $r_{1,2}$ from each other so as to form a ring zone the width of which being relatively small as compared to the basis area of the power plant site, so as to prevent the break in of cold air and winds through the exit otherwise flowing reversely to the upward cooling air stream.

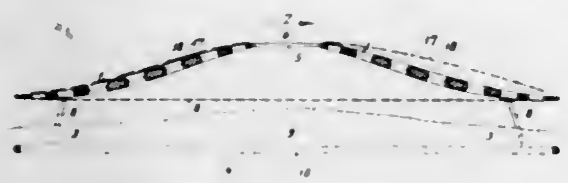
4,036,022
METHOD OF PRODUCING AND PROTECTING DEPOSITS OF SEDIMENTARY MATERIAL ON FLOORS OF BODIES OF WATER

Ole Jeppe Fjord Larsen, Auroravej 32^A, Rodovre, Copenhagen, Denmark

Division of Ser. No. 133,720, April 13, 1971, Pat. No. 3,830,066, which is a continuation of Ser. No. 667,954, Sept. 15, 1967, abandoned. This application Aug. 9, 1974, Ser. No. 496,317

Int. Cl.^{2} E02B *3/04*

U.S. Cl. 61—3 **28 Claims**



1. Apparatus for producing and protecting deposits of sedimentary material on a floor of a body of water, said apparatus comprising a flexible sheet located beneath the surface of the water in totally upwardly spaced relationship close to but above said floor, means for maintaining said flexible sheet so positioned, and a rigid apertured framework underlyingly supporting said flexible sheet.

4,036,023
FLOOD CONTROL SYSTEM FOR A DAM

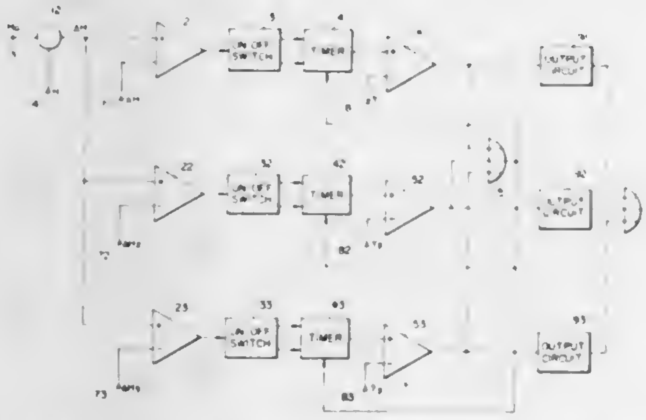
Kuniaki Matsumoto; Junichi Hatakeyama, both of Kokubunji, and Masaharu Okamoto, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed July 26, 1976, Ser. No. 708,634

Claims priority, application Japan, Aug. 1, 1975, 50-93099

Int. Cl.^{2} E02B *7/40*

U.S. Cl. 61—25 **8 Claims**



1. A flood control system for a dam having a gate for controlling the water outflow therefrom comprising:

first means for setting a reference water level;

second means for measuring the actual water level;

third means responsive to said first and second means for generating a deviation signal corresponding to the water level deviation between the set reference water level and the measured actual water level;

proportional-position control means for generating a first control signal proportional to said deviation signal generated by said third means;

integration control means for generating a second control signal corresponding to the integration result of said deviation signal generated by said third means;

differentiation control means for generating a third control signal corresponding to the differentiation result of said deviation signal generated by said third means; and

fourth means for determining the outflow to be discharged from said dam in response to the sum of said first, second, and third control signals.

4,036,024
DEVICE FOR CLOSING OFF A MINE GALLERY ESPECIALLY FOR USE TO PREVENT SPREADING OF UNDERGROUND EXPLOSIONS

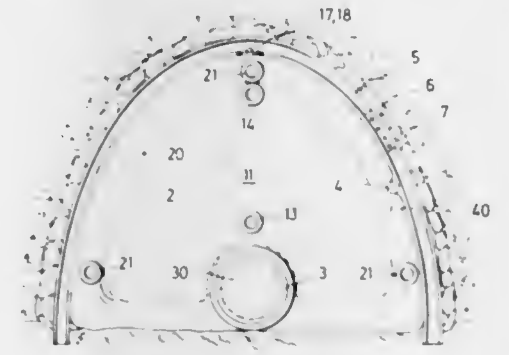
Raimund Dreker, Essen; Gerhard Endras, Augsburg, and Bernhard Langerbein, Lunen, all of Germany, assignors to Bergwerksverband GmbH, Essen, Germany

Filed June 11, 1975, Ser. No. 585,806

Claims priority, application Germany, June 12, 1974, 2428290

Int. Cl.^{2} E21F *5/00*

U.S. Cl. 61—42 **6 Claims**



1. A device for closing off a mine gallery, especially for use to prevent spread of underground explosions, comprising a inflatable bag of flexible substantially airtight material and movable from a collapsed to an inflated position, said bag having in said inflated position a substantially cylindrical peripheral surface engaging an inner peripheral surface of the mine gallery and opposite curved end faces extending across the mine gallery, said peripheral surface having substantially midway between said end faces an annular constriction; a hardenable material filling, in said inflated position, the interior of said bag and said annular constriction so that the material in said annular constriction provides a seal and interlock between said bag and the surrounding face of the mine gallery; first conduit means communicating with the interior of the bag to inflate the latter first with a gas under pressure and subsequently with said material while the same second conduit means communicating with the interior of said annular constriction to fill the latter with said material while the same is in flowable and still unhardened condition; and at least one overpressure valve in an uppermost portion of the inflated bag to discharge the pressure gas during filling the bag with said hardenable material.

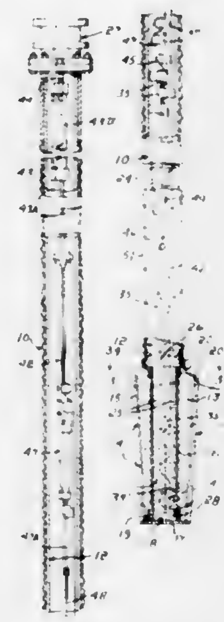
4,036,025
COMPOSITE PILE HAVING THE INSIDE DIAMETER OF THE TIP LESS THAN THAT OF THE PILE AND MANDREL FOR DRIVING THE SAME

Charles L. Guild, 7 Stone Tower Lane, Barrington, R.I. 02806

Continuation-in-part of Ser. No. 629,508, Nov. 6, 1975. This application Aug. 25, 1976, Ser. No. 717,510

Int. Cl.^{2} E02D *7/30*

U.S. Cl. 61—53.72 **15 Claims**



9. An expansible mandrel for use in driving a tubular pile having a tip attached thereto having a central, upwardly opening core provided with a seat at each end thereof and an upwardly disposed sleeve portion of cross sectional area larger than the core to which the pile is connected and within which the seats are exposed, said mandrel including lengthwise sections, a head interconnecting the upper ends of the sections, each section including a main portion for driving engagement with the interior of the pile, the tip portion of smaller cross section for driving engagement with the core, and an intermediate portion connecting said main and tip portions and establishing an outwardly projecting shoulder engageable with the upper seat of the pile tip, the length of the tip portions being coextensive with that of the core of the pile tip and each tip portion including at its lower ends, a boot portion engageable with the lower seat of the pile tip, expanding means within said mandrel operable to force the appropriate mandrel sections into their pile and core-gripping relationship and means operable to return said sections into their retracted position in which the pile and core are released.

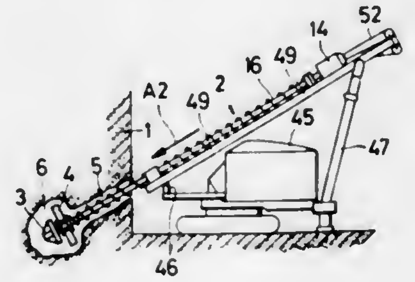
4,036,026
METHOD AND APPARATUS FOR ESTABLISHING AN ANCHOR

Kingo Asayama, Hirakata, Japan, assignor to Kabushiki Kaisha Takechi Koumusho, Osaka, Japan

Division of Ser. No. 485,777, July 5, 1974, Pat. No. 3,973,409. This application Nov. 17, 1975, Ser. No. 632,448

Int. Cl.^{2} E02D *5/74*

U.S. Cl. 61—56.5 **1 Claim**



1. A method establishing an anchor inside a retaining wall from the outside thereof comprising the steps of providing an earth auger having an auger shaft, a rod having a thin synthetic resinous film and a detachably mounted boring head and radially expansible blades, rotating said earth auger to create an initial penetration bore, said rotation being in a direction to keep the blades retracted, at the bottom of the initial penetration bore reversing the direction of rotation of the auger to expand the blades, boring a radially enlarged opening starting at the bottom of the initial penetration bore, reversing the direction of rotation of the auger to retract the blades and detaching the auger shaft and its expansible blades from the boring head and its rod and withdrawing the same through the initial penetration opening while simultaneously introducing grout through the auger shaft to fill the enlarged opening and the initial penetration bore, allowing the grout to set, when the need for the anchor has ceased utilizing the resinous film as a parting agent, separating the rod from the boring head and withdrawing it from the grout for recovery and reuse.

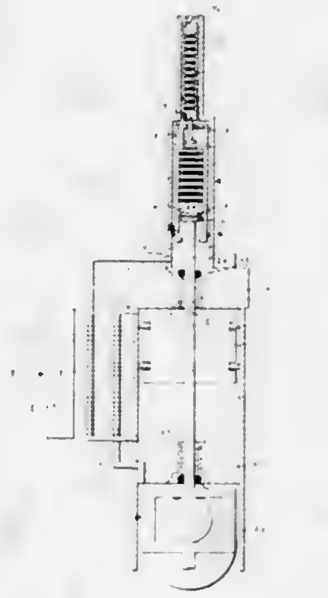
4,036,027
LOST-MOTION REFRIGERATION DRIVE SYSTEM

Walter H. Bamberg, Stoughton, Mass., assignor to Cryogenic Technology, Inc., Waltham, Mass.

Filed Apr. 30, 1976, Ser. No. 681,936

Int. Cl.^{2} F25B *9/00*

U.S. Cl. 62—6 **9 Claims**



1. In a refrigeration apparatus of the type including a sealed working volume defined by intercommunicated first and second elongated vessels having first and second piston elements reciprocating axially therein, the improvement:

said first and second intercommunicated elongated vessels being positioned in a line along a single axis having at least one fixed sealing wall positioned therebetween;

an axially-moveable rod being included extending along said axis through a sliding seal in said sealing wall connecting said first and second piston elements;

a coupling means for coupling said rod with said second piston element but allowing lost axial motion of said rod relative to said second piston element without a corresponding motion of said second piston element over a portion of the axial travel of said rod in both directions;

an intercommunicating passage for joining a first end of said first elongated vessel to a first end of said second elongated vessel; and

an energy source for driving said shaft to reciprocate axially.

4,036,028

PROCESS AND APPARATUS FOR EVAPORATING AND HEATING LIQUIFIED NATURAL GAS

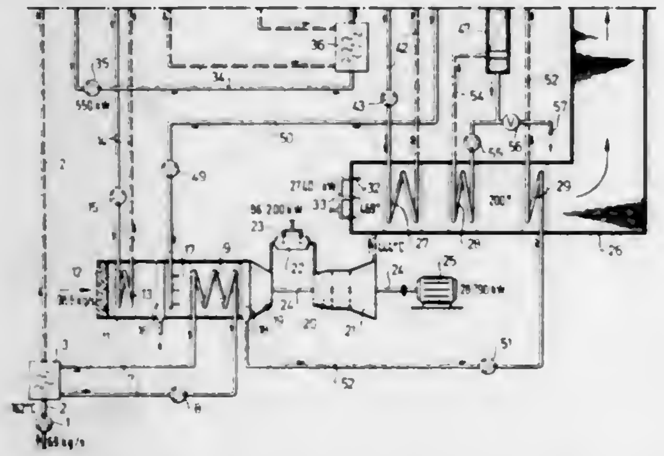
Charles Mandrin, Winterthur, Switzerland, assignor to Sulzer Brothers Limited, Winterthur, Switzerland

Filed Oct. 30, 1975, Ser. No. 627,331

Claims priority, application Switzerland, Nov. 22, 1974, 15545/74

Int. Cl.² F17C *7/02*

U.S. Cl. 62—52 **7 Claims**



1. An apparatus for evaporating and heating liquid natural gas comprising

means defining a predetermined flow path for a flow of liquid natural gas;

an open gas turbine system having an air intake and an exhaust flue for a flow of hot exhaust gases;

a first heat exchange system for cooling air taken into said air intake and for heating the flow of liquid natural gas;

a second heat exchange system for extracting heat from the flow of exhaust gases in said flue and for heating the flow of natural gas with the extracted heat, said second heat exchange system including a first closed piping system having a hydrocarbon heat exchange medium therein, a first heat exchanger for receiving heat from the flow of exhaust gases to heat the hydrocarbon medium, a second heat exchanger for heating of the natural gas in said flow path in heat exchange relation with the hydrocarbon medium, a compressor means downstream of said second heat exchanger in said flow path for compressing the hydrocarbon medium and a vapor turbine upstream of said second heat exchanger in said flow path for expanding the hydrocarbon medium to produce work;

means for admixing an anti-freeze agent into said gas turbine system air intake; and

a rectifying means for receiving and vaporizing the anti-freeze agent downstream of said air intake, said rectifying means having a head product removal line connected to a third heat exchanger in said first closed piping system for receiving heat from the flow of exhaust gas.

4,036,029

AIR CONDITIONING UNIT FOR AUTOMOBILES

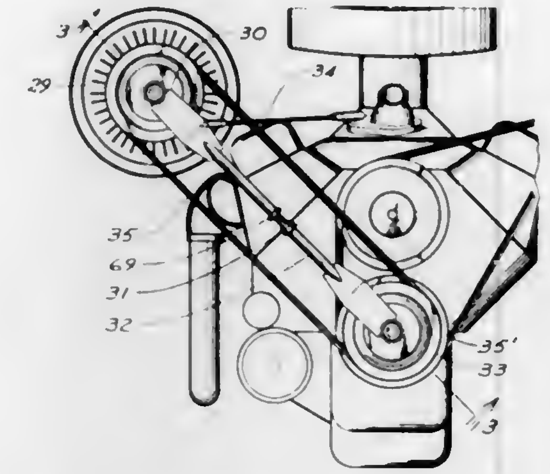
Philip L. Francis, 4812 Estrada Da Costa, Sarasota, Fla. 33581

Filed June 25, 1975, Ser. No. 590,324

Int. Cl.² B60H *3/04*

U.S. Cl. 62—243 **8 Claims**

1. An air conditioning unit comprising a compressor condenser and evaporator, an outer casing for said compressor, said condenser and evaporator circular in shape and mounted upon the outer casing of said compressor, a shaft for rotating said compressor condenser and evaporator as a single unit, said shaft for rotating the compressor connected to one end of said outer casing of the compressor, said compressor casing including a plurality of interior cylinders, pistons reciprocally mounted in said cylinders, a second shaft extending through the compressor, means on said second shaft for reciprocating said pistons, a brake for controlling rotation of said second shaft whereby the reciprocation of said pistons may be controlled independently of rotation of the compressor casing.



4,036,030

ASSEMBLY FOR THE DAMPING OF FLEXURAL AND TORSIONAL VIBRATION IN THE SHAFTS OF MACHINES

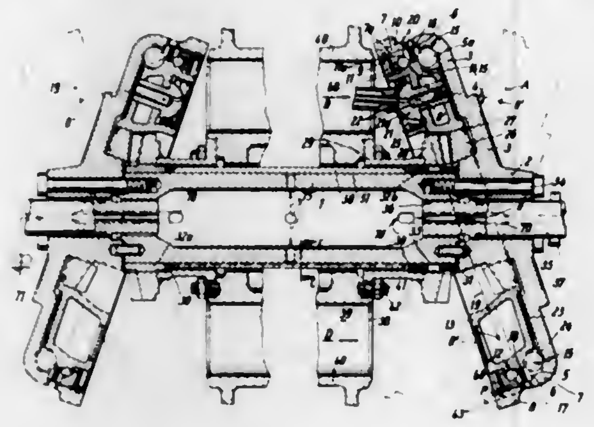
Hermann Ernst Robert Papst, Karl-Maier-Strasse 1, St. Georgen, Germany

Filed Sept. 16, 1974, Ser. No. 506,043

Claims priority, application Germany, Sept. 18, 1973, 2346969

Int. Cl.² F16C *1/00, 3/00*

U.S. Cl. 64—1 V **15 Claims**



1. An assembly for the damping of flexural and torsional vibrations in a rotatable machine shaft which extends between a pair of spaced bearings, the improvement comprising:

a bend resistant tubular member surrounding said shaft,

means for rotating said tubular member in the same direction and at substantially the same speed as said shaft,

a minute clearance defined between said shaft and tubular member between said bearings,

a viscous damping medium filling said clearance, and

supply means for supplying said clearance with said medium under pressure through said shaft.

4,036,031

UNIVERSAL CONNECTION MEANS IN AN ORBITAL FLUID PRESSURE DEVICE

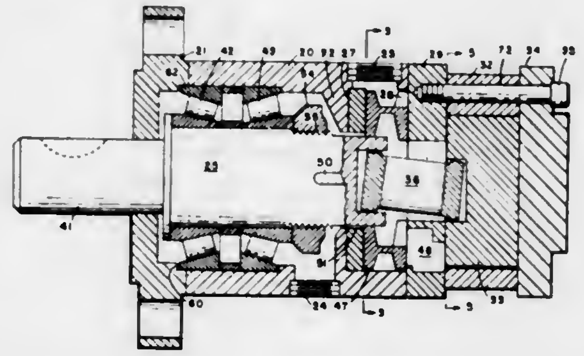
George V. Woodling, 22077 Lake Road, Rocky River, Ohio 44116

Continuation of Ser. No. 494,057, Aug. 2, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,145

Int. Cl. F16d *3/18*

U.S. Cl. 64—7 **27 Claims**

1. Universal connections means between first and second rotatable body means is an orbital fluid pressure device, said first body means having a first body axis, said second body means having a second body axis, said first body axis and said second body axis being disposed to intersect each other at an universal point, one of said body means including an internal polygonal socket configuration and the other body means including an external polygonal head configuration, said internal and external polygonal configurations interfittingly engaging each other for transmitting torque therebetween in a torque transmitting direction, said polygonal configurations providing universal relative movement therebetween in all directions other than in said torque transmitting directions, said polygonal configurations including at least an internal torque transfer wall and an external torque transfer wall confrontingly engaging each other, one of said transfer walls comprising substantially flat wall means and the other comprising substantially contour wall means, said flat wall means and said contour wall means having freedom from both interference upon relative universal movement therebetween, said flat wall means and said contour wall means upon transmission of torque defining at least a polygonally disposed line segment contact therebetween.



4,036,032

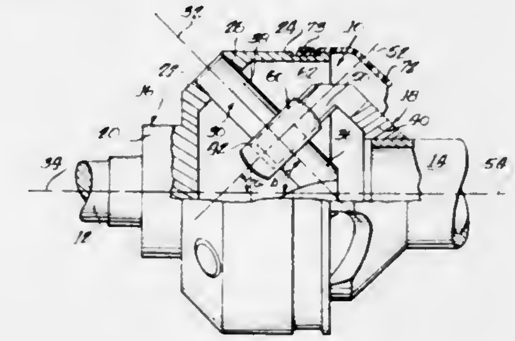
UNIVERSAL JOINT

Metin Mustafa Durum, Elmhurst, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.

Filed Dec. 5, 1975, Ser. No. 637,903

Int. Cl.² F16D *3/30*

U.S. Cl. 64—21 **9 Claims**



1. A universal joint for the transmission of torque between two shafts comprising a drum member coupled to one of said shafts, at least three trunnions connected to and extending inwardly from said drum member at an acute angle with respect to said one shaft, said trunnions having an end remote from said drum member, a coupling member rotationally and slidably mounted on each of said trunnions, said groove member having at least three grooves extending inwardly at an acute angle with respect to said other shaft, said coupling members being received within said grooves whereby torque can be transmitted between said shafts when said shafts are at an angle, and said trunnions being secured together at said remote ends.

4,036,033

PLURAL CAM TRACKS FOR ROCKABLE JACKS

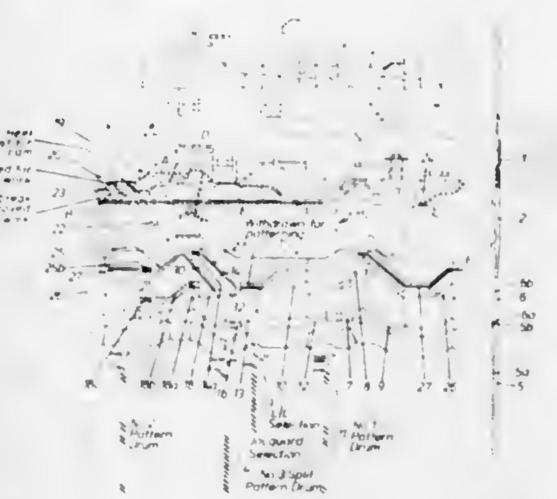
Leslie William Digby Jesson, Leicester, England, assignor to The Bentley Engineering Company, Ltd., England

Filed June 30, 1975, Ser. No. 591,648

Claims priority, application United Kingdom, July 11, 1974, 30679/74

Int. Cl.² D04B *9/10, 15/68*

U.S. Cl. 66—14 **11 Claims**



1. Circular knitting machine comprising a cylinder, tricks in the cylinder, rockable jacks in the tricks, a butt at each end of the rockable jacks, the butts at each end of the individual jacks being alternatively projectable from the tricks by rocking of the jacks, selection means and cam means for sliding a first group of rockable jacks in the tricks and for sliding a second group of the jacks differently from the first group, the cam means defining a first track portion ending at a first position, a second portion starting at a second position spaced in a trickwise direction from said first position by the distance between the alternatively projectable butts, first means for rocking those individual jacks having alternatively projectable butts at the first and second position, and the cam means further defining a third track portion passing between the first and second positions.

4,036,034

ELECTRONIC METHOD AND APPARATUS FOR PATTERN FORMATION IN CIRCULAR KNITTING MACHINE

Noboru Aisaka; Tadashi Shindo, both of Yokohama, and Tatsuya Kawakami, Tokyo, all of Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Continuation-in-part of Ser. No. 554,310, Feb. 28, 1975, abandoned, which is a continuation of Ser. No. 295,100, Oct. 5, 1972, abandoned, which is a continuation of Ser. No. 53,365, July 6, 1970, abandoned. This application Feb. 27, 1976, Ser. No. 662,167

Claims priority, application Japan, July 7, 1969, 44-53918

Int. Cl.² D04B *9/00*

U.S. Cl. 66—50 R **11 Claims**

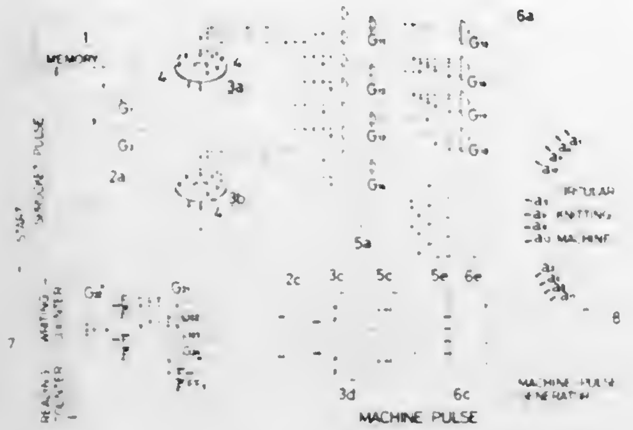
1. A method of pattern formation in a circular knitting machine provided with a set of selectively operable needle actuators rotatable relatively to an annular array of knitting needles, comprising the steps of:

storing in a memory device pattern signals given in binary notation for a desired pattern to be knitted;

alternatingly writing the pattern signals stored in said memory device into first one and then the other of a pair of counter stages;

reading out the stored pattern signals for one course of pattern knitting from one counter stage of said pair simultaneously with the writing of the stored pattern signals for the next course of pattern knitting in the other counter stage of said pair;

feeding the pattern signals read out from said one counter stage of said pair to corresponding needle actuators; and

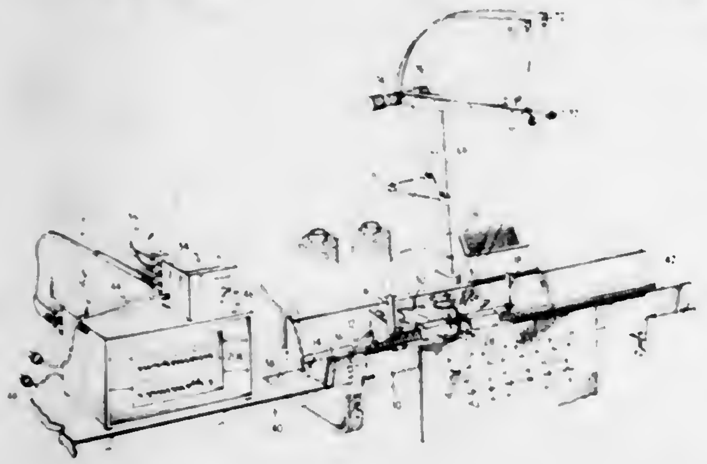


switching over to the other counter stage of said pair for feeding the pattern signals read out therefrom to corresponding needle actuators after completion of one course of pattern knitting.

4,036,035
AUTOMATED HOME KNITTING MACHINE

William Kahan, New York, N.Y.; John Vernon Landau, Jr., Mount Lakes, N.J.; Howard David Rogers, Fanwood, N.J.; Fredrick Alexander Rupinski, Lyndhurst, N.J.; Thomas Richard Peer, Glenwood, N.J., and Martin David Brennan, Flanders, N.J., assignors to The Singer Company, New York, N.Y.

Filed Oct. 30, 1975, Ser. No. 627,431
Int. Cl.^{2} B04D *7/00, 15/66*
U.S. Cl. 66—75.2 **51 Claims**

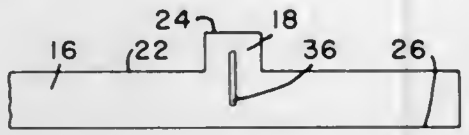


1. In a knitting machine, the combination comprising a needle bed supporting a plurality of needles in side by side relation; a carriage mounted on the bed for movement traversing such needles, the carriage including needle actuating camming; a program card including individual stitch instructions within one area of the card for a design shape to be repetitively formed in fabric to be knit on the machine, and other instructions outside the design area for controlling the knitting of said fabric; means for reading out the instructions in both of said areas of the program card; electronic control means connected with the reading means, the electronic control means being adapted to store signals representing instructions on the program card; a pulse generator on the carriage operable in timed relation to movement of the carriage, and needle actuating means on the carriage operable in synchronism with the pulse generator and responsive to the operation of said electronic control means for selectively determining paths for the needles through the said needle actuating camming according to the instructions on the card in and outside the design area.

4,036,036
LATCH NEEDLE FOR KNITTING MACHINES

Albert Sidney Ashmead, Torrington; William Alden Ross, New Hartford, and Richard Wilton Shepard, Torrington, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Mar. 22, 1976, Ser. No. 669,401
Int. Cl.^{2} D04B *35/02, 35/04*
U.S. Cl. 66—123 **5 Claims**

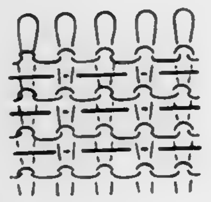


1. In a latch needle having a hook, a pivotable latch, a roundout, and a body consisting of a blade and a butt, the improvement of the body of the needle having at least one lateral opening to relieve stress, absorb shock, and dampen vibrations; said at least one opening extending from the blade into the butt and located so as not to extend to the top or bottom of the body.

4,036,037
KNITTED TEXTILE CASING FOR SAUSAGES

Gebhard R. Huckfeldt, Oestmannstreppe 1, 2000 Hamburg 55, Germany

Filed July 14, 1975, Ser. No. 595,803
Claims priority, application Germany, July 13, 1974, 2433751
Int. Cl.^{2} A22C *13/00*
U.S. Cl. 66—170 **6 Claims**



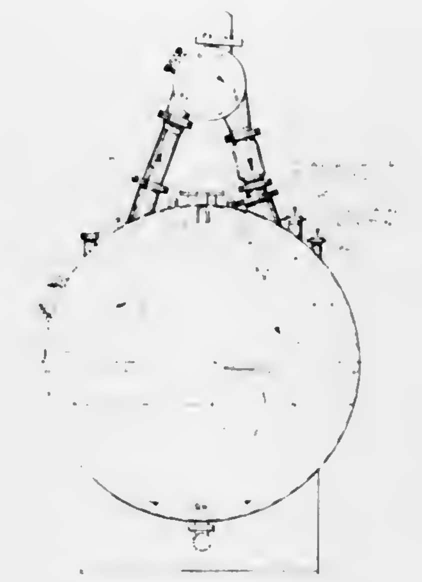
1. In a tubular sausage casing providing a sausage skin for containing sausage therein comprising a reinforcing tubular base fabric and a coating in interlocking association therewith and together providing said sausage skin, the improvement wherein the tubular base fabric comprises a tubular textile knitted fabric of knitted threads and additional weft threads running in a direction extending generally circumferentially of the tubular fabric and thereby to extend generally circumferentially about the sausage within the sausage skin, said additional weft threads having a strength related to the strength of the knitted threads for eaay circumferential tearing of the knitted threads of the sausage skin with said additional weft threads for permitting selective manual removal of sections of the sausage skin by selectively manually tearing the sausage skin from the sausage.

4,036,038
APPARATUS FOR LOW LIQUOR RATIO WET PROCESSING OF TEXTILE FABRIC

Christoph W. Aurich, Clemson, S.C.; William Cleere Sturkey, Charlotte, and James Keith Turner, Lincolnton, both of N.C., assignors to Gaston County Dyeing Machine Company, Stanley, N.C.

Filed May 20, 1976, Ser. No. 688,189
Int. Cl.^{2} D06B *3/28*
U.S. Cl. 68—5 C **11 Claims**

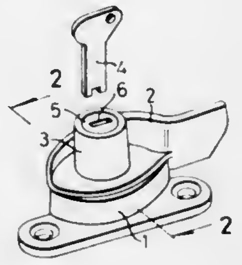
1. In apparatus for low liquor ratio wet processing of textile fabric in endless loop form while recirculating the fabric loop through a processing system including a vessel arrange for transiently storing a major portion of said fabric loop and a superstructure for said vessel disposed and equipped for progressively withdrawing the fabric loop from and returning it to the vessel storage to effect said fabric recirculation, the improvement with comprises a lifter roll and selectively operable aspirating means housed in said superstructue and to cause recirculating travel of the fabric loop, a foam generator mounted on said vessel, means for applying a low liquor ratio foaming formulation of the processing liquor externally to said recirculating fabric in a non-persistently foamed condition by feeding processing liquor under pressure selectively to either or both of said aspirating means and said foam generator adjacent the point of fabric return to said vessel storage so that the foamed processing liquor tends to decay to liquid phase in the course of migratory saturation of the stored fabric portion as it progresses through said vessel, and means for recovering a decayed liquid phase of said foamed processing liquor from said vessel and for continually recycling the recovered liquor to said applying means for reapplication to non-persistently foamed condition to said recirculating fabric.



4,036,039
SASH LOCK

Yoshitaka Nakanishi, 12-9, Yawata 5-chome, Ichikawa, Chiba, Japan

Filed Dec. 24, 1975, Ser. No. 643,945
Claims priority, application Japan, Dec. 28, 1974, 50-2435[U]
Int. Cl.^{2} E05B *63/14, 47/00*
U.S. Cl. 70—90 **15 Claims**

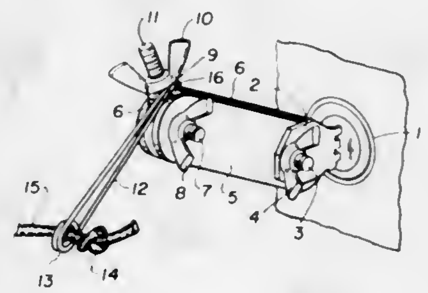


1. A sash lock, comprising; a base; a rotatable latch cam pivoted to the base; a locking member disposed on the latch for unlockably locking the latch cam to control rotation thereof; a rotatable actuating member disposed on the locking member; and a key for rotating the actuating member to shift the locking member into and between locking and unlocking positions thereof, each of said members having a cam surface, one such surface being engageable with the other and normally engaged therewith to derive from the rotating of the actuating member a rectilinear motion of the locking member between the locking and unlocking positions thereof, and wherein each cam surface has a recessed flat cam surface portion, an inclined cam surface portion connected to said recessed one, and a projecting flat cam surface portion connected to said inclined one so that, when the projecting flat cam surface portions are mutually engaged, the locking member is in the locking position, and when a projecting flat cam surface portion and a recessed flat cam surface portion are mutually engaged, the locking member is in the unlocking position thereof.

4,036,040
REMOTE CONTROL DEVICE FOR KEY ACTUATED SYSTEMS

Carmelo C. Graizzaffi, 22 Foster Road, Lake Bonkonkoma, N.Y. 11779

Filed Aug. 8, 1975, Ser. No. 603,248
Int. Cl.^{2} E05B *17/00;* **A47G** *29/10*
U.S. Cl. 70—431 **7 Claims**



1. A remote control device for key actuated ignition systems comprising:

a. an adjustable arm having a first and a second end,
b. holding means adapted to hold a key,
c. linking means to connect the holding means to the first end of said arm, the key and arm positions being separately adjustable to place the key axis at a selected angle with respect to the axis of the arm, and
d. a flexible line secured to the second end of the adjustable arm, and

wherein said linking means comprises a body member having a first and a second end, a first coupling means attached to the first end of said body member to connect said holding means to said body member, and a second coupling means attached to the second end of said body member to connect said arm to said body member, and said first and second coupling means including separate means for securing said holding means and arm to the body member at respective selected positions, and

wherein said body member includes a first hole adjacent its first end and a second hold adjacent its second end, said first coupling means comprises a first fastening means having a shaft and a head on one end of shaft, such as a bolt, the shaft portion of which is positioned in the first hole in said body member and passes through a hole in the head of the key, and

wherein the arm includes a first hole at the end adjacent the body member and said second coupling means comprises a second fastening means having a shaft with a head on one end, such as a bolt, second and third adjustable securing means such as nuts, and a third fastening means having a shaft and an eye at one end of the shaft such as an eye bolt, the shaft portion of said second fastening means being located in the second hole in said body member and passing through the eye of the third fastening means, the second securing means being attached to the second fastening means at an adjustable point on the shaft towards the end opposite the head to secure the third fastening means to said body member, the shaft portion of the third fastening means passing through the first hole in the arm, and said third securing means being attached to the third fastening means at an adjustable point on the shaft towards the end opposite the eye to secure said arm to said body member, whereby said key may be set to any angle about said first fastening means, said third fastening means may be set to any angle within a 180° range about said second fastening means and said arm may be set to any angle about said third fastening means.

4,036,041

GAGE CONTROL SYSTEM FOR ROLLING MILL

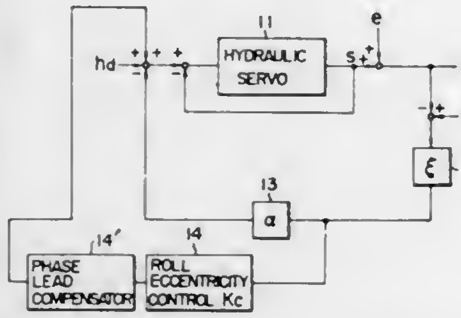
Ken Ichiryu, Mito; Toyotsugu Masuda, Hitachi; Haruo Kinoshita, Hitachi; Toshiyuki Kajiwara, Hitachi, and Shigemichi Matsuka, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Feb. 11, 1976, Ser. No. 657,271

Claims priority, application Japan, Feb. 12, 1975, 50-16872

Int. Cl.^{2} B21B *37/00*

U.S. Cl. 72—8 **15 Claims**



1. A gage control system for use with a rolling mill comprising roll means for defining a roll gap through which a material is passed to be rolled and hydraulic pressure means adapted to set the roll gap at a given value and to control a rolling pressure applied through said roll means to the material passing through said roll gap, said system comprising:

gap setting means for applying a gage command to said pressure means to set the roll gap at a predetermined value,

position setting means for detecting the actual value of the roll gap and feeding back a gap signal corresponding to the actual value of the roll gap to said pressure means,

pressure detecting means for detecting the rolling pressure applied to the material passing through the roll gap and determining the amount of deformation of said rolling mill from the detected rolling pressure,

multiplier means for multiplying the output of said pressure detecting means relating to the amount of said deformation by a predetermined coefficient and applying, as a negative back, the result of said multiplication to said pressure means, and

feed back means for applying, as positive feed back, the output of said pressure detecting means through a narrow-band filter to said pressure means, said filter allowing the passage of substantially only components relating to eccentricity of said roll means.

4,036,042

APPARATUS FOR ADJUSTING BIASING FORCE OF LEAF SPRING

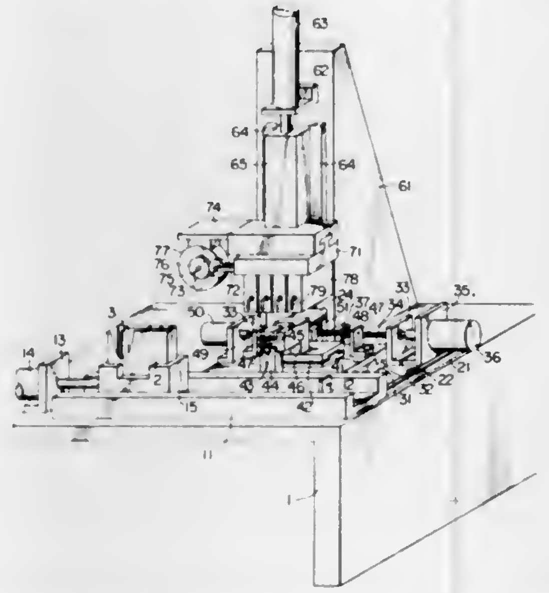
Hitoshi Kubota; Takayuki Nishi, both of Yokohama, and Takashi Kobayashi, Fujisawa, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,157

Claims priority, application Japan, Aug. 20, 1975, 50-100211

Int. Cl.^{2} B21D *11/10*

U.S. Cl. 72—9 **2 Claims**



1. An apparatus for adjusting biasing force of a leaf spring comprising:

a. means for adjusting said biasing force through imparting to said leaf spring a plastic deformation, said biasing force adjusting means having at least four stationary rollers for supporting said leaf spring and at least two movable rollers adapted to impart said plastic deformation to said leaf spring while it is supported by said stationary rollers;

b. means carrying said adjusting means for moving said stationary and movable rollers of said adjusting means to and from said leaf spring;

c. means for measuring the biasing force of said leaf spring having at least one measuring element adapted to make one reciprocating movement between a stand-by position where it does not contact said leaf spring and a measuring position where said leaf spring is deflected by said measuring element by a predetermined amount;

d. a sequence control circuit for controlling the operation of said measuring means; and

e. control circuit means connected to said measuring element of said measuring means and to said stationary and movable rollers of said adjusting means, said control circuit means being adapted to compare the measured biasing force of said leaf spring with a reference value to decide whether the measured biasing force is acceptable, to determine the direction in which the plastic deformation is to be imparted and the amount of deformation to be imparted when said biasing force is decided to be unacceptable, and to control said adjusting means and said means for moving said stationary and movable rollers in accordance with the determined direction and amount thereby to adjust the biasing force of said leaf spring.

4,036,043

EXTRUSION DIE FOR HOT HYDROSTATIC EXTRUSION OF ALUMINUM AND ALUMINUM ALLOYS

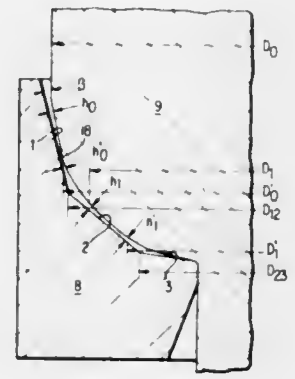
Yoshihiro Yamaguchi, Ashiya; Tomiharu Matsushita; Masataka Noguchi, both of Nishinomiya; Hideaki Ide, and Kunihiko Nishioka, both of Kobe, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Oct. 20, 1975, Ser. No. 623,631

Claims priority, application Japan, Oct. 18, 1974, 49-119924

Int. Cl.^{2} B21C *3/10, 9/00, 23/32, 25/02*

U.S. Cl. 72—41 **9 Claims**



1. A die for use in a hot hydrostatic extrusion process, in which a billet comprising aluminum or an aluminum alloy or a billet having aluminum and an aluminum alloy at its outer periphery is preheated and charged into a container whereupon extrusion is carried out by means of a pressure medium, said die having a inlet portion and an outlet portion and comprising:

a plurality of contiguous stepped conical portions serving as approach portions to said die outlet;

said conical portions having conical surfaces whose opening angles increase from said inlet of said die toward said outlet thereof, said conical surface which is closest to said die inlet having an opening angle of less than 60°, and the difference between the opening angles between adjacent conical surfaces being less than 90°;

said conical surface closest to said die inlet defining an open area into which said pressure medium may be initially introduced between said conical surface closest to said die inlet and said billet; and

said contiguous conical surfaces define annular pockets between said contiguous conical portions and said billet for housing pools of said pressure medium;

whereby during said extrusion, said pressure medium enters the area defined between said billet and said conical surface closest to said die inlet so as to prevent the formation of dead metal and is also extracted from said pockets so as to enter the area defined between said billet and said conical surfaces so as to lubricate said billet thereby preventing seizure thereof within said die.

4,036,044

PROCESS FOR FORMING METAL PIPES TO A DESIRED SHAPE

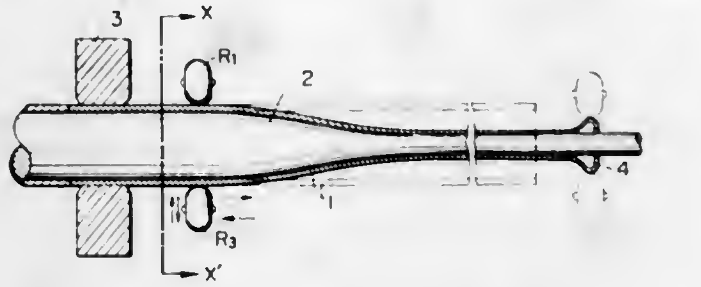
Tomio Yoshimura, Osaka, Japan, assignor to Zenzo Matsunaga, Tokyo, Japan

Filed Mar. 30, 1976, Ser. No. 671,940

Claims priority, application Japan, Apr. 7, 1975, 50-41990

Int. Cl.^{2} B21B *19/12*

U.S. Cl. 72—85 **1 Claim**



1. A process for forming metal pipes to a desired shape comprising fitting a metal pipe onto a model having same profile as the one desired to form, fixing the pipe on the model, arranging a plurality of metal rollers at the same distance and around the metal pipe in such a manner that these rollers are in contact with the pipe always keeping their centers on the circumference of a concentric circle and on a plane perpendicular to the longitudinal center axis of the model irrespective of the change in their position during their forward and backward movement relative to and their left or right-ward movement along the longtudinal center axis of the model, each of said metal rollers being provided with a driving means so that each of said rollers may be forcibly driven, and rotating the metal pipe integral with the model in the longitudinal direction while forcing the rollers to move relative to and along the longitudinal center axis of the model to thereby form the metal pipe to a desired shape.

4,036,045

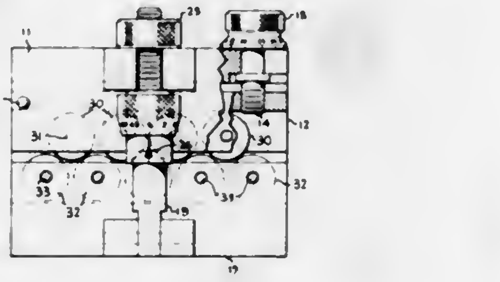
CALIBRATED ADJUSTABLE ROLL STRAIGHTENER FOR WIRE

Emmett P. Ham, and Albert S. Johnson, Jr., both of Goldsboro, N.C., assignors to General Electric Company, Schenectady, N.Y.

Filed July 14, 1976, Ser. No. 705,344

Int. Cl.^{2} B21D *3/02*

U.S. Cl. 72—165 **6 Claims**



1. A wire straightener comprising:

a frame having two parts;

first pivot means joining said parts at one side thereof;

offset adjusting means interconnecting the sides of said parts opposite said first pivot means;

a first support means having a plurality of rolls in fixed spatial relation;

a second support means, comprising one of said parts, having a plurality of rolls in fixed spatial relation;

second pivot means for locating one end of each of said support means relative to the other; and

pitch adjusting means coupled to the other ends of said support means for controlling the spacing of said other ends.

4,036,046
WIRE DRAWING

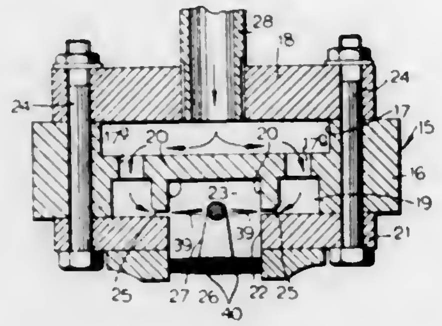
Peter Gough Davies, Cardiff; Keith Thomas Jones, Blackwood, and Brian Salmon, Cardiff, all of England, assignors to GKN Somerset Wire Limited, England

Filed Apr. 28, 1976, Ser. No. 681,256

Claims priority, application United Kingdom, May 7, 1975, 19080/75

Int. Cl.^{2} B21C *9/00*

U.S. Cl. 72—286 **22 Claims**



1. Apparatus for wire drawing comprising a die and a rotatable block around which the filament leaving the die is arranged to be wrapped, the apparatus including means located between the die and the block for cooling the filament using a liquid coolant and a wiping means for wiping substantially all the liquid coolant from the filament before the latter passes onto the block, said cooling means comprising an elongated chamber through which the filament is arranged to pass whilst in a substantially straight configuration and moving in the direction of its length, said chamber being provided with nozzles arranged to direct jets of the liquid coolant onto the straight moving filament and with a slot which extends longitudinally from one end of the chamber to the other, a deformable baffle which forms part of the wall of the chamber extending across said slot and the arrangement allowing a substantially straight length of filament to be inserted into and withdrawn from the chamber through said slot by movement of said straight length relative to the chamber in a direction substantially at right angles to the longitudinal axis of said straight length thus deflecting said baffle.

4,036,047
BODYMAKER PUNCH AND RAM

Edward C. Miller, Broomfield, Colo., assignor to Ball Corporation, Muncie, Ind.

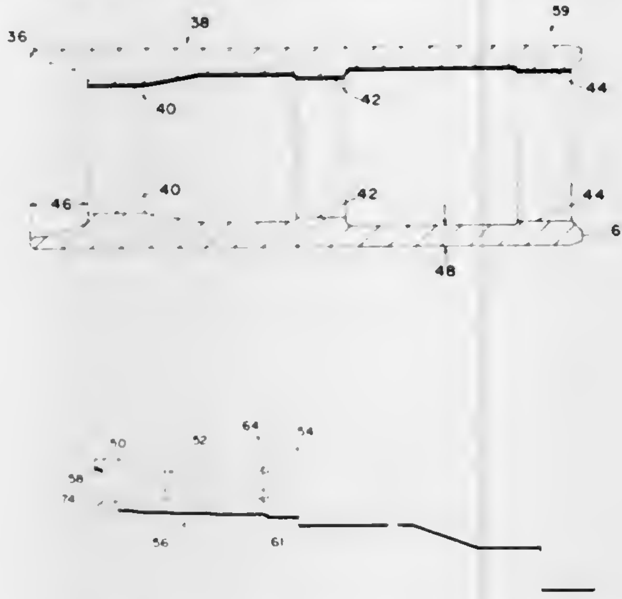
Filed Oct. 28, 1975, Ser. No. 626,676

Int. Cl.^{2} B21D *22/21*

U.S. Cl. 72—347 **6 Claims**

3. A bodymaker punch for use in making bodies, said punch comprising a nose for engagement with and deformation of said can material and an improved body portion for strengthening said body to prevent breakage thereof, said punch being a hollow cylindrical member having an external diameter and a first and a second internal diameter and further having at least first and second lands disposed about the interior surface thereof said first land having a first internal diameter and said second land having a second internal diameter, a first of said lands being disposed adjacent said nose to thus increase the cross-section of said body portion at this location; a second of said lands being disposed near the end of said body portion most remote from said nose and wherein the difference between said first internal diameter of said first land and the first internal diameter of said punch is greater than the difference between said second internal diameter of said second land and said second internal diameter of said punch; said first land being disposed along a portion of the interior surface of said body having said first internal diameter and said second land being disposed along a portion of the interior surface of said body having said second internal diameter, said first internal diameter being less than said second internal diameter.

4. A ram for supporting a bodymaker punch for use in making can bodies wherein said ram has an improved body portion for engagement with and support of said punch, said ram having a plurality of lands disposed along the external length thereof, a first of said lands being disposed at the rearward moving end of said ram and having an external diameter which is greater than the external diameter of said first land to thereby increase the mass of material in said ram at said rearward moving end; a second of said lands being disposed at the forward moving end of said ram, said forward moving end having means disposed therein for securing a punch to said ram, said means for securing a punch to said ram comprising a cylindrical, axial bore opening at said forward moving end of said ram for receiving a punch mounting nut, said cylindrical, axial bore having a threaded portion nearer said rearward moving end and a cylindrical portion near said forward moving end, said cylindrical portion complementing a similar portion disposed on a punch mounting nut for receiving therethrough the punch mounting nut, said cylindrical portion being of sufficient length and diameter to cause forces subjected on said punch by said punch mounting nut to be equally distributed.



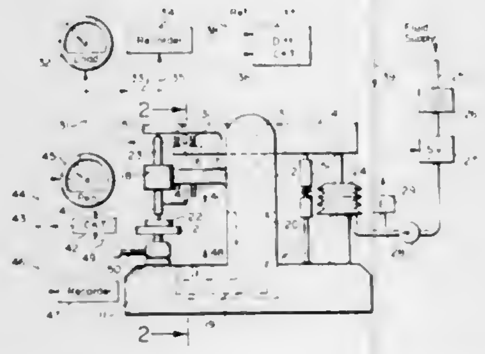
4,036,048
HARDNESS TESTING DEVICE

Robert A. Webster, 1044 20th St., Unit N, Santa Monica, Calif. 90403

Filed Jan. 21, 1977, Ser. No. 760,945

Int. Cl.^{2} G01N *3/42*

U.S. Cl. 73—81 **5 Claims**



3. A hardness testing device including, in combination:

a. a frame body having an horizontal base and a central upwardly extending portion carrying a pivot shaft;

b. a cross beam centrally pivoted to said pivot shaft, one end of said beam on one side of said pivot shaft being forked to define an upper bending beam portion and a lower reference beam portion extending in substantially parallel vertically spaced relationship;

c. said frame body including an arm integrally secured to and horizontally extending from said central upwardly extending portion beneath said reference beam, said arm terminating in a vertical guide bearing;

d. said frame body including a leg secured to and horizontally extending from a lower portion of said central upwardly extending portion adjacent to said horizontal base in spaced relationship thereto;

e. A specimen platform supported on said horizontal base of said frame body beneath said guide bearing;

f. a penetrating probe vertically movable in said guide bearing with its upper end engaging the underside end portion of said bending beam and its lower end engaging a specimen receivable on said platform;

g. force applying means between the other end of said cross beam on the other side of said pivot shaft and said horizontal base;

h. first electrical measuring means connected between said bending beam portion and said reference beam portion of said cross beam providing a first signal responsive to movement of said bending beam relative to said reference beam;

i. second electrical measuring means connected between said penetrating probe and said arm for providing a second signal responsive to movement of said probe relative to said vertical guide bearing;

j. third electrical measuring means connected between the extending end portion of said leg and said horizontal base for providing a third signal responsive to movement of said horizontal base relative to said leg;

k. first indicating means responsive to said first signal to provide an indication of the force applied to said probe resulting from application of force by said force applying means;

l. circuit means subtracting said third signal from said second signal; and

m. second indicating means connected to said circuit means and responsive to an output signal from said circuit means constituting the difference between said second signal and third signal to provide an indication of the penetration of said penetrating probe into said specimen.

4,036,049
METHOD FOR DETERMINING ENGINE MOMENT OF INERTIA

Richard Eric Hanson, Winchester, Mass., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed June 28, 1976, Ser. No. 700,650

Int. Cl.^{2} G01M *15/00*

U.S. Cl. 73—116 **1 Claim**

1. A method of determining the rotational moment of inertia of an engine type power plant, comprising the steps of

running an unloaded power plant up to a high speed of approximately 2500 r.p.m., de-energizing the power plant of decelerate same from said high speed to a low speed of approximately 1000 r.p.m., and measuring the elaspsed time period, to thereby ascertain the average deceleration rate of the unloaded power plant;

applying a known external load to the power plant; said external load being approximately 10 percent of the power plant friction torque;

running the loaded power plant up to the same aforementioned high speed, de-energizing the loaded power plant to decelerate same from the aforementioned high speed to the same aforementioned low speed, and measuring the elasped time period, to thereby ascertain the average deceleration rate of the loaded power plant;

and calculating the moment of inertia according to the equation $I = F_4/(d_2 - d_1)$

where

I is moment of inertia

F_4 is the known external load

d_2 is deceleration rate of the loaded power plant, and

d_1 is deceleration rate of the unloaded power plant.

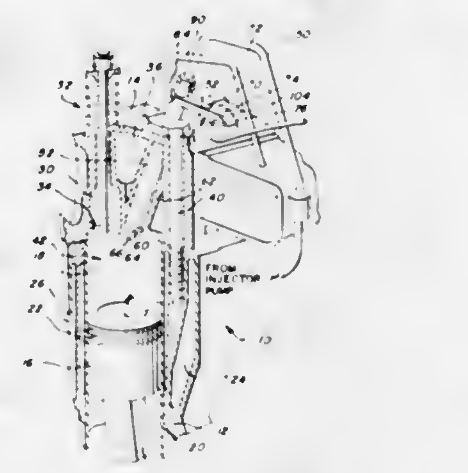
4,036,050
ENGINE MONITORING APPARATUS

Joseph L. Dooley, 2753 W. 84th St., Chicago, Ill. 60652, and Edward Yelke, 945 S. Kensington Ave., LaGrange, Ill. 60525

Filed Mar. 24, 1976, Ser. No. 670,058

Int. Cl.^{2} G01M *15/00*

U.S. Cl. 73—119 A **10 Claims**



1. A performance monitoring system for engines having one or more cylinders adapted to receive fuel injected through a nozzle which is pressure seated into a cylinder inlet port, said system comprising holding means adapted for engaging said nozzle and maintaining pressure tending to seat said nozzle against said port, and transducer means operatively associated with said holding means for generating an electrical signal in response to changes in pressure within said cylinder.

4,036,051
HEAT METERS

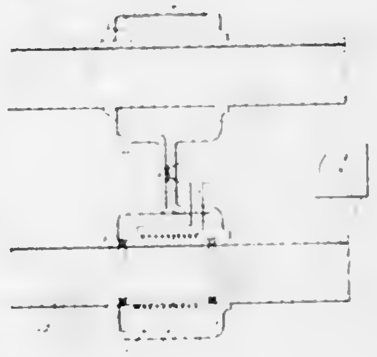
Roger Fell, 5 Egremont Road, Milnrow, Lancaster, and Brian Clifton, 39 Beech House, The Beeches Manchester, Lancaster, both of England

Filed Oct. 3, 1975, Ser. No. 619,182

Claims priority, application United Kingdom, Oct. 8, 1974, 43553/74

Int. Cl.^{2} G01K *17/10*

U.S. Cl. 73—193 R **1 Claim**



1. Heat metering apparatus for measuring heat loss or gain in a confined heat transporting medium flowing in a system having spaced conduits, heat sensitive means for monitoring the temperature of the medium passing through one of said conduits, a thermally conductive section in the other conduit in thermal contact with the medium passing therethrough, means thermally insulating said thermally conductive section from the remainder of said other conduit, means for heating said thermally conductive conduit section, heat sensitive means for monitoring the temperature of said thermally conductive section, and measuring and control means interconnecting said heat sensitive means for detecting measured temperature differences between them and for energizing said heating means for minimizing said differences and measuring the energy so supplied, said heat sensitive means comprising gas filled bulbs associated with the respective conduits and interconnected by a capillary tube containing a switch to form a differential thermometer, and said measuring and control means including a power supply and power input indicator in circuit with said heating means and said switch.

4,036,052

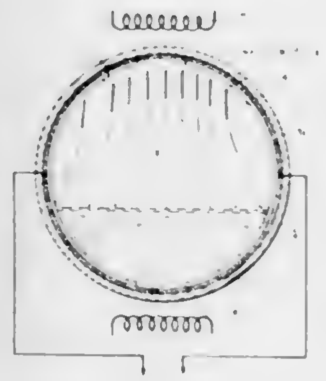
ELECTROMAGNETIC FLOWMETER USABLE IN LESS-THAN-FULL FLUID LINES

John L. Searle, Richboro, Pa., assignor to Fischer & Porter Co., Warminster, Pa.

Filed July 30, 1976, Ser. No. 710,118

Int. Cl.² G01F *1/58*

U.S. Cl. 73—194 EM **7 Claims**



1. An electromagnetic flowmeter for accurately measuring the flow rate of fluid in a fluid line which is normally less-than-full, said flowmeter comprising:

A. a flow tube interposable in said line and provided with a pair of arcuate electrodes in direct contact with said fluid and spanning a substantial portion of the total circumference of the tube to render the electrodes operative with respect to the fluid passing through the tube in a fluid level range whose lowest point is a level close to empty, each electrode having a shape whose total area includes a substantial portion which is disposed adjacent to the bottom of the tube and is therefore always in contact with the fluid passing therethrough regardless of fluid level, whereby the percentage change in the total electrode area due to changes in fluid level are minimized; and

B. electromagnetic means to establish a magnetic field in said tube which is intercepted by said fluid to induce a signal in said electrodes.

4,036,053

METHODS OF AND MEANS FOR MEASURING LIQUID FLOW

Roy Jenkins, 86, All Saints Road, Cheltenham, England

Filed Feb. 27, 1976, Ser. No. 661,993

Claims priority, application United Kingdom, Feb. 28, 1975, 8378/75

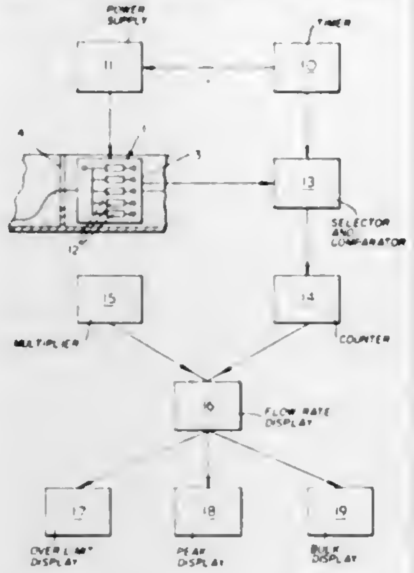
Int. Cl.² G01F *1/68, 23/00*

U.S. Cl. 73—204 **6 Claims**

1. A flowmeter comprising an immersible sensing element and measuring means connected thereto, said sensing element having a plurality of temperature-sensitive circuit components in spaced array for disposition in a conduit or weir so as to be immersed and cooled to an extent dependent on the depth of liquid in the conduit or weir, said measuring means including:

a. a timer which completes a heating circuit for the temperature-sensitive elements for a selected period at selected intervals,

b. a comparator connected to the temperature-sensitive components for differentiating between the components of one temperature state and the components of another temperature state,



c. a counter responsive to the comparator for recording the number of components of one of said temperature states to indicate the depth of immersion of the sensing element and hence the flow rate.

4,036,054

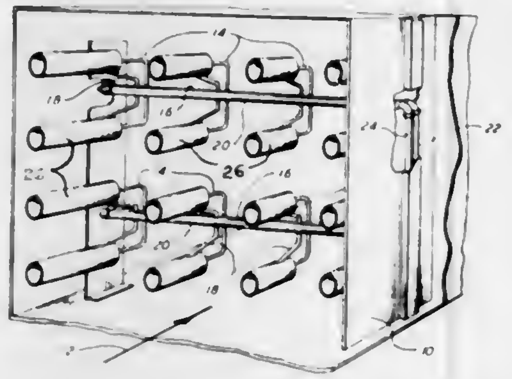
FLUID PRESSURE SENSING APPARATUS

Roger T. Goulet, Liverpool, N.Y., assignor to Cambridge Filter Corporation, Syracuse, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,234

Int. Cl.² G01F *1/46*

U.S. Cl. 73—212 **12 Claims**



1. Apparatus for measuring pressure in an enclosed duct through which a fluid is flowing in a known direction, said apparatus comprising in combination:

a. a plurality of hollow total pressure sensing tubes fixedly supported within the duct and having open ends directed oppositely to the direction of fluid flow;

b. a plurality of hollow air flow straighten tubes open at both ends and supported within the duct and extending longitudinally along the axis thereof; and

c. each of said sensing tubes being arranged with said open ends thereof positioned within one of said straightener tubes, the length of said straightener tubes in the upstream direction from said open end of the associated total pressure sensing tube being equal to at least approximately eight times the largest internal lateral dimension of said straightener tubes.

4,036,055

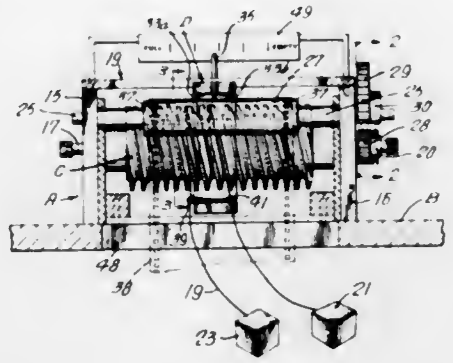
LIQUID LEVEL MEASURING APPARATUS

Bernard H. Engelhardt, Dollard des Ormeaux, and Marcus Mintz, Chomedey, both of Canada, assignors to Bernard J. Engelhardt, Canada

Filed June 3, 1976, Ser. No. 692,379

Int. Cl.² G01F *23/08*

U.S. Cl. 73—312 **8 Claims**



1. A liquid level measuring and recording apparatus comprising;

a record inscribing means and a record retaining means, one of said inscribing means or retaining means being adapted to be rotatably driven relative to said other means, said one means comprising rotating means, said rotating means being rotatable in one direction only;

float means in said liquid adapted to follow the change of level of said liquid level;

first means connecting said float means to said rotatable means said rotatable means being driven when said liquid level is changing in one way, said rotatable means being non-rotatably disposed when said liquid level is changing in the other way;

said first means further connecting said float means to said record inscribing means to move said record inscribing means in a straight line along one direction on said record retaining means when said liquid level is changing is said one way, and for moving said record inscribing means in an opposed direction on said record retaining means when said liquid level is changing in said other way;

whereby,

when said liquid level changes in said other way, a straight line will be inscribed in the one direction on said record retaining means by the motion of record inscribing means on said record retaining means; and

when said liquid level is changing in the one way, a straight line will be inscribed at an angle to said one direction and in the other direction on said record retaining means by the motion of said record inscribing means on said record retaining means.

4,036,056

SINGLE-SLIDE PRESS FOR CARRYING OUT MULTIPLE FUNCTIONS WITH A SINGLE WORK-INPUT STROKE

William T. Saunders, Weirton, W. Va., assignor to National Steel Corporation, Pittsburgh, Pa.

Filed Feb. 23, 1976, Ser. No. 659,994

Int. Cl.² B21D *31/02*

U.S. Cl. 72—329 **8 Claims**

1. Apparatus for use in the manufacture of a cup-shaped can body from flat rolled sheet metal, which manufacture embodies multiple step operations carried out at differing force requirements including at least the steps of cutting a sheet metal blank, clamping the sheet metal blank for drawing, and drawing the sheet metal blank into a cup-shaped can body, comprising

press means having single slide characteristics capable of carrying out such multiple step operations with a single work-input stroke,

such press means including:

frame means defining a longitudinal axis of symmetry for the press means,

fixed bed means, and

a single, work-input, movable slide means,

such slide means being movable toward the fixed bed means in a direction parallel to the longitudinal axis of symmetry,

the fixed bed means including:

a work table surface for supporting flat rolled sheet metal from which a blank is to be cut, such work table surface lying in a plane perpendicular to the longitudinal axis of symmetry,

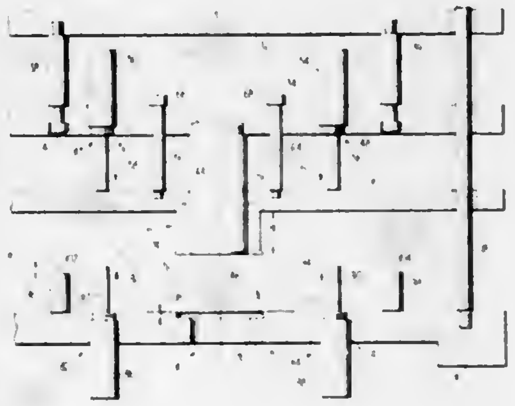
female cutting edge means for cutting a blank from flat rolled sheet metal supported on the work table means,

female drawing die means defining at least one female drawing die opening having a longitudinal axis parallel to the axis of symmetry of the press means and circumscribed by the female cutting edge means,

female clamping surface means for a cut sheet metal blank, located intermediate the female die opening and the female cutting edge means, such clamping surface means lying in a plane perpendicular to the axis of symmetry of the press means, and

counterforce means located to exert force in a direction parallel to such axis of symmetry and opposite to the direction of movement of such slide means toward the fixed bed means;

the single, work-input, movable slide means being subdivided into interrelated substructures including:



a draw punch support plate mounted for movement with such slide means and extending laterally in generally perpendicular relationship to the axis of symmetry of the press,

a clamping plate in longitudinally spaced relationship from the support plate and extending laterally in generally perpendicular relationship to the axis of symmetry,

the clamping plate being mounted for movement with such slide means and for relative longitudinal movement with respect to such support plate, and

male draw punch means mounted on the support plate for movement parallel to the longitudinal axis of the press means, such male draw punch means comprising at least one male plunger,

the clamping plate defining aperture means for longitudinal passage of such male plunger,

male cutting and clamping structure mounted on the clamping plate means to extend longitudinally in the direction of the female cutting and clamping means,

the male cutting and clamping structure including male cutting edge means circumscribing a male clamping surface means, the male clamping surface means lying on a plane perpendicular to the axis of symmetry of the press means and being in circumscribing relationship to the male plunger,

force modifying means connected to such support plate and extending longitudinally toward and contacting the clamping plate to modify the force exerted by the male cutting and clamping structure supported on the clamping plate, such force modifying means exerting a selected force in parallel ralationship to the axis of symmetry, the selected force having a direction which is the same as the direction of movement of the slide means toward the fixed bed means,

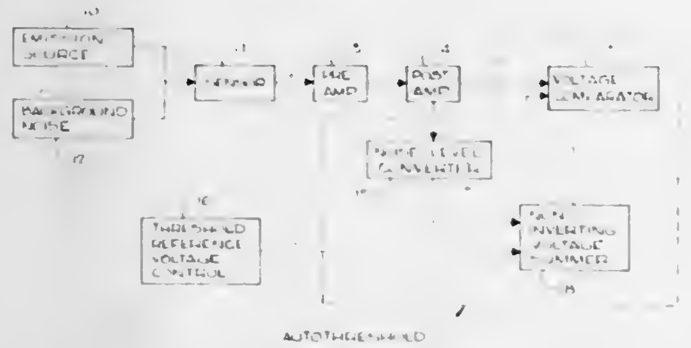
such male plunger, support plate with force modifying means, and the clamping plate with male cutting and clamping structure being movable longitudinally toward the work table means with the male cutting edge means and clamping surface means positioned to contact flat rolled sheet metal supported on the work table surface and, after cutting of a sheet metal blank with a selected force, clamp the sheet metal blank with a force less than such selected cutting force as the clamping plate contacts the counterforce means of the fixed bed means,

the counterforce means permitting longitudinal movement of the clamping plate and the male clamping surface means in the direction of movement of the slide means toward the fixed bed means at such reduced force,

means for limiting longitudinal movement of the clamping plate to a pre-selected distance related to the thickness gage of such sheet metal blank, with

such male plunger being movable longitudinally into and through the female drawing die opening with ejection of the drawn cup-shaped can body being in the direction of movement of such slide means toward the fixed bed means.

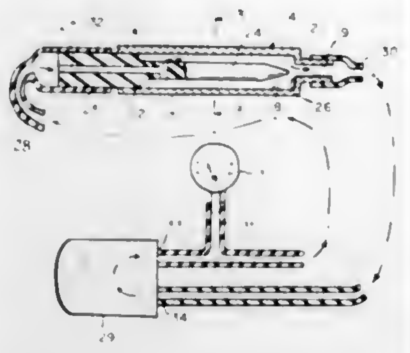
4,036,057
AUTOMATIC THRESHOLD CONTROL MEANS AND THE USE THEREOF
Carroll F. Morais, Sacramento, Calif., assignor to Acoustic Emission Technology Corporation, Sacramento, Calif.
Filed Apr. 15, 1975, Ser. No. 568,277
Int. Cl.² G01N *3/00*
U.S. Cl. 73—88 R **15 Claims**



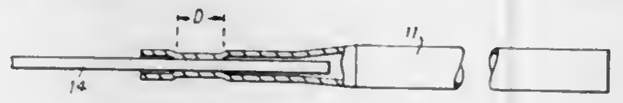
1. An acoustic emission apparatus for the detection and/or location of structural flaws comprising sensor means, and means for receiving signals emitted from said sensor means and for determining the location of flaws in the workpiece being monitored, the improvement comprising an automatically variable threshold voltage level control means connected to said means for receiving signals from said sensor means.

4,036,058
HOT SPOT THERMOMETER
John R. Bodker, Rochester, N.Y., assignor to Qualitrol Corporation, Fairport, N.Y.
Filed Aug. 5, 1976, Ser. No. 711,995
Int. Cl.² G01K *1/08, 5/48*
U.S. Cl. 73—350 **5 Claims**

1. The combination comprising an electrical transformer apparatus having a tank containing cooling fluid in which the coils of a transformer winding are immersed, a thermometer unit having a hollow-ended body of ceramic dielectric material inserted into a space between the coils, the body being connected in a closed circuit filled with gas, a pump connected in the circuit for circulating the gas about the circuit, a heat sensing element of dielectric material arranged in the hollow of the body expanding and contracting in response to temperature changes developing in the transformer winding to cause corresponding variations in the pressure of the circulating gas, and a sight gas pressure gage connected in the circuit adapted to indicate said pressure variations.



4,036,059
THERMAL SYSTEM
Thomas Charles Cliff, St. Austell, England, assignor to United Gas Industries Limited, London, England
Filed Jan. 20, 1976, Ser. No. 650,615
Claims priority, application United Kingdom, Feb. 14, 1975, 6309/75
Int. Cl.² G01K *5/10*
U.S. Cl. 73—368 **5 Claims**

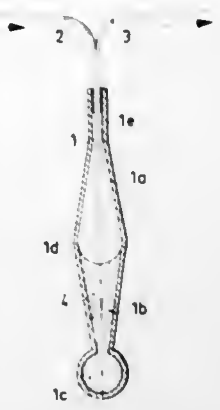


1. A thermal system of the kind comprising a phial for containing mercury and a capillary tube leading from the phial, said system being formed in two parts, one part including the phial and a length of the capillary tube being formed of substantially nickel-free steel and the other part comprising the rest of the capillary tube being formed of stainless steel, the two parts being sealed to one another at a joint made at a point along the length of the capillary tube where it is exposed to a temperature at which the liability to corrosive attack by the mercury is reduced to an acceptable level.

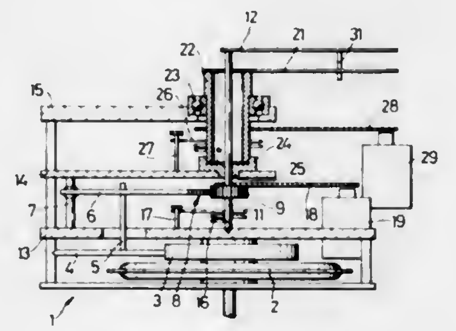
4,036,060
TEMPERATURE MEASURING PROCESS AND PROBE
Alain Deficis, Toulouse - Cedex, France, assignor to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France
Filed Aug. 10, 1976, Ser. No. 713,260
Claims priority, application France, Aug. 13, 1975, 75.25462
Int. Cl.² G01K *5/02*
U.S. Cl. 73—368 **14 Claims**

3. A thermometric probe comprising a closed capillary enclosure internally limited by a revolution surface the directrix of which has a predetermined shape, a liquid which expands under the action of heat contained inside said enclosure so as to form a meniscus inside same, a first optical conductor to bring a beam of light from a source and which penetrates inside the enclosure so that its emitting end is disposed facing

the meniscus, and a second optical conductor to return the reflected light to light analysis means and which penetrates into the enclosure so that its receiving end is disposed facing said meniscus.



4,036,061
BLOOD PRESSURE INDICATOR GAUGE
Blasius Speidel, Hochmeisterstrasse 244, 7453 Jungingen, Germany
Filed June 17, 1975, Ser. No. 587,641
Int. Cl.² A61B *5/02*
U.S. Cl. 73—410 **21 Claims**



1. A blood pressure indicator gauge designed for the measurement and the temporary recording of the systolic and/or the diastolic blood pressure of a patient as a component part of a blood pressure measuring apparatus which includes means for generating first and second electrical electrical signals at the instances at which said systolic and diastolic pressures are established, respectively, inside a measuring sleeve of the apparatus, the indicator gauge comprising in combination:

a gauge housing;

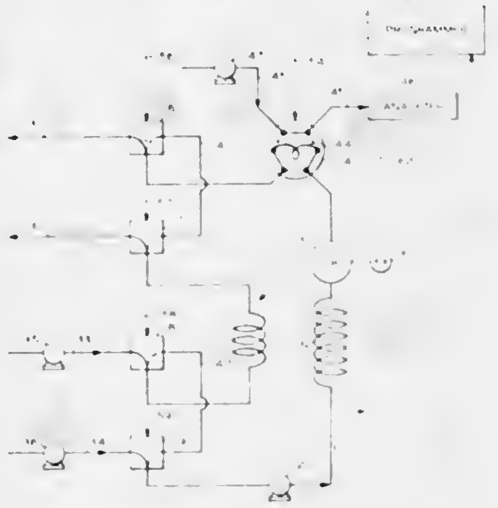
a pointer shaft rotatably journalled in the housing and carrying a pointer attached to one of its extremities;

a return spring connected to the pointer shaft so as to rotationally bias the latter in the direction of a return movement;

a pressure capsule adapted for pressure communication with the measuring sleeve of the apparatus and including mechanical capsule movement translating means which operatively engage the pointer shaft so as to angularly advance the latter in a pushing action in opposition to the rotational return movement bias of the return spring, when the capsule expands in response to a pressure increase; and

means for blocking a spring-driven pointer return movement in any pointer position within an angular pressure measurement range, in response to the reception from the apparatus of one of said electrical signals; said pointer blocking means comprising; a first blocking member mounted on the pointer shaft, at a distance from said pointer, for rotation therewith, said blocking member having a generally flat planar surface; a non-rotatable second blocking member supported by the housing so as to be normally positioned a minimal distance from the first blocking member in all positions of the latter within said pressure measurement range; said first and second blocking members being engageable against each other, in response to said one electrical signal, thereby arresting the first blocking member and the shaft and pointer to which member is attached.

4,036,062
SAMPLE DILUTION
Charles G. Cruzan, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 31, 1976, Ser. No. 719,216
Int. Cl.² G01N *1/10*
U.S. Cl. 73—422 GC **18 Claims**



1. Apparatus comprising:

first conduit means having a passageway therethrough with a first internal volume;

second conduit means having a passageway therethrough with a second internal volume, said second internal volume having a predetermined size relationship to said first volume;

fluid oscillator means, forming at least a portion of at least one of said first and second conduit means, for imparting flow oscillation to at least a portion of the fluid passing therethrough;

means for filling said passageway of said first conduit means with a diluent liquid;

means for filling said passageway of said second conduit means with a sample material;

means for connecting said passageway to said first conduit means and said passageway of said conduit means to form a closed conduit loop; and

means for circulating said diluent liquid and sample material through said conduit loop to cause mixing thereof.

4,036,063
SAMPLE DILUTION
Lewis B. Roof, and Grady T. Porter, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.
Filed Aug. 31, 1976, Ser. No. 719,215
Int. Cl.² G01N *1/10*
U.S. Cl. 73—422 GC **16 Claims**

1. Apparatus comprising:

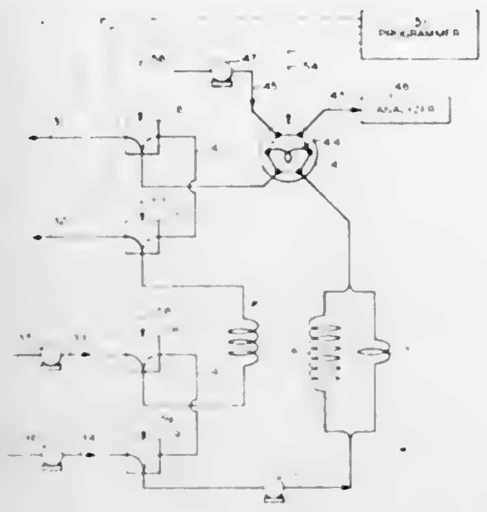
first conduit means having a passageway therethrough with a first internal volume;

second conduit means having a passageway therethrough with a second internal volume, said second internal volume having a predetermined size relationship to said first internal volume;

parallel flow passageway means forming at least a portion of at least one of said first and second conduit means for providing at least two parallel passageways having different flow transmission time characteristics through at least a portion of the associated conduit means;

means for filling said passageway of said first conduit means with a diluent liquid;

means for filling said passageway of said second conduit means with a sample material;

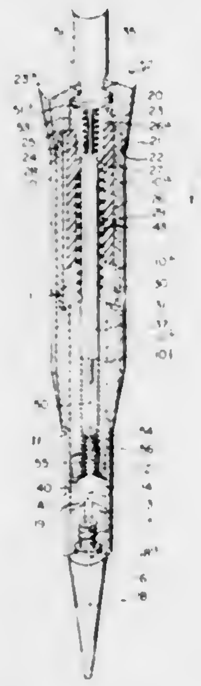


means for connecting said passageway of said first conduit means and said paassageway of said second conduit means to form a closed conduit loop; and

means for circulating said diluent liquid and sample material through said conduit loop to cause mixing thereof.

4,036,064
PIPETTE DEVICE

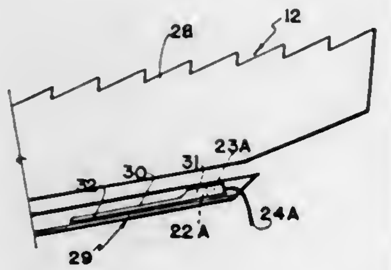
Steven J. Hydo, Wellington, Ohio, assignor to Gilford Instrument Laboratories, Inc., Oberlin, Ohio
Filed Sept. 11, 1975, Ser. No. 612,351
Int. Cl.² B01L *3/02*
U.S. Cl. 73—425.6 **33 Claims**



1. A pipette device for providing analysis of single samples of liquids comprising an elongated body having a chamber for holding liquids therein, a probe tip on one end of said body and having a passageway defining the inlet and outlet for said chamber, a primary plunger assembly movable disposed in said chamber and actuatable to aspirate and expel liquids from said chamber, said primary plunger assembly being actuatable in a first direction into said chamber to define zero chamber volume and actuatable in a second direction to aspirate a predetermined volume of a first liquid material into said passageway of said probe tip and into said chamber to substantially fill said chamber, a second plunger assembly disposed within said body and actuatable in said first direction to expel a predetermined portion of said first liquid material from said chamber, said second plunger assembly being actuatable in said second direction to effect the aspiration of a second liquid into the inlet of said chamber, and said actuator being thereafter actuatable in said first direction to expel both said first and second liquids from said chamber.

4,036,065
GRAIN LOSS MONITOR

William P. Strelioff; William S. Elliott, and Dale Johnson, all of Saskatoon, Canada, assignors to Senstek Ltd., Saskatoon, Canada
Filed May 11, 1976, Ser. No. 685,282
Int. Cl.² G01N *29/00*
U.S. Cl. 73—432 R **11 Claims**

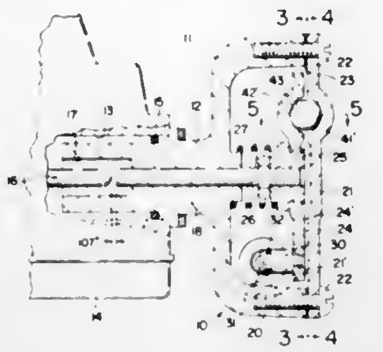


1. A grain loss monitor device for combines and the like which includes a sieve component and a straw walker assembly for separating threshed grain from straw, chaff and the like; comprising in combination a sensor component situated adjacent the rear end of the sieve component, said sensor component including pick-up and support means spanning said sieve component adjacent the rear end thereof and spaced above said rear end, and a plurality of substantially vertical sensing fingers secured to said pick-up and support means and depending therefrom in spaced relationship across the rear end of the sieve component, said fingers extending downwardly from said pick-up and support means to adjacent the rear end of said sieve component whereby a constant percentage of grain passing over said sieve component impinges upon said fingers, electrical transducer means in said pick-up and support means responsive to said impingement of grain, electrical amplifying means operatively connected to said transducer means and detector means operatively connected to said amplifying means, said detector means detecting a range of amplitudes of voltage spikes above a pre-determined amplitude, the range of amplitudes including voltage spikes developed from said grain impingement, a pulse generating circuit connected to the amplitude detecting circuit and responsive to the detected voltage spikes to generate square wave pulses and a measuring circuit connected to said pulse generating circuit.

4,036,066
TRANSMISSION MODULATOR VALVE CONTROL

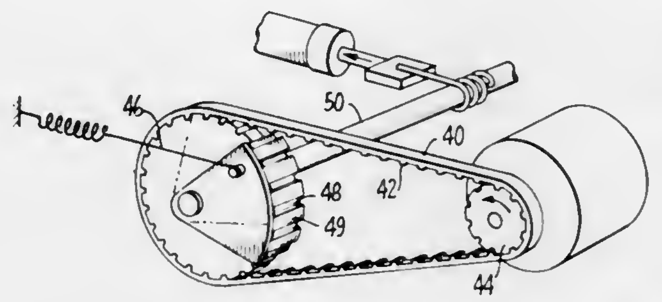
Richard D. Houk, Stow, Ohio, assignor to Samuel Moore and Company, Aurora, Ohio
Filed Apr. 21, 1976, Ser. No. 678,726
Int. Cl.² F16H *25/08*
U.S. Cl. 74—55 **17 Claims**

1. An actuator for applying linear force to the push pin of an automatic transmission modulator valve to automatically change shift speeds in direct proportion to engine load demands, comprising interfacing rotary and stationary cam plates having circumferentially arranged opposed complementary cam surfaces, anti-friction elements between and contacting said surfaces, and means operatively connecting said rotary cam plate to the engine throttle for applying rotary force to said rotary plate, said rotary plate transmitting an increased value of said force linearly to said push pin in direct proportion to the travel of the throttle.



4,036,067
INTEGRAL REVOLUTION CLUTCH

Alexander D. R. Walker, Mt. View, Calif., assignor to N-Dimensions, Inc., Cupertino, Calif.
Filed Sept. 8, 1975, Ser. No. 611,125
Int. Cl.² F16H *27/00*
U.S. Cl. 74—112 **6 Claims**



1. An integral revolution clutch comprising:

a continuously rotatable drive pulley;

a driven shaft;

a secondary pulley mounted for free rotation about the axis of the driven shaft;

belt means engaging both said drive pulley and said secondary pulley to rotate said secondary pulley continuously said belt means engaging only a portion of the driving face of said secondary pulley;

a segment member aligned with a portion of the driving face of said secondary pulley, said member having an arcuate length of less than 180°, said segment member being fixed to said driven shaft and normally lying over only that portion of the driving face of said secondary pulley not engaged by said belt means;

stop means normally preventing rotation of said driven shaft;

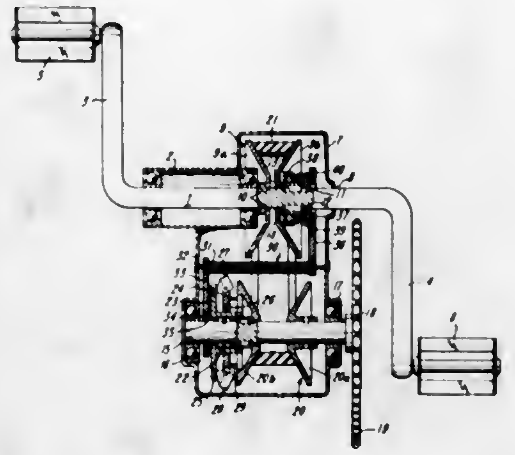
bias means urging said driven shaft against said stop means, in the direction of rotation of the secondary pulley;

stop release means for releasing said stop means whereby said bias means urge said segment member into engagement with said belt, causing said belt to rotate said segment and said driven shaft;

and stop restoration means for restoring said stop means to interrupt rotation of said segment member and said driven shaft after an integral number of revolutions.

4,036,068
ENCAPSULATED TRANSMISSION UNIT

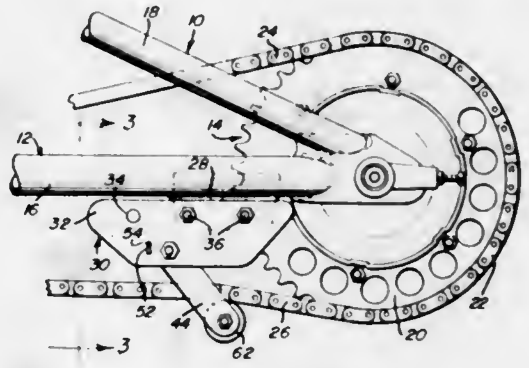
Robert B. Gilbert, 443 Hazelhurst St., New Lebanon, Ohio 45345
Division of Ser. No. 346,625, March 30, 1973, Pat. No. 3,948,112. This application Jan. 20, 1976, Ser. No. 650,797
Int. Cl.² F16H *55/52*
U.S. Cl. 74—230.17 E **18 Claims**



1. A transmission unit comprising an input shaft, an output shaft, adjustable drive means through which said input shaft drives said output shaft, means associated with one of said shafts and responsive to the rotational speed thereof, said responsive means being operatively related to said drive means to adjust the transmission ratio between said input and output shafts in response to changes in rotational speed of said one of said shafts, a housing for said apparatus and means connecting said output shaft in a driving relation to said housing.

4,036,069
MOTORCYCLE CHAIN GUIDE AND TENSIONER

Dwaine H. Clark, 8421-23 Rosemead Blvd., Pico Rivera, Calif. 90660
Filed Apr. 13, 1976, Ser. No. 676,547
Int. Cl.² G01F *3/14*
U.S. Cl. 74—242.1 TA **10 Claims**

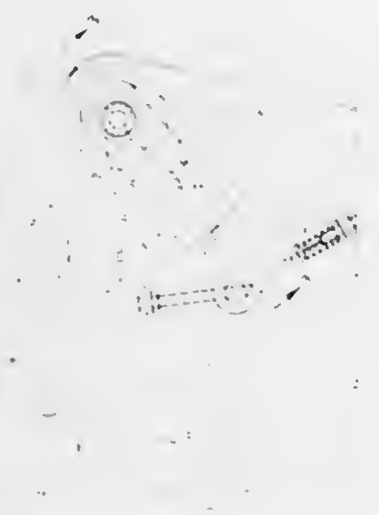


1. A chain tensioner and guide assembly for a motorcycle and in particular for a motorcycle of the type including swing arm suspension for the rear wheel of the motorcycle, said assembly including a single upstanding mounting plate having a generally horizontal upper marginal edge portion, said upper marginal portion including means adapting said plate for rigid support from a depending mount flange extending along an associated swing arm with upper marginal portion lapped over at least the lower marginal portion of said mount flange, an elongated pivot shaft having one end portion thereof removably rigidly secrued through said plate with the other end portion of said pivot shaft projecting laterally outwardly of said plate, a pair of parallel arms having a first pair of corresponding ends mounted on said other end portion of said pivot shaft at points spaced therealong, said plate including a lower

marginal edge portion, the other pair of corresponding ends of said arms projecting downwardly below said lower marginal edge portion and having axle means extending and connected therebetween, a roller journaled on said axil means between said other pair of arm ends and spring means operatively connected between said plate and one of said arms for yieldingly biasing said arms in one direction of angular displacement about said pivot shaft relative to said plate.

4,036,070
SLACK BELT CLUTCH

Roy George Knight, Thebarton, Australia, assignor to Scott Bonnar Limited
Filed July 15, 1976, Ser. No. 705,625
Int. Cl.² F16H *7/08, 7/10*
U.S. Cl. 74—242.7 **7 Claims**

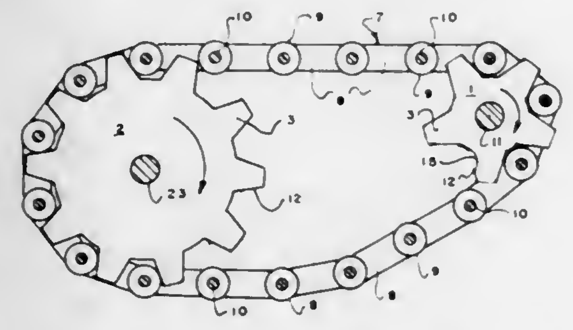


1. A slack belt clutch wherein a belt extends between a driving and a driven pulley, and clutch actuating means operatively engage the belt or at least one of said pulleys, the clutch actuating means being operable either to tighten the belt to engage said pulleys with sufficient belt tension to engage drive therebetween, or alternatively to loosen the belt so that the belt disengages said drive,

comprising a belt lift device engageable against the belt, and coupling means coupling the belt lift device to the clutch actuating means, being so constructed and arranged that actuation of the clutch to cause the belt to be loosely coupled to the pulleys in turn causes the belt lift device to lift the belt from contact with the driving pulley.

4,036,071
SPROCKET AND METHOD FOR PRODUCING SAME

Oliver R. McKnight, Bossier City, and William M. Seaman, Jr., Shreveport, both of La., assignors to Hollis and Company, Caddo, La.
Filed Apr. 2, 1976, Ser. No. 673,284
Int. Cl.² F16H *55/30, 55/06;* **B21D** *53/26;* **B21K** *1/28*
U.S. Cl. 74—243 R **5 Claims**



1. A method of producing a template profile for a sprocket comprising:

a. selecting a sprocket face width, number of sprocket teeth, chain pitch and chain barrel diameter for a selected sprocket application;

b. laying out the sprocket center;

c. calculating a pitch diameter by dividing said chain pitch by the trigonometric function: sin (180° ÷ number of sprocket teeth selected);

d. inscribing a pitch circle about said sprocket center using said pitch diameter;

e. forming a regular polygon within said pitch circle, said polygon having chordal lines corresponding to the length of said chain pitch;

f. laying out additional lines corresponding in length to said pitch diameter and running through said sprocket center connecting pitch points formed by coincidence of said chordal lines with the intersections of said chordal lines of said regular polygon;

g. laying out first reference lines through said pitch points perpendicular to said additional lines connecting said pitch points and tangent to said pitch circle at said pitch points;

h. calculation of a loading curve angle by adding: 40° + (60° ÷ said number of sprocket teeth selected);

i. laying out second reference lines through said pitch points along said first reference lines and rotated from said first reference lines through said loading curve angle at said pitch points;

j. establishing loading curve center point distances from said pitch points along said second reference lines by multiplying 0.9 × (said chain barrel diameter + 0.18);

k. laying out loading curve center points by measuring said loading curve center point distance along said second reference lines from said pitch points;

l. calculating clearance curve radii by adding 0.18 to said chain barrel diameter and dividing by 2;

m. laying out clearance curves from said clearance curve radii by inscribing an arc from each of said pitch points through said additional lines corresponding to said pitch diameter to form the fillets of said template;

n. laying out loading curves by inscribing an arc from each of said loading curve center points, continuing said clearance curves to form the tooth shoulders of said template;

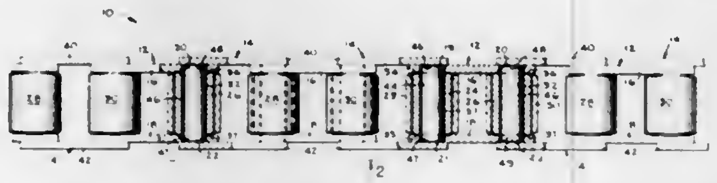
o. calculating topping curve center point distances by the formula: 1.2 × (2 × said clearance curve radius);

p. locating topping curve center points by laying off said topping curve center point distances along said chordal lines from said pitch points; and

q. laying out topping curves from said topping curve center points by extending said loading curves on each of said shoulders of said template until said topping curves meet.

4,036,072
WELDED STEEL ROLLER CHAIN

John F. McKeon, Carmel, Ind., and Roy E. Lambert, Englewood, Fla., assignors to FMC Corporation, San Jose, Calif.
Filed June 12, 1975, Ser. No. 586,472
Int. Cl.² F16G *13/02, 13/06*
U.S. Cl. 74—245 R **4 Claims**



1. In a roller chain having alternately interconnected roller links and pin links, said roller links being provided with axially bored bushings extending between roller link side bars,

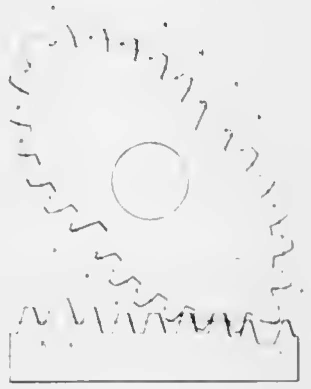
each said pin link having a pair of laterally spaced imperforate side bars extending longitudinally of the chain on opposite sides, said side bars having inside and outside faces, with said inside faces lying adjacent the ends of said roller link side bars,

a pair of pins extending transversely of the chain between said pin link side bars with each said pin extending through a pair of roller link side bars and a respective roller link bushing, said pins being substantially cylindrical with curved side surfaces therealong and at the end portions thereof,

and welds fusing said pin link side bars to said pins at the end portions thereof, respectively, with said pin link side bars being free of welds on the outside faces thereof remote from said roller link ends.

4,036,073
ELLIPTIC GEAR WHEEL

Akitoshi Kitano, Horinouchi 1403, Hayama, Miura, Kanagawa, Japan
Filed Dec. 10, 1975, Ser. No. 639,455
Claims priority, application Japan, Dec. 10, 1974, 49-141673
Int. Cl.² F16H *35/02, 1/04, 55/04, 55/06*
U.S. Cl. 74—393 **13 Claims**



1. In a flow meter, driving pump or the like, the combination of a first gear rotor and a second gear rotor, both mounted for rotation about their centers operatively positioned with their teeth in mesh for all angular positions of each of said gears, in which one of said rotors has a pitch circle defined by a curve obtained so that at the polar coordinates, when *a, b* and *c* represent numbers relating to the length, *d* represents a positive number from zero to 1 and *x* represents an independent variable, and the length of a radius vector ρ_1 is obtained by the following formula:

$$\rho_1 = a + \cos 2x \left\{ \frac{c \cdot d^2 \left|\sin^2 2x\right|}{(1 - d^2\cos^2 2x)^2} - b \right\} \tag{1}$$

and assuming that μ represents the number determined by *a, b, c,* and *d,* then the directional angle θ_1 of the vector ρ_1 is obtained by the following formula:

$$\theta_1 = \frac{1}{\mu} \quad \frac{dx}{\rho_1} \tag{2}$$

and the other rotor has a pitch circle engaging said first-mentioned pitch circle and defined by a second curve so obtained that at the polar coordinates, the length of a radius vector ρ_2 is obtained by the following formula:

$$\rho_2 = a - \cos 2x \left\{ \frac{c \cdot d^2 \left|\sin^2 2x\right|}{(1 - d^2\cos^2 2x)^2} - b \right\} \tag{3}$$

and the direction angle

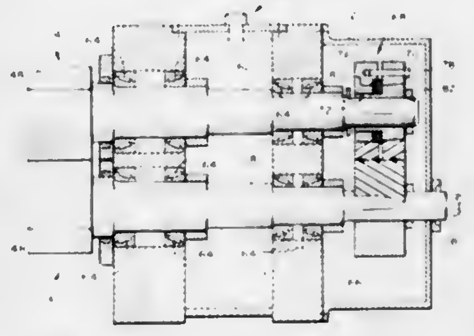
-continued

$$\theta_2 = \frac{1}{\mu} \quad \frac{dx}{2} \tag{4}$$

and the tooth form on the longer and shorter radius portions of each of said pitch circles having a greater tool pressure angle than that of the tooth form on the intermediary portion between said longer and shorter radius portions along the pitch circle.

4,036,074
ANTI-BACKLASH GEAR SYSTEM

Ernest Robert Bodnar, R.R. 1, Kingsworth Road, Kingcross Estates, King City, Ontario, Canada
Filed Oct. 1, 1975, Ser. No. 618,630
Int. Cl.² F16H *55/18, 35/08*
U.S. Cl. 74—409 **3 Claims**



1. An anti-backlash gear system for use between a drive shaft and a driven shaft and wherein one said shaft is provided with a gear having helical teeth thereon, said anti-backlash system comprising;

a gear portion fixed to the other said shaft, and having helical teeth meshing with said helical gear, said gear portion having a width less than the width of said helical gear;

a movable gear portion, slidably mounted on said shaft, and being slidable therealong from a spaced apart initial position towards said fixed gear portion into backlash take up relation, said movable gear portion having a width less than that of said helical gear, and having helical teeth meshing therewith;

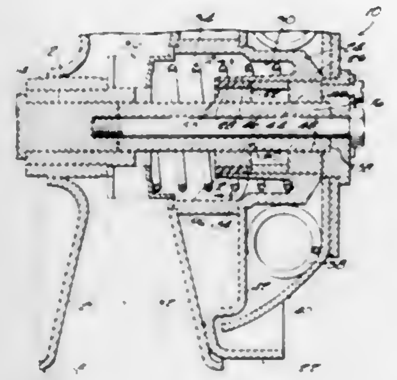
spring means engaging said movable gear portion, and urging the same normally away from said fixed gear portion, and,

adjustable means for moving said movable gear portion towards said fixed gear portion, against the pressure of said spring into said backlash take up relation thereto.

4,036,075
VARIABLE SPEED POWER TRANSMISSION INCLUDING MEANS FOR MINIMIZING BACKLASH

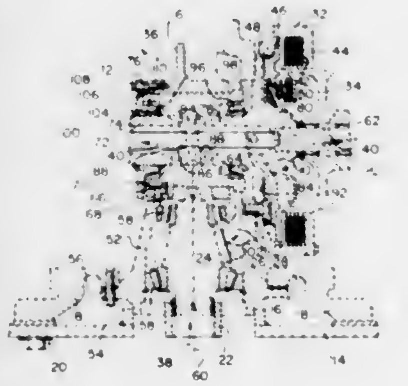
George G. Lassanske, Oconomowoc, Wis., assignor to Outboard Marine Corporation, Waukegan, Ill.
Filed May 5, 1976, Ser. No. 683,625
Int. Cl.² F16H *55/18*
U.S. Cl. 74—409 **9 Claims**

1. A power transmission comprising a shaft adapted for connection to a power source and having a driving portion, a fixed member affixed on said shaft and having a flange, a movable member having a flange and a hub having a bore, drive means carried by said hub bore mounting said movable member on said shaft driving portion with said flanges of said fixed and movable members in facing relationship for common rotation of said movable member with said shaft and for axial movement of said movable member on said shaft between a position spaced from said fixed member to provide a neutral drive condition and a position adjacent said fixed member to provide a power transmitting condition, said drive means comprising axially spaced first and second bushings each having a central aperture which receives said shaft driving portion and has driven surfaces which are drivingly engaged by said shaft driving portion during rotation of said shaft by said power source, said first bushing being affixed to said hub bore, and means for resiliently urging said second bushing rotationally relative to said first bushing, whereby portions of said driven surfaces of said first and second bushings apply a predetermined torque on said shaft driving portion to thereby minimize backlash between said movable member and said shaft driving portion, biasing means urging said movable member toward said spaced position, and means operable in response to rotation of said shaft for overpowering said biasing means and moving said movable member to said adjacent position.



4,036,076
GEAR ADJUSTING, LOCKING, AND PRE-LOADING MEANS

John C. Anderson, Brookfield, Ill., assignor to International Harvester Company, Chicago, Ill.
Filed Feb. 25, 1976, Ser. No. 661,239
Int. Cl.² F16H *55/18, 1/14*
U.S. Cl. 74—409 **10 Claims**

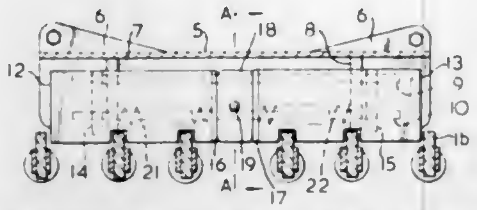


1. A relatively axially slideable pair of relatively non-rotatable members disposed one within another having:
  first locking means comprising a thrust washer and engaging both members with opposite force tending to create axial slide motion; and
  second adjusting means comprising a nut engaging both members and pre-loaded to prevent slide motion.

4,036,077
SAFETY DEVICE FOR LOCKING A PLURALITY OF OPERATION LEVERS

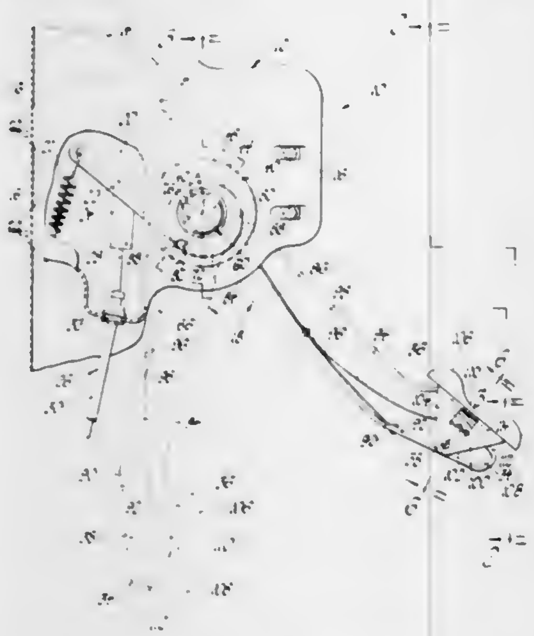
Takayuki Akiyama, Sagamihara, Japan, assignor to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan
Filed Feb. 6, 1976, Ser. No. 655,952
Claims priority, application Japan, Mar. 13, 1975, 50-30456
Int. Cl.² G05G *5/00*
U.S. Cl. 74—526 **8 Claims**

1. A safety device for locking a plurality of operation levers, the device comprising a frame on which the levers are mounted for pivotal movement with respect thereto, two lock plates mounted side by side on the frame for movement towards and away from one another between locked and unlocked positions of the device in response to rotary movement of a cam disposed therebetween; a respective link pivoted to each of the levers having its free end supported for linear reciprocal movement in response to the pivotal movement of the respective lever, the link having an engaging portion which co-operates with an engaging portion on the respective lock plate on movement of the lock plate towards the locked position to lock the link against the said reciprocal movement.



4,036,078
BRAKE PEDAL POSITIONING MECHANISM

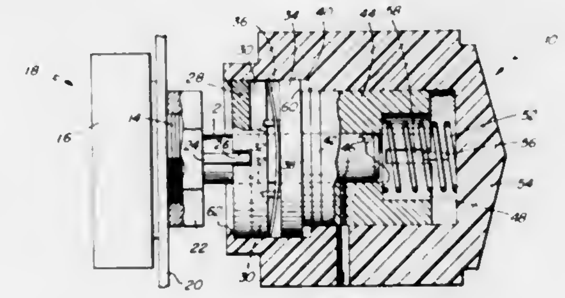
Anthony A. Muehling, 14583 Maddelein, Detroit, Mich. 48205
Filed June 3, 1976, Ser. No. 692,418
Int. Cl.² G05G *5/22, 1/16*
U.S. Cl. 74—529 **15 Claims**



1. A vehicle parking brake pedal positioning mechanism comprising: a frame adapted for mounting on a vehicle body; a parking brake pedal mounted on the frame for movement about a pivotal axis between a released position and an actuated condition; said frame including a first cam surface extending about the pivotal axis and including a portion having increasing radii therefrom moving in a direction corresponding to the direction of brake pedal movement from the released position to the actuated condition; a locking member mounted on the frame for pivotal movement about the pivotal axis and including a second cam surface having a portion with increasing radii from the pivotal axis in the same direction as the first cam surface portion; a slide mounted for pivotal movement with the brake pedal and for sliding movement relative thereto; said slide including first and second opposite ends respectively engaged in a slidable manner with the first and second cam surface portion such that movement of the pedal from the released position to the actuated condition pivotally moves the slide into a locking relationship between the cam surface portions and thereby positions the pedal in the actuated condition in an infinite position manner against movement toward the released position; spring means for normally biasing the locking member about the pivotal axis to maintain an engaged condition between the second end of the slide and the second cam surface portion on the locking member; and release means for selectively pivoting the locking member about the pivotal axis in a direction opposite to the normal bias of the spring means so as to permit the pedal to move to the released position.

4,036,079
BRAKE LOCK KNOB ASSEMBLY

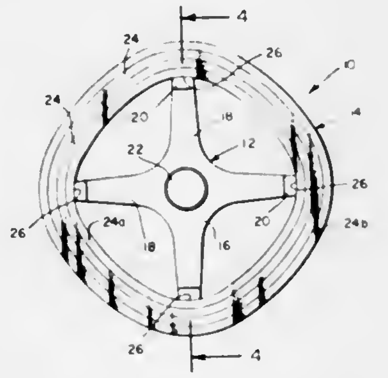
Albert R. Pratt, Weston, Mass., assignor to Raytheon Company, Lexington, Mass.
Filed May 3, 1976, Ser. No. 682,436
Int. Cl.² G05G *5/06, 1/10*
U.S. Cl. 74—531 **10 Claims**



1. A control knob assembly for mounting on an end portion of a rotatable shaft and comprising:
  a bushing disposed to encircle the end portion of the shaft and having first interlocking means for transmitting rotational movement to the shaft, the bushing also being provided with first frictional means for preventing rotational movement of the shaft;
  a nonrotatable member disposed adjacent the bushing and having second frictional means disposed to releasably engage the first frictional means for locking the shaft in a preselected angular position;
  a cup-shaped knob shell coaxially disposed with respect to the bushing, the shell having releasing means for disengaging the frictional means and having second interlocking means for transmitting rotational movement to the shaft; and
  spring means disposed between the bushing and the shell for resiliently positioning the shell in predetermined relationship with the bushing.

4,036,080
MULTI-RIM FLYWHEEL

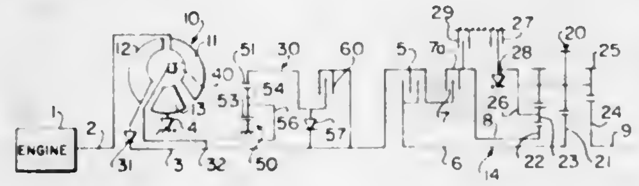
Johan A. Friedericy, Palos Verdes Estates, and Dennis A. Towgood, Huntington Beach, both of Calif., assignors to The Garrett Corporation, Los Angeles, Calif.
Filed Nov. 29, 1974, Ser. No. 528,388
Int. Cl.² F16F *15/30;* **F16C** *15/00;* **H02K** *7/02*
U.S. Cl. 74—572 **27 Claims**



3. A flywheel comprising hub means having a plurality of spokes, and a plurality of nested rims positioned on said spokes, said rims having a noncircular configuration when said flywheel is at rest and having a substantially circular configuration when said flywheel is spinning at a preselected speed.

4,036,081
OVERDRIVE MECHANISM FOR AUTOMOTIVE POWER TRANSMISSION

Kiyoshi Onuma, and Syuji Nagano, both of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed June 25, 1975, Ser. No. 590,130
Claims priority, application Japan, Mar. 6, 1975, 50-26544
Int. Cl.² F16H *3/04, 47/08, 57/10*
U.S. Cl. 74—781 R **6 Claims**



1. An improved automatic transmission with an overdrive device for an engine having a driving member comprising:
  a. a change gear mechanism having:
    i. an input shaft,
    ii. a planetary gear train, and
    iii. a plurality of frictional engagement means for interconnecting said input shaft to said planetary gear train;
  b. a torque converter having:
    i. a pump impeller connected to the driving member of the engine,
    ii. a turbine runner connected to said input shaft of said change gear mechanism,
    iii. a stator located between said pump impeller and said turbine runner, and
    iv. a converter housing for enclosing said pump impeller, said turbine runner, and said stator in fluid flow relationship therein;
  c. an overdrive device positioned outside of said converter housing between said torque converter and said change gear mechanism, said device having:
    i. an overdrive gear train including a sun gear affixed to the housing of said automatic transmission, a carrier responsive to said pump impeller, a ring gear, and a pinion rotatably supported by said carrier and engaging said ring gear and said sun gear, said ring gear thereby being responsive to said pump impeller and rotating at a higher speed than said pump impeller,
    ii. overdrive clutch means connected to said input shaft of said change gear mechanism outside of said converter housing and activated in response to the operation of said change gear mechanism for engaging said ring gear whereby said input shaft of said change gear mechanism rotates with said ring gear in response to movement of said pump impeller, and
    iii. an intermediate shaft rotatably and co-axially disposed around said input shaft of said change gear mechanism having a first end connected to said pump impeller in said converter housing and a second end extending out of said converter housing and connected to said carrier; and
  e. a one-way clutch connecting said turbine runner to said input shaft, said one-way clutch decoupling said shaft from said turbine runner when the speed of said input shaft exceeds that of said turbine runner.

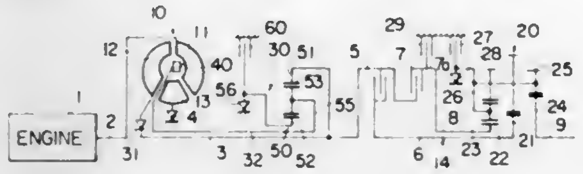
4,036,082
OVERDRIVE DEVICE

Kiyoshi Onuma, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 18, 1975, Ser. No. 588,045

Int. Cl.² F16H *3/04. 47/08. 57/10*

U.S. Cl. 74—781 R **6 Claims**



1. An improved automatic transmission with an overdrive device for an engine having a driving member comprising:

- a. a change gear mechanism having:
  - i. an input shaft,
  - ii. a planetary gear train, and
  - iii. a plurality of frictional engagement means for interconnecting said input shaft to said planetary gear train;
- b. a torque converter having:
  - i. a pump impeller connected to the driving member of the engine,
  - ii. a turbine runner connected to said input shaft of said change gear mechanism,
  - iii. a stator located between said pump impeller and said turbine runner, and
  - iv. a converter housing for enclosing said pump impeller, said turbine runner, and said stator in fluid flow relationship therein;
- c. an overdrive device positioned outside of said converter housing between said torque converter and said change gear mechansim, said device having:
  - i. an overdrive gear train including a sun gear, a carrier responsive to said pump impeller, a ring gear connected to said input shaft of said change gear mechanism for rotation therewith, and a pinion rotatably supported by said carrier and engaging said ring gear and said sun gear, said sun gear thereby being rotated by said carrier,
  - ii. overdrive brake means outside of said converter housing and activated in response to the operation of said change gear mechanism for locking said sun gear against rotation whereby said ring gear is rotated by movement of said carrier in response to movement of said pump impeller, and
  - iii. an intermediate shaft rotatably and co-axially disposed around said input shaft of said change gear mechanism having a first end connected to said pump impeller in said converter housing and a second end extending out of said converter housing and connected to said carrier; and
- d. a one-way clutch connecting said turbine runner to said input shaft, said one-way clutch decoupling said shaft from said turbine runner when the speed of said input shaft exceeds that of said turbine runner.

4,036,083
DRIVE ENGAGEMENT PRESSURE CONTROL BY TRIMMER BIAS CONTROL

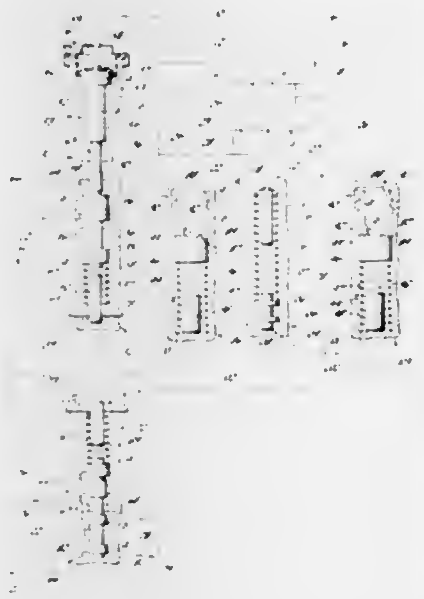
Ted M. McQuinn, Carmel, Ind., assignor to General Motors Corporation, Detroit, Mich.

Filed Aug. 28, 1974, Ser. No. 501,247

Int. Cl.² B60K *41/18*

U.S. Cl. 74—867 **5 Claims**

1. In a drive and drive engagement control: fluid pressure engaged drive establishing friction means operative in response to engagement pressure for engaging to establish a drive; a source of fluid pressure; drive control means selectively supplying fluid engagement from said source to said friction means for establishing a drive; torque demand means providing a torque demand signal proportional to torque demand from idle to full torque demand; bias signal means operatively connected to said torque demand means and being controlled to provide a biasing signal having an increasing value from a minimum value to a maximum value proportional to torque demand from idle to full torque demand, to provide substantially said minimum value at all torque demand values and to increase from substantially said minimum value to said increasing value; trimmer regulator valve means connected to said friction means and having biasing means connected to said bias signal means and operative in response to the supply of engagement pressure to said friction means for controlling the engagement pressure in said friction means to provide, at idle torque demand, the minimum value biasing signal acting on said biasing means, and an initial minimum value engagement pressure permitting slip at minimum idle drive torque and the engagement pressure increasing at a low rate relative to time over a predetermined trimming time period to an intermediate engagement pressure value providing non-slip drive at maximum idle drive torque and at higher to full torque demand initially controlling said bias signal means to provide substantially said minimum value biasing signal providing substantially said same initial minimum value engagement pressure at all torque demand values and progressively increasing said biasing signal value and the engagement pressure value at a higher rate relative to time and to higher values proportional to higher to full torque demand in a significant large initial portion of said time period and then from said higher values increasing engagement pressure substantially at said same low rate to a maximum engagement pressure proportional to higher to full torque demand providing non-slip drive at higher to full drive torque.



4,036,084
APPARATUS FOR REMOVING AND REPLACING SPIRAL SPRINGS IN CLOCK BARRELS

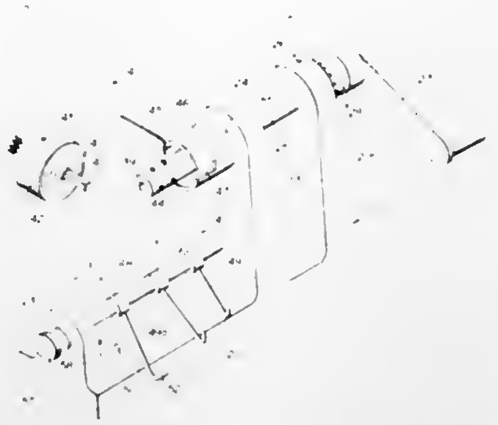
Marvin D. Schirmer, 05598 Levage Drive, Florence, Oreg. 97439

Filed Aug. 25, 1976, Ser. No. 717,536

Int. Cl.² G04D *3/00;* **B23P** *19/04*

U.S. Cl. 81—7.5 **11 Claims**

1. Apparatus for removing clock springs from their mountings and for replacing the springs after servicing, said apparatus comprising a support body, a spring winding and unwinding rotary shaft journaled on the support, reversible locking means for said rotary shaft to lock the same against retrograde movement selectively in opposite directions, said rotary shaft having coupling means adapted for connection releasably with a clock spring arbor, at least one transfer sleeve having an end slot adapted for placement over the rotary shaft, a second shaft parallel to the rotary shaft on said support body and spaced laterally from the rotary shaft, and at least one clock spring end engaging and securing hook on said second shaft and shiftable axially and circumferentially thereon to selected positions of use.



4,036,085
HANDLE STRUCTURE FOR PERCUSSIVE TOOLS

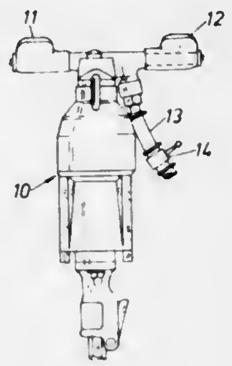
Fritiof Stig Sjöstrand, Los Angeles, Calif.; Anders Gunnar Rudolf Lundmark, Stockholm, and Gosta Ivar Ekstrom, Nacka, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Filed Feb. 18, 1976, Ser. No. 659,033

Claims priority, application Sweden, Feb. 18, 1975, 7501818

Int. Cl.² B25B *19/00*

U.S. Cl. 81—52.3 **25 Claims**



1. A handle structure for a hammer tool, said hammer tool recoiling when delivering impacts to a work surface, comprising:

- a handgrip **(11, 12)** for applying pressure thereon so as to force the tool against a material to be worked, said handgrip **(11, 12)** including a wing-shaped portion **(16)**, said wing-shaped portion **(16)** projecting toward an operator, the upper side of said wing-shaped portion providing a support for the palm, thereby forming a main pressure surface;
- means for pivotally connecting said handgrip to the tool at a forward portion of the handgrip, said forward portion being turned away from the operator and said wingshaped portion extending eccentrically relative to said pivotal connecting means so that recoil forces of the tool are applied eccentrically relative to the hinge of the wrist of an operator; and
- a lift surface provided in front of said pressure surface, said lift surface resting against the hand of an operator during lifting of the tool, for turning said handgrip about said pivotal connection when changing from lifting action on said lift surface to pressure action on said pressure surface.

4,036,086
THREAD CUTTING APPARATUS AND METHOD OF OPERATING SAME

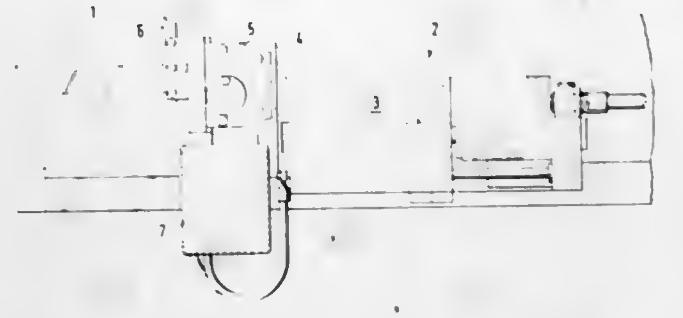
Helmut Thumm, Oschweg 45, D 7418 Metzingen; Lothar Reusch, Mozartstrasse 9, D 7410 Reutlingen 27, and Rainer Wahl, Jorglestrasse 17, D 7441 Grafenberg, all of Germany

Filed Jan. 21, 1976, Ser. No. 650,939

Claims priority, application Germany, June 14, 1975, 2526742

Int. Cl.² B23B *21/00*

U.S. Cl. 82—24 R **11 Claims**



1. A thread cutting apparatus for a turning machine of the type having a longitudinal slide path and a tool slide longitudinally movable along the path, the apparatus comprising

- a tool;
- means for supporting said tool on the tool slide, said means comprising
  - a piston and cylinder assembly including a piston member and a cylinder member, one of said members being mounted on said tool slide and being longitudinally movable with said tool slide, and the other of said members being laterally movable relative to said one member by application of fluid pressure to said assembly, said tool being mounted on said other of said members; and
- means for adjusting the lateral position of said other member relative to said one member, said means including
  - a threaded portion on one of said members, an adjusting nut threadedly engaging said threaded portion, a drive shaft for rotatably driving said nut, a drive motor coupled to said drive shaft, pulse transmitter means coupled to said drive shaft for producing signals representative of rotation of said shaft, and means responsive to said signals fo controlling said drive motor.

4,036,087
APPARATUS FOR CUTTING STRIP MATERIAL INTO LENGTHS AND FOR STACKING THE CUT LENGTHS OF STRIP MATERIAL

Hans Braun, Weilheim, Germany, assignor to L. Schuler GmbH, Germany

Filed Nov. 25, 1975, Ser. No. 635,111

Claims priority, application Germany, Nov. 27, 1974, 2455937

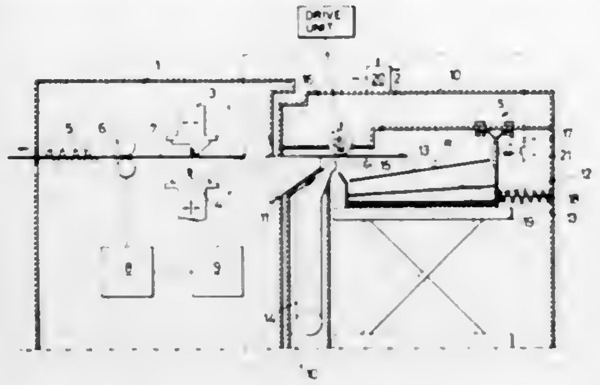
Int. Cl.² B65H *35/06*

U.S. Cl. 83—79 **16 Claims**

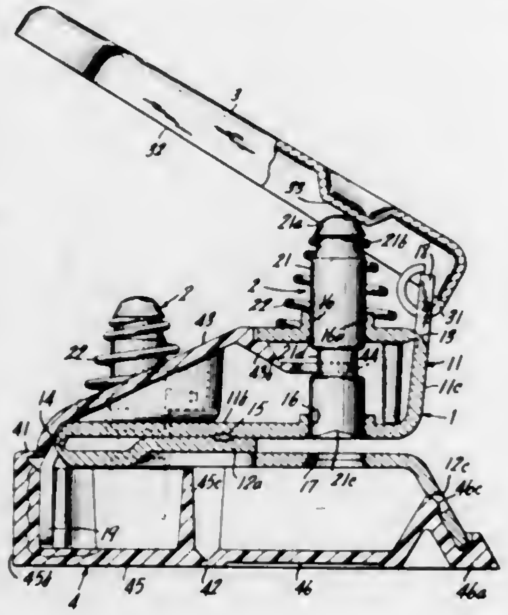
1. Apparatus for processing strip material comprising:

- cutting apparatus for cutting strip material into strip portions,
- stacking apparatus disposed downstream of said cutting apparatus and including means for stacking said strip portions adjacent one another, said stacking apparatus including air supply means for supplying air to respective undersides of said portions to form a cushion of air for said strip portions as they are stacked,
- and an accelerating anchoring roller member engageable with said strip portions for acceleratingly conveying strip portions from the cutting apparatus to respective positions adjacent an inlet portion of said stacking apparatus where they are engaged by said air from said air supply means, said anchoring roller means forms the exclusive means for transferring said strip portions from respective positions

where they are cut to respective positions at said inlet portion of said stacking apparatus where they are engaged by and controlled by said air from said air supply means, said anchoring roller member includings anchoring means for aiding in anchoring said strip portions for movement with peripheral portions of said anchoring roller member, said anchoring roller member is disposed in a frame of the stacking apparatus above an air outlet of said air supply means, and control means for controlling an anchoring effect of the anchoring means as a function of the cutting process in the cutting process.

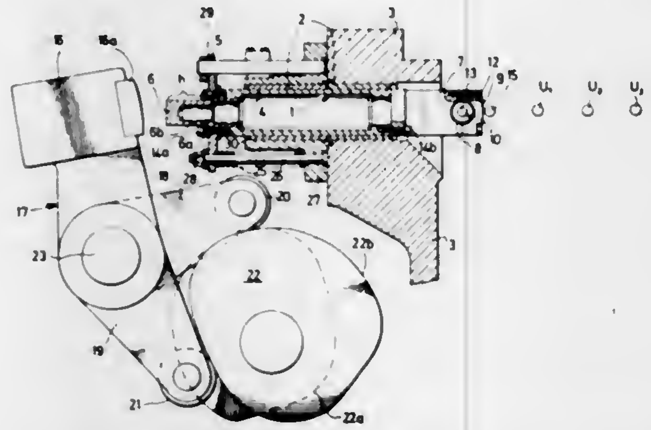


4,036,088
PAPER PUNCH WITH VARIABLE SPACING
Henry Ruskin, Cranford, N.J., assignor to Rolodex Corporation, Secaucus, N.J.
Filed Aug. 30, 1976, Ser. No. 718,968
Int. Cl.^{2} B26F *1/02*
U.S. Cl. 83—167 **20 Claims**



1. A punching device for punching paper and like sheet material comprising a frame, a cooperating base supporting said frame, individual punches removably and interchangeably mountable in said frame and an operating handle for actuating said punches, said frame comprising a single sheet of metal shaped to form a punch-holding section of U-cross section comprising an upper portion, a lower portion and a portion connecting said upper and lower portions at one side, the opposite side being open, and a die section joined with said lower portion by a fold line and underlying said lower portion with a space between said lower portion and said die section to receive the material to be punched, said upper portion and lower portion having aligned bearing holes to receive and guide said punches, and said die section having punching holes aligned with said bearing holes and adapted to receive the lower ends of said punches when actuated by said operating handle.

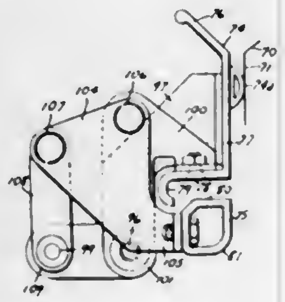
4,036,089
DEVICE FOR SHEARING ROD SECTIONS ON AN AUTOMATIC MULTI-STAGE CROSS-FED PRESS
Roger Criblez, Bottmingen, Switzerland, assignor to Hatebur Umformmaschinen AG, Basel, Switzerland
Filed June 11, 1976, Ser. No. 695,302
Claims priority, application Germany, June 12, 1975, 2526151
Int. Cl.^{2} B26D *1/02*
U.S. Cl. 83—198 **7 Claims**



1. An assembly for shearing rod sections with a movable cutter carriage carrying a shearing blade between a resting position and a shearing position, said assembly comprising:

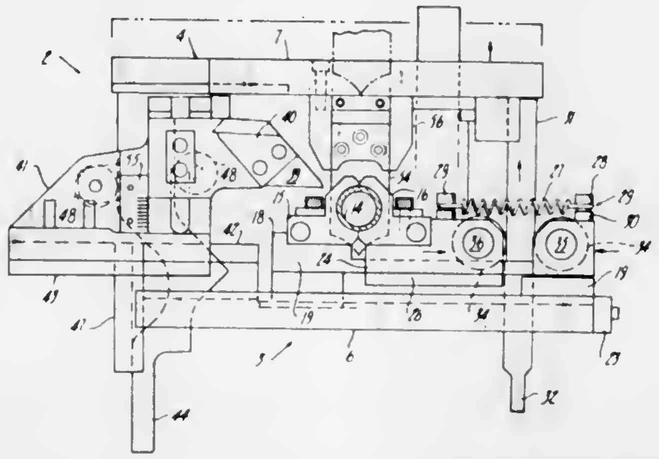
a. a reciprocating impact head carried at one end of an impact lever for driving the cutter carriage,
b. means for moving the impact head into contact with an adjacent end of the cutter carriage to effect motion of the cutter carriage to the shearing position,
c. means for biasing the cutter carriage toward the impact head and the resting position to effect the return stroke motion of the cutter carriage, and
d. said biasing means includes at least one elastic element which provides a continuous biasing force,
e. means for breaking contact of the impact head with the adjacent end of the cutter carriage on completion of the return stroke to draw the impact head a predetermined distance back to a starting position from which the impact head is ready to strike said adjacent end of the cutter carriage with considerable momentum upon activation of said moving means.

4,036,090
FABRIC SPREADING CARRIAGE FOR FACE UP, ONE WAY OPERATION HAVING FABRIC CLAMPING CUTTING ASSEMBLY
Jerome H. Feld, 1500 Ocean Parkway, Brooklyn, N.Y. 11230
Division of Ser. No. 436,150, Jan. 24, 1974, Pat. No. 3,941,366.
This application Mar. 11, 1975, Ser. No. 557,401
Int. Cl.^{2} B26D *5/20*
U.S. Cl. 83—282 **3 Claims**



1. Cutter box construction for use with a wheeled fabric spreading carriage having a supply of fabric thereon from which a web of fabric emanates, said cutter box construction comprising: a housing having first and second parallel walls, said walls defining a first upper opening and a second lower opening through which said web of fabric passes, cutting means arranged for movement transversely of said web in the interstice between said first and second walls, and means supported within said housing for clamping said web selectively only between said supply and said cutting means, whereby a segment of said web severed by said cutting means may fall free through said lower opening after severance, while the remaining portion of the web is selectively maintained in predetermined fixed relation relative to said housing.

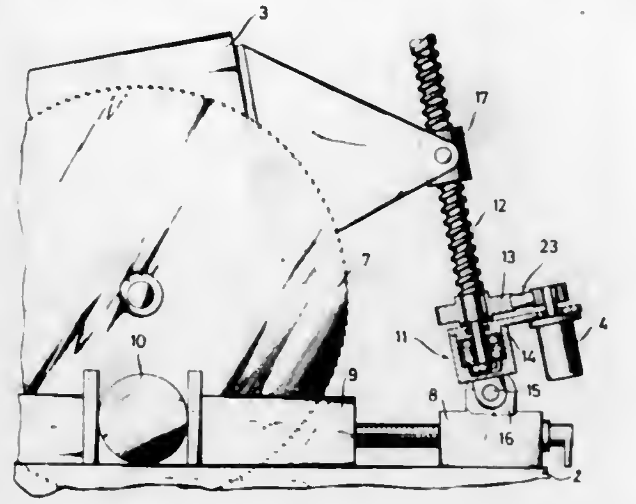
4,036,091
UNIVERSAL DOUBLE CUT DIE SET
Alexander Borzym, Dearborn, Mich., assignor to Alpha Industries, Inc., Detroit, Mich.
Filed June 11, 1976, Ser. No. 695,242
Int. Cl.^{2} B26D *5/22;* B23D *25/06*
U.S. Cl. 83—319 **4 Claims**



1. A cutoff die set operable in various mechanical press arrangements for severing elongate workpieces comprising, in combination, a lower die shoe, an upper die shoe, guide post means fixed to the shoes and interconnecting the shoes for guided relative reciprocation to effect the cutoff, and tube cutting means operated by the relative reciprocation, the guide post means consisting of three guide post bushings and three guide posts, each post being slidable in one of the bushings; the first and second of the posts having parallel axes lying spaced apart in a first plane parallel to the direction of the said reciprocation and the third post and one of the first and second posts having parallel axes lying spaced apart in a second plane parallel to the direction of the said reciprocation and approximately perpendicular to the said first plane, so that the die set is tolerant of side thrusts of various orientation exerted by a ram operating the die; the die set including clamping jaw means mounted on one of the shoes for holding a workpiece during the cutoff operation, the clamping jaw means comprising a first carriage slidably mounted on one of the shoes for movement transverse to the direction of relative reciprocation of the shoes and comprising a second carriage slidably mounted on the first carriage for movement opposite to that of the first carriage; and means operated by relative reciprocation of the shoes to move the said carriages.

4,036,092
TABLE-MOUNTED CIRCULAR SAW
Dieter Kaltenbach, Rebweg 33, 785 Lorrach, Germany
Filed June 17, 1975, Ser. No. 587,738
Claims priority, application Germany, Nov. 8, 1974, 2452960
Int. Cl.^{2} B27B *5/04, 5/18*
U.S. Cl. 83—471.2 **23 Claims**

1. A table-mounted circular saw, comprising stationary support means having portions which define a working plane; an arm pivotably mounted on said stationary support means and having an end portion which is movable towards and away from said working plane; a circular saw blade rotatably mounted on said arm for movement therewith; displacement means for positively pivoting said arm, comprising two mechanical elements interengaging and movable relative to one another, one of said elements being screw spindle means oriented lengthwise of the direction of relative movement and the other element being spindle nut means meshing with said screw spindle means, said screw spindle means and said spindle nut means connected to said support means and said end portion of said arm, respectively, and constituting the only means for pivoting said arm with said circular saw blade relative said support means; and drive means rotating one of said mechanical elements with reference to the other mechanical element.



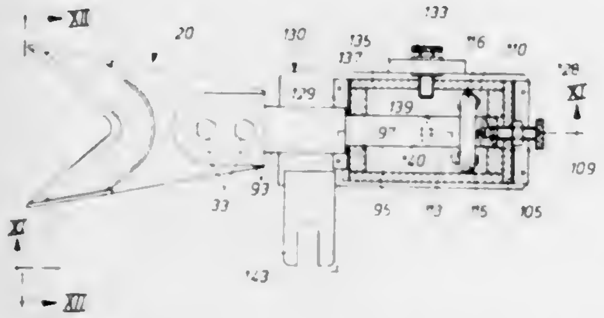
4,036,093
SAW FOR CUTTING TRUSS MEMBERS, RAFTERS AND THE LIKE WITH DIMENSIONAL ACCURACY
Roland H. Thorsell, Corvallis, Oreg., assignor to Excor, Inc., Corvallis, Oreg.
Filed Aug. 18, 1976, Ser. No. 715,620
Int. Cl.^{2} B27B *5/20*
U.S. Cl. 83—471.3 **14 Claims**

1. A power saw for cutting truss members and the like with accuracy comprising a relatively stationary base, a carriage movably mounted on the base for translation horizontally, means connected with the carriage to move it relative to the base, an upstanding guide and support post on the carriage and movable therewith, a power saw carrier arm guidably mounted on said post and movable therealong toward and

away from the base, a power saw means on said carrier arm including a vertical axis pivot shaft for the power saw means to allow turning the power saw means to various angles, cooperating adjustable angle stop means for said vertical axis pivot shaft allowing the power saw means to be positioned accurately and repetitively at various cutting angles, means to releasably hold the power saw means in selected predetermined angular positions, a power drive means for said saw carrier arm on said upstanding guide and support post including a rotary screw shaft and a driven nut engaging said screw shaft and connected with the saw carrier arm to raise and lower it on said post, said power drive means additionally comprising a pair of oppositely turning drive motors for said screw shaft and being operatively coupled therewith, a clutch connected with each drive motor and adapted when energized to transmit power from that drive motor to said screw shaft for turning the screw shaft in one direction, a coacting brake for the screw shaft to prevent overtravel thereof when energized, limit switch means including switch actuators driven by the screw shaft to activate and deactivate said clutches and said brake, a workpiece table forming a part of said carriage, a power-operated work clamp on said carriage and above said table and operable to clamp workpieces to said table during the cutting thereof by the power saw means, and a retractable power-operated workpiece positioning fence on said relatively stationary base and adapted to engage and position workpieces resting on said table prior to clamping the workpieces and retracting from the workpieces after the clamping thereof to clear said power saw means.

4,036,094
SHEARING DEVICE FOR STRANDS OF PLASTIC MATERIAL

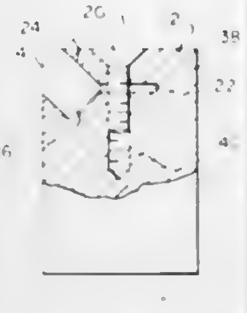
Lothar Schaar, Heuerssen, Germany, assignor to Hermann Heye, Obernkirchen, Germany
Filed Mar. 24, 1976, Ser. No. 670,172
Claims priority, application Germany, Apr. 17, 1975, 2516854
Int. Cl.^{2} B26D *5/08*
U.S. Cl. 83—623 **22 Claims**



1. In a device for shearing gobs from at least one strand of plastic material, such as a strand of molten glass, a combination comprising two cooperating shear blades movable toward and away from each other, each of said shear blades comprising a frame, a cutting element fixedly connected to said frame and formed from material having a high heat penetration coefficient, high wear resistance, and good heat conductivity, each of said cutting elements having a cutting edge, a clearance face facing the other blade and including with a horizontal plane a clearance angle and which, starting from the cutting edge of one cutting element, extends away from the other blade, each of said cutting elements having, at the side opposite said clearance face, a pressure face including with a vertical plane a pressure angle and which, starting from the cutting edge of one cutting element, extends away from the other shear blade.

4,036,095
ARRANGEMENT FOR SHEARING BLADES WITH CEMENTED HARD CARBIDE INSERTS

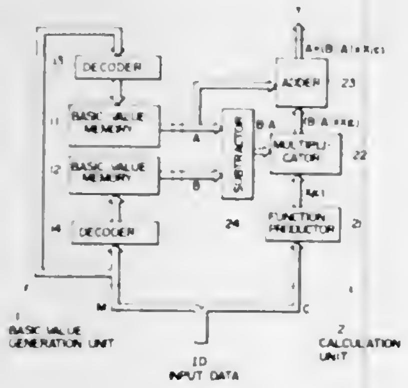
Joseph B. Huber, Acme, and Thomas A. Brown, Greensburg, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.
Filed Feb. 12, 1975, Ser. No. 549,305
Int. Cl.^{2} B26D *7/26*
U.S. Cl. 83—674 **8 Claims**



1. In a shearing blade, especially for shearing metal, the shearing blade being substantially rectangular in cross section and of a length which is a multiple of any lateral dimension thereof and comprising: a holder in the form of a bar, said bar having a longitudinal generally rectangular recess formed therein along one corner, said recess extending diagonally into the holder and having an outwardly facing bottom wall and two opposed side walls and being open on the outer side, an elongated cutting insert of a cemented hard metal carbide material seated in said recess and having a sharp corner along the open side of the recess forming a cutting edge on said insert, one of said opposed side walls forming an integrally connected movable wall portion adjacent said recess, a slot formed along said recess at the juncture of said movable wall portion and said bottom wall of said slot, said movable wall portion having a through hole and seat region transverse to the plane of the slot and within the range of said slot, and a bolt means extending through the movable wall portion and said holder such that advancing said bolt moves said opposed side walls relatively closer together clamping said insert and holding said insert compressively when said holder is in shearing operation.

4,036,096
MUSICAL TONE WAVESHAPE GENERATOR

Norio Tomisawa, Hamamatsu; Yasuji Uchiyama, Hamakita; Takatoshi Okumura, and Toshio Takeda, both of Hamamatsu, all of Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Shizuoka, Japan
Filed July 10, 1975, Ser. No. 594,809
Claims priority, application Japan, July 11, 9174, 49-79983; July 25, 1974, 49-85403; July 25, 1974, 49-85404
Int. Cl.^{2} G10H *1/00, 5/00*
U.S. Cl. 84—1.01 **13 Claims**

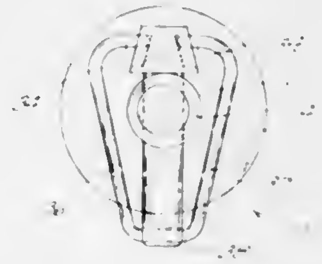


1. A waveshape generator for generating waveshapes, for conversion into musical tones from input data consisting of plural digits and sequentially and repetitively changing in

number, said waveshape generator comprising: first means having said data coupled thereto and including a first and second memory each storing a plurality of basic amplitudes obtained by sampling one period of a waveshape at a coarse interval and a read out circuitry for producing two sequentially occurring basic amplitudes A and B in response to the value of most significant digits of the input data; and calculation means connected to said first means and receiving said input data and conducting calculation "$A + (B - A) \times X(c)$" where $X(c)$ is a selected function whose value is determined by a fraction portion C represented by least significant digits of the input as variables (provided $0 = \leqq X(c) \leqq 1$), waveshape amplitudes between the basic amplitudes A and B being sequentially calculated and output in response to the change in the value of said fraction portion C.

4,036,097
PIN FASTENER

Donald L. Greenwood, Rte. 2, Box 19A, Akron, Iowa 51001
Filed May 27, 1976, Ser. No. 690,468
Int. Cl.^{2} F16B *21/18*
U.S. Cl. 85—5 CP **5 Claims**



1. A pin fastener for locking a bushing member on a shaft member, the shaft member having a hole formed diametrally therein proximate one end thereof, the pin fastener comprising:

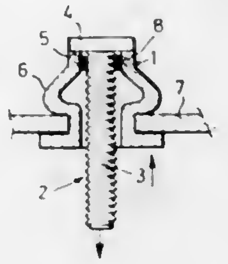
an elongated pin having a head connected to one end of a shank, said shank free end having a notch formed diametrally there across and said head having a pair of elongated canted slots formed therein opposite each other with said slots being generally longitudinally disposed relative to the axis of said pin with the upper ends thereof distal said shank being closer together than the lower ends nearest said shank; and

a snap ring having an open section formed therein for providing a pair of ends with said ends pivotably and movably disposed in said slots, said ring movable from a first position with said ends disposed in said upper ends of said slots and said ring disposed in said notch to a second position with said ends disposed in said lower ends of said slots and said ring disposed distal of said notch.

4,036,098
FASTENING ELEMENT

Herbert Schruff, Friedrichstr. 44, 5508 Hermeskeil 3, Germany
Continuation-in-part of Ser. No. 444,175, Feb. 20, 1974, abandoned. This application Nov. 3, 1975, Ser. No. 628,128
Claims priority, application Germany, Sept. 28, 1973, 2348754; May 9, 1975, 2520586
Int. Cl.^{2} F16B *13/06*
U.S. Cl. 85—70 **6 Claims**

1. A fastening element adapted to be fixed in an opening in a wall which is accessible only from a front side of the wall, said element comprising a one-piece cylindrical upsettable shell, said shell being open at opposite first and second ends, said first end being provided with an outwardly extending flange, said flange being larger than the wall opening for positioning against the front side of the wall, a cylindrical inset member disposed in said shell, engagement means provided on a rear portion of said inset member for axially moving said second end of said shell together with said inset member rear portion when said inset member is axially moved within said shell, said engagement means including an enlarged flanged head provided on said inset member rear portion, said enlarged head being disposed outside said shell for abutment of an underside surface of said enlarged head against said second end of said shell to define a closed-linkage juncture therebetween, said enlarged head having an outside diameter equal in length to outside diameter of said shell, said enlarged head being smaller than the wall opening to permit insertion of both said enlarged head and associated second end of said shell through the wall opening, connecting means for preventing relative rotational movement between said enlarged head and said shell second end, said connecting means providing a material-closure, homogeneous joint, said material-closure, homogeneous joint consisting of spot welds provided in planes running parallel to one another, each of said spot welds being disposed inside said shell between an internal longitudinal surface of said second end of said shell and an external longitudinal surface of said inset member near said rear portion and spaced from said enlarged flanged head, said inset member being provided with screwthreaded means for threaded engagement with a screwthread device for axially moving said enlarged head toward said front end of said shell, said shell including abutment-forming means disposed between said first and second ends for enlarging outwardly to define a bulge which is larger than the wall opening when said enlarged head is moved axially toward said shell second end so that said bulge abuts against a rear side of the wall, and said screwthreaded means further being adapted to receive threaded members for fastening construction parts thereto.

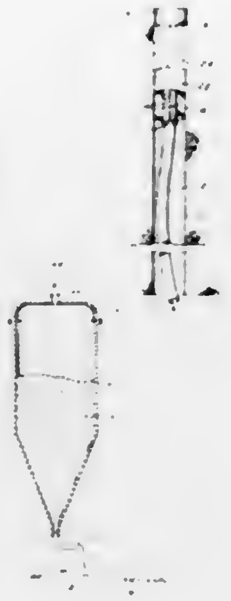


4,036,099
METHOD OF LOADING BLAST HOLE WITH EXPLOSIVE

Gordon B. French, Rifle, Colo., assignor to Occidental Oil Shale, Inc., Grand Junction, Colo.
Filed July 25, 1975, Ser. No. 599,096
Int. Cl.^{2} F42D *1/08*
U.S. Cl. 86—20 C **22 Claims**

22. In a method of loading explosive in an upwardly extending blast hole having an open lower end and a closed upper end wherein a conduit is inserted in the open end of the blast hole toward the closed end and a mixture of air and ANFO particles is ejected from the end of the conduit for packing ANFO in the end of the unfilled portion of the blast hole, the improvement comprising:

moistening the walls of the blast hole; and ejecting the mixture of air and ANFO particles at least partly against the moistened walls of the blast hole.



4,036,100

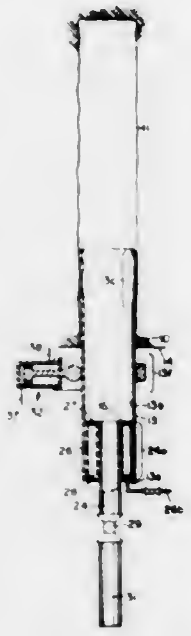
APPARATUS AND METHOD FOR LOADING FLUENT EXPLOSIVES IN UPWARDLY EXTENDING BOREHOLES

Eldon Kenneth Hurley, Carthage, Mo., assignor to Hercules Incorporated, Wilmington, Del.

Filed June 7, 1976, Ser. No. 693,659

Int. Cl.² F42D *1/08*

U.S. Cl. 86—20 C **16 Claims**



13. A method for loading a fluent explosive into an upwardly extending borehole, comprising:

inserting into said borehole an open tubular member, retaining an open end of said tubular member outside said borehole;

expanding a portion of said tubular member into engaging contact with the adjacent borehole wall for support of said tubular member in said borehole and for closing a first space between said tubular member and said borehole wall to prevent gravitation of said fluent explosive therebetween when said fluent explosive is conveyed through said tubular member into said borehole;

inserting a conduit axially into said tubular member through said open end of said tubular member outside of said borehole to a height wherein the upper end of said conduit is below said borehole;

supporting said conduit in said tubular member;

closing at least a portion of a second space between said conduit and said tubular member sufficiently to prevent gravitation therebetween of fluent explosive when said fluent explosive is conveyed through said tubular member into said borehole;

introducing said fluent explosive through said conduit, through a portion of said tubular member and into said borehole;

collapsing a portion of said tubular member below said borehole and above said upper end of said conduit sufficiently to prevent gravitation of said fluent explosive from said tubular member through the collapsed portion thereof.

4,036,101

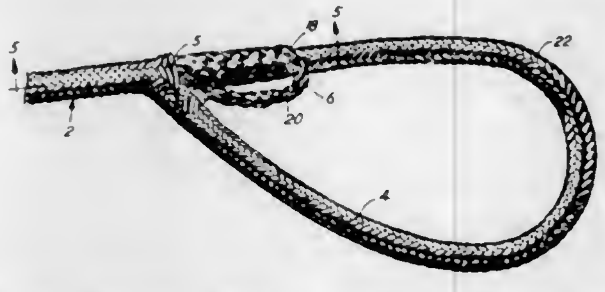
DOUBLE HOLLOW BRAIDED ROPE ASSEMBLY AND METHOD

Ralph G. Burnett, Kenosha, Wis., assignor to The Burnett Company, Ltd., Kenosha, Wis.

Filed Dec. 1, 1975, Ser. No. 636,412

Int. Cl.² B66C *1/12;* **D04C** *1/12;* **F16G** *11/00*

U.S. Cl. 87—8 **12 Claims**



1. A rope assembly which comprises a flexible double braided hollow rope including an outer braided jacket having a central axial opening therein and an inner braided core having a central axial opening therein and a rope end inserted into the center of the hollow inner core along the longitudinal axis of the hollow rope to form a loop, the rope end being retained in the opening of the core against pullout by the rope braids of the hollow core gripping the rope end portion and the rope braids of the outer braided jacket gripping the core surrounding the rope end portion when tension is applied thereto.

11. The method of splicing a rope assembly of the flexible double braided hollow type which includes an outer braided jacket having a central axial opening therein and an inner braided core having a central axial opening, which comprises the steps of (1) making an opening in the braids of the outer jacket, (2) forming a loop by withdrawing a portion of the inner core through the opening, (3) inserting the end of the rope into the braids of the inner core and into the central axial opening therein, (4) manipulating the braids of the outer jacket to cover the loop of the inner core with the end of the rope therein to substantially recover the loop of the inner core, and (5) tensioning the loop so that the braids of the inner core grip the end of the rope and the braids of the outer braided jacket grip the inner core about the rope end.

4,036,102

CARTRIDGE BELT GUIDE FOR AMMUNITION BOX

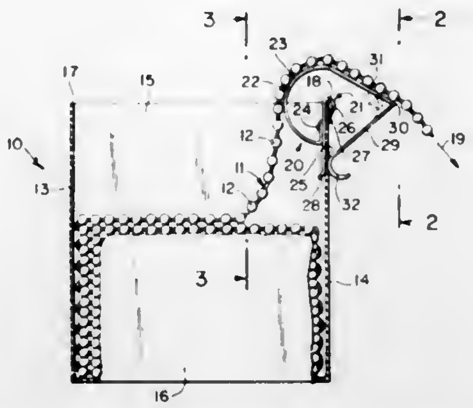
Gary J. Marrotte, 18 Red Pine Road, Medford, N.Y. 11763, and H. Christopher Mulder, 142 Wilson Ave., Long Beach, N.Y. 11561

Filed Jan. 21, 1976, Ser. No. 651,126

Int. Cl.² F41D *9/02*

U.S. Cl. 89—33 BB **6 Claims**

1. A cartridge belt guide for an ammunition box, which comprises clamp means disposed to engage a wall of an ammunition box for support thereby; and a guide member connected to said clamp means for support thereby in overextending relation to an edge of said wall, said guide member having a guide surface positioned for sliding contact engagement with a cartridge belt to facilitate the withdrawal thereof from the ammunition box, said clamp means having a generally flat surface disposed to lie against said wall on the inside of the ammunition box and having a hook portion disposed to extend around said edge from inside the ammunition box and overlie said wall on the outside of the ammunition box.



4,036,103

MAGAZINE APPARATUS FOR PROPELLANT CHARGES AND METHOD OF MAKING SAME

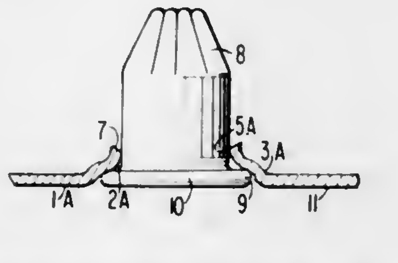
Heinz Gawlick, Vagen Post Feldkirchen-Westerham; Horst Rammensee, Nurnberg; Karl Mack, Ansbach, and Fritz Schneider, Burgbernheim, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft and Impex-Essen Vertrieb Von Werkzeugen GmbH, Germany

Filed Jan. 10, 1975, Ser. No. 540,242

Claims priority, application Germany, Jan. 19, 1974, 2402553

Int. Cl.² F42B *39/08*

U.S. Cl. 89—35 R **15 Claims**



1. Magazine apparatus comprising a planar strip of material, a plurality of holes extending transversely through said strip and spaced at intervals along the length of said strip, and a cartridge holding collar for each of said holes, said cartridge holding collar being a deformed portion of said planar strip and extending out of the plane of said strip, each of said collars being configured to securely engage a cartridge inserted through a respective hole in the manner of a clamping seat.

4,036,104

LIGHTWEIGHT METHOD OF CONSTRUCTION FOR RIBBED APPLIQUE ARMOR

Victor H. Pagano, Rochester, and Freeman O. Moore, Jr., Warren, both of Mich., assignors to The United States Government as represented by the Secretary of the Army, Washington, D.C.

Filed Feb. 17, 1976, Ser. No. 658,546

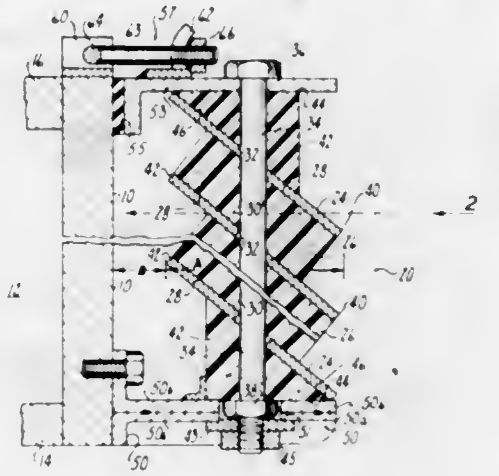
Int. Cl.² F41H *7/04*

U.S. Cl. 89—36 H **3 Claims**

1. In a military vehicle having outer upright walls formed of armor plate:

the improvement comprising a series of louver modules mountable on external surfaces of the armor plate to intercept enemy projectiles directed toward the vehicle:

each louver module comprising a series of flat plate louvers (**24**) arranged in spaced parallel relation at an acute angle to the general plane of the module; at least two rows of spacer blocks (**26** and **26***a*) interposed between adjacent ones of the louvers at spaced points therealong, said spacer blocks having parallel faces engaging the louver spacing; upper and lower triangular end blocks (**42**) having first surfaces thereof engaging face areas of the endmost louvers, and second surfaces thereof extending normal to the general plane of the module; tie bolts (**34**) extending through aligned openings in the louvers and blocks; and nut means threaded onto the bolts to force the louvers tightly against the blocks;



and means for removably mounting each module on the vehicle without disconnecting the nut means from the tie bolts; each mounting means comprising a series of laterally spaced brackets (**50**) projecting from the vehicle outer walls to underlie the triangular end blocks and thereby carry the module weight; vehicle-engaging spacer means (**53**) carried by the module at its upper end for spacing the module from the vehicle external surface; and manually-operable latch means (**57**) operable to draw the module toward the vehicle surface, whereby said spacer means (**53**) and latch means (**57**) cooperably rigidify the module position.

4,036,105

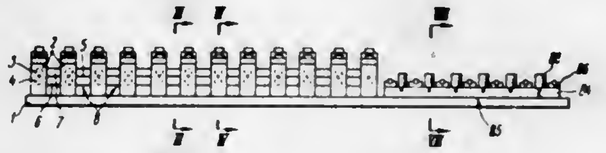
MACHINE FOR EDGE FORMING OF SHEETS FOR WELDING

Ivan Alexeevich Sukhov, Pudozhskaya ulitsa, 4a, kv. 22; Igor Nikolaevich Soloviev, ulitsa Stoikosti, 2/11, kv. 227; Vyacheslav Mikhailovich Shults, Grazhdansky prospekt, 108, korpus 1, kv. 107; Alexandr Sergeevich Lipilov, Piskarevsky prospekt, 24, kv. 17, and Victor Reingoldovich Stilve, Grazhdansky prospekt, 23, korpus 3, kv. 76, all of Leningrad, U.S.S.R.

Continuation of Ser. No. 573,254, April 30, 1975, abandoned. This application Mar. 12, 1976, Ser. No. 666,502

Int. Cl.² B23C *3/12;* **B23D** *1/02*

U.S. Cl. 90—24 F **6 Claims**



1. A machine for edge forming of sheets for welding, by machining lateral edges of sheets horizontally moving in a production flow comprising: separate casings mounted in series in a spaced relation to one another; fixed cutting tools oppositely mounted along the edges of a sheet being machined; drive rolls for feeding the sheet being machined to the cutting tools, the rolls being accommodated, at least in pairs, in the

separate casings; support rollers mounted adjacent to the cutting tools above and beneath the sheet being machined; longitudinally extending beams inter-connecting in series the separate casings, the beams being disposed above and under the sheet being machined so as to form upper and lower longitudinally extending beams; the upper longitudinally extending beams supporting, between the casings, axles of the support rollers located above the sheet being machined; the lower longitudinally extending beams supporting, between the casings, the cutting tools and axles of the support rollers located beneath the sheet being machined; grooves provided on the opposite sides of the casings; and drawbars mounted in the grooves and partially received within the longitudinally extending beams in parallel with the direction of the sheet movement, the drawbars being axially movable in the direction corresponding to the movement of the casings towards one another, under the action of wedges mounted in the beams, through a distance providing for prestressing of the beams.

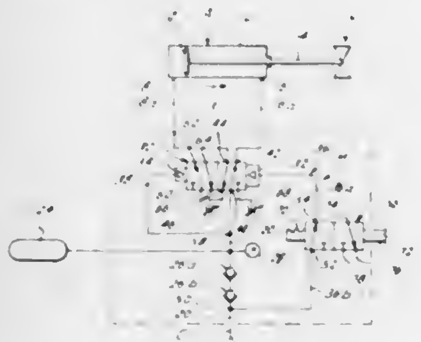
4,036,106
ACTUATOR CONTROL SYSTEM

Lawrence F. Athy, Jr., Houston, Tex., assignor to Southwestern Manufacturing Co., Tex.

Filed Apr. 3, 1975, Ser. No. 564,647

Int. Cl.² F15B *13/042, 21/00*

U.S. Cl. 91—5 3 Claims



1. A control system for controlling the operation of a valve, comprising:

a. a double-acting valve actuator having first and second portions for receiving operating fluid and being movable between a first position and a second position in response to fluid in said first and second portions, respectively;
b. a first fluid line connected to said first portion of said valve actuator for conveying fluid thereto;
c. a second fluid line connected to said second portion of said valve actuator for conveying fluid thereto;
d. single conduit means for supplying fluid under pressure to operate said valve actuator and also provide a control signal at a point thereof;
e. reverse fluid means connected to said single conduit means for accumulating fluid under pressure from the said single conduit means;
f. control valve means having an opening position and a closing position, comprising:
    1. an inlet port and an outlet port conveying fluid under pressure from said single conduit means to said first fluid line when said control valve means is in the opening position;
    2. an inlet port and an outlet port conveying fluid under pressure from said reserve fluid means to said second fluid line when said control valve means is in the closing position; and
    3. pressure operator means responsive to the control signal to move said control valve means from the opening position to the closing position;
g. check valve means in said single conduit means interposed between said control signal point and said reserve fluid means; and
h. said reserve fluid means being of a sufficient fluid capacity to provide for a plurality of successive movements of said actuator means between said first and second positions thereof without the addition of fluid thereto from said single conduit means.

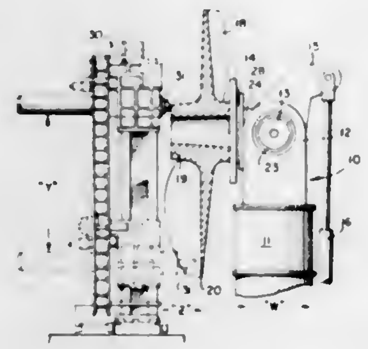
4,036,107
WORKPIECE ORIENTATION COLUMN AND PROCESS

Henry G. Constantine, New Orleans, La., assignor to Avondale Shipyards, Inc., Avondale, La.

Division of Ser. No. 389,446, Aug. 20, 1973, Pat. No. 3,917,249, which is a continuation-in-part of Ser. No. 152,816, June 14, 1971, abandoned. This application July 17, 1975, Ser. No. 596,957

Int. Cl.² B23C *1/14, 3/16*

U.S. Cl. 90—11 C 13 Claims



1. A process for machining with a milling machine having a milling head a large, complex, three dimensional workpiece having at least two faces, comprising the steps of:

a. Rigidly mounting at least one face of said workpiece to a supporting member spaced from said milling machine;
b. Continuously machining said workpiece with said milling machine during a period of time;
c. During said period of time, continuously moving said workpiece with respect to at least one of the following five axes of motion, angularly about a vertical axis, angularly about a horizontal axis, angularly about an axis which is rotatable between a vertical and a horizontal position, a linear axis in a horizontal plane, and a linear axis in a vertical plane; and
d. During said period moving said workpiece at one or more points in time with respect to each of the angular ones of said five axes.

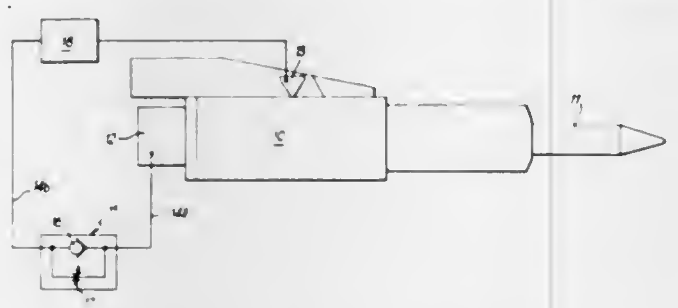
4,036,108
PRESSURE FLUID OPERATED PERCUSSION TOOLS

Reginald Andrew Phillips, Warrington, England, assignor to Dobson Park Industries, Ltd., Colwick, England

Filed Sept. 12, 1975, Ser. No. 612,915

Int. Cl.² F01L *25/06*

U.S. Cl. 91—165 5 Claims



1. In a percussion tool having a hammer piston slidably mounted in a cylinder, said piston being driven in one direction by first fluid means applied to said cylinder on one side of the piston which acts to compress second fluid means on the other side of the piston, said second fluid means when compressed being subsequently allowed to expand by exhausting said first

fluid means from said one side of the piston and drive said piston in the opposite direction, the improvement comprising: pressure responsive valve means controlling the application and exhausting of said first fluid means to and from said cylinder, and delay means coupled between said valve means and said other side of said piston, said delay means including a restrictor valve through which the fluid of the second fluid means flows and a one-way valve arranged in parallel with the restrictor valve, said delay means being operable to selectively delay or retard the manifestation of a change in pressure of said second fluid means to said valve means whereby the rate of operation of said tool is reduced.

4,036,109
DEVICE FOR MOVING AND POSITIONING AN ELEMENT OF A MACHINE

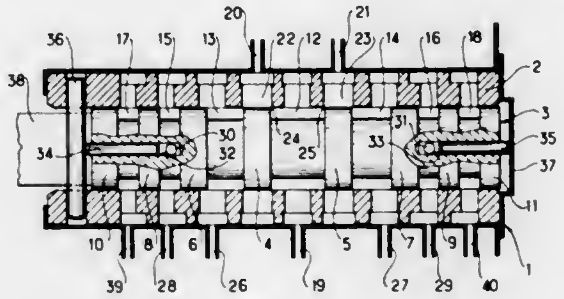
Paul Wolff, Illkirch Graffenstaden, France, assignor to Compagnie Industrielle des Telecommunications Cit-Alcatel, France

Division of Ser. No. 363,160, May 23, 1973, abandoned. This application Nov. 26, 1974, Ser. No. 527,226

Claims priority, application France, May 23, 1972, 72.18292

Int. Cl.² F01B *15/00;* **F15B** *13/16*

U.S. Cl. 91—216 A 22 Claims



1. A device including a servo-valve for controlling the flow of pressurized fluid between a supply duct leading into said servo-valve and first and second servo-valve outlet ducts; said servo-valve comprising:

- a sleeve,
- a valve shaft arranged in said sleeve for longitudinal sliding movement relative to said sleeve between two end positions,
- a plurality of shoulders formed on said valve shaft for separating the space between the sleeve means and valve shaft into a plurality of chambers including a distribution chamber communicated with said supply duct which is formed between a first and second of said shoulders, a first fluid return chamber formed between the first shoulder and a third of said shoulders, and a second fluid return chamber formed between the second shoulder and a fourth of said shoulders, said first and second return chambers being connected to respective first and second fluid return lines,
- a first bore leading to said first outlet duct and extending through the sleeve to a first opening located adjacent travel positions of said first shoulder, said first opening having a longitudinal dimension corresponding approximately to the longitudinal thickness of said first shoulder such that said first shoulder effects varying degrees of closing of said first opening during relative movement of said sleeve and valve shaft with a resultant variation in fluid pressure supplied through said first bore to said first outlet duct,
- a second bore leading to said second outlet duct and extending through the sleeve to a second opening located adjacent travel positions of said second shoulder, said second opening having a longitudinal dimension corresponding approximately to the longitudinal thickness of said second shoulder such that said second shoulder effects varying degrees of closing of said second opening during relative movement of said sleeve and valve shaft with a resultant variation in fluid pressure supplied through said second bore to said second outlet duct,

first and second control compartments having volumes which vary in opposite proportions with respect to one another during relative movement of said valve shaft,

first and second control ducts leading from a fluid control circuit to said respective first and second control compartments for applying control fluid pressure to said control compartments to control the relative movement of the sleeve and valve shaft;

and said device further comprising a fluid operated jack having: first and second jack units, one of said jack units being mobile and one being relatively fixed, said first jack unit including a first jack element formed as a hollow body, said second jack unit including a second jack element formed as a piston separating the inside of the hollow body into first and second compartments communicating respectively with said first and second outlet ducts such that changes in pressure supplied to said first and second outlet ducts effects relative movement of said first and second jack units, and wherein said valve shaft is coupled by coupling means with said mobile jack units.

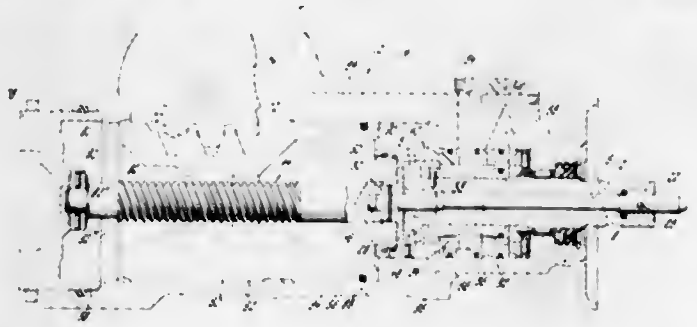
4,036,110
POWER STEERING GEAR WITH PISTON NUT AND SCREW OPERATIVELY CONNECTED BY CENTRALIZING ROOT DIAMETER THREAD

David A. Galonska; James B. McCarthy, and Joseph A. Rutkiewicz, all of Saginaw, Mich., assignors to General Motors Corporation, Detroit, Mich.

Filed Nov. 14, 1975, Ser. No. 631,838

Int. Cl.² F15B *9/10, 13/10*

U.S. Cl. 91—375 A 3 Claims



1. A power steering gear unit comprising a housing, an input member operatively mounted for turning movement in said housing and extending outside one end thereof, an output member operatively mounted for turning movement in said housing, piston means mounted for longitudinal sliding movement in said housing and cooperating therewith to provide first and second expansible and contractible fluid pressure chambers therein, gear means drivingly connecting said piston means to said output member so that said output member turns in response to sliding movement of said piston means, valve means in said housing operatively connected to said input member and having a connection to a source of pressurized hydraulic fluid for selectively supplying and exhausting pressurized fluid to and from said chambers to hydraulically move said piston means and said connected output member to predetermined positions as controlled by the amount of movement of said input member, elongated actuator means extending through said piston means and operatively connected to said input member for turning movement therewith, mechanical drive means operatively interconnecting said actuator means and said piston means to permit said actuator means to move said piston means in said housing, said mechanical drive means comprising first thread means formed externally on said actuator and second thread means formed internally in said piston, said second thread means having a screw thread profile with a major diameter spaced from a major diameter of the second thread means and a minor diameter which directly contacts a minor diameter of the thread of said first thread means to decrease a friction radius between said piston and said actuator means to facilitate the movement of said piston by said actuator

means and further to reduce an axial flow path of fluid through said piston means so that pressure differentials can be built up in said chambers for the hydraulic actuation of said piston means.

4,036,111

DEVICE FOR DISCONTINUING AND AUTOMATICALLY RESTORING THE OPERATIONAL FUNCTION OF A SPRING BRAKE ACTUATOR

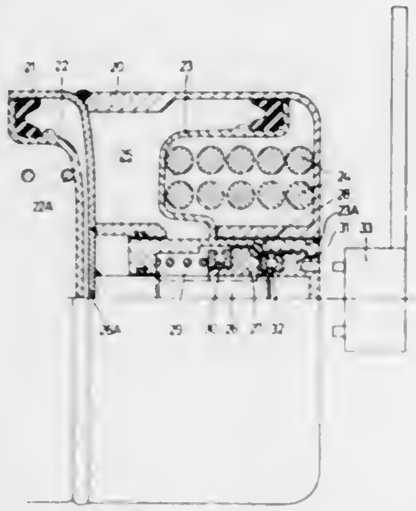
Nils Goran Dahlkvist, Darlington; Lars Bengt Axelsson, Newton Aycliffe, both of Durham, England, and Nils Borje Lennart Sander, Malmo, Sweden, assignors to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Division of Ser. No. 639,407, Dec. 10, 1975, Pat. No. 3,994,206, which is a continuation of Ser. No. 514,929, Oct. 15, 1974, abandoned. This application June 29, 1976, Ser. No. 700,895

Claims priority, application Sweden, Oct. 25, 1973, 7314472

Int. Cl.² F01B *9/00*

U.S. Cl. 92—29 **3 Claims**



1. In a device for discontinuing and automatically restoring the operational function of a spring brake actuator with a spring compressed by fluid pressure in the brake system, preferably arranged in series with a service brake actuator and comprising a cylinder with a fluid pressure operated piston movable therein to operate a brake push rod and having a spring actuating the piston in an operation direction forward for brake application at the fall of fluid pressure acting on the piston, the combination comprising, a conveying mechanism carried by the push rod comprising a rotatable nut engaging threads on said push rod and forming a clutch held in continuous engagement between said push rod and said piston to prevent nut rotation during all normal operation so that no parts of the conveying mechanism move relative to each other under normal conditions, manually operable means mechanically disengaging the clutch to permit a return of the push rod alone without influence by said spring when fluid pressure is not acting on the piston, and means operable when said clutch is disengaged during a single movement return stroke of said piston in response to fluid pressure automatically rotating said nut to a position on said push rod reconnecting said clutch thereby reconnecting said push rod into said continuous engagement with said piston whereby said clutch is disengaged only for one brake system stroke following manual disengagement during said fall of fuid pressure.

4,036,112

ROLLING DIAPHRAGM SEALING DEVICES

Karl-Wolfgang Hubschmann, Langweid, Germany, assignor to Motoren-Werke Mannheim AG, Mannheim, Germany

Filed June 30, 1975, Ser. No. 592,073

Claims priority, application Germany, July 2, 1974, 2431745

Int. Cl.² F15B *21/04*

U.S. Cl. 92—80 **7 Claims**

1. In combination,

an internal part;

a housing defining a bore receiving said internal part, one of said internal part and said housing being reciprocable relative to the other longitudinally of said bore;

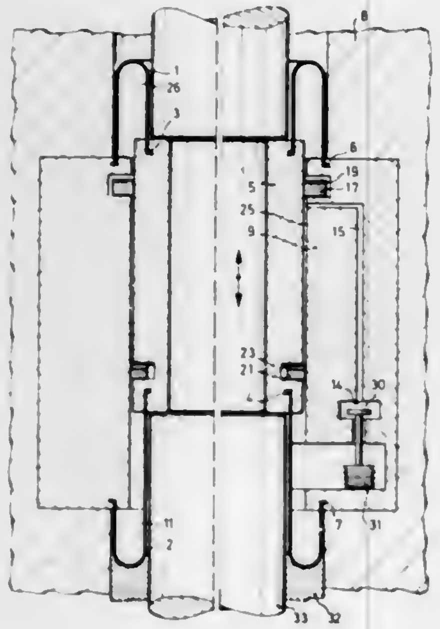
a first annular rolling sealing diaphragm havig external and internal annular edges respectively connected in a fluid-tight manner to said housing and to said internal part;

a second annular rolling sealing diaphragm spaced from the first diaphragm longitudinally of said bore and having external and internal annular edges respectively connected in a fluid-tight manner to said housing and to said internal part,

portions of the first diaphragm facing the second diaphragm bounding a first annular chamber for receiving a diaphragm-supporting liquid to support said first diaphragm against a relatively low pressure in said bore;

pumping means operable by the relative reciprocation between said internal part and said housing to pump liquid from said second chamber to said first chamber to compensate for leakage losses from said first chamber;

return ducting leading to said second chamber for returning said liquid thereto;



return flow regulating means arranged to regulate the flow of said liquid through said return ducting; and

pressure-responsive control means arranged to control said regulating means;

said housing including surface portions in which said second diaphragm seats in its axially outer end position; and

said pumping means comprising a mobile annular one-way seal carried by said one of said internal part and said housing at a location intermediate the first and second diaphragms and bearing sealingly and slidably on said other of said internal part and said housing for displacing said liquid, and another annular one-way seal carried by said other of said internal part and said housing at a location intermediate the first and second diaphragms and bearing sealingly on said one of said internal part and said housing and disposed nearer to said first chamber than is said mobile annular one-way seal, portions of said internal part, said housing, said mobile annular one-way seal, and said other annular one-way seal defining a pumping chamber of said pumping means from which said return ducting extends.

4,036,113

PRESSURE PISTON FOR A DIE-CASTING MACHINE

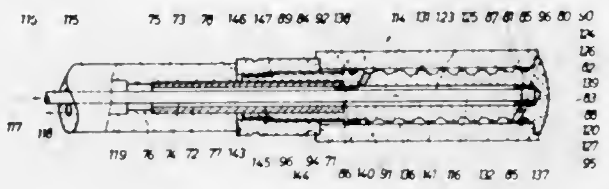
Hugo Kunz, Ziegeleistrasse 21, (D-7743) Frickenhausen, Germany

Filed Sept. 26, 1975, Ser. No. 616,993

Claims priority, application Germany, Sept. 28, 1974, 2446503; Oct. 8, 1974, 2447980

Int. Cl.² F01B *29/00, 31/00;* **F16J** *1/10*

U.S. Cl. 92—111 **29 Claims**



1. A plunger for a die-casting machine, said plunger comprising:

a carrier having and elongated along a longitudinal axis, said carrier being formed at one axial end with a piston crown and at said crown with a radially projecting flange and with a blind bore extending to immediately adjacent said crown and opening at the other axial end of said carrier, said carrier further having centered on said axis and extending axially away from said crown a carrier portion formed with an external thread;

a clamping ring threaded onto said thread at said carrier portion; and

a detachable piston skirt formed as an axially elongated sleeve having a central portion radially spacedly surrounding said carrier and braced axially between said flange and said ring, said carrier portion extending axially away from said crown past said ring.

4,036,114

APPARATUS FOR CIGARETTE FILTER MANUFACTURE

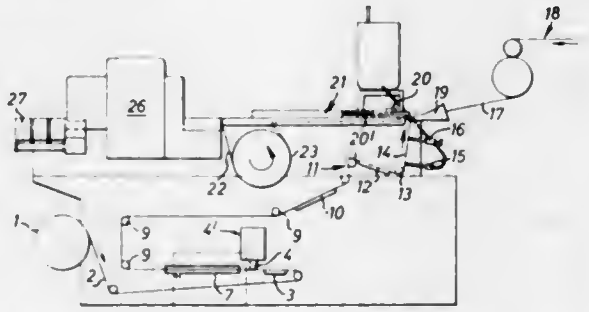
John Anthony Luke, Romsey, England, assignor to Brown & Williamson Tobacco Corporation, Louisville, Ky.

Filed July 28, 1976, Ser. No. 709,346

Claims priority, application United Kingdom, Aug. 11, 1975, 33430/75

Int. Cl.² A24C *5/50;* **B05C** *5/02*

U.S. Cl. 93—1 C **3 Claims**



1. In an apparatus for forming cigarette filter rods in which a filter material in the form of a processed tow and a porous filter wrapping paper are each directed along a perdetermined pathway from a supply source to a garniture for combination thereat, said apparatus including a said garniture, means feeding said tow from said supply, through a collector funnel and to said garniture, and an adhesive applicator means positioned along said pathway intermediate said supply source and said garniture and being adapted to apply adhesive to a predetermined area on said paper, the improvement comprising

a. an additional applicator means positioned along said pathway intermediate said supply source and said adhesive applicator means, said additional applicator means being adapted to apply a film-forming material to a predetermined area of said paper and being positioned a sufficient distance from said adhesive applicator means to permit drying of said film-forming material to an impervious film prior to said film-forming material reaching said adhesive applicator means;

b. guide means for guiding said paper to said adhesive applicator means, whereby said adhesive is applied to a predetermined area coinciding with the area covered by said impervious film; and

c. means guiding said adhesive coated paper to said garniture to effect wrapping of the paper about said tow.

4,036,115

SACK MAKING EQUIPMENT

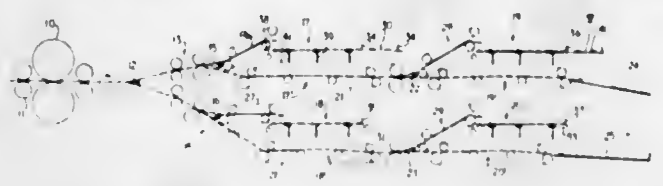
Ronald Frank Hatch, Grays Point, Australia, assignor to St. Regis-Aci Pty. Limited, Botany, Australia

Filed July 28, 1975, Ser. No. 599,511

Claims priority, application Australia, Aug. 8, 1974, 8452/74

Int. Cl.² B31B *21/02*

U.S. Cl. 93—8 R **35 Claims**



1. A bag making machine comprising a tubing machine having means for forming a tube of suitable material, and means for cutting the formed tube into tube-lengths and axially discharging the tube-lengths therefrom, each said tube-length being spaced apart during discharge from said tubing machine, a first tube-end sealing machine, a second tube-end sealing machine, a transfer machine adapted to receive a flow of spaced and axially disposed tube-lengths formed by said tubing machine and to transfer said tube-lengths to said tube-end sealing machines in spaced relationship to each other, said transfer machine comprising: a first feed conveyor feeding said first tube-end sealing machine, a second feed conveyor feeding said second tube-end sealing machine, each said feed conveyor having a receiving end and a discharge end, first flow directing means for directing tube-lengths selected by said first flow directing means from said flow of spaced tube-lengths received at an input to said transfer machine in a cyclic predetermined sequence to said receiving end of said first feed conveyor, second flow directing means, said first flow directing means operable to direct the remaining tube-lengths of said flow to said second flow directing means by-passing said first feed conveyor, said second flow directing means operable to direct tube-lengths received at said second flow directing means to said receiving end of said second feed conveyor or to a discharge.

4,036,116

METHOD OF STACKING FLAT BAGS OR SACKS WHICH ARE FOLDED ABOUT AT LEAST TWO TRANSVERSE FOLD LINES

Konrad Tetenborg, and Rudolf Telljohann, both of Lengerich, Germany, assignors to Windmoller & Holscher, Lengerich, Germany

Filed Feb. 3, 1976, Ser. No. 654,921

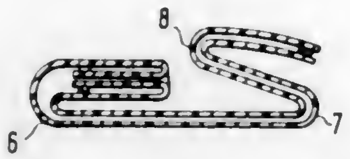
Claims priority, application Germany, Feb. 5, 1975, 2504801

Int. Cl.² B31B *1/26*

U.S. Cl. 93—32 **2 Claims**

1. A method of stacking flat bags or sacks which are folded about at least two transverse fold lines and are open at one end, with a reinforced margin at the opening being formed by a plurality of layers that include handle apertures, the method comprising the steps of folding the margin portion of the bag onto the central bag or sack portion about a fold line disposed below the reinforcing layers, folding the base portion of the bag or sack about two fold lines in Z formation onto the central

bag or sack portion in such a way that the fold line of the base portion which is nearer the margin at the opening of the bag stops short of or just touches the outer edge of the margin, and stacking the folded bags on one another.



4,036,117

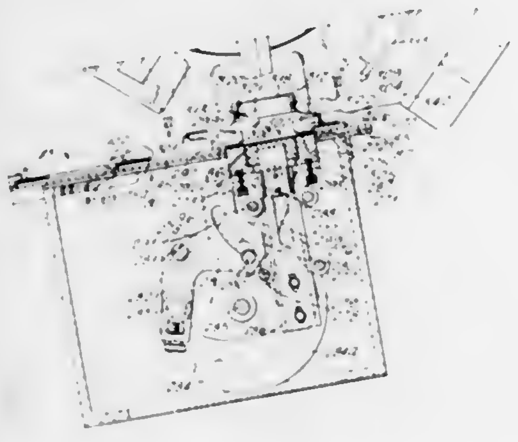
PACKING MACHINES

Robert W. Davies; Leonard Thornton; Maxwell F. Veness, and Leonard H. Calver, all of London, England, assignors to Molins Limited, London, England

Division of Ser. No. 443,938, Feb. 19, 1974, Pat. No. 3,977,157. This application July 7, 1976, Ser. No. 703,383

Int. Cl.² B31B *1/46*

U.S. Cl. 93—51 R **7 Claims**



5. Apparatus for folding a blank of a packet, in particular a hinged lid cigarette packet, comprising first and second folders which are stationary and spaced apart for successively folding edge portions of the blank during movement thereof, a movable platform having at least two sections for supporting the blank, the sections having supporting surfaces parallel to one another and being movable relative to one another in a direction perpendicular to said supporting surfaces, and drive means operable cyclically to move all the sections of the platform past the first folder and to continue moving at least one section of the platform past the second folder while leaving at least one of the other sections stationary.

4,036,118

ROD-LIKE ARTICLES

Rolf Penzias, London, England, assignor to Molins Limited, England

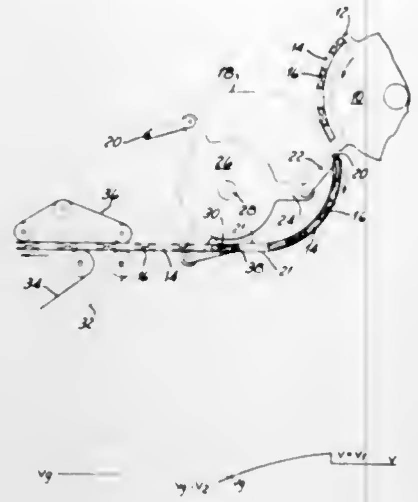
Filed Mar. 11, 1976, Ser. No. 665,860

Claims priority, application United Kingdom, Mar. 15, 1975, 10896/75

Int. Cl.² F01B *29/00*

U.S. Cl. 93—77 FT **12 Claims**

1. Apparatus for feeding rod-like articles in succession comprising a drive member rotatable about an axis, a cam track surrounding the axis, a plurality of feed members connected to the rotatable drive member and constrained to follow a course determined by the cam track when the drive member is rotated about its axis, guide means defining a path associated with part of said course, and means for feeding groups of in line rod-like articles onto said path, each feed member being arranged to engage the trailing end of the rear article of a group at a pick-up point on said path and convey said group along said path past a release point on said path, the distance between said path and said axis progressively decreasing over at least part of said path between said pick-up point and said release point.



4,036,119

METHOD AND MACHINE FOR THE PRODUCTION OF COMPOSITE FILTER MOUTHPIECES

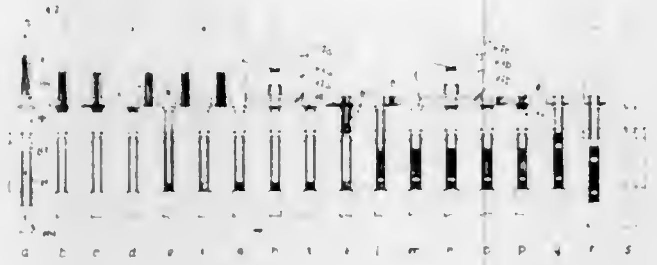
Bernhard Schubert, New Bornsen, and Otto Blidung, Geesthacht, both of Germany, assignors to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Division of Ser. No. 483,668, June 27, 1974, Pat. No. 3,961,633, which is a division of Ser. No. 275,096, July 25, 1972, Pat. No. 3,834,285. This application Feb. 9, 1976, Ser. No. 656,712

Claims priority, application Germany, July 26, 1971, 2137318; July 26, 1971, 2137319; Sept. 10, 1971, 2145375

Int. Cl.² A24C *5/50*

U.S. Cl. 93—77 FT **14 Claims**



1. A method of making composite filter mouthpieces, comprising the steps of moving a continuous web of wrapping material lengthwise; placing onto one side of the moving web a single file of axially spaced filter plugs and moving the filter plugs with the web; placing filter disks between successive plugs of said file, including individually holding each of the filter disks at one axial end thereof and positioning each of the thus held filter disks in abutment with one of the adjacent filter plugs, and moving the filter disks with the web and filter plugs; draping the web around the filter plugs and filter disks to form an elongated filter rod wherein filter plugs alternate with filter disks, including connecting said filter disks with the abutting filter plugs by means of said wrapping material; and severing the filter rod to form a plurality of discrete mouthpieces each of which contains at least one filter disk and at least a portion of at least two filter plugs.

4,036,120

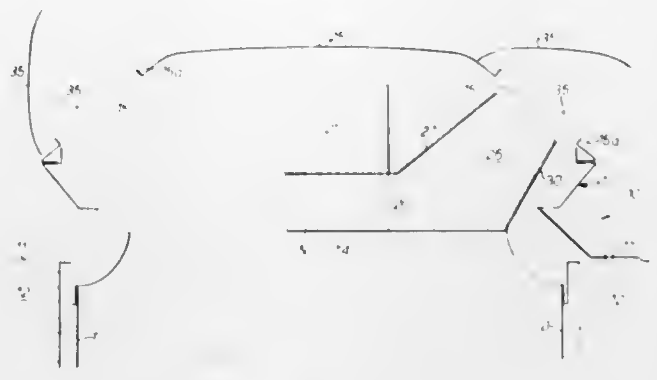
VENTILATORS

Raymond Alfred Frank Burtenshaw, Clanfield, England, assignor to Colt International Limited, Hampshire, England

Filed Nov. 14, 1975, Ser. No. 631,905

Int. Cl.² F24F *7/06*

U.S. Cl. 98—43 R **16 Claims**



1. A powered extract roof ventilator comprising:
a fan including a fan impeller,
a body housing presenting a bottom ventilation opening to be positioned in the roof structure, and having a top wall for weathering the ventilation opening and a plurality of side walls which are downwardly and outwardly inclined from said top wall at a substantial angle to the vertical and horizontal, the body housing have side openings on all sides thereof, said openings each being formed in a respective side wall of the body housing which is downwardly and outwardly inclined from said top wall at a substantial angle to the vertical and horizontal, each side opening being defined by a surrounding wall on the outside of the inclined side wall and projecting outwardly of the body housing to form a gutter with the side wall to drain water down the outside of the side wall portions around the respective opening, the fan impeller being housed in the body housing and being arranged to draw air into the body housing through said ventilation opening and to discharge air through said side openings, and
dished flaps associated respectively with each of said side openings, said dished flaps being located on the outside of the body housing in registration with its respective side opening and hinged to the body housing so as to be swingable between open and closed positions in which each flap guies air discharged through the respective side opening and closes the respective side opening respectively, each flap in its closed position overhanging the complete surrounding wall defining the respective side opening to the outside thereof and in spaced relation thereto around its whole periphery, thereby to weather the respective side opening.

4,036,121

BREWING APPARATUS FOR BEVERAGE-BREWING MACHINE

Karl Bieri, Zurich, Switzerland, assignor to Hagezet-Aktiengesellschaft, Zurich, Switzerland

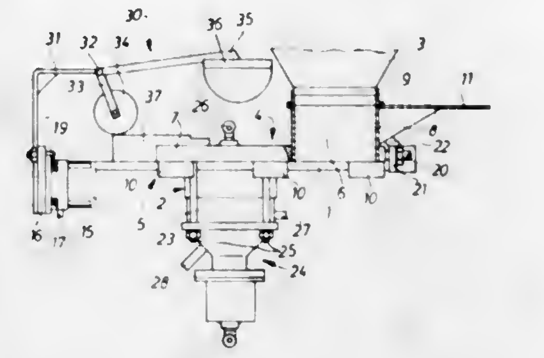
Filed Oct. 1, 1975, Ser. No. 618,333

Claims priority, application Switzerland, Oct. 2, 1974, 13270/74

Int. Cl.² A47J *31/00*

U.S. Cl. 99—289 R **5 Claims**

1. Apparatus employing a brewing liquid for brewing beverages from a grund or powdered material insoluble in the brewing liquid comprising:
A base plate,
means integral with said base plate defining a stationary beverage brewing chamber having an inlet opening,
a container for storing the material to be brewed, said container having an outlet,
an intermediate member which is movable with respect to the base plate between a first and second position along the predefined path,
a brewing head and a transport container carried by said intermediate member and spaced apart along the path of movement of the intermediate member, said brewing head including means cooperating with said brewing chamber for pressure sealing the inlet opening thereof when said intermediate member is in said first position, said transport container having an inlet and an outlet and being constructed and arranged so that said transport container inlet is aligned with said storing container outlet when said intermediate member is in said first position and so that said transport container outlet is aligned with said brewing chamber inlet when said intermediate member is in said second position, and
means for moving said intermediate member from said first position wherein said transport container receives material from said storing container to said second position wherein the transport container outlet dispenses material into said brewing chamber and the brewing head is out of operative relationship with said brewing chamber.



4,036,122

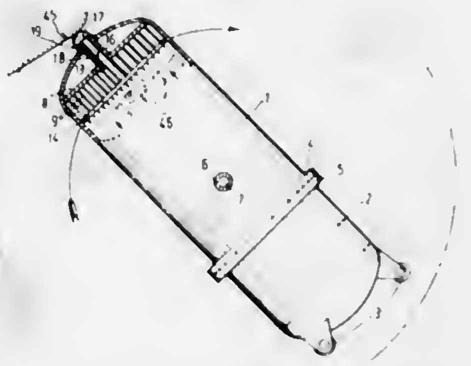
APPARATUS FOR TREATING MEAT, MORE PARTICULARLY HAM MEAT

Christianus Petrus Langen, Cuyk, Netherlands, assignor to H. J. Langen & Sons Ltd., Rexdale, Canada

Division of Ser. No. 571,592, April 25, 1975. This application Jan. 19, 1976, Ser. No. 650,249

Int. Cl.² B02B *3/12, 23/00;* A22C *9/00;* A23L *1/31*

U.S. Cl. 99—533 **12 Claims**



9. A meat curing machine comprising:
a. a meat curing tank closed to contain a curing fluid,
b. means for mounting said tank for rotation about a horizontal axis,
c. said meat curing tank having at least two elongated meat curing chambers each having a radial axis and having side walls extending away from said horizontal axis, said radial axes being circumferentially spaced from one another, said chambers each having a closed end at the radially outer end thereof and an open end thereopposite, the open end of one chamber communicating with the open

end of each other chamber in a common open end of the curing tank,

d. a second tank having a meat storage chamber formed therein, said storage chamber having an open inner end adapted to sealingly engage said common open end of said curing tank to place said storage chamber in sealed communication with said meat curing chambers,

e. means for releasably securing said second tank with respect to said curing tank for rotation therewith,

f. a plurality of meat penetrating needles mounted in each of said curing chambers and supported at the radial outer ends thereof, said needles extending parallel to said side walls and having free ends projecting towards said horizontal axis whereby meat tumbling under its own weight from one chamber into another meat curing chamber having needles will be penetrated substantially in the direction of the radial axis of that chamber by the needles, and

g. drive means for rotatably driving said meat curing tank about said horizontal axis with said second tank secured thereto.

4,036,123

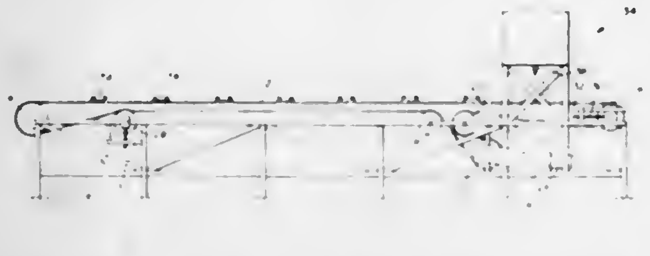
MACHINE OF CUTTING CORES OF VEGETABLES

James Elliott Conkey, Seneca Falls, N.Y., assignor to Kibbey Machine Company, Incorporated, Seneca Falls, N.Y.

Filed Aug. 29, 1975, Ser. No. 609,032

Int. Cl.² A23N *23/00, 4/12;* A47J *23/00, 25/00*

U.S. Cl. 99—538 **3 Claims**



1. A machine for cutting or sectioning the cores of leafy vegetables such as heads of cabbage or the like, said machine comprising:

a. an elongated supporting frame having a feed end and a discharge end;

b. conveying means mounted on said frame for continuous travel substantially along a first plane at a uniform linear speed from said feed end to said discharge end;

c. retainer means on said conveying means for releasably holding said vegetables in positions with the cores thereof extending substantially perpendicular to said first plane;

d. a stationary core cutting station through which said conveying means travels;

e. core cutting means at said cutting station mounted for cyclical reciprocal movement in a second plane substantially perpendicular to said first plane for engaging and cutting the cores of said vegetables during continuous travel of said conveyor;

f. means for moving said cutting means in said second plane into engagement with said cores of said vegetables when said vegetables reach said cutting station, said moving means moving said cutting means at a cyclical speed relative to said continuous uniform linear speed such that said cutting means completes a core cutting operation before said conveying means has traveled more than an incremental distance whereby it is unnecessary to stop said conveying means during said core cutting operation; and

g. means actuated by said cutting means when moved in the direction of engagement with said cores of said vegetables for withdrawing said cutting means in said second plane at the end of the core cutting operation without separating said vegetables into discrete portions whereby substantially all of said vegetables are retained for subsequent use.

4,036,124

SLUDGE PRESS

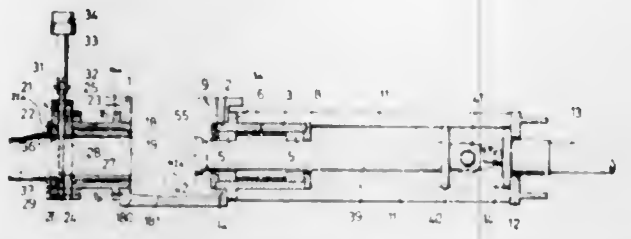
Niklaus Seiler, Neuenhofstr. 20, 5600 Lenzburg, and Hanspeter Seiler, Erzgrubenweg 18, 5000 Aarau, both of Switzerland

Filed Mar. 14, 1975, Ser. No. 558,717

Claims priority, application Switzerland, Mar. 18, 1974, 3701/74

Int. Cl.² B30B *15/08. 1/32*

U.S. Cl. 100—98 R **26 Claims**



1. A press, particularly a sludge press, comprising a receptacle for the material to be presses; an elongated hollow barrel having an open rear end in communication with the interior of said receptacle and an open front end; a piston reciprocable in line with said barrel between a retracted position in which the material in said receptacle can enter the rear end of said barrel and an extended position in which said piston is located in and at least close to said front end of said barrel, said piston having a front face and a first annular cutting edge surrounding said front face and said barrel having at said rear end thereof a complementary second annular cutting edge through which said piston passes during movement toward said extending position; and a valve provided at said front end of said barrel, said valve having a valve member movable between a first position in which said front end of said barrel is at least substantially sealed, particularly during movement of said piston from said extended position, and a second position in which said front end is exposed so that said piston can expel material from said barrel forwardly during movement to said extended position thereof.

4,036,125

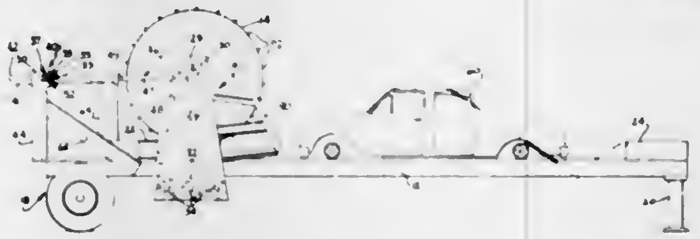
TRAILER MOUNTED AUTOMOBILE CRUSHER

John R. Mezei, 3940 Knapp NE., Grand Rapids, Mich. 49505

Filed Jan. 16, 1976, Ser. No. 649,750

Int. Cl.² B30B *3/02*

U.S. Cl. 100—100 **13 Claims**



1. A vehicle crusher for flattening automobiles or the like comprising:

a reinforced, elongated bed;

a crushing roller positioned on and perpendicular to the length of said bed and mounted for vertical movement relative thereto during crushing;

means operatively connected to said roller for powering the roller along the length of the bed; and

means extending below and connected to the roller and movable vertically with said roller for limiting the vertical movement of said roller from said bed as said roller is powered down the bed and over a vehicle to be crushed.

4,036,126

DEVICE FOR STAMPING SOIL INTO GROUPS OF GROWTH POTS

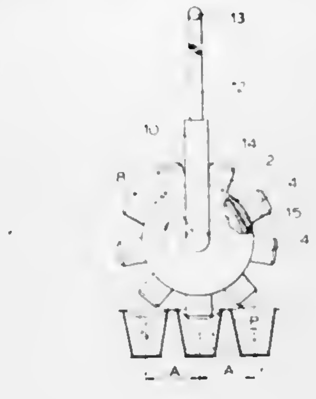
Marius Gundersen, Larvik, Norway, assignor to Vefi A/S, Norway

Filed Mar. 1, 1976, Ser. No. 662,310

Claims priority, application Norway, Mar. 5, 1975, 750739

Int. Cl.² B30B *3/02, 9/00;* B65B *1/24*

U.S. Cl. 100—210 **1 Claim**



1. A device for tamping soil in groups of stationary soil-filled growth pots positioned in evenly spaced side by side relationship comprising a cylindrical roller rotatably supported in a holder having a rodlike handle at its end opposite said roller, said roller including longitudinally and circumferentially evenly spaced tampering projections, the longitudinal and circumferential spacing between the center of the outer surface of each adjacent projection being equal and corresponding to the spacing between the centers of any of said adjacent pots, each projection having a cross-sectional shape substantially conforming to the shape of the opening of said pots, the outer end of each projection being substantially flat and having a bevelled edge around the perimeter thereof to facilitate the entrance of the projection into the open end of said pots to tamp the soil therein, said projections which are in longitudinal alignment being affixed to a supporting plate and said supporting plate being secured to said roller.

4,036,127

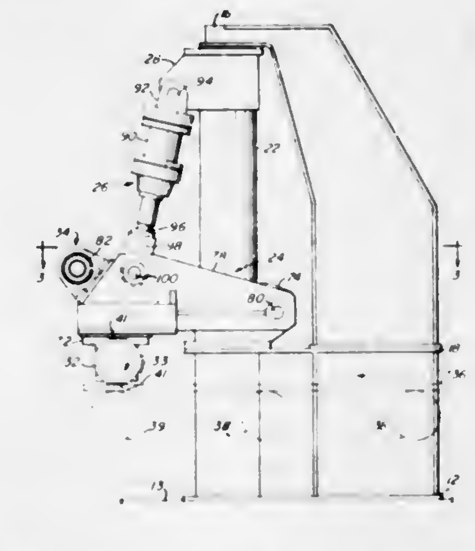
PLATE MARKING APPARATUS

Edwin W. Speicher, Pittsburgh, Pa., assignor to M. E. Cunningham Company, Ingomar, Pa.

Filed Oct. 23, 1975, Ser. No. 625,059

Int. Cl.² B41F *17/00*

U.S. Cl. 101—5 **8 Claims**



1. Apparatus for impressing a preselected mark on the surface of an object to be marked comprising,

a frame,

a support member secured to said frame,

a carriage mounted for vertical and lateral movement on said support member,

marking means to impress a preselected mark upon a surface of the object to be marked, said marking means including marking elements, said marking means rotatably supported on said carriage,

drive means mounted on said carriage and drivingly connected to said marking means for rotating said marking means through a single revolution to urge said marking elements into marking engagement with the surface of the object to impress preselected marks thereon,

a first piston cylinder assembly having a cylinder with an end portion pivotally secured to said support member,

said first piston cylinder assembly having an extensible piston rod with an end portion pivotally connected to said carriage so that extension of said piston rod exerts a preselected marking force on said marking means to position and maintain said marking means in marking relation with the object to be marked,

a second piston cylinder assembly having a cylinder with an end portion pivotally connected to said frame, and

said second piston cylinder assembly having an extensible piston rod with an end portion pivotally connected to said carriage so that actuation of said piston cylinder assembly extends and retracts said piston rod to laterally swing said carriage in a horizontal plane.

4,036,128

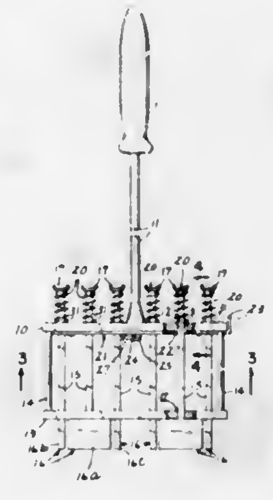
BRANDING IRON WITH QUICKLY CHANGEABLE CHARACTERS

Harlan Easton, R.F.D. 3, Blooming Prairie, Minn. 55917

Filed Mar. 5, 1976, Ser. No. 664,405

Int. Cl.² A01K *11/00*

U.S. Cl. 101—9 **1 Claim**



1. A portable instrument for branding animals, comprising, in combination:

a base plate;

a handle projecting out of one surface of said base plate in a first direction;

a guide plate;

means mounting said guide plate spaced from and substantially parallel to said base plate on the side thereof removed from said handle;

a plurality of non-circular rods slidable through like non-circular aligned holes in said base and guide plates, to project therebeyond;

a like plurality of heatable marking elements fixed to the ends of said rods which extend beyond said guide plate, said elements being configured and positioned to jointly define the sides and midlines of a plurality of adjacent rectangular figures;

finger buttons fixed to the ends of said rods which extend beyond said base plate;

resilient means acting between said base plate and said finger buttons for normally maintaining said elements against said guide plates;

detent means carried by said rods for holding them individually in working positions in which they define a working plane;

release means traversed by said rods for engagement by said detent means in the working positions of said rods and operable out of a normal position to simultaneously release the detents of all rods which are in working position;

and means resiliently urging said release means into said normal position,

the displacement between said base plate and said guide plate being such that heat conduction from such marking elements is not detrimental to said resilient means and said detent means.

4,036,129
SQUEEGEE DEVICE

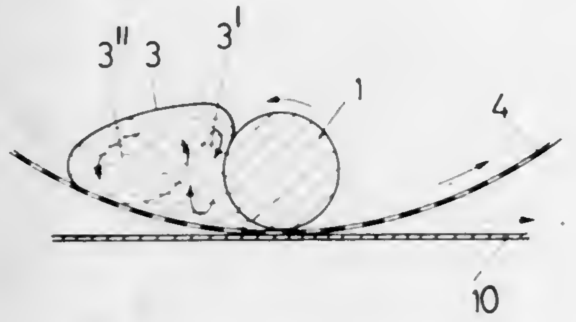
Johannes Zimmer, Ebentalerstrasse 133, 9020 Klagenfurt, Austria

Filed Oct. 9, 1975, Ser. No. 621,212

Claims priority, application Austria, Oct. 15, 1974, 8277/74; Aug. 25, 1975, 6532/75

Int. Cl.^{2} B41F *15/44*

U.S. Cl. 101—120 **6 Claims**



1. In a system for applying a liquid or viscous material to a surface to be treated, the system being of the type including a squeegee roller displaceable toward the surface to be treated and rotatable in the direction of movement thereof, a sump of liquid or viscous material positioned on the upstream side of said squeegee roller with respect to the direction of movement of the surface, and a feed tube positioned to supply said material to said sump; the improvement comprising:

a plate element extending from said feed tube and supported thereby at a position to contact said upstream side of said squeegee roller;

said plate element extending along the entire length of said squeegee roller;

said plate element having thereon seal means to prevent passage of said liquid or viscous material from said sump wardly between said plate element and said squeegee roller;

and

a lowermost edge of said plate element being positioned to extend beyond the rotational axis of said squeegee roller toward the surface to be treated and spaced from such surface;

whereby said plate element thus positioned prevents said sump from retarding rotation of said squeegee roller.

4,036,130
INTAGLIO PRINTING PLATE MANUFACTURE

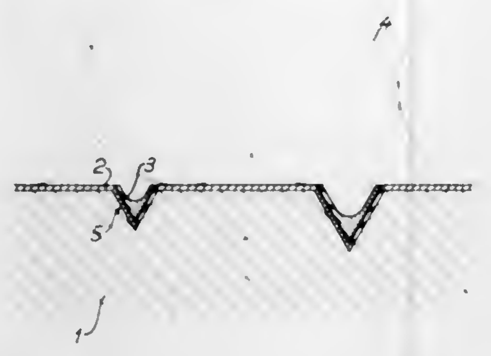
Gualtiero Giori, Lonay, Switzerland, assignor to De La Rue Giori S.A., Switzerland

Filed July 28, 1975, Ser. No. 599,789

Claims priority, application Switzerland, July 30, 1974, 10442/74

Int. Cl.^{2} B41M *1/10;* **B24B** *31/06;* **G03F** *7/10*

U.S. Cl. 101—170 **9 Claims**



1. A process for manufacturing an intaglio printing plate for offset printing comprising the steps of:

providing a plate having a surface with non-printing surface areas and engraved printing grooves for copperplate impression printing, a layer of a first material which retains a wetting agent to become ink repellent on said non-printing surface areas,

applying over all of the surface of said plate including the engraved grooves a 0.01 to 0.1 mm thick layer of a second material which is hardenable and has ink accepting properties and which adhers strongly to the plate and partly fills the engraved grooves with said second material to define concave recesses of a depth and form for offset printing, said second material being a synthetic resin base varnish,

hardening said layer of said second material, and thereafter mechanically removing said second material from the non-printing surface areas of the plate outside of said grooves and simultaneously polishing edges of said second material, in said engraved grooves, flush with said non-printing surface, while leaving intact said layer of said first material on the non-printing surface areas and said second material within said grooves.

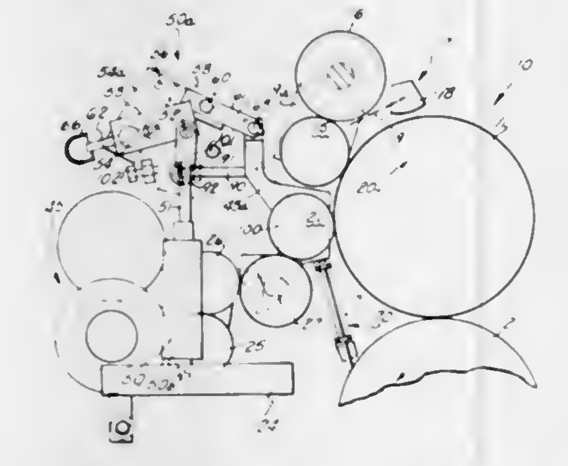
4,036,131
DAMPENER

Donald Fenton Elmore, Xenia, Ohio, assignor to Harris Corporation, Cleveland, Ohio

Filed Sept. 5, 1975, Ser. No. 610,735

Int. Cl.^{2} B41F *13/24*

U.S. Cl. 101—247 **7 Claims**



1. Apparatus for use in a lithographic printing press having a plate cylinder for carrying a printing plate and an inker having at least one ink form roll for applying ink to the printing plate, said apparatus comprising a dampener form roll for applying dampening solution to the printing plate, said dampener form roll having a thrown-on position for transferring dampening solution to a plate, a thrown-off position out of dampener solution transferring relationship with a plate and a wash-up position in fluid-transmitting relation with an ink form roll of the inker, a throw-off mechanism for moving said dampener form roll between said thrown-on and thrown-off positions including a motor and a linkage mechanism interconnecting said motor and said dampener form roll, means in said linkage mechanism for selectively connecting or disconnecting said linkage mechanism, and at least one spring for moving said dampener form roll to said wash-up position upon disconnection of said linkage mechanism.

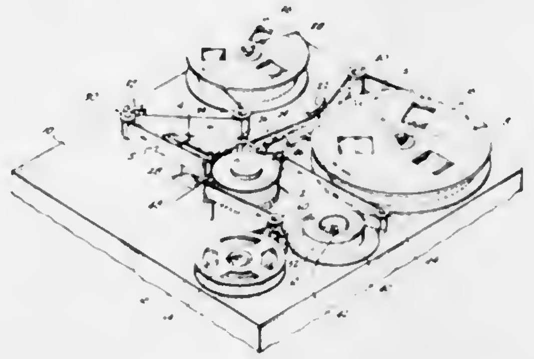
4,036,132
LABEL STRIPPING APPARATUS FOR LABEL PRINTERS

Larry P. Ellefson, Seattle, Wash., assignor to Interface Mechanisms, Inc., Mountlake Terrace, Wash.

Filed Nov. 13, 1975, Ser. No. 631,743

Int. Cl.^{2} B41F *1/08*

U.S. Cl. 101—288 **9 Claims**



1. A label-stripping apparatus for use with label stock comprising an elongated strip of label stock backing having a front surface and a back surface and further comprising a plurality of labels removably adhering to and spaced along the front surface of the elongated strip, said apparatus including:

a. first means having a label stripping surface capable of causing the labels to separate from the front surface of the elongated strip of label stock backing when the back surface thereof is moved across said label stripping surface, in a longitudinal direction of the elongated strip,

b. second means for moving the elongated strip of label stock backing under substantially uniform tension from a supply position to a take-up position and located with respect to said first means so that the back surface of said elongated strip of label stock backing is pressed against said label stripping surface and the elongated strip of label stock backing is caused to travel in a first direction from said supply position to said label stripping surface, across said label stripping surface, and in a second direction, angularly disposed substantially 90° from said first direction, from said label stripping surface to said take-up position,

c. said first means further including a backing pressure surface which is located between said label stripping surface and said take-up position in proximity to said label stripping surface for engaging the front surface of the elongated strip of label stock backing after the elongated strip travels across said label stripping surface, said backing pressure surface being substantially tangent to the portion of the elongated strip between the label stripping surface and the take-up position in said second direction and being spaced from said label stripping surface in said second direction by an amount so as to result in a substantially constant length of the elongated strip of label stock backing being maintained at all times between said supply position and said take-up position.

4,036,133
PRINTING PLATE CLAMPING ASSEMBLY

Alex Kocsis, Granger, Ind.; Gerald Kasner, Union, Mich.; Rudy Fermi, South Bend; David Bratton, Mishawaka, both of Ind., and John Pickard, San Antonio, Tex., assignors to K & F Manufacturing Company, Inc., Granger, Ind.

Filed Dec. 12, 1975, Ser. No. 640,169

Int. Cl.^{2} B41F *27/12*

U.S. Cl. 101—415.1 **13 Claims**

1. Apparatus for releasably clamping a plate edge portion of thin flexible printing plate to press cylinder means with said printing plate supported in an in-use printing position on a circumferential surface of said press cylinder means; said apparatus including:

clamp members movable between a clamping position with said clamp member means clampingly engaged in plate detent means of said plate edge portion and a non-clamping position out of clamping engagement with said plate detent means,

biasing means for biasing said clamp members means toward said clamping position,

clamp member retaining means movable between a retaining position lockingly retaining said clamp member means in said non-clamping position against the force of said biasing means and a non-retaining position permitting said clamp member means to move toward said clamping position,

and retainer release means for accommodating selective manual movement of said retaining means from said retaining position to said non-retaining position,

said clamp member retaining means including a retaining strap member attached to and movable with said clamp member means and extending in a generally circumferential direction when in an in-use position on a press cylinder means, said restraining strap member including strap member means,

said retainer release means including a release bar extending transversely to said retaining strap member and having release bar detent means,

said release bar being movable between a locking position with said release bar detent means engaged with said strap member detent means to hold said clamp member means in a non-clamping position and a release position with said release bar detent means released from said strap member detent means to permit movement of said retaining strap member and said clamp member means toward the clamping position.

4,036,134
SYMBOL INDICATION DRUM

Takashi Funaki, Nagano, Japan, assignor to Kabushiki Kaisha Sankyo Seiki Seisakusho, Japan

Division of Ser. No. 410,336, Oct. 29, 1973, abandoned. This application June 11, 1975, Ser. No. 585,772

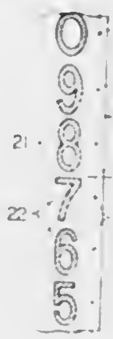
Claims priority, application Japan, Nov. 4, 1972, 47-127312[U]

Int. Cl.^{2} B41M *1/40;* **G01D** *13/12*

U.S. Cl. 101—426 **3 Claims**

1. In a method of manufacturing a drum having indicia

transferred onto its periphery from an inked master by preparing a relatively elongated master by providing thereon a series of inked indicia in correctly positioned longitudinal relation to each other and each having a lateral edge spaced the same predetermined distance from a reference lateral edge of the master, and rolling a drum longitudinally of the master with a selected axial end thereof coincident with such reference edge to transfer the inked indicia onto the cylindrical periphery of the drum as printed indicia; the improvement comprising the steps of providing a cylindrical tester sleeve of transparent material having an internal diameter slightly greater than the external diameter of the drum; marking a circumferentially continuous reference line on the inner periphery of the tester sleeve with all points thereof at such predetermined distance from one axial end of the tester sleeve; and inserting the printed drum into the tester sleeve with the selected axial end of the drum flush with such one axial end of the tester sleeve to check whether such lateral edges of the printed indicia coincide with such continuous reference line; whereby, by virtue of such circumferentially continuous reference line, all such lateral edges of the printed indicia can be checked simultaneously for such predetermined distance from such selected axial end of the drum without the necessity of effecting relative rotation of the tester sleeve and the drum; further including the step of providing the master with inked reference points each located adjacent a respective indicia, with the reference points being aligned longitudinally of the master and symmetrically located relative to the respective indicia; the inked indicia on the master being essentially centered laterally thereof and the inked reference points being located at such predetermined distance from the reference lateral edge of the master.



4,036,135
OFFSET DUPLICATOR WITH MASTER TREATING MEANS

Hermann Raible, and Rolf Muller, both of St. Georgen, Germany, assignors to Mathias Bauerle GmbH, St. Georgen, Germany

Filed June 23, 1975, Ser. No. 589,026

Claims priority, application Germany, Sept. 30, 1974, 2446608

Int. Cl.² B41F *7/00*

U.S. Cl. 101—463 **19 Claims**

3. A rotary duplicating machine having a master cylinder and a treating unit for converting a master while the master is being attached to the master cylinder, comprising:

selective means operable to drive the master cylinder at a printing speed and at a starting speed;

feed means for feeding a master to the treating unit;

conveyor means for transporting said master from the treating unit to the master cylinder;

clamping means on the master cylinder for clamping one end of the master to the master cylinder;

said drive means driving the feed means and the conveyor means at a speed to move a master at substantially the same speed as moved by the master cylinder when operating at its starting speed, and

control means for rendering the drive means inoperative when the clamping means clamps one end of the master to the master cylinder.

14. A method of treating a master with a conversion solution while the master is being attached to a master cylinder of a duplicating machine in which the master cylinder is selectively operable at a printing speed and a starting speed, comprising the steps of:

transporting a master to a treating means by feed means operable at the starting speed of the master cylinder;

discontinuing transport of the master by the feed means in response to arrival of one end of the master at conveyor means;

operating the conveyor means for delivering said one end of the master to a clamping means on the master cylinder;

discontinuing the drive of the conveyor means when said one end of the master is clamped to the master cylinder by the clamping means;

operating the master cylinder at the starting speed to draw the master through the treating means while the master is being wrapped around the master cylinder; and

operating the master cylinder at the printing speed when the master is wrapped completely around the master cylinder.

15. A duplicating machine including master clamping means, comprising:

a master cylinder for supporting a master and rotatable selectively at a printing speed and a starting speed;

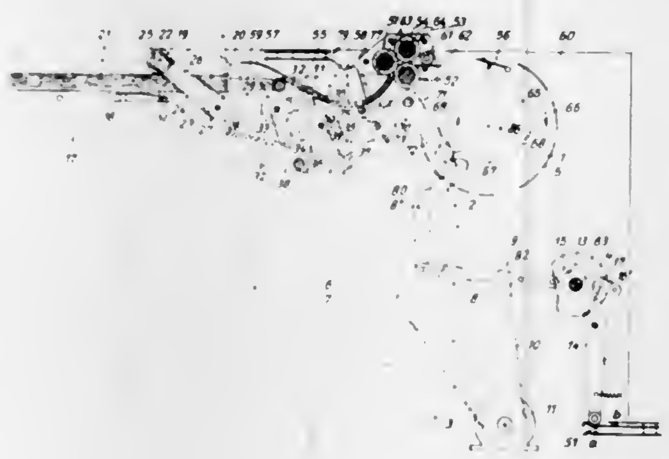
a cam disc interconnected with the master cylinder and provided with an outer periphery having a first and a second timing surface;

follower means carried by the master cylinder for coaction with the cam disc;

said clamping means being positioned on the master cylinder and operable from an open position for ejecting a master to a closed position for master clamping, and through a master inserting position intermediate the open and closed positions; and

actuator means for operating the clamping means to the open position when the follower means coacts with the first timing surface of the cam disc and for operating the clamping means to the master inserting position when the follower means coacts with the second timing surface of the cam disc,

said actuator means operating the clamping means from the master inserting position to the closed position when the said follower means coacts with the periphery of the cam disc spaced from the first and second timing surfaces.



4,036,136
CORONA PRODUCING A PLANOGRAPHIC PRINTING SHEET

Tohru Takagi, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Filed Mar. 14, 1975, Ser. No. 558,300

Claims priority, application United Kingdom, Mar. 18, 1974, 49-4929966

Int. Cl.² H01T *19/00*

U.S. Cl. 101—467 **2 Claims**

1. A method for producing a planographic printing plate or sheet which is characterized in that the surface of an oleophilic body comprising an oleophilic resin is subjected to a corona discharge treatment to form a hydrophilic layer on said surface, wherein said olephilic resin is polybutadiene, said corono discharge is the discharge of a sinusoidial AC voltage of 3 kHz frequency and 15,000 volts at a current of 1.8 amps, and wherein not less than 0.05 milliwatt hour of discharge current is applied to each 1 cm² of the surface of said body, whereby the wettability of said surface is increased.

4,036,137
METHOD AND MEANS OF EXTRACTING A SOIL ANCHOR CONSISTING OF A PRESTRESSED STEEL TENDON

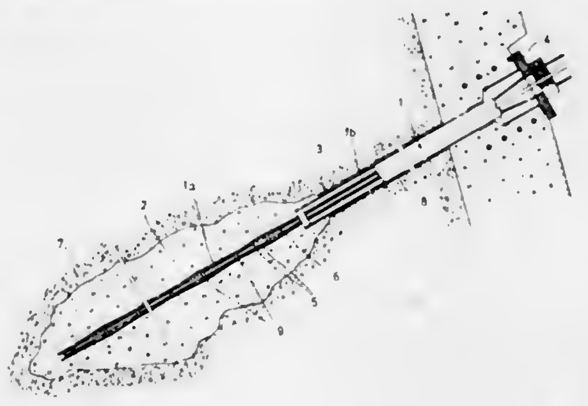
Hans Dietrich, Bolligen, Switzerland, assignor to Losinger AG of Bern, Switzerland

Filed June 13, 1975, Ser. No. 586,801

Claims priority, application Switzerland, June 19, 1974, 8424/74

Int. Cl.² F42D *1/00*

U.S. Cl. 102—23 **2 Claims**



1. A method of extracting a ground anchor embedded in the ground and including a prestressed tendon having a confinement member and a stressed member, said confinement member extending to the bottom of a borehole in the ground in which the anchor was introduced and bonded therein by a hardening agent injected into the borehole and surrounding and bonded to the confinement member, said stressed tension member extending through an encasing tube to an anchor plate at the entry of the borehole, whereby a hollow loading tube was placed substantially centrally and longitudinally of substantially the entire length of said tendon and introduced simultaneously with the anchor into said borehole, the improvement comprising:

A. introducing an explosive into the last-mentioned tube along the entire length of the confinement member;

B. detonating the explosive and rupturing the hardened agent surrounding the confinement tube and loosening the bond with the confinement member; and

C. withdrawing the loosened tendon out of the soil in which the anchor was embedded.

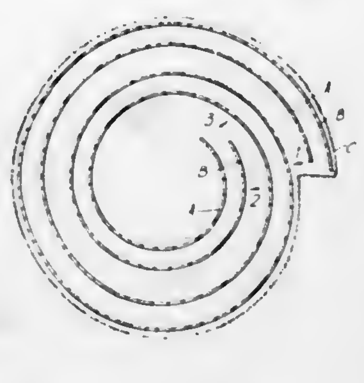
4,036,138
RIGID WATERPROOF CONTAINER FOR SLURRIED EXPLOSIVES IN SMALL DIAMETERS

Gopal Mohan Chopra; Tyagaraja Gangadharan, and Ram Narain Sinha, all of Bihar, India, assignors to Indian Explosives Limited, India

Filed Dec. 17, 1975, Ser. No. 641,456

Int. Cl.² F42B *3/00*

U.S. Cl. 102—24 R **8 Claims**



1. A waterproof and rigid container for slurried explosives which comprises a tube or shell formed by superimposing partially or wholly a shrinkable film on paper and rolling the film and paper into the shape of a tube or shell of continuous and successive layers of the film and paper, the inner layer being the film and the outer layer being the paper, and thereafter crimping the tube or shell at one end, the tube or shell so formed being externally coated with a suitable waterproofing medium under predetermined conditions thereby causing a partial shrinkage of the film and, when required, the waterproofed tube or shell is filled with an explosive and the filling or mouth end is crimped and waterproofed forming a rigid and waterproof cartridge.

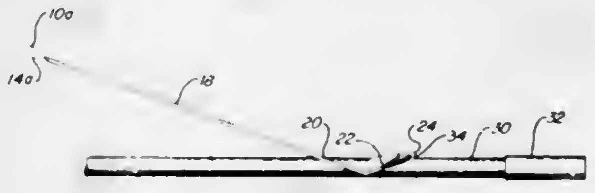
4,036,139
ELECTRICALLY INITIATED FUSE IGNITOR

Robert Edward Eckels, 2101 Youngfield, Golden, Colo. 80401

Filed Jan. 9, 1976, Ser. No. 647,661

Int. Cl.² C06C *5/06*

U.S. Cl. 102—28 R **10 Claims**



1. An electrically initiated pyro-detonation cap assembly resistant to static electricity comprising:

a. a length of fuse means of the ignition type having an ignition train;

b. a pyro-detonation cap secured to an end of said fuse means;

c. a cut in said of fuse means exposing the ignition train therein;

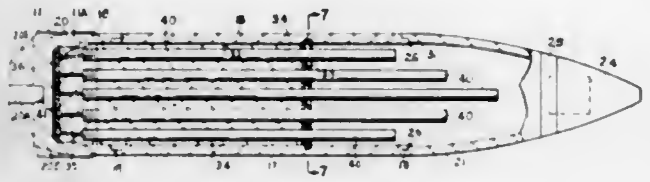
d. a pyro-alloying, conducting bridgewire mounted in said cut essentially in contact with said ignition train, said bridgewire comprising a pyro-alloying composition which is not a resistance wire, and

e. an electrical lead secured to and extending from each end of said bridgewire to an electric current source, arranged to activate the alloying reaction of said bridgewire and ignite said fuse ignition train.

4,036,140
AMMUNITION

Abraham L. Korr, Philadelphia, Pa.; Evan Harris Walker, Aberdeen, Md.; Charles M. Dickey, Huntingdon Valley, and Bransby W. Bushey, Philadelpia, both of Pa., assignors to The United States of America as represented bythe Secretary of the Army, Washington, D.C.

Filed Nov. 2, 1976, Ser. No. 737,925
Int. Cl.² F42B *5/02*
U.S. Cl. 102—38 **6 Claims**



1. An ammuniton round comprising,

a main projectile body portion having a tubular sidewall rearwardly terminating in a base portion,

a boom extending rearwardly from said base portion and terminating in a plurality of canted stabilizing fins,

a cartridge case secured to said projectile body portion, said cartridge case containing a primer and housing said boom,

a plurality of sequentially initiatable traveling charges surrounding said boom and intermediate said base portion and said primer,

an ignition delay element intermediate longitudinally successive ones of said traveling charges,

a forward ogive portion connected to said sidewall and having a forwardmost nose member containing fuze means,

an ogival ejection element carried by a rearward portion of said ogive portion,

ignition means interconnecting said ogival ejection element with said fuze means,

a plurality of launch tubes secured in said projectile main body portion, each launch tube carrying a plurality of fin stabilized sub-projectiles and means including a primer and traveling charges for launching the corresponding fin stabilized sub-projectiles from the respective launch tube,

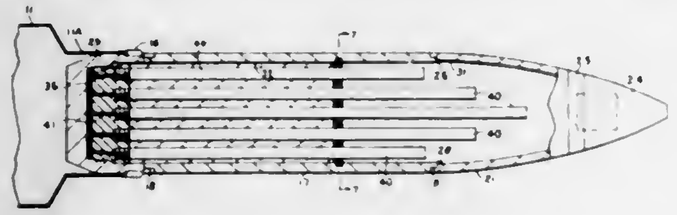
an initiator secured in said base portion, and

ignition means interconnecting said initiator with said ogival ejection element and each of said launch tube primers.

4,036,141
AMMUNITION

Abraham L. Korr, 8712 Hickory Drive, Philadelphia, Pa. 19136; Evan Harris Walker, 834 Paradise Road, Aberdeen, Md. 21001, and Charles M. Dickey, 3549 Brae Bourn Drive, Huntingdon Valley, Pa. 19006

Filed Aug. 2, 1976, Ser. No. 710,493
Int. Cl.² F42B *9/02*
U.S. Cl. 102—38 **9 Claims**



1. In an ammunition round having a projectile secured in a mouth of a cartridge case, said case having means for operatively launching said projectile,

said projectile having a main body portion and a forward ogive portion, said ogive portion having a forwardmost nose member containing fuze means,

an ogival ejection element carried by a rearward portion of said ogive portion,

ignition means interconnecting said ogival ejection element with said fuze means,

a plurality of launch tubes secured in a base support positioned in said projectile main body portion, each launch tube carrying a plurality of sub-projectiles, a rearmost primer, and a plurality of sequentially initiated traveling charges intermediate said sub-projectiles and said primer,

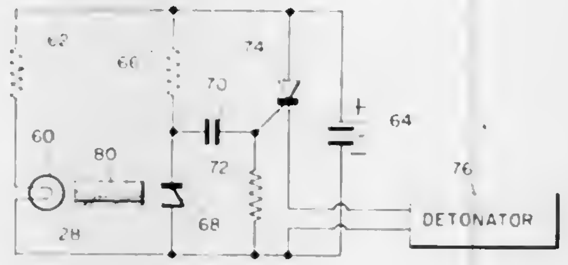
an initiator secured in a base portion of said projectile main body portion, and

ignition means interconnecting said initiator with said ogival ejection element and each of said launch tube primers.

4,036,142
OBSCURATION FUZE AND SENSOR

David Williams, Bethesda, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 18, 1967, Ser. No. 610,204
Int. Cl.² F42C *13/02, 19/12, 11/00*
U.S. Cl. 102—70.2 R **10 Claims**

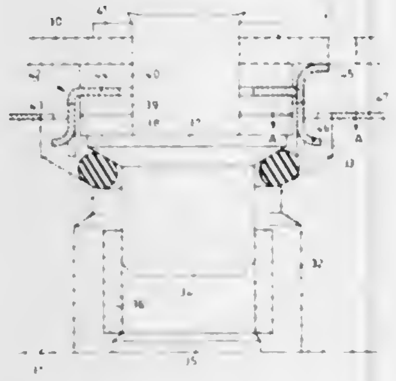


1. An obscuration fuze comprising means defining a sensing gap, a light source coupled to said means for directing light across said gap, a detector coupled to said means for sensing changes in the light conductivity of the medium within said gap, and firing means coupled to said detector for exploding a charge in response to changes in the light conductivity of said medium.

4,036,143
IMPACT CONTACT DEVICE FOR PROJECTILES

John Lennart Nordgren, and Gunnar Gudmund Thordarson, both of Jarfalla, Sweden, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Mar. 18, 1976, Ser. No. 668,087
Claims priority, application Sweden, Mar. 26, 1975, 7503490
Int. Cl.² F42C *19/06*
U.S. Cl. 102—70.2 R **4 Claims**



1. An impact contact device in an ignition tube adapted to be mounted on the nose part of a projectile, the tube including a rigid nose part and a rigid base part, comprising a rotational joint for mechanically holding together said nose and base parts so as to allow relative rotation of the two parts, said rotational joint being dimensioned so as to have a mechanical strength such that it yields due to resilience or a break when exposed to given forces which appear upon lateral impact of the projectile against a target, contact means arranged at the interface area between the two parts and responsive to a relative motion, in a lateral or axial direction, between the two parts for operating an ignition circuit when said relative motion exceeds a certain value, a portion of the base part that faces the nose part comprising a metallic plate having a central aperture and forming a mechanical barrier between the two parts and an electric ground for the ignition circuit, said contact means comprising a first contact element supported by the nose part and including a generally sleeve-shaped metallic body which projects from the nose part into a recess in said metallic plate, said contact means further comprising a second contact element supported by the base part and electrically connected to the metallic plate and normally positioned at a distance from the first contact element but arranged to come into contact with the first contact element upon relative motion between the nose and base parts thereby to operate said ignition circuit, a conductor extending through said central aperture for interconnecting the nose part and the base part and surrounded by the sleeve-shaped body, said recess in the metallic plate comprising a widened portion of the central aperture which is situated at the surface of the metallic plate that faces the nose part.

4,036,144
ARMING SYSTEM

James M. Meek, Silver Spring, Md., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

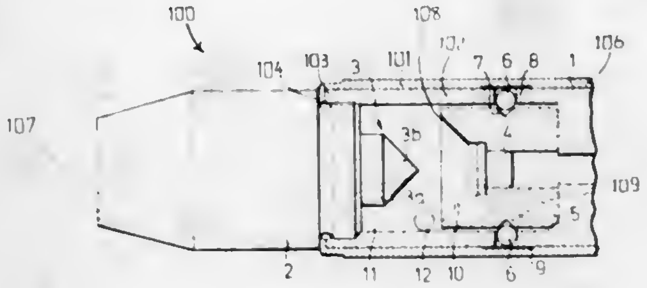
Filed Jan. 29, 1959, Ser. No. 790,028
Int. Cl.² F42C *15/40*
U.S. Cl. 102—70.2 R **4 Claims**

1. An arming system for use in an ordnance missile, said system consisting of two parts contained within said missile and electrical wiring connections for transmitting electrical signals therebetween, the first part comprising: an arming rotor, a spring biasing said rotor for rotation to an armed position, means for locking said rotor against rotation to said armed position, said means adapted to unlock said rotor for rotation when said means receives a series of electrical signals of predetermined duration in a predetermined sequence from said electrical wiring connections; the second part comprising: a series of environmental sensing switches each adapted to close in response to a predetermined condition which the missile experiences during proper missile flight, a distributor, contacts adapted to be closed by said distributor in a predetermined sequence and for predetermined time periods, and a source of electrical power connected to said contacts and to said electrical wiring connections so that said series of electrical signals is applied to said electrical wiring connections.

4,036,145
PERCUSSION FUSE ASSEMBLY

Willi Luebbers, Trittau, Germany, assignor to Nico-Pyrotechnik Hanns-Juergen Diederichs KG., Trittau, Germany

Filed June 4, 1976, Ser. No. 693,001
Claims priority, application Germany, June 19, 1975, 2527339
Int. Cl.² F42C *1/04*
U.S. Cl. 102—73 R **2 Claims**



1. In an explosive munitions shell disposed in a cartridge separable upon firing of the shell and having a charge-containing shell body and a shell head disposed forwardly of and in spaced relation to the shell body, an improved percussion fuse assembly which comprises, in combination, a fuse body interconnecting the shell body and the shell head, the fuse body having a fixed sleeve portion containing at least one radial bore therethrough, an impact member lockably supported for axial movement in the sleeve portion between a rearmost rest position and a frontmost impact position, the impact body having an annular groove disposed in the periphery thereof in radial alignment with the first bore of the sleeve member when the impact member is in its rearmost position, a first blocking sphere seatable in the aligned first bore and peripheral groove to normally prevent substantial forward motion of the impact member, the impact member having a first frusto-conical inwardly and rearwardly extending central recess in the front surface thereof and a percussion cap disposed adjacent the rear end of the first recess, a second sphere carried in the fuse body and disposed in the first recess of the impact member during an acceleration of the shell, the second sphere being movable inertially and forwardly from the first recess and along the inner wall of the sleeve portion during a deceleration of the shell, and a firing pin centrally disposed in and extending rearwardly from the rear surface of the shell head and engageable with the percussion cap when the impact member is in its frontmost position, the firing pin having a front cylindrical portion and a rear conical portion abutting the front portion and tapering inwardly in the rearward direction at a conical angle which corresponds to the conical angle of the first recess, the internal wall of the first recess being larger than the external wall of the rear portion of the firing pin for clamping the second sphere therebetween upon a deceleration of the shell while the second sphere is disposed within the first recess, the wall of the front cylindrical portion of the firing pin defining, with the wall of the sleeve portion, a second annular recess disposed in the normal path of inertial movement of the second sphere during a deceleration of the shell for receiving the second sphere.

4,036,146
PASSENGER TRANSPORTATION SYSTEM

Philranzo Tyus, 225 S. Witmer No. 104, Los Angeles, Calif. 90026

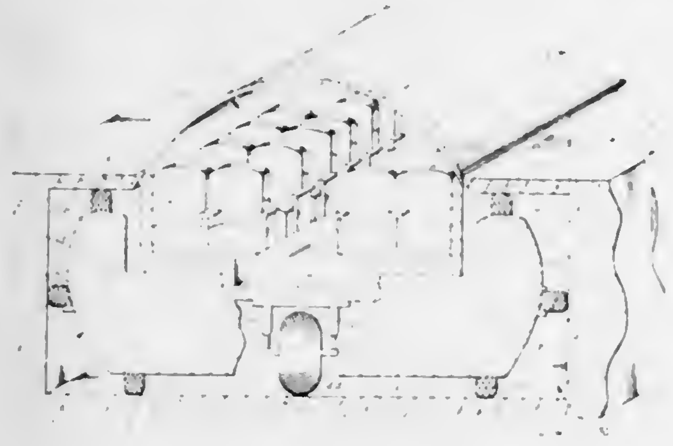
Filed Nov. 19, 1975, Ser. No. 633,247
Int. Cl.² B61B *13/00*
U.S. Cl. 104—1 R **6 Claims**

1. A passenger transportation system comprising:

an elongated conduit having a generally rectangular-shaped hollow interior defining a bottom wall surface, spaced apart upright side wall surfaces above the conduit bottom surface, and an upper wall surface above the side walls and spaced from the conduit bottom surface, each wall surface being substantially flat from end-to-end, and an elongated opening in the upper wall surface extending continuously along the length of the conduit;

a transport vehicle in the conduit for being transported lengthwise through the conduit;

a suspension system comprising a series of longitudinally spaced apart rigid carrier frames secured to the transport vehicle to support the transport vehicle above the conduit bottom surface, each carrier frame supporting a drive roller traveling on said conduit bottom surface, a pair of bottom guide rollers on opposite sides of the drive roller traveling on said conduit bottom surface, a separate lateral guide roller traveling on each conduit side surface, and a separate upper guide roller traveling on portions of said conduit upper surface on opposite sides of the elongated opening therein;



each carrier frame further supporting a respective biasing means engaged with each roller to urge the drive roller and bottom, lateral, and upper guide rollers outwardly into pressure contact with their respective conduit wall surfaces so as to maintain the transport vehicle centered in the conduit cross-section during transit of the vehicle lengthwise in the conduit, the upper guide rollers extending upwardly into contact with the conduit upper surface portions on opposite sides of the transport vehicle;

the transport vehicle having an elongated interior section for carrying passengers, an upper portion of said interior section projecting through the opening in the conduit continuously along the length of said interior section, and door means in the projecting upper portion of the vehicle for allowing access to the vehicle interior.

4,036,147

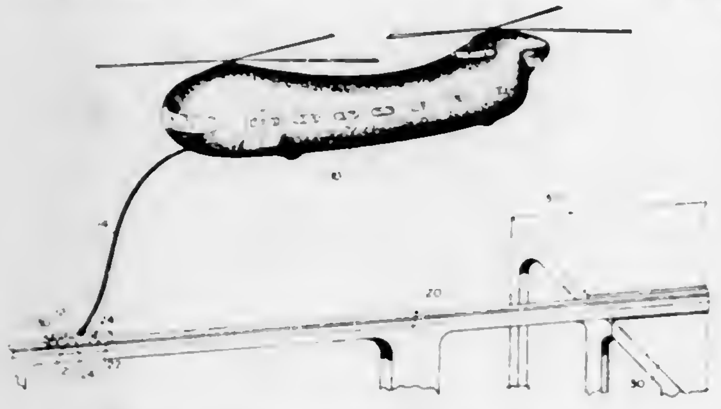
RAPID TRANSIT SYSTEM

Wayne A. Westling, 1530 21st St., Manhatten Beach, Calif. 90266

Continuation of Ser. No. 562,831, March 28, 1975, abandoned. This application June 23, 1976, Ser. No. 698,940

Int. Cl.^{2} B64F *3/02*

U.S. Cl. 104—23 R **1 Claim**



1. A transit system comprising: an elongated structure mounted at an elevation above the ground and including a pair of spaced parallel electrically energized rails electrically insulated from one another; a trolley positioned on said structure for movement along the rails and including a first wheel engaging one of the rails and a second wheel insulated from the first wheel and engaging the other of said rails; an electrically energized aircraft of the helicopter type; and a retractable electric cable extending from the trolley to the aircraft and electrically connected to the first and second wheels to supply electric power to the motors of the aircraft and constituting the sole coupling between the elongated structure and the aircraft, in which the rails are positioned one above the other, in which the first and second wheels respectively engage the under surfaces of the rails, and in which the trolley includes a third wheel which engages the upper surface of the upper rail.

4,036,148

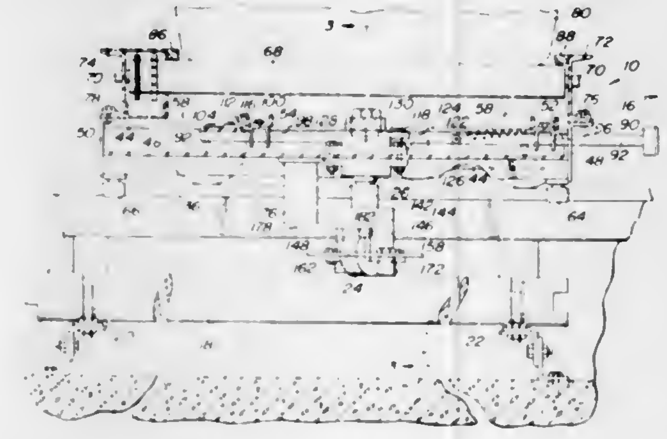
VEHICLE AND TRACK SYSTEM

Vercoe C. Jones, and Robert A. Hale, both of Easton, Pa., assignors to SI Handling Systems, Inc., Easton, Pa.

Filed Nov. 6, 1975, Ser. No. 629,242

Int. Cl.^{2} B61B *13/12*

U.S. Cl. 104—166 **16 Claims**



1. A driverless vehicle system comprising a substantially continuous support surface having a channel therebelow, a vehicle mounted on wheels and being adapted to ride on spaced track portions of said support surface, said vehicle having a portion for supporting a load, a guide surface generally flush with said support surface and located between said track portions, said guide surface having an elongated slot in said support surface, an elongated drive shaft means mounted for rotation within said channel and being substantially parallel with said slot, said vehicle including a drive wheel means on the bottom side thereof, said drive wheel means extending downwardly through said slot and including a drive wheel in said channel, said drive wheel being oscillatable about an upright axis and rotatable about a horizontal axis, the periphery of said drive wheel contacting the periphery of said drive shaft means, a control member coupled to said drive wheel for oscillating said drive wheel, said control member being located beneath the level of said support surface and being mounted for oscillation between a vehicle drive position and a vehicle stop position, an actuator means at spaced locations beneath said support surface for selectively oscillating said control member about said upright axis to cause said vehicle to stop, said actuator means being movable between an operative position wherein it can engage said control member for oscillating the same and an inoperative position wherein it cannot engage said control member.

4,036,149

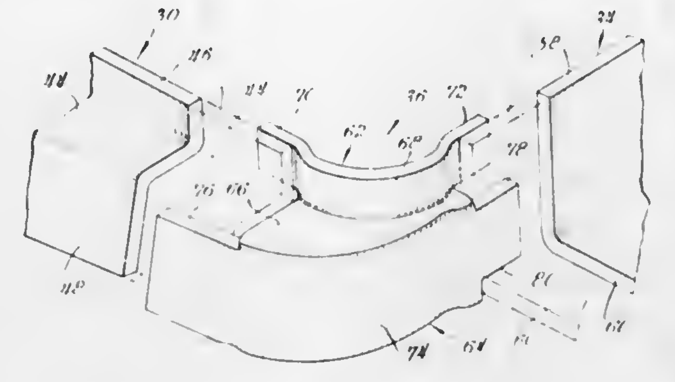
FABRICATED HOPPER CAR OUTLET DOOR FRAME

Clarence E. White, Kenosha, Wis., assignor to Miner Enterprises, Inc., Chicago, Ill.

Filed Aug. 4, 1975, Ser. No. 601,921

Int. Cl.^{2} B61D *7/02, 7/22;* **F16B** *1/00, 5/07*

U.S. Cl. 105—280 **12 Claims**



1. A fabricated hopper outlet door frame comprising an upper frame member; a pair of side frame members respectively secured at their one ends to the ends of said upper frame member, said side frame members comprising inner and outer leg portions and a web which are positioned in an approximately Z-configuration as viewed in cross section; a lower frame member extending between the other ends of said side frame members; and a pair of corner fittings respectively interconnecting said other ends of said side frame members and the adjacent ends of said lower frame member, each of said corner fittings including a first generally axially outward radially inner wall section comprising an intermediate wall portion and having first and second end flange portions lying in perpendicular planes, a second generally axially inward radially outer wall section comprising an intermediate wall portion and having at least a first end flange portion generally radially spaced from said first end flange portion of said wall section, and an intermediate wall section integral with said first and second wall sections with the wall sections being positioned in an approximately Z-configuration as viewed in cross section, said first end flange portions of said first and second wall sections being respectively in juxtaposition to the inner and outer leg portions of the adjacent end of one of said side frame members and being secured thereto, said second end flange portion of said first wall section being in juxtaposition to a part of the adjacent end of said lower frame member and being secured thereto.

4,036,150

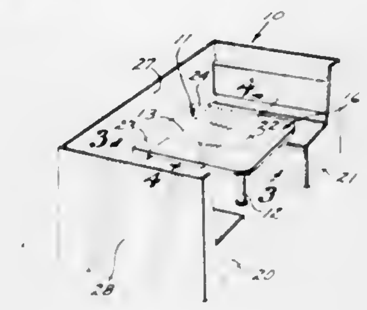
DINING TABLE SERVICE ASSEMBLY

Joseph C. Algier, 3437 Procyon Ave., Las Vegas, Nev. 89114

Filed June 14, 1976, Ser. No. 695,476

Int. Cl.^{2} A47B *35/00*

U.S. Cl. 108—50 **10 Claims**



1. A dining table service assembly for providing food to seated patrons comprising:

a. a stationary dining table segment secured in place between seating positions and having a tongue extending longitudinally between said seating positions with a laterally expansive horizontal top terminating in contoured edges with subjacent surfaces for supporting a weight from above,

b. a mobile serving cart carrying a table segment support having laterally spaced supporting members,

c. a separate removable dining table segment having longitudinally extending arms with expansive horizontal upper surfaces terminating in edges formed in a contour to mate with the aforesaid contour of said edges of said tongue and spaced for lateral engagement with the aforesaid tongue to rest on and bear down against said subjacent surfaces, said removable table segment being positionable to removably engage said stationary table segment with the top of said tongue and the upper surfaces of said arms, lying in a common horizontal plane, and also being positionable to be removably supported on said table segment support separate from said stationary dining table segment.

4,036,151

MICROWAVE COOKING APPARATUS WITH TURNTABLE

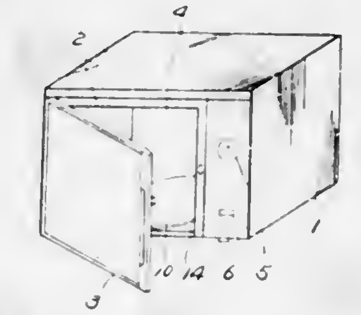
Yasuo Shin, Ikoma, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 362,217, May 21, 1973, abandoned. This application June 26, 1975, Ser. No. 590,512

Claims priority, application Japan, May 26, 1972, 47-63713[U]

Int. Cl.^{2} A47B *85/00*

U.S. Cl. 108—20 **4 Claims**



1. A turntable for use in a microwave oven, made of a low dielectric loss inorganic material such as glass and ceramics and adapted to rotate a foodstuff mounted thereon at the base portion of said microwave oven during cooking, said turntable being removably engaged with the base of the microwave oven and comprising:

a raised edge provided at the peripheral portion of the upper surface thereof and serving as a drain for collecting the liquid ingredients from the foodstuff; a connection provided on the turntable and removably engaged with a source of driving force for rotating said turntable, said engagement providing a pedestal for rotation of said turntable; and one or more legs provided at the lower surface thereof for stabilizing the turntable when positioned on a level surface, whereby said turntable, because of its removable engagement with the driving source, functioning as a foodstuff supporter within the oven and as a tableware when the turntable is removed from the oven.

4,036,152

REFUSE COMPACTOR-INCINERATOR DISPOSER

James A. Bright, Dayton, Ohio, assignor to General Motors Corporation, Detroit, Mich.

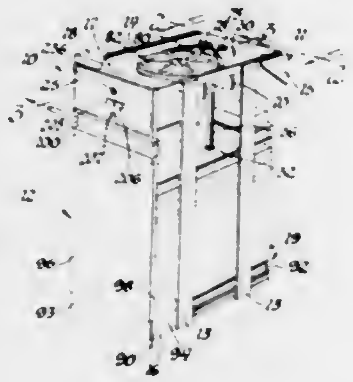
Filed Nov. 17, 1975, Ser. No. 632,494

Int. Cl.^{2} F23G *5/10*

U.S. Cl. 110—8 E **4 Claims**

1. A refuse compactor-incinerator appliance comprising a housing including a top and a base, an upper horizontally disposed partition spaced below said top dividing said housing into an upper drive chamber and a lower drawer space,, means for supporting a top insulation wall subjacent said partition for

vertical movement, first spring means biasing said top wall in a downward direction, a lower insulation wall supported on said base, ram means including a ram plate mounted in said drawer space for vertically reciprocal movement, ram drive means in said drive chamber including means for vertically extending said ram plate into the drawer space and retracting said plate to an elevated position whereby said first spring means are compressed, electric motor means in said drive chamber having a driving connection with the drive means in said drive chamber for actuation of said ram means, means for supporting a drawer assembly on said housing for movement between a compacting-incinerating position in said housing and a position disposed outwardly of said housing, said drawer assembly including an open-ended insulated sleeve carried thereon, second spring means normally resiliently supporting said insulated sleeve a defined distance above said lower insulation wall and below said upper insulation wall, a refuse receptacle carried within said sleeve adapted to receive said ram plate, said ram plate when driven downwardly a predetermined distance allowing said first spring means to bias said upper insulation wall into abutting engagement with the upper end of said insulated sleeve, and said first spring means being of sufficient predetermined force to overcome the force of said second spring means causing said sleeve to move downwardly whereby its lower open end is placed in abutting engagement with said lower wall thereby defining an insulated combustion chamber.



4,036,153

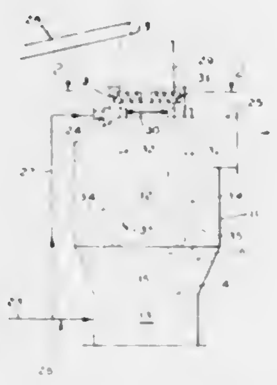
FLUID BED INCINERATOR FEED SYSTEM

Robin Gustav Nauta, Woodbury, Conn., assignor to Dorr-Oliver Incorporated, Stamford, Conn.

Filed July 3, 1975, Ser. No. 592,977

Int. Cl.² F23G *5/00*

U.S. Cl. 110—8 F **4 Claims**



1. A fluid bed unit comprising a reaction chamber, a windbox separated from said reaction chamber by a constriction plate, a body of particulate solids subject to fluidization on said constriction plate, air supply means for introducing fluidizing air into said windbox, vertically disposed feed means for conducting feed into said reaction chamber, said feed means extending into said reaction chamber through the top of said fluid bed unit and terminating close to and above the level of the fluidized body of particulate solids in said reaction chamber and at least one secondary air supply pipe surrounding and concentric with said feed pipe but spaced therefrom so that an annular air passage is provided between said pipes for downwardly discharging a secondary air supply into said reaction chamber at a level close to and above, but directed toward, the fluidized body of particulate solids.

4,036,154

SOIL CULTIVATING IMPLEMENTS

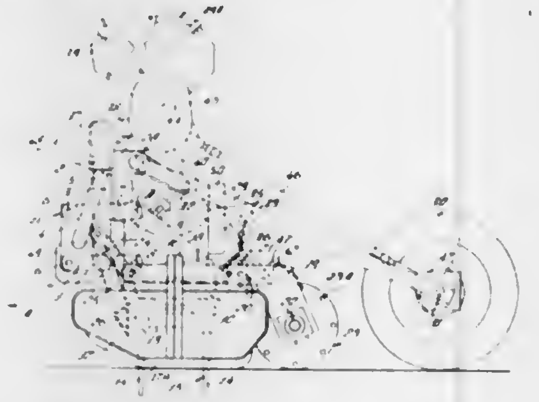
Cornelis van der Lely, 7 Bruschenrain, Zug, Switzerland

Filed Jan. 13, 1975, Ser. No. 540,444

Claims priority, application Netherlands, Jan. 18, 1974, 7400690

Int. Cl.² A01B *33/00*

U.S. Cl. 111—10 **10 Claims**



1. A rotary harrow having a frame, said frame comprising a first and forward frame portion with coupling means for coupling said implement to a prime mover and a second, elongated frame portion located to the rear of said first frame portion, said second frame portion extending transverse to the direction of travel and a row of soil-working members being mounted on the second frame portion, drive means connected to rotate said soil-working members about upwardly extending axes, ground-engaging supporting roller means adjustably interconnected to the second frame portion at the rear thereof to control the working depths of said soilworking members, ground-engaging supporting wheel means being pivotably interconnected to an upper part of said first frame portion by rearwardly extending arm means and said wheel means providing additional support for the implement, said arm means being pivotably upwardly and downwardly relative to the first frame portion to change the amount of additional support for said implement, setting means linking said arm means to a lower part of said first frame portion and retaining said wheel means in a chosen supporting position relative to said first frame portion, said first and second frame portions being linked to one another and vertically displaceable with respect to one another during operation.

4,036,155

AUTOMATIC GUIDING APPARATUS FOR SEWING MACHINE

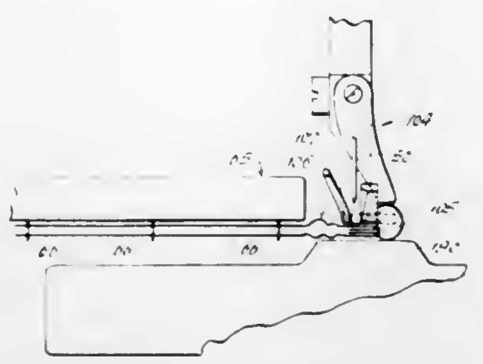
Ernest M. Junkins, 121 Wheeler Road, Monroe, Conn. 06468

Division of Ser. No. 850,950, Aug. 18, 1969, Pat. No. 3,683,831, and Ser. No. 280,107, Aug. 14, 1972, Pat. No. 3,901,172. This application June 25, 1975, Ser. No. 590,318

Int. Cl.² D05B *21/00, 35/10*

U.S. Cl. 112—121.15 **7 Claims**

1. An apparatus for guiding work along a predetermined path with respect to a sewing machine having a needle to form a line of stitching substantially corresponding to the path and positioned a precise margin from the edge of the work comprising a work holder for holding the work, drive means for causing the work holder to move the work at the needle along the normal feed path to the needle, means for supporting the work holder to normally space the edge of the work at the needle transversely beyond the needle a distance that is greater than the precise margin and guide means having a surface spaced transversely of the needle by a distance equal to the precise margin and engageable by the edge of the workpiece to force the edge to a distance transversely of the needle that corresponds to the precise desired margin.



4,036,156

DEVICE FOR SEWING TOGETHER PLIES OF MATERIAL ADJUSTED TO EQUAL LENGTHS

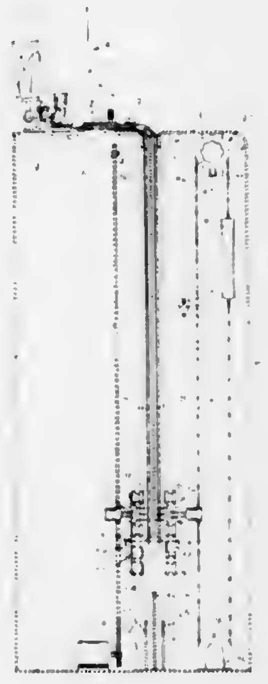
Dietmar Becker, Kaiserslautern; Fritz Jehle, Enkenbach-Alsenb.; Rubi Schonthaler, Kaiserslautern, and Erich Willenbacher, Karlsruhe, all of Germany, assignors to Pfaff Industriemaschinen GmbH, Germany

Filed Dec. 2, 1975, Ser. No. 636,995

Claims priority, application Germany, Dec. 12, 1974, 2457535; Oct. 11, 1975, 2545685

Int. Cl.² D05B *21/00*

U.S. Cl. 112—121.26 **10 Claims**



1. In a sewing unit including a sewing machine, a device for automatically adjusting two plies of material, which are to be sewn together by the sewing machine and which register with each other at their leading edges, to mutually equal lengths and to maintain their trailing edges in fixed relation to each other during the sewing operation, said device comprising, in combination, a relatively elongated intermediate plate separating the two plies in advance of the sewing machine; respective clasps, adjacent opposite surfaces of said intermediate plate, selectively engageable with the adjacent ply of material; means mounting said clasps for movement in the feed direction of the plies by engagement with the respective adjacent plies; respective sensing means operatively associated with each ply of material and each operable to sense the trailing edge of the associated ply; means operable, responsive to sensing of the trailing edge of an associated ply by the respective sensing means, to effect engagement of the respective clasp with the associated ply of material for movement therewith; a structural part interconnecting said clasps; and means, including said structural part, operable to exert a pull on the plies of material in a direction opposite to the feed direction of the plies of material.

4,036,157

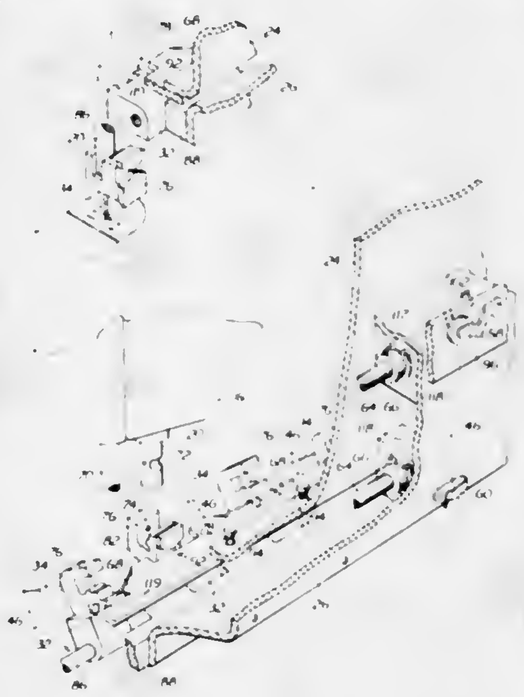
AUTOMATIC THREAD CHANGER

Alfred D. Sacchetti, 1903 Sharon Road, Meadowbrook, Pa. 19046

Filed Dec. 10, 1975, Ser. No. 639,569

Int. Cl.² D05B *1/08*

U.S. Cl. 112—163 **10 Claims**



1. An automatic thread changer for use in connection with a continuous stitching sewing machine having a non-rotating, non-translatory vertically reciprocating needle bar assembly which includes a needle bar, said automatic thread changer comprising a plurality of threaded needles each extending from a needle holder, means for detachably securing said needle bar with any one of said needle holders, and means to move said needle holders one by one sequentially into positive attachment but detachable connection with said needle bar assembly to form a temporary but solid needle bar assembly comprising said needle bar, one of said needle holders and its associated needle, for use in continuous stitching with a selected first one of said needle holders and needles whereby said first needle holder may be detached from said needle bar assembly and a second needle holder brought into operative but detachable connection with said needle bar assembly for use in continuous stitching.

4,036,158

SEWING MACHINE

Marcel Fresard, Petit-Lancy, Geneva; Olindo Baruffa, Thonex, Geneva, and Jean-Pierre Gabriel, Veyrier, Geneva, all of Switzerland, assignors to Mefina S.A., Fribourg, Switzerland

Filed May 10, 1976, Ser. No. 684,938

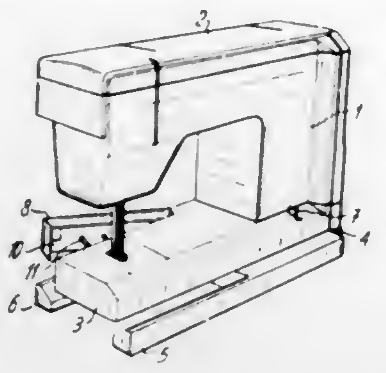
Claims priority, application Switzerland, May 16, 1975, 6367/75

Int. Cl.² D05B *75/00*

U.S. Cl. 112—258 **12 Claims**

1. In a sewing machine having a frame including a column, said column including a base, an upper arm and a free arm carried by said column, two longitudinal supports disposed on either side of said free arm, the improvement comprising guide means connecting said supports to said base means carried by

said base and cooperating with said support connecting means for moving each of said supports laterally between a position adjacent a lower longitudinal edge of said free arm and a position spaced apart from said free arm.



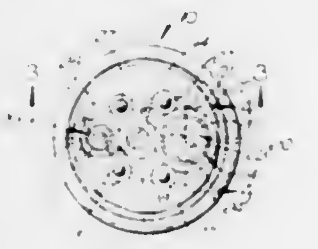
4,036,159
EASY OPEN END

Gordon R. Gane, Pleasanton, and Lawrence C. Hoffmann, Jr., Oakland, both of Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Division of Ser. No. 586,671, June 13, 1975, Pat. No. 3,967,751. This application Feb. 10, 1976, Ser. No. 657,013

Int. Cl.² B21D *51/44*

U.S. Cl. 113—1 F **22 Claims**



1. A method for producing an easy open closure member having at least one depressible tab comprising the steps of selecting a closure blank of ductile metal and provided with a main panel and an outer peripheral reinforcing rib, initially working and subjecting a portion of the panel closer to the center of the panel than to said rib and at least one additional portion of the panel located intermediate a predetermined part of the said rib and first mentioned portion of the panel to selective drawing pressures and forming an embossment in said first mentioned panel portion and an unsymmetrical outwardly disposed dimple in said second mentioned panel portion while locating the central vertical axis of the dimple at a predetermined point on the panel, then while controlling the flow of the metal making up the dimple restructuring the dimple by expanding the dimple outwardly into a confined opening and while relocating the central vertical axis of the dimple, then differentially work hardening and reshaping the metal in the peripheral base of the said dimple and portions of the panel adjacent thereto to complete the formation of the dimple and establish selectively offset concentric inner and outer dimple base sections interconnected by a web, then without producing any material thinning of the portions of the dimple located in the confined opening subjecting said web to compressive forces and materially thinning all but a selected amount of the material in the said web to provide in the web an embrittled thin tear line portion and a sector thereof more work hardened than other sectors of said tear line portion and during said thinning of the web and forming said tear line portion allowing the terminal ends of the tear line portion to form and recede into a depressible tab hinge portion.

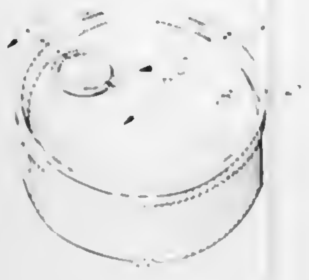
4,036,160
METHOD OF MAKING WEAKENING LINES IN SHEET METAL

John Sherburne Kelley, Wenham, Mass., assignor to USM Corporation, Boston, Mass.

Filed May 24, 1976, Ser. No. 689,642

Int. Cl.² B21D *51/44*

U.S. Cl. 113—121 C **7 Claims**



1. The method of making a digitally disruptable closure in a sheet metal blank comprising, in sequence:

a. bending a portion of the blank out of its plane to provide a closure-defining peripheral wall in the blank,

b. coining the wall periphery lengthwise to score and establish a non-fractured residuum thickness,

c. transversely bending said wall to tension the metal across the residuum thickness until a fractured section characterized by irregular fissures and matching edges is produced therein, and then

d. swaging at least one of the edges of said fractured section to lock the closure disruptably to the remainder of the blank.

4,036,161
UNDERWATER ANCHORING APPARATUS

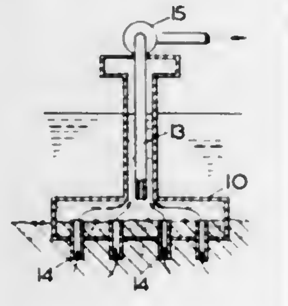
Ralph Alan Nixon, Hamilton, Scotland, assignor to The Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, London, England

Division of Ser. No. 453,638, March 21, 1974, Pat. No. 3,967,393. This application Feb. 10, 1976, Ser. No. 656,884

Claims priority, application United Kingdom, July 4, 1973, 31935/73

Int. Cl.² B63B *21/27*

U.S. Cl. 114—296 **9 Claims**



1. Underwater anchoring apparatus for establishing a means of anchorage in the bed of a volume of water comprising

a substantially hollow closed structure submersible in the volume of water,

at least two substantially unobstructed intake passageways located in the lower region of said structure, and

collecting means operative in use to induce into the interior of said structure through said intake passageways water from the lower strata of said volume of water, said water being induced into said interior and carrying with it into said interior solid matter from the waterbed which solid matter settles in said structure to substantially fill said structure and cause the structure to become at least partially buried in said bed of said volume of water.

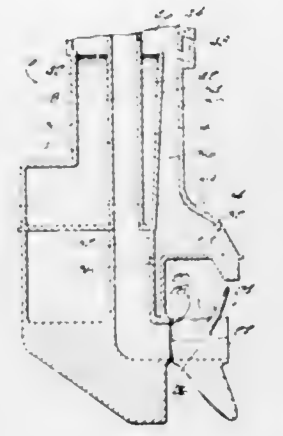
4,036,162
MARINE PROPULSION DEVICE HAVING INCREASED REVERSE THRUST

Daniel F. Maier, Lake Villa, and John D. Sheldon, Zion, both of Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed May 11, 1976, Ser. No. 685,297

Int. Cl.² B63H *5/13*

U.S. Cl. 115—17 **14 Claims**



1. A marine propulsion device comprising an engine having an exhaust port for discharging exhaust gas, and also comprising a lower unit having wall means defining an exhaust passage in communication with said exhaust port, said lower unit also having a propeller, said lower unit also having a cavitation plate located above said propeller and submerged in water during idle engine operation, said lower unit also having an exhaust outlet in communication with said exhaust passage, said exhaust outlet affording discharge of the exhaust gas below said cavitation plate and aft of said propeller, said lower unit also having an outer wall including an outlet, said outer wall outlet being located above said cavitation plate and submerged in water during idle engine operation, said lower unit also having passage means in communication with said exhaust passage and said outer wall outlet, said passage means affording, during reverse engine operation, discharge of a portion of the exhaust gas from said exhaust passage out said outer wall outlet.

4,036,163
APPARATUS FOR MOUNTING AND DISMOUNTING A SUBMERGED PROPELLER UNIT FOR A FLOATING BODY

Anders Lennart Pehrsson, Kristinehamn, Sweden, assignor to Aktiebolaget Karlstads Mekaniska Werkstad, Karlstad, Sweden

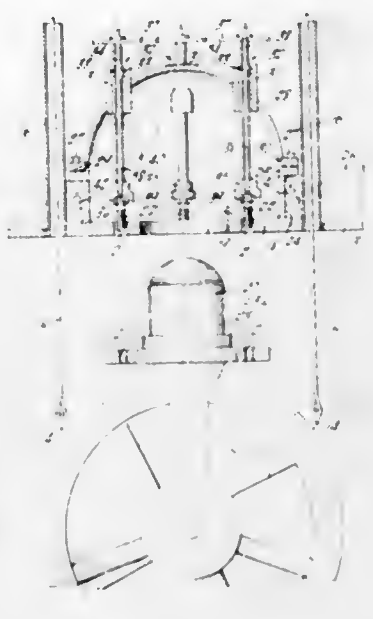
Filed June 1, 1976, Ser. No. 691,838

Claims priority, application Sweden, June 6, 1975, 7506470

Int. Cl.² B63H *5/12. 5/14*

U.S. Cl. 115—34 R **7 Claims**

1. Apparatus for mounting and dismounting a submerged propeller unit having a flange adapted to be secured by fastening means on the outside of a flange surrounding an opening formed in an outside wall of a floating body below the waterline, wherein the improvement comprises a watertight enclosure detachably secured inside said body and covering said wall flange and opening, a plurality of means in the wall of said enclosure providing access to the interior thereof from inside the body, and a plurality of tool means extending through said respective access means in watertight relation thereto and operable from a location inside the body and outside the enclosure for adjusting a plurality of fastening means inside the enclosure to render the same effective or ineffective to secure a propeller unit flange on the outside of said body opening flange.



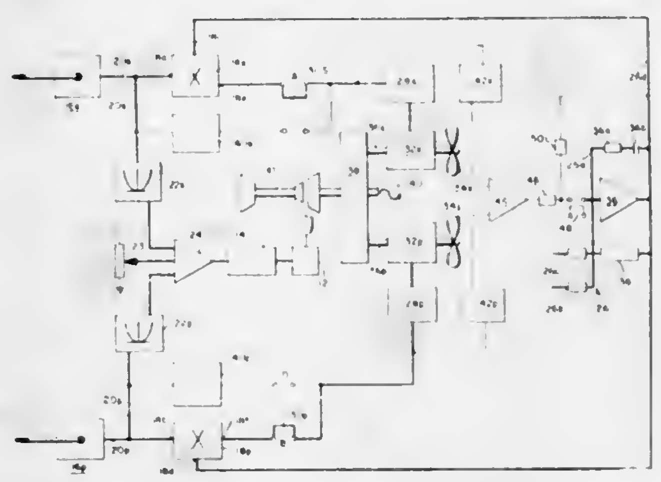
4,036,164
TWIN CONTROLLABLE PITCH PROPELLERS OPERATED FROM SINGLE PRIME MOVER

Ronald A. Kowach, and William I. Rowen, both of Schenectady, N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Sept. 2, 1976, Ser. No. 719,839

Int. Cl.² B63H *3/10*

U.S. Cl. 115—37 **6 Claims**



1. A control system for a variable pitch twin propeller propulsion system of a vessel including a port propeller and a starboard propeller, both of said propellers being driven through a transmission by a single prime mover operating at a predetermiend substantially fixed rotational speed and wherein said port and starboard propellers are to present a substantially fixed load to said prime mover in a first mode, said control system comprising:

an isochronous governor for generating a signal representative of a deviation from said predetermined system fixed rotational speed,

port manual control means for generating a signal representative of a setting of the desired pitch for said port propeller, and starboard manual control means for generating a signal representative of a setting of the desired pitch for said starboard propeller,

port servo means for setting the pitch of said port propeller, said port servo means being responsive to a first signal for setting the pitch of said port propeller, and said starboard servo means being responsive to a second signal for setting the pitch of said starboard propeller,

a port multiplier for applying a first signal to said port servo, and a starboard multiplier for applying a second signal to said starboard servo, each said multiplier having a first input and a second input and an output,

means for connecting said signal from said isochronous governor to the first input of said port and starboard multipliers, and

means for connecting said signal from said port manual control means to the second input of said port multiplier, and means for connecting said signal from said starboard manual control means to the second input of said starboard multiplier, and

means for connecting the output of said port multiplier to the port servo means and means for connecting the output of said starboard multiplier to said starboard servo means.

4,036,165
PARKING GUIDE

Harmin V. Wood, 617 Hanford Place, Westfield, N.J. 07090
Filed May 11, 1976, Ser. No. 685,294
Int. Cl.^{2} B60Q *1/06;* **G09F** *17/00*
U.S. Cl. 116—28 R **6 Claims**

1. A parking guide for assisting the driver of a vehicle to avoid contact with a fixed obstacle comprising in combination:

means including a bracket mounted on a support so that its forward end is interposed at a fixed position between the approaching end of said vehicle and said obstacle,

a fulcrum lever pivotally mounted on said bracket for partial rotation from a rest position to an operated position in a plane substantially parallel to the plane of said bracket,

a vertically extending contact lever responsive to contact by said vehicle and having one end fixed to one side of said fulcrum lever, and the other end depending vertically from said lever for pivotal movement,

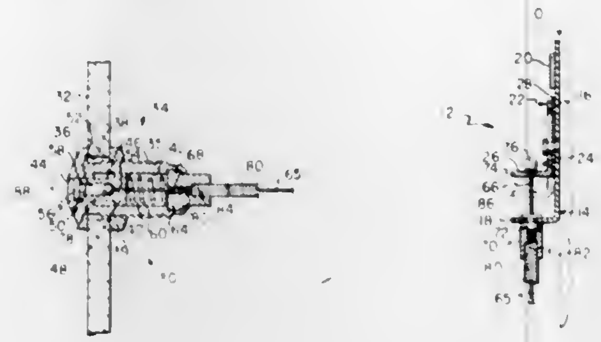
a bell comprising a resonator and a clapper mounted on the bracket, said clapper disposed to strike said bell in response to movement of said fulcrum lever to the operated position,

a reflector plate having an extended surface rotatably mounted on said bracket adjacent the forward end thereof, said reflector plate being spring biased and retained by a first means in a retracted position substantially parallel to said bracket, and said reflector responsive to rotation of said fulcrum lever to assume a fully visible position in the line of vision of said driver, and

a second means connected to said fulcrum lever and responsive to deflection of said contact lever by said vehicle to move said fulcrum lever from the rest position to the operated position, initiating the striking of said resonator by said clapper, causing release of said first means and the rotation of said reflector from said retracted position to said fully visible position.

4,036,166
REMOTE HIGH TEMPERATURE INDICATING APPARATUS

William T. Fleming, Boonton, N.J., assignor to Walter Kidde & Company, Inc., Belleville, N.J.
Filed Mar. 10, 1976, Ser. No. 665,516
Int. Cl.^{2} G01K *11/06*
U.S. Cl. 116—114.5 **8 Claims**



1. Apparatus for indicating at a visually accessible location remote from an object whether the temperature of said object has at some time reached a predetermined high temperature comprising:

a sensor assembly including,

a first bracket formed of a heat conducting material having first and second surfaces, said bracket adapted to be fixedly fastened to said object with said first surface thermally communicating with said object,

a second bracket adjacent said second surface of said first bracket and adapted for movement in a predetermined direction relative to said first bracket,

a fusible material having a fusion temperature in range including said predetermined high temperature, said fusible material joining said first and second brackets;

an elongated flexible member having a first end held in fixed relationship relative to said second bracket and terminating at a second end; and

indicating means for indicating whether said first end is restrained relative to said first bracket including

a housing having an opening,

a plunger slidably contained within said housing movable between a first exposed position and a second position at least partially within said housing,

a spring urging said plunger towards said exposed position, said spring also engaging said second end of said elongated flexible member and urging movement of said second bracket relative to said said base first bracket in said predetermined direction.

4,036,167
APPARATUS FOR MONITORING VACUUM DEPOSITION PROCESSES

Chih-shun Lu, Cupertino, Calif., assignor to Inficon Leybold-Heraeus Inc., East Syracuse, N.Y.
Filed Jan. 30, 1976, Ser. No. 653,936
Int. Cl.^{2} C23C *13/08*
U.S. Cl. 118—7 **7 Claims**

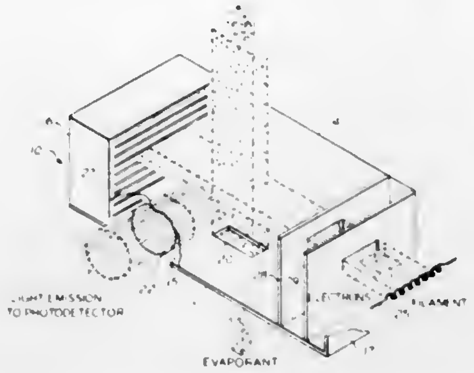
1. In a vapor deposition system having a vapor deposition chamber in which a substrate to be coated is received, and an evaporant source in the chamber providing vaporized particles for deposit on the substrate, a sensor for determining the deposition rate and composition of the vapor atmosphere in the chamber, said sensor comprising:

an enclosure arranged in the path of the evaporant particles to receive a sample of the vaporized particles in the deposition chamber;

an electron beam source providing relatively low energy electrons sufficient to excite the outer shell electrons of the atoms of the sample of the vaporized particles in said enclosure;

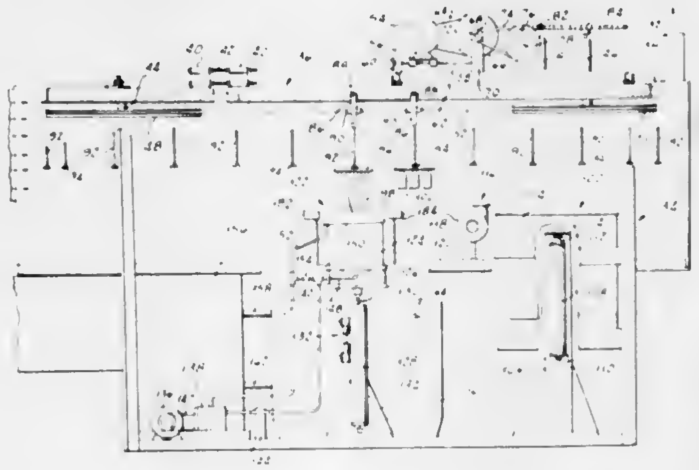
an optical opening in said enclosure receiving the light emitted by the photons produced as the electrons of the excited atoms drop back to lower energy states, said opening receiving light in a path perpendicular to the path of the excitation electron beam; and

a photodetector optically coupled to said opening.



4,036,168
APPARATUS FOR COATING ARTICLES

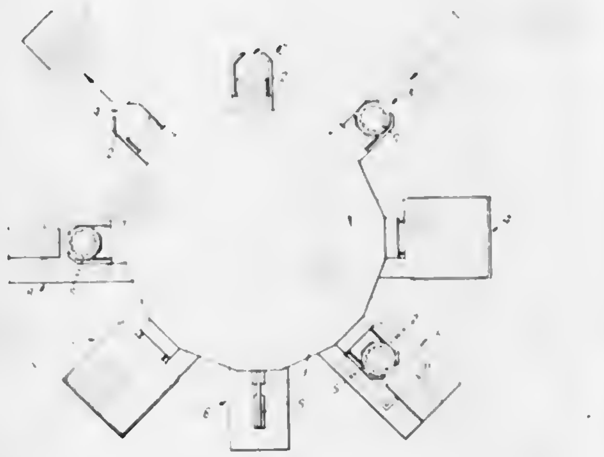
Albert J. Laliberte, South Woodstock, Conn., and Armand DeAngelis, Southbridge, Mass., assignors to Omnitech Inc., Southbridge, Mass.
Division of Ser. No. 395,779, Sept. 10, 1973, Pat. No. 3,956,540. This application Nov. 17, 1975, Ser. No. 632,368
Int. Cl.^{2} B05C *21/00, 3/02*
U.S. Cl. 118—8 **3 Claims**



1. Apparatus for coating an article with a curable synthetic resin including in combination, a chamber, means in said chamber at a coating station for applying a coating of synthetic resin to an article, means for heating the ambient temperature in said chamber to a temperature sufficiently above room temperature to precure a coating of said resin applied to an article, a reservoir for holding a supply of said coating resin, means for feeding resin for said supply to said applying means, and means for cooling said supply of resin in said reservoir to a temperature below room temperature, said apparatus including a precuring zone in said chamber and a conveyor for carrying articles to said coating station and from said coating station through said precuring zone, cleaning means at a cleaning station, said conveyor successively carrying said article to said cleaning station and to said coating station and from said coating station through said precuring zone, said applying means comprising a tank, means mounting said tank below said conveyor and means for moving said article at said coating station and said tank relative to each other to immerse said article in said resin and to withdraw said article from said resin, said moving means performing one of said immersing and withdrawal operations at a relatively rapid rate and the other of said immersing and withdrawal operation at a relatively slower controlled rate, said means for moving said article at said coating station and said tank relative to each other comprising means mounting said tank below said conveyor for movement from a first position remote from said conveyor to a second position adjacent to said conveyor, means for rapidly raising said tank from said first position to said second position to immerse articles supported by said conveyor at said cleaning station, and means for relatively slowly lowering said tank at a controlled rate from said second position toward said first position to withdraw said articles from said solution, said apparatus including means responsive to complete withdrawal of said articles from said tank for rapidly returning said tank to its first position.

4,036,169
APPARATUS FOR COATING ARTICLES

Peter Harvey, London, England, assignor to MacPherson Powders Limited, England
Division of Ser. No. 463,580, April 24, 1974, abandoned. This application Aug. 7, 1975, Ser. No. 602,512
Int. Cl.^{2} B05C *19/00*
U.S. Cl. 118—66 **10 Claims**



1. Apparatus for applying a layer of plastics material to selected surfaces of a metal article which article has slots extending throughout its length and opening into first and second end faces of the article, which apparatus comprises means for a first heating of the article, a plurality of operating stations located at circumferentially spaced locations around a circular path, which operating stations comprise a slot-coating station providing means for directing a stream of powdered plastics material to slot defining surfaces of said slots of the article, an end coating station including a vertically adjustable table having a carrier surface for carrying and applying powdered plastics material to at least a part of a downward facing first end face to the article, a turning station incorporating means for turning the article over so that the second end face is downward facing, a second end coating station incorporating a vertically adjustable table having a carrier surface for carrying and applying powdered plastics material to at least a part of the second end face of the article, means for a second heating of the article to coalesce the plastics material and form a coating on each selected surface of the article, means for conveying the article through the several operating stations to enable the coating of the surfaces defining the slots and both end faces of the article for delivery to the means for second heating, and article support means on said means for conveying for receiving the article from said means for first heating, onto said means for conveying, the stations being arranged around the circular path in any order, provided that the turning station is encountered between the two end coating stations on passing around the circular path.

4,036,170

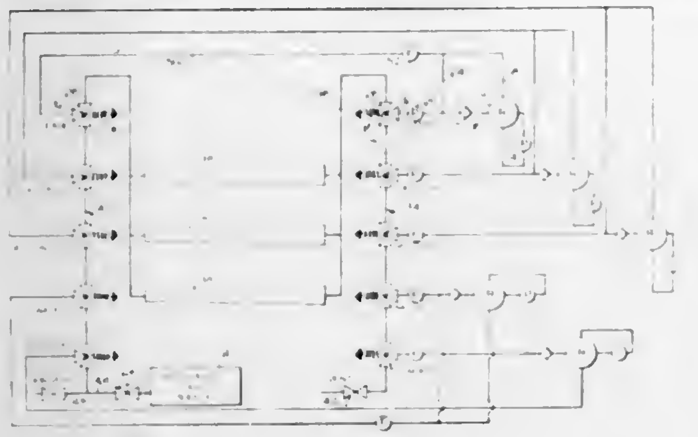
MEANS FOR APPLYING ZINC STEARATE COATINGS TO THE BORE SURFACES OF FERROUS ALLOY TUBES

Harold Goodheim, Elnora, N.Y., assignor to The United States Government, Washington, D.C.

Filed Oct. 10, 1975, Ser. No. 621,325

Int. Cl.^{2} B05C *7/04*

U.S. Cl. 118—73 **3 Claims**



1. In a system for successively flowing each of a plurality of individually stored treatment fluids through a series of parallel tubes, with a minimum of contamination between successive fluids, the combination of,

a plurality of multiport valves connected to form a manifold adjacent each of the opposite ends of the tubes in respective communication with each of the treatment fluids,

switch means for activating corresponding valves in each of said manifolds to establish a flow path between the tubes and one of the treatment fluids,

pump means interposed between each of the stored treatment fluids and said manifold nearest thereto for circulating the selected fluid through the tubes in response to the actuation of said switch means,

valve means in one of said manifolds for introducing pressurized air into said established flow path to force said selected treatment fluid back to the initial storage position thereof, and

vent means in the other of said manifolds for exhausting said pressurized air from said flow path to thereby purge any residue of said selected treatment fluid therein prior to the circulation of the next selected treatment fluid through the tubes.

4,036,171

VACUUM DEPOSITION THROUGH PLURAL MASKS ON PLURAL SUBSTRATES

Gilbert Ramet, Chescaux-Noreaz, Switzerland, assignor to Ebauches S.A., Neuchatel, Switzerland

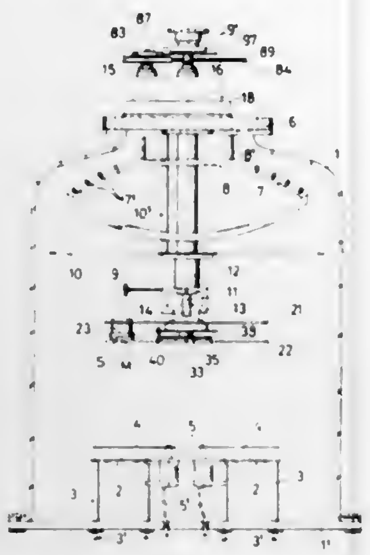
Filed Mar. 3, 1975, Ser. No. 554,458

Claims priority, application Switzerland, Mar. 4, 1974, 3000/74

Int. Cl.^{2} C23C *13/12*

U.S. Cl. 118—49.1 **6 Claims**

1. Apparatus for depositing under vacuum successive plural layers on a plurality of substrates with the use of masks, comprising a vacuum chamber, and in said chamber at least one support carrying substrates, at least one support carrying masks, and means for the vacuum deposition of at least two layers of material contained in evaporative cups on the said substrates through the said masks, said substrate support comprising a horizontal rotating plate, said mask support comprising a rotating plate parallel to the first-mentioned plate, and the means for depositing layers comprising at least one cup containing materials to be disposed on the substrates, a mechanism for changing masks which permits moving the rotatable plates toward and away from each other and advancing one of them with respect to the other, an alignment system for masks relative to the substrates, and drive mechanism for uniformly rotating the assembly of masks and substrates, characterized in that a rotative drive axle of the substrate support and an axle of the mask support are coaxial and in that the mask and substrate supports are secured in the vacuum chamber to the ends of these axles.



4,036,172

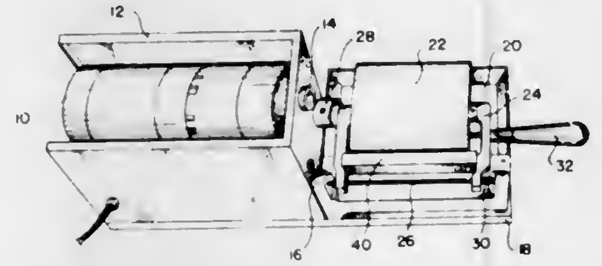
LIQUID APPLICATOR

Carlo Re, 2947 N. Bristol St., Santa Ana, Calif. 92607

Filed May 20, 1976, Ser. No. 688,144

Int. Cl.^{2} B05C *1/02*

U.S. Cl. 118—262 **3 Claims**



1. A liquid applicator comprising: a drum; a mounting bracket rotatably mounting said drum and exposing an upper portion of said drum to permit a workpiece to be held against said drum to enable said drum to apply a liquid to the workpiece; a pan of liquid mounted on said mounting bracket under said drum in position such that the surface of said drum is below the surface of the liquid in said pan when the applicator is operational for applying a liquid coating to the surface of said drum; and a rod supported on the surface of said drum and extending parallel to the axis of rotation of the drum for controlling the thickness of the liquid coating applied to the surface of the drum, said rod having shoulders at each end thereof and an uninterrupted surface between shoulders, said shoulders determining the space between the uninterrupted surface of the rod and the surface of the drum, and said space determining the thickness of the liquid coating on the surface of the drum.

4,036,173

INTERNAL COATING AND SANDBLASTING BUG FOR PIPE

Manfred E. Nicklas, 1627 Redwood Drive, Harvey, La. 70058

Filed July 21, 1975, Ser. No. 597,515

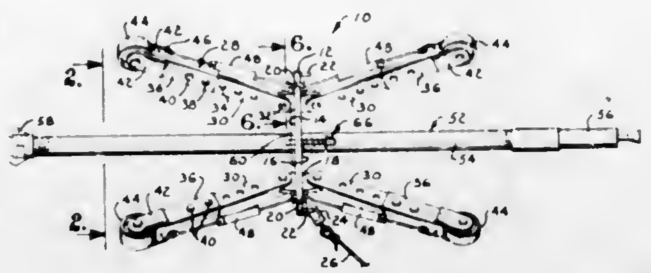
Int. Cl.^{2} B05C *7/02*

U.S. Cl. 118—306 **5 Claims**

1. Apparatus adapted to travel through a hollow, open-ended object to allow work to be performed on the internal surface of the object through utilization of a tool having a flange plate rigid therewith, said apparatus comprising:

a central mounting plate adapted to receive said flange plate in abutting relationship;

a plurality of legs extending outwardly from said mounting plate in the direction of said internal surface;



a wheel mounted on the end of each leg and adapted to engage said internal surface; and

releasable locking means for releasably securing said flange plate to said mounting plate.

4,036,174

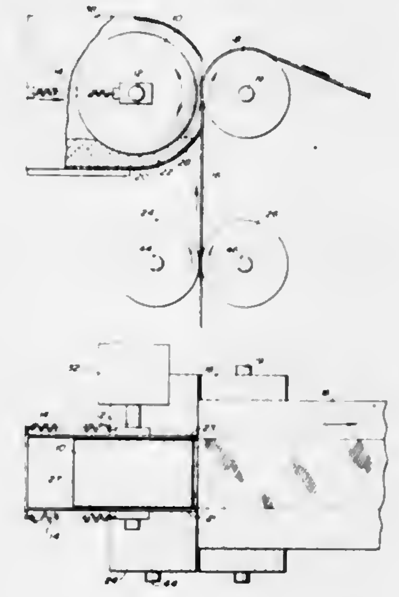
APPARATUS FOR THE APPLICATION OF COLORANT TO POLYMERIC SURFACE

Arvind R. Saklikar, Park Forest, and Jack M. Van Eck, South Holland, both of Ill., assignors to The Sherwin-Williams Company, Cleveland, Ohio

Division of Ser. No. 546,582, Feb. 3, 1975. This application Mar. 29, 1976, Ser. No. 671,200

Int. Cl.^{2} B05C *5/02*

U.S. Cl. 118—623 **7 Claims**



1. Apparatus for applying a design of polymeric colorant to a polymeric surface, said apparatus comprising:

a cylindrical roller magnet mounted for rotation about its longitudinal axis including a cylindrical outer surface and means for continuously rotating said roller magnet between a colorant reservior and a colorant application zone disposed in operative communication with a work path;

non-magnetic side walls extending radially outward at least from said roller magnet outer surface to said application zone for controlling the width of colorant applied to said surface along said work path;

means for positioning said polymeric surface along said work path in operative communications with said application zone;

means for continuously urging said roller magnet toward said work path into positive contact with said polymeric surface;

a reservoir for holding a supply of a magnetic powder and polymeric colorant mixture in close proximity to at least the magnet outer surface in a manner such that at least said outer surface will attract the mixture during rotation of said roller magnet and carry said mixture toward said application zone; and,

means for moving said roller magnet and polymeric surface relative to each other along said work path whereby said magnet will continuously attract said mixture thereto during rotation thereof and will continuously carry said mixture to said application zone where at least said colorant will be applied to said polymeric surface and at least temporarily retained thereon by a triboelectric effect caused by said roller magnet being urged into contact with said polymeric surface along said work path.

4,036,175

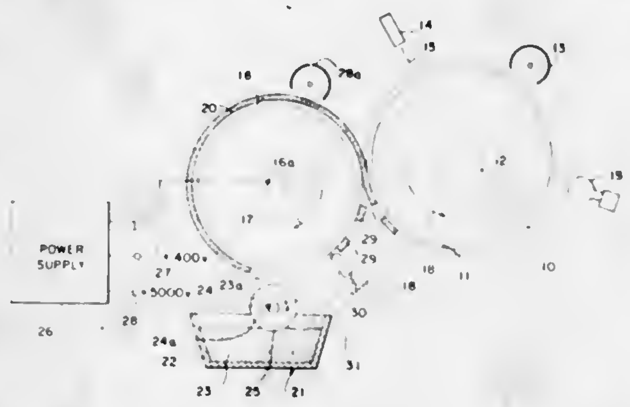
HIGH SPEED DEVELOPMENT TECHNIQUE

Edwin R. Phillips, Rosemont, and Raymond J. Stankiewicz, Philadelphia, both of Pa., assignors to Sperry Rand Corporation, New York, N.Y.

Filed Mar. 30, 1976, Ser. No. 671,794

Int. Cl.^{2} G03G *15/08*

U.S. Cl. 118—651 **23 Claims**



1. In a system for developing images utilizing the deposition of toner on selected portions of an image forming substrate which are caused to assume values of electric potential distinctively different from those of other portions of the image forming substrate, said system including an auxiliary substrate, means for applying to the auxiliary substrate a coating of the toner having an electric charge of a predetermined polarity, and means for bringing the coated auxiliary substrate into close proximity to the image forming substrate for transfer of toner to the selected portions of the image forming substrate,

the improvement which comprises:

means for establishing, between the auxiliary substrate and the coating applying means, a potential difference of such polarity as to propel the charged toner away from the applying means and toward the auxiliary substrate, and

at least the surface of the auxiliary substrate which is coated with the toner being made of a metal conductor.

4,036,176

SYSTEM FOR CULTURING AQUATIC ANIMALS

James C. McCarty, San Carlos, and Dominick Mendola, Sausalito, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation of Ser. No. 546,381, Feb. 3, 1975, abandoned. This application Nov. 20, 1975, Ser. No. 633,900

Int. Cl.^{2} A01K *61/02*

U.S. Cl. 119—3 **13 Claims**

1. An apparatus for culturing aquatic animals which comprises

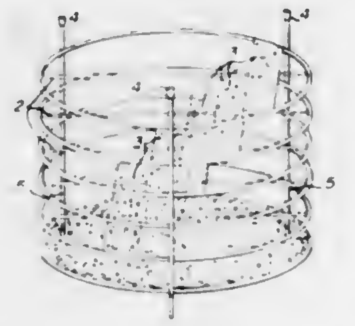
a. a container suitable for retaining water;

b. a plurality of horizontally oriented platforms vertically spaced from each other in said container, said platforms (i) having an area which is slightly less than the inside cross-sectional area of said container, (ii) being substantially parallel to each other, and (iii) being designed to allow water and solid aquatic animal food particles to pass therethrough, and

c. a feeding station having an area smaller than the platform on which it is placed and being placed on each of said platforms in a manner so that each feeding station (i) is vertically and horizontally spaced from each adjacent station, (ii) has a structure such that said solid food particles are retained thereon when dropped onto said feeding station, and (iii) is of substantially the same area as the adjacent feeding station.

11. A process for raising aquatic animals in a closed-loop aquaculture system which comprises

placing in a container a plurality of horizontally oriented platforms substantially parallel to and vertically spaced from each other, said platform (i) having an area which is slightly less than the inside cross-sectional area of said container, (ii) being designed to allow water and solid food particles for aquatic animals to pass therethrough and (iii) having a feeding station on each platform, each feeding station (a) being vertically and horizontally spaced from each adjacent feeding station, (b) being designed to retain solid food particles thereon, and (c) being of substantially the same area as each adjacent feeding station;



placing suitable aqueous medium in said container;

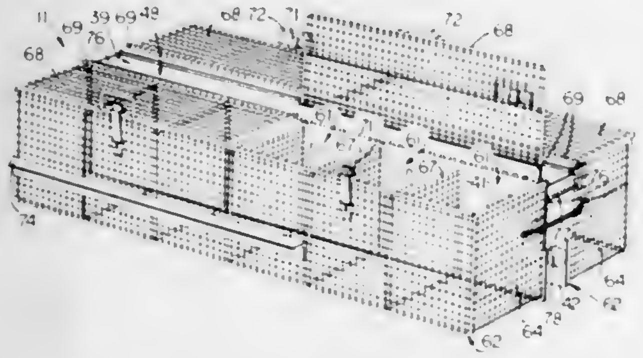
placing aquatic animals in said medium;

dropping suitable food particles onto the surface of said aqueous medium so that approximately equal amounts of such food particles fall on each of said feeding stations at suitable intervals;

passing said aqueous medium from said container through a biological filter to convert ammonia and nitrites in said aqueous medium to non-harmful amounts of nitrates; and

passing said aqueous medium exiting from biological filter back to said container.

4,036,177
BIO-TEST CAGE AND SUPPORT THEREFOR
Phillip A. DeSmit, Portage, Mich., assignor to Unifab Corporation, Kalamazoo, Mich.
Filed Feb. 13, 1976, Ser. No. 657,969
Int. Cl.² A01K *1/02*
U.S. Cl. 119—18 **8 Claims**



5. An animal confining and housing device, comprising:

elongated frame means, said elongated frame means including at least one elongated food trough means fixedly secured to said frame means for holding a supply of food therein;

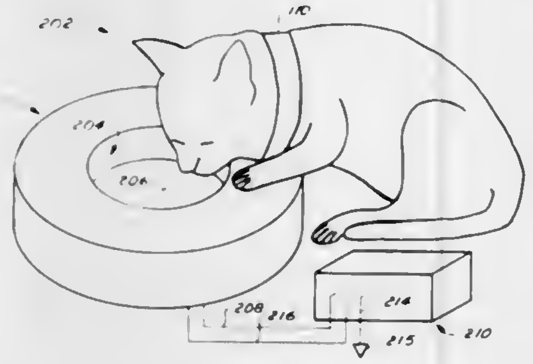
at least a pair of rows of separate compartments fixedly secured to said frame means and extending coextensively with said elongated food trough means and on opposite sides of said elongated food trough;

means defining a passageway in a wall between said food trough means and the interior of said compartments;

separate removable cover means for said compartmens in said rows to permit access to the interior of said compartments and an animal contained therein; and

water supply means fixedly connected to said frame means between said pair of rows below said food trough means and releasable coupling means connected in fluid circuit with said water supply means for securing said water supply means to a source of water, said water supply means including valve means in a plurality of said compartments positioned on said wall adjacent said passageway means and being operable by an animal present in said plurality of compartments to release water for consumption by the animal.

4,036,178
ELECTRONIC LOCK AND KEY SYSTEM
Barry Thomas Lee, 22715 Clarendon St., Canoga Park, Calif. 91364, and Gilbert Peter Hyatt, 11101 Amigo Ave., Northridge, Calif. 91324
Continuation-in-part of Ser. No. 438,328, Jan. 31, 1974, Pat. No. 3,897,753. This application June 2, 1975, Ser. No. 583,136
Int. Cl.² A01K *5/02*
U.S. Cl. 119—51 R **33 Claims**



1. A control system comprising:

excitation means for generating an excitation signal;

identification means for generating an identification signal in response to the excitation signal, said identification means including at least one monolithic integrated circuit;

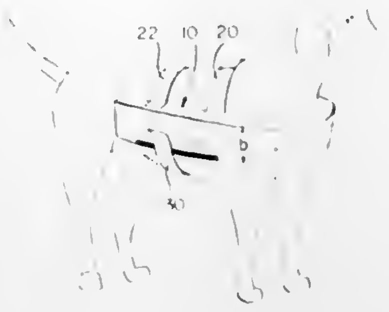
sensor means for generating a sensor signal in response to the identification signal; and

control means for providing control in response to the sensor signal.

4,036,179
ANIMAL PROTECTOR
James E. Turner, and Louise L. Turner, both of 15346 25th NE., Seattle, Wash. 98155
Filed Apr. 7, 1976, Ser. No. 674,405
Int. Cl.² A01K *29/00*
U.S. Cl. 119—96 **4 Claims**

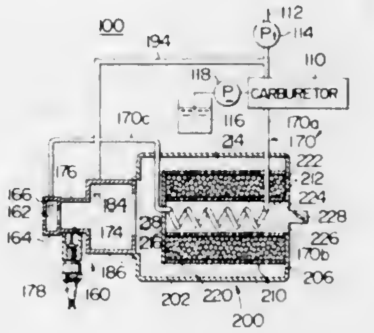
3. An animlal protector, comprising:

an elongated, resilient pad having a horizontal upper wall, a horizontal lower wall, vertical end walls, a bent central portion connected to parallel spaced end portions terminating at said end walls and defining a cavity therebetween, upper strap means connected between the parallel spaced end portions and spanning over said cavity, and lower strap means connected between the parallel spaced end portions and spanning below said cavity whereby the pad is adapted to be suspended around an animal's neck with the upper strap means riding on the animal's back and the lower strap means riding on the animal's belly,



said pad having a thickness sufficient to prevent the animal's mouth from reaching the belly, back and rear extremities of the animal.

4,036,180
FUEL REFORMING SYSTEM FOR AN INTERNAL COMBUSTION ENGINE
Masaaki Noguchi, Nagoya; Tsuchio Bunda, Okazaki, and Taro Tanaka, Chiryu, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan
Filed Mar. 3, 1976, Ser. No. 663,470
Claims priority, application Japan, Mar. 5, 1975, 50-27490
Int. Cl.² F02B *43/08;* F02M *31/00*
U.S. Cl. 123—3 **11 Claims**



1. A fuel reforming system for converting a rich mixture of air and a fuel into a reformed gaseous mixture containing hydrogen and for feeding the reformed gaseous mixture into a combustion chamber of an internal combustion engine, said system comprising:

means for producing the rich mixture of air and the fuel;

a burner of vortex combustion type for imperfectly burning the rich air-fuel mixture to cause partial oxidation of the fuel contained in the rich air-fuel mixture thereby to produce a partially oxidized gaseous mixture;

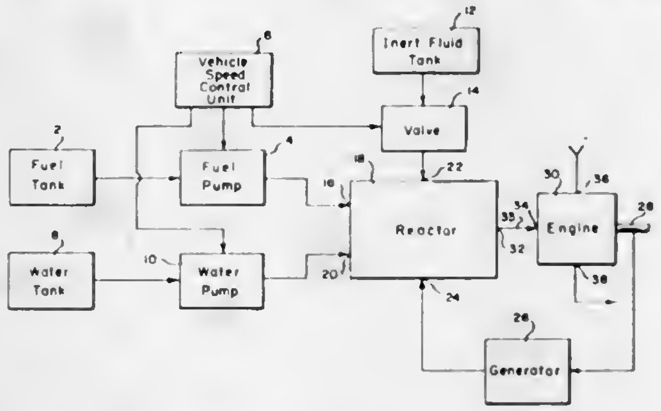
said burner including an ignition chamber disposed downstream of said rich mixture producing means so that the rich air-fuel mixture is introduced into said ignition chamber to form a vortex of the rich air-fuel mixture therein, said ignition chamber being provided with an igniting means for igniting the rich air-fuel mixture received from said rich mixture producing means, said burner further including an imperfect combustion chamber disposed in communication with said ignition chamber for receiving the thus ignited rich air-fuel mixture from said ignition chamber to cause the partial oxidization of the fuel and thus produce the partially oxidized gaseous mixture;

a reactor vessel provided with an inlet through which the interior of said vessel is communicated with said imperfect combustion chamber of said burner, said reactor vessel being also provided with an outlet leading to said combustion chamber of said engine;

generally tubular means defining therein a central passage and a generally tubular chamber surrounding said central passage and being in fluid flow communication therewith, said tubular means being disposed in said reactor vessel so that said tubular means and said reactor vessel cooperate to define therebetween a second passage surrounding said tubular chamber and being in fluid flow communication with said imperfect combustion chamber and with said tubular chamber and so that said central passage is connected to said reactor vessel, whereby said partially oxidized gaseous mixture can flow through said second passage into said tubular chamber; and

catalyst means disposed in said tubular chamber for facilitating catalytic conversion of said partially oxidized gaseous mixture to the reformed gaseous mixture, the reformed gaseous mixture thus produced flowing out of said tubular chamber into said central passage and then through said outlet of said reactor vessel toward said combustion chamber of said engine.

4,036,181
HIGH TEMPERATURE FLUID-WALL REACTORS FOR TRANSPORTATION EQUIPMENT
Edwin Matovich, Brea, Calif., assignor to Thagard Technology Company, Irvine, Calif.
Continuation-in-part of Ser. No. 271,560, July 13, 1972, Pat. No. 3,933,434, and Ser. No. 591,949, June 30, 1975, and Ser. No. 591,950, June 30, 1975, and Ser. No. 606,222, Aug. 20, 1975, and Ser. No. 616,393, Sept. 24, 1975, and Ser. No. 631,912, Nov. 14, 1975. This application Jan. 19, 1976, Ser. No. 649,964
Int. Cl.² F02B *43/00*
U.S. Cl. 123—3 **8 Claims**



1. A fuel converter for a transportation vehicle powered by an internal combustion engine comprising:

a. a container for a hydrocarbon fuel;

b. a tank for water;

c. an electrical power source;

d. a high temperature fluid-wall reactor for converting the hydrocarbon fuel and water into a synthesis gas mixture containing carbon monoxide and hydrogen, the reactor having (d.1) a hydrocarbon fuel input, (d.2) a water input, (d.3) an electrical power input, (d.4) a reactor tube having an inlet end and an outlet end, the interior of the tube defining a reactor chamber, (d.5) means for generating an annular envelope of an inert fluid which is substantially transparent to radiation radially inwardly of the inner surface of the reactor tube to constitute a protective blanket for the inner surface, (d.6) means connected to the hydrocarbon fuel input for introducing the hydrocarbon fuel into the reactor chamber through the inlet end of the reactor tube in a predetermined path axially of the reactor tube, the hydrocarbon fuel being confined by the protective blanket substantially centrally within the reactor chamber and out of contact with the inner wall of the reactor tube, (d.7) means connected to the water input for introducing water into the reactor chamber along at least a portion of the predetermined path of the hydrocarbon fuel, (d.8) electrical means connected to the electrical power input for directing high intensity radiant energy into the reactor chamber to coincide with at least a portion of the predetermined path of the hydrocarbon fuel. and (d.9) a gas mixture output connected to the outlet end of the reactor tube;

e. means for metering fuel from the container into the hydrocarbon fuel input of the reactor;
f. means for metering water from the water tank into the water input of the reactor;
g. means for metering electrical power from the power source into the power input of the reactor, and
h. a manifold connecting the gas mixture output of the reactor to a combustion fuel input of the internal combustion engine for directing the synthesis gas mixture from the reactor to the engine.

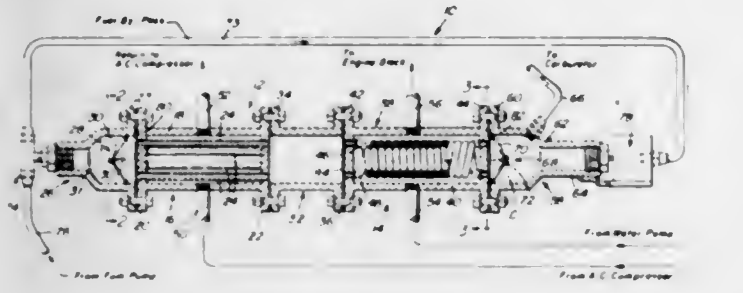
4,036,182
GASOLINE REFRACTIONATOR FOR INTERNAL COMBUSTION ENGINES

Mack C. Gandy, Tatum, N. Mex., assignor to Dale Gandy, Lovington, N. Mex., a part interest

Filed May 13, 1976, Ser. No. 686,669

Int. Cl.^{2} F02B *43/08;* **F01P** *1/06*

U.S. Cl. 123—3 **15 Claims**



7. A gasoline refractionator for internal combustion engines, comprising, in combination:

a. first heat exchanger means for receiving gasoline from a fuel source and cooling the gasoline sufficiently to cause the gasoline to separate into lighter and heavier components; and
b. second heat exchanger means connected to the first heat exchanger means and receiving separated components of gasoline from the first heat exchanger means for heating separately the components to a temperature at which the components will tend to remain separated even when in physical contact with one another.

4,036,183
ROTARY PISTON ENGINE

Toshibiko Igashira, Toyokawa; Shunzo Yamaguchi, Mishio, and Masami Hujita, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Continuation-in-part of Ser. No. 470,294, May 15, 1974, Pat. No. 3,977,368. This application Apr. 25, 1975, Ser. No. 571,743

Claims priority, application Japan, Apr. 29, 1974, 49-48417; May 7, 1974, 49-50455; June 14, 1974, 49-68576

The portion of the term of this patent subsequent to Aug. 31, 1993, has been disclaimed.

Int. Cl.^{2} F02B *53/10*

U.S. Cl. 123—8.13 **7 Claims**

1. A rotary piston engine comprising:

housing means having a trochoidal peripheral wall and side walls,

rotor means disposed within said housing and having sides cooperating with the peripheral and side walls of said housing to define a plurality of working chambers respectively,

said rotor means being operable to perform a planetary rotary movement causing the engine to perform intake, compression, combustion and exhaust strokes,

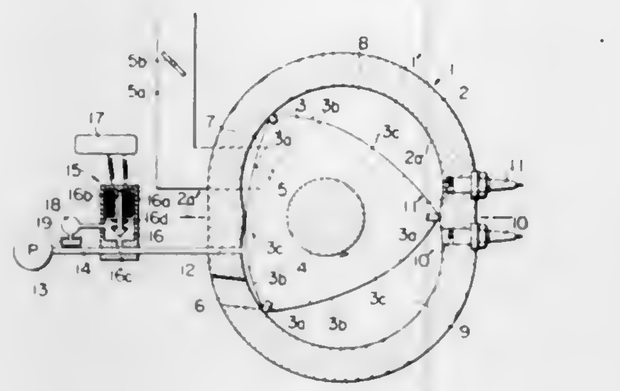
first intake port means formed in a portion of said housing which is on the leading side in a rotational direction of said rotor means with respect to the minor axis of trochoidal curves of said peripheral wall,

said first intake port being adapted to open into one of said working chambers which is in the intake stroke, and

exhaust port means opening to a portion within the housing which is on the trailing side in a rotational direction of said rotor means with respect to the minor axis,

wherein the improvement comprises:

second intake port means formed in a portion of said housing between said exhaust port means and the minor axis of the trochoidal curves,



said second intake port means being adapted to directly open into one of said working chambers which is at the initial stage of the intake stroke,

means connected to said second intake port means for supplying rich mixture into said working chambers through said second intake port means, and

means connected to said first intake port means for supplying air only into said working chambers through said first intake port means.

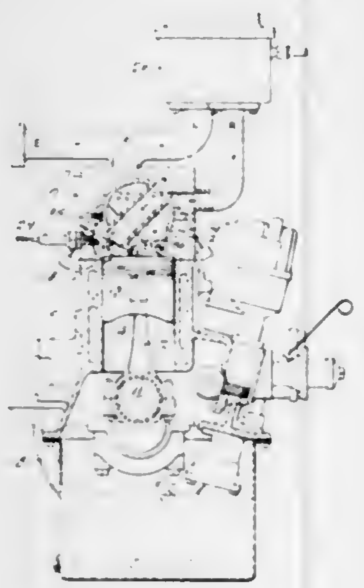
4,036,184
STRATIFIED CHARGE ENGINE

William D. Guenther, Hagerstown, Ind., assignor to Dana Corporation, Toledo, Ohio

Continuation-in-part of Ser. No. 449,241, March 8, 1974, Pat. No. 3,948,227. This application Dec. 13, 1974, Ser. No. 532,391

Int. Cl.^{2} F02M *13/06;* **F02B** *19/10;* **F01L** *7/00*

U.S. Cl. 123—75 B **2 Claims**



1. A stratified charge engine comprising an engine block, a cylinder within said block, a piston mounted for reciprocation within said cylinder and defining therewith a main combustion chamber, a pre-combustion chamber in open communication with said main combustion chamber, first and second valve bodies adjacent said cylinder, a first inlet passage for transmitting a lean fuel/air charge from a metering device to said first valve body, a second inlet passage for transmitting a rich fuel/air charge from a metering device to said first valve body, a first inlet port in said first valve body for establishing communication between said first inlet passage and said main combustion chamber upon rotation of said valve body to a predetermined position, a second inlet port in said first valve body for establishing communication between said second inlet passage and said pre-combustion chamber upon rotation of said valve body to such predetermined position, an exhaust port defined through said second valve body for registry with said main combustion chamber upon rotation of said second valve body to a predetermined position, means responsive to engine load for adjusting timing of the establishment of sequential communication of said first inlet port and said exhaust port with said first inlet passage and said exhaust manifold respectively wherein the time of communication is controlled in response to engine load when the piston is adjacent top dead center and also when the piston is adjacent bottom dead center during normal intake and exhaust cycles of the engine.

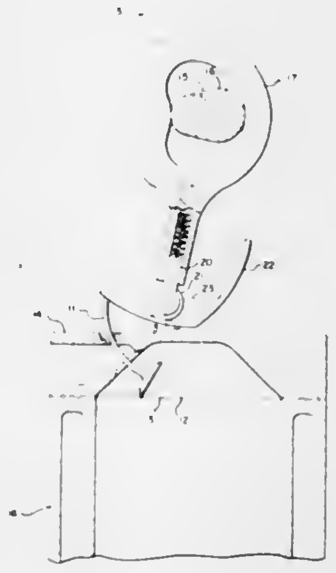
4,036,185
ENERGY-EFFICIENT VALVE GEAR

Edward H. Key, 910 E. Illinois St., Wheaton, Ill. 60187

Filed Apr. 9, 1976, Ser. No. 675,613

Int. Cl.^{2} F01L *1/30*

U.S. Cl. 123—90.25 **2 Claims**



1. An improvement to a valve train comprising a cylinder head and poppet valve thereon, a valve-actuating rocker platen pivotally mounted on said cylinder head by means of a pivot member so that said platen may pivot between positions on either side of said member, a valve connected to one end of said rocker platen for movement of said valve simultaneously with movement of said rocker platen between said rocker platen positions, and actuator means for moving said rocker platen between said positions thereby positively moving said valve between its open position and its closed position, said actuator means comprising a rotary cam means and cooperating follower pivotally mounted and spring-biased into engagement with said rocker platen and engaged with said cam means for pivoting said rocker arm upon rotation of said cam means, said follower comprising a pivotally mounted casing, spring-biased plunger means on said casing and biased to a roller bearing on and adapted to ride over said rocker platen thereby to move said platen between said positions, the roller rotatably attached to the pivoted plunger means at the roller center of rotation; the improvement wherein the platen is pivotally mounted at a point above the surface on which the roller rides and further, the radius of the roller equals the vertical distance from the platen to the point of pivotal mounting so that the center of rotation of the roller passes through the axis of the pivot point of said platen.

4,036,186
AIR-FUEL MIXTURE RATIO CORRECTING SYSTEM FOR CARBURETOR

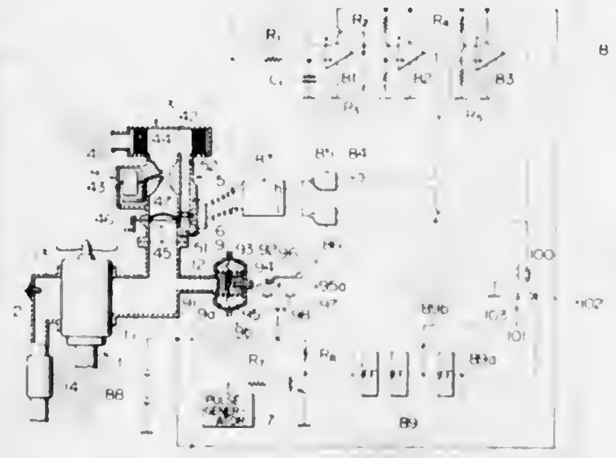
Tadashi Hattori, Nishio; Shigetaka Takada, Oobu; Kenji Hayashi, Aichi, and Toshiharu Iwata, Okazaki, all of Japan, assignors to Nippon Soken, Inc., Nishio, Japan

Filed June 3, 1974, Ser. No. 475,917

Claims priority, application Japan, June 4, 1973, 48-63243; June 4, 1973, 48-63244; June 4, 1973, 48-63245; July 26, 1973, 48-84346; Sept. 27, 1973, 48-109060

Int. Cl.^{2} F02M *7/00, 13/04;* **G01N** *3/00, 27/42*

U.S. Cl. 123—32 EA **14 Claims**



1. An air-to-fuel ratio controlling system for an internal combustion engine comprising:

a carburetor connected to an intake manifold of an internal combustion engine and including a main passage and a bypass passage for supplying an air-fuel mixture to said engine; a main valve positioned in said main passage for controlling the amount of the air-fuel mixture, a bypass valve positioned in said bypass passage for compensating the air-to-fuel ratio of said air-fuel mixture by controlling the amount of air flow therethrough;

a pulse motor coupled to said bypass valve for driving said valve in order to control the degree of opening of said bypass valve;

a pulse generator for generating a train of pulses having a frequency which varies in proportion to the rotational speed of said engine;

a frequency divider connected to said pulse generator for converting the train of pulses from said pulse generator into plural trains of pulses having different and lower frequencies;

detecting means coupled to an intake manifold of said internal combustion engine for detecting a rapid change of the operational speed of said internal combustion engine;

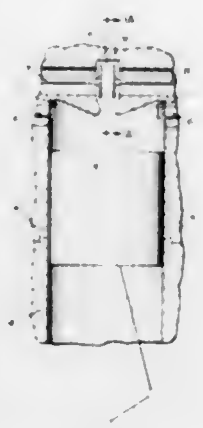
selecting means connected to said detecting means for selecting one of said plural trains of pulses from said frequency divider in accordance with the detected operational speed of said engine;

air-to-fuel ratio sensing means disposed in an exhaust manifold of said internal combustion engine for detecting the air-to-fuel ratio of the air-fuel mixture supplied to said engine; and

a control circuit connected to said selecting means, said air-to-fuel ratio sensing means and said pulse motor for driving said pulse motor at a speed determined by the selected train of pulses from said selecting means, the rotational direction of said pulse motor depending on the output from said air-to-fuel ratio sensing means.

4,036,187
CLEAN SPARK IGNITION INTERNAL COMBUSTION ENGINE

Hui-tzeng Ting, P.O. Box 18, Crum Lynne, Pa. 19022
Continuation-in-part of Ser. No. 376,304, July 5, 1973, abandoned. This application Mar. 16, 1976, Ser. No. 667,409
Int. Cl.² F02B *19/10, 19/16*
U.S. Cl. 123—32 SP **4 Claims**

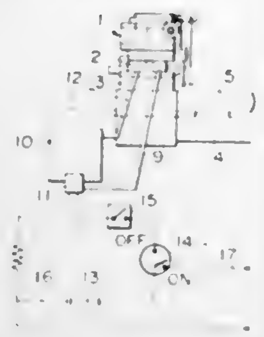


1. In a four-stroke spark ignition engine having fuel injectors in the cylinder wall and a combustion chamber in the cylinder-head, the stratification of air-fuel mixture is obtained by the combined employment and unique arrangement of such devices as said combustion chamber which is divided into two separate chambers, the first chamber being bounded by the piston top at or near the top dead center, the lower part of the cylinder-head, and a throat opening leading to the second chamber which is located on top of said first chamber; the inlet and exhaust valves which are located in said second chamber; the fuel injector or injectors which are located at or near the bottom dead center, and create atomized fuel droplets covering the vicinity of the piston top when injection takes place at the bottom dead center; and the spark plug or plugs which are located at or near the bottom of said first chamber, such that said stratification of air-fuel mixture is obtained with the rich mixture at or near the piston top during the end of intake stroke, and said stratification is maintained throughout the ensuing compression stroke due to the fact that the time interval of said compression stroke is extremely short as compared with the time required by natural diffusion or turbulence to undo said stratification such that at the instant of ignition a lean mixture is trapped in said second chamber, and a rich mixture is trapped in said first chamber where said spark plug or plugs give ignition to said rich mixture first, and the ignited mixture will reach more complete combustion later during the expansion stroke by mixing with the lean mixture released from said second chamber.

4,036,188
CARBURETOR EQUIPPED WITH A COOLING SYSTEM

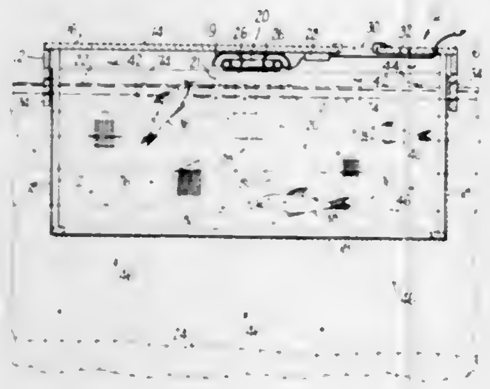
Hiroshi Sami; Kaoru Taira, and Teruo Kumai, all of Toyota, Japan, assignors to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan
Filed Nov. 8, 1974, Ser. No. 522,131
Claims priority, application Japan, July 18, 1974, 49-82482
Int. Cl.² F01P *1/06*
U.S. Cl. 123—41.31 **4 Claims**

1. A carburetor in an internal combustion engine which incorporates intake manifold heating by exhaust gases to improve startability and warming-up performance of the engine, comprising a fluid cooling system means for a carburetor casing, said cooling system means including a pumping means for a cooling fluid and a power circuit means for said pumping means, said power circuit means incorporating an engine ignition switch and a timer and adapted to drive said pumping means for only a predetermined duration from the instant when said ignition switch is opened.



4,036,189
COLLECTION AND FEEDING OF INSECTS TO ANIMALS

Gregor N. Neff, 85 Myrtle Ave., Dobbs Ferry, N.Y. 10522
Division of Ser. No. 497,540, Aug. 14, 1974, Pat. No. 3,951,104, which is a continuation-in-part of Ser. No. 477,839, June 10, 1974, abandoned, and Ser. No. 460,619, April 12, 1974, Pat. No. 3,939,802, which is a continuation-in-part of Ser. No. 213,966, Dec. 30, 1971, abandoned. This application Feb. 10, 1976, Ser. No. 656,890
Int. Cl.² A01K *61/02*
U.S. Cl. 119—51 R **23 Claims**



1. A method of feeding aquatic animals, said method comprising attracting insects from within a body of water by directing into said water electromagnetic energy consisting predominantly of energy having a wavelength in the range of 3,000 Angstroms to 4,000 Angstroms, and feeding said insects to said animals.

4,036,190
DEVICE FOR AUTOMATIC CONTROL OF ELECTRONIC SPARK IGNITION ADVANCE FOR INTERNAL COMBUSTION ENGINES

Umberto Bigliani, Leumann-Collegno (Turin), and Rafael Jacoel, Milan, both of Italy, assignors to Fiat Societa per Azioni, Turin, Italy
Filed May 10, 1976, Ser. No. 684,824
Claims priority, application Italy, June 10, 1975, 68488/75
Int. Cl.² F02P *5/04*
U.S. Cl. 123—117 D **6 Claims**

1. Device for the automatic control of spark advance in an electronic ignition system for an internal combustion engine, of the type comprising an ignition spark discharge control circuit which controls the discharge, reference means located on a rotary part of the engine and comprising a protuberance phase-displaced in advance, with respect to a top dead centre reference on the rotary part, by an angle equal to the maximum spark advance angle required, at least one series of teeth located on the said rotary part, first and second electromagnetic pick-ups which cooperate with said protuberance and with said teeth to provide respective electrical output pulses, and a circuit connected to said pick-ups for variation of the instant of discharge,

wherein the improvements consists in that the circuit for the variation of the instant of discharge comprises:

pulse counter means for counting the pulses emitted by the second pick-up as said teeth pass the said pick-up, in each ignition cycle,

means for enabling said counter for a predetermined period of time (T) commencing with the passage of the said protuberance past the first pick-up,

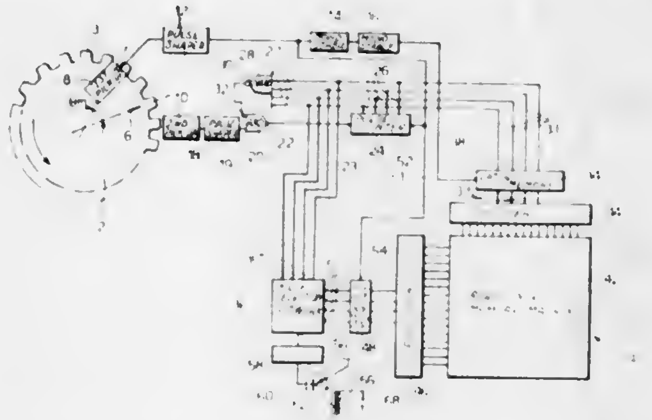
memory means for storing the count of said counter means after this predetermined time (T) and for transforming the count into a signal representing a reference value of the required spark advance angle,

a parking memory for storing the said reference value,

reset means for resetting the said pulse counter means and clearing the memory means of the said reference value upon the next passage of the said protuberance in correspondence with the said first pick-up,

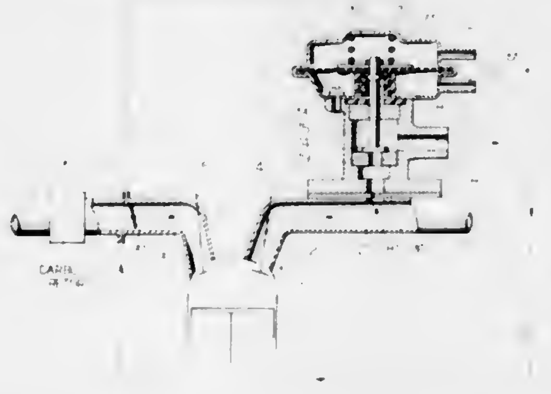
comparator means for comparing the said reference value stored in the parking memory with the instantaneous count in the pulse counter means after said resetting thereof, and

a spark discharge circuit connected to said comparator means, the latter initiating operation of said spark discharge circuit when said instantaneous count reaches parity with the reference value.



4,036,191
EXHAUST GAS RECIRCULATION SYSTEM

Kenichi Numata, Kariya, and Yukihiko Muramatu, Hekinan, both of Japan, assignors to Nippondenso Co., Ltd., Kariya, Japan
Filed Oct. 8, 1975, Ser. No. 620,914
Claims priority, application Japan, Nov. 5, 1974, 49-134281[U]
Int. Cl.² F02M *25/06*
U.S. Cl. 123—119 A **1 Claim**



1. An exhaust gas recirculation system for internal combustion engines having an exhaust pipe and an intake pipe comprising:

a pressure control chamber with a diaphragm arrangement for receiving a pressure signal,

a shaft fixed to said diaphragm arrangement for reciprocally moving in accordance with said pressure signal,

a valve body housing an inlet and outlet,

a valve seat disposed in valve body housing between said inlet and outlet, said valve seat having a valve opening,

a valve body fixed to said shaft and disposed in said valve housing, said valve body seating on said valve seat for opening and closing said valve opening in accordance with the reciprocal movement of said shaft so that said outlet is connected with said inlet when valve opening is opened,

a bellows member fixed between said diaphragm arrangement and said valve body housing, and

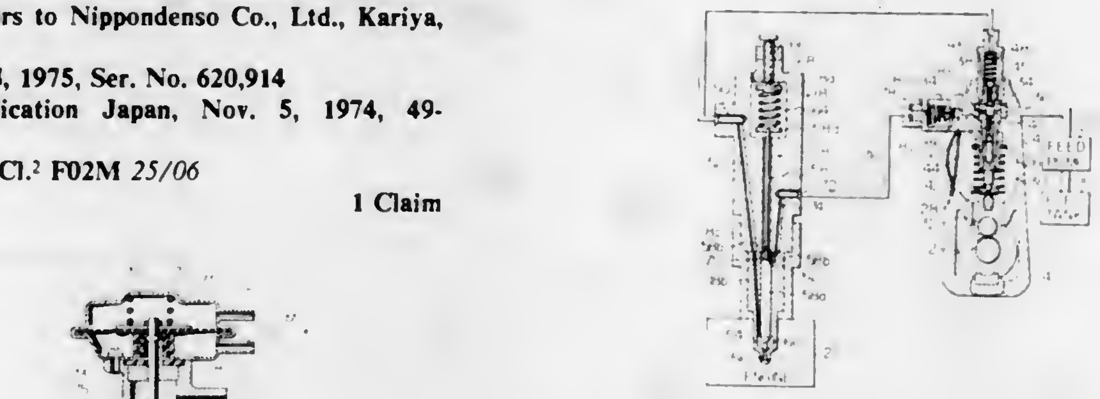
a detachable gasket member disposed between said valve body housing and said exhaust pipe, and having a flow control orifice at a position corresponding to said inlet, said flow control orifice being smaller than that of the valve opening of said valve seat so that the amount of exhaust gas flowing through said flow control orifice is thereby controlled,

said exhaust pipe also having an opening at a position corresponding to said flow control orifice,

whereby the exhaust gases of said engine flow from said exhaust pipe into said intake pipe through said opening, flow control orifice, and valve body housing when said diaphragm arrangement receives said pressure signal, while in the reverse condition, the exhaust gas flow is interrupted by said valve body, and said detachable gasket member can be easily cleared or renewed when said recirculation system has run over a limited period and further can be changed in compliance with the type of engine to match the dimension of said flow control orifice to the required exhaust gas flow rate specific to said type of engine.

4,036,192
ENGINE FUEL INJECTION SYSTEM

Kenji Nakayama, Higashi Matsuyama, Japan, assignor to Diesel Kiki Co., Tokyo, Japan
Filed Feb. 7, 1975, Ser. No. 548,101
Claims priority, application Japan, Feb. 8, 1974, 49-15408; Aug. 20, 1974, 49-94644
Int. Cl.² F02M *47/02*
U.S. Cl. 123—139 AT **13 Claims**



1. A fuel injection system for an engine comprising, in combination:

a fuel source;

a plunger pump adapted to be driven by the engine and having a barrel in which a plunger is sealingly slidable, the barrel and plunger defining a pressure chamber, the barrel being formed with a first and a second hole through the circumference thereof, the plunger being formed with a longitudinal passageway opening at one end into the pressure chamber and a circumferential groove connected to the other end of the longitudinal passageway, the first hole being connected to the fuel source;

a fuel injection nozzle adapted to be operatively connected to the engine and connected to the pressure chamber, the plunger pump being connected to supply fuel from the fuel source to the nozzle at high pressure, the nozzle having a valve element biased to block fuel flow through the nozzle, the valve element having a first surface exposed to pressurized fuel from the pump so that the valve element is urged by the pressurized fuel applied to the first surface in a direction opposite to the biasing force so that the force of the pressurized fuel on the first surface overcomes the biasing force during the injection stroke of the pump plunger to move the valve element to allow fuel flow through the nozzle and thereby fuel injection into the engine, the valve element having a second surface connected to the second hole and arranged so that the pressurized fuel from the pump applied to the second surface urges the valve element in the same direction as the biasing force; and,

a valve connected to feed pressurized fuel from the pump to the second surface of the valve element near the end of the injection stroke of the plunger whereby the biasing force and the force of the pressurized fuel applied to the second surface of the valve element in combination move the valve element against the force of the pressurized fuel applied to the first surface of the valve element to move the valve element to block fuel flow through the nozzle and terminate the fuel injection, said valve including the plunger and the barrel formed with the second hole, the first and second holes being arranged so that in sequence during the injection stroke of the plunger, the second hole is covered by the end of the plunger defining the pressure chamber thereby blocking communication between the pressure chamber and the second surface of the valve element, the first hole is covered by the end of the plunger defining the pressure chamber thereby blocking communication between the pressure chamber and the fuel source, the second hole is uncovered by the circumferential groove of the plunger thereby allowing communication between the pressure chamber and the second surface for the valve element and the first hole is uncovered by the circumferential groove of the plunger thereby allowing communication between the pressure chamber and the fuel source, said valve further including a check valve unit connected between the second hole of the barrel and the second surface of the valve element of the nozzle to permit fuel flow only from the second hole to the second surface, said check valve unit comprising a chamber formed therewithin, a passageway connected between the chamber and the second hole of the barrel, and a valve element urged by a compression spring disposed in the chamber to block the passageway and formed with a longitudinal constricted passageway to bypass the passageway.

4,036,193
ELECTRONICALLY CONTROLLED FUEL INJECTION PUMP

Masayoshi Kobayashi, Kawagoe, and Takeo Kimura, Higashi-Matsuyama, both of Japan, assignors to Diesel Kiki Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 274,655, July 24, 1972, abandoned. This application May 6, 1975, Ser. No. 575,077

Claims priority, application Japan, July 30, 1971, 46-67266[U]

Int. Cl.² F02M *39/00*

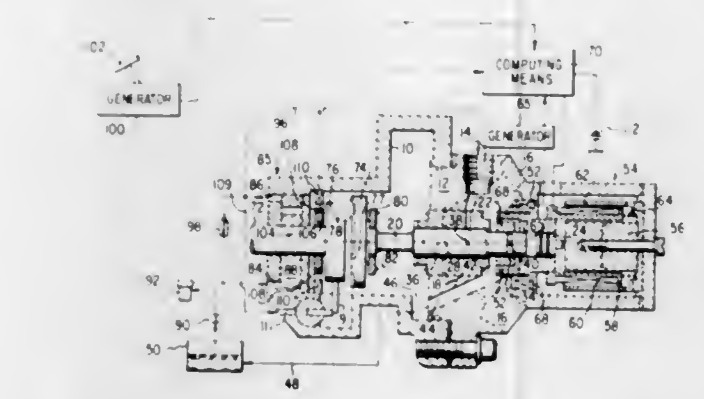
U.S. Cl. 123—139 AB **9 Claims**

1. A fuel injection pump comprising:

an enclosure;

a pump element comprising a plunger rotatingly and reciprocally movable in the enclosure to define a compression chamber of variable volume, the pump element connecting the compression chamber to a fuel inlet during an intake stroke of the pump element and connecting the compression chamber to a fuel outlet during a compression stroke of the pump element;

a movable overflow member for connecting the compression chamber to a fuel reservoir during the compression stroke of the pump element, the position of the pump element at which the overflow member connects the compression chamber to the fuel reservoir being variable in dependence on the position of the overflow member to determine the fuel injection volume, said movable overflow element being in direct sliding engagement with said plunger and including a bore in which said plunger is received;



an electrical actuator having a linearly movable actuator element connected to move the overflow member, said electrical actuator member comprising a solenoid and said linearly movable actuator member comprising a coil of said solenoid; and

a closed loop electrical servo control means for electrically controlling the electrical actuator to linearly move the actuator element to move the overflow member to a position corresponding to the required fuel injection volume.

4,036,194
FUEL INJECTION SYSTEM

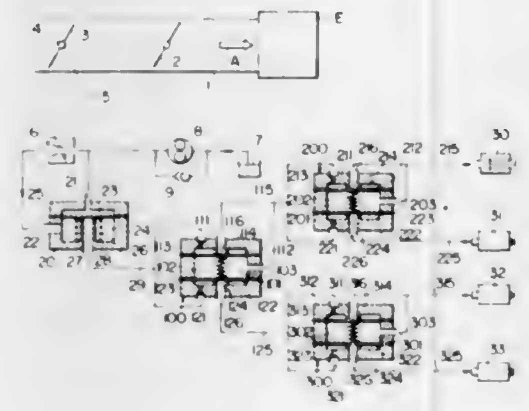
Hisanori Kobayashi, Aichi, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed July 8, 1975, Ser. No. 594,089

Claims priority, application Japan, July 14, 1974, 49-80571; Oct. 3, 1974, 49-114186; Oct. 23, 1974, 49-122162

Int. Cl.² F02M *69/00*

U.S. Cl. 123—139 AW **9 Claims**



1. A fuel injection system for use in combination with an internal combustion engine having a plurality of fuel injection nozzles, comprising means for metering the total quantity of fuel flow to be introduced into the engine and fuel distribution means for distributing the fuel from said fuel metering means equally to said plurality of fuel injection nozzles, said distribution means including at least one fuel dividing means for dividing one fuel flow into two fuel flows in a predetermined ratio,

said fuel dividing means comprising a housing defining therein with at least one enclosed space, first and second diaphragms arranged to divide each said space into two outer chambers and an intermediate chamber between said outer chambers, a first inlet means into one of said outer chambers for receiving said one fuel flow, a second inlet means into the other of said outer chambers for receiving said one fuel flow, restrictor means communicated with each of said first and second inlet means for restricting fuel flow into each of said outer chambers, the opening areas of said respective restrictor means being in said predetermined ratio, discharge means having a valve port located in opposed relation with said diaphragm and a discharge passage for discharging fuel from each of said outer chambers through said valve port to said discharge passage, spring means disposed within said intermediate chamber and extending between said diaphragms, and means for introducing a part of the fuel in at least one of said discharge passages into said intermediate chamber, whereby said two fuel flows in the predetermined ratio are obtained through said respective discharge passages.

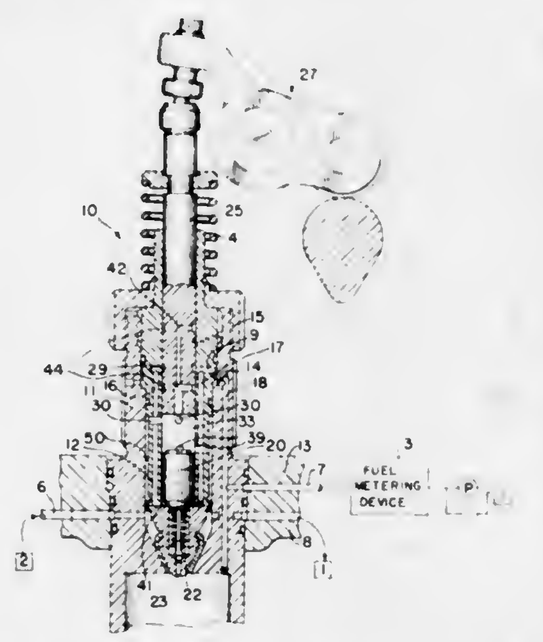
4,036,195
UNIT FUEL INJECTOR

John M. Bailey, Dunlap, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 24, 1975, Ser. No. 634,952

Int. Cl.² F04B *35/02;* F02M *61/00*

U.S. Cl. 123—139 AK **5 Claims**



1. A unit fuel injection system comprising; housing means having first bore means therein, piston means reciprocatingly mounted within said first bore means and biased to a first position, injection means for selectively communicating fuel from said first bore means to a point of fuel utilization, unrestrained free-floating plunger means slidably mounted within said first bore means between said piston means and said injection passage means, first chamber means formed within said first bore means between said floating plunger means and said piston means, first fluid communication means for communicating first fluid from a first source thereof to said first chamber means; second chamber means formed within said housing means between said unrestrained floating plunger means and said injection passage means; second fluid communication means for communicating a second fluid from a second source thereof to said second chamber means with said piston means in a first position;

said piston means including a piston member, biasing means for urging said piston member in a first direction away from said injection passage means to said first position, and cam means operable for periodically urging said piston member in a second direction toward a second position allowing said piston member to block said second communication means immediately upon movement from said first position.

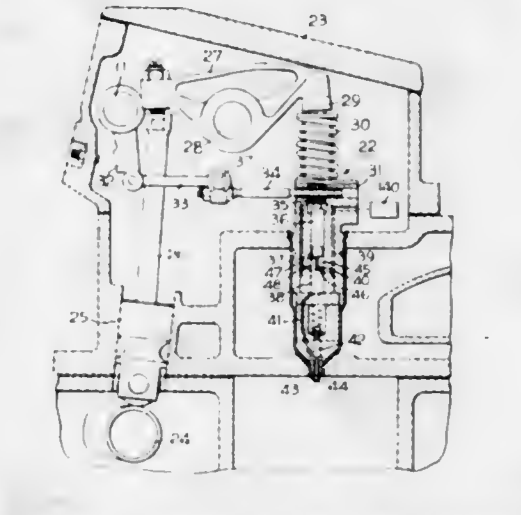
4,036,196
SPRING LOADED LEVER TO OPERATE CONTROL RACK OF FUEL INJECTOR

William I. Hamilton, deceased, late of Chicago Heights, Ill. (by Edna L. Hamilton, joint tenancy for the estate), assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed Aug. 25, 1975, Ser. No. 607,602

Int. Cl.² F02D *1/04*

U.S. Cl. 123—140 R **8 Claims**



1. A fuel injection control on a diesel engine for controlling a plurality of fuel injectors comprising, an engine driven governor, a speed responsive member driven by said governor responsive to engine speed, a plurality of fuel injectors each including a fuel injection plunger, a fuel injection control rack, a metering pinion on each of said fuel injection plungers for metering fuel injection, means defining a fuel injection pump including said fuel injection plunger defining a land forming at least one helical edge and a port to selectively vary quantity of fuel injection in response to rotation of said plunger, at least one governor control shaft, a collar defining an axial slot mounted on said control shaft, a fuel injection control arm mounted on said governor control shaft and connected to said fuel injection control rack, said control arm defining a lug received in said slot, said lug defining an angular width of less than the width of said slot to provide a lost motion connection between said collar and said lug, resilient means resiliently biasing said lug for an engaging position on one side of said slot to provide positive increase of quantity of fuel injection and permitting relative movement between said governor control shaft and control arm when fuel quantity is decreased.

4,036,197
AUTOMOTIVE IGNITION DISTRIBUTOR CONVERSION MEANS

Craig S. Beshore, 753 Puma Canyon Lane, Glendora, Calif. 91740

Filed Nov. 3, 1975, Ser. No. 628,415

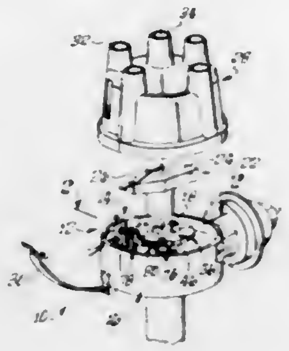
Int. Cl.² F02P *7/02*

U.S. Cl. 123—146.5 A **13 Claims**

1. A universal retro-fittable ignition timing detector mounting bracket for an automotive ignition distributor of the kind having a body mounting a timing rotor with ignition timing elements uniformly spaced about its circumference and a timing element detector to be located in timing element sensing relation to the rotor wherein the detector senses and provides electrical ignition timing pulses in response to rotation of said timing elements past said detector, said bracket comprising:

a first relatively fixed base part including means for securing said part to the distributor body with a given axis of said part parallel to and spaced laterally from the turning axis of the timing rotor, a second relatively adjustable part for mounting said timing detector, and

adjustable means movably mounting said second part on said first part for selective independent adjustment of the second part relative to the first part in both longitudinal directions of said given axis and any lateral direction of said given axis to permit selective adjustment of said detector axially, radially, and circumferentially of the timing rotor for locating said detector in timing element sensing relation to said rotor and in a selected position about the rotor axis, such that the detector provides said ignition signals in response to rotation of the rotor timing elements past a given point relative to the distributor body.



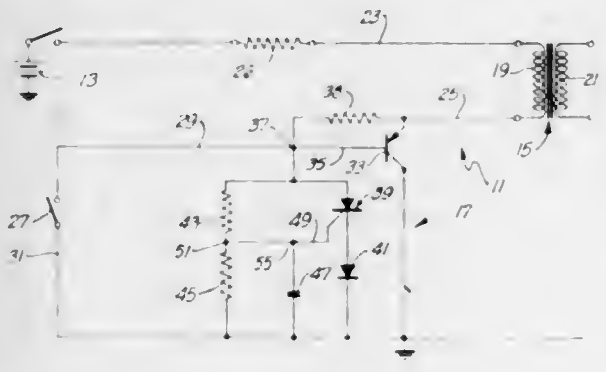
4,036,198
IGNITION SYSTEM WITH PROGRAMMABLE DWELL

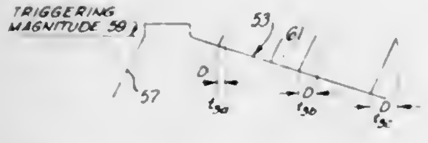
Homer E. Howard, 2024 Paloma Drive, Costa Mesa, Calif. 92627

Filed Oct. 17, 1975, Ser. No. 623,486

Int. Cl.² F02P ***1/00***

U.S. Cl. 123—146.5 A **9 Claims**





1. An engine ignition control system electrically connectible to an ignition circuit which includes a source of electrical energy, an ignition coil, and timing means for repetitively and alternately providing first and second timing signals with the interval between adjacent timing signals being related to engine speed, said control system comprising:

means responsive to one of the first timing signals for providing a triggering signal a variable interval after said one timing signal and before the next to occur of the second timing signals subsequent to said one timing signal with the variable interval reducing with increases in engine speed;

switch means responsive to said triggering signal for completing a first circuit from the source of electrical energy through the coil to charge the coil; and

said switch means including means responsive to the next to occur of the first timing signals subsequent to said one timing signal to open said first circuit to discontinue the charging of the coil whereby the coil can be charged during charging interval which extends from about the time of the initiation of the triggering signal to about the time of said next to occur of the first timing signals and said coil is not being charged during said variable interval of time.

4,036,199
DEVICE FOR PROTECTING AN IGNITION DEVICE FOR MOTOR VEHICLES

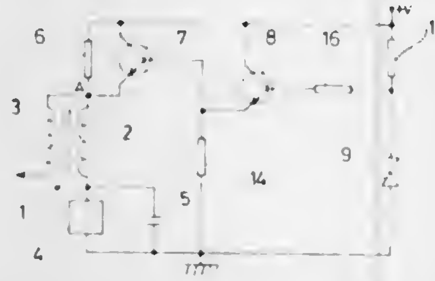
Louis Jean Chateau, Rosny-sur-Bois, France, assignor to Ducellier & Cie, Paris, France

Filed Mar. 16, 1976, Ser. No. 667,465

Claims priority, application France, Mar. 18, 1975, 75.08332

Int. Cl.² H05B ***37/02***

U.S. Cl. 123—148 E **3 Claims**



1. An internal combustion engine ignition system comprising an ignition coil having primary and secondary windings, a control device for the ignition coil, a current limiting resistor, the primary winding, control device and the current-limiting resistor being connected in series between a pair of supply terminals, and a circuit for short-circuiting the current-limiting resistor when the voltage on the supply terminals is less than a predetermined value, said circuit comprising a zener diode and at least one resistor connected in series between the supply terminals, said zener diode conducting when there is a voltage in excess of said predetermined value on the supply terminals, a first transistor having its base connected to one electrode of the zener diode a second transistor of which the emitter-collector junction is connected across the current-limiting resistor, the base of the second transistor being connected to one of the electrodes of the first transistor so that said second transistor is conductive when the zener diode is non-conductive.

4,036,200
CAPACITOR DISCHARGE IGNITION CIRCUIT

Andrew Kuehn, III, St. Paul, Minn., assignor to Systematics, Inc., St. Paul, Minn.

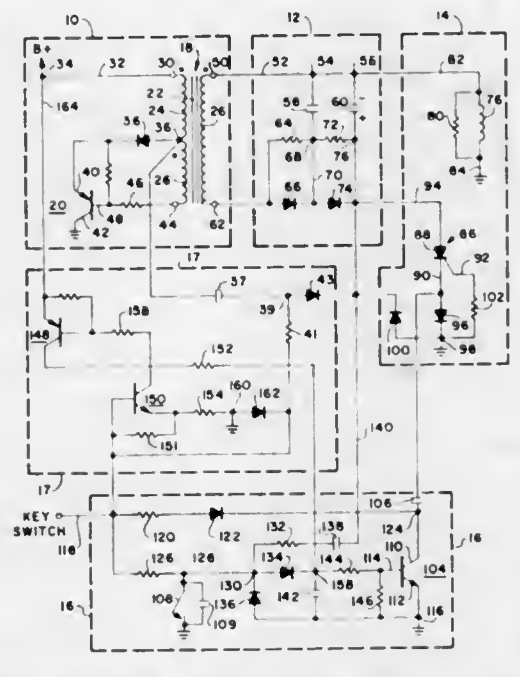
Continuation of Ser. No. 516,584, Oct. 21, 1974, abandoned, which is a continuation of Ser. No. 394,759, Sept. 6, 1973, abandoned, which is a continuation of Ser. No. 216,528, Jan. 10, 1972, abandoned, which is a division of Ser. No. 62,398, Aug. 10, 1970, Pat. No. 3,654,910. This application Sept. 11, 1975, Ser. No. 612,369

Int. Cl.² F02P ***1/00***

U.S. Cl. 123—148 E **2 Claims**

1. In a capacitive discharge ignition circuit of the type including an ignition coil, a direct current source including a storage battery, a set of distributor points a capacitive energy storage circuit coupled to said battery, an electronic switching means for coupling said energy storage circuit to said ignition coil each time said electronic switching means is triggered, a trigger circuit coupled to said electronic switching means for normally producing trigger signals for operating said electronic switching means each time the distributor points open, and an ignition key switch terminal coupled to said direct current source, and comparator means for preventing the triggering of said electronic switch means after the key switch has been opened comprising:

a. a first and a second semiconductor amplifier circuit each having a pair of output electrodes and a control electrode;
b. means coupling said pair of output electrodes of said first semiconductor amplifier in series between one terminal of said battery and said trigger circuit;



c. means connecting the output electrodes of said second semiconductor amplifier between the control electrode of said first semiconductor amplifier and the other terminal of said battery; and
d. means connecting the control electrode of said semiconductor amplifier to said key switch terminal, whereby said comprising means is operable for inhibiting said trigger circuit from producing said trigger signals when the voltage from said source of direct current falls below a predetermined threshold following the opening of said key switch.

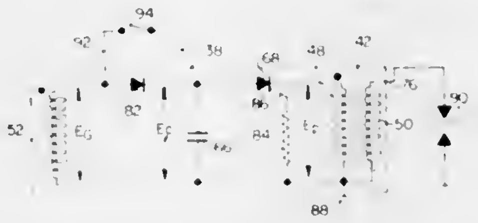
4,036,201
SINGLE CORE CONDENSER DISCHARGE IGNITION SYSTEM

Bob O. Burson, East Longmeadow, Mass., assignor to R. E. Phelon Company, Inc., East Longmeadow, Mass.

Filed Apr. 29, 1975, Ser. No. 572,908

Int. Cl.² F02P ***3/08, 3/06***

U.S. Cl. 123—148 CC **5 Claims**



1. A capacitor discharge system for an internal combustion engine comprising a permanent magnet means rotated about a circular path in synchronism with the operation of said engine, a core of ferromagnetic material mounted adjacent said circular path and having one portion providing a path for the varying flux generated by the movement of said magnet means past said core, a charging winding and a transformer core portion, said charging winding being offset from said primary and secondary windings radially with respect to said circular path; said charging winding and primary winding being wound on said one core portion such that the voltages induced therein by said varying flux each includes half wave voltages of opposite polarity, a charging circuit including a capacitor connected across said charging winding and a diode poled to pass half wave voltages of one polarity for charging said capacitor and maintaining said capacitor charged when the voltage generated in said charging winding is opposite said one polarity, circuit means connecting said capacitor with said primary winding for discharging said capacitor through said primary winding and including an electronic switch means having anode, cathode and control electrodes, the anodecathode junction of said switch means interconnecting the ends of said charging winding and said primary winding which are simultaneously at the same polarity, said control electrode being connected to the other end of said primary winding, the polarity of which is opposite said same polarity, said switch means being nonconductive during the charging of said capacitor by said one polarity of the voltage generated in said charging coil and being rendered conductive by voltage generated in the primary winding opposite said same polarity whereby said capacitor is charged during one complete half cycle of voltage generated in the charging coil and discharged during the next half wave voltage generated in said charging winding.

4,036,202
INTERNAL COMBUSTION ENGINES

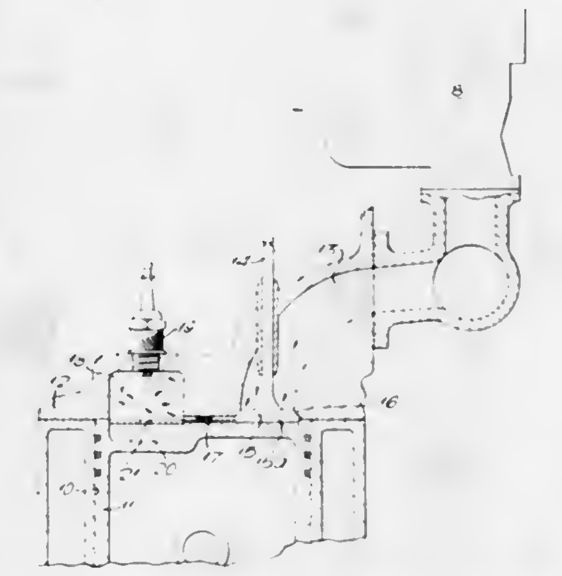
Henry Weslake, Maryland, Point Hill, Rye, England

Filed Aug. 20, 1975, Ser. No. 606,092

Claims priority, application United Kingdom, Aug. 23, 1974, 37194/74; Nov. 7, 1974, 48231/74

Int. Cl.² F02B ***17/00, 19/00;*** **F01L** ***3/22***

U.S. Cl. 123—32 ST **12 Claims**



1. An internal combustion engine having at least one cylinder containing a reciprocable piston, an inlet passage for air or air/fuel mixture leading to the engine cylinder, means to ignite the air/fuel mixture, a branch passage leading from the inlet passage to the ignition means to deliver air or air/fuel mixture thereto, and a single valve for opening and closing both the inlet and branch passages, the valve having a first position for closing both said inlet and branch passages, a second position for opening said branch passage and closing said inlet passage, and a third position for opening both said branch and inlet passages.

4,036,203
ELASTIC BAND TYPE TOY CANNON

Clyde H. Chapman, 9535 Yorkwood, Houston, Tex. 77016

Filed Dec. 5, 1975, Ser. No. 638,181

Int. Cl.² F41B ***7/00***

U.S. Cl. 124—21 **4 Claims**

1. A toy cannon which comprises;

an elongate hollow barrel having a breach end and a muzzle end, there being a lengthwise slot extending along a substantial portion of said barrel and terminating short of said muzzle end;

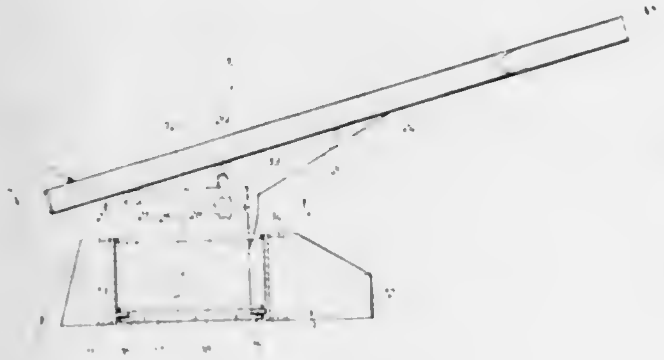
a transversely extending projectile plunger slidably received within said barrel;

an outwardly projecting, protruding tabular means carried on said plunger and extending to the exterior of said barrel through the lengthwise slot in said barrel;

an elongate resilient force means adapted to be joined at one end to a fixed point relative to said barrel and at the other end to said protruding tabular means to impart axial movement to said plunger along said barrel; said force means being housed in cowling means extending along substantially the full length of the barrel and afixed to the outer surface of said barrel;

a pivot point near the breach end of said barrel;

a latch means pivotly mounted on said pivot point, said latch means incorporating a hook which engages and holds said plunger when said plunger is forced to the rear of said barrel against the force of said force means, said latch means holding said plunger means for a specified interval;



base means supporting said barrel and enabling said barrel to be aimed in a specified direction;

a turntable included in said base which rotates in a generally horizontal plane about a vertical axis to thereby permit adjustment of said barrel to a specified azimuthal angle;

a fixed pivot point included in said base, a means joining said barrel to said pivot point, and a means for locking said barrel at a specified angle of elevation upon rotation about said pivot point;

an opening means formed in the side of said barrel which permits said latch means to extend therethrough and which is externally exposed for hand manipulation to release said latch means; and

two protruding tabular means carried on said plunger which are arranged diametrically opposite of one another and wherein said barrel has a pair of lengthwise opposing slots, said tabular means protruding respectively through opposing slots.

4,036,204
TRIGGER RELEASE DEVICE FOR BOW STRINGS

Joseph D. Scott, 2112 S. Fernwood Drive, Savannah, Ga. 31404

Filed Dec. 10, 1975, Ser. No. 639,353

Int. Cl.^{2} F41B *5/00*

U.S. Cl. 124—35 A **4 Claims**

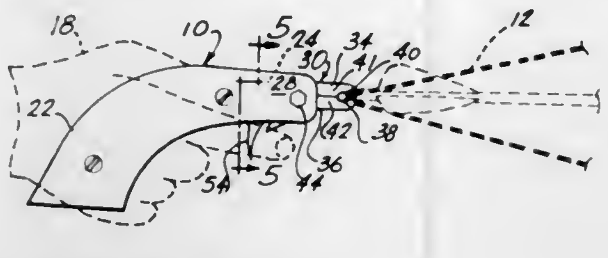
1. In a release device for the bow string of a bow which is used to propel an arrow:

a handle,

a pair of first and second opposed jaws pivotally mounted on said handle and each of said jaws having a cavity therein so that said jaws when closed together from an opening therebeneath in which a bow string is confined,

a first jaw member including said first jaw thereon and a second jaw member including said second jaw thereon, said first and second jaw members each being elongated and having a respective first pivot connected by first pivot means therebetween, said first pivot means mounting said first and second jaw members on said handle,

a trigger member having a pivot attaching portion and there being second pivot means pivotally connecting the pivot attaching portion of said trigger member with said second jaw member,



a trigger on said trigger member,

a notch in said trigger member, and

a projecting portion on said first jaw member for engagement in said notch in said trigger member when said jaws are closed.

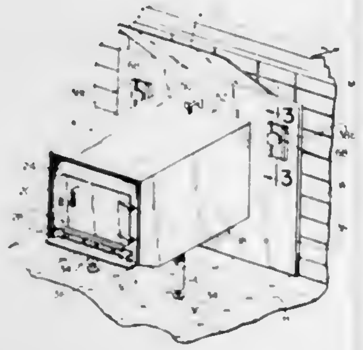
4,036,205
FIREPLACE STOVE

Robert William Hayes, Avon, Conn., assignor to Hayes-Te Equipment Corporation, Unionville, Conn.

Filed May 2, 1975, Ser. No. 573,872

Int. Cl.^{2} F24C *15/30*

U.S. Cl. 126—126 **10 Claims**



1. A fireplace stove comprising a generally planar flat plate of such a size that marginal portions are adapted to overlie the sides of a fireplace opening, a hollow rectangular firebox structure which includes a horizontal top and vertically extending side walls, said firebox structure having a rear wall supported by said plate and having a bottom wall and a front wall defining an access opening, an access door in said opening, said front wall further including an air inlet opening adjacent the lower portion of said front wall, a side valve for metering flow of inlet air, said plate defining an exhaust opening adjacent the upper portion of the rear wall of said firebox structure, a damper valve is said exhaust opening, and handle means accessible from outside said firebox to adjust the position of said damper valve.

4,036,206
SELECTIVE SOLAR ENERGY ABSORPTION

John Frederick Straub, Aston, Pa., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

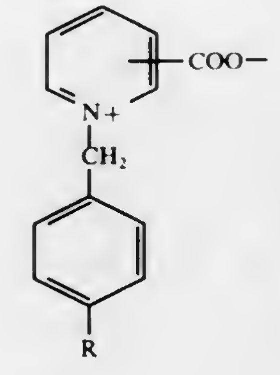
Filed July 30, 1976, Ser. No. 710,096

Int. Cl.^{2} F24J *3/02;* **C25D** *3/56, 5/48;* **B23P** *3/00*

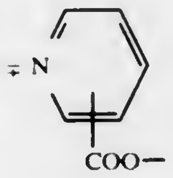
U.S. Cl. 126—270 **10 Claims**

1. In a process for the selective absorption of solar energy wherein the ratio at 120° C (250° F) of absorptivity of the surface for solar energy, α_S, to black body radiation emissivity, ϵ_B, of the surface with respect to heat energy is at least 5:1, the improvement comprising

absorbing the solar energy on a blackened white brass electroplated surface in which the electroplate contains about 0.5 to 20% by weight copper, balance zinc, and which electroplate has been prepared by the electrolytic deposition of bright white brass from an alkaline cyanide electroplating bath containing dissolved therein zinc, copper, cyanide and, in an amount to yield a metal deposit of improved brightness, at least one brightener which is an inner salt of a quaternized pyridine carboxylic acid having the general formula:



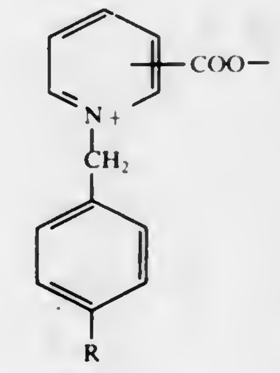
wherein R is —H or —CH$_2$ — N



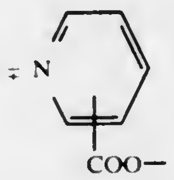
and which bright white brass electroplate has been blackened by contact with an oxidizing acid solution containing 0.1% to 10% by weight nitric acid.

6. An apparatus for the selective absorption of solar energy wherein the ratio at 120° C (250° F) of absorptivity of the surface for solar energy, α_S, to black body radiation emissivity, ϵ_B, of the surface with respect to heat energy is at least 5:1, the improvement comprising

the absorber on which the solar energy is absorbed being a blackened white brass electroplated surface in which the electroplate contains about 0.5 to 20% by weight copper, balance zinc, and which electroplate has been prepared by the electrolytic deposition of bright white brass from an alkaline cyanide electroplating bath containing dissolved therein zinc, copper, cyanide, and in an amount to yield a metal deposit of improved brightness, at least one brightener which is an inner salt of a quaternized pyridine carboxylic acid having the general formula:



wherein R is —H or —CH$_2$ — N



and which bright white brass electroplate has been blackened by contact with an oxidizing acid solution containing 0.1% to 10% by weight nitric acid.

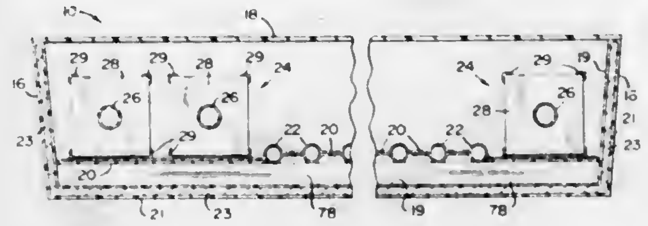
4,036,207
WATER HEATING ASSEMBLY

Clyde W. Bouse, Clearwater, Fla., assignor to General Energy Devices, Clearwater, Fla.

Filed Dec. 11, 1975, Ser. No. 639,983

Int. Cl.^{2} F23J *3/02*

U.S. Cl. 126—271 **15 Claims**



1. A water heating assembly of the type energized by solar energy, said assembly comprising: water storage means, heat collector means including a casing having facing means, said heat collector means further comprising a collector plate including water filled conduit means disposed relative to said casing, said conduit means being disposed in fluid communication with said storage means, primary heater means mounted in fluid communication with said conduit means of said collector plate, said primary heater means including a plurality of heat collector elements mounted in spaced relation along at least a portion of the length of said conduit means, pump means disposed in fluid driving relation between said heat collector means and said water storage means, insulating means disposed between said plurality of heat collector elements and said collector plate whereby said primary heater means is supported by and substantially insulated from direct contact with said collector plate; and said facing means being disposed relative to said casing for transmitting solar radiation to said heat collector means when said facing means is exposed to the source of solar energy.

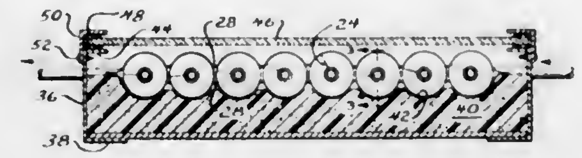
4,036,208
FINNED TUBE SOLAR ENERGY ABSORBER

Carl F. Bauer, Chicago, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Dec. 29, 1975, Ser. No. 645,119

Int. Cl.^{2} F24J *3/02*

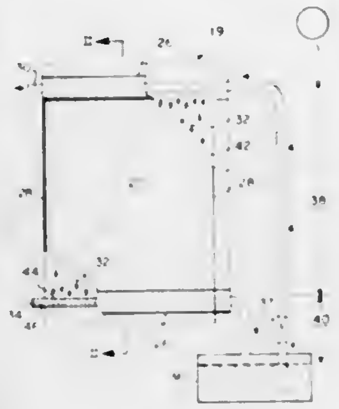
U.S. Cl. 126—271 **5 Claims**



1. A solar energy absorber comprising a plurality of closely spaced, generally parallel, finned tube portions having spaced, radially extending fins whose outer diameter is at least about twice the internal diameter of the tubing and whose height is greater than the space between fins, said plurality of finned tube portions being arranged in a generally planar array, a pair of sheets of plastic film overlying and underlying said finned tube portions, each of said sheets being in tight contact with the respective upper or lower outer peripheral surface of said fins along at least the major portion of the respective upper or lower circumferential portion of each fin, said sheets of plastic film cooperating with the side walls of said fins and the outer surface of the tubing to define a series spaced, substantially closed compartments which limit convection heat loss from said absorber.

4,036,209
ATMOSPHERIC HEAT EXCHANGE METHOD AND APPARATUS

Jack J. Press, 17426 Plaza Destacado, San Diego, Calif. 92128
Filed June 26, 1975, Ser. No. 590,644
Int. Cl.^{2} F24J *3/02*
U.S. Cl. 126—271 **8 Claims**



1. An atmospheric heat exchanger comprising:

a sealed container having front and rear walls both made of thin, pliable sheet material having substantially the same physical properties and having smooth inner surfaces capable of contacting each other in face-to-face relationship defining therebetween an unrestricted liquid passageway substantially throughout the inner dimensions of said walls, said container walls capable of conforming to the shape of its supporting structure;

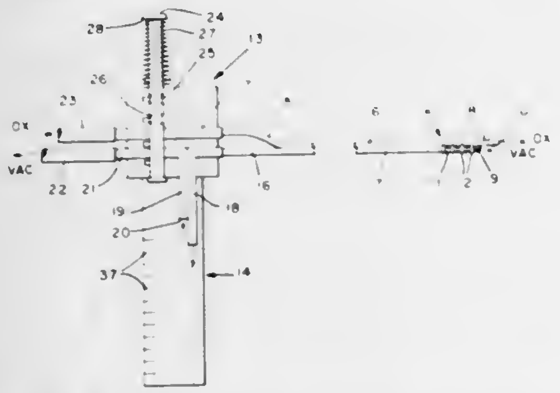
said container having liquid inlet and outlet means for circulating a liquid medium through said container;

negative pressure means for maintaining said conformable film walls in close, uniform relation to said other wall to define a liquid passageway therebetween having a minimum thickness;

whereby said minimum thickness passageway creates a venturi to uniformly spread the liquid over the entire passageway and to increase the velocity of the liquid flow therethrough to enhance the heat transfer between said walls and said liquid.

4,036,210
DOUBLE LUMENED CATHETER

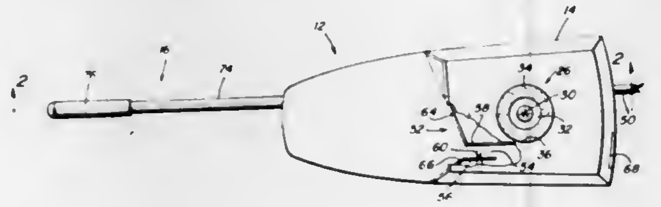
Roy L. Campbell, 3415 Canterberry St., Greensboro, N.C. 27408, and Steven Loveland, 2904 Shadow Ridge Drive No. 7, Augusta, Ga. 30909
Filed June 9, 1975, Ser. No. 585,067
Int. Cl.^{2} A61B *10/00;* **A61M** *25/00*
U.S. Cl. 128—2 F **4 Claims**



1. A multi-lumened catheter having at least two lumens, one of said lumens being an oxygenation lumen and the other being an aspiration lumen, each of said lumens having an opening therein, and a protuberance whereby the aspiration lumen is spaced by said protuberance from approximate tissue surfaces, said lumens having a common flow control means in communication therewith and having multiple flow positions for controlling independently or simultaneously the flow through said lumens, said control means having a plunger means, said plunger means having a locking tab member affixed thereto for locking said plunger means into the desired flow position for controlling the flow through said lumens.

4,036,211
TEMPERATURE, PULSE AND RESPIRATION DETECTION APPARATUS

George J. Veth, Fairfield, and Douglas G. Noiles, New Canaan, both of Conn., assignors to United States Surgical Corporation, Baltimore, Md.
Filed Apr. 8, 1975, Ser. No. 566,073
Int. Cl.^{2} A61B *5/00*
U.S. Cl. 128—2 R **36 Claims**



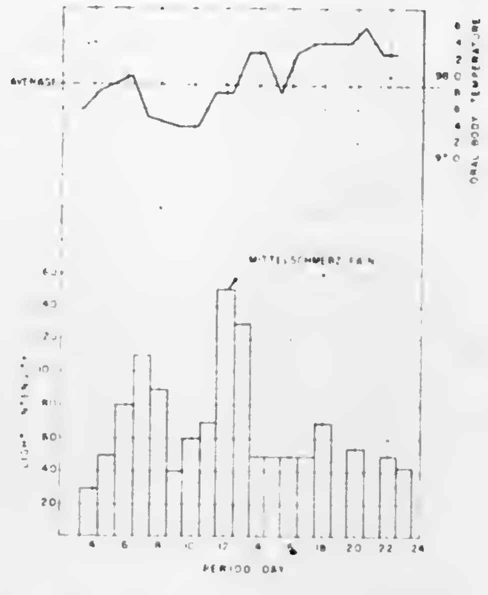
1. An apparatus for sensing temperature, pulse and respiration comprising a housing and a probe extending from said housing so that when the probe is placed in a patient's mouth the patient's lips are adapted to contact at least a portion of the housing, temperature sensor means mounted on said probe for insertion into the mouth, photoelectric pulse sensor means mounted on said housing and positioned to be contacted by tissue through which blood is circulating, respiration sensor means mounted in said housing and positioned to be in the path of nasal air flow when said probe is inserted into the mouth, said housing having an opening for exposing said respiration sensor means to said nasal air flow, and a disposable cover for removably covering said probe and at least a portion of said housing comprising a radiation-transmitting portion adapted to associate with said photoelectric pulse sensor means and an opening adapted to associate with said respiration sensor means.

4,036,212
METHOD OF PREDETERMINING TIME OF OVULATION IN WOMEN AND IN ANIMALS TO CONTROL CONCEPTION

Richard F. Karuhn, 1705 W. 61st St., Downers Grove, Ill. 60515
Continuation-in-part of Ser. No. 643,036, Dec. 22, 1975, abandoned. This application Oct. 12, 1976, Ser. No. 731,348
Int. Cl.^{2} A61B *10/00*
U.S. Cl. 128—2 R **10 Claims**

1. The method of monitoring the progress of the ovulation cycle of a female mammal of the kind having an ovulation cycle which comprises periodically determining the concentration of ATP in the mammal's vaginal fluid over the period

of desired investigation by measuring the intensity of light resulting from the reaction of the ATP content of periodically



taken samples of the fluid with luciferase/luciferin in the presence of magnesium and manganese ions.

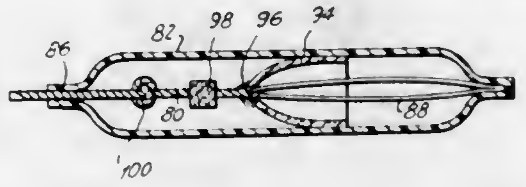
4,036,213
PROCESS FOR DETERMINING VERTEBRAE LOCATIONS IN HUMANS

Ralph R. Gregory, Monroe, Mich., assignor to National Upper Cervical Chiropractic Research Association, Inc., Monroe, Mich.
Filed May 3, 1976, Ser. No. 682,519
Int. Cl.^{2} A61B *5/10*
U.S. Cl. 128—2 S **2 Claims**

1. A process for determining the adjustment to be made to the vertebrae in the human spine which comprises the steps of (1) establishing the location of the atlas vertebra in each of the lateral, sagittal and transverse planes, (2) positioning a human in a standing position on separate support surfaces for each foot, (3) determining the width of the uppermost part of each ilium and adjusting the spacing between the feet such that the width between the center of each heel is the same as the width between each said uppermost part of each ilium, (4) determining the deviation of the uppermost portion of each ilium from the axis of the lateral and sagittal planes, (5) adjusting the height of the plane upon which at least one foot is supported unti the uppermost portion of each ilium lies substantially in the same lateral plane and substantially in the same horizontal plane and recording any deviation therefrom (6) adjusting the location of the atlas vertebra, and (7) thereafter determining any deviation from the axis of the lateral and sagittal planes of each ilium when the support surfaces for each foot lie in the same horizontal plane.

4,036,214
FLUID-COLLECTING AND MICROORGANISM-DETECTING DEVICES

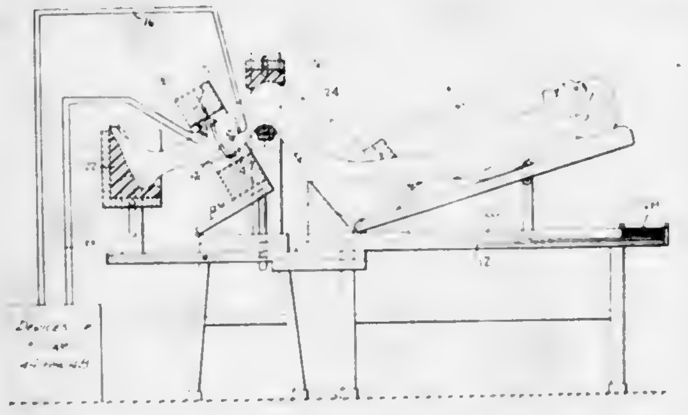
Louis Bucalo, 155 Roberts St., Holbrook, N.Y. 11741
Filed Apr. 14, 1975, Ser. No. 568,139
Int. Cl.^{2} A61B *10/00*
U.S. Cl. 128—2 F **14 Claims**



1. In a device for collecting body fluids and/or detecting whether or not certain microorganisms are present in a body cavity, an enclosure having a hollow interior and adapted to be introduced into the body cavity, transfer means extending through a wall portion of said enclosure from the exterior to the interior thereof for automatically transferring a body fluid from the exterior to the interior of said enclosure in response to contact of said transfer means with a body fluid in the body cavity, and closure means formed at least in part by a portion of said enclosure for closing said enclosure automatically, after transfer of a body fluid into said enclosure by said transfer means, in a manner preventing body fluids and/or microorganisms therein from moving into or out of said enclosure after closure of the latter by said closure means, said closure means including a means for automatically rendering said closure means operable to close said enclosure, so that the transfer of the body fluid from the exterior to the interior of said enclosure and the closing of said enclosure go forward in a fully automatic manner upon introduction of said enclosure into the body cavity.

4,036,215
APPARATUS AND METHOD FOR ELIMINATING PERTURBATIONS OF A KINETIC ORIGIN IN THE BLOOD FLOW WAVEFORM

Henri Georges Doll, New York, N.Y., assignor to Doll Research, Inc., New York, N.Y.
Filed Feb. 6, 1975, Ser. No. 547,630
Int. Cl.^{2} A61B *5/02*
U.S. Cl. 128—2.05 F **15 Claims**



1. An electromagnetic flowmeter apparatus for use in measuring the pulsatile flow in a blood vessel of a living subject, the flowmeter apparatus including means adapted to establish a uniform magnetic field in the vicinity of a limb of a living subject, electrode means adapted to be positioned within the magnetic field in conductive contact with said limb of a living subject for detecting electrical signals generated by pulsatile blood flow in the limb, and means coupled to the electrode

means for producing a blood flow waveform from the signals detected by the electrode means, wherein the improvement comprises:

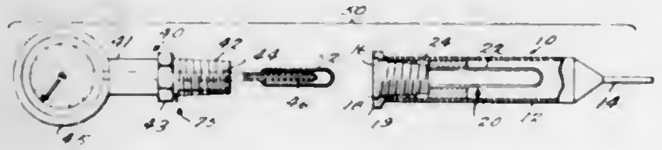
ballistic pickup means adapted to be positioned on the limb of the living subject in the magnetic field near the attachment location of the electrode means of said flowmeter for producing a signal in response only to movement of the limb and

means having an input coupled to the ballistic pickup means and to the electrode means and an output coupled to the waveform producing means of the flowmeter for adding subtractively the ballistic signal produced by the ballistic pickup means to the electrical signals detected by the electrode means in such proportion as substantially to cancel an undesired ballistic component of a blood flow waveform produced by the waveform producing means of the flowmeter.

4,036,216

BODY FLUID PRESSURE SYSTEM

Maynard Ramsey, III, 2416 Watrous Ave., Tampa, Fla. 33609
Filed Sept. 4, 1975, Ser. No. 610,389
Int. Cl.^{2} A61B *5/02*
U.S. Cl. 128—2.05 D **21 Claims**



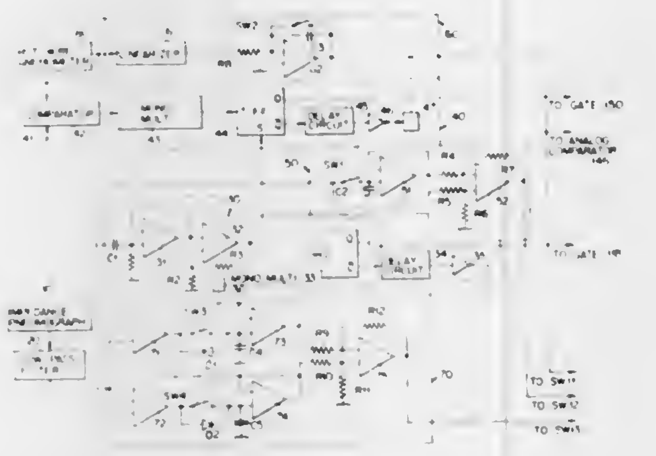
1. A disposable blood pressure monitor comprising an elongated tubular structure, means on one end of said tubular structure adapted to place the interior of said tubular structure in direct communication with a fluid system to be monitored, a flexible tube shaped membrane received within said tubular structure, said flexible tube shaped membrane separating said tubular structure into first and second chambers, gauge means engaging the other end of said tubular structure, said gauge means being removably in said tubular structure and adapted to place the interior of said tubular structure in a pressure transfer communication with the fluid system to be monitored, said gauge means comprising a plug means, a pressure indicating means mounted to said plug means, a tube means extending through said plug means and communicating with said pressure indicating means, sensor means mounted on said tube means and an incompressible fluid filled sack member secured to said tube means and containing said sensor means, said sack member communicating with said pressure indicating means, and engaging the inner wall of said flexible tube shaped membrane through said tube means placing said gauge means in a pressure responsive communication with the fluid system to be monitored.

4,036,217

DEVICE FOR MEASURING A RESPIRED AMOUNT OF AIR

Ayao Ito, and Akinori Ishida, both of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Tokyo, Japan
Filed Mar. 31, 1976, Ser. No. 672,439
Claims priority, application Japan, Mar. 31, 1975, 50-38959
Int. Cl.^{2} A61B *5/08*
U.S. Cl. 128—2.08 **20 Claims**

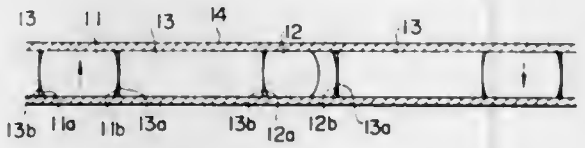
1. A device for measuring a respired amount of air comprising a respired amount of air-indicating signal generator for detecting an amount of air respired by a body to be measured and generating an electrical signal corresponding to said respired amount of air, an impedance pneumograph for detecting an impedance variation corresponding to said respired amount of air of said body, a reference level setting circuit for receiving an output signal from said impedance pneumograph to set a reference level with respect to said output signal, a memory circuit for receiving, when it is placed in a write-in mode, an output signal from said reference level setting circuit as a writing address signal and storing as information an output signal from said respired amount of air-indicating signal generator corresponding to said output signal from said reference level setting circuit, a peak-to-peak amplitude detector for detecting a maximum amplitude for each cycle of said output signal from said impedance pneumograph, a calibration completion-detecting circuit for detecting that said output signal from said respired amount of air-indicating signal generator has exceeded a specified level, to indicate that a desired calibration signal has been obtained, and an operation mode selecting means for setting, when it has received a calibration completion-indicating output signal from said detecting circuit, said memory circuit to a readout mode and electrically isolating said respired amount of air-indicating signal generator and said reference level setting circuit from said memory circuit and simultaneously coupling said peak-to-peak amplitude detector to said memory circuit, thereby to read out a respired amount of air-indicating information signal stored in said memory circuit by using an output signal from said peak-to-peak amplitude detector as a reading address signal.



4,036,218

ENDOSCOPE

Nobuo Yamashita, Tama; Yoshisada Hayamizu, Hachiouji; Yoshitaka Nagai, Hachiouji; Toshihiro Imai, Hachiouji, and Kazumasa Matsuo, Hachiouji, all of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed Dec. 18, 1975, Ser. No. 641,887
Claims priority, application Japan, Dec. 19, 1974, 49-144948; Dec. 19, 1974, 49-144949; Dec. 19, 1974, 49-144950
Int. Cl.^{2} A61B *1/00*
U.S. Cl. 128—4 **8 Claims**

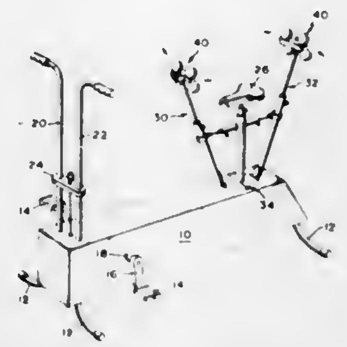


1. An endoscope having an objective side and an eyepiece side and comprising optical elements constituting an image-transmitting optical system and an outer tube for holding said optical elements therein, said image-transmitting optical system being arranged so that respective adjacent surfaces of respective optical elements contact each other and two optical elements positioned at both ends of said outer tube out of said optical elements are respectively fixed to said outer tube.

4,036,219

EXERCISE AND MASSAGING APPARATUS

Luther G. Simjian, 7 Laurel Lane, Greenwich, Conn. 06830
Filed Mar. 17, 1976, Ser. No. 667,634
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.^{2} A61H *7/00*
U.S. Cl. 128—48 **24 Claims**



1. An exercise and massaging apparatus comprising in combination:

a stationary support;

pedal means including a rotatable pedal shaft mounted to said shaft support;

a seat supported by said support;

an arm upstanding from said support and mounted for reciprocating rotational motion about a substantially vertical axis;

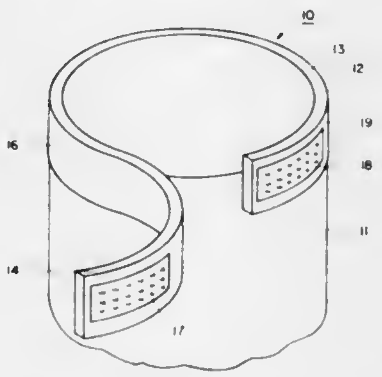
mounting means disposed at the upper portion of said arm for fastening thereto massaging means adapted to engage the torso of a person sitting on said seat, and

drive means coupled between said pedal shaft and said arm for causing responsive to the operation of said pedal means and rotation of said pedal shaft said arm and massaging means to undergo reciprocating rotational motion.

4,036,220

BODY MEMBER PROTECTIVE DEVICE

Gerald John Bellasalma, 96 Park St., West Caldwell, N.J. 07006
Filed Oct. 15, 1975, Ser. No. 622,517
Int. Cl.^{2} A61F *13/00*
U.S. Cl. 128—82 **10 Claims**

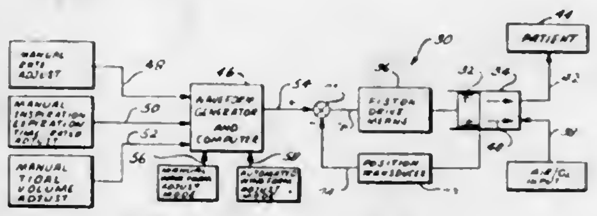


1. In a protective device comprising a flexible tubular body member enclosing means having at least one body member securing means comprising a foam-like cushionable band fixedly mounted upon the exterior surface of one end of the tubular member and having a non-adhered overlapping portion in excess of the circumference of the tubular member, a flexible collar fixedly mounted upon the cushionable band and the overlapping portions thereof, and a body member fastening means adapted to secure the protective device about the body member to be protected, the fastening means comprising a plurality of flexible hooks fixedly mounted upon the overlapping portion of the cushionable material and a plurality of flexible hook engaging loops fixedly mounted upon the cushionable material beneath the overlapping portion, the hooks and loops adapted for rapid and easy engagement and disengagement, the improvement which comprises fixedly mounting the flexible hooks in a recessed section of the overlapping portion of the cushionable material.

4,036,221

RESPIRATOR

Deane Hillsman; Albert M. Cook, and James G. Simes, all of Sacramento, Calif., assignors to Sutter Hospitals Medical Research Foundation, Sacramento, Calif.
Continuation-in-part of Ser. No. 490,183, July 19, 1974, abandoned, which is a continuation of Ser. No. 249,380, May 1, 1972, abandoned. This application Apr. 2, 1975, Ser. No. 564,336
Int. Cl.^{2} A61M *16/00*
U.S. Cl. 128—145.6 **29 Claims**



1. A volume-cycled respirator system for delivering a controlled volume of gas to a patient, the system comprising:

a. displaceable gas delivery means having a position which is adjustable for forcing periodically a volume of gas under pressure into the lungs of a patient throughout an inspiratory period of a respiratory cycle;

b. drive means operatively connected to the gas delivery means to displace the volume of gas to be delivered;

c. means for generating a reference signal representing variations in the position of the gas delivery means with respect to time throughout the inspiratory period necessary to deliver a desired volume of gas in accordance with a desired volume-versus-time waveform; and

d. closed loop feedback means for controlling the instantaneous position of the gas delivery means throughout the inspiratory period, the closed loop feedback means including

1. first means responsive to the actual position of the gas delivery means for generating a position feedback signal representing the actual volume of gas displaced by the gas delivery means with respect to time throughout the inspiratory period,
2. second means responsive to said reference signal and said position feedback signal for providing throughout the inspiratory period a position error signal representing the deviation between the instantaneous desired position and the corresponding actual position of the gas delivery means, and
3. third means for applying said position error signal to the drive means for adjusting the instantaneous position of the gas delivery means in proportion to said error signal throughout the inspiratory period to deliver gas to the patient in accordance with the desired volume-versus-time waveform.

4,036,222

AUTOMATIC ELECTRONIC APPARATUS FOR MEASURING THE BRONCHIAL RESISTANCE AND THE ELASTANCE OF THE PULMONARY TISSUE

Claude Gillard, Brussels, and Marcel Mauroy, Nouvelles, both of Belgium, assignors to Soram S.A., Geneva, Switzerland
Filed Apr. 15, 1975, Ser. No. 568,330
Claims priority, application Belgium, May 8, 1974, 144095
Int. Cl.^{2} A61B *5/08*
U.S. Cl. 128—2.08 **9 Claims**

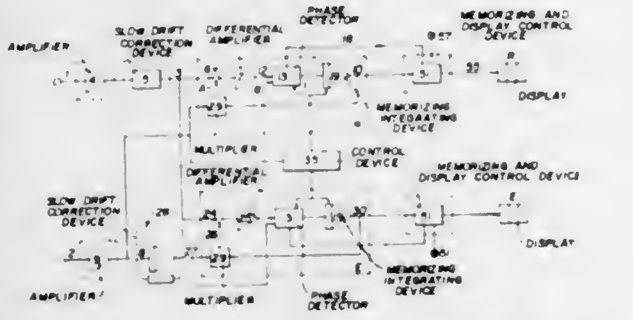
1. Automatic electronic apparatus for measuring and dis-

playing simultaneously the resistance R to air flow through the bronchial tracts and the elastance E of the pulmonary tissue of a subject, the parameters *R* and *E* being included in the known Röhrer equation

$$p(t) = R\,v(t) + E\,v(t)$$

wherein variables $p(t)$, $v(t)$ and $v(t)$ are instantaneous values, with reference to their mean values, of endothoracic or buccal pressure, buccal or endotracheal air flow, and volume of pulmonary air, respectively, and wherein the variables $p(t)$ and $v(t)$ are convertible to a first voltage signal and a second voltage signal, respectively proportional to the pressure and air flow, said apparatus comprising:

- a. first means for preamplifying said first voltage signal;
- b. second means for preamplifying said second voltage signal;
- c. first means, responsive to said preamplified first voltage signal, for correcting for slow drift of said preamplified first voltage signal to generate a third voltage signal of zero mean value of the pressure;


AMPLIFIER
SLOW DRIFT CORRECTION DEVICE
DIFFERENTIAL AMPLIFIER
PHASE DETECTOR
MEMORIZING AND DISPLAY CONTROL DEVICE
DISPLAY
MEMORIZING INTEGRATING DEVICE
MULTIPLIER
CONTROL DEVICE
DIFFERENTIAL AMPLIFIER
MEMORIZING AND DISPLAY CONTROL DEVICE
SLOW DRIFT CORRECTION DEVICE
DISPLAY
MEMORIZING INTEGRATING DEVICE
AMPLIFIER
MULTIPLIER
PHASE DETECTOR

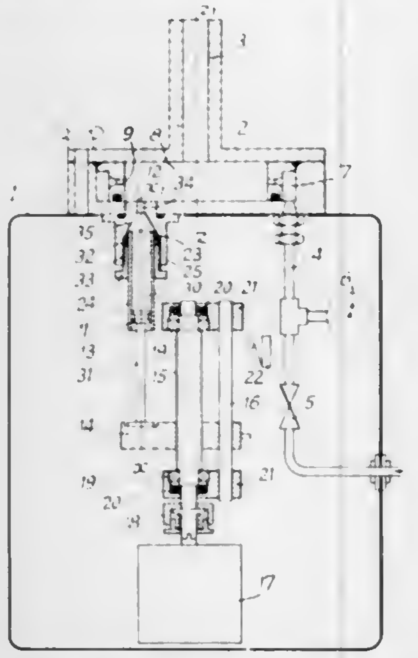
- d. second means, responsive to said preamplified second voltage signal, for correcting for slow drift of said preamplified second voltage signal and for integrating said preamplified second voltage signal to generate a fourth voltage signal of zero mean value of the air volume;
- e. first automatic computing means, responsive to said third voltage signal and said preamplified second voltage signal, for generating a fifth alpha voltage signal representing R and a sixth error signal which is cancelled when said fifth voltage signal represents the correct value of R;
- f. second automatic computing means, responsive to said third voltage signal and said fourth voltage signal, for generating a seventh beta voltage signal representing E and an eighth error signal which is cancelled when said seventh voltage signal represents the correct value of E;
- g. first means, responsive to said fifth and sixth signals, for displaying the correct value of R; and
- h. second means, responsive to said seventh and eighth signals, for displaying the correct value of E.

4,036,223
APPARATUS FOR GENERATING AEROSOLS OF SOLID PARTICLES

Jean-Claude Obert, 16, Traverse Saint Pierre, 13100 -Aix-en-Provence, France

Filed Jan. 20, 1976, Ser. No. 650,685
Claims priority, application France, Jan. 29, 1975, 75.03493
Int. Cl.^{2} A61M *15/00*
U.S. Cl. 128—266 **15 Claims**

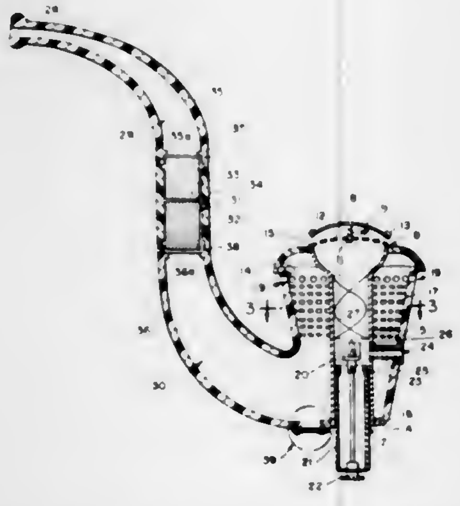
1. An apparatus for generating aerosols of solid particles, particularly inhalable aerosols of vaccines, comprising, a micronizer having a cylindrical chamber formed therein, said micronizer having a pair of opposed axial ends by first first and second flat end walls located perpendicular to the longitudinal axis of the chamber and closing the ends of the chamber, one of said first end walls having an axial outlet formed therein to permit aerosol in said chamber to pass therethrough; and a peripheral side wall extending between said end walls, said side wall and said end walls defining said chamber therebetween; said side wall including a plurality of inlet nozzles for compressed gas opening tangential to said longitudinal axis into said chamber; means for introducing compressed gas into said nozzles; means for introducing a determined dose of a pulverulent product, said introducing means comprising, at least one cavity formed in one of said end walls the second of said end walls and radially disposed from said longitudinal axis and communicating with the inside of said chamber through a conduit formed in the second end wall, a syringe associated with said cavity comprising a doser tube containing a determined dose of said pulverulent product, said tube having opposite opened front and rear ends with said front end being axially engaged in its associated cavity; means for removably securing and sealing said open front end of the doser tube within the cavity in which it is engaged; and means for introducing and pushing substantially all of the pulverulent product in said syringe into said chamber through said channel; said pushing means including a plunger slidably positioned in said doser tube and means for pushing said plunger from the rear end of the tube towards the forward open end to urge pulverulent product in the tube through said channel.



4,036,224
PORTABLE CONDITIONED AIR BREATHING PIPE

Peter N. Choporis, 543 S. Beverly Lane, Arlington Heights, Ill. 60005, and Robert N. Choporis, 880 N. Lake Shore Drive, Chicago, Ill. 60611

Filed Oct. 10, 1975, Ser. No. 621,372
Int. Cl.^{2} A61M *15/06*
U.S. Cl. 128—212 **9 Claims**



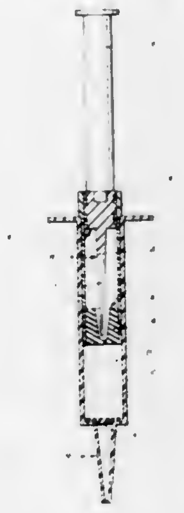
1. A portable conditioned air breathing pipe adapted to be supported by the mouth of the user comprising:

- a. a pipe bowl having a top, sides, and bottom, and a heat conductive tube running from an opening in the top of said bowl to an opening in the bottom of said bowl, a space surrounding the sides of said tube between the outer surface of said tube and the inner surface of said bowl, said tube having a first open end being sealed with respect to the opening in the top of said bowl and a second open end sealed with respect to the opening in the bottom of said bowl said space between the outer surface of said tube and the inner surface of said bowl forming a heating chamber,
- b. heating means mounted to heat said heat conductive tube of (a), said heating means comprising a burner unit having a container tubular fuel fitted into said opening in the bottom of said bowl and into the lower part of said heat conductive tube, and a jet burner on the top of said fuel container which when lit projects a flame upwardly into said tube,
- c. passageways between the outside of said bowl and said heating chamber to admit fresh air so that it contacts the heated surface of said heat conductive tube,
- d. a mouthpiece, and
- e. a rigid tubular casing connecting said mouthpiece and said heating chamber in the bowl of said pipe so that fresh air heated in said heating chamber can be withdrawn to the mouth of the user.

4,036,225
BICOMPARTMENTAL SYRINGE

Jean-Robert Maury, Le Peycher Montpeyroux de Lonchat (Dordogne), France

Filed Sept. 18, 1975, Ser. No. 614,363
Claims priority, application France, Sept. 19, 1974, 74.31687
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—218 M **4 Claims**

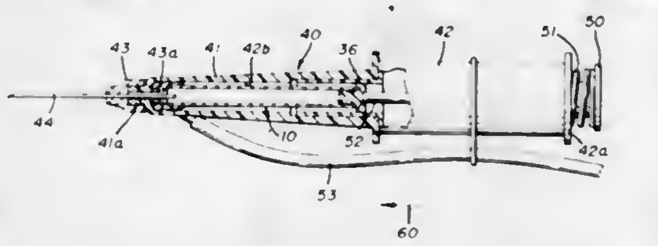


1. A combined mixing and injecting syringe comprising:
a pair of complentary members joined to form an elongated compartment,
piston means slideably disposed at one end of one of said members and having a needle-like extension extending therefrom toward the opposite end of the said one member,
plunger means for moving said piston means toward said other membrs,
a first diaphragm disposed in the elongated compartment intermediate the ends of the compartment and separating the compartment into two separate and isolated chambers which may each contain a different substance,
and a second diaphragm disposed across said other member to define one end of the compartment,
said needle-like extension of said piston means being positioned in one chamber before operation of said plunger means causes the extension to puncture said first diaphragm,
and said extension having means defining an elongated recess extending along a substantial length of said extension toward the tip of the extension whereby communication of materials is permitted between chambers when the first diaphragm is punctured.

4,036,226
CARTRIDGE AND SEALING MEANS THEREFOR

Oscar Malmin, 127 E. Wayne Ave., Akron, Ohio 44301

Continuation of Ser. No. 509,424, Sept. 26, 1974, Pat. No. 3,974,831. This application Mar. 3, 1976, Ser. No. 663,434
The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.
Int. Cl.^{2} A61M *5/00*
U.S. Cl. 128—218 D **4 Claims**



1. In combination with a hypodermic syringe of the type having a elongate hollow body with a double-ended needle disposed on one end, a movable plunger on the opposed end, and aspirating means disposed adjacent the end carrying the needle, the improvement comprising;

- A. a cartridge having
  - 1. an elongate hollow body with a substantially uniform diameter throughout its length and having
    - a. opposed first and second ends and
    - b. being receivable within said body of said syringe, with said first end of said cartridge body being disposed adjacent said needle and said aspirating means and said second end being disposed adjacent said plunger;
- B. a first unitary resilient seal member
  - 1. received externally on said first end of said cartridge body in sealing relationship thereto and
  - 2. engaging the inner surface of said syringe body in sealing relationship therewith;
- C. a second unitary resilient seal member
  - 1. received on said second end of said cartridge body in sealing relationship thereto and
  - 2. engaging the inner surface of said cartridge body in sealing relationship therewith;
- D. said first seal member having
  - 1. a main body portion which overlies said first end of said cartridge; and
  - 2. an annular extension extending from said body portion and engaging the outer surface of said cartridge body and the inner surface of said body of said syringe; at least one projecting rib carried by said annular extension for engagement with the inner surface of said body of said syringe.

4,036,227
OSMOTIC RELEASING DEVICE HAVING A PLURALITY OF RELEASE RATE PATTERNS

Alejandro Zaffaroni; Alan S. Michaels, both of Atherton, and Felix Theeuwes, Los Altos, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Continuation-in-part of Ser. No. 354,344, April 25, 1973, abandoned. This application Dec. 23, 1974, Ser. No. 536,006
Int. Cl.^{2} A61M *37/00*
U.S. Cl. 128—260 **24 Claims**

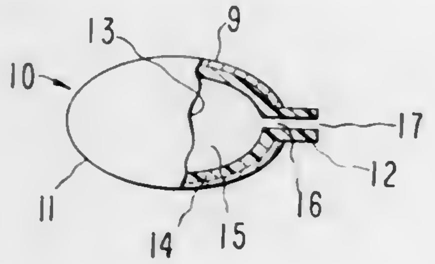
1. An oral osmotic device for the controlled dispensing of a unit dosage amount of drug to the gastrointestinal tract, said device comprising;

- a. a shaped semipermeable wall formed of an inert, nontoxic material that is permeable to the passage of an external gastrointestinal tract fluid, substantially impermeable to the passage of drug, and maintains its integrity during the drug dispensing period;

b. the wall surrounding and forming a compartment containing a unit dosage amount of drug, said drug being soluble in the external fluid and exhibiting an osmotic pressure gradient across the wall against the fluid when the device is in the environment of use;

c. a layer formed of a nontoxic erodible material on the exterior surface of the semipermeable wall;

d. a passageway communicating with the compartment and the exterior of the device for dispensing drug from the device and adapted to pass a therapeutically effective amount of drug in the environment of use; and,



e. wherein in operation when the osmotic device is in the environment of use, the layer erodes at a controlled rate to regulate the amount of fluid available to the wall for imbibition by the osmotic device, with fluid imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate controlled by the permeability of the wall and the osmotic pressure gradient across the wall producing a drug solution that is dispensed from the device through the passageway at a controlled and continuous rate over a prolonged period of time.

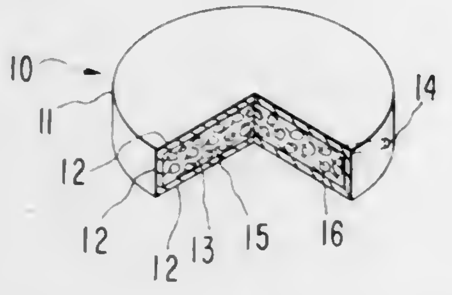
4,036,228
OSMOTIC DISPENSER WITH GAS GENERATING MEANS

Felix Theeuwes, Los Altos, Calif., assignor to Alza Corporation, Palo Alto, Calif.

Filed Sept. 11, 1975, Ser. No. 612,465

Int. Cl.^{2} A61M ***31/00***

U.S. Cl. 128—260 **24 Claims**



1. An osmotic device for the continuous dispensing of an active agent to an environment of use, said device comprising:

a. a shaped wall formed of a semipermeable material that maintains its integrity during the dispensing period and which wall is characterized as permeable to the passage of an external fluid in the environment of use and substantially impermeable to the passage of agent;

b. the wall surrounding and forming a compartment containing an active agent and an effervescent couple which couple is soluble in the external fluid and which couple exhibits an osmotic pressure gradient across the wall against the external fluid;

c. a passageway in the wall communicating with the compartment and the exterior of the device for dispensing agent from the device; and

d. wherein in operation with the device in the environment of use, external fluid is continuously imbibed through the wall into the compartment in a tendency towards osmotic equilibrium at a rate determined by the permeability of the wall and the osmotic pressure gradient across the wall, thereby wetting the couple which reactively produces an effervescent solution which dispenses agent through the passageway from the device at a controlled rate over a prolonged period of time.

4,036,229
APPARATUS FOR ASSISTING THE TREATMENT OF WOUNDS OR INFLAMMATIONS INTERNAL TO THE HUMAN BODY

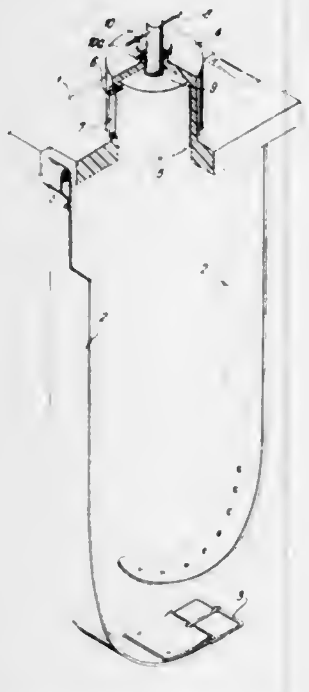
Rosolino Marinello, Viale Leonardo da Vinci No. 4, Mantova, Italy

Filed Oct. 24, 1975, Ser. No 625,708

Claims priority, application Italy, Nov. 6, 1974, 42690/74

Int. Cl.^{2} A61F ***7/02***

U.S. Cl. 128—268 **4 Claims**



1. Apparatus for treating limited areas of the skin, said apparatus comprising:

- a plate of resilient material defining a central hole extending through said plate,
- a means for applying continuing pressure to a medicament in contact with the skin at an area of disorder including
- a tube on one side of said plate having substantially the same inner diameter as said hole and coaxial therewith
- a plug slidably mounted in said hole and tube,
- screw means for moving said plug axially of said tube,
- cooperating guide means on said tube and plug for guiding said plug during said axial movement, and
- belt means connected to said plate for holding said plate against an area of the skin.

4,036,230
MEDICINAL INSERT INSTRUMENT

Kenneth Waldock Adams, 414 Pocatello Road, Middletown, N.Y. 10940

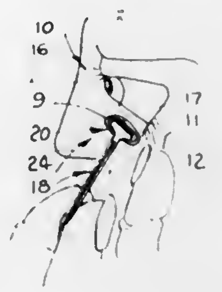
Filed Aug. 18, 1976, Ser. No. 715,319

Int. Cl.^{2} A61N ***7/00***

U.S. Cl. 128—269 **15 Claims**

1. A hand-held instrument for facilitating the application and/or removal of a medicinal substantially elliptically-shaped insert, to and from an eye, said instrument comprising:

- an elongated wand-like stem to be hand-held for applying said medicinal insert to said eye, said wand-like stem having a first end, and a second end opposite said first end; and
- an applicator section supported upon said first end of said wand-like stem for receiving a medicinal elliptically-shaped insert, and for placing said medicinal insert generally upon a sclerotic or eyelid portion of said eye, said applicator section having a relatively weak adhesion surface area generally less than a surface area of said insert, said applicator section having a shape generally conforming to, and aligning with, said substantially elliptically-shaped insert wherein a lateral dimension of said adhesion surface is greater than a longitudinal dimension thereof and said longitudinal dimension of said adhesion surface of the applicator member being generally coincident with a longitudinal dimension of said insert, and said lateral dimension of said adhesion surface of the applicator being generally coincident with a lateral dimension of said insert, whereby the substantially elliptically shaped insert may be easily directed into, and placed upon, the eye by said applicator section.



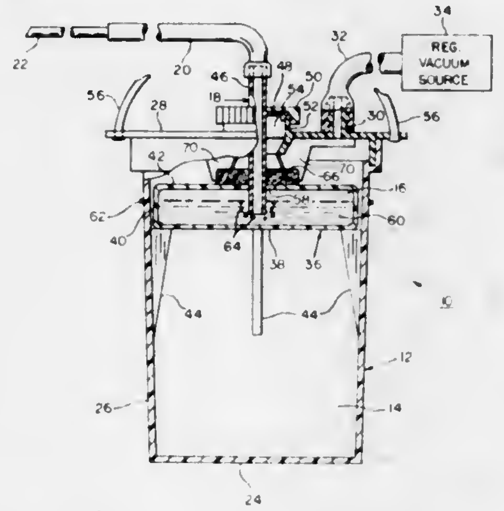
4,036,231
THORACIC DRAINAGE UNIT WITH DEFOAMING MEANS

Larry H. Dodge, St. Charles, and Byron G. Economidy, Manchester, both of Mo., assignors to Sherwood Medical Industries Inc., St. Louis, Mo.

Filed Nov. 20, 1975, Ser. No. 633,873

Int. Cl.^{2} A61M ***1/00***

U.S. Cl. 128—276 **16 Claims**



1. A thoracic drainage collection device comprising a container for collecting body fluid having a chamber adapted to receive an initial quantity of liquid therein, fluid passage means having an inlet for fluid communication with a body cavity to be drained, said fluid passage means extending into said chamber and having an outlet disposed below the level of the liquid in said chamber when said initial quantity of liquid is disposed therein so that all gas flowing from said fluid passage means flows into liquid in said chamber, gas outlet means on said container for passing gas out of said container, and defoaming means in said container in the flow path of substantially all gas flowing from said outlet to said gas outlet means.

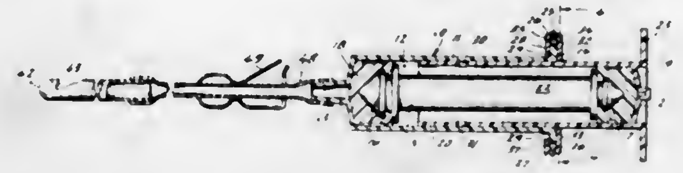
4,036,232
ASPIRATION DEVICE

Joseph Nicholas Genese, Waukegan, Ill., assignor to Abbott Laboratories, North Chicago, Ill.

Filed Apr. 19, 1976, Ser. No. 677,950

Int. Cl.^{2} A61M ***1/00***

U.S. Cl. 128—278 **11 Claims**



1. An aspirating device comprising:

- a barrel member having an internal wall and defining a nozzle portion and an open end portion;
- a piston member having a first and second head portion receivable in said barrel member;
- a first sealing element carried by said first piston head portion at one end engageable with said internal wall;
- a second sealing element carried by said second piston head portion and disposed at another end;
- a hollow telescoping member having a closed end portion constructed and arranged to fit within the confines of said barrel member and in sealing engagement with said second sealing element;
- holding means operatively associated with said telescoping member and said barrel member to retain said telescoping member in a fixed position when said telescoping member is moved in a direction away from said nozzle portion; and
- means operatively associated with said nozzle portion to temporarily close said nozzle portion to the atmosphere.

4,036,233
FLEXIBLE WAIST DIAPER

Theodore Fredrick Kozak, Manchester, Conn., assignor to Union Carbide Corporation, New York, N.Y.

Filed July 2, 1976, Ser. No. 702,220

Int. Cl.^{2} A41B ***13/02; A61F 13/16***

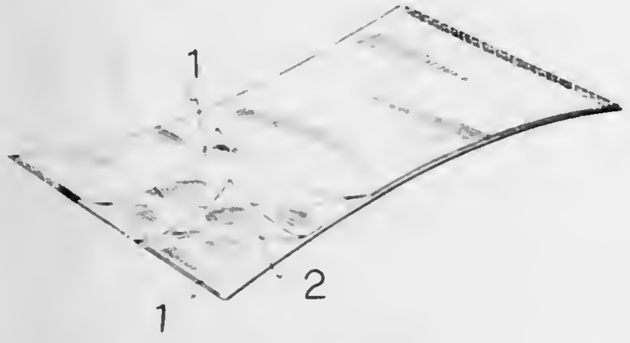
U.S. Cl. 128—287 **19 Claims**

1. A disposable diaper having a stretchable waistband comprising in combination, a topsheet for placement adjacent to the body and being provided with means for passing liquid therethrough, a water impermeable backsheet and an absorbent pad disposed between said topsheet and backsheet, one of said topsheet or backsheet being a stretchable plastic film having a Young's Modulus of less than 5000 lbs/in^2 and which exhibits recovery characteristics such that at up to 20% elongation it will recover about 99% and from 20 to 50% elongation it will recover from 99 to 90% respectively and still maintain a force of not less than 0.05 lbs, the other of said topsheet or backsheet being fabricated from a non-stretchable material, said topsheet and backsheet having end portions extending beyond said absorbent pad in diaper length direction, said stretchable plastic film constituting said topsheet or backsheet being adhered to said non-stretchable material in said end

portions to form a reinforced stretchable waistband for said diaper, said non-stretchable material in said end portion being provided with openings in an amount and frequency such as to permit effective stretching of said waistband, and fastening means secured to opposing corners of said waistband on one of the end portions of said diaper.

4,036,234
DIAPER SUPPLEMENT INSERT

Haruo Ishizuka, 9-15, Ohyada 3-chome, Adachi, Tokyo, Japan
Filed Jan. 31, 1977, Ser. No. 764,455
Int. Cl.² A61F *13/16;* **A41B** *13/02*
U.S. Cl. 128—287 **7 Claims**

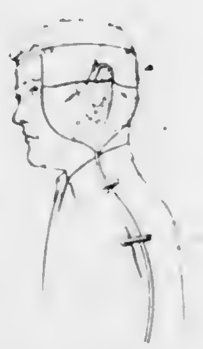


1. A diaper supplement comprising:
- a. a plurality of fine-mesh water-repellent tricot-like cloths substantially oblong in shape;
- b. coarse water-absorbent gauze like cloths of the same size as (a), interlarded between said water-repellent cloths; and
- c. a waterproof cloth of about the same size as said water-repellent and water-absorbent cloths;

said water-repellent cloths, said water-absorbent cloths and said waterproof cloth being adhered to each other along the long sides at both edges.

4,036,235
DRAINAGE DEVICE FOR EAR IRRIGATION

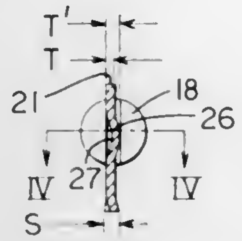
Lucille Hathaway, 4855 Monroe St., Lot 612, Toledo, Ohio 43623
Filed June 4, 1975, Ser. No. 583,587
Int. Cl.² A61F *11/00, 13/00*
U.S. Cl. 128—292 **2 Claims**



1. Drainage device for ear irrigation comprising
- a. receptacle having a flat flexible inner wall and a somewhat eider outer flexible wall secured at its side edge portions to said inner wall expand outwardly to form a basin,
- b. an upward extension on said inner wall, providing a substantial head-engaging portion above the upper edge of said outer wall,
- c. strap attaching means on the upper part of said extension embracingly to engage the patient's forehead,
- d. a vertically elongate opening of generally diamond shape in said inner wall and extending into said extension and enabling the patient's ear to be slipped therethrough so that the upper edge of said basin is approximately level with the meatus of the auditory canal, and
- e. a discharge tube leading from the bottom of said basin.

4,036,236
SURGICAL SAW

Earl H. Rhodes, Jr., Kalamazoo, Mich., assignor to Stryker Corporation, Kalamazoo, Mich.
Filed Oct. 6, 1975, Ser. No. 619,580
Int. Cl.² A61B *17/14;* **B27B** *33/02*
U.S. Cl. 128—317 **2 Claims**



1. In a surgical saw having a handpiece, a chuck on said handpiece and drive means for effecting reciprocating movement of said chuck axially thereof, the combination comprising:

elongated, relatively thin blade means having sidewardly offset saw teeth along one lengthwise edge thereof and an integral offset portion extending lengthwise of said blade means throughout the length thereof and disposed intermediate between and spaced from the lengthwise edges thereof, the overall thickness of said blade means, as measured across the offset portion, being no greater than the thickness as measured transversely across the offset toothed edge;

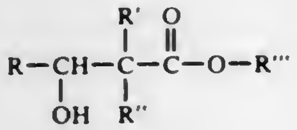
said offset portion being of a shallow V-shaped configuration and projecting outwardly of said blade means from only one side thereof, the other side of said blade means having a shallow groove formed therein as defined within said offset portion, said offset portion and the remaining portions of said blade means, except for the toothed edge, being of a substantially uniform material thickness; and

shank means rigidly and fixedly secured to one end of said blade means and projecting longitudinally thereof, said shank means having an enlarged portion provided with a slot extending thereacross, and said one end of said blade means being snugly disposed within said slot and fixedly connected to said enlarged portion, said shank means being engageable by said chuck whereby said blade means can be reciprocated lengthwise thereof by said drive means.

4,036,237
SMOKING COMPOSITION

Lina Chen Teng, Richmond, Va., assignor to Philip Morris Incorporated, New York, N.Y.
Filed Feb. 20, 1976, Ser. No. 659,691
Int. Cl.² A24B *15/04*
U.S. Cl. 131—17 R **5 Claims**

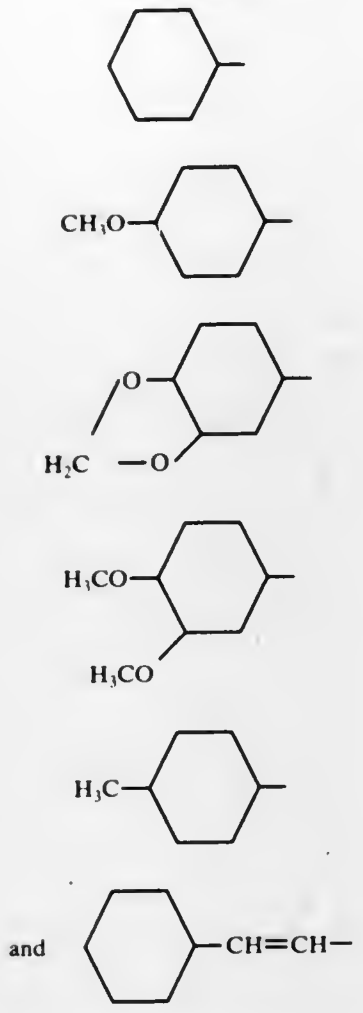
1. A smoking product comprising a smoking material and from at least 0.0001 percent by weight based on said smoking material, of a beta-hydroxy ester having the formula:



$$R-\underset{\substack{|\\ OH}}{CH}-\overset{\substack{R'\\ |}}{\underset{\substack{|\\ R''}}{C}}-\overset{\substack{O\\ \|}}{C}-O-R'''$$

wherein R may be a member selected from the group consisting of:

-continued



wherein R' is a lower alkyl group, particularly methyl or ethyl; wherein R'' is a lower alkyl group, particularly methyl or ethyl; and wherein R''' is a member selected from the group consisting of H, M, which may for example be an alkaki metal such as sodium or potassium, and alkyl containing from 1 to 8 carbon atoms, for example, methyl, ethyl, n-propyl, isopropyl, n-butyl, sec.-butyl, isobutyl, tert.butyl, n-amyl, n-hexyl, n-heptyl and n-octyl.

4,036,238
APPARATUS FOR CONTROLLING AMOUNT OF TOBACCO FILLER IN CIGARETTE MANUFACTURING MACHINE

Yutaka Okumoto, Oyama Higashi, Japan, assignor to The Japan Tobacco & Salt Public Corporation, Tokyo, Japan
Filed Feb. 10, 1976, Ser. No. 656,893
Claims priority, application Japan, Feb. 10, 1975, 50-16327
Int. Cl.² A24C *5/34*
U.S. Cl. 131—21 B **8 Claims**

1. An apparatus for controlling an amount of a tobacco filler as it is conveyed by a conveyor in a cigarette manufacturing machine, comprising detecting means for detecting an amount of a tobacco filler and transmitting an electrical signal corresponding to the amount detected, integrating means for integrating said electrical signal, an electrical servo valve operative in response to said integrated electrical signal from said integratng means, a hydraulic piston means actuated by said electrical servo valve, a trimming hydraulic means coupled to said piston means and moving in response to the movement of said piston means and a negative feed back means for feeding back an electrical signal corresponding to a displacement of the trimming means to the electrical servo valve to control the movement of the piston means.

4,036,239
HOPPER FOR A CIGARETTE MAKING MACHINE

Edward G. Preston; Jan A. Rakowicz, both of London, England, and Francis A. M. Labbe, Neuilly-sur-Seine, France, assignors to Molins Limited, London, England
Filed Apr. 28, 1976, Ser. No. 681,097
Claims priority, application United Kingdom, May 2, 1975, 18394/75
Int. Cl.² A24B *1/02, 7/14*
U.S. Cl. 131—109 R **15 Claims**

1. A cigarette machine hopper comprising:
- a first continuous band extending along a predetermined path and having an operative run along said path;
- b. a second continuous band having a further operative run adjacent to and extending approximately parallel to at least a portion of said operative run of said band;
- c. means for driving said first and second bands respectively such that said operative runs move in the same direction at different speeds; and
- d. means for feeding particulate tobacco onto said first band upstream of said operative run of said second band;
- e. said first and second bands each having a plurality of spike means thereon, the spike means of the two bands being angularly arranged to tease said tobacco and stretch any lumps therein as said tobacco is fed along said path between said confronting surfaces of said operative runs.

4,036,240
SMOKING APPARATUS WITH REPLACEABLE FILTERING CARTRIDGE

Joseph E. Murray, Jr., 27 Alpine St., No. 16, Malden, Mass. 02148
Filed Dec. 16, 1974, Ser. No. 533,244
Int. Cl.² A24F *1/30*
U.S. Cl. 131—173 **6 Claims**

1. A smoking apparatus comprising:
- A. a pipe bowl,
- B. a hollow pipe stem,
- C. a pipe body, said body including a detachable base portion and means for detachably connecting said portion to the remainder of said body and further including a re-

placeable filtering cartridge, disposed within said base portion, said cartridge having a top member and comprising:

1 a means for containing a predetermined volume of liquid filtering agent therein,

2 first smoke port means providing a first smoke port,

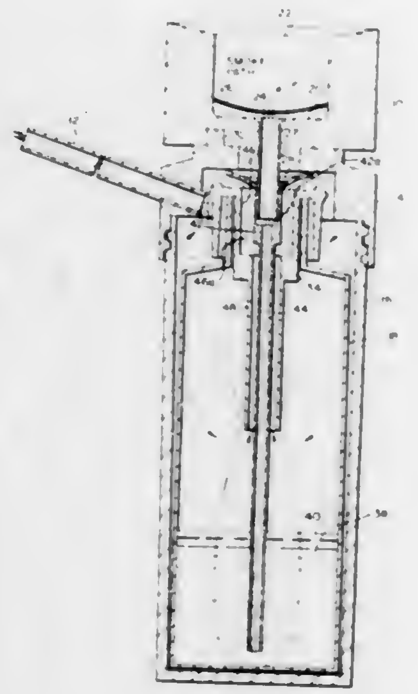
3 a first tubular extension member, attached to and extending from said first port means to a point interior to said cartridge,

4 second smoke port means providing a second smoke port, and

5 a second tubular extension member attached to and extending from said second port means to a point interior to said cartridge, and

wherein said first tubular extension member is adapted to extend into said liquid filtering agent only when said cartridge is substantially upright, and to extend only to points located above the top surface of said liquid filtering agent otherwise, and

wherein said second tubular extension member is adapted to extend only to points located above the top surface of said liquid filtering agent for all orientations of said cartridge, and



wherein said first and second port means are integrally attached to said top member, and wherein further said first port means and first tubular extension member are substantially coaxial with and disposed within said second port means and second tubular extension member, said first and second port means being integrally attached by one or more radially extending struts,

D. connecting means for interconnecting said bowl, stem and body to provide a smoke path when said smoking apparatus is upright from the lower interior portion of said bowl to the bore of said stem, said path between said bowl and stem sequentially including:

1. the interior regions of said first port means and said first tubular extension member,
2. the interior region of said cartridge below said top surface,
3. the interior region of said cartridge above said top surface,
4. the interior regions of said second tubular extension member and said second port means, and
5. the interior region of said body between said cartridge and said body.

4,036,241
FILM-FORMING CARBOXY-CONTAINING RESIN AND A POLYVALENT METAL SALT IN A HAIR SPRAY AND A METHOD OF USING THE SAME

Gerhart Karg, Pompton Lakes, N.J., and Christopher D. Vaughan, Greenwood Lake, N.Y., assignors to Avon Products, Inc., Suffern, N.Y.

Filed Oct. 1, 1975, Ser. No. 618,469

Int. Cl.^{2} A45D *7/00;* **A61K** *7/11*

U.S. Cl. 132—7 **20 Claims**

1. A hair setting resin composition comprising an alcoholic medium containing substantially uniformally dispersed therein an amount sufficient to form a hair retaining film of a film-forming resin selected from the group consisting of (1) a copolymer of a vinyl alkyl ether and a C_1–C_5 alkyl half-ester of maleic anhydride, (2) a C_2–C_6 alkene/maleic anhydride half-C_1–C_5 ester copolymer, and (3) a copolymer of a vinyl ester and acrylic acid or an alpha or beta-substituted acrylic acid wherein said substituent is hydrogen or a single C_1–C_3 alkyl, and a polyvalent metal C_5–C_{20} alkyl carboxylic acid salt capable of forming a stable, non-toxic, clear, glossy film with said resin; the anhydride or acid being used in an amount sufficient to form said resin to contain at least 5 percent by weight of free carboxylic acid groups therein; the amount of salt being sufficient to contain a stoichiometric ratio of metal to free polymeric carboxyl group of from about 1 to 10 to less than 1 to 1; the resultant pH of the composition being between about 3.5 and 7.5.

15. The method of shaping human hair comprising forming the hair into the desired configuration and applying an effective amount to form a hair retaining film of the composition of claim 1 thereto.

4,036,242
HOPPER PAYOUT FOR VARIOUS COIN DENOMINATIONS

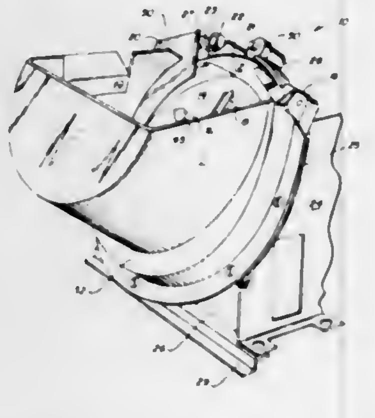
Charles T. Breitenstein, Elk Grove Village, and Frank G. Nicolaus, Chicago, both of Ill., assignors to Spiral Step Tool Company, Elk Grove Village, Ill.

Continuation of Ser. No. 384,624, Aug. 1, 1973, Pat. No. 3,942,544. This application Dec. 15, 1975, Ser. No. 640,631

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.^{2} G07D *3/14, 9/00*

U.S. Cl. 133—4 R **11 Claims**



1. In a coin handling apparatus of the type having a coin hopper with a coin outfeed passage directing coins gravitationally in bulk against the lower face portions of an inclined rotating coin transport disc operative to pick up and transport coins seriatim to a region in the upper level of disc travel, the improvement comprising:

means supporting said disc for rotation in a fixed plane of inclination confronting said outfeed passage by antifriction bearing means including at least three rotative bearing members respectively supportively engaging with peripheral margins of the disc at points spaced apart thereabout substantially equidistantly,

at least two of said bearing members being situated adjacent the lower portion of said disc which is proximate to said outfeed passage and an eccentrically-acting loading effect of bulk coins pressing against the disc thereat,

another said bearing member being situated in the region of said upper level of disc travel, whereby the interengagement between said bearing members and peripheral portions of the disc is such that the imbalanced loading effect of the bulk coin mass against one region of the disc is alleviated to constrain the disc for rotation in a fixed plane relative to the hopper as aforesaid.

4,036,243
APPARATUS FOR COOLING HOT SLABS

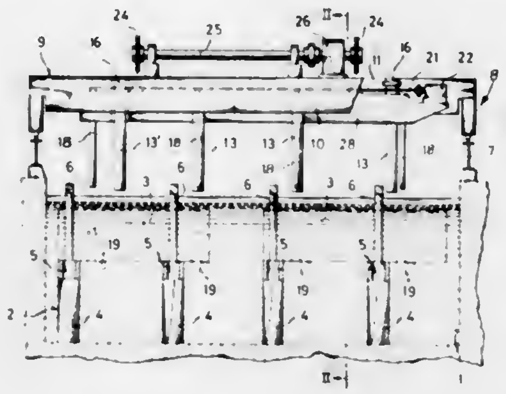
Willi Manthey, Duisburg, and Horst Deiwick, Krefeld-Gartenstadt, both of Germany, assignors to BWG Bergwerk-und Walzwerk Maschinenbau G.m.b.H., Duisburg, Germany

Filed July 6, 1976, Ser. No. 702,587

Claims priority, application Germany, July 7, 1975, 2530237

Int. Cl.^{2} B08B *3/04*

U.S. Cl. 134—76 **11 Claims**



1. An apparatus for cooling hot slabs in a soaking pit divided into a plurality of slab-receiving compartments formed by rows of stakes rising from parallel beams within the pit, comprising:

rail means alongside said pit paralleling said beams;

a transporter riding on said rail means, said transporter including a traverse spanning said pit;

first and second guide means fixedly depending from said traverse at locations separated in the transport direction by a distance substantially equaling twice the spacing of said stakes;

vertically movable gripper means on said traverse disposed between said first and second guide means and defining therewith a first and a second carrying cage alignable with a pair of adjoining compartments; and

hoist means on said transporter for reciprocating said gripper means between an elevated transport position above said stakes and an immersion position at the level of said beams, said gripper means being provided with retractable slab-supporting means alternately extendable across the bottoms of said cages for depositing a hot slab from said first cage on two of said beams in one compartment and then lifting a cooled slab into said second cage from the other compartment of said pair of adjoining compartments.

4,036,244
VERTICAL ARCH SHELTER

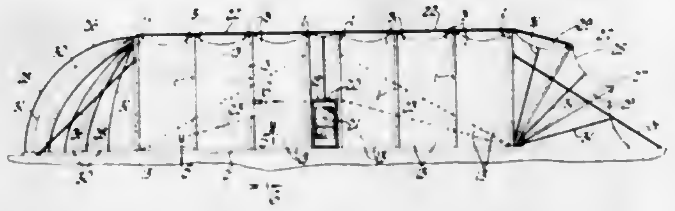
Carl F. Huddle, Pleasant Ridge, Mich., assignor to Tension Structures Co., Pleasant Ridge, Mich.

Continuation-in-part of Ser. No. 339,333, May 8, 1973, abandoned, which is a continuation-in-part of Ser. No. 93,293, Nov. 27, 1970, abandoned. This application June 12, 1975, Ser. No. 576,101

Int. Cl.^{2} A45F *1/16;* **E04B** *1/32*

U.S. Cl. 135—4 R **15 Claims**

1. A vaulted membrane shelter comprising at least two substantially vertical arches with curved bights mounted on a base face to face but spaced apart with means to fix said arches in space to form a vaulted framework; a tensioned flexible membrane extending between and being operatively attached to said arches by means that permits membrane tensioning movement downward along arch circumference; said membrane being fabricated to form an inward concave curvature



between the bights of said arches, having a maximum depression of at least 5% of the distance between said arches, producing double curvature in said membrane; and means for maintaining tension in said membrane acting between the lower portion of said membrane and said base to diminish membrane vibration and increase rigidity of said shelter.

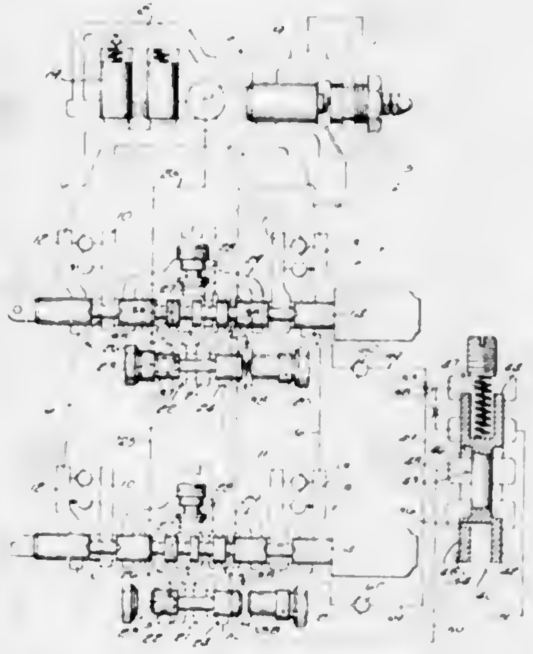
4,036,245
PRESSURE COMPENSATED HYDRAULIC CONTROL VALVE

Francis Henry Tennis, Oconomowoc, Wis., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Dec. 29, 1975, Ser. No. 645,203

Int. Cl.^{2} F15B *13/08*

U.S. Cl. 137—117 **15 Claims**



11. In combination with a hydraulic control valve:

A. a pressure compensating valve device having a supply port for high pressure supply fluid, a use port through which such supply fluid can issue for flow to the control valve, an excess fluid port to which fluid from the supply port can flow in bypass relation to the use port, and a valve member by which part of the high pressure fluid entering the supply port can be diverted to the use port and the remainder can be diverted to said excess fluid port, in bypass relation to the use port, in quantities such as to tend to maintain a substantially constant pressure drop across said control valve;

B. an excess fluid flow control mechanism having an inlet connected with said excess fluid port, an outlet for connection with a reservoir, and fluid pressure responsive valve means to control flow of fluid from the inlet to the outlet;

C. and means to render said valve means responsive to variations in the pressure differential between supply fluid and fluid at said excess fluid port, to thereby effect movement of said valve means in a direction to restrict communication between the inlet and outlet in consequence of rise in the pressure of supply fluid, and to effect movement of said valve means in the non-restricting direction in consequence of rise in the pressure of fluid at the excess fluid port.

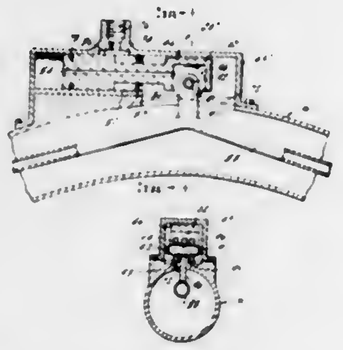
4,036,246
FUEL SUPPLY AND DISTRIBUTION SYSTEM

Richard Henry Cornell, Marblehead, Mass., assignor to General Electric Company, Lynn, Mass.

Division of Ser. No. 487,888, July 12, 1974, Pat. No. 3,949,775. This application Oct. 31, 1975, Ser. No. 627,727

Int. Cl.^{2} G05D *11/00*

U.S. Cl. 137—118 **4 Claims**



1. A fuel supply and distribution system comprising:
an annular manifold tube for receiving a flow of pressurized fuel,
an actuator having a piston slidably disposed therein wherein the piston is actuated in response to changes in the pressure of the fuel in the manifold tube,
a plurality of flow dividing valves disposed about the circumference of the manifold tube each including a metering piston translatably disposed therein for regulating the flow of fuel from the manifold tube,
linkage means extending through the manifold tube interconnecting the actuator with the flow dividing valves such that movement of the actuator piston is simultaneously imparted to the flow dividing valve pistons, and
wherein the linkage means includes a tubular linkage extending circumferentially around the manifold and including a plurality of radially extending flange means each in rotatable engagement with respective metering pistons within the pressure regulating valves for converting movement of the tubular linkage around the circumference of the manifold tube to translational motion of the metering piston within its respective dividing valve.

4,036,247
MULTI-PRESSURE, SINGLE LINE SUPPLY SYSTEM

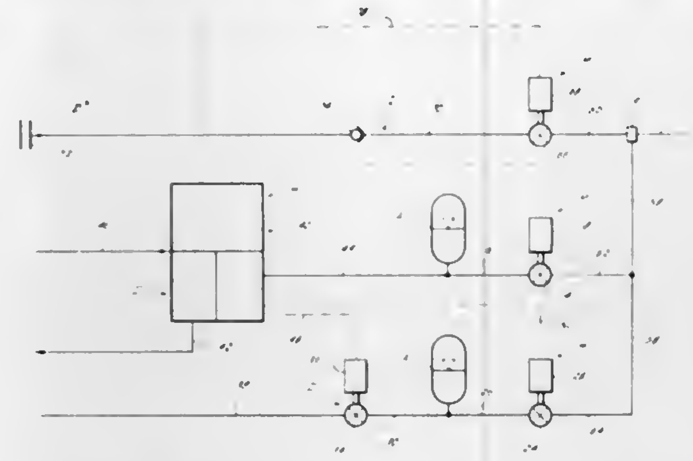
Benton F. Baugh, Houston, Tex., assignor to Vetco Offshore Industries, Inc.

Filed Mar. 15, 1976, Ser. No. 667,175

Int. Cl.^{2} E21B *43/01*

U.S. Cl. 137—236 **14 Claims**

1. A system for conveying fluid from a single subsea supply conduit to provide a fluid supply for both subsea well valve control apparatus and fluid injection apparatus, comprising:
fluid receiving means for receiving fluid under pressure from a single subsea supply conduit;
injection means operably connected to said fluid receiving means for injecting fluid from said fluid receiving means into a subsea well flowline;
accumulator means for supplying fluid to a subsea well valve control apparatus;
said accumulator means being in interruptible fluid communication with said fluid receiving means for being charged with fluid from said fluid receiving means; and
regulating means operably connected to said fluid receiving means, said injection means, and said accumulator means for regulating fluid flow from said fluid receiving means to control injection by said injection means and to control charging of said accumulator means, whereby said injection means and said accumulator means are both supplied with fluid from a single subsea supply conduit.



4,036,248
VALVE BODY FOR SLEEVE VALVE

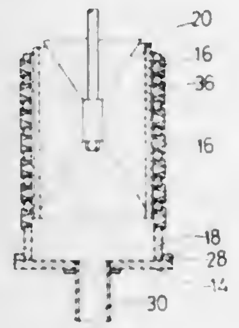
Ikuo Yoshimori; Teruaki Nanao, and Toshio Sugino, all of Hirakata, Japan, assignors to Kubota Ltd., Osaka, Japan

Filed Feb. 13, 1976, Ser. No. 658,111

Claims priority, application Japan, Feb. 14, 1975, 50-20983

Int. Cl.^{2} F16K *3/26*

U.S. Cl. 137—271 **6 Claims**



1. A valve body for a sleeve valve including the valve body having a peripheral wall formed with a multiplicity of discharge ports extending therethrough, a lower end provided with a bottom cover and an upper end to be secured to an upper wall of a reducing chamber, and a valve cylinder gate having open upper and lower ends and slidably fitted in the valve body in contact with the inner surface of the body, the valve cylinder gate being coupled to means operable from outside for upwardly or downwardly driving the gate to control the number of the discharge ports maintaining the interior of the valve body in communication with the outside thereof and to thereby regulate the flow of water, the valve body being formed with straight bores extending through the peripheral wall and having a uniform inner diameter, each of the straight bores fixedly fittingly receiving thereing a nozzle member including a straight cylindrical portion of a uniform outer diameter, the cylindrical portion having an outwardly tapered opening axially extending therethrough to constitute each of the discharge ports.

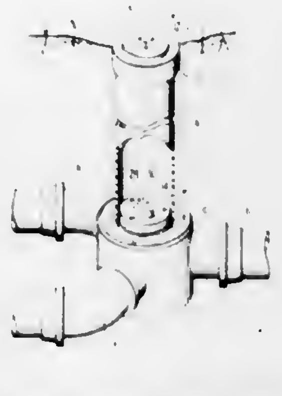
4,036,249
DIVERTER VALVE

Carlos V. Perry, Sr., 8805 Early St.; Carlos V. Perry, Jr., 9304 Stuart Ave., and Christopher G. Perry, 7452 Carlton Lane, all of Manassas, Va. 22110

Filed Nov. 29, 1976, Ser. No. 745,763

Int. Cl.^{2} F16K *11/07*

U.S. Cl. 137—367 **5 Claims**



1. A diverter valve for underground installations operating at relatively low pressures for controlling the flow of effluent from a septic tank to a plurality of leach beds, having a valve body, a valve plug, and a retainer cap for the valve plug, comprising;
a thick-walled valve body of cast urethane defining a vertically disposed cylindrical central valve chamber having an inlet port and a plurality of spaced outlet ports, centrally disposed circular openings in the top and bottom walls of the valve body, the walls of which provide bearing surfaces for a tapered valve plug,
integrally cast downwardly tapered and uniformly spaced heavy ribs extending from the top to the bottom walls of the valve body dividing the central chamber into a plurality of substantially uniform smaller chambers communicating directly with the central chamber,
a valve plug comprising a unitary urethane casting having circular top and bottom sections rotatively mounted for sealing contact with the upper and lower bearing surfaces of the valve body, the valve body having a cut-away center section providing a passageway for alternately connecting the inlet port with one of the outlet ports, the remaining center portion of the valve plug being in slidable and sealing contact with at least two of the ribs to close at least one of the outlets while one outlet remains open, the valve plug having an integrally cast shaft at the upper end thereof, said shaft extending through the upper central opening in the top of the valve body and through an opening in the retainer cap, the upper end of the shaft having an upwardly extending projection adapted to receive a slotted tool to actuate the plug from ground level, and
a circular groove in the top surface of the valve body adapted to receive a section of pipe, closed with a cap provided with a screw-threaded plug to afford access to the valve plug for operating the same.

4,036,250
BLOW-DOWN SAFETY VALVE

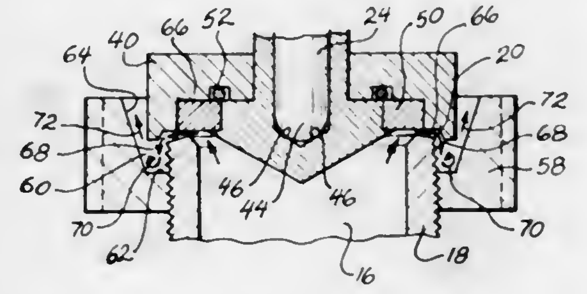
James W. Dashner, Charlotte, N.C., assignor to Consolidated Valve Industries, Inc., Matthews, N.C.

Filed Feb. 4, 1976, Ser. No. 655,068

Int. Cl.^{2} F16K *37/00*

U.S. Cl. 137—476 **11 Claims**

1. A blow-down safety valve for use with elevated temperature fluid systems and the like to open when the pressure in said fluid system reaches a predetermined maximum level, said valve including a casing formed with an inlet conduit presenting a generally annular valve seat, a valve member selectively movable between a position seated on said valve seat, and an open positon spaced therefrom, said valve member including a generally flat seating portion for selective abutment with said annular valve seat and a fluid deflecting portion depending generally perpendicularly from said flat seating portion at a location beyond the peripheral extend of said valve seat whereby when said valve member initially permits gas to bleed at said valve seat fluid will flow along a first direction extending generally parallel to said valve seat and then be deflected by said fluid deflecting portion to a second direction substantially perpendicular to said first direction, and a blow-down ring mounted about said inlet conduit adjacent said valve seat thereof, said blow-down ring forming an annular cavity including a bottom wall in said blow-down ring located directly beneath said fluid deflecting portion of said valve member and including a side wall extending from said bottom wall generally toward and beyond said fluid deflecting portion in spaced relation thereto whereby fluid flowing in said second direction will collect in said cavity and be directed therefrom by said side wall in a third direction extending generally opposite to said second direction.



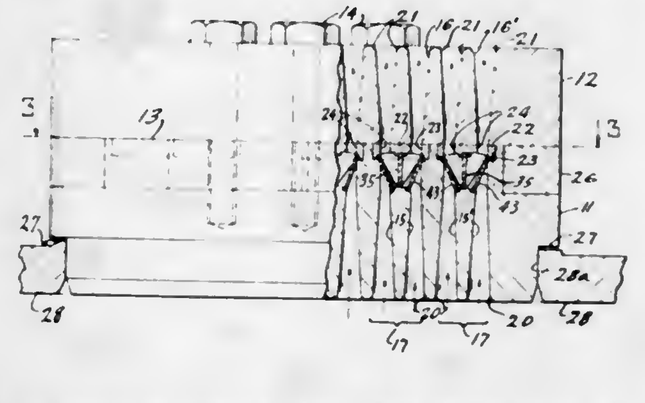
4,036,251
FLUID COMPRESSOR VALVE

William F. Hartwick, and Charles H. Melcher, both of Mount Vernon, Ohio, assignors to Cooper Industries, Inc., Houston, Tex.

Filed May 10, 1976, Ser. No. 684,625

Int. Cl.^{2} F16K *15/02*

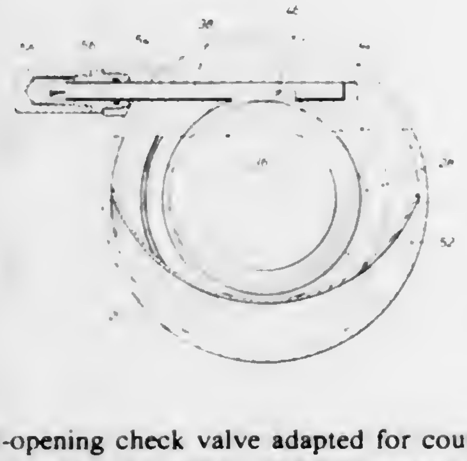
U.S. Cl. 137—512.1 **9 Claims**



1. An improved one-way fluid valve construction comprising a valve housing including a valve inlet block and a valve outlet block having generally planar abuttin inner surfaces, means attaching said valve inlet block and said valve outlet block together with said inner surfaces abutting, a valve stop insert, opening means between said valve inlet block and said valve outlet block retaining said valve stop insert, said valve stop insert having two curved surface areas facing said valve inlet block, a pair of spaced ports each extending through said valve inlet block, said valve stop insert and said valve outlet block, first and second rigid valve plates, means supporting each of said valve plates in said valve inlet block between said ports for pivoting between first and second positions, said first valve plate closing one of said ports when in said first position and opening said one port when pivoted to said second position and said second valve plate closing the other of said ports when in said first position and opening said other ports when pivoted to said second position, said valve plates each having

an edge which sweeps across a different one of said curved surface areas of said valve stop insert when pivoted, and spring means extending between said valve plates for simultaneously biasing both of said valve plates away from each other towards said first positions whereby said valve plates inhibit fluid flow in one direction through said ports.

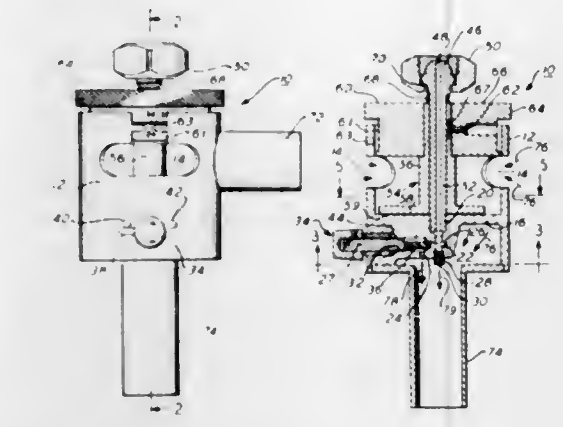
4,036,252
FULL BORE PIPELINE VALVE APPARATUS
Thomas Wheatley, 3717 Pinemont, Houston, Tex. 77018
Filed Aug. 18, 1975, Ser. No. 605,231
Int. Cl.² F16K *15/03, 15/18*
U.S. Cl. 137—527.8 **3 Claims**



1. A full-opening check valve adapted for coupling into a pipeline of a specified upstream and downstream sizes which are equal to define a valve which will pass a pipeline pig of sizes up to a pig making full circle contact with the upstream and downstream pipes which check valve comprises

- a funnel shaped housing having one end sized to be welded to a downstream pipe and which one end includes an axial opening equal to the pipe in internal diameter and which housing enlarges to a diameter larger than the pipe internal diameter, and which housing ends at a transverse shoulder;
- an end plate welded across said housing at said transverse shoulder, said end plate having an axial passage matching the upstream pipeline internal diameter, said end plate further being counter bored to define a downstream shoulder;
- a flapper valve sized to fit against said shoulder and having a circular shape;
- a hinge pin joined to said flapper valve;
- a hinge pin passage means in said end plate perpendicular to the path of flow through said housing, said passage means being spaced from said shoulder to pivotly rest said flapper valve against said shoulder in a fully closed position closing said axial passage to reverse flow;
- a curved guide plate in said housing downstream from said end plate positioned to bottom support a pig passing through said housing and which plate slopes toward the end opening in said housing and which plate further extends across said housing;
- an appendage to said end plate having a bore aligned with the hinge pin passage and disposed for receiving the hinge pin therein; said bore having
- an internally threaded counterbore for receiving the externally threaded end of a sleeve,
- a seal means for preventing leakage around said hinge pin; and
- the other end of said sleeve being threadedly connected to a cap nut for protecting the end of said hinge pin.

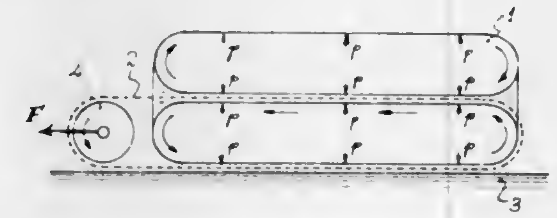
4,036,253
GAS DILUTION DEVICE
Frank Joseph Fegan, West Orange, and William Harold Smith, Rahway, both of N.J., assignors to Peace Medical, West Orange, N.J.
Filed Nov. 12, 1975, Ser. No. 631,220
Int. Cl.² F16K *19/00*
U.S. Cl. 137—556 **12 Claims**



1. A gas dilution device comprising:

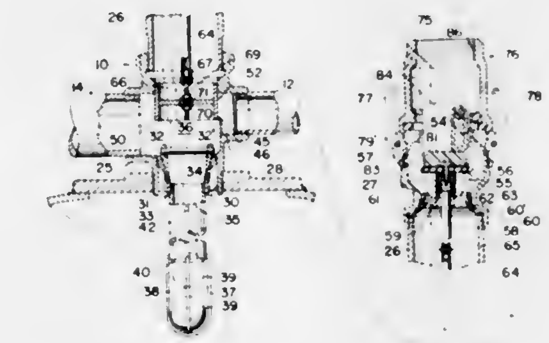
- a first gas receiving nozzle,
- settable orifice means in fluid communication with said nozzle for forming a plurality of selected physically spaced streams of said first gas at a plurality of selected given velocities,
- a gas mixing and delivery chamber,
- gas receiving port means including settable gas restriction means in fluid communication with said chamber for selectively restriction the flow of a second gas drawn into said chamber through said port by the flow of said first gas, said gas restriction means including means settable anywhere within a first given range arranged to provide in cooperation with the setting of said orifice means a first gas dilution ratio settable anywhere within a second given range,
- said orifice means being disposed in fluid communication with and arranged to direct said streams into said chamber in a manner to draw said second gas into said chamber through said port, and
- means coupled to said orifice means for selectively setting said orifice means to provide a selected velocity of said first gas into said chamber, the selected velocity corresponding to the setting of said gas restriction means whereby the first gas flowing into said chamber is mixed with and diluted with the second gas at a selected dilution ratio corresponding to a given first gas velocity and corresponding gas restriction magnitude within said first range.

4,036,254
CONTAINER THAT CAN BE DISPLACED BY ROTARY FORCE
Francisco Alcalde Pecero, Santa Clara No. 40, Seville, Spain
Filed Aug. 27, 1975, Ser. No. 608,108
Claims priority, application Spain, Jan. 29, 1975, 434253
Int. Cl.² E03B *11/00*
U.S. Cl. 137—581 **9 Claims**



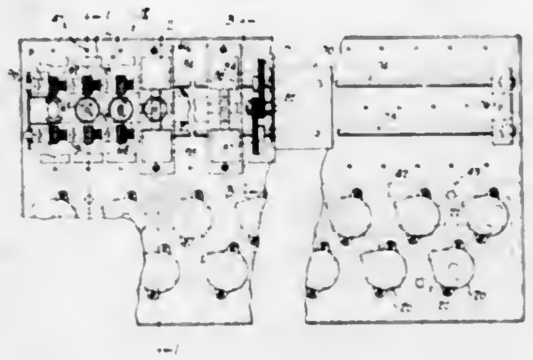
1. A longitudinally extending flexible container for a voluble material adapted to impart to the material contained therein a rotary motion along the longitudinal axis of the container as said container is moved along an abutting surface; said container being defined by a continuous flexible outer skin adapted to conform to the surface along which the container is moved, said skin having the shape of an elongated torus with its shorter opposite sides assuming a convex annular configuration of semi-circular cross-section surrounding a hole formed along an axis substantially parallel to the longer sides of the skin when the contents are rotated about said axis as the container is moved along the abutting surface, said axis being defined by means interposed in said hole and held in position therein by pressure exerted thereon by the voluble material to cause said skin to be successively turned inside itself and displaced along the abutting surface as a force is applied to said interposed means in the direction of desired movement of the container.

4,036,255
VAPOR RECOVERY ADAPTER
Fred A. Wilson, Florence, Ky., assignor to Dover Corporation, New York, N.Y.
Filed Sept. 18, 1975, Ser. No. 614,708
Int. Cl.² F16K *11/14, 1/14*
U.S. Cl. 137—587 **9 Claims**



1. A vapor recovery adapter for use with a plurality of tanks having vapor therein to be removed including a housing mounted on one of the tanks and having a first inlet port communicating with the one tank to receive vapor therefrom, said housing having a second inlet port communicating with at least one other tank to receive vapor therefrom, said housing having a first outlet port in communication with a vent to atmosphere, said housing having a chamber with which said first and second inlet ports and said first outlet port communicate whereby vapor may flow from the tanks through said first and second inlet ports to said first outlet port, said housing having a second outlet port disposed above said first outlet port, and housing having a passage therein, one end of said passage communciating with said chamber and the other end of said passage communicating with said second outlet port, and valve means movable in said housing between a first position in which said valve means blocks said first outlet port and opens said second outlet port without blocking communication of said first inlet port with said chamber and communication of said second inlet port with said chamber and a second position in which said valve means blocks said second outlet port and opens said first outlet port without blocking communication of said first inlet port with said chamber and communication of said second inlet port with said chamber, said valve means being moved to its first position when at least one of the connected tanks is being supplied liquid to expell vapors from any of the connected tanks through said second outlet port, said valve means being moved to its second position when none of the connected tanks is being supplied liquid.

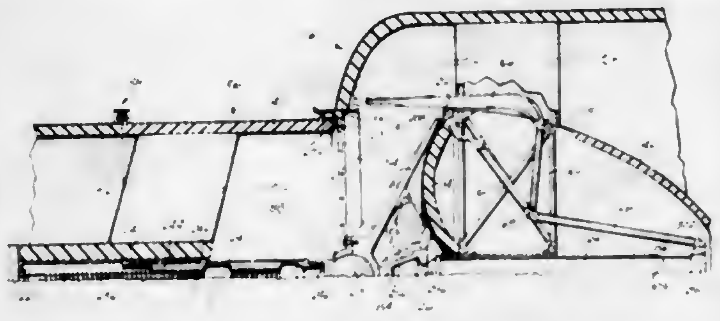
4,036,256
ADJUSTABLE VALVE ASSEMBLY
Arthur T. Bublitz, Saline, Mich., and Eugene F. Holben, Haddonfield, N.J., assignors to Reliance Electric Company, Pepper Pike, Ohio
Division of Ser. No. 602,245, Aug. 6, 1975, Pat. No. 3,982,726. This application May 10, 1976, Ser. No. 684,860
Int. Cl.² F16K *31/04*
U.S. Cl. 137—595 **7 Claims**



1. A ganged valve assembly including a plurality of valve bodies;

- each of said valve bodies including a valve seat and a valve member movable in a first plane along a valve axis in two directions relative to the respective valve seat to establish a variable orifice therewith,
- a motor,
- line shaft means connected to be driven by said motor and journalled for rotation about a second axis and transverse to said plurality of valve bodies in a second plane substantially normal to said first axis,
- each of said valve bodies including first and secong drive trains from said line shaft means to the respective valve member,
- first and second clutch means in each of said first and second drive trains, respectively,
- and actuator means connected to actuate each of said first and second clutch means.

4,036,257
LIQUID CARGO LOADING APPARATUS
Carl V. Hanson, Renton, and Philip C. Whitener, Seattle, both of Wash., assignors to The Boeing Company, Seattle, Wash.
Filed Mar. 26, 1975, Ser. No. 562,264
Int. Cl.² F16L *29/00*
U.S. Cl. 137—614.06 **25 Claims**



1. In a coupling apparatus for loading and unloading liquid to and from a transport and including a valve assembly mounted on said transport and a liquid conducting hollow boom positionable with respect to said transport and having a valve assembly at its positionable end for mating engagement with said transport valve assembly, the combination therewith comprising:

- movable valve closure means and toggle locking means therefor mounted in said transport valve assembly, said toggle locking means having a locked condition in which said transport valve closure means is held in a locked, closed position and having an unlocked condition in which said transport valve closure means is unlocked and is free to move to a open valve position;

plunger means mounted in said transport valve assembly and connected to said toggle locking means and being movable from a normal unactuated position to an actuated position to cause said toggle means to assume its unlocked condition, and being movable from said actuated position back to its unactuated position to cause said transport valve closure means to assume its closed position and to cause said toggle means to assume said locked condition;

actuator means carried by said boom valve assembly and engagable with said plunger means for displacing it to its actuated position upon movement of said boom into mating engagement with said transport valve assembly and for withdrawing said plunger means toward its normal, unactuated position upon movement of said boom out of said mating engagement;

said boom valve assembly including a movable valve closure means and motive means for displacing said boom closure means from a normally closed position adjacent said boom end to an open position spaced therefrom; and

said boom valve closure means being engagable with said unlocked transport valve closure means duriing said mating engagement of said valve assemblies for forcibly impelling said transport valve closure means to its open position in unison with said boom valve closure being displaced to its open position.

4,036,258
HIGH SPEED SHUT OFF OF CONDUITS

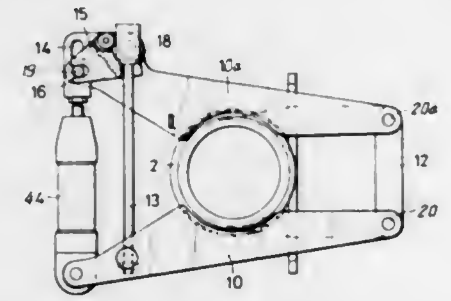
Hans Richard Wolters, Schwalmtal, and Heinz Keltjens, Hemmerden, both of Germany, assignors to Mannesmann Aktiengesellschaft, Dusseldorf, Germany

Filed Jan. 7, 1976, Ser. No. 646,951

Claims priority, application Germany, Jan. 8, 1975, 2500896

Int. Cl.² F16L *37/28*

U.S. Cl. 137—614.04 **5 Claims**



1. High speed shut off and separation device for two normally interconnected conduits, comprising:

a pair of valves in the ends of the conduits including valve members biasing each other into open position when the conduit ends abut, but separating the conduit ends from each other and closing both conduits when the ends do not abut but are separated;

collar means on each conduit end, the collar means together forming a single collar when the conduit ends abut concentrically;

a pair of brackets having first and second operating positions, the brackets in the first position engaging the two collar means for holding the conduits together, the brackets when in the second position being disengaged from the collar means so that said valves close;

a pair of arm means respectively on said brackets and carrying said brackets; and

means including (a) at least one pneumatic or hydraulic drive for interconnecting one end each of said arm means with each other for moving the brackets from the first to the second position for shut-off and separation, further including (b) a tie rod pivoted on one of the arm means; (c) a latch on the other one of the arm means and cooperating with the tie rod for locking the arms and brackets in the first position; and (d) cam means on the latch operated in response to operation of said drive for unlatching the tie rod.

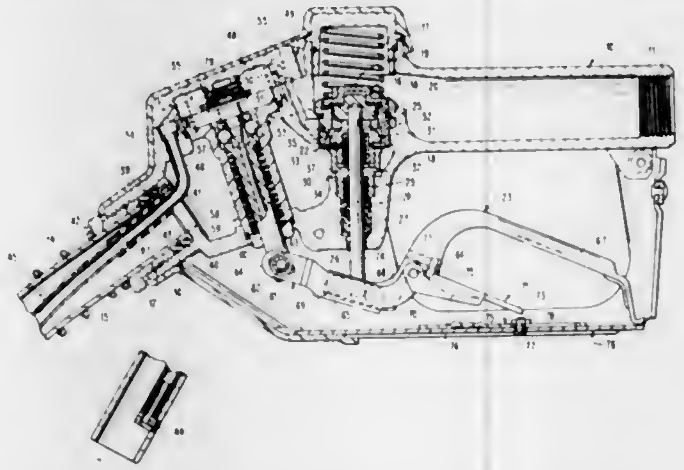
4,036,259
FLUID DISPENSING NOZZLE

Paul R. Wilder, and Chester W. Wood, both of Cincinnati, Ohio, assignors to Dover Corporation, New York, N.Y.

Continuation of Ser. No. 439,302, Feb. 2, 1974, abandoned, which is a division of Ser. No. 244,844, April 17, 1972, Pat. No. 3,817,285. This application June 12, 1975, Ser. No. 586,192

Int. Cl.² B67D *5/37*

U.S. Cl. 137—801 **5 Claims**



1. A body having a valve to control flow therethrough, a spout to dispense fluid from said body, said spout having one end disposed within said body, means to releasably connect said spout to said body to prevent relative movement between said spout and said body unless said spout is subjected to a sufficient force to remove said spout from said releasably connecting means and said body, alignment means cooperatively engaging said one end of said spout and said body in a fixed manner to positively prevent rotation of said spout and maintain alignment of said spout relative to said body without preventing removal of said spout when said spout is subjected to the sufficient force to remove said spout from said releasably connecting means said body, and said alignment means including means to cooperate with said one end of said spout and said body to limit the movement of said spout into said body, said releasably connecting means being resilient so that forceable removal of said spout will not damage said connecting means.

4,036,260
GATE VALVE WITH EXPANDABLE AND CONTRACTABLE CLOSURE MEMBER

Albert Sidney Davis, 11822 S. Evelyn Circle, Houston, Tex. 77071; Robert William Davis, 4310 Goldfinch, Houston, Tex. 77035, and Joseph Paul Weber, Rte. 1, Box 589A, Alvin, Tex. 77511

Filed June 26, 1975, Ser. No. 590,686

Int. Cl.² F16K *3/18*

U.S. Cl. 138—94.3 **25 Claims**

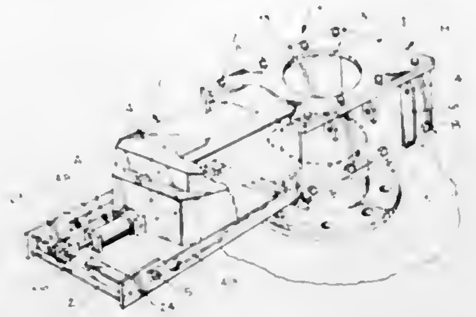
1. A valve comprising:

a housing having at least one opening therethrough around which is provided a seat;

closure means having a seat engaging surface thereon for blocking flow through said opening;

actuator means connected to said closure means for transversely moving said closure means relative to the flow path of said opening, between a first position, out of said flow path, and a second position, in said flow path;

biasing means carried by said housing biasing said closure means away from said seat during movement between said first and second positions without engaging said seat engaging surface during said movement; and



means for expanding said closure means when in said second position, in a direction parallel to said flow path for sealingly engaging said seat engaging surface with said seat means to provide a fluidtight seal of said opening.

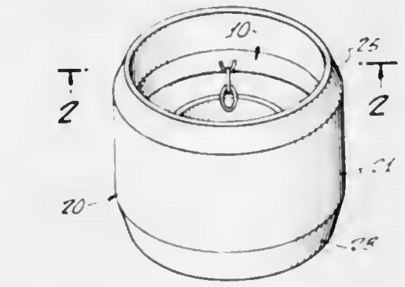
4,036,261
THREAD PROTECTOR FOR OIL-WELL PIPE AND BLADDER INCORPORATED THEREIN

Ernest D. Hauk, Signal Hill; Thomas D. Hauk, and Kenneth J. Carstensen, both of Huntington Beach, all of Calif., assignors to Service Equipment Design Co., Inc., Signal Hill, Calif.

Filed July 29, 1975, Ser. No. 600,109

Int. Cl.² F16L *57/00;* B65D *59/06*

U.S. Cl. 138—96 T **38 Claims**



1. A fluid operated thread protector for the threaded end of a pipe section, which comprises:

a. housing means having a first portion sized to be mounted around the exterior of the threaded end of a pipe section, said housing means also having a second portion sized to be mounted within the interior of said threaded end,

b. bladder means having a first portion mounted within said first portion of said housing means and exterior to said threaded end,

said bladder means also having a second portion mounted around said portion of said housing means, being interposed between said threaded end and said second portion of said housing means,

c. means to create greatly increased fluid pressures within said housing means and thereby effect fluid shifting of at least part of said first portion of said bladder means radially inwardly into tight gripping relationship to the exterior of said threaded end, and also effect fluid shifting at at least part of said second portion of said bladder means radially outwardly into tight gripping relationship to the interior of said threaded end,

whereby said threaded end is tightly gripped in response to fluid forces and on both the exterior and interior thereof,

d. means to prevent said housing means from shifting off said bladder means,

whereby said housing means is prevented from shifting off said threaded end despite loads and shocks received by said housing means during movement of said pipe section, and

e. means to prevent unintentional loss of the fluid pressure maintaining in said shifted positions said first and second portions of said bladder means.

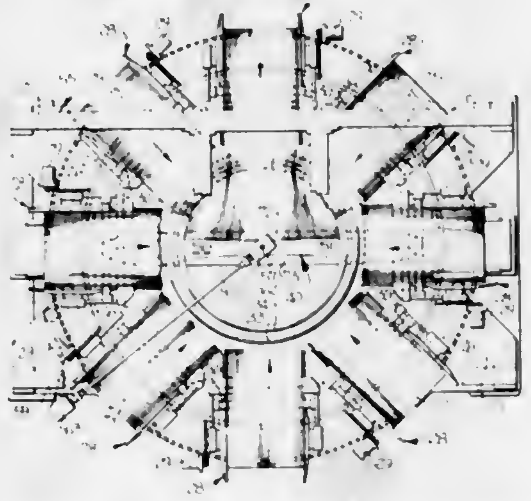
4,036,262
TRIAXIAL WEAVING MACHINE WITH WARP STRAND GUIDES

Burns Darsie, and Richard A. Schewe, both of Rockford, Ill., assignors to Barber-Colman Company, Rockford, Ill.

Filed Jan. 29, 1976, Ser. No. 653,490

Int. Cl.² D03D *41/00*

U.S. Cl. 139—11 **17 Claims**



1. In a weaving machine for making triaxial fabrics and having a plurality of elongate heddles arranged in weftwise rows for guiding warp strands, means for shifting the warp strands weftwise during weaving, creel means for supplying warp strands for weaving and mounted for rotation in timed relation with weftwise shifting of the warp strands, and means for guiding warp strands passing from said creel means to said heddles along substantially constant length paths, the improvement wherein said warp strand guiding means comprises generally circular first guide means for engaging all the warp strands and having a diameter less than the weftwise length of said rows of heddles, yarn separator means for engaging warp strands intermediate said first guide means and said heddles and being mounted for movement in timed relation with weftwise shifting of the warp strands and rotation of said creel means, and second guide means adjacent to and cooperating with said yarn separator means for maintaining engagement of said warp strands with said yarn separator means.

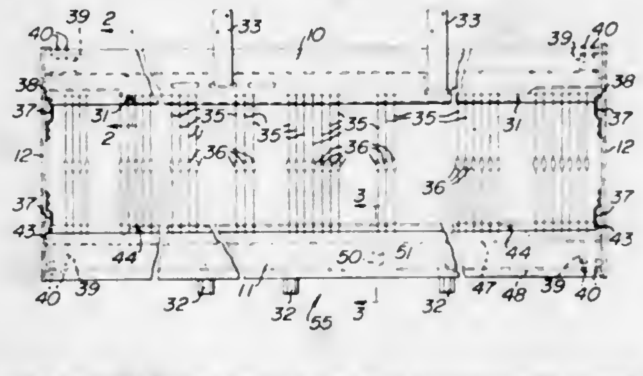
4,036,263
HEDDLE FRAME

Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed June 14, 1976, Ser. No. 696,127

Int. Cl.² D03C *9/06*

U.S. Cl. 139—91 **5 Claims**



1. In a heddle frame having top and bottom rails connected at their ends by struts,

said bottom rail comprising
a rear plate having a continuous and uninterrupted bottom edge,
a front plate having a continuous and uninterrupted bottom edge,
an upper horrizontal wall connecting said front and rear plates,
a lower horizontal wall connecting said front and rear plates and spaced above the edges of said plates,
said plates and said walls providing a box like section,
a block member for push rod engagement in said section having its upper margin spaced downwardly from said upper horizontal wall and in the proximity of the neutral axis of the section and retained therein,
said lower horizontal wall having portions terminated in spaced relation to said block member for push rod access to said block member.

4,036,264

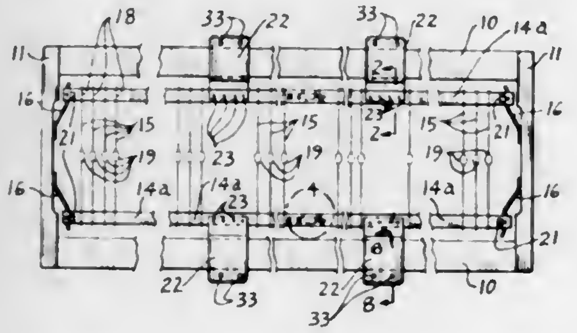
LOOM HARNESS

Frank H. Kaufmann, Greenville, S.C., assignor to Steel Heddle Manufacturing Company, Greenville, S.C.

Filed July 23, 1976, Ser. No. 708,119

Int. Cl.² D03C *9/06*

U.S. Cl. 139—92 **8 Claims**



1. The combination with a heddle frame having top and bottom rails, and a plurality of heddles in said frame of
upper and lower heddle rods parallel to and in spaced relation to said rails for carrying said heddles,
each of said heddle rods comprising a plurality of aligned rod sections with opposite outer vertical continuous aligned faces,
certain of said rod sections having secured thereto a rail attachment member for engagement with one of said rails,
means for retaining meeting ends of aligned rod sections against horizontal and vertical displacement,
said means including interengaging vertical face portions intermediate said vertical faces and extending inwardly from the ends of said rod sections, and
a member for holding said face portions in engagement.

4,036,265

DEVICE FOR SUPPORTING THE SLAY DRIVE OF A LOOM

Jaromír Malásek, Ostrava; Vladimír Kuda, Blazkovice; Pavel Dvoracek, Brno, and Vladimír Horn, Brno, all of Czechoslovakia, assignors to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi, Brno, Czechoslovakia

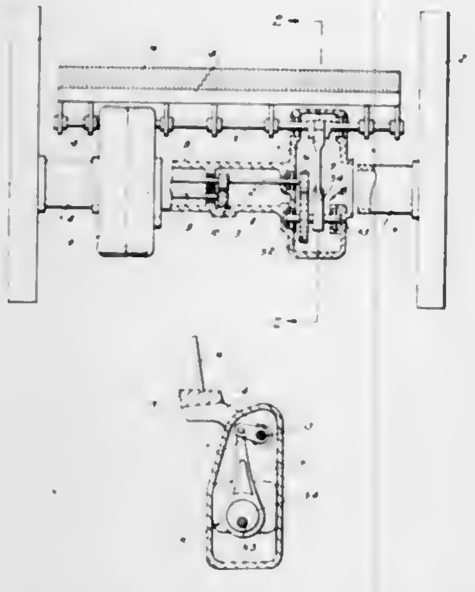
Continuation-in-part of Ser. No. 258,348, May 31, 1972, abandoned. This application Mar. 29, 1976, Ser. No. 671,116

Claims priority, application Czechoslovakia, June 2, 1971, 4033/71

Int. Cl.² D03D *49/60*

U.S. Cl. 139—190 **2 Claims**

1. In an apparatus for supporting a slay drive in a loom having a pair of spaced side members, the drive including a mutually cooperating main shaft, driven shaft and slay shaft, the apparatus comprising a self-supporting closed housing extending between the side members and receiving the main and driven shafts, the housing including a center part having a pair of gear boxes disposed on opposed outer ends thereof and a pair of end pieces individually extending between the respective gearboxes and the adjacent side members of the loom, each end piece being removably affixed to the associated gear box and side member, means disposed in each gear box for journalling spaced portions of the slay shaft, meansfor supporting the driven shaft in the central portion of the housing with



the ends of the driven shaft terminating in the respective gear boxes, means disposed in the housing for rotatably coupling the main and driven shafts, and motion-changing means disposed in each gear box and associated with the driven shaft and the slay shaft journalling means for converting the rotational movement imparted to the driven shaft by the main shaft into an oscillatory motion of the slay shaft.

4,036,266

TAKE-UP MOTION FOR LOOMS

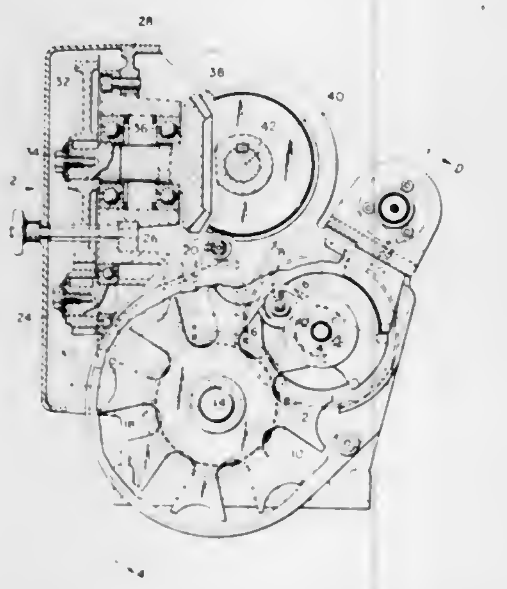
Siegbert Gsell, Neuravensburg; Hans Geiger, and Hans-Jurgen Maierhofer, both of Lindau, all of Germany, assignors to Lindauer Dornier Gesellschaft mbH., Germany

Filed Apr. 1, 1976, Ser. No. 672,736

Claims priority, application Germany, Apr. 17, 1975, 2516888

Int. Cl.² D03D *49/20*

U.S. Cl. 139—304 **3 Claims**



1. In a cloth take-up motion for looms with gradual taking-up of the cloth in which a take-up roller is adapted to be driven by drive shaft means and gear system means, and wherein the drive shaft executes one revolution with each weft,
the improvement which comprises crank means and pin means on said drive shaft means,
means axially displaceably mounting said pin means in said crank means,
Maltese cross means in which said pin means is adapted to engage,
electromagnet means and shifting linkage means whereby said pin means is adapted to be engaged in and disengaged from said Maltese cross means,
and reduction gear means connecting said Maltese cross means with said take-up roller.

4,036,267

DEVICE TO DETECT THE BELT TENSION OF WEFT INSERTING MEMBERS IN SHUTTLELESS LOOMS

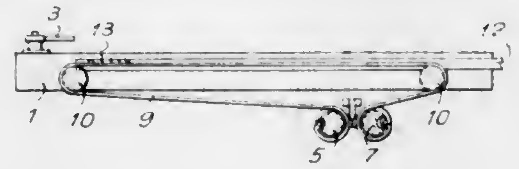
Luciano Santi, Florence, Italy, assignor to Officine Galileo Meccanotessile S.p.A., Florence, Italy

Filed Aug. 5, 1976, Ser. No. 712,063

Claims priority, application Italy, Aug. 7, 1975, 9509/75

Int. Cl.² D03D *51/18*

U.S. Cl. 139—336 **7 Claims**



1. A device to detect the tension uniformity of a belt in a weft inserting member of a shuttleless loom of the type having a belt anchored at its ends to fixed contiguous points, guide rollers for said belt, and a movable carriage supporting said rollers and movable with reciprocating motion to control a gripper for insertion of weft threads, said device comprising a cylindrical anchoring body on which one belt end is partly wound, an elastic means mounted on said body and disposed between the belt end and said body, said elastic means having resiliency and tending to displace the belt section wound on said body and serving to displace the belt section in the event of a reduction in the belt tension, and means for detecting such displacement of the belt section.

4,036,268

WIRE WRAPPING APPARATUS

Derek Ward, 11 Tui Vale Road, Auckland, New Zealand

Filed Mar. 30, 1976, Ser. No. 671,823

Int. Cl.² B21F *15/00*

U.S. Cl. 140—124 **15 Claims**

1. A tool for stripping an insulated wire and/or wrapping the wire around a terminal tag, said tool comprising a sleeve member and abit member adapted to slide axially within said sleeve member, said bit member having a longitudinal aperture at the free or operative end thereof adapted to receive said terminal tag, a recessed portion in the side of said bit member intermediate of the length thereof, a groove-channel means in the side of said bit member between said free end and said recesses portion, and a first insulating shearing means substantially at the junction of said groove-channel means with said recessed portion, said sleeve member incorporating a second insulating shearing means within said sleeve member axially located a predetermined distance from the free end of said sleeve member so that in use, upon said bit member being axially advanced, so that at least a part of said recessed portion protrudes from the free end of said sleeve member an insulated wire is inserted between the said sleeve and said bit and said bit withdrawn axially into said sleeve causing said first and said second insulation shearing means to coact with one another to rupture the insulation on said wire, said axial movement being continued to at least partially strip a predetermined length of insulation from said wire, said longitudinal aperture in said bit then being engageable with said terminal tag and said bit rotated thereabout causing said wire to wrap about said tag, where, by virtue of said second insulation shearing means being located a predetermined distance from the end of said sleeve member, a predetermined length of the wire-wrapped around the base of said tag retains the insulation covering.

4,036,269

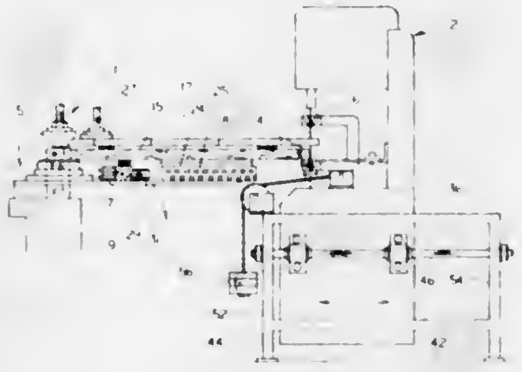
AUTOMATIC SHAPING DEVICE WITH A PRE-CUTTING ASSEMBLY

Arthur J. Rhodes, 2601 Benoch Ave., Louisville, Ky. 40216

Filed Sept. 4, 1975, Ser. No. 610,417

Int. Cl.² B27C *9/00, 5/02;* B26D *1/46*

U.S. Cl. 144—1 D **5 Claims**



1. In an automatic shaping device having a table, a power-driven shaping tool mounted to project above said table, a power-driven workpiece carrying member movably mounted to said table, said workpiece carrying member including template carrying means, the improvement comprising:
a frame having a cutting assembly means movably mounted thereto, said cutting assembly means including a power-driven band saw with a housing therefor;
forcing means cooperating with said cutting assembly and attached thereto for forcing said band saw into said workpiece; and,
a guide assembly attached to said housing, said guide assembly engageable with a template in conformity with a pattern defined by the outer periphery of said template.

4,036,270

LOG PEELING MACHINE

Kenneth G. Bright, Camas Valley, Oreg., assignor to Robert L. Westbrook and Henry Westbrook, III, both of Smith River, Calif., part interest to each

Continuation-in-part of Ser. No. 529,814, Dec. 5, 1974, abandoned. This application Oct. 1, 1975, Ser. No. 618,628

Int. Cl.² B27L *1/00*

U.S. Cl. 144—208 E **33 Claims**

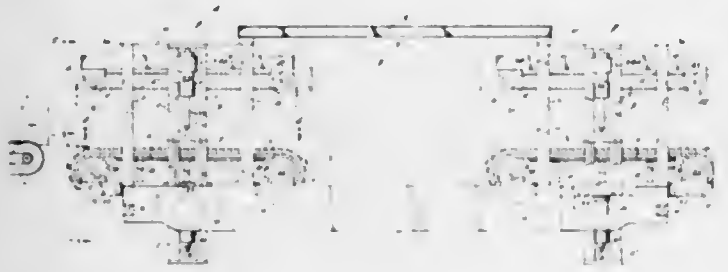
1. In a log peeling machine having a fixed axis peeler drum assembly supported on an elongate machine frame for the removal of the outer log surface, the improvement comprising a log conveying apparatus disposed intermediate upright members of the machine frame for linear passage of a log along an axis coincident with the fixed axis of said peeler drum assembly, said conveyor apparatus comprising,
a conveyor assembly disposed below the log being peeled, said assembly comprising,
  a horizontal conveyor frame adapted for vertical travel relative to the machine frame,
  a continuous log conveyor having upper and lower runs entrained about said frame for supported travel of the log along the conveyor frame,

- a motor on said frame powering said log conveyor,
- hydraulic means acting on said frame to move same toward and away from the projected axis of the peeler drum assembly,

a log hold down assembly supported by the peeling machine and disposed above the log path, said hold down assembly comprising,

- a hold down frame,
- rotatable means mounted in a spaced apart manner on said frame and adapted to bear in a spaced apart manner upon a log being peeled confining same against the conveyor assembly,
- a motor carried by said frame in driving connection with said rotatable means,
- guide means slidably entrained on said upright members of the machine frame for travel toward and away from the projected axis of the peeler drum assembly,
- pivot means interconnecting the hold down frame and said guide means permitting limited rotational movement of the frame about the horizontal axis of said pivot means permitting desired contact of said rotatable means with the log regardless of varying log diameters,
- hydraulic means acting on said hold down frame to vertically position same and to urge said rotatable means thereon into forceful log contact, and

said conveyor assembly and hold down frame hydraulic means comprising cylinders of like displacement and in series communication with one another and with an operator controlled source of pressure so as to impart synchronous closing movement to said conveyor and hold down frames moving same toward the projected axis of the peeler drum assembly to confine a log for passage along said axis through said peeler drum assembly in a precise manner.

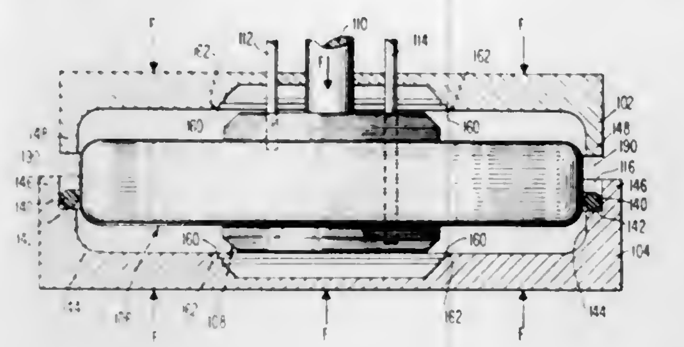


23. In a log peeling machine having infeed and outfeed conveyor apparatuses disposed on a machine frame for the transfer of a log in an axial manner, the improvement comprising a peeler drum assembly disposed on said machine frame intermediate said apparatuses, said peeler drum assembly comprising,

- a drum structure rotatably supported by the machine frame and adapted for powered rotation in one direction about a horizontal axis constituting the peeler drum assembly axis,
- motorized cutter head assemblies swingably mounted on said drum structure for movement toward the drum structure axis,
- means carried by said drum structure urging said cutter head assemblies toward a log moving in a coaxial manner through the drum structure,
- a hydraulic tank structure rotatable with said drum structure,
- counterrotating means adapted for powered rotation opposite to said one direction of drum rotation, and
- drum mounted pump components in driven connection with said counterrotating means providing the cutter head assemblies with a power source.

4,036,271
SEAMLESS RETREAD ENVELOPE

Fredrick Joseph Presti, 164 Shady Brook Circle, Warrington, Pa. 18976
Filed Sept. 10, 1975, Ser. No. 612,187
Int. Cl.² B29H *17/36*
U.S. Cl. 150—54 B **1 Claim**

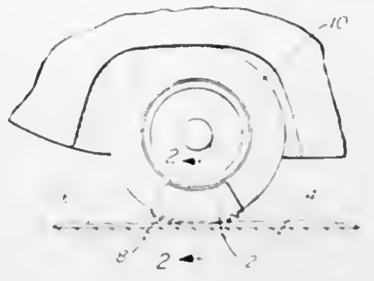


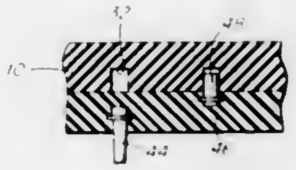
1. An article of manufacture for encasing the exterior surfaces of a tire having a cured tread adhered thereto by an uncured bonding layer during the curing of said tire, to form a retreaded tire, said article comprising a seamless compression-formed envelope for encasing the tread, bonding layer and side walls of said tire to thereby retain said tread against said tire and to prevent air from contacting said bonding layer, during said curing process, said envelope being compression molded to comprise two parallel, co-cylindrical substantially circular peripheral edges connected and spanned by a single elastomeric web extending radially outwardly from said edges, said elastomeric web having a U-shaped radial cross-section, said web comprising side wall and base wall portions, said side wall portions being generally disposed within parallel spaced apart planes and extending for a distance at least sufficient to encase at least the side walls of said tire to be encased, and said base wall portion being disposed generally within a cylindrical surface which is concentric to and of a radius which is greater than the radius of said peripheral edges by a distance at least as great as the side wall to be encased, said side wall portions portion and base wall portion being joined to each other by curved connecting portions.

4,036,272
SURE GRIP WINTER TIRE TRACTION DEVICE

Poy Lee, 52 Tennyson St., Somerville, Mass. 02145
Continuation-in-part of Ser. No. 547,624, Feb. 6, 1975, Pat. No. 3,937,262. This application Nov. 24, 1975, Ser. No. 634,514
The portion of the term of this patent subsequent to Feb. 10, 1993, has been disclaimed.
Int. Cl.² B60C *27/00, 11/14*
U.S. Cl. 152—210 **2 Claims**

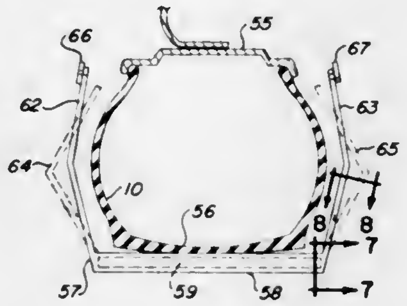
1. A device for attachment to a vehicle tire to improve traction of the tire with a surface upon which the tire rests, said device comprising an arcuate segment of a studded tire which is of a size that permits the segment to be attached to the vehicle tire and has a plurality of studs embedded in the segment with one end of the studs extending radially outwardly of the segment, a second plurality of studs also embedded in the segment and means for holding the studs of the second plurality of studs in the segment with one end of the studs extending radially inwardly of the inner surface of the segment.





4,036,273
TRACTION AUGMENTING ROAD GRIPS

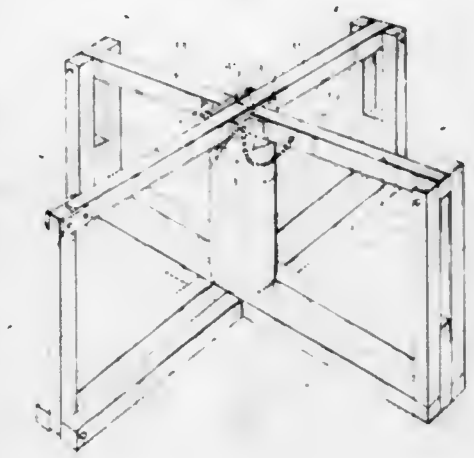
Kenneth E. Kemper, 2905 Cable Road, Anaconda, Mont. 59711
Filed June 16, 1975, Ser. No. 587,271
Int. Cl.² B60C *27/00, 27/10*
U.S. Cl. 152—225 R **9 Claims**



1. A traction augmenting rib removably attachable to a vehicle tire or the like which has a cross-section of a generally flat surface engaging portion and outwardly bulging sidewalls attachably cooperating with a mounting rim comprising an elongated member of semi-rigid flexible material having a central section at least as wide as the surface engaging portion of the tire and a pair of side arms each having one end thereof attached to a respective end of said central section so as to form a generally U-shaped configuration, at least one rigid cross bar embedded within said central section so as to extend throughout the length of said central section, said central section having a generally smooth inner surface for flush interfacing with the surface engaging portion of the tire, said arms being arranged in an outwardly directed spring bow relative to the sidewalls of the tire when the inner surface of said central section is placed against the surface engaging portion of the tire, and means for applying forces to the other ends of said side arms in a direction radially inward relative to the axis of the tire and with sufficient magnitude to at least partially straighten said side arms, each said side arm having sufficient length for responding to said radially inward force so that the said other end thereof is positioned at least in proximity to the edge of the mounting rim, said side arms each being adapted to flexingly follow changes in contour of the tire during movement of the vehicle.

4,036,274
SAFETY CAGE FOR TIRE INFLATION

Aubrey A. Peel, Sr., Rte. 2, 1505 Nemeth St., Auburndale, Fla. 33823
Filed July 6, 1976, Ser. No. 702,719
Int. Cl.² B60C *25/00*
U.S. Cl. 157—1 **9 Claims**

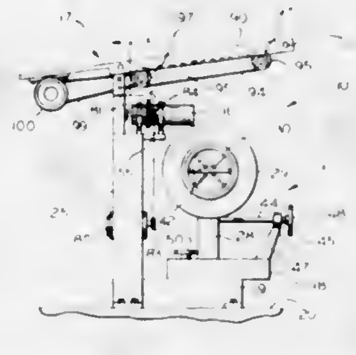


1. Safety cage for placing a pneumatic tire during inflation comprising in combination:

- a base frame;
- a center post member attached to said base frame and protruding therefrom, said center post member having a locking bracket fixedly attached thereto;
- side frame members attached to said base frame in a spaced relationship to said center post member;
- top frame members attached to said side frame members and movable toward said center post member in one position and movable to a second position to allow a pneumatic tire around said center post member, each said top frame member having a locking member mounted thereon for locking to said locking bracket fixedly attached to said center post member.

4,036,275
TIRE STRIPPING APPARATUS

Charles Earl Branick, 1601 S. 9th St., Fargo, N. Dak. 58102
Continuation of Ser. No. 460,356, April 12, 1974, abandoned.
This application June 20, 1975, Ser. No. 588,725
Int. Cl.² B29H *21/08;* B24B *21/02*
U.S. Cl. 157—13 **18 Claims**



11. In combination, an apparatus for stripping tread from tires comprising,

- tire support means including drive means for rotating a tire mounted thereon about its normal axis of rotation,
- cutting means for engaging a tire mounted on said tire support means for removing excess material from said tire,
- tire abrading means, second support means disposed adjacent said tire support means and supporting said tire abrading means for movement into engagement with said tire, said tire abrading means includes an elongate support,

coupling means for pivotally mounting said elongate support on said second support means adjacent said tire support means, belt sanding means mounted on said support means for pivotal movement therewith into selective tangential engagement with a tire supported on said tire support means, said coupling means also mounting said elongate support on said second support means for movement in an arcuate path which is generally normal to the axis of said elongate support whereby the shoulder portions of said tire may be abraded.

4,036,276
METHOD OF SHAPING A MOULD UNDER A REDUCED PRESSURE

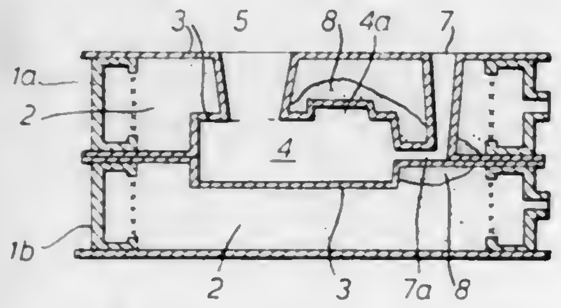
Kyozo Yahagi, and Takashi Yasukuni, both of Mihara, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 26, 1975, Ser. No. 617,164

Claims priority, application Japan, Sept. 30, 1974, 49-111635

Int. Cl.^{2} B22C *1/16*

U.S. Cl. 164—7 **2 Claims**



1. In a method for producing a cavity mould, wherein:
a flask is filled with moulding sand not containing a binder and covered with an airtight film which constitutes a shield having an ingate and sprue runner; a pattern is placed on the shield and the shield is formed thereabout; negative pressure is drawn on the moulding sand through the flask to maintain a mould cavity in the shape of the pattern and the pattern is removed;
the improvement wherein:
when the flask is being filled with moulding sand, instead of entirely using moulding sand not containing a binder, in the region of the mould sprue runner and elsewhere adjacent the shield where the shield is likely to be destroyed during introduction of molten metal into the mould cavity, the moulding sand not containing a binder is omitted, and instead thereof there is filled into those regions of the flask moulding sand mixed with 0.5–3.0 percent binder, by weight.

2. A reduced-pressure shaped mould, comprising:
a flask having means drawing a vacuum therethrough;
said flask containing a filling of moulding sand;
said flask also having an airtight film covering, including a portion lining surface means of the moulding sand and defining a mould cavity with an ingate and sprue runner communicating with the mould cavity;
said moulding sand not containing binder, except by said surface means about the sprue runner and by said surface means elsewhere where the shield is likely to be destroyed during introduction of molten metal into the mould cavity, the moulding sand of these exceptions being mixed with 0.5–3.0 weight percent binder.

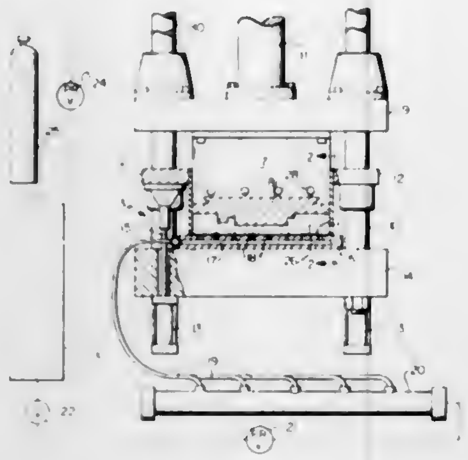
4,036,277
HIGH SPEED METHOD AND APPARATUS FOR PRODUCING FOUNDRY MOLDS

Kent Woonton, Kitchner, Canada; Jeffrey R. Short, III, Lincolnshire, Ill., and Kenneth N. Roach, Willowdale, Canada, assignors to J. R. Short Milling Co., Chicago, Ill.

Filed Oct. 17, 1975, Ser. No. 623,411

Int. Cl.^{2} B22C *15/08*

U.S. Cl. 164—16 **10 Claims**



1. A method for producing foundry mold parts, comprising
preparing a foundry sand mix comprising binder material which can be cured by a curing gas to render the mold part rigid;
depositing the sand mix upon an endless foraminous conveying member to form on the conveying member a bed of sand mix of predetermined depth;
moving the conveying member to present a portion of the bed of sand mix at a forming station at a time when the sand mix is characterized by adequate plastic flowability for forming and the binder material retains a curing potential adequate for rigidification of the formed mold part;
supporting the conveying member and said portion of the bed of sand mix at the forming station and forming said portion into the shape desired for the mold part by pressing a pattern into said portion with a pressure of 10–150 p.s.i. toward the conveying member while laterally confining said portion;
passing a gaseous curing agent through the foraminous conveying member into the formed portion of sand mix while the pattern is in engagement therewith and said portion is still laterally confined and thereby curing the shaped mold part to at least such an extent that the mold part can be moved and handled without breakage or significant deformation;
withdrawing the pattern from the shaped mold part so cured; and
removing the mold part from the forming station by advancing the conveying member beyond the forming station.

4,036,278
PROCESS FOR THE PRODUCTION OF LARGE STEEL INGOTS

Aldo Ramacciotti, Rome, Italy, assignor to Centro Sperimentale Metallurgico S.p.A., Rome, Italy

Filed Nov. 11, 1975, Ser. No. 630,765

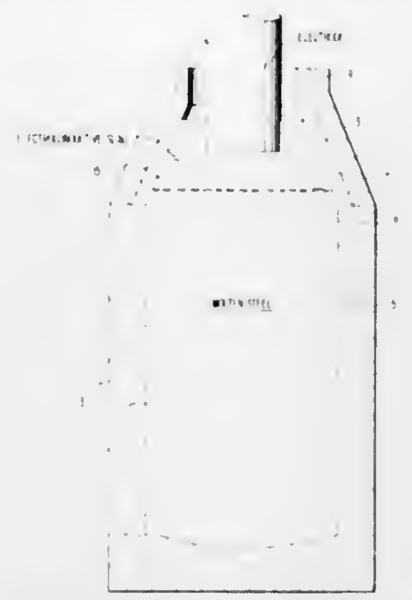
Claims priority, application Italy, Nov. 11, 1974, 53975/74

Int. Cl.^{2} B22D *27/02, 27/06*

U.S. Cl. 164—52 **8 Claims**

1. In a process for the production of a large steel ingot free from defects due to shrinkage cavities and with reduced segregation and low absorbed hydrogen content, comprising teeming a quantity of liquid steel into an ingot mold, establishing a layer of electrically conductivity liquid slag over said steel, immersing an electrode in said slag, and passing an electric current through said electrode and slag and steel to keep said

slag molten and to supply heat to the liquid steel in the mold; the improvement comprising, in a first stage, maintaining the electric current through said electrode and slag and steel at a level to supply just the amount of heat to the slag bath and metal in the top of the mold which is needed to maintain the layer of slag and only that part of the metal bath beneath the slag and contained in the top of the mold in a molten state while metal elsewhere in the mold solidifies and the level of the molten metal at the top of the mold decreases due to shrinkage of the metal in the mold upon solidification; and in a second stage increasing the current through the electrode and slag and steel sufficiently to melt a portion of the electrode to restore the original level of the steel in the mold.



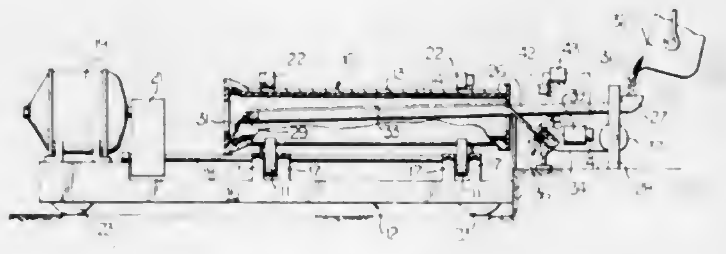
4,036,279
METHOD OF TREATING MOLTEN METAL IN CENTRIFUGAL CASTINGS

John R. Nieman, Pekin, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Sept. 8, 1976, Ser. No. 721,655

Int. Cl.^{2} B22D *27/20, 13/02*

U.S. Cl. 164—57 **5 Claims**



1. A method of centrifugal treating molten metal in casting comprising the steps of:
supporting an elongated hollow casting mold on a plurality of rollers with its longitudinal axis disposed substantially horizontal;
positioning a pouring chute with its discharge end disposed within the hollow casting mold and its receiving end outside of the hollow casting mold, the discharge end being lower than the receiving end;
positioning a guide member adjacent the pouring chute with one of its ends being adjacent the discharge end of the pouring chute;
rotating the casting mold by powerably driving at least one of the rollers;
pouring a molten base metal from a ladle into the receiving end of the pouring chute so that the molten base metal flows in a stream through the pouring chute and from the discharge end into the rotating casting mold;
feeding a treating agent in wire form from a wire feed mechanism along the guide member and into the stream of molten base metal adjacent the discharge end of the pouring chute for meltably intermixing therewith; and
controlling the wire feed mechanism and hence the feed rate of the wire in direct proportion to the flow rate of the molten base metal through the pouring chute.

4,036,280
METHOD OF STARTING THE CASTING OF A STRAND IN A CONTINUOUS CASTING INSTALLATION

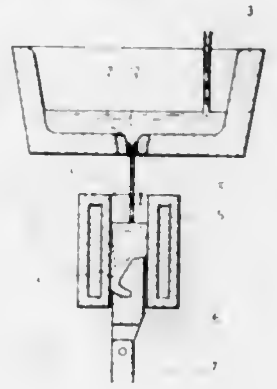
Adalbert Röhrig, Wadenswil; Fritz Willim, Birmensdorf, both of Switzerland, and Brian Hannah, Kempton Park, Transvaal, South Africa, assignors to Concast AG, Zurich, Switzerland

Filed July 16, 1976, Ser. No. 705,800

Claims priority, application Switzerland, July 18, 1975, 9423/75

Int. Cl.^{2} B22D *11/08*

U.S. Cl. 164—82 **7 Claims**



1. A method for starting-up the casting of a continuously cast strand, comprising the steps of:
a. providing a continuous casting mold equipped with a dummy bar having a dummy bar head for starting-up the continuous casting of a molten metal;
b. providing a tundish having a bottom pouring outlet;
c. prior to the start of casting inserting at least one meltable body into the bottom pouring outlet of the tundish to effect partial reduction in the cross-sectional area of said outlet;
d. teeming the molten metal from the tundish into the continuous casting mold;
e. reducing the throughflow rate of the molten metal teemed from the tundish into the continuous casting mold by means of the meltable body during a time interval lasting from the start of teeming the molten metal into the continuous casting mold until reaching a predetermined level of the molten metal in the continuous casting mold while melting the meltable body inserted into the bottom pouring outlet; and
f. accommodating the melting time of the meltable body to said time interval by selecting any one of at least its dimensions, the material from which it is formed, or both.

4,036,281
METHOD FOR CONTINUOUSLY CASTING A SLAB

Irving Rossi, Dunros Farm, James St., Morristown, N.J. 07960

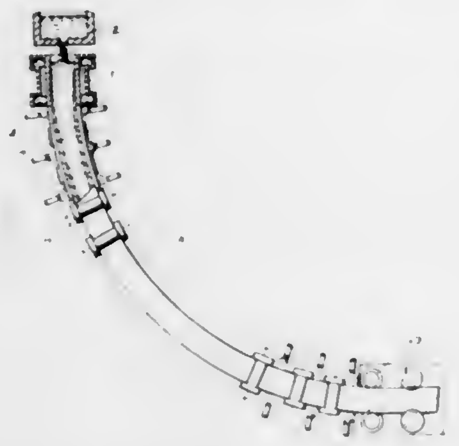
Filed Oct. 3, 1975, Ser. No. 619,464

Int. Cl.^{2} B22D *11/124*

U.S. Cl. 164—89 **3 Claims**

1. The method of continously casting a steel strand in the form of a rectangular slab having opposed wide side walls and opposed narrow end walls joining said wide side walls which comprises pouring molten steel into the upper end of a chilled mold having a mold passage of substantially rectangular cross section, continuously withdrawing from said mold a partially solidified strand comprising relatively thin soldified side and end walls forming an outer shell surrounding an inner molten core, subjecting the surfaces of said narrow end walls and the surfaces of the wide side walls immediately adjoining them to

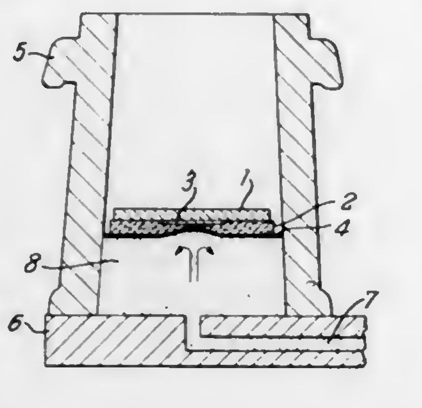
very intensive cooling below said mold by applying coolant fluid directly onto said surfaces to rapidly build up soldified metal in said narrow end walls and in portions of said side walls immediately adjoining said end walls, simultaneously subjecting the other surfaces of said wide side walls extending laterally therefrom to less intensive cooling by applying coolant fluid directly onto said surfaces so that there is a differential in the intensity of the cooling applied to the respective surfaces, the coolant applied to said narrow end surfaces and to said immediately adjoining wide side surfaces being applied at sufficiently high intensity to increase the wall thickness of said end walls and of the immediately adjoining wide side walls more rapidly than the thickness of those portions of said wide side walls extending laterally therefrom is increased by the coolant applied thereto, whereby the thickened end walls and immediately adjoining thickened portions of said wide side walls act as the ends of constrained beams to support and resist deflection of remaining portions of the wide side walls caused by the ferrostatic pressure of said molten core, and continuously applying coolant fluid to said narrow end and wide side surfaces of such differential intensities along continuous areas of said surfaces extending longitudinally of said strand from the level where the strand emerges from the mold to the level where the walls of said shell become self-sustaining.



4,036,282

PROCESS OF INGOT CASTING

Hidetoshi Asahara, Kobe, Japan, assignor to Foseco International Limited, Brimingham, England
Filed Sept. 2, 1975, Ser. No. 609,805
Claims priority, application Japan, Sept. 4, 1974, 49-101603
Int. Cl.² B22D *27/00*
U.S. Cl. 164—123 13 Claims

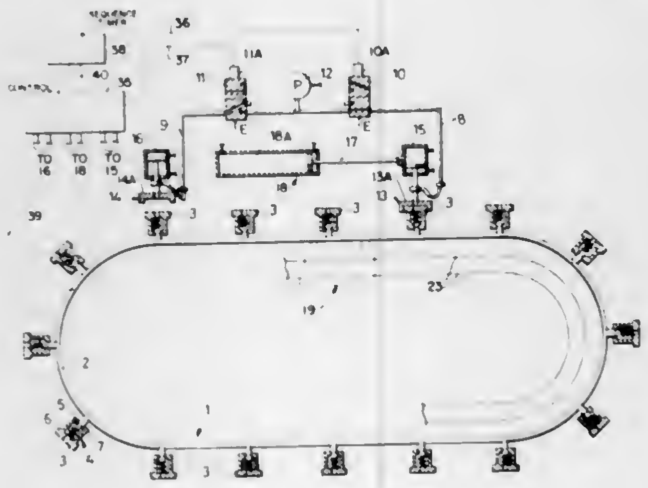


1. In a process for producing an ingot from a molten metal by bottom pouring molten metal into an ingot mould, the improvement which comprises locating in the ingot mould, prior to the commencement of pouring, a multi-layered board having a first layer which is a preformed slab comprising an anti-piping composition including an exothermic material and a second layer adjacent the first layer which is a preformed slab comprising a fluxing agent, a fibrous material and a binder, the second layer having a central cavity therein filled with a preformed refractory slab comprising a refractory material, a fibrous material and a binder, the slabs being arranged such that the refractory slab is enclosed within the board, and the board being located in the mould with the first layer uppermost.

4,036,283

RAIL CONVEYOR FOR FOUNDRY MOLDING BOXES

Herbert Grolla, Laasphe, Westphalia, Germany, assignor to Heinrich Wagner Maschinenfabrik, Laasphe, Westphalia, Germany
Continuation-in-part of Ser. No. 550,428, Feb. 18, 1975, abandoned. This application July 22, 1976, Ser. No. 707,613
Claims priority, application Germany, Mar. 1, 1974, 2409851
Int. Cl.² B22C *15/22*
U.S. Cl. 164—160 5 Claims

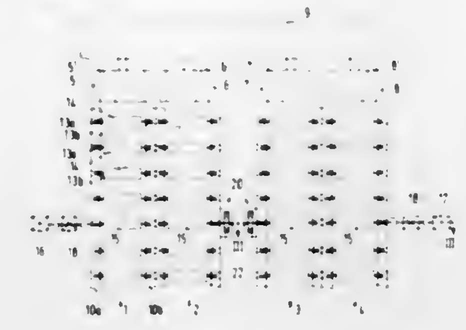


1. In a rail conveyor apparatus, comprising:
a plurality of rail conveyor trucks coupled together and movably supported on a rail and at least one foundry molding box mounted on each rail conveyor truck, each of said foundry molding boxes having a vacuum connector member on said truck associated therewith, said connector member having inner and outer ends;
a vacuum source;
first conduit means for interconnecting said inner ends of said connector members to said vacuum source;
at least a pair of coupling elements;
second conduit means coupling said vacuum source to said pair of coupling elements;
valve means in said second conduit means for alternately connecting said coupling elements to said vacuum source;
coupling head means connected to at least one of said coupling elements for effecting a coupling of at least one of said coupling elements to said outer end of one of said connector members on one of said rail conveyor trucks prior to an uncoupling of the other of said coupling elements from said outer end of another connector member on another rail conveyor truck; and
drive means connected to at least one of said pair of coupling elements for driving at least one of said pair of coupling elements in timed sequence with the movement of said rail conveyor trucks and said connector trucks and said connector members thereon whereby a vacuum is provided in said first conduit means for the period of time that said coupling head means couples said one coupling element to said one connector member so that said vacuum source is continuously maintained in coupled relation to said first conduit means.

4,036,284

CONTINUOUS CASTING APPARATUS FOR SLABS

Rudolf Hoffmann, Heyenfeldweg 50a, Krefeld, Germany (415)
Filed Mar. 8, 1976, Ser. No. 664,564
Claims priority, application Germany, Mar. 19, 1975, 2511913
Int. Cl.² B22D *11/128*
U.S. Cl. 164—280 10 Claims

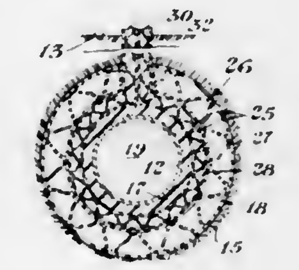


1. Continuous casting apparatus for slabs, comprising:
first and second mould means, arranged in closely spaced, side-by-side relationship;
a common distributor groove for supplying melt to said mould means;
first and second independent guide tracks operatively connected respectively to said first and said second mould means, and arranged in side-by-side relationship located as closely adjacent each other as possible, each of said independent guide tracks having idler rollers and individually driven rollers for guiding a cast slab;
first motor means located on the free outside of said first guide track, and connected to the driven rollers of said first guide track;
second motor means also located on the free outside of said first guide track; and
drive shaft means extending across said first guide track from said second motor means to the driven rollers of said second guide track, and connected to said driven rollers of said second guide track.

4,036,285

ARRANGEMENT TO CONTROL HEAT FLOW BETWEEN A MEMBER AND ITS ENVIRONMENT

John S. Best, Frankenmuth, Mich., assignor to The Dow Chemical Company, Midland, Mich.
Division of Ser. No. 331,089, Feb. 9, 1973, Pat. No. 3,948,313, which is a continuation of Ser. No. 112,636, Feb. 4, 1971, Pat. No. 3,768,547. This application Dec. 10, 1975, Ser. No. 639,334
The portion of the term of this patent subsequent to Oct. 30, 1990, has been disclaimed.
Int. Cl.² E21B *43/24*
U.S. Cl. 165—45 4 Claims

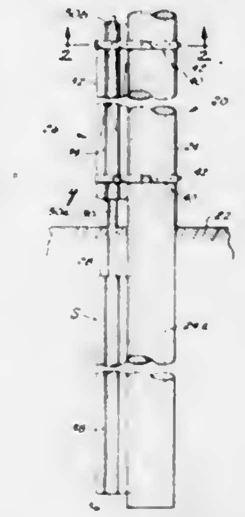


1. An arrangement to remove excess heat from an underground fluid line, said arrangement comprising a thermal bleed exposed directly to the line to dissipate heat from the line, said thermal bleed comprising a cell structure providing means for bleeding excess quantities of heat from said line to the atmosphere by natural heat transfer mechanism, said thermal bleed extending substantially about the periphery of said line, a heat sink located between said thermal bleed and earth supporting said line, said heat sink of sufficient capacity to prevent heat from such line from reaching said earthen support.

4,036,286

PERMAFROST STABILIZING HEAT PIPE ASSEMBLY

John H. Anderson, and Elmer D. Waters, both of Richland, Wash., assignors to McDonnell Douglas Corporation, Long Beach, Calif.
Continuation-in-part of Ser. No. 303,221, Nov. 2, 1972, Pat. No. 3,823,769. This application Apr. 22, 1974, Ser. No. 462,916
The portion of the term of this patent subsequent to July 16, 1991, has been disclaimed.
Int. Cl.² F28D *15/00*
U.S. Cl. 165—45 4 Claims



1. In a structural support installation in a permafrost or similar environment, an improved permafrost stabilizing assembly comprising:
a support structure including a tubular body having a normally lower portion thereof installed in a generally permafrost-like medium, said support body having a accommodation space therein, and means for sealing said lower body portion at a lower end thereof to produce an accommodation space which is closed at its lower end;
at least one heat pipe element including a cylindrical tubular container having a charge of working fluid therein, said container comprising a normally lower portion including a predetermined part which is installed in said accommodation space, and a normally upper portion including a predetermined part adapted to be coupled to a heat exchanger at least partially exposed to a generally atmosphere-like medium, said accommodation space being comparatively large laterally in respect to said lower container portion, said predetermined part of said lower container portion being installed in said accommodation space at least in proximity longitudinally to an inner surface of said support body, and said upper container portion having a wall sufficiently strong and thick to allow safe processing work thereon;
a first substance having a thermal conductivity greater than air generally filling said accommodation space remaining between said support body and said lower container portion of said at least one heat pipe element; and
at least one heat exchanger including a radiator having a cylindrical tubular body, and heat transferring fins affixed to a predetermined part thereof, said radiator body having a cylindrical coupling surface generally positioned concentrically at least in proximity to said predetermined part of said upper container portion of said at least one heat pipe element, and said predetermined part of said upper container portion of said at least one heat pipe element of said radiator body with its cylindrical coupling surface being sized to provide for an interference press fit such that said radiator body can be press-fitted on said prede-

termined part of said upper container portion for attachment thereto,

whereby heat picked up by said support body from said permafrost-like medium is conducted at least partially by said first substance to said predetermined part of said lower container portion of said at least one heat pipe element installed in said accommodation space and transported by said working fluid in vaporized form to said predetermined part of said upper container portion of said at least one heat pipe element coupled to said at least one heat exchanger for transfer to said atmosphere-like medium accompanied with condensation of said vaporized working fluid for return to said predetermined part of said lower container portion of said at least one heat pipe element.

4,036,287
RADIATOR FOR HEATING PLANTS WITH ELEMENTS

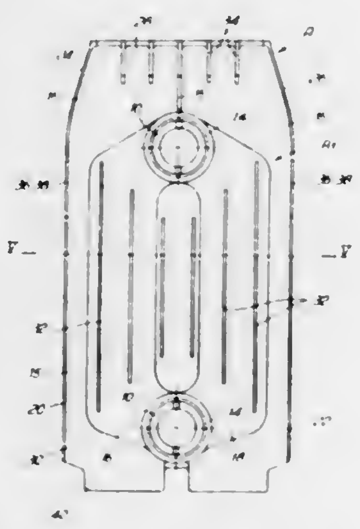
Giuseppe Perani, Brescia, Italy, assignor to Fonderie F. Ili Perani S.p.A., Brescia, Italy

Filed Jan. 29, 1975, Ser. No. 545,217

Claims priority, application Italy, Feb. 1, 1974, 20683/74

Int. Cl.^{2} F24H *9/04*

U.S. Cl. 165—55 **7 Claims**



1. A radiator for heating plants consisting of a plurality of tubular elements arranged side by side and in successive order, said tubular elements being mechanically connected and hydraulically connected to each other by means of upper and lower lateral connections wherein each of said tubular elements consists of a hollow tubular plate housed in a substantially parallelepipedically shaped block with a tapered open top and an open bottom, said block being provided, at the edge of its faces, with upright coplanar wings alignable head against head with the wings of the adjacent elements to form, between said elements, chimneylike ducts, the upper openings of which have a smaller cross-section than the lower openings to increase the circulation of hot air, and side upper openings being defined by matching notches in the edges of said coplanar wings to further increase the circulation of hot air.

4,036,288
RADIATOR, ESPECIALLY FOR THE AIR-CONDITIONING SYSTEM OF AN AUTOMOBILE

Rene Neveux, Les Clayes-sous-Bois, France, assignor to Societe Anonyme Francaise du Ferodo, Paris, France

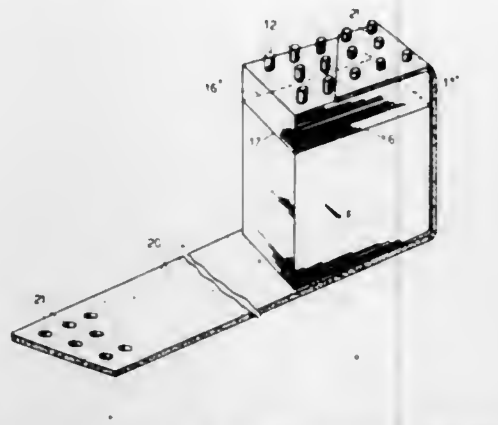
Filed July 10, 1975, Ser. No. 594,620

Claims priority, application France, July 10, 1974, 74.23998

Int. Cl.^{2} F28D *1/04, 7/00;* **F28F** *1/30, 9/00*

U.S. Cl. 165—69 **3 Claims**

1. A radiator adapted to be used in the air conditioning system of an automotive vehicle having water tanks and an air duct, the radiator comprising a plurality of tubes extending between said water tanks, a stack of fins affixed to and traversed by said tubes, means for connecting said water tanks to a circuit of primary fluid circulating through said tubes, means for circulating a secondary fluid through said stack of fins in a direction substantially prallel to said fins and thus substantially perpendicular to said tubes, and a gasket for the air tight mounting of the radiator within said air duct of said air conditioning sytem, said gasket being made of a single flat band of foam material applied against the edges of said fins, having a width at least equal to that of the dimension of the fins measured parallel to the direction of flow of said secondary fluid through the radiator, the length of said band being at most equal to the perimeter of a longitudinal section of the stack of fins, said band being applied onto said fins with a slight tension and having holes through which the end portions of the tubes protrude with respect to the stack of fins to maintain said band in position with respect to said fins.



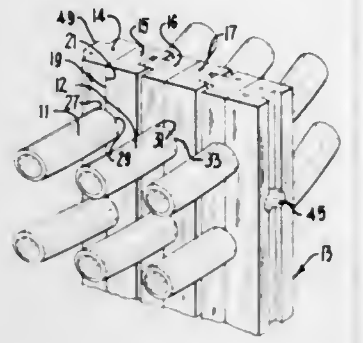
4,036,289
HEAT EXCHANGER TUBE BUNDLE SUPPORT SYSTEM

Shih-che Cheng, San Diego, and Jay Stephen Kaufman, Del Mar, both of Calif., assignors to General Atomic Company, San Diego, Calif.

Filed Jan. 20, 1975, Ser. No. 542,518

Int. Cl.^{2} F28D *7/00;* **F28F** *9/00*

U.S. Cl. 165—82 **5 Claims**



1. In a heat exchanger, a tube bundle comprising a plurality of coaxil convoluted tubes with the convolutions of the respective tubes having different radii, and a spacer structure comprising a plurality of elongated parallel bars arranged in pairs, said bars in each pair having abutting surfaces with semicircular recesses therein to form circular openings accommodating the convolutions of one of said tubes means intermediate their ends securing said bars in each pair together such as to cause said bars in each pair to claim the convolutions of the associated tube in said circular openings, said bars in adjacent pairs having facing surfaces formed in an interfitting tongue and groove configuration extending continuously the full length thereof, said tongues and grooves having radial and circumferential clearances therein sufficient to accommodate radial and circumferential thermal expansion differences in the adjacent tubes.

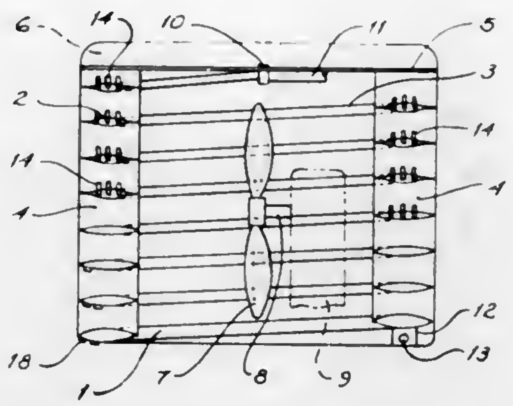
4,036,290
HELICAL EXPANSION CONDENSER

Donald A. Kelly, 58-06 69th Place, Maspeth, New York, N.Y. 11378

Filed Jan. 24, 1972, Ser. No. 219,985

Int. Cl.^{2} F28B *1/06;* **F28D** *15/00*

U.S. Cl. 165—105 **8 Claims**



1. A helical expansion condenser consisting of a continuous helical coil of elliptical cross-section with a vapor entrance at the top and a condensate exit at the bottom,

multiple flat fin spacing means vertically disposed between the coils of said continuous helical coil,

a perforated metal sheet uniformly disposed and secured to the top of said continuous helical coil,

multiple uniform fins secured to the top of said perforated metal sheet,

a centrally disposed cooling fan and drive means within the said continuous helical coil,

sealed vapor entrance connection means disposed at the top of said continuous helical coil,

sealed condensate exit means disposed at the bottom of said continuous helical coil,

multiple short heat pipes angularly and uniformly disposed midway into the top surface of said continuous helical coil, weld joining and sealing of each said heat transfer pipe onto the top surface of said continuous helical coil.

4,036,291
COOLING DEVICE FOR ELECTRIC DEVICE

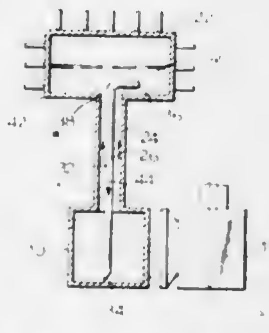
Gai Kobayashi, and Yoshiro Shikano, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 17, 1975, Ser. No. 559,393

Claims priority, application Japan, Mar. 16, 1974, 49-30486

Int. Cl.^{2} H01L *23/42*

U.S. Cl. 165—105 **7 Claims**



1. A vapor cooling device for an electric device comprising, in combination, at least one vapor cooling means having charged therein an amount of a condensible coolant in the form of a liquid phase capable of removing heat generated from an electric device by changing said coolant from its liquid phase to its vapor phase, condenser means disposed above said vapor cooling means, a connection tube member for connecting said vapor cooling means to said condenser means to put both means in fluid communication, said condenser means condensing the coolant in its vapor phase from said vapor cooling means into its liquid phase through the phase change, said coolant in its liquid phase further filling said condensor means to include a liquid surface positioned above the junction of said connection tube member and said condenser means, and at least one auxiliary tube member disposed within said connection tube member including an upper end portion extending from the junction of said connection tube member and said condenser means and bent extending laterally and opening within said condenser means below said liquid surface of said coolant and also including a lower end opening within said vapor cooling means, said vapor cooling means, said condenser means, said connection tube member and said auxiliary tube member forming a closed coolant loop.

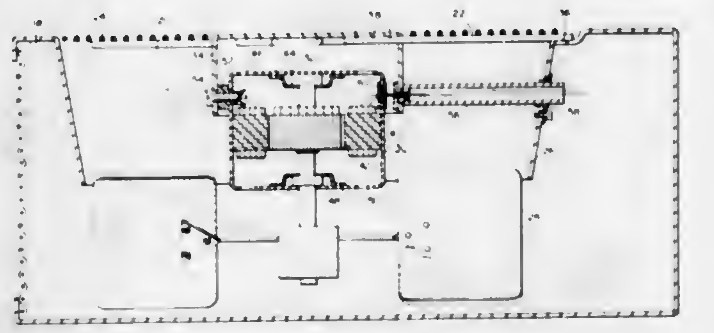
4,036,292
REFRIGERATION CONDENSER

Louis P. Hine, Jr., Pleasanton, Calif., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Oct. 21, 1975, Ser. No. 624,353

Int. Cl.^{2} F24H *3/06;* **F28F** *13/12*

U.S. Cl. 165—122 **7 Claims**



1. A refrigeration condenser including:

a housing containing a condenser coil and having side walls and a top wall, said top wall having an opening for the flow of condensing air therethrough;

motor shield and support means in the center of said top wall opening;

a vertical shaft fan motor having an enclosing shell, said shell being supported directly from said motor shield and support means;

a fan secured to said motor shaft below said motor; and

a series of radial spokes having their radially outer ends rigidly secured to said housing at the perimeter of said top wall opening and extending in a substantially straight line to said motor shield and support means with their radially inner ends rigidly secured to said motor shield and support means so that the weight of said motor and fan is borne in part at least by tension in said spokes.

4,036,293
HEAT EXCHANGER FOR GASES OF GREATLY VARYING TEMPERATURES

Eggert Tank, Fellbach, and Manfred Stute, Esslingen, both of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed June 7, 1974, Ser. No. 477,187

Claims priority, application Germany, June 9, 1973, 2329634; June 9, 1973, 2329636

Int. Cl.^{2} F28F *19/00*

U.S. Cl. 165—134 **54 Claims**

43. A heat-exchanger for gases of greatly varying temperatures, comprising a collective chamber means for the colder gases and a metal recuperator means having a number of pipes which are fastened to the collective chamber means, the hotter gases thereby flowing through between the pipes of the recuperator means, characterized by protective means arranged within the area of the connecting places between the pipes of the recuperator means and the collective chamber means for protecting the connecting places against the hot gases, and in

that the protective means covers off the pipe-connecting places directly exposed to the inflowing hot gases and is constructed bent approximate S-shaped in cross section and adjoins tangentially the outer wall of the collective chamber means.

4,036,294

HEAT EXCHANGER ASSEMBLY DESIGNED AS A LONGITUDINAL COUNTERFLOW DEVICE

Hans Ecker, Ludwigshafen, Germany, assignor to Hochtemperatur-Reaktorbau GmbH, Cologne, Germany

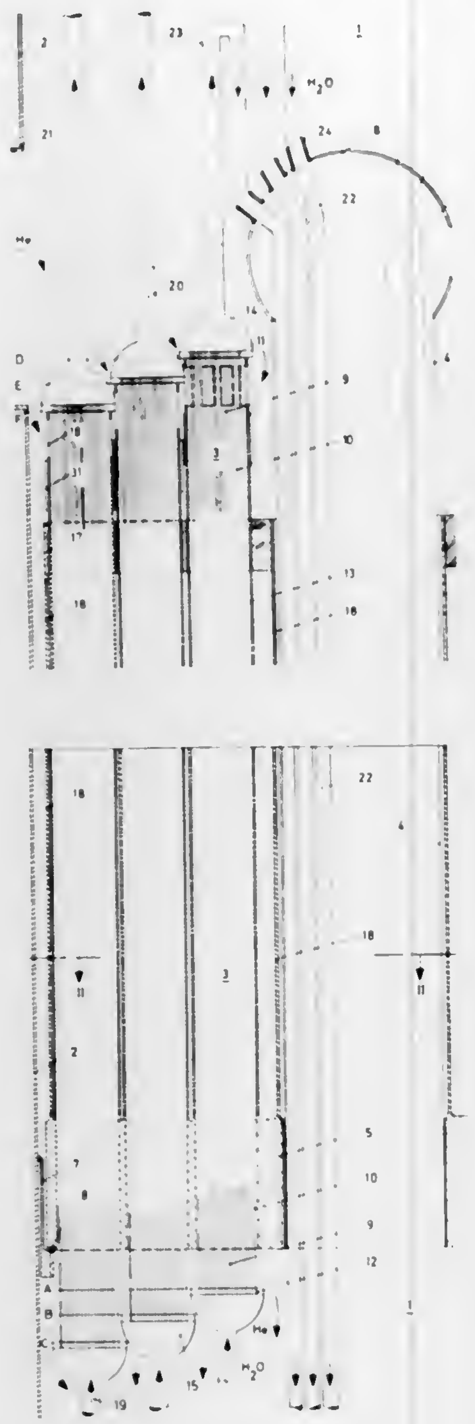
Filed Apr. 15, 1976, Ser. No. 677,237

Claims priority, application Germany, Apr. 22, 1975, 2517693

Int. Cl.^{2} F28D *7/10*

U.S. Cl. 165—154 **11 Claims**

1. A heat exchanger assembly of the counterflow type having a vertically extending longitudinal configuration comprising a plurality of individual tube nests each of said nests being formed of a plurality of individual tubes adapted to have a first heat exchange medium flow therethrough, tube plates connected to the ends of said tubes between which said tubes extend, a guide shell surrounding each of said tube nests for effecting therein flow of a secondary heat exchange medium around the individual tubes of said tube nest, each of said tube nests being formed by its associated guide shell and tube plates as individual boxes, said boxes thus formed, when viewed in a plane extending transversely to the longitudinal direction of said heat exchanger assembly, being arranged as a hexagonal grid, a supporting structure generally located in the bottom region of said vertically extending heat exchanger assembly and having said boxes welded thereto, a housing for said heat exchanger assembly surrounding said hexagonal grid of boxes and forming together with said supporting structure a tight joint to enclose said assembly, a central guide shell located centrally of said hexagonal grid and surrounded by said boxes, said central guide shell enclosing therein a plurality of return tubes for returning to said tubes forming said tube nests the heat exchange medium flowing therethrough, and a hood enclosing said central guide shell and having said return tubes extending therethrough with said return tubes welded to said hood.



4,036,295

METHOD AND APPARATUS FOR CONNECTING FLOWLINES TO UNDERWATER INSTALLATIONS

Kerry G. Kirkland, Houston; Anthony J. Masciopinto, Humble, and James H. Owens, Houston, all of Tex., assignors to Armco Steel Corporation, Middletown, Ohio

Filed Apr. 22, 1976, Ser. No. 679,226

Int. Cl.^{2} E21B *7/12*

U.S. Cl. 166—.6 **14 Claims**

1. In an underwater installation of the type in which a flowline to be laid along the bottom of a body of water is connected to a flow unit which is supported adjacent the bottom of the body of water, the combination of

a permement base mounted adjacent the bottom of the body of water and comprising

locator means in a fixed relation relative to the installation, and

means for connection to elongated guide means to extend from the surface of the body of water to the underwater installation;

a flowline;

a flowline base assembly superimposed on said permanent base and comprising

means operatively related to said locator means to locate said flowline base assembly in a predetermined position relative to said locator means,

connector means, and

swivel means;

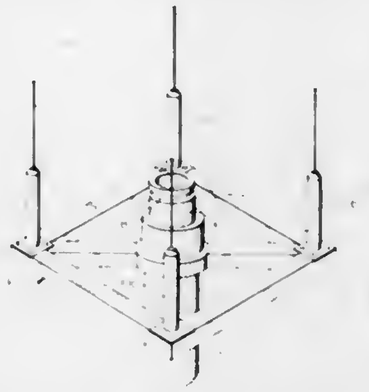
one end of said flowline being connected to said swivel means;

said connector means, said swivel means and said flowline being arranged to establish a flow path for conducting fluid via said flowline when the installation is complete, said swivel means being constructed and arranged for free swivelling about a swivel axis which is aligned with a portion of said flow path;

a flow unit base superimposed on said flowline base assembly,

said flow unit base carrying the flow unit of the underwater installation and including means operatively related to said locator means of said permanent base to locate the flow unit in a predetermined position relative to said locator means and therefore also in a predetermined position relative to said flowline base assembly; and

remotely operated power means for establishing connection between the flow unit and said swivel means via said connector means.



4,036,296

SUBSURFACE WELL APPARATUS

James D. Mott, Houston, Tex., and Tosh Miyagishima, Simi, Calif., assignors to Hydril Company

Filed May 23, 1975, Ser. No. 580,240

Int. Cl.^{2} E21B *43/12*

U.S. Cl. 166—322 **10 Claims**

1. An improved apparatus for effecting operation of a rotatable ball closure element of a through-the-bore movable subsurface safety valve for controlling flow of well fluids through the bore of a well tubing at a desired subsurface location, including:

a tubular frame means movable through the bore of a tubing to and from a subsurface location in a well;

means with said frame means for releasably securing said frame means with the well tubing at the desired subsurface location;

a ball closure element having an outer spherical surface and a flow opening formed therethrough;

annular seat means formed by said frame means having a central opening therethrough for sealingly engaging with said outer spherical surface of said ball closure element to block passage of fluid between said ball closure element and said seat means, said ball closure element rotatable on said seat means to and from an open position aligning said flow opening with a central opening of said annular seat means for enabling flow and a closed position with said flow opening out of communication with said central opening to block flow of fluid with said ball closure element;

cage means partially surrounding said ball closure element and connected with said annular seat means for pivotally connecting with said ball closure element to hold said ball closure element adjacent said annular seat means during rotation of said ball closure element; and

operator means partially surrounding said ball closure element for effecting rotation of said ball closure element, said operator means including:

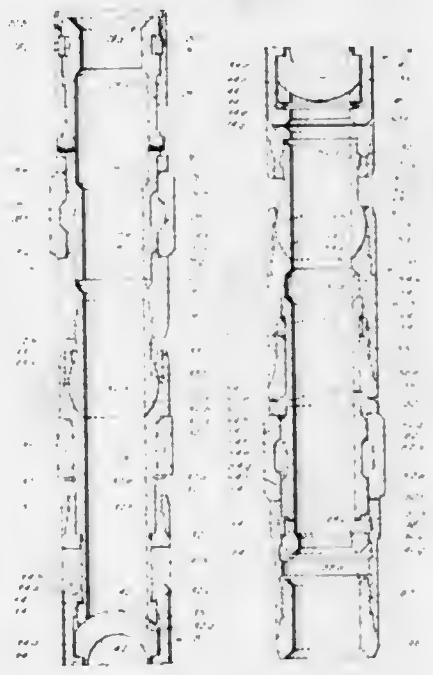
a longitudinally bisected operator sleeve having longitudinally extending slots formed in said operator sleeve on opposite sides of said ball to provide clearance for enabling controlled longitudinal movement of said longitudinally bisected operator sleeve relative to said cage means;

a first securing ring mounted with said longitudinally bisected operator sleeve above said ball closure element to secure said first and second portions of said longitudinally bisected operator sleeve as a unit for simultaneous movement;

a second securing ring mounted with said longitudinally bisected operator sleeve below said ball closure element to secure said first and second portions of said operator sleeve as a unit for simultaneous movement;

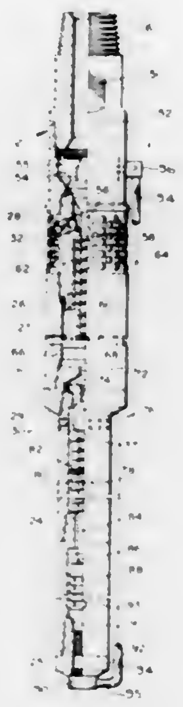
means carried by said longitudinally bisected operator sleeve for engaging said ball closure element to rotate said ball closure element to and from the open and closed position when said operator sleeve moves longitudinally relatively to said cage means;

means connected with said longitudinally bisected operator sleeve for effecting longitudinal operating movement of said bisected operator sleeve to rotate said ball closure element to and from the open and closed position, said means for effecting longitudinal operating movement including a first tubular operator portion and a second tubular operator portion having a universal joint connection therebetween to enable flexing of said first tubular portion relative to said second tubular portion for enabling flexing of said operator means during passage of said operator means through curves in the tubing.



4,036,297
SUBSURFACE FLOW CONTROL APPARATUS AND METHOD

Patrick S. Swihart, Sr., 3507 Baumann, Midland, Tex. 79701
Continuation-in-part of Ser. No. 560,350, March 21, 1975, Pat. No. 3,968,839. This application July 2, 1976, Ser. No. 702,144
Int. Cl.^{2} E21B ***43/12, 47/06***
U.S. Cl. 166—250 **15 Claims**

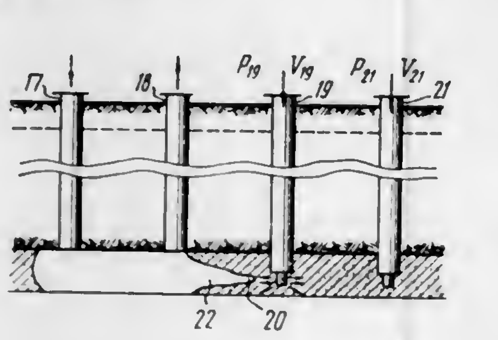


1. In a borehole having a fluid producing formation location downhole therein, and a production tubing extending downhole into proximity of the formation, with the tubing forming a produced fluid flow path and a borehole annulus, the improvement comprising:
- a subsurface flow controller for controlling flow of fluid from the formation into the tubing string, said controller being in the form of a fluid conducting hollow body and having an upper and lower end portion, said hollow body having means forming a piston chamber, a production inlet chamber, and a production outlet chamber therewithin;
- said piston chamber having a piston reciprocatingly received therewithin and dividing the last said chamber into an upper and lower piston chamber;
- a pilot valve, means by which said pilot valve is actuated in response to the pressure differential between the bottomhole pressure and the tubing pressure above the tool to thereby control the flow of produced fluid into and out of said lower piston chamber;
- a production valve seat separating said production outlet chamber from said production inlet chamber, a production valve element having means by which it is actuated by said piston from an opened to a closed position for controlling fluid flow through said production valve seat; a choke forming a produced fluid inlet into said production inlet chamber; means forming a bleed port which is arranged respective to the piston so that downhole pressure is effected within said upper piston chamber when said production valve is closed and which is effected within said lower piston chamber when said production valve is moved to the open position; and means biasing said production valve element towards the closed position;
- so that increased bottomhole pressure opens said pilot valve to cause said piston to open said production valve element, and fluid flow can occur through said production valve seat until a reduced flow rate through the last said seat causes the production valve element to assume a closed position.

9. Method of controlling mixed liquid and gaseous fluid flow from a producing formation located downhole in the borehole, wherein the produced fluid flows uphole through a production tubing string, comprising the steps of:
1. locating a flow controller downhole in a borehole in proximity of the production formation;
2. connecting the flow controller to the tubing string so that fluid flow through the tubing string is controlled by the action of the controller;
3. sensing the pressure differential between the formation pressure and tubing pressure, and moving the controller to a fluid flow position in response to the bottomhole pressure increasing to a value which will expel most of the accumulated liquid from the borehole;
4. sensing the flow rate through the tubing string and moving the controller to a position to prevent fluid flow through the tubing string in response to the flow rate decreasing to a value which is in excess of a rate of flow where insufficient velocity through the tubing string is available to carry liquid to the surface by entrainment.

4,036,298
METHOD OF CONNECTION OF WELLS BY IN-SITU COMBUSTION

Efim Vulfovich Kreinin, Starye Kuzminki 127a Kvartal, 9b, kv. 69, and Kirill Nikolaevich Zvyagintsev, ulitsa Dolgoprudnaya, 13a, kv. 51, both of Moscow, U.S.S.R.
Filed Aug. 12, 1975, Ser. No. 603,820
Claims priority, application U.S.S.R., Aug. 21, 1974, 2056358
Int. Cl.^{2} E21C ***43/00***
U.S. Cl. 166—251 **3 Claims**

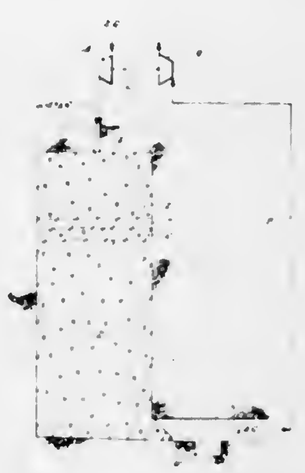


1. A method of mine-less connection of a series of first, second, third and successive wells for underground gasification via a unitary gasification channel by the fire infiltration technique, comprising the steps of: setting a combustion center by igniting the mineral bed in a first well to be connected by the gasification channel; forcing a gaseous, oxygen-containing blast at a permanent flow rate into a second well; measuring the pressure of the blast forced into the second well; and forcing a gaseous, oxygen-containing blast into a third well upon the pressure of the blast in the second well dropping considerably, each of the wells being disposed adjacent the preceding well in the series and in the direction of formation of the gasification channel.

4,036,299
ENRICHING OFF GAS FROM OIL SHALE RETORT

Chang Yul Cha, Bakersfield, Calif., and Richard D. Ridley, Grand Junction, Colo., assignors to Occidental Oil Shale, Inc., Grand Junction, Colo.
Continuation-in-part of Ser. No. 492,289, July 26, 1974, abandoned. This application Sept. 22, 1975, Ser. No. 615,558
Int. Cl.^{2} E21B ***43/24***
U.S. Cl. 166—261 **47 Claims**

1. A method of recovering liquid and gaseous products from fragmented oil shale in an in situ oil shale retort in which a combustion zone is advanced therethrough, which comprises the steps of:
- establishing a combustion zone having a temperature higher than about 800° F in the fragmented oil shale in the in situ oil shale retort;
- introducing into said combustion zone, in the direction in which said combustion zone is to be advanced, a gaseous feed mixture comprising an oxygen supplying gas and water vapor at a rate sufficient to maintain the temperature in said combustion zone at a temperature higher than about 800° F and to advance said combustion zone through the in situ oil shale retort, and producing combustion product gases in said combustion zone;



- passing flue gas, comprising said combustion product gases and unreacted gaseous feed mixture gases, from the combustion zone through the fragmented oil shale in the in situ retort in the direction of the advancement of said combustion zone, thereby retorting oil shale in a retorting zone on the advancing side of said combustion zone to produce liquid and gaseous products;
- condensing water vapor on unretorted oil shale on the advancing side of the retorting zone to form liquid water; and
- withdrawing liquid water, said liquid product and retort off gas comprising said gaseous products and said flue gas from the in situ oil shale retort on the advancing side of said combustion zone.

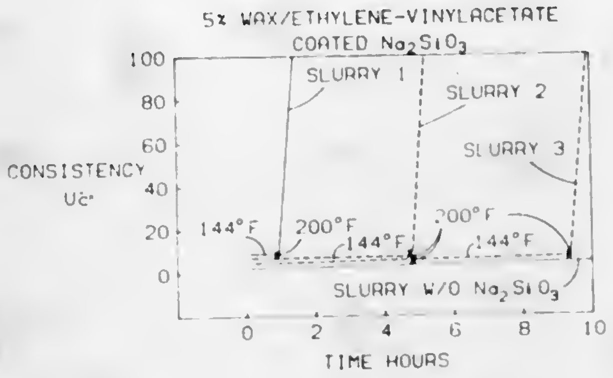
4,036,300
MICELLAR FLOODING PROCESS

LeRoy W. Holm, and Donald H. Ferr, both of Fullerton, Calif., assignors to Union Oil Company of California, Brea, Calif.
Filed June 23, 1976, Ser. No. 699,199
Int. Cl.^{2} E21B ***43/22***
U.S. Cl. 166—273 **30 Claims**

1. In a method for recovering petroleum from a subterranean reservoir including the steps of injecting into said reservoir through an injection well a micellar displacement system comprising a micellar solution and an aqueous phase, and thereafter injecting an aqueous flooding medium to drive said micellar displacement system towards a spaced production well from which fluids are recovered, the improvement which comprises:
- introducing into said reservoir with said micellar displacement system a chelating agent in an amount in excess of that amount required to chelate multivalent cations contained in said aqueous phase of said micellar displacement system, said chelating agent being selected from the group consisting of aminopolycarboxylic acids, the ammonium salts and the alkali metal salts thereof.

4,036,301
PROCESS AND COMPOSITION FOR CEMENTING CASING IN A WELL

Charles A. Powers; George B. Holman, both of Tulsa, and Robert C. Smith, Inola, all of Okla., assignors to Standard Oil Company (Indiana), Chicago, Ill.
Continuation-in-part of Ser. No. 518,543, Oct. 29, 1974, abandoned, which is a division of Ser. No. 561,518, March 24, 1975, abandoned. This application July 12, 1976, Ser. No. 704,717
Int. Cl.^{2} E21B ***33/14***
U.S. Cl. 166—293 **13 Claims**

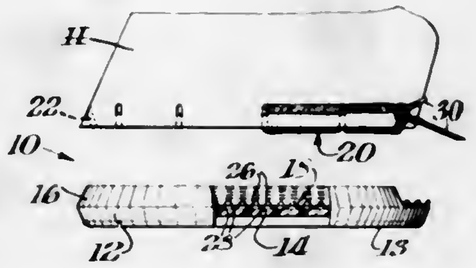


11. A method of preserving the desirable short wait-on-cement time characteristic of an accelerated cement slurry in cementing applications, wherein external retarder-type contamination is anticipated, involving the specific improvement of adding to the cement slurry, prior to placement, an encapsulated accelerator having a coated which will soften and melt at the temperatures characteristic of the cement placement, placing said cement slurry with said encapsulated accelerator and holding said encapsulated accelerator in place such that said coating softens and melts, releasing said accelerator which promotes a rapid set of said cement slurry.

13. A cement slurry comprising from about 2 parts by weight to about 15 parts by weight anhydrous sodium metasilicate granules per 100 parts by weight dry cement, wherein said anhydrous sodium metasilicate granules are isolated from the slurry by an external coating or organic wax.

4,036,302
HORSESHOE MANUFACTURE

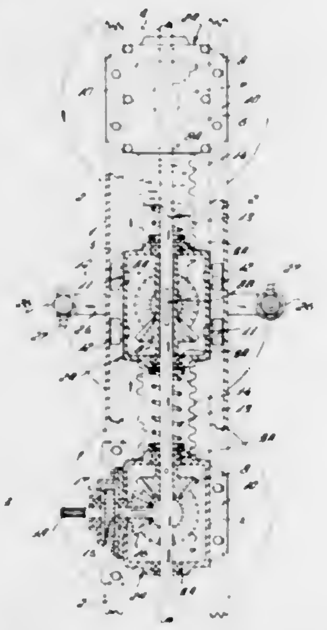
Dudley W. C. Spencer, 619 Skipley Road, Wilmington, Del. 19801
Continuation-in-part of Ser. No. 614,766, Sept. 18, 1975, Pat. No. 4,013,126, which is a continuation-in-part of Ser. No. 426,446, Dec. 20, 1973, Pat. No. 3,917,000, which is a continuation-in-part of Ser. No. 71,121, Sept. 10, 1970, Pat. No. 3,664,428. This application Apr. 5, 1976, Ser. No. 673,371
Int. Cl.^{2} A01L ***3/00***
U.S. Cl. 168—4 **23 Claims**



1. A horseshoe assembly comprising a shoe element, said shoe element having a body member with a lower wear surface and an upper securing surface, adhesive means on said shoe element, hoof-threading means for being threaded through holes in a horse's hoof, said hoof threading means being in the

form of a lace being flexible and non-toxic and absorbtive, said adhesive means being intimately secured to said lace, and said lace having a breaking strength less than the strength of the horse's hoof.

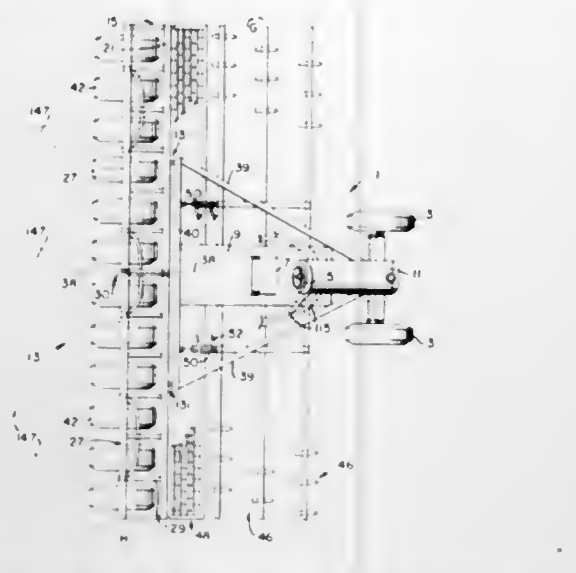
4,036,303
SOIL CULTIVATING MACHINES
Ary van der Lely, Maasland, Netherlands, assignor to C. van der Lely N. V., Maasland, Netherlands
Filed Sept. 16, 1975, Ser. No. 613,901
Claims priority, application Netherlands, Sept. 18, 1974, 7412332
Int. Cl.^{2} A01B *33/06, 61/04*
U.S. Cl. 172—49 12 Claims



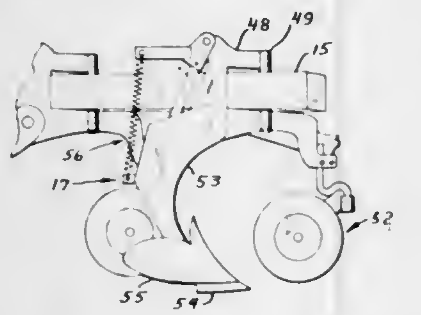
1. A soil-cultivating machine comprising an elongated frame and a plurality of adjacent soil-working members mounted on said frame in row that extends horizontally and transverse to the direction of travel, said soil-working members during operation, being positioned side-by-side and working overlapping strips of soil, said members being rotatably mounted on corresponding upwardly extending shafts and driving means including a pinion transmission means engaging the shafts of said soil-working members and rotating same about upwardly extending axes defined by said shafts, displaceable means interconnecting at least one of said soil-working members to said frame and said soil-working member, its upwardly extending shaft and a respective pinion transmission connection as a unit, being displaceable out of a normally central position and deflectable in a generally horizontal direction against resilient opposition in either one of two opposite directions, with respect to a neighboring soil-working member.

4,036,304
WHEEL MOUNTING FOR CULTIVATOR PLANTER
Arthur F. Crow, Jr., R.F.D. 3, Milford, Ill. 60953
Filed Jan. 14, 1976, Ser. No. 649,089
Int. Cl.^{2} A01B *71/00*
U.S. Cl. 172—260 9 Claims

1. A cultivator planter including a drive section and a driven section, the driven section being forwardly positioned with respect to the drive section, the drive section including a plurality of traction wheels and a frame of substantial width from which said plurality of traction wheels are mounted, said frame being formed in two longitudinally extending sections, means provided on the adjacent ends of said two sections for releasably locking said sections together, the driven section including manually operable steering wheels and a plurality of cultivating implements and said drive and driven sections being releasably connected together.

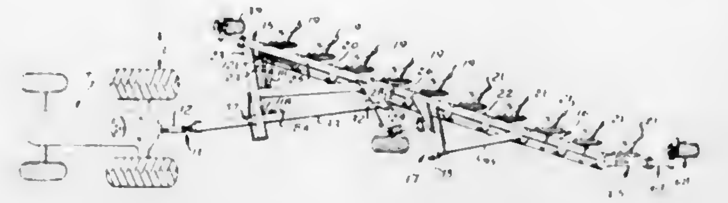


4,036,305
GANG PLOW
Jon E. Kinzenbaw, Ladora, Iowa, assignor to DMI Inc., Goodfield, Ill.
Division of Ser. No. 432,894, Jan. 14, 1974, Pat. No. 3,918,528, Division of Ser. No. 226,903, Feb. 16, 1972, Pat. No. 3,817,333. This application June 12, 1975, Ser. No. 586,146
The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.
Int. Cl.^{2} A01B *69/00*
U.S. Cl. 172—283 1 Claim



1. In an adjustable plow system including a main beam adapted to be pulled behind a traction vehicle and inclined relative to the direction of travel of said vehicle, the improvement comprising a plurality of moldboard plow units rotatably mounted to said beam for movement about vertical axes, each unit comprising:
- a yoke straddling said beam and including an upper portion extending above said beam and a lower portion extending beneath said beam and directly beneath said upper portion of said yoke; a shaft carried by said beam and connected to said upper and lower portions of said yoke and having an axis extending vertically; and mounting means for pivotally mounting said unit to permit said yoke to be rotated about said axis of said shaft over a continuous range;
- means connecting said units together so that they rotate in unison; and
- means for rotating said units to adjust the lateral spacing thereof.

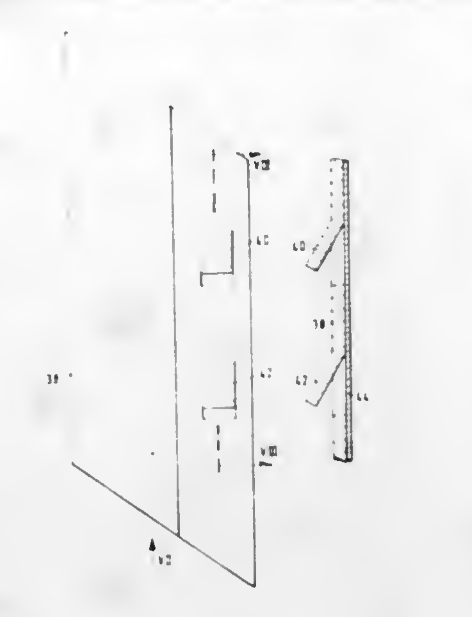
4,036,306
MULTI-UNIT ADJUSTABLE PLOW PULLED BY VEHICLE AND HAVING STEERING WHEEL TURNABLE ONLY ON ADJUSTMENT OF PLOW
Jon E. Kinzenbaw, Williamsburg, Iowa, assignor to DMI Inc., Goodfield, Ill.
Filed Sept. 29, 1975, Ser. No. 617,891
Int. Cl.^{2} A01B *69/00*
U.S. Cl. 172—287 7 Claims



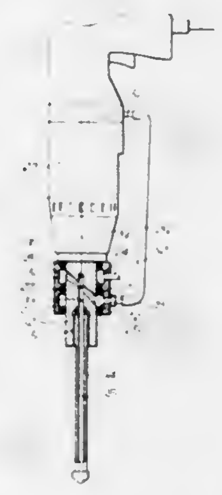
1. In combination with a vehicle, a plow system adapted to be pulled by said vehicle, said flow system comprising: an articulated main frame including
- a forward frame section including a first inclined beam,
- a rear frame section including a second inclined beam, and means for pivotally mounting the forward end of said rear frame section to the rear end of said forward frame section for pivotal movement about a horizontal axis, the axes of said first and second inclined beams extending generally in the same vertical plane when said system is in operation;
- hitch means for pivotally connecting said main frame to said vehicle;
- a first plurality of plow units mounted for rotation about vertical axes to said first inclined beam;
- a second plurality of plow units mounted for rotation about vertical axes to said second inclined beam;
- power means for rotating said plow units in unison to adjust the cut between adjacent units;
- support wheel means for supporting said system including a steering wheel mounted for steering motion about a vertical axis on unplowed ground when said system is in operation;
- linkage means responsive to the adjustment of said plow units for turning said steering wheel with respect to said frame sections, said linkage means turning said steering wheel with respect to said frame sections only in response to the width adjustment of said plow units and independent of the turning of said vehicle and said linkage means further maintaining said steering wheel in fixed position with respect to said frame sections for a given adjusted setting of said units independent of the turning of said vehicle.

4,036,307
PLOUGH SHARE WITH REINFORCEMENT PLATE COVERING TONGUE HOLES THEREIN
Sarel Johannes Marais, Lang St., Moorreesburg, Cape Province, South Africa
Filed Apr. 14, 1976, Ser. No. 676,999
Int. Cl.^{2} A01B *15/06*
U.S. Cl. 172—749 7 Claims

1. A plough share made of metal plate, the share having a straight cutting edge, a convex inner curved side and a substantially parallel convey outer curved part, and thickened outer part adjacent the outer curved part which converges toward the straight cutting edge, the share further including at least two spaced tongues pressed out of the metal plate from the convex inner curved side to the outer curved part and thereby forming holes in the metal plate, the tongues projecting on the outer curved part rearwardly and being adapted to engage in complementary holes formed in the frog of the plough, and a reinforcement plate attached to the plough share on the convex inner part thereof opposite to the side to which the frog is to be attached and, wherein the reinforcement plate covers the holes formed by the pressed out tongues.



4,036,308
APPARATUS FOR REMOVING THE DRILLINGS FROM THE DRILLING SITE OF A DRILL
Hugo Dellenberg, Moordeich, Germany, assignor to Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung, Uphusen, Germany
Filed Apr. 7, 1975, Ser. No. 565,568
Claims priority, application Germany, Apr. 9, 1974, 2417228
Int. Cl.^{2} E21C *7/02*
U.S. Cl. 173—75 13 Claims



1. An apparatus for removing the drillings from a drilling site of a drill of a drilling machine provided with a housing, a chuck and a motor for driving said drill which is inserted into the cavity of the chuck, said apparatus comprising:
- a. a suction conduit having an open end at said drilling site and a closed end spaced therefrom, said conduit extending in the direction of the rotational axis of said drill for sucking in drillings from the drilling site toward said closed end;
- b. a wall having a cylindrical outer surface, said wall surrounding said closed end of said suction conduit and a portion of said suction conduit adjacent to said closed end, said cylindrical outer surface having first and second axially spaced holes formed on opposed sides thereof, and first and second cross conduits connecting said first and second holes respectively to said portion of said suction conduit, said first and second cross conduits meeting at said suction conduit to form a continuous passage through

said wall for conveying a compressed air stream from said first hole to said second hole across said suction conduit;
c. a connecting ring surrounding said cylindrical wall surface and forming an inner air supply annulus closed by said cylindrical wall surface;
d. a compressed air source and a connecting piece on said connecting ring for connecting said air supply annulus to said compressed air source; and
e. said connecting ring being adapted for non-rotating connection to said housing in such a position that said first axial hole opens into said inner air supply annulus, and said first cross conduit connects said inner air supply annulus with said suction conduit, and said second axial hole opens into an area outside said inner air supply annulus, and said second cross conduit connects said suction conduit with said second axial hole to remove the drillings from said portion of said suction conduit by said compressed air passing through said first and second cross conduits and across said suction conduit.

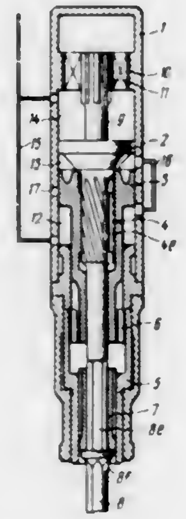
4,036,309
DOUBLE-PISTON ROCK DRILL

Anatoly Mikhailovich Petreev, ulitsa Sibiryakov-Gvardeitsev, 8, kv. 59; Anatoly Alexeevich Lipin, ulitsa Vatutina, 17, kv. 9; Vladimir Davydovich Rabko, Krasny prospekt, 186, kv. 60; Gennady Ilich Suxov, ulitsa Sovetskaya, 47, kv. 22, all of Novosibirsk; Vladimir Ivanovich Kunegin, ulitsa Dzerzhinskogo, 3, kv. 17, and Alexandr Safronovich Kurdjukov, ulitsa Karla Libknekhta, 113, kv. 26, both of Kyshtym Chelyabinskoi oblasti, all of U.S.S.R.

Continuation of Ser. No. 584,930, June 9, 1975, abandoned. This application Mar. 4, 1976, Ser. No. 664,000

Int. Cl.^{2} B25D *9/06*

U.S. Cl. 173—103 5 Claims



1. A double-piston rock drill with a rotary drive of a drill steel including an overrunning clutch and a screw pair comprising a housing accomodating: pistons each having a head and a rod, said pistons dividing the inner space of said housing into chambers and one of said pistons having an appropriately arranged outer helical thread and the other said piston having an inner helical thread, said threads forming said screw pair, at least one of said pistons being adapted to strike against the shank of said drill steel; said overrunning clutch forming; together with said screw pair, rotary drive of said drill steel; an air distribution system for admitting compressed air to said chamber and for discharging exhaust air into atmosphere; a rotable chuck for receiving the shank of said drill steel arranged in the front portion of said housing; one of said pistons being in force transmitting connection with said rotary drive of said drill steel and cooperating, during the drilling, with said rotatable chuck of the drill steel, and the other of said pistons being kinematically connected with the rock drill housing so as to avoid their relative rotation at least in one direction.

4,036,310
LINING FOR A PILE DRIVING HEAD AND METHOD AND TOOL FOR THE REMOVAL OF SAID LINING

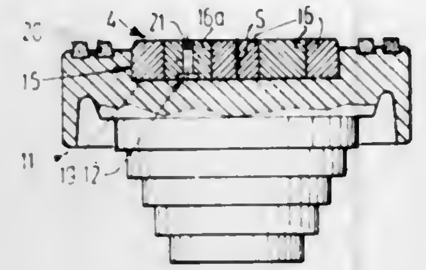
Hans Günther Schnell, Hamburg, Germany, assignor to Van Kooten B.V., Naarden, Netherlands

Filed June 16, 1975, Ser. No. 587,152

Claims priority, application Netherlands, June 26, 1974, 7408633

Int. Cl.^{2} E02D *7/02*

U.S. Cl. 173—131 11 Claims



1. For use in a pile driver including a driving head having an upwardly opening chamber formed therein,
a lining in said chamber including,
a plurality of coplanar lining elements in side by side relation in said chamber of the driving head, an armature positioned in said chamber adjacent at least one of said lining elements and being removable from said chamber, said armature having interengaging means extending axially therealong in the direction of said lining elements for interengagement with a removing tool adapted to remove said armature thereby to leave a space in the chamber adjacent said at least one lining element to accommodate ready removal of said lining elements.

4,036,311
ROD SHAPED HAND-TOOL

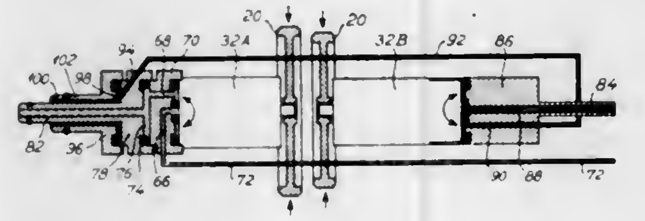
Sven Karl Lennart Goof, Gammel Strandvej 236A, Humlebaek, Denmark

Filed Mar. 7, 1975, Ser. No. 556,448

Claims priority, application Denmark, Mar. 12, 1974, 1334/74

Int. Cl.^{2} B23B *45/04*

U.S. Cl. 173—169 19 Claims



1. A rod-shaped handpiece, such as a dental syringe, a drilling instrument, or the like manually operable or controllable handpieces, the handpiece comprising: a rod-shaped handle portion in the form of a casing having a longitudinal axis; an annular actuating member positioned in said handle portion, having energy supplying means, energy removing means, actuatable means and a casing for enclosing the actuatable means; a return member associating with said actuating member; said actuating member, by a manual press, being movable from a central position to an outer position, from which outer position it is moved back to the central position by said return member when the press has ceased; said actuating member being comprised of at least one ring **(20)** movable between said positions substantially perpendicularly to said longitudinal axis **(22)** of the casing, the ring having an axis, a thickness in a direction parallel to its axis, and an external dimension perpendicular to its axis; wherein said external dimension of said ring is larger than the thickness thereof, the axis of said ring, when in said central position, being parallel to said longitudinal axis of the casing, and said external dimension being at least flush with the surface of said casing **(12)** when said actuating member is in its central position; and wherein the axis of said ring, when in its outer position, is moved relative to the axis of said casing.

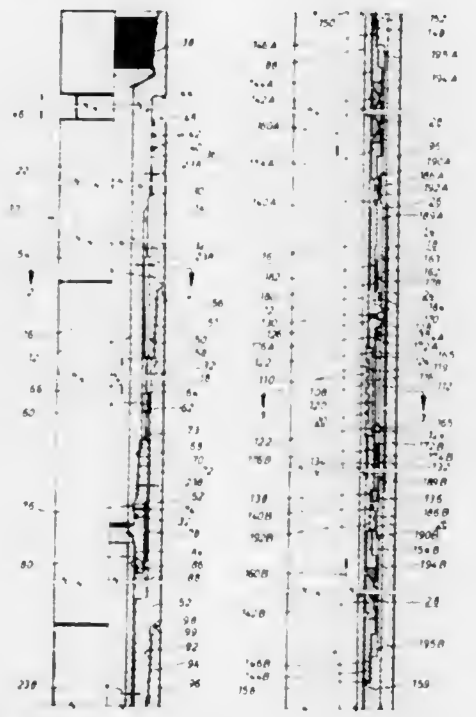
4,036,312
WELL JAR

Kenneth R. DeLuish, Humble, Tex., assignor to HYCALOG Inc., Houston, Tex.

Filed Sept. 13, 1976, Ser. No. 722,495

Int. Cl.^{2} E21B *1/10*

U.S. Cl. 175—302 32 Claims



1. A well jar comprising:
first and second telescoped members each having an impact surface, said second member engageable to a device susceptible of being stuck,
a resilient member associated with said first member and compressible only in response to a force on said first member exceeding a predetermined magnitude,
latching means having an extending portion coupled with said resilient member for releasably preventing displacement of said first member relative said second member,
biasing means for biasing said latching means away from said displacement preventing relationship,
release means having an opening sized to receive said extending portion and rotatable relative said first member for releasing said latching means, and,
means for transmitting forces imposed on said first member to said release means,
said resilient member being compressible to impose a force through said transmission means to said release means, said release means being rotatable to register said opening therein with said extending portion, said latching means being radially displaceable responsive to said biasing means to simultaneously engage said extending portion within said opening and to release said first member, said first member being axially displaceable to drive said surfaces into impact-producing contact.

4,036,313
MOUNTING FOR INBOARD CUTTERS ON A RAISE DRILL

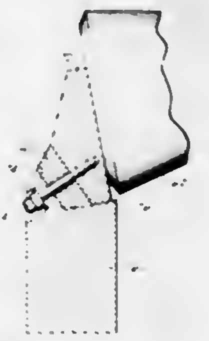
Robert L. Dixon, Brea, and Malcolm D. Maxsted, Harbor City, both of Calif., assignors to Smith International, Inc., Irvine, Calif.

Filed July 3, 1975, Ser. No. 593,036

Int. Cl.^{2} E21B *9/24*

U.S. Cl. 175—344 19 Claims

1. A raise drill comprising:
a drive stem adapted to be connected to a rotating drill string,
a cutter mounting frame secured to the drive stem and projecting radially therefrom,
a cutter assembly including a shaft and a rotary cutter journaled for rotation on the shaft, the shaft projecting beyond the ends of the cutter, the stem having a bore for receiving one end of the cutter shaft,
a yoke member receiving the other end of the shaft,
means securing the shaft end to the yoke member,
means for mounting the yoke member to the cutter mounting frame including a mounting member secured to the frame, the mounting member having first and second intersecting planar surfaces, the first surface extending substantially parallel to the axis of said bore, and the second surface extending at an obtuse angle to the first surface and facing the stem, the yoke member having a first surface substantially parallel to the axis of rotation of the cutter adapted to slidably engage the first surface of the mounting member, and a second surface spaced from the second surface of the mounting member and parallel thereto,
a spacer inserted between said second surfaces, and
means extending between the yoke member and mounting member for clamping the spacer between said second surfaces.



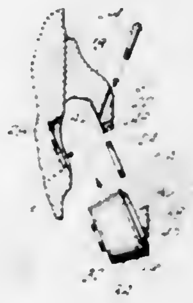
4,036,314
HOLE OPENER WITH IMPROVED ROTARY CUTTER MOUNTING

Robert L. Dixon, Brea, and Robert E. Allison, Whittier, both of Calif., assignors to Smith International, Inc., Irvine, Calif.

Filed June 28, 1976, Ser. No. 700,313

Int. Cl.^{2} E21B *9/08*

U.S. Cl. 175—364 12 Claims

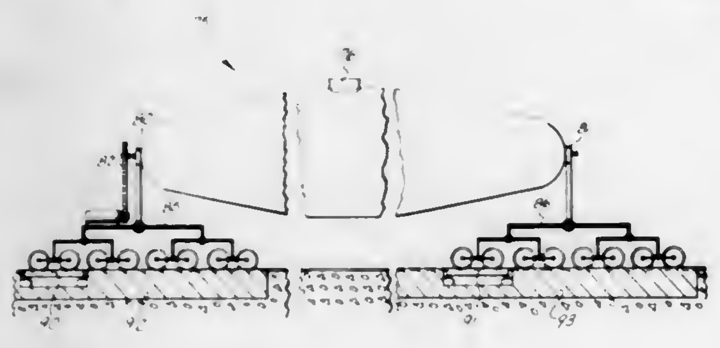


1. An earth boring drill apparatus comprising a drive stem, a cutter mounting leg secured to the stem, a removable cutter assembly including a shaft and a rock boring cutter mounted for rotation on the shaft, a bore in a side of the stem for slidably receiving the inner end of the shaft; the cutter mounting leg having a shaft supporting portion spaced apart from and extending substantially parallel to the stem for supporting the outer end of the cutter shaft; a support engaging lug on the outer end of the cutter shaft, the shaft supporting portion of the

mounting leg and the support engaging lug having mating surfaces extending parallel to the axis of the shaft for maintaining axial alignment of the shaft and the bore and preventing rotation of the shaft, the shaft being movable in an axial direction between the stem and the mounting leg with the mating surfaces in contact by an amount sufficient to permit the shaft to be withdrawn from the bore, and means clamping the opposing surfaces together to secure the outer end of the cutter assembly to the mounting leg.

4,036,315
WEIGHING SYSTEM

Rune Flintb, and Nordstrom Kjell, both of Vasteras, Sweden, assignors to Transcale AB, Vasteras, Sweden
Continuation of Ser. No. 587,112, June 16, 1975, abandoned.
This application Oct. 6, 1976, Ser. No. 730,074
Int. Cl.² G01G *19/04*
U.S. Cl. 177—1 **9 Claims**

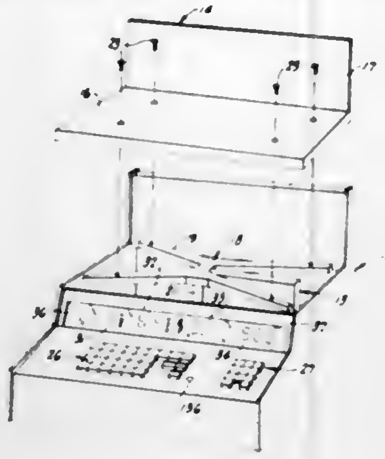


1. A method of weighing a vehicle containing a body of liquid where the center of gravity of the body of liquid may shift in an uncontrollable manner within the vehicle and which vehicle has a first group of axles at the forward end thereof and a second group of axles at the rearward end thereof with each axle having at least two wheels thereon and wherein the axles of each group are symmetrically spaced about a center through which the load is applied to the axle group, said weighing method including the steps of locating the wheels of a known fraction of the axles of the first group of axles on a first weighing platform, locating the wheels of a known fraction of the axles of said second group of axles on a second weighing platform, sensing the weight of said wheels on said first and second platforms, and providing an indication of the entire weight of said vehicle based upon said sensed weight and said known fractions.

4,036,316
COMPUTING SCALE AND METHOD WITH TARING CAPABILITY

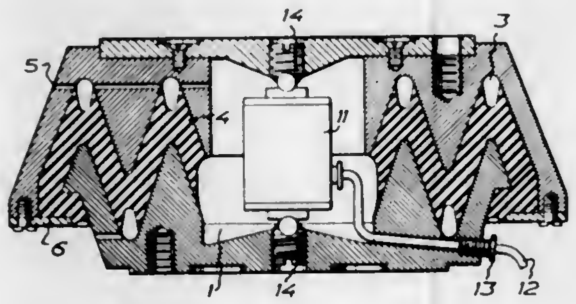
Frank C. Rock, Santa Rosa, Calif., assignor to National Controls, Inc., Santa Rosa, Calif.
Division of Ser. No. 510,467, Sept. 30, 1974, Pat. No. 3,951,221.
This application Dec. 19, 1975, Ser. No. 642,482
Int. Cl.² G01G *23/22, 13/14*
U.S. Cl. 177—1 **9 Claims**

1. In a method for determining the weight of an object, the steps of: providing an electrical signal corresponding to the weight of the object, converting the electrical signal to digital signals representative of the instantaneous weight of the load at a predetermined clock rate, storing a plurality of the instantaneous weight signals on a rotating basis whereby the oldest of the stored signals is replaced by the instantaneous weight signal provided during each successive clock period, determining the average of the stored signals to provide a continuously updated signal representative of the average instantaneous weight of the load, storing a signal corresponding to the average instantaneous weight at a predetermined time, and combining the stored signal with subsequent signals representative of the average weight of the load to effect subtraction of the weight represented by the stored signal from the weight represented by each of the subsequent signals and provide successive signals representative of the average instantaneous net weight of the object.



4,036,317
APPARATUS FOR MEASURING LOADS

John William Hellkvist, Malmo, Sweden, assignor to AB Stathmos, Jonkoping, Sweden
Filed Nov. 6, 1975, Ser. No. 629,683
Int. Cl.² G01G *5/04, 19/08, 21/10*
U.S. Cl. 177—209 **6 Claims**



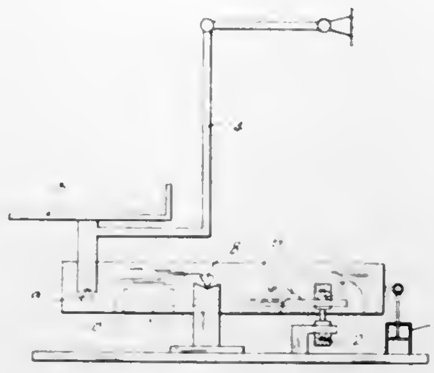
1. An apparatus for measuring loads with the use of a plurality of measuring points, said measuring points consisting of one load-supporting measuring element being placed at each measuring point, wherein each measuring element comprises an upper fastening element, a lower fastening element and means interjacent thereto for taking up lateral forces acting upon the measuring element, said means comprises a ring of resilient material whereby a central space is provided therein for accommodating a pressure medium consisting of a transducer or a volume of measuring liquid.

4,036,318
SHOP SCALES WITH DIGITAL WEIGHT INDICATION

Jarl Nyholm, Vespertie 6, 00320 Helsinki 32, Finland
Filed May 16, 1975, Ser. No. 578,096
Claims priority, application Finland, May 21, 1974, 741557
Int. Cl.² G01G *3/14*
U.S. Cl. 177—211 **5 Claims**

1. A shop scale for digital indication of weight, comprising:

a. a balance lever;
b. a support means;
c. a first pair of knife edges carrying the balance lever on the support means;
d. a second pair of knife edges on the balance lever;
e. a weighing platform acting on the second knife edges to deflect the balance lever;
f. a transverse plate attached to said balance lever;
g. a pick-up arm having a planar surface with strain gauge means mounted thereon for measuring bending of the pick-up arm;
h. one end of the pick-up arm being rigidly attached to said transverse plate;

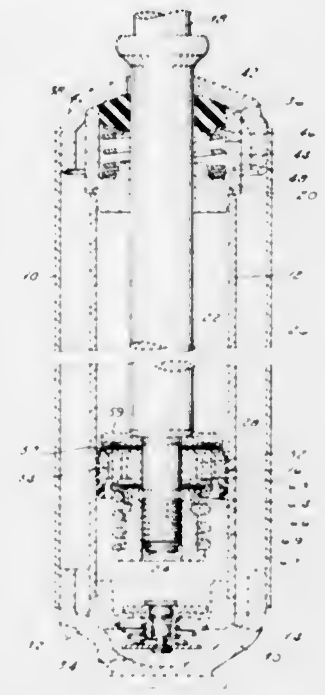


i. stop means attached to said support means, the other end of said pick-up arm engaging with said stop means and thereby preventing deflection;

whereby said other end of said pick-up arm is isolated from torsional effects caused by loads on the weighing platform.

4,036,319
HYDRAULIC SHOCK ABSORBER FOR A MOTOR VEHICLE HAVING FLOW CONTROL VALVING THAT BECOMES MORE RESTRICTIVE DURING THE SERVICE LIFE OF THE SHOCK ABSORBER

Lee R. Andre, Tecumseh, Mich., assignor to Ford Motor Company, Dearborn, Mich.
Filed Nov. 12, 1975, Ser. No. 631,252
Int. Cl.² F16F *9/50*
U.S. Cl. 188—282 **3 Claims**



1. A hydraulic shock absorber constructed to become stiffer during usage having first and second fluid chambers and flow control means constructed to provide a restrictive fluid passage for the controlled flow of hydraulic fluid from said first chamber to said second chamber;

said flow control means including a fluid passage, a valve seat positioned about one end of said passage and a valve element;

spring means exerting a cumulative spring force upon said valve element urging said valve element into seated engagement with said valve seat;

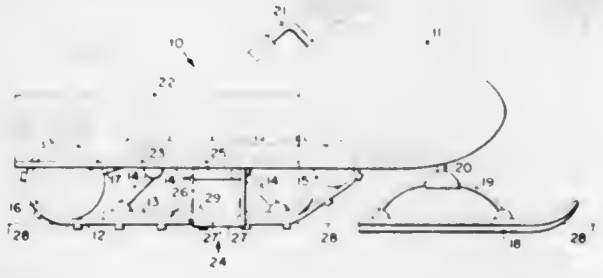
said spring means comprising a primary spring exerting a spring force urging said valve element toward said seated position and a secondary spring exerting a spring force tending to counter the force of said primary spring on said valve element;

said secondary spring having a service life substantially less than the service of said primary spring whereby the cumulative force of said primary spring and said secondary spring increases during the service life of said shock absorber;

said secondary spring comprising a Belleville spring having an annular fatigue groove constructed to cause said spring force exerted by said secondary spring to be substantially reduced during repeated flexing of said secondary spring.

4,036,320
LUBRICATION DEVICE FOR SNOWMOBILE SLIDERAIL

Kenneth R. Rabehl, Beaver Dam, Wis., assignor to James T. Murray, Beaver Dam, Wis., a part interest
Filed Feb. 12, 1975, Ser. No. 549,456
Int. Cl.² B62D *55/00*
U.S. Cl. 180—5 R **7 Claims**

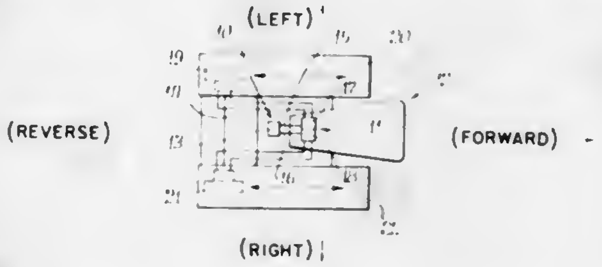


1. In a vehicle comprising an endless belt support means for supporting and driving the vehicle on ice and snow surfaces and comprising slide rail means slidingly engaged with portions of said belt means to support the body of said vehicle from said belt means, the combination with said vehicle of:

means attached to portions of the body of said vehicle to engage a portion of said surfaces alongside said belt means and said slide rail means and deflect said portion of said surfaces into engagement with said slide rail means and said belt means engaged by said slide rail means.

4,036,321
SINGLE LEVER STEERING CONTROL FOR HYDRAULIC DRIVE VEHICLES

Cyril W. Habiger, Joliet, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Mar. 3, 1976, Ser. No. 663,595
Int. Cl.² B62D *11/04*
U.S. Cl. 180—6.48 **19 Claims**



1. For use with a vehicle having opposite sides, a left side driving means having first speed control means, and a right side driving means having second speed control means, improved control means for selectively controlling the operation of said speed control means of said driving means to effect a selective steering drive of the vehicle comprising: a manually operable control lever; mounting means for mounting the control lever for pivotal movement about a transverse first axis; a first operating lever movable with said control lever about said axis; first connecting means connecting said first operating lever to said second speed control means for causing

selective variable speed forward and rearward operation of said right side driving means; a second operating lever movable with said control lever about said axis; second connecting means for connecting said second operating lever to said first speed control means for causing selective variable speed forward and rearward operation of said left side driving means; and positioning means movable with said control lever for selectively movably engaging either of said operating levers to adjustably change the disposition of said operating levers relative to each other in parallel planes parallel to said axis as a result of movement of the control lever parallel to said axis to effect differential adjustment of said first and second connecting means and thereby differential operation of the right and left side driving means for causing a desired steering of the vehicle, movement of said control lever and operating levers about said first axis causing concurrent adjustment of said first and second connecting means selectively concurrently with or independently of said differential adjustment.

4,036,322

AUTOMATIC LOCKING SAFETY BELT RETRACTOR REEL

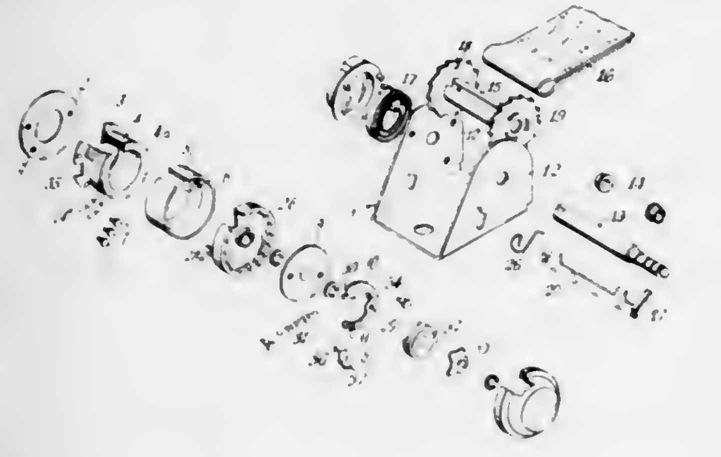
Takezo Takada, deceased, late of Hikone, Japan, and by Juichiro Takada, legal authorized heir, 3-12-1,, Shin, Setagaya, Tokyo, Japan

Continuation-in-part of Ser. No. 462,678, April 19, 1974, abandoned. This application Mar. 2, 1976, Ser. No. 663,169

Claims priority, application Japan, Apr. 25, 1973, 48-046136

Int. Cl.² A62B *35/02;* B65H *75/48*

U.S. Cl. 180—82 C **7 Claims**



1. An automatic braking safety belt retractor comprising a belt reel rotatable in opposite belt extraction and retraction directions, spring means urging said reel to rotate in a belt retraction direction, means for fastening the safety belt about the body of an occupant, inertia activated braking means transferable from a reel release condition to a condition braking said reel against rotation in a belt extraction direction in response to a function of the rotational speed of said reel exceeding a predetermined value, switch-actuated electromagnetic means for retaining said braking means in said reel release condition in response to the energization of said electromagnetic means prior to engagement of said safety belt fastening means regardless of the value of said function, means responsive to the occupation of a vehicle seat associated with said retractor for energizing said eletromagnetic means, a buckle carried by the belt wound on said reel and means responsive to the coupling engagement of said buckle for deenergizing said eletromagnetic means and deactuating said retaining means independently of the occupation of said seat.

4,036,323

VEHICLE CONTROL APPARATUS

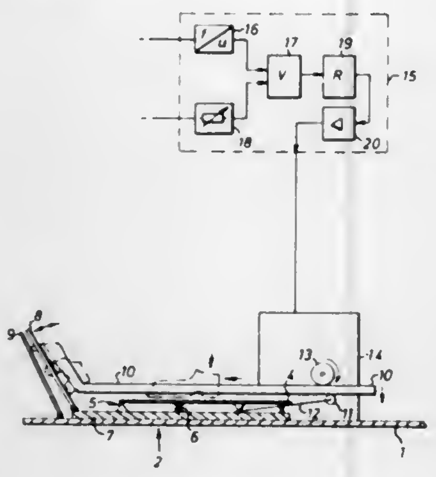
Karl-Heinz Schmail, Moncalieristrasse 5, D-757 Baden-Baden, Germany

Filed Jan. 17, 1975, Ser. No. 542,056

Claims priority, application Germany, Jan. 25, 1974, 2403586; Feb. 23, 1974, 2408764

Int. Cl.² B60K *31/00*

U.S. Cl. 180—105 R **28 Claims**



1. An apparatus for automatically regulating the speed of a motor driven vehicle comprising:

an actuating member separate from, and adapted to be placed in the vehicle rearward of, the vehicle accelerator pedal and movable from a raised inactive position to a lowered actuating position under the action of the driver's foot, and means for moving the actuating member back to its raised inactive position when not being urged to said lowered actuating position,

connecting means connectable to a part of the vehicle which controls the speed of the vehicle motor,

a speed control means selectively drivingly engagable with the connecting means upon and in response to movement of the actuating member to said lowered actuating position for moving the connecting means, to in turn operate the said part of the vehicle which controls the speed of the vehicle,

and a control circuit including first emitter means for emitting a first signal representative of the actual vehicle speed and a second emitter means for emitting a second signal representative of an ideal speed, and control means for receiving said first and second emitted signals and for emitting a difference signal representative of the difference therebetween and for operating said speed control means in response to and by an amount related to the difference signal to in turn move the connecting means in response to said difference signal.

4,036,324

NOISE REDUCTION

Colin Washbourne, Birmingham, England, assignor to Foseco International Limited, Birmingham, England

Filed July 30, 1975, Ser. No. 600,474

Claims priority, application United Kingdom, Aug. 16, 1974, 36234/74

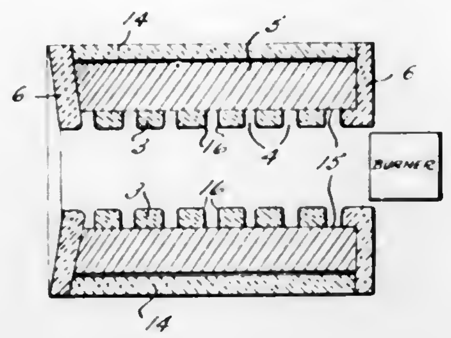
Int. Cl.² F01N *1/04, 7/18, 3/06*

U.S. Cl. 181—42 **3 Claims**

1. A fluid fuel burner assembly comprising a burner, and

a burner quarl consisting essentially of a substantially nonporous ceramic material tube having substantially radial vents along its length, the ceramic material tube being surrounded along at least part of its length by at least one sound absorbing chamber, and

wherein the outside of the sound absorbing chamber comprises a surrounding wall of sealed ceramic material connected to the ceramic tube by two radial flanges.



4,036,325

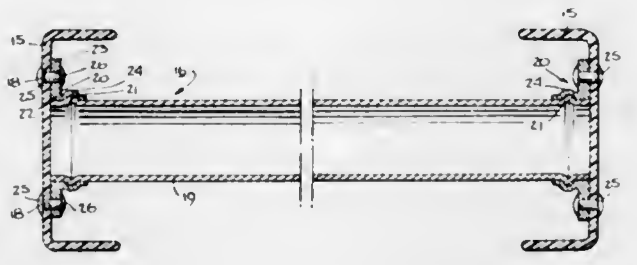
RUNG ASSEMBLY FOR A LADDER AND A METHOD OF MAKING THE RUNG ASSEMBLY

George Robert Ruff, Newberry, and Danny O'Brian Derrick, Columbia, both of S.C., assignors to Shakespeare Company, Columbia, S.C.

Filed June 30, 1975, Ser. No. 591,957

Int. Cl.² E06C *7/50*

U.S. Cl. 182—46 **11 Claims**



1. A rung assembly for a ladder comprising:

a rung having at least one deformed end and a bead within said end; and

a flanged fitting mounted on said end of said rung, said fitting having a deformed collar portion, a bead disposed intermediately of said collar portion and in interlocking relation with said bead on said rung and an outwardly directed flange for securing said assembly to a ladder siderail.

4,036,326

LUBRICATING OIL PUMP

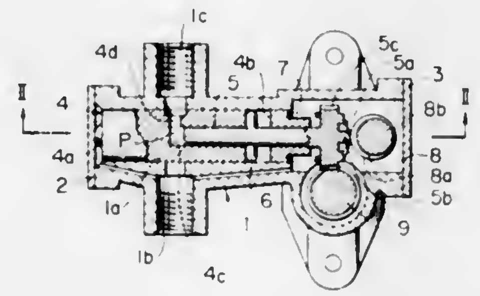
Osamu Mukai; Akira Miyatani, both of Yokohama; Kokichi Fukuzawa, Yamato; Yoshiro Nagao, Chigasaki; Kenichi Kubota, Tokyo; Masakuni Shibuya, Tokyo, and Shigelu Kobayashi, Tokyo, all of Japan, assignors to Mikuni Kogyo Kabushiki Kaisha, Japan

Filed July 30, 1975, Ser. No. 600,486

Claims priority, application Japan, Aug. 2, 1974, 49-92604

Int. Cl.² F16N *13/04*

U.S. Cl. 184—27 R **8 Claims**



1. A lubricating oil pump comprising a pump body having a cylinder chamber, suction port and at least one delivery port, a distributor rotatably fitted in said cylinder chamber and having a blind hole in the inside thereof, a plunger slidably fitted in said blind hole and having a cam on the outer end face thereof, said plunger being rotated in rotational direction integrally with said distributor about their common axis but being capable of performing relative movement in thrust direction in respect to said distributor, a cylindrical guide-column member provided to said pump body and engageable with said cam, said cylindrical guide-column member thus making said plunger perform reciprocating movement in thrust direction with respect to said distributor when said plunger is rotated, a spring applied between said distributor and plunger and biasing said plunger so that said cam is pushed against said cylindrical guide-column member, and said distributor is pushed against said pump body to prevent relative movement in thrust direction between said distributor and pump body, a pump chamber formed in said blind hole and between said distributor and plunger and communicatable with said suction port and delivery port and drive gearing within said pump cooperating with gearing on one of said plunger or distributor to rotate said plunger and distributor.

4,036,327

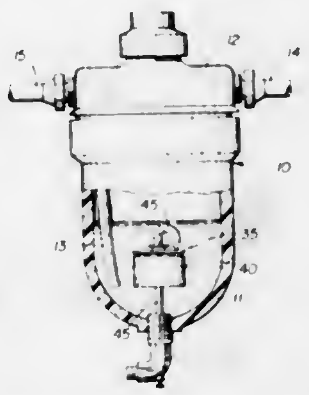
AIR LINE LUBRICATOR WITH SAFETY DEVICE

Robert M. Moore, deceased, late of Englewood, Colo., and by Bette J. Moore, personal representative, 4695 S. Jason, Englewood, Colo. 80110

Filed Jan. 8, 1976, Ser. No. 647,344

Int. Cl.² F01M *1/08;* F16N *7/32*

U.S. Cl. 184—55 A **7 Claims**



1. An improved air line lubricator safety device for use in a lubricator having an oil bowl containing oil and pressurized air and means feeding oil to an air line leading to an air operated device, the safety device being of type having an air tube mounted in the lubricator and an oil level controlled member moveable relatively to the end of the air tube, said member being supported by the oil to seal the air tube when the oil level is above a predetermined level and the air tube being opened when the oil falls below said predetermined level, allowing air to escape the oil bowl and actuate a signal device located outside the lubricator, the improvement comprising:

a. said oil level controlled member having a tiltable member mounted on its upper side for sealingly contacting the air tube when the oil level is above said predetermined level, and for tilting with respect to the upper side of the oil level controlled member to progressively open the air tube as the oil falls below said predetermined level; and

b. said air tube having a relatively small orifice sealingly contacted by said tiltable member and having a relatively larger interior bore, the small orifice providing superior sealing against air and oil leaks under conditions of vibrations and pressurized atmosphere within the lubricator, and said relatively larger interior bore of tube preventing the air tube from becoming clogged with particles of heavy oil from the lubricator bowl.

4,036,328

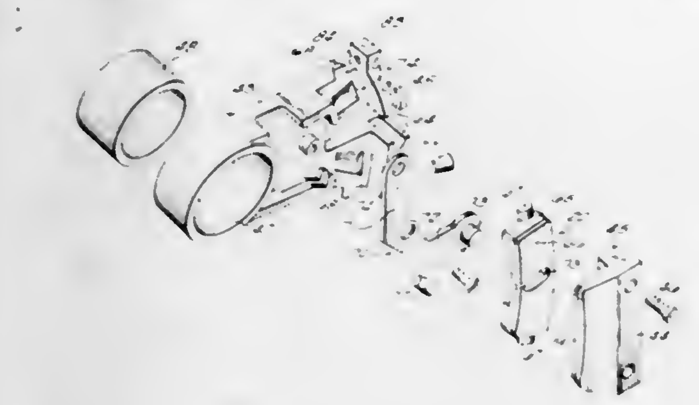
DISC BRAKE APPARATUS SUITABLE FOR BICYCLES

Neil R. Hoffman, Mequon, and Johannes H. Jansen, Milwaukee, both of Wis., assignors to Brake Engineering, Inc., Milwaukee, Wis.

Division of Ser. No. 606,711, Aug. 21, 1975, Pat. No. 3,985,391. This application May 5, 1976, Ser. No. 683,484

Int. Cl.² F16D *55/16*

U.S. Cl. 188—26 **9 Claims**



1. A caliper brake assembly for a bicycle wheel or the like that is rotatably mounted on relatively fixed structure and normally rotates only in one direction, said assembly being cooperable with a disc-like rotor that has axially opposite flat faces and is constrained to concentric rotation with the wheel, said assembly comprising:

A. a body having a connecting portion and a pair of opposing caliper legs that project in one radial direction from said connecting portion, said legs being spaced apart in axial directions and each having substantial extent in circumferential directions, one of said legs having substantially greater extent in said radial direction than the other;

B. attachment means on said one leg for securing said body to fixed structure in straddling relation to an edge portion of a rotor to have the caliper legs overlying the opposite faces of the rotor, said attachment means being arranged to confine the body against motion in said radial and circumferential directions;

C. a first brake pad on said other caliper leg having a substantially flat friction surface facing in the axial direction towards said one caliper leg and engageable with the adjacent face of a rotor straddled by the body;

D. a movable brake pad carried on said one caliper leg, having a substantially flat friction surface that faces the friction surface on said first brake pad and is engageable with the opposite face of a rotor straddled by the body;

E. cooperating means on said one caliper leg and on the movable brake pad confining the latter against motion relative to the body in radial directions and other than substantially translatory motion in other directions, said cooperating means comprising

1. a lug on the movable brake pad at each of the circumferentially opposite ends thereof, each of said lugs projecting outwardly in a circumferential direction from its circumferential end of the brake pad,
2. a pair of lugs on said one caliper leg, one for each of said lugs on the movable brake pad, said lugs on said one caliper leg projecting in said circumferential directions from the circumferentially opposite sides of said one caliper leg and each opposing its lug on the movable brake pad and being adjacent thereto; and
3. a pair of coiled garter springs, one embracing each of said lugs on the movable brake pad and the adjacent lug on said one caliper leg and thereby urging the movable brake pad in the axial direction away from the first brake pad;

F. a bell crank overlying said one caliper leg and pivoted thereto to swing about a fulcrum axis which extends in said axial directions, said bell crank having

1. one arm projecting in one of said circumferential directions beyond said one caliper leg and
2. another arm projecting substantially radially and having a connection with the movable brake pad whereby swinging of the bell crank imparts motion in said circumferential directions to the movable brake pad;

G. cooperating ramp means on the body and on the movable brake pad whereby force imposed upon the movable brake pad in said one circumferential direction produces substantially translatory movement of the movable brake pad relative to the body, obliquely in said one circumferential direction and in the axial direction towards the first brake pad, said ramp means defining opposing surfaces on the body and on the movable brake pad, respectively, at least one of said surfaces being inclined axially and circumferentially to the friction surface of the movable brake pad; and

H. biasing means reacting between the body and said bell crank to urge the latter to swing in the direction that carries the movable brake pad in the opposite circumferential direction.

4,036,329

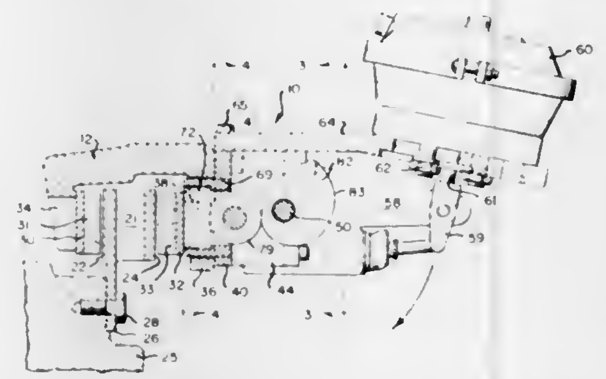
DISC BRAKE WITH ROTARY CAM ACTUATED RECIPROCATING PISTONS

Bruce D. Anderson, Berkley, Mich., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Filed Nov. 12, 1975, Ser. No. 631,097

Int. Cl.² F16D *55/08*

U.S. Cl. 188—72.7 **5 Claims**



4. An actuator for a disc brake comprising a caliper including a web and a pair of spaced depending legs, a pair of apertures open through one of said legs, a piston slidably mounted in each of said apertures, roller means rotatably mounted to each of said pistons, a shaft rotatably mounted to said caliper, and a spaced pair of cams mounted for rotation with said shaft, each of said cams including an outer surface of increasing radial dimension aligned with an annular surface of one of said roller means.

4,036,330

DISC BRAKE

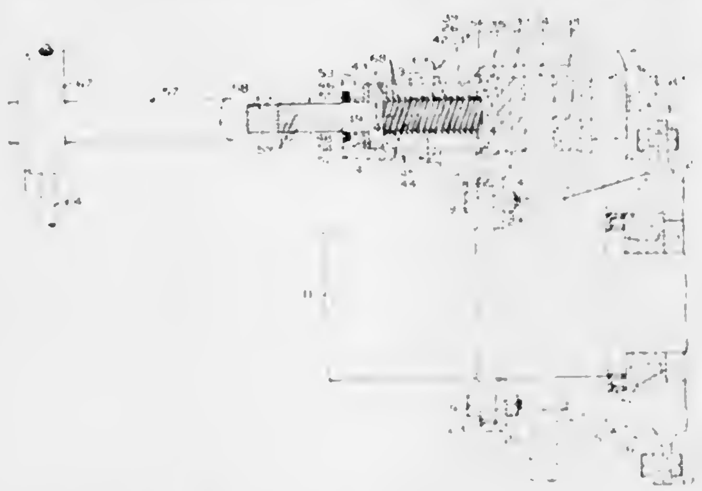
Dale A. Henning, and Jack D. Rainbolt, both of Troy, Ohio, assignors to The B. F. Goodrich Company, Akron, Ohio

Continuation-in-part of Ser. No. 533,947, Dec. 18, 1974, abandoned. This application Feb. 11, 1976, Ser. No. 657,179

Int. Cl.² F16D *55/224*

U.S. Cl. 188—72.8 **10 Claims**

1. A disc brake comprising a nonrotatable mounting member, a housing in sliding engagement with said mounting member, a brake disc rotatable about an axis, a first friction lining carrier located on one side of said disc and in sliding engagement with said mounting member, said first friction lining carrier having a first friction lining movable into and out of clamping engagement with said disc, a screw and nut assembly including two actuating members in threaded engagement, one of said actuating members being in force-transmitting engagement with said housing in the axial direction relative to said disc and the other of said actuating members being in force-transmitting engagement with said friction lining carrier in the axial direction relative to said disc, means to hold a first member of said actuating members against rotation relative to said mounting member and means to apply torque and rotate a second member of said actuating members relative to said first member in one direction to generate an axial force urging said first member axially relative to said mounting member to apply a brake clamping force on said brake disc with the resultant torque forces from rotation of said disc being transmitted from said friction lining carrier directly to said mounting member, said actuating members being subject only to said axial force and said torque for rotating said second member relative to said first member of said actuating members, said actuating members having threads with a helix angle which is small enough to provide said brake clamping force upon applying braking torque to said second member in a first direction of rotation and said helix angle being large enough to generate an overhauling torque from said clamping force which is sufficient by itself to rotate said second member in a second direction opposite to said first direction upon release of said braking torque whereby said brake clamping force is released without the application of additional force to rotate said second member in said second direction.



4,036,331

VEHICLE ANTI-SKID BRAKE CONTROL APPARATUS

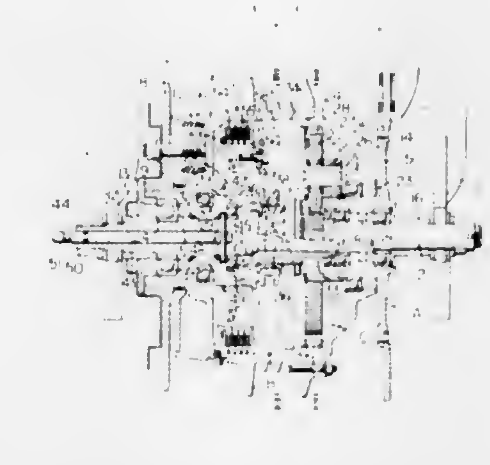
Tsutomu Hayashi, Hoya; Takeshi Kawaguchi, Fujimi, and Noriyuki Maeda, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 25, 1976, Ser. No. 690,040

Claims priority, application Japan, May 31, 1975, 50-65605

Int. Cl.² B60T *8/04*

U.S. Cl. 188—187 **12 Claims**



1. A vehicle anti-skid brake control apparatus comprising:

first brake means for directly receiving a mechanical brake force for primarily absorbing the travelling energy of a vehicle, and

second brake means operable, upon application to said first brake means of a brake force in excess of a critical level determined by the travelling speed of the vehicle, for cutting off a mechanical circuit for transmitting the brake force from said first brake means to an associated road wheel of the vehicle and thereafter to secondarily absorb the rest of the vehicle travelling energy not absorbed by said first brake means.

4,036,332

SLACK ADJUSTER BUILT INTO A BRAKE UNIT FOR A RAIL VEHICLE BRAKE SYSTEM

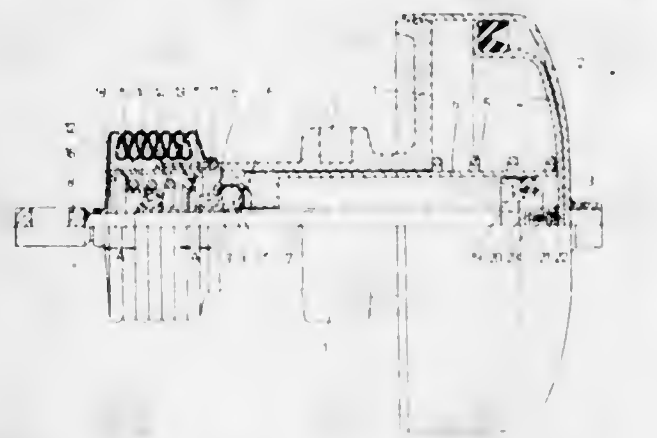
Nils Börje Lennart Sander, Malmö, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed June 24, 1976, Ser. No. 699,387

Claims priority, application Sweden, July 14, 1975, 7508016

Int. Cl.² F16D *65/66;* **B61H** *15/00*

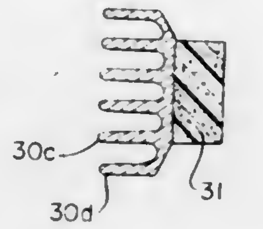
U.S. Cl. 188—196 D **14 Claims**



1. A slack adjusting brake unit mechanism for railway brake systems comprising in combination, a piston, a tube member attached to said piston and axially movable with said piston, an axially movable non-rotatable threaded spindle adapted for connection to the braking system coaxially positioned within said tube, a nut in non-self-locking thread engagement with said spindle having two opposed clutch surfaces axially displaced by the nut a first predetermined distance, a set of two clutch surfaces on said tube disposed for respectively mating with said clutch surfaces on said nut in different axial positions of said nut and spaced at an axial distance greater than said first predetermined distance thereby to transmit force from said piston to said spindle, two spaced shoulders on said nut, a fore control member and a rear control member both axially movable spaced between said two shoulders and adapted to engage them to limit axial movement of each respective control member in a corresponding direction, a spring between said control members urging them apart toward engagement with said shoulders, a housing, limit means affixed to said housing at two spaced positions limiting movement of said control members axially over a predetermined slack adjustment distance between said shoulders whereby contact of either said control member with a respective one of said limit means to move such away from one of said shoulders causes axial motion of said spindle to move said nut from a position with one opposed clutch surface thereon non-rotatably engaged with a corresponding mating clutch surface on said tube to an opposed axial position with the opposite clutch surfaces non-rotatably engaged passing through an intermediate position wherein the nut will rotate on said spindle with axial motion of the spindle.

4,036,333
BICYCLE BRAKE SHOE WITH HEAT DISSIPATING MEANS

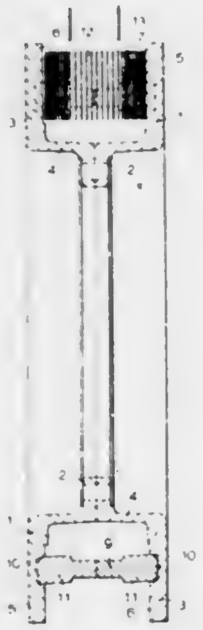
William R. Mathauser, P.O. Box 5, Sun Valley, Idaho 83353
Filed Feb. 13, 1976, Ser. No. 657,931
Int. Cl.^{2} F16D *65/807*
U.S. Cl. 188—264 A **8 Claims**



1. A brake means comprising a brake shoe which includes a backing plate having a flat central portion with a plurality of cooling fins on one side thereof and integral extension portions extending outwardly from opposite edges of said central portion and being angled toward said one side for dissipating heat generated in the brake shoe by a braking action to the atmosphere, an elongate parallelepiped pad of friction material having only one face bonded on the other side of the shoe backing plate in thermal contact therewith, all of the other faces of said pad being free of contact with said backing plate with one free face oriented for engagement with a rim of a wheel and the like during the braking action and being longitudinally curved to approximate the radius of curvature of the wheel rim, said friction material having heat transfer means dispersed therein for transferring heat therethrough and said pad having a transverse dimension substantially smaller than that of said backing plate so that the backing plate extension portions extend outwardly of said pad on both sides thereof, said heat transfer means, said thermal bonding, said fins and said backing plate cooperating to transfer heat away from said one free face during the braking action.

4,036,334
BRAKING MEMBER HAVING A PLURALITY OF COATING FINS

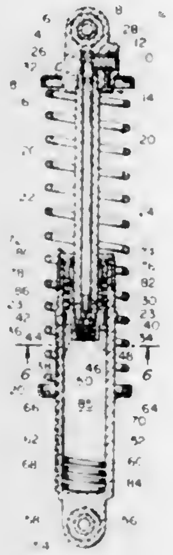
Peter William Brown, West Midlands, England, assignor to Girling Limited, Birmingham, England
Filed Mar. 30, 1976, Ser. No. 671,992
Claims priority, application United Kingdom, Apr. 8, 1975, 14276/75
Int. Cl.^{2} F16D *65/807, 65/827, 65/847*
U.S. Cl. 188—264 A **24 Claims**



1. A rotatable braking member for a vehicle brake, the braking member having a braking surface for engagement by a non-rotatable friction member, and a cooling face spaced from and in direct heat transfer relationship with said braking surface, a plurality of spaced cooling fins separate from said braking member and arranged adjacent to said cooling face in a relatively spaced relationship, said cooling fins having a coefficient of thermal conductivity higher than that of the braking member, and heat conducting mounting means for securing said fins to said braking member and for maintaining said fins in said relatively spaced relationship, said heat conducting mounting means having a co-efficient of thermal conductivity higher than that of the braking member and providing a heat transfer connection between all said fins and said cooling face, and said heat conducting mounting means comprising a plurality of individual angularly spaced struts which are separate both from said fins and said braking member, said struts being secured to said fins and each of said struts having an end in direct heat exchange relationship with said cooling face, and passages defined between adjacent fins, said fins being operative to dissipate heat to a flowable working medium within said passages, and at least one of the passages being substantially uninterrupted circumferentially with respect to the direction of rotation of said braking member, braking forces being transmitted through said braking member independently of said struts.

4,036,335
ADJUSTABLE SHOCK ABSORBER

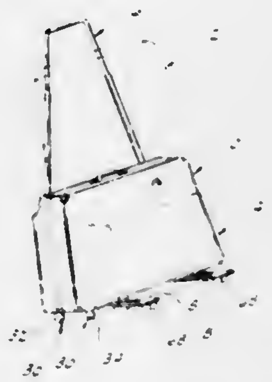
John T. Thompson, West Los Angeles, and Arnold A. Cowan, Encino, both of Calif., assignors to Arnold A. Cowan, Encino, Calif.
Continuation of Ser. No. 457,059, April 1, 1974, abandoned, which is a division of Ser. No. 379,612, July 16, 1973, Pat. No. 3,848,710, which is a continuation of Ser. No. 179,752, Sept. 13, 1971, abandoned. This application Aug. 8, 1975, Ser. No. 602,996
Int. Cl.^{2} F16F *9/44*
U.S. Cl. 188—319 **9 Claims**



1. In a hydraulic shock absorber the combination of: a pressure tube having a reciprocable piston assembly therein, said assembly including a hollow piston rod having a piston on one end thereof, said piston having a central, axial, primary fluid passageway communicating one portion of said pressure tube with the other through said hollow piston rod and said piston, attachment means on the other end of said hollow piston rod for attachement of said shock absorber to an unsprung mass, said attachement means having an axial bore with a transverse bore communicating to the exterior thereof; an elongate adjustable metering rod shiftably mounted in said hollow piston rod and axial bore of said attachment means and movable into and out of restricting hydraulic fluid position with respect to said central, axial, primary fluid passageway, said metering rod having a length at least as long as said hollow piston rod and having one extremity within said attachment means having a recessed portion and the other extremity having a reduced portion; and externally accessible adjusting means disposed in said transverse bore of said attachment means in operative engagement with said recessed portion of said metering rod to adjust the position of said metering rod to any desired position within the stroke limits of said metering rod for movement of the reduced portion of said metering rod into said central, axial, primary fluid passageway and means located in said transverse bore for locking said adjustment means and therefore said metering rod in each adjusted position.

4,036,336
WHEELED SUITCASE CONVERTIBLE TO LUGGAGE CART

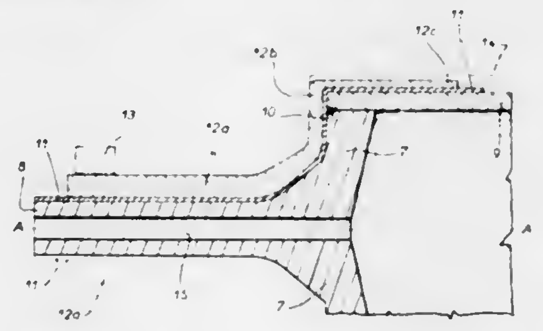
Oscar L. Burtley, Box 4, Rte. 3, Lake Land Hills, Carbondale, Ill. 62901
Filed Mar. 25, 1976, Ser. No. 670,279
Int. Cl.^{2} A45C *5/14*
U.S. Cl. 190—18 A **7 Claims**



1. In a suitcase having a bottom wall, a top wall and sidewalls, said bottom wall having rolling means and said top wall having a handle, the improvement comprising a retractable handle having a pair of longitudinally extending members connected at their proximal ends to a selected sidewall and connected at their distal ends to a cross-member forming a grip, said longitudinally extending members received in retracted condition within said selected sidewall, said improvement further including recesses in adjoining portions of the selected sidewall and the top wall for cooperative receipt of the longitudinally extending members in retracted condition so that said members are maintained in a plane below the plane of the topwall.

4,036,337
ONE-PIECE CONDUCTOR ROLLER FOR ELECTROLYTIC PROCESSING OF STRIP MATERIALS

Georges Arjalies, La Garde, and Jean-Claude Guillais, Sartrouville, both of France, assignors to Les Traitements de Surface Nobel-Bozel, Gaillonnet-Seraincourt, France
Filed June 24, 1976, Ser. No. 699,636
Claims priority, application France, June 26, 1975, 75.20149
Int. Cl.^{2} C25D *7/04*
U.S. Cl. 191—1 A **2 Claims**



1. A roller for the continuous electrolytic processing of metallic or metallized strip materials comprising

a hollow cylindrical body,

two flanges disposed along a common longitudinal axis with and fastened to the respective ends of said cylindrical body,

each said flange comprising end to end along said common longitudinal axis, a cup and a half roller shaft in a single piece, each said flange being fastened to a respective end of said cylindrical body at the periphery of said cup,

inner walls of said cup of said flanges disposed face to face to each other to form inner end walls of the roller,

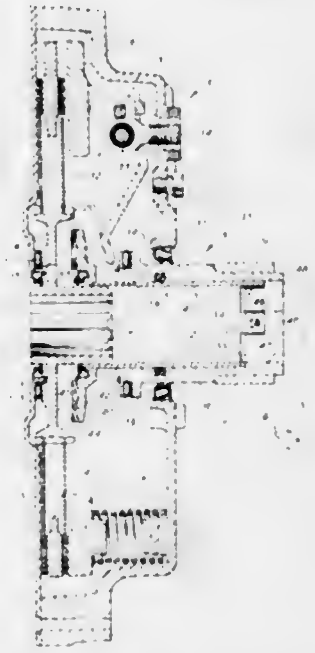
said flanges being axially transpierced by a longitudinal bore on said inner wall of said cup to convey a cooling fluid to refrigerate the roller,

said body and said flanges having their outer surface covered with a continuous layer of uniform thickness of a corrosion-resistant metal and covered thereon with a continuous layer of a metal of good electrical conductivity having a constant cross section for the passage of an electric current,

the zone of the face of the roller being provided with an outer coating of a hard metal thereon.

4,036,338
SEALED OIL-FILLED CLUTCH

Donald F. Linn, Manlius; Frederick C. Schmidt, Syracuse, and John P. Yanko, Liverpool, all of N.Y., assignors to Lipe-Rollway Corporation, Syracuse, N.Y.
Filed Nov. 17, 1975, Ser. No. 632,258
Int. Cl.^{2} F16D *67/02, 13/56*
U.S. Cl. 192—13 R **8 Claims**



1. A friction clutch for connecting driving and driven shafts comprising an oil-tight enclosure adapted to be secured to the flywheel of an engine for rotation therewith, the enclosure being a two piece assembly having flat flywheel engaging plate and a dished cover member, means within the enclosure for normally effecting a driving connection between the shafts, release levers operable to disengage said driving connection, and means to actuate the release levers including a non-rotatable, axially movable sleeve encircling the driven shaft and extending from outside the oil-tight enclosure into the interior thereof, the actuating means includng at the inner end of the sleeve a thrust bearing engageable with the release levers.

4,036,339

TEMPERATURE SENSITIVELY ACTUATED HYDRAULIC COUPLING FOR DRIVING FANS

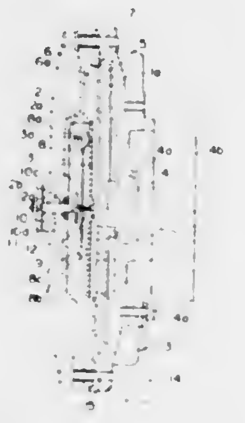
Yasubee Kikuchi, Shuzenjimachi, Japan, assignor to Usui Kokusai Sangyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jan. 12, 1976, Ser. No. 648,134

Claims priority, application Japan, Feb. 4, 1975, 50-014710

Int. Cl.^{2} F16D *35/00, 43/25*

U.S. Cl. 192—58 B **3 Claims**



1. Temperature sensitively actuated hydraulic coupling comprising a casing on one side, a cover on the other side, a torque transmission chamber on the casing side, a storage chamber on the cover side, said torque transmission chamber and storage chamber being in communication via a fluid inlet and separated by a partition arranged between the casing and the cover, a pin extending through a hole at the center of the cover, of which inner end comes in contact with a slender plate that is a component of a fluid transfer mechanism, and a compression spring acting against said pin at its end through said slender plate, and a fluid transfer mechanism so constructed that hydraulic coupling is increased by outward movement of said pin, while it is decreased by inward movement thereof characterized in that a permanent magnet having a through hole aligned with a center hole of the cover is provided on the outer side wall of the cover and a temperature sensitive magnetic element is fastened to the outer end of said pin, said temperature sensitive magnetic element consisting of Mn-Zn ferrite having a property that the magnetic attractive force between said temperature sensitive magnetic element and said permanent magnet is quickly reduced at a predetermined temperature where the hydraulic coupling is controlled, said temperature sensitve magnetic element being located opposite to said permanent magnet whereby as said temperature sensitive magnetic element senses higher temperature than said working temperature, the magnetic attractive force becomes decreased lower than the counter force by the spring and thereby said temperature sensitive magnetic element is moved away from the permanent magnet in a moment, while as said temperature sensitive magnetic element senses a temperature lower than said working temperature, said attractive force overcomes the spring force and thereby the ferrite is magnetically attracted by the magnet quickly, and thus in the former case, said pin is moved outward instantaneously to increase the hydraulic coupling, while in the latter case, said pin is moved inward instantaneously to decrease the hydraulic coupling.

4,036,340

COMMERCIAL VEHICLE DRIVEN BY AN INJECTION INTERNAL COMBUSTION ENGINE HAVING A TRANSMISSION WITH HYDRODYNAMIC COUPLING OR WITH A HYDRODYNAMIC TORQUE CONVERTER

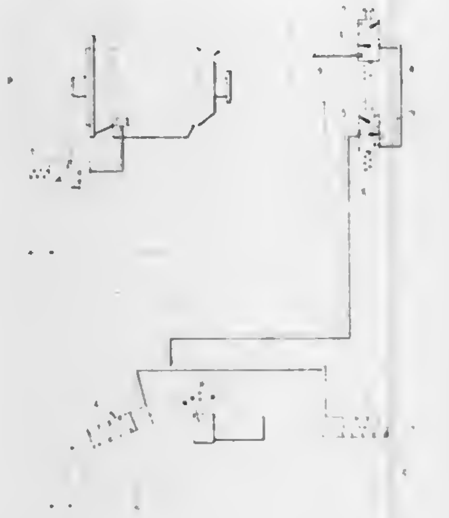
Ernst-Wilhelm Hufendiek, Stuttgart, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Apr. 23, 1976, Ser. No. 679,685

Claims priority, application Germany, Apr. 24, 1975, 2518119

Int. Cl.^{2} F02D *9/06;* **B60K** *41/16*

U.S. Cl. 192—.084 **10 Claims**



1. A commercial vehicle driven by an injection internal combustion engine, which comprises a transmission including a hydrodynamic device and a by-pass clutch means, and an engine braking means actuatable by way of a switch means, said injection internal combustion engine including an injection pump and controller means for said injection pump having a stop position and an idling position, characterized by an adjusting means operatively connected with the controller means of the injection pump and including an actuating cylinder adapted to be acted upon by a pressure medium and influenceable in dependence on the engine braking means, and control means operatively connected between the adjusting means and the switch means for influencing said adjusting means during operation of the internal combustion engine, said control means being operable upon disengagement of the by-pass clutch means—shortly prior to reaching the idling rotational speed of the internal combustion engine—to effect an automatic adjustment of the controller means for the injection pump from the stop position to the idling position thereof.

4,036,341

CLUTCH PLATE WITH MULTIPLE SPRING AND FRICTION DAMPERS

Bruno Beeskow, Bietigheim; Günter Wörner, Rommelshausen, and Peter Schrape, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

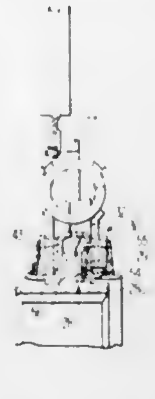
Filed June 11, 1975, Ser. No. 585,839

Claims priority, application Germany, June 24, 1974, 2430160

Int. Cl.^{2} F16D *3/14*

U.S. Cl. 192—106.2 **15 Claims**

1. A clutch disk for motor vehicle main clutches which comprises a disk means carrying friction linings and torsionally elastically arranged with respect to a hub means, several spring means with different characteristics being provided for a multistage torsional elasticity which are arranged in first window means, said hub means including a hub flange and said first window means being arranged in one of the two parts consisting of hub flange and disk means, said spring means also cooperating with corresponding larger, second window means provided in the respective other of said two parts, friction damping means coordinated to the spring means, one of said friction damping means being operable in the idling range and the others being operable in the operating range, and control means for determining the start of operation of the friction damping means operable in the operating range, characterized in that at least three spring stages of continuously harder characteristics, one friction means for the idling range and two separate main friction means with control means for the operating range are provided, each friction means including at least one friction disk, the control means being so constructed and arranged that the friction disk for the idling range is coordinated to the control means for the first main friction means so that with the beginning of the second spring stage, in lieu of the idling friction means, the effect of the first main friction means commences and the effect of the second main friction means still starts within the range of the second spring stage in such a manner that its damping action, in addition to the damping action of the first friction means, starts already within the range of the second spring stage by a corresponding distance of the control means thereof with respect to one of window means and spring ends of the third stage.



4,036,342

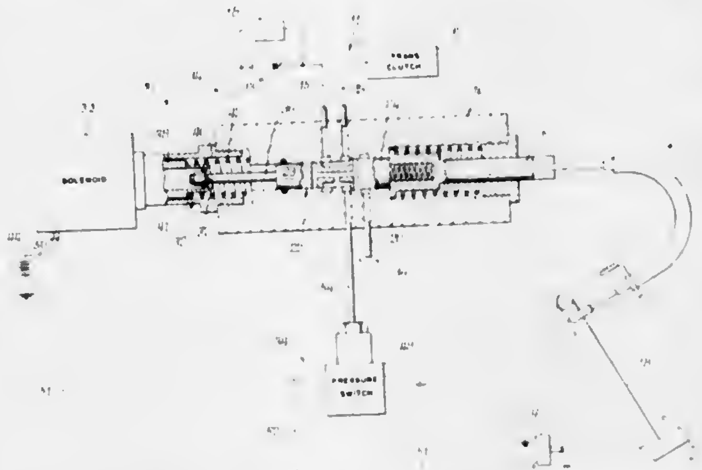
INCHING VALVE WITH MEANS PREVENTING HIGH PRESSURE INCHING

David S. Finn, Metamora, Ill., assignor to Towmotor Corporation, Mentor, Ohio

Filed June 28, 1976, Ser. No. 700,281

Int. Cl.^{2} F16D *25/062*

U.S. Cl. 192—109 F **7 Claims**



1. In a control system for a hydraulic pressure actuated clutch including an inching valve variably shiftable between a full clutch engaging position and a clutch disengaging position and a manual control member connected for normally shifting the valve between said positions for controllably varying the clutch engaging pressure, a pressure limiting arrangement for automatically reestablishing full clutch engagement pressure to the clutch whenever partial clutch engagement pressure exceeds a predetermined level, said arrangement comprising:

biasing means connected to said inching valve sufficient to shift the valve to its full clutch engaging position irrespective of the operation of the manual control apparatus;

actuator means connected for disengaging said biasing means; and

control means for selectively operating said actuator means and including first means responsive to the application of said manual control member to effect the disengagement of said baising means upon a predetermined application of said member, and second means responsive to said clutch engagement pressure for effecting the reengagement of the biasing means when said pressure exceeds a predetermined level.

4,036,343

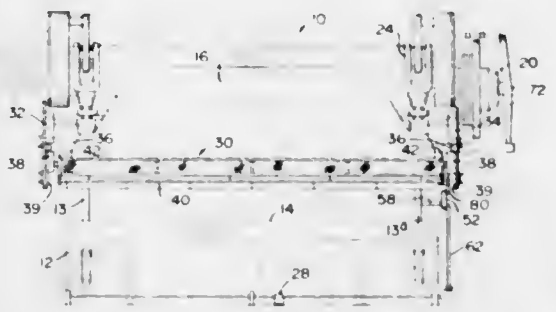
FAIL SAFE PRESS BRAKE GUARD

John McPhee, Scarborough, Canada, assignor to Rusco Industries, Inc., Los Angeles, Calif.

Filed Aug. 29, 1975, Ser. No. 609,023

Int. Cl.^{2} F16D *9/00*

U.S. Cl. 192—134 **7 Claims**



1. A press brake safety device comprising a press brake including a frame having a work positioning means thereon, a ram positioned on the frame for vertical reciprocation towards and away from engaging work on the work positioning means, a drive motor connectable to the ram by a clutch, pitman and eccentric means, and a foot treadle for controlling said clutch to actuate said ram for work engaging movement, the improvement comprising a guard for the ram positioned in front of the same and extending therebelow, air cylinders engaging ends of said guard to mount it on the frame and to move it vertically with but in advance of said ram to and from a position shielding said work positioning means, a lightweight protector bar vertically movably positioned on the lower end of said guard, linkage means connecting said foot treadle to said clutch means to engage the same on depression of said foot treadle, safety means connecting to said linkage means for rendering the same inoperative, and air operated control means connected to said protector bar to actuate said safety means upon movement of said protector bar in relative to said guard.

4,036,344

MULTIPLE-PLATE CLUTCH

John M. Nolan, Pittsfield, Mass., assignor to General Electric Company

Filed Dec. 15, 1975, Ser. No. 640,533

Int. Cl.^{2} F16D *47/54*

U.S. Cl. 192—48.3 **3 Claims**

1. A multiple element clutch comprising:

a. two members disposed concentrically about a common axis with either or both of said members having freedom of rotational movement about said axis;

b. a plurality of clutch elements with at least one clutch element carried by each member for interconnecting said members for uniformity of rotation about said axis when said clutch elements are engaged with each other;

c. said clutch elements comprising a series of clutch plates centered on said axis with alternate plates carried by a different one of the two members;

d. said alternate clutch plates carried by one member being keyed to a carrier for rotational movement about said axis with said carrier independently of said member and for translational movement parallel to said axis independently of said carrier;

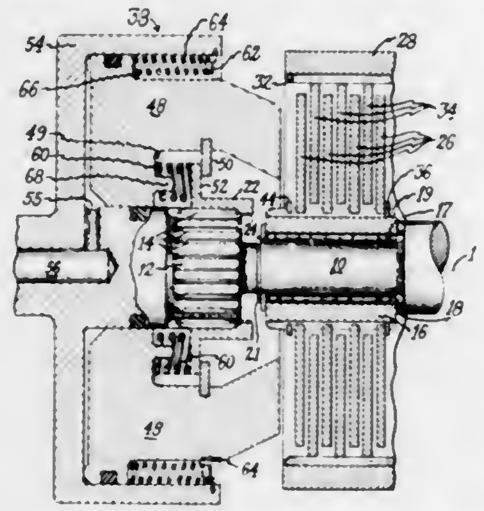
e. said carrier being ring-shaped, centered on said axis and attached to said one member so as to permit rotational motion about said axis independently of said one member and so as to deny axial translation independently of said one member;

f. said alternate clutch plates carried by the other said member being attached thereto so as to deny their rotational motion about said axis independently of said other member and so as to permit their axial translation independently of said other member;

g. interconnecting means for locking said clutch elements and said carrier to said one member for unitary rotation with respect to said axis;

h. said interconnecting means being a ring-shaped element centered on said axis and keyed to said one member proximate said carrier so as to deny its rotation about said axis independently of said one member and to permit its translation parallel to said axis to permit contact with said carrier;

i. said carrier and said interconnecting means each having locking means to engage with each other on contact to lock said carrier and interconnecting means together for unitary rotational motion about said axis;



j. actuating means for sequentially:

1. actuating said interconnecting means to lock said one member to its clutch element,

2. causing said plurality of clutch elements to engage each other to interconnect said members with respect to rotation about said axis,

3. disengaging said clutch elements. and

4. deactivating said interconnecting means;

and

k. said actuating means comprising a hydraulic piston supported by one of the members for movement parallel to said axis, said piston including means for translating said interconnecting means into and out of contact with said carrier and means for exerting a force against said clutch elements to press said clutch elements together,

whereby deleterious effects of interaction between disengaged clutch elements as a result of operation in a viscous medium are abated.

4,036,345

CONVEYORS

John Edmund Richard Webb, Bodorgan, Wales, assignor to Hydaroll Limited, Birmingham, England

Filed July 9, 1975, Ser. No. 594,447

Claims priority, application United Kingdom, Oct. 11, 1974, 44156/74

Int. Cl.^{2} B65G *13/12*

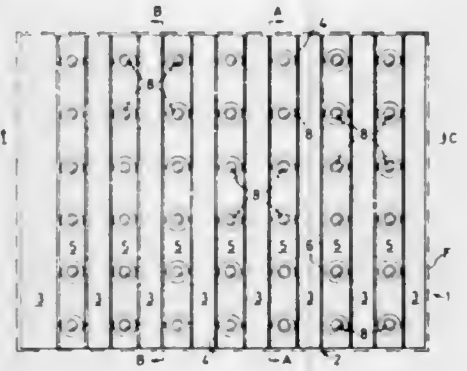
U.S. Cl. 193—35 SS **14 Claims**

1. A platform device for material handling, comprising in combination:

a fixed frame, said fixed frame comprising a plurality of spaced apart first elongate support members and a plurality of first discrete elongate members, said discrete and support members having upper surfaces, said plurality of discrete elongate members being attached to said upper surfaces of said elongate support members and extending at right angles to the length of said elongate support members;

a movable frame, said movable frame comprising a plurality of spaced apart second elongate support members and a plurality of second discrete elongate members, said second discrete elongate members and said second elongate support members having upper surfaces, said second discrete elongate members being attached to said upper surfaces of said second elongate support members and extending at right angles to the length of said second elongate support members;

the fixed and movable frames being so arranged that their respective elongate support members are parallel and their respective discrete members are parallel and interdigitate;



a plurality of individual rotatable members set in and extending above said upper surfaces of said second discrete elongate members of the movable frame;

inflatable means disposed under and attached to said second elongate support members of said movable frame and operable for raising and lowering the movable frame as a unit so that in a lower position of said movable frame a load can be supported on said upper surfaces of said first discrete elongate members of said fixed frame and in a raised position of said movable frame said rotatable members extend above the upper surfaces of said first discrete elongate members of said fixed frame for moving a load over said device.

4,036,346

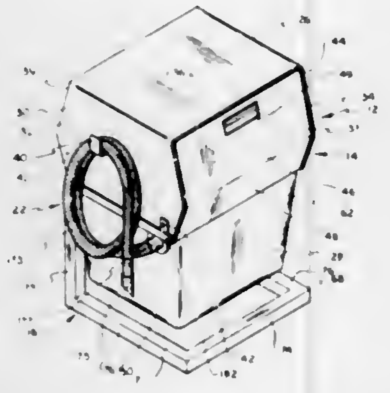
COIN OPERATED VACUUM APPARATUS

Richard W. Livingston, 10100 Raytown Road, Kansas City, Mo. 64134

Filed May 28, 1976, Ser. No. 690,897

Int. Cl.^{2} A47L *5/00*

U.S. Cl. 194—9 T **12 Claims**



1. A vacuum apparatus generally used in vehicle cleaning operations, comprising:

a. a housing means connected to a basic support means;

b. said housing means including a cover head assembly pivotally connected to said basic support means and a receptacle assembly removably connected to said basic support means;

c. said receptacle assembly having a canister member with an upper opening and an inlet air opening;

d. a vacuum power means mounted on said canister member to seal around said upper opening by weight of said vacuum power means and suction generated thereby;

e. said vacuum power means having a filter and motor assembly mounted on a motor head support assembly; and

f. said filter and motor assembly having a vacuum motor member operable when energized to draw inlet air through said inlet air opening, a portion of said motor member, and discharged through said motor head support assembly.

4,036,347

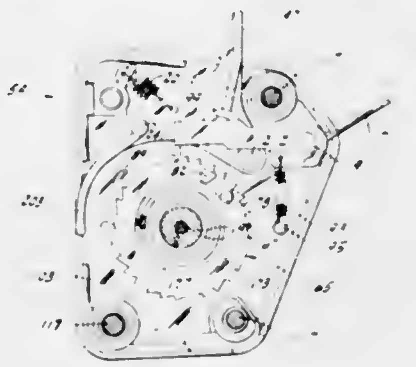
COIN TOTALIZER FOR DIFFERENT DENOMINATIONS

Barry L. Smi[illegible], Florissant, Mo., assignor to UMC Industries, Inc., Stamford, Conn.

Filed Apr. 15, 1976, Ser. No. 677,310

Int. Cl.^{2} G07F *5/08*

U.S. Cl. 194—48 **7 Claims**



1. A coin totalizer comprising:

a ratchet member rotatable on an axis in a forward direction away from a zero position in steps corresponding to a unit coin value and in reverse direction back to zero position;

a pawl carrier rotatable on said axis away from a retracted position and in return direction back to retracted position;

trip means extending from said pawl carrier movable downward by coins of different denominations dropping in respective coin chutes for rotating the pawl carrier in the direction away from its retracted position different amounts corresponding to the value of the different coins, said trip means being released after rotation by a coin for upward return and return of the pawl carrier to retracted position;

a driving wheel on said pawl carrier engageable with said ratchet member for stepping said ratchet member forward upon rotation of the pawl carrier in return direction;

a first spring for rotating the pawl carrier in return direction to return it and said trip means to retracted position;

a second spring for rotating the ratchet member in reverse direction to its zero position;

a holding pawl for the ratchet member;

reset means for releasing the driving pawl and the holding pawl for resetting the ratchet member to zero position;

a lockout member movable between a retracted position and an operative position;

a latch for said lockout member movable between a retracted position wherein the lockout member is free to move to its operative position and a latching position wherein it latches said lockout member in retracted position;

means biasing the latch to its retracted position;

means on said ratchet member engageable with said latch when the ratchet member returns to its zero position for moving the latch against its bias to its latching position and determining the zero position of the ratchet member;

said first spring being characterized in that the force exerted thereby on the pawl carrier for returning the pawl carrier and trip means to retracted position after a coin has driven the trip means down is lower than the force applied via the trip means by a coin of the lightest weight to be handled, said first spring exerting force on the ratchet member via the pawl carrier and driving pawl in opposition to the second spring when the trip means moves up and the pawl carrier and driving pawl step the ratchet member forward,

said second spring being characterized in that the force exerted thereby on the ratchet member when the ratchet member is at its zero position is sufficient to overcome the latch biasing means for movement of the latch to its latching position when the ratchet member returns to its zero position but insufficient when the ratchet member is at its zero position and as it rotates forward to overcome the first spring, whereby the first spring is effective to return the pawl carrier and trip means to retracted position when the ratchet member is stepped forward.

4,036,348

FIXING DEVICE FOR A TYPE-CARRIER DISK

Giampaolo Guerrini, Ivrea (Turin), Italy, assignor to Ing. C. Olivetti & C., S.p.A. Ufficio Brevetti, Ivrea (Turin), Italy

Filed July 8, 1975, Ser. No. 594,067

Claims priority, application Italy, July 10, 1974, 69194/74

Int. Cl.^{2} B41J *1/30*

U.S. Cl. 197—53 **14 Claims**

1. A fixing device for attaching a type-carrier disk with flexible tongues to a selection shaft of a printing machine, wherein said selection shaft has a shaft axis and includes contrast means defining a rotation plane substantially perpendicular to said shaft axis and a conical end, said contrast means extending radially outwardly a predetermined radial distance from said shaft axis, and wherein said type-carrier disk comprises a central part and a conical seat for cooperating, respectively, with said contrast means and said conical end for aligning said type-carrier disk with respect to said selection shaft, and means for exactly defining the angular position of said disk with respect to said selection shaft, said fixing device comprising:

at least one aperture in said disk, said aperture being defined in part by a first aperture edge radially spaced from said shaft axis a distance less than said predetermined radial distance,

at least one attachment member supported by said selection shaft and extending axially beyond said rotation plane and at an angle thereto, said attachment members being extendable through said apertures, each of said attachment members being movable between a first position wherein said attachment member can be passed through said aperture and a second position wherein said attachment member engages said first edge of said aperture,

resilient means urging said attachment members toward said second position so that when said attachment means extends into said aperture said attachment means engages said first edge to hold said type-carrier disk against said contrast member and said conical seat against said conical end, and knob means for attaching and detaching said type-carrier disk.

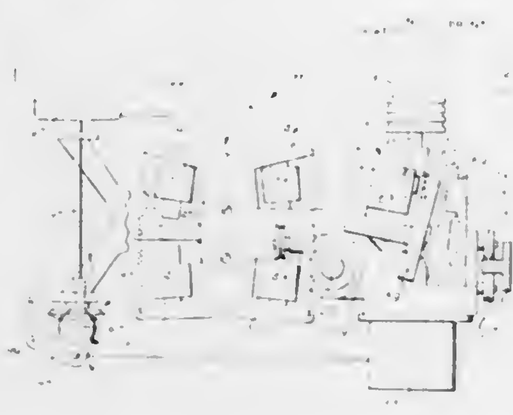
4,036,349
COMBINED MECHANISM FOR IMPACTING A PRINT MEMBER AND ADVANCING A PRINTING RIBBON

Edward Feldman, Teaneck, and George Lupinacci, Nutley, both of N.J., assignors to Sweda International, Inc., Pinebrook, N.J.

Filed Feb. 28, 1975, Ser. No. 554,002

Int. Cl.² B41J *33/22, 33/32*

U.S. Cl. 197—151 **7 Claims**



1. A device for impacting a print member and advancing a printing ribbon comprising:

print means comprising a rotatable print member having a plurality of print bands thereon and having null, cocked, and print positions,

yoke means for supporting said print member therein,

support means having said yoke means rotatably mounted thereon,

electromagnetic means having a stator and an armature, said stator being mounted on said support means and said armature being coupled to said yoke means, for actuating said print means thereby causing said print member to impact,

a ribbon advance means coupled to said yoke means, for advancing said ribbon one increment each time said electromagnetic means is energized,

said ribbon advance means including a first elongated link member;

said first link member having an upper end and a lower end, said upper end being pivotably coupled to said yoke means;

a second link member pivotably coupled to said supporting means,

one-way clutch means, connected to and driven by said second link member, for moving said printing ribbon in only one direction, and

a flexible cable connecting means, coupled to said first and second link members, wherein

said first link member is rotated in a first direction, said flexible cable connecting means is drawn taut, and said second link member is rotated in a first direction, whereby said one-way clutch means is engaged thereby advancing said ribbon one increment when said electromagnetic means is energized, wherein

said first link member is rotated in a second direction, opposite to said first direction, said flexible cable connecting means goes slack, and said second link member is rotated in said second direction, when said electromagnetic means is de-energized, and wherein

said first link member is rotated in said first direction, said flexible cable connecting means remains slack, and said second link member remains stationary, after said print member impacts.

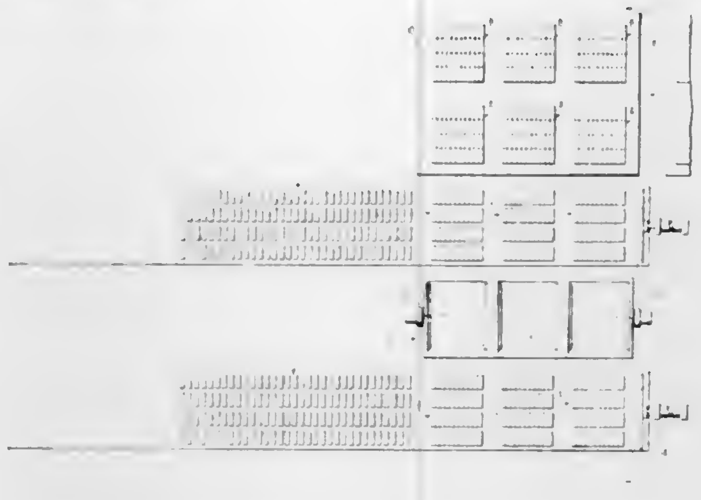
4,036,350
METHOD AND APPARATUS FOR HANDLING BRICK FOR INSPECTION AND FEEDING

Robert E. Jones, 15 S. Oak Forest Drive, Asheville, N.C. 28803

Filed Jan. 8, 1974, Ser. No. 431,637

Int. Cl.² B65G *57/00*

U.S. Cl. 198—420 **2 Claims**



1. A method of separating bricks for inspection and subsequently regrouping and stacking them into layers comprising the steps: arranging two groups of bricks in rows on a horizontal plane with the bricks in each row being spaced in end-to-end relationship with the faces of each of the bricks exposed upwardly, spacing each of the rows of bricks from each other, regrouping each of the groups with the bricks in adjacent rows substantially engaging each other and with the ends of the bricks in each row substantially engaging each other, feeding one of the groups onto an article of conveyance, and then feeding the other group on the first group while on the article of conveyance and wherein the rows of bricks are spaced from each other by conveying the two groups on to horizontal conveyor surfaces movin faster than the speed of the bricks as they arrive on said horizontal conveyor surfaces, and wherein prior to depositing the second group of bricks on the first group of bricks a horizontal platě is inserted over the first group of bricks, the second group of bricks is placed on the horizontal plate, and the horizontal plate is retracted out from between the two groups of bricks to deposit the second group of bricks on the first group of bricks.

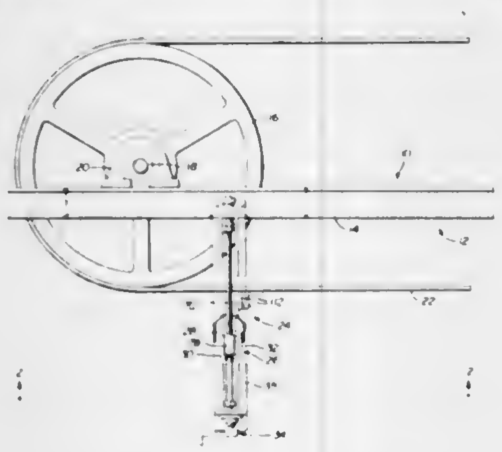
4,036,351
CONVEYOR BELT CLEANER

Robert C. Reiter, Aurora, Ill., assignor to Material Control, Inc., Aurora, Ill.

Filed Feb. 12, 1976, Ser. No. 657,351

Int. Cl.² B65G *45/00*

U.S. Cl. 198—499 **8 Claims**



1. A conveyor belt cleaner for a conveyor including a frame, a rotatable drum carried by the frame and an endless belt trained about the drum and providing delivery and return runs, said cleaner including a vertically movable support adapted to be mounted transversely of the belt to be cleaned, a wiper blade engageable with said belt, means for mounting said wiper blade on said support, and jack screw means adapted to be interposed between the frame and said support and effective upon operation thereof to move said support and wiper blade relative to the belt, and wherein said support includes a pair of spaced apart, generally horizontal upper and lower flanges connected by a vertically extending web, an opening in the upper flange, a tubular collar disposed about the opening in said upper flange, said collar being secured to said upper flange and extending from the upper side thereof, a threaded shaft extending through said collar and said flanges, abuttment means secured to said shaft adjacent the lower side of said upper flange, a spring interposed between said collar abuttment means and said lower flange for biasing said blade towards the belt, a wiper blade support secured to the upper end portion of said shaft, means securing said wiper blade to said wiper blade support, and adjustment means carried by said threaded shaft for varying the biasing force of said spring.

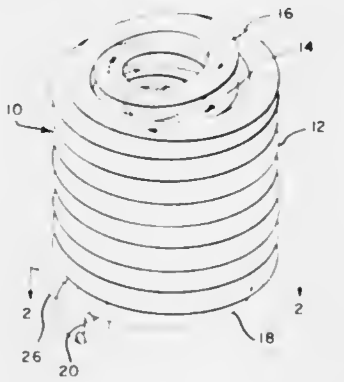
4,036,352
ENDLESS CONVEYOR

David Laverne White, Dallastown, Pa., assignor to Alto Corporation, Pa.

Continuation of Ser. No. 600,493, July 30, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,469

Int. Cl.² B65G *15/02*

U.S. Cl. 198—778 **1 Claim**



1. An endless conveyor including a closed path for a continuous conveyor belt; a support extending along the path; an endless belt on the path resting on the support and having an inner edge and an outer edge; drive members located at spaced intervals along the inside path for moving the belt downstream along the path; said belt including a number of rods extending laterally across the width of the path and resting upon the support, integral links at the ends of the rods defining an inner chain of links and an outer chain of links, each link of the outer chain extending from its respective rod along the path and around an adjacent rod, said drive members engaging links of said inner chain to move the belt downstream along the path, wherein the improvement comprises each link in said inner chain extending from its respective rod upstream with respect to the direction of movement of the belt and around the adjacent upstream rod to define a link recess and to secure the adjacent rods together and thereby fix the pitch of the inner chain; the interior openings of the links of the outer chain having sufficient width and length along the path so that the rods float in such openings and are free for limited movement toward and away from each other so that the pitch of the outer chain is free to vary in response to change in the radius of curvature of the path, whereby drag forces exerted on the rods by said support bias the rods upstream with respect to the links of the inner chain and force the inner links against the link recesses of their respective upstream rods to lock the inner links together to support the rods without column loading of the rods.

4,036,353
TRANSFER APPARATUS FOR GRIPPING AND HOLDING A SPINNING COP

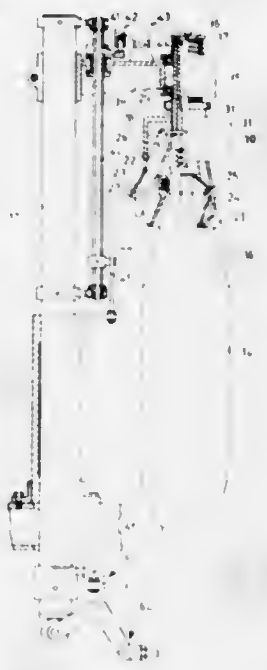
Xaver Suter, Thalwil, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed June 21, 1976, Ser. No. 697,944

Claims priority, application Switzerland, July 3, 1975, 8684/75

Int. Cl.² B65G *47/74*

U.S. Cl. 198—486 **10 Claims**



1. Transport apparatus for gripping and holding spinning cops (**14'**) to transport the cops in automatic winding machines (**10, 11**) comprising

gripper means (**16**) having a centering cone (**32**) to center a spinning cop form (**14'**) and a plurality of circularly located gripper jaws (**21**) arranged to engage the outer surface of an end (**14''**) of the cop form and to clamp the cop (**14'**) therebetween;

operating levers (**23**) linked to and supporting the gripper jaws (**21**);

spring means (**27**) attached to the respective gripper jaws (**21**) and to the respective operating levers (**23**) and tending to hold the jaws in open position but permitting rocking of the jaws (**21**) to a cop engaging position;

said gripper jaws defining an area forming an engagement zone (**21'**) located on facing surfaces of the gripper jaws (**21**) and positioned relative to the attachment point of the spring means (**27**) on the jaws (**21**) to effect closing movement of the gripper jaws (**21**) to cop engaging position upon axial pressure directed against said engagement zone (**21'**) by said end (**14''**) of the cop (**14'**).

4,036,354
CONVEYOR BELT CLEANER

Robert C. Reiter, Aurora, Ill., assignor to Material Control, Inc., Aurora, Ill.

Filed Dec. 22, 1975, Ser. No. 642,757

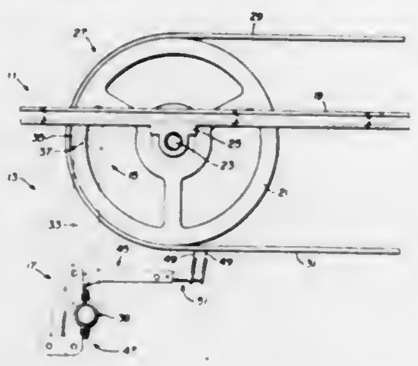
The portion of the term of this patent subsequent to Nov. 30, 1993, has been disclaimed.

Int. Cl.² B65G *45/00*

U.S. Cl. 198—499 **14 Claims**

1. A scraper blade assembly for a belt cleaner mounted on a conveyor system having a rotatable drum and an endless belt trained about said drum and providing delivery and return runs, said belt cleaner including a support fixedly located transversely of and adjacent to one of said runs and having a plurality of individual scraper blade assemblies operably disposed along said support, each of said scraper blade assemblies comprising: a generally L-shaped arm having an arcuate midportion; a bracket assembly rigidly connected to said support

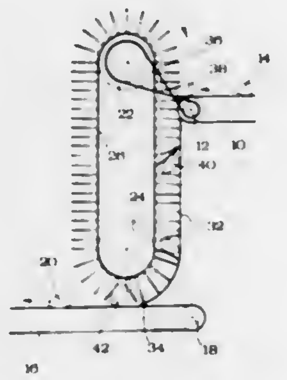
and including plate means for pivotally supporting said arm at said arcuate midportion so as to limit the lateral movement and canting of said arm, said plate means including a pair of parallely opposed upright plates; an individual and distinct scraper blade mounted on one end of each of said arms; tension spring means connected between the other end of said arm which is disposed on the opposite side of said pivotally supported midportion from said one end on which said scraper blade is mounted and said bracket assembly for tensioning said other end toward said bracket assembly to urge said arm to pivot in one direction and bias said scraper blade toward said one run;



a stop means for limiting the movement of said arm in said one direction to prevent such damage as may occur when said blade becomes worn, said one end of said arm further includes a relatively straight portion and a blade mounting means telescopically received within said straight portion for enabling a staggered arrangement of scraper blades to be achieved with only uniform, completely substituteable arms whose lengths may be telescopically adjusted, said blade mounting member including a flange connected to the distal end of said blade mounting member and fastening means for securing said wiper blade to said flange.

4,036,355
EGG ESCALATOR

Roberto Valli, Via IV Novembre 1/a, Galatea (Forli), Italy
Filed May 27, 1975, Ser. No. 581,049
Claims priority, application Italy, June 11, 1974, 12021/74
Int. Cl.^{2} B656 *19/00*
U.S. Cl. 198—607 **2 Claims**



1. An egg escalator for transfer of eggs delivered along a first powered horizontal conveyor at an upper level onto a second conveyor at a lower level, the path between said conveyors being essentially vertical, comprising: a first roller rotatably supported in a fixed position in front of and higher than the conveyor at the upper level;

a second roller rotatably supported beneath and parallel to the first roller and directly above the conveyor at the lower level;

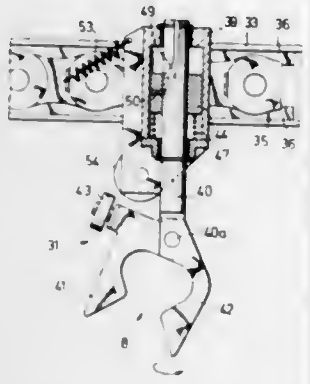
a belt extending around said rollers for driving support therewith, and defining a path comprising two vertical runs and an upper and lower bend, the belt having rigidly connected, resilient and flexible spiked projections at right angles to its surface, the projections being at least as long as the average length of an egg and being close to each other along the length and the width of said belt whereby each egg is held by at least two projections, each egg deflecting at least two projections and being held by said at least two deflected projections during the transfer; the projections urging each egg away from the belt onto said conveyor at the lower level;

a screen stationarily supported at close distance in front of the belt projections and extending between the two conveyors;

driving means connected to the first roller for driving the belt so that its portion in front of the screen moves from said conveyor at the upper level toward said conveyor at the lower level, said first horizontal conveyor at the upper level force feeding the eggs at a point below the upper bend between the spiked projections of said belt whereby the eggs travel along a vertical path immediately after being fed on the belt without going through the upper bend.

4,036,356
PRODUCT HANDLING EQUIPMENT FOR AN IMBRICATED PRODUCT FORMATION

Walter Reist, Schonenbergstrasse 16, 8340 Hinwil, Switzerland
Division of Ser. No. 411,689, Nov. 1, 1973, Pat. No. 3,948,551. This application June 16, 1975, Ser. No. 587,341
Claims priority, application Switzerland, Nov. 10, 1972, 16383/70
The portion of the term of this patent subsequent to Apr. 6, 1993, has been disclaimed.
Int. Cl.^{2} B65G *15/00*
U.S. Cl. 198—680 **10 Claims**

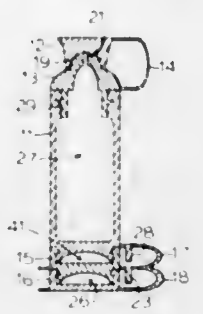


1. Equipment for the handling and manipulation of articles, especially printed products arriving in fish-scale formation, comprising a multiplicity of clamps for engaging said products, means for operatively connecting said multiplicity of clamps with one another, each of said clamps comprising clamp jaws having clamping surfaces for engaging a product, said clamp jaws forming a clamp gap when the clamp is closed, means for pivotably mounting said clamp jaws of each clamp about a pivot axis, said clamping surfaces being substantially perpendicular to said pivot axis, the clamp jaws of each clamp being pivotable in planes substantially perpendicular to said pivot axis in a substantially scissor-like manner at the region of the clamp gap away from one another into their open position and towards one another into their closed position, the scissor-like pivoting of said clamp jaws into their closed position causing gripping engagement of said clamping surfaces with the article.

4,036,357
CONTACT LENS CASES

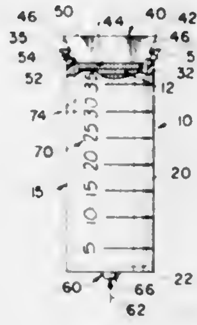
John Cas Czelen, 550 Whitehaven Parkway NW., Washington, D.C. 20007
Filed Jan. 14, 1976, Ser. No. 649,022
Int. Cl.^{2} A45C *11/04;* B65D *85/54*
U.S. Cl. 206—5.1 **1 Claim**

1. A contact lens case of one functional unit, there being no segments completely disattachable from the unit during normal use, constructed of a flexible, plastic-like material, comprising: a fluid reservoir of cylindrical design, a concave depression on the base of said reservior creating a primary storage space for a contact lens, a snap-fit primary lens storage cap covering the primary lens storage space, a protruding lip appended to the primary lens storage cap to aid manipulation, a strap hinge connecting said primary cap with said reservoir, a concave depression on the outer surface in the base of said primary lens storage cap creating a secondary storage space for a contact lens, a snap-fit secondary storage cap covering the secondary lens storage space, a protruding lip appended to the secondary lens storage cap to aid manipulation, a strap hinge connecting said secondary cap with the strap of the primary cap, transverse ribs on the strap hinges for the storage caps, a fluid dispensing structure on the upper end of the fluid reservoir cylinder, a snap-fit cap enclosing the fluid dispensing structure, an interlocking fit between the fluid dispensing structure and the fluid reservoir whereby the fluid dispensing structure may be releasably secured to said fluid reservoir cylinder, providing a fluid-tight seal, and separable to provide access to the fluid reservoir.



4,036,358
CLEAR VIEW COIN WRAP

Philip Kelley, 32 Leighton St., Pepperell, Mass. 01463
Filed Nov. 2, 1976, Ser. No. 738,245
Int. Cl.^{2} A45C *11/00*
U.S. Cl. 206—.82 **10 Claims**

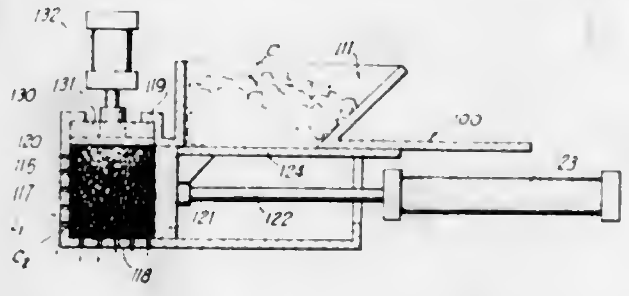


1. A reuseable coin holder for use in removably holding a specific number of coins of a particular diameter within the confines thereof including:

a. a cylindrical shell having a closed end defined by a bottom wall and an open end for insertion of the coins therein in stacked relationship,
b. said open end formed by a frusto-conical section including a tapered wall having an inner surface inclined relative to said shell in order to facilitate the entrance of the coins therein,
c. closure means operatively associated with said section and adapted to be removably secured thereto and extend thereacross and close off said open end when the coins are stacked therein, said closure including:
   1. an elongated body element having a bottom end and a top end in spaced relationship to each other,
   2. an outer end on each side of said body element tapered to substantially conform to said inner wall of said section,
   3. a pair of aligned apertures in said inner wall of said section, and
   4. a pair of prongs extending outwardly from each said outer end and adapted to snap into said apertures such that said closure is retained in fixed position on said shell with the stacked coins contained therein.

4,036,359
BALED WOOD CHIPS

Claudius R. Strickland, Jr., Ashburn, Ga., assignor to American Hoist & Derrick Company
Continuation of Ser. No. 431,104, Jan. 7, 1974, abandoned. This application June 2, 1976, Ser. No. 692,055
Int. Cl.^{2} B65D *71/00*
U.S. Cl. 206—83.5 **4 Claims**



1. A wood chip product suitable for producing paper pulp comprising a quantity of green, naturally moist wood chips in a compressed condition generally perpendicular to the general planes of said chips and having the fibres of adjacent chips intermeshed, said fibres retaining their integrity, said quantity of wood chips occupying from approximately one-half to approximately one-sixth its normal volume and having a substantially reduced quantity from its normal amount of clear liquid, therein.

4,036,360
PACKAGE HAVING DESSICANT COMPOSITION

Robert J. Deffeyes, Arlington, Tex., assignor to Graham Magnetics Incorporated, Graham, Tex.
Filed Nov. 12, 1975, Ser. No. 631,361
Int. Cl.^{2} B65D *81/26;* F17C *11/00;* B32B *5/16;* C09K *3/00*
U.S. Cl. 206—204 **10 Claims**

1. A dessicant composition of the type adapted to absorb moisture in packing applications comprising

at least 20% of a particulate dessicant material and

b. as a binder therefor, an effective quantity of an organic resin comprising at least about 50% of a prepolymerized polyurethane resin having an MVT value of at least 40 grams per 24 hours per 100 in^2, and wherein said polyurethane has the following minimal physical characteristics:
Tensile strength — 1000 psi and
Elongation — 200%.

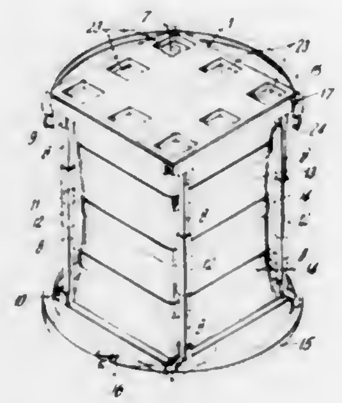
4,036,361
COLLAPSIBLE CONTAINER

Leo Jacobson, 59 Cathay Road, and Wallace Forman, 66 Newkirk Ave., both of East Rockaway, N.Y. 11518
Filed Dec. 18, 1975, Ser. No. 642,119
Int. Cl.^{2} B65D *19/00*
U.S. Cl. 206—386 **16 Claims**

1. A collapsible containing device for containing both liquid and solid cargoes, said device comprising:

a flexible component as the primary containing means which is in the form of a bag or sleeve attached at its upper and lower extremities to the upper and lower plates of a collapsible supporting frame;

a collapsible supporting frame comprising an upper rigid plate having an opening therein with closure means for filling and emptying the containing device and a lower rigid plate, said plates are attached to each other by collapsible leg members fixedly secured along the perimeter of each of said plates by hinge means which enable said leg members to have an open or extended position and a closed position, wherein said leg members in the open or extended position are perpendicular to said plates and are sufficiently long to fixedly support the upper plate in elevated relation above the lower plate to enable the outer sides of said flexible component to be substantially vertical and taut when the device is filled with cargo, and wherein in the closed or collapsed position the leg members reduce



in length so that the upper and lower plates become substantially adjacent to one another and wherein the flexible component collapses toward the three-dimensional center of the containing device;

said containing device characterized as having sufficient strength and endurance to be used in both manual and mechanized transporting systems and where said device efficiently utilizes storage and carrier space when full with cargo and is capable of collapsing when empty to a compact configuration which is significantly smaller in volumetric size than its open configuration.

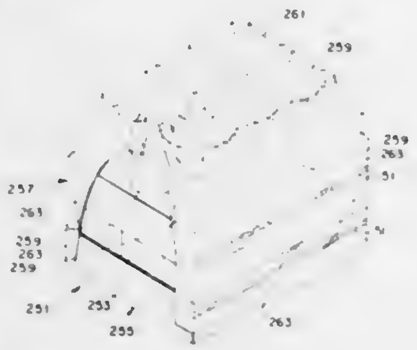
4,036,362
PACKAGE

John E. Ullman, Huntingdon Valley, Pa., assignor to Huntingdon Industries Incorporated, Bethayres, Pa.

Continuation-in-part of Ser. No. 404,642, Oct. 9, 1973, Pat. No. 3,890,763. This application Mar. 31, 1975, Ser. No. 563,667

Int. Cl.^{2} B65D *65/14, 65/38;* **B65B** *53/00*

U.S. Cl. 206—432 **2 Claims**



1. A package for articles such as cans, bottles, and the like, comprising a tray having a bottom and upstanding walls extending therefrom with a first pair of spaced-apart walls connected together by a second pair, a sheet covering said articles, and adhesive means connecting the sheet to the first pair of walls to hold the articles to the tray, said film sheet being pressed against said adhesive and said walls to effect an adhesive connection prior to heat shrinking said film sheet, an inverted top tray positioned on top of the articles to keep the articles in vertical alignment, the inverted top tray being covered by said sheet, said top tray having a bottom resting on the top of the articles with walls extending downwardly from said bottom and surrounding said articles to keep the articles confined within said walls to hold the articles against tilting, said inverted top tray being provided with holes that receive the tops of the articles, said sheet covering the tops to the articles.

4,036,363
AUTOMATIC FILLING OF BAGS

Robert J. Kugler, East Meadow, N.Y., assignor to Action Packaging Corporation, Brooklyn, N.Y.

Continuation-in-part of Ser. No. 434,377, Jan. 18, 1974, abandoned, which is a continuation of Ser. No. 274,509, July 24, 1972, abandoned. This application Apr. 8, 1976, Ser. No. 674,872

Int. Cl.^{2} B65D *85/54, 33/28*

U.S. Cl. 206—526 **4 Claims**

1. A bag-pack adapted to be loaded into a machine for automatic filling of bags, said bag-pack comprising:

a plurality of bags made of heat-sealable plastic material, each bag having first and second walls joined by heat-sealed seams at the sides of the bag and defining an opening at the top of the bag, said first wall having a hem at the top thereof defining a first passageway open at each end, a strip of plastic protruding directly through said opening and attached to the inside surface at the top of said second wall by two heat-sealed seams extending across said wall from one side to the other, said heat-sealed seams defining a second passageway open at each end, and cord-closure means contained in said first and second passageways and being adapted to draw the top of the bag closed; and

means engaging said strips of plastic for retaining said bags in a stack arrangement.

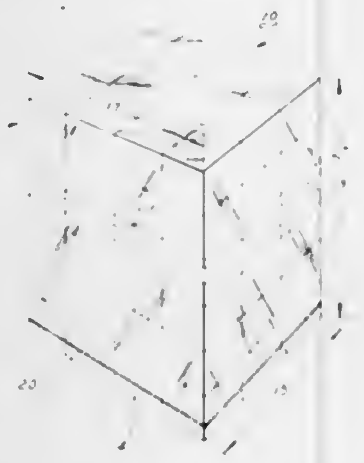
4,036,364
UNITIZED PALLETLESS LOAD AND METHOD OF FORMING SAME

Everett J. Ambrose, Simsbury, Conn., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 8, 1976, Ser. No. 674,753

Int. Cl.^{2} B65D *85/16, 63/00*

U.S. Cl. 206—526 **4 Claims**



1. In a palletless load unit which includes:

vertically stacked layers containing plural articles comprising lightweight plastic containers, each having a weight range of from about 0.03 to 0.13 grams per cubic centimeter of internal volume, said load unit exerting a pressure of between about 15 to 150 pounds per square foot, the improvement which includes:

strapping means locally perimetrically disposed around the vertical side walls of the lowermost layer and compressively engaging outer articles therein at a force of between about 5 to 50 pounds to unitize such outermost layer, said strapping means being vertically narrow having a height substantially less than that of said articles in said lowermost layer and except for the weight of the upper layers, said lowermost layers being unrestrained from movement in the vertical direction.

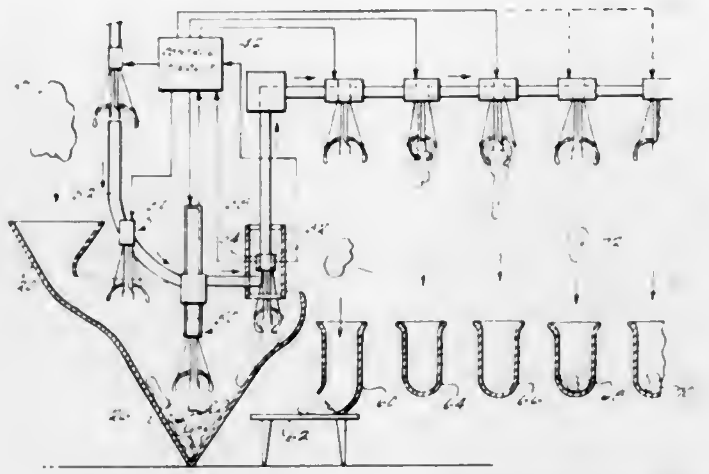
4,036,365
LINEN SORTER WITH A CONVEYOR MOUNTING INDIVIDUAL LINEN PICKERS

Howard Rosenfeld, New York, N.Y., assignor to Burlington Industries, Inc., Greensboro, N.C.

Filed Apr. 18, 1975, Ser. No. 569,570

Int. Cl.^{2} B07C *5/34*

U.S. Cl. 209—73 **21 Claims**



1. A system for sorting articles at least some having attached as a part thereof a quantity of at least one material which produces secondary radiation at a predetermined energy level in response to impinging radiation and which forms a code identifying the article comprising:

a source of radiation,

a plurality of picker means each including means for grasping and releasing an article,

a hopper for receiving said articles,

means for conveying each said picker means over said hopper so as to grasp an article therein and conveying an article grasped thereby randomly oriented past said source and thereafter past a plurality of article locations,

a detector for receiving said secondary radiation and producing an electrical output signal indicating the material attached to said article and accordingly identifying the article, and

means connected to said detector for causing each picker means to release a grasped article after movement past said source and detector at one of said locations in accordance with said output signal.

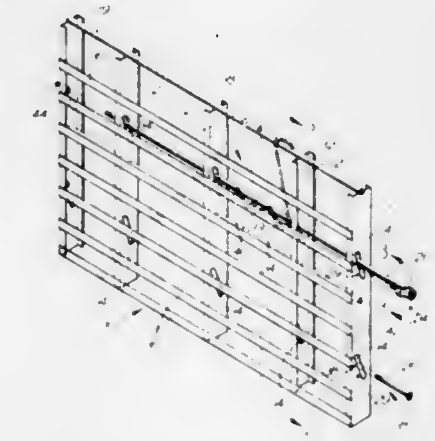
4,036,366
STORAGE RACK AND HANGER ASSEMBLY

Cal L. Dixon, and Charles E. Ross, both of Tulsa, Okla., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.

Filed Mar. 17, 1976, Ser. No. 667,741

Int. Cl.^{2} E05B *73/00*

U.S. Cl. 211—4 **4 Claims**



1. A meat hook rack and hanger assembly for supporting and immobilizing meat hooks and the like comprising the combination of a frame provided with posts and each of said posts having at least one inclined elongated slot aligned with a similar slot on an adjacent post, a first bar means fixedly mounted on the frame and a second bar means mounted within the slots of the posts of said frame and in movable spaced and generally parallel relation to said first bar means, each of said bar mans having such a configuration as to be engageable with only one of the separate and opposed curved end portions of a generally S-shaped meat hook and locking means engageable with selected parts of the frame and the second bar means for immobilizing the second bar means and the meat hooks engaged therewith after said second bar means has been moved a selected distance away from the first bar means and the selected parts of the second bar means and the frame brought into registry with each other.

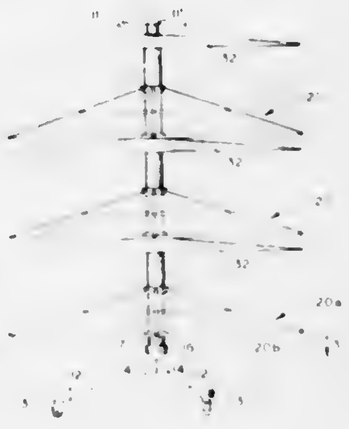
4,036,367
ROTATABLE SHOE RACK

Sherwood C. Stambaugh, 9453 State Route 43, Streetsboro, Ohio 44240, and Marie K. Hephner, 3881 W. Valley Drive, Fairview Park, Ohio 44126

Filed Oct. 14, 1976, Ser. No. 732,539

Int. Cl.^{2} A47F *5/02, 7/08*

U.S. Cl. 211—37 **8 Claims**



1. A rotatable shoe rack comprising a base, a vertical column supported on the base, at least two vertically spaced wire racks independently rotatably mounted on said column, said racks having concentric wire rings at different levels for supporting shoes in side-by-side positions, said rings connected to radial spokes having vertical hub portions rotatable on said column, spacer sleeves tightly and non-rotatably fitting the column above each of said hub portions, and disk covers supported on the upper ends of said spacer sleeves and extending over the racks immediately below.

4,036,368
FISHING ROD APPLIANCE

Daniel Munsch, 17 Abrew St., Bayshore, N.Y. 11706

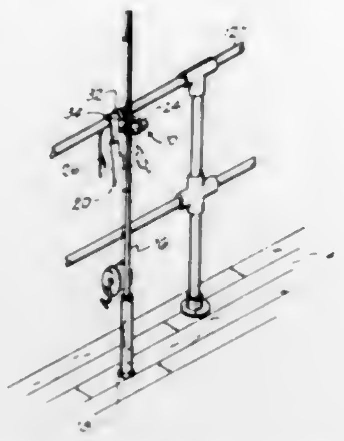
Filed June 5, 1975, Ser. No. 584,129

Int. Cl.^{2} A01K *97/10*

U.S. Cl. 211—60 R **6 Claims**

1. A fishing rod holder comprising a first section having two arcuate shaped portions bent in opposite directions and a second section of substantially planar shape in substantial nonaxial alignment with said first section, said second section being generally U-shaped and having its distal ends bent inward towards each other, said first section having means to

mount said holder, said second section including an internally threaded recess, fastening means containing a wood thread at one end and a metal thread at an opposite end, said metal thread engaging said recess in male-female engagement.



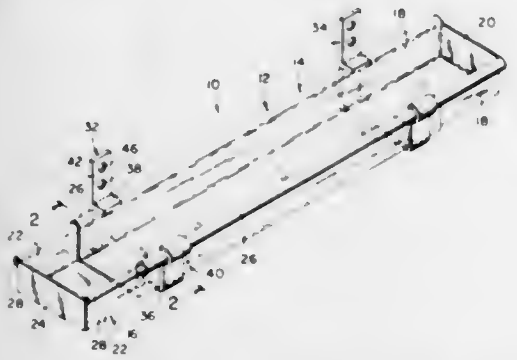
4,036,369
EXPANDABLE RACK

Stephanie Eisenberg, New York, N.Y., assignor to Nash Metalware Co. Inc., New York, N.Y.

Filed Sept. 2, 1975, Ser. No. 609,588

Int. Cl.² A47F *5/08;* **E04D** *13/06*

U.S. Cl. 211—88 **4 Claims**



1. An expandable rack comprising (1) shelf means consisting of a plurality of shelf sections and (2) bracket means for slidably supporting said shelf means at loci intermediate the outer ends thereof and for securing said shelf means to surfaces adjacent only one longitudinal side of said shelf means, said shelf sections being adapted to slide longitudinally into or out of one another whereby the length of said rack and the position of said shelf means with respect to said bracket means can be varied while said bracket means is secured to said surfaces.

4,036,370
GOODS STOWAGE UNIT

Alfred Eugène Chevalier, Quartier Notre Dame, 83260 La Crau, France

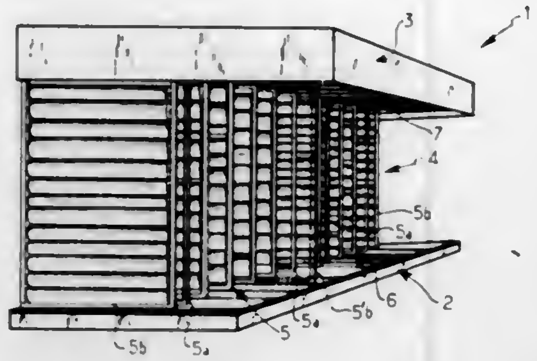
Filed Mar. 25, 1976, Ser. No. 670,564

Claims priority, application France, Feb. 2, 1976, 76.02803

Int. Cl.² A47F *5/00*

U.S. Cl. 211—162 **3 Claims**

1. Goods stowage unit of the type comprising a framework having a base and a false-ceiling substantially parallel with the said base and rigidly connected to the latter, a set of vertical parallel storage elements mounted between and extended obliquely with respect to said base and said false-ceiling, said base having a set of parallel grooves of pressed steel sheet, in each groove is accommodated, over substantially the whole length of said groove, a channel bar with flanges, grooved rollers on opposite sides of some of said storage elements and cooperating with said flanges, the free ends of said flanges being substantially flush with the upper surface of said base and defining a rolling path for said rollers.



4,036,371
SUPPORT STRUCTURE FOR FURNITURE, SHELVES OR THE LIKE

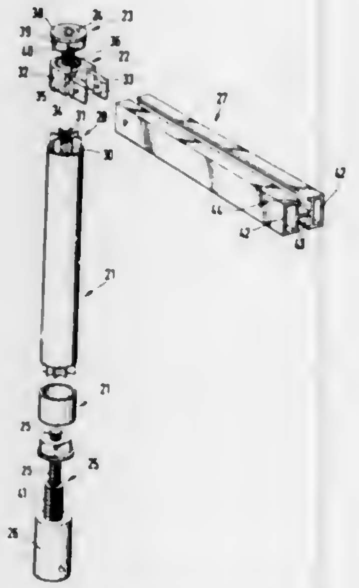
Karl Michel, Ulm, Germany, assignor to Gebruder Vieler GmbH, Letmathe, Germany

Filed Feb. 13, 1976, Ser. No. 657,832

Claims priority, application Germany, Feb. 18, 1975, 7504893[U]

Int. Cl.² A47B *96/14*

U.S. Cl. 211—182 **10 Claims**



1. A support structure for furniture or the like comprising at least one vertical column and at least one crossbar releasably connected to said column, said column comprising at least two tubular column sections, each having one end face abutting against a corresponding end face of an adjacent column section and an opposite end face, a tension member extending through said tubular column sections and engaging the inner surfaces thereof to maintain said sections axially aligned with each other, and a pair of end members respectively engaging said opposite end faces of said column sections and connected to said tension member for maintaining the one end face of one column section in tight abutment with the one end face of the other column section, one of said tubular column sections constituting a coupling member and being provided with laterally extending coupling means to which the crossbar is releasably connected; and cooperating means on said coupling member and said tension member for preventing turning of said members relative to each other while permitting axial movement relative to each other, said cooperating means comprising a plurality of radially projecting and longitudinally extending ribs on said tension member and at least one longitudinally extending groove in said coupling member in which one of said ribs is engaged.

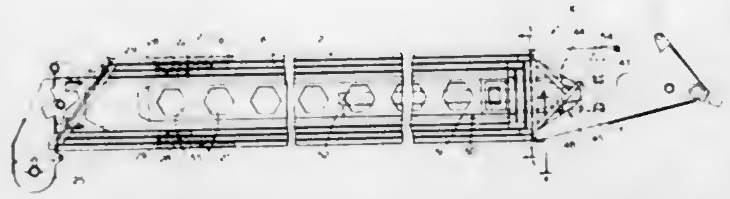
4,036,372
EXTENSION AND RETRACTION MEANS FOR THE TELESCOPIC BOOM ASSEMBLY OF A CRANE

Kamlaker P. Rao, Aurora; William L. Lowe, Naperville, and O. Thomas Nephew, Geneva, all of Ill., assignors to Clark Equipment Company, Buchanan, Mich.

Filed Dec. 15, 1975, Ser. No. 641,191

Int. Cl.² B66C *23/70*

U.S. Cl. 212—144 **17 Claims**



1. In a mobile material handling apparatus, such as a rotatable crane, having a telescoping crane boom assembly comprising a plurality of telescoping boom sections, apparatus for extending and retracting said boom assembly including:

a fluid pressure operated cylinder nested within the innermost telescoping section of the crane boom assembly,

guide means mounted on a movable end portion of the cylinder to protectively enclose the cylinder and to maintain the orientation thereof with respect to the telescoping sections of the crane boom assembly,

a plurality of means linearly aligned for locking respective adjacent movable sections of a telescoping crane boom assembly in assembled relation, and

a latch mechanism mounted on the guide means, said latching mechanism comprising

first latching means for engaging a boom section for extension and retraction thereof by means of the cylinder, and second latching means, distinct from the first latching means, for selectively and cooperatively engaging one of said boom locking means for locking and unlocking thereof to permit extension and retraction of a selected movable section of the boom assembly.

4,036,373
AUTOMATIC INSPECTION APPARATUS

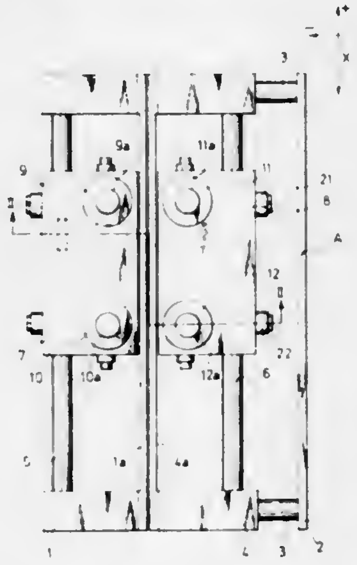
Igarashi Taenzi, and Tsubota Toshio, both of Kyoto, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Filed Nov. 3, 1975, Ser. No. 628,120

Claims priority, application Japan, Nov. 9, 1974, 49-129215

Int. Cl.² B25J *9/00*

U.S. Cl. 214—1 BB **5 Claims**



1. An automatic inspection apparatus comprising a carrier body on the (Y, −) side which is slidably supported by X-direction guide rods, and a carrier body on the (Y, +) side slidable on both X- and Y-direction guide rods, each carrier body accommodating a plurality of tap shafts vertically movable therethrough, so that the tap shafts are raised and lowered as desired for the inspection of an object to be inspected, characterized in that each carrier body houses a drive shaft operatively coupled to a prime mover for rotation, a plurality of screw gears, each of which is spring-biased in one way, are fitted on the drive shaft axially slidably thereon, said screw gears and tap shafts being operatively interconnected through gear means to raise and lower the tap shafts, so that in case of overloading on the load side the screw gears are tripped against the spring forces and the displacements of the screw gears can be detected, each of said gear shafts having at one end of skew gear in mesh with one of the screw gears and at the other end a pinion mesh with a rack provided on the associated tap shaft.

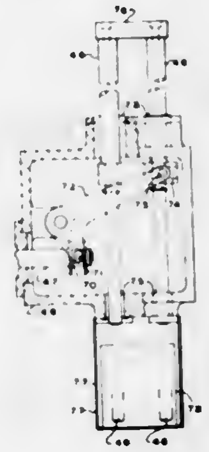
4,036,374
MULTI-MOTION PARTS HANDLER

Duane W. Woltjen, Manchester, Mo., assignor to AMC Industries, Inc., Stamford, Conn.

Filed Nov. 4, 1975, Ser. No. 628,474

Int. Cl.² B65G *47/91*

U.S. Cl. 214—1 BB **17 Claims**

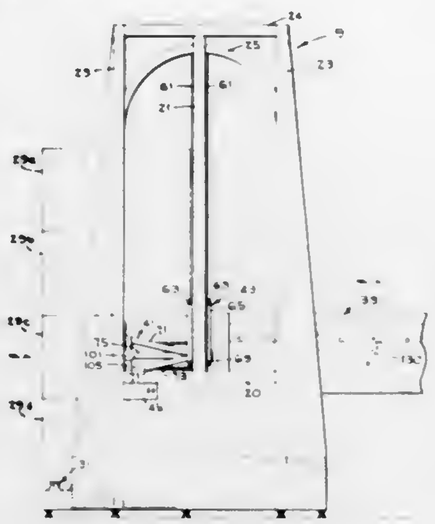


1. A multi-motion parts handler for use in transferring a part from one position and through a variety of motions to another and the intended position, including transfer means for use in supporting a part through its variety of said motions, said transfer means including at least one arm capable of reciprocal movement in a lineal direction, means operatively associated with said arm to induce said movement in the said lineal direction, a shaft coupled to said transfer means and disposed for inducing its reciprocating motion in another lineal direction, a roller gear indexing drive operatively associated with said shaft and provided for inducing the transfer means in an oscillating motion, said roller gear indexing drive including in combination an indexing cam and roller follower hub, said roller follower hub being secured to said shaft, means associated with said indexing cam for inducing said shaft and its coupled transfer means into its reciprocating movement in the said another lineal direction, motor means which when energized providing for rotation of said indexing cam and inducing movement of the said means operatively associated with said arm, a speed reducer coupled with said motor means and providing for a reduction in its speed of rotation, whereby upon actuation of said indexing drive and the means associated with the arm said transfer means and its arm is induced into a plurality of movements for precision transfer of a part.

4,036,375
BIN DESTACKER AND RESTACKER

Wayne L. McClintic, Riverside, Calif., and Charles E. Sheetz, Woodstock, Va., assignors to FMC Corporation, San Jose, Calif.

Filed Jan. 20, 1976, Ser. No. 650,814
Int. Cl.² B65G *57/09*
U.S. Cl. 214—6 F **3 Claims**

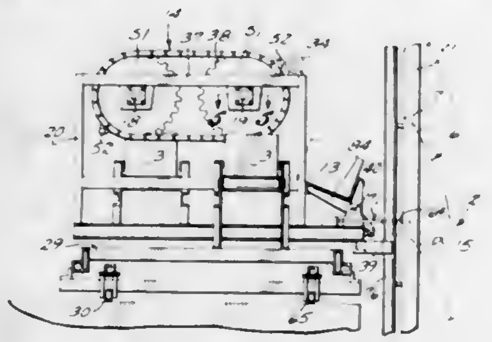


1. An apparatus for stacking or destacking containers comprising frame means, a pair of pivot arms, means rotatably mounting one end of each of said pivot arms to said frame means so that said pivot arms extend in spaced parallel relationship, a first sprocket mounted adjacent said one end of one of said pivot arms and being secured against rotation relative to said frame means, a second sprocket rotatably secured to the other end of said one pivot arm, an endless chain received about said first and second sprockets, container clamping means rotatably secured to said other ends of said pivot arms and being rigidly connected to said second sprocket, means for moving said clamping means apart and together to clamp a container therebetween, means for rotating said pivot arms about the axis of said first sprocket when a container is clamped by said clamping means to transfer said container from one end of the apparatus to the other while the orientation of said container is undisturbed, said means for rotating said pivot arms comprising chains secured to said other ends of said pivot arms, and means constraining said chains to move in parallel arcuate paths at the top of said apparatus.

4,036,376
CARGO TRANSPORT SYSTEM

Allan R. Ide, 10066 Bloomfield, Cypress, Calif. 90630

Filed Apr. 8, 1976, Ser. No. 675,198
Int. Cl.² B65G *67/58*
U.S. Cl. 214—14 **16 Claims**



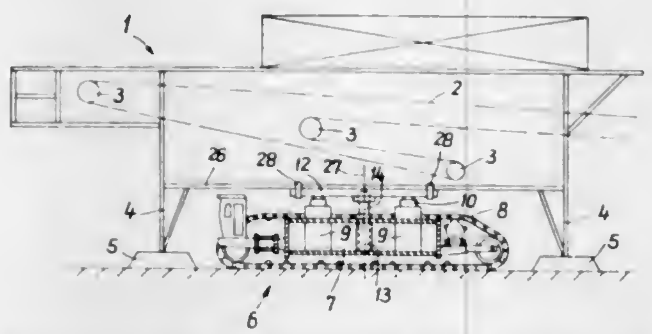
15. In a cargo transport system for transferring discrete cargo loads from a vessel upon which is mounted a lateral conveyor means for directing movement of discrete cargo loads along a path terminating at a loading station on said vessel to a conveyor tower extending vertically from a cargo terminal to the aforesaid loading station and carrying thereon an endless conveyor means formed with discrete receptacles transversing the length of said tower, so that each of said receptacles sequentially approaches the loading station to receive a cargo load therefrom; the improvement wherein there is provided at said loading station;

- a platform transversely oriented with respect to said lateral conveyor means and mounted on said vessel and sloped downward therefrom toward said endless conveyor means for sequentially and passively receiving discrete cargo loads from said lateral conveyor means, and for allowing loads so received to slide toward an approaching receptacle;
- powered cargo delivery means for forcing cargo loads onto said sloped platform from said lateral conveyor means;
- receptacle sensing means for detecting an approaching receptacle in said endless conveyor means for actuating said powered cargo delivery means to effect delivery of a sequential load onto said platform means as aforesaid whereby said cargo load slides from said platform into said approaching receptacle.

4,036,377
DEVICE FOR TRANSPORTING LOADS, ESPECIALLY FOR BELT DRIVING STATIONS IN OPEN PIT MINING

Heinz Weber, Krefeld-Traar, Germany, assignor to Fried. Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany

Filed Mar. 27, 1975, Ser. No. 562,487
Claims priority, application Germany, Apr. 5, 1974, 2416642
Int. Cl.² B60P *1/02*
U.S. Cl. 214—512 **6 Claims**

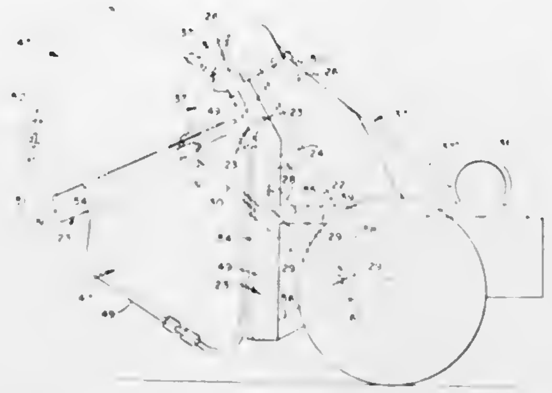


1. A device for lifting and transporting loads, especially for moving belt driving stations in open pit mining, which includes: caterpillar chain carrying means, propelling means associated with said carrying means for propelling same, a plurality of supporting means comprising in combination fluid operable cylinder-piston means with their axes extending upwardly substantially perpendicularly with regard to said carrying means, lifting plaftform means arranged above said supporting means for selectively supporting a load means associated with at least one of said supporting means and connecting the latter to at least one of said supporting means, and means associated with said lifting platform for permitting independent turning of said lifting platform and said propelling means relative to each other, said means associated with said lifting platform including additional fluid operable cylinder-piston means and latch means interconnecting said lifting platform and said carrying means, said additional fluid operable cylinder-piston means being inclined relative to each other so that the forces generated thereby have components tending to create rotary movements about a common vertical axis, whereby the lift platform can be rotated or when the latch means is actuated the carrying means can be rotated relative to the lifting platform means.

4,036,378
ATTACHMENT TO POLE SKIDDER VEHICLE FOR LOADING, HAULING, AND STACKING CUT LOGS

Leroy D. Luukonen, Box 53, and Arthur E. Tieden, both of Laporte, Minn. 56461

Filed May 20, 1976, Ser. No. 688,252
Int. Cl.² B66C *1/42*
U.S. Cl. 214—92 **4 Claims**

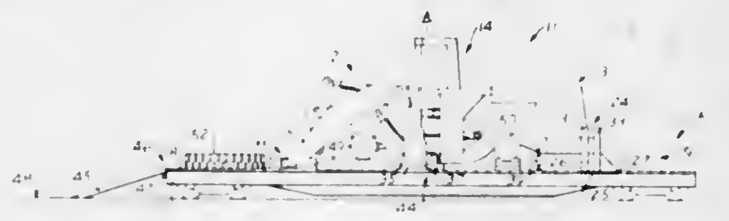


1. An attachment for a pole skidder vehicle for hauling and stacking cut logs comprising a frame adapted to be detachably mounted to the rear of the pole skidder vehicle, said frame having a pair of fixed upright arms, a pivotally mounted movable plate pivotally mounted to the upper end of the fixed arms, hydraulic means to actuate the movement of the plate, a separate length of cable for initially stacking cut logs thereon, a winch cable for the vehicle having a plurality of detachable connections thereon whereby the winch cable may be placed across the top of the stack and connected to the outer ends of the separate length of cable to encircle the stack, a winch on the vehicle, said winch acting to wind the winch cable to draw the initial stack up against the movable plate, whereupon the initial stack of cut logs may be hauled to a stacking location, said movable plate may thereby be actuated to pivot the movable plate and initial stack upward and the vehicle backed up to the end of a row of previously stacked cut logs at the stacked location and at least one of the cable connections detached and the cables wound back by the winch to enable the initial stack to be unloaded at the end of the previously stacked row of cut logs.

4,036,379
SECURING-UNLOADING APPARATUS FOR FLATCAR CARRIED WHEELED VEHICLES

William H. Godfrey, Aurora, and Neal L. Woessner, Montgomery, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 17, 1976, Ser. No. 697,302
Int. Cl.² B65G *65/00;* B65D *3/16*
U.S. Cl. 214—152 **15 Claims**



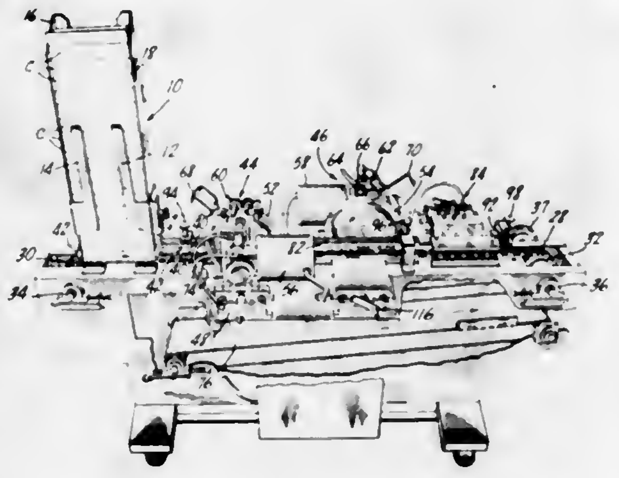
15. A method for loading, securing, and unloading a wheeled vehicle having a movable lift arm and front and rear wheels on a flatcar having a lift arm means having a pivotally movable supporting element, a holding means, and a tensioning means, comprising:

- positioning the wheeled vehicle on the flatcar with the lift arm in contact with the supporting element and the opposed end of the vehicle in contact with the holding means; connecting the vehicle to the flatcar with a preselected force by a tensioning means;
- thereafter releasing the tensioning means;
- raising the front wheels in response to lowering the vehicle lift arm in forcible contact with the supporting element;
- installing resilient tires on the front wheels of the vehicle;
- raising the vehicle lift arm free from contact with the supporting element and supporting the vehicle on the resilient front tires;
- pivoting the supporting element to a preselected lower elevation;
- raising the rear of the vehicle;
- installing resilient tires on the rear wheels of the vehicle; and
- driving the vehicle over the lift arm means and from the flatcar.

4,036,380
APPARATUS FOR OPENING CIGARETTE CARTONS AND PACKS AND REMOVING THE CIGARETTES

R. Arlen Berry, Greensboro, and Albert W. Thompson, McLeansville, both of N.C., assignors to Loews Theatres, Inc., New York, N.Y.

Filed June 15, 1976, Ser. No. 696,362
Int. Cl.² B65B *21/02*
U.S. Cl. 214—305 **10 Claims**



1. Apparatus for opening cigarette cartons and the packs of cigarettes in the cartons and removing the cigarettes from the packs comprising means for conveying the cartons of cigarette packs along a predetermined path with the cigarettes aligned transversely to the axis of the path, means at a first station along the path for removing both side walls of the cartons and both ends of all of the packs in the cartons, means at a second station along the path for directing jets of air in a direction parallel to the axes of the cigarettes and confined substantially to a region traversed by the center row of cigarettes in each pack as the packs move along the path to blow seriatim the cigarettes in the center rows out of the packs, means at a third station along the path for directing divergent jets of air generally parallel to the axes of the cigarettes at regions traversed by the remaining cigarettes not removed from the packs at the second station to blow at least some of the remaining cigarettes out of the packs, and means at the second and third stations for restraining the carton and packs from being blown from the conveying means by the air jets.

4,036,381

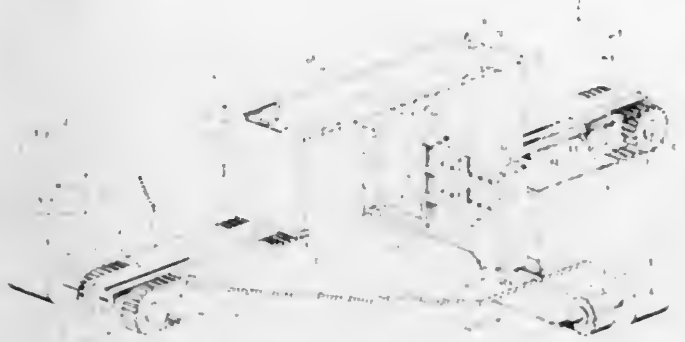
APPARATUS FOR TRANSFERRING SAMPLE HOLDERS RELATIVE TO A MOVABLE MAGAZINE

Thomas Christian Nielsen, Endwell, and James Louis Sirico, Vestal, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 5, 1975, Ser. No. 610,723

Int. Cl.² B07C *5/36*

U.S. Cl. 214—310 **6 Claims**



1. A sample handling system for storing, conveying and presenting a plurality of sample test tube containers to at least one work station, said system comprising:

a plurality of substantially identical sample container holders, each of said sample container holders carrying a plural number of said sample containers in a predetermined linear array and in an upright manner,

at least one six-sided box-like magazine for carrying therein a plural number of said holders, said magazine having top and bottom horizontal closed first and second sides, respectively, two parallel vertical closed third and fourth sides, a vertical closed fifth side extended between said first and second sids and between said third and fourth sides, and a sixth open side configured as an access for accessing said holders, said sixth side being parallel to said fifth side, said holders being aligned in side-by-side relationship with respect to said access when carried by said magazine and having respective predetermined edge portions thereof in proximal alignment with said access, each of said linear arrays being disposed in an orthogonal relationship with said access when said holders are in said side-by-side relationship,

first horizontal conveying means for moving said magazine along a first horizontal path, said magazine being conveyed with its bottom side in contacting relationship with said first conveying means and havings its third and fourth vertical sides on a transversely aligned orientation with respect to said first path and its fifth and sixth sides in a parallel aligned orientation with respect to said first path,

second horizontal conveying means being operable to selectively and incrementally move said holders along a second horizontal path, said second conveying means intersecting said first path at a predetermined location thereof, and said second conveying means extending adjacent to at least said one work station, said first conveyor means being operable to selectively and incrementably position said magazine at said location, and

holder transfer means for transferring at said location said holders through said access relative to the interior of said magazine and to said second conveyor means, said holder transfer means having a protruding member means movable along said second path by said second conveyor means, each of said holders having a cooperative member means disposed in the respective said edge portions thereof and engageable by said protruding member means, said holders when carried by said magazine having their respective cooperative members means in substantial alignment, said bottom second and vertical third and fourth sides of said magazine having aligned recesses to expose said aligned cooperative member means when carrying said holders therein, and said protruding member means having an at rest home position at said location at which the protruding member means is in protruding alignment with said aligned cooperative member means, said recesses of said magazine and said cooperative member means of said holders providing a non-obstructing relationship with said protruding member means whenever said protruding member means is in said home position and said first conveyor means is operably incrementing said magazine at said location.

4,036,382

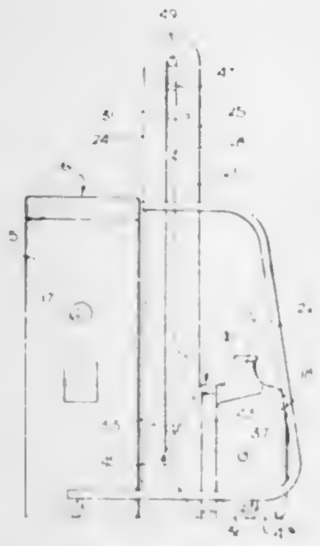
BOTTLE HANDLING APPARATUS

Eric Perry; Roy T. Heath, both of Arcadia; Lee F. Rost, La Verne, and Braughler Cowan, Rancho Santa Fe, all of Calif., assignors to C & P Industries, Inc., Newport Beach, Calif.

Filed Sept. 15, 1975, Ser. No. 613,615

Int. Cl.² B65B *21/02*

U.S. Cl. 214—313 **11 Claims**



1. An apparatus for vertically moving a container and for rotating such container into an inverted position comprising:

at least one generally vertical rail having a first edge and a second edge, and a generally vertical guide slot disposed between said first and second edges, said guide slot having an upper end adjacent to the upper end of said rail said first and second edges and said guide slot lie in a common vertical plane,

a carrier for receiving such container, said carrier including guide means for cooperatively engaging said guide slot for reciprocal movement within said guide slot and for defining a pivot axis at said upper end of said guide slot for rotation of said carrier about said upper end of said guide slot;

at least one idler wheel disposed for rotation at said upper end of said rail, said carrier engaging said idler as said carrier rotates about said upper end of said guide slot at said pivot axis;

drive means coupled to said carrier for upwardly moving said carrier along said first edge of said first rail, for rotating said carrier about said upper end of said guide slot in engagement with said idler wheel and for downwardly moving said carrier in an inverted position along said second edge of said rail;

whereby said carrier and container may be raised along said first edge of said rail, rotated to an inverted position and then lowered along said second edge of said rail.

4,036,383

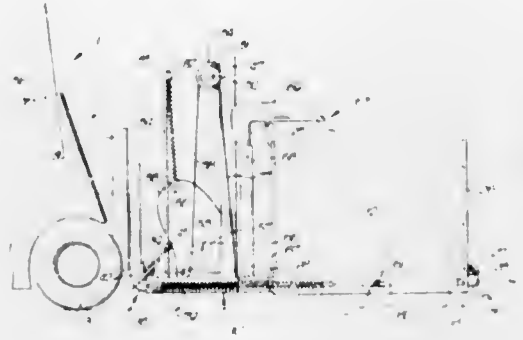
FORK LIFT TRUCK TOTE BOX DUMPER

Curtiss B. Allen, 190 Terracina, Redlands, Calif. 92373

Filed Mar. 19, 1976, Ser. No. 668,578

Int. Cl.² B65G *65/04*

U.S. Cl. 214—313 **6 Claims**



1. The combination of:

frame means impalable horizontally upon the prongs of a fork pick-up truck and insertible, when supported as so impaled upon said prongs, into suitable horizontal openings provided therefor in the bottom of a tote box;

a box cradle pivotally mounted on a low transverse axis on the forward end of said frame means and extending therebeyond, said cradle including a flat cradle base which is normally in co-planar relation with said frame means when the latter is inserted into said horizontal box openings whereby said cradle base is also inserted into said box openings so as to underlie said box;

means on said cradle preventing said box falling from said cradle when the latter is rotated to invert said box;

means mounted on said frame means and controlled from the driver's seat of said fork lift truck for power rotating said cradle to first dump the contents from said box, while retaining said box confined within said cradle, and then reversibly rotating said cradle thereby returning said cradle base to its co-planar relation with said frame means permitting said box to be set down right side up on the ground and said frame means and cradle base withdrawn from the bottom openings in said box, by manipulating said fork lift truck with said frame means impaled thereon,

said cradle including a rear box limit stop fixed on said cradle base and an upper box limit stop fixed on said rear box limit stop, which stops join with said cradle base to provide fixed barriers limiting movement of said box with reference to said cradle in any of three directions dispersed at intervals of ninety degrees readily about said transverse axis;

said box being an element of said combination and including horizontally forwardly extending flange means along the front lower edge thereof just above said horizontal box openings herein; and

a forward box limit stop means on the front edge of said cradle base and extending upwardly therefrom to be interposed in front of said box when said frame means and cradle base have been fully inserted into said box bottom openings and then lifted into supporting relation with said box,

said forward box limit stop means being shaped to interlock with said flange means thereby securely retaining said box in said cradle while the contents are being dumped therefrom.

4,036,384

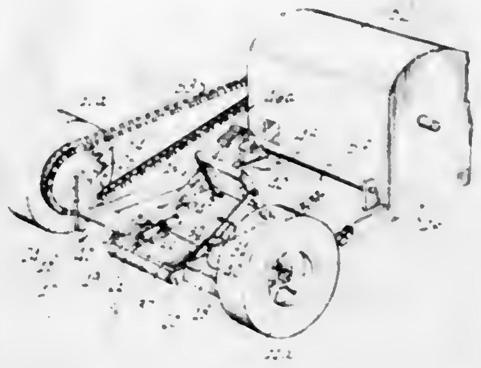
TRUCK FOR TRANSPORT OF AIRPLANE BY ITS NOSE LANDING WHEEL

Philip L. Johnson, 705 Vesta St., Inglewood, Calif. 90302

Filed July 16, 1976, Ser. No. 705,948

Int. Cl.² B60B *29/00*

U.S. Cl. 214—334 **6 Claims**



6. A truck for elevating and trapping the pneumatically tired nose carriage wheel of an airplane, and for subsequently transporting the airplane over the ground surface by said wheel, comprising:

a truck frame;

two front wheels and at least one rear wheel for said frame;

a horizontal pick-up roller mounted for rotation on a transverse axis on the front end of the said frame, with the underside thereof spaced above the ground surface, said roller being engageable upwardly and forwardly with the tire of the nose wheel of the airplane in front of the point of engagement of the nose wheel with the ground surface;

a turntable mounted for rotation on a vertical axis on said frame, said turntable being spaced generally rearwardly of the axis of said front wheels, and being spaced above the ground surface at a level generally coordinated with the height of the topside of said pick-up roller above ground surface;

a gate pivotally mounted on the normally front side of said turntable on a horizontal axis transverse of said frame, said gate being pivotally movable between an initial forward downwardly swung position, in which it acts as a bridge between said pick-up roller and the normally front edge of the turntable, and an upwardly swung second position in which it forms a barrier behind the airplane nose wheel;

a rearward barrier for said wheel on the normally rearward side of the turntable; and

means responsive to relative translation of said turntable and nose wheel into a centered position of the nose wheel on the turntable for elevating said barrier into said upwardly swung second position.

4,036,385

SAFETY CLOSURE FOR CONTAINERS

Glenn H. Morris, 4203 Highwood Drive, Chattanooga, Tenn. 37415

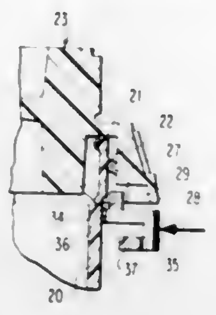
Filed May 28, 1976, Ser. No. 690,962

Int. Cl.² B65D *55/02, 85/56;* **A61J** *1/00*

U.S. Cl. 215—209 **14 Claims**

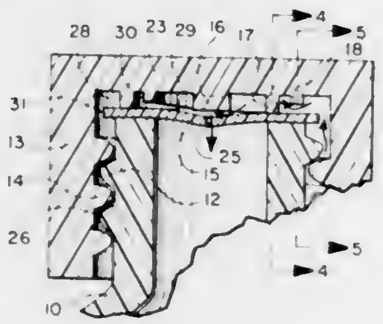
1. In a container, a body portion having a threaded mouth, a screw closure for the container rotationally engageable with the threaded mouth and having a circumferentially extending group of locking teeth, and a release element on the side wall of said body portion having a part adapted to interlock with a tooth of said screw closure when the screw closure is applied to said threaded mouth of said body portion, said release element including a circumferentially extending spring-like bendable element spaced radially outwardly from the container side wall, a radially extending arm connecting an end of the release element to the container side wall, said release element movable laterally toward and away from said side wall and said part interlocking with said tooth and preventing rotational

removal of said screw closure when the release element is in an outward position relative to said side wall, and said part separating from said tooth and releasing said screw closure for rotational removal when said release element is moved laterally to an inward position relative to said side wall.



4,036,386
VENTING CLOSURE ASSEMBLY

Masato Nishioka, and Daniel Dulaney Carter, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio
Filed June 14, 1976, Ser. No. 696,145
Claims priority, application Philippines, July 9, 1975, 17362
Int. Cl.² B65D *51/16*
U.S. Cl. 215—260 **3 Claims**



1. A venting closure comprising a cap and resilient gasket adapted for use on a threaded neck container including a threaded outer wall, an inner wall, and an interconnecting rim;

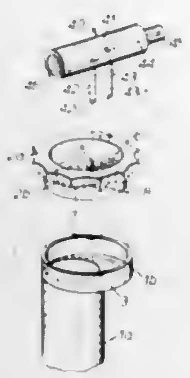
wherein said cap has a top wall; a cylindrical skirt depending from said top wall having thread means for engaging the threaded outer wall of the container neck; a plurality of staggered circumferential flanges, concentric with said skirt, depending downwardly from the top wall of said cap, adapted to be oppositely disposed to the rim of said container neck; and a central boss depending downwardly from the top of said cap;

wherein each of said flanges has a full depth portion and a tapered portion in generally helical form, the pitch of which at every point is equal to or less than the pitch of the threads and is in the same direction; wherein at least one flange is adapted to be oppositely disposed to substantially the entire periphery of the rim of said container neck; and wherein the tapered portions when the cap is seated against the gasket form an interconnected open channel permitting tranverse air flow completely across said plurality of flanges;

and wherein said gasket when seated is in supporting engagement between the full depth portions of said flanges and the rim of said container neck; said gasket having a skirt/gasket clearance around at least some portions of its periphery, and a centrally located hole around the periphery of which the gasket is in sealing engagement with said boss; said gasket being adapted to flex under the influence of an externally applied pressure differential to permit the passage of air from the atmosphere into said container.

4,036,387
PREPARING BLOOD AND LIKE SAMPLES

William Wardock Feaster, L'Estoril, Princesse Grace Avenue, Monte Carlo, Monaco
Filed Nov. 25, 1975, Ser. No. 635,212
Int. Cl.² B65D *51/16*
U.S. Cl. 215—309 **16 Claims**



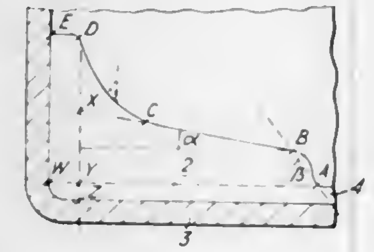
1. Apparatus for storing a fluid or the like, comprising

a. a container having first and secnd portions, and means defining a sealing surface at the junction between said first and second container portions, and

b. a closure member mounted in said first container portion, said closure member containing at least one passageway for the fow of fluid to and from said second container portion, respectively, said closure member being movable relative to said container between closed and opened positions in which said passageway is sealed from and is in communication with said second container portion, respectively.

4,036,388
SEALING GASKETS FOR CONTAINER CLOSURES

James John Alexander Davidson, St. Neots, England, assignor to W. R. Grace & Co., Cambridge, Mass.
Division of Ser. No. 580,199, May 23, 1975, abandoned. This application Aug. 23, 1976, Ser. No. 716,901
Claims priority, application United Kingdom, May 28, 1974, 23611/74
Int. Cl.² B65D *53/00, 53/04*
U.S. Cl. 215—341 **3 Claims**



1. A roll-on cap blank destined to closing and sealing a bottle, which comprises an end panel, a depending peripheral skirt and a liner affixed to said end panel, said liner having (a) a flat central panel occupying from 50 to 94% of the internal radius of the cap blank and (b) an adjoining peripheral portion occupying the remaining 6 to 50% of the radius, the configuration of the peripheral portion being as follows, namely; considering the cap blank in an up-turned position relative to that which the cap occupies on the container and considering the peripheral portion in a radially outward direction, it comprises consecutively:

i. a first part (AB) of relatively steep gradient upwards from the edge of the central panel which makes an angle (β) with the plane of the central panel of from 25 to 90° and which has a radial length of from 5 to 30% of the radial length (AW) of the whole peripheral portion (AE);

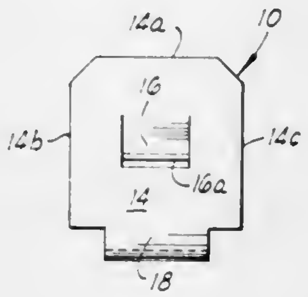
ii. an adjoining relatively flat step part (BC) of constant gradient which makes an angle (α) with the plane of the central panel of from 0 to 25° and which has a radial length of from 10 to 70% of the radial length (AW) of the whole peripheral portion (AE);

iii. an adjoining corner part (CD) sloping upwardly, the height (DX) of which above the plane of the step part is from 20 to 65% of the height (DY) of the top of the corner part above the plane of the central panel, and

iv. an adjoining final marginal part (DE) which extends to the skirt at a level not below that of the corner part and which has a radial length of from 2 to 15% of the radial length (AW) of the whole peripheral portion (AE).

4,036,389
RETAINER CLIP AND SYNTHETIC RESIN BOX COMBINATION

Harold T. Pate, and Richard J. Borsh, both of Cleveland, Ohio, assignors to Indian Head Inc., New York, N.Y.
Filed Aug. 25, 1975, Ser. No. 607,555
Int. Cl.² H02G *3/14;* **F16B** *19/00, 37/02*
U.S. Cl. 220—3.8 **5 Claims**



1. A spring metal fastener of generally V-shaped configuration comprising:

a first flat, substantially monoplanar leg having a first end edge and two side edges, each side edge intersecting a line coincident with said end edge, said side edges being free edges;

a second flat, substantially monoplanar leg having an opening formed therethrough and disposed centrally therein;

a bend portion joining one end of said first leg to one end of said second leg and reverse bent through an angle of from about 132° to about 137° to define an acute angle between said first and second legs of from about 43° to about 48°; and

a tongue pressed out of the central portion of said first leg and projecting in a plane which extends toward said second leg at an angle to the plane of said first leg, said tongue projecting a distance from the plane of said first leg, as measured normal to that plane, which is from about one-half to about two-thirds of the total distance of projection of said bend portion from the plane of said first leg, also as measured to the plane of said first leg.

3. In combination,

a synthetic resin box having wall means defining a hollow interior and defining an opening at one side of said box, said wall means defining a slot adjacent said opening at one side of box and further defining an elongated screw passage way having an axis extending parallel to said slot, a portion of said wall means separating said slot from said passageway; and

a spring metal fastener mounted in said wall means and including:

a first flat, substantially monoplanar leg having a first end edge of two side edges, each side edge intersecting a line coincident with said end edge, said side edges being free edges; said first leg being positioned in said slot with the plane thereof extending substantially parallel to the axis of said elongated screw passageway, and with one flat side first leg bearing against one side of said slot;

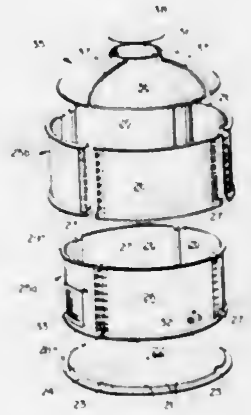
a tongue pressed out of said first leg at an acute angle to the plane thereof and resiliently bearing against the second side of said slot;

a second flat, substantially monoplanar leg having a central opening therethrough, which opening has its center aligned with the axis of said elongated screw passageway; and

a bend portion joining one end of said first leg to one end of said second leg and reverse bent through an angle of from about 132° to about 137° to define an acute angle between said legs of from about 43° to about 48°, said bend portion bridging across said portion of said wall means separating said slot from said passageway.

4,036,390
PLASTIC TANK PANELS AND JOINT ASSEMBLY

Dwain E. Morse, Ventura County, Calif., assignor to Morse California Co., Fillmore, Calif.
Filed Oct. 17, 1975, Ser. No. 623,316
Int. Cl.² B65D *7/02, 7/42*
U.S. Cl. 220—5 A **42 Claims**



1. A modular-construction tank comprising:

A. a base; and

B. a ring module which fits sealably upon said base, comprising, in combination:

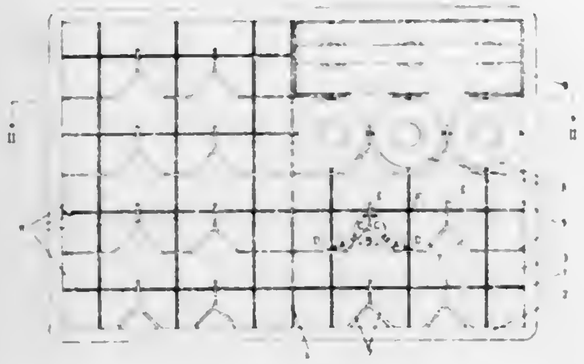
1. a plurality of curved wall panels which are principally made from a thin-walled material, each comprising:
   - a. a main wall section,
   - b. a strap assembly, and
   - c. a recurved wall section which is disposed along each vertical side of said main wall section, said recurred wall section comprising:
     1. an inwardly disposed diagonal which extends from said main wall section along a first partial bend;
     2. a circumferentially disposed strip which extends from said diagonal along a second partial bend; and
     3. a radially disposed and outwardly extending flange which extends out of said strip along a right-angled bend; and
2. a plurality of butt joints, each comprising:
   - a. a pair of said strap assemblies,
   - b. a pair of said recurved wall sections, and
   - c. an interconnecting means for conjoining and circumferentially compressing said wall panels across said butt joint to form said ring module;

whereby hydrostatic pressure causes said strap assemblies and said interconnecting means to be in tension from hoop stress and said recurved wall sections to be free of tension.

4,036,391

PLASTIC BOTTLE CASE

Ulrich Prodel, Bad Salzuflen BRD, Germany, assignor to Spumalit-Anstalt, Liechtenstein
Filed Oct. 22, 1976, Ser. No. 734,741
Claims priority, application Germany, Oct. 25, 1975, 2547830
Int. Cl.² B65D *1/24, 75/00, 85/00*
U.S. Cl. 220—21 **5 Claims**

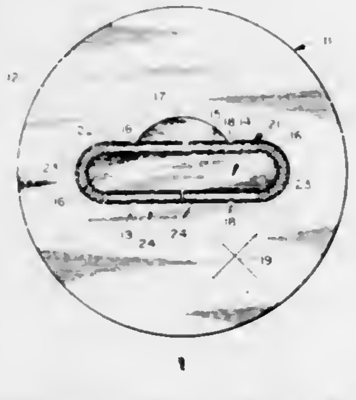


1. Plastic bottle case comprising four side walls, a bottom, and a plurality of partitions extending between only two opposite side walls, said partitions having spaced V-shaped laterally projecting portions and a projection extending parallel to said opposite side walls from the apex of each of said V-shaped portions, said partitions and said projections being spaced apart a distance slightly greater than the diameter of bottles to be received in said case and said V-shaped projection portions and said projections together extending a distance greater than the radius of said bottles but not to the next partition.

4,036,392

DISPOSABLE BEVERAGE CONTAINER COVER ELEMENT CARRYING FOLDED DRINKING STRAW

Marvin C. Martin, 520 Peren Ave., Chesapeake, Va. 23320
Filed Nov. 1, 1976, Ser. No. 737,407
Int. Cl.² B65D *1/24, 1/36, 57/00*
U.S. Cl. 220—23 **7 Claims**



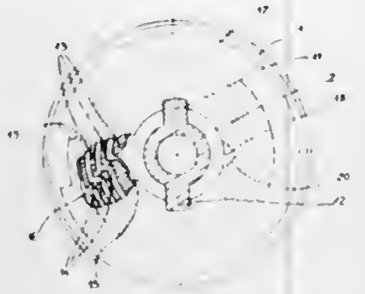
1. A disposable cover element for a disposable beverage container, comprising:

a section adapted to close the upper opening of said beverage container having a recess formed in the exterior surface thereof, said recess being adapted to receive a folded drinking straw having a straight central length extending between two transversely corrugated lengths each of which is bent into a halfloop configuration and further having at least one straight terminal length, said section of said cover element carrying a plurality of projecting portions extending into said recess over an appreciable portion of the depth thereof for readily removably securing said folded drinking straw in said recess.

4,036,393

CAP FOR A FUEL TANK

Michel Neiman, Paris, France, assignor to Societe de Diffusion Neiman, Courbevoie, France
Filed June 10, 1976, Ser. No. 694,760
Claims priority, application France, July 24, 1975, 75.23081
Int. Cl.² B65D *51/16*
U.S. Cl. 220—206 **9 Claims**

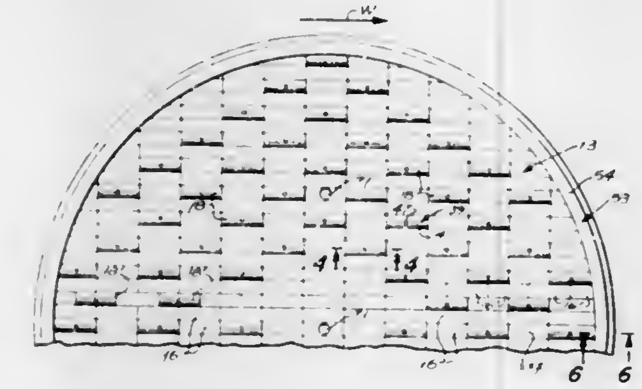


1. A cap for a fuel tank comprising a closure element having an inside surface which in use faces towards the interior of the tank, means defining a labyrinthine venting passage on said inside surface, said passage having exit and entrance ends, and plug means movable between first and second positions relative to said means defining said passage, in one of said positions being effective to close said passage and in the other position being effective to open said passage.

4,036,394

FLOATING ROOF FOR LIQUID STORAGE TANKS

Robert W. Bodley, Highland, and Reign C. Ulm, Schererville, both of Ind., assignors to Aerojet-General Corporation, El Monte, Calif.
Continuation of Ser. No. 342,454, March 19, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,844
Int. Cl.² B65D *87/20*
U.S. Cl. 220—222 **16 Claims**



1. A floating roof for a liquid storage tank comprising a single-deck lid of a plurality of fluid-tight interconnected rectangular steel plates and auxiliary means for imparting buoyancy to the lid including a plurality of elongate buoys of low silhouette on the upper surface of the lid, each buoy having as its base one of the plates and having longitudinal sides inclined toward each other and the base, such that tht the buoy is of increasingly smaller horizontal section from its base to its top and of such construction as to stiffen the junctions between the buoy and adjacent plates.

16. A method of minimizing fatigue cracking due to wind action upon a floating roof for a liquid storage tank of the type wherein the floating roof comprises a lid formed by the interconnection of a plurality of fluid tight plates by welding or the like, said roof having a plurality of buoy means arranged upon the upper surface of the roof to provide floating support of the roof in the event of deck puncture or precipitation loading, comprising the steps of:

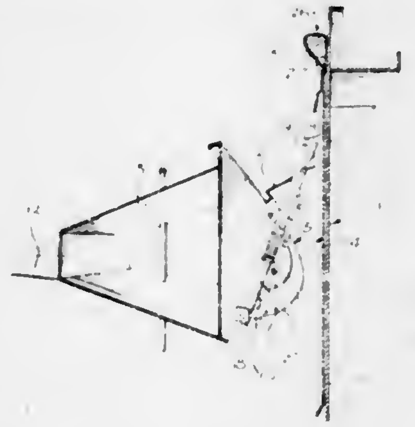
constructing each of said plurality of buoys to have a base consisting substantially of a different one of said plurality of plates forming said lid, and further including structure attached to said base upon said deck lid to form a closed buoy of increasingly smaller horizontal section from the base to the top of said buoys, each of said buoys having a length greater than its width, and a width greater than its height to effect a relatively long and low buoy silhouette and impart stiffening to the interconnection junctions paralleling the longest dimension of said buoy between each buoy base plate and its adjacent plate, and

orienting said lid structure within said storage tank with the lower surface thereof adapted to contact the top surface of said liquid contents in an essentially flat contacting relationship and with the longest dimension of each of said plurality of buoys being essentially parallel to the prevailing wind direction at the site of the storage tank.

4,036,395

SECONDARY SEALING DEVICE FOR STORAGE VESSEL HAVING A FLOATING ROOF

James C. Tuckey, Hacienda Heights, Calif., assignor to Pacific Erectors Corporation, Sante Fe Springs, Calif.
Filed June 4, 1976, Ser. No. 692,750
Int. Cl.² B65D *87/207*
U.S. Cl. 220—224 **3 Claims**



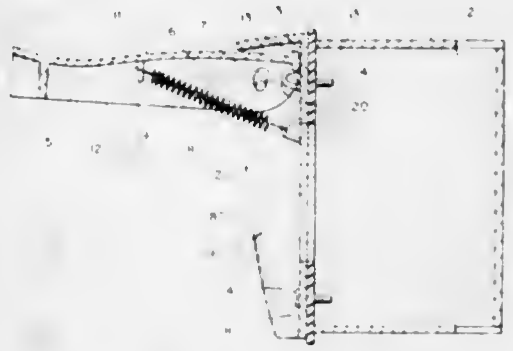
1. In a liquid storage vessel which includes a cylindrical tank and a circular floating roof and which has a primary sealing structure that includes:

a. a pontoon mechanically coupled to the floating roof and disposed about its perimeter;
b. a set of hangers, each of the hangers having a first end and a second end with the first end being mechanically coupled to the pontoon so that the hanger may pivot about its first end;
c. a set of sealing shoes, each of which is disposed about the perimeter of the floating roof and adjacent to the sidewall of the cylindrical tank so that it contacts it and each of which is mechanically coupled to the second end of one of the hangers;
d. a set of metal bands, each of which is mechanically coupled to one of the hangers;
e. a set of counterweights, each of which is mechanically coupled to one of the metal bands so that it exerts a downward force on the hangers; and
f. a fabric sealing material disposed about the perimeter of the floating roof and secured thereto on one its sides in a gas-tight manner and mounted adjacent to the sealing shoes in the combination with a secondary sealing device comprising, said secondary sealing device:
    a. a support member of an inelastic material having a substantially rectangular cross-section and being of a particular length, said support member being mechanically coupled to the sealing shoe so that the fabric sealing material may contact the inner sidewall of the cylindrical tank;
    b. an elongated inner core member of elastic material having substantially a rectangular cross-section and being the same length as said support member, said core member being secured to said support member and adapted so that the fabric sealing material may be looped over said core member and secured on both sides of the loop to said support member.

4,036,396

WEATHERPROOF JUNCTION BOX COVER ASSEMBLY

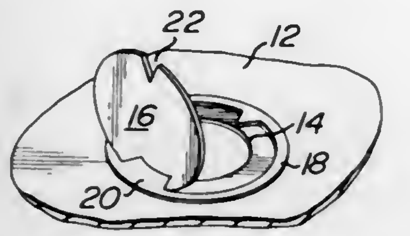
Richard T. Kennedy, Oaklawn; Algird R. Quitschau, Downers Grove, and Ernest S. Kettelson, Joliet, all of Ill., assignors to Square D Company, Park Ridge, Ill.
Filed Oct. 14, 1975, Ser. No. 621,906
Int. Cl.² H02G *3/18*
U.S. Cl. 220—242 **2 Claims**



1. A weatherproof junction box cover assembly, comprising a structural member for mounting relationship with a junction box, a cover member, pivot means associated with said members to hingedly mount said cover member on said structural member, a cooperative inter-related hood associated with said structural member and said cover member, shiftable bias means operably mounted on said assembly to normally bias said cover toward a closing position, said shiftable bias means being shiftable with respect to such members to vary the operative effect of said bias means, wherein said shiftable biasing means includes a spring to normally bias said cover toward a closing position, said spring including shiftable interconnecting means to shift the operation of said cover from a first mode to a second mode, mounting means on said cover assembly, said shiftable interconnecting means being shiftably connectable to said mounting means of said assembly, said mounting means including first mounting means having first and second connecting stations positioned on one of said members for connection of said shiftable interconnecting means of said spring thereto and dis-connection therefrom, said first connecting station being spaced apart from said second connecting station on said one of said members, a second interconnecting means of said spring located oppositely of said shiftable interconnecting means, second mounting means of said assembly on the other of said members spaced apart from said first mounting means in the direction said cover member moves when opening, said second interconnecting means of said spring being connectible to said second mounting means, said shiftable interconnecting means including a first end providing means for connection to and disconnection from said first mounting means, said pivot means defining a pivotal axis directed perpendicular to the direction of opening and closing of said cover member and located intermediately of said first and second mounting means, a straight line between said first mounting means and said second mounting means lying on a first side of said pivotal axis when said cover member is in the fully open position, a straight line between said second pair of lugs of said first mounting means and said second mounting means lying on an opposite second side of said pivotal axis when said cover member is in the fully open position.

4,036,397
CONTAINER WITH EASY OPEN TOP

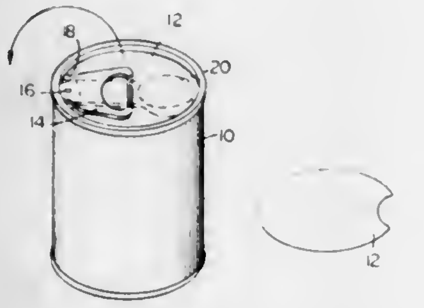
Thomas A. Walraven, West Chester; John G. Thomas, Berwyn, and James B. Hall, Chester Springs, all of Pa., assignors to Christiana Metals Corporation, West Chester, Pa.
Filed Sept. 7, 1976, Ser. No. 720,533
Int. Cl.^{2} B65D *41/32*
U.S. Cl. 220—268 **8 Claims**



1. A container adapted to contain a product, a lid for said container, said lid having at least one hole therethrough, a disk juxtaposed to the hole and joined thereto by a bond in the form of an annular loop which circumscribes said hole, means including a portion of the bond to define a hinge for the disk, a stress director at a location spaced from the hinge to initiate tearing of said disk adjacent the ID of said bond as finger pressure is applied to the disk and causes the disk to move into said container with said disk remaining connected to the lid at said hinge.

4,036,398
CONTAINER WITH REMOVABLE RING AND UTENSIL CARRYING LID

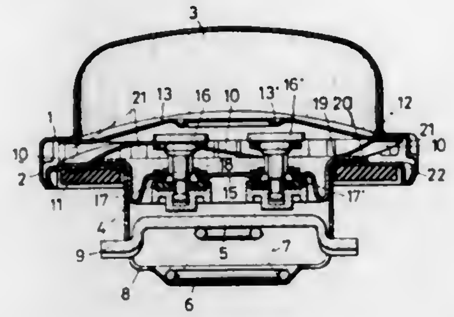
Roy Hoogvelt, and Jack Hoogvelt, both of Eagle Rock, Calif., assignors to The Raymond Lee Organization, Inc., a part interest
Filed Aug. 31, 1976, Ser. No. 719,174
Int. Cl.^{2} B65D *41/32*
U.S. Cl. 220—270 **2 Claims**



1. In combination with a container having a removable lid, said lid having outer and inner surfaces and being peripherally sealed to the container: a pull ring secured to the outer surface of the lid in a selected region, the periphery of said region being weakened whereby the ring and said region can be readily separated as a unit from the remainder of the lid; and a disposable eating utensil secured removably to the inner surface of the lid, said utensil having a handle, said handle being secured to said region whereby the ring, region and utensil form a removable unit.

4,036,399
GAS CAP WITH AUTOMATIC PRESSURE COMPENSATION

Theodor Gerdes, Langenfeld, Germany, assignor to Blau KG Fabrik fur Kraftfahrzeugteile, Langenfeld, Germany
Filed Sept. 1, 1976, Ser. No. 719,413
Claims priority, application Germany, Sept. 4, 1975, 2539320
Int. Cl.^{2} B65D *51/16, 45/00, 83/10*
U.S. Cl. 220—303 **11 Claims**



1. A gas cap, particularly for filler pipes of motor vehicles, comprising an inner part having bayonet- portions for engagement with corresponding portions of a filler pipe; an outer part mounted on said inner part freely rotatable relative thereto; biasing means biasing said parts away from one another so as to maintain them at a predetermined distance; passage means in said parts in communication with the ambient atmosphere and adapted to communicate with the interior of a filler pipe; valve means normally closing said passage means; valve actuating means on said outer part and operative to open said valve means when said outer part is displaced to a first position towards said inner part counter to said biasing means; and coupling means for coupling said parts together for joint rotation only when said outer part is displaced toward said inner part past said first porition to a second position.

4,036,400
TANDEM COLUMN VENDER ANTI THEFT DEVICE

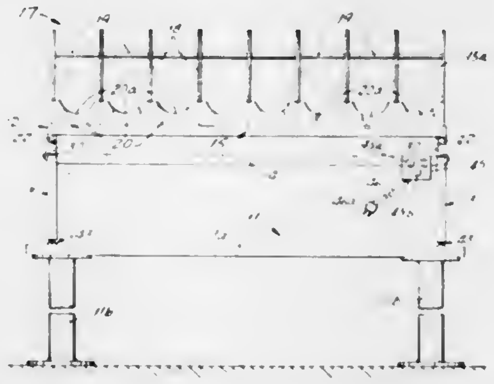
Kenneth W. Oden, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ranson, W. Va.
Filed Aug. 5, 1976, Ser. No. 711,828
Int. Cl.^{2} G07F *11/08*
U.S. Cl. 221—67 **6 Claims**

1. In a vending apparatus having means, including a planar side wall, defining a compartment for containing and confining at least two columns of generally cylindrical articles with articles of one column axially displaced from the articles of the other column in a front to rear direction, a longitudinally extending lower bail extending below both columns in supporting relation to at least the bottom articles thereof and being swingable about a fore-and-aft axis for lateral movement from a first position supporting said articles to a terminal position wherein all portions thereof are sufficiently spaced from one side wall to permit downward passage of said articles therebetween, said bail having a laterally extending portion below only one of said columns extending farther toward said side wall than the remainder of said bail whereby said bail may be moved laterally away from said side wall to permit the bottom article of the other column to drop therepast while said laterally extending portion supports the bottom article of said one column and further lateral movement of said bail to said terminal position then permits said bottom article of said one column to drop therepast, an upper bail in rigidly fixed relation to said lower bail and swingable therewith and arranged to swing into supporting engagement with those articles of said columns above said bottom articles in response to swinging movement of said lower bail away from said first position; the improvement comprising:

a member freely swingable and pendulously suspended from said upper bail, intermediate the ends thereof, to hang in said other column, adjacent said one column, in position to block movement of an article supported by said alterally extending portion into said other column when the bottom article of said other column has dropped past said lower bail.

4,036,401
HOT SHELF ASSEMBLY

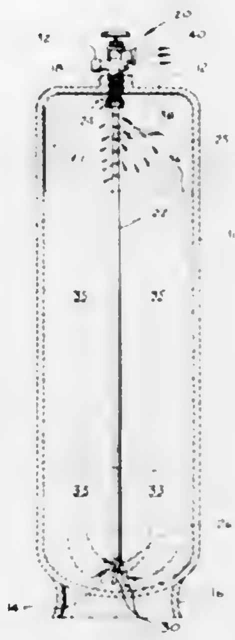
Walter E. Nachtigall, Jr., Minnetonka, Minn., assignor to Palm Brothers, Incorporated, Minneapolis, Minn.
Filed Sept. 15, 1975, Ser. No. 613,259
Int. Cl.^{2} A47F *1/00;* **B65G** *60/00;* **H05B** *1/00*
U.S. Cl. 221—150 A **14 Claims**



1. A dispensing device comprising: a base having a generally therebetween, facing object supporting surface, a support for positioning the base at an elevation, means movably mounting said base on the support, said base being tiltable from a horizontal position to at least one inclined position, said mounting means including first connecting means secured to the base and second connecting means secured to the support, pivot means pivotally connecting the first connecting means with the second connecting means and lock means for holding the first and second connecting means in at least one selected relative position, means for holding at least one object on the top of said base when in said inclined position, said holding means including one chute, said chute including spaced apart side walls for confining said object therebetweem, there being no object supporting surface forming a part of said chute throughout the majority of the length of said side walls, stop means at one end of said chute for preventing said object from escaping from said chute under the influence of gravity, and means carried by said chute and adapted to engage said base to maintain said chute in the desired operative position on said base, and means mounted in said base for varying the temperature thereof.

4,036,402
INDUSTRIAL FUEL STORAGE AND SELF-BLENDING TANK AND METHOD

Otis Max Taylor, East Point, Ga., assignor to TMC, Inc., Dunwoody, Ga.
Filed July 22, 1976, Ser. No. 707,519
Int. Cl.^{2} B67B *7/24*
U.S. Cl. 222—1 **6 Claims**



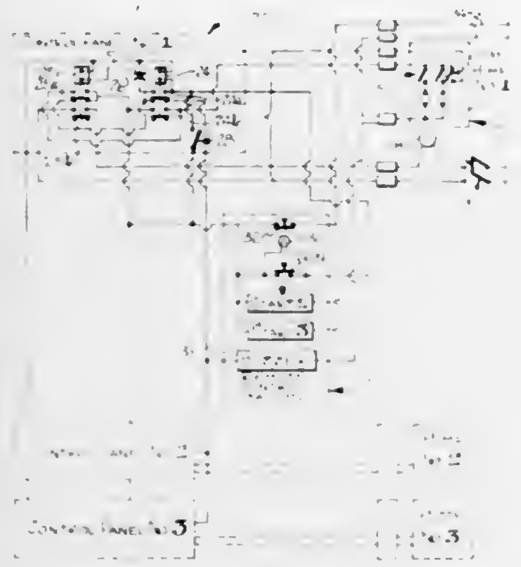
1. An industrial fuel storage and self-blending tank comprising: a container having a top, a bottom and sides adapted to be filled with a plurality of liquids of diverse specific gravities to a maximum liquid fill level located below said top thereby providing a vapor chamber between at least said maximum liquid fill level and said top; an outlet adjacent said container top through which vapors may controllably exit the vapor space and enclosed chamber; a dip tube mounted within said container extending from adjacent said container bottom to said container outlet and having a top portion extending upwardly from said maximum liquid fill level through said vapor space to said outlet, a bottom portion located adjacent said container bottom, and an intermediate portion extending between said bottom and top dip tube portions, said dip tube intermediate portion being impervious to the flow of liquid between the interior and exterior thereof, said dip tube bottom portion having a lower tube opening therein through which liquid may flow from the exterior to the interior thereof, and said dip tube top portion having an upper tube opening therein through which gases may flow from the exterior to the interior thereof; a wick mounted within said dip tube overlaying at least a portion of said upper tube opening; and valve means for controlling the flow of gases through said container outlet.

5. A method of storing and self-blending a mixture of fuels of diverse specific gravities comprising the steps of:

a. paritially filling a container with the fuels in their liquid state leaving a vapor space above the surface thereof;
b. sealing the container;
c. storing the sealed container thereby permitting the fuel of greater specific gravity to gravitate to the bottom of the container and the fuel of lesser specific gravity to rise thereabove to the surface;
d. drawing liquid fuel of greater specific gravity from adjacent the bottom of the container upwardly by wicking action from adjacent the bottom of the container through and out of contact with the fuel of lesser density into the wick disposed in the vapor space above the surface of the liquid fuel; and
e. drawing vapors of the fuel of lesser specific gravity evaporated from the surface of the liquid fuels out of the container through the liquid fuel of greater specific gravity in the wick within the vapor space.

4,036,403
FUEL DISPENSING ARRANGEMENT

Gerald O. Barnes, 6616 Plank Road, Charlotte, N.C. 28216, and Charles E. Horne, 1241 Cheshire Ave., Charlotte, N.C. 28208
Filed Oct. 22, 1975, Ser. No. 624,533
Int. Cl.^{2} B67D *5/22*
U.S. Cl. 222—23 **8 Claims**



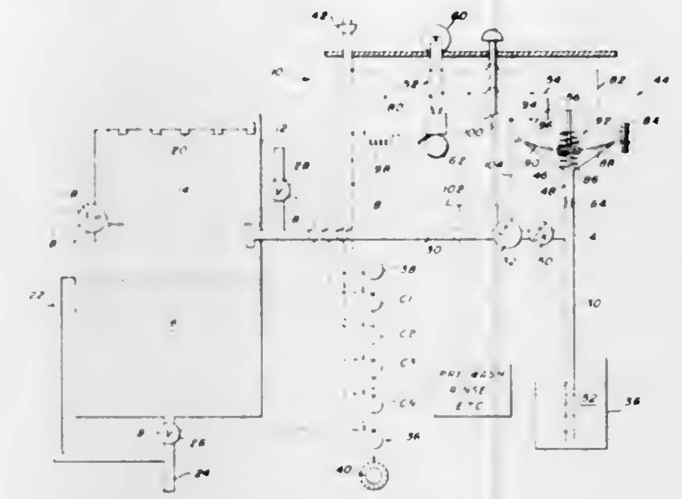
1. In a fuel dispensing arrangement having dispenser means with electrically driven pump means for delivering fuel, control means located remotely from said dispenser means and operable by a supervisor for selectively enabling fuel delivery from said dispenser means; and relay means having contacts switchable among a plurality of conditions, said relay means being connected with said control means for responding thereto by switching to a first condition in which contacts are connected to enable energization of said pump means in preparation for fuel delivery from said dispenser means and connected with said dispenser means for responding thereto by switching to a second condition in which contacts are connected for energizing said pump means for delivering fuel from said dispenser means and to a third condition in which contacts are connected for de-energizing said pump means on termination of fuel delivery from said dispenser means and for precluding energization of said pump means until said relay means are returned to said first condition by operation of said control means; the improvement comprising warning means located at said control means and operatively connected with said relay means for signaling to a supervisor that said relay means is in said third condition whereby the attention of the supervisor is directed to the termination of fuel delivery from said dispenser means.

4,036,404
MEANS FOR INDICATING DISHWASHER ADDITIVE ABSENCE

James D. Robinson, Memphis, Tenn., assignor to Auto-Chlor System, Memphis, Tenn.
Filed May 7, 1976, Ser. No. 684,006
Int. Cl.^{2} B67D *5/32, 5/14*
U.S. Cl. 222—39 **6 Claims**

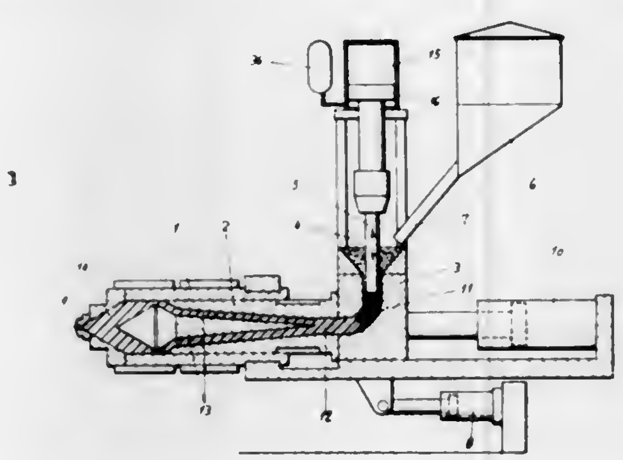
1. In a dishwashing machine comprising a reservoir for containing an additive, a supply line connecting the reservoir to a point within the dishwashing machine where the additive is normally added, a pumping means in the supply line for pumping the additive from the reservoir to said point, the pumping means including a check-valve means for retaining the additive in the supply line when the pumping means is not pumping, and control means for controlling the pumping means, the improvement which comprises:

a vacuum operated switch and a connecting line connecting the vacuum operated switch to the supply line between the reservoir and the pumping means, the pumping means, switch and connecting line being physically located above the maximum possible level of additive in the reservoir, the vacuum operated switch comprising at least one pair of electrical contacts, a chamber opening only to the connecting line, one wall of the chamber defining a diaphragm moveable with respect to the remaining portion of the chamber, biasing means for biasing the position of the diaphragm to a preselected position, adjusting means for adjusting the biasing means and connector means for connecting the diaphragm to a moveable portion of the at least one pair of electrical contacts, the adjusting means being adjusted such that the weight of the additive in the supply line between the connecting line and the reservoir is sufficient, when present, to create a vacuum within the chamber sufficient to operate the switch against the biasing means.



4,036,405
INJECTION MOLDING MACHINE WITH FEED CONTROL

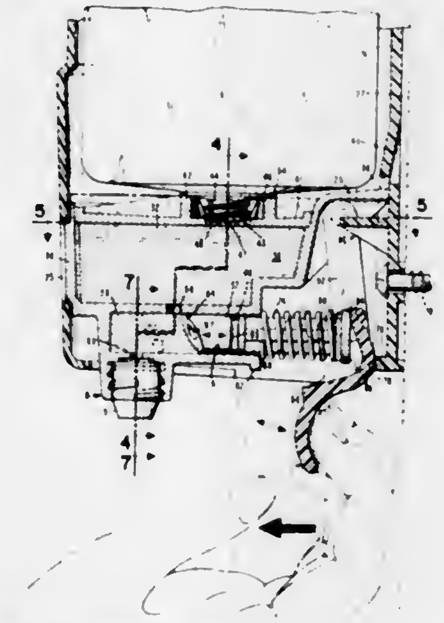
Ingolf Mombäecher, Reinfeld, Germany, assignor to Braas & Co. GmbH, Frankfurt am Main, Germany
Filed Jan. 24, 1975, Ser. No. 543,959
Claims priority, application Germany, Nov. 19, 1973, 2357583
Int. Cl.^{2} B29F *1/06*
U.S. Cl. 222—63 **4 Claims**



1. An injection molding machine for plastic material comprising an axially elongated injection cylinder, an axially extending displaceable element mounted in said injection cylinder with the axis of said displaceable element extending in the same direction as the axis of said injection cylinder, said displaceable element having an axially extending bore therethrough, one of said injection cylinder and displaceable element being axially movable relative to the other, said injection cylinder and displaceable element each having a first end and a second end with the first ends of each facing in the same direction and the second ends facing in the opposite direction from the first end, an injection nozzle positioned on the first end of said injection cylinder, a feed device located adjacent the second ends of said injection cylinder and displaceable element, said feed device including a feed hopper and a plunger reciprocally mounted in said feed hopper, means for conveying plastic material from said feed hopper into the bore at the second end of said displaceable element, pressure means in operative communication with said plunger for driving the reciprocating movement of said plunger, first switch means and second switch means spaced apart in the direction of the reciprocating movement of said plunger for reversing the movement thereof, said first and second switch means disposed in communication with said pressure means, said first and second switch means being selectively and separately positionable along the reciprocal path of movement of said plunger so that said first switch means defines the extent to which said plunger is inserted into said feed hopper and establishes the inserted position of said plunger and said second switch means defines the extent to which said plunger is retracted out of said feed hopper and establishes the retracted position of said plunger, and said pressure means including a device for retaining said plunger in the inserted position when a sufficient amount of plastic material has been supplied into the bore in said displaceable element for effecting the injection molding operation.

4,036,406
DISPENSER FOR LIQUIDS

Paul W. Jespersen, and Raymond F. DeLuca, both of Stamford, Conn., assignors to Georgia-Pacific Corporation, Portland, Oreg.
Continuation of Ser. No. 476,000, June 3, 1974, abandoned. This application Apr. 8, 1976, Ser. No. 674,928
Int. Cl.^{2} G01F *11/06*
U.S. Cl. 222—181 **34 Claims**



1. A dispenser for liquids comprising:

a supporting chassis;

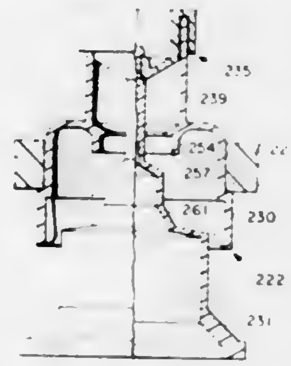
a supply tank mounted on said chassis for storing a quantity of a liquid;

a pump mounted on said chassis and communicating with said supply tank for pumping the liquid out of the dispenser; and

a nozzle mounted on said chassis and communicating with said pump for conveying the liquid out of the dispenser, said nozzle including a housing member having an internal passage extending therethrough, an insert mounted within said housing member passage, said insert having a pair of generally opposed ends and sides extending between said ends, said insert further having a passage extending from an opening in one of said ends thereof to an opening through at least one of said sides thereof, said insert end opening communicating with said pump, and a compressively elastically deformable sleeve interposed between said housing member and said insert, said sleeve being compressed radially against said insert sides including the portion of said one side having said insert side opening therethrough by generally radially inward forces exerted by said housing member upon said sleeve, the portion of said sleeve adjacent said housing member being retained against radially outward deflection by said housing member, the portion of said sleeve adjacent said insert encasing the portion of said insert having said insert side opening therethrough to normally seal said insert side opening and thereby prevent the liquid from leaking out of the nozzle, whereby when the pump is actuated, the liquid compressively elastically deforms the portion of said sleeve adjacent said insert so that the sleeve is forced away from said insert side opening and the liquid flows into said insert passage through said insert end opening, through said insert passage, out of said insert passage through said insert side opening, past said sleeve and out of said housing member passage.

4,036,407
DOSING VALVE

Thomas James Slone, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio
Filed Mar. 26, 1976, Ser. No. 670,587
Int. Cl.^{2} E03D *9/03*
U.S. Cl. 222—188 **14 Claims**



1. An improved dosing valve having a stationary member and a moveable component for dispensing a metered dose of a liquid product from a substantially rigid reservoir containing a quantity of a liquid product, said moveable component being axially moveable manually upwardly and moveable downwardly by gravity between an UP position and a DOWN position respectively, said improvement comprising means for forming an air-lock seal between cooperating portions of said stationary member and said moveable component for independently obviating flow from said reservoir when said moveable member is disposed at said DOWN position, and means forming an other seal intermediate other cooperating portions of said stationary member and said movable component for independently obviating flow from said dosage valve when said moveable component is disposed at said UP position, and means including a dose chamber cooperatively associated with said air-lock seal and said other seal for metering and dispensing a said metered dose of said liquid product each time said moveable component gravitates downwardly from said UP position to said DOWN position, and for metering a dose-volume of air upwardly into said reservoir each time said moveable component is moved upwardly from said DOWN position to said UP position.

4,036,408
HOPPER HAVING MEANS FOR DIRECTING BLASTS OF GAS TO A DISCHARGE OUTLET OR THE HOPPER

Richard H. Dugge, St. Louis, Mo., assignor to ACF Industries, Incorporated, New York, N.Y.
Filed Dec. 24, 1975, Ser. No. 644,363
Int. Cl.^{2} B65G *3/12*
U.S. Cl. 222—193 **5 Claims**

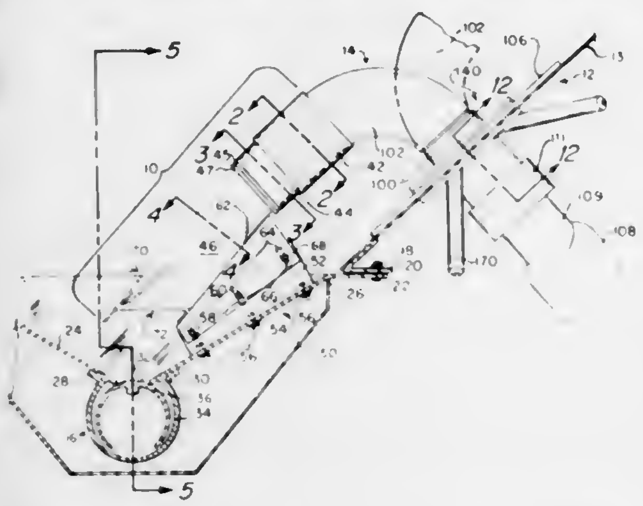
1. A hopper having a plurality of inclined sides; a bottom discharge outlet attached to the lower ends of the inclined sides;

a nozzle for directing blasts of gas into said hopper extending through one of said sides and into the interior of said hopper at a position spaced above said discharge outlet;

the portion of said nozzle extending within said hopper being of elbow shape;

a conduit fixedly mounted within said hopper, said conduit communicating at one end with said nozzle and extending downwardly to said discharge outlet to direct blasts of gas from said nozzle toward said discharge outlet;

means mounting said nozzle for rotation within said hopper between a first position aligned with and communicating with said one end of said conduit to direct blasts of gas toward said discharge outlet to dislodge bridged or clogged lading adjacent said outlet, and a plurality of other positions directing said elbow shaped portion to other areas of the hopper to direct blasts of gas to said other areas to dislodge bridged or clogged lading at said other areas.



4,036,409

FLUID METERING DEVICE

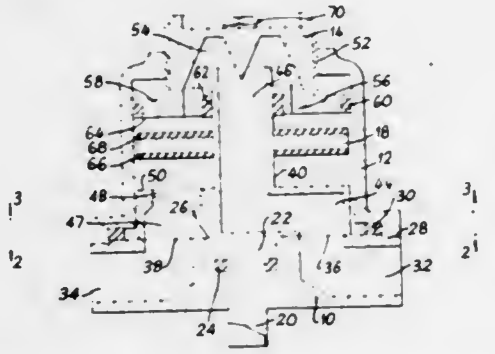
Jules Langlais, 8 Rue Claude Debussy, 59130 Lambersart, France

Filed Apr. 20, 1976, Ser. No. 678,472

Claims priority, application France, Apr. 23, 1975, 75.12582; Feb. 12, 1976, 76.03825

Int. Cl.² G01F *11/04*

U.S. Cl. 222—249 **7 Claims**



1. a fluid metering device comprising a sealed casing provided with an inlet pipe and a delivery pipe for the metered fluid, a piston defining two variable-volume chambers in the casing and a distribution unit which rotates or oscillates in the casing and co-operates in sealing-tight manner with the part of the walls adjacent the pipes, the unit being formed with a first passage opening directly into the first chamber and a second passage prolonged by a tubular portion which extends through the piston via an orifice along which it can slide, and which opens into the second chamber, the two passages being such that, during a portion of the rotation or oscillation, the inlet pipe is connected to the first of the two chambers and the delivery pipe is connected to the second chamber and, during another portion of the rotation or oscillation, the delivery pipe is connected to the first chamber and the inlet pipe to the second chamber, the resulting alternate connection causing the element forming a piston to move and deliver the fluid admitted into each of the two chambers, characterised in that the casing is a hollow upright cylinder, the base of which provides a plane upper surface perpendicular to the generating axis of the cylinder, the inlet and delivery pipes opening on to the said surface, the said surface co-operating in sealing-tight manner with movable plane surfaces of the distribution unit which bound the orifices of the two passages which extend from below and through the distribution unit.

4,036,410

INJECTION MOLDING MACHINE WITH FEED PLUNGER IN HOPPER

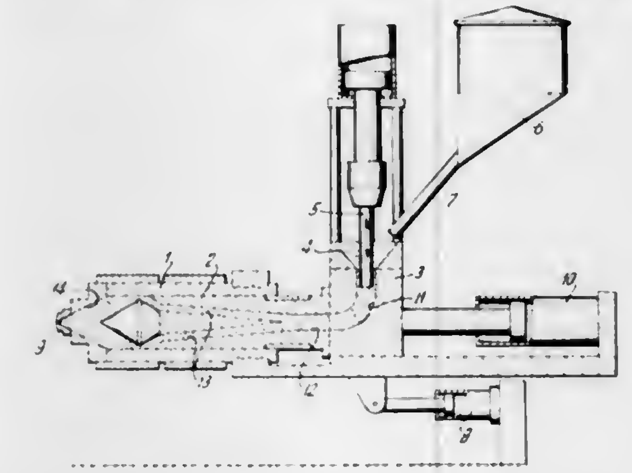
Ingolf Mombäecher, Reinfeld, Germany, assignor to Braas & Co. GmbH, Frankfurt am Main, Germany

Filed Jan. 24, 1975, Ser. No. 543,958

Claims priority, application Germany, June 29, 1974, 2431421

Int. Cl.² B29F *1/06*

U.S. Cl. 222—255 **6 Claims**



1. An injection molding machine for plastic material comprising an axially elongated injection cylinder, an axially extending displaceable element mounted in said injection cylinder with the axis of said displaceable element extending in the same direction as the axis of said injection cylinder, said displaceable emement having an axially extending bore therethrough, one of said injection cylinder and displaceable element being axially movable relative to the other, said injection cylinder and displaceable element each having a first end and a second end with the first ends of each facing in the same direction and the second ends facing in the opposite direction from the first ends, an injection nozzle positioned on the first end of said injection cylinder, a feed device located adjacent the second ends of said injection cylinder and displaceable element, said feed device including a feed hopper and a plunger reciprocally mounted in said feed hopper, a pressure block positioned between said feed hopper and the second end of said displaceable element, said pressure block having a passage therethrough in communication with and extending between said feed hopper and the bore at the second end of said displaceable element, said passage having a uniform cross sectional area for the axial length thereof, the passage in said pressure block having at least a substantially continuously curving section extending from the bore at the second end of said displaceable element toward said feed hopper, said bore in said displaceable element comprising a first section extending from the second end toward the first end of said displaceable element with said first section having a uniform transverse cross sectional area for the axial length thereof, and a second section extending from the end of said first section remote from the first end of said displaceable element toward the first end of said displaceable element and said second section comprising a plurality of ducts disposed in diverging relation from said first section of said bore toward the first end of said displaceable element, said displaceable element at the first end thereof having a double cone-shaped tip, said plurality of ducts terminating at the opposite ends thereof from the first section of said bore adjacent said double cone-shaped tip, and the combined transverse cross sectional area of said plurality of ducts corresponding substantially to the transverse cross sectional area of said first section of said bore and also to the transverse cross sectional area of said passage through said pressure block.

4,036,411

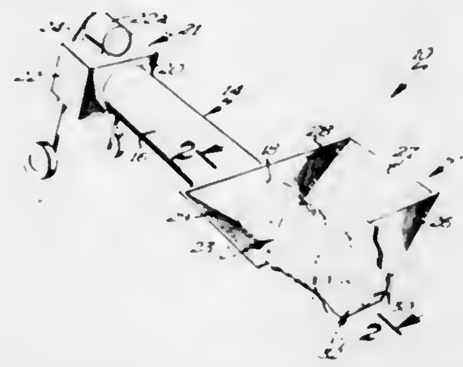
LOW PROFILE AUGER AND HOPPER ASSEMBLY

Loren N. Westhoff, Salem, S. Dak., assignor to SOS Consolidated, Inc., Birmingham, Mich.

Filed Sept. 26, 1975, Ser. No. 617,110

Int. Cl.² B65G *33/14*

U.S. Cl. 222—413 **1 Claim**



1. Product conveying and distribution apparatus adapted to be disposed upon a supporting surface, said apparatus comprising:

a hopper for receiving said product, said hopper comprising:

2 a rigid, planar base surface of substantially triangular shape substantially parallel to said supporting surface, and adapted to contact same;

- a plurality of sidewalls extending integrally upwardly from said planar surface and rigid therewith defining an upwardly opening product receptive enclosure; and
- a rear wall projecting upwardly from a bottom edge of said hopper which intersects and coincides with the base line of said substantially triangular shaped base surface; and

an auger assembly comrising:

- an elongated, tubular auger housing of substantially uniform diameter throughout the greater portion of its length having a rotatable auger supported and disposed therewithin, said auger assembly being received within said hopper obliquely with respect to said planar hopper surface, at a first predetermined angle with respect to said supporting surface; and said auger comprising a tapered flighting portion disposed adjacent said planar hopper surface, said tapered flighting portion of said auger tapered t a second predetermined angle, said first and second predetermined angles being substantially equal, whereby dead spots withibn said hopper are substantially avoided and mechanical contact between said planar surface and said auger tapered portion is obviated.

4,036,412

ELASTOMERIC CARTRIDGE WITH SLITTED NOZZLE TIP

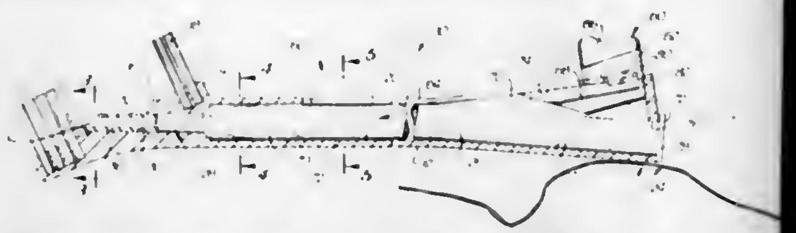
Burnie M. Craig, Pasadena, Calif., assignor to Loren S. Fond, Beverly Hills, Calif.

Division of Ser. No. 449,822, March 11, 1974, Pat. No. 3,938,897, which is a continuation-in-part of Ser. No. 232,714, March 8, 1972, abandoned. This application Nov. 24, 1975, Ser. No. 634,603

Int. Cl.² B65D *35/38, 35/52*

U.S. Cl. 222—490 **2 Claims**

1. A dispensing cartridge having a tubular tip of elastomeric material provided with a peripheral wall of nonuniform thickness in cross section and terminating in an end wall, said tip being provided adjacent its terminus with a self-closing slit extending longitudinally of said tip and having a portion formed in said peripheral wall and extending longitudinally of said tip away from said end wall, said peripheral wall, when viewed in cross section, comprising non- concentric inner and outer substantially circular walls, and said portion of said slit being formed in the thinnest portion of said peripheral wall.



4,036,413

CONTAINER CLOSURE CONSTRUCTION

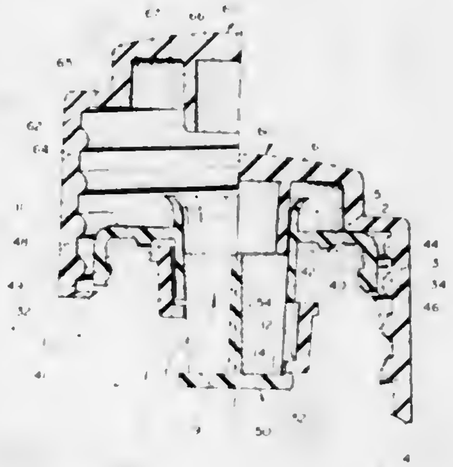
Jean Bernard Camps, Sao Paulo, Brazil, assignor to Perticamps S.A.Embalagens, Brazil

Filed Apr. 23, 1976, Ser. No. 679,686

Claims priority, application Brazil, Oct. 27, 1975, 13500842

Int. Cl.² B65D *41/62*

U.S. Cl. 222—500 **4 Claims**

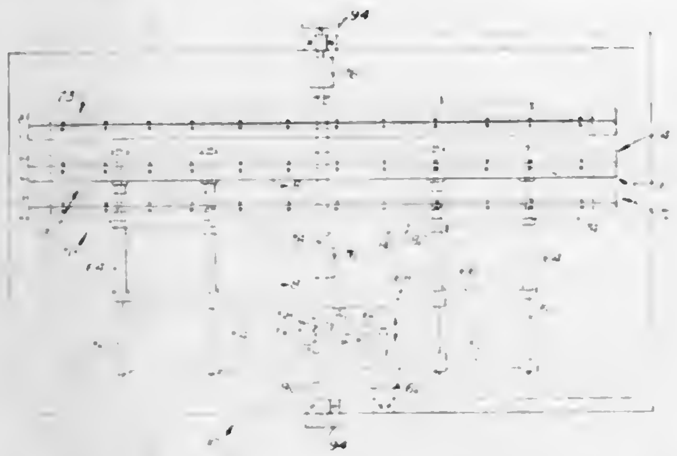


1. A closure contruction comprising a container having an externally threaded neck portion, with a top opening and a rim encircling the opening having an encircling cap bead receiving recess on the enterior thereof below said rim, an inner closure cap having a top cap part overying the container rim and a portion of the opening of the container and including an annular side skirt portion engaged around the exterior of said container neck portion, and with an inwardly extending cap bead engaged in a cap bead receiving recess of said container, said inner closure cap having a hollow cylindrical part extending through said top cap part and opening into the container and extending on the interior of said inner closure cap below the interior of said top cap part and extending on the exterior of said inner closure cap above the exterior of said top cap part, an outer cover having an internally threaded outer cover skirt part threadably engageable wih said internally threaded neck portion of said container, said outer cover having a top cap edge wall overlying said rim and engageable over said top cap part, said outer cover part also including a central raised cap part above said ledge wall overlying said hollow cylindrical part, and a stopper projection on the interior of said raised cap part engageable into said hollow cylindrical part, a floating stopper engaged in said hollow cylindrical part, having a bottom disc portion of a dimension greater than the diameter of the lower portion of said hollow cylindrical part, and a retaining ring having a flange engaged over said hollow disc portion, and being displaceable on said floating stopper, between said disc portion and the lower portion of said hollow cylindrical part.

4,036,414

FABRIC CREASING MACHINE

Fernando Miranda, Aguadilla 57 Condado, San Juan, P.R.
Filed Dec. 1, 1976, Ser. No. 746,365
Int. Cl.² D06J *1/00*
U.S. Cl. 223—28 **10 Claims**

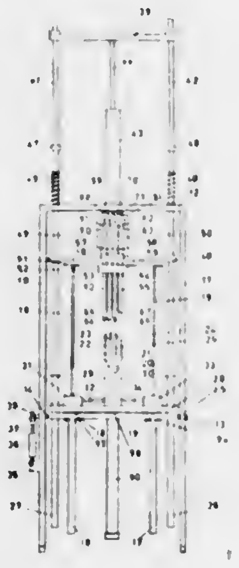


1. A fabric creasing machine comprising a first set of creasing bars with at least one of said bars being supported for relative movement in a horizontal direction between open and closed positions so as to produce a gap therebetween in the open position, means connected to at least said one bar for moving said one bar between an open and closed position, vacuum means associated with said bars for causing a limited portion of a fabric above the bars to enter such gap when the bars are in an open position, means connected to said bars for heating the bars, and means for subjecting the apex of the crease to superheated steam while the creasing bars are in a closed position applying heat and pressure only to the limited portion of the fabric between the creasing bars without applying heat or pressure to the remainder of the fabric immediately adjacent said limited portion of the fabric.

4,036,415

GLOVE TURNING AND BLOCKING PROCESS AND APPARATUS

Colin Filko; Richard Stanley Smith, both of Winnipeg; Lawrie Gandier McIntosh, Etobicoke, and Willem John Bouman, Toronto, all of Canada, assignors to Sterling Glove Machinery Ltd., Winnipeg, Canada
Continuation-in-part of Ser. No. 636,590, Dec. 1, 1975. This application Dec. 6, 1976, Ser. No. 747,670
Int. Cl.² A41H *43/00*
U.S. Cl. 223—40 **14 Claims**

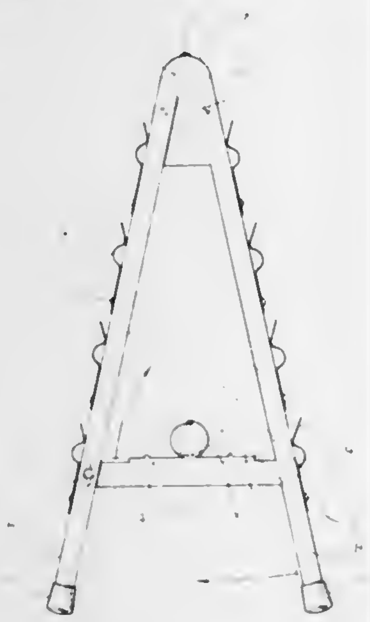


6. Apparatus for turning and blocking gloves comprising:
at least one finger mounting member of relatively small diameter adapted to be received inside a finger of a stitched, inside out glove mounted thereon;
at least one finger receiving mandrel of relatively larger diameter adapted to be arranged in substantial longitudinal alignment with said at least one finger mounting member;
an expandable and retractable wrist clamp adapted to expand to grip the inside of the wrist portion of the glove mounted on said at least one finger mounting member, said wrist clamp being movable relative to said at least one finger mounting member in a direction longitudinally thereof towards and away from said at least one finger receiving mandrel, for transferring a glove finger mounted on said at least one finger mounting member onto said at least one finger receiving mandrel by rolling the finger onto the outer surface thereof;
a sealing clamp surrounding said at least one finger receiving mandrel and adapted to engage with the edge of the wrist clamp to grip therebetween in substantially sealing manner an edge of a glove gripped by said wrist clamp, around the periphery of said edge;
means for supplying air pressure to the inside of a glove sealingly gripped between said sealing clamp and said wrist clamp.

4,036,416

COMBINATION FOLDABLE GOLF CLUB CARRIER AND SCORE KEEPING DEVICE

Gerald W. Lowe, 9330 Tropico Drive, La Mesa, Calif. 92041
Filed Feb. 6, 1976, Ser. No. 655,856
Int. Cl.² B65D *69/00*
U.S. Cl. 224—45 R **2 Claims**

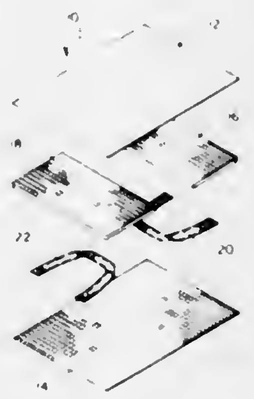


1. A foldable "A" frame device designed to relieve the golfer of inconveniences caused by unnecessarily heavy and bulky conventional golfing equipment; a device which is easy to carry around the golf courses and convenient to handle when stowing and transporting to and from the golf course; a structure consisting primarily of two identical "A" frame assemblies, each assembly a vertex block (7) with a hole to receive and secure by means of fasteners (11) an extended dowel (1) end of a handle, each said vertex block having tapered sides, the tapered sides of said vertex blocks slip fitting into aluminum channel legs (8) and each vertex block held accurately by one fastener (10) on which said legs can be pivoted from a 13° open angle, to an inward 0° closed position in which case said Legs would lie parallel to each other, and each leg consisting of four (more or less may be used according to manufacturers discretion) accurately formed thin spring steel gripper clips attached by fasteners (10) equally spaced vertically and aligned so that the horizontally positioned golf clubs can be easily inserted, securly held within the clip radii, and easily identified and snapped vertically on and off said clips, and in addition a golf ball tube and tray assembly maintains the proper spacing between the two "A" frames and it consists of a length of split plastic tube (13) which is used as a new type of receptacle for retaining golf balls and said tube is centrally attached to a tray (12) on which angles (14) serve as horizontal cross members to brace and rigidify the "A" frame assemblies, one end of each said Angle being attached to channel legs (8) by means of fasteners (10) which serves as a pivot to fold said tray assembly upward, an operation which precedes the folding of said channel legs (8) inward to the closed parallel position, opposite ends of said angles being notched for the purpose of locking said tray assembly into the open position by means of locating screws (25) and wing nuts (16) respectively, and finally it should be noted that if golf clubs are intact when said golf ball tube and tray assembly is folded upward, one club will interfere with said golf ball tube and must be removed from this position in order to achieve complete closure of said legs.

4,036,417

BOOK COVER AND CARRYING DEVICE

Seeran M. Traphagan, 1360 Kirkley Road, Columbus, Ohio 43221
Filed July 6, 1976, Ser. No. 703,066
Int. Cl.² B65D *77/00*
U.S. Cl. 224—45 N **9 Claims**



1. A cover for a book comprising:
a composite body panel including two substantially identically dimensioned sheets of flexible limp material with peripherally disposed raw edges, each said sheet having one surface carrying an ornamental aspect and being superimposed upon the other such that each said one surface is outwardly facing, the peripheries of each said sheet being mutually inwardly folded along a margin spaced a select distance from each corresponding said raw edge to define a body panel periphery having a contour generally corresponding to the contour of the outer cover of said book when open:
first and second pocket panels, each present as a sheet of flexible limp material with peripherally disposed raw edges, each said sheet being symmetrically shaped about a centrally disposed fold line, having one surface carrying an ornamental aspect and folded about said fold line to outwardly expose said one surface, each said folded first and second pocket panels being situated upon said composite body panel at mutually oppositely disposed portions of said body panel periphery, said pocket panel raw edges being superimposed in alignment with said body panel sheet raw edges, the peripheries of each said pocket panel sheet, when said pocket panel sheet is folded about said fold line, being unidirectionally folded along a margin spaced a select distance from each corresponding said raw edge thereof to define a three-sided pocket panel periphery aligned with adjacent said portions of said body panel periphery and defining therewith a pocket for receiving portions of said book outer cover;
first stitching internally disposed within said composite body panel, situate along and extendig through said body panel sheet and pocket panel margins, securing together said body panel sheets and said first and second pocket panels, continuous adjacent said aligned and superimposed pocket panel and body panel raw edges, and continuous along said body panel margin at least a select distance beyond said first and second pocket panel margins;
second stitching extending through said composite body panel and said first and second pocket panels, disposed outwardly thereupon and continuous along a margin spaced inwardly from said body panel periphery; and
first and second loop-type handles, each present as an elongate flexible limp material sheet having an ornamental aspect upon one surface thereof, folded along elongate fold lines to externally dispose said one surface, stitched to internally position the raw edges disposed in said elongate sense and to define oppositely disposed ends having exposed raw edges, said ends being internally disposed in spaced relationship within said composite body panel and secured thereto by said first and second stitching.

5. The method of making a cover for a book formed of two substantially identically dimensioned body panel sheets and two pocket panels each said body panel and pocket panel sheet being present as a single, limp, flexible sheet having one surface representing an ornamental aspect, the method comprising the steps of:
superimposing said two body panel sheets one upon the other with the peripherally disposed raw edges thereof being coincident and said one surface of each being arranged in mutually facing relationship;
folding symmetrically each said pocket panel sheet in half, the peripherally disposed raw edges of each half being coincident and said one surface of each being outwardly disposed when so folded;
positioning a said folded pocket panel sheet intermediate said two body panel sheets are oppositely disposed locations, said coincident raw edges of each said folded pocket panel sheet being coincident with adjacent said raw edges of each said body panel sheet and said folds therein being disposed in facing parallel relationship and spaced a given distance apart;
stitching through the assemblage of said body panel sheets and said folded pocket panel sheets, said stitching being located along a first margin spaced inwardly a select distance from corresponding said body panel sheet raw edges, said stitching being carried out in continuous fashion and commencing and terminating within a said space intermediate said pocket panel folds to define a gap;
turning said assemblage inside-out through said gap; and
stitching through said turned assemblage along a second margin spaced from said first margin and continuously about the entire peripheries of said body panel sheets.

4,036,418

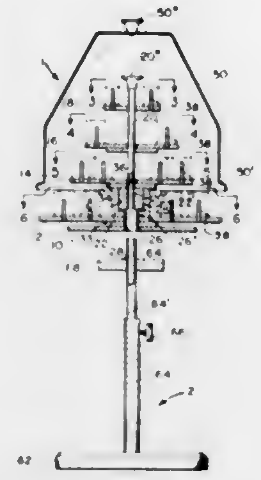
SPOOL HOLDER

Kazimirz Chlebda, 425 Margaret Ave., Baltimore, Md. 21221
Filed Jan. 28, 1976, Ser. No. 653,244
Int. Cl.² A47G *23/00*
U.S. Cl. 224—48 F **2 Claims**

1. A spool holder comprising in combination:
a. a base adapted to support a plurality of circular horizontal spool supporting discs in spaced relationship, one above the other and above the said base, including a bottom disc rotatably supported on said base and means for supporting at least two independently rotatable discs at different spaced intervals from the bottom disc and from each other and on the same vertical axis as the said bottom disc including a plurality of spool-positioning pins positioned on the supper surface of each disc,
b. a spacer positioned adjacent the center of the upper surface of the bottom disc having a central opening extending therethrough including a shoulder adjacent the bottom of the spacer and adjacent the upper surface of the bottom disc,
c. a coupling for connecting the base with the said spacer

having an outwardly turned flange about the upper portion thereof for engaging the shoulder of the spacer for rotatably supporting the spacer and the bottom disc on the said base and means for fixing the said coupling to at least the base member,

d. a plug element fixed within the upper portion of the said spacer having a central opening therein,



e. the means for supporting the independently rotatable discs being in the form of a perpendicular spindle, said spindle being affixed to said plug element,

f. separately spaced spacers affixed to the spindle for supporting each of the two upper discs centrally and at spaced intervals on said spindle, each upper disc having a central opening extending therethrough to permit independent rotation of each upper disc around the spindle.

4,036,419
SEVERING APPARATUS

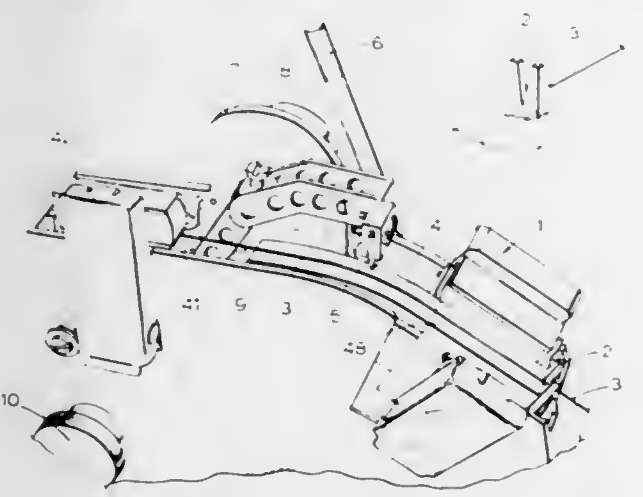
Paul Christopher Hensel, Woodbridge, and Ronald Geoffrey Spiers, N. Wembley, both of England, assignors to The Post Office, London, England

Filed July 7, 1976, Ser. No. 703,187

Claims priority, application United Kingdom, July 14, 1975, 29511/75

Int. Cl.^{2} B26F *3/00*

U.S. Cl. 225—96.5 **11 Claims**



1. A device for severing a dielectric optical waveguide comprising at least one dielectric optical waveguide clamping means for holding a portion of said dielectric optical waveguide against an anvil means, means for applying a constant force to said anvil means independent of displacement of said anvil means so that a pre-set tension is applied to said dielectric optical waveguide, and knife means for engaging said dielectric optical waveguide and initiating a fracture through said dielectric optical waveguide.

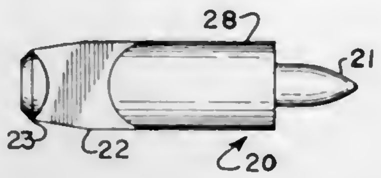
4,036,420
PINWHEEL FOR PAPER FEEDING

Frank J. Lockwood, 7011 W. Archer Ave., Chicago, Ill. 60638

Continuation-in-part of Ser. No. 640,259, Dec. 13, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,735

Int. Cl.^{2} B65H *17/38*

U.S. Cl. 226—87 **10 Claims**



6. A pinwheel feeding mechanism for feeding paper and the like having a platen, a plurality of movable feeding pins seated in sockets in said platen for continuously and progressively advancing paper and the like for an associated mechanism, wherein, said pinwheel comprises a feeding mechanism having a preformed platen of aluminum, having sockets machined in said platen to selected dimensions, said platen being anodized thereby providing a durable, yet easily machined platen, and said pins having an inside end and an outside end, said inside end being tapered from a point spaced from said outside end for providing increased wear and durability characteristics while preventing the penetration of foreign matter past said pin.

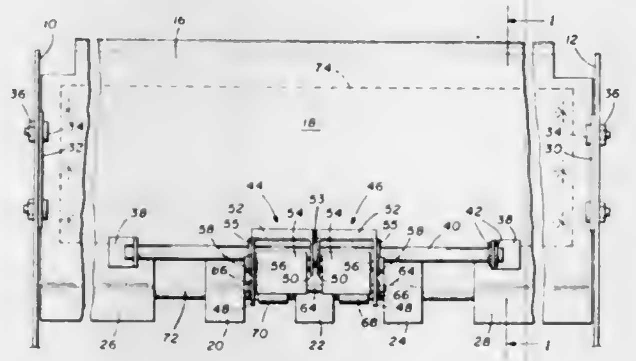
4,036,421
WEIGHTED PINCH ROLLS

Robert P. Clark, Richardson, and Eugene F. Miller, Plano, both of Tex., assignors to Xerox Corporation, Stamford, Conn.

Filed June 17, 1976, Ser. No. 696,956

Int. Cl.^{2} B65H *17/22*

U.S. Cl. 226—185 **2 Claims**



1. A transport assembly comprising: support means, a drive roll rotatably mounted on said support means about a given first axis, a pair of axially spaced apart bracket means pivotally mounted independently of each other intermediate the ends thereof on said support means about a second axis generally parallel to said first axis, each said bracket means including a pair of axially spaced apart inner and outer legs rigidly secured to each other, the inner leg of each bracket means facing each other, weight means for each of said bracket means located between respective pair of said inner and outer legs and pivotally secured thereto, a shaft extending between said outer legs of each of said bracket means generally parallel to said axes said operatively connected to only the outer leg of each of said bracket means, a pair of axially spaced pinch rollers located on said shaft between a respective pair of said inner and outer legs and rotatably carried by said bracket means, said weight means providing a force biasing said rollers into engagement with said drive roll.

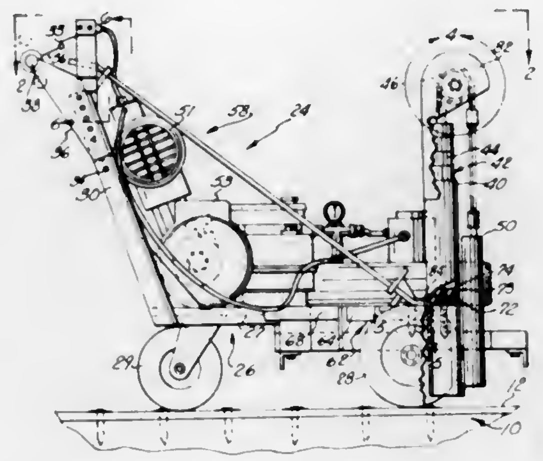
4,036,422
ROOFING NAIL APPLICATOR

William R. Harvey, Hinckley, Ohio, assignor to Lexsuco, Inc., Solon, Ohio

Filed Apr. 30, 1975, Ser. No. 573,008

Int. Cl.^{2} B27F *7/02*

U.S. Cl. 227—110 **7 Claims**



1. Apparatus for driving a fastener into a portion of a piece of material, said apparatus comprising a weight adapted to be supported in a raised position a predetermined vertical distance above the portion of said material, said weight including a fastener impacting portion, means for aligning said fastener with said fastener impacting portion of said weight, means for releasing said weight to enable it to accelerate from said raised position under the influence of gravity for imparting a force to said fastener to drive said fastener into said portion of said material and including an air actuatable piston, a chain having a first portion thereof secured to said weight, a second portion of said chain being secured to a portion of said air actuatable piston, a pulley adapted to engage said chain between said first and second portions, said means for releasing said weight further including means associated with said air actuatable piston for rapidly moving said piston in a first direction for rapidly urging said chain in a first direction tending to create sufficient slack between the first and second portions of the chain to permit said weight to fall said predetermined distance under the influence of gravity, means associated with said air actuatable piston for moving said piston in a second direction for moving said chain in a second direction for raising said weight to said raised position after weight has driven said fastener into said material and for maintaining said weight in the raised position until released by said means for releasing said weight, said air actuatable piston cooperating with said chain to prevent said weight from dropping more than a predetermined distance greater than said predetermined vertical distance.

4,036,423
EXPANDABLE PACKAGE

Robert L. Gordon, Monroe, N.Y., assignor to International Paper Company, New York, N.Y.

Continuation of Ser. No. 517,145, Oct. 23, 1974, abandoned. This application May 24, 1976, Ser. No. 689,494

Int. Cl.^{2} B65B *43/02, 85/70*

U.S. Cl. 229—43 **9 Claims**

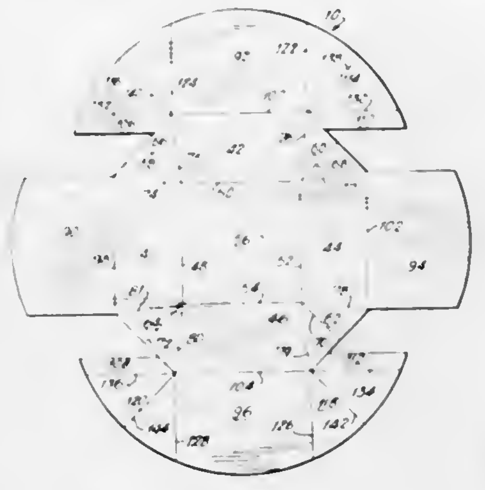
1. A non-metallic food package comprising a base portion and a flexible cover and capable of providing in an expanded condition a volume substantially greater than the volume of the package in a storage condition,

said base portion comprising a bottom panel of polygonal shape, side panels foldably connected to said bottom panel to form an open container section, and a flange portion foldably connected to said side panels,

said flange portion comprising a plurality of vertical support panels and connecting panels therebetween, each connecting panel being foldably connected to one adjacent vertical support panel and being adhesively bound to another adjacent vertical support panel, so that said flange portion has a continuous outer periphery,

said flexible cover being secured to said flange portion along said outer periphery,

said flange portion being folded inwardly of the side panels into said open container section, and



said connecting panels being outwardly expandable, whereby said flange portion and said flexible cover provide said package in the expanded condition with a volume substantially greater than the volume of the package in the storage condition.

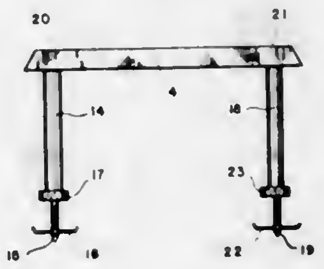
4,036,424
HANDLE DEVICE

Imre Thany, New York, N.Y., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed Jan. 19, 1976, Ser. No. 650,161

Int. Cl.^{2} B65D *5/46*

U.S. Cl. 229—52 A **9 Claims**



1. A handle device, comprising

handle means, said handle means including a leg; and

grapple means affixed to the handle means for grappling an inside surface of a puncturable container, said grapple means comprising resilient wire affixed to the leg of the handle means and having ends, said wire flattening to the leg when the leg is forced to penetrate into a container and stretching out due to its resiliency after penetrating the container and catching the inside surface of the container with its ends when the handle is pulled.

4,036,425

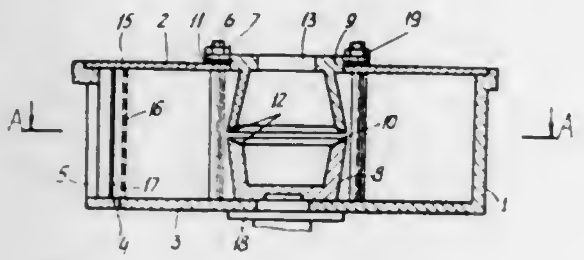
ROTOR FOR A CENTRIFUGE

Mikhail Ivanovich Ilin, ulitsa Sadovaya, 214, kv. 5, Krasnodar; Viktor Ivanovich Polyakov, Sudskoi proezd, 17, korpus 1, kv. 83, Moscow; Valery Alexandrovich Trofimov, ulitsa Kirova, 67, kv. 25, Penza; Ivan Karpovich Drankovsky, ulitsa Slavy, 5, kv. 41, Penza, and Alexandr Ivanovich Boitsov, prospekt Pobedy, 91, kv. 60, Penza, all of U.S.S.R.

Continuation of Ser. No. 575,424, May 7, 1975, abandoned, which is a continuation of Ser. No. 467,785, May 7, 1974, abandoned, which is a continuation of Ser. No. 332,137, Feb. 13, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 667,946

Int. Cl.² B04B *1/10, 15/06*

U.S. Cl. 233—2 4 Claims



1. A centrifuge rotor comprising: a housing with a removable sealing lid arranged concentrically; a tapered accelerating bowl disposed inside said housing and attached to the bottom thereof concentrically; filtering vanes arranged inside said housing between the bottom thereof and said lid, each filtering vane being pivotally attached at its end which is spaced at a minimum distance from the axis of the housing, said rotor housing accommodating an additional tapered accelerating bowl secured concentrically to said housing on said lid so that the two bowls face each other with their end faces of the largest diameters and define a gap therebetween through which the starting product is fed to the filtering surface of the vanes, said diameters being equal.

4,036,426

METHOD OF CLEANING A CENTRIFUGE

Thomas Hamilton Little, Devon, Pa., assignor to Pennwalt Corporation, Philadelphia, Pa.

Filed Feb. 15, 1974, Ser. No. 442,697

Int. Cl.² B04B *3/04*

U.S. Cl. 233—7 12 Claims

1. A method of cleaning a centrifuge after use for processing materials, said centrifuge having a bowl formed about a generally horizontal axis and being provided with an axial screw conveyor disposed coaxially therein, comprising the steps of:

a. emptying said bowl of process materials;
b. introducing cleaning liquid to said bowl;
c. rotating said bowl and said cleaning liquid therewith for a substantial period of time to impose upon said cleaning liquid by rotation a centrifugal force which is approximately equal to or less than the gravitational force on said cleaning liquid, whereby the axial screw conveyor and the interior of the bowl are cleaned by the agitating and tumbling action of the cleaning liquid; and
d. emptying said bowl;

the step of introducing cleaning liquid to said bowl being performed by partially filling said bowl until it contains no more of said cleaning liquid than the volumetric capacity of the bowl for cleaning liquid during normal process operation with the bowl rotating.

4,036,427

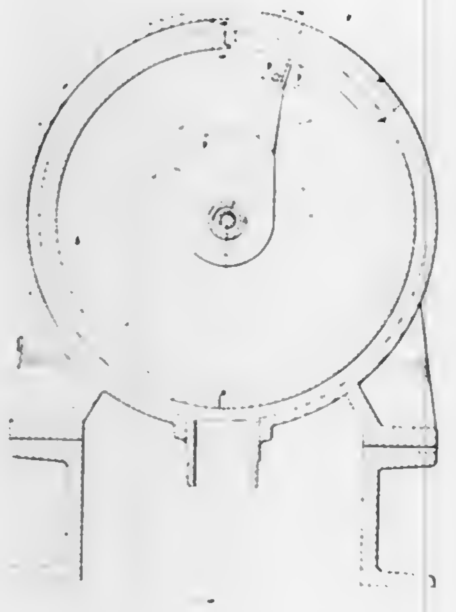
COMBINATION PITOT PUMP AND CENTRIFUGAL SEPARATOR

John W Erickson, Huntington Beach; Vitolis Budrys, La Mirada, and Francis Barton Brown, La Crescenta, all of Calif., assignors to Kobe, Inc., Huntington Beach, Calif.

Filed June 6, 1975, Ser. No. 584,574

Int. Cl.² B04B *1/12, 11/08*

U.S. Cl. 233—10 70 Claims



1. A combination pitot pump and centrifugal separator, including:

a. a rotary casing mounted for rotation in a selected direction about an axis;
b. means for delivering to the interior of the casing a contaminated fluid to be pumped and cleaned;
c. a pumped fluid discharge duct coaxial with the casing;
d. a pitot tube extending radially of said axis in the rotary casing and having adjacent its outer end an inlet facing in a direction opposite to the direction of rotation of the rotary casing, the pitot tube having a passage connected to the inlet and extending generally in the direction of casing rotation and toward the axis to an outlet connected to the discharge duct;
e. orifice means carried by the outer periphery of the rotary casing and communicating between the interior and the exterior thereof for discharging from the casing contaminant matter in fluid introduced into the casing and separated centrifugally therefrom within the casing; and
f. means operable during pumping and separating operation of the pump and separator for agitating centrifugally separated accumulations of contaminant matter on the inner surface of the casing along the entire extent of the outer periphery thereof.

4,036,428

FLUID PRESSURE OPERATED EDDY CURRENT BRAKE FOR AIR DRIVEN CENTRIFUGE

Douglas Howard Durland, and Malcolm Canmore McGilvray, Jr., both of Palo Alto, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

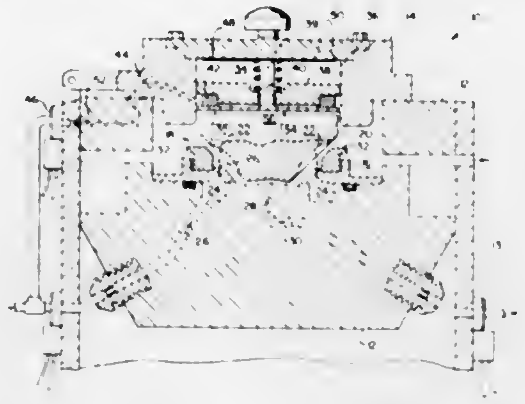
Filed Apr. 29, 1976, Ser. No. 681,303

Int. Cl.² B04B *9/06*

U.S. Cl. 233—23 R 5 Claims

1. In an air driven centrifuge having a rotor at least a portion of which is formed of an electrically conductive material and means for rotating the rotor on a supporting cushion of pressurized air about an axis, an improved method of braking the rotor when rotating comprising the steps of:

a. moving a source of constant magnetic flux from a first position wherein it is biased against the bias force to a second position by a fluid pressure means to allow the rotor to freely rotate, said first position being so disposed that eddy currents are induced into said electrically conductive portion of the rotating rotor sufficient to produce a braking effect to rapidly reduce the rotation of the rotor, said second position being so disposed that substantially no eddy currents are induced in the electrically conductive portion of the rotating rotor by said magnetic flux; and,



b. removing said fluid pressure means whereby said source of constant magnetic flux will be moved by the bias force from said second position to said first position to brake the rotor.

4,036,429

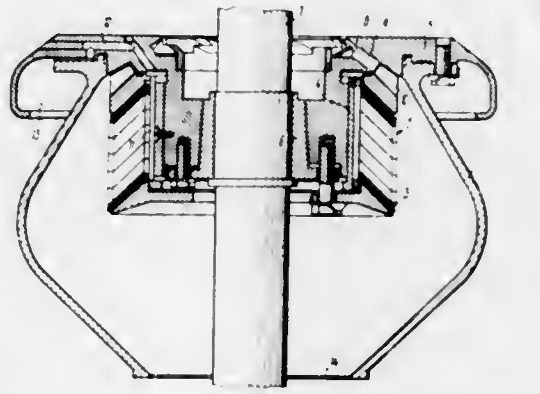
BOWL OF CENTRIFUGAL SEPARATOR

Jury Filoretovich Ivin, ulitsa Kosareva, 15, kv. 62; Arkady Nikolaevich Levischev, ulitsa Griboedova, 30, kv. 21, both of Sverdlovsk, and Vasily Ivanovich Sokolov, Kutuzovsky prospekt, 2, kv. 181, Moscow, all of U.S.S.R.

Filed Mar. 18, 1975, Ser. No. 559,409

Int. Cl.² B04B *1/08*

U.S. Cl. 233—27 8 Claims



1. In a centrifugal separator, a pack of cone-shaped discs and means carrying said pack with the discs thereof arranged along a common axis passing through the centers of said discs, spacer means being situated between each pair of adjacent discs for providing therebetween a gap of predetermined thickness, each disc having an inner suface directed toward and an outer surface directed away from said axis, and each disc fixedly carrying on one of its surfaces a plurality of elongated strips circumferentially distributed about said axis and extending substantially radially with respect thereto so that the strips fixed to said one surface of each disc define radial spaces between themselves, and said strips having a thickness less than the thickness of said gap so that while liquid is compelled to flow radially in said spaces between said strips the liquid is free to flow circumferentially in the part of each gap situated beyond the strips situated therein, the major portion of the liquid which is to be separated passing radially through the spaces between said strips while the part of each gap situated beyond said strips defines a stagnant zone of annular configuration in which there is a substantially negligible movement of the liquid being separated so that solid particles can accumulate in the stagnant zone, and liquid-delivery means situated adjacent one end of said pack for delivering liquid to be separated thereto.

4,036,430

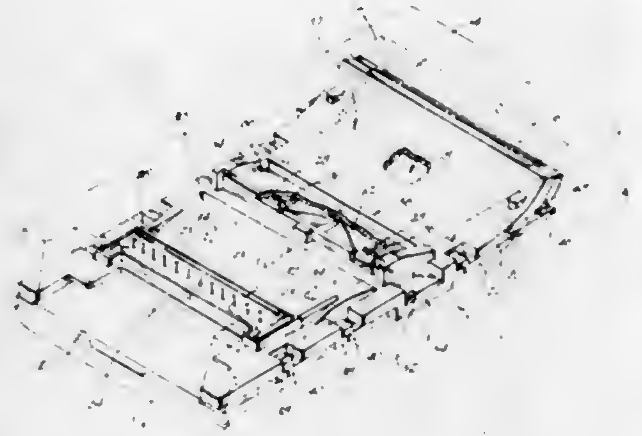
MANUALLY OPERABLE CARD READER

Helmut Eppich, West Vancouver, Canada, assignor to Ebco Industries, Ltd., Richmond, Canada

Filed May 13, 1976, Ser. No. 686,244

Int. Cl.² G11B *25/10*

U.S. Cl. 235—61.11 E 25 Claims



1. A manual card reader for reading data recorded on a card comprising:

card guide means having defined therein first and second card openings and a slotted passageway having first and second oppositely disposed major boundary walls and first and second oppositely disposed minor boundary walls, said passageway being dimensioned for the passage of a card and interconnecting said first and second card openings, said passageway including a first region extending a predetermined distance from said first card opening and a second region inclined relative to said first region and extending between said first region and said second card opening, the inclination between said first and second regions of said passageway for causing a card inserted in said first card opening and manually pulled from said second card opening to frictionally contact at least a portion of said major boundary walls of said passageway; and

data reading means for supplying an electrical signal representative of said data recorded on said card, said data reading means positioned along said slotted passageway in spaced proximity with said second card opening, said data reading means supplying said electrical signal as a card is manually moved through said passageway.

4,036,431

METHOD AND APPARATUS FOR USE IN SETTING A COUNTER

Lars F. Gidlof, 999 N. Doheny Drive, Los Angeles, Calif. 90069

Filed Apr. 2, 1976, Ser. No. 673,199

Int. Cl.² H03K *21/36;* **G06M** *3/14*

U.S. Cl. 235—92 PE 6 Claims

1. An apparatus for use in setting the output of a counting means capable of providing an output indicating a numeric value corresponding to the number of electric pulses supplied to a first terminal of said counting means, which indicated number is capable of being either increased or decreased as said pulses are supplied to said counting means in accordance with a signal supplied to a second input terminal of said counting means, said apparatus comprising:

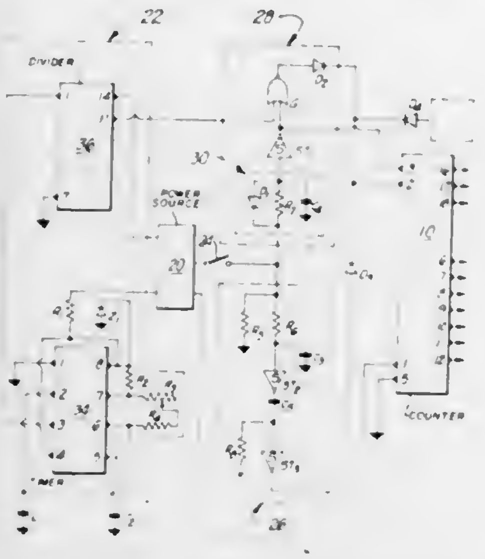
power supply means for supplying electric power,

a first pulse generating means for providing a series of electric pulses capable of being counted by said counting means, said first pulse generating means being connected to said power supply means,

a second pulse generating means for providing within a first time interval a pulse capable of being counted by said counting means each time a current is supplied to said second pulse generating means,

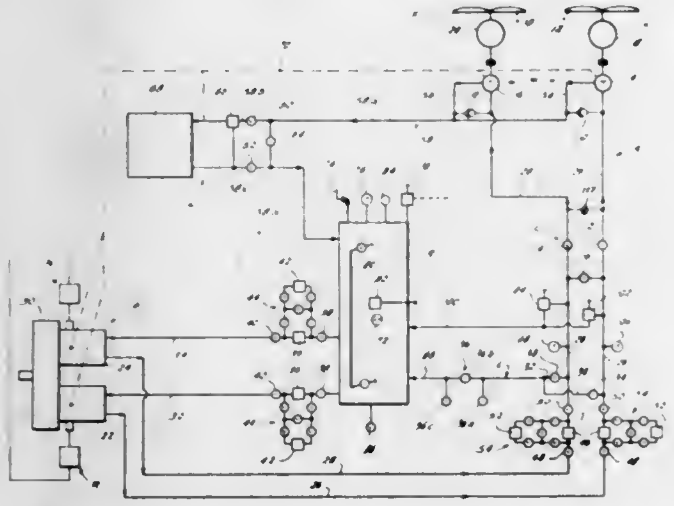
control means for concurrently within a second time interval which is greater than said first time interval providing a signal to said second input terminal of said counting means and providing pulses from said first pulse generating means to said first terminal of said counting means each time current is supplied to said control means, and

normally open switch means for concurrently connecting said control means and said second pulse generating means to said power supply so that when said switch means is closed current is simultaneously supplied to said control means and said second pulse generating means.



4,036,432
VARIABLE SPEED FAN DRIVE SYSTEM

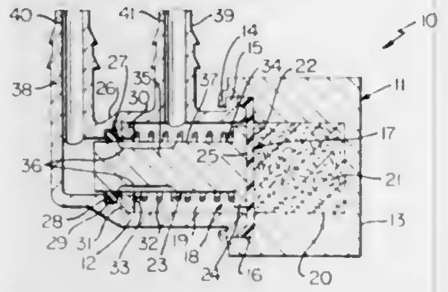
Albert L. George, P.O. Box 3604, Lafayette, La. 70501
Filed Nov. 3, 1975, Ser. No. 628,125
Int. Cl.² F01P *7/02*
U.S. Cl. 236—35 **1 Claim**



1. A variable speed fan drive system comprising:
fan means for cooling a substance;
pump means for supplying operating fluid to operate said fan means;
motor means in fluid communication with said pump means to receive operating fluid therefrom for rotating said fan means at a speed corresponding to the fluid displacement of said pump means;
temperature sensing means for sensing the temperature of the substance cooled by said fan means and producing a pressure control signal corresponding to the temperature;
pump displacement control means operably connected between said temperature sensing means and said pump means for regulating the fluid displacement of said pump means in response to said control signal wherein said pump displacement means includes:
pump discharge conduit means for conveying operating fluid from said pump means to said motor means;
variable orifice means mounted in said pump discharge conduit means for forming an orifice of variable size in said discharge conduit means;
orifice control valve means operably connected to said temperature sensing means for receiving said control signal and regulating the size of the orifice of said variable orifice in response to said control signal; and
differential pressure compensator means mounted with said discharge conduit means across said variable orifice means for detecting a fluid pressure differential across said variable orifice means and regulating the output of said pump means in response thereto, whereby the output of said pump means is regulated in response to the temperature of the substance cooled by said fan means.

4,036,433
THERMALLY OPERATED CONTROL DEVICE AND METHOD OF MAKING THE SAME

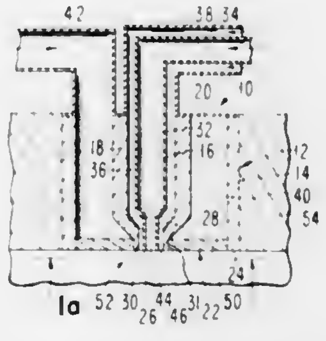
Joseph P. Wagner, and Byron L. Jackson, both of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.
Filed Nov. 6, 1975, Ser. No. 629,291
Int. Cl.² G05D *23/02*
U.S. Cl. 236—100 **12 Claims**



1. In a thermally operated control device having a housing means provided with a chamber divided into two sections by a flexible diaphragm and with thermally expansible material filling one of said sections to act on one side of said diaphragm and with a plunger disposed in the other of said sections and having one end thereof abutting the other side of said diaphragm to be moved thereby, the improvement wherein said sections are substantially of the same size adjacent said sides of said diaphragm and wherein said one end of said plunger substantially fills said other section adjacent said other side of said diaphragm to minimize the deformation and stretching of said diaphragm as said material forces said diaphragm into said other section upon expansion of said material, said housing means including two parts secured together with said diaphragm having an outer peripheral means secured between said parts and a normally flat center part coplanar with said peripheral means, each housing part having a substantially cylindrical interior surface respectively defining one of said sections of said chamber, said one end of said plunger being substantially rigid and substantially disc-shaped, said plunger having a reduced substantially cylindrical body extending medially from said disc-shaped end thereof.

4,036,434
FLUID DELIVERY NOZZLE WITH FLUID PURGED FACE

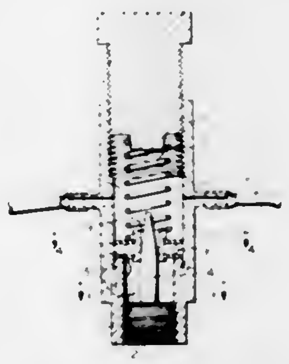
Roger E. Anderson, Rancho Cordova, and Emil Schmauderer, Jr., Folsom, both of Calif., assignors to Aerojet General Corporation, El Monte, Calif.
Filed July 15, 1974, Ser. No. 488,472
Int. Cl.² B05B *7/00, 15/02*
U.S. Cl. 239—8 **23 Claims**



1. A method of handling a first fluid having dissolved or suspended solids therein comprising: directing said first fluid along a confined path having an exit end; injecting the first fluid from said path into a region adjacent to the exit end of the path; and forming a fluid buffer near said exit end of said path to prevent any substantial rearward flow of the first fluid after it exits from said path to thereby prevent the build up of said solids at said exit end of the path by directing a second, pressurized fluid to a point proximate said exit end, dividing the second fluid into a multiplicity of second fluid streams and discharging the streams in an exit end surrounding relation to thereby generate in said region a relatively low pressure, low velocity and low volume buffer defined by the second fluid, said buffer flowing in the same direction as the first fluid flowing in said region; whereby the buffer flow prevents the backflow of injected first fluid and thereby also prevents said build up of solids.

4,036,435
DRIP IRRIGATION EMITTER

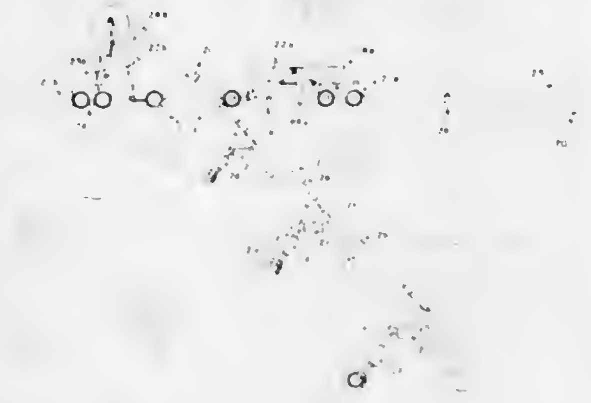
George J. Pecaro, P.O. Box 633, Pauma Valley, Calif. 92061
Filed July 23, 1975, Ser. No. 598,250
Int. Cl.² B05B *1/32, 15/02*
U.S. Cl. 239—116 **12 Claims**



1. A drip irrigation emitter for controlling the flow of fluid in an irrigation system comprising:
a. a hollow elongated body having a hollow interior and at least one outlet port;
b. an inlet connector fitting into an end of said hollow body;
c. a pin member fixedly attached to said inlet connector and extending axially within said hollow body;
d. a collar member axially movable within said hollow body, said collar member having a center bore with said pin member projecting into said bore to form a varying volume orifice defined as the space between the boundary of the bore and the periphery of the pin member wherein the flow of said fluid through said emitter is controlled by the size of said orifice;
e. a seat member extending radially from the interior of the hollow elongated body;
f. means for transmitting a yieldable force to said collar member in a direction opposite to the direction of flow of said fluid through said emitter, urging it toward said seat member; and
g. adjuster means coupled to said yieldable force transmitting means for adjusting the yieldable force exerted thereby, wherein said adjuster means are positioned on said hollow body such that said adjuster means can be adjusted exteriorly from said hollow body.

4,036,436
SELF-PROPELLED LINEAR IRRIGATION SYSTEM

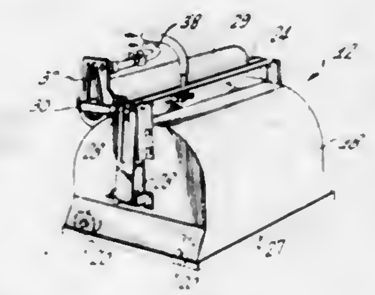
Norman S. Standal, Star Rte., Bliss, Idaho 83314
Filed Sept. 2, 1975, Ser. No. 609,343
Int. Cl.² B05B *3/18;* **A01G** *25/09*
U.S. Cl. 239—183 **21 Claims**



1. A self-propelled linear irrigation system comprising:
a. an elongated line move having a plurality of sprinkler outlets along its length;
b. a plurality of mobile supports spaced along said line move;
c. a main tractor having a water pipe outlet engaging means and a compressed air pipe outlet engaging means;
d. a pneumatic prime mover attached to each mobile support and to the main tractor for propelling same; and
e. linear guide means for said tractor.

4,036,437
APPARATUS WITH REVERSING LINEAR TRAVERSE MECHANISM FOR SPRAYING MATERIAL

Alfred J. Dreher, Pasadena, Calif., assignor to Alfred J. Dreher, Padadena, Calif.
Filed Feb. 18, 1976, Ser. No. 658,890
Int. Cl.² B05B *3/18*
U.S. Cl. 239—186 **23 Claims**



1. A machine for directing a spray of material across a target surface, said machine having a carriage movable in a first direction across the target surface and nozzle means supported

in the carriage, for spraying the material against the target surface, wherein the improvement comprises:

a shaft rotatably mounted in said carriage, having oppositely directed spiral camming threads thereon, and aligned in a second direction substantially perpendicular to said first direction in generally parallel relation to said target surface;

drive means for rotating said shaft;

a sliding nut for engaging one at a time of said spiral camming threads, with means for automatically engaging alternate ones of said camming threads at opposite extremes of travel of said nut on said shaft, to convert rotational motion of said shaft to linear reciprocating motion of said nut at a substantially constant speed;

a housing for said shaft and said nut, including means engaging said nut to maintain alignment thereof and prevent rotation thereof on said shaft; and

carrier means connecting said nut to said nozzle means, including sealing means to exclude harmful material from said housing;

whereby said nozzle means is reciprocated linearly in said second direction without drive reversal or unnecessary dwell at the ends of its travel, and said shaft, nut and housing can withstand transient mechanical stresses imposed by the spraying of some materials.

4,036,438

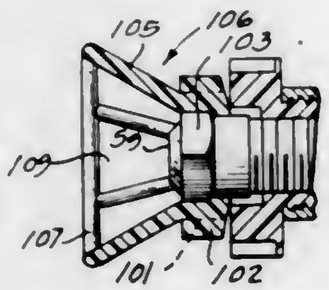
ANTI-INJECTION PAINT SPRAY NOZZLES

Richard Leroy Soderlind, and Glenn A. L. Lund, both of Minnetonka, Minn., assignors to Sperry Tech Corporation, Minneapolis, Minn.

Filed July 21, 1975, Ser. No. 597,757

Int. Cl.² B05B *1/04*

U.S. Cl. 239—288.5 **9 Claims**



1. A safety nozzle assembly for airless spray cup guns comprising, in combination, a nozzle member having an axial end with a conical depression extending into the axial end and reducing in diameter to a point adjacent a co-axial nozzle orifice open to the depression, the conical depression having a depth between approximately 3 and 9 mm and an included angle of between 30° and 90°, a protective barrier extending outwardly from the nozzle member in the direction of a stream of spray exiting the depression, the barrier including an extended annular member attached to the periphery of the nozzle member, the annular member having a wall portion extending downstream from the nozzle member axial end a distance greater than 15 mm and terminating at an annular open end, the wall portion being circumferentially discontinuous for at least a portion its length providing openings to the interior of the extended barrier radially outwardly and axially adjacent to the nozzle member, the opening providing a free flow of air through the extended barrier, the openings having a dimension preventing accidental entry therethrough to the interior of the barrier of a finger of a user of the cup gun except through the open end, the extended barrier dimensioned to prevent injection of a user's skin by a stream of fluid exiting the nozzle opening when the skin is positioned at the open end, the conical depression preventing injection of the user's skin when the skin substantially covers the depression at the time of activation of the cup gun, the depression providing a hydrostatic cushion by having an internal area between the nozzle opening and the axial face which will be substantially filled by pumped fluid exiting the orifice within a period less than the time period necessary for penetration of the skin of a user by the pumped fluid stream when the skin closes the end face, the conical depression and extended barrier each having a minimum diameter at any point downstream of the nozzle opening greater than the diameter of a cone of spray from the nozzle orifice at that point.

4,036,439

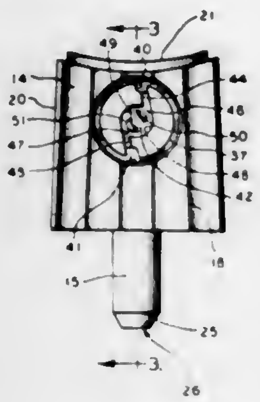
SPRAY HEAD FOR NEBULIZATION OF FLUIDS

Elward Howard Green, Addison, Ill., assignor to Newman-Green, Inc., Addison, Ill.

Filed Sept. 24, 1975, Ser. No. 616,406

Int. Cl.² B05B *1/30*

U.S. Cl. 239—466 **12 Claims**



1. A spray head having means including a duct for dispensing nebulized fluid from a pressurized container comprising;

a body member having a projection terminating at an outer face and having at least two passages communicating with said duct and extending to said outer face;

baffle elements disposed on said projection extending axially outwardly of said face;

an insert mounted in said body member having a peripheral wall extending into a bore in said body member radially outwardly of said passages and having a radial wall comprising a rear face opposing said baffle elements and forming therewith and with said peripheral wall inner and outer generally concentric swirl chambers, said passages having outlet end portions tangential to said outer chamber providing inlets communicating therewith;

said baffle elements each having an arcuate contour and having a leading end portion including means directed into the direction of swirling moment of the fluid stream for splitting the stream to cause a part thereof to continue in the outer chamber and divert a part thereof to churn in the inner chamber;

each baffle element having a trailing portion in respect to the direction of movement of the fluid in said chambers comprising a surface diverging toward the splitting means of the adjacent baffle element and;

said insert having a discharge orifice in the radial wall thereof communicating with said inner chamber.

4,036,440

METHOD AND APPARATUS FOR THE TREATMENT OF WASTE WOOD, SUCH AS STUMPS AND SNAG, TO MAKE IT SUITABLE FOR THE PRODUCTION OF PAPER PULP

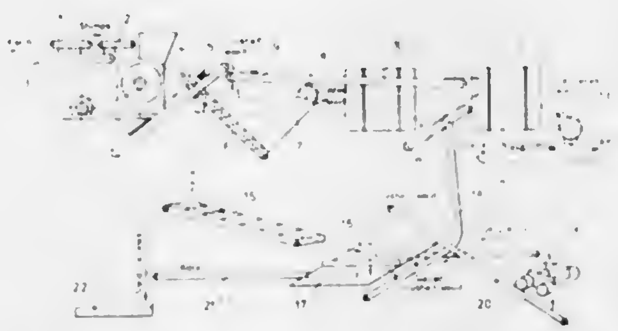
Eino Mäkilä, Pulp; Unto Virtanen, Joutseno, and Kyösti Savinainen, Pulp, all of Finland, assignors to Joutseno-Pulp Osakeyhtio, Pulp, Finland

Filed Dec. 30, 1975, Ser. No. 645,337

Claims priority, application Finland, Jan. 17, 1975, 750112

Int. Cl.² B02C *23/10*

U.S. Cl. 241—20 **9 Claims**



1. A method for the continuous treatment of raw waste wood including stumps and snag to remove sand, stone, earth, other impurities and bark attached thereto and embedded therein and to thereby render said waste wood suitable for the production of pulp, the method comprising

delivering said raw waste wood to a crushing zone;

crushing said raw waste wood to fragment it and to partially loosen the attached and embedded impurities and bark therefrom;

passing the crushed wood fragments, detached impurities and detached bark to a washing zone including a washing tank containing water;

subjecting the material fed into the washing zone to jets of water under high pressure as the material enters the washing tank to further promote the removel of bark and impurities from the crushed wood fragments;

passing said materials fed into the washing zone into the water in said water tank where an accept portion, comprising crushed wood fragments and bark, tends to float to a discharge outlet at the top surface of the water and a reject portion, comprising sand, stone, earth, bark and heavier crushed wood fragments, tends to sink to a discharge outlet at the bottom of said water tank;

subjecting the sinking material in the washing tank to submerged flow jets;

controlling the strength and direction of said submerged flow jets to entrain the heavier crushed wood fragments with the accept crushed wood fragments while permitting the sand and stone impurities and the heaviest crushed wood fragments to sink to the bottom of the washing tank;

discharging said accept portion, including the heavier crushed wood fragments entrained therewith, from the top surface of the water tank and delivering said accept portion to a chipper for further treatment;

passing said reject portion to a separation zone where the sand and stones therein are separated from the heaviest crushed wood fragments and bark therein;

feeding said separated crushed heaviest wood fragments of the reject portion to a coarse sieve which retains the larger heaviest crushed wood fragments of the reject portion; and

passing the retained larger heaviest crushed wood fragments of the reject portion to the chipper where they are reduced to a size suitable for pulp porduction.

4. An apparatus for continuous treatment of waste wood including stumps and snag to remove sand, stone, earth and other impurities and bark attached thereto and embedded therein to thereby render said waste wood suitable for production of pulp, the apparatus comprising

crusher means for fragmenting said raw waste wood and partially loosening the attached and embedded impurities and bark therefrom;

a washer tank for washing the sand, earth and stone impurities and bark from said crushed wood fragments and for separating said materials into accept and reject portions, said washer tank having a body of water therein said having an inlet region for receiving the output from said crusher means, a first outlet region near the surface of said body of water for discharging an accept portion of said crusher output, comprising crushed wood fragements and bark which tend to float near the surface of said body of water, and a second outlet region at the bottom of the water tank for discharging a reject portion of said crusher output, comprising sand, stone, earth, bark and heavier crushed wood fragments which tend to sink towards said second outlet region;

means adjacent said first outlet region for removing said accept portion from said tank;

nozzle means near the inlet region of said washer tank for directing jets of water under high pressure against the crushed wood fragments as they are received by said tank to promote the detachment of impurities and bark attached to or embedded in the incoming crushed wood fragements;

submerged flow nozzle means pivotally mounted in said washer tank for directing water generally upwardly said first outlet region for entraining the heavier crushed wood with the accept portion of the crusher output while permitting the sand and stone impurities and the heaviest crushed wood fragments to sink towards the second outlet region,

means attached to said submerged flow nozzle means for controlling the direction of flow of water from said flow nozzle means;

a sand separator positioned adjacent said second outlet region of said washer tank to receive the reject portion of the washed materials, comprising sand, stones, earth, bark and the heaviest crushed wood fragments, and to remove said sand, earth and stones from said bark and heaviest crushed wood fragments;

a coarse sieve positioned to receive said bark and heaviest crushed wood fragments of the reject portion from said sand separator for retaining the larger heaviest crushed wood fragments; and

means for receiving said larger heaviest crushed wood fragments from said coarse sieve and for chipping the retained larger heaviest crushed wood fragments to reduce them to a size suitable for pulp production.

4,036,441

PROCESS FOR RECOVERING USABLE MATERIALS FROM WASTE MATERIAL CONTAINING METALS AND NON-METALS

Albert T. Basten, Voerendaal, and Hubert H. Dreissen, Geleen, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Mar. 29, 1976, Ser. No. 671,542

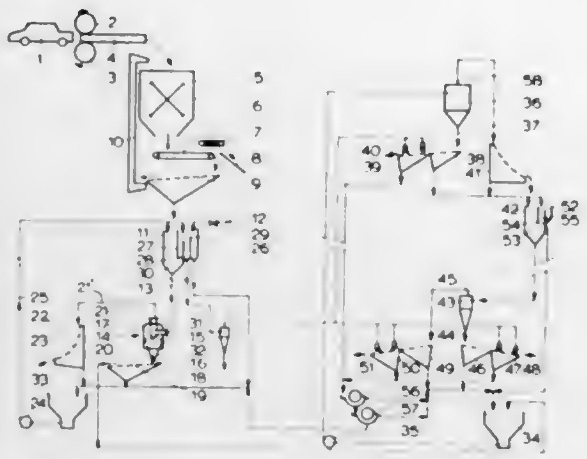
Claims priority, application Netherlands, Mar. 29, 1975, 7503809

Int. Cl.² B02C *23/10*

U.S. Cl. 241—20 **14 Claims**

1. A process for separating scrap comprised of non-ferromagnetic metals into several fractions by specific gravity, which scrap has been recovered from waste products composed of metals and non-metals in a preliminary treatment, said preliminary treatment comprising the steps of grinding said waste and reducing the particle size to a size ranging up to about 50 mm, magnetically separating ferromagnetic components from the ground waste and separating by a primary specific-gravity separation non-metallic components from the non-ferromagnetic metallic portion of the ground waste, the said process comprising the steps of mixing said non-ferromag-

netic metallic portion with a heavy, preferably aqueous suspension medium having a specific gravity of at least 2.2, feeding said mixture to a secondary specific-gravity separator comprising a hydrocyclone having a top angle of the cone-shaped part ranging between 45° to 90°, separating the non-ferromagnetic portion into first and second portions, discharging the first portion comprised of the suspension and a specifically heavy fraction from the tip of the secondary hydrocyclone, said heavy fraction comprised of metals having a specific gravity of more than 3.0, discharging the second portion comprised of the suspension and a specifically lighter fraction from the overflow of the hydrocyclone, said lighter fraction comprised of metals having a specific gravity of less than 3.0, and draining the suspension away from the heavy and lighter fractions.



4,036,442

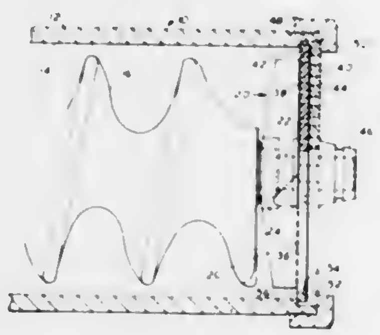
LOW FRICTION MEAT EXTRUDER AND CUTTER MEANS THEREFOR

J. Haywood Barnes, Wadsworth, Ohio, assignor to Edwin W. Oldham and Vern L. Oldham, Akron, Ohio, part interest to each

Filed Nov. 26, 1975, Ser. No. 635,403

Int. Cl.² B02C *18/36*

U.S. Cl. 241—82.5 **9 Claims**



1. In a meat cutting and/or extrusion device including a frame having a tubular portion in which a screw extruding means is positioned for forcing meat along the axis of such frame portion, the combination of an operative apertured discharge means carried by said frame at an end thereof and positioned normal to said axis, a rotatable cutter means secured to and rotating with said extruding means immediately adjacent said discharge means for cutting the meat into pieces, said discharge means comprising an apertured metal reenforcing disc and an apertured low friction plastic cutter disc positioned adjacent said cutter means and being parallel to said metal disc, the apertures in said metal and plastic discs being aligned, and means securing said discharge means to said frame.

4,036,443

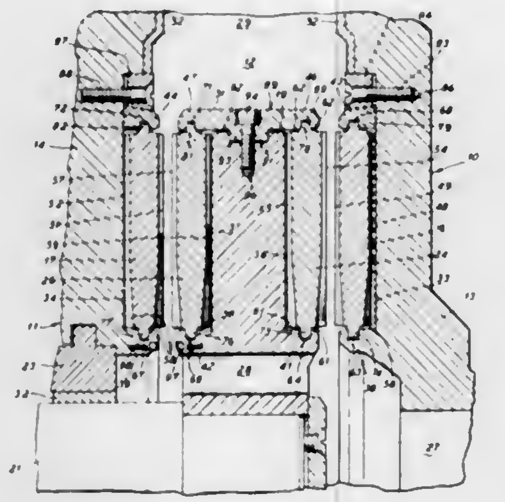
REFINER HEAD ASSEMBLY AND REFINING DISK THEREFOR

Martin O. Saltarelli, Lenox, Mass., assignor to Beloit Corporation, Beloit, Wis.

Continuation of Ser. No. 511,936, Oct. 3, 1974, abandoned. This application Nov. 24, 1975, Ser. No. 634,612

Int. Cl.² B02C *7/12*

U.S. Cl. 241—297 **8 Claims**



1. A refiner head assembly for use in a refiner apparatus, said assembly comprising

a. a backing head means having an axis, said head means having a circumferentially extending, radially spaced inner flange means upstanding from one face thereof and further having a circumferentially extending, axially spaced outer flange means upstanding from said one face thereof, said flange means being in radially spaced relationship,

b. each of said inner and outer flange means further having a circumferentially extending sidewardly opening groove defined therein, said respective grooves being in generally opposed relationship to each other,

c. refining disk means adapted to be positioned adjacent said one face between said inner and said outer flange means having an axially located aperture defined therein, said refining disk means having an inner radially inwardly projecting, circumferentially extending tongue means defined in radially inner edge portions of said refining disk means, and further having an outer radially outwardly projecting, circumferentially extending tongue means defined in radially outer edge portions of said refining disk means,

d. said inner and outer tongue being adapted to seat in said inner and outer groove means, respectively, when said backing head means and said refining disk means are in assembled engagement with one another,

e. said refining disk means defining spaced, opposed side face portions thereon, said face portions adapted for working a pulp composition when said refiner head assembly is operatively connected with a disk refiner apparatus,

f. the interrelationship between said backing head means, said refining disk means, said flange means, said groove means, and said tongue means being such that said refining disk is operatively joinable to said backing head with either one of said opposed side faces thereof being in adjacent relationship to said one face and yet maintain a desired configuration between exposed side face and said backing head means.

4,036,444

APPARATUS FOR PNEUMATICALLY SEPARATING A FOOT LAP FROM A SPINNING COP

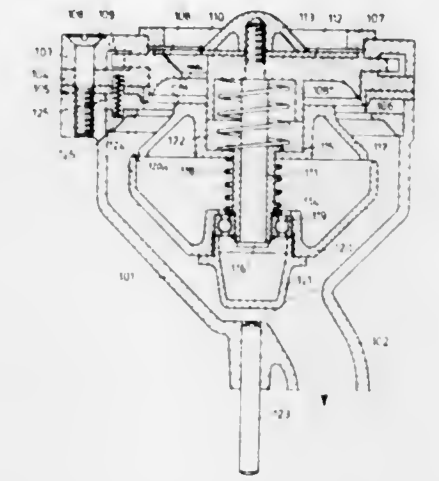
Xaver Suter, Thalwil, Switzerland, assignor to Maschinenfabrik Schweiter AG, Horgen, Switzerland

Filed June 21, 1976, Ser. No. 697,943

Claims priority, application Switzerland, July 3, 1975, 8685/75

Int. Cl.² B65H *67/08, 54/22*

U.S. Cl. 242—35.6 E **10 Claims**



1. Apparatus for pneumatically separating a foot lap from spinning cops (14') for use in automatic winding machines, comprising

a housing (**101, 103, 104**) having a longitudinal axis and formed with a suction connection (**102**) to which pneumatic suction is applied;

a suction nozzle terminating the suction connection in the housing including

a rotating centering cone (**113**) and a cone support element (**108**) having an upper surface (**112**) facing the spinning cop (**14'**) and being formed with a nozzle opening (**110**) communicating with the suction connection (**102**);

means forming a first clamping position (**250**) for thread (**200**) sucked from the spinning cop (**14'**) located beneath the upper surface (**112**) including

means forming a first clamping surface (**108*a***) located beneath the upper surface (**112**) and rotatable therewith;

a rotatable first clamping element (**117**) having a second clamping surface (**117*a***) cooperating with the first clamping surface (**108*a***);

means (**123, 119, 118**) effecting relative axial movement of said first clamping position forming means and said first clamping element (**117**) to engage said first and second clamping surfaces (**108*a*. 117*a***) upon such axial movement and pinch a sucked-off thread (**200**) therebetween;

means forming a second clamping position (**251**) for thread (**200**) sucked from the spinning copy (**14'**) located axially beneath said first clamping position (**250**) and having means (**125**) forming a third clamping surface;

a second clamping element (**120**) having a fourth clamping surface (**120*a***) cooperating with the third clamping surface;

operating means (**123, 121**) effecting relative axial movement of said third clamping surface forming means (**125**) and said second clamping element (**120**) to engage said third and fourth clamping surface and pinch a sucked-off thread (**200**) therebetween;

said operating means (**123, 121**) being operable sequentially with respect to said means forming the second clamping position to stretch a sucked-off thread essentially taut between said first and second clamping positions (**250, 251**);

and cutter means (**106**) located in interfering position with respect to an imaginary straight surface between said clamping positions to sever a thread (**200**) clamped between said clamping positions (**250, 251**).

4,036,445

CIRCUIT ARRANGEMENT FOR MONITORING THE OPERATION OF AN ELECTRONIC YARN CLEARER

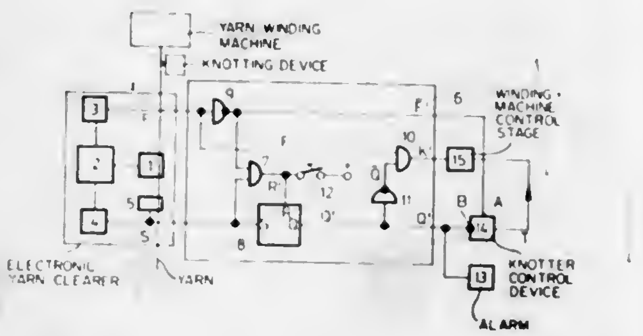
Hansruedi Stutz, Dietlikon, and Hans Späni, Zurich, both of Switzerland, assignors to Aktiengesellschaft Gebruder Loepfe, Wetzikon, Switzerland

Filed Apr. 21, 1975, Ser. No. 569,786

Claims priority, application Switzerland, May 15, 1974, 6637/74

Int. Cl.² B65H *63/02;* **D01H** *13/22;* **D02J** *1/14;* **G01L** *5/04*

U.S. Cl. 242—37 A **6 Claims**



1. An electronic yarn clearer mounted on an automatic yarn winding machine provided with an automatic yarn knotting device, said electronic yarn clearer comprising yarn transverse dimension sensing means, an electronic circuit serially connected to said sensing means and having a first output stage means for generating cutting pulses indicative of incorrect yarn transverse dimension, and a second output stage means for generating continuous signals indicative of yarn travel, or signals indicative of failure of yarn travel or yarn, said failure signal serving for inhibiting the winding operation and actuating the yarn knotting device, and further comprising a circuit arrangement for detecting incorrect operation of the electronic yarn clearer, said circuit arrangement having a first input operatively connected to said first output stage means and a second input operatively connected to said second output stage means, and comprising logic means for combining said cutting pulses and continuous signals into at least one logic output signal indicative of continued yarn travel during a predetermined time interval commencing with said cutting pulse.

4,036,446

METHOD AND APPARATUS FOR BRAKING A BOBBIN CHUCK AND FOR RELEASING A BOBBIN TUBE THEREON

Hugo Schär, Dattlikon, Switzerland, assignor to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Sept. 26, 1975, Ser. No. 617,235

Claims priority, application Switzerland, Oct. 9, 1974, 13554/74

Int. Cl.² B65H *63/08*

U.S. Cl. 242—39 **12 Claims**

1. In combination

a machine frame;

a stop mounted on said frame;

a friction drive drum;

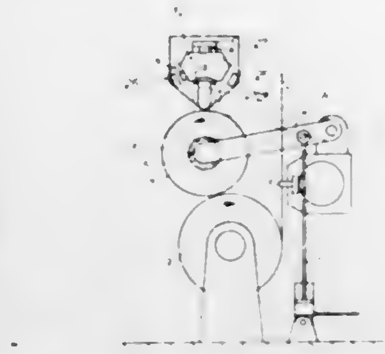
a rotatable bobbin chuck pivotally mounted on said machine frame for movement towards and away from said drum, said chuck including a releaseable bobbin tube holding device;

a brake shoe including a bore therein;

means for moving said chuck towards said brake shoe;

means pivotally mounting said brake shoe about a fixed axis on said machine frame;

means in said bore for guiding said brake shoe radially of said axis and to define a pressure chamber;
pneumatic means for supplying pressurized gas to said chamber of said brake shoe;
a connection between said pressure chamber and said bobbin tube holding device for supplying pressurized gas to said holding device to release a bobbin tube thereon; and



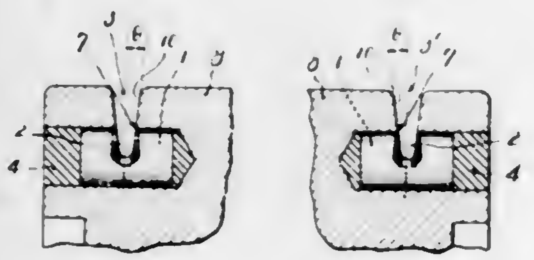
a push-off piston mounted in said brake shoe and disposed in a direction tangential of brake shoe rotation about said fixed axis facing said stop, said piston being slidably disposed in a cylinder in communication with said chamber to selectively close said connection during a winding operation to prevent release of said bobbin tube holding device and open said connection upon stoppage of said bobbin chuck to release said holding device.

4,036,447

GROOVED TRAVERSE DRUM FOR WINDER

Masao Mino, Yao, Japan, assignor to Kabushiki Kaisha Mino Seisakusho, Osaka, Japan

Filed Oct. 30, 1975, Ser. No. 627,355
Claims priority, application Japan, Nov. 7, 1974, 49-135105
Int. Cl.² B65H *54/28, 54/48*
U.S. Cl. 242—43.2 **3 Claims**



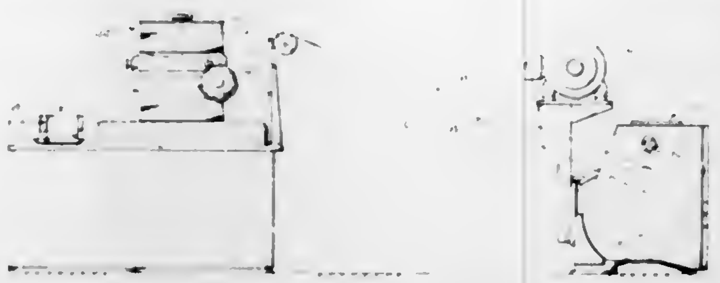
1. In a grooved traverse drum construction having a cylindrical drum body and a spiral yarn guide groove formed in the peripheral surface of the cylindrical drum body, said yarn guide groove having a traverse end at each end of the drum body, with each traverse end having opposed spaced lateral side walls therein, the improvement of an aperture extending into each end of the drum body and intersecting the bottom of the opposed lateral side walls of each traverse end of the yarn guide groove, a wear-resistant element positioned in each axially extending aperture and extending inwardly beyong the traverse end of the yarn guiding groove, each of said wear-resistant elements comprising a body portion and a recess having opposite spaced side walls centrally positioned in said body portion, with the opposite spaced side walls of the recess portion being flush with the opposed spaced lateral side walls of each traverse end of the yarn guide groove and constituting a lower extension thereof whereby said recess portion constitutes the bottom of each of the traverse ends of the yarn guide groove.

4,036,448

APPARATUS FOR FORMING SPOOLED AND SPOOL-LESS BUNDLES OF WIRE AND THE LIKE

Charles Henry Carey, and Donald Richard Haury, both of Cuyahoga Falls, Ohio, assignors to Wean United, Inc., Pittsburgh, Pa.

Filed Oct. 14, 1975, Ser. No. 621,708
Int. Cl.² B21C *47/00*
U.S. Cl. 242—81 **5 Claims**



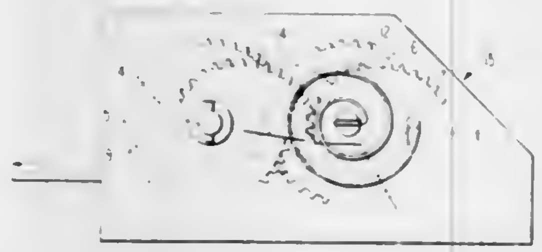
1. An apparatus for selectively forming spool-less and spooled bundles of elongated material, such as, wire, comprising:
a draw block means for forming interconnecting convolutions of said material,
means for rotating said block means so that the convolutions are formed under tension,
material collecting means selectively employed for receiving material from said draw block means to form spool-less bundles of said material,
said block means including means for supporting said collecting means for rotation with said drawing block means,
material accumulating means selectively employed in place of said collecting means for receiving material from said draw block means to form spooled bundles of said material,
said accumulating means including supportable by said draw block means,
said accumulating means also including means for selectively allowing the accumulating means to rotate with said draw block means for allowing relative rotation therebetween, and
spooling means for receiving said material from said accumulating means for forming said material into a spooled bundle.

4,036,449

BELT ROLL-UP MECHANISM FOR A SAFETY BELT IN A VEHICLE

Winfried Schreiber, Sindelfingen, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Sept. 5, 1975, Ser. No. 610,787
Claims priority, application Germany, Sept. 6, 1974, 2442745
Int. Cl.² B65H *75/48*
U.S. Cl. 242—107 **12 Claims**



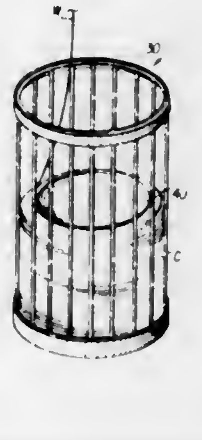
1. A belt roll-up mechanism for a safety belt means in a vehicle, comprising a pull-back means effective at least during the driving operation for acting upon the safety belt means and shifting means for controlling the value of the pull-out force developed by the pull-back means, said shifting means including two axially parallel disposed cam wheels in slip-free engagement with each other, each cam wheel hving an effective lever arm, said shifting means varying the effective lever arms of said cam wheels over the entire pulled-out range of the safety belt means for controlling the pull-out force.

4,036,450

METHOD AND APPARATUS FOR PAYING OUT WIRE

James O. Lowery, Ranburne, Ala.; Jimmy D. Blackmon, Carrollton, Ga.; W. Carl Jones, Carrollton, Ga., and Lee K. Brewton, Carrollton, Ga., assignors to Southwire Company, Carrollton, Ga.

Filed Dec. 23, 1975, Ser. No. 643,917
Int. Cl.² B65H *49/00*
U.S. Cl. 242—129 **4 Claims**



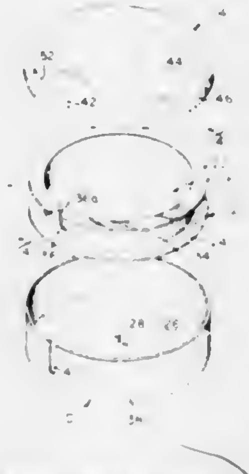
1. Apparatus for paying-out wire from a horizontally disposed coil of wire of given diameter comprising a stemless wire pack container for holding the coil of wire, means for withdrawing wire overhead from said stemless container, said withdrawing means including guide means disposed a substantial distance above said container at a point disposed on the vertical axis of said coil for substantially reducing the magnitude of the inward component of force acting along the wire as it is withdrawn from said container, said distance being such that the ratio of the distance to the diameter of the coil is at least 5:1, said withdrawing means including a rotatable sheave having a groove formed in the periphery thereof, first means for guiding the wire onto the sheave and second means for guiding the wire off the sheave, said first and second guiding means being arranged with respect to said sheave to assure that the wire contacts said sheave over approximately 270° of the periphery thereof.

4,036,451

HOOK AND LEADER STORAGE DEVICE

Denzil B. Pipkin, 20626 Cypress, Alderwood Manor, Wash. 98036

Filed July 30, 1976, Ser. No. 710,253
Int. Cl.² B65H *45/18;* B65D *85/66*
U.S. Cl. 242—137.1 **11 Claims**



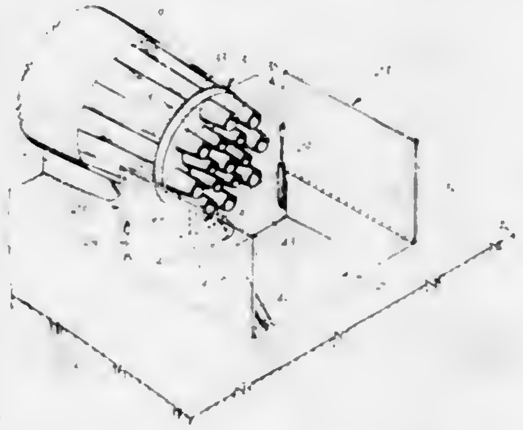
1. A hook and leader storage device comprising:
a container,
a reel journaled in the container and having a hook storage zone, said reel having a leader storage zone therearound within said container,
hook anchoring means in the hook storage zone,
inner port means in the reel for the passage of leaders from hooks anchored in the hook storage zone to the leader storage zone,
outer port means in the container arranged to be placed in registration with said first port means responsive to turning of the reel, whereby a leader tied to a hook placed in anchored position in the hook storage zone can be passed radially outward through said inner and outer port means with its free end outside of the container and then can be wound on the reel to occupy the leader storage zone by turning the reel in the container.

4,036,452

RETRACTABLE ENGINE NOISE SUPPRESSION SYSTEM FOR OVER-THE-WING JET AIRCRAFT

George S. Schairer, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Continuation of Ser. No. 544,238, Jan. 27, 1975, abandoned. This application May 6, 1976, Ser. No. 683,771
Int. Cl.² B64D *33/06*
U.S. Cl. 244—1 N **7 Claims**



1. In a jet aircraft including wings and jet engines mounted such that the exhausts of said jet engines pass chordwise over said wings and create noise sources having centers located beyond the trailing edge of said wings, the improvement comprising a plurality of multiple aperture arrays, one of said multiple aperture arrays being associated with each of said jet engines of said aircraft, each of said multiple aperture arrays being movable between a stowed position whereat said multiple aperture array lies outside of the exhaust path of the jet engine with which said array is associated and an operative position whereat said multiple aperture array lies in the exhaust path of the jet engine with which said array is associated, each of said multiple aperture arrays including a plurality of apertures spaced from one another and positioned so as to split the exhaust of the jet engine with which said array is associated into separate streams when said array is in its operative position, said spacing being such that ambient air is entrained by said separate streams and mixes with the separate exhaust streams of said jet engines, said entraining and mixing of said ambient air with said exhaust streams causing the centers of said noise sources to be moved from said locations beyond the trailing edge of said wings to said locations above the wings of said aircraft.

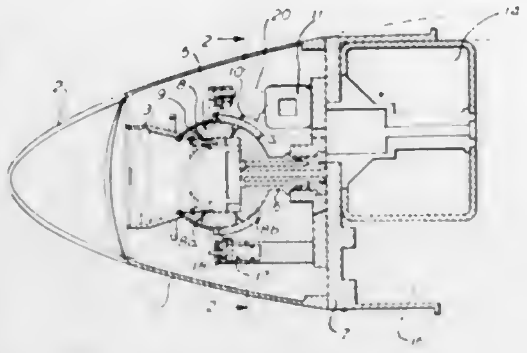
4,036,453
WIDE ANGLE TORQUING SCHEME

John Lorenz Evans, Oakland, and Bart Joseph Zoltan, Old Tappan, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Jan. 7, 1976, Ser. No. 647,224

Int. Cl.² F41G *7/00;* **G01C** *19/28, 19/12, 19/24*

U.S. Cl. 244—3.16 **6 Claims**



1. In an optical gyroscope device having a spherically shaped rotor mounted on gas bearings, a torquer system comprising:

- a plurality of torquer pole pieces positioned around the lower rotor hemisphere of said gyroscope,
- a bias coil, said bias coil establishing a flux field about said pole pieces when an excitation current is permitted to flow therethrough,
- a control coil, said control coil, establishing a flux field about said pole pieces caused by a current commanding movement of the rotor of said gyroscope, and
- magnetically permeable means affixed to said lower rotor hemisphere facing said poles pieces and separated by a narrow gap from said pole pieces for closing the magnetic circuit between the pole faces of said pole pieces.

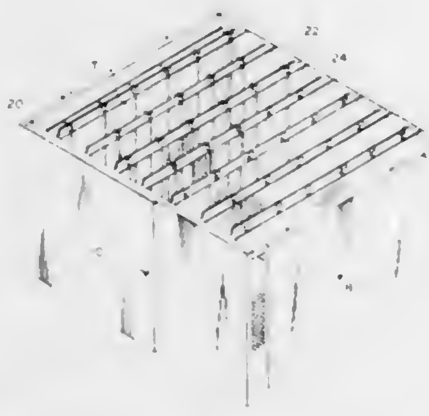
4,036,454
BULK TOBACCO CONTAINER

Bertram L. Jordan; John D. Mitchell, and J. C. Sessoms, Jr., all of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed July 13, 1976, Ser. No. 704,869

Int. Cl.² A24B *1/08*

U.S. Cl. 294—5.5 **2 Claims**



1. A bulk container for tobacco leaves comprising in combination:

- a. a six-sided container having at least one side completely open so as to receive a mass of tobacco leaves,
- b. a tine frame which is adapted to fit over and engage the open side of said container,
- c. a plurality of tines that are adapted to pass through openings in the tine frame and penetrate downwardly into the mass of tobacco within said container, each of said tines consisting of an elongated rod which is pointed at its lower end and bent over at an essentially right angle at its other end,

said tine frame comprising

1. a pair of elongated parallel side members that are spaced apart a distance corresponding to the distance between two opposite side members of said six-sided container,
2. a plurality of parallel tine support members extending between said parallel side members and at right angles thereto, each tine support member being composed of two elongated sections of metal that are joined together at right angles, one of said sections having a plurality of holes therein which the pointed ends of said tines are adapted to be inserted and the other of said sections having slots therein which are adapted to accomodate the bent over portions of said tines.

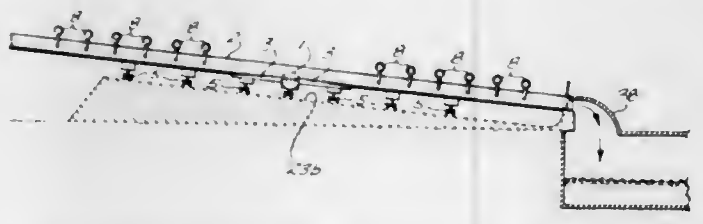
4,036,455
AIR-CARGO LINER

Philip C. Whitener, Seattle, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Dec. 23, 1974, Ser. No. 535,413

Int. Cl.² B64D *9/00*

U.S. Cl. 244—118 R **18 Claims**



1. The method of handling cargo for an air-cargo liner having a landing gear which comprises tilting the air-cargo liner laterally while supported by its landing gear and thereby tilting the wing of the air-cargo liner into a spanwise inclined position with its lower tip spaced from the ground, and moving cargo through the lower tip of the spanwise inclined wing into a cargo hold in the wing.

7. An air-cargo liner comprising a wing including a covering and several elongated, substantially straight, spar and cargo hold tubes of constant and uniform cross section throughout their lengths having their lengths extending spanwise of said wing unbrokenly from wing tip to wing tip and forming structural wing spars integrated with said wing covering, said tubes having openings in corresponding outboard ends through a tip of said wing for loading cargo into the interior of said tubes.

4,036,456
ROCKET CATAPULT WITH DIRECT MECHANICALLY ACTUATED IGNITION OF ROCKET MOTOR

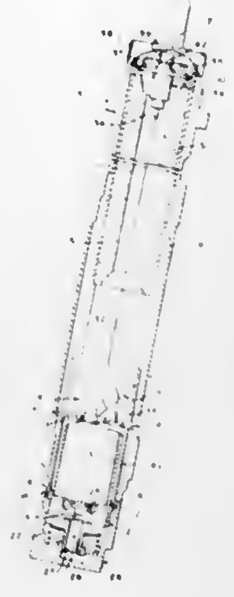
Everett B. Skinner, Gilbert, and James O. Lair, Tempe, both of Ariz., assignors to Talley Industries of Arizona, Inc., Mesa, Ariz.

Filed Mar. 5, 1975, Ser. No. 555,444

Int. Cl.² B64D *25/10*

U.S. Cl. 244—122 AD **9 Claims**

1. In a rocket catapult having a catapult tube and a rocket motor tube capable of telescoping apart upon actuation to eject a mass from a vehicle, the rocket motor tube having an exhaust nozzle at its lower end and containing a solid fuel propellant charge, the improvement for causing ignition of such propellent charge comprising: a mechanically actuable igniter in the rocket motor tube disposed to ignite such propellant; and mechanical actuating means connected said igniter and an anchoring portion of the rocket catapult which is maintained within the catapult tube throughout operation of the rocket catapult, for directly mechanically actuating said igniter when the rocket motor tube has traveled a predetermined distance with respect to the catapult tube.



4,036,457
AIRCRAFT DE-ICING

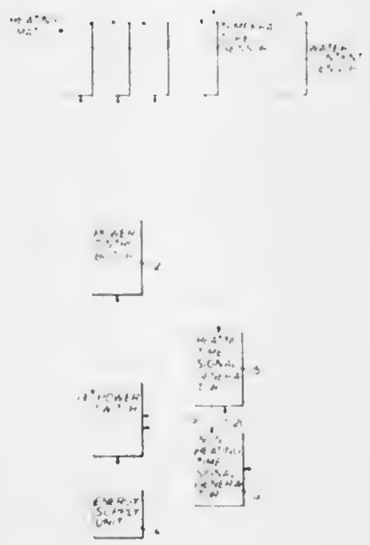
Wolfgang Volkner, Rellingen, and Hellmuth Schmedemann, Tornesch, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Sept. 8, 1975, Ser. No. 611,270

Claims priority, application Germany, Sept. 10, 1974, 2443224

Int. Cl.² B64D *15/14*

U.S. Cl. 244—134 D **4 Claims**



1. In a method for de-icing aircraft surfaces by means of a plurality of electrical resistance heaters which are sequentially supplied with heating current, the delivery of current to each heater being effectuated during a succession of cycles each constituted by a heating period during which heating current is supplied to the heater and a nonheating period during which no current is supplied to the heater, thereby controlling the average current supplied to the heater, the improvement comprising controlling the duration of each period of a cycle by the steps of: measuring the temperature at the resistance heaters; measuring the water vapor content of the atmosphere surrounding the aircraft; adjusting the length of the heating period of each heater during each cycle as a function of the measured temperature at the resistance heaters, and adjusting the length of the nonheating period for each heater during each cycle as a function of the measured water vapor content.

4,036,458
DEVICE FOR THE BIDIRECTIONAL MOVEMENT OF AN INFORMATION SUPPORT

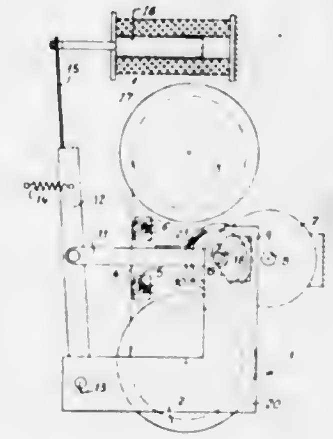
Henri Matthey, La Chaux de Fonds, and Georges Delessert, Vesenaz, both of Switzerland, assignors to Telectronics SA, Geneva, Switzerland

Filed Aug. 20, 1974, Ser. No. 498,968

Claims priority, application Switzerland, Sept. 18, 1973, 13384/73

Int. Cl.² G03B *1/04;* **G11B** *15/32*

U.S. Cl. 242—201 **10 Claims**



1. A device for the bidirectional feeding of an information support having first and second spools about which the support is wound, a reversible motor with a driving shaft, an idle roller, means mounting said idle roller for movement between three positions, said idle roller contacting said driving shaft and said first spool in one of said positions, said idle roller contacting said driving shaft and said second spool in a second of said positions, and said idle roller being out of contact with said driving shaft in the third of said positions, and means for moving said idle roller selectively to any of said three positions.

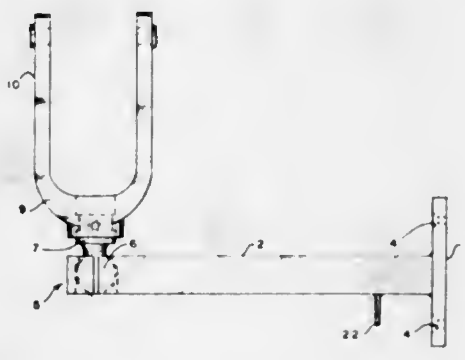
4,036,459
INSTRUMENT SWIVEL BRACKET

Merwin K. Alexander, Clayton; Daniel J. Meyer, Ballwin, and Philip Cohen, Clayton, all of Mo., assignors to Optical Associates, Inc., St. Louis, Mo.

Filed Feb. 27, 1976, Ser. No. 661,977

Int. Cl.² F16M *1/00*

U.S. Cl. 248—11 **6 Claims**



1. A swivel bracket for mounting a projector or other instrument away from a supporting surface, and including an extension having the length to dispose the bracket a distance away from a surface, said extension having one end capable of fastening to a supporting surface, fastening means provided for mounting the extension and its held bracket to a supporting surface, said bracket including a swivel yoke for mounting of an instrument, said yoke incorporating a ball proximate its bottom end, said extension having means provided proximate one end to acccommodate the said ball for swivel movement, said means comprising a separable swivel socket, said swivel socket being separable into approximate halves, fastening means securing said halves together, an integral annulus provided proximate the upper portion of said socket for seating said ball from above, approximately one half of said annulus being formed on each of said half sockets, a projection extending from the lower portion of said socket, for locating said ball from below, and said projection extending from one of said half sockets.

4,036,460

DEVICE FOR DEPENDENTLY SUPPORTING AN OBJECT

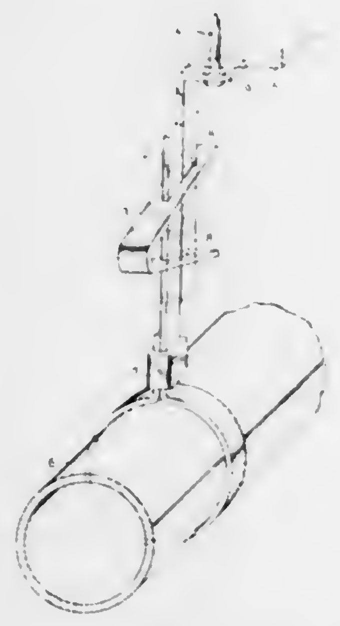
Friedrich Storck, Rodenberg; Rudolf Kunesch, and Gernot Missbach, both of Munich, all of Germany, assignors to Hilti Aktiengesellschaft, Schaan, Liechtenstein

Filed Aug. 28, 1975, Ser. No. 608,687

Claims priority, application Germany, Sept. 2, 1974, 7429525[U]

Int. Cl.² E21F *17/02*

U.S. Cl. 248—59 **8 Claims**



1. A support device for dependently supporting an object comprising a first elongated support element, a second elongated support element, and a clamp strap disposed in locking engagement with said first and second support elements, said clamp strap having a first leg and a second leg, each of said first leg and second leg having at least one slot therein, said first and second support elements having an overlapping portion extending in the elongated direction of said first and second support elements and disposed in contiguous relation with the overlapping portion of the other of said first and second support elements, each of the overlapping portions of said first and second support elements extending through one of said slots in each of said first and second legs of said clamp strap and being held in locking engagement with the other said support element within the slots by said clamp strap, each of said legs of said clamp strap being elongated and said at least one slot in each said leg extending in the elongated direction of the leg, wherein the improvement comprises that at least one of said first and second support elements is band-shaped and flat and has a rectangularly shaped transverse cross section, at least a portion of said slots in each said leg of said clamp strap in which said band-shaped support element is positioned has the same rectangularly shaped transverse cross section as said band-shaped support element for receiving said band-shaped support element in form-fitted engagement and the rectangularly shaped transverse cross section of said band-shaped support element having a longer dimension and a short dimension with the longer dimension extending in the elongated direction of the leg of said clamp strap and being greater than the shorter dimension of said band-shaped element extending transversely so that said band-shaped element is rigid in the direction of the longer dimension of the transverse cross section thereof.

4,036,461

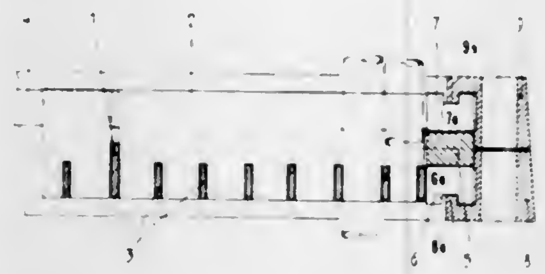
SUPPORTING GRID FOR PIPES

Vincenzo Soligno, Milan, Italy, assignor to Breda Termomeccanica S.P.A., Milan, Italy

Continuation of Ser. No. 456,223, March 19, 1974, abandoned. This application Oct. 21, 1975, Ser. No. 624,475

Int. Cl.² F28F *9/00*

U.S. Cl. 248—68 R **2 Claims**



1. A supporting grid for pipes comprising:

a. an upper and lower set of intersecting strips having interengaging milled slots at the intersecting points, and

b. an external annular frame, said frame being formed of a lower and an upper part of substantially identical configuration, an upper and lower set of block-like spacers positioned between the ends of adjacent strips to substantially fill the peripheral space therebetween, said spacers having opposed, generally radially extending surfaces in surface-to-surface contact with substantial surface areas of the ends of adjacent strips, said strips and said frame being of different materials, said strips being provided at their ends with upper and lower grooves facing axially outwardly and spaced inwardly from the ends thereof, said spacers being provided with upper and lower grooves aligned with the grooves in the strips, said frame having an upper and lower annular flange overlying the surface of the strips and spacers radially outwardly of the grooves and terminating in an annular dog extending axially into said grooves in the strips and spacers, said grooves having a width greater than the dogs thereby providing play between the dogs and grooves to enable differential thermic expansion of the strips and frame, the axially inner surfaces of the spacers and the ends of the strips being aligned and defining axially spaced and substantially continuous annular surfaces, an independent annular ring extending peripherally between the outer ends of the strips and between the upper and lower spacers in engagement with said annular surfaces, and means securing the upper and lower parts of the frame together to enable assembly without deformation and to rigidly secure the grid in assembled condition.

4,036,462

MUSICAL INSTRUMENT SUPPORTING APPARATUS

Edward A. Sheftel, 1456 Colby, Apt. 4, Los Angeles, Calif. 90053

Filed June 22, 1972, Ser. No. 265,157

Int. Cl.² G10G *5/00*

U.S. Cl. 248—166 **1 Claim**

1. A musical instrument supporting apparatus comprising:

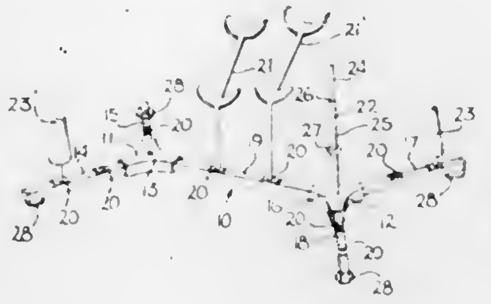
a. a pair of base members each having:

i. a central hub;

ii. a pair of legs pivotally coupled to said central hub and adapted to be pivotally rotated about a pivoting end thereof and being in a planar relationship with respect to each other when pivoted to their extended position;

iii. an extender pivotally coupled to said central hub and adapted to be pivoted about a pivoting end thereof and being in a planar relationship with respect to said legs when pivoted to its extended position;

b. a spreader bar adapted to be removably coupled to said extenders, the ends of said spreader bar each being slidably mounted about one of said extenders when said extenders are in the extended position;



c. musical instrument supporting means for securelysupporting musical instruments, said musical instrument supporting means comprising an instrument support having first and second cylindrical members in axial abuttment with one another, said first cylindrical member having a smaller diameter than said second cylindrical member, and a base member in axial abuttment to said second cylindrical member and disposed on the opposite end thereof from said first cylindrical member; and

d. supporting means disposed within said central hub, legs and spreader bar, each of said supporting means having portions in cooperative relationship with said mounting members.

4,036,463

PAINT CAN AND BRUSH RECEPTACLE

Jeffrey E. Hopkins, Danville, Va., and Bobby B. Bennett, Reidsville, N.C., assignors to Jeffrey E. Hopkins, Danville, Va.

Filed June 4, 1976, Ser. No. 692,648

Int. Cl.² B44D *3/12;* **E06C** *7/14*

U.S. Cl. 248—210 **5 Claims**

1. Device for releasably suspending a paint can and brush from the side rail of a ladder within easy access of a painter thereon and for self-leveling the paint can comprising:

a. a receptacle including a paint can housing and a brush well;

b. a ladder clamping bracket with clamping means for releasably mounting said ladder clamping bracket to said side rail;

c. a receptacle support bracket attached to said ladder support bracket for free pivotal movement about a horizontal axis to form a self-leveling support, and including a hook-like hanger means for releasably suspending said receptacle therefrom;

d. said receptacle comprising:

i. a cylindrical can receiving housing having an open top and of such dimension as to receive a one-gallon paint can;

ii. a brush well including a generally rectangular housing having side walls and an open top of such relative size as to support brushes upright therein when not in use, and protruding from one side of the upper end of said can receiving housing; and

iii. said brush well housing being of such size and shape as to be suspended without fasteners from said hanger means with said brush well being positioned between said can receiving housing and said ladder side rail.

4,036,464

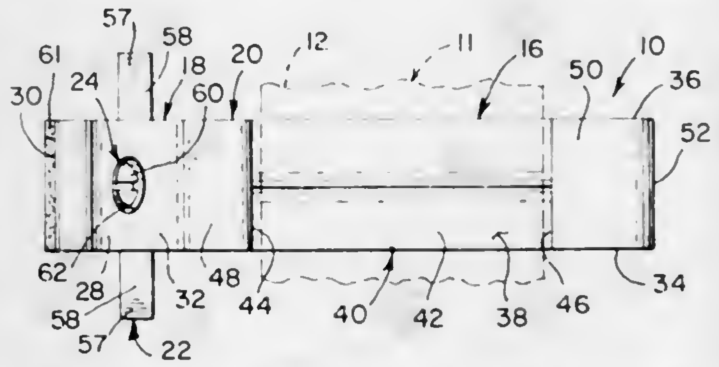
HEADSET HANGER

Steven W. Olson, 8011 N. New Braunfels, No. 117, San Antonio, Tex. 78209

Filed May 19, 1976, Ser. No. 688,034

Int. Cl.² A47F *5/08*

U.S. Cl. 248—309 R **5 Claims**



1. A hanger adapted to be mounted on a wall or other surface for supporting a headset having a headband and a headphone coupled thereto with a cord surface to the headset comprising:

A. abutting means having a contacting surface for extending along a side of a wall or other surface;

B. support means for receiving the headband portion of the headset thereon and extending outwardly from said abutting means and having a pair of oppositely disposed side surfaces;

C. said support means has a concave curved support surface to approximately conform to the angle of curvature of the headband positioned thereon;

D. spaced apart retaining means extending upwardly from said support means for receiving the headband portion therebetween so as to contain said headband on said support means;

E. said spaced apart retaining means forms a receiving slot having a width slightly greater than the dimension of the headband therebetween, such that lateral movement of the headband on the holder is restricted;

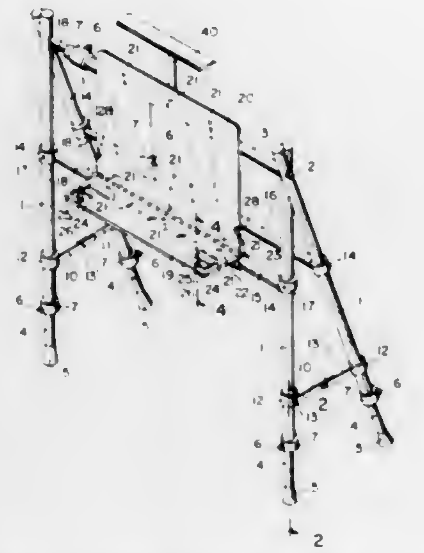
F. downwardly extending hook means for retaining the cord of the headset in place during storage, said hook means integrally formed with said abutting means;

G. said downwardly extending hook means includes a pair of spaced apart depending lugs terminating beyond said oppositely disposed side surfaces, each of said lugs having a downwardly extending inclined surface converging towards each other and forming an open top trough for the cord, such that to release the cord from its seated position, an upward movement is required to lift the cord above the open top of the trough, said lugs being in alignment with each other with said inclined surfaces substantially disposed in a plane normal to said contacting surface, and

H. coupling means in operative relation with said abutting means for securing the holder in fixed position, such that said contacting surface of said abutting means engages the wall or other surface.

4,036,465
ADJUSTABLE STAND

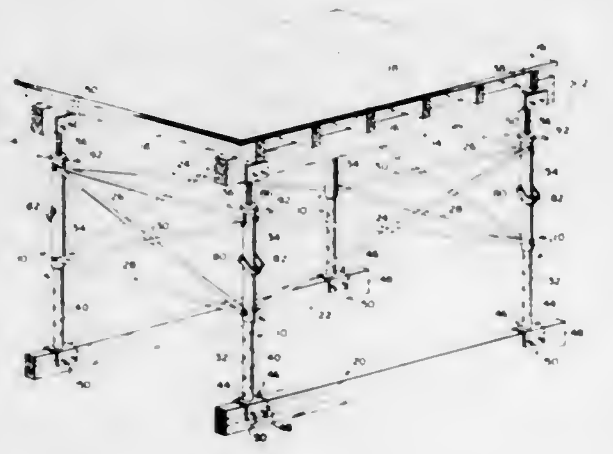
Sam J. Kellner, 315 E. 69th St., New York, N.Y. 10021
Filed Feb. 9, 1976, Ser. No. 656,174
Int. Cl.^{2} A47B *97/04*
U.S. Cl. 248—463 **6 Claims**



1. An adjustable, portable stand including a first and a second pair of legs each comprising a jacket and a runner telescoping from within said jacket, each pair of leg jackets being fastened together at one end to permit angular motion therebetween and having means for stably effecting an angular separation therebetween; means for fixedly adjusting the telescoped length of each runner; a pair of cross bracing members each comprising a jacket and runner telescoping from within said jacket and disposed between said first and second pair of legs having a means for fixedly adjusting the length of each cross member; and a table having back plate fixed to said cross member jackets and a bottom plate joined to said back plate by a hinge permitting fixed angular movement therebetween.

4,036,466
FLYING DECK-TYPE CONCRETE FORM INSTALLATION

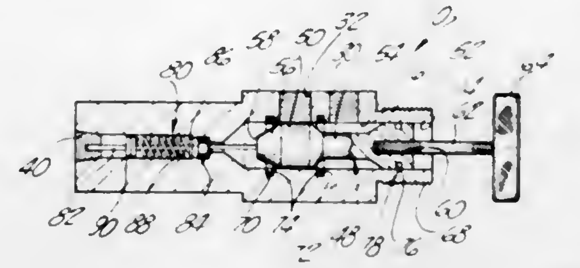
Richard A. Van Meter, Rolling Meadows, Ill., assignor to Symons Corporation, Des Plaines, Ill.
Continuation-in-part of Ser. No. 426,965, Dec. 20, 1973, abandoned. This application Apr. 16, 1975, Ser. No. 568,607
Int. Cl.^{2} E04G *11/38, 11/56*
U.S. Cl. 249—18 **2 Claims**



1. A unitary concrete form installation of the flying deck type, preadjustable to selected lengthwise and transverse dimensions and adapted to produce a horizontal building floor slab, said installation comprising, in combination a deck formwork adapted for forming a concrete slab thereon and including a pair of horizontally disposed front and rear longitudinally extending deck-supporting stringers spaced apart a selected distance, and scaffolding operatively supporting said stringers and consequently the formwork, said scaffolding comprising front and rear longituidnally extending base supporting sills of selected length disposed beneath said stringers respectively a pair of longitudinally spaced vertically disposed supporting posts extending between each of said sills and its associated stringer thereabove, said posts being disposed in quadrilateral relationship whereby each post on the front sill is traversely aligned with a corresponding post on the rear sill, each of said posts being of telescopic construction and including an inner lower tubular staff, an inner upper elevation screw, and an outer intermediate sleeve within which said staff and elevation screw are telescopically slidable, an inverted U-shaped saddle member supported on the upper surface of the sill beneath each post and having side flanges which straddle the sill and have performed nail holes therethrough, nails projecting through said nail holes and into the associated sill and serving fixedly to secure each saddle member in position on the associated sill, a pilot post projecting upwardly from each said saddle member, the lower end of each staff being telescopically received over the associated pilot post, a removable fastening pin projecting transversely through each pilot post and the associated staff and serving to secure the staff in position on the associated saddle member, a shore head on each post and having a socket-forming tube depending therefrom, a pilot stem on the upper end of each elevation screw and projecting into the asociated socket-forming tube, means releasably fastening each shore head to the associated stringer in supporting relationship, each said staff being formed with a series of vertically spaced pairs of diametrically opposed holes arranged in vertical rows on opposite sides of the staff, each said sleeve being provided with a pair of diametrically opposed holes in the lower region thereof and designed for selective register with the pairs of holes in the associated staff, a fastening pin projecting through said holes in each sleeve and through a selected pair of opposed holes in the associated staff, a nut threadedly received on each said elevation screw and slidably supported on the upper end of the associated sleeve for sliding rotation thereon, said nut being effective upon turning thereof in opposite directions to raise and lower the elevation screw to vary the effective length of the corresponding post, a pair of tubular cross braces of selected length extending longitudinally between each pair of said longitudinally spaced posts, a pair of tubular cross braces of selected length extending transversely between each pair of said transversely aligned posts, a pair of horizontally disposed vertically spaced apart tubular braces of selected length extending between each pair of transversely aligned posts and disposed on opposite sides of said cross braces extending between the transversely aligned posts, each of said cross braces and horizontally disposed braces extending continuously from one post to the other of the posts between which it extends, flattened ends on said braces having attachment holes therethrough, two vertically spaced pair pairs of threaded studs extending radially from each of said sleeves respectively adjacent to the upper and lower ends thereof, the studs in each pair extending at a right angle to each other and in vertically spaced apart relation, said studs projecting through said attachment holes, and wing nuts threadedly received on said studs and serving to hold the ends of said braces in position on the sleeves, thereby providing a form installation which may be transported as a single unit from one location to another for producing floor slabs in successive locations without dismantling the installation between locations and which may be dismantled following use.

4,036,467
VALVE

Thomas B. Dalton, Muskegon, Mich., assignor to Westran Corporation, Muskegon, Mich.
Filed Apr. 23, 1975, Ser. No. 570,744
Int. Cl.^{2} F16K *31/122, 31/60, 31/143*
U.S. Cl. 251—14 **2 Claims**



1. A valve comprising:
- a housing having a through bore,
- a fluid inlet bore intersecting said through bore,
- a fluid outlet bore intersecting said through bore at a position longitudinally spaced from said inlet bore,
- a control shuttle disposed in said through bore and axially movable between a first and second position, said control shuttle being operable to permit fluid communication between said inlet bore and said outlet bore when said control shuttle is in said first position, said control shuttle being operable to shut off the fluid communication between said inlet bore and said outlet bore when said control shuttle is in said second position;
- a handle secured to said control shuttle for moving said control shuttle to said first and second positions, and
- a hydraulic actuator responsive to an external hydraulic pressure and operable to shift said control shuttle from said first position to said second position when said external pressure exceeds a predetermined value whereby said control shuttle remains in said second position until returned by said handle to said first position, said hydraulic actuator comprising a piston disposed in said through bore and movable axially therein toward and away from said control shuttle, said piston being movable independently of said control shuttle, a second fluid inlet formed in said housing in communication with the side of said piston away from said control shuttle to move said piston toward said control shuttle upon a predetermined increase in the fluid pressure at said second fluid inlet, said piston having a portion engaging said control shuttle to move said control shuttle from said first position to said second position when said control shuttle is in said first position and said predetermined pressure has been produced at said second fluid inlet.

4,036,468
BUTTERFLY VALVE WITH SELF ENERGIZING SEAL

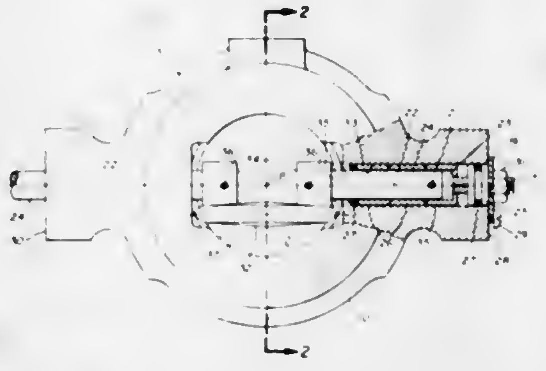
Anthony M. Webb, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.
Filed Sept. 30, 1975, Ser. No. 618,126
Int. Cl.^{2} F16K *25/00*
U.S. Cl. 251—84 **6 Claims**

1. An improved butterfly valve for unidirectional flow of fluid comprising:

a. a body having a substantially circular first opening therethrough, for the flow of fluid, and parallel faces perpendicular to the first axis of said first opening, one of said faces being an upstream face, and the other a downstream face, said housing adapted to be clamped between spaced parallel pipe flanges;

b. a second cylindrical opening through said body, the second axis of said second opening intersecting, and perpendicular to, said first axis, and shaft means journalled in said second opening;

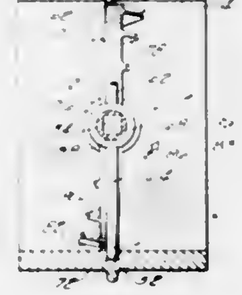
c. a unitary circular ring seal means inserted and longitudinally immovably fixed in position by a shoulder into said body on said upstream face thereof, said seal means comprising a thin circular cylindrical ring of rigid material, and a circular ring of elastomeric material bonded to the internal surface of said cylindrical ring, at least part of the internal seating surface of said elastomeric material in the form of a cone, tapering toward said upstream surface, said conical surface tangent to a spherical surface centered at the intersection of said first and second axes; said elastomeric ring being constant in crosssection, and wedge shaped in crosssection with the wide portion of said wedge facing the high upstream fluid pressure; whereby the area of said wedge exposed to said high upstream fluid pressure, is greater than the area of said wedge exposed to the low downstream pressure;



d. closure disc means rigidly fastened to said shaft means and having a circular face, the edge of said disc in the form of a ridge, the peak of which is circular in crosssection, the plane through said ridge, when said valve is closed, is perpendicular to and coaxial with said first axis and upstream a selected distance from said second axis, with said ridge in limited penetration of said conical surface of said elastomeric material; whereby said ring seal is self energizing.

4,036,469
BUTTERFLY VALVE

Daniel T. Robinson, Milwaukee, Wis., assignor to Milwaukee Valve Company, Inc., Milwaukee, Wis.
Filed May 9, 1975, Ser. No. 575,934
Int. Cl.^{2} F16K *1/22*
U.S. Cl. 251—306 **4 Claims**



1. A butterfly valve comprising
- a body having a cylindrical bore defining a flow passage extending straight through said body;
- a generally disc-shaped valve member including diametrically opposed, generally semicircular portions having a peripheral seating surface of spherical shape;
- means supporting said valve member in said bore for rotation therein between an open position and a closed position to shut off flow through said flow passage;
- a continuous internal groove in said bore including diametrically opposed, generally semicircular portions positioned to lie opposite respective of said valve member semicircu-

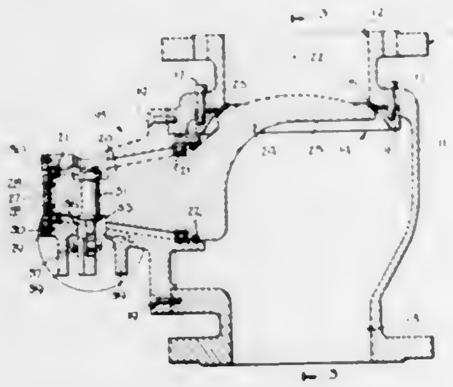
lar portions when said valve member is in the closed position;

a resilient sealing member disposed in said groove and including diametrically opposed, generally semicircular sections which are sealingly engaged by said valve member seating surfaces when said valve member is in the closed position;

a plurality of first and second axially extending fins respectively located on opposite sides of said valve member and respectively circumferentially spaced along the periphery of the opposite of said valve member semicircular portions, each of said fins having a curvilinear outer surface for slidably engaging respective of said sealing member semicircular sections for a predetermined portion of the rotational travel of said valve member, both after sealing contact is broken between said sealing member and said valve member seating surface during valve opening and prior to establishment of said sealing contact during valve closing, and thereby retaining said sealing member in said groove while permitting fluid flow past said valve member through passages defined between said fins during said predetermined travel, and

said fin outer surfaces together with said valve member seating surface defining the central segment of a sphere.

4,036,470
CANTILEVERED BALL VALVE
Henry Illing, Parksville, N.Y., assignor to Kieley & Mueller, Inc., Middletown, N.Y.
Filed May 9, 1973, Ser. No. 358,830
Int. Cl.² F16K *5/06*
U.S. Cl. 251—309 **13 Claims**



1. A cantilevered ball valve comprising

a valve housing at least two openings for passage of fluid flow and an access opening,

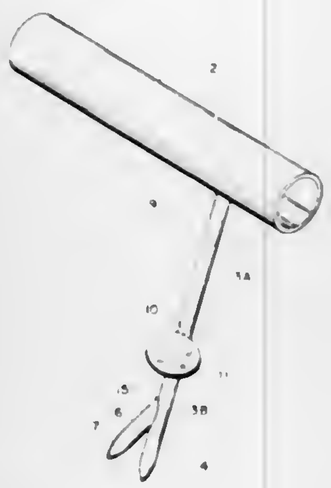
a plate removably covering said access opening;

at least one annular valve seat mounted within said housing around one of said two openings, said valve seat being removably mounted through said access opening;

a spindle rotatably mounted in said housing on a longitudinal axis diametrically opposite said access opening, and

a valve body integrally formed on said spindle, said valve body constituting a cantilevered extension of said spindle having an annular seating surface on one side for sealing seating on said valve seat and a substantially flat surface on the opposite side, said extension extending from a peripheral portion of said spindle with said surfaces offset radially from said longitudinal axis of said spindle.

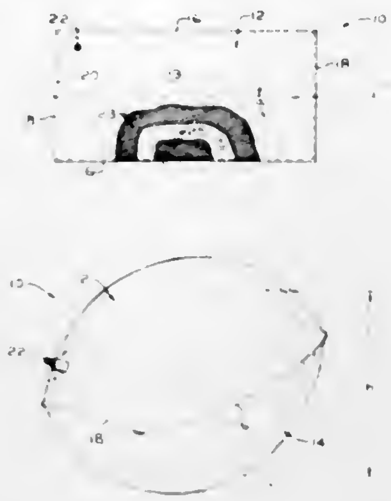
4,036,471
UPHOLSTERY AND THE LIKE STAPLE REMOVER
Timothy Darrell Allen, 567 Santiago Ave., and Weston Hamaker, 309 Arcade Blvd., both of Sacramento, Calif. 95815
Filed May 28, 1976, Ser. No. 691,097
Int. Cl.² B25C *11/00*
U.S. Cl. 254—28 **10 Claims**



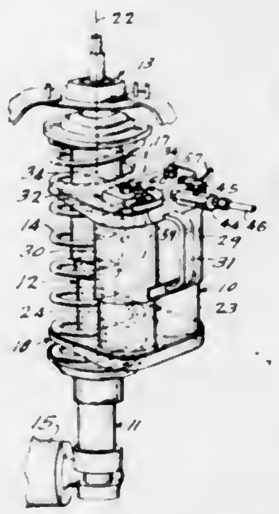
1. A staple remover comprising:
a. A tubular handle,
b. A main shaft affixed to the handle at a point in from one end of said handle at about a 70° angle to the length of said handle in a plane that bisects the midpoint of said handle, said shaft terminating at the opposite end in two extending portions which are spaced apart from the other to define a longitudinally extending slit for receiving a staple, wherein said extending portions taken together from a cone with the apex thereof at the free ends of said extending portions,
c. A finger retaining mean secured at one end thereof to said shaft at about the midpoint of said shaft,
d. A secondary shaft affixed to said main shaft at an angle of about 35° horizontally and about 10° vertically from said main shaft, and positioned on the shaft on the side thereof corresponding to the longer portion of said handle, relative to the attachment of said shaft to said handle, said secondary shaft terminating in a cone at the opposite end thereof and having a slit bisecting the apex of said cone longitudinally.

4,036,472
PNEUMATIC LIFTING DEVICE
Roy Lee Orndorff, Jr., Kent, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio
Filed Nov. 9, 1976, Ser. No. 740,348
Int. Cl.² B66F *3/24*
U.S. Cl. 254—93 HP **6 Claims**

1. A pneumatic lifting device comprising a closed, flat, inflatable bag including upper and lower closely adjacent rectangular walls having length to width ratios greater than one, each of said walls comprising an even number of superimposed layers of rubberized, substantially mutually parallel cords, with the cords in each layer disposed to extend at an acute angle of less than 55° relative to the longitudinal centerline of the wall in which they are contained and in a direction opposite to the cords in an immediately adjacent layer.

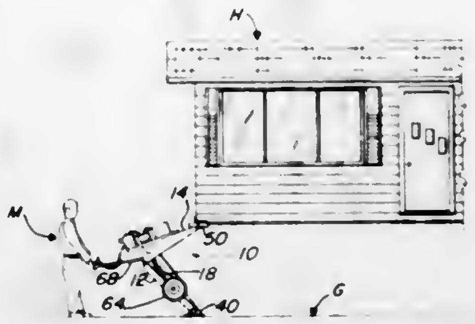


4,036,473
SPRING COMPRESSOR TOOL
Kenneth Donald Kloster, 5153 Rambo Lane, Toledo, Ohio 43623
Continuation of Ser. No. 547,918, Feb. 7, 1975, abandoned. This application Apr. 26, 1976, Ser. No. 680,178
Int. Cl.² B23P *19/04*
U.S. Cl. 254—10.5 **10 Claims**



1. A spring compressor tool for compressing a spring having opposed ends comprising, an upper pressure shoe having a generally U-shaped helical portion including walls defining a spring receiving channel, a lower pressure shoe having a generally U-shaped helical portion including walls defining a spring receiving channel, a pair of fluid cylinders positioned between said upper and lower shoes, a pair of telescoping sleeves surrounding an end of each of said fluid cylinders and connected to one of such shoes, each of said cylinders including a cylinder body, a piston positioned to slide within said body, a piston rod attached to said piston and extending through one of said telescoping sleeves, and a cap connected to one end of the cylinder body, said cap defining therethrough a bore for slidably receiving said piston rod, said cap and said piston defining a chamber, a fluid header assembly positioned adjacent said telescoping sleeve, said fluid header assembly defining an inlet air passageway connected to said chambers and a vent passageway connected to said chambers, valving means for supplying air to said inlet air passageway and for venting said vent passageway to atmosphere, and spring return means positioned within said sleeves for urging said shoes apart.

4,036,474
PORTABLE JACK
Vernon L. Owan, Highway Nos. 2 & 85 North, Williston, N. Dak. 58801
Filed June 15, 1976, Ser. No. 696,216
Int. Cl.² B66F *3/00*
U.S. Cl. 254—124 **19 Claims**



1. A portable jack apparatus for raising and lowering bulky objects, comprising:

a lower frame member;

an upper frame member, said upper and lower frame members being of approximately equal length and being pivotally attached together at a common transverse axis at their respective rearward ends;

an axially expandable and contractable lift means pivotally attached between said upper and lower frame members for alternatively pivoting said forward ends of said upper and lower frame members away from and toward each other about said common transverse axis to raise and lower said jack apparatus;

load support means on the forward end of said upper frame member for supporting a load on the jack apparatus;

base support means on the forward end of said lower frame member for supporting the jack apparatus as a load is being supported by said load support means;

drive means mounted on said jack apparatus for driving said lift means;

wheels rotatably mounted on said lower frame member between said base support means and said common transverse axis, the diameters of said wheels being proportioned and coordinated with their actual location of mounting such that the weight of the jack apparatus is carried by said wheels when no load is being supported by said load support means and is transferred to said base support means when a load is being supported by said load support means; and

elongated handle means extending in a rearward direction from a location adjacent to the rearward ends of said frame members and terminating in main control means for controlling said drive means at a position remote from said frame members whereby said jack apparatus can be manuevered into place under a load and operated by said main control means to engage the load and transfer support of the weight from said wheels to said base support means from a position spaced rearwardly of and away from said frame members.

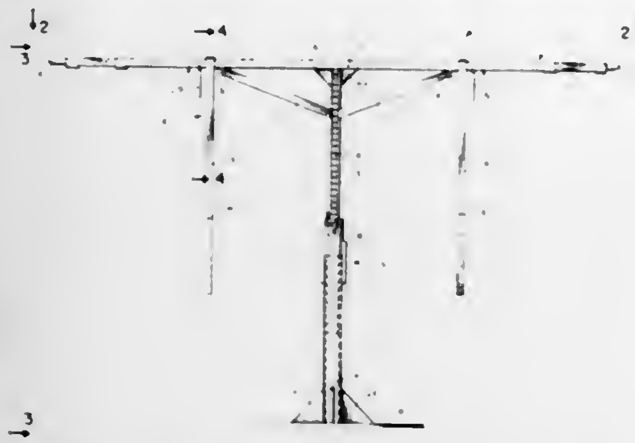
4,036,475
DEVICE FOR INSTALLING CEILING INSULATION
O'Neal Singleton, 412 W. 7th St., Donaldsonville, La. 70346
Filed Sept. 30, 1976, Ser. No. 728,468
Int. Cl.² B66F *3/00*
U.S. Cl. 254—133 R **1 Claim**

1. A device for lifting layers of insulation material in a position for attaching to a ceiling which comprises:

a. a support platform on which said layers rest, said platform having openings through which spikes fixedly attached to said ceiling can pass, said platform comprising parallel primary bars attached to and secured relative to one another by secondary bars perpendicular to said primary bars;

b. a lifting assembly attached to said platform having means for raising said platform in position for attaching said layers on said platform; and

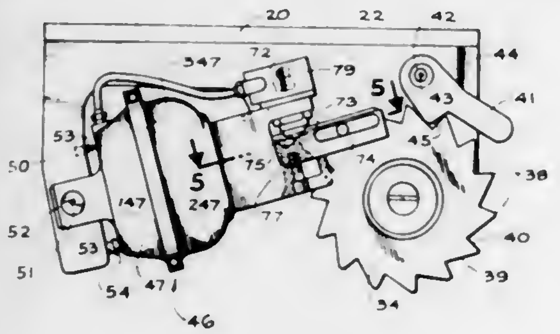
c. a securing means comprising at least two straps attached at one end to one of said primary bars; each strap having multiple openings at its other ends through which one end member of a releasing assembly can pass, said releasing assembly comprising a curved rod having one end member movably attachable to one of said primary bars and said other end member movably attachable and extending beyond another outside primary bar and through one of said multiple openings.



4,036,476
AUTOMATIC TAKE-UP WINCH

Donald R. Douce, 1517 Merced, Space 62, South El Monte, Calif. 91733, and Wesley E. Buford, 1042 Wingate, Covina, Calif. 91723

Filed Feb. 25, 1976, Ser. No. 661,341
Int. Cl.^{2} B66D *1/48*
U.S. Cl. 254—172 **16 Claims**



1. An automatic take-up winch comprising:

a reel element mounted for rotation about an axis and about which an elongated flexible member is to be wound;

a ratchet mechanism permitting rotation of said reel element in a take-up direction through a series of different positions and adapted to releasably prevent rotation of said element in a reverse unwinding direction from said different positions; and

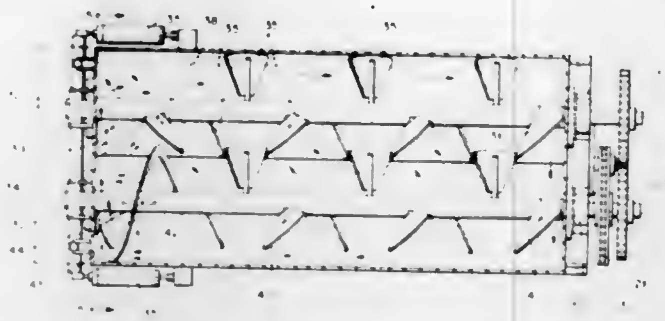
a power unit including a power actuated part operable upon movement in one direction to turn said reel element in said take-up direction from one of said positions to another;

said part then being retractable in an opposite direction relative to said reel element in preparation for another take-up step, while the reel element is retained by said ratchet mechanism against rotation in said unwinding, direction; said power actuated part being automatically operated to wind said flexible member to a desired tension when said part senses a slack condition in said flexible member.

4,036,477
MIXER

Benjamin Sieradzki, Berkeley, and John David Giese, Kensington, both of Calif., assignors to Chemetron Corporation, Chicago, Ill.

Filed May 6, 1976, Ser. No. 683,848
Int. Cl.^{2} B01F *7/00*
U.S. Cl. 259—41 **8 Claims**



1. A mixer for mixing and discharging materials such as ground meat or the like, comprising:

a. an elongated tub having a discharge end;

b. means to selectively close said discharge end;

c. a pair of shafts mounted for rotation in said tub, said shafts having a plurality of spaced mixing paddles having the same hand pitch mounted thereon in an overlapping arrangement between said shaft centers, each mixing paddle being adapted, upon shaft rotation, to approach a complementary curved surface of said tub to clean same;

d. driving means connected to each shaft adjacent the end of said tub opposite the discharge end to drive one shaft in one direction and the other shaft in another;

e. a first mixing means mounted on said one shaft adjacent said discharge end and having an opposite hand pitch than the plurality of mixing paddles thereon; and

f. a second mixing means mounted on said other shaft adjacent said discharge end and having the same hand pitch as the mixing paddles thereon, whereby upon rotation of said one shaft, said first mixing means causing flow toward said discharge end and said mixing paddles causing flow toward the tub drive end and also toward said other shaft, and upon counter rotation of said other shaft, said mixing paddles thereon causing flow toward said discharge end and also toward said one shaft and said second mixing means causing flow toward said discharge end, for efficient mixing and discharge action upon opening said discharge end.

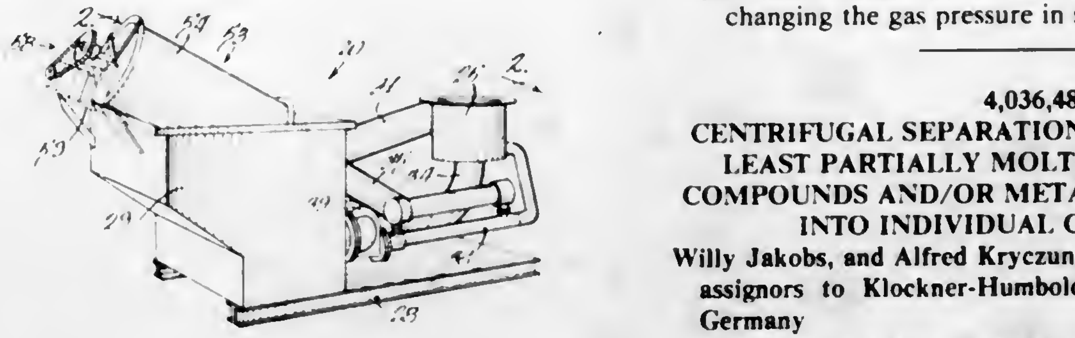
4,036,478
LIQUID QUENCHING SYSTEM

Jonathan Smith, Glen Ellyn, Ill.; Robert C. Larko, and Eugene E. Booth, both of Meadville, Pa., assignors to Sunbeam Equipment Corporation, Meadville, Pa.

Continuation of Ser. No. 488,548, July 15, 1974, abandoned. This application Dec. 22, 1975, Ser. No. 642,875
Int. Cl.^{2} C21D *9/62*
U.S. Cl. 266—133 **7 Claims**

1. A quenching apparatus for a heat treating furnace comprising a reservoir containing a liquid quenchant, a quench chute having an inlet end positioned to receive heated parts discharged from the furnace, a quench connector provided between the furnace and said quench said chute, a funnel member disposed in said connector, the lower portion of said funnel member extending into said quench chute, said quench chute having an initial downward portion and an upward-inclined portion terminating in an outlet end, said outlet end being in fluid communication with said reservoir, means supplying said quenchant from said reservoir to said quench chute, said means comprising a first conduit and a second conduit, said first conduit supplying quenchant by gravity flow and said second conduit including pump means for pumping additional

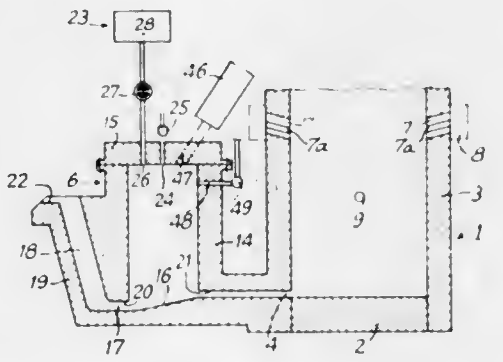
quenchant into said quench chute, both said first and second conduits supply said quenchant to said chute above said inlet end, said second conduit pumping quenchant into said chute through said connector below the top of said funnel member, said parts received from he furnace being quenched in said chute and conveyed through said chute by the quenchant, segregating means provided at said outlet end for receiving both said parts and said quenchant, said segregating means permitting return of said quenchant to said reservoir and providing continuous discharge of said parts substantially dry of said liquid quenchant.



4,036,479
CUPOLA FURNACE

Louis G. Chazé, Rennes, France, assignor to Centre Technique des Industries de la Fonderie, Paris, France

Filed May 12, 1976, Ser. No. 685,699
Claims priority, application France, May 20, 1975, 75.15668
Int. Cl.^{2} C21B *7/14*
U.S. Cl. 266—195 **8 Claims**



1. An improved cupola furnace system for controlling the tapping of pig iron without cutting off the blast and leaving the furnace tap hole constantly open, said cupola furnace comprising a hearth and a sidewall extending upwardly from the hearth for containing molten pig iron and slag up to a predetermined level, said sidewall having at least one tap hole at the level of said hearth and extending from adjacent said hearth to the exterior of said sidewall for removing molten pig iron from said furnace, said furnace also having a passageway extending from the interior of said sidewall to a point exteriorly thereof which is spaced upwardly from said hearth for removing slag from said furnace and having an air chamber and air-blowing tuyeres extending from said chamber to the interior of said sidewall at points above said predetermined level and said system further comprising:

a storage tank adjacent said furnace and having an upper end and a lower end and a first opening at said lower end, means connecting said tap hole with said opening in said lower end of said tank for the flow of molten pig iron from said furnace to said tank, said tank also having a second opening spaced from said first opening, the upper edge of said second opening being below the upper edge of said first opening, and having a siphon tube extending upwardly from said second opening for the flow of molten pig iron from said tank outwardly of said tube, said tube having a sill at the upper end thereof over which said molten pig iron flows when removed from said tank and said sill being located above said predetermined level;

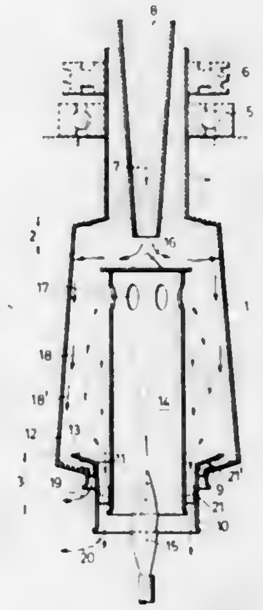
means for sealing said upper end of said tank and thereby preventing the outflow of gas from said upper end thereof when said tank contains molten pig iron; and

gas means connected to said upper end of said tank for changing the gas pressure in said upper end of said tank.

4,036,480
CENTRIFUGAL SEPARATION OF MIXTURES OF AT LEAST PARTIALLY MOLTEN METALS, METAL COMPOUNDS AND/OR METAL-CONTAINING SLAGS INTO INDIVIDUAL CONSTITUENTS

Willy Jakobs, and Alfred Kryczun, both of Cologne, Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Apr. 27, 1976, Ser. No. 680,775
Claims priority, application Germany, May 2, 1975, 2519622
Int. Cl.^{2} C21C *7/00*
U.S. Cl. 266—204 **6 Claims**



1. A mechanism for the centrifugal separation of hot materials such as mixtures of molten metals and slag comprising in combination:

a rotary housing drum having a separation chamber therein with an inlet for receiving material to be separated and with outlets at one end for the flow of separated materials;

means for rotationally driving the drum about an axis of rotation;

rotational support bearings for supporting the drum;

and a flame conducting heater shell within said chamber for heating the material being separated with opening means in the shell for the outlet of hot flame gases into the chamber with said heater shell being mounted to rotate with the drum.

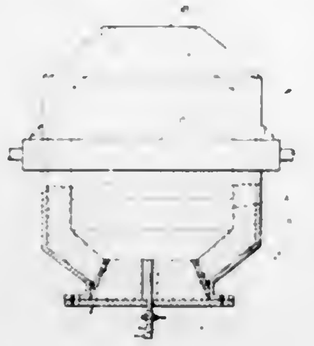
4,036,481
STEEL CONVERTER VESSEL TUYERE BLOCK CONSTRUCTION

Jai K. Pearce, Pittsburgh, Pa., and William Wells, Sydney, Canada, assignors to Pennsylvania Engineering Corporation, Pittsburgh, Pa.

Filed June 14, 1973, Ser. No. 369,820
Int. Cl.^{2} C21C *5/48*
U.S. Cl. 266—222 **8 Claims**

1. A refractory lined metallurgical vessel for containing a quantity of molten metal to be treated, tuyere support means affixed in said refractory lining and comprising a hollow, tubular, metallic housing for receiving tuyere means, tuyere means disposed in said tuyere support means, said support means

extending at least partially through said lining and being constructed and arranged to position said tuyere means with its discharge end beneath the level of said molten metal, said tuyere means having a smaller cross-sectional area than and being is located within said housing to provide a gap therebetween and a refractory material disposed in said gap, said tubular housing having one end disposed exteriorly of said nessel for receiving said tuyere means, and mounting means on the exterior end of said housing for securing said tuyere means therein.



4,036,482
APPARATUS FOR HARDENING WORKPIECES OF STEEL

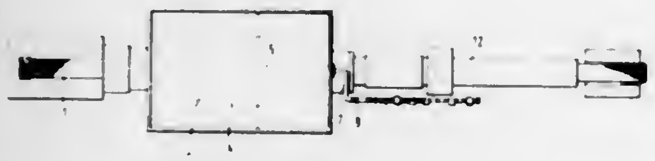
Wolfgang Kieferle, Ravensburg, Germany, assignor to Hawera probst Kommanditgesellschaft Hartmetall-Werkzeugfabric Ravensburg, Ravensburg, Germany

Division of Ser. No. 559,247, March 17, 1975. This application Aug. 4, 1976, Ser. No. 711,481

Claims priority, application Germany, Mar. 18, 1974, 2412982; Dec. 5, 1974, 2457605

Int. Cl.^{2} C21D *1/06*

U.S. Cl. 266—252 9 Claims



1. An apparatus for hardening a workpiece of steel, which includes: a furnace comprising a furnace chamber, at least one gas retort extending into said furnace chamber for introducing a pressurized gas mixture of purified air and propane into said furnace chamber, said furnace chamber having an inlet and an outlet, a cooling section adjacent said outlet, endless conveyor means extending through said furnace and its furnace chamber and also through said cooling section for receiving workpieces to be hardened and carrying the same through said furnace chamber and said cooling section and subsequently discharging the cooled hardened workpieces, and adjustable transmission means associated with said conveyor means for setting and varying the speed of said conveyor means.

4,036,483
BLAST-FURNACE LINING ARRANGEMENT

Eberhard Böhmer, Heilshorn, and Wilhelm Hüsch, Bremen-Aumund, both of Germany, assignors to Klockner-Werke AG, Duisburg, Germany

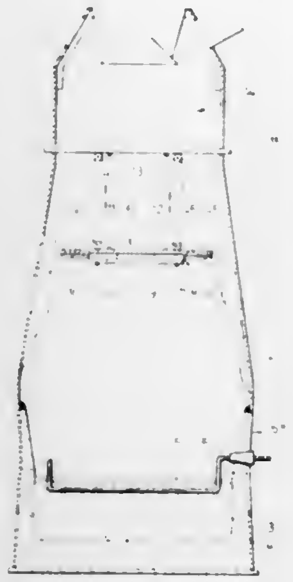
Filed Mar. 8, 1976, Ser. No. 664,809

Claims priority, application Germany, Mar. 12, 1975, 2510628

Int. Cl.^{2} C21B *7/06*

U.S. Cl. 266—281 12 Claims

1. An arrangement for lining a blast furnace of the type having an upright circumference wall and a closed top together bounding an interior of the blast furnace which has different transverse dimensions at different elevations of the blast furnace, comprising a working platform; means for introducing said working platform into the interior of the blast furnace, including an opening through a lower region of the circumferential wall of the blast furnace; means for lifting and lowering said working platform in the interior of the blast furnace between different elevations of the latter, including transversely aligned through openings at an upper region of the circumferential wall of the blast furnace below the closed top thereof, at least one support beam partly received in said through openings and extending transversely across the interior of the blast furnace, and means for suspending said working platform from said support beam for displacement toward and away from the latter; and means for adjusting the transverse dimensions of said working platform to those of the interior of the blast furnace at any particular elevation of the latter at which said working platform is located.



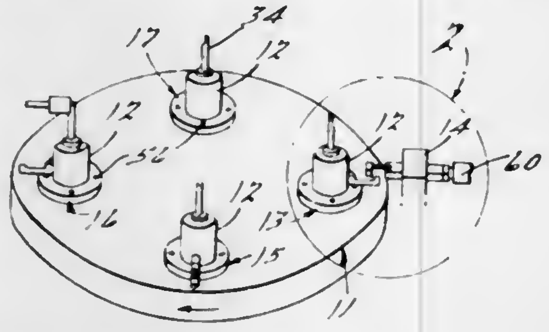
4,036,484
COLLET LOCKING AND OPERATING MECHANISM THEREFOR

Anthony K. Schneemann, 25761 Briarbank, Southfield, Mich. 48075

Filed June 21, 1976, Ser. No. 698,039

Int. Cl.^{2} B23Q *1/16*; 29 *38 C*

U.S. Cl. 269—57 8 Claims



1. A clamping fixture comprising,

an angularly advanceable table having a plurality of fixtures thereon movable to a loading and working station,

each of said fixtures having a base containing a central threaded aperture,

a collet body having an external thread connected to the thread of the aperture,

a truncated conical head on the end of said body having a central aperture communicating with slots through the head to form sections,

a collet sleeve about said collet body having a truncated conical recess which receives said collet head,

and means to advance and retract said sleeve to clamp and unclamp the collet head, said means including an actuating pin movable normal to the collet, a transverse pin through said actuating pin extending through diametrical slots in said base and through diametrical disposed slots in the collet sleeve which are positioned at a small angle to provide a lock for securing the collet sleeve in locked engagement with the collet head when a workpiece is disposed therewithin, and

an actuating device provided at the loading station which moves the actuating pin of the fixture thereat longitudinally in both directions to unlocked and locked positions.

4,036,485
JIG

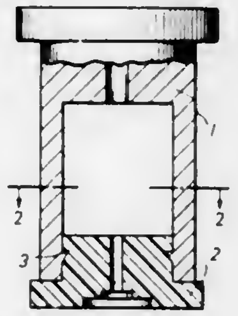
Rigobert Schimmer; Horst Gesing, both of Belecke; Wolfgang Beerwerth, Neheim-Husten, and Jürgen Messerschmidt, Belecke, all of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Division of Ser. No. 157,854, June 29, 1971, which is a continuation-in-part of Ser. No. 62,994, Aug. 11, 1970, abandoned. This application June 19, 1973, Ser. No. 371,371

Claims priority, application Germany, Aug. 11, 1969, 1940769

Int. Cl.^{2} B23K *1/12, 3/00*

U.S. Cl. 269—285 2 Claims



1. A reusable soldering jig assembly including means for temporarily positioning components to be soldered to one another, comprising in combination:

a. a jig made of a plastic resistant to high temperature and reducing conditions; and

b. a steel cylindrical means for providing a handle on said jig; said steel cylindrical means being provided, at one end, with means for bearing against said jig for gripping said jig and holding said jig in a unitary assembly with said steel cylindrical means.

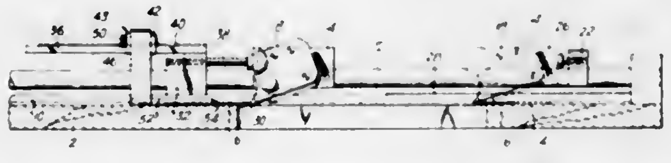
4,036,486
STOP MEANS FOR MAT BOARD CUTTER

Homer B. Molpus, Jackson, Mich., assignor to C & H Manufacturing Company, Jackson, Mich.

Filed Aug. 6, 1976, Ser. No. 712,157

Int. Cl.^{2} B26D *5/08*

U.S. Cl. 269—303 4 Claims



1. In a mat board cutter having a base with abutment means for positioning a mat board thereon, a clamp bar for clamping the mat board on said base, a guide rail on said clamp bar for guiding a mat cutter therealong and a cutter-carrying body slidable along said guide rail, the improvement comprising:

a pair of stop blocks selectively adjustable along said guide rail on respectively opposite sides of said body and each having a stop member thereon in position to engage said body to predetermine the start and finish of a cut made by the cutter thereon, both said stop members being selectively adjustable, relative to said stop blocks, in a direction generally parallel to said guide rail, a first one of said stop blocks being adjacent said abutment means;

the other of said stop blocks having a positioning member thereon engageable with the edge of said mat board opposite said one edge, said positioning member being adjustably mounted on said other stop block.

4,036,487
SHEET FOLDING APPARATUS

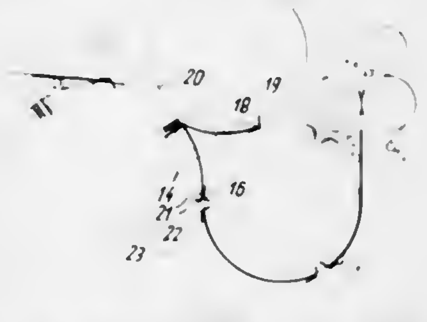
Paul Heimlicher, Bolligen, and Eduard Von Hein, Bern, both of Switzerland, assignors to Maschinenfabrik Wifag, Bern, Switzerland

Filed Sept. 9, 1975, Ser. No. 611,807

Claims priority, application Sweden, Sept. 12, 1974, 7411525

Int. Cl.^{2} B65H *45/16*

U.S. Cl. 270—71 3 Claims



1. A process for producing a fold in a paper sheet comprising the steps of moving said sheet along a first rotary path upon first rotary means while the leading and trailing edges of said sheet taken relative to the direction of travel of said sheet along said path are supported upon said first rotary means, gripping a portion of said sheet along a line intermediate said leading and trailing edges thereof and withdrawing said gripped sheet by said gripped portion from said first rotary means to about a second rotary means while moving said sheet into a second rotary path about said rotary means to form in said sheet a fold extending transversely to the direction of travel of said sheet along said first path, and supporting and carrying said leading edge of said sheet by gripping said leading edge by third rotary means to hold said leading edge thereon while reversing the direction of travel of said leading edge during formation of said fold as said sheet is drawn along said second rotary path about said second rotary means, said leading edge being directed to move through a portion of a third rotary path defined by said third rotary means simultaneously with movement of said gripped portion of said sheet about said second rotary path.

4,036,488
CHANNEL RECEPTACLE TRAY FOR FINISHED PHOTOCOPIES

Charles B. Allen, 9446 214th Place, Queens Village, N.Y. 11429

Filed July 2, 1976, Ser. No. 702,248

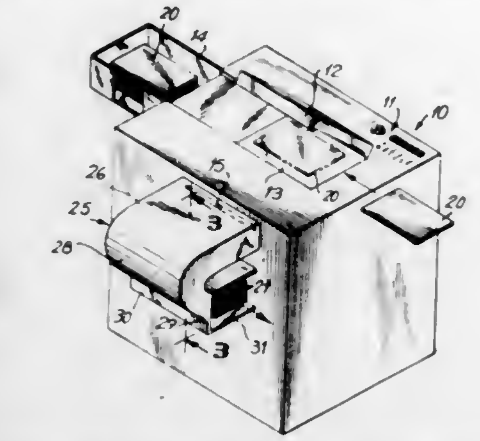
Int. Cl.^{2} B65H *29/00*

U.S. Cl. 271—186 4 Claims

1. A receptacle device for attachment to the copy output opening of a photocopy machine comprising:

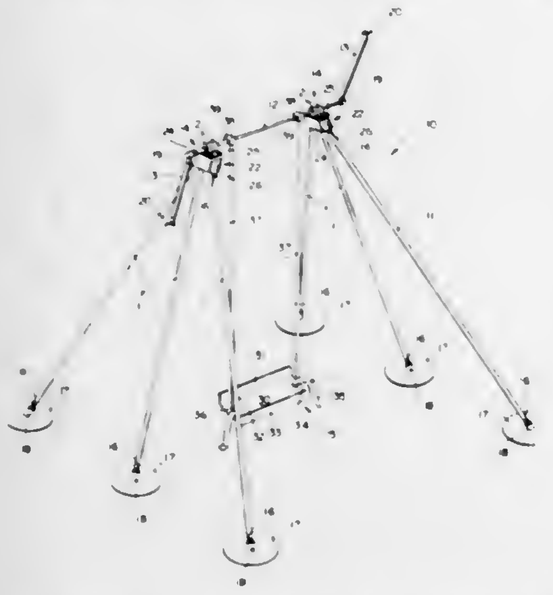
a gravity chute comprising a C-shaped channel having an open upper and a lower end, the upper end of which covers the output opening of the photocopy machine for receiving the finished photocopies, said channel being dimensioned and configured to permit relatively free and uninhibited sliding of the photocopies therethrough, and including a first horizontal section having a length approximately equal to the length of the copies to be reproduced, a second curved section integrally formed with said first horizontal section, said second curved section bending approximately 180°, and a third section substantially parallel with said first section and integrally formed at the bottom portion of said curved section, and

a receiving tray formed adjacent the opposite lower end of said C-shaped channel and adjacent to the bottom leg thereof for collecting the finished copies so that when the copies are projected into the top leg, solely under the force of gravity, they traverse the C-shaped channel so that their top surface becomes inverted and comes to rest in the collection tray formed in the bottom of said channel.



4,036,489
360° SWING

Istvan Potyondy, 4828 Zuni St., Denver, Colo. 80221
Filed Jan. 30, 1976, Ser. No. 653,726
Int. Cl.² A63G *1/20, 9/08*
U.S. Cl. 272—49 **6 Claims**



6. A 360° swing for the exercise and amusement of users thereof wherein the user can swing through any circular arc from 0° to 360°, the device comprising, in combination:

a pair of ground engaging upstanding support means;

a bearing and bracket assembly mounted at the top of each support means;

a top cross bar of a length greater than the distance between said bearing and bracket assemblies, supported thereby for rotation about its horizontal axis;

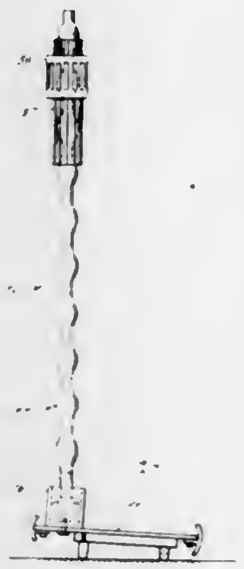
a crank handle rigidly affixed to each end of the top cross bar;

two spaced swing bars rigidly attached at their top ends to the top cross bar; and

a passenger supporting assembly rigidly attached to the bottom ends of said swing bars, with safety means associated with said passenger supporting assembly to prevent the passenger becoming detached therefrom in any position of said passenger supporting assembly, whereby the passenger together with the swing bars and passenger supporting assembly can swing through any circular arc from 0° to 360° by effort of the passenger, aided, as desired, by other individuals manually actuating the crank handles.

4,036,490
POLYTETRAFLUOROETHYLENE COATED EXERCISING POST KIT WITH REPETITIVE VARYING DIAMETER

Max Rice, 120 MacDougal St., New York, N.Y. 10012
Continuation-in-part of Ser. No. 569,460, April 18, 1975, Pat. No. 3,957,266. This application May 5, 1976, Ser. No. 683,492
Int. Cl.² A63B *23/00*
U.S. Cl. 272—67 **3 Claims**



1. A polytetrafluoroethylene coated exercising post kit with repetitive varying diameters, comprising in combination, an inclined platform, an upstanding post supported pivotally upon a ball and socket joint mounted upon said platform and a pair of removable pipes stored upon an upper end of said post; said post and pipes providing means for exercising various parts of a person's body; wherein said post is made of tubular metal sections interconnected together, an outer surface of said post being coated with polytetrafluorethylene and said post being formed with spaced apart bulbous enlargements throughout its length.

4,036,491
BODY MASSAGING AND REDUCING BELT

Frank C. Vierra, and Joyce L. Vierra, both of Maxwell, Calif., assignors to The Raymond Lee Organization, Inc., New York, N.Y., a part interest
Continuation of Ser. No. 579,615, May 21, 1975, abandoned. This application Mar. 11, 1976, Ser. No. 666,125
Int. Cl.² A63B *21/12*
U.S. Cl. 272—119 **2 Claims**

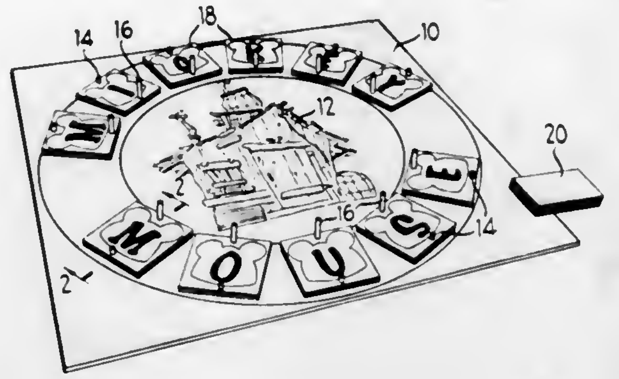
1. A body massaging and reducing belt, comprising

a substantially trough-like means being a substantially belt-like member and having free end portions and adapted to be worn around the waist area of a user desiring to lose weight, said means comprising a channel extending continuously between said free ends, said channel being open upwardly and having a side that engages the body of the user; and

a plurality of balls in the trough-like member free to rotate therein and shifting in said member during movement of the waist area of a user to gently massage and tone the body of the user and to reduce the user's weight.

4,036,492
GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Nov. 10, 1975, Ser. No. 630,721
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 R **5 Claims**



1. A game apparatus, comprising:

a game board having a plurality of playing positions thereon;

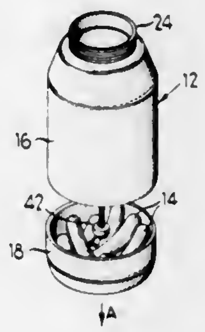
indicating means at said playing positions on the game board in the form of letters of the alphabet capable of combining to define at least one word;

upwardly protruding means at the playing positions for covering by players of the game; and

a set of playing cards having alphabetical indicating means thereon identical to the indicating means at least at some of said playing positions on the game board whereby one player of the game can communicate the indicating means on a card from said set thereof and other players of the game can attempt to be the first to cover the upwardly protruding means at the particular playing position having indicating means thereat corresponding to the indicating means on the card so that the winning player can be awarded the card for spelling a word.

4,036,493
GAME APPARATUS

Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed Oct. 23, 1975, Ser. No. 624,750
Int. Cl.² A63F *9/00*
U.S. Cl. 273—1 M **5 Claims**



1. A game apparatus, comprising, in combination:

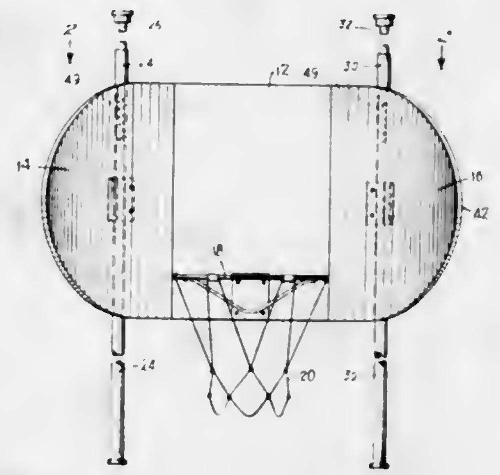
a container having an upper portion and a separable generally cup-shaped lower portion combining to define an interior cavity of the container, with the lower container portion defining the bottom of the interior cavity, and a deposit opening in one of the said container portions in communication with the interior cavity;

a plurality of playing pieces depositable into the interior cavity of said container through said opening so as to come to rest on the separable lower portion of the container; and

weight responsive release means in the form of attracting magnetic means between said upper and lower container portions to hold the same together but to release the separable lower portion from the upper portion in response to a sufficient number of playing pieces being deposited into the container, said attracting magnetic means including a permanent magnet fixed within the bottom of the cup-shaped lower container portion and an attractive permanent magnet fixed to means secured within the upper container portion and extending downwardly into the lower cotainer portion for positioning the permanent magnets in close proximity.

4,036,494
BASKETBALL GAME DEVICE

Thomas H. Hayes, 46 Evergreen Ave., Westport, Conn. 06880
Filed May 25, 1976, Ser. No. 689,939
Int. Cl.² A63B *63/04*
U.S. Cl. 273—1.5 R **10 Claims**



1. A basketball game device intended for use in a room of a home or the like, comprising in combination:

a. a basketball backboard assemblage including a central panel part, a hoop mounted on the front of the central panel part, said hoop being adapted to receive and pass a simulated resilient basketball thrown at said panel part, a pair of wing panel parts constituting side panels, and means hingedly attaching said wing panel parts at opposite side edges of the central panel part, to enable them to occupy different operative angular positions with respect thereto, and

b. demountable means adapted for engagement with surfaces of the room for mounting said assemblage in a high operative position in the room with the said wing panel parts extending from the side edges of the central panel part,

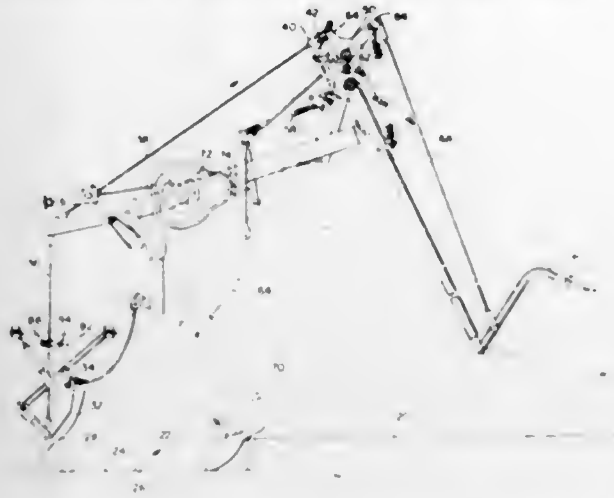
c. said demountable mounting means comprising two multipart telescoping poles, the parts of each pole being relatively movable and having means for maintaining their respective engagement with the floor and ceiling of the room.

4,036,495
TIME DELAY MECHANISM FOR AUTOMATIC PINSETTING MACHINE

Thomas A. Blawn, 1898 Islip Ave., Central Islip, N.Y. 11722, and James F. Blawn, 190 Victory Drive, Lake Ronkonkoma, N.Y. 11779
Filed June 14, 1976, Ser. No. 695,769
Int. Cl.² A63D *5/00*
U.S. Cl. 273—43 R **7 Claims**

1. In an automatic pinsetting machine having a liftable cushion coupled through a cushion rod to a time delay means, said cushion adapted to sense the slightest impact of a bowled ball for cycling the pinsetting machine after a specified time delay, the improvement comprising an actuator, adjustably connected to said cushion rod, a micro-switch mounted adjacent said cushion rod, said actuator adapted to move with said cushion rod to close said micro-switch, a control circuit connected to said micro-switch for commencing the action of the time delay means and continuing the operation thereof after

said micro-switch receives an initial closing force, and a switching circuit in communication with said control circuit and said time delay means for activating said time delay means to commence the cycling of the pinsetter.



4,036,496

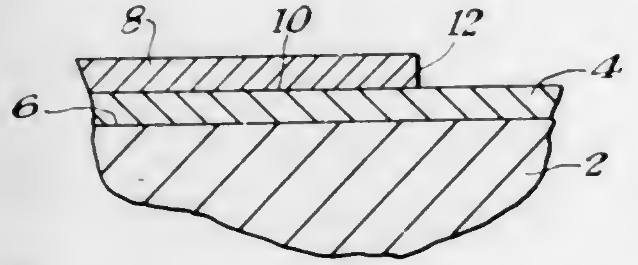
BOWLING LANE CONDITIONING METHOD AND ARTICLE PRODUCED THEREBY

Raymond B. E. Robinson, 4241 NE. 19th Ave., Fort Lauderdale, Fla. 33308

Continuation of Ser. No. 503,856, Sept. 6, 1974, abandoned, which is a continuation of Ser. No. 362,164, May 21, 1973, abandoned. This application Aug. 18, 1975, Ser. No. 605,500

Int. Cl.^{2} A63D *1/04*

U.S. Cl. 273—51 **2 Claims**



1. A process of conditioning the finished surface of a bowling lane comprising:
applying a solution consisting essentially of dimethylpolysiloxane of not less the 30,000 centistokes measured at 25° C. in a volatile carrier to said surface, and allowing said carrier to evaporate following said application step so as to leave a uniform coating consisting essentially of said dimethylpolysiloxane on said finished surface.

2. In a finished bowling lane and lane conditioner combination the improvement comprising:
a thin conditioner layer consisting essentially of dimethylpolysiloxane of not less than 30,000 centstokes measured at 25° C.

4,036,497

AMUSEMENT APPARATUS WITH A BALL DROP AND A ROTATING RECEPTACLE

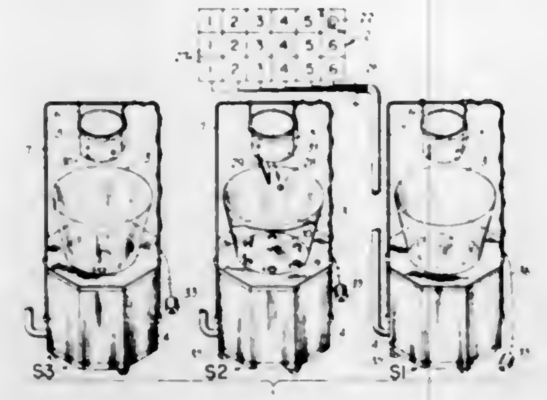
Joseph Benjamin Garto, 2240 E. 8th St., Brooklyn, N.Y. 11223, and Anthony Garto, 2075 Shore Parkway, Brooklyn, N.Y. 11214

Filed Oct. 7, 1975, Ser. No. 620,426

Int. Cl.^{2} A63F *7/02*

U.S. Cl. 273—101 **7 Claims**

6. An amusement game of chance employing several players of each of whom plays at an identical station and each of which includes: token means disposed in a receptacle means, said receptacle means being formed of a pivotably releaseable retaining means, a rotatable receiving means disposed below said receptacle means, having a plurality of identifiable positions for receiving said token means; electrical switch means disposed in each of said positions for energizing display means connected thereto and corresponding to the respective position on said receiving means; release means governed by each of said players for releasing said token means from said retaining means, whereby said token means settles at respective positions in said rotating receiving means through the urging of a guide means centrally disposed in said receiving means, to thereby energize said electrical switch means.



4,036,498

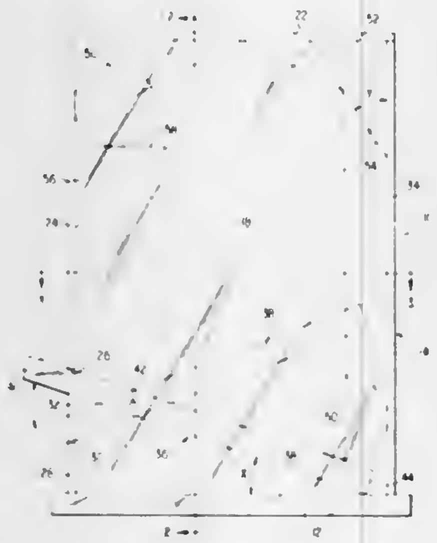
NOVELTY DISC MANIPULATING DEVICE

Burton D. Goldberg, 15109 Watergate Road, Silver Spring, Md. 20904

Filed Apr. 27, 1976, Ser. No. 680,844

Int. Cl.^{2} A63B *67/06*

U.S. Cl. 273—101 **5 Claims**



1. An amusement device comprising:
an upstanding housing including a pair of spaced vertical side walls formed at least in part of transparent material;
a pivotally mounted operating lever;
said lever having an inner portion disposed in said housing and an outer portion projecting beyond said housing for digital engagement by an operator;
said housing including a top wall extending across said side walls at the top thereof;
said housing also including a first end wall extending between said side walls above the projecting outer portion of said lever and a second end wall extending between said side walls along the opposite end thereof;
a rebound member within said housing having an angularly disposed rebound surface extending between said top wall and said second end wall;
a support member within said housing including a support surface disposed beneath said top wall, said support member being attached to said first end wall; and
a disc disposed within said housing for free movement therein, said disc having a thickness less than and a diameter greater than the spacing between said side walls;
said disc ordinarily resting upon its edge on the inner portion of said operating lever, but said disc being propelled upwardly when digital pressure is applied to the outer portion of said operating lever to contact said rebound surface or said top wall or both and then to bounce toward said support surface,
said amusement device having as its objective the placement of said disc on said support surface through operation of said operating lever,
said rebound surface forming an angle between 30° and 45° with said second end wall,
said support surface having a flat surface parallel with said top wall,
said support surface being disposed within said housing at substantially the same elevation where said rebound surface intersects said second end wall.

4,036,499

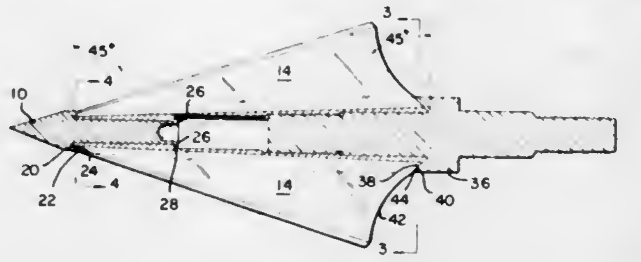
ARROW BROADHEAD

Donald D. Sherwin, 701 Madison, Port Richey, Fla. 33568

Filed Nov. 26, 1975, Ser. No. 635,708

Int. Cl.^{2} F41B *5/02*

U.S. Cl. 273—106.5 B **4 Claims**



1. An improved arrow broadhead comprising in combination:
a rear ferrule adapted to be affixed to an arrow shaft having a collet with a tapered front undercut;
a front ferrule being a hollow tubular body with at least one longitudinal axial slot in its exterior surface, removably secured to one end of said rear ferrule coaxial thereto, and having a rear tapered section to substantially match said tapered front undercut of said rear ferrule, for close engagement therewith, and a front tapered section;
a removable blade placed in said axial slot, projecting from said front ferrule and being substantially the same longitudinal length as said front ferrule, and further having its rear end tapered to substantially match said tapered fron undercut of said rear ferrule, for axial wedging engagement therewith, and its front end tapered to be substantially flush with said front tapered section of said front ferrule;
a tip removable secured to said fron tapered section of said front ferrule and having a tapered undercut section to substantially match said front tapered section of said front ferrule for close engagement therewith and to substantially match said front tapered end of said blade, for axial wedging engagement therewith;
said axial wedging engagement of said blade with said tip and rear ferrule imparting through said front and rear end tapers of said blade, a transverse wedging engagement between said blade and said front ferrule;
whereby the tapered sections of the collet and the tip overlap and wedge the respective tapered ends of the blade to the front ferrule along the respective tapered sections of said front ferrule.

4,036,500

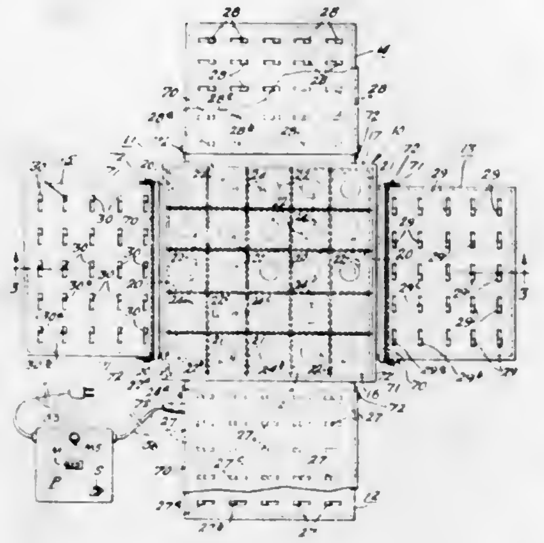
ELECTRICAL GAME DEVICE

James T. Kiernan, 2 Hamlet Road, Levittown, Pa. 19056

Filed Feb. 2, 1976, Ser. No. 654,477

Int. Cl.^{2} A63F *3/00*

U.S. Cl. 273—130 AB **7 Claims**



1. A game device, comprising:
a game board,
means dividing said game board into a series of playing spaces arranged in a preselected pattern,
electrically-energizable means carried by said board for separately illuminating said playing spaces,
at least two playing stations associated with said game board,
a series of control switches corresponding in number to said playing spaces and having actuators mounted at each playing station,
circuit means electrically connecting the switches at one playing station with the switches at the other playing station and with said illuminating means for said spaces so that one switch at each playing station controls the illumination of one of said playing spaces, and
means for supplying electrical power to said circuit means to illuminate each playing space for which an odd number of its control switches are in an on position and to prevent illumination of each playing space for which an even number of its control switches are in on position.

4,036,501

BOARD GAME APPARATUS

John Hovnanian, 1530 Hancock St., Arlington, Mass. 02174

Filed Sept. 24, 1975, Ser. No. 616,270

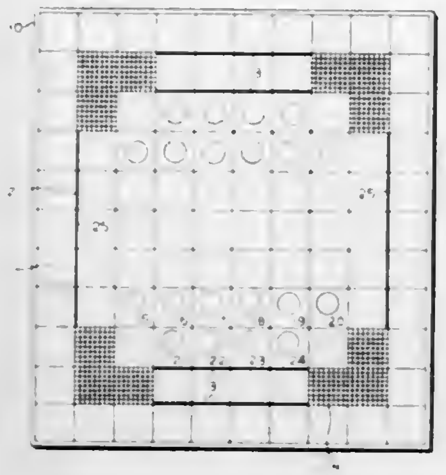
The portion of the term of this patent subsequent to Aug. 5, 1992, has been disclaimed.

Int. Cl.^{2} A63F *3/00*

U.S. Cl. 273—131 K **1 Claim**

1. A board game apparatus comprising a board and two sets of playing pieces, each set consisting of a single large piece, a single piece of smaller size, another single piece of smaller size than the aforementioned piece, and 7 pieces smaller than the last mentioned piece; said board having on its surface two sets of lines parallel to the sides of the board, the lines of one set being perpendicular to those of the other set, whereby 110 squares of equal size are provided, 38 of said squares forming a continuous path around the periphery of the board, the remaining squares being within said path and forming a major playing area, having at each of its corners an area equivalent in size and shape to three squares, said areas being of distinctive appearance and forming an L-shaped figure, two rows of four squares each between legs of the L-shaped figures and adjacent the

inside top and bottom edges of the continuous path, the remaining 52 squares being arranged in seven rows, the uppermost and lowermost rows each having six squares and the five central rows each having eight squares.



4,036,502
INDICATOR DEVICE

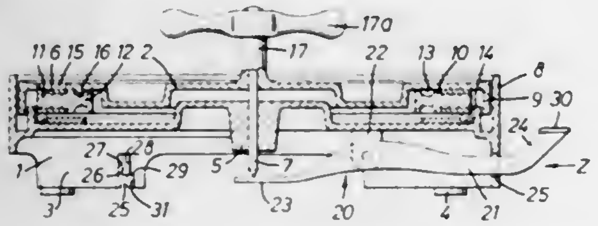
Barnett Levy, 8 Esterbrook Street, Westminster SW1P 4NL, London, England

Filed Mar. 29, 1976, Ser. No. 671,447

Claims priority, application United Kingdom, Apr. 2, 1975, 13540/75; Aug. 21, 1975, 34841/75

Int. Cl.² A63F *5/04*

U.S. Cl. 273—142 J **3 Claims**



1. An indicator device comprising a base member, a ring positioned on said base member, a plurality of characters arranged around said ring, a spindle passing through said base member at the center of said ring, a disc carried by said spindle for rotary movement relative to said ring about the center of said ring, a handle on said disc for rotating said disc relative to said base member, indicating means on said disc for indicating one of said plurality of characters, cooperating locating means on both said disc and said ring, said locating means engageable with each other for locating said indicating means in register with any one of said plurality of characters at which said indicating means may stop, said ring locating means entraining said ring when both said locating means are engaged and a lever mechanism acting on said spindle for moving said disc away from said base member to disengage said cooperating locating means and enable spinning of the disc.

4,036,503
PUZZLE GAME

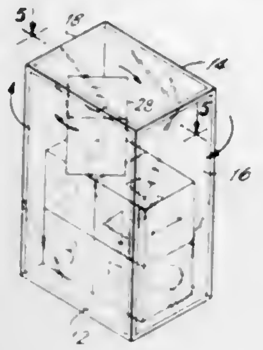
Martin Lance Golick, 217-02 75th Ave., Bayside, N.Y. 11364

Filed Jan. 28, 1976, Ser. No. 653,011

Int. Cl.² A63F *9/08*

U.S. Cl. 273—153 S **7 Claims**

1. A manipulative puzzle game comprising a substantially rectangular parallelepiped box having a bottom, a top, opposed side walls, a front wall and a back wall, the side walls of said box being narrower than said front wall and said back wall, said front wall being transparent, and a plurality of identically shaped regular polyhedrons, said polyhedrons being disposed within said box in a plurality of juxtaposed stacks, the number of said polyhedrons being one less than the capcity of said box for such polyhedrons, whereby one of the stacks of polyhedrons contains one less polyhedron than the balance of stacks or layers of polyhedrons, the width of the side walls of said box being slightly greater than the greatest distance between the vertices of opposed angles of a perimeter of a plane face of one of said polyhedrons, whereby careful manipulation of said box by horizontal twisting causes rotation of at least one of said polyhedrons about a central vertical axis, and the height of said box being slightly greater than the total height of one of the stacks of polyhedrons in said box to permit the upper polyhedron in said one stack to roll over about the vertex of a lower horizontal dihedral angle upon careful tilting of said box, at least one plane face of each of said polyhedrons bearing a visually distinguishing feature.



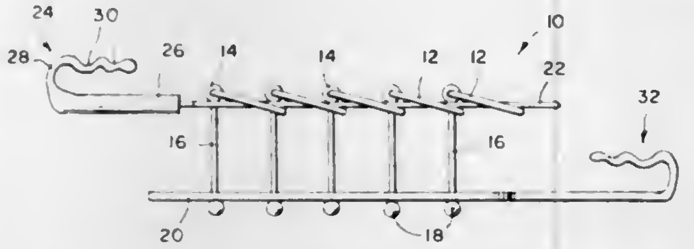
4,036,504
RING PUZZLE

Claude Touchette, 12 Lockport, Toronto, Ontario, Canada

Filed May 24, 1976, Ser. No. 689,176

Int. Cl.² A63F *9/08*

U.S. Cl. 273—158 **2 Claims**



1. In a puzzle having a plurality of postlike members and a plurality of ring-like members, said ringlike members being articulately attached adjacent the corresponding ends of respective ones of said post-like members, and an elongated, closed loop-like member in interlocking engagement with respective pairs of said post-like and ring-like members so that said loop-like member can normally be disengaged from said post-like and ring-like members only be a series of prescribed manipulations of all of said members, the improvement comprising

- a substantially U-shaped handle on one end of said loop-like member having separated portions for gripping by the thumb and fingers of one hand while the other hand manipulates said rings,
- the other ends of said post-like members being connected to an elongated base member, and
- a substantially U-shaped handle connected to one end of said base member,
- said U-shaped handle on said base member being on the other end of said puzzle than said U-shaped handle on said loop-like member.

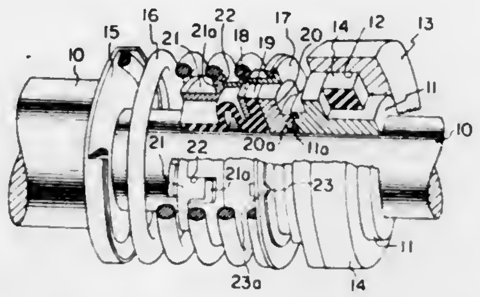
4,036,505
MECHANICAL SEALS

James R. Floyd; Paul N. Dalenberg, both of Saginaw, and Robert B. Slivensky, Bridgeport, all of Mich., assignors to The Wickes Corporation, San Diego, Calif.

Division of Ser. No. 442,186, Dec. 6, 1973, Pat. No. 3,969,451, which is a continuation of Ser. No. 143,789, May 17, 1971, abandoned. This application May 13, 1976, Ser. No. 686,039

Int. Cl.² F16J *15/34*

U.S. Cl. 277—96.2 **19 Claims**



1. A mechanical seal and seat assembly of the class wherein a relatively movable seal and seat therefor have confronting lapped sealing interfaces to seal off a fluid which wets the interface and wherein the seat has an interface microhardness in the range of at least about 200 kilograms per square millimeter, the seal being formed by homogeneously dispersing nonabrasive particles in a particulate matrix mix comprising hydrocarbon binder and graphite, compressing the mix and particles into seal form, and baking the seal to substantially dehydrogenize the binder to create a non-graphitic free carbon bond for the graphite and particles, the seal having said particles in said seal interface; and the particles having a microhardness in the range of at least about 200 kilograms per square millimeter and being of a size, hardness and shape to be nonabrasively smooth to the seat interface.

4,036,506
TILTABLE SLED

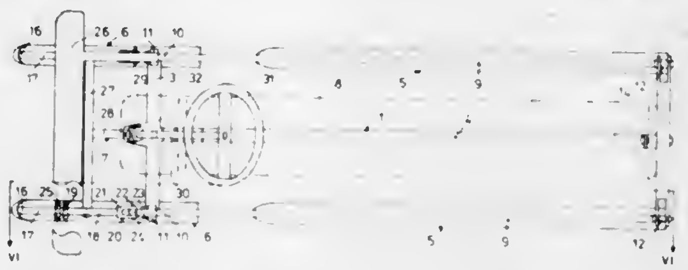
Rudi Scheib, Gartenstrasse 11, 7015 Korntal, Germany

Filed June 11, 1976, Ser. No. 695,285

Claims priority, application Germany, June 12, 1975, 2526169; Feb. 26, 1976, 2607748

Int. Cl.² B62M *27/02*

U.S. Cl. 280—21 A **24 Claims**



1. A sled including a sled-contact-surface comprising:

- a sled frame having two front steerable runners and two rear runners which are tiltable around canting axes running in the direction of travel each lying essentially parallel above the sled-contact-surface, said runners being connected with each other by at least one jointed-parallelogram which transfers canting motion;
- steering elements connected to said sled frame with each said front runner being situated tiltably in one of said steering elements;
- steering axles positioned essentially perpendicular to said sled-contact-surface, each of said steering elements being pivotable about a corresponding steering axle for steering motion relative to said sled frame; and
- cardanic joints connecting each of said front runners with corresponding rear runners for the transferral of said canting motion with said steering axle being intersected by the canting axis of the corresponding front runners, the canting axis of the corresponding rear runners, and the joint axes of said corresponding cardanic joints.

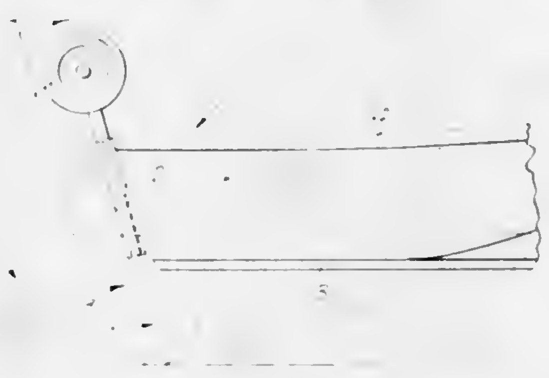
4,036,507
WHEELS AND ASSEMBLY FOR A BOAT

Eldon V. Henderson, Rte. 1, Box 204-H, West Sacramento, Calif. 95691

Filed Dec. 19, 1975, Ser. No. 642,253

Int. Cl.² B60P *3/10;* **B63C** *1/00*

U.S. Cl. 280—414 A **1 Claim**



1. A wheel assembly for a boat comprising a substantially U-shaped framework for vertical attachment to the stern of a boat, a substantially Y-shaped support bar having a pair of spaced apart arms fitted inside said U-shaped framework and slidably mounted for movement along the framework and a leg extending from said arms, a plurality of wheels mounted on the outer end of the leg of the support bar, a pivot means extending through said U-shaped framework and through elongate slots in the ends of said arms, said arms pivotally mounting said support bar to said framework with said slots permitting the support bar to move along said framework, means for locking the support bar and framework together including a transverse pin across the arms of the support bar and a plurality of notches in the ends of the U-shaped framework, said notches being adapted to lockingly receive the transverse pin after the support bar moves and thereby hold the wheels in contact with the road or upwardly in the air, and a spring between the support bar and the U-shaped framework for resiliently separating the bar and the framework a distance equal to the elongated slots to thereby assist in inserting the pin in the notches.

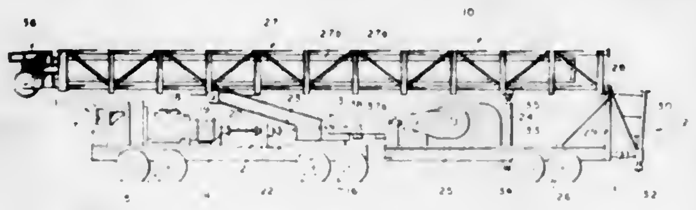
4,036,508
SELF-PROPELLED DRILLING AND WORKOVER RIG

Kenneth Harmon Eddy, and Kenneth Harmon McGill, both of Beaumont, Tex., assignors to Dresser Industries, Inc., Dallas, Tex.

Filed Nov. 25, 1974, Ser. No. 526,645

Int. Cl.² B60D *7/02*

U.S. Cl. 280—492 **2 Claims**



1. Self-propelled articulated mobile drilling apparatus transportable over uneven terrain to a remote drilling site, said apparatus comprising:

- a power vehicle having front and rear axle sets thereon;
- power generating means on said power vehicle adapted to propel said power vehicle;

a tandem vehicle attached to said power vehicle and having an axle set and a drawworks thereon;
rotatable compound attachment means attaching said tandem vehicle to said power vehicle and arranged to allow vertical and horizontal swivel movement simultaneously between said two vehicles;
a drilling mast structure carried on said tandem vehicle; and,
power transfer means on said two vehicles adapted to transfer power from said generating means to said drawworks wherein said attachment means further comprises:
  base plate means on said power vehicle;
  table means rotatably mounted on said plate means and attached thereto;
  elongated support means attached to said tandem vehicle an extending over said table means;
  rotatable attachment means between said support means and said table means arranged to provide vertical flexing of said support means on said table means; and,
  headrest means attached to said plate means and extending over said power vehicle; said headrest means arranged to support a mast structure extending from said tandem vehicle.

4,036,509
SKI BRAKE APPARATUS

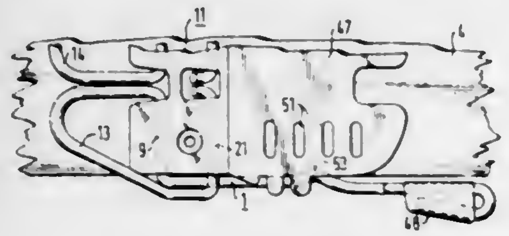
Gunter Schwarz, Steinacherstrasse 67, 8804 Au, Zurich, Switzerland

Filed July 11, 1975, Ser. No. 595,791

Claims priority, application Switzerland, July 17, 1974, 9863/74; Jan. 14, 1975, 478/75

Int. Cl.² A63C *7/10*

U.S. Cl. 280—605 **18 Claims**



1. A brake apparatus for a ski comprising two brake elements, each brake element incuding a pivotable brake arm, a brake shaft extending substantially perpendicularly from the brake arm and forming a pivot axis for said brake arm, said shaft being arranged substantially parallel to the upper surface of the ski and transverse to the longitudinal axis thereof, spring loop means connected to said shaft and adapted to be engaged and deformed by a ski boot for actuating an associated brake arm, said spring loop means comprising a bracket having a bent end mounted at the ski and spaced forwardly of the brake arm pivot axis in a longitudinal direction toward the tip of the ski, said bent end extending substantially parallel to said pivot axis, and means for pivotally mounting the shafts of said brake elements at the ski so as to be pivotable from a preparatory position in which said spring loop means are engaged by said ski boot and deformed so that the bracket is urged against the upper surface of the ski and the brake arms lie adjacent the sides of the ski into a braking position in which said spring loop means are at least partly disengaged from said ski boot so that the bracket is spaced above the upper surface of the ski and the brake arms extend at least partly beneath the lower surface of the ski, each of said brake arms having an outer end positioned forwardly in the direction of the ski tip with respect to the pivot axis of such brake arm when the brake arms are in said preparatory position.

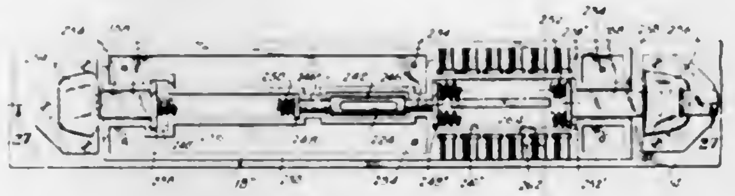
4,036,510
SAFETY SKI BINDING

Frank P. D'Alessio, Franklin Lakes, N.J., and Erl A. Koenig, Troy, N.Y., assignors to G P I, Franklin Lakes, N.J.

Division of Ser. No. 415,466, Nov. 13, 1973, Pat. No. 3,936,064, which is a continuation-in-part of Ser. No. 121,422, March 5, 1971, Pat. No. 3,838,866. This application Sept. 26, 1975, Ser. No. 617,230

Int. Cl.² A63C *9/08*

U.S. Cl. 280—613 **20 Claims**



1. A safety binding for releasably securing a boot to a ski having an upper surface, comprising a sole plate defining a housing; means for securing said boot to said sole plate; and first and second sets of means for releasably affixing said sole plate to said ski upper surface, said sets of means being shaped to permit both relative lateral and relative normal displacement of said ski and sole plate at both sets thereof, both of said sets of means including cooperative interengaging surfaces defining a pocket and a projection into said pocket, one of each of which surfaces is positioned on said ski and the other of each of which surfaces is positioned on said sole plate and the surfaces of each of which sets of means contact each other along an interfere shaped to cause said plate to be positioned laterally and normally relative to said ski upper surface in the region of both of said sets of means as said cooperating interengaging surfaces of each such set are concurrently impelled toward each other; means for impelling said surfaces in each of said sets toward each other concurrently, which impelling means includes front and rear plunger means mounted within said housing each of said front and rear plunger means defining, at an outer end thereof projecting forwardly and rearwardly respectively of said sole plate, one of said pocket and projection of each of said first and second sets of means respectively, said impelling means being sufficiently yielding to permit said cooperating interengaging surfaces of either of said sets of means to become disengaged from each other through relative displacement by motion having an axial component and either a lateral component, a normal component, or a combination of lateral and normal components due to the application of force moments counter-directional to the force moments imparted to said cooperating interengaging surfaces by said impelling means; and support means for mounting on said ski, one of said pocket and projection of the one of said first and second sets of means positioned forwardly of said sole plate, said support means including a sole plate engaging surface defining a convex curve in a plane substantially parallel to said ski upper surface, said impelling means being adapted such that a front surface of said sole plate normally abuts said sole plate engaging surface of said support means substantially in the region of the apex of the convex curve thereof when said sole plate is mounted on said ski to prevent forward motion of said sole plate during use.

4,036,511
CARBONLESS MANIFOLD BUSINESS FORMS

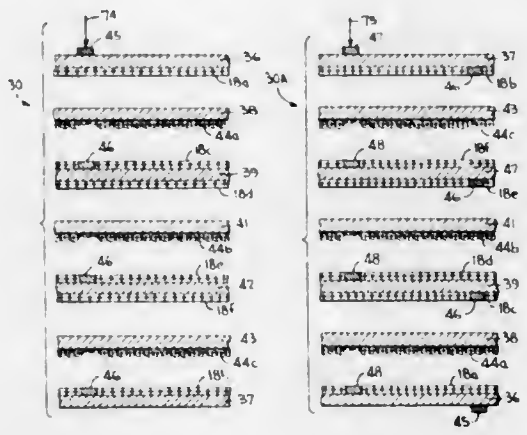
George E. Maalouf, Niagara Falls, N.Y., assignor to Moore Business Forms, Inc., Niagara Falls, N.Y.

Division of Ser. No. 561,623, March 24, 1975, Pat. No. 3,981,523. This application Mar. 8, 1976, Ser. No. 664,941

Int. Cl.² B41L *1/36;* **B41M** *5/22*

U.S. Cl. 282—27.5 **6 Claims**

1. A manifold set of carbonless recording sheets, comprising:
a stack including at least two superimposed sheets;
each of said sheets having on each of its surfaces, a coating comprising an initially colorless color forming reactive component,
a reactive component of each of the coatings of one of said sheets being capable of reacting to produce a colored mark with a reactive component of each of the coatings of a second of said sheets upon coming into reactive contact therewith,
said one sheet being disposed in overlying relationship to said second sheet such that one of its coatings is disposed against one of the coatings of said second sheet, whereby upon application of pressure to said stack, said one coating of said one sheet is forced into said reactive contact with said one coating of the second sheet to thereby produce a colored mark,
said sheets being capable of rearrangement such that said one sheet overlies said second sheet with its other coating disposed against the other coating of the second sheet, whereby upon application of pressure to said stack said other coating of said one sheet is forced into said reactive contact with said other coating of the second sheet to thereby produce another colored mark.



4,036,512
PIPE JOINTS

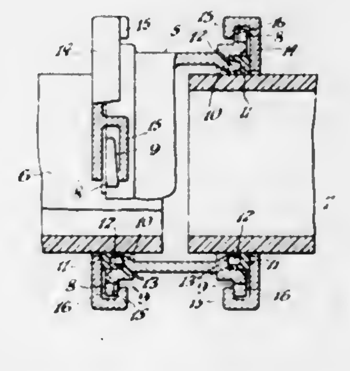
Robert Arthur Francis, 28 Skyline Drive, Keilor, Victoria, Australia

Filed Sept. 30, 1975, Ser. No. 619,972

Claims priority, application Australia, Oct. 1, 1974, 9113/74

Int. Cl.² F16L *17/00*

U.S. Cl. 285—111 **1 Claim**



1. A pipe joint for butt jointing of pipes comprising a sleeve adapted to receive and embrace the respective ends of pipes to be joined, a plurality of spaced apart radially projecting lugs at each end of the sleeve, said lugs having inner inclined wedging faces, and apertured closure for each end of said sleeve, spaced apart channeled flanges on said closures to engage the lugs on the sleeve to provide a bayonet type connection, said flanges being formed with stops to determine full engagement of said flanges with said lugs and being further formed with inner faces which are engaged by the wedging faces of said lugs; flanges integrally formed with said sleeve adjacent each end thereof and extending radially inwardly to form annular guides for said pipes, said flanges and the radially inner portions of said closures which are longitudinally spaced therefrom forming annular recesses about the pipe ends, resilient generally V-shaped sealing rings mounted in said annular recesses, each of said sealing rings comprising an annular groove defined by generally flat, inwardly directed peripheral lips and being formed with circumferentially spaced and radially arranged reinforcing webs, the inner surface of the outer flange of each closure bearing directly against the outer face of each respective sealing ring to press the sealing ring into said annular recess and effect initial sealing engagement of the peripheral lips with the sleeve and respective pipes, with the fluid pressure in the pipes resulting in continued sealing pressure being exerted on said peripheral lips to respectively sealingly engage the same with the adjacent inner surface of the sleeve and the adjacent outer surface of the respective pipes.

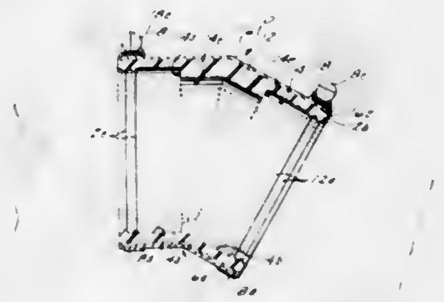
4,036,513
PIPE FITTING

Edward J. Loftus, Orange, Calif., and Gerald F. Hofberger, Peoria, Ariz., assignors to Gerald F. Hofberger, Peoria, Ariz.

Filed Feb. 2, 1976, Ser. No. 654,095

Int. Cl.² F16L *21/06*

U.S. Cl. 285—179 **3 Claims**



1. A pipe fitting comprising in combination:
a rigid sheet metal sleeve formed from two angularly disposed cylindrical portions the inner peripheral edges of which intersect and are joined along a common plane disposed transverse and at an angle to both cylindrical portions,
both longitudinal axes of the cylindrical portions lying in a single plane which is perpendicular to the common plane,
the adjacent cylindrical portions disposed in the single plane meeting at an obtuse angle which is bisected by the common plane,
a thick-walled annular resilient member disposed within and lining the sheet metal sleeve,
the end portions of the resilient member having an annular enlarged internal diameter section for receiving the ends of pipes,
the enlarged internal diameter sections extending inwardly such that a thickened central V-shaped section is left in the central section of the resilient member as viewed in the single plane, the angle included in the V-shaped section being the supplement of the obtuse angle,
the inner surface of the central V-shaped section being dimensioned to be in line with the internal surfaces of the two pipes to be received in the annular enlarged internal diameter sections so as to provide smooth uninterrupted liquid flow,
the sheet metal sleeve is split and the edges substantially overlap each other to provide for circumferential dimensional adjustment, and
clamping means comprising a circumferential clamp adjacent each free end of the sheet metal sleeve to provide firm gripping of the ends of the pipes which are inserted within the annular enlarged internal diameter sections of the thick-walled annular resilient member.

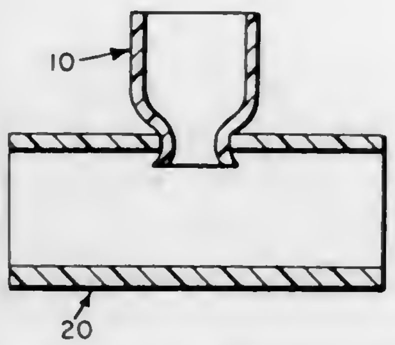
4,036,514
PIPE FITTING

Finn Hannover, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 265,993, June 26, 1972, abandoned, which is a continuation-in-part of Ser. No. 212,465, Dec. 27, 1971, abandoned. This application Oct. 23, 1974, Ser. No. 517,225

Int. Cl.² F16L *41/00*

U.S. Cl. 285—222 **6 Claims**



1. An article of manufacture comprising a tubular pipe fitting of unitary construction of solid organic polymeric material throughout, said solid organic polymeric material having the property, after being cold formed, of being permanently and irreversibly heat-expandable, said tubular pipe fitting for connecting a branch pipe to a main pipe of larger diameter than said branch pipe, sad tubular pipe fitting having a first and second tubular body portion, only said second tubular body portion being cold formed,

said first tubular body portion being of substantially uniform internal and external diameters, adapted to be bonded at one end to said branch pipe, and integrally connected at its other end to

said second cold-formed and heat-expandable tubular body portion having an internal and external diameter at its terminus which is less than the external diameter of said first tubular body portion and which is adapted to be inserted into an opening in said main pipe and, upon heating, expand permanently and irreversibly to increase the internal and the external terminus diameters; to directly tightly engage said opening and firmly interlock with said main pipe.

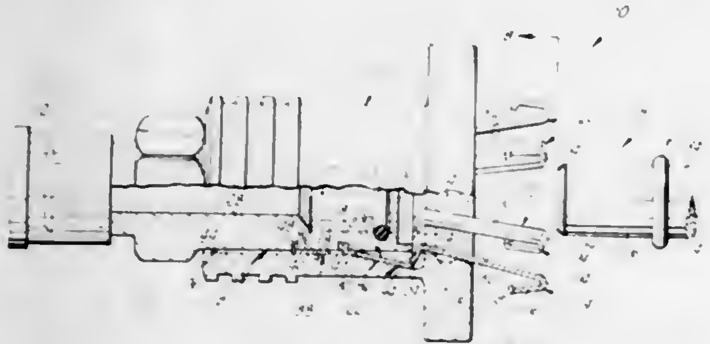
4,036,515
COUPLING ASSEMBLY

Thomas D. Karcher, Rocky River, and Richard J. Silagy, Parma, both of Ohio, assignors to The Hansen Manufacturing Co., Cleveland, Ohio

Filed Jan. 14, 1976, Ser. No. 649,092

Int. Cl.² F16L *37/18*

U.S. Cl. 285—315 **21 Claims**



1. A coupling assembly for connecting a pair of conduits in fluid communication, said coupling assembly comprising a socket body adapted to be connected with one of said conduits, said socket body including means for defining a socket chamber, a plug body adapted to be telescopically received in said socket chamber, said plug body having a longitudinally extending side surface and an annular retaining surface, a plurality of longitudinally extending spring fingers connected with the said socket body and resiliently deflectable sidewardly between an engaged position holding said plug body against axial and sidewise movement relative to said socket body and a disengaged position in which said spring fingers are ineffective to hold said plug body against movement relative to said socket body, each of said spring fingers including first surface means for engaging said annular retaining surface on said plug body to hold said plug body against axial movement relative to said socket body and a second surface means connected with and extending away from said first surface means for engaging said longitudinally extending side surface of said plug body to hold said plug body against sidewise movement relative to said socket body, said second surface means including a longitudinally extending side surface which extends parallel to and is disposed in abutting engagement with said side surface of said plug body throughout the length of said longitudinally extending side surface of said second surface means to grip said plug body between said spring fingers and hold said plug body against sidewise movement when said spring fingers are in said engaged position, said socket body including surface means for defining a plurality of spaced apart openings in an outer side surface of said socket body, each of said spring fingers having at least a pair of spaced apart projections which are received in said opening in said outer side surface of said socket body to retain said spring fingers against axial movement relative to said socket body.

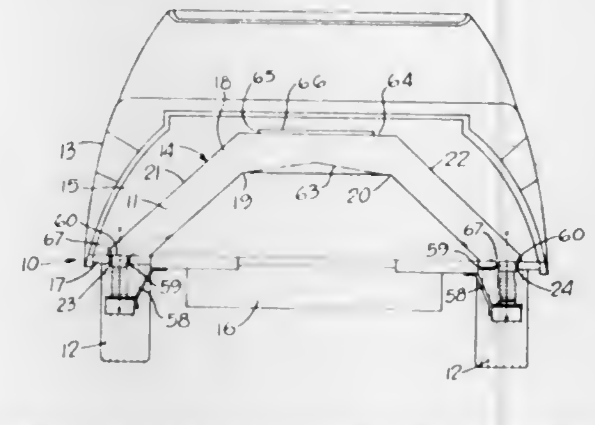
4,036,516
SAND DISPENSING DEVICE FOR A MOTOR VEHICLE

Frank Oldham, 113 Green Ave., Hempstead, N.Y. 11550

Filed July 7, 1975, Ser. No. 593,877

Int. Cl.² B60B *39/06;* **B61C** *15/10*

U.S. Cl. 291—38 **2 Claims**



1. A sanding device for a motor vehicle having a pair of rear wheels, a floor board, an interior compartment, and a trunk, which comprises:

- a. a sand storage unit having a pair of open ends and a top base with a threaded aperture therein;
- b. hollow rectangularly shaped members having open ends affixed at one of said ends to each of said open ends of said storage unit;
- c. cylindrical sleeve members affixed linearly to one of said other open ends of each of said rectangularly shaped members, each said sleeve member adapted to be received through said floor board;
- d. chute assemblies affixed linearly onto each of said sleeve members, each of said chutes disposed below said floor board;
- e. dispensing unit assemblies affixed linearly onto each of said chute assemblies;
- f. means for opening and closing each said dispensing unit, wherein each said dispensing unit has a closed bottom base and a movable end wall, said movable end wall of each said dispensing unit affixed to one end of one of a plurality of cables, said movable end wall of each said dispensing unit being rotated upwardly by application of tension to each said cable;
- g. a common cable element, one end of said common cable element joined to said other end of each said cable within an interior of said motor vehicle;
- h. a lever arm having a handle end and a cable mounting end rotatably adapted to be mounted at its center onto a central hub of a steering wheel, said cable mounting end of said lever arm joined to another end of said common cable element; and
- i. a tension spring joined between said cable mounting end of said lever arm and a C-clamp mounted on a steering column.

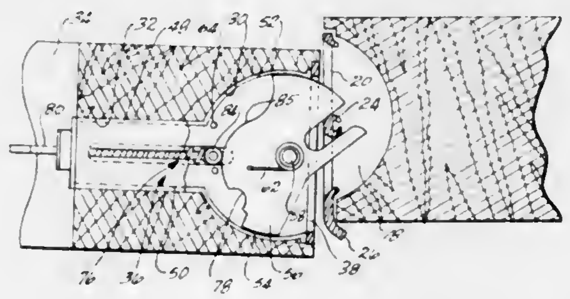
4,036,517
ROTARY DOOR LATCH

Samuel I. Talmadge, 1350 Almayo Ave., Los Angeles, Calif. 90064

Continuation-in-part of Ser. No. 577,180, May 14, 1975, abandoned. This application Feb. 23, 1976, Ser. No. 660,111

Int. Cl.² E05C *19/02*

U.S. Cl. 292—216 **14 Claims**



1. A door closure for latching a hinged door to a door jamb, comprising a striker plate on the jamb having a surface tangent to the arcuate path of the outer edge of the door, the striker plate having a pair of openings forming a vertically extending post between the openings and a lip extending beyond the edge of the jamb in the direction that the door swings open, a latch assembly mounted on the door along the outer edge opposite the position of the striker plate, the latch assembly including a frame recessed in the door, a rotary latch member pivotally supported in the frame for rotation about a vertical axis, the latch member being rotatable between an open and a closed position, the latch member having a portion projecting beyond the edge of the door toward the jamb when the latch is in the open position, the projecting portion having a surface extending outwardly in a direction away from the pivot at small angle in a direction away from the jamb to produce a wedging action when brought into contract with the lip of the striker plate as the door is moved toward the closed position, the movement of said surface of the projecting portion against the lip of the striker plate causing the latch member to rotate about said vertical axis, the rotary latch member having a notch opening radially outwardly from the pivot in a direction parallel to the edge of the door when the latch is in the open position, the relative movement between the door and striker plate rotating the latch member so that the post engages the notch causing continued rotation of the latch member to the closed position as the door swings fully shut, and releasable detent means locking the latch member in the closed position.

4,036,518
DOOR BRACE

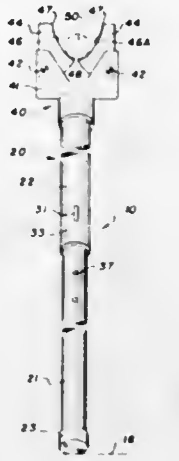
Eduard Jost, 656 E. 45th Ave., Vancouver, British Columbia, Canada (V5W 1Y7)

Filed June 21, 1976, Ser. No. 697,993

Int. Cl.² E05C *17/54*

U.S. Cl. 292—339 **2 Claims**

1. A brace for a door comprising a telescopic rod having upper and lower ends, means for selectively adjusting the length of the rod, a floor-gripping member on the lower end, a head fitted to the upper end, a pair of jaws mounted on the head, pivot means securing each jaw to the head for swinging movement between handle-gripping and handle-releasing positions, said pair of jaws having opposing edges provided with non-skid surfaces, said opposing edges having opposite curvature and being spaced with respect to the pivot means whereby a force applied to open the door tends to tighten the grip of the pair of jaws upon the handle.



4,036,519
STREAMLINING APPARATUS FOR ARTICULATED ROAD VEHICLE

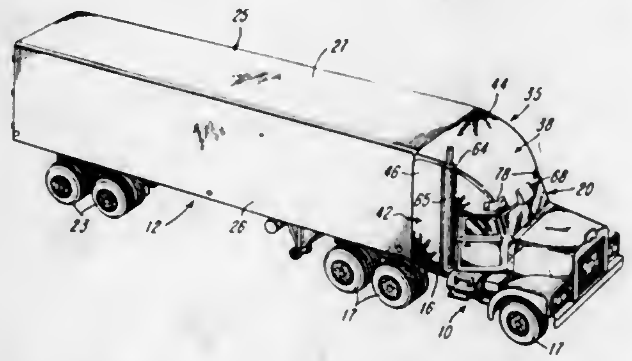
Ronald A. Servais, Dayton; Paul T. Bauer, Bellbrook, and Alan F. Meckstroth, Dayton, all of Ohio, assignors to Aerospan Corporation, Dayton, Ohio

Continuation of Ser. No. 500,075, Aug. 23, 1974, Pat. No. 3,945,677. This application Mar. 17, 1976, Ser. No. 667,632

The portion of the term of this patent subsequent to Mar. 23, 1993, has been disclaimed.

Int. Cl.² B62D *35/00*

U.S. Cl. 296—1 S **10 Claims**

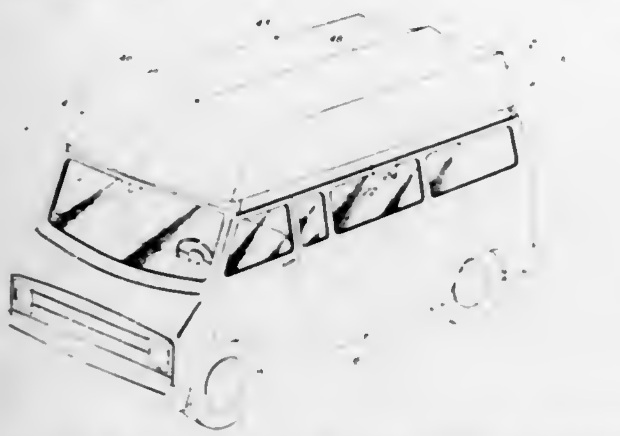


1. Apparatus for mounting on a wheel supported road vehicle to streamline the flow of air past the vehicle and to reduce the aerodynamic drag on the vehicle, said apparatus comprising an air enclosure member defining an air chamber and including a flexible wall, means for mounting said enclosure member on the vehicle in a position where said flexible wall projects outwardly from the vehicle and is exposed to the flow of air past the vehicle when the vehicle is moving forwardly along a road, said flexible wall being capable of collapsing inwardly in response to the pressure exerted by the flow of air past the vehicle, means defining a ram air inlet for said air enclosure member, said air inlet being positioned to receive a small portion of the air flowing past the vehicle for pressurizing said chamber with sufficient pressure to avoid collapsing of said flexible wall, and the forward projected area of said inlet is substantially small relative to the forward projected area of said air enclosure member to minimize aerodynamic drag associated with said air inlet.

4,036,520
COMBINATION RECREATIONAL VEHICLE ATTACHMENT

Samuel J. Zuidema, 87 Bearfoot Road, West Milford, N.J. 07480

Filed May 10, 1976, Ser. No. 685,032
Int. Cl.^{2} B60D *3/10*
U.S. Cl. 296—23 B **17 Claims**



1. A recreational vehicle boat-roof structure attachment situated in place of and out of the plane of the original vehicle roof wherein; after removal of substantially all of the original vehicle roof, a perimeter strip of said original roof remains which merges into a perimeter drip rail channel concavity comprising in combination:

a boat structure dimensioned to cover said vehicle roof area;

a boat lip extending around the perimeter of the gunwhale of said boat structure being in a perpendicular relation to and displaced a slight distance from the gunwhale edge;

a wedging boat support lip extending continuously about the perimeter of and resting upon said original roof strip, wedging boat said support lip having a concave lower surface, conforming to the slope of said original roof, and three flat surfaces, an outer surface and said concave surface merging into a narrow edge which rests in said drip rail channel concavity;

securing means to extend through said outer and concave wedging boat support lip surfaces into said original roof strip;

a layer of caulking substance between said original roof strip and said concave wedging boat support lip surface;

a continuous strip of weather stripping upon the upper surface of said wedging boat support lip;

a rectangular indentation within the upper corner of said outer surface of said wedging boat support lip;

a continuous strip of adhesive substance secured within said rectangular indentation;

latch means secured to the inner surface of said wedging boat support lip to attach to and secure said recreational vehicle boat-roof structure attachment to said vehicle; and

roller means secured to the inner surface of said wedging boat support lip, being placed near the rear of said vehicle to accommodate said gunwhale edge and to assist removal of said recreational vehicle boatroof structure attachment when moved 90° from the rest position.

4,036,521
TRUCK COVER ASSEMBLY

Alain Jean-Marie Clenet, 369 Paseo de Playa No. 111, Ventura, Calif. 93001

Filed Dec. 23, 1974, Ser. No. 535,365
Int. Cl.^{2} B60P *7/02*
U.S. Cl. 296—100 **4 Claims**

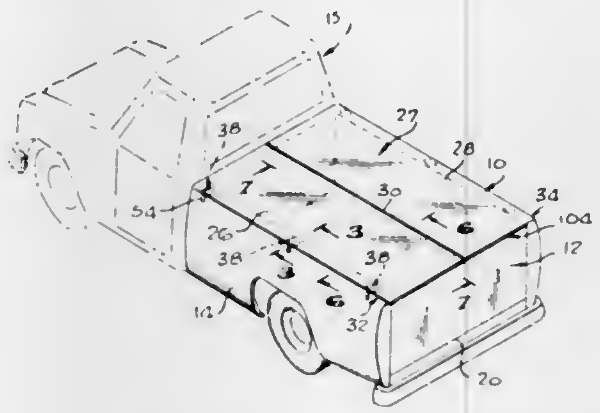
4. Apparatus for covering an open body of a truck that has opposite truck body sides comprising:

a cover formed of flexible sheet material and having first and second opposite outer edge portions and an inner portion between said outer edge portions; and

first and second mount means for mounting the respective outer edge portion of said cover on the opposite truck body sides;

said first mount means including a lever having innner and outer lever portions, means for pivotally supporting the inner lever portion, and a plurality of latches spaced along the length of said lever, each engagable with only one location along said lever;

said outer lever portion being attached to said first outer edge portion of said cover and said lever being pivotable between a release position and a latched position, said outer lever portion of said cover lying further from said second outer edge portion when said lever is in said latched position than when said lever is in said release position, so that when the lever is pivoted from said release position to said latched position the cover is pulled taut, and said latches being constructed to engage portions of said lever when said lever is pivoted to said latched position;

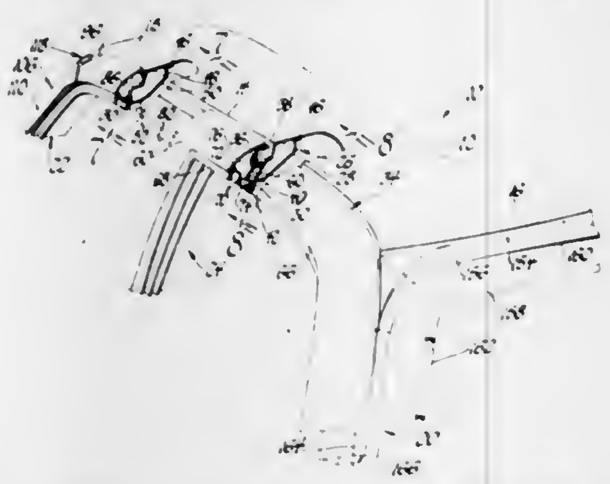


said lever extending along a majority of the length of a corresponding truck body side wall, and being constructed so it can twist 90° along its length without permanently deforming, whereby different locations along said lever can be separately pressed into engagement with a latch to facilitate moving the entire lever to its latched position.

4,036,522
VEHICLE BODY ROOF CONSTRUCTION

Delbert D. DeRees, Utica, Mich., and Jacques Emile Pinsonneault, Windsor, Canada, assignors to American Motors Corporation, Detroit, Mich.

Filed Apr. 2, 1976, Ser. No. 673,174
Int. Cl.^{2} B60J *9/00*
U.S. Cl. 296—154 **24 Claims**

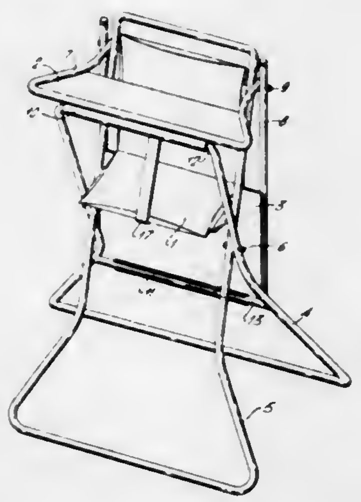


12. A vehicle body roof construction comprising: a roof panel including a first edge portion for defining the upper extremity of a longitudinal opening and a second edge portion that has a juncture with the first edge portion and defines a lateral side extremity of the roof; a pillar for supporting the roof panel at the juncture of the edge portions thereof and including pillar inner and outer members that define an enclosed chamber; each of said pillar members including first and second portions that respectively project along the first and second edge portions of the roof panel in a spaced relationship to each other; said first and second projecting pillar portions including depressions where the pillar inner and outer members are interengaged along the cross sections of the projecting portions and welded to each other in a spaced relationship from the juncture of the roof panel edge portions so as to enclose the chamber defined between the pillar members and to provide a pillar capable of interconnecting a header member along the first roof panel edge portion and a roof rail member along the second edge portion of the roof panel without requiring the pillar inner member to have any access welding holes.

4,036,523
CHILD'S CHAIR

Knud Nielsen, Mosebakken 16, 2830 Virum, Denmark

Filed Sept. 22, 1975, Ser. No. 615,877
Claims priority, application Denmark, Sept. 25, 1974, 5055/74
Int. Cl.^{2} A47C *4/00*
U.S. Cl. 297—130 **16 Claims**



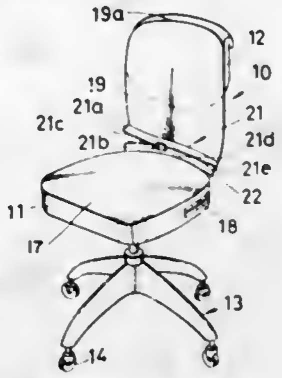
1. A collapsible child's chair comprising first and second, generally planar frames each having opposite ends, pivot means pivoting said frames together intermediate their opposite ends for pivoting movement between an erect and a collapsed condition, first and second substantially rigid linking means each securable to both of said frames to maintain said frames in said erect condition, each said first and second frames having portions extending to opposite sides of said pivot means, each of said linking means being connected to one of said frames at a portion thereof at one side of said pivot means and one of said linking means being connected to the other of said frames at portions thereof on opposite sides of said pivot means, at least one of said linking means having one end thereof permanently and pivotally secured to said frames and the other end thereof being releasably secured to the other of said frames and at least one end of the other of said linking means being releasably secured to one of said frames.

4,036,524
CHAIR

Ikuo Takamatsu, Uozu, Japan, assignor to Yoshida Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 22, 1976, Ser. No. 651,402
Claims priority, application Japan, Feb. 6, 1975, 5017107[U]
Int. Cl.^{2} A47C *27/00*
U.S. Cl. 297—219 **2 Claims**

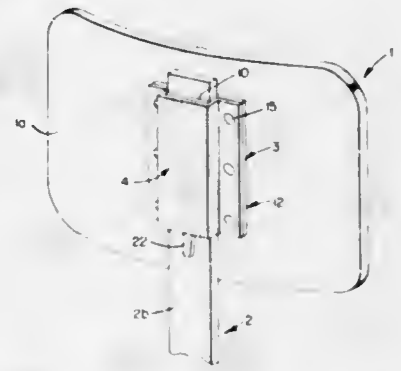
1. In combination, a chair having a seat with an upper surface and a free rear upper marginal edge, support means depending from said seat, a back-rest supported in spaced relation above said seat and in general alignment with the free rear upper marginal edge of said seat, said back-rest having a free upper edge and a free front face, a single sheet protective cover of a width substantially equal to the width of the back-rest, said cover having a top edge engaged with and over the free upper edge of the back-rest, and a lower edge generally paralleling the free rear upper marginal edge of the seat in adjacent spaced relation thereabove, a separable sliding clasp fastener comprising a pair of stringers, one of said stringers being secured to and along said lower edge of the cover and depending therefore, the second of said stringers being secured to the free rear upper marginal edge of said seat and extending upwardly therefrom, said sliding clasp fastener further including a slider releasabiy interlocking said stringers, and thereby said back-rest cover and said seat, and providing a continuous exposed surface between the back-rest and the free upper marginal rear edge and upper surface of the seat.



4,036,525
BACKREST ADJUSTMENT MECHANISM

Victor G. Howk, Sturgis, Mich., assignor to GF Business Equipment, Inc., Youngstown, Ohio

Filed Apr. 8, 1976, Ser. No. 674,959
Int. Cl.^{2} A47C *1/00*
U.S. Cl. 297—353 **9 Claims**



1. A mounting and adjustment assembly for attaching a rest member to an upright post member including, a housing secured to said rest member, said housing provided with a vertical channel juxtaposed said rest member, said post member slideably disposed within said channel, displaceable actuating means disposed within said housing channel, said actuating means provided with catch means, attachment means within said housing channel securing said actuating means therein and allowing limited displacement thereof, said attachment means comprising a planar retainer plate fixedly disposed within said housing channel, said plate provided with a cutout including an arcuate bearing section, said actuating means comprising a lever having a planar circular bearing portion journalled within said plate bearing section, said lever catch means projecting from the plane of said circular bearing portion toward said post member lock means, a plurality of lock means on said post member, spring means normally urging said catch means to engage one said lock means to immobilize said rest member relative said post member and a finger portion on said lever accessible from outside said housing and manually operable to displace said catch means against the force of said spring means to disengage said catch means from said post member lock means to allow vertical adjustment of said rest member relative said post member.

4,036,526

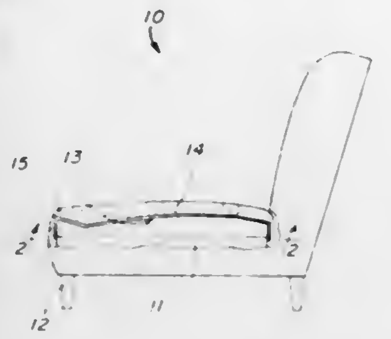
FURNITURE SPRING SUPPORT

William G. Baechle, 1710 Russell Ave., Evansville, Ind. 47712, and Edward L. Roehm, B-4 Old Courthouse, Evansville, Ind. 47708

Filed Aug. 16, 1976, Ser. No. 714,775

Int. Cl.^{2} A47C *7/02*

U.S. Cl. 297—452 **10 Claims**



1. A spring support for a piece of furniture comprising:

a plastic sheet to be incorporated into a piece of furniture, said sheet extending laterally across to form a seat and including a generally center portion to supportingly receive a person with said center portion having a generally curved convex configuration as viewed from above, said sheet further including a front end portion and a first intermediate portion between said front end portion and said center portion and further including a back end portion and a second intermediate portion between said back end portion and said center portion, said sheet including a straight longitudinal axis extending from said front edge portion to said back edge portion, said first intermediate portion and said second intermediate portion being integral with said center portion and being located along said longitudinal axis outwardly of said center portion, said first intermediate portion and said second intermediate portion each having a cross sectional area less than said center portion and less than said front end portion and less than said back end portion providing a greater downward deflection of said first intermediate portion and of said second intermediate portion than of said center portion when a person is sitting atop of said center portion.

4,036,527

TRANSPORTATION SEATING CONSTRUCTION AND SYSTEM

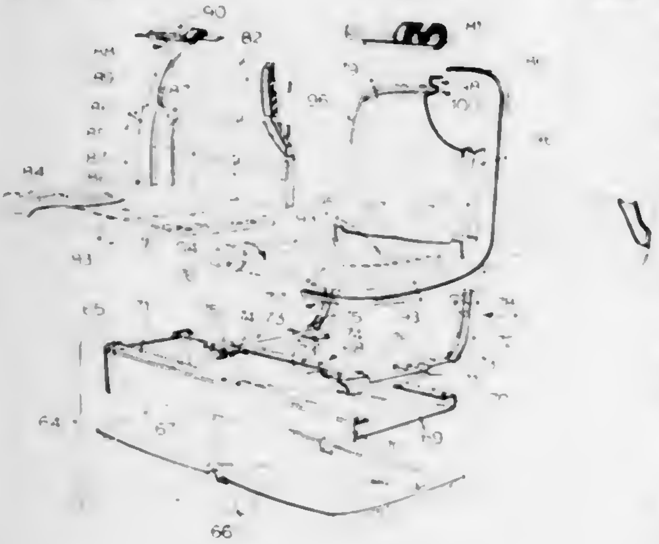
Thomas L. Faul, Toronto, Canada, assignor to Otaco Limited, Orilia, Canada

Filed Oct. 15, 1975, Ser. No. 622,652

Claims priority, application United Kingdom, Apr. 10, 1975, 14858/75

Int. Cl.^{2} A47C *7/02*

U.S. Cl. 297—454 **19 Claims**



1. A frameless, stressed skin seat construction adapted for direct attachment without frame members either to others of its kind or to a support component, comprising:

an integral sheet metal seat pan formed to define (a) inverted U-shaped portions at opposite side for contributing beam strength to the sides, (b) a convex upward cylindrical surface spanning the front for providing load supporting capability to the front, and (c) a concave upward dished portion in the rear half of the seat pan for providing torsion resistance to the seat pan as a whole;

an integral sheet metal back pan formed to define (d) rearward opening U-shaped portions at opposite sides for contributing beam strength to the sides (e) a concave forward dished portion in the lower half of the back pan for providing torsion resistance to the back pan as a whole, and (f) a rearwardly opening U-shaped channel at the top for providing beam strength to the top;

the seat pan and back pan being secured together such that the securement is weaker than the pans themselves, whereby sufficient force exerted to fold the pans together will cause buckling of the securement rather than bending of said pans.

4,036,528

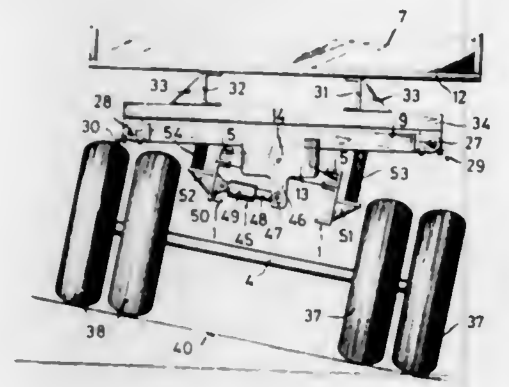
TRUCK WITH TILTABLE BODY

Heinrich Langendorf, Bahnhofstrasse 115, 4355 Waltrop, Germany

Filed Oct. 14, 1975, Ser. No. 622,065

Int. Cl.^{2} B60P *1/16*

U.S. Cl. 298—17 S **7 Claims**



1. A tipping vehicle comprising a chassis and a tipping body which initially rests on a front frame member and can be inclined backwards by pivoting about a rear axis contained in a rear tipping member by means of an elevating mechanism mounted on the chassis, the rear tipping member being mounted on the chassis for pivotal movement about an axis extending in the longitudinal direction of the vehicle and drive means for pivoting the rear tipping member being coupled between the rear tipping member and the frame, whereby after the tipping body has been lifted from the front frame member, the rear tipping member and the elevating mechanism pivot until the transverse direction of the tipping body is horizontal, said drive means comprises at least one thrust piston unit pivotally connected both to the rear tipping member and to the chassis.

4,036,529

SUPPORT SYSTEM FOR A UNITIZED PAIR OF AUGER CONVEYORS

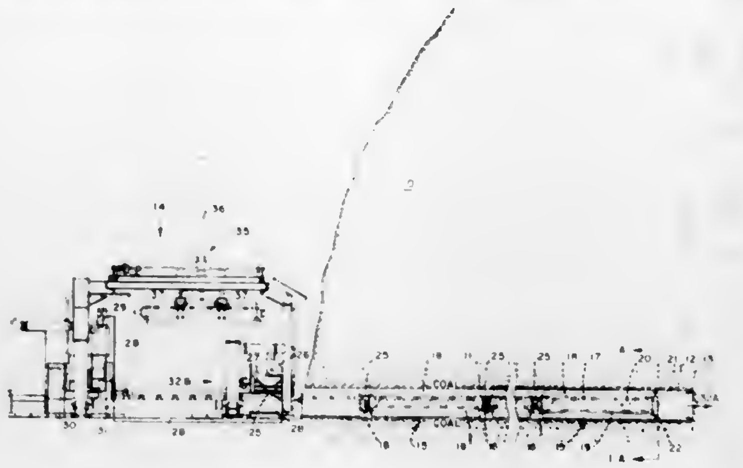
Arthur L. Hawthorne, St. Clairsville, Ohio, and David R. Hazen, McMurray, Pa., assignors to Continental Oil Company, Ponca City, Okla.

Filed May 2, 1975, Ser. No. 574,135

Int. Cl.^{2} E21C *27/22*

U.S. Cl. 299—19 **5 Claims**

1. In an auger mining system which forms an opening comprising a pair of axially aligned cylindrical holes in the earth, said opening having a bottom, said system having a pair of side-by-side auger conveyors, each auger having a shaft and a flight around said shaft, which shafts are journaled through bearings at each end to a spacing member and wherein said spacing members are rigidly tied to each other by a longitudinal member having an underside and a supporting apparatus comprising an elongated skid means attached to the underside of said longitudinal member of said suger pair and extending to the bottom of said opening.



4,036,530

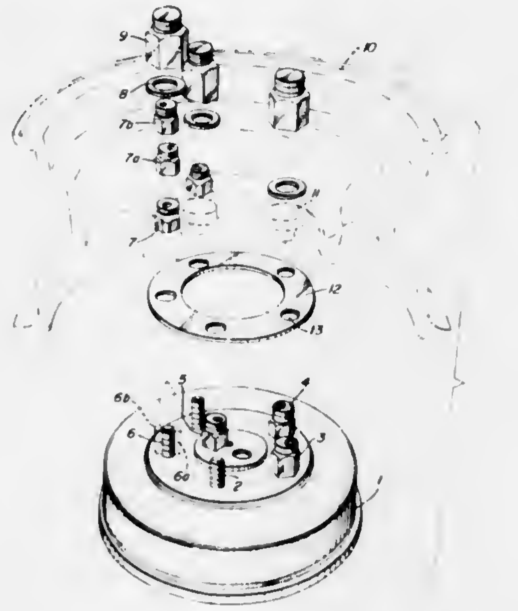
WHEEL ADAPTOR DEVICE

Merlyn R. Reppert, Torrance, Calif., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 521,026, Nov. 5, 1974, abandoned. This application Apr. 7, 1975, Ser. No. 565,352

Int. Cl.^{2} B60B *3/16*

U.S. Cl. 301—9 DN **8 Claims**



1. In combination, a vehicle wheel having a circle of round mounting holes therein, a set of adaptor bolts for mounting said vehicle wheel onto a circle of vehicle wheel mounting studs, wherein said mounting holes, said bolts, and said studs are all equal in number but said mounting holes and said studs may be located on different diameter circles, each said adaptor bolt comprising an internally threaded bore for cooperation with a mounting stud, said bolt being small enough to fit entirely through a wheel mounting hole, said bolt having external threads adapted to mate with means to hold said wheel on said studs, and said internally threaded bore being eccentrically located in said adaptor bolt with respect to said external threads, whereby said adaptor bolts can mount a wheel formed with one diameter circle of openings onto any one of a plurality of different circle diameters of wheel mounting studs.

4,036,531

VALVE FOR A PULSE-WAVE PNEUMATIC CONVEYANCE INSTALLATION

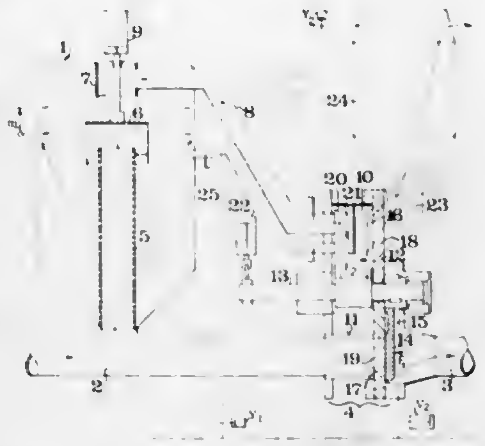
Otto Rusterholz, Via G.A. Borgese 14, Milan, Italy

Filed May 10, 1976, Ser. No. 684,779

Claims priority, application Italy, May 16, 1975, 23390/75

Int. Cl.^{2} B65G *53/58*

U.S. Cl. 302—26 **9 Claims**



1. A valve device particularly adapted for cyclically cutting off the flow of a carried fluid (air) and of a solid incoherent material in a pneumatic conveyance installation in which the advance of said fluid and said material takes place by the agency of cyclical pulse waves, said valve device comprising a housing and valve elements; said housing including a body, first and second end plates, and a discharge conduit; said end plates and said body in combination defining a valve chamber, said valve elements including a shaft rotatably journalled in said housing and passing through at least said valve chamber and said second end plate, first and second entrance passages through said first end plate into said valve chamber, a first vane carried by said shaft for rotation therewith and cooperation with said first end plate selectively separately to close said entrance passages, a vent passage from said valve chamber through said second end plate, a second vane carried by said shaft for rotation therewith and for cooperation with said second end plate for closing said vent passage at a time when said first vane has closed said second entrance passage, a discharge passage through said second end plate from said valve chamber remote from said vent passage, a supply passage through said second end plate adjacent said discharge passage and independent of said valve chamber, said discharge passage and said supply passage opening into said discharge conduit, and a third vane carried by said shaft for rotation therewith and for cooperation with said second end plate for closing said discharge passage and said supply passage when said first entrance passage is closed and said second entrance passage and said vent passage are open, the relationship of said vanes and said passages being one wherein when said shaft is rotated to open said first entrance passage said vent passage and said second entrance passage are closed and said discharge passage and said supply passage are open.

4,036,532

FLUIDIZING OUTLET

Jerry D. Waddell, O'Fallon, and John J. Scheeter, St. Charles, both of Mo., assignors to ACF Industries, Incorporated, New York, N.Y.

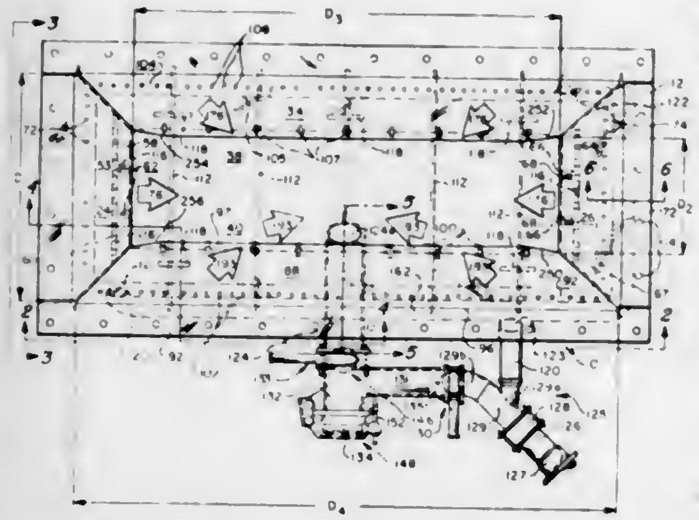
Continuation-in-part of Ser. No. 616,508, Sept. 24, 1975, abandoned. This application Sept. 27, 1976, Ser. No. 727,030

Int. Cl.^{2} B65G *53/36*

U.S. Cl. 302—53 **16 Claims**

1. A fluidizing outlet comprising:

a bottom pan inclined downwardly from an upper mounting flange for mounting on a hopper; at least one plenum sheet extending from said mounting flange downwardly; said plenum sheet and said bottom pan defining therebetween a plenum chamber; at least a portion of said plenum sheet at the lower edge thereof being spaced from the bottom pan within the range of about 0.03 to about 0.04 inches to define first fluidizing openings; said first fluidizing openings being sufficient to effect fluidization of particulate lading, being sufficient that the openings are not readily clogged during operation, and being sufficient to obtain substantially complete removal of the lading during unloading; said plenum sheet having a plurality of second fluidizing openings spaced from said lower edge of said plenum sheet in communication with said plenum chamber and extending through said plenum sheet and being spaced from each other within the range of about 0.75 to about 1.25 inches and of a size within the range of from about 0.002 to about 0.004 in.^{2} and sufficient to effect fluidization of particulate lading, sufficient that the openings are not readily clogged during operation, and sufficient to obtain substantially complete removal of the lading during unloading; and means for supplying fluidizing air to said plenum chamber whereby said fluidizing air may pass through said first and second fluidizing openings to fluidize the lading.



4,036,533

FORCE LIMITING DEVICE FOR A PARKING BRAKE ACTUATOR ARRANGED IN SERIES WITH A SERVICE BRAKE ACTUATOR

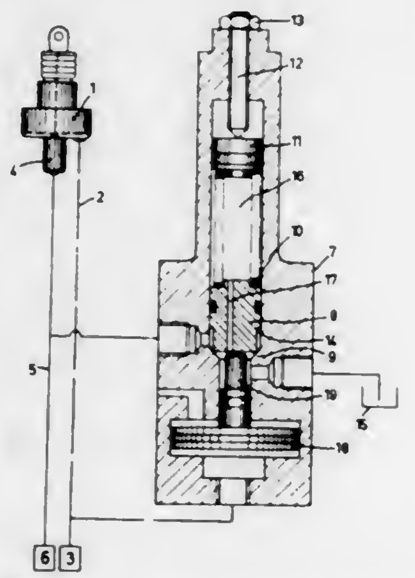
Uno Ingemar Kraft, Malmö, Sweden, assignor to Svenska Aktiebolaget Bromsregulator, Malmo, Sweden

Filed Nov. 30, 1976, Ser. No. 746,116

Claims priority, application Sweden, Dec. 5, 1975, 7513714

Int. Cl.^{2} B60T ***15/02;*** **F16D** ***65/14***

U.S. Cl. 303—6 A **7 Claims**



1. A force limiting device connected with the hydraulic and air pressure lines in a braking system having the hydraulic pressure line coupled to control a parking brake actuator and the air pressure line connected to control a service brake actuator wherein said brake actuators are connected in series, said force limiting device operable to limit the maximum force on the two actuators to that maximum force supplied by a single one of said pressure lines, and comprising in combination, an overflow valve connected between the hydraulic line and a hydraulic tank to control flow in a path from said line into said tank, a movable valve member for closing and opening said path, a bias spring holding said member in a position closing said path, hydraulic means operable from pressure in said hydraulic line to overcome the force of said spring and open said path at a predetermined hydraulic pressure, and air means operable from pressure in said air line to overcome the force of said spring and open said path at a predetermined air pressure in the line.

4,036,534

ANTI-SKID CONTROL APPARATUS WITH BOOSTER DEVICE AND PRESSURE REDUCING DEVICE

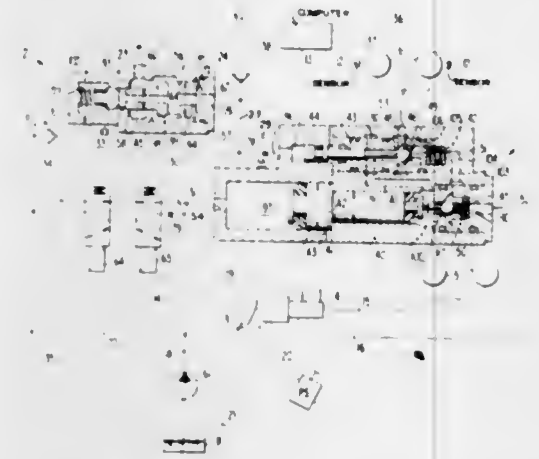
Toshiyuki Kondo, Anjo, and Takashi Nagashima, Toyota, both of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed July 7, 1976, Ser. No. 703,149

Claims priority, application Japan, July 7, 1975, 50-83340; July 7, 1975, 50-83341; July 7, 1975, 50-83342

Int. Cl.^{2} B60T ***8/02***

U.S. Cl. 303—6 R **4 Claims**



1. In a hydraulic brake system of the type having a master cylinder, rear wheel brake cylinders operatively connected to said master cylinder, an actuator disposed between said master cylinder and said brake cylinders for controlling the brake pressure increase to be applied to the brake cylinder in accordance with a brake lock condition, control means for applying a brake pressure increase controlling signal to the actuator, hydraulic brake booster means for operating the master cylinder in accordance with brake pedal depression, and a fluid pressure power source means for supplying power pressure to said booster means wherein the actuating pressure of the hydraulic brake booster means is utilized as the actuating pressure for the actuator, the improvement comprising regulating means interposed between said booster means and said actuator, said regulating means including a valve for decreasing the output pressure of the regulating means when the pressure of said booster means being applied to said regulating means rises above a predetermined value, piston means in said actuator responsive to the output pressure of said regulating means and valve means in said actuator under the control of said piston means for controlling communication between said master cylinder and said brake cylinders, said piston means being adapted to open said valve means to permit communication between said master cylinder and said brake cylinders when the output pressure of said regulating means is below a predetermined value thereby increasing the output pressure of the actuator at the same ratio as the input pressure thereto and also being adapted to repeat on-off movement of said valve means when the output pressure of said regulating means is more than said predetermined value to increase the output pressure of the actuator at a smaller ratio than the input pressure thereto.

4,036,535

BRAKING FLUID PRESSURE CONTROL DEVICE

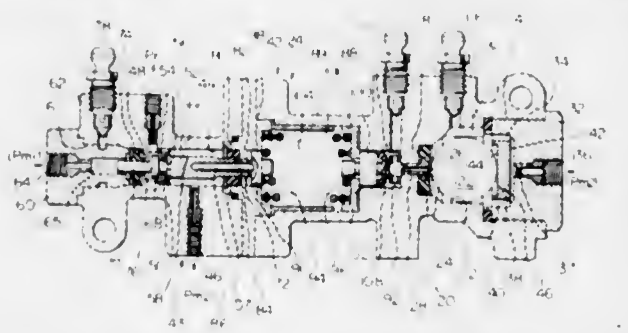
Sadao Katoh, Yokosuka, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Mar. 31, 1976, Ser. No. 672,174

Claims priority, application Japan, Apr. 1, 1975, 50-42839[U]

Int. Cl.^{2} B60T ***8/26, 13/06***

U.S. Cl. 303—6 C **9 Claims**



1. A fluid pressure control device for a motor vehicle hydraulic braking system, comprising a housing formed therein with a first cavity having outer and inner opposite end walls, each of said end walls being formed with an aperture, a plunger axially movably extending through said first cavity and slidably fitted in said apertures, said plunger having a first series of positions in which an input fluid pressure is less than a critical fluid pressure and an output fluid pressure is equal to said input fluid pressure, and a second series of positions in which said input fluid pressure is greater than said critical fluid pressure and said output fluid pressure is less than said input fluid pressure, said plunger being formed with a first bore which extends inwardly and axially from an inner end of said plunger and has a blind end and an open end, said first bore being tapered toward said blind end, a push rod located in said first bore and engaging against said blind end and projecting from said open end outside said plunger, said first bore providing at said open end a clearance between said plunger and said push rod, said clearance being reduced toward said blind end, said housing being formed therein with a second cavity and a second bore which opens into said second cavity and is located between said inner end wall and said second cavity, a plunger seat slidably fitted in said second bore and engaging against an inner end of said push rod, biasing means located in said second cavity, said housing being formed therein with a fluid chamber into which a second fluid pressure equal to said input fluid pressure is delivered, a piston slidably fitted in said fluid chamber, said biasing means being located between said plunger seat and said piston to urge same in opposite directions, said piston being urged by the pressure of fluid in said fluid chamber to urge said biasing means, and a control valve operable in response to a predetermined deceleration rate to close an inlet of said second fluid pressure to said fluid chamber to maintain the pressure of fluid in said fluid chamber at a predetermined value.

4,036,536

WHEEL SLIP CONTROL SYSTEM ADAPTED TO USE ON LOW COEFFICIENT SURFACES

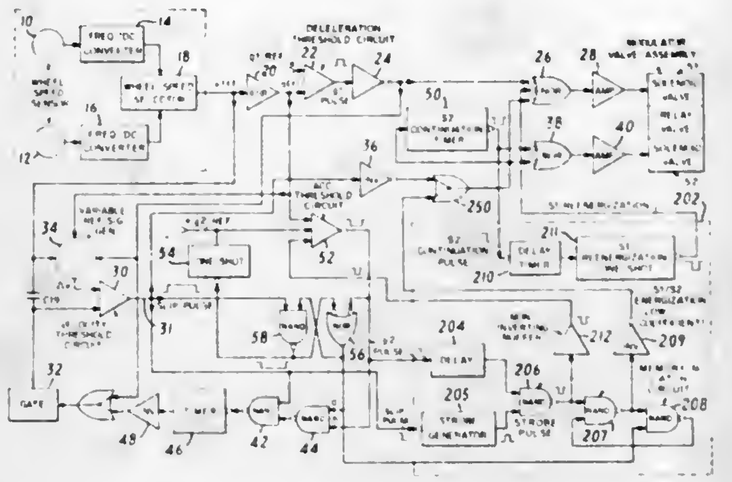
Donald S. Quon, St. Louis County, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed July 15, 1976, Ser. No. 705,662

Int. Cl.^{2} B60T ***8/02***

U.S. Cl. 303—96 **6 Claims**

1. In a vehicle having at least one monitored wheel and a wheel slip control system of the type wherein at least a wheel deceleration signal is used to trigger the energization of at least one level of brake relief and at least a wheel acceleration signal is used to trigger termination of energization of at least one level of brake relief, the improvement comprising:



a. means for re-energizing said at least one level of brake relief for a first fixed predetermined period of time; and
b. means for delaying the operation of said re-energizing means for a second fixed predetermined period of time after the termination of said energization.

4,036,537

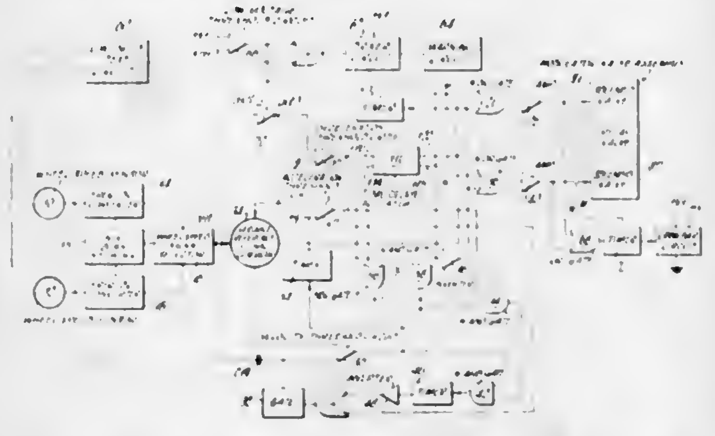
TIME DELAYED ACTUATION OF WHEEL SLIP CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES AND THE LIKE

Joseph E. Fleagle, Overland, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.

Filed Oct. 6, 1975, Ser. No. 620,164

Int. Cl.^{2} B60T ***8/02, 8/08***

U.S. Cl. 303—106 **8 Claims**



1. In combination with a wheel slip control system for automotive vehicles and the like wherein deceleration signals and deceleration plus velocity change signals are separately processed to provide two or more levels of brake relief, the invention comprising:
a. means for blocking at least a first level of brake relief;
b. means for removing the block from said first level of brake relief;
c. said means for removing being actuated by the trailing edge of a signal indicating the first simultaneous occurrence of a predetermined combination of wheel velocity and wheel deceleration conditions; and
d. said means for removing containing means for remaining continuously actuated as long as the time between the trailing edges of the signals indicating succeeding simultaneous occurrences of said predetermined combination of wheel velocity and wheel deceleration conditions remains below a predetermined value.

4,036,538

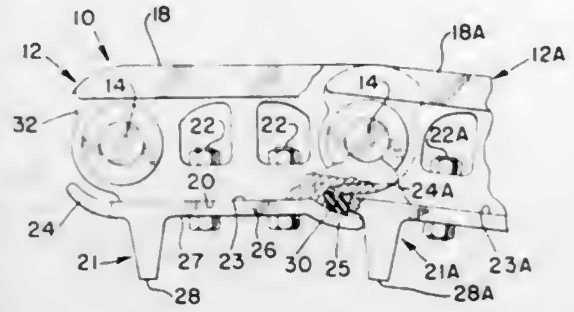
TRACK SHOE BACK-BEND BUMPER

Glen M. Haslett, Peoria, and Roger L. Boggs, East Peoria, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed Nov. 24, 1975, Ser. No. 634,950

Int. Cl.² B62D *55/22*

U.S. Cl. 305—47 **6 Claims**



1. In an endless track assembly including a plurality of links, each link having a pair of upstanding link elements; hinge means for separating each pair of upstanding link elements and interconnecting each pair of link element to an adjacent pair of link elements to allow flexure of said endless track in first and second directions; and a plurality of track shoes having a link side and a grouser side, each shoe removably affixed on the link side to a matching link, each track shoe defining an overlap portion at one end and an underlap portion at the opposite end, the overlap portion of one track shoe in overlapping relation with the underlap portion of the adjacent track shoe, said track shoes further having a grouser portion on the grouser side extending outwardly therefrom and adjacent to said underlap portion, with flexure in the first direction limited by the overlap portion of the one shoe engaging the grouser portion of the adjacent shoe, the improvement comprising resilient means associated with said overlap portion for lessening impact shock between said overlap portion of the one shoe and said grouser portion of the adjacent shoe during flexure in the first direction;

and further wherein said underlap portion of each adjacent track shoe comprises outwardly extending projections generally at right angles to said grouser and spatially separated to define a pair of notches, each of said notches aligned with a link element of the link associated with the said one track shoe and further wherein said resilient means comprises an elastomeric member removably disposed between the overlap portion of the one track shoe and the link element to which the said one track shoe is affixed, with a notch on the underlap portion of the adjacent track shoe surrounding said elastomeric member on three sides so that said underlap portion of the adjacent track shoe contacts and compresses said elastomeric shape during flexure in the first direction before said overlap portion of the one track shoe contacts the grouser portion of the said adjacent track shoe.

4,036,539

DRILL STRING SYSTEM

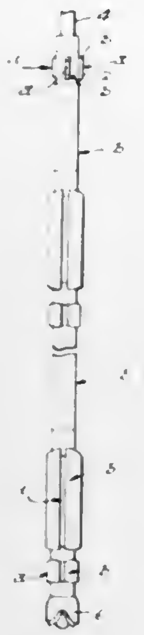
Leonard R. Saunders, 2522 Watts Road, Houston, Tex. 77025, and G. D. Skip Allard, 14602 Dale Hollow Lane, Cypress, Tex. 77429

Filed May 9, 1975, Ser. No. 576,030

Int. Cl.² F16C *1/26*

U.S. Cl. 308—4 A **11 Claims**

1. In a drill string, including a metallic tubular body having wear-resistant bearing surfaces extending outwardly from said body, the improvement in combination with said drill string, comprising a coating of hard, slick adherent plastic on the non-bearing surfaces of said string, to reduce material build-up between the non-bearing surfaces during drilling.



4,036,540

SCREW EXTRUDER HOUSING

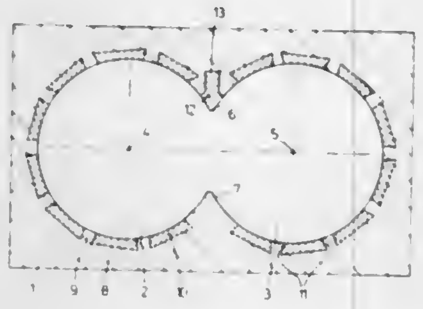
Wilhelm Seufert, Korntal, Germany, assignor to Werner & Pfleiderer, Stuttgart, Germany

Filed May 19, 1975, Ser. No. 579,008

Claims priority, application Germany, June 1, 1974, 2426732

Int. Cl.² F16C *33/00*

U.S. Cl. 308—239 **8 Claims**



1. In a screw extruder housing for a screw extruder machine, which housing has one or more axially parallel bores for a screw shaft, the wall of each bore being provided with a wear-resistant lining, the improvement wherein:

the wall of each bore is provided over its entire periphery with a plurality of recesses which are bounded by lands formed between adjacent recesses; and

each of said recesses has a wearing insert disposed therein, said insert being made of a non-metallic material more wear resistant than the wall and being produced by the process of introducing the insert material into said recesses in the wall in a formable condition, and forming and hardening the inserts in situ.

4,036,541

LOCKING ARRANGEMENT FOR CABINETS

Seymour M. Kantor, 9 Errol Place, New Rochelle, N.Y. 10809

Filed June 24, 1976, Ser. No. 699,818

Int. Cl.² E05B *65/46;* **E05D** *13/04*

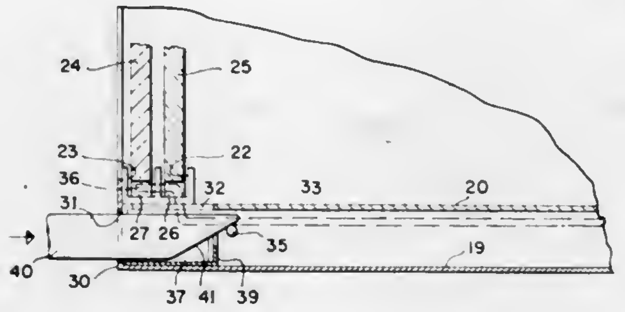
U.S. Cl. 312—138 R **26 Claims**

21. Pilferage protection display cabinet arrangement which comprises

a housing having an access aperture,

sliding panel means movable along a predetermined sliding path for closing and opening the access aperture and having contact surface means concealed from the exterior of the housing,

an obstruction element disposed within the housing and concealed from the exterior thereof, and mounted for movement into and out of blocking position and normally resiliently biased toward such blocking position for blocking contact with the contact surface means of the sliding panel means to prevent the opening thereof when such sliding panel means is moved to close the access opening,



means defining a selectively shaped restrictive tool insert guideway extending along a path from the exterior to the interior of the housing, and

control means disposed within the housing and hidden from the exterior thereof, and situated crosswise of the path of the guideway and operatively connected to the obstruction element for effecting the movement of the obstruction element out of the normally biased blocking position upon exterior insertion of a corresponding selectively shaped cooperating tool into the guideway and along such path and into coactive motion transmission contact with such control means.

4,036,542

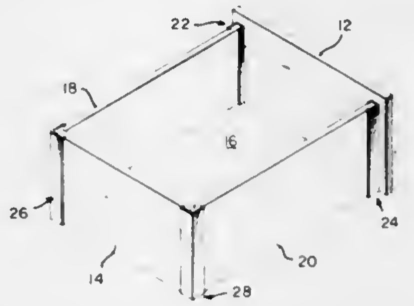
KNOCK-DOWN DRAWER CONSTRUCTION

Robert M. Courtwright, Tacoma, Wash., assignor to Hauserman, Inc., Tacoma, Wash.

Filed Dec. 8, 1975, Ser. No. 638,537

Int. Cl.² A47B *47/00, 43/00*

U.S. Cl. 312—330 R **7 Claims**



1. A knock-down drawer construction comprising:

a drawer front;

a pair of resilient front clamps, generally U-shaped in cross section, each clamp having a center leg, an inner leg, and an outer leg, said clamps being fastened to the rear face of said drawer front at spaced apart points thereof by threaded fasteners each of which extend through said center legs and engage said drawer front, said fasteners having a head projecting rearwardly beyond the rear face of said center leg, said clamps further including inwardly extending tabs along the vertical edges of said outer legs;

a pair of drawer sides, each side having its forward end received by one of said front clamps with the tabs of each clamp inserted in a vertical groove on the outer face of the respective drawer side, the inner faces of said drawer sides containing a longitudinal slot adjacent the lower edges thereof which extend the full length of said side, the forward edges of said sides having recesses formed therein adjacent the rearwardly projecting heads of said fasteners, said recesses being of sufficient depth to accommodate the projecting portion of said fasteners such that said clamps receive said drawer sides with the major portion of the forward edges thereof abutting the center legs of said clamps.

4,036,543

PLUG RECEPTACLE HAVING A ROTATABLE RECEPTACLE MEMBER

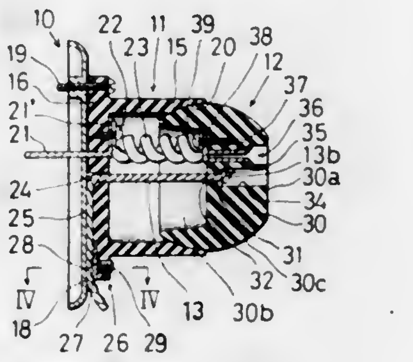
Bunsaku Taketomi, 56-141 aza-Ishikane, oaza-Iwasaki, Nisshin-cho, Aichi, Aichi, Japan

Filed Oct. 27, 1976, Ser. No. 735,914

Claims priority, application Japan, Oct. 27, 1975, 50-146691[U]; Nov. 29, 1975, 50-162554[U]; July 12, 1976, 51-92616[U]

Int. Cl.² H01R *39/00*

U.S. Cl. 339—2 R **12 Claims**



1. A plug receptacle comprising:

a socket member adapted for connection with an outlet in a wall of a room or the like and having an open end;

a ball member bearing on said open end of said socket member;

means for connecting said ball member to said socket member to hold said ball member in bearing relation to said socket member;

said socket member comprising:

a sleeve having one end formed with a flared bearing surface encircling said open end of said socket member, said sleeve having an internal radius defining a minimum radius of said bearing surface;

an insulating base provided at another end of said sleeve;

means provided on said insulating base for fastening said socket member to said wall outlet; and

contact blades projecting from said insulating base and adapted for insertion into said wall outlet;

said ball member comprising:

a body including a generally flat front surface; a concavely shaped rear surface generally facing said insulating base; and a spherically shaped outer peripheral surface extending between said front and rear surfaces and having a radius which is greater than said minimum radius of said bearing surface of said sleeve;

openings formed through said body and open at said front surface;

connectors provided on said rear surface and connected to said contact blades by conductors; and

female receptacles each placed in one of said openings and connected to one of said connectors;

said connecting means having one end releasably fastened to said insulating base and another end flexibly connected to said rear surface of said ball member body, whereby said outer peripheral surface of said ball member is slidably held in contact with said bearing surface of said socket member.

4,036,544

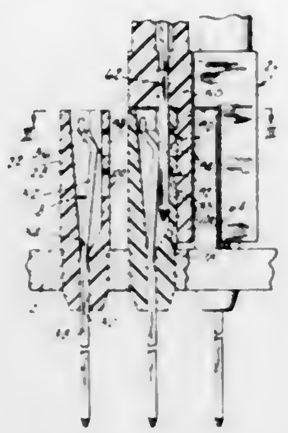
CONTACT FOR MULTIPLE CONDUCTOR CONNECTOR

Josef Keglewitsch, Addison, Ill., assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 515,225, Oct. 16, 1974, abandoned. This application Feb. 2, 1976, Ser. No. 654,197

Int. Cl.^{2} H01R *13/54*

U.S. Cl. 339—91 R **5 Claims**



1. An electrical connector assembly comprising:

a first connector part including a first electrical contact and a first contact support for supporting said first electrical contact with a protective wall of insulating material for said first contact; and

a second connector part matable with said first connector part and including a projecting second electrical contact which is matable with said first electrical contact, and a guide wall of insulating material having a portion spaced from said second electrical contact for receiving said protective wall therebetween, said second electrical contact fitting between a portion of said first electrical contact and protective wall,

said guide wall including a projecting portion biased by said second electrical contact into an interference relationship with said protective wall, and

said protective wall including a receiving portion which receives said projecting portion in response to a predetermined mated positioning of said contacts.

4,036,545

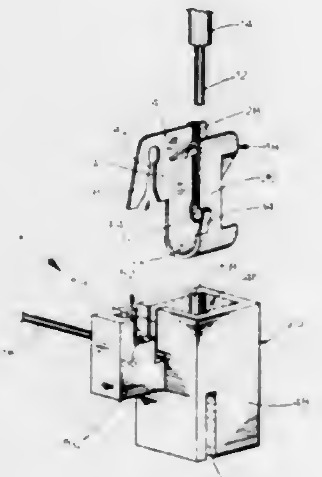
CONNECTOR ASSEMBLY

Eugene J. Mysiak, Cicero, and Allen J. Bury, Prospect Heights, both of Ill., assignors to Molex Incorporated, Lisle, Ill.

Filed May 6, 1976, Ser. No. 683,963

Int. Cl.^{2} H01R *9/08*

U.S. Cl. 339—95 D **3 Claims**



3. A connector assembly comprising:

an insulation displacement terminal including a relatively rigid portion with a first insulation cutting edge formed thereon and a resilient portion spaced from said rigid portion having a second insulation cutting edge formed thereon facing and movable toward the first cutting edge, the space between said first and second cutting edges defines an insulation displacement slot for receiving a wire and being spaced a distance not less than the diameter of the conductive part of the wire; and

a housing with an opening through which said terminal is receivable, said housing including a first compartment for receiving the rigid portion of the terminal and said wire and a second compartment spaced from the first compartment for receiving the resilient portion of the terminal, said compartments having means allowing communication with a loading slot defined therebetween for receiving said wire prior to engagement with said terminal, said second compartment having a cam surface formed thereon for engagement with the resilient portion for moving the second cutting edge toward the first cutting edge as the terminal is inserted into the housing, whereby said cutting edges displace the insulation of the wire at the loading slot and engage the conductive part thereof.

4,036,546

PARTS COMPRISING A METAL STRAP, U-SHAPED METAL CLIP, AND ADJUSTABLE CLAMPING MEANS, FOR MAKING AN ELECTRICAL TERMINAL ASSEMBLY

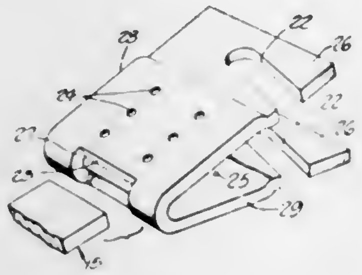
John T. Thompson, 244 Loring St., Los Angeles, Calif. 90024, and George W. Gillemot, 2331 20th St., Santa Monica, Calif. 90405

Continuation of Ser. No. 419,135, Nov. 26, 1973, abandoned, which is a continuation-in-part of Ser. No. 286,078, Sept. 5, 1972, abandoned, which is a continuation-in-part of Ser. No. 107,949, Jan. 20, 1971, abandoned. This application Mar. 27, 1975, Ser. No. 562,436

The portion of the term of this patent subsequent to Oct. 17, 1989, has been disclaimed.

Int. Cl.^{2} H01R *3/02, 7/08*

U.S. Cl. 339—95 R **4 Claims**



1. Parts for making a solderless terminal assembly, comprising:

a. an elongated heavy-gauge high-capacity wide strap of rectangular cross section and of ductile metal;

b. a long U-shaped clip of metal formed from heavy gauge strip stock of substantially greater width than said strap, said clip having a rectangular opening extending transversely of the bight portion thereof sized to receive one end of said strap inserted endwise therethrough, and said clip having a pair of aligned openings through the free ends of its legs, the legs of said clip having strap gripping areas which are provided with protrusions projecting from the inner surfaces of said clip legs, said protrusions being adapted to penetrate into opposite surfaces of the strap when said legs are clamped thereagainst; and

c. adjustable clamping means mountable in said aligned openings for clamping and anchoring one end of said strap immovably between said gripping areas of said clip legs, when inserted therebetween, to provide a high capacity electrical and strong mechanical connection therebetween as said clamping means is tightened.

4,036,547

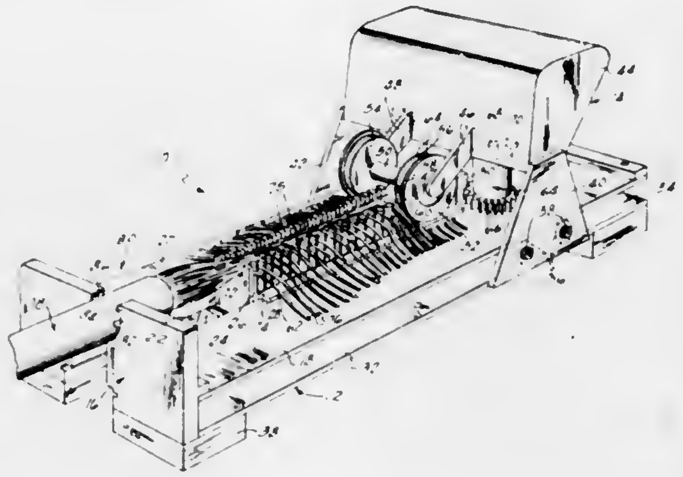
ELECTRICAL CONNECTOR HAVING AN ELONGATE REAR SLOT COMMUNICATING WITH CONDUCTOR RECEIVING CHANNELS VIA CONDUCTOR RECEIVING AND HOLDING NOTCHES

John Peter Nijman, West Hill, Canada, assignor to Bunker Ramo Corporation, Oak Brook, Ill.

Continuation of Ser. No. 527,998, Nov. 29, 1974, abandoned, which is a division of Ser. No. 402,132, Oct. 1, 1973, Pat. No. 3,866,293. This application July 27, 1976, Ser. No. 708,930

Int. Cl.^{2} H01R *11/20*

U.S. Cl. 339—99 R **3 Claims**



1. An electrical connector comprising:

a contact support including a rear end element;

means defining a plurality of channels in said end element, each of said channels opening laterally outwardly of said end element;

a plurality of insulation-piercing contact portions disposed in said channels and supported by said contact support;

a ridge extending rearwardly from said end element and transversely across said channels; and

notch means defining a plurality of rearwardly open notches in said ridge, each of said notches contiguously opening into and communicating with a respective channel to receive and hold a respective conductor.

4,036,548

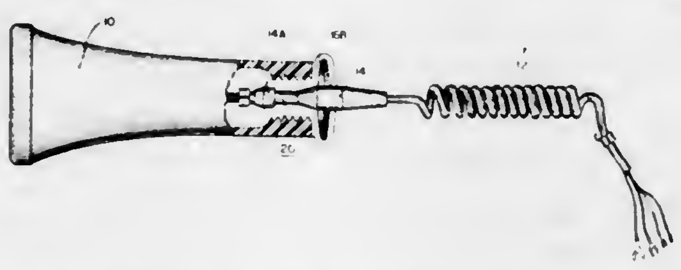
GRIP ASSEMBLY FOR ATTACHING AN ELECTRIC CORD TO AN ELECTRIC APPLIANCE, AND THE LIKE

Wesley L. Thomas, 109 S. Catalina St., Los Angeles, Calif. 90004

Continuation-in-part of Ser. No. 613,080, Sept. 9, 1975, abandoned. This application Aug. 6, 1976, Ser. No. 712,184

Int. Cl.^{2} H01R *13/58*

U.S. Cl. 339—103 C **7 Claims**



1. A grip assembly for use with an electrical appliance, and the like, for attaching an electric cord to the appliance, said grip assembly including: a sleeve affixed to the end of the cord and having an external peripheral shoulder formed thereon; and a plurality of arcuate-shaped members positioned adjacent to one another to surround said sleeve and having external threads thereon to enable the arcuate-shaped members to be threaded into the appliance to form a split bushing surrounding the sleeve for receiving the sleeve and having an inner bore surface engaging the periphery shoulder thereon.

4,036,549

WIRE CONNECTOR

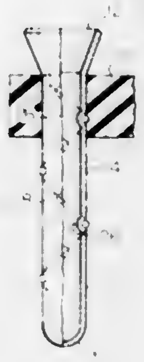
Takeo Honda, and Hisatomo Matsushima, both of Yokohama, Japan, assignors to Victor Company of Japan, Limited, Japan

Continuation of Ser. No. 500,551, Aug. 26, 1974, abandoned. This application Apr. 7, 1976, Ser. No. 674,833

Claims priority, application Japan, Aug. 27, 1973, 48-96015; Nov. 20, 1973, 48-133936[U]; Nov. 30, 1973, 48-138435[U]

Int. Cl.^{2} H01R *9/06*

U.S. Cl. 339—275 R **3 Claims**



1. An electrical connector comprising: a hollow elongated conductive sleeve portion having a conductor-receiving bore having a generally cross section for receiving, in use, an elongated conductor insertable therein; said sleeve portion having at least one row of spaced rigid projections projecting inwardly of said bore and disposed axially and perimetrically of said bore along a generally helical path; and said projections having an inward extent a into said bore satisfying the relationship $D - 2a < d < D - a$ wherein D is a transverse dimension of the bore and d is a transverse dimension of the elongated conductor so that the elongated conductor contacts the projections when inserted into the bore and assumes a generally helical shape, thereby to impart resistance to removal of the elongated conductor from said bore.

4,036,550

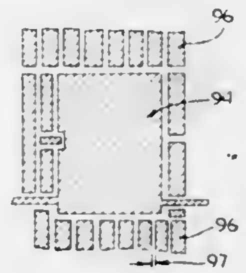
LIQUID CRYSTAL DISPLAY

James Shou-Chen Yih, Sunnyvale, Calif., assignor to Intel Corporation, Santa Clara, Calif.

Continuation of Ser. No. 388,832, Aug. 16, 1973, abandoned. This application July 28, 1975, Ser. No. 599,593

Int. Cl.^{2} G02F *1/13*

U.S. Cl. 350—160 LC **8 Claims**



1. In a liquid crystal display which includes a first and second substrate disposed in a substantially parallel configuration and having a liquid crystal material disposed therebetween, said second substrate having conductive transparent indicia members thereon and a plurality of electrical leads selectively coupled to said indicia members, an improvement comprising:

a substantially reflective and conductive surface on said first substrate in underlying relationship to said indicia members, said reflective and conductive surface covering a substantial part of said first substrate and said surface on said first substrate being configured and arranged into a plurality of non-energized areas without direct electrical connection thereto, energized areas having electrical connections thereto, and a nonconductive and nonreflective isolation area between each of said non-energized areas and each of said energized areas, at least one of said non-energized areas being aligned with respect to each of said electrical leads so as to completely underlie said one electrical lead, one of said energized areas being aligned with respect to at least one of said indicia members so as to underlie said one indicia member, each of said electrical leads overlies said isolation area and at least one of said non-energized areas to display said indicia members without displaying said electrical leads and said isolation area.

4,036,551

DISPLAY APPARATUS

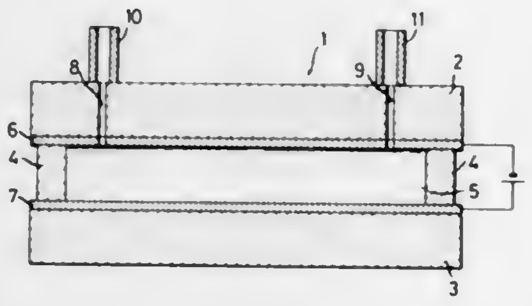
Hiroshi Mori, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Mar. 22, 1976, Ser. No. 668,974

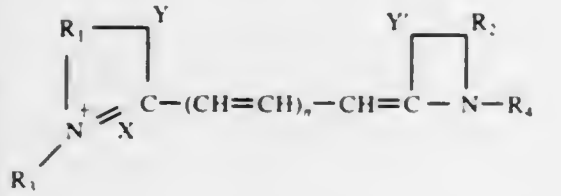
Claims priority, application Japan, Mar. 22, 1975, 50-34697

Int. Cl.^{2} G02F *1/16*

U.S. Cl. 350—160 R **11 Claims**



1. A display apparatus comprising:
a. a first transparent electrode;
b. a second electrode arranged opposite to said first transparent electrode; and
c. an electric-responsive layer containing cyanine dye, interposed between said first transparent electrode and said second electrode, said cyanine dye being represented by the following general formula:



where R_1 and R_2 represent aromatic group or $—CH=CH—$, R_3 and R_4 represent alkyl group, Y and Y' represent $—CH=CH—$, $—O—$, $—S—$, $—Se—$ or $=C=(CH_3)_2$, X represents I, Br or Cl, and $n=0, 1, 2$ or 3.

4,036,552

RETROREFLECTIVE MATERIAL MADE BY RECORDING A PLURALITY OF LIGHT INTERFERENCE FRINGE PATTERNS

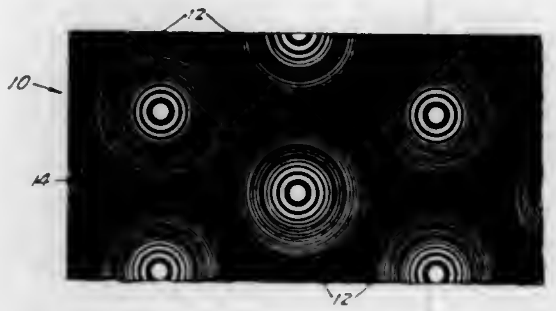
Pui Kum Lee, White Bear Lake, and Wolfgang H. Strehlow, Woodbury, both of Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Feb. 10, 1975, Ser. No. 548,439

Int. Cl.^{2} G02B *5/12*

U.S. Cl. 350—97 **1 Claim**

1. A retroreflective material comprising a transparent medium having at one surface thereof a plurality of diffraction elements defining an array of fresnel zone plates each of which diffraction elements represent a light interference fringe pattern, said medium having a thickness equal to a given focal length associated with the fresnel zone plates and having a reflective material on an opposite surface in the back focal plane of the fresnel zone plates defined by said given focal length, to enable the continuous retroreflection of light incident at any point of said one surface.



4,036,553

METHOD OF CONTROLLING AN OPTICAL CHARACTERISTIC

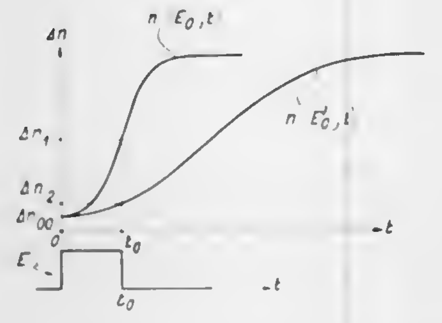
Joseph Borel, Echirolles; Jean-Claude Deutsch, Grenoble; Guy Labrunie, Seyssinet, and Jacques Robert, St-Egreve, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Division of Ser. No. 392,324, Aug. 28, 1973, abandoned. This application Mar. 3, 1975, Ser. No. 554,987

Claims priority, application France, Aug. 29, 1972, 72.30685; July 17, 1973, 73.26109

Int. Cl.^{2} G02F *1/16*

U.S. Cl. 350—160 LC **2 Claims**



1. A method of controlling the optical index of the points of a liquid crystal layer to a desired value n_0, said layer comprising a plurality of points, with an electric field, the application of an electric field of amplitude E_0 at a point causing the appearance of an electric field of amplitude E'_0 at some of the adjacent points, comprising the steps of:
determining the transitory response $n\ (E,t)$ of the liquid crystal index n at an electric field of amplitude E, t being the duration of application of said electric field,
selecting a pair of values E_0 and t_0 from said transitory response so that the index $n\ (E_0, t_0)$ at said point obtained after the application of an electric field of amplitude E_0 for a duration t_0 is equal to a desired value n_0, and so that the index $n\ (E'_0, t_0)$ at said adjacent points obtained under the influence of the electric field of amplitude E'_0 for said duration t_0 differs only slightly from the index value before the electric field is applied and applying to said liquid crystal at said points, said electrical field of amplitude E_0 for a duration t_0, to obtained said desired value n_0 at said points and to maintain unchanged the optical index at said adjacent points.

4,036,554

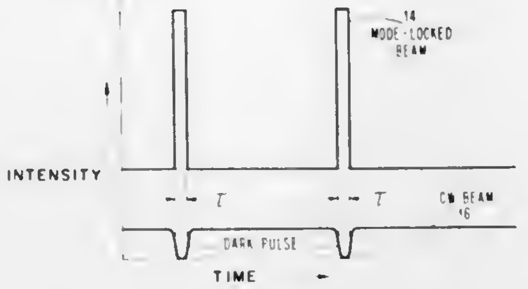
LASER MODULATOR FOR PRODUCING DARK-PULSES

Robert James Bennett, Carmel, and Daniel Richard Grischkowsky, Peekskill, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 29, 1976, Ser. No. 727,747

Int. Cl.^{2} H01S *3/00*

U.S. Cl. 350—160 R **10 Claims**



1. A laser modulator for generating a laser output beam containing dark pulses comprising:
a two-photon absorption cell containing a metal vapor,
a first laser beam introduced as a first input to said absorption cell,
and a second, mode-locked laser beam including mode-locked pulses introduced as a second input to said absorption cell, said mode-locked pulses of said second laser beam causing a two-photon absorption to completely extinguish said first laser beam during the period of said mode-locked pulses to produce an output laser beam from said absorption cell having dark pulses occurring in synchronism with said mode locked pulses.

4,036,555

ELECTROMAGNETIC TRIGGER DEVICE IN MOTOR-DRIVEN CAMERA CAPABLE OF TIME EXPOSURE

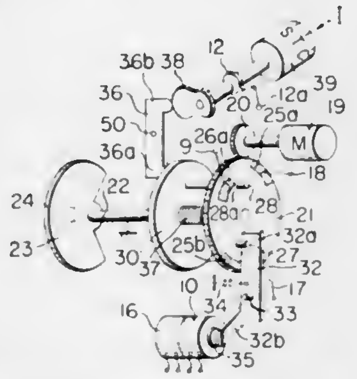
Osamu Maida, Tokyo, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 11, 1975, Ser. No. 557,388

Claims priority, application Japan, Mar. 19, 1974, 49-30548

Int. Cl.^{2} G03B *21/38*

U.S. Cl. 352—169 **15 Claims**



1. An electromagnetic trigger device in a motor-driven camera comprising:
1. a power source;
2. a motor;
3. trigger switch means;
4. shutter driving means driven by said motor for driving a shutter and movable between a closed shutter position in which the shutter is completely closed and an open shutter position in which the shutter is fully open;
5. latching means movable between a latching position and a non-latching position, said latching means being adapted, when moved to said latching position, to latch said shutter driving means which occupies one of the closed and open shutter positions;
6. a motor switch for electrically connecting said motor to said power source when said latching means is in the non-latching position;
7. starting electromagnetic means energized to attract said latching means to move it to the non-latching position for a predetermined time interval when said trigger switch means is operated, sid predetermined time interval being shorter than the shorter of the time required for said shutter driving means to move from the closed shutter position to the open shutter position and the time required for said shutter driving means to move from the open shutter position to the closed shutter position;
8. a selector member for selecting continuous exposure mode and time exposure mode;
9. holding electromagnetic means responsive to said selector member and said triger switch means, said holding electromagnetic means being energized to hold said latching means in the non-latching position when said selector member selects the continuous exposure mode and when said trigger switch means is being operated; and
10. preventing means responsive to said selector member, said preventing means preventing said latching means from latching said shuttr driving means which occupies the open shutter position when said selector member selects the continuous exposure mode,

said lathcing means including rotary means rotating in unison with said shutter driving means and movable means attracted by said starting electromagnetic means to be moved from the latching position to the non-latching position,
said movable means being, when it is in the latching position, engaged with said rotary means to latch said shutter driving means occupying one of the closed shutter position and the open shutter position,
said movable means being a single latching lever and said rotary means including first and second members,
said single latching lever being engaged with said first member to latch said shutter driving means in the closed shutter position and with said second member to latch said shutter driving means in the open shutter position,
said preventing means preventing engagement of said latching lever and said second member,
said shutter driving means including a rotary disk,
each of said first and second members comprising a projection extended from a side surface of said disk,
said second member being displaceable with respect to said disk, and
said preventing means including means for displacing the second member to a position in which said latching lever occupying the latching position is not engaged with said second member when said selector member selects the continuous exposure mode.

4,036,556

PRECONDITIONING IMAGE TRANSFER AREAS IN DOCUMENT REPRODUCTION MACHINES

Arthur Holt Knight, and Thomas Travis Underhill, both of Boulder, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jan. 15, 1976, Ser. No. 649,755

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 355—14 **11 Claims**

1. A document reproduction machine having means for substituting a new image transfer surface means for a used image transfer surface means, means indicating that said new image transfer surface means is in a predetermined position with respect to said substitute means, said machine being operable in successive machine cycles;
the improvement including, in combination:
means for initiating a preset number of said machine cycles and including means for cycling said machine for said preset number of machine cycles;
means for inhibiting document reproduction during said preset number of machine cycles; and

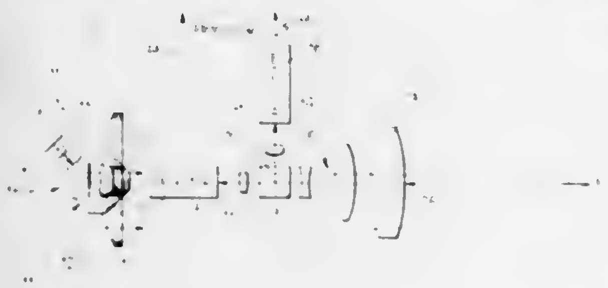
control means being responsive to said indication of said predetermined position to actuate said initiating and inhibiting means.

4,036,557

LASER DOPPLER VELOCIMETER

Craig M. Christensen, Atherton, Calif., assignor to Noctua, Inc., Belmont, Calif.

Filed Oct. 14, 1975, Ser. No. 621,709
Int. Cl.^{2} G01P *3/36*
U.S. Cl. 356—28 **25 Claims**



1. A laser doppler velocimeter for measuring the velocity of material at a reference point, said velocimeter comprising:

a pulsed laser source for generating a pulsed coherent radiation input beam having first and second orthogonal polarization components;

first beam splitter means for generating a pair of parallel emergent beams of coherent radiation from said input beam, said parallel emergent beams having different polarization states; said beam splitter means including a first optical axis, a radiation input face to which said input beam is directed, a pair of radiation output faces, said beams emerging from said radiation output faces parallel to said first optical axis, means for generating a first one of said pair of parallel emergent beams as a preselected fractional portion of said first polarization component and for generating the remaining one of said pair of parallel emergent beams as substantially all of said second polarization component and the remaining fractional portion of said first polarization component;

means for focussing said pair of beams to said reference point to produce reflected radiation having a first polarization component containing both doppler differential frequency information and background noise and a second polarization component containing substantially only background noise; and

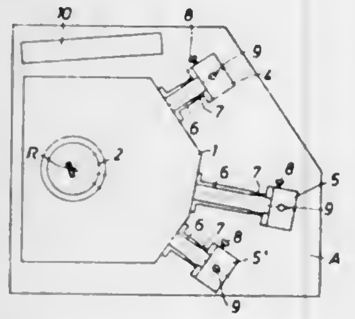
means for separating said reflected radiation into a pair of beams containing said first and second polarization components, respectively, so that the separated reflected beam pair may be directed to a measurement device.

4,036,558

FOCALIZATION PROCESS OF SPHERICAL CONCAVE DIFFRACTION GRATINGS

Michel Pouey, Vanves, France, assignor to Etablissement Public: Agence Nationale de Valorisation de Recherche (ANVAR), Neuilly sur Seine, France

Continuation-in-part of Ser. No. 277,857, Aug. 4, 1972, abandoned. This application Dec. 30, 1974, Ser. No. 537,460
Claims priority, application France, Apr. 21, 1972, 72.14214
Int. Cl.^{2} G01J *3/40, 3/12*
U.S. Cl. 356—79 **16 Claims**



1. In a spectrometric system including a first fixed member defining an entrance slit of finite area, a second fixed member defining an exit slit of finite area, a concave reflective diffraction grating having a selected radius of curvature, the center of said entrance slit presenting an entrance aperture which with the center of said grating defines an optical axis for incident radiation and the center of said exit slit presenting an exit aperture which with the center of said grating defines an optical axis for diffracted radiation, and means for rotating said grating about a fixed axis perpendicular to and passing through the intersection of said optical axes whereby successively to focus different wave lengths of incident radiation at said exit slit, the improvement wherein:

said first member is located a distance r from said center of the grating and said second member is located a distance r' from said center of the grating such that $r > m$ and $r' > n$ where m and n are those distances at which the first and second members would be located to produce a zero sum of the object and image tangential focus for a system having its entrance slit, and consequently its entrance aperture, of negligible area the differences $r - m$ and $r' - n$ being such as to displace the Gaussian reference sphere of the system by an amount sufficient substantially to compensate for those aberrations introduced by said finite, non-negligible area of said entrance slit.

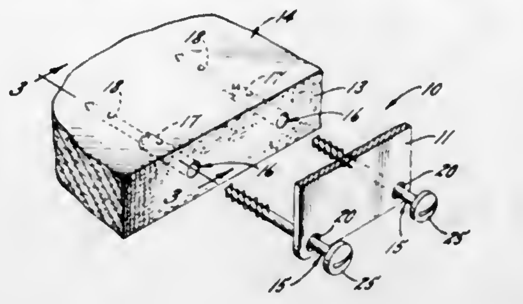
4,036,559

JOINT SECURING AN ARTICLE TO PARTICLE BOARD

Donald G. Whitchurcb, Rockford, Ill., assignor to Elco Industries, Inc., Rockford, Ill.

Filed Sept. 11, 1975, Ser. No. 612,317
Int. Cl.^{2} F16B *7/18*
U.S. Cl. 403—405 **1 Claim**

1. A joint structure including a piece of composition board having a peripheral edge, a hole formed in and extending inwardly from the edge of said board, an article having an aperture formed therethrough, and a screw extending inwardly through said aperture and into said hole to secure said article to said board, said screw having an elongated shank of substantially uniform diameter and having an enlarged head formed integrally on the outer end of said shank, first and second helical threads formed on the inner portion of said shank with said first thread having a major diameter greater than the major diameter of said second thread and said shank, the outer portion of said shank between said inner portion and said head being unthreaded, said hole including an outer section having a diameter greater than the major diameter of said first thread and further including a coaxial inner section having a diameter somewhat less than the diameter of said shank, said inner section of said inner section of said hole having a length greater than the length of the inner threaded portion of said shank and receiving the entire length of said threaded portion and part of the length of said outer unthreaded portion, and said outer section of said hole having a length at least equal to the length of said inner threaded portion of said shank and less than the length of said outer unthreaded portion of said shank and receiving the latter portion with radial clearance.

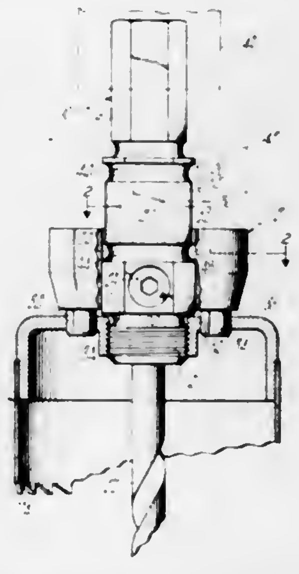


4,036,560

HEAVY DUTY HOLE SAW AND ARBOR ASSEMBLY

Calvin M. Clark, Bernardston, Mass., and Americo P. D'Attilio, East Hartford, Conn., assignors to Stanadyne, Inc., Hartford, Conn.

Filed Nov. 3, 1975, Ser. No. 628,105
Int. Cl.^{2} B23B *41/02;* B27M *3/00*
U.S. Cl. 408—204 **4 Claims**



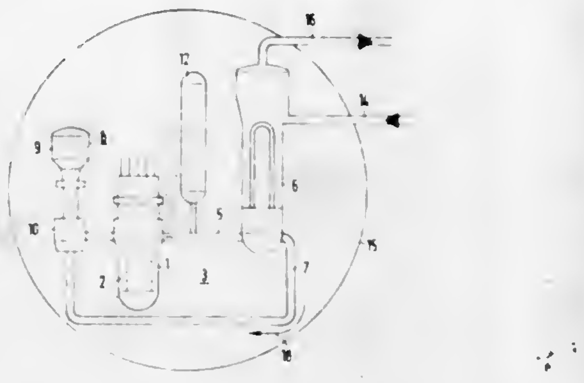
1. For engagement with a power operated chuck, a hole saw and arbor assembly comprising a rotatable chuck engaging arbor including a drive shaft and a threaded section at an end of the drive shaft, a drive collar mounted on the drive shaft for non-rotating axial sliding movement on the drive shaft between a working position and a release position, a hole saw mounted on the threaded section of the arbor for rapid assembly and disassembly of the saw and arbor, a quick-disconnect drive pin fixed to the drive collar, and an opening in the hole saw for receiving the pin when the drive collar is in working position on the drive shaft to transmit torque between the drive collar and saw during rotation of the arbor, the drive collar in said working position being in confronting face to face relation to the saw, the drive collar in release position being in retracted relation to the saw and remotely spaced from the saw a distance sufficient to withdraw the drive pin from the saw opening without disengaging the arbor and chuck while permitting quick and easy assembly and disassembly of the saw and the threaded section of the arbor.

4,036,561

PRIMARY COOLANT PUMP FOR NUCLEAR REACTORS

Elmar Harand, Hochstadt; Gerd Richter, Nurnberg, and Günter Tschöpel, Erlangen, Tennenlohe, all of Germany, assignors to Kraftwerk Union Aktiengesellschaft, Mulheim, Germany

Filed Aug. 28, 1974, Ser. No. 501,337
Claims priority, application Germany, Sept. 6, 1973, 2345081
Int. Cl.^{2} B27C *9/00;* G21C *9/00*
U.S. Cl. 415—18 **2 Claims**



1. A pressurized-water reactor main coolant pump comprising a pump housing having an inlet passage and an outlet passage through which passages the housing is connected in a cold leg of a pressurized water reactor pressure-vessel main cooling loop containing pressurized-water coolant, said housing containing a rotative impeller and the pump having a rotary motor having a normal rotative speed and connected to said impeller to rotate the impeller at said speed to circulate said coolant by a coolant flow normally inwardly through said inlet passage and outwardly through said outlet passage via said housing, a leak in said loop sufficient to cause the pressurized-water coolant discharge through said housing via its said passages at a velocity driving said impeller at a rotative speed greater than said normal rotative speed, causing a reduction in the pressurized-water coolant's pressure at one of said passages relative to the coolant's pressure at the other of said passages, and means automatically responsive to said reduction in pressure for applying a rotative braking force to said impeller; said means comprising at least one non-rotative brake element and a rotative braking surface connected with said impeller to rotate therewith, said brake element being movable from an inoperative position to an operative position where the brake element frictionally engages said surface to brake the impeller against rotation, said brake element having means for normally biasing it to said inoperative position and being movable to said operative position by a piston which is connected to the brake element, said piston being fluid-connected through a valve with a source of fluid pressure for moving the piston so it moves said brake element to its said operative position, said valve being normally closed and having opening means for opening the valve automatically in response to said reduction in pressure.

4,036,562

FOOD DEHYDRATOR AND FAN THEREFOR

Jack H. Barnes, Kellogg Star Rte., Box 100, Oakland, Oreg. 97462

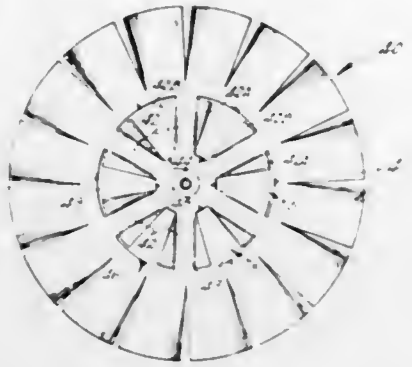
Filed June 30, 1975, Ser. No. 591,617
Int. Cl.^{2} F04D *29/32*
U.S. Cl. 415—79 **3 Claims**

1. A circular fan blade formed from a single sheet of lightweight material for moving air in opposite directions past articles being dried in a food dryer, said blade comprising,

an outer series of vanes comprising the peripheral portion of the blade, said vanes having substantially radial leading and trailing edges and being of a pitch to propel an airflow in one direction,

an annular planar blade area inwardly of said vanes, an inner series of vanes formed from said single sheet of material inwardly of said planar blade area with each inner vane having leading and trailing edge components and being of a pitch opposite to the pitch of each outer vane, said inner vanes adapted to propel an airflow in a direction opposite to the airflow discharged by the outer series of vanes, and

a central planar hub portion coplanar with said annular blade area and adapted to receive the shaft of a power source.



4,036,563
WAVE MOTOR COMPRISED OF A SUBMERGED FLOATING NETWORK OF CHAMBERS FORMED BY WALLS PERMITTING VARIABLE GEOMETRY

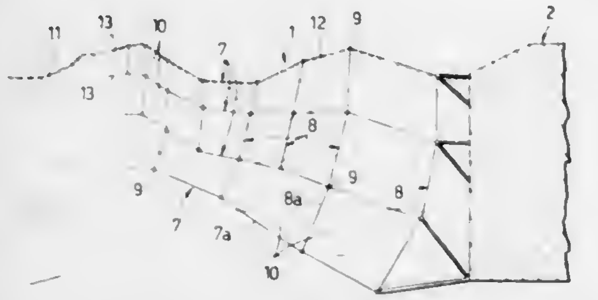
Rolf E. A. Tornkvist, Ritobergsvagen 8-16 L, 00330 Helsingfors 33, Finland

Continuation-in-part of Ser. No. 544,770, Jan. 28, 1975, abandoned. This application June 16, 1976, Ser. No. 696,821

Claims priority, application Finland, Feb. 5, 1974, 312/74; Jan. 9, 1975, 750052/75

Int. Cl.² F04B *17/00;* **F03B** *13/12*

U.S. Cl. 417—331 8 Claims



1. A wave energy transformer for transforming wave energy in a body of water into pressure energy of a pipe system containing water obtained from the body comprising: means forming walls defining a plurality of mutually adjacent floating chambers which are submerged in and in communication with the body of water, said means including a plurality of buoyantly submerged panels pivotally interconnected so that water movement in and around the chambers due to wave action causes the chambers to deform by virtue of relative movement between panels; and pump means having relatively movable parts connected between at least two walls of each chamber, said pump means having an inlet in communication with the body of water and an outlet connected to the pipe system and being operable upon relative movement between its movable parts to draw in water from the body and discharge water to the pipe system.

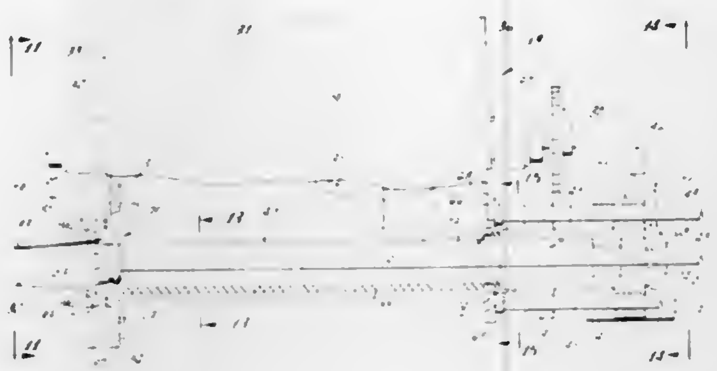
4,036,564
CONCRETE PUMPING APPARATUS

John A. Richards, 1312 Olwyn Drive, Tustin, Calif. 92680

Filed Aug. 2, 1971, Ser. No. 167,959

Int. Cl.² F04B *17/00, 19/02, 15/02*

U.S. Cl. 417—344 21 Claims



1. A concrete pumping apparatus, comprising:

a concrete hopper including a discharge end, said hopper having a plurality of longitudinally extending channels defined in its bottom portion to collect plastic concrete supplied to said hopper, said discharge end having a discharge outlet in communication with each of said channels;

slide valve means mounted on said discharge end of said hopper for controlling the discharge of concrete from said discharge outlets, said slide valve means including a fixed wear plate mounted on said hopper discharge end and a movable wear plate, said fixed wear plate having openings aligned with said discharge outlets and said movable wear plate having an opening for selective alignment with said openings in said fixed wear plate, said fixed and movable wear plates having planar wear faces that make sliding contact with each other in a predetermined plane of contact whereby selectively shifting said movable wear plate with respect to said fixed wear plate the discharge of concrete from said discharge outlets may be controlled;

concrete confining sleeves mounted in each of said channels for reciprocating movement along the axes of said channels, each of said concrete confining sleeves having a discharge end that lies in a given plane so that the sleeve discharge ends may be positioned in the plane of contact of the wear surfaces of said wear plates, each of said concrete confining sleeves being movable between a retracted position where it is substantially withdrawn from said hopper and a fully extended position where it communicates with one of said discharge outlets and has its discharge end positioned in the plane of contact of the wear surfaces of said wear plates, said sleeves being operable during their extension through plastic concrete in said hopper to receive and confine concrete therein;

concrete-pumping pistons mounted within each of said sleeves for reciprocating movement therein, each of said pistons including a flat concrete-contacting face and being movable from a retracted position to a fully extended position within its respective sleeve so that said flat piston face is in the plane of its associated sleeve end, whereby said piston and sleeve ends may both be positioned in the plane of contact of the wear faces of said wear plates; and

control means connected to said movable wear plate, to said sleeves and to said pistons for selectively programming the movement of said sleeves and pistons and effecting the shifting of said movable wear plate so that whenever said concrete pumping apparatus is operated plastic concrete within said hopper is received in and pumped out of said sleeves through said slide valve means sequentially through each of said discharge outlets.

4,036,565
PUMP CONSTRUCTION

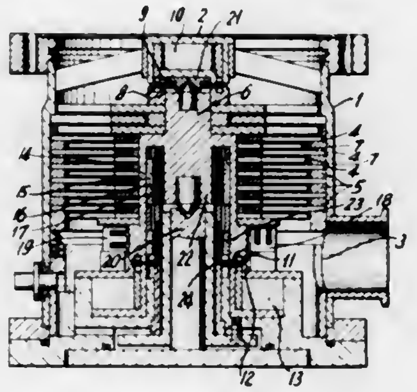
Willi Becker, Braunfels, Germany, assignor to Balzers Patent und Beteiligungs AG, Liechtenstein

Filed Sept. 22, 1975, Ser. No. 615,342

Claims priority, application Switzerland, Sept. 27, 1974, 13132/74

Int. Cl.² F04C *17/00*

U.S. Cl. 417—420 8 Claims



1. A turbo vacuum pump, comprising a cylindrical casing having an intake adjacent one end and an exhaust adjacent an opposite end of said casing, a stator mounted in said cylindrical casing, a rotor arranged within said casing, first rotor mounting means for the radial mounting of said rotor, second rotor mounting means for the axial mounting of said rotor, said second rotor mounting means for the axial mounting comprising an electrodynamic system disposed adjacent said exhaust and including a permanent magnet arrangement which is secured to said rotor and which produces a substantially radial field, and a coil arranged concentrically in respect to said rotor and immersed in said permanent magnet arrangement, said first rotor mounting means comprising at least one permanent magnet arrangement which is fixed to the casing and said rotor has a magnetic portion axially aligned and oppositely facing said permanent magnetic arrangement.

4,036,566
FLUID DISPLACEMENT APPARATUS

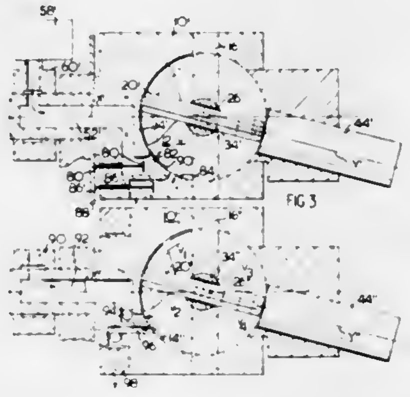
Leon A. Konopeskas, London, Canada

Filed May 2, 1975, Ser. No. 573,946

Claims priority, application Canada, May 7, 1974, 199185

Int. Cl.² F01C *3/06;* **F04C** *3/00;* **F01C** *1/00;* **F02B** *55/14*

U.S. Cl. 418—68 9 Claims



1. A fluid displacement apparatus comprising:

a. a body having a chamber defined therein, at least a portion of the inner surface of such chamber being in the form of a concave spherical segment and having an axis of symmetry,

b. partition means sealingly engaged with said chamber and defining an enclosed space therewith,

c. a baffle defining an imaginary plane extending through said partition means in sealing engagement therewith and movable relative thereto about pivot means defining a first pivot axis lying in the plane defined by said baffle, the orientation of the first pivot axis being fixed relative to said chamber and located in an imaginary plane defined by said partition and perpendicular to and intersecting the axis of symmetry of the chamber,

d. said baffle having a peripheral edge, a portion of which defines an arc of a circle to sealingly engage said inner surface of said chamber in relatively movable relation thereto such that said baffle is capable of oscillating motion relative to said chamber about said first pivot axis whereby to vary the volumes of the regions located between said inner surface and said partition on the opposing sides of said baffle, said baffle defining an axis lying in the plane of the baffle and intersecting said first pivot axis,

e. port means and valve means communicating with said chamber for permitting or effecting inflow and outflow of fluid from said chamber in a selected fashion during the occurrence of said oscillating motion of said baffle relative to said chamber, and

f. rotatable shaft means operatively connected to said baffle and/or said chamber for rotation of said shaft means about an axis coinciding with said axis defined by the baffle and/or said axis of symmetry defined by the chamber during said oscillating motion of the baffle relative to said chamber whereby the oscillating motion of the baffle relative to the chamber effects rotation of the shaft means or vice versa.

4,036,567
GLOBOID WORM TYPE ROTARY MACHINE

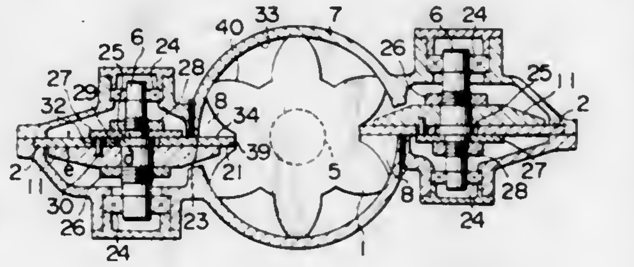
Goro Sato, Atami, Japan, assignor to Hokuetsu Kogyo Co., Ltd., Japan

Filed Apr. 8, 1975, Ser. No. 566,047

Claims priority, application Japan, Apr. 15, 1974, 49-40980

Int. Cl.² F01C *1/08, 19/00;* **F04C** *17/04, 27/00*

U.S. Cl. 418—105 6 Claims



1. A globoid worm type rotary machine comprising a casing, a globoid worm rotor housed in said casing, and pinions extending through apertures in said casing so as to have their teeth extending into the casing and meshing with said globoid worm rotor, a support for said pinion, a rotatable shaft carrying said support, said pinion having a bore receiving said support which bore is larger in diameter than the diameter of the support to permit relative displacement between said pinion and said support in the radial and circumferential directions, and means coupling said pinion to said support and permitting relative displacement between said pinion and said shaft in the circumferential and diametric directions, said means including an elastic member interposed between said support and said pinion for providing resilient displacement of the pinion in its circumferential and diametric directions, whereby said teeth of the pinion can adaptedly engage the threads of said globoid worm rotor.

4,036,568

MACHINES FOR MANUFACTURE OF POWDERS

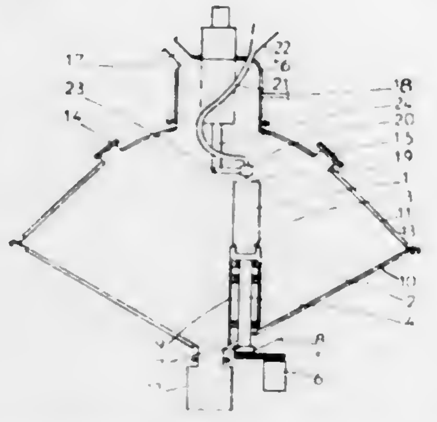
Jean G. Morlet, Nevers; Yves C. Honnorat, Imphy, and Gerard D. Raisson, Nevers, all of France, assignors to Creusot-Loire, Paris, France

Continuation-in-part of Ser. No. 529,948, Dec. 5, 1974, abandoned. This application Nov. 21, 1975, Ser. No. 634,278

Claims priority, application France, Dec. 7, 1973, 73.43735

Int. Cl.² B22D *23/08;* **B29C** *23/00*

U.S. Cl. 425—8 **13 Claims**



1. Apparatus for manufacturing metal powder consisting of spherical particles having a diameter between 10 microns and 1000 microns, by spraying molten metal from the end surface of one end of a consumable substantially cylindrical solid metal electrode rotated at high speed about its longitudinal axis, the apparatus comprising:
- means for rotating said consumable electrode about said axis and at high speed;
- means for locally heating at least one zone of said end surface of said one end of said consumable electrode to fusion point;
- means for relatively moving said consumable electrode and said local fusion zone to compensate for consumption of said consumable electrode, whereby when said rotating means is energized and said electrode is rotated at high speed, said fusion zone moves across said end surface of said consumable electrode in a spiral path, metal liquified thereby is expelled centrifugally from said end of said consumable electrode in the form of metal droplets; means for cooling said droplets and
- means for recovering said metal droplets when cooled.

4,036,569

FULL-AUTOMATIC PANNING SYSTEM FOR WHITE BREAD PRODUCTION LINE

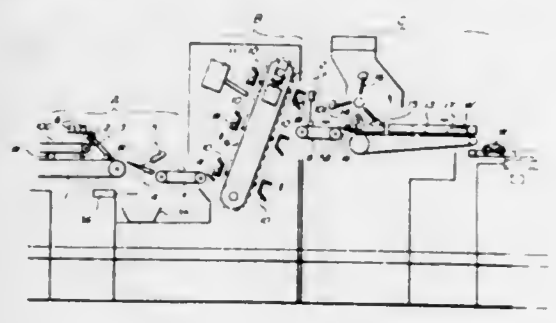
Tatsuo Oshikiri, Tokyo, Japan, assignor to Kabushiki Kaisha Oshikiri Kikai Selsaku-Sho, Tokyo, Japan

Filed Mar. 1, 1976, Ser. No. 662,437

Claims priority, application Japan, Mar. 6, 1975, 50-27483; Mar. 6, 1975, 50-27484; Mar. 6, 1975, 50-27485; Mar. 24, 1972, 47-29552; Mar. 24, 1972, 47-34809[U]

Int. Cl.² A21C *9/08*

U.S. Cl. 425—140 **21 Claims**



1. An automatic panning system for white bread production line, including an elongated travel path having a plurality of work stations in series; comprising:
- a. dough piece-selecting device (A) first work station which detects cylindrically formed dough pieces in a molder and transfers these one by one intermittently said device having means selecting and removing cylindrical dough pieces longer than a predetermined length and making a narrow pitch with a preceeding dough piece,
- b. a centering machine (B) second work station fed by said first work station operable to transfer the selected dough pieces including sensing means for sensing for lateral deviations in a column of the transferred detected dough pieces to correct them by the deviating amount,
- c. a bending machine (C) third work station fed by said second work station operable to bend the cylindrical dough peices transferred from the centering machine into predetermined shapes, and,
- d. a circular table panning machine (D) fourth work station fed by said third work station having means to receive the bent dough pieces one by one and moving them successively to pan a plurality of the dough pieces into a bread pan.

4,036,570

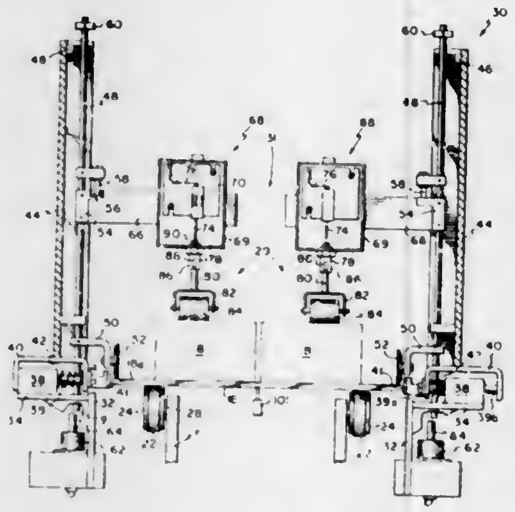
CEMENTITIOUS PRODUCT MAKING SYSTEM WITH PRODUCT HEIGHT GAUGING MECHANISM

Harry F. Cruzen, and Robert W. Gresham, both of Alpena, Mich., assignors to Besser Company, Alpena, Mich.

Continuation of Ser. No. 684,154, May 7, 1976, abandoned, which is a division of Ser. No. 475,757, June 3, 1974, Pat. No. 3,963,397. This application Oct. 14, 1976, Ser. No. 732,388

Int. Cl.² B28B *1/08*

U.S. Cl. 425—141 **7 Claims**



2. Apparatus for gauging the height of a block which is removed from a vibratile mold comprising:
- frame means;
- means thereon for conveying pallets carrying blocks of cementitious material in a forward path of travel;
- support means vertically movable on said frame means between a raised, inoperative position and a lowered position dependent on the level of the top of said pallet; and
- block height sensing means, mounted on said support means for vertical movement relative thereto to a level dependent upon the height of the formed block and independent of the thickness of the pallet for sensing the level of the top of the block as it moves thereby.

4,036,571

MOLDING APPARATUS FOR MAKING IRIS LEAF

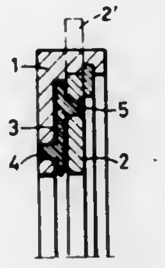
Hermann Geyer, Lengfeld, Wurzburg; Albert Baab, and Paul Himmelsbach, both of Bad Kreuznach, all of Germany, assignors to Jos. Schneider & Co. Optische Werke Kreuznach, Bad Kreuznach, Germany

Division of Ser. No. 551,722, Feb. 21, 1975, Pat. No. 4,009,946. This application Nov. 14, 1975, Ser. No. 632,099

Claims priority, application Germany, Feb. 23, 1974, 2408793

Int. Cl.² B29F *1/14*

U.S. Cl. 425—556 R **8 Claims**



1. A mold for making an iris leaf for an optical component, comprising:
- a pair of separable mold halves with confronting surfaces forming a pair of shallow cavities therebetween and a sprue channel with branches extending from an injection gate between said cavities to respective edges of said cavities;
- a plurality of shearing bolts guided in bores transverse to said surfaces at the junctions of said branches with said edges for severing a foil-shaped body molded in each cavity from a runner in said sprue channel; and
- ejection means in one of said mold halves for dislodging the molded bodies from said cavities.

4,036,572

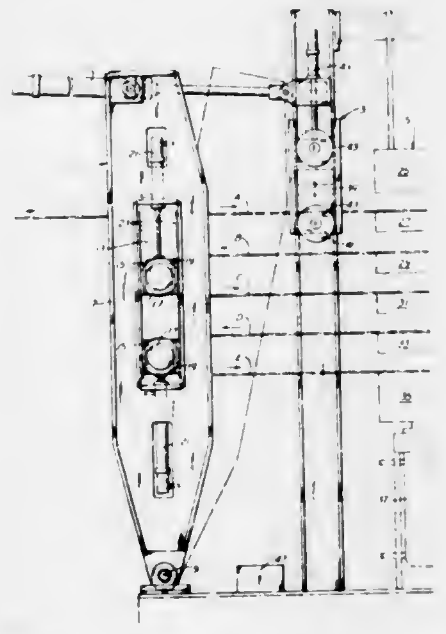
BELT TENSIONING DEVICE FOR A VULCANIZING PRESS

Oscar Lewis Yeager, Pittsburgh, Pa., assignor to Wean United, Inc., Pittsburgh, Pa.

Filed June 23, 1976, Ser. No. 699,116

Int. Cl.² B29C *3/00*

U.S. Cl. 425—338 **8 Claims**



1. An apparatus for tensioning a belt in a multiplaten vulcanizing press located at one side of and adjacent to said press comprising:
- a support,
- a pivotal frame connected to said suport and having an opening,
- means for pivotally moving said frame,
- means in said opening for horizontally engaging a strand of said belt when extending from between the press platens in a manner to tension the strand in said press upon a pivotal movement of said frame away from said press and to untension the strand in said press upon a pivotal movement of said frame toward said press, and
- means for moving said belt engaging means to maintain the strand in a horizontal alignment with a platen of said press to assure a uniform tension of the strand in said press.

4,036,573

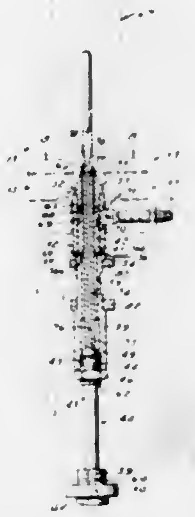
STRETCH BLOW MOLDING APPARATUS

Ivan L. Kauffman, Commerce Township, Oakland County, and Robert C. Kellogg, Hartland Township, Livingston County, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Continuation of Ser. No. 415,850, Nov. 14, 1973, abandoned. This application June 23, 1976, Ser. No. 699,145

Int. Cl.² B29C *17/07*

U.S. Cl. 425—529 **2 Claims**

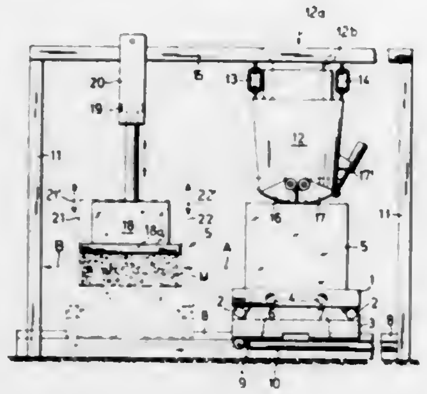


1. In a blow molding machine having a mold assembly with a longitudinal axis and an opening with a locating shoulder therein, the combination comprising:
- stretch pin means mounted in operative relation with said mold assembly having:
  - a. a tubular body;
  - b. a blow air nozzle mounted in said body carrying a preform having a flangelike protrusion adjacent an open end for locating and sealing said preform against said shoulder in the mold assembly;
  - c. a stretch pin slidably mounted longitudinally through said blow air nozzle between retracted and extended positions for stretching said preform;
  - d. first blow air passage means operatively formed through said tubular body and blow air nozzle including an annular passage adjacent the open end of the preform for admitting blow air under pressure into the preform for blowing the preform into a finished article;
  - e. second air ejection passage means in the stretch pin including an outlet forward of said first blow air passage means when the stretch pin is in said extended position for ejecting the finished article from the stretch pin; and
  - f. valve means responsive to the pressure of the blow air to prevent blow air from exiting through the second air ejection passage means during blowing of the article.

4,036,574
DEVICE FOR THE PRODUCTION OF CARBON BODIES

Willy Jakobs, Proz-Grengel, and Kurt Wilkens, Cologne, both of Germany, assignors to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany

Filed Dec. 1, 1975, Ser. No. 636,544
Claims priority, application Germany, Dec 2, 1974, 2456911
Int. Cl.² B29C *3/00;* B30B *11/02*
U.S. Cl. 425—432 8 Claims

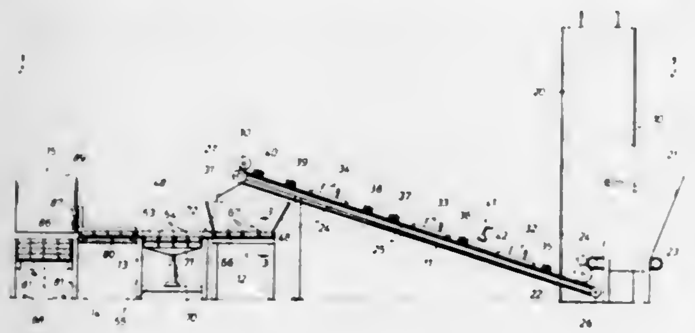


1. A mechanism for the production of carbon bodies such as electrodes for the aluminum industry comprising:
- a jarring table;
- a resilient mount therefor;
- an oscillation exciter attached to the table;
- a mold box arranged on the table;
- a base frame supporting the resilient mount;
- a horizonal slide supporting the base frame;
- a drive for horizontally sliding the base frame on the horizontal slide between fixed first and second positions;
- a material charging container above the mold selectively fixed vertically and fixed horizonally at said first horizontal charging position;
- an openable closure means carried on the charging container for metering by the selected vertical position of the container the flow of material from the charging container; and
- a pressing compression device and a compression weight fixed on said second position of the mold, whereby the mold box may be charged at the first position and the carbon material therein jarred and compressed at the second position; and wherein
- said horizontal slide is positioned to guide the container accurately between said first and second positions.

4,036,575
CONCRETE PRODUCT MANUFACTURING SYSTEM

Douglas F. Prince, Houston, Tex., assignor to Castone Development Corporation, Houston, Tex.

Division of Ser. No. 307,154, Nov. 16, 1972, Pat. No. 3,904,723. This application June 9, 1975, Ser. No. 584,713
Int. Cl.² B28B *13/02*
U.S. Cl. 425—443 7 Claims

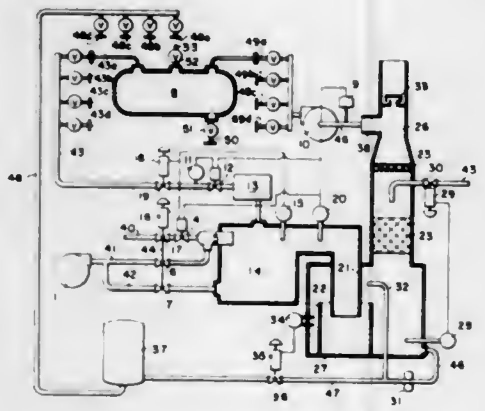


1. Concrete product manufacturing system comprising:
- a. mixer means adapted to continuously receive raw materials, including aggregates, cement and liquids, and to continuously mix said raw materials to form a wet concrete mixture;
- b. receiver means adjacent said mixer means for continuously receiving said wet concrete mixture from said mixer means and maintaining therein a static head above a predetermined limit, the lower portion of said receiver means forming a preload area into which a portion of said wet concrete mixture may be precompacted by the static head exerted by said wet concrete mixture in said receiver means; and
- c. mold means adjacent said receiver means for repeatedly receiving charges of said precompacted wet concrete mixture from said preload area of said receiver means to form precured concrete products;
- d. said mold means and said receiver means being mounted for reciprocable movement, relative to each other, from a first position in which said mold means is directly beneath said preload area of said receiver means to a second position in which said mold means is not beneath said receiver means, said receiver means being in a position at all times to receive wet concrete mixture from said mixer means to maintain said static head therein.

4,036,576
INCINERATION SYSTEM FOR THE DISPOSAL OF A WASTE GAS AND METHOD OF OPERATION

Charles Kennedy McCracken, Blue Bell, Pa., assignor to The Trane Company, La Crosse, Wis.

Filed Aug. 11, 1976, Ser. No. 713,458
Int. Cl.² F23G *7/06*
U.S. Cl. 431—5 16 Claims



1. A method of operating an incinerator for the disposal of a waste gas comprising the steps of:
- a. admitting fuel and combustion air to said incinerator for combustion therein;
- b. admitting waste gas and incineration air to said incinerator; and
- c. modulating the flow of fuel, combustion air and incineration air to said incinerator between predetermined minimum and maximum values in response to temperature changes within said incinerator, an increase in temperature resulting in decreased fuel and combustion air flow and increased incineration air flow.

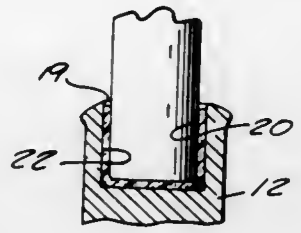
4,036,577
CANDLE SNUGGER

Robert D. Veitel, and Myrtle M. Veitel, both of 1333 Martha Washington Drive, Wauwatosa, Wis. 53213

Filed Feb. 26, 1976, Ser. No. 661,473
Int. Cl.² F23D *3/16;* F23N *5/02*
U.S. Cl. 431—35 1 Claim

1. In combination a candle with a candle butt and a candle holder with an opening, a compressible and yieldable circular disk of polyurethane foam having opposed friction surfaces and a diameter greater than the diameter of the butt of the candle, said disk being adapted to be concentrically positioned

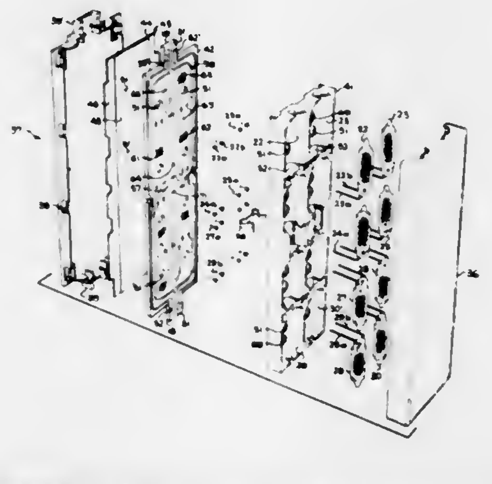
with respect to the holder opening and to form a pocket around the candle occupying the space between the candle and the candle holder opening to encapsulate the butt of the candle and secure the candle in the holder said disk being sized with respect to the diameter of the candle so that the disk has an upper margin arranged around the periphery of the candle adjacent the top of the candle holder and wherein the disk is treated with a heat activated composition which gasifies when exposed to the candle flame to snuff out the candle as the candle burns proximate said disk.



4,036,578
PHOTOFLASH ARRAY AND METHOD OF CONSTRUCTION

Richard M. Herman, Cleveland, Ohio, assignor to General Electric Company, Schenectady, N.Y.

Filed May 13, 1976, Ser. No. 686,145
Int. Cl.² F27D *1/08*
U.S. Cl. 431—98 10 Claims



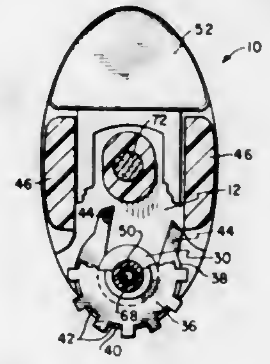
1. A photoflash array comprising a plurality of flash lamps each having pair of lead-in wires, a circuit board carrying circuitry for flashing said lamps and having pairs of connector areas for the respective pairs of lead-in wires of said lamps, pairs of openings through said circuit board at said pairs of connector areas, respectively, a plurality of pairs of eyelets respectively positioned through said pairs of openings with the eyelet shanks extending from one side of said circuit board, said flash lamps being positioned over the other side of the circuit board and their pairs of lead-in wires respectively extending into and connected to said pairs of eyelets, and a sheetlike electrically conductive shield member positioned substantially parallel to said one side of the circuit board, one of the eyelet shanks of one or more of said pairs thereof extending farther from said one side of said circuit board than the other eyelet shank of the pair and contacting against said shield member to space it from said circuit board.

4,036,579
LIGHTER

William E. Marynissen, Old Greenwich, Conn., assignor to Bic Pen Corporation, Milford, Conn.

Filed Apr. 30, 1975, Ser. No. 573,384
Int. Cl.² F23Q *2/08, 25/00, 1/02*
U.S. Cl. 431—131 9 Claims

1. A lighter for burning a fuel of a type capable of providing a combustible gas upon being permitted to expand under atmospheric pressure which comprises:
- a. a body member defining an internal chamber for containing a supply of fuel, said fuel chamber further defining a fuel supply opening through which the fuel may pass;
- b. an extension positioned on said body member and defining an output orifice which is communicable with said fuel supply opening in such a manner that fuel permitted to pass through said fuel supply opening is directable to said extension for projecting a flame from said output orifice;
- c. selectively operable valve means positioned and structured for selective movement from a first position which seals said fuel supply opening and prevents fuel from passing therethrough to a second position which permits fuel to pass from said fuel supply opening to said output orifice;
- d. fuel expansion control means positioned intermediate said internal chamber and said extension and constructed of a material which is structured and adapted for selectively varying the fuel permitted to pass through said fuel supply opening, independent of said selectively operable fuel valve means, to vary the height of the flame produced by said expansible fuel in proportion to the amount of fuel permitted to pass;



- e. a rotatably mounted control member defining a plurality of radial extending teeth about the periphery, said control member being operatively connected to said fuel expansion control means to adjust the fuel expansion control means in relation to the angular position of the control member with the control member being rotatable from a first limit position which substantially restricts expansion of fuel from said fuel supply opening to said output orifice and a second limit position which permits relatively unrestricted fuel expansion through said fuel supply opening; and
- f. at least one limit member positioned about said control member and having deformable tab means bendable between at least two of said radial extending teeth to prevent selective relative rotary movement of said limit member and control member while causing said limit member to rotate therewith, said limit member having at least one leg member positioned and dimensioned to engage a wall portion of said body member to limit at least the maxium amount of fuel permitted to expand through said fuel expansion control means when said fuel valve means is in the open position.

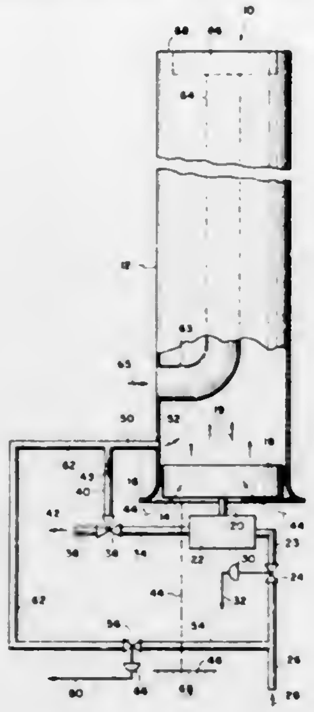
4,036,580
TURBINE-DRIVEN AIR-POWERED FLARE

Robert D. Reed; Robert E. Schwartz, and Roger K. Noble, all of Tulsa, Okla., assignors to John Zink Company, Tulsa, Okla.

Filed June 4, 1976, Ser. No. 693,000
Int. Cl.² F23D *13/20*
U.S. Cl. 431—202 9 Claims

1. In an air powered flare combustion apparatus comprising:
- a. a flare stack, comprising an outer cylindrical wall;
- b. primary air driving means, mounted at the upstream end of said flare stack;

c. internal cylindrical conduit means for the flow of waste gases to be flared;
d. burner means for burning said waste gases attached to said internal conduit and positioned at the downstream end of said outer cylindrical wall, and ignition means;
the improvement in means to provide complete and smokeless combustion of said waste gases, comprising;

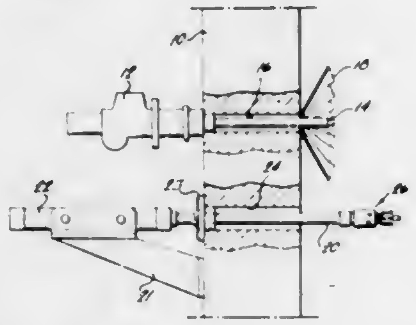


e. said primary air driving means comprising steam powered means; and
f. means to inject the exhaust steam from said steam powered air driving means into said combustion apparatus;
whereby said exhaust steam will chemically participate in the combustion process and assist in the complete and smokeless combustion of said waste gases.

4,036.581
IGNI I ER

David R. Keyser, Churchville, and Pierce H. Zavod, King of Prussia, both of Pa., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 3, 1976, Ser. No. 720,310
Int. Cl.² F23Q *1/00*
U.S. Cl. 431—267 **6 Claims**

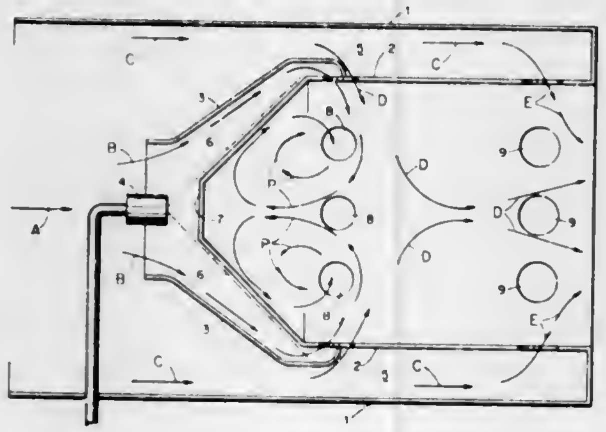


1. An igniter, comprising:
a manifold, adapted to receive pressurized gas, provided with a nozzle adapted to pass the gas therethrough;
a chamber connected to said manifold and provided with a plurality of orifices;
a first hollow tube, centrally mounted on said chamber opposite the nozzle, having a closed end and an open end forming a resonant cavity, the closed end being distant from said chamber and the open end opening into said chamber and being adapted to receive the gas from the nozzle; and
a cluster of second hollow tubes, arranged about said first hollow tube, mounted on said chamber opposite the nozzle, each of said second tubes having a closed end and an open end forming a resonant cavity, the closed end being distant from said chamber and the open end opening into said chamber and being adapted to receive the gas from the nozzle.

4,036,582
COMBUSTION CHAMBER FOR GAS TURBINE POWER PLANTS HAVING DEVICES FOR THE GASEOUS PROCESSING OF THE FUEL BEING INTRODUCED THEREIN

Adolf Fehler, Pfaffing, and Günter Kirschey, Munich, both of Germany, assignors to Motoren- und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Oct. 31, 1975, Ser. No. 627,918
Claims priority, application Germany, Nov. 2, 1974, 2452178
Int. Cl.² F23Q *9/08*
U.S. Cl. 431—352 **5 Claims**



1. In a combustion chamber for gas turbine power plants including means for the gaseous processing of the fuel being introduced therein, the combination of:
a. said combustion chamber having a flame tube with an essentially conically shaped flame tube backwall; and at least one fuel ejection nozzle located upstream of said flame tube backwall, said nozzle ejecting a fuel cone extending exteriorly along said flame tube backwall, the conical configuration of said backwall being substantially similar to that of said fuel cone;
b. and an air infeed hood surrounding said flame tube backwall and at least partly said fuel ejection nozzle, said hood and said flame tube backwall forming an annular passageway decreasing in cross-section in the downstream direction of said flame tube backwall; and a plurality of apertures in the side walls of said flame tube arranged directly adjacent said flame tube backwall and providing communication between said annular passageway with the interior of said flame tube.

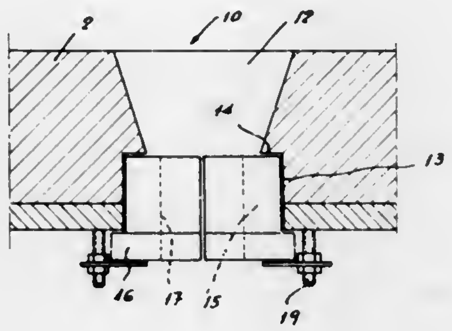
4,036,583
ROTARY FURNACE FOR THE CONTINUOUS MANUFACTURE OF SOLID ALKALINE SILICATES

Jose Felip Sugranes, Valencia, Spain, assignor to Foret, S. A., Barcelona, Spain

Continuation of Ser. No. 541,689, Jan. 16, 1975, abandoned. This application Apr. 8, 1976, Ser. No. 675,217
Int. Cl.² F27B *7/32*
U.S. Cl. 432—117 **3 Claims**

1. A rotary furnace for the continuous manufacture of solid alkaline silicates, said rotary furnace comprising:
an inclined rotary tubular body;
means at the higher end of said body for continuously charging therein materials to be treated;
heating means at the lower end of said body for melting said materials; and

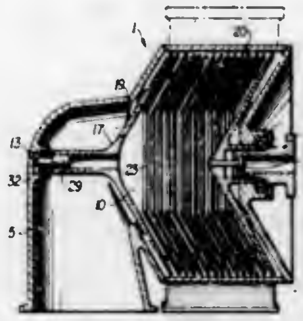
means for continuously discharging the resulting product from said body, said discharging means comprising at least one outlet opening formed through the side wall of said body, each said at least one outlet opening being located adjacent said lower end of said body, said body being free of openings between said at least outlet opening and said higher end of said body, and a bushing of refractory material extending into each said at least one outlet opening, each said bushing having an open passage extending completely therethrough to the atmosphere exterior of said body, there being free and open communication between the interior of said body and the exterior atmosphere through said outlet opening and said passage, each said passage having an area less than the area of the respective said outlet opening, said passage area being the same for all bushings mounted in said body, said passage area comprising means for controlling the desired rate of discharge of said product from said body.



4,036,584
TURBINE

Benjamin G. Glass, 3011 Stockett Way, San Diego, Calif. 92117

Filed Dec. 18, 1975, Ser. No. 642,169
Int. Cl.² F01D *1/36*
U.S. Cl. 415—90 **8 Claims**



1. A turbine comprising a housing and a circular rotor journalled within said housing, fluid inlet means in said housing and said inlet means extending substantially tangentially with respect to said rotor, said rotor comprising an assembly of adjacent circular members and the rear faces of said circular members having raised spiral fence baffles that affix and space adjacent members with respect to one another and define an expanding fluid channel towards exhaust openings in the centers of these members, the openings of the circular members intermediate the end members of said assembly being obstruction-free and the axis of rotation of said rotor extending through said exhaust openings, a front end member of said rotor comprising a web with exhaust slots and having an outer convex side, a central stem on said convex side being journalled to said housing with shaft means, a rear end member of said rotor comprising a coupling that is journalled to the rear of said housing.

CHEMICAL

4,036,585

BLEEDFAST PHTHALOCYANINE DYES FOR PAPER

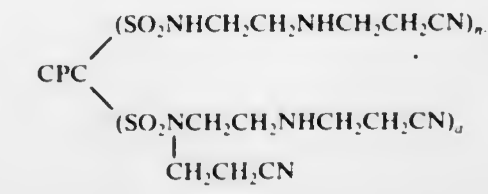
Daniel Shaw James, Hockessin, and Vincent Gerard Witterholt, Wilmington, both of Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Aug. 10, 1976, Ser. No. 713,038

Int. Cl.^{2} D06P ***1/14;*** **C09B** ***47/04***

U.S. Cl. 8—1 XA **5 Claims**

1. A dye of the formula



$$\mathrm{CPC}\begin{cases}(\mathrm{SO_2NHCH_2CH_2NHCH_2CH_2CN})_{n\text{-}a}\\(\mathrm{SO_2NCH_2CH_2NHCH_2CH_2CN})_a\\\quad\;\; |\\\quad\;\; \mathrm{CH_2CH_2CN}\end{cases}$$

wherein *n* is an average number of 3 to 4, *a* is 0 to 3 but less than *n*, and CPC is copper phthalocyanine.

4,036,586

PROCESS FOR OXIDIZING SULFUR DYES

Marvin Herbert Rowe, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 16, 1975, Ser. No. 622,889

Int. Cl.^{2} C09B ***49/00;*** **D06P** ***1/30***

U.S. Cl. 8—37 **4 Claims**

1. In the continuous process of oxidizing sulfur dyes on cellulosic fibers by contacting said fibers containing said dye in a reduced state with a hydrogen peroxide solution comprising decomposition inhibitors, the improvement wherein the hydrogen peroxide solution of 0.1 % to 0.5 % by weight of H_2O_2 and a pH of from 2 to 7 comprises from 0.01 to 0.2 gram of a water-soluble copper salt per liter of said peroxide solution.

4,036,587

PROCESS FOR DYEING CELLULOSE FIBERS

Hans Wolf, Ludwigshafen; Jozsef Gerendas, Neustadt, and Ernst Wilhelm, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Sept. 2, 1975, Ser. No. 609,562

Claims priority, application Germany, Sept. 19, 1974, 2444823

Int. Cl. C09b ***69/00***

U.S. Cl. 8—92 **6 Claims**

1. A process for the dyeing of cellulose fibers or mixtures of cellulose fibers with synthetic fibers which comprises dyeing a textile material made of said cellulose fibers or said mixtures of fibers by the exhaustion method in an aqueous liquor that had been used in the acid pre-treatment of said fibers and containing a dye for cellulose fibers and, as a dyeing assistant and complexing agent, from 0.05 to 2% by weight, based on the material being dyed, of a water-soluble polymer selected from the group consisting of water-soluble homopolymers of acrylic acid, water-soluble copolymers of acrylic acid with up to 50% by weight of methacrylic acid, methacrylamide, acrylamide, acrylonitrile, methacrylonitrile, esters of acrylic acid and methacrylic acid, crotonic acid and itaconic acid, copolymers of maleic acid with styrene, copolymers of maleic acid with vinyl esters, copolymers of maleic acid with vinyl ethers and the alkali metal and ammonium salts of the said polymers, said polymer having a viscosity of 7.5% by weight solution of the polymer in water at a pH of 9 and a temperature of 20° C of from 1 to 300 centipoises.

4,036,588

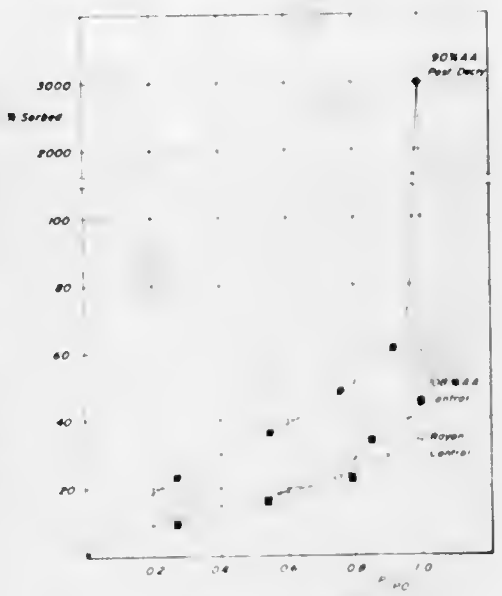
METHOD OF INCREASING THE WATER ABSORPTION OF CELLULOSE-CONTAINING MATERIALS

Joel Lawson Williams, Cary, and Vivian Thomas Stannett, Raleigh, both of N.C., assignors to Research Corporation, New York, N.Y.

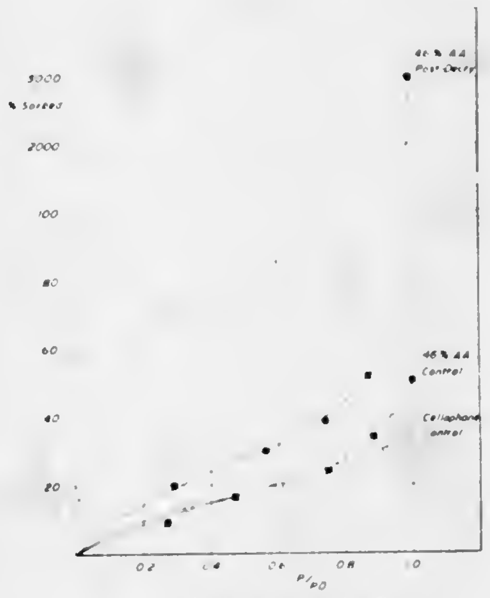
Filed Mar. 9, 1976, Ser. No. 665,181

Int. Cl.^{2} D06M ***13/20, 13/30, 13/34, 5/24***

U.S. Cl. 8—130.1 **17 Claims**



WATER SORPTION ISOTHERMS FOR ACRYLIC ACID GRAFTED RAYON AT 25° C



WATER SORPTION ISOTHERMS FOR ACRYLIC ACID GRAFTED CELLOPHANE AT 25° C

1. In a process for imparting water-absorbent properties to a cellulose-containing material by graft-copolymerizing onto said material at least one vinyl monomer containing a hydrophilic group the improvement comprising treating said graft-copolymerized material with a decrystallizing agent for cellulose in an amount and for a time sufficient to increase the water absorbency of the graft copolymerized material.

4,036,589

DETERMINING THE CONCENTRATION OF A BIOCIDE ADDITIVE IN A LIQUID

Robert Daniel King, Mill Valley, Calif., assignor to J. R. Schneider Co., Inc., Tiburon, Calif.

Continuation-in-part of Ser. No. 588,517, June 19, 1975, abandoned. This application Mar. 22, 1976, Ser. No. 668,868

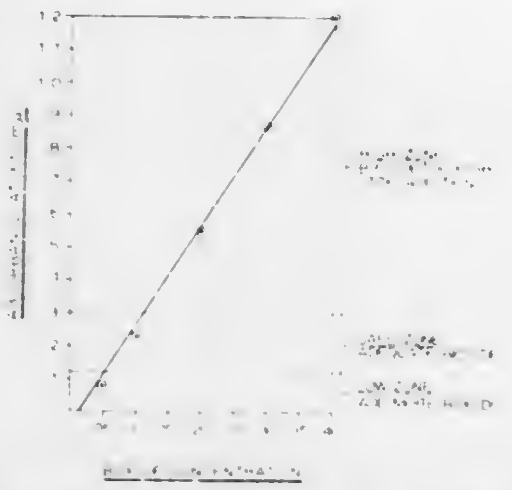
Int. Cl.^{2} B01D ***17/04;*** **G01N** ***33/16***

U.S. Cl. 23—230 B **14 Claims**

1. A method for determining the biocide concentration in an

oil-water emulsion containing a biocide that in acid aqueous solution liberates material reacting with a modified Schiff's reagent, comprising the following steps:

1. providing said oil-water emulsion containing a biocide that in acid aqueous solution liberates material reacting with a modified Schiff's reagent,
2. adding a predetermined sample of said emulsion to a test tube containing (a) a lower aqueous phase solution for breaking said emulsion, and (b) an upper phase of a non-water-miscible solvent for said oil,
3. shaking the test tube vigorously,



4. thereafter adding to said test tube and mixing with the liquid therein a predetermined amount of modified Schiff's reagent consisting essentially of an aqueous solution of rosaniline hydrochloride, sodium bisulfite, and hydrochloric acid,
5. permitting the test tube to stand for a predetermined time interval sufficient to separate said phases and to develop color strength in said aqueous phase if said liberated material is present, and
6. reading the color intensity of said aqueous phase, as calibrated for biocide concentration.

4,036,590

METHOD AND APPARATUS FOR THE AUTOMATIC ANALYSIS OF THE CONCENTRATION OF AN INDIVIDUAL COMPONENT OF A FLUID IN A METAL-DEPOSITING BATH HAVING SEVERAL COMPONENTS

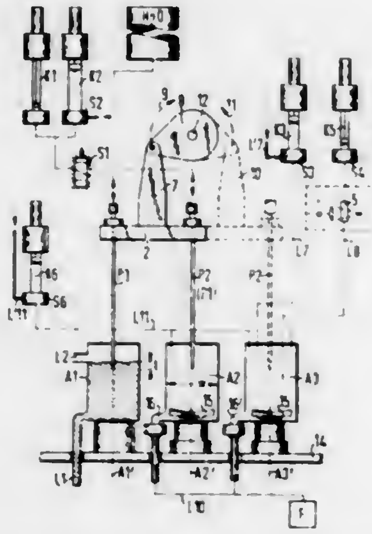
Johannes Helder, Brugge; Hubert De Steur, Drongen; Marc De Vogelaere, Sint-Kruis, all of Belgium, and Wolfgang Pernegger, Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed May 25, 1976, Ser. No. 689,925

Claims priority, application Germany, June 3, 1975, 2524611

Int. Cl.² G01N *21/24, 33/20*

U.S. Cl. 23—230 R **3 Claims**



1. A method for the automatic analysis and determination of the magnitude of specific components of a bath fluid having a plurality of components in a metal-depositing bath, comprising the steps of:

a. pumping the bath fluid for several minutes in a circulation system located partially outside the bath;
b. taking a sample quantity from the circulation system and diluting the sample quantity in at least first and second dilution operations including the step of,
    i. removing a diluted measured fractional quantity from the first dilution operation and again diluting that fractional quantity in the second dilution operation to create a highly diluted measured quantity;
c. adding a reaction agent and solvent to the highly diluted measured quantity to create a solvent-reaction agent mixture;
d. rinsing a measuring cuvette of a colorimeter with the solvent-reaction agent mixture; and
e. colorimetrically measuring the solvent-reaction agent mixture to determine the magnitude of the specific bath component

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4,036,591

METHOD FOR PLACING A CORROSION TEST SPECIMEN INTO AN ENVIRONMENT TO BE TESTED

Herman F. Stanfill, Brea, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Aug. 18, 1976, Ser. No. 715,241

Int. Cl.² G01N *31/00, 33/20*

U.S. Cl. 23—230 C **6 Claims**

1. A method for passing a corrosion test specimen through a contaminating environment and into an environment to be tested, which comprises:

encapsulating said specimen in ice; and

passing said specimen through said contaminating environment and into said test environment.

4,036,592

DETECTION OF CARBON MONOXIDE

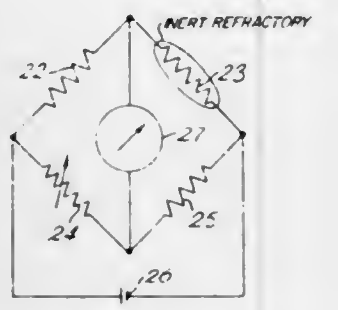
David Keith Brown; David William Dabill; Jack Graham Firth; Alan Jones, and Thomas Alwyn Jones, all of Sheffield, England, assignors to National Research Development Corporation, London, England

Filed May 28, 1975, Ser. No. 581,697

Claims priority, application United Kingdom, June 5, 1974, 25045/74

Int. Cl.² G01N *27/16, 31/12;* **H01C** *3/00*

U.S. Cl. 23—232 E **9 Claims**



1. A method of testing an oxygen-containing atmosphere for the presence of carbon monoxide, the method comprising:

bringing said atmosphere into contact with a catalyst consisting of a platinum base alloy containing rhodium in a proportion of not less than about 10% by weight while maintaining said catalyst at a temperature such that it is capable of causing combustion of carbon monoxide but will not readily cause combustion of hydrogen in said atmosphere; and

sensing any thermal effect on said catalyst caused by the occurrence thereon of a combustion reaction.

8. An apparatus for use in gas detection, the apparatus comprising:

a Wheatstone bridge circuit in adjacent arms of which are respectively connected similar resistors respectively constituted by first and second coils of wire each consisting of a platinum base alloy containing rhodium in a proportion of not less than about 10% by weight, said second coil being embedded in a bead of an inert refractory material and said first coil and said bead being exposed for contact with an atmosphere to be tested;

means for energising said bridge circuit, said energising means being operative to pass through said first coil when said bridge circuit is balanced an electric current such that when an atmosphere containing oxygen, carbon monoxide and hydrogen is brought into contact with said first coil it will cause combustion of carbon monoxide but will not readily cause combustion of hydrogen; and

means responsive to an out-of-balance condition of said bridge circuit.

4,036,593

APPARATUS FOR PURIFICATION OF EXHAUST GASES

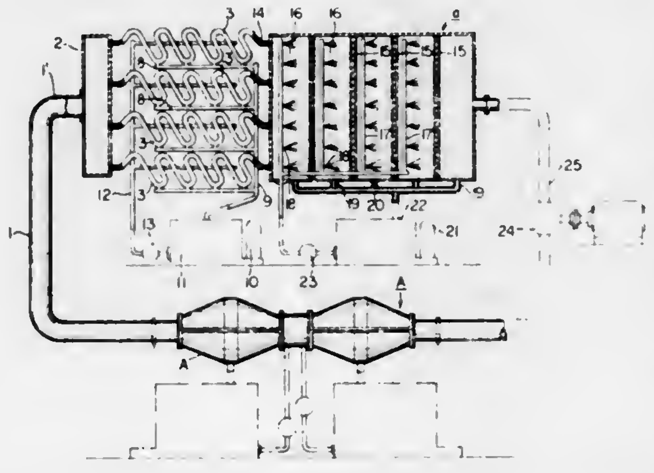
Shinobu Satoh, No.1-51, Hizumi 1-chome, Kashiwazaki, Niigata, Japan

Division of Ser. No. 453,192, March 21, 1974, Pat. No. 3,961,019. This application Mar. 1, 1976, Ser. No. 662,433

Claims priority, application Japan, Mar. 30, 1973, 48-36992

Int. Cl.² B01D *25/08, 47/06;* **B01J** *1/00*

U.S. Cl. 23—260 **6 Claims**



1. An apparatus for purifying an exhaust gas emitted by a combustion operation and flowing through a flue, comprising: a first reaction purifier comprising one or a plurality of sinuous gas flow conduits connected at one end to said flue for receiving exhaust gas therefrom, said gas flow conduit or conduits having upper reversely curved bends connected by intermediate upright sections to lower reversely curved bends; a plurality of serially arranged first nozzles located in said upright sections for injecting jets of pressurized aqueous solution of alkaline material into the exhaust gas flowing through said upright sections for reaction with said exhaust gas, all of said nozzles in said upright sections being arranged to inject said aqueous solution in the same lengthwise direction in said upright sections and in the same direction as the direction of flow of the exhaust gas in said upright sections so as to add energy to and react with said exhaust gas; discharge conduits connected to said lower reversely curved bends for removing said aqueous alkaline solution and precipitates contained therein; a second reaction purifier comprising a shower box having one end thereof connected to the other end of said gas flow conduit or conduits, said shower box containing a plurality of serially arranged, generally planar, upright, horizontally spaced-apart glass fiber mats extending transverse to the direction of gas flow through said shower box, a plurality of second nozzles disposed upstream of and in confronting relationship to each of said mats for directing streams of an aqueous solution of oxygen-generating material toward the mats, all of said second nozzles being arranged to direct said streams of aqueous solution of oxygen-generating material in the same direction in said shower box and in the same direction as the direction of flow of the exhaust gas in said shower box, and exhaust port means connected to the lower end of said shower box for removing said aqueous solution of oxygen-generating chemical from said shower box; and exhaust conduit means connected to said shower box downstream of the last mat therein for removing purified exhaust gas from said shower box.

4,036,594

APPARATUS FOR RECOVERING HIGHER MELTING ORGANIC MATERIALS VIA FRACTIONAL SUBLIMATION

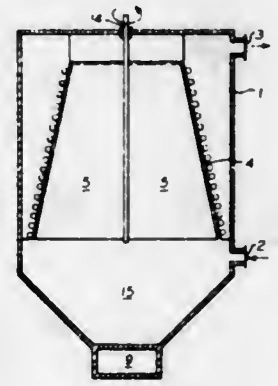
Gunter Ibing, Mulheim (Ruhr), and Herbert Haferkorn, Bottrop, both of Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

Division of Ser. No. 533,416, Dec. 16, 1974. This application July 16, 1975, Ser. No. 596,349

Claims priority, application Germany, Dec. 17, 1973, 2362659

Int. Cl.² B01D *7/02*

U.S. Cl. 23—264 **7 Claims**



1. An apparatus for the recovery of higher melting, organic materials comprising upright container means with gas inlet means laterally connected to the lower part of said container means, a gas outlet means connected to the upper part of the container means, at least one wall opposed to said gas inlet means and disposed in the path of gas flow from said gas inlet means to said gas outlet means, said wall defining a zone on the upstream side thereof and a zone on the downstream side thereof, said wall being perforated to permit gas to flow from said upstream side thereof to said downstream side thereof, said wall having attached thereto on the downstream side thereof cooling means comprising at least one thermostatically controlled cooling coil through which passes a cooling fluid, said apparatus having collection means for collecting solids deposited on the upstream side of said wall, said wall being at least partially opposed to a bottom portion of said apparatus and tapering downward with means for product removal.

4,036,595

CONTINUOUS CRYSTAL GROWING FURNACE

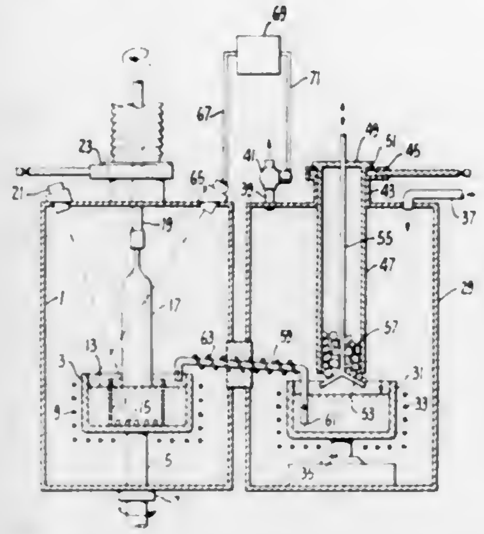
Robert E. Lorenzini, Menlo Park; Akiyoshi Iwata, Sunnyvale, and Karl Lorenz, Redwood City, all of Calif., assignors to Siltec Corporation, Menlo Park, Calif.

Filed Nov. 6, 1975, Ser. No. 629,609

Int. Cl.² B01J *17/18*

U.S. Cl. 23—273 SP **4 Claims**

1. In an apparatus for growing a semiconductor crystal from a melt of a semiconductor material maintained in a first crucible, said first crucible being enclosed in a first chamber, the improvement comprising a second crucible having means for melting solid material to provide a melt in said second crucible and means for introducing said molten material from said second crucible to said first crucible, said means including a tube extending into the molten material of the second crucible whereby liquid is withdrawn from the second crucible from a point between the bottom of the crucible and the top surface of the melt, said second crucible being mounted in an enclosed second chamber separate from said first chamber, said second chamber having a top opening leading to said second chamber, said top opening having valve means to selectively close or open said top opening, and a tight fitting cannister adapted to be inserted into said top opening, said cannister being elongated and having a valve means at the bottom thereof and operating means connected to said bottom valve means and extending out through the top of the cannister whereby the contents of the cannister can be selectively introduced by actuating said operating means.--



4,036,596
APPARATUS FOR CONTINUOUS SULFONATION

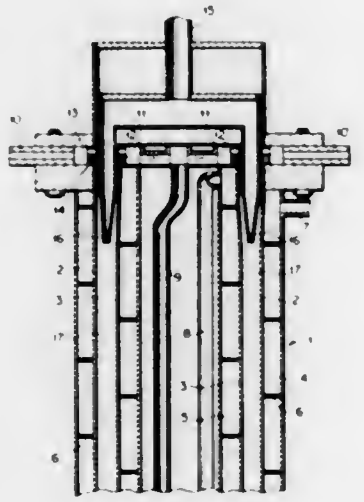
Toshiaki Ogoshi, Funabashi; Yozo Miyawaki; Fusao Kondo, both of Chiba, and Susumu Sakurai, Narashino, all of Japan, assignors to Lion Fat & Oil Co., Ltd., Tokyo, Japan

Filed June 25, 1976, Ser. No. 699,712

Claims priority, application Japan, June 30, 1975, 50-80645

Int. Cl.² B01J *10/00;* C07B *13/06*

U.S. Cl. 23—283 **6 Claims**



1. In an apparatus for continuous sulfonation comprising at least one vertically extending, cylindrical reaction wall having a reaction surface down which a liquid material to be sulfonated flows in the form of a thin film, and at least one annular nozzle for feeding a gaseous sulfonating agent to a corresponding reaction zone, wherein the improvement comprises an annular feeding device mounted on an upper end of said at least one cylindrical reaction wall for feeding said liquid material to be sulfonated to said reaction surface, and having a number of rectangular slots horizontally equidistantly arranged in a row; and in the percentage of slot area expressed by the formula:

$$\frac{a \times c}{a(b + c)} \times 100$$

where a represents the vertical clearance of the opening of each slot and is in the range of 0.2 mm to 1.0 mm; b the interval between two adjacent slots; and c the horizontal width of opening of each slot; said a, b and c are so chosen as to permit said percentage of slot area to range from 40 to 90%.

4,036,597
APPARATUS FOR PURIFYING GASES

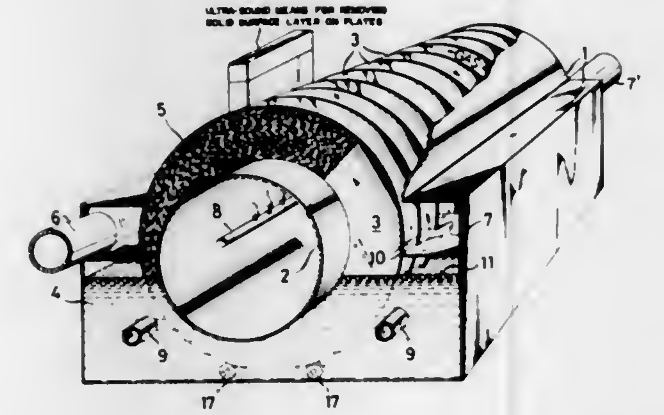
Peter Filss, Julich, Germany, assignor to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung, Julich, Germany

Division of Ser. No. 380,619, July 19, 1973, Pat. No. 3,907,967. This application May 21, 1975, Ser. No. 579,372

Claims priority, application Germany, July 25, 1972, 2236389

Int. Cl.² B01J *10/00*

U.S. Cl. 23—284 **9 Claims**


ULTRA-SOUND MEANS FOR REMOVING SOLID SURFACE LAYER ON PLATES
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7. An apparatus for purifying gases, especially industrial waste gases, which includes in combination: a liquid as an aqueous solution to form a layer to absorb impurifications and harmful substances from the gas to be purified, housing means including a gas inlet and a gas outlet and a container having the liquid therein at a level below said gas inlet and said gas outlet, rotatable driven pipe means and a plurality of annular rotatable plate means coaxially mounted on said pipe means for rotation therewith, said plate means being axially spaced from each other by a few millimeters and the pipe means being rotatably journalled in the housing means so that said plate means are immersed only partially in such liquid and, when the pipe means and plate means rotate, a layer of liquid is formed on said plate means above the level of said liquid, and means connected to and in contact with said pipe means to evaporate the liquid on said plates to form a solid surface layer capable of adsorbing and chemically reacting with impurifications and harmful substances from the gas to be purified, and means in said liquid for removing impurifications and harmful substances adsorbed from the gas and chemically fixed by said solid surface layer from said annular plate means.

4,036,598
MECHANICAL VIBRATOR FOR USE IN MATERIAL TRANSPORT APPARATUS AND THE LIKE

Albert M. Soldate, 276 Hacienda Drive, Arcadia, Calif. 91006

Division of Ser. No. 420,692, Nov. 30, 1973, Pat. No. 3,915,890. This application June 2, 1975, Ser. No. 583,031

Int. Cl.² B01J *8/40;* F01N *3/15*

U.S. Cl. 23—288 B **18 Claims**

1. Catalyst regeneration apparatus comprising:

a. a closed circuit for simultaneously utilizing and regenerating a particulate catalyst circulated through the closed circuit, the closed circuit including a reaction chamber of closed cross-section having a spaced apart inlet and outlet, a regeneration chamber of closed cross-section having a spaced apart inlet and outlet, and gas seal conduit means of closed cross-section in which the reaction chamber outlet communicates by a tubular feed conduit with the regenerator inlet, and the regenerator outlet communicates by a tubular return conduit with the reaction chamber inlet;

b. means mounting the closed circuit in a substantially horizontal position;

c. a predetermined quantity of a particulate catalyst contained in the closed circuit;

d. means for introducing a stream of reactant gas to the reaction chamber;

e. means for withdrawing said stream of reactant gas from the reaction chamber;

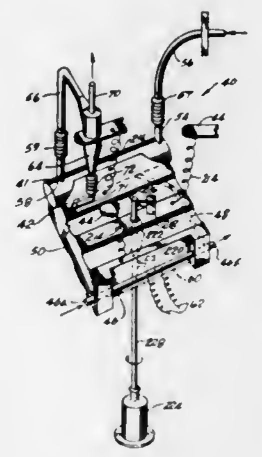
f. means for passing said stream of reactant gas through the reaction chamber to contact the particulate catalyst contained in the reaction chamber prior to the gas being withdrawn from the reaction chamber to promote suitable reactions between components of the reactant gas;

g. means for regenerating spent catalyst particles passing through the regeneration chamber;

h. means for vibrating the horizontally disposed closed circuit as a unit to continuously circulate said catalyst particles in a fluidized, generally random cross-sectional dispersion through the closed circuit so that the particles travel in the reaction chamber and then through the feed conduit, the regeneration chamber, and the return conduit, and then back to the reaction chamber, to allow spent catalyst to be constantly regenerated from its passage through the regeneration means, the vibrating means causing said catalyst particles to travel in a preselected direction between the inlet and outlet of the reaction chamber; and

i. means for passing the stream of reactant gas through the reaction chamber in a direction opposite to the fluidized flow of catalyst particles therein;

j. said quantity of catalyst particles and the cross-sectional dimensions of the gas seal conduit means both being sufficient to cause the catalyst particles to circulate through said conduit means in a generally uniform, substantially completely filled cross-sectional dispersion to provide resistance to appreciable gas flow through the inlet and outlet openings of the reaction chamber so that regeneration of the catalyst particles takes place in the regeneration chamber without being affected by reactions between the reactant gas and the fluidized catalyst particles circulating through the reaction chamber.



4,036,599
POLYCRYSTALLINE ALUMINA FIBERS AS REINFORCEMENT IN MAGNESIUM MATRIX

Ashok Kumar Dhingra, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 378,624, July 12, 1973, abandoned. This application Aug. 15, 1975, Ser. No. 604,933

Int. Cl.² B32B *5/00, 15/14*

U.S. Cl. 428—608 **2 Claims**

1. A fiber-reinforced metal composite consisting essentially of

A. substantially aligned, continuous, polycrystalline alumina fibers which are substantially all alpha alumina and have
  1. a diameter of about 15 to 30 microns,
  2. a microscopic roughness height between 0.20 and 0.40 micron,
  3. a microscopic roughness period between 0.8 and 1.5 micron, and
  4. a tensile strength of at least about 125,000 pounds per square inch after removal from the composite, said fibers comprising between about 50 and 80 percent of the composite by volume; and

B. a matrix of magnesium or magnesium alloy containing at least 90 percent magnesium by weight and having an average grain size in the composite of less than about 4 microns.

4,036,600
STEEL SUBSTRATE ELECTROPLATED WITH Al POWDER DISPERSED IN Zn

Hajime Kimura; Takahisa Yoshihara, and Shunichi Harada, all of Chiba, Japan, assignors to Kawasaki Steel Corporation, Kobe, Japan

Filed May 27, 1976, Ser. No. 690,737

Claims priority, application Japan, June 5, 1975, 50-67094

Int. Cl.² B32B *15/18, 15/20;* C25D *15/00*

U.S. Cl. 428—555 **8 Claims**

1. A composite comprising a steel sheet substrate having electrolytically plated thereon a layer consisting essentially of 1.5–70% by weight of aluminum dispersed in zinc, said layer having been plated electrolytically from an electrolytical zinc plating bath containing dispersed aluminum powder of a particle size of at least 100 meshes (at most 147 μm diameter) while agitating said bath, said composite being characterized by the substantial absence of a detrimental alloy layer of iron and of zinc-aluminum at the interface of said substrate and said layer.

4,036,601
CORROSION-RESISTANT TURBINE BLADES AND METHOD FOR PRODUCING THEM

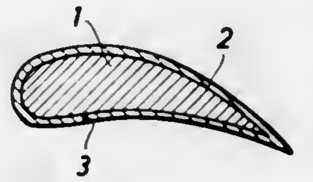
Peter Weimar, and Franz Bauer, both of Karlsruhe, Germany, assignors to Gesellschaft fur Kernforschung m.b.H., Karlsruhe, Germany

Filed Mar. 26, 1975, Ser. No. 562,158

Claims priority, application Germany, Mar. 26, 1974, 2414641

Int. Cl.² B32B *15/00*

U.S. Cl. 428—663 **12 Claims**



1. Turbine blade comprising a core of a highly heat-resistant alloy and a highly heat-resistant, nonporous, corrosion-resistant, metallic protective cover fitted onto said core and forming a gas-tight metallurgical bond therewith, said protective cover having great strength, high ductility and a uniform layer thickness, wherein the core is made of a molybdenum-rhenium alloy having a rhenium content of from 30 to 50 weight percent, the

remainder molybdenum, and the protective cover is made of a metal selected from the group consisting of rhenium, rhodium, iridium, and platinum, said metal having a high melting point and being resistant to oxidation in air at temperatures of about 1200° C.

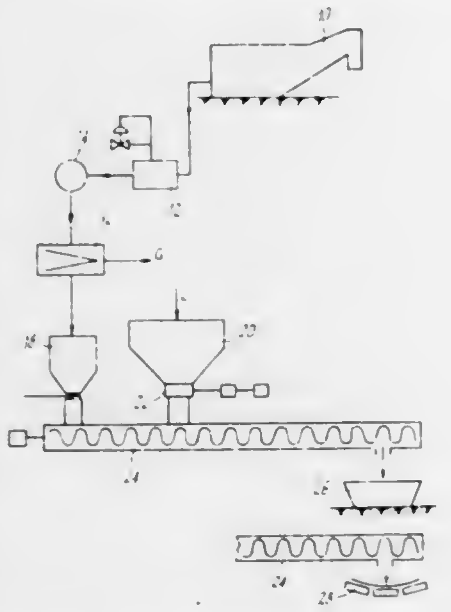
4,036,602
DIFFUSION COATING OF MAGNESIUM IN METAL SUBSTRATES

Michael F. Dean, and Roy L. Blize, both of San Antonio, Tex., assignors to Chromalloy American Corporation, New York, N.Y.
Filed Nov. 26, 1975, Ser. No. 635,619
Int. Cl.² B32B *15/04*
U.S. Cl. 428—621 **22 Claims**

1. As an article of manufacture, a metal substrate characterized by an adherent protective coating comprised of a sacrificial thermally diffused coating bonded to said sustrate comprising at least one intermetallic compound of magnesium with a magnesium-reacting matrix metal selected from the group consisting of silver, copper, nickel, cobalt, cerium, silicon, tin and zinc, said sacrificial coating being anodic to said metal substrate.

4,036,603
APPARATUS FOR REMOVING SOLID MATTER FROM COAL TAR

Henri Georges Bernet, Sceaux, France, and Theophile Martens, Ertvelde, Belgium, assignors to Societe Francaise d'Etude d'Installations Siderurgiques Sofresid, Montreuil, France and S.A. Sidmar, Gent, Belgium
Filed Jan. 23, 1975, Ser. No. 543,770
Claims priority, application France, Apr. 25, 1974, 74.14375
Int. Cl.² B30B *11/00;* C10L *5/22;* C10C *1/00*
U.S. Cl. 44—13 **5 Claims**



1. An apparatus for removing solid matter from coal tar recovered from a coal distillation operation, said apparatus comprising:
heating means for reheating said coal tar to achieve a desired degree of fluidity thereof;
centrifuging means for receiving the thus reheated coal tar and separating said coal tar into a first, liquid phase consisting of tar which is substantially free of residual solids and a second, solid phase consisting of solid matter wetted with tar;
a duct positioned to receive said second, solid phase from said centrifuging means;
an elongate screw mixer positioned to receive adjacent a first end thereof said second, solid phase from said duct;
hopper means for supplying a solid carbon-containing material to said screw mixer at a position downstream from said first end thereof; and
said screw mixer comprising means for mixing said carbon-containing material with said second, solid phase to improve the handling properties of said second, solid phase.

4. An apparatus as claimed in claim 1, further comprising briquetting press means provided at a second end of said screw mixer for pressing into briquettes the mixture of said second, solid phase and carbon-containing material.

4,036,604
FUEL

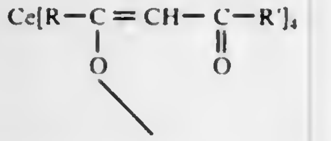
David L. Simon, 120 Dawn Drive, Centerreach, N.Y. 11720
Filed Aug. 13, 1974, Ser. No. 497,135
Int. Cl.² C10L *1/18*
U.S. Cl. 44—53 **14 Claims**

1. A process for making an internal combustion engine fuel comprising;
a. preparing a batch by mixing, on a volume basis,
1—8 parts turpentine
1—4 parts alcohol comprising an alcohol from the group of methyl or ethyl alcohol
7—20% of a blending agent from the group comprising an aldehyde or a ketone, and
(b) reducing the temperature of the batch to below the intended operating temperature, at most 10° F. of the fuel to cause said batch to separate out into two phases based on density.

4,036,605
CHELATES OF CERIUM (IV), THEIR PREPARATION AND GASOLINE CONTAINING SAID CHELATES

Robert J. Hartle, Gibsonia, Pa., assignor to Gulf Research & Development Company, Pittsburgh, Pa.
Division of Ser. No. 177,148, Sept. 1, 1971, abandoned. This application June 11, 1973, Ser. No. 368,566
Int. Cl.² C10L *1/30*
U.S. Cl. 44—68 **13 Claims**

1. A gasoline motor fuel composition comprising a major amount of gasoline and a small amount, sufficient to improve the antiknock characteristics of said gasoline, of a chelate of cerium (IV) represented by the general formula



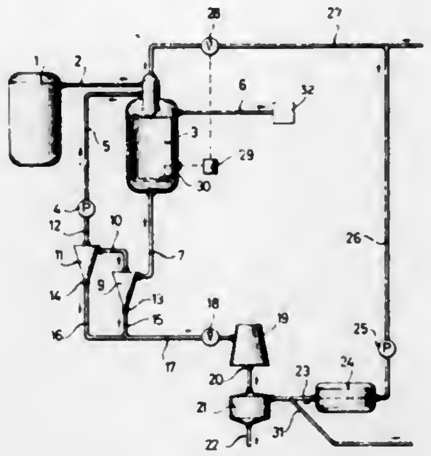
$$Ce[R-\underset{\substack{|\\ O}}{C}=CH-\underset{\substack{\|\\ O}}{C}-R']_4$$

where R and R′ are selected from the group consisting of alkyl, aryl, aralkyl, alkaryl and cycloalkyl radicals containing from 1 to 12 carbon atoms and the sum of the carbon atoms in said radicals is 3 to 24.

4,036,606
METHOD OF CLEANING GASES AND APPARATUS THEREFOR

Fritz Zimmermann, Essen-Steele, and Arthur Lenk, Essen-Borbeck, both of Germany, assignors to STEAG Aktiengesellschaft, Essen, Germany
Filed Aug. 29, 1975, Ser. No. 608,930
Claims priority, application Germany, Sept. 19, 1974, 2444819
Int. Cl.² C10J *3/68;* B01D *47/06*
U.S. Cl. 48—77 **4 Claims**

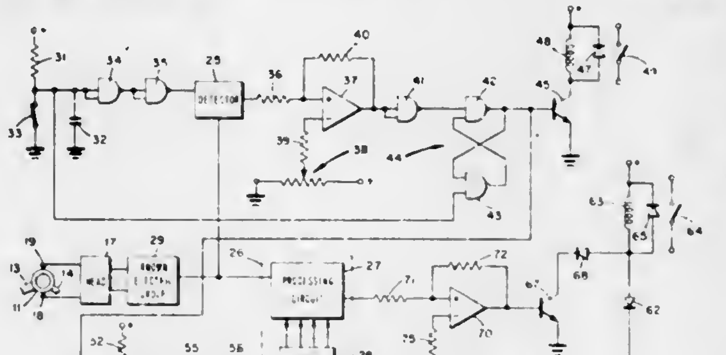
1. An apparatus suitable for cleaning gases generated by the pressurized gasification of coal by removing impurities of tar, dust and salts therefrom comprising:
a pressurized coal gasification unit, generating a crude gas stream containing tar, dust and salts,
a scrubbing unit connected to the coal gasification unit and receiving the crude gas stream containing tar, dust and salts and having means for contacting the crude gas stream with wash water,
a plurality of hydrocyclones having their discharge members in a series and operably connected to said scrubbing unit for separating from said wash water, a concentrate stream containing said tar, dust and salts,



a wash water pump operably connected to said scrubbing unit and to said discharge member of one of said hydrocyclones for circulating wash water through said scrubbing unit, and
a sedimentation separating tank operably connected to the concentrate discharge members of said plurality of hydrocyclones for separating said tar, dust and salts from said concentrate stream.

4,036,607
METHOD AND RELEVANT APPARATUS TO CHECK THE ROTATION OF MECHANICAL WORKPIECES BEING MACHINED ON GRINDERS

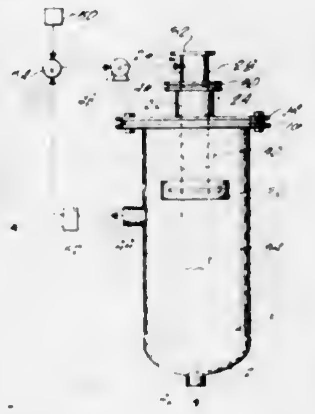
Tomaso Freddi, Bologna, Italy, assignor to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C., Bentivoglio, Italy
Continuation of Ser. No. 473,829, May 28, 1974, abandoned. This application Oct. 3, 1975, Ser. No. 619,246
Claims priority, application Italy, May 25, 1973, 3412/73
Int. Cl.² B24B *49/04*
U.S. Cl. 51—165 R **10 Claims**



1. A method for checking the operation of a grinding machine for the machining of rotating mechanical workpieces, substantially of circular cross-section, comprising the steps of:
obtaining a measuring signal responsive to the workpiece size, this step being carried out both before and during the stock removing phases of the machining operation;
processing the measuring signals occurring at subsequent time intervals, said processing step including generating at least one variable signal responsive to the measurement of size variations of the workpiece both before and during the stock removing phases of the machining operation;
comparing the variable signal generated with a reference signal;
utilizing the result of the comparison for providing a signal indicative of the evenness of the rotation of the workpiece; and
utilizing the latter signal as a conset for the prosecution of the machining depending on whether the workpiece rotates evenly.

4,036,608
METHOD AND APPARATUS FOR CONDENSING PYROLYSIS OILS

Richard M. Gundzik, Placentia, and Forrest E. Logan, Claremont, both of Calif., assignors to Occidental Petroleum Corporation, Los Angeles, Calif.
Filed Aug. 11, 1975, Ser. No. 603,877
Int. Cl.² B01D *47/00*
U.S. Cl. 55—89 **10 Claims**



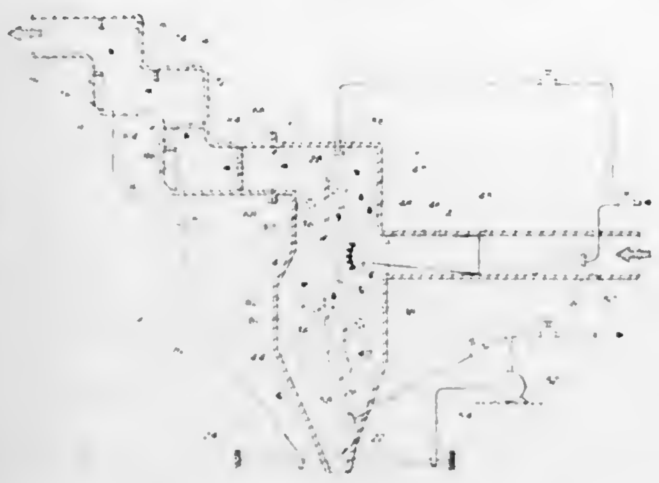
1. A method for separating pyrolysis oil and a hydrocarbon constituent in a vapor discharge stream from a flash pyrolysis process or a tar producing process comprising the steps of: mixing a high temperature heat transfer fluid with the discharge stream in an inlet pipe having an interior surface extending vertically from above the upper end of a vertically extending closed vessel into the interior of the vessel by directing the high temperature heat transfer fluid tangentially to the flow of the discharge stream in the inlet pipe and along the interior surface of said pipe; bubbling the resulting mixture through a body of liquid contained by the vessel and collected from the mixture discharged from the pipe to the vessel, withdrawing liquid containing primarily pyrolysis oil and high temperature heat transfer fluid from the surface of the contained liquid body, withdrawing heavier oil-solid condensates from the bottom of the contained liquid body, and exhausting the remaining vapor discharge stream from the vessel at a level above the contained liquid body.

4,036,609
ENDLESS BELT IMPINGEMENT APPARATUS AND METHOD

Ladislav J. Pircon, 305 Canterbury Lane, Oak Brook, Ill. 60521
Continuation-in-part of Ser. No. 252,914, May 12, 1972, Pat. No. 3,920,422, which is a continuation-in-part of Ser. No. 190,248, Oct. 18, 1971, Pat. No. 3,853,506. This application Nov. 17, 1975, Ser. No. 632,648
The portion of the term of this patent subsequent to Dec. 10, 1991, has been disclaimed.
Int. Cl.² B01D *45/10*
U.S. Cl. 55—91 **17 Claims**

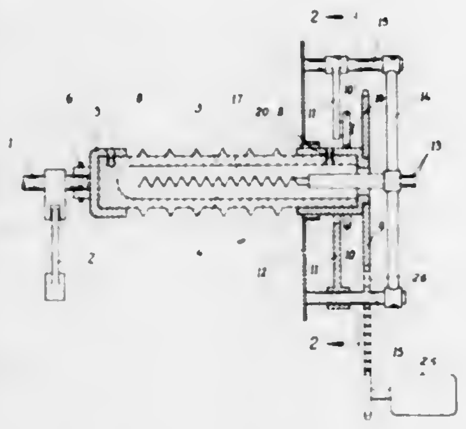
9. A process having a pressure drop of about 0.4 to 8 inches of water for removing particulate matter from gas streams comprising passing said gas stream having particulate matter therein through the entry of a nozzle; accelerating the gas stream through a converging portion of said nozzle having a mean angle of convergence of about 4° to 8° providing outlet velocities of about 2 to 12 times the entrance velocity; passing

said particulate-containing gas stream from the nozzle outlet through an expansion zone decelerating the gas, said acceleration and deceleration of the gas stream causing particulates to agglomerate; impinging said agglomerates and particulates upon an endless travelling belt of substantially imperforate



material thereby separating said particulates and agglomerates from said gas stream; driving said belt trained over an idler roller which is spaced from a drive means; removing said particulates and agglomerates from the expansion zone; and separately removing clarified gas from the expansion zone.

4,036,610
RAPPING SHAFT DRIVE ASSEMBLY FOR ELECTROSTATIC PRECIPITATORS
Xaver Johann Hüppi, Zurich, Switzerland, assignor to Elex A.G., Zurich, Switzerland
Filed May 23, 1975, Ser. No. 580,202
Int. Cl.^{2} B03C *3/76*
U.S. Cl. 55—112 **3 Claims**



1. A rapping system for an electrostatic precipitator including a housing with a plurality of high voltage electrodes therein, said rapping system comprising: a rapping shaft with hammer means attached thereto operable to rap said electrodes while energized and a rapping shaft drive assembly, the housing having an opening in alignment with said rapping shaft drive assembly, said rapping shaft drive assembly including a rotatably mounted isolator connected to said rapping shaft at one end and a drive means at the opposite end; said isolator including heat means therein whereby dust accumulating on the outer periphery thereof is kept above a preselected temperature; and rotatable support means supporting the isolator, the support means including at least two support rollers including bearing means therein in communication only in points with said isolator such that heat transmitted from said heated isolator to said at least two rollers is minimized.

4,036,611
ELECTRODE HANGER ALIGNING DEVICE
Robert L. Bennett, Louisville; Orville C. Parrott, Fern Creek; Allan R. Getzin, and A. Ervin McClain, both of Louisville, all of Ky., assignors to American Air Filter Company, Inc., Louisville, Ky.
Filed Mar. 25, 1976, Ser. No. 670,270
Int. Cl.^{2} B03C *3/86*
U.S. Cl. 55—149 **2 Claims**

1. In combination with an electrode hanger for an electrostatic precipitator, an electrode hanger aligning device comprising: a handle member and a hanger engaging member attached to said handle member, said hanger engaging member including means receiving said electrode hanger therein and means in said means receiving said electrode hanger aligning said electrode hanger, said hanger engaging member being of U-shaped cross-section, said hanger engaging member including an inwardly extending lip portion at the upper extremity of one leg of said hanger engaging member, the leg opposed to said one leg including said lip includes a threaded aperture therethrough; said means aligning said electrode hanger being a threaded adjusting member rotatably mounted within said threaded aperture in combination with a forming recess in said one leg including said lip, said forming recess receiving said adjusting member with said electrode hanger disposed therebetween.

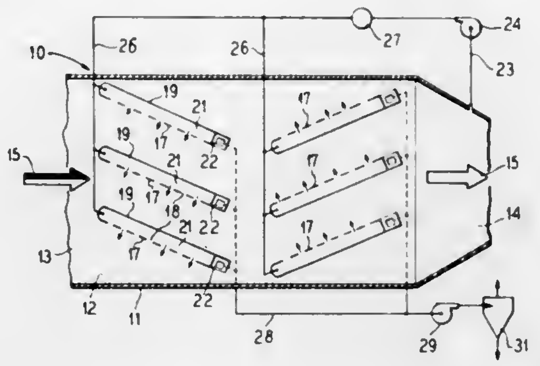
4,036,612
APPARATUS FOR SEPARATING PARTICLES FROM A GAS STREAM
Friedrich-Wilhelm Guttmann, Bensberg-Refrath, Germany, assignor to Klockner-Humboldt-Deutz Aktiengesellschaft, Germany
Filed May 17, 1976, Ser. No. 686,726
Claims priority, application Germany, May 17, 1975, 2522097
Int. Cl.^{2} B01D *45/08*
U.S. Cl. 55—282 **4 Claims**

1. Apparatus for the separation of solid particles from a stream of gas comprising:

A. a housing having defined therein a chamber and having a gas input port defined in one end region thereof and a gas output port defined in an opposed end region thereof for passage of a gas stream longitudinally through said chamber,

B. a plurality of spaced, parallel deflecting plates located in said chamber so as to extend generally diagonally across said chamber transversely relative to the direction of flow of a said gas stream therethrough, the front face of each said deflecting plates being inclined to said gas input port and to said direction of flow,

C. wall members connected with each said deflecting plate to define a relatively shallow cavity over and about the rear face of each said deflecting plate said wall members further being connected with each said deflecting plate to define a transversely extending channel along the terminal edge portion of each deflecting plate relative to said direction of flow, the mouth of each channel being in generally parallel relationship to its adjacent said deflecting plate,

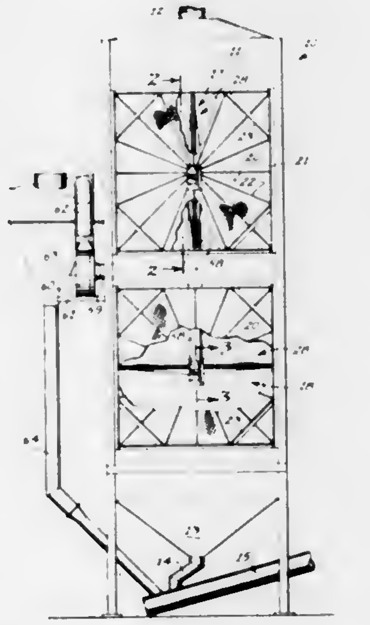


D. each said deflecting plate having a plurality of small gas flow apertures extending therethrough,

E. gas pressurizing means, gas pressure regulating means, and first conduit means interconnecting said gas pressurizing means and said gas pressure regulating means with each one of said cavities, and

F. particle collection means and second conduit means interconnecting said particle collection means with an end region of each one of said channels.

4,036,613
ROTARY SWEEP ARM FOR SELF-CLEANING FILTER APPARATUS
William E. Brown, and Clyde M. Smith, both of Nashville, Tenn., assignors to Woods Metal Company, Inc., Nashville, Tenn.
Filed Aug. 25, 1976, Ser. No. 717,516
Int. Cl.^{2} B01D *46/04*
U.S. Cl. 55—294 **9 Claims**



1. In a filter system including a housing having a gas inlet and a gas port which is covered by a screen member having an intake surface and an exhaust surface, a self-cleaning apparatus comprising:

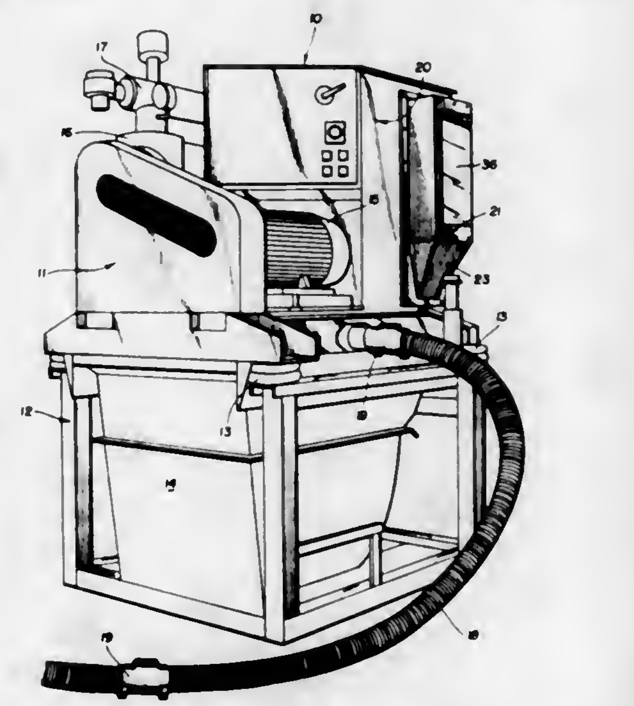
a. a hollow sweep arm having an elongated radial intake slot,

b. exhaust means connected to said sweep arm for establishing a vacuum in said intake slot,

c. drive means mounting said sweep arm for rotary movement on the intake side of said screen member, said intake slot being closely adjacent said intake surface so that the vacuum in said slot cleans said intake surface as said arm sweeps over said intake surface and

d. adjustable vane means in said intake slot for regulating the vacuum along the radial extent of said intake slot.

4,036,614
PRESSURE RELIEF MEANS FOR INDUSTRIAL VACUUM
Thomas M. DeMarco, Chicago, Ill., assignor to NFE International, Ltd., Arlington Heights, Ill.
Filed Mar. 21, 1975, Ser. No. 560,945
Int. Cl.^{2} B01D *46/42*
U.S. Cl. 55—310 **6 Claims**



1. In an industrial vacuum unit having means for creating a flow of air and creating both a negative vacuum pressure and a positive pressure, pressure relief means comprising:

a housing mounted to said vacuum unit and having dividing means for partitioning said housing into a lower inlet chamber and an upper outlet chamber;

said vacuum unit having an opening and said inlet chamber having a first opening for receiving air from the vacuum unit through said opening and admitting same into said inlet chamber;

said dividing means having an opening for air flow between said inlet and outlet chambers;

said outlet chamber having outlet means providing an opening for releasing air from said housing;

movable sealing means mounted adjacent said outlet means; and,

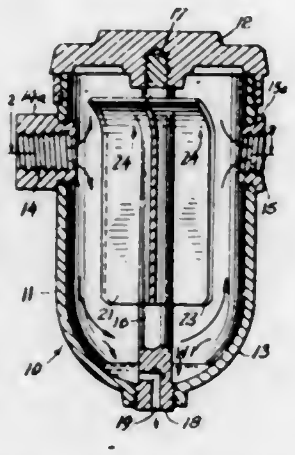
support means mounted to said housing intermediate said outlet means and said movable sealing means and engageable with said movable sealingmeans to cover said outlet means for providing an air-tight seal of said outlet means for preventing the flow of air through said pressure relief means when said negative vacuum pressure exists in said industrial vacuum unit and for permitting movement of the sealing means away from thesupport means to allow the flow of air through the outlet means and the support means when positive pressure exists in said vacuum unit;

filter means mounted in said outlet chamber for removing particles from said flow of air passing through the housing; and

said inlet chamber having guide surface means extending below said filter means downwardly towards and in communication with said first opening for receiving said particles falling from the filter means and for downwardly directing these particles through said first opening and the opening of said vacuum unit and thereby into said industrial vacuum unit.

4,036,615
MIST SEPARATOR

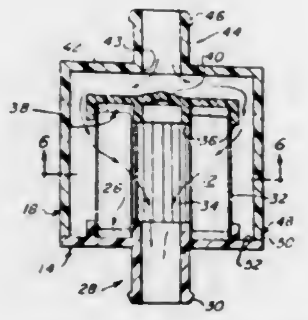
Leo Heintzelman, 4990 Burlingame, Wyoming, Mich. 49509
Filed Sept. 15, 1975, Ser. No. 613,494
Int. Cl.² B01D *45/08*
U.S. Cl. 55—442 **6 Claims**



1. A mist separator comprising a cylindrical housing having a bottom and a cover so as to form a hollow-shaped vessel said housing having an inlet opening in one side and an outlet opening in an opposite side thereof and baffle plates positioned therebetween, said baffle plates extending radially across the diameter of said housing but terminating short of the walls thereof and axially from a point above and adjacent said inlet opening spaced from said cover to a point substantially below said inlet opening and spaced from said bottom and a water discharge nozzle in the bottom of said housing, a portion of said baffle plates extending above said inlet opening being curved downwardly toward the discharge nozzle to direct the flow of air downwardly, said bottom being closed except for said nozzle, and said nozzle being small relative to said inlet opening and being open to the atmosphere whereby a portion of the downwardly directed air acts to help expel the separated water through said water discharge nozzle.

4,036,616
BACTERIA FILTER AND METHOD OF ASSEMBLING SAME

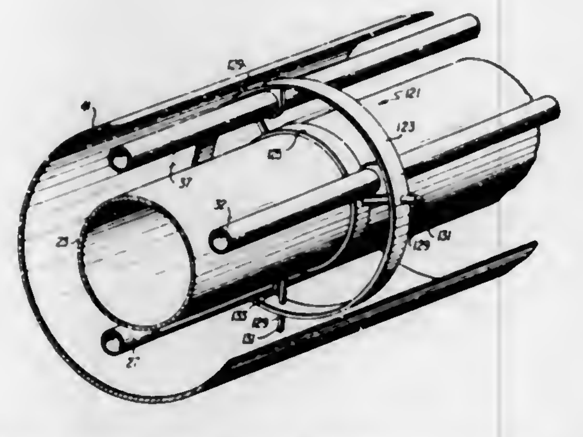
John Byrns, Los Angeles, Calif., assignor to Robert A. Baker, Santa Barbara, Calif., a part interest
Filed May 1, 1974, Ser. No. 465,734
Int. Cl.² B01D *46/10*
U.S. Cl. 55—498 **6 Claims**



1. A filter device comprising in combination:
a base member substantially of circular disk configuration with a central opening therethrough, a pair of raised concentric circular rims surrounding said opening on one face of the base member defining a continuous open circular channel, a hollow tubular neck co-axial with said opening protruding away from the other face of the element defining an outlet passage of the filter device,
a generally cylindrical filter element with longitudinally extending pleats surrounding a hollow core of the filter element,
a first charge of adhesive material sealing one end of the filter element in the circular channel of the base member,
an end cap substantially of circular disk configuration overlying and covering the other end of said filter, said end cap further having a pair of raised concentric circular rims on one face thereof defining a raised continuous open circular channel, said end cap having a centrally located conical deflector on its other face,
a second charge of adhesive material sealing the opposite end of the filter element in the continuous open circular channel of the end cap,
a hollow generally cylindrical housing member having one open end and an end wall at the opposite end, the open end of said housing member being circumferentially sealed to the outer periphery of said base member, said housing member being disposed in spaced surrounding concentric relationship with the filter element and having its end wall spaced apart from and in substantially parallel relationship with said end cap, the end wall of said housing member having a centrally located opening therethrough in axial alignment with the conical deflector on the end cap, and a hollow tubular neck co-axial with said opening in the end wall defining an inlet passage of the filter device whereby fluid flowing into the device through the inlet passage will be dispersed radially by the conical deflector on the end cap and thereby flow radially inwardly through the filter element before being emitted through the outlet passage in the base member.

4,036,617
SUPPORT SYSTEM FOR AN ELONGATED CRYOGENIC ENVELOPE

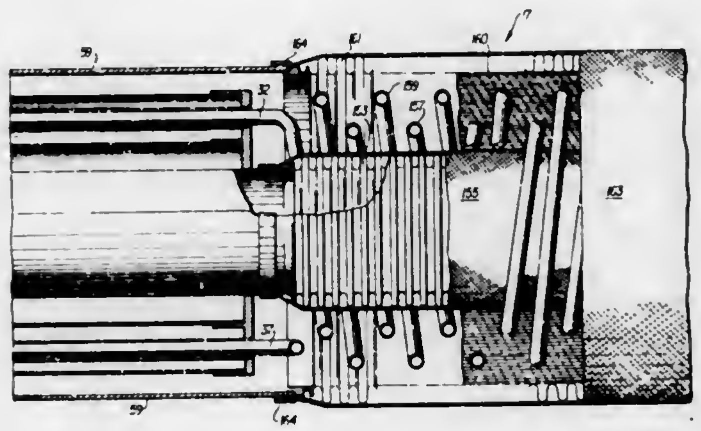
Kenneth R. Leonard, and James R. DeHaan, both of Boulder, Colo., assignors to Cryogenic Technology, Inc., Denver, Colo.
Filed Apr. 18, 1975, Ser. No. 569,481
Int. Cl.² F17C *7/02*
U.S. Cl. 62—55 **15 Claims**



1. An elongated cryogenic envelope comprising:
an inner tube;
an outer tube generally coaxial with said inner tube;
a refrigeration tube positioned intermediate said inner and outer tubes;
means for supporting said inner tube within said outer tube and said refrigeration tube intermediate said inner and outer tubes, at least a portion of the volume between said inner tube and said outer tube providing a vacuum chamber for holding a vacuum;
said means for supporting said inner tube within said outer tube including:
a high-thermal-conductivity ring surrounding said inner tube said ring being positioned intermediate said inner and outer tubes; and
a positioning means for positioning said ring intermediate said inner and outer tubes, said positioning means comprising at least one low-thermal-conductivity spoke extending between said surrounding ring and said outer tube; and wherein said at least one refrigeration tube is supported by a radially extending portion of said ring.

4,036,618
FLEXIBLE CRYOGENIC ENVELOPE

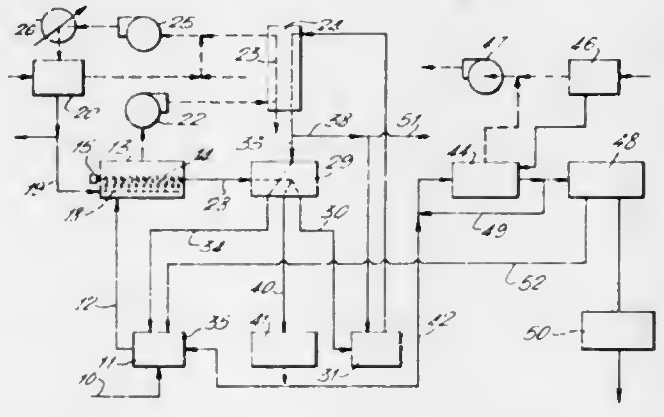
Kenneth R. Leonard, and John D. Loudon, both of Boulder, Colo., assignors to Cryogenic Technology, Inc., Denver, Colo.
Filed Apr. 18, 1975, Ser. No. 569,498
Int. Cl.² F17C *7/02*
U.S. Cl. 62—55 **17 Claims**



1. A flexible cryogenic envelope including:
a rigid portion comprising:
a rigid inner tube and a rigid outer tube generally coaxial with said rigid inner tube;
a means for holding said inner and outer tubes in positions spaced from one another;
a flexible portion comprising:
a flexible inner tube; a layer of reinforcing braid surrounding said inner flexible tube; an outer flexible tube generally coaxial with said inner tube; a layer of braid covering said outer flexible tube for protecting said outer flexible tube, at least a portion of the volume between the inner layer of braid and said outer flexible tube providing a vacuum chamber in said flexible envelope for holding a vacuum; and refrigeration means for directing refrigeration through said vacuum chamber in said flexible envelope; and
means for connecting said rigid portion to one end of said flexible portion.

4,036,619
FREEZER CONCENTRATION

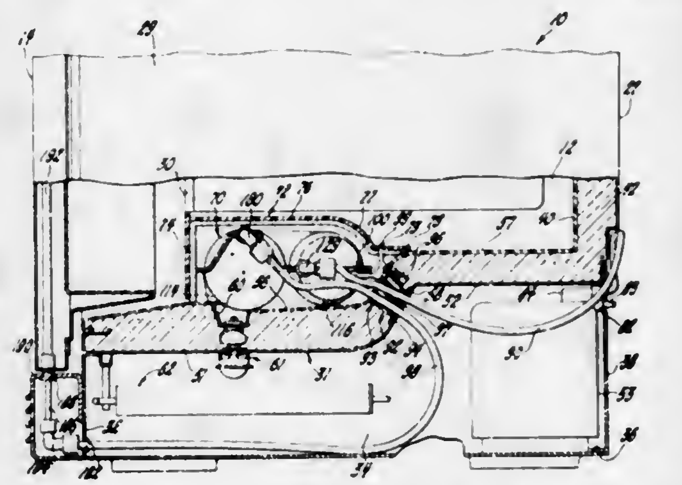
Neophytos Ganiaris, Riverdale, N.Y., assignor to Struthers Patent Corporation, Houston, Tex.
Division of Ser. No. 320,592, Jan. 2, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,447
Claims priority, application United Kingdom, Jan. 5, 1972, 364/72
Int. Cl.² B01D *9/04;* C02B *1/12*
U.S. Cl. 62—123 **9 Claims**



1. An apparatus for freeze concentration of a comestible liquid comprising a direct contact crystallizer, an indirect contact crystallizer, means for feeding the comestible liquid to the direct contact crystallizer whereby a slurry of ice and liquid is formed therein, means for feeding said liquid from the direct contact crystallizer to the indirect contact crystallizer whereby an ice-liquid slurry is formed therein, means to inject a cooling medium into the liquid when said comestible liquid is in the direct contact crystallizer to form said slurry of ice and liquid therein, and means for supplying a cooling medium to the indirect contact crystallizer for cooling said liquid in the indirect contact crystallizer to form said ice-liquid slurry therein.

4,036,620
WATER CHILLING TANK FOR REFRIGERATOR

Louis D. Benasutti, Fairborn, and Jost S. Sucro, Dayton, both of Ohio, assignors to General Motors Corporation, Detroit, Mich.
Filed June 4, 1976, Ser. No. 692,971
Int. Cl.² F25D *23/12;* B67D *5/62*
U.S. Cl. 62—338 **3 Claims**



1. A water container for installation in an above-freezing portion of a refrigerator to cool water supplied to the container through a water valve connected between the container having first and second side-by-side elongated generally cylindrical sectioned water storage chambers formed by upper and lower half shells sealed together along a horizontally disposed seam which circumscribes the shells and includes one portion forming a medial seam, said first chamber having an inlet and said second chamber having an outlet, said inlet and said outlet both located adjacent the seam's one side edge, a crossover passage interconnecting said chambers at their closed ends, said cross-over passage formed with a generally semi-circular cross section in said upper half shell having its underside closed by a portion of said seam extending inwardly from said seam's second side edge, said first chamber, said crossover passage and said second chamber having cross sections which constantly increase in area from said first chamber inlet to said second chamber outlet, said seam having a portion of its one side edge offset upwardly a predetermined distance from the seam plane, an inlet tube connecting with said first chamber inlet, an outlet tube connecting with said outlet at a location substantially tangent with said second chamber's highest point of curvature, whereby water follows a U-shaped flow path upon entering said first chamber inlet at a point lower than said second chamber outlet, such that chilled water exits said second chamber outlet at said container's highest point obviating entrapment of air within said container, each of said first and second chambers formed with a plurality of baffle means whereby the water entering the inlet is made to change directions defining an undulating constantly diverging U-shaped flow path between the inlet and the oulet of said chambers.

4,036,621

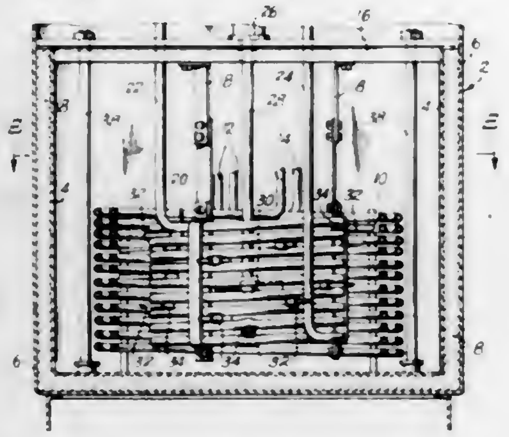
BEVERAGE DISPENSERS

Paul F. Burton, Charles Town, W. Va., assignor to Dixie-Narco, Inc., Ranson, W. Va.

Filed Aug. 6, 1976, Ser. No. 712,214

Int. Cl.² F25D *17/02;* B67D *5/62;* F28F *1/10*

U.S. Cl. 62—394 **3 Claims**



1. In a beverage dispenser and cooler having a cooling tank for holding a body of water, a beverage circulating coil in said tank and a refrigerant evaporator coil in said tank for freezing water therein to effect cooling of a beverage in said beverage circulating coil; the improvement comprising:

heat conductive projections secured to and extending away from said evaporator coil and spaced apart sufficiently to form separate ice projections from the body of ice formed on said evaporator coil and thereby increase the ice surface exposed to water in said tank, said evaporator coil being a helical coil of generally cylindrical form, said projections comprising metal rods extending generally radially of said evaporator coil, between the turns thereof, and being secured in heat conducting relation thereto.

4,036,622

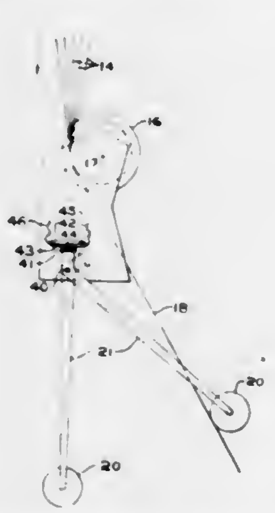
METHOD AND APPARATUS FOR FORMING GLASS STRAND

Thomas D. Carroll, Shelby, and Christopher G. Cross, Forest City, both of N.C., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed June 4, 1976, Ser. No. 693,057

Int. Cl.² C03B *37/02*

U.S. Cl. 65—3 R **16 Claims**



1. In a method of forming glass strand comprising attenuating glass filaments from molten glass contained in a bushing through orifices in the bushings, applying a binder and/or size to the filaments from an application surface of an applicator, gathering the filaments into a unified strand in a gathering shoe, traversing the strand across the face of a rotating spiral, and collecting the strand on a rotating collet, the improvement comprising: continuously contacting the strand with a strand detecting means, said means comprising a gravitationally activated pivoting rod means provided between the gathering shoe and the collet and independent of the gathering shoe, and automatically energizing a circuit means to deactivate the collet in response to a loss of contact of the detecting means with said strand.

4,036,623

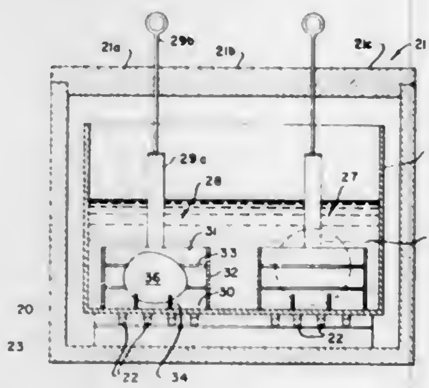
METHOD OF MAKING HARDENED OPHTHALMIC LENSES BY ION EXCHANGE

Emil W. Deeg, Woodstock, Conn., and Richard D. Courtemanche, Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Continuation of Ser. No. 390,742, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 157,481, June 28, 1971, abandoned. This application Sept. 8, 1975, Ser. No. 611,383

Int. Cl.² C03C *15/00*

U.S. Cl. 65—30 E **3 Claims**



1. An ion replacement method for strengthening an ophthalmic crown type of glass wherein the oxide weight percent content of said glass consists essentially of oxides falling within the limits defined by the following table:

SiO_2: 60–75
Na_2O: 5–10
K_2O: 5–10
CaO: 7–15
LiO: 0–5
MgO: 0–2
ZnO: 2–8
Al_2O_3: 0–7
ZrO_2: 0–2
TiO_2: 0–2
Sb_2O_3: 0–2
CeO_2: 0–4.5
As_2O_3: 0–1.5

to enable said glass when suitably supported for drop-ball test purposes to withstand without fracture the impact produced by a ⅝ steel ball dropped freely from a height of 50 inches onto the outer face of the glass near the center thereof, said method consisting essentially of subjecting said glass to a heat treatment period, said treatment period consisting of an initial preheating to a temperature sufficiently high to prevent damage to said glass when it is subsequently placed in a heated potassium nitrate salt bath, said salt bath being at a temperature above the strain point of said glass, submersing said heated glass in a liquid bath of potassium nitrate having a soaking temperature above the strain point of the glass for a time of from approximately 2 to 63 hours, withdrawing said glass article from said bath and lowering the temperature of the glass article.

4,036,624

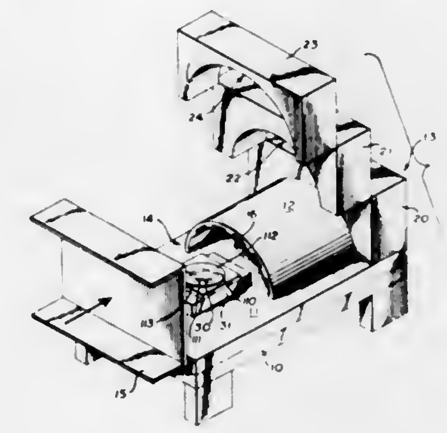
HEAT TREATMENT METHOD FOR MAKING PHOTOCHROMIC GRADIENT LENSES

David A. Krohn, Southbridge, Mass., and Emil W. Deeg, Woodstock, Conn., assignors to American Optical Corporation, Southbridge, Mass.

Division of Ser. No. 624,688, Oct. 22, 1975. This application Mar. 18, 1976, Ser. No. 668,175

Int. Cl.² C03C *15/00;* C03B *31/00*

U.S. Cl. 65—30 R **5 Claims**



1. In a method of making ophthalmic quality lenses, or lens blanks, having a reversible, progressive, local variation in phototropic, or photochromic, behavior, said lens or lens blank including a portion ultimately to serve as a distance portion and another portion ultimately to serve as a near portion, the distance portion and near portion being contiguous with the near portion being below the distance portion when the lens is glazed in a frame, the reversible, progressive, local variation in phototropic or photochromic behavior being substantially more resistant to light transmission near the top which defines the upper limit of the distance portion thereof and substantially less resistant to light transmission in the near portion when said lens is glazed in a frame, the transition in light transmission from the top of the lens to the bottom being substantially uniform laterally of said lens when glazed,

comprised of an unnucleated oxide glass lens or lens blank, exhibiting no photochromic properties to the eye before nucleation, and being made of glass consisting of ophthalmic quality glass, said lens, or lens blank, containing through its volume at least 0.005 volume percent of at least one silver halide selected from the group consisting of silver chloride, silver bromide, silver iodide and mixtures thereof,

after nucleation in at least that portion of the lens, or lens blank, showing phototropic or photochromic behavior, said halide being in the form of particles, there being a progressive variation in the average linear dimension of said particles substantially corresponding to the variation in phototropic or photochromic behavior of the lens, or lens blank, the average linear dimensions of said silver halide particles being smaller than about 5 nanometers in the near portion and said particles substantially, progressively, increasing in size to about 50 nanometers in the distance portion, the improvement comprising the steps of

forming a lens, or lens blank, from a glass making batch, said lens, or lens blank, containing throughout its volume at least 0.005 vol. % of at least one silver halide selected from the group consisting of silver chloride, silver bromide, silver iodide, and mixtures thereof,

subjecting said glass lens, or lens blank, to a heat treatment, said heat treatment consisting of subjecting the distance portion of such a lens, or lens blank, to a temperature above the strain point but below the softening point thereof for a time period sufficient to grow silver halide particles having an average linear dimension of about 50 nm, substantially progressively lessening the temperature of heat treatment across said lens from the top edge which defines the upper limit of the distance portion to that area spaced therefrom which constitutes the near portion in such a manner as to form silver halide particles of progressively smaller average linear dimension to thereby produce a lens characterized by a local variation in phototropic or photochromic behavior

the greatest photochromic or phototropic behavior being exhibited in the distance portion.

4,036,625

METHOD OF AND FURNACE FOR BATCH CHARGING INTO A GLASS MELTING FURNACE

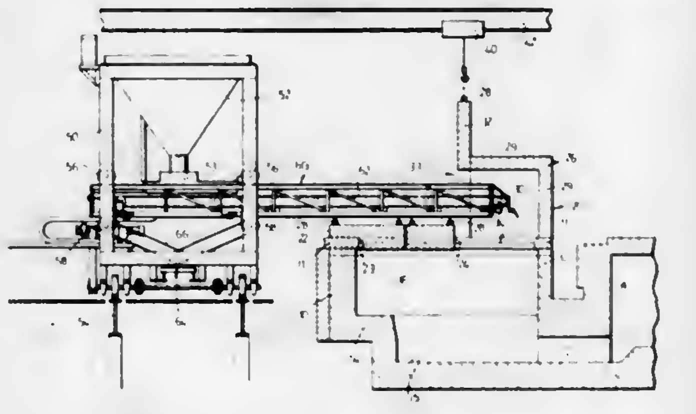
Charles Chamberlain Holmes, Birmingham; Wallace Skinner, Kingswinford, and George Roland Mattocks, Kidderminster, all of England, assignors to Elemelt Limited, London, England

Filed Apr. 8, 1976, Ser. No. 674,943

Claims priority, application United Kingdom, Apr. 8, 1975, 14308/75

Int. Cl.² C03B *3/00*

U.S. Cl. 65—134 **22 Claims**



1. A furnace for use in the melting of glass and comprising a furnace chamber for containing a body of molten glass, heating means for heating the body of molten glass, and outlet means through which molten glass is conducted from the chamber, wherein the furnace comprises

a. means defining an opening through which solid state glass batch material may be delivered into the furnace chamber, and

b. means for varying the area of the molten glass which is exposed for the reception of batch material.

18. A method of melting glass comprising

a. delivering solid state glass batch material onto the surface of a body of molten glass undergoing heating in a furnace chamber;

b. withdrawing molten glass from the chamber; and

c. controlling the area of the surface of the body of molten glass onto which glass batch material is delivered in accordance with the rate of withdrawal of molten glass from the chamber.

4,036,626

METALLIC SEAL FOR PREVENTING TIN LEAKS IN A FLOAT GLASS FURNACE

John S. Sieger, Glenshaw, and Joseph A. Gulotta, New Kensington, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

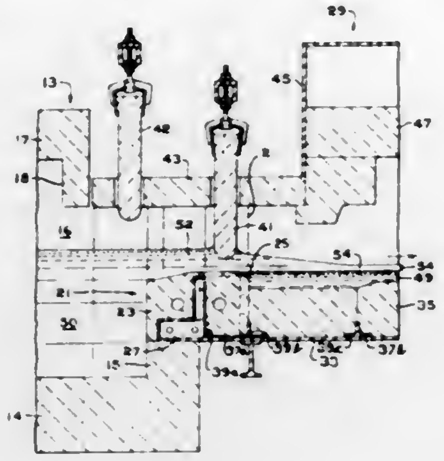
Filed May 18, 1976, Ser. No. 687,568

Int. Cl.² C03B *18/02*

U.S. Cl. 65—182 R **12 Claims**

1. In an apparatus for forming flat glass comprising an enclosed chamber which includes a metal casing having a refractory liner disposed therein for containing a pool of molten metal consisting essentially of tin wherein the refractory liner comprises a plurality of refractory pieces having joints between adjacent pieces, which joints provide communication between the pool of molten metal and the casing, the improvement which comprises

metal seals located inside the casing in the vicinity of at least some of the refractory liner joints, extending into the joints and contacting each refractory piece adjacent thereto for preventing the leakage of molten tin therethrough, said metal seals comprising metal which reacts with molten tin causing the metal to swell pressing against the contacted refractory pieces, the metal of each metal seal having a melting point greater than the melting point of tin.



4,036,627

HIGH ANALYSIS FERTILIZER

Roger Calvin Funk, Stow, Ohio, assignor to The Davey Tree Expert Company, Kent, Ohio

Filed Nov. 21, 1975, Ser. No. 634,108

Int. Cl.² C05C *9/00*

U.S. Cl. 71—29 **3 Claims**

1. A dry high analysis fertilizer composition having the nutrients N, P and K comprising organic and inorganic nutrient components, said organic component being a powdered ureaformaldehyde blend, said ureaformaldehyde blend having generally water soluble and water insoluble nitrogen-releasing nutrient compounds, said water insoluble nitrogen-releasing compound being of a size to pass an 80-mesh sieve so that said water insoluble compound may pass through the nozzles of conventional fertilizer spraying and injecting equipment, said water insoluble compound being methylene urea and said water soluble compound being unreacted urea, the ratio of said water insoluble compound to said water soluble compound being approximately one to three parts of methylene urea to one part of unreacted urea, said inorganic component being monopotassium phosphate, said organic and inorganic components being mixed uniformly throughout the fertilizer composition in a ratio by weight of approximately 4:1 respectively, whereby the effective percentage of the nutrients N, P and K are present generally in the range of 29–31% for nitrogen, expressed as N, 9.7–10.3% phosphorus expressed as P_2O_5, and 6.8–7.2% soluble potash expressed as K_2O.

4,036,628

PHOSPHORUS CONTAINING HERBICIDE ANTIDOTES

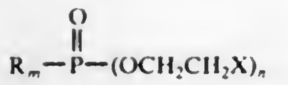
Ferenc M. Pallos, Walnut Creek, and Don R. Baker, Orinda, both of Calif., assignors to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 305,770, Nov. 13, 1972, abandoned. This application June 2, 1975, Ser. No. 582,944

Int. Cl.² A01N *9/36, 9/00, 9/12*

U.S. Cl. 71—86 **18 Claims**

1. A herbicidal composition comprising an active herbicidal thiocarbamate compound selected from S-ethyl dipropyl thiocarbamate, S-ethyl diisobutyl thiocarbamate, S-propyl dipropyl thiocarbamate, S-2,3,3-trichloroallyl-diisopropyl thiocarbamate, S-ethyl cyclohexyl ethyl thiocarbamate, S-ethyl hexahydro-1H-azepine-1-carbothioate and S-4-chlorobenzyl diethyl thiocarbamate and an antidotally effective amount of an antidote compound corresponding to the formula



$$R_m-\overset{\overset{O}{\|}}{P}-(OCH_2CH_2X)_n$$

wherein R is lower alkoxy having from 1 to 6 carbon atoms, inclusive, haloalkyl having from 1 to 6 carbon atoms, inclusive, and wherein halo refers to fluoro, chloro and bromo substitutions, or haloalkoxy having from 1 to 6 carbon atoms, inclusive and wherein halo refers to fluoro, chloro and bromo substitutions, X is chlorine or bromine, *n* is an integer from 1 to 3, inclusive, *m* is 0 or an integer 1 or 2, provided that $n + m$ is 3.

4,036,629

3-(3,4-EPOXY-4-METHYLCYCLOHEXYL)BUTYL ESTERS

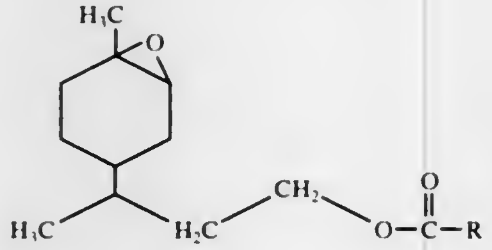
Jerry G. Strong, Warren, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 153,056, June 14, 1971, abandoned. This application Feb. 18, 1976, Ser. No. 659,079

Int. Cl.² A01N *9/28;* **C07D** *303/16*

U.S. Cl. 71—88 **10 Claims**

1. A compound having the formula:



wherein R is alkyl of 1–12 carbon atoms, or alky of 1–12 carbon atoms containing 1–3 substituents selected from the group consisting of halogen, alkoxy of 1–4 carbon atoms, and phenoxy.

10. A plant growth regulant composition comprising a plant growth regulating amount of at least one compound of claim **1** and a carrier therefor.

4,036,630

SYNERGISTIC HERBICIDAL COMPOSITION FOR PADDY FIELDS

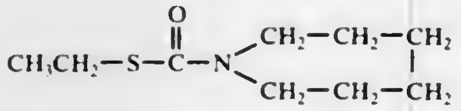
Teruhiko Toyama, Fujisawa, and Yoshio Takasawa, Chigasaki, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

Division of Ser. No. 290,002, Sept. 18, 1972, Pat. No. 4,001,004. This application Apr. 16, 1976, Ser. No. 677,534

Int. Cl.² A01N *9/12*

U.S. Cl. 71—88 **6 Claims**

1. A herbicidal composition for use in paddy fields consisting essentially of a herbicidally effective amount of a mixture of α-(β-naphthoxy)-propionanilide and a synergistic proportion of a compound having the general formula



and an inert carrier, the ratio of said α-(β-naphthoxy)-propionanilide to said compound being 1:1–4.

4,036,631

PYRAZOLONE DERIVATIVES AND THEIR USE AS HERBICIDES

Takuo Konotsune, and Katsuhiko Kawakubo, both of Tokyo, Japan, assignors to Sankyo Company Limited, Tokyo, Japan

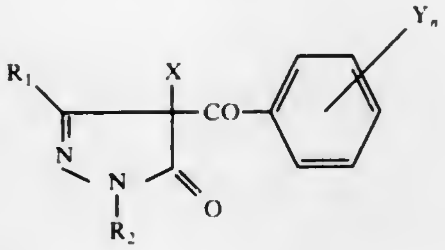
Filed Aug. 12, 1976, Ser. No. 713,900

Claims priority, application Japan, Sept. 23, 1975, 50-115344

Int. Cl.² A01N *9/22;* **C07D** *231/20*

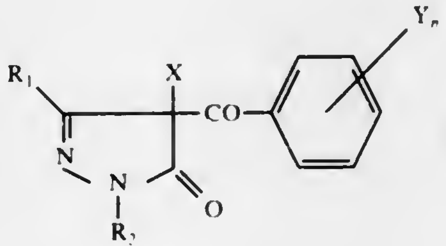
U.S. Cl. 71—92 **25 Claims**

1. A compound having the formula



wherein R_1 represents a hydrogen atom or a lower alkyl group, R_2 represents a lower alkyl group or a lower alkenyl group, X represents a halogen atom, Y represents a halogen atom, a nitro group, a lower alkyl group or a lower alkoxy group, *n* is an integer of 1 to 3 and when *n* is 2 or 3, Y's may be the same or different.

19. A method for the destruction of undesirable weeds which comprises applying to said weeds a herbicidal amount of a compound having the formula



wherein R_1 represents a hydrogen atom or a lower alkyl group, R_2 represents a lower alkyl group or a lower alkenyl group, X represents a halogen atom, Y represents a halogen atom, a nitro group, a lower alkyl group or a lower alkoxy group, *n* is an integer of 1 to 3 and when *n* is 2 or 3, Y's may be the same or different.

4,036,632

HERBICIDAL AGENTS

Kurt Westphal, Wuppertal-Vohwinkel; Werner Meiser, Wuppertal-Elberfeld; Ludwig Eue, Cologne-Stammheim, and Helmuth Hack, Cologne-Buchheim, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Division of Ser. No. 526,663, Nov. 25, 1974, Pat. No. 3,966,715, which is a continuation of Ser. No. 120,713, March 3, 1971, abandoned, which is a continuation-in-part of Ser. No. 6,647, Jan. 28, 1970, Pat. No. 3,671,523, which is a continuation-in-part of Ser. No. 630,225, April 12, 1967, Pat. No. 3,961,936. This application Jan. 19, 1976, Ser. No. 650,576

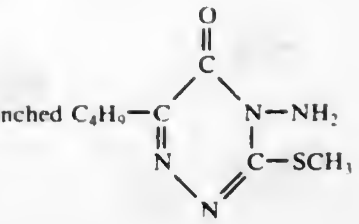
Claims priority, application Germany, Nov. 14, 1966, 1542873

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.² A01N *9/22*

U.S. Cl. 71—93 **2 Claims**

1. A method for selectively controlling weeds in growing tomatoes which comprises applying to the locus thereof a herbicidally effective amount of a 3-methylthio-4-amino-6-branched butyl-1,2,4-triaqine-5-one having the formula



4,036,633

CROTONANILIDES

Jacques Perronnet, and Pierre Girault, both of Paris, France, assignors to Roussel-UCLAF, Paris, France

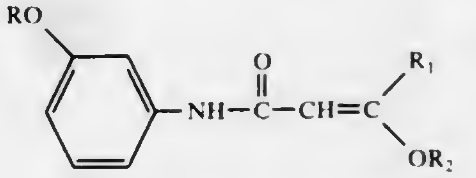
Filed Sept. 16, 1975, Ser. No. 613,911

Claims priority, application France, Oct. 3, 1974, 74.33320

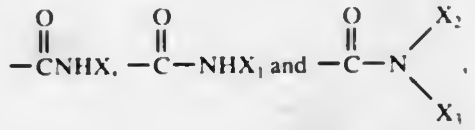
Int. Cl.² C07C *103/60;* **A01N** *9/20;* **C07C** *125/06*

U.S. Cl. 71—106 **23 Claims**

1. A compound of the formula



wherein R is selected from the group consisting of



$$-\overset{\overset{O}{\|}}{C}NHX,\ -\overset{\overset{O}{\|}}{C}-NHX_1 \text{ and } -\overset{\overset{O}{\|}}{C}-N\begin{matrix}X_2\\ X_1\end{matrix},$$

X is selected from the group consisting of alkyl of 1 to 8 carbon atoms and cycloalkyi of 3 to 7 carbon atoms, X_1 is alkoxyalkyl of 2 to 12 carbon atoms, X_2 is alkyl of 1 to 3 carbon atoms, X_3 is selected from the group consisting of alkyl of alkoxy of 1 to 3 carbon atoms, and R_1 and R_2 are individually alkyl of 1 to 3 carbon atoms.

16. A herbicidal composition comprising a herbicidally effective amount of at least one compound of claim **1** and a carrier.

4,036,634

OXIDATION AND SINTER-RESISTANT METAL POWDERS

Anthony V. Fraioli, Essex Fells, N.J., and John A. DeRosa, Queens Village, N.Y., assignors to Plessey, Incorporated, Mellville, N.Y.

Division of Ser. No. 565,835, April 7, 1975, Pat. No. 3,966,463, which is a continuation-in-part of Ser. No. 496,714, Aug. 12, 1974, abandoned. This application Feb. 6, 1976, Ser. No. 655,836

Int. Cl.² C22C *1/05, 5/02*

U.S. Cl. 75—.5 A **1 Claim**

1. A gold powder consisting essentially of gold and no more than about two percent of a coprecipitated oxide selected from the group consisting of titania and zirconia; in an amount sufficient to achieve a tap density greater than 6 and a sintering temperature higher than 600° C.

4,036,635

PROCESS FOR MAKING A STEEL MELT FOR CONTINUOUS CASTING

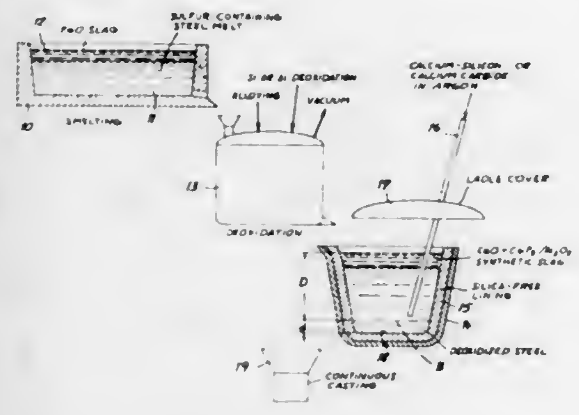
Wilhelm Klapdar, Essen; Helmut Richter, Oberhausen; Edgar Spetzler, Oberhausen, and Jochen Wendorff, Oberhausen, all of Germany, assignors to Thyssen Niederrhein AG Hutten- und Walzwerke, Oberhausen, Germany

Filed June 17, 1976, Ser. No. 697,225

Claims priority, application Germany, June 18, 1975, 2527156

Int. Cl.^{2} C21C *7/06, 7/10*

U.S. Cl. 75—49 **11 Claims**



1. A process for producing a steel melt for continuous casting comprising the steps of:

a. forming a sulfur-containing steel melt below an iron-oxide-containing slag in a smelter vessel;

b. discharging said sulfur-containing steel melt from said vessel while retaining said slag therein;

c. deoxidizing said sulfur-containing steel melt discharged in step b. from said vessel in a ladle by adding at least one substance selected from the group which consists of silicon and aluminum thereto to produce a deoxidized sulfur-containing steel melt;

d. introducing said deoxidized sulfur-containing steel melt into a covered ladle and forming above said deoxidized sulfur-containing steel melt in said covered ladle a synthetic slag which consists of pulverulent lime and 10 to 30% of a silica-free fluxing agent; and

e. blowing into said deoxidized sulfur-containing melt in said covered ladle at a depth of at least 2000 mm and about 300 mm above the bottom of said covered ladle in a neutral carrier gas a finely divided calcium-containing substance in a quantity in excess of a quantity of calcium required to stoichiometrically react with the sulfur of said deoxidized sulfur-containing melt, said covered ladle having a silica-free lining.

4,036,636

PYROMETALLURGICAL PROCESS FOR SMELTING NICKEL AND NICKEL-COPPER CONCENTRATES INCLUDING SLAG TREATMENT

Paul R. Ammann, Boxford, and Jonathan J. Kim, Chelmsford, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,896

The portion of the term of this patent subsequent to Dec. 31, 1991, has been disclaimed.

Int. Cl.^{2} C22B *15/00*

U.S. Cl. 75—74 **17 Claims**

1. A process for extracting nickel values from a nickel bearing slag comprising the steps of:

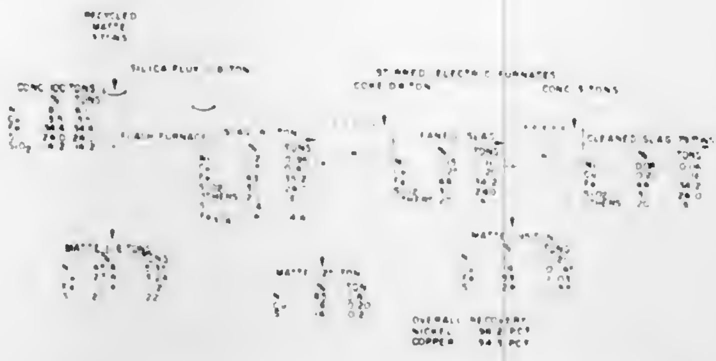
a. introducing the slag into a reactor;

b. maintaining the temperature of the slag in the reactor at a level at which the slag is molten;

c. adding a solid reductant to the slag in the reactor, the amount of reductant being sufficient to lower the oxygen potential of the slag to a level at which a nickel bearing phase separates from the slag;

d. mixing the reductant into the slag in the reactor, while the slag is molten, with a liquid cooled, metal bladed, mechanical, rotating stirrer to reduce the slag, said stirrer being rotated at a speed sufficient to pump said reductant into the slag and keep it submerged in the slag long enough for it to decrease the oxygen potential and lower the soluble nickel content of the slag to enable the formation of a nickel bearing phase; and,

e. separating a nickel bearing phase from the slag.



4,036,637

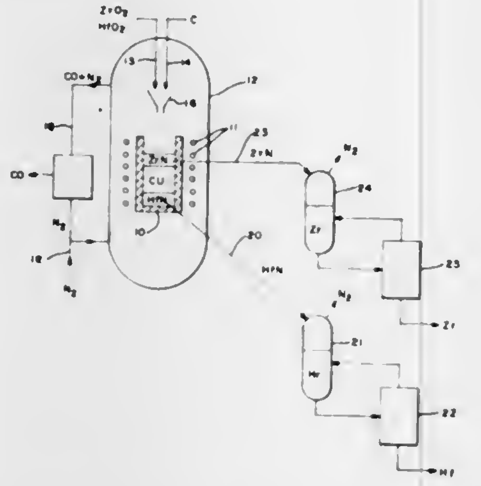
SEPARATION OF ZIRCONIUM-HAFNIUM BY NITRIDE PRECIPITATION

Robert N. Anderson, Palo Alto, and Norman A. Parlee, Los Altos Hills, both of Calif., assignors to Parlee-Anderson Corporation, Menlo Park, Calif.

Filed Oct. 24, 1974, Ser. No. 517,581

Int. Cl.^{2} C22B *34/00;* C01G *23/00, 56/00*

U.S. Cl. 75—84 **16 Claims**



1. In a method for the separation of a light metal reactive with nitrogen and a heavy metal reactive with nitrogen from a mixture containing the same metals, the steps of dissolving said mixture in a molten metal solvent which does not form a nitride under the conditions prevailing in the system, converting the light and heavy metals into nitride products insoluble in said solvent by maintaining a nitrogen-containing atmosphere over the molten metal solvent having a nitrogen partial pressure sufficient for said conversion, said molten solvent having a specific gravity sufficiently greater than said light metal nitride so that said last named nitride floats in a separate phase in the upper portion of said solvent, said metal solvent having a specific gravity sufficiently less than said heavy metal nitride so that said last named nitride sinks in a separate phase in the lower portion of said solvent, said metal solvent being present in sufficient quantity to form a liquid barrier separating said light and heavy metal nitrides into distinct phases.

4,036,638

BINARY AMORPHOUS ALLOYS OF IRON OR COBALT AND BORON

Ranjan Ray, Morristown, and Sheldon Kavesh, Whippany, both of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Division of Ser. No. 631,752, Nov. 13, 1975, abandoned, which is a continuation-in-part of Ser. No. 590,532, June 26, 1975. This application Nov. 28, 1975, Ser. No. 636,323

Int. Cl.^{2} C22C *38/00, 19/07*

U.S. Cl. 75—123 B **2 Claims**

1. A binary amorphous metal alloy that is about 100% amorphous having high mechanical hardness of at least about 1000 kg/mm^2, a tensile strength of at least about 470,000 psi and an elastic moduli of at least about 23×10^6 psi (in a saturating field), a saturation magnetization of at least about 10.8 kGauss and a coercive force less than about 0.1 Oe, characterized in that the alloy consists of the binary composition M_aB_b, where M is one element selected from the group consisting of iron and cobalt, B is boron, *a* ranges from about 75 to 85 atom percent and *b* ranges from about 15 to 25 atom percent.

4,036,639

PRODUCTION OF COPPER

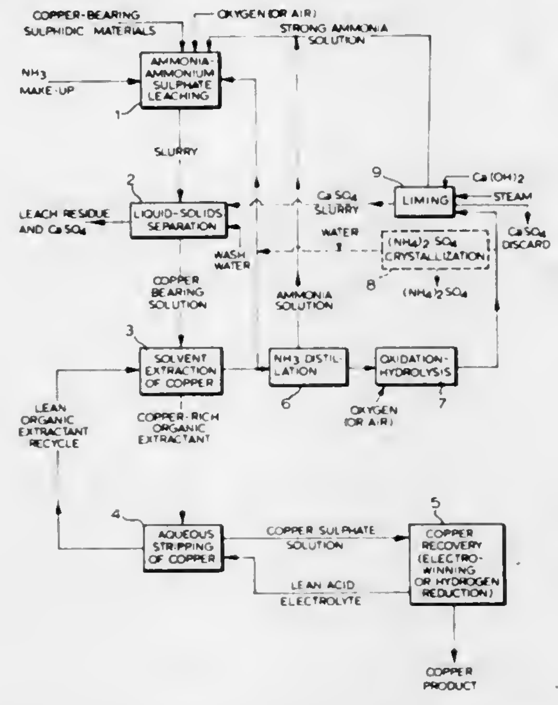
William J. Yurko, Edmonton, Canada, assignor to Sherritt Gordon Mines Limited, Toronto, Canada

Continuation of Ser. No. 504,487, Sept. 10, 1974, abandoned. This application Sept. 7, 1976, Ser. No. 720,852

Claims priority, application Canada, Sept. 10, 1973, 180656

Int. Cl.^{2} C22B *15/10*

U.S. Cl. 75—101 BE **7 Claims**



2. A process for recovering copper from cuprlferous sulphidic material comprising the following steps:

a. leaching the cupriferous sulphidic material under oxidizing conditions with an ammonium sulphate-containing ammoniacal aqueous leach medium to obtain a substantially iron-free copper-containing aqueous leach liquor and an insoluble residue;

b. separating the copper-containing aqueous leach liquor from the insoluble residue;

c. contacting the separated copper-containing aqueous leach liquor with an organic extractant for copper of the ionic exchange type having substantially greater affinity for copper ions than for other cations present in the aqeuous leach liquor to extract copper from the aqueous leach liquor, said organic extractant being dissolved in a substantially water-immiscible organic diluent;

d. separating the ammoniacal ammonium sulphate-containing aqueous leach liquor of reduced copper content from the organic diluent and dissolved copper-carrying organic extractant;

e. recycling a portion of the separated ammoniacal aqueous liquor containing ammonium sulphate directly to the leaching step;

f. recycling another portion of the separated aqueous leach liquor to the leaching step via an ammonium distillation step and a subsequent sulphate ion removal step, ammonia being distilled off from said other portion of the aqueous leach liquor during said ammonium distillation step and recycled to the leaching step, and said sulphate ion removal step removing an amount of sulphate ions from said other portion of the aqueous leach liquor about equivalent to the sulphur extracted from the cupriferous sulphate material during the leaching step;

g. contacting the organic diluent and dissolved copper-carrying organic extractant, thereby reconstituting the organic extractant and forming an acidic copper sulphate solution;

h. separating the organic diluent and reconstituted dissolved organic extractant from the acidic copper sulphate solution;

i. recycling the separated organic diluent and reconstituted dissolved organic extractant to copper extraction step (c);

j. recovering copper in elemental form from the acidic copper sulphate solution in a copper winning operation to produce elemental copper and sulphuric acid solution; and

k. recycling the sulphuric acid solution to copper stripping step (g).

4,036,640

ALLOY STEEL

Thoni V. Philip, and Gunvant N. Maniar, both of Reading, Pa., assignors to Carpenter Technology Corporation, Reading, Pa.

Filed Jan. 6, 1977, Ser. No. 757,250

Int. Cl.^{2} C22C *38/22, 38/24, 38/26, 38/30*

U.S. Cl. 75—126 C **12 Claims**

1. An alloy steel, which is hardenable by heating up to about 2150° F while retaining a Snyder-Graff grain size of 9 or finer and tempered to a room temperature hardness of at least about R_c 60, which in its heat treated condition is substantially free of retained austenite, which by weight consists essentially of about

	w/o
Carbon	0.5-1.1
Manganese	0.10-<0.50
Silicon	0.10-<0.80
Chromium	3.5-5.0
Molybdenum	2.5-5.0
Vanadium	0.5-2.0
Cobalt	0.5-4.0
Columbium	0.15-0.50
Aluminum	up to 0.10

and the balance essentially iron and incidental impurities.

4,036,641

CAST IRON

Edward Raymond Evans, Birmingham, and John Victor Dawson, Stratford-upon-Avon, both of England, assignors to British Cast Iron Research Association, Birmingham, England

Filed Jan. 20, 1976, Ser. No. 650,774

Int. Cl.^{2} C22C *33/08*

U.S. Cl. 75—130 A **13 Claims**

1. A method of treating molten carbon-containing iron to produce a cast iron with a compacted graphite structure comprising adding to the molten iron in a single step a quantity of an alloy containing silicon, magnesium, titanium and a rare earth, the balance being iron.

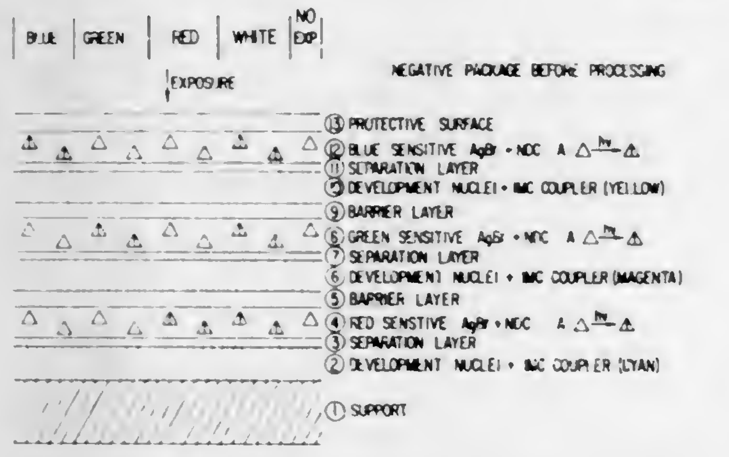
4,036,642
COPPER BASE ALLOY CONTAINING TITANIUM, ANTIMONY AND CHROMIUM

W. Gary Watson, Cheshire, and John F. Breedis, Trumbull, both of Conn., assignors to Olin Corporation, New Haven, Conn.
Filed May 19, 1976, Ser. No. 687,671
Int. Cl.² C22C *9/00;* **C21D** *1/44*
U.S. Cl. 75—164 **8 Claims**

1. A high conductivity and high strength copper base alloy consisting essentially of 0.08 to 1.0% by weight titanium, 0.05 to 1.5% by weight antimony, 0.1 to 1.0% by weight chromium, balance copper, wherein the titanium and antimony are present at an atomic ratio of not more than 10% above 5 atoms of titanium per 3 atoms of antimony.

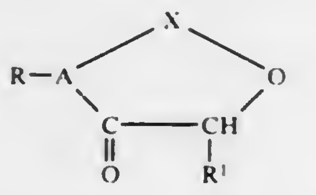
4,036,643
DIFFUSION TRANSFER COLOR PROCESS USING LACTONE OR SULTONE RING CONTAINING LIPOPHILIC NON-DIFFUSING COLOR FORMERS WHICH YIELD DIFFUSING DYES

Felix Viro, Apalachin, and Michael C. Mourning, Vestal, both of N.Y., assignors to GAF Corporation, New York, N.Y.
Continuation-in-part of Ser. No. 368,976, June 11, 1973, abandoned. This application Nov. 1, 1974, Ser. No. 520,128
Int. Cl.² G03C *7/00, 5/54, 1/40, 1/71*
U.S. Cl. 96—29 D **14 Claims**


BLUE
GREEN
RED
WHITE
NO EXP
EXPOSURE
NEGATIVE PACKAGE BEFORE PROCESSING
⑬ PROTECTIVE SURFACE
⑫ BLUE SENSITIVE AgBr + NDC A △ hν ▲
⑪ SEPARATION LAYER
⑩ DEVELOPMENT NUCLEI + IMC COUPLER (YELLOW)
⑨ BARRIER LAYER
⑧ GREEN SENSITIVE AgBr + NDC A △ hν ▲
⑦ SEPARATION LAYER
⑥ DEVELOPMENT NUCLEI + IMC COUPLER (MAGENTA)
⑤ BARRIER LAYER
④ RED SENSTIVE AgBr + NDC A △ hν ▲
③ SEPARATION LAYER
② DEVELOPMENT NUCLEI + IMC COUPLER (CYAN)
① SUPPORT

1. In a color diffusion transfer process carried out in a photographic film package having one or more color sensitive silver halide emulsion layers which respond to exposure by actinic radiation from different primary colors and which also contain color couplers yielding dyes of complementary colors to said different color sensitive layers, said film package being coated at a pH below 9, but preferably below pH 7, to provide a storage stable package in which color formers do not diffuse, and said package reacting with an alkaline aqueous processing and developing solution containing a p-phenylene diamine developer, the improvement comprising:

a. providing as the aforesaid color coupler a waterinsoluble, transient heterocyclic 2-equivalent color coupling compound having a lactone or sultone ring, said transient heterocyclic color coupling compound being resistant to splitting of said ring in alkaline aqueous solution in the absense of oxidative coupling; said transient heterocyclic color coupling compound being a compound of the formula:



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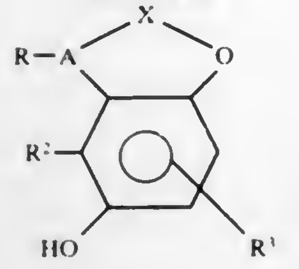
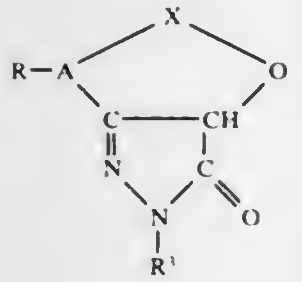
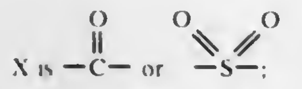


or



wherein



$$X \text{ is } -\overset{O}{\overset{\|}{C}}- \text{ or } -\overset{O\;\;O}{\overset{\diagdown\;\diagup}{S}}-;$$

A is a chain of 1 to 3 atoms containing only carbon atoms in the chain or containing up to 1 nitrogen atom for chains of 2 or 3 atoms;

R is attached to and satisfies the valences of the atoms in A and is independently, one or more hydrogen, an aliphatic radical or an aromatic radical, or R is an aromatic radical and A is provided by two adjacent carbon atoms in an aromatic ring of R;

R¹ is an activating group associated with a ketomethylene coupler; and

R² and R³ are independently hydrogen, halogen, cyano, an aliphatic radical or an aromatic radical, or R, R² and A together form a benzene ring fused to the benzene ring to which A and R² are attached; said transient heterocyclic color coupling compound being incorporated in a high boiling photographically inert oil dispersion to provide droplets having substantially no water solubility and no diffusion at pH below 9, yet being responsive to said alkaline processing and developing solution at pH above 9 to allow reaction of said transient heterocyclic color coupling compound with locally oxidized p-phenylene diamine and to thereby from imagewise water soluble and diffusible dye, the water solubility and diffusibility characteristics being bestowed upon the dye by a newly formed carboxylic or sulfonic acid group as a result of ring opening in coupling position by oxidative coupling reaction, said diffusible dye being free to diffuse out into a mordanted receiving sheet,

b. exposing said package in imagewise fashion and

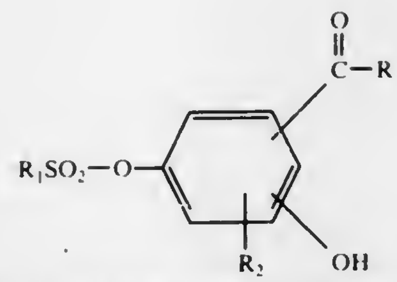
c. after exposing developing said package in an alkaline processing solution having a pH above 9 and containing a p-phenylene diamine developer and in contiguous contact with said mordanted receiving sheet.

4,036,644
PHOTORESIST PROCESS AND PHOTOSENSITIVE O-QUINONE DIAZIDE ARTICLE WITH ALIPHATIC CARBOXYLIC ACID AS ADHESION PROMOTOR

Leon H. Kaplan, Yorktown Heights; John Baldwin Lounsbury, Pleasant Valley, both of N.Y., and Steven Michael Zimmerman, Totton, England, assignors to International Business Machines Corporation, Armonk, N.Y.
Continuation-in-part of Ser. No. 342,123, March 16, 1973, abandoned. This application Jan. 15, 1975, Ser. No. 541,360
Int. Cl.² G03C *5/34, 1/60*
U.S. Cl. 96—36 **10 Claims**

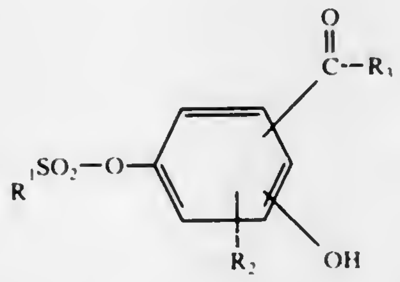
1. A process for forming a resist mask pattern on a silicon substrate having a surface coating selected from the group consisting of silicon oxide, phosphosilicate glass, sputtered quartz and metal comprising:

coating the surface coating with a layer of radiation sensitive polymer resist composition consisting essentially of a novolak resin and a diazo ketone sensitizer having the formula



in which R_1 is a naphthoquinone (1,2) diazide radical, R_2 is selected from the group consisting of hydrogen and hydroxyl, and R_3 is selected from the group consisting of hydrogen, alkyl, acyl, alkoxy, acyloxy, amino, and heterocyclic groups, in proportions of between about 1:1 and 1:6 weight of sensitizer to resin and from about 1 to 11% by weight of solids in the resist of an aliphatic carboxylic acid containing from about 3 to 30 carbon atoms, exposing said layer patternwise to actinic radiation for said sensitizer, and removing the exposed portions of said layer with a solvent developer for the actinic radiation exposed polymer resist composition to uncover the areas of the substrate surface beneath the exposed portions of the resist layer.

10. An article comprising a silicon substrate having a surface coating selected from the group consisting of silicon oxide, phosphosilicate glass, sputtered quartz and metal coated with a layer of resist consisting essentially of a novolak polymer, a light sensitive diazo ketone compound having the formula



in which R_1 is a naphthoquinone-1,2)-diazide radical, R_2 is selected from the group consisting of hydrogen and hydroxyl, and R_3 is selected from the group consisting of hydrogen, alkyl, acyl, alkoxy, acyloxy, amino, and heterocyclic groups, in proportions of between about 1:1 and 1:6 by weight of diazo ketone of novolak polymer, and from about 1 to 11% by weight based on resist solids of an aliphatic carboxylic acid containing from about 3 to 30 carbon atoms.

4,036,645
PHOTODETECTORS AND THIN FILM PHOTOVOLTAIC ARRAYS

Russell Stuart Pinder, and Leslie Clark, both of Newcastle-upon-Tyne, England, assignors to International Research and Development Company Limited, Newcastle-upon-Tyne, England
Filed Mar. 18, 1975, Ser. No. 559,483
Claims priority, application United Kingdom, Mar. 21, 1974, 12648/74
Int. Cl.² G03C *5/00*
U.S. Cl. 136—89 C **13 Claims**

1. In a method of forming a photo-voltaic hetero-junction in which at least one region of a semi-conducting material of a first conductivity type is treated through an opening in a resist layer to convert said at least one region into semiconducting material of a second conductivity type, the improvement which comprises the steps of:

i. coating a layer of semi-conducting material of the first conductivity type with a layer of photo-resist material applied directly to the semi-conducting material;

ii. exposing at least one area of the photo-resist layer to light by way of masking means;

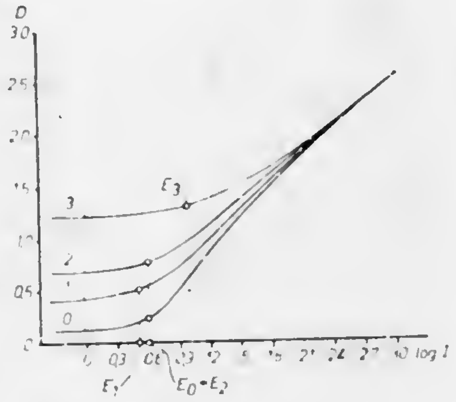
iii. developing the photo-resist layer and removing the unexposed part of the layer to uncover at least one region of the said layer of semi-conducting material of the first conductivity type;

iv. introducing a chemical capable of converting the surface of the said at least one uncovered region into semi-conducting material of the second conductivity type to form a hetero-junction thereat; and

v. applying electrically-conducting material to the semi-conducting material of the second conductivity type to provide a contact to the hetero-junction.

4,036,646
COLOR CORRECTION OF UNWANTED SIDE DENSITIES IN LIGHT-SENSITIVE COLOR PHOTOGRAPHIC ELEMENTS

Ehrhard Hellmig, and Erwin Ranz, both of Leverkusen, Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Filed Mar. 4, 1975, Ser. No. 555,150
Claims priority, application Germany, Mar. 8, 1974, 2411105
Int. Cl.² G03C *7/00, 7/04, 3/00*
U.S. Cl. 96—74 **5 Claims**



1. A light sensitive color photographic multilayer material having built-in means for color correction of unwanted side densities, essentially consisting of supported spectrally sensitive silver halide emulsion layers in superimposed relationship comprising a blue-sensitive silver halide emulsion layer with a colorless yellow-forming coupler, a green-sensitive silver halide emulsion layer with a colorless magenta-forming coupler and a red-sensitive silver halide emulsion layer with a colorless cyan-forming coupler, at least a first of said spectrally sensitive emulsion layers having a coupler providing an image dye produced by chromogenic development having a main density in the spectral sensitivity range of said first emulsion layer and an unwanted side density in the spectral sensitivity range of a second of said spectrally sensitive emulsion layer and said second spectrally sensitive emulsion layer being partially fogged and developable to form on chromogenic development a dye of a color that compensates for the unwanted side density in said first emulsion layer, and a yellow filter layer wherein the improvement comprises said second spectrally sensitive emulsion layer has been fogged to a degree that produces on chromogenic development a color density of between 0.25 and 0.75 in the unexposed areas of said second emulsion layer and said second emulsion layer having in the fogged state a threshold photosensitivity not less than that in the unfogged state.

4,036,647
PACKAGE FOR MAKING PHOTOPOLYMERIZED PLATES

Robert G. Brault, Santa Monica; Cesar C. DeAnda, Santa Susana; Joe A. Jenney, Los Angeles, and John D. Margerum, Woodland Hills, all of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Oct. 13, 1972, Ser. No. 298,715

Int. Cl.² G03C *1/48*

U.S. Cl. 96—76 C **8 Claims**

1. A new and improved method of storing components of photopolymerizable composition used in the recording of photopolymer images and photopolymer holograms wherein a monomer solution is separated from a photo-catalytic solution prior to the formation of said photopolymerizable composition comprising storing said monomer solution in a collapsible container separated from said catalytic solution which has been coated onto a substrate separated by spacers from a cover plate connected to said container by a fluid ingress means and a breakaway seal.

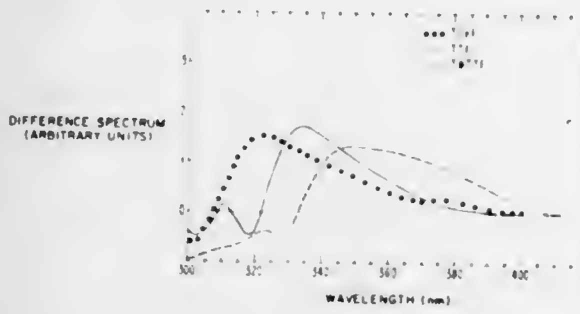
4,036,648
HIGHLY CONDUCTIVE PRINTING MEDIUM CONTAINING A HALOGENATED HYDROCARBON PHOTOACTIVATOR AND A TETRATHIAFULVALENE OR A RELATED COMPOUND THEREOF

Edward Martin Engler, Wappingers Falls; Frank Benjamin Kaufman, New York, and Bruce Albert Scott, Shrub Oak, all of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

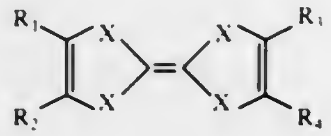
Filed June 30, 1975, Ser. No. 591,992

Int. Cl.² G03C *1/52;* **G03G** *5/00*

U.S. Cl. 96—90 R **11 Claims**



1. A highly conductive printing medium comprising a substrate having disposed thereon a layer of an organic π-electron donor compound dissolved in a halocarbon capable in a complex with said organic π-electron donor compound of generating a free radical upon exposure to actinic radiation said medium being sensitive to actinic radiation, said organic π-electron donor compound having the emperical formula $C_6H_4X_4R_1R_2R_3R_4$ and the structural formula,



where X is selected from the group consisting of O, S, Se and Te and R_1, R_2, R_3, and R_4 is an organic substituent, selected from the group consisting of hydrogen, an alkyl group, halogen, CO_2Me, phenyl groups, substituted phenyl groups and fused cyclics and substituted fused cyclics selected from the groups consisting of cyclopentene, cyclohexene, benzene, furan, thiophene, dihydrofuran and dihydrothiophene.

4,036,649
SILVER HALIDE EMULSION SENSITIZED WITH A FUSED DIAZEPINE

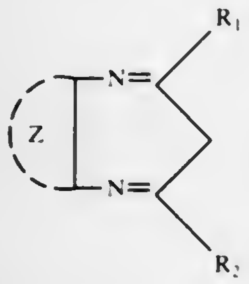
Henry John Schwalenstocker, Jr., Pittsford, N.Y., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 17, 1976, Ser. No. 696,915

Int. Cl.² G03C *1/28*

U.S. Cl. 96—107 **9 Claims**

1. A photographic element comprising a support bearing a layer of a negative-working, developingout, silver halide emulsion containing a sensitizing amount of either a) at least one fused diazepine of the formula



wherein R_1 and R_2 may be the same or different and are selected from the group consisting of H, C_1–C_4 alkyl, and phenyl; and Z represents the non-metallic atoms necessary to complete an aromatic ring structure selected from the group consisting of benzene, pyridine, and naphthalene, which aromatic ring structure may contain halogen or lower alkyl groups as ring substituents; and b) a salt of said diazepine.

4,036,650
HEAT DEVELOPABLE PHOTOSENSITIVE MATERIAL CONTAINING COMPOUNDS OF SULFUR

Noriko Hasegawa, Tokyo; Hajime Kobayashi, Mitaka; Ichiro Endo, Yokohama, all of Japan, and Kikuo Kinjo, deceased, late of Tokyo, Japan (Kinjo, legal representative; by Ayako), assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 26, 1975, Ser. No. 608,006

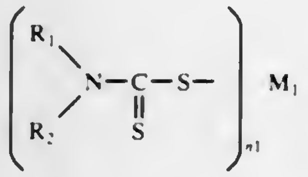
Claims priority, application Japan, Aug. 27, 1974, 49-98661; Aug. 27, 1974, 49-98662

Int. Cl.² G03C *1/02, 1/36, 1/34*

U.S. Cl. 96—114.1 **24 Claims**

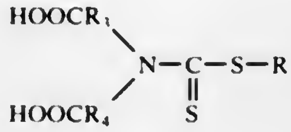
1. In a heat developable photosensitive material comprising an organic silver salt, a silver halide and a reducing agent, the improvement comprising said heat developable photosensitive material further containing, as a component for producing fogless and stable images of high contrast, at least one member selected from the group consisting of sulfur an sulfur compounds of the formulae:

(1)

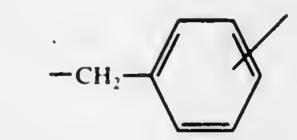


wherein R_1 and R_2 are similar or dissimilar and are selected from the group consisting of hydrogen, alkyl, alkanoyl, phenyl, tolyl, xylyl, benzyl, and a heterocyclic group, M_1 is selected from the group consisting of a metal ion, an ammonium ion, an alkylammonium ion and a heterocyclic ion, and n_1 is determined depending upon the valency of M_1 and is an integer of 1-3;

(2)

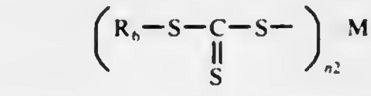


wherein R_3 and R_4 are similar or dissimilar and are selected from the group consisting of alkylene, phenylene, tolylene, dimethyl phenylene, and



where the methylene group is attached to the nitrogen atom and the floating radical in the benzene ring to the carboxyl group, and R_5 is alkyl; and

(3)



$$\left(R_6{-}S{-}\underset{\underset{\displaystyle S}{\|}}{C}{-}S{-} \right)_{n2} M_2$$

wherein R_6 is selected from the group consisting of hydrogen, alkyl, alkanoyl, phenyl, toyl, xylyl, benzyl and a heterocyclic group M_2 is selected from the group consisting of metal ion, an ammonium ion, an alkylammonium ion and a heterocyclic ion, and n_2 is determined depending upon the valency of M_2 and is an integer of 1-3.

4,036,651
ELECTROLESS COPPER PLATING BATH

Joel Alan Weiner, Cranbury, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Feb. 26, 1974, Ser. No. 445,968

Int. Cl.² C23C *3/02*

U.S. Cl. 106—1 **4 Claims**

1. A bath for electrolessly depositing copper consisting essentially of a copper salt, a chelating agent for copper ion, sufficient alkali metal hydroxide or carbonate to maintain a pH of about 11-13.3, formaldehyde and sufficient sodium hypophosphite to appreciably increase the copper plating rate of the bath.

4,036,652
ENCAPSULATED PIGMENTS

Jules Rothmayer, Cincinnati, Ohio, assignor to Sun Chemical Corporation, New York, N.Y.

Filed Apr. 7, 1976, Ser. No. 674,418

Int. Cl.² C08K *9/10*

U.S. Cl. 106—308 N **5 Claims**

1. A process for encapsulating pigments which comprises the steps of (1) mixing a high solids pigment presscake containing about 40 to 50 percent by weight of water with ammonia and an ammonia-soluble acrylic resin to form a fluid mixture, (2) removing sufficient water from the mixture to form a kneadable mass, and (3) dispersing the mass under conditions of high shear to yield a finely-divided encapsulated pigment presscake, the amount of resin being about 10 to 40 parts by weight per 100 parts by weight of pigment presscake and the amount of ammonia being about 5 to 50 parts by weight per 100 parts by weight of pigment.

4,036,653
AMORPHOUS SILICON NITRIDE COMPOSITION CONTAINING CARBON, AND VAPOR PHASE PROCESS

Howard Wayne Jacobson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed May 28, 1975, Ser. No. 581,564

Disclosure was also published under second Trial Voluntary Protest Program on Mar. 23, 1976

Int. Cl.² C04B *35/58;* **C23C** *11/14*

U.S. Cl. 106—47 R **9 Claims**

1. An amorphous silicon nitride composition consisting essentially of from 95.0% to 99.9% by weight of amorphous silicon nitride, calculated as Si_3N_4 and based on the total weight of the composition, and from 0.1% to 5.0% by weight of carbon, calculated as elemental carbon and based on the total weight of the composition, the carbon being uniformly distributed within the silicon-nitrogen bonds in the amorphous silicon nitride.

4. Vapor phase process for preparing an amorphous silicon nitride composition according to claim **1** by the steps of (i) intimately contacting gaseous silicon tetrachloride ($SiCl_4$), gaseous ammonia (NH_3) and a gaseous hydrocarbon at a temperature from 1000°C. to 1500°C., hydrocarbon does not substantially decompose to form carbon prior to reaction of $SiCl_4$ and NH_3 to form silicons nitride (ii) condensing the products of the vapor phase reaction of step (i) and (iii) recovering the amorphous silicon nitride composition.

4,036,654
ALKALI-RESISTANT GLASS COMPOSITIONS

Brian Yale, Ormskirk, and Anup Sircar, Sheffield, both of England, assignors to Pilkington Brothers Limited, St. Helens, England

Continuation-in-part of Ser. No. 426,142, Dec. 19, 1973, abandoned. This application Mar. 22, 1976, Ser. No. 669,002

Claims priority, application United Kingdom, Dec. 19, 1972, 58613/72

Int. Cl.² C03C *3/04, 13/00;* **C04B** *31/06*

U.S. Cl. 106—52 **5 Claims**

1. An alkali-resistant glass composition consisting essentially of, in weight percentages:

SiO2	45 to 65%
ZrO2	6 to 20%
RO	20 to 45%

the total of SiO_2 + ZrO_2 + RO being not less than 94% by weight of the glass, where RO represents at least one divalent oxide of the group consisting of CaO, MgO, SrO, BaO and ZnO, the amount of said divalent oxide or oxides lying within the ranges, in weight percentages: CaO 20 to 45%, MgO 0 to 10%; SrO 0 to 8%; BaO 0 to 10% and ZnO 0 to 5% and wherein if components other than SiO_2, ZrO_2 and RO are included in said glass composition, each such component does not exceed 5% by weight of the composition.

4,036,655
INORGANIC COMPOSITION

Koichi Yamada; Tadanori Hashimoto, and Yoshinori Furumi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Sept. 11, 1974, Ser. No. 504,964

Claims priority, application Japan, Sept. 14, 1973, 48-104061; Sept. 14, 1973, 48-104063

Int. Cl.² C04B *31/00*

U.S. Cl. 106—77 **8 Claims**

1. An inorganic composition which consists essentially of

A. 2 to 1,000 parts by weight of a calcined polyvalent metal-borate-type mixture obtained by calcining at a temperature of about 300°C to about 1,500°C a mixture comprising 100 parts by weight of (*i*) (*a*) a borate of a metal of Groups II to VIII of the Periodic Table or (*i*) (*b*) at least one boric acid compound selected from the group consisting of boric acid compound selected from the group consisting of boric acid and boric oxide and at least one phosphoric acid compound selected from the group consisting of phosphoric acid, phosphorus pentoxide and a metal phosphate selected from the group consisting of sodium phosphate, potassium phosphate, and lithium phosphate and (ii) not more than 2,000 parts by weight of at least one polyvalent metal compound selected from the group consisting of polyvalent metal oxides, hydroxides, carbonates, phosphates, silicates, sulfates, and nitrates and

B. 100 parts (as solid matter) by weight of water-soluble silicates.

4,036,656

FOAMED MASTIC COMPOSITION, BUILDING ARTICLES COATED THEREWITH, AND METHOD OF PREPARING SAME

Mario P. Bucco, Annandale, and Alvin Van Valkenburg, McLean, both of Va., assignors to The Mearl Corporation, Ossining, N.Y.

Division of Ser. No. 3,528, Jan. 16, 1970, abandoned, which is a continuation-in-part of Ser. No. 560,940, Jan. 13, 1966, abandoned, which is a continuation-in-part of Ser. No. 430,470, Jan. 4, 1965, abandoned. This application Aug. 29, 1975, Ser. No. 608,890

Int. Cl.^{2} C04B *9/04*

U.S. Cl. 106—88 7 Claims

1. A method for the preparation and application of a foamed magnesia cement, which comprises:

a. pre-forming an aqueous foam by aerating a solution of a hydrolyzed animal protein foaming agent in water;

b. mixing magnesia, a magnesium salt selected from the group consisting of magnesium sulfate and magnesium chloride, and a foam stabilizing fire resistant filler in an aqueous slurry;

c. adding the pre-formed form to said slurry to provide a pumpable and sprayable foam cement, the foamed cement having a wet density in the range of about 8 to 30 pounds per cubic foot;

d. pumping the thus foamed cement to the point of application;

e. spraying the foamed cement upon a suitable substrate to form a layer thereon; and

f. air-drying said layer to convert the same to a foamed magnesia cement.

4,036,657

HIGH IRON OXIDE HYDRAULIC CEMENT

Povindar K. Mehta, El Cerrito, Calif., assignor to Reagents of the University of California, Oakland, Calif.

Filed July 23, 1975, Ser. No. 598,411

Int. Cl.^{2} C04B *7/02, 7/04*

U.S. Cl. 106—89 9 Claims

1. High iron-oxide hydraulic cement compositions comprising from about 15 to about 65% by weight tetracalcium aluminoferrite, from about 10 to about 20% by weight tetracalcium trialuminosulfate, and from about 10 to about 15% by weight calcium sulfate.

4,036,658

PROCESS FOR THE PREPARATION OF AN IMPREGNATED BUILDING MATERIAL, AND THE PRODUCT THEREBY OBTAINED

Josef Alfred Pühringer, Taby; David Yngve Mikael Lund, Bromma; Rolf Bo Fröberg, Jarna, and Erik Vilhelm Bernhard Örnelius, Bromma, all of Sweden, assignors to Nya Asfalt AB, Stockholm, Sweden

Filed Apr. 25, 1974, Ser. No. 464,208

Claims priority, application Sweden, May 4, 1973, 7300155

Int. Cl.^{2} C04B *7/35*

U.S. Cl. 106—90 12 Claims

1. A process for the preparation of plaster or mortar as a hydrofobous building material, wherein said plaster or mortar contains a ballast material and a binder, comprising impregnating the ballast material in a proportion of 5 to 90% by volume of said ballast material with a water repellant, said water repellant being a silane or a siloxane solution, a predominant part of the water repellant ballast material having a grain size of about 0.1 to 4 mms; drying said impregnated ballast material, admixing said impregnated ballast with said binder in an amount sufficient for forming plaster or mortar, said plaster or mortar possessing substantial water-repellant and substantial water vapor diffusion characteristics by allowing the material to reject water yet allowing the expelling of moisture from or through the incorporated plaster or mortar.

4,036,659

CEMENT COMPOSITION

Duane L. Stude, Tulsa, Okla., assignor to The Dow Chemical Company, Midland, Mich.

Filed Mar. 1, 1976, Ser. No. 662,666

Int. Cl.^{2} C04B *7/35*

U.S. Cl. 106—90 19 Claims

1. A cement composition comprising portland cement and the calcium sulfate hemihydrate form of gypsum in a weight ratio of from 3:1 to 1:3 and, based on the total weight of said portland cement and gypsum:

a. from about 5 to about 25 percent urea; and

b. from about 0.1 to about 2 percent of at least one retarder selected from the group consisting of

1. a water soluble salt of lignosulfonic acid,
2. a low molecular weight hydroxypolycarboxylic acid,
3. a sodium, potassium, or lithium salt of a low molecular weight hydroxypolycarboxylic acid, and
4. an alkaline hexametaphosphate.

4,036,660

METHODS OF USING CEMENTING COMPOSITIONS HAVING IMPROVED FLOW PROPERTIES, CONTAINING SULFONATED COPOLYMERS OF STYRENE-MALEIC ANHYDRIDE

Leonard J. Persinski, Pittsburgh, Pa.; Fred David Martin, Socorro, N. Mex., and Sally Lee Adams, Pittsburgh, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

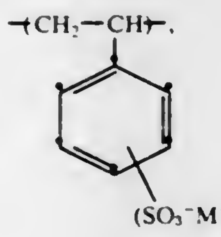
Continuation-in-part of Ser. No. 553,391, Feb. 27, 1975, Pat. No. 3,952,805. This application Apr. 14, 1976, Ser. No. 676,767

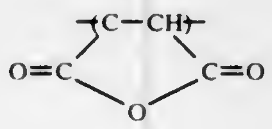
The portion of the term of this patent subsequent to Apr. 27, 1993, has been disclaimed.

Int. Cl.^{2} C04B *7/35*

U.S. Cl. 106—90 6 Claims

1. In a method of subjecting an aqueous hydraulic cement slurry to flow for the purpose of handling or transporting said slurry, the improvement comprising adding to said slurry, prior to subjecting said slurry to flow, from about 0.01 to about 5.0 percent by weight, based on weight of hydraulic cement on a dry basis, of a copolymer of randomly repeating units of the following formulas:





and

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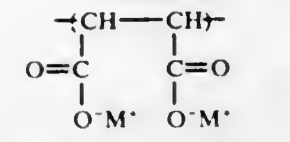


$$-\!\!\!\left(\begin{array}{cc}\mathrm{CH} & \!\!-\!\!\!-\mathrm{CH}\\ | & |\\ \mathrm{O{=}C} & \mathrm{C{=}O}\\ | & |\\ \mathrm{O^-M^+} & \mathrm{O^-M^+}\end{array}\right)\!\!\!-$$

where M is hydrogen, ammonium or alkali metal ion, and *n* is an integer of 1 to 3.

4,036,661

ASPHALT MINERAL AGGREGATE COMPOSITIONS CONTAINING SILANES AS ADHESION PROMOTERS

Robert J. Schmidt, deceased, late of El Cerrito, Calif., and Peter E. Graf, Orinda, Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Feb. 12, 1973, Ser. No. 331,424

Int. Cl.^{2} C08L *95/00;* **C09D** *3/24*

U.S. Cl. 106—273 N 11 Claims

1. A surfacing composition comprising (A) 100 parts by weight of a mineral aggregate, (B) 3 to 20 parts by weight of an asphalt and (C) from 0.0001 to 0.10 parts by weight of a silane of the formula:

$R^b - R^a - Si - X_3$

wherein

1. X represents halogen or alkoxy,
2. R^a represents alkylene, and
3. R^b represents amino or aminoalkylene amino.

4,036,662

METAL ADDITIONS TO PIGMENTS OF PSEUDOBROOKITE-TITANIUM DIOXIDE STRUCTURE

Jacob Rademachers; Henning Erfurth, and Franz Hund, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Oct. 20, 1975, Ser. No. 624,214

Claims priority, application Germany, Oct. 26, 1974, 2451042

Int. Cl.^{2} C09C *1/36, 1/22;* **C01G** *23/00, 49/00*

U.S. Cl. 106—300 16 Claims

1. A temperature-stable inorganic pigment of pseudo-brookite-titanium dioxide structure having the composition $Fe_2TiO_5 \cdot x\ TiO_2$, wherein x is from 0 to about 15, and containing about 0.1 to 10% by weight of the pigment of at least one metal selected from the group consisting of lithium, sodium, potassium, magnesium, zinc, calcium, aluminum, copper, vanadium, chromium, manganese, cobalt and nickel.

4,036,663

INORGANIC PIGMENTS AND METHODS FOR PRODUCING THE PIGMENTS AND AQUEOUS SLURRIES THEREOF

Lloyd E. Williams, Bel Air, and Guillermo A. Almagro, Aberdeen, both of Md., assignors to J. M. Huber Corporation, Locust, N.J.

Division of Ser. No. 198,020, Nov. 5, 1971, abandoned. This application Sept. 15, 1975, Ser. No. 613,581

Int. Cl.^{2} C08J *3/00;* **C08K** *9/02;* **C09C** *1/00;* **C08K** *3/00*

U.S. Cl. 106—308 B 4 Claims

1. In a method for producing an aqueous dispersion of finely divided inorganic pigments in an aqueous medium to form aqueous dispersions thereof, the improved method comprising the steps of (1) intimately dry blending finely divided particulates of an inorganic pigment selected from the group consisting of hydrated silicas, calcium silicates, aluminum silicates, alumina, and sodium aluminosilicates, with from about 0.1 to 15.0 percent by weight based on the weight of said pigment of a soluble deliquescent salt selected from the group consisting of aluminum sulfate, aluminum nitrate, aluminum chloride, and aluminum acetate, to thereby form a substantially uniform solids mixture of said deliquescent salt in said pigment, and (2) dispersing said solids mixture into an aqueous medium to form a slurry of said mixture having a concentration on the order of about 10 to 50 weight percent of the solids mixture in the aqueous medium, said resulting dispersion being characterized by improved stability and remaining in uniform suspension over extended periods of time.

4,036,664

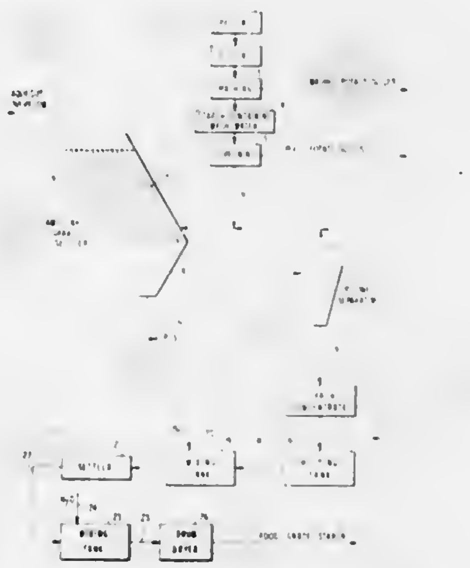
PROCESS FOR CONCENTRATING DILUTE AQUEOUS STARCH MIXTURES

William F. Priebe, Irving, Tex., assignor to Frito-Lay, Inc., Dallas, Tex.

Filed May 2, 1975, Ser. No. 573,978

Int. Cl.^{2} C13L *1/00*

U.S. Cl. 127—69 15 Claims



1. A process for the concentration of finely-divided starch in an aqueous mixture having less than about 1 weight percent starch which comprises separating said aqueous mixture in a gravity settling zone into fractions of lesser and greater contents of starch solids, said fraction of greater starch content containing about 5 to 20 weight percent of starch solids and being of flowable and pumpable consistency, passing said fraction of about 5 to 20 weight percent of starch solids to a centrifugal separation zone, wherein fractions of greater and lesser starch solids content are separated, said fraction of greater starch content containing about 30 to 60 weight percent of starch solids and at least about 2 times the percent of starch solids in said fraction passed to said centrifugal separation zone.

4,036,665

THERMOPILE FOR MICROWATT THERMOELECTRIC GENERATOR

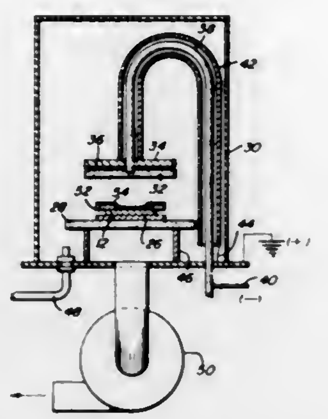
Harold N. Barr; Warren Charles Lyon, both of Baltimore, and Thomas S. Bustard, Elicott City, all of Md., assignors to Nuclear Battery Corporation, Columbia, Md.

Filed July 16, 1974, Ser. No. 488,970

Int. Cl.^{2} H01L *35/04, 35/16*

U.S. Cl. 136—202 11 Claims

1. A thermopile assembly comprising a substrate and thin film thermopile means bonded to said substrate by sputtering, said thermopile means including a plurality of semiconductor thermoelectric elements, said thermopile assembly having been



annealed at 250 to 450° C after said thermopile means is bonded to said substrate by sputtering.

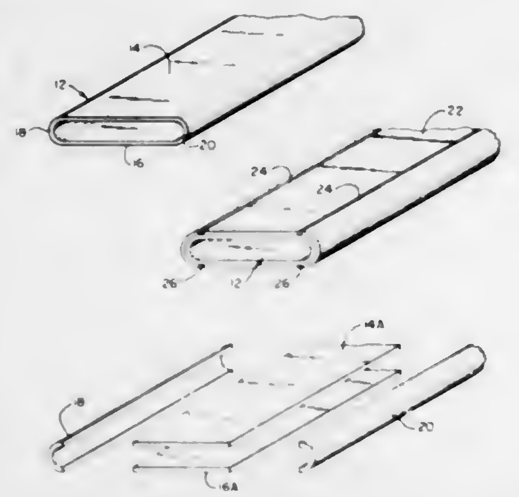
4,036,666
MANUFACTURE OF SEMICONDUCTOR RIBBON

Abraham I. Mlavsky, Lincoln, Mass., assignor to Mobil Tyco Solar Energy Corporation, Waltham, Mass.

Filed Dec. 5, 1975, Ser. No. 638,187

Int. Cl.² H01L *21/208, 21/302;* B01J *17/18*

U.S. Cl. 148—1.5 **12 Claims**



1. A method of producing substantially monocrystalline ribbons for use in fabricating solid state electronic devices comprising the steps of:

- a. providing a substantially monocrystalline body of a semiconductor material in the form of a flat oval tube having a pair of opposed mutually spaced substantially flat side wall sections connected together by a pair of opposed side edge sections; and
- b. severing said opposed side edge sections from said tube so that said side wall sections are separated as discrete ribbons.

4,036,667
PROCESS FOR PRODUCING IMPROVED, PROTECTIVE CONVERSION COATINGS ON ALUMINUM AND ITS ALLOYS, WHEREIN ALUMINUM IS THE PRINCIPAL CONSTITUENT

Eli Simon, 7175 Little Harbor Drive, Huntington Beach, Calif. 92648

Filed June 16, 1976, Ser. No. 696,575

Int. Cl.² C23F *7/26*

U.S. Cl. 148—6.2 **1 Claim**

1. A method for imparting corrosion-resistant, tightly adherent, gold-colored, esthetically-appearing, chemically-bonded coatings to aluminum and its alloys, wherein aluminum is the principal constituent, by immersion of the metal substrate for 5 to 10 minutes at 65° to 85° F. in aqueous compositions consisting of: from 0.075 to 0.125 gm. of sodium nitroferricyanide dihydrate; a hexavalent chromium compound selected from the group consisting of from 0.75 to 1.25 gm. sodium dichromate dihydrate, 0.75 to 1.25 gm. anhydrous potassium dichromate, and 0.50 to 0.83 gm. chromium trioxide; an inorganic fluoride compound selected from the group consisting of 0.075 to 0.125 gm. potassium fluoride dihydrate, and 0.03 to 0.06 gm. anhydrous sodium fluoride; and 100 ml. of water with the solution adjusted to a pH of 1.4±0.3 with nitric acid, as required.

4,036,668
BONDING FLUOROELASTOMERS TO METAL

William D. Brandon, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Continuation-in-part of Ser. No. 307,420, Nov. 17, 1972, abandoned. This application Mar. 17, 1975, Ser. No. 558,765

Int. Cl.² C23C *11/12;* B32B *25/04*

U.S. Cl. 148—6.35 **8 Claims**

1. A method of bonding fluoroelastomers directly to metal without the use of a bonding agent between the fluoroelastomers and the metal while simultaneously curing the fluoroelastomers comprising pretreating a metal member by roughening a bonding surface thereof and then oxidizing the roughened bonding surface under oxidation conditions so controlled as to form an adherent oxide thereon; pressing a fluoroelastomer compounded with a minor amount of CaO evenly dispersed therethroughout directly to the adhered oxide covered bonding surface of the pretreated metal member without the use of a bonding agent other than said adherent oxide between said fluoroelastomer and said bonding surface; curing the fluoroelastomer-CaO dispersion at an elevated temperature in direct pressed contact with the adherent oxide covered bonding surface of the metal member and simultaneously forming a bond with said adhered oxide covered surface; and postcuring the resultant product to strengthen the bond.

4,036,669
MECHANICAL PRECONDITIONING METHOD

Greville B. Brook, Bucks, England; Peter L. Brooks, Palo Alto, and Roger F. Iles, Foster City, both of Calif., assignors to Raychem Corporation, Menlo Park, Calif.

Filed Feb. 18, 1975, Ser. No. 550,555

Int. Cl.² C22F *1/08*

U.S. Cl. 148—11.5 C **16 Claims**

1. A method for expanding the hysteresis loop of an article comprised of a metallic composition capable of undergoing a reversible transformation between austenitic and martensitic states wherein the A_s of the composition is elevated above its normal A_s, said method comprising deforming the article from an original configuration into a second deformed configuration from which heat recovery towards said original configuration is desired, applying constraining means to said article and holding the article in said deformed configuration at a temperature above the temperature M_s at which formation of martensite in the metallic composition is induced thermally in the absence of applied stress for a time sufficient to cause at least a portion of the deformation to be retained as heat recoverable strain, the recovery of which towards the original configuration begins above the normal A_s of the metal composition, when the constraining means is removed and removing said constraining means.

4,036,670
TOOL STEEL

Maurice P. De Walt, New Kensington, Pa., assignor to Continental Copper & Steel Industries, Inc., New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,953

Int. Cl.² C21D *7/14, 9/22*

U.S. Cl. 148—12.1 **12 Claims**

1. Process of heating steel substantially protected against attendant decarburization during such heating which comprises preliminarily cleaning and roughening the steel workpiece exterior, applying an adherent removable protective surface coating of metal material onto the exterior of the steel workpiece to be heated, carrying out such heating of the thereby protected steel workpiece, said heating including at least one hot working step, and thereafter removing the resultant metal material coating.

4,036,671
FLUX FOR THE SUBMERGED ARC WELDING OF ORDINARY, SEMI-ALLOYED OR SPECIAL STEELS

Robert Jean De Haeck, St. Pieters-Kapelle, Belgium, assignor to La Soudure Electrique Autogene, Procedes Arcos, S.A., Brussels, Belgium

Filed Apr. 13, 1976, Ser. No. 676,473

Claims priority, application Belgium, Apr. 14, 1975, 155372

Int. Cl.² B23K *35/34*

U.S. Cl. 148—24 **8 Claims**

1. Powdered flux for submerged arc welding, with a high efficiency level, of ordinary, semi-alloyed, alloyed or special steels, comprising:

- A. about 40 to about 70% of (i) iron powder or (ii) one or more iron alloys or (iii) a mixture thereof, any alloying constituents comprising no greater than about 45% of ingredient (A);
- B. about 10 to about 30% of CaF_2;
- C. about 5 to about 15% CaO;
- D. about 5 to about 14% of SiO_2;
- E. about 0.2 to about 9% of Al_2O_3;
- F. about 3 to about 10% of ZrO_2;
- G. about 3 to about 12% of $MnOSiO_2$;
- H. about 2 to about 7% of FeMn;
- I. about 2 to about 7% of FeSi;
- J. about 0.1 to about 1.3% of $Fe_2O_3.FeO$; and
- K. 0 to about 0.3 wt. % of TiO_2; and wherein the ratio;

$$\frac{\%\ CaF_2 + \%\ CaO + \%\ MnOSiO_2}{\%\ SiO_2 + \%\ Al_2O_3 + \%\ Fe_2O_3\ FeO + \%\ TiO_2 + \%\ ZrO_2 + \%\ FeMn + \%\ FeSi} > 1.3.$$

4,036,672
METHOD OF MAKING A JUNCTION TYPE FIELD EFFECT TRANSISTOR

Sadao Kobayashi, Hachioji, Japan, assignor to Hitachi, Ltd., Japan

Filed May 5, 1976, Ser. No. 683,265

Claims priority, application Japan, May 14, 1975, 50-56109

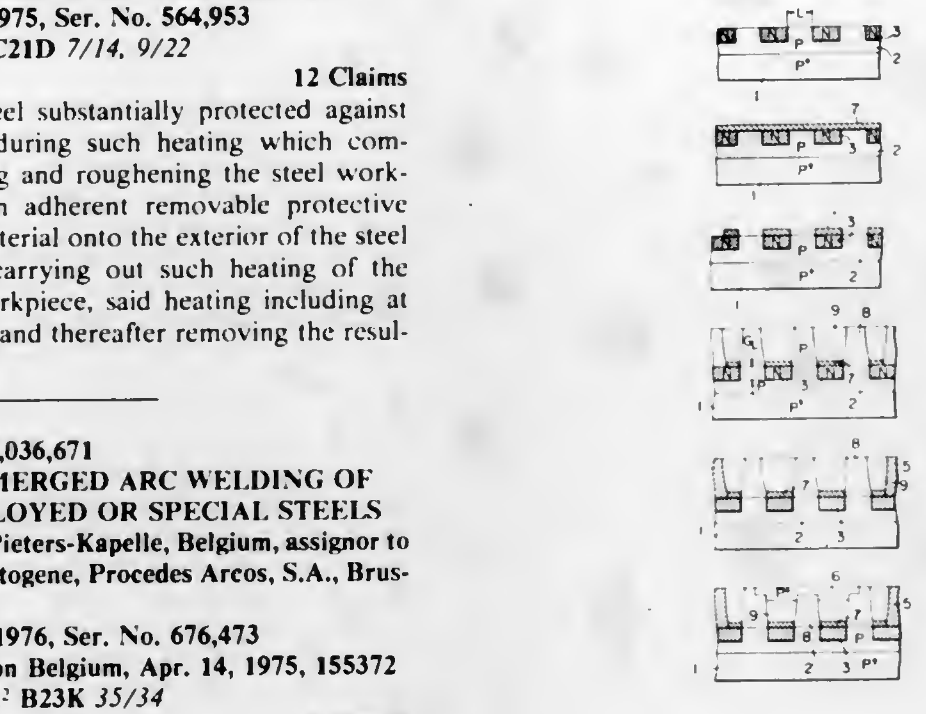
Int. Cl.² H01L *21/74, 29/80*

U.S. Cl. 148—175 **3 Claims**

2. A method of manufacturing a vertical structure junction type field effect transistor comprising the steps of:

- forming, in a semiconductor substrate of a first conductivity type forming a drain region, a gate region of a second conductivity type except the portion forming a channel portion;
- forming a film masking the upper surface of said gate region, said film exhibiting the property of preventing the migration of impurity ions of the second conductivity type;
- epitaxially growing a channel region of the first conductivity type on the upper side of said channel portion and simultaneously a polycrystalline silicon layer on said film; and

forming a source region in at least said epitaxial layer.



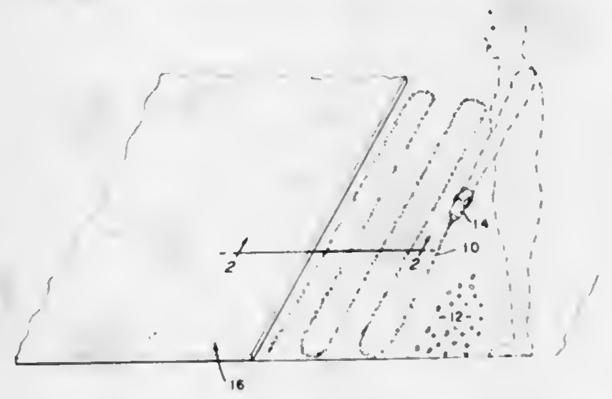
4,036,673
METHOD FOR INSTALLING SURFACE COVERING OR THE LIKE

Robert E. J. Murphy, Nutley; Laurence F. Haemer, Fairfield, and Edward C. Scholl, Tuckerton, all of N.J., assignors to Congoleum Corporation, Milwaukee, Wis.

Continuation of Ser. No. 429,187, Dec. 28, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 668,249

Int. Cl.² B32B *5/18*

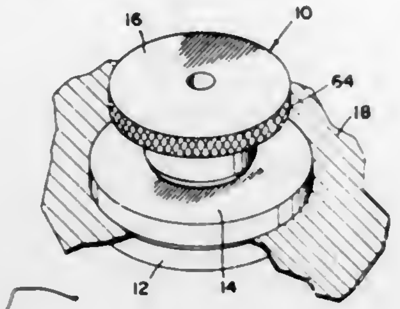
U.S. Cl. 156—71 **14 Claims**



1. A method for installing a sheet of surface covering material on a floor surface comprising:

- a. depositing a bead of a foamed latex-based adhesive to a portion of said floor surface,
- b. laying said sheet on said foamed adhesive while said adhesive is wet,
- c. applying pressure to said sheet for substantially completely collapsing the foam and spreading said adhesive to cover substantially the entire area of contact of said surface covering and said floor surface and thereby causing said adhesive to conform to any irregularities of said floor surface, and allowing said adhesive to dry, thereby uniformly bonding said sheet to said floor surface.

4,036,674
FABRIC REPAIR TOOL
James W. Labenz, 4426 Sheffield Ave., Philadelphia, Pa. 19136
Filed Dec. 31, 1975, Ser. No. 645,646
Int. Cl.² B32B *35/00*
U.S. Cl. 156—98 **23 Claims**

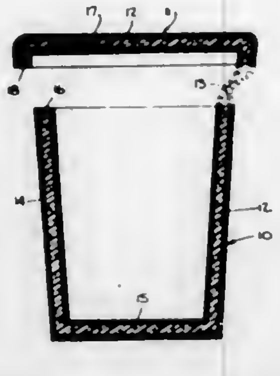


1. A fabric repair tool comprising
- a. a base plate;
- b. fabric holding means extending from the base plate to engage the fabric;
- c. hold down ring means overlying the fabric holding means to sandwich the fabric therebetween,
  - 1. said hold down ring means defining an opening;
- d. turning knob means insertable into the opening,
  - 1. said turning knob means comprising a cutter, the cutter cutting through a part of the fabric to remove a damaged area and to form a hole in the fabric when the turning knob means is inserted into the opening and
  - 2. a portion of said fabric holding means being adapted to engage the damaged area during the cutting.

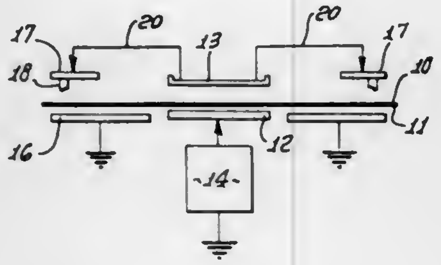
18. The method of repairing a damaged fabric comprising the steps of
- holding the fabric at the damaged area by engaging the fabric between a base plate and a holding ring;
- cutting a hole of predetermined shape in the fabric to remove the damaged area without applying another substance;
- removing the fabric from contact with the base plate and holding ring;
- cutting an identical shaped patch in the fabric without applying a layer of another substance;
- applying the patch within the hole and aligning the fabric weave;
- affixing the patch in position to remain within the cut hole by laminating material layer to the patch and a portion of the fabric and providing pins in the base plate and holding the fabric by inserting the pins through the fabric near the damaged area while cutting the hole.

4,036,675
FILM-LINED FOAM PLASTIC RECEPTACLES AND LAMINATED MATERIALS AND METHODS FOR MAKING THE SAME
Stephen W. Amberg, Toledo, Ohio, and Frank S. Landers, Chicago, Ill., assignors to Owens-Illinois, Inc., Toledo, Ohio
Division of Ser. No. 482,321, June 24, 1974, Pat. No. 4,008,347. This application Apr. 2, 1976, Ser. No. 673,155
Int. Cl.² B29C *3/00*
U.S. Cl. 156—245 **22 Claims**

1. A method of laminating a polyolefin plastic film to a surface of a foamed plastic material comprising the steps of applying an initially wet coating of a heat-sensitive plastic resin adhesive on a surface of substantially unoriented polyolefin film and drying said coating, and thereafter heating said dried adhesive to a temperature above its softening point but below the softening points of said film and said foamed plastic material while holding said coated film surface and said foamed plastic material surface against each other, and thereafter cooling the laminated material to a temperature below said softening point of the adhesive.



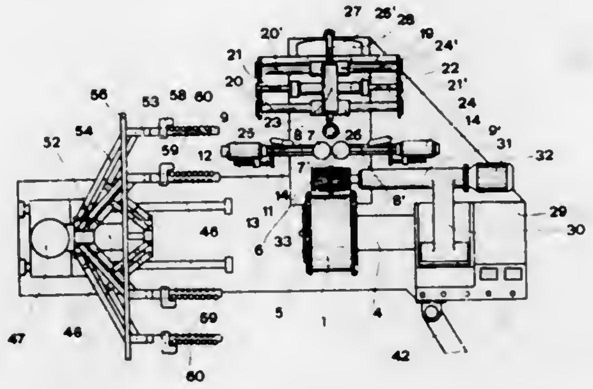
4,036,676
HEAT SEALING OF PLASTIC SHEETS
William Pennington, 30200 Oceanaire Drive, Palos Verdes Peninsula, Calif. 90274
Continuation of Ser. No. 565,234, April 14, 1975, abandoned, which is a division of Ser. No. 422,574, Dec. 6, 1973, Pat. No. 3,876,486. This application Aug. 23, 1976, Ser. No. 716,983
Int. Cl.² B29C *27/04;* H05B *9/04*
U.S. Cl. 156—273 **3 Claims**



1. The method of heat bonding plastic sheets that includes
- a. providing first and second pairs of relatively movable plates, providing flexible connections between the second of the first pair of plates to the second of the second pair of plates, placing the sheets between said plates of each pair, effecting relative closing movement of the plates of each pair and transmitting high frequency electrical energy from the first to the second of said first pair of plates in one direction through a first portion of said sheets of sufficient area as to preclude heat bonding of the sheets at said first portion thereof,
- b. transmitting said energy from the second of said first pair of plates through said flexible connections to the second of said second pair of plates, and
- c. transmitting said energy between said second pair of plates and back through a second and elongated portion of the sheets spaced from said first portion of the sheets and of sufficiently reduced area as to effect heating bonding of the sheets at said second portion.

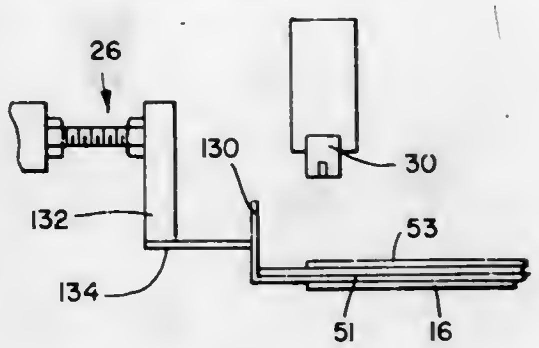
4,036,677
MACHINE FOR TREATING WORN OUT PNEUMATIC TIRES AND FOR APPLYING A PRE-MOLDED TREAD RING
Carlo Marangoni, Via Bellavista 22, Rovereto, Trento, Italy
Filed May 13, 1975, Ser. No. 577,111
Claims priority, application Italy, May 14, 1974, 22672/74
Int. Cl.² B29H *17/37, 17/38, 21/01, 21/08*
U.S. Cl. 156—394 **1 Claim**

1. A machine for retreading worn-out pneumatic tires comprising, in combination, a support; a chuck mounted on said support for rotation about an axis and operative for supporting a tire to be retreaded thereon; means for inflating the tire on said chuck; means for selectively rotating the tire on said chuck about said axis; means for peeling the worn-out tread from the tire to obtain a tire carcass, including a cutting element mounted on said support for displacement toward and away from the tire in a path along a plane normal to said axis; means for preparing the peeled outer peripheral surface of the carcass for application of a new annular tread thereto, including at least one brush mounted on said support across said chuck from said peeling means for displacement toward and away from the carcass substantially along said plane; means for expanding the new annular tread and for positioning the same on the prepared outer periphal surface of the carcass, including a plurality of expanding arms, means for mounting said expanding arms on said support axially of said chuck for simultaneous movement parallel to and radially of said axis, including rails located at one side of said plane and extending parallel to said axis, a carriage movable over said rails toward and away from said chuck, a cylindrical body mounted on said carriage and having a central axis coinciding with said axis, a sleeve mounted on said cylindrical body for axial displacement relative thereto, and first links articulated to said sleeve and to said expanding arms and forming a parallelogram linkage therewith, and means for sequentially moving said expanding arms relative to said support between a retraced position in which said expanding arms are located axially adjacent said chuck and axially spaced therefrom and at a radial distance from one another at which the new annlar tread can be placed onto said expanding arms in unstressed condition, a fully expanded position in which the new annular tread is fully expanded and positioned over the outer peripheral surface of the carcass with spacing therefrom, and a partially expanded position in which the inner surface of the new annular tread contacts the outer peripheral surface of the carcass between said expanding arms and adheres thereto, the adhesion of the surfaces permitting the return of said expanding arms toward said retracted position without entrainment of the new annular tread, including a cylinder-and-piston unit accommodated in said cylindrical body and having a shank extending axially outwardly of the latter, a disc-shaped body connected to the shank, and second links pivoted on said disc-shaped body and on said first links, and means for pressing the new annular tread against the outer peripheral surface of the carcass, including at least one pressing roller mounted on said support at said peeling means for displacement between a retracted position outside said path and an extended position in which said pressing roller contacts the outer surface of the new annular tread and presses the same against the carcass.



4,036,678
LAP SEAM FOLDER AND WIDE WIDTH SEALER
Everette M. Lambert, 3380 Edward Ave., Santa Clara, Calif. 95050
Filed Apr. 21, 1975, Ser. No. 570,308
Int. Cl.² B65C *1/00*
U.S. Cl. 156—461 **10 Claims**

1. Apparatus for heat sealing first and second elongate pieces of material together, said apparatus comprising:
- a working bed;
- means for dispensing the first and second elongate pieces of material onto the working bed so that the second piece overlies the first piece with a marginal portion of the first piece being exposed;
- means for folding the exposed marginal portion of said first piece of material over a corresponding marginal portion of said second piece of material;
- means for heat sealing said material portions of the first and second pieces of material together; and
- means for accumulating the heat sealed material, including means for transferring the accumulated heat sealed material to the dispensing means for dispensing said heat sealed material onto the working bed with the latter said means for joining said heat sealed material to another piece of elongate material so that an article can be formed having relatively large transverse dimensions from a plurality of such elongate pieces of material.



4,036,679
PROCESS FOR PRODUCING CONVOLUTED, FIBERIZED, CELLULOSE FIBERS AND SHEET PRODUCTS THEREFROM
Sangho E. Back, and Imants Reba, both of Vancouver, Wash., assignors to Crown Zellerbach Corporation, San Francisco, Calif.
Filed Dec. 29, 1975, Ser. No. 644,472
Int. Cl.² D21C *9/00*
U.S. Cl. 162—9 **22 Claims**

1. A process for producing convoluted, fiberized cellulose fibers which are twisted and bent in a substantially lasting manner, without appreciable reduction of fiber length or freeness, comprising subjecting low moisture content cellulose pulp at a consistency of from about 70%, up to about 90% by weight, based on the dry basis weight of the pulp, said consistency being sufficient to preclude substantial fibrillation and the attendant strength and bonding development, while at the same time preventing fiber damage and scorching, to mechanical treatment which gives rise to structural deformation of the fibers causing them to become convoluted and at the same time fiberizing and fluffing the pulp, the mechanical treatment including continuously feeding the pulp at a relatively high throug-put rate into and through a work space formed between opposed, spaced apart working elements to a point of discharge from the work space, the elements including opposed surfaces capable of engaging the pulp, the feeding step being conducted at a rate correlated with the rate of relative movement of the working elements and the spacing between the working surfaces so as to maintain the work space filled with a mass of fibers under sufficient compression so that the pulp is engaged by the working surfaces and contortive forces are imparted to the fibers which are effective to produce convoluted, fiberized fibers which are substantially nonfibrillated.

4,036,680

DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL WITH A SODA PULPING LIQUOR CONTAINING A DIELS ALDER ADDUCT OF BENZOQUINONE OR NAPHTHOQUINONE IN ADMIXTURE WITH A NITRO AROMATIC COMPOUND

Harry Hutchinson Holton, Beloeil, and Gordon Hart Segall, Mont St.Hilaire, both of Canada, assignors to Canadian Industries, Ltd., Montreal, Canada

Filed Dec. 14, 1976, Ser. No. 750,442

Int. Cl.^{2} D21C *3/20, 9/10*

U.S. Cl. 162—65 **8 Claims**

1. A process for the delignification of lignocellulosic material comprising the steps of:

1. treating the lignocellulosic material in a closed reation vessel with a soda pulping liquor containing from 0.001 to 10.0% by weight, based on the lignocellulosic material, of a diketo hydroanthracene selected from the group consisting of the unsubstituted and lower alkyl-substituted Diels Alder adducts of naphthoquinone and benzoqunione, and from 0.01 to 10.0% by weight, based on lignocellulosic material, of a nitro aromatic compound selected from the group consisting of mono- and di-nitrobenzenes and the amino, carboxy, hydroxy and methyl derivatives of said nitrobenzenes, the treatment taking place at a temperature in the range of 150° to 200° C. for a period of 0.5 to 480 minutes, and
2. displacing the pulping liquor from the lignocellulosic material with water or an aqueous liquor inert to the lignocellulosic material to obtain delignified lignocellulosic material.

4,036,681

DELIGNIFICATION OF LIGNOCELLULOSIC MATERIAL WITH AN ALKALINE PULPING LIQUOR CONTAINING A DIELS ALDER ADDUCT OF BENZOQUINONE OR NAPHTHOQUINONE

Harry Hutchinson Holton, Beloeil, Canada, assignor to Canadian Industries, Ltd., Montreal, Canada

Filed Dec. 14, 1976, Ser. No. 750,448

Int. Cl.^{2} D21C *3/20, 9/10*

U.S. Cl. 162—65 **10 Claims**

1. A process for the delignification of lignocellulosic material comprising the steps of

2. treating the lignocellulosic material in a closed reaction vessel with an alkaline pulping liquor containing from 0.001 to 10.0% by weight, based on the lignocellulosic material, or a diketo hydroanthracene selected from the group consisting of the unsubstituted and lower alkyl substituted Diels Alder adducts of naphthoquinone and benzoquinone, the treatment taking place at a temperature in the range of from 150° to 200° C. for a period of 0.5 to 480 minutes, and
2. displacing the pulping liquor from the lignocellulosic material with water or an aqueous liquor inert to the lignocellulosic material to obtain a delignified lignocellulosic material.

4,036,682

PAPER WITH SYNERGISTIC DRY STRENGTH ADDITIVES AND PROCESS THEREFOR

Lock-Lim Chan, Whitby, and Arthur Herbert Guitard, Pickering, both of Canada, assignors to Borden, Inc., Columbus, Ohio

Filed June 25, 1975, Ser. No. 590,314

The portion of the term of this patent subsequent to Feb. 8, 1994, has been disclaimed.

Int. Cl.^{2} D21D *3/00*

U.S. Cl. 162—167 **18 Claims**

1. The process for the manufacture of paper of improved dry strength and negligible wet strength comprising forming an aqueous suspension of fibrous cellulosic material containing a cationic polymer prepared in an aqueous medium having pH of about 8 to 10 and an anionic polymer in the respective weight ratio of from 99:1 to 50:50 which is sufficient to impart synergistic dry strength to the paper, sheeting the cellulosic material to form a web and drying the web; the cationic polymer being a reaction product of a ketone, an aldehyde and a polyamine, the mol ratio of reactants being from 1.8 to 4 mols of the aldehyde and from 0.1 to 1 mol of the polyamine per mol of the ketone; the anionic polymer is selected from the group consisting of (a) polymers of acrylamide and maleic acid or derivatives thereof in respective mol ratio of from 90:10 to 98:2, (b) polymers of acrylamide or methacrylamide with acrylic or methacrylic acid in respective mol ratio of from 90:10 to 98:2, and (c) mixtures of the two polymers.

4,036,683

WEB PRESS FOR A PAPER MACHINE

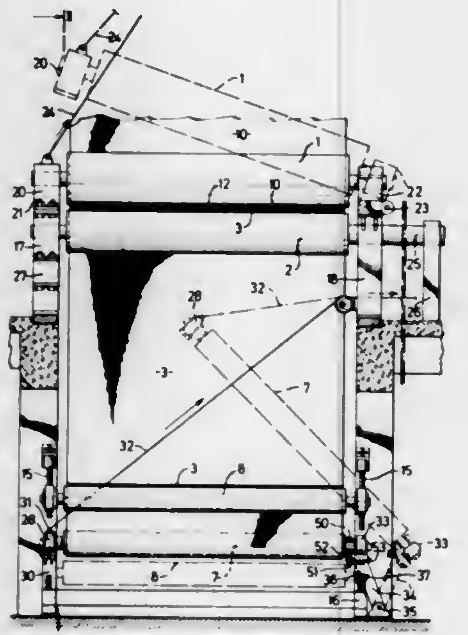
Mario Biondetti, Schio, Italy, assignor to Escher Wyss G.m.b.H., Ravensburg, Germany

Filed Aug. 26, 1976, Ser. No. 718,084

Claims priority, application Switzerland, Aug. 28, 1975, 11140/75

Int. Cl.^{2} D21F *3/02*

U.S. Cl. 162—274 **3 Claims**



1. A web press for a paper machine comprising
a plurality of press rolls for pressing of an endless press felt thereagainst;
a plurality of guide rolls disposed below said press rolls to guide the felt in a downwardly directed loop, at least one of said guide rolls being located in the bottom region of the loop and being pivotally mounted about an axis adjacent one end thereof to pivot upwardly from an operative position;
a first bearing journalled on an end of said one guide roll opposite said one end;
a second bearing journalled on said one end;
means for releaseably mounting said first bearing with said one guide roll in said operative position;
a support mounting said second bearing thereon, said support being pivotal about said axis with said axis being horizontally disposed transverse to said one guide roll below said second bearing; and
an abutment for supporting said support beneath said second bearing.

4,036,684

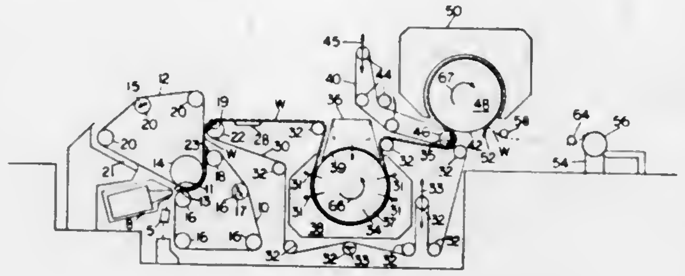
HIGH BULK TISSUE FORMING AND DRYING APPARATUS

Arnold J. Schmitt, and Merle G. Linkletter, both of Beloit, Wis., assignors to Beloit Corporation, Beloit, Wis.

Filed Aug. 4, 1975, Ser. No. 601,521

Int. Cl.^{2} D21F *5/04, 5/18*

U.S. Cl. 162—290 **4 Claims**



1. In a papermaking machine for the manufacture of high bulk tissue web, having at least one forming wire, and web drying means comprising transpiration drying means which includes means supplying heated air and a foraminous surface through which the air is directed, the combination comprising:
a looped first fabric exposed in web receiving contact with the forming wire and arrayed (a) to carry the freshly formed web on the upper surface of the first fabric directly onto the foraminous surface of the transpiration drying means;
(b) to hold the web directly exposed to the foraminous surface so that the means supplying heated air passes it successively through the foraminous surface, the web, and the first fabric as the web is dried thereby; and (c) to carry the web from the transpiration drying means; and
means for removing the web under positive control from the first fabric so that the web is carried during its entire passage from reception off the forming wire through the transpiration drying means and supported over, and in direct exposure with, the foraminous surface of the transpiration drying means.

4,036,685

METHOD AND APPARATUS FOR DETECTING THE LEAK OF COOLANT INTO THE JACKET OF A NUCLEAR REACTOR FUEL ROD

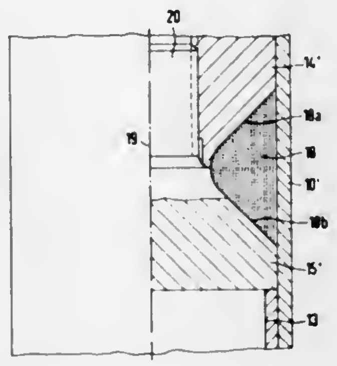
Helmut Betzmeir, Langensendelbach, and Hans Lettau, Baiersdorf, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed July 27, 1972, Ser. No. 275,551

Claims priority, application Germany, July 28, 1971, 2137641

Int. Cl.^{2} G21C *3/16*

U.S. Cl. 176—19 LD **3 Claims**



1. For use in a nuclear reactor incorporating water as the coolant thereof, a nuclear fuel rod including a nuclear fuel element and a jacket enclosing said element wherein the improvement comprises a coolant absorbing means mounted within said jacket for indicating the entry of coolant into said jacket; and means for mounting said absorbing means in an abutting relationship with respect to the inner wall of said jacket, at a predetermined location adjacent one end thereof; the combination being so constructed and arranged that upon entry of coolant into said jacket, said absorbing means expands radially of said jacket in response thereto to deform said jacket in a radial direction thereby indicating the presence of coolant therewithin, and wherein said absorbing means is made of a sintered material selected from the group consisting of magnesium oxide and a mixture of magnesium oxide and aluminum oxide, said absorbing means having a substantially cylindrical shape, with the side wall thereof abutting the inner wall of said jacket, for deriving pressure forces substantially directed radially against said jacket when absorption of coolant causes the expansion of said absorbing means, and wherein said absorbing means is ring-shaped.

4,036,686

APPARATUS FOR EXAMINING THE FUEL RODS OF A NUCLEAR REACTOR

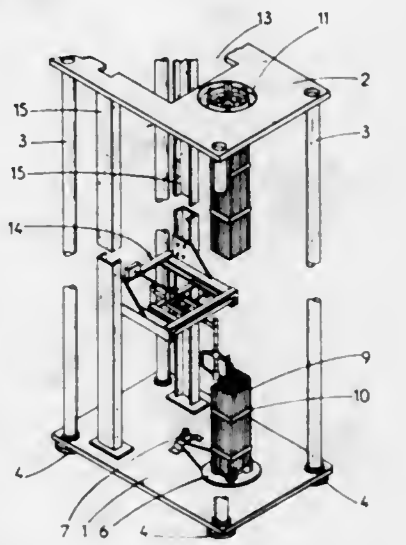
Jean-Claude Weilbacher, L'Isle Adam; and Guy Bodson, Neuilly-sur-Seine, both of France, assignors to Societe Franco-Americaine de Constructions Atomiques-Framatome, Courbenvie; Bodson S. A., Nanterre, both of France

Filed Jan. 7, 1976, Ser. No. 647,167

Claims priority, application France, Jan. 22, 1975, 75.01924

Int. Cl.^{2} G21C *17/08*

U.S. Cl. 176—19 R **7 Claims**



1. In an installation for use in examining the fuel rods in an assembly of fuel rods the improvement comprising:
a. an examination station adapted to be submerged including a lower plate and an upper plate fixedly spaced from said lower plate and further comprising:
a rotatable receptacle mounted on said lower plate for receiving a vertical assembly of rods to be examined, said rotatable receptacle being positionable in at least one of four orientations;

three movable carriages and respective means for moving said carriages, a first one of said carriages being movable on slides parallel to the rods of an assembly resting on the receptacle, a second one of said carriages being movable on horizontal slides carried by said first carriage, and a third one of said carriages being movable horizontally in a direction perpendicular to the direction of movement of said second carriage; and
an apparatus for examining fuel rods and for permitting the visual examination of the rods of a fuel assembly immersed in the tank of a nuclear reactor or in a deactivation tank, the apparatus comprising an endoscope having a first tube of relatively large diameter, said endoscope being provided with a prism and an optical system of stabilized glass, and at least one arm supporting at least one mirror facing the prism and inclined relative to the plane defined by the axes of the tube of said endoscope and of said arm, the thickness of the arm-mirror assembly being less than

the free space between the rods in the assembly to be examined, a support attached to said first tube, and a television camera attached to said support for recording images reflected by said optical system, said prism, and said mirror;

b. a service station adapted to be situated on an external platform and comprising:

a remote-control assembly for controlling movement of said three carriages and rotation of said receptacle; and

an observation station for observing images transmitted by said endoscope, the recorded images from said television camera being transmitted to said observation station.

4,036,687
NUCLEAR REACTORS

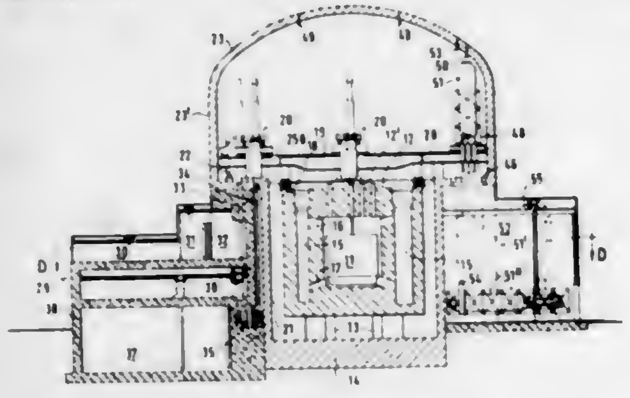
Allan Robert Rickard, Lutterworth, and Brian Victor George, Willoughby Waterleys, both of England, assignors to Nuclear Power Company Limited, London, England

Filed May 7, 1975, Ser. No. 575,342

Claims priority, application United Kingdom, May 10, 1974, 20907/74

Int. Cl.^{2} G21C *19/20*

U.S. Cl. 176—37 **6 Claims**



1. A nuclear reactor installation comprising a fluid-cooled nuclear heat source, a primary pressure vessel containing the heat source, a secondary pressure containment vessel enclosing the primary pressure vessel and providing external-missile protection therefor, and a plurality of auxiliary-facility stations disposed outside the secondary pressure containment vessel, wherein the secondary pressure containment vessel comprises a lower wall portion surrounding the primary pressure vessel, an annular wall portion integral with the lower wall portion and extending outwardly therefrom, and an upper wall portion integral with the annular wall portion and extending over the annular wall portion and over the primary pressure vessel, the annalar wall portion and the primary pressure vessel being formed with openable sealed vertical penetrations communicating with the respective auxiliary-facility stations and with the primary pressure-vessel interior respectively and handling means being provided, within the secondary pressure containment vessel and above the said annular wall portion and the primary pressure vessel, for lifting reactor components vertically through such penetrations and transporting them over the said annular wall portion and the primary pressure vessel

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4,036,688
APPARATUS FOR CONTROLLING MOLTEN CORE DEBRIS

Martin P. Golden, Trafford; Roger W. Tilbrook, Monroeville, and Neal F. Heylmun, Pittsburgh, all of Pa., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

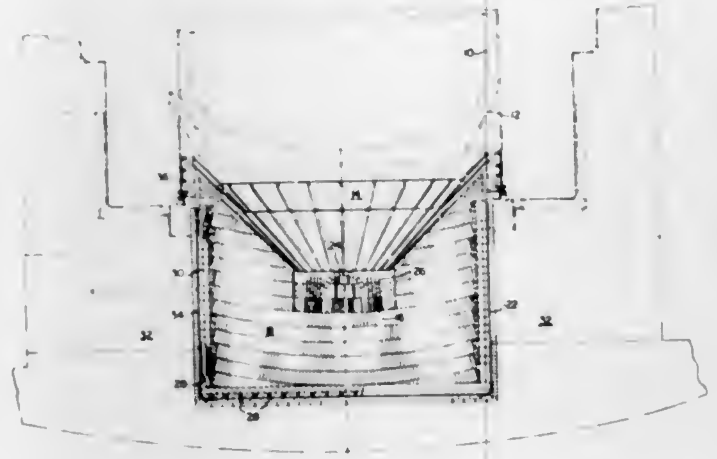
Filed Apr. 9, 1975, Ser. No. 566,489

Int. Cl.^{2} G21C *9/00*

U.S. Cl. 176—38 **9 Claims**

1. Apparatus for controlling molten debris from meltdown of a nuclear reactor core, said core being contained in a reactor vessel and including nuclear fuel, said vessel also containing a circulating liquid coolant, wherein said debris melts through the bottom of said reactor vessel causing said debris and said coolant to fall, said apparatus disposed below said vessel and comprising:

- a. at least one debris receptacle comprising:
  - i. at least one generally spherical upwardly convex dome comprised of dome blocks which blocks are comprised of a high melting point material and at least some of which blocks have neutron poison rods therein;



  - ii. a plurality of bricks positioned radially about said dome comprised of a high melting point material, at least some of said bricks having neutron poison rods therein which extend above said bricks; and
  - iii. a layer of pellets positioned above said bricks and about at least a portion of the rods of said bricks, said pellets comprised of a material having a density at least equivalent to that of said molten fuel and being miscible with said molten fuel; and
- b. means disposed below and radially about said bricks and pellets for supporting and controlling said dome, bricks and pellets.

4,036,689
MULTICHAMBER HYDROGEN GENERATING PLANT HEATED BY NUCLEAR REACTOR COOLING GAS

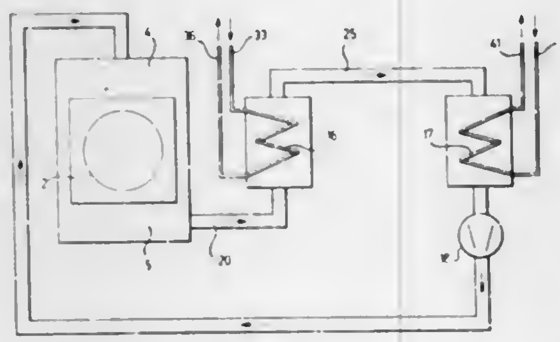
Heinrich Baumgaértner, Ketsch, Germany, assignor to Hochtemperatur-Reactorbau GmbH, Cologne, Germany

Filed Nov. 21, 1975, Ser. No. 634,053

Claims priority, application Germany, Nov. 23, 1974, 2455507

Int. Cl.^{2} G21D *9/00*

U.S. Cl. 176—39 **15 Claims**



1. A plant for the production and utilization of heat energy derived from a gas-cooled, high-temperature nuclear reactor, comprising:

- a. a thick-walled vessel;
- b. a high temperature reactor contained in a centrally oriented cavity within said vessel;
- c. a plurality of secondary reactors comprising cracking ovens for the production of hydrogen in first pods within the wall of said vessel;
- d. a number of steam generators corresponding to the number of said secondary reactors, said generators being contained in second pods within the wall of said vessel;

- e. a number of blowers corresponding to the number of said steam generators each of said blowers being contained in one of said second pods and being positioned beneath one of said steam generators;
- f. conduit means for transporting hot cooling gas from said nuclear reactor to said secondary reactors and from said secondary reactors to said blowers; and
- g. conduit means for transporting cooling gas of lower temperature from each of said blowers to said nuclear reactor comprising annular spaces surrounding said nuclear reactor, said secondary reactors, said blowers and said hot gas conduit means.

4,036,690
NUCLEAR REACTOR FUEL ELEMENT ASSEMBLIES

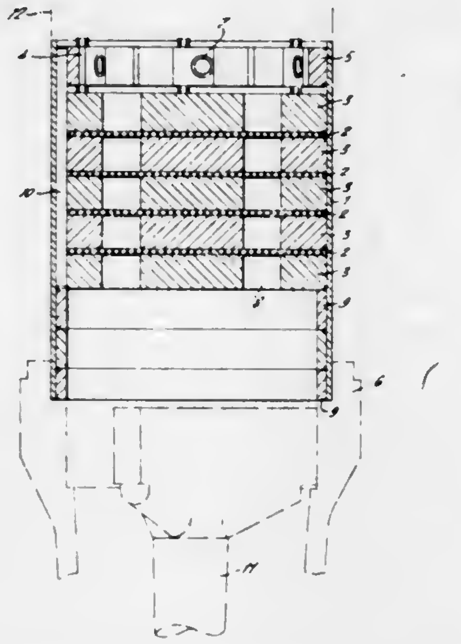
Colin Betts, Hale Altrincham; Alfred Edward Collinson, Padgate Warrington, and David Frederick Hart, Stretton Warrington, all of England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Dec. 8, 1975, Ser. No. 638,669

Claims priority, application United Kingdom, Dec. 31, 1974, 56230/74

Int. Cl.^{2} G21C *15/04*

U.S. Cl. 176—40 **3 Claims**



1. A nuclear reactor fuel element assembly having an axial flow cavitation suppressing impedance comprising a tubular body member and a series of flow defining plates arranged transversely to the longitudinal axis of the body member and clamped into face-to-face abutment, the series being formed from a first and a second set of plates arranged so that a plate of one set alternates, as viewed in the direction of flow, with a plate of the other set, the plates of the first set being of woven wire mesh and the plates of the second set having cylindrical apertures to provide downstream spaces between plates of the first set for defining a flow which is cavitation suppressed by virtue of eddy induced pressure drops developed in the downstream spaces, corresponding apertures in successive plates being aligned to provide continuous flow paths through the series of plates.

4,036,691
NUCLEAR FUEL ELEMENT

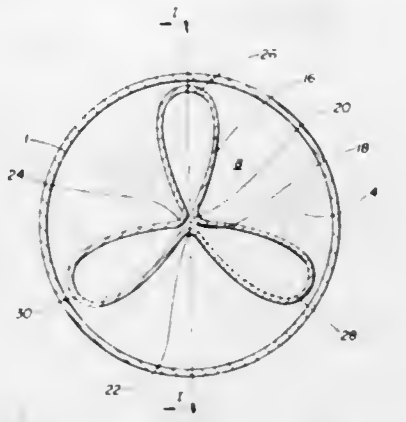
Ronald Ross Meadowcroft, and Alastair Stewart Bain, both of Deep River, Canada, assignors to Atomic Energy of Canada Limited, Ottawa, Canada

Filed Mar. 1, 1976, Ser. No. 662,857

Claims priority, application Canada, Dec. 3, 1975, 240961/75

Int. Cl.^{2} G21C *3/04*

U.S. Cl. 176—68 **1 Claim**



1. A nuclear fuel element, comprising:

- a. a tubular cladding of a material selected from the group consisting of zirconium and zirconium alloys,
- b. end closures sealing the ends of the tubular cladding, the end closures being of a material selected from the group consisting of zirconium and zirconium alloys,
- c. a plurality of cylindrical, nuclear fuel pellets in the tubular cladding and extending therealong, in end-to-end relation, to a fission gas plenum chamber in the tubular cladding and adjacent an end closure, the fuel pellets loosely fitting in the tubular cladding in a radial direction,
- d. a heat resistant disc separating the cylindrical, nuclear fuel pellets from the plenum chamber and loosely fitting in the tubular cladding in a radial direction, and
- e. a spacer in the plenum chamber and supporting the disc from falling into the plenum chamber, the spacer being of the shape of a tube, which has been deformed inwardly towards a radially central portion of the tubular cladding at a plurality of circumferentially spaced positions to provide a plurality of circumferentially spaced looped portions looping substantially radially outwardly from the radially central portion of the tubular cladding to positions adjacent the tubular cladding, the looped portions being substantially orthogonal to the tubular cladding, and the spacer being of a material selected from the group consisting of zirconium and zirconium alloys.

4,036,692
NUCLEAR FUEL ELEMENT NUT RETAINER CUP

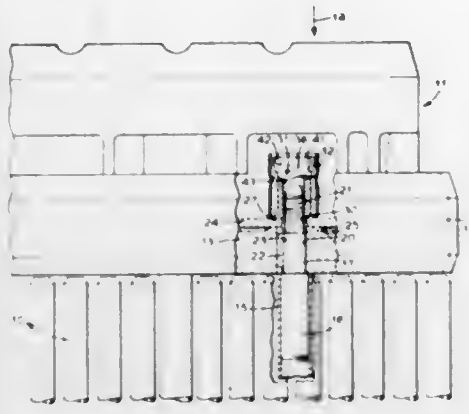
Lewis Anthony Walton, Lynchburg, Va., assignor to The Babcock & Wilcox Company, New York, N.Y.

Filed Aug. 1, 1975, Ser. No. 601,000

Int. Cl.^{2} G21C *3/30;* F16B *43/00*

U.S. Cl. 176—76 **1 Claim**

1. A nut plate for a nuclear reactor fuel element in which the fuel element has an array of end portions for engaging the nut plate comprising a plurality of linking members joined together to form a lattice of said linking members, nodes formed by said linking members where said linking members are joined together, at least some of said nodes having apertures formed therein, each of said apertures being positioned relative to the other of said nodes in a disposition that matches the fuel element end portion array, a plurality of hollow locking cups, each individual one of said cups being secured to said network of linking members at a respective one of said apertured nodes and in general alignment with said respective node aperture, a plurality of nuts, each individual one of said nuts being received within a respective one of said locking cups, for engagement between said individual nuts and at least some of the respective fuel element end portions and a flange formed on said nut, and an ear formed on said locking cup protruding toward said nut and spaced from said nut flange to selectively engage said flange whereby said ear and flange combination permits said nuts to be fully disengaged from the fuel element end portions but prevents said nuts from being fully withdrawn from said respective cups.



4,036,693

TREATMENT OF CELL CULTURE MICROCARRIES

David W. Levine, Somerville; William G. Thilly, Cambridge, and Daniel I. C. Wang, Belmont, all of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Feb. 2, 1976, Ser. No. 654,134

Int. Cl.² C12B *3/00*

U.S. Cl. 195—1.8 **14 Claims**

1. In the method of growing anchorage-dependent cells in a suspension of positively charged microcarriers in culture medium:

the improvement comprising treating said microcarriers by contacting them with a nontoxic macromolecular polyanion.

4,036,694

PROCESS FOR BEET SUGAR PRODUCTION

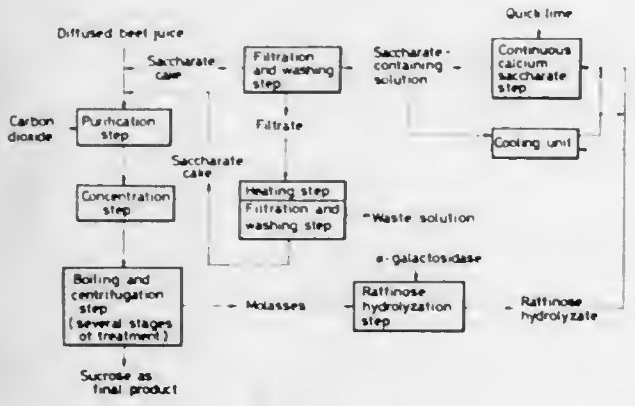
Shinichi Meguro, Tokyo; Shinsaku Imafuku; Kazuo Kawamura, both of Kitami; Shigeki Hashimoto, Tokyo, and Shigeyoshi Narita, Kitami, all of Japan, assignors to Hokkaido Sugar Co., Ltd., Tokyo, Japan

Filed Sept. 23, 1975, Ser. No. 616,133

Claims priority, application Japan, Sept. 28, 1974, 49-110991

Int. Cl.² C12B *1/00;* C13J *1/04*

U.S. Cl. 195—11 **6 Claims**



1. In a process for manufacturing beet sugar comprising purifying diffused beet juice, concentrating the purified beet juice, recovering sucrose from the concentrated beet juice in a boiling and centrifugal separation step, adding quicklime to the molasses remaining after the centrifugal separation of sucrose from the massecuite to produce calcium saccharate and returning the resultant saccharate cake to the diffused beet juice-purifying step, the improvement which comprises

- a. adding α-galactosidase to the molasses remaining after the centrifugal separation of sucrose thereby hydrolyzing the raffinose present in the molasses into sucrose and galactose before said quicklime addition;
- b. continuously adding quicklime to the resultant raffinose hydrolyzate to produce calcium saccharate;
- c. continuously withdrawing from the calcium saccharate-forming step substantially the same amount of the saccharate-containing solution as the amount of raffinose hydrolyzate being fed into the calcium saccharate-forming step and forwarding the saccharate cake obtained by filtering and washing said saccharate-containing solution to the diffused beet juice-purifying step; and
- d. at the same time, continuously withdrawing from the calcium saccharate-forming step a second volume of the saccharate-containing solution which is three to ten times the volume of the raffinose hydrolyzate being fed into the calcium saccharate-forming step, cooling said second withdrawn solution and returning the cooled solution to the calcium saccharate-forming step.

4,036,695

PROCESS FOR THE PREPARATION OF ESTRENE-3,17-DIONE DERIVATIVES

Karl Petzoldt, and Rudolf Wiechert, both of Darmstadt, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

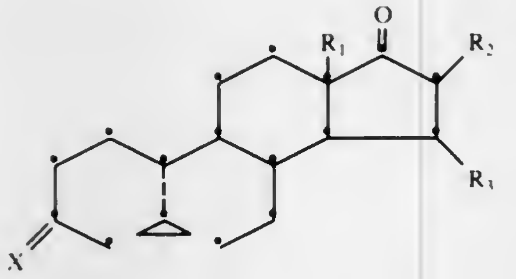
Filed Nov. 19, 1975, Ser. No. 633,415

Claims priority, application Germany, Nov. 23, 1974, 2456068

Int. Cl.² C07B *29/02*

U.S. Cl. 195—51 B **11 Claims**

1. A process for the preparation of estrene-**3,17-dione** compounds of Formula I



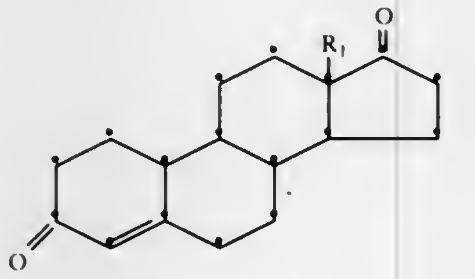
wherein X is keto or ketalized keto;

Δ is a carbon atom linked to the adjacent carbon atoms by a double bond and two single bonds;

R_1 is methyl or ethyl; and

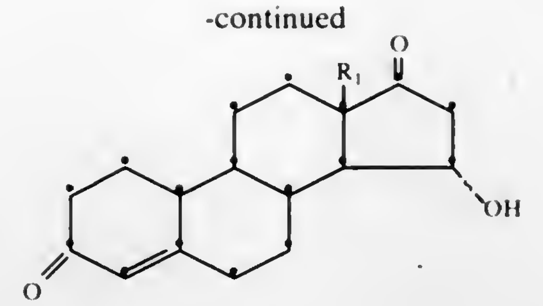
R_2 and R_3 collectively are a carbon-to-carbon bond or methylene which comprises

- a. fermenting an **18-alkyl-4-estrene-3,17-dione** of the formula



wherein R_1 is as above with a fungal culture of the genus Penicillium or Fusarium to produce a **15α**-hydroxy steroid of the formula

-continued



wherein R_1 is as above;

- b. in either order, ketalizing the **3-keto** group of the thus-produced **15α**-hydroxy steroid and forming a sulfonic acid ester of the α-hydroxy group thereof; and
- c. either treating the ketalized and esterified compound (i) with a base to produce a Δ^{15} steroid of Formula I wherein R_2 and R_3 collectively are a carbon-to-carbon bond or (ii) with dimethylsulfoxonium methylide to form a **15β,16β**-methylene steroid of Formula I wherein R_2 and R_3 collectively are methylene.

4,036,696

PREPARATION OF ANTIBIOTICS BY FERMENTATION

Edward O. Stapley, Metuchen, N.J., and Justo M. Mata, Madrid, Spain, assignors to Merck & Co., Inc., Rahway, N.J.

Continuation of Ser. No. 541,039, Jan. 14, 1975, abandoned, which is a continuation of Ser. No. 463,948, April 25, 1974, abandoned, which is a division of Ser. No. 331,417, Feb. 12, 1973, Pat. No. 3,914,157, which is a continuation-in-part of Ser. No. 19,496, March 13, 1070, abandoned, Ser. No. 51,319, June 30, 1970, abandoned, and Ser. No. 203,896, Dec. 1, 1971, abandoned. This application June 14, 1976, Ser. No. 695,492

Int. Cl.² C12D *9/00*

U.S. Cl. 195—80 R **4 Claims**

1. The method for the preparation of 7β-(D-5-amino-5-carboxyvaleramido)-3-(carbamoyloxymethyl)-7-methoxy-3-cephem-4-carboxylic acid which comprises growing in an aqueous nutrient medium under aerobic conditions an actinomycete capable of producing the desired product wherein the actinomycete is Streptomyces lactamdurans NRRL 3802.

4,036,697

KINETIC ASSAY FOR ALPHA-AMYLASE

Kenneth Jonas Pierre; Ker-Kong Tung, and Henriette Nadj, all of Vista, Calif., assignors to Beckman Instruments, Inc., Fullerton, Calif.

Filed Feb. 13, 1976, Ser. No. 657,976

Int. Cl.² G01N *33/00, 31/14*

U.S. Cl. 195—99 **37 Claims**

1. An alpha-amylase assay comprising:

- a. performing simultaneous reactions which comprise:
  - I. reacting a polysaccharide having glucose molecules primarily connected through alpha 1,4 linkages in the presence of an alpha-amylase specimen to form alpha-maltose;
  - ii. reacting alpha-maltose with phosphate ions in the presence of maltose phosphorylase to form glucose and beta-D-glucose-1-phosphate;
  - iii. reacting beta-D-glucose-1-phosphate in the presence of beta-D-pgosphoglucomutase to form glucose-6-phosphate; and
  - iv. reacting glucose-6-phosphate in the presence of glucose-6-phosphate dehydrogenase and a co-enzyme selected from a group consisting of beta-nicotinamide-adenine dinucleotide, beta-nicotinamide-adenine-dinucleotide phosphate, and mixtures thereof to form the reduced form of said co-enzyme and 6-phosphogluconate; and
- b. measuring the rate of production of said reduced co-enzyme,

wherein the alpha-amylase being measured is rate-limiting.

4,036,698

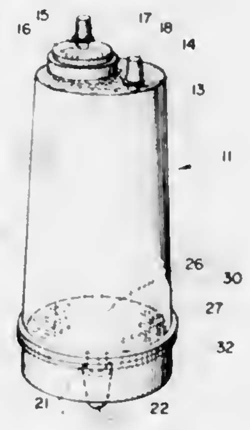
METHOD AND APPARATUS FOR MEMBRANE FILTER STERILITY TESTING

John H. Bush, Weston, Mass., and Jean Lemonnier, Le Vesinet, France, assignors to Millipore Corporation, Bedford, Mass.

Filed Nov. 6, 1974, Ser. No. 521,251

Int. Cl.² C12K *1/04, 1/10*

U.S. Cl. 195—103.5 M **7 Claims**



1. A method of testing for sterility of a liquid test material comprising the steps of:

first, providing an aliquot of said test material to each of first and second substantially identical canisters, each of said canisters having first and second ports in a first end thereof and a third port in the opposite end thereof and each of said canisters having a filter support member positioned within said canister parallel and spaced from said first end thereof and a second membrane filter supported on said filter support member, said second membrane filter facing said first canister end and sealed to the walls of said canister, said first port including a first membrane filter in it to provide that air flowing through said port has any microorganism above a predetermined size carried therein screened by said first filter, said first port being capped during said first step to provide a substantially hermetic seal and said second and third ports being opened to provide for passage of fluid through said canister whereby microorganisms in said test material are deposited on the second membrane filters within said canisters,

second, flushing each of said canisters with sterile solution with said ports in the same condition as during said first step to remove all of said test material from said second membrane filter, except for bacteria which has been trapped on said filters,

third, sealing said third port on the first one of said canisters while leaving said first port open and providing through said second port a known volume of a first microorganism growth medium;

fourth, sealing said third port of the second one of said canisters, while leaving said first port of said second of said canisters open and providing through said second port a known volume of a second mircoorganism growth medium, and

fifth, sealing all three of said ports to said canisters while maintaining the canisters in a specified range of temperatures for predetermined periods to allow bacterial growth in said first and second media, said media being formulated such that the growth of bacteria above a predetermined amount effects a visually measurable change in the appearance of the fluid within said canisters.

4,036,699

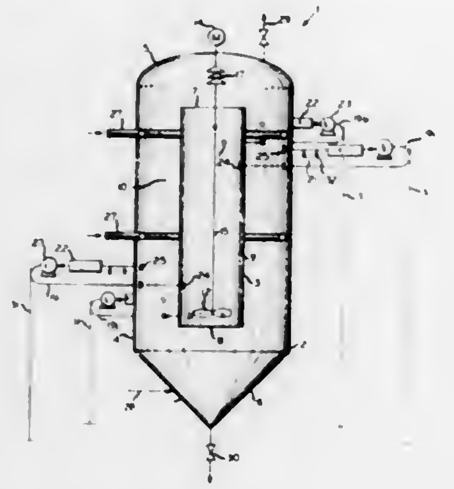
FERMENTATION APPARATUS AND METHOD

Donald J. Quigg, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 2, 1976, Ser. No. 654,436

Int. Cl.^{2} C12B *1/14*

U.S. Cl. 195—142 **6 Claims**



1. A fermentation apparatus comprising:

a. a vessel having a chamber therein;

b. a draft tube mounted in said chamber and having flow openings adjacent opposite ends thereof, said draft tube defining a first flow path therethrough and defining a second flow path between same and portions of said vessel;

c. first flow inducing means in said vessel for inducing flow of fluid along said first and second flow paths;

d. a conduit having a major portion thereof positioned exteriorly of said vessel and having a first end opening into one of said first flow path and said second flow path and a second end opening into one of said first flow path and said second flow path forming a third flow path with said first and second ends being circumferentially spaced apart;

e. heat exchange means positioned exteriorly of the vessel and being in heat transfer relation with said conduit; and

f. second flow inducing means in communication with said conduit and being operable to induce flow therethrough.

4,036,700

NUCLEAR REACTOR INSTALLATION

Heinrich Dorner; Axel Jungmann, and Manfred Scholz, all of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

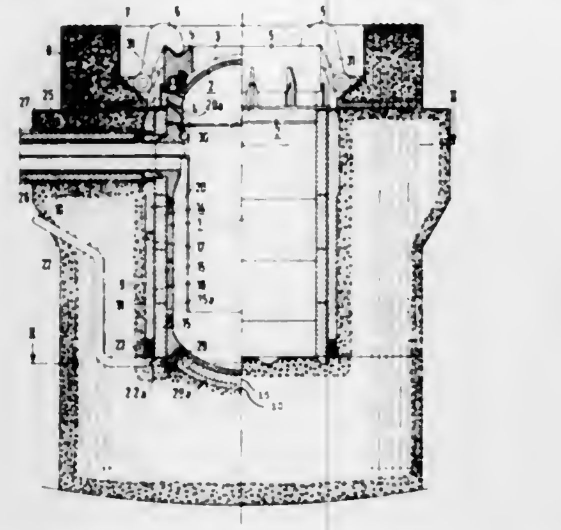
Filed July 8, 1974, Ser. No. 486,645

Claims priority, application Germany, July 9, 1973, 2334773

Int. Cl.^{2} G21C *13/04*

U.S. Cl. 176—87 **8 Claims**

1. A nuclear reactor installation comprising a metal pressure vessel having a vertical side wall, a reinforced-concrete wall surrounding said side wall and forming an annular space around said side wall, and a fluid-permeable layer of discrete particles surrounding said side wall and compacted in said space to transmit radial force from said side wall to said concrete wall, a thermally insulating and pressure-resistant encasement surrounding and normally engaging said side wall between the latter and said layer, and means for flowing a fluid coolant through said layer.



4,036,701

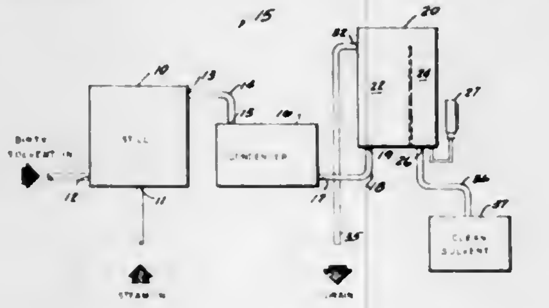
STEAM DISTILLATION APPARATUS CONVERTIBLE TO TWO SEPARATE MODES OF OPERATION

Byron Jan Clay, 103 Kathy Drive, Brownsburg, Ind. 46112; Michael Lhotellier Wall, 1721 Shawnee Road, Indianapolis, Ind. 46260, and James Robert Cunningham, 117 E. South St., Lebanon, Ind. 46052

Continuation of Ser. No. 543,673, Jan. 24, 1975, abandoned. This application May 10, 1976, Ser. No. 684,904

Int. Cl.^{2} B01D *3/02:* **B01J** *1/00*

U.S. Cl. 202—204 **10 Claims**



1. Distillation apparatus for purifying solvents which are immiscible with water comprising:

a. distillation apparatus for steam distilling solvents including:

  1. a vaporizer having a steam inlet, a dirty solvent inlet and a vapor outlet, and

  2. a condenser having an inlet connected to said vapor outlet, and having a liquid outlet for condensed liquids;

b. phase separation means connected to said liquid outlet, said phase separation means including:

  1. a tank which has an inlet, a first outlet opening in the upper portion of said tank, a second outlet opening higher than said first outlet opening, and a third outlet opening higher than said second outlet opening, and

  2. a coalescer within said tank and connected to said inlet whereby all of the liquids flowing into said tank are forced to pass through said coalescer.

c. first means for alternately permitting said first outlet opening to be connected to a plug means or for permitting said fist outlet opening to be connected to a tube extending to a point near the bottom of said tank; and

d. second means for alternately permitting said second outlet opening to be opened to a point near the upper portion of said tank or for permitting said second outlet opening to be connected to a tube extending within said tank to a point near the bottom of said tank, while said second means is open to a point near the upper portion of said tank.

4,036,702

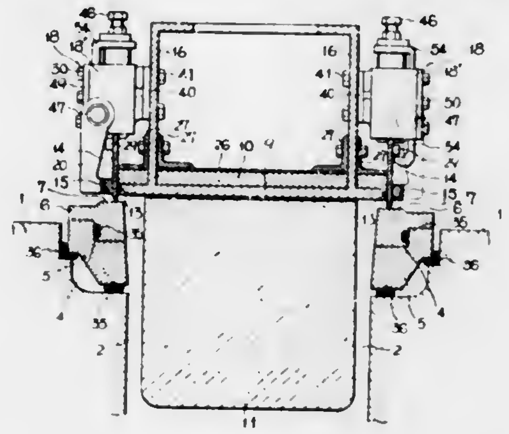
COKE OVEN SEALING APPARATUS

Konno Nagayoshi, No. 29-11, 3-chome, Takanodai, Nerima, Tokyo, Japan

Filed June 30, 1976, Ser. No. 701,115

Int. Cl.^{2} C10B *1/06, 25/06*

U.S. Cl. 202—248 **8 Claims**



1. In a coke oven sealing apparatus the combination of a door and door sealing frame wherein said door includes a base plate having an outer metallic door body and an inner adiabatic door plug connected to said base plate, said outer metallic door body having an outer adiabatic member, said base plate having a groove formed therein, a sealing means disposed in said groove, a knife edge seal fitted in said groove, a spring unit for adjusting said knife edge seal relative to said door frame, said door frame including an inner and outer frame member, and said knife edge seal having spaced U-shaped slots formed therein to add flexibility, and a holding means for holding said knife edge seal against said grooved base plate, the improvement comprising: a pair of projections located on either side of said U-shaped slots on the outer side of said knife edge seal, and a hooped shaped projection having a hole formed thereon on the outer side of said knife edge seal for reception of said holding means, said holding means including a pair of arms mounted to either side of said spring unit, a coil spring for biasing each of said arms toward said knife edge seal, said arms having an inwardly bent lower end to engage in the hole of said looped projection, said spring unit including a hook lever, said hook lever having a lower end hook for engaging said pair of projections on said knife edge seal, a first clamp means for the adjustable pressing of the inner frame member only against the coke oven, a second clamp means for adjustable pressing both the inner and outer frame member against the coke oven, and drawbars disposed on opposite sides of said door frame to draw said inner and outer frame members laterally.

4,036,703

METHOD OF SEPARATING CHLORINATED ALIPHATIC HYDROCARBONS WITH 1 TO 3 CARBON ATOMS FROM MIXTURES THEREOF BY EXTRACTIVE DISTILLATION

Jean-Claude Leroi, Villeurbanne, and Francois Vachet, Decines, both of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed June 17, 1976, Ser. No. 697,200

Claims priority, application France, June 25, 1975, 75.19892; Apr. 23, 1976, 76.12120

Int. Cl.^{2} B01D *3/40;* **C07C** *17/38*

U.S. Cl. 203—57 **13 Claims**

1. A method of at least partially separating chlorinated aliphatic C_1 to C_3 hydrocarbons from mixtures of at least two of the chlorinated hydrocarbons by extractive distillation, comprising subjecting the mixture of the chlorinated hydrocarbons to extractive distillation in contact with one or more organic third compounds having a boiling point higher than that of the substances to be separated, the extractive distillation being carried out at a temperature below the boiling point temperature for the third compound, in which the third compound is selected from the group consisting of methyl, ethyl, normal propyl and isopropyl mono and dichloroacetates; benzyl alcohol; salicylaldehyde, benzaldehyde, n-heptanal, methylisobutylketone, tetramethylurea, γ-butyrolacetone; normal propyl, isopropyl, normal, secondary and tertiary butyl acetylacetates; diethyl oxalate, dimethyl succinate and preferably methyl and ethyl acetylacetates; acetic anhydride, N-formylmorpholine, 2-chloro ethanol, hexamethylphosphotriamide, dimethyl sulphate and normal tributyl and triisobutyl phosphates, and recovering as overhead a separated distillate stream which contains a higher proportion of one of the chlorinated hydrocarbons then said mixture and a bottoms stream containing said third compound and a higher proportion of the other chlorinated hydrocarbons than said mixture.

4,036,704

LIQUID CHROMATOGRAPHICAL METHOD

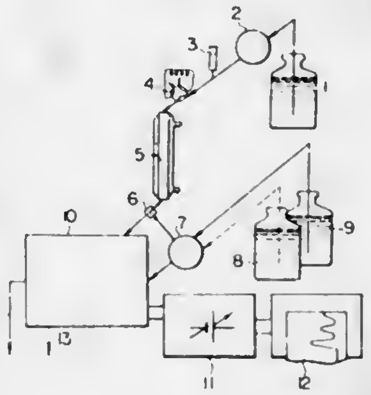
Yoshinori Takata, Ibaraki, Japan, assignor to Hitachi, Ltd., Japan

Filed Nov. 27, 1973, Ser. No. 419,353

Claims priority, application Japan, Dec. 11, 1972, 47-123344

Int. Cl.^{2} B01D *15/08;* **G01N** *27/42*

U.S. Cl. 204—1 T **5 Claims**



1. A process for measuring the quantity of at least one electrolytically oxidizable component selected from the group consisting of S^{2-}, HS^-, SO_3^{2-}, HSO_3^{2-}, $S_2O_3^{2-}$, $S_2O_6^{2-}$, $S_3O_6^{2-}$, and $S_4O_6^{2-}$ and contained in an eluate solution obtained from a liquid chromatographic separation column, said process comprising mixing with said eluate solution a catalyst, comprising Cu^{2+} in a dilute acid solution effecting catalytic oxidation of said at least one electrolytically oxidizable component, and measuring the electric current produced by said catalytic oxidation.

4,036,705

METHOD FOR METAL EXCHANGE

Charles Douglas Eidschun, Jr., 11004 64th Terrace, North, Seminole, Fla. 33542

Continuation-in-part of Ser. No. 502,536, Sept. 3, 1974, abandoned. This application May 23, 1975, Ser. No. 580,304

Int. Cl.^{2} C25D *5/02, 5/06*

U.S. Cl. 204—15 **15 Claims**

1. A method for exchanging metal on a workpiece, comprising the steps of:

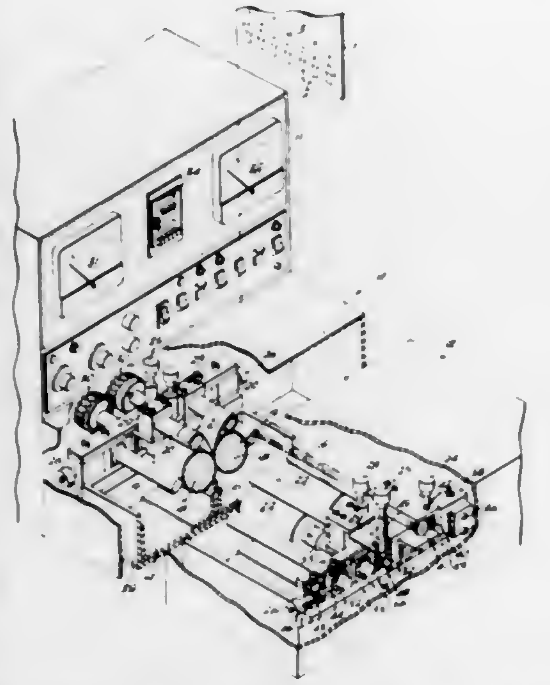
positioning a pair of horizontally disposed counterrotating rollers each of which is covered with a material capable of absorbing a fluid,

positioning the rollers in tangential wiping contact with a workpiece which is inserted vertically therebetween,

applying an electrolytic solution to said rollers from a location beneath the point of tangential contact,

fixedly jigging and holding the workpiece stationary between said horizontal rollers to fix an area of tangential wiping metal exchange on the workpiece between the rollers,

further positioning and orienting the jig so that the workpiece is in a vertical plane passing between the rollers and positioning the point of metal exchange in an area substantially perpendicular to the mutual diameters of the rollers,



and timing the contact in relation to the concentration of fluid and work area contact proportional to the current whereby repeatable metal exchange may be achieved with a smooth surface aided by continuous wiping contact and fixed positioning.

4,036,706

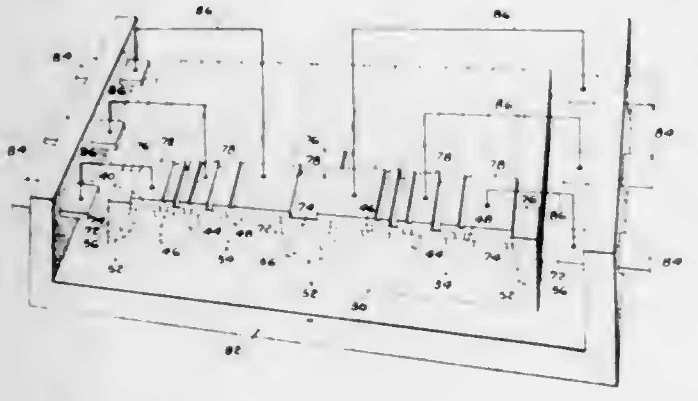
METHOD FOR PROVIDING ELECTRICAL ISOLATION BETWEEN SPACED PORTIONS OF A LAYER OF SEMICONDUCTIVE MATERIAL AND THE PRODUCT PRODUCED THEREBY

Raymond E. Scherrer, West Palm Beach, Fla., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Mar. 25, 1976, Ser. No. 670,498

Int. Cl.² C25D *5/02. 7/12. 5/48*

U.S. Cl. 204—15 **10 Claims**



1. A method for providing electrical isolation in semiconductive material while maintaining a planar surface, comprising the steps of:

removing the semiconductive material from regions of a planar surface in which isolation is desired to form an isolation moat;

forming a dielectric layer on the surfaces of the semiconductive material defining the moat;

depositing a metal over the semiconductive material so that the metal covers the planar surface of the semiconductive material and only a portion of the surfaces defining the isolation moat;

forming a protective layer over the metal deposited in the isolation moat;

selectively removing the metal deposited on the planar surface of the semiconductive material using an etchant that attacks said metal but has little or no effect on the protective layer; and

selectively plating metal into the isolation moat to substantially fill said moat and provide a planar surface with the semiconductive material.

4,036,707

METHOD FOR METALLIZING THERMOSETTING PLASTICS

Herbert Januschkowetz, Neukatzwang, and Hans Laub, Nurnberg, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 19, 1976, Ser. No. 715,722

Claims priority, application Germany, Aug. 29, 1975, 2538571

Int. Cl.² C25D *5/10. 5/56. 5/54*

U.S. Cl. 204—20 **14 Claims**

1. A method for metallizing a thermosetting resin comprising:

a. etching the surface of said resin with an oxidizing acid;

b. activating the surface of said resin with a stannous chloride solution;

c. sensitizing said resin in an aqueous solution of from 0.1 to 0.5 g per liter of palladium chloride and 1 to 6 ml of concentrated hydrochloric acid per liter;

d. immersing said resin at about 90° C in an accelerator bath having a pH of about 7, said bath containing sodium hypophosphite, trisodium citrate, ammonium chloride and 2,4-dihydroxy benzoic acid;

e. electrolessly nickel-plating said resin at a temperature of between about 96° to 99° C in a fast-depositing nickel bath having a pH of about 6.5 to 6.9 to form a nickel layer;

f. electroplating said nickel layer with copper; and

g. metallizing said copper layer to form a metallized layer.

4,036,708

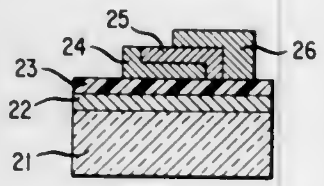
TECHNIQUE FOR NUCLEATING B.C.C. TANTALUM FILMS ON INSULATING SUBSTRATES

Eugene David Feit, Berkeley Heights, and Newton Schwartz, Morristown, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed May 13, 1976, Ser. No. 686,118

Int. Cl.² C25D *11/26;* H01G *13/00*

U.S. Cl. 204—38 A **9 Claims**



1. In the method of making a capacitor which comprises the steps of producing a layer of tantalum on a non-conducting substrate, electrolytically anodizing a portion of the tantalum layer, and applying an electrically conductive film to the anodized portion, the improvement which comprises depositing an organic compound having a vapor pressure less than 90 torr at 190° C with a thickness of a monolayer upon said substrate prior to deposition of the tantalum layer.

4,036,709

ELECTROPLATING NICKEL, COBALT, NICKEL-COBALT ALLOYS AND BINARY OR TERNARY ALLOYS OF NICKEL, COBALT AND IRON

Edward P. Harbulak, Allen Park, Mich., assignor to M & T Chemicals Inc., Greenwich, Conn.

Continuation of Ser. No. 615,195, Sept. 22, 1975, abandoned. This application Nov. 15, 1976, Ser. No. 741,710

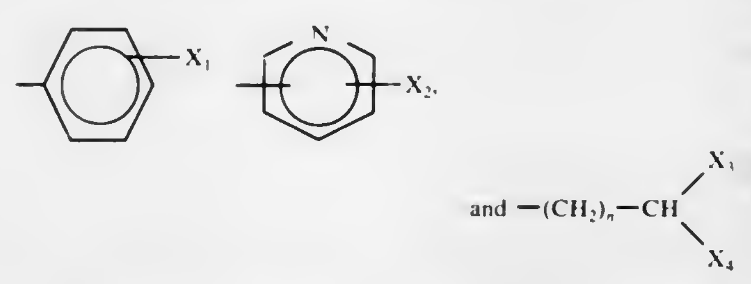
Int. Cl.² C25D *3/12. 3/56*

U.S. Cl. 204—43 T **14 Claims**

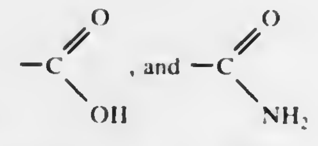
8. In a composition for the preparation of an electrodeposit which contains; at least one metal selected from the group consisting of nickel and cobalt or; binary or ternary alloys of the metals selected from nickel, iron, and cobalt; which comprises an aqueous acidic electroplating solution containing at least one member selected from nickel compounds and cobalt compounds or compounds providing nickel, cobalt and iron ions for electrodepositing nickel, cobalt, nickel-cobalt alloys, nickel-iron alloys, cobalt-iron alloys or nickel-iron-cobalt alloys, the improvement comprising the presence of 10 micromoles per liter to 2000 micromoles per liter of an organic disulfide compound or salt thereof having the formula:

$R_1-S-S-R_2$

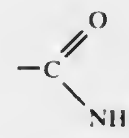
wherein R_1 and R_2 are each independently selected from



where *n* is an integer from 0 to 5, X_1 and X_2 are selected from —OH, $-NH_2$,



or salts thereof, X_2 may additionally be hydrogen and X_3 and X_4 are each independently selected from —H, —OH, $-NH_2$, and



or salts thereof, provided that X_3 and X_4 are not simultaneously hydrogen.

4,036,710

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 525,719, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 315,112, Dec. 12, 1972, abandoned. This application Dec. 24, 1975, Ser. No. 644,098

Int. Cl.² C25D *3/38*

U.S. Cl. 204—52 R **26 Claims**

14. An aqueous acidic copper electroplating bath containing at least one member independently selected from each of the following two groups:

A. from 0.005 to 1.0 gram per liter of at least one member of the group consisting of basic diaminotriphenylmethane dyes, basic triaminotriphenylmethane dyes, basic triaminodiphenylnaphthylmethane dyes, and their reduction products; and

B. sulfoalkyl sulfide compounds containing the grouping RS_n—Alk—SO_3M where n is an integer 1 to 5, where M is one gram-equivalent of a cation, where —Alk— is a divalent aliphatic hydrocarbon group of 1 to 8 carbon atoms, and where R is selected from a group consisting of hydrogen, a metal cation, a monovalent hydrocarbon radical including one which carries inert substituents, in which no carbon atom is bound exclusively to heteroatoms, a sulfonic group MO_3S— and a sulfolanyl group in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

4,036,711

ELECTRODEPOSITION OF COPPER

Otto Kardos, Ferndale; Donald A. Arcilesi, Mount Clemens, and Silvester P. Valayil, Pontiac, all of Mich., assignors to M & T Chemicals Inc., Greenwich, Conn.

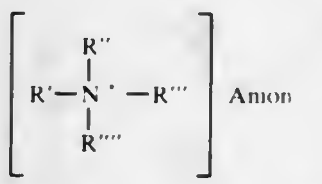
Continuation-in-part of Ser. No. 641,965, Dec. 18, 1975, abandoned, which is a continuation of Ser. No. 525,716, Nov. 21, 1974, abandoned, which is a continuation-in-part of Ser. No. 315,112, Dec. 14, 1972, abandoned. This application Sept. 17, 1976, Ser. No. 724,692

Int. Cl.² C25D *3/38*

U.S. Cl. 204—52 R **22 Claims**

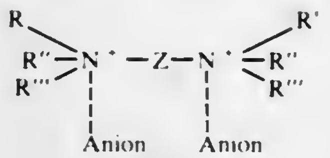
1. A process for electrodepositing copper from an aqueous acidic copper plating bath containing at least one member independently selected from each of the following two groups:

A. 0.005 gram per liter to 10.0 grams per liter of quaternized aryl and aralkyl amines selected from those exhibiting the formulae:

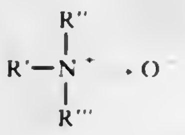


$$\left[R'-\overset{\overset{\large R''}{|}}{\underset{\underset{\large R''''}{|}}{N^+}}-R''' \right] \text{Anion}$$

I

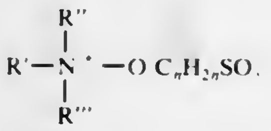


II.



$$R'-\overset{\overset{\large R''}{|}}{\underset{\underset{\large R'''}{|}}{N^+}}\cdot O^-$$

III.



$$R'-\overset{\overset{\large R''}{|}}{\underset{\underset{\large R'''}{|}}{N^+}}-O\,C_nH_{2n}SO_3^-$$

IV.

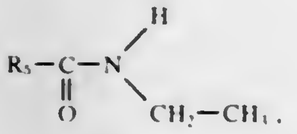
wherein R', R'', R''' and R'''' are each independently selected from the group consisting of substituted and unsubstituted monovalent alkyl, aryl, aralkyl and cycloalkyl radicals provided that at least one aryl or aralkyl radical is present on each quaternary nitrogen atom; wherein Z is a bivalent hydrocarbon radical which may be substituted and/or interrupted by heteroatoms; wherein $n = 3$ or 4; wherein the Anion may be absent if one of the radicals R' to R'''' carries an anionic substituents and

B. sulfoalkyl sulfide compounds containing the grouping —S—Alk—SO_3M where M is one gram-equivalent of a cation and — Alk — is a divalent radical selected from a group consisting of unsubstituted and substituted aliphatic hydrocarbon radicals containing 2 to 8 carbon atoms which may be interrupted by heteroatoms in an amount of 0.01 milligrams per liter to 1000 milligrams per liter.

4,036,712
PROCESS FOR PREPARING N-(α-ALKOXYETHYL)-CARBOXYLIC ACID AMIDES

Michael Mitzlaff, Bad Homburg, Taunus, Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany
Filed Jan. 23, 1976, Ser. No. 651,693
Claims priority, application Germany, Jan. 25, 1975, 2503114; Sept. 6, 1975, 2539767
Int. Cl.² C25B *3/10*
U.S. Cl. 204—59 R **10 Claims**

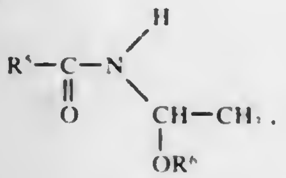
1. In a process for the alkoxylation of a secondary N-ethyl-carboxylic acid amide of the formula



wherein R^6 is alkyl of from 1 to 6 carbon atoms, in the presence aryl of from 6 to 10 carbon atoms, by electrolysis with an alcohol of the formula

R^6—OH

wherein R^6 is alkyl of from 1 to 6 carbon atoms, in the presence of a quaternary ammonium salt, an alkali salt or a combination thereof, to yield an N-α-alkoxyethyl compound of the formula



the improvement which comprises electrolysis by a current quantity of at least 2.5 Faraday/mole of acid amide in the presence of an alkali salt of tetrafluoroboric acid, a tetraaikyl ammonium tetrafluorobroate, a tetraalkyl ammonium hexafluorophosphate or a combination thereof, sais alkyl being of 1 to 6 carbon atoms.

4,036,713
PROCESS FOR THE PRODUCTION OF HIGH PURITY LITHIUM HYDROXIDE

Patrick M. Brown, Exton, Pa., assignor to Foote Mineral Company, Exton, Pa.
Filed Mar. 4, 1976, Ser. No. 663,851
Int. Cl.² C25B *1/20, 1/26*
U.S. Cl. 204—98 **5 Claims**

1. An economical process for the production of high purity lithium hydroxide from a brine containing lithium and other alkali and alkaline earth metal halides, which comprises:

concentrating said brine to a lithium content of about 2 to about 7% to precipitate almost all of the alkali and alkaline earth metals other than lithium,

adjusting the pH of the concentrated brine to about 10.5 to about 11.5, thus precipitating substantially all of any remaining calcium, magnesium and iron contaminants,

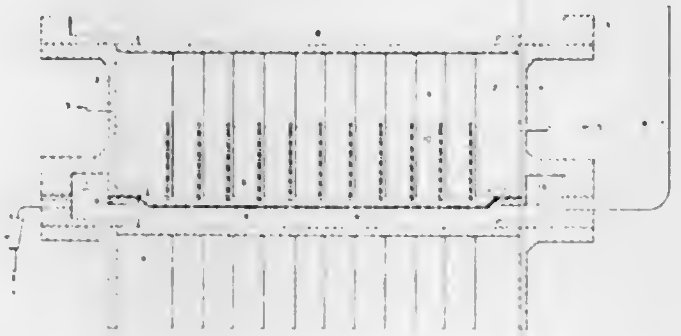
neutralizing the thus purified brine with hydrochloric acid, and

electrolyzing the thus purified and neutralized brine as the anolyte in the electrolytic cell in which a cation selective permeable membrane separates the anolyte from the catholyte,

whereby the lithium ions in the anolyte migrate through the membrane to form high purity lithium hydroxide in the catholyte and hydrogen and chlorine are evolved at the electrodes as by-products.

4,036,714
ELECTROLYTIC CELLS AND PROCESSES

Robert Spitzer, New York, N.Y., assignor to E. I. Du Pont de Nemours and Company, Inc., Wilmington, Del.
Division of Ser. No. 298,922, Oct. 19, 1972, Pat. No. 3,864,226. This application Jan. 24, 1975, Ser. No. 543,912
Int. Cl.² C25B *1/16, 1/26, 1/02, 1/22*
U.S. Cl. 204—99 **25 Claims**

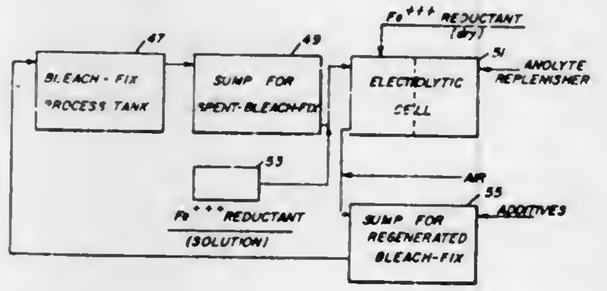


24. A process for the electrolysis of an aqueous solution containing sodium and/or potassium ions in solution with anions of the mineral acids and/or of the organic acids and/or hydroxyl ions in an electrolytic cell comprising

a foraminous anode,
a composite membrane comprising
a polymeric membrane facing said anode and
  a cathode layer of metal permeable to alkali metal ions in intimate contact with said polymeric membrane at its surface facing away from said anode, said polymeric membrane horizontally positioned to support said metal thereon and
a membrane or a diaphragm between said anode and composite membrane comprising
  passing an electric current through said aqueous solution between said anode and cathode and withdrawing the anode product through said anode.

4,036,715
METHOD OF RECOVERING SILVER FROM PHOTOGRAPHIC BLEACH-FIX AND CONCURRENTLY REGENERATING THE BLEACH-FIX

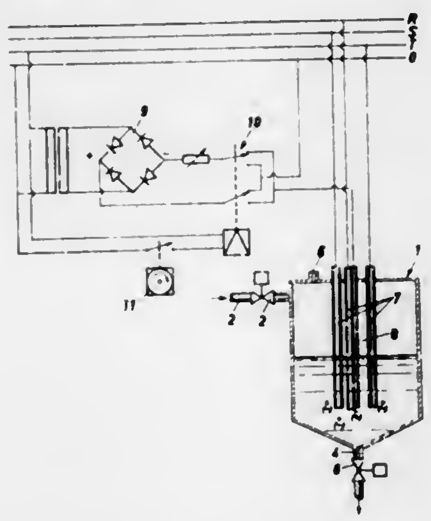
Harry C. Baden; Charleton C. Bard, and Donald J. Brugger, all of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.
Filed Dec. 20, 1971, Ser. No. 209,748
Int. Cl.² C25C *1/20;* **G03C** *5/38*
U.S. Cl. 204—109 **5 Claims**



1. A method for electrolytically recovering silver from spent aqueous bleach-fix photographic processing solution containing ions of both silver and iron III comprising introducing into said processing solution a chemical compound characterized by the ability to reduce iron III to iron II, impressing a direct electrical current between a cathode which is immersed in a first pool of such processing solution and an anode which is immersed in a second pool of anolyte solution of a carbonate, borate phosphate or silicate, thereby plating silver onto said cathode, said first and second pools being separated from one another by non-porous cation permeable barrier or a porous barrier, and excluding air from said pools.

4,036,716
METHOD TO PREVENT THE FORMATION OF INCRUSTATIONS ON WORKING ELECTRODES IN ELECTRODE STEAM GENERATORS OR THE LIKE AND A MEANS FOR PERFORMING THE METHOD

Peter Hulthe, Vastra Frolunda, Sweden, assignor to Goteborgs Analyslaboratorium AB, Sweden
Filed Mar. 24, 1975, Ser. No. 561,080
Claims priority, application Sweden, Apr. 5, 1974, 74045931
Int. Cl.² C23F *13/00*
U.S. Cl. 204—147 **13 Claims**



1. A method for reducing or eliminating the formation of incrustations of water soluble materials on working electrodes which are immersed in a water bath containing said water soluble materials, said electrodes being connected to a source of alternating current, said improvement comprising the steps of:

adding an auxiliary electrode;

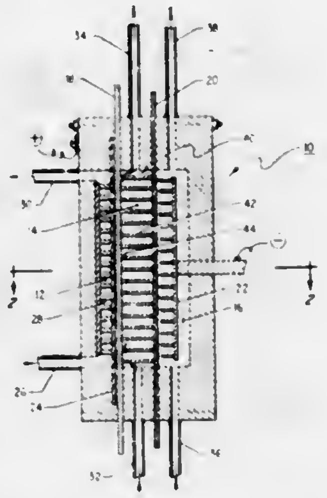
superimposing, between said auxiliary electrode and said working electrodes, a direct current voltage such that a low PH-value is obtained in the water near the working electrodes; and

reversing, periodically, the direct current polarity such that the working electrodes and the auxiliary electrode periodically act as an anode and as a cathode causing the PH-value of the water to vary between acidic and alkaline.

4,036,717
METHOD FOR CONCENTRATION AND PURIFICATION OF A CELL LIQUOR IN AN ELECTROLYTIC CELL

Andrew D. Babinsky, Chagrin Falls, and Leo L. Benezra, Mentor, both of Ohio, assignors to Diamond Shamrock Corporation, Cleveland, Ohio
Filed Dec. 29, 1975, Ser. No. 644,977
Int. Cl.² C25B *1/02, 1/16*
U.S. Cl. 204—153 **4 Claims**

1. A method for concentrating and purifying an aqueous cell liquor containing alkali metal hydroxide in electrolytic cell comprising the steps of: assembling a three compartment electrolytic cell having a porous catalytic anode, a porous diaphragm to divide the anode compartment from a central compartment, an essentially hydraulically impermeable cation-exchange membrane dividing the central compartment from a cathode compartment, a cathode, a stratification network contained within the central compartment and sufficient openings into the compartments to introduce and remove materials therefrom; charging the cathode compartment of the three compartment electrolytic cell with a dilute aqueous solution of pure alkali metal hydroxide; charging the central compartment with the aqueous cell liquor containing alkali metal hydroxide to be concentrated and purified and recirculation thereof; stratifying the aqueous cell liquor containing alkali metal hydroxide within the central compartment; supplying a flow of hydrogen gas to the anode compartment side of the porous catalytic anode at a gauge pressure; preheating the electrolytic cell and materials to be charged thereto to a temperature in excess of 60° C.; applying a direct electrolyzing current across the anode and cathode of the electrolytic cell; recycling hydrogen gas emanating from the anode and cathode compartments to the anode compartment and across the porous catalytic anode; removing aqueous concentrated and pure alkali metal hydroxide from the cathode compartment; and removing aqueous impurities and alkali metal salts from the central compartment.



4,036,718
PROCESS FOR PREPARING A FRIABLE TETRAFLUOROETHYLENE POLYMER POWDER FROM UNSINTERED COAGULATED DISPERSION GRADE TETRAFLUOROETHYLENE POLYMER

Michael Trevenen Brown, Welwyn Garden City, and William George Rodway, Welwyn, both of England, assignors to Imperial Chemical Industries Limited, London, England
Continuation of Ser. No. 267,035, June 28, 1972, abandoned, and a continuation-in-part of Ser. No. 111,700, Feb. 1, 1971, abandoned. This application Dec. 2, 1975, Ser. No. 636,957
Claims priority, application United Kingdom, Feb. 3, 1970, 5037/70; Sept. 17, 1971, 43436/71
Int. Cl.² C08F *2/46, 114/00*
U.S. Cl. 204—159.2 **7 Claims**

1. A process for the manufacture of a finely divided tetrafluoroethylene polymer comprising subjecting in powder form an unsintered coagulated dispersion grade of a tetrafluoroethylene polymer selected from tetrafluoroethylene homopolymers and copolymers of tetrafluoroethylene with up to 10% by weight, based on the weight of the copolymer, of an ethylenically unsaturated comonomer, to γ-radiation until it has received a dose of at least 2 M Rads, and comminuting the irradiated polymer to a finely divided form having a number average particle size less than 5 μm as measured optically.

4,036,719
IRRADIATABLE POLYMER COMPOSITION WITH IMPROVED OXIDATION RESISTANCE

Bernard J. Lyons, Atherton, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Continuation-in-part of Ser. No. 405,521, Oct. 11, 1973, abandoned. This application July 1, 1975, Ser. No. 592,243

The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.² C08F *8/00*

U.S. Cl. 204—159.14 **12 Claims**

1. An irradiation cross-linked polymer composition, having improved resistance to oxidation, comprising a polymer selected from the group consisting of polyethylene, polypropylene, ethylene-vinyl acetate copolymer, ethylene-acrylic ester copolymers, ethylene-propylene copolymer, ethylene-propylene-diene terpolymer, polyvinyl chloride, polyvinylidene chloride, chlorinated polyethylene and polyolefin elastomers and minor effective amounts of an organic phosphite antioxidant which is substantially an insoluble compound under effective irradiating conditions of less than 50 mrads to which the composition has been subjected, said phosphite having the general formula $R_1O(ROPOR')_nA_x$ wherein the R and R' radicals may be the same or different, and may alone or in combination comprise the group consisting of alkyl, substituted alkyl, aryl, substituted aryl, and made together form a ring and contain further phosphite moieties, R_1 is alkyl, substituted alkyl, aryl, substituted aryl, or hydrogen and may contain further phosphite moieties and A is hydrogen or OR_1, wherein *n* is 1 or 2, *x* is 0 or 1.

4,036,720
HYDROGEN ISOTOPE SEPARATION

Marion D. Clark, Oxon Hill, and Thomas J. Manuccia, Laurel, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 22, 1976, Ser. No. 734,904

Int. Cl.² B01K *1/00;* **C01B** *1/28, 4/00;* **C01C** *1/02*

U.S. Cl. 204—177 **7 Claims**

1. A method of separating isotopes of hydrogen which comprises subjecting a mixture of nitrogen and isotopes of hydrogen in a H_2 — N_2 mole ratio from 1:4 to 10:1 to a glow electrical discharge from 10^{-3} to 10^{+1} eV per reactant molecule at a temperature from 50° K to 200° K and at a pressure from about 0.3 Torr to about 25 Torr if said glow electricl discharge is self-sustained or to the condensation pressure of nitrogen if said glow electrical discharge is external.

4,036,721
METHOD FOR COATING A CONDUCTIVE MATERIAL

Hisao Kato, Neyagawa; Hideo Yagi, Kyoto, and Shunji Fukuta, Takatsuki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 486,834, July 9, 1974, Pat. No. 3,988,231. This application May 25, 1976, Ser. No. 690,046

Int. Cl.² C25D *13/20*

U.S. Cl. 204—181 **16 Claims**

1. A method for coating a conductive material, which consists essentially of physically coating a conductive material with an inorganic composition which is substantially non-chemically reactive to the substrate, said inorganic composition containing at least a monobasic aluminum phosphate to form an inorganic coating layer and then applying thereto an organic electrodepositable composition by electrophoretic means to form an organic coating layer.

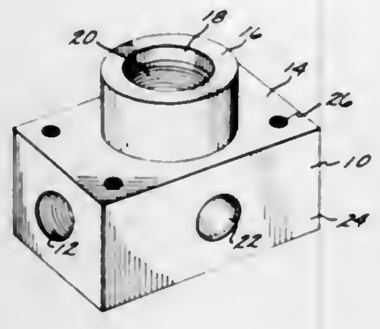
4,036,722
FLOW THROUGH CELL ASSEMBLY

Gordon R. Brushwyler, Anaheim, and Timothy F. Scott, Brea, both of Calif., assignors to Robertshaw Controls Company, Richmond, Va.

Filed Aug. 21, 1975, Ser. No. 606,443

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 B **4 Claims**



1. In a continuous flow respirometer having an elongated residence tube, a metering pump to force a liquid therethrough at a constant flow rate, and dissolved oxygen cells to sense the oxygen content of the liquid entering and exiting said residence tube, the improvement comprising a cell assembly for a plurality of instrument probes, one each at the inlet and outlet of said residence tube, each assembly comprising:

- a housing having a through passageway in open communication with said residence tube for transit of said stream of liquid;
- a first transverse bore extending from the top surface of said housing and intersecting said through passageway;
- a second transverse bore extending laterally from one side of said housing, intersecting said housing, intersecting said through passageway and perpendicular thereto;
- a first instrument probe meter carrying the cathode of one of said dissolved oxygen cells and mounted in said first transverse bore and terminating generally coplanar with the top surface of said through passageway; and
- a second instrument probe meter carried in said second transverse bore and extending transversely across said through passageway immediately beneath, but out of contact with, the lower end of said first instrument probe to block a substantial cross section of said through passageway and be in substantial flow obstruction to said through passageway and to define a narrow flow constriction there in immediately beneath said first probe meter.

4,036,723
RF BIAS SPUTTERING METHOD FOR PRODUCING INSULATING FILMS FREE OF SURFACE IRREGULARITIES

Bradford Clyde Schwartz; Ralph Donald Silkensen, and Gerald Steving, all of Longmont, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 606,692, Aug. 21, 1975, abandoned. This application June 1, 1976, Ser. No. 691,917

Int. Cl.² C23C *15/00*

U.S. Cl. 204—192 EC **22 Claims**

1. In the method of forming an electrically insulative coating having a surface smoothness value of 250 A or less, peak to valley, over a polycrystalline or a microroughened substrate having surface irregularities of as great as 500 A, the steps of:

- RF bias sputtering a first substantially continuous layer of electrically insulative material over said substrate at a reemission coefficient of about 0.35 or lower; and then
- RF bias sputtering a second layer of said electrically insulative material over said first layer of electrically insulative material at a reemission coefficient of about 0.6 or greater to provide a surface smoothness of at least about 250 A, peak to valley, or smoother.

4,036,724
DEVICE FOR THE CONTINUOUS DETERMINATION OF CARBON MONOXIDE CONTENT OF AIR

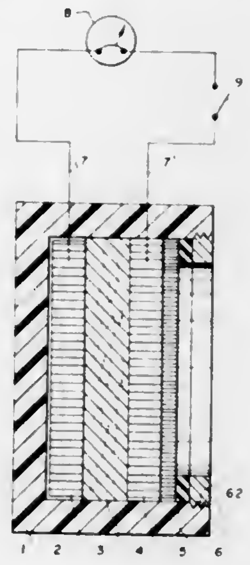
Horst Binder, Petterweil; Reinhard Knodler, Diedenbergen; Alfons Kohling, Eschborn, and Gerd Sandstede, Frankfurt am Main, all of Germany, assignors to Dragerwerk Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 455,505, March 27, 1974, abandoned. This application May 23, 1975, Ser. No. 580,532

Claims priority, application Germany, Apr. 2, 1973, 2316365

Int. Cl.² G01N *27/46*

U.S. Cl. 204—195 R **6 Claims**



1. An electrochemical cell, for the continuous determination of the carbon monoxide content of a gas, such as air, in the emission and immission ranges, comprising, in combination, a receptacle containing an acid electrolyte; a cathode having a surface in contact with the electrolyte; a diffusion anode, depolarizable by carbon monoxide, having an inner active layer in contact with the electrolyte and a superposed outer hydrophobe gas diffusion layer out of contact with the electrolyte; means subjecting the anode to the carbon monoxide-containing gas by flow of the gas through said diffusion layer; said anode, at a potential of less than 1000 mV relative to a hydrogen electrode in the same electrolyte, being subject to oxygen-reduction; said cathode being constituted by an unpolarizable material, selected from the group consisting of oxides and mixed oxides of the transition metals, having an oxidation potential of over 1000 mV relative to a hydrogen electrode in the same electrolyte; and current measuring means connected, in short circuiting relation, between said cathode and said anode to polarize said anode to the potential of said cathode so that, in the absence of carbon monoxide, no current flows between said cathode and said anode and so that no oxygen-reduction takes place at said anode; whereby said anode, when subjected to a gas containing both oxygen and carbon monoxide, functions only as an anode for the oxidation of the carbon monoxide and is depolarized relative to said cathode to provide a corresponding current flow through said current measuring means; said cell functioning without any external current source.

4,036,725
WHEEL SELECTIVE JET PLATING SYSTEM

Robert M. Allen, Mill Valley, and Michael Seyffert, Santa Cruz, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

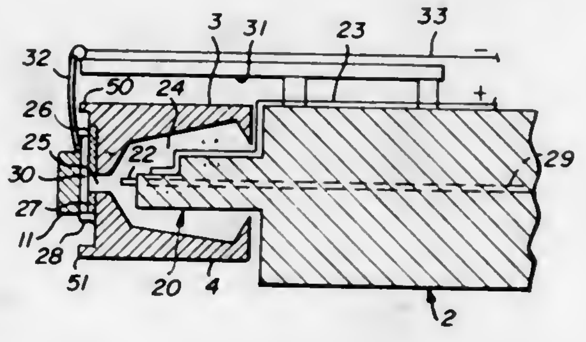
Filed Nov. 21, 1975, Ser. No. 634,046

Int. Cl.² C25D *17/00*

U.S. Cl. 204—206 **15 Claims**

1. An apparatus for electroplating metal on a continuous metal strip comprising:

- a plurality of stationary fluid jets spaced along a circular line for jetting a plating fluid containing a metal against said strip;
- a central assembly for supporting said fluid jets in a fixed position relative to said strip, said central assembly including means for coupling said jets to a source of plating fluid under pressure;
- means for moving said strip in a circular path past said jets while said fluid is being jetted from said jets against said strip;
- said moving means comprising:
  - an annular ring-shaped assembly mounted for rotation about said central assembly, said ring-shaped assembly having an upper and a lower outer peripheral edge;
  - a slot between said edges in registration with said fluid jets; and



  - means located on opposite sides of said slot forming a fluid-sealing means between said strip and said ring-shaped assembly for masking a predetermined surface area of said strip;
- means for rotating said ring-shaped assembly about said central assembly;
- means for holding said strip against said masking means in a fluid-tight sealing relationship therewith as said ring-shaped assembly is rotated about said central assembly; and,
- means for causing a current to flow in said fluid; including means for coupling a d.c, current source between said strip and said fluid jets whereby said metal in said plating fluid is removed from said fluid and plated on the surface of said strip between said masking means as said strip is moved past said fluid jets.

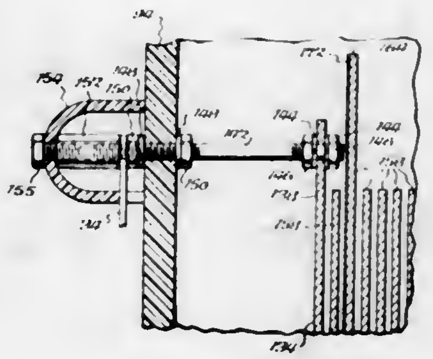
4,036,726
METHOD AND APPARATUS FOR ELECTROCHEMICAL CONTAMINANT REMOVAL FROM LIQUID MEDIA

Stephen B. Gale, Williamsville; Phillip P. O'Donnell, Buffalo, and Stanley Bruckenstein, Williamsville, all of N.Y., assignors to Andco Incorporated, Buffalo, N.Y.

Division of Ser. No. 547,940, Feb. 7, 1975. This application Feb. 2, 1976, Ser. No. 654,563

Int. Cl.² C02B *1/82;* **C02C** *5/12;* **C25C** *7/00, 7/02*

U.S. Cl. 204—231 **13 Claims**



1. In an electrochemical cell for removing a contaminant ion from an ionizing medium and having a cell body:

a. a pair of outer electrode elements positioned in said body in spaced apart relation;

b. means for applying electrical potentials of opposite polarity directly to said outer electrodes;

c. additional electrode elements between said outer electrode elements in closely spaced relation;

d. means in said cell body defining a flow path for an ionizing medium in operative relation to said electrodes;

e. whereby the electric potentials applied to said outer electrode elements induce electric charge on said additional electrode elements to cause electric current flow through said ionizing medium; and

f. one of said additional electrode elements in neighboring relation to a corresponding one of said outer electrode elements being of sufficient size so as to extend beyond said outer electrode element so as to shield said outer electrode element from flux field effects causing excessive current density.

4,036,727

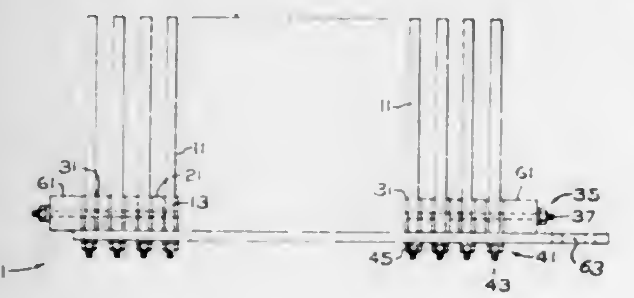
ELECTRODE UNIT

Henry W. Rahn, Pittsburgh, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 522,669, Nov. 11, 1974, Pat. No. 3,984,304. This application Apr. 20, 1976, Ser. No. 678,781

Int. Cl.^{2} C25B *1/26, 9/02*

U.S. Cl. 204—268 **3 Claims**



1. A bipolar electrolyzer comprising a plurality of electrolytic cells electrically and mechanically in series, at least one of said comprising an anode assembly of one bipolar unit and a cathode assembly of the next adjacent bipolar unit in the electrolyzer;

A. said anode assembly comprising:
   1. a plurality of parallel silicon anodes, each of said anodes comprising a silicon substrate having an electrical conductivity greater than about 100 (ohm-centimeters)$^{-1}$, an electrically conductive surface thereon, an aperture passing through the base portion of said silicon substrate, and elastic clip means on the base of said silicon anodes adapted for connection with corresponding means on the cathode assembly of adjacent bipolar electrolyte cell;
   2. a plurality of electrolyte-resistant spacers, at least one of said spacers being disposed between a pair of adjacent silicon anodes, each of said spacers having an aperture corresponding to the apertures in said silicon substrates;
   3. a plurality of flexible gaskets, at least one of said flexible gaskets being interposed between a spacer and the silicon adjacent to one surface thereof, and at least one of said flexible gaskets being interposed between the opposite surface of the spacer and the silicon anode adjacent thereto, each of the said flexible gaskets having an aperture corresponding to the apertures in the silicon substrates and the spacers;
   4. compressive means passing through each of said silicon anodes, said flexible gaskets, and said spacers, providing a compressive force thereon whereby to provide an electrolyte tight seal between each of said silicon anodes and the flexible gaskets adjacent thereto, and between each of said spacers and the flexible gaskets adjacent thereto, whereby to form an electrolyte tight wall having silicon anodes extending outwardly from one side thereof and electrical connection means extending on the opposite side thereof;

B. said cathode assembly comprising.
   1. an electrolyte permeable, metal backscreen, extending substantially from one edge of the bipolar unit to the opposite edge thereof and substantially from the bottom of the bipolar unit to the top thereof, and substantially parallel to and spaced from the anodic unit of the next adjacent electrolyte cell;
   2. a plurality of hollow, finger-like metal cathodes joined to said backscreen at the bases thereof, extending outwardly from said backscreen and interleaved between said anodes; said cathodes having electrolyte permeable walls;
   3. electroconductive means extending from said cathodes through said backscreen to elastic clip means corresponding to elastic clip means of the anode assembly of the next adjacent electrolytic cell.

4,036,728

CONVERTING A DIAPHRAGM ELECTROLYTIC CELL TO A MEMBRANE ELECTROLYTIC CELL

Andrew D. Babinsky, Chagrin Falls, Ohio, assignor to Diamond Shamrock Corporation, Cleveland, Ohio .

Filed May 21, 1976, Ser. No. 688,842

Int. Cl.^{2} C25B *11/03, 13/08;* **C25C** *7/04*

U.S. Cl. 204—283 **8 Claims**

1. A method for forming a membrane over a standard diaphragm cell foraminous electrode comprising the steps of: suspending a matting material in a fluid medium; inserting a foraminous electrode into the suspension; vacuum forming a layer of the suspended matting material over the surface of the foraminous electrode so as to substantially reduce the porosity of the foraminous electrode material; applying to the surface of the foraminous electrode with the matting material thereon, a layer of thermoplastic material including NAFION particles in the sulfonyl fluoride form; baking the foraminous electrode with the layers in place until the thermoplastic material is fused into a thin and uniform film on the surface of the matting material which is substantially impermeable to hydraulic flow; and hydrolyzing the NAFION to change the sulfonyl fluoride form to the cation exchange sulfonic acid form.

4,036,729

DIAPHRAGMS FROM DISCRETE THERMOPLASTIC FIBERS REQUIRING NO BONDING OR CEMENTING

Arvind S. Patil, 8253 Colony Drive, Grosse Ile, Mich. 48138, and Eugene Y. Weissman, 356 N. Clifton, Birmingham, Mich. 48010

Filed Apr. 10, 1975, Ser. No. 566,911

Int. Cl.^{2} C25B *13/06, 13/08*

U.S. Cl. 204—296 **7 Claims**

1. In an electrolytic cell having a diaphragm deposited on a cathode screen, an improved diaphragm therefor, comprising:

an entanglement of highly branched thermoplastic polymeric fibers, the fibers being capable of withstanding the internal conditions of the cell, the fibers being of the type produced by extruding a polymer melt in the presence of an auxiliary liquid medium which shears the melt into the highly branched fibers, and

wherein the fibers are entangled to a degree such that they are free of bonding or cementing agents.

4,036,730

SOLVENT-REFINING OF COAL

Andries Brink, Sasolburg; Cornelis Kleynjan, Lochvaal, and Quintin John Beukes, Sasolburg, all of South Africa, assignors to South African Coal, Oil & Gas Corporation Limited, South Africa

Filed May 20, 1975, Ser. No. 579,145

Claims priority, application South Africa, May 24, 1974, 74/3326

Int. Cl.^{2} C10G *1/04*

U.S. Cl. 208—8 **30 Claims**

1. A process for the production of solvent-refined coal which comprises the steps of:

a. heating coal slurried in a solvent having hydrogen carrier characteristics in the presence of hydrogen at a partial pressure of several times atmospheric pressure to substantially liquefy the coal,

b. during said heating step controlling the heating temperature and partial pressure of hydrogen to attain a rate of free radical formation, said rate being a function of temperature, which exceeds the rate of radical hydrogenation, said latter rate being a function of partial pressure of hydrogen, and continuing said control or a period of time sufficient to chemically combine a small percentage of the liquefiable matter of the coal with the resulting formation of larger nondissolved solid particles, and

c. separating non-dissolved solids from the solution formed by said liquefying and control steps.

4,036,731

HYDROGENATION OF COAL

Terence Geoffrey Martin, Winchcombe, England, assignor to Coal Industry (Patents) Limited, London, England

Filed Oct. 28, 1975, Ser. No. 626,102

Claims priority, application United Kingdom, Dec. 19, 1974, 54981/74

Int. Cl.^{2} C10G *1/06*

U.S. Cl. 208—8 **7 Claims**

1. A process for the hydrogenative extraction of coal characterized by

extracting coal with an organic solvent in the presence of a hydrogen donor at a temperature greater than the critical temperature of said solvent, said temperature being within the range of 340° C to 480° C,

separating the gas phase extract from the solids residue, and condensing the extracted products from the gaseous or vapor phase.

4,036,732

TAR SANDS EXTRACTION PROCESS

Cyrus A. Irani, Westfield; Edward W. Funk, Linden; Ernesto Gomez, Elizabeth, and Ramon L. Espino, Summit, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 6, 1975, Ser. No. 547,640

Int. Cl.^{2} C10G *1/04*

U.S. Cl. 208—11 LE **7 Claims**

1. In a process for the extraction of bitumen from tar sands, the improvement which comprises countercurrent contacting of the tar sands in an extraction zone with a solvent consisting essentially of paraffins having from 5 to 9 carbon atoms at a ratio of from 2 to 10 parts by weight solvent per part bitumen present in the tar sand, maintaining the asphaltene fraction of the tar sands in suspension in a solution of a major portion of the bitumen in the major portion of said solvent in said extraction zone, separating said solution along with the suspended asphaltenes from said extraction zone, separating said solution from said asphaltenes, passing said separated solution to a distillation zone and therein distilling off said solvent, passing extracted sand from said extraction zone along with a minor portion of said solvent and a minor portion of bitumen into a water contacting zone and therein contacting said extracted sand with sufficient water at a temperature of at least 100° F. to separate substantially all of the bitumen and the solvent from said sand.

4,036,733

FLUORESCENT BENZANTHRONIC DYES

Filippo Maria Carlini, Novara; Giampiero Pieri, Saronno (Varese); Camillo Paffoni, Pogno (Novara), and Gioacchino Boffa, Novara, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

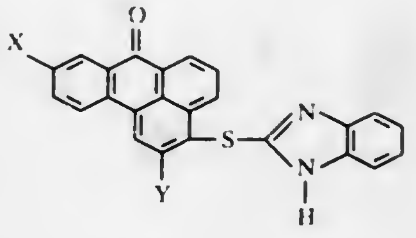
Filed Apr. 21, 1976, Ser. No. 679,029

Claims priority, application Italy, Apr. 24, 1975, 22722/75

Int. Cl.^{2} C10G *41/00;* **C10L** *1/24;* **C07D** *235/04;* **C08K** *5/16*

U.S. Cl. 208—12 **10 Claims**

1. A plastosoluble fluorescent organic dye derived from benzanthrone, and having the general formula:



(I)

wherein

X = —H or —Br; and

Y = —H, $-OCH_3$ or $-OC_2H_5$.

10. A bulk-dyed polystyrene, polymethylmethacrylate, rigid PVC, polyethylene, acrylonitrile/butadiene/styrene copolymer, polycarbonate or mineral oil, wherein the dye has the general formula (I) as defined in claim 1.

4,036,734

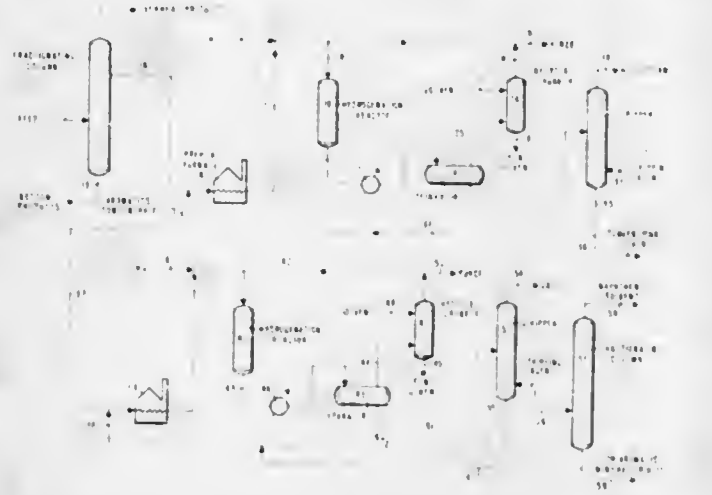
PROCESS FOR MANUFACTURING NAPHTHENIC SOLVENTS AND LOW AROMATICS MINERAL SPIRITS

Richard S. Manne; Sam R. Bethea, and Edward A. Kelso, all of Baytown, Tex., assignors to Exxon Research and Engineering Company, Linden, N.J.

Filed Nov. 2, 1973, Ser. No. 412,065

Int. Cl.^{2} C10G *23/00*

U.S. Cl. 208—57 **16 Claims**



1. A process for the simultaneous production of a naphthenic hydrocarbon liquid useful as a naphthenic solvent and a low aromatics hydrocarbon liquid useful as mineral spirits which comprises blending a hydrocarbon oil boiling within the range between about 100° F. and about 600° F. with an aromatics concentrate which contains at least 50 weight percent aromatics compounds, has an initial boiling point about the same as that of said hydrocarbon oil, and boils within the range between about 100° F. and about 600° F., said hydrocarbon oil having a lower aromatics content then said aromatics concentrate, to produce a blend containing in excess of about 10 weight percent aromatic compounds; hydrogenating said

blend in the presence of a hydrogenation catalyst under conditions sufficient to convert aromatics present in said blend into lower boiling naphthenic compounds; fractionating the hydrogenated blend; and recovering a highly naphthenic overhead fraction containing naphthenic constituents boiling below the initial boiling points of said hydrocarbon oil and said aromatics concentrate and a bottoms fraction of low aromatics content containing constituents present in said blend prior to hydrogenation.

4,036,735

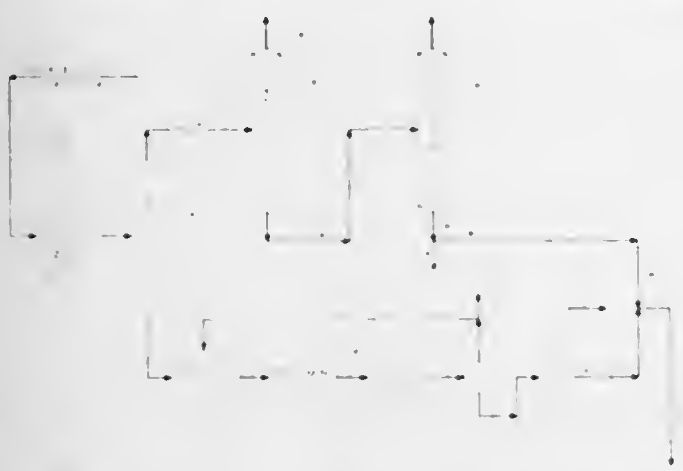
PROCESS FOR UPGRADING MOTOR GASOLINE

Ronald R. Roselius, Richmond, and Alexander G. Edeleanu, Moraga, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Filed Apr. 2, 1973, Ser. No. 347,100

Int. Cl.^{2} C10G *39/00*

U.S. Cl. 208—89 **9 Claims**



1. A process for producing high quality gasoline from a naphtha feedstock comprising:

1. contacting said feedstock together with hydrogen in a hydrotreating zone at hydrotreating conditions, with a hydrotreating catalyst, thereby obtaining a hydrocarbon effluent;
2. separating said hydrocarbon effluent into
   a. a first fraction comprising C_4^- hydrocarbons, and
   b. a second fraction comprising C_5^+ hydrocarbons;
3. contacting at least a portion of said second fraction and hydrogen in a reforming zone at reforming conditions, with a reforming catalyst, thereby obtaining a reformate;
4. contacting at least a portion of said reformate and hydrogen in a hydrocracking zone at hydrocracking conditions with a shape selective hydrocracking catalyst, thereby obtaining a hydrocracking zone effluent comprising a normally gaseous hydrocarbon product and a C_4^+ normally liquid product; and
5. blending at least the C_5^+ portion of said C_4^+ normally liquid product and at least a portion of C_4 hydrocarbons from said first fraction to obtain said high quality gasoline.

4,036,736

PROCESS FOR PRODUCING SYNTHETIC COKING COAL AND TREATING CRACKED OIL

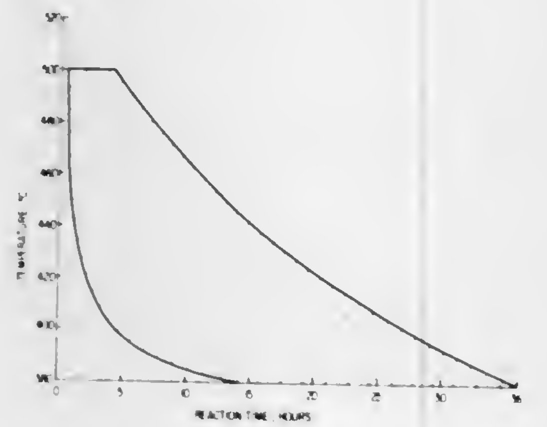
Hiromi Ozaki, Urawa; Mamoru Yamane, Tokyo; Haruo Yoshikai, and Hachio Kodama, both of Toda, all of Japan, assignors to Nippon Mining Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 583,698, June 4, 1975, abandoned, which is a continuation of Ser. No. 428,412, Dec. 26, 1973, abandoned. This application Mar. 12, 1976, Ser. No. 666,309

Claims priority, application Japan, Dec. 22, 1972, 47-128176; July 2, 1973, 48-73676; Germany, Dec. 14, 1973, 2362252; France, Dec. 21, 1973, 73.45985

Int. Cl.^{2} C01G *9/36*

U.S. Cl. 208—106 **9 Claims**



1. A process for producing synthetic coking coal which comprises delayed coking a heavy hydrocarbon oil by:

heating said heavy hydrocarbon oil in a furnace to a coking temperature of from about 380° to about 500° C and sufficient to initiate cracking;

then introducing the heated heavy hydrocarbon oil into a coking drum;

maintaining the heavy hydrocarbon oil in said coking drum for a time ranging from ½ to about 36 hours at said coking temperatures to effect coking thereof;

introducing a diluent gas into the body of said hydrocarbon oil in the coling drum at a flow rate greater than 5 l/hr kg of heavy hydrocarbon oil to maintain the partial vapor pressure of the cracking product vapor over said heavy hydrocarbon oil in said coking drum at about 50 to about 600 mm Hg during said coking;

and recovering a synthetic coking coal having a free-swelling index greater than 4 and containing 20-40 wt.% volatile matter.

4,036,737

HYDROCRACKING IN STRONG ACID SYSTEMS WITH NOBLE METAL COMPONENT

Jos Wristers, Plainfield; Michael Siskin, Maplewood, and Joseph J. Porcelli, Scotch Plains, all of N.J., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 317,610, Dec. 22, 1972, Pat. No. 3,901,790. This application May 14, 1975, Ser. No. 577,350

Int. Cl.^{2} C10G *13/08*

U.S. Cl. 208—108 **13 Claims**

1. A hydrocracking process which comprises contacting a hydrocarbon feedstock which has an initial boiling point of at least about 215° C with hydrogen, under hydrocracking conditions, and with a substantially liquid phase acid catalyst comprised of:

a. a metal fluoride wherein the metal is selected from the group consisting of tantalum, niobium, boron and mixtures thereof;

b. an acid selected from the group consisting of hydrofluoric acid, C_1–C_4 trifluoroalkylsulfonic acid, fluorosulfonic acid and trifluoroacetic acid; and

c. a supported Group VIII noble metal hydrogenation component; the acid being present in at least an equimolar ratio relative to the metal fluoride and at least a portion of the metal fluoride is dissolved in the acid, the hydrogenation component being dispersed in the liquid acid phase and recovering a hydrocarbon product having an average molecular weight lower than the molecular weight of the feedstock.

4,036,738

HYDROCRACKING IN STRONG ACID SYSTEMS WITH PALLADIUM OR IRIDIUM

Jos Wristers, Plainfield, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed May 14, 1975, Ser. No. 577,349

Int. Cl.^{2} C10G *13/08*

U.S. Cl. 208—108 **14 Claims**

1. A hydrocracking process which comprises contacting a hydrocarbon feedstock which has an initial boiling point of at least about 215° C with hydrogen, under hydrocracking conditions, and with a substantially liquid phase acid catalyst comprised of:

a. a metal fluoride wherein the metal is selected from the group consisting of tanalum, niobium, boron and mixtures thereof;

b. an acid selected from the group consisting of hydrofluoric acid, C_1-C_4 trifluoroalkylsulfonic acid, and trifluoroacetic acid; and

c. a supported palladium or iridium hydrogenation component; the acid being present in at least an equimolar ratio relative to the metal fluoride and at least a portion of the metal fluoride is dissolved in the acid, the supported palladium or iridium being dispersed in the liquid acid phase and recovering a hydrocarbon product having an average molecular weight lower than the molecular weight of the feedstock.

4,036,739

CATALYTIC CRACKING PROCESS USING AMMONIA-STABLE ZEOLITE CATALYST

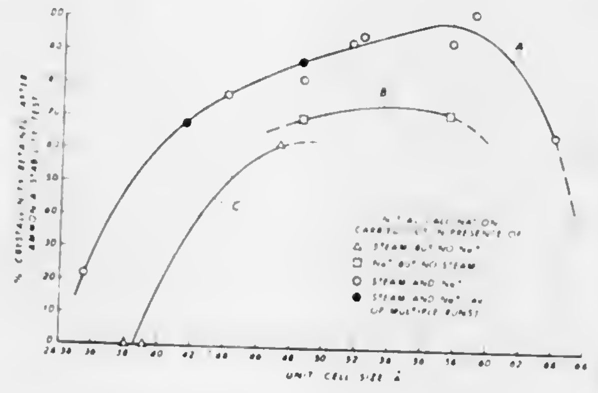
John W. Ward, Yorba Linda, Calif., assignor to Union Oil Company of America, Los Angeles, Calif.

Continuation-in-part of Ser. No. 406,684, Oct. 15, 1973, Pat. No. 3,929,672, which is a continuation-in-part of Ser. No. 191,123, Oct. 20, 1971, abandoned, and Ser. No. 236,185, March 20, 1972, Pat. No. 3,781,199. This application July 22, 1975, Ser. No. 598,114

The portion of the term of this patent subsequent to Dec. 16, 1992, has been disclaimed.

Int. Cl.^{2} C10G *11/04;* B01J *29/12*

U.S. Cl. 208—120 **10 Claims**



1. A process for the catalytic cracking of a hydrocarbon feedstock to produce lower boiling hydrocarbons, which comprises contacting said feedstock, under non-hydrogenative cracking conditions, with a cracking catalyst comprising a major proportion of a refractory oxide of a difficulty reducible metal, and intimately admixed therewith a minor proportion of an ammonia-stable Y zeolite composition prepared by the steps of:

1. calcining an ammonium-sodium Y zeolite containing about 0.6 – 5 weight-percent of sodium as Na_2O, said calcining being carried out at a temperature between about 600° and 1650° F in contact with at last about 0.2 psi of water vapor for a sufficient time to substantially reduce the unit cell size of said zeolite and bring it to a value between about 24.40 and 24.64 A;
2. subjecting the calcined zeolite to further ammonium ion exchange under conditions adjusted to replace at least about 25 percent of its residual zeolitic sodium ions with ammonium ions and produce a final product containing less than about 1 weight-percent Na_2O; and
3. calcining the product from step (2) at a temperature between about 600° and 1500° F for a time sufficient to effect substantial deammoniation, but insufficient to reduce the unit cell size thereof to below about 24.40 A.

4,036,740

HYDROCARBON CATALYTIC CRACKING PROCESS

Thomas C. Readal; Joel D. McKinney, and Robert A. Titmus, all of Pittsburgh, Pa., assignors to Gulf Research & Development Company, Pittsburgh, Pa.

Filed Oct. 28, 1975, Ser. No. 625,836

Int. Cl.^{2} C10G *11/04;* B01J *8/24*

U.S. Cl. 208—120 **7 Claims**

1. In a process which comprises contacting a hydrocarbon feed with a cracking catalyst in a cracking zone under cracking conditions to produce a lower boiling gasoline fraction and thereafter heating the deactivated catalyst in the presence of oxygen in a regeneration zone to a temperature in the range of 800° to 1600° F. until the concentration of carbon on the catalyst is less than 0.3 weight percent; the improvement which comprises conducting the cracking process until the concentration of metal contaminants on the catalyst is at least 1500 ppm nickel equivalents, determining the carbon dioxide and carbon monoxide concentrations in the gaseous effluent withdrawn from said regeneration zone, and adjusting the rate of flow in said hydrocarbon feed to said cracking zone of a treating agent selected from the group consisting of antimony, bismuth, manganese and compounds of such treating agents convertible to the oxide form so as to maintain a volume ratio of carbon dioxide to carbon monoxide in said gaseous effluent of at least 2.2.

4,036,741

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

Ernest L. Pollitzer, Skokie, and John C. Hayes, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 538,240, Jan. 2, 1975, Pat. No. 3,957,624. This application Mar. 3, 1976, Ser. No. 663,418

The portion of the term of this patent subsequent to May 18, 1993, has been disclaimed.

Int. Cl.^{2} C10G *35/06*

U.S. Cl. 208—139 **·27 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state

under hydrocarbon conversion conditions or in a mixture of these states.

24. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % germanium, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the corresponding elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,036,742

HYDROCARBON CONVERSION WITH AN ACIDIC SULFUR-FREE MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 656,925, Feb. 10, 1976. which is a continuation-in-part of Ser. No. 550,083, Feb. 14, 1975, Pat. No. 3,939,059. This application Aug. 9, 1976, Ser. No. 713,020

Int. Cl.^{2} C10G *35/08*

U.S. Cl. 208—139 **28 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon conversion conditions with an acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, about 0.001 to about 1 wt. % germanium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, rhenium and germanium are uniformly dispersed throughout the porous carrier material, wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

25. An acidic sulfur-free catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.1 to about 5 wt. % cobalt, about 0.01 to about 2 wt. % rhenium, about 0.001 to about 1 wt. % germanium and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt, rhenium and germanium are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; wherein substantially all of the germanium is present in an oxidation state above that of the elemental metal; and wherein substantially all of the rhenium and catalytically available cobalt are present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,036,743

HYDROCARBON CONVERSION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 20, 1976, Ser. No. 724,892

Int. Cl.^{2} C01G *35/08*

U.S. Cl. 208—139 **23 Claims**

1. A process for converting a hydrocarbon which comprises contacting the hydrocarbon at hydrocarbon conversion conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % bismuth, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

23. An acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % nickel, about 0.01 to about 5 wt. % bismuth, and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available nickel, and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available nickel is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under hydrocarbon conversion conditions or in a mixture of these states.

4,036,744

OLEFIN SEPARATION PROCESS

Donald H. Rosback, Elmhurst, and Richard W. Neuzil, Downers Grove, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 531,656, Dec. 11, 1974, Pat. No. 3,969,223, which is a continuation-in-part of Ser. No. 423,599, Dec. 10, 1973, abandoned, which is a division of Ser. No. 317,861, Dec. 22, 1972, Pat. No. 3,929,669. This application July 28, 1975, Ser. No. 599,918

Int. Cl.^{2} C10G *25/04;* **B01J** *29/08*

U.S. Cl. 208—310 Z **10 Claims**

1. In a process for the separation of olefins from a feed mixture comprisng olefins and saturates which process comprises the steps of:

a. contacting at adsorption conditions said mixture with an adsordent comprising sodium type Y zeolite; and,

b. selectively adsorbing said olefins to the substantial exclusion of said saturates and thereafter recovering said olefins,

the improvement which comprises employing an adsorbent prepared by the steps of:

i. contacting a precursor mass comprising a type Y zeolite having a Na_2O/al_2O_3 ratio less then about 0.7 with an aqueous sodium hydroxide solution having a sodium hydroxide cencentration of from about 0.5 to 10% by weight at a temperature of from about 50° to 300° F. for a time period of from about 0.5 to 5 hours to increase the sodium cation content to a Na_2O/Al_2O_3 ratio of greater than about 0.7 and to remove from about 1 to about 15 wt.% silica and alumina from the precursor mass;

ii. washing said mass with water maintained at pH greater than 7 to remove excess sodium hydroxide solution and,

iii. at least partially dehydrating said mass at dehydrating conditions.

4,036,745

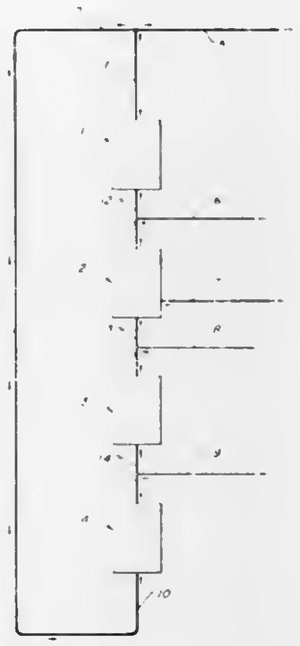
PROCESS FOR SEPARATING NORMAL AND ISOPARAFFINS

Donald B. Broughton, Evanston, Ill., assignor to UOP Inc., Des Plaines, Ill.

Filed Sept. 24, 1975, Ser. No. 616,470

Int. Cl.^{2} C10G *25/04*

U.S. Cl. 208—310 Z **14 Claims**



1. In a process for the separation of normal paraffins from a feed stream containing a mixture of normal paraffins and isoparaffins along with aromatic hydrocarbons which process employs an adsorbent consisting essentially of a 5A zeolite and comprises the steps of:

a. contacting said adsorbent with said feed at adsorption conditions to effect the selective adsorption of normal paraffins and a portion of the aromatic hydrocarbons by said adsorbent;

b. removing a raffinate stream comprising less selectively adsorbed isoparaffins from said adsorbent;

(c) contacting said adsorbent with a desorbent material at desorption conditions to effect the desorption of normal paraffins from said adsorbent;

(d) removing from said adsorbent an extract stream comprising normal paraffins, and;

(e) passing at least a portion of said extract stream to a separation means and therein separating at separation conditions normal paraffins from desorbent material,

The improvement which comprises using a two-step desorption operation which comprises the steps of:

i. contacting at first desorption conditions said adsorbent with a first desorbent material. said material comprising an aromatic hydrocarbon having a boiling point different than said mixture to effect the desorption of said feed aromatic hydrocarbons;

ii. removing a first extract stream comprising said feed aromatic hydrocarbons and said first desorbent material from said adsorbent;

iii. contacting at second desorption conditions said adsorbent with a second desorbent material to effect the desorption of normal paraffins:

iv. removing a second extract stream comprising normal paraffins and second desorbent material from said adsorbent; and

v. passing at least a portion of said second extract stream to a separation means and therein separating at separation conditions normal paraffins from said second desorbent material.

4,036,746

FLOTATION WITH AMINE-STABILIZED DIALKYL DITHIOPHOSPHATES

Lawrence Evans Strow, and Franklin Anderson Bolth, both of Baltimore, Md., assignors to Minerec Corporation, New York, N.Y.

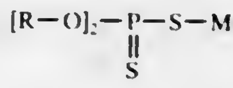
Division of Ser. No. 497,905, Aug. 16, 1974, Pat. No. 3,971,836. This application Mar. 22, 1976, Ser. No. 669,256

Int. Cl.^{2} B03D *1/02*

U.S. Cl. 209—166 **3 Claims**

1. In the flotation of finely divided copper sulfide ores for the recovery of contained mineral values, the improvement comprising utilizing as a promoter therein a neutralized storage-stable mixture of:

an aqueous solution of a dialkyl dithiophosphate having the general formula



$$[R-O]_2-\underset{\underset{S}{\|}}{P}-S-Me$$

where R is an alkyl group having 3 to 6 carbon atoms and Me is a dissociating cation; said solution being neutralized with sufficient caustic to remove all initial acidity and 0.5 to 5% by weight of a trialkyl amine.

4,036,747

ADSORBENT FOR RECYCLING ARTIFICIAL KIDNEY

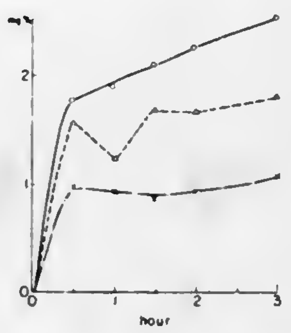
Masatake Hori, and Shintaro Kikuchi, both of Hyogo, Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Continuation of Ser. No. 446,105, Feb. 26, 1974, abandoned. This application June 24, 1975, Ser. No. 589,835

Claims priority, application Japan, Feb. 27, 1973, 48-23508

Int. Cl.^{2} B01D *13/00*

U.S. Cl. 210—22 A **1 Claim**



1. In a method for removing uremic wastes from dialyzed fluid in an artificial kidney of the recycle type which comprises treating artificial kidney dialyzate with an adsorbent, the improvement according to which the adsorbent consists essentially of activated carbon and gel-type alumina, the ratio of activated carbon to gel-type alumina being 10:1 to 10:10 by weight, the gel-type alumina employed being that produced by the process which comprises neutralizing an aqueous solution of an aluminum salt by the addition of an alkali, removing the salt formed and other solutes by aqueous washing to obtain an alumina sol, maintaining said sol in a hydrophobic medium under heating to thereby cause it to age into a gel and drying the said gel, the gel-type alumina containing silica in an amount of from 0 to 30% by weight.

4,036,748

ASYMMETRIC, SEMIPERMEABLE MEMBRANES OF POLYBENZ-1,3-OXAZINE DIONES-(2,4)

Birger Knickel, Meerbusch-Lang; Rudolf Binsack, Krefeld; Hans Rudolph, Krefeld; Hans Jurgen Rosenkranz, Krefeld, and Ludwig Bottenbruch, Krefeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed Apr. 16, 1975, Ser. No. 568,605

Claims priority, application Germany, Apr. 19, 1974, 2418996

Int. Cl.^{2} B01D *13/00*

U.S. Cl. 210—23 H **6 Claims**

1. In the method of desalination of sea water by reverse osmosis employing a membrane, the improvement wherein said membrane is an asymmetric semipermeable membrane of a homoor copoly-benz-1,3-oxazine dione-(2,4).

4,036,749

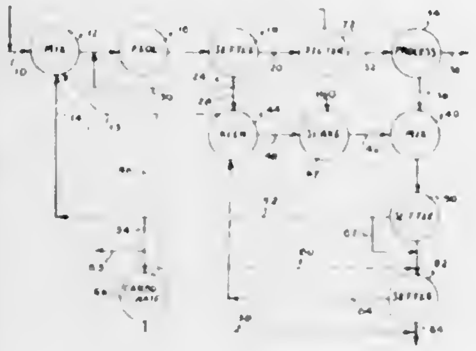
PURIFICATION OF SALINE WATER

Donald R. Anderson, 3062 Blume Drive, Los Alamitos, Calif. 90720

Continuation-in-part of Ser. No. 573,045, April 30, 1975, abandoned. This application Nov. 8, 1976, Ser. No. 739,620

Int. Cl.^{2} B01D *13/02, 21/01;* **C02B** *1/20*

U.S. Cl. 210—23 H **10 Claims**



1. A method for selectively removing calcium salts from raw water containing dissolved salts, including calcium bicarbonate, in a total amount no greater than about 10,000 parts per million, and for purifying the water wherein said dissolved salts in said raw water are concentrated in a residual portion during said purification thereof to a content approaching their solubility limits at the purification processing conditions, which comprises the following sequential steps for reducing the volume of said residual portion:

a. adding magnesium hydroxide precipitant to the raw water in an amount sufficient to precipitate calcium carbonate settling said precipitate, and recovering a treated water having a substantially reduced dissolved calcium content that said raw water and passing said treated water to said processing;

b. processing said treated water to separate a purified water from a residual water enriched with salts by reverse osmosis, distillation, electrodiaylsis or freezing;

c. adding calcium hydroxide to at least a portion of the residual water from said processing in an amount sufficient to precipitate soluble magnesium values in said waste brine as insoluble magnesium hydroxide; and

d. separating magnesium as magnesium hydroxide from said waste brine and returning the separated magnesium hydroxide as substantially the entirity of the precipitant to step (a).

4,036,750

USE OF ACTIVATED FLUID COKE TO REMOVE ORGANIC CONTAMINANTS FROM WASTE WATERS

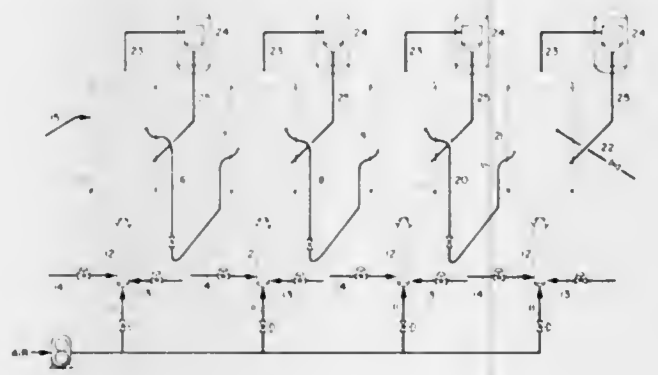
Stanley E. Jaros, North Plainfield, N.J., and William J. Metrailer, Baton Rouge, La., assignors to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 454,279, March 25, 1974, abandoned, which is a continuation of Ser. No. 267,232, June 28, 1972, abandoned. This application Jan. 20, 1975, Ser. No. 542,587

The portion of the term of this patent subsequent to Oct. 18, 1991, has been disclaimed.

Int. Cl.^{2} B01D *15/02*

U.S. Cl. 210—27 **14 Claims**



1. A countercurrent process for removing organic contaminants from waste water which comprises the steps of:

1. introducing activated fluid coke suspended in water into the top of a vessel;
2. introducing said waste water into the bottom of the vessel and passing the same upwardly therethrough in contact with said activated fluid coke;
3. removing in a water slurry from the bottom of said vessel activated fluid coke containing organic contaminants; and
4. recovering waste water depleted in organic contaminants from the top of the vessel;

said activated fluid coke being characterized by having a total surface area of at least 400 square meters per gram, a pore volume of at least 0.2 cubic centimeters per gram, an ash content of about 0.15 weight percent and an average particle size ranging from about 50 to about 600 microns.

4,036,751

METHOD OF TREATING WATER CONTAINING CHROMATE

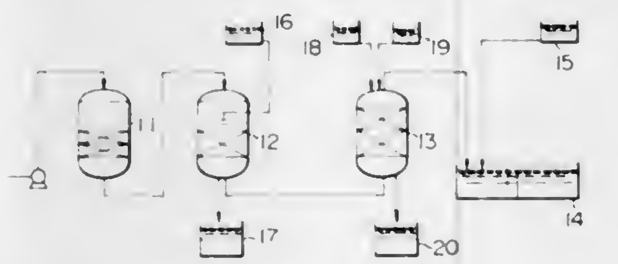
Nobuhiro Orita; Koichi Yabe, both of Yokohama, and Akifumi Kawanami, Kohnosu, all of Japan, assignors to Kurita Water Industries Ltd., Osaka, Japan

Filed Apr. 30, 1976, Ser. No. 681,781

Claims priority, application Japan, Jan. 23, 1976, 51-6807

Int. Cl.^{2} B01D *15/06;* **B01J** *1/09;* **C02B** *1/56, 1/76*

U.S. Cl. 210—35 **12 Claims**



1. A method of treating water contaminated with chromate ions, which consists essentially of the steps of

a. flowing said water through a bed of weakly acidic cation exchange resin, at least a major portion of which is in H-form, to adjust the pH of the water to from 3 to 5 and to transform the chromate ions in said water to bichromate ions,

b. then passing the water discharged from step (a) through one or more beds of weakly basic, salt-form, anion exchange resin to remove bichromate ions from said water,

c. and recovering a treated water product from the water discharged from step (b)

the steps (a), (b) and (c) being carried out until the bichromate ion content of the treated water product rises to a selected level,

d. then flowing an alkali metal hydroxide solution through said bed of beds of weakly basic anion exchange resin in the reverse direction to the direction in which the water has previously been flowed therethrough in order to elute the bichromate ion therefrom and to convert said weakly basic anion exchange resin to the hydroxyl form,

e. flowing an acid solution through said bed or beds of weakly basic anion exchange resin to transform same into said salt form,

f. flowing an acid solution through said bed of cation exchange resin to transform same to weakly acidic cation exchange resin in H-form

and then repeating the steps (a), (b) and (c).

4,036,752

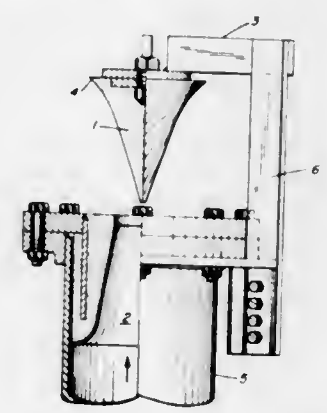
DEWATERING CLAY SLURRIES

Marvin Stevens Lassiter, Sr., Lakeland, Fla., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 543,763, Jan. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 410,840, Oct. 29, 1973, abandoned. This application Nov. 3, 1975, Ser. No. 628,031

Int. Cl.^{2} B01D *21/01*

U.S. Cl. 210—46 **6 Claims**



1. A process for removing water from slurried waste clay products of ore processing operations comprising

depositing slurried slimes of about 3 to 5 % solids into a mined out area until the area is full,

removing supernatant water settling the slimes, from the settled clay wastes until about one foot of water remains upon the slurried slimes,

floating sprinkler heads on the water the sprinkler heads being attached to spray line means connected to a source of sand slurry,

spraying sand slurry over the surface of the waste product with a spray nozzle unit comprised of a nozzle mounted in a pipe tee for dispersing the sand slurry upward, a cone deflector with a configuration of a Tractrix curve mounted with brackets above the nozzle on a vertical arm which connects at its lower end to the pipe tee, and pressure means for propelling the sand slurry through the nozzle and against and away from the cone to cause a circular spray of sand slurry wherein the ratio of waste sands sprayed over waste clays varies from 25/75 to 75/25 on dry weight basis and removing water from the sand sprayed slurry.

4,036,753

PYROLYSIS PROCESS FOR TREATING SEWAGE SLUDGE CONTAINING CHROMIUM

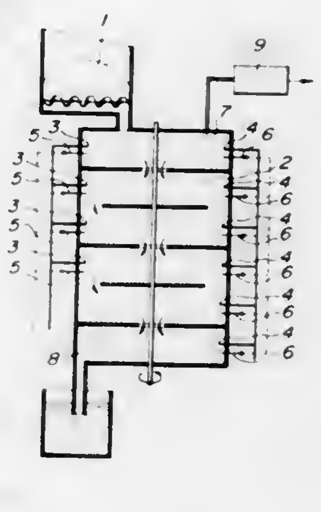
Tsuyoshi Majima, Toyokawa, and Katsunosuke Hara, Kariya, both of Japan, assignors to NGK Insulators, Ltd., Nagoya, Japan

Filed July 6, 1976, Ser. No. 703,011

Claims priority, application Japan, July 18, 1975, 50-87896

Int. Cl.^{2} C02C *3/00*

U.S. Cl. 210—63 R **3 Claims**



1. A pyrolysis process for treating sewage sludge containing chromium, which comprises

burning combustible gas produced by thermal decomposition of the sewage sludge in a pyrolysis furnace by supplying oxygen of less than the theoretical amount necessary for burning the sewage sludge, and

keeping the partial pressure of oxygen in the furnace substantially at zero.

4,036,754

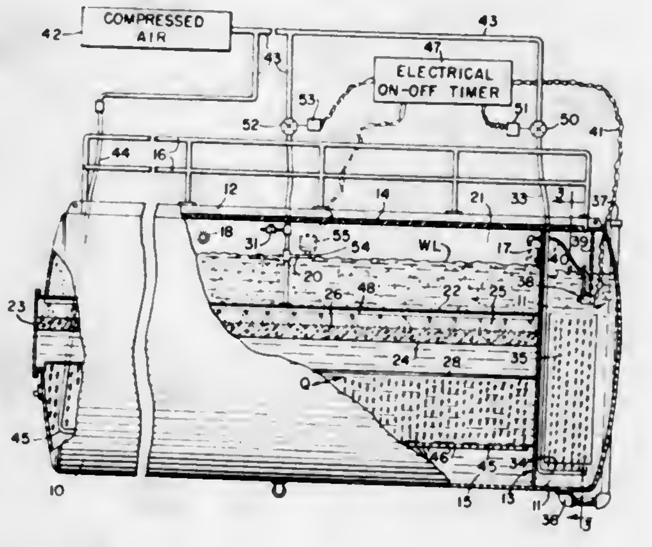
SEWAGE TREATMENT APPARATUS

Howard P. Peasley, 7923 Chowning Road, Richmond, Va. 23229

Filed Aug. 4, 1976, Ser. No. 711,762

Int. Cl.^{2} C02C *1/12;* **B01D** *23/24*

U.S. Cl. 210—139 **12 Claims**



1. Apparatus for treating a mixed liquor of sewage water and solids by bacterial digestion to recover clarified effluent water, comprising:

a. a main treatment tank having means to introduce sewage into the tank and having means to aerate and circulate the mixed liquor, and having a smaller internal clarification compartment communicating into the main tank at a location about which the liquor circulates;

b. effluent pipe means coupled with the clarification compartment and operative to drain clarified effluent therefrom when the liquid level in the clarification compartment is at the drainage level of the pipe;

c an auxiliary compartment adjacent the main treatment tank and separated therefrom by a weir located higher than said drainage level and disposed so that a proportion of the mixed liquor circulting in the main tank will overflow the weir into the auxiliary compartment when the level of the liquid in the main tank is raised to said weir level;

d. means for periodically backflushing the contents of the clarification compartment to displace the contents into the main tank and raise the liquid level in the tank above the level of the weir and cause overflow of the mixed liquor into the auxiliary compartment;

e. second means operative between each periodic backflushing for aerating and circulating the contents of said auxiliary compartment, and further including means for disabling said second aerating means to permit settling of solids in the auxiliary chamber to leave a supernatant liquid therein; and

f. means for transferring the supernatant liquid back into the main tank.

9. Apparatus for treating sewage materials by bacterial digestion to recover clarified effluent water therefrom, comprising:

a. a closed main treatment tank having a partition at the one end, the partition having an overflow weir therethrough at a first level near the top of the tank;

b. means for delivering raw sewage into the tank;

c. a clarification compartment comprising an outer wall which is approximately cylindrical about a horizontal axis, the compartment being small in volume as compared with the volume of the main tank and being disposed with its axis near the center of the tank, and the compartment having a longitudinal slot opening through its bottom communicating into the main tank;

d. a digester compartment connected to the tank at the partition and located to receive overflow from the main tank via the weir when the level in the main tank exceeds said first level, and having means to draw off materials from the bottom of the digester compartment;

e. an effluent pipe extending into the tank at a second level below the level of the weir, and connected with the top of the clarification compartment and including a drainage valve which is normally open to maintain the level of the water in the tank at said second level by draining effluent water collected from the top of the clarification compartment, and the drainage valve being selectively closeable;

f. first aeration means in the main tank operative to aerate the sewage therein and to cause it to circulate about the clarification compartment;

g. second aeration means in the digester compartment selectively controllable to inject air to aerate the sewage therein and to cause it to circulate to maintain solid materials in suspension, and to cease injecting air to permit solid materials to settle toward said draw-off means; and

h. compressed air means operative to inject air into the top of the clarification compartment to purge it by backflushing its contents through said slot and displace the contents into the main tank, the volume of the clarification compartment being sufficient that when its contents are displaced into the tank part of the contents of the main tank overflow the weir into the digester compartment.

4,036,755

FILTER FOR CLEANING LUBRICATING OIL IN INTERNAL COMBUSTION ENGINES

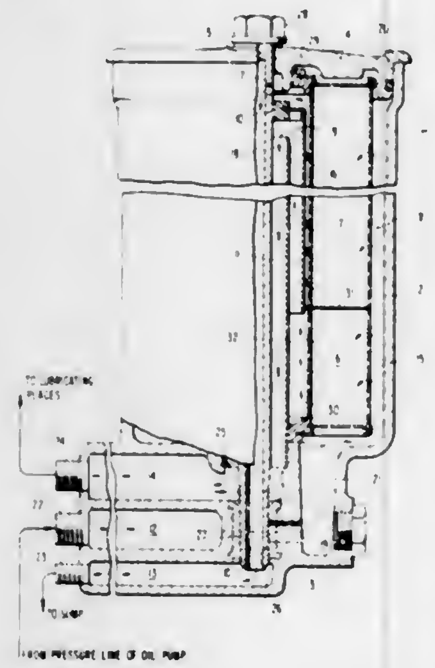
Wolfram Dahm, Raidwangen; Josef Lederhaas, Denkendorf; Roland Merkle; Horst Lutz, both of Stuttgart; Peter Moser, Weinstadt-Beutelsbach; Friedrich Noltemeyer, Hohenacker, and Heinz Roger, Stuttgart, all of Germany, assignors to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 19, 1975, Ser. No. 642,568

Claims priority, application Germany, Dec. 19, 1974, 2460073

Int. Cl.² F01M *1/10*

U.S. Cl. 210—168 **23 Claims**



1. A filter for cleaning lubricating oil in internal combustion engines comprising

at least one filter insert means for cleaning lubricating oil, said filter insert means including a main filter and a fine filter arranged coaxially;

filter housing means for accommodating said filter insert means, said filter housing means comprising a housing member having (a) a hollow interior portion for accommodating said filter insert means, (b) an insert opening disposed at the top of said housing member for inserting said filter insert means, (c) a bottom portion closing off said hollow interior portion, said bottom portion including a plurality of separate channel means in operative communication with said hollow interior portion for respectively introducing dirty oil into said filter housing means and discharging clean oil from said filter housing means, and (d) cover means for covering said insert opening;

bolt means engaging said bottom portion for securing said cover means to said housing member, said bolt means including bore means axially extending from a geodetically upper portion of said housing member at said cover means to a geodetically lower portion of said housing member at said bottom portion for circulating auxiliary clean oil from said fine filter from said geodetically upper portion to a first of said plurality of separate channel means for discharging said auxiliary clean oil;

drainage connection means for operatively communicating said first channel means with said hollow interior portion separately from a second of said plurality of separate channel means for introducing said dirty oil, said drainage connection means being operatively closed off by an end portion of said bolt means at said bottom portion, wherein, upon moving said end portion to open said drainage connection means, oil from said hollow interior portion drains through said first channel means;

partition pipe means extending approximately over the entire length of said fine filter for conducting said auxiliary clean oil from said fine filter to said bore means at said geodetically upper portion;

upright pipe means provided between said partition pipe means and said bolt means for conducting main clean oil from said main filter to a third of said plurality of separate channel means for discharging said main clean oil, said upright pipe means extending from approximately said geodetically upper portion and being connected to said bottom portion so that said main clean oil flows from said approximately geodetically upper portion to said third channel means separately from said second channel means.

4,036,756

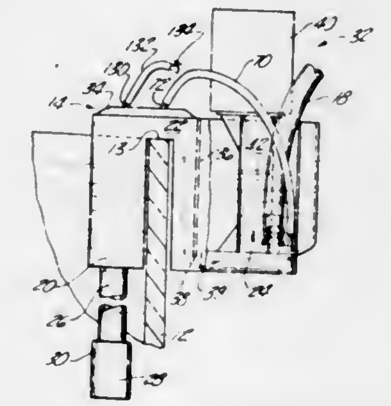
AQUARIUM FILTER ASSEMBLY

Denzel J. Dockery, 3317 E. Bristol Road, Burton, Mich. 48529

Filed June 10, 1975, Ser. No. 585,691

Int. Cl.² E04H *3/20*

U.S. Cl. 210—169 **11 Claims**



1. For use with an aquarium tank having at least one vertical wall and an interior at least partly filled with water, a device comprising,

a filter having an inlet and an outlet with said filter outlet open to the interior of said aquarium tank,

a housing adapted to be mounted on one wall of said aquarium tank, said housing having a first hollow portion positioned on the interior of and extending downwardly into the tank so that the interior of the housing first portion is in fluid communication with the water in the interior of the tank, a second hollow portion adapted to sit upon said last mentioned wall of said tank so that the interior of the housing second portion is open to the upper end of the interior of the housing first portion, a third hollow portion positioned exteriorly of said tank, the interior of said third portion forming a downwardly extending fluid channel open at its top to the interior of said second housing portion, and a fourth hollow portion disposed exteriorly of said tank and horizontally adjacent said third housing portion, wherein the interior of said fourth portion is in fluid communication with the bottom of said fluid channel and whereby fluid communication is established between the interiors of said tank and said housing fourth portion through the interiors of said housing first, second, and third portions,

pump means carried in said housing fourth portion, said pump means having a housing, said pump housing having a fluid inlet open to the interior of said fourth housing portion and a fluid outlet fluidly connected to said filter inlet, and

venturi passage means integrally formed in said pump housing for creating a partial vacuum at a port in said pump housing upon actuation of said pump means, and

conduit means for connecting said port to an upper part of said housing second portion and open to the interior of said housing second portion, whereby upon actuation of said pump means, said venturi passage means and said conduit means evacuate the interior of said housing second portion and siphon water from said aquarium tank into the interior of the housing second portion to thereby establish water flow from said aquarium tank into the interior of said housing fourth portion.

4,036,757

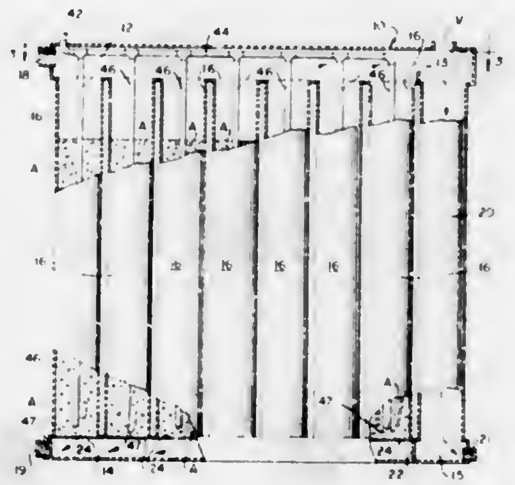
BACKFLUSH FILTER SYSTEM

Howard P. Peasley, 7923 Chowning Road, Richmond, Va. 23229

Filed Aug. 4, 1976, Ser. No. 711,763

Int. Cl.² B01D *23/24, 29/08*

U.S. Cl. 210—196 **9 Claims**



1. A filter system to be backflushed during a purge cycle, the filter system being coupled to receive substantially clarified water from a main treatment unit, said system comprising:

a. multiple upright filter columns, each column being tall and narrow and having an upper end and a lower end and each column being substantially filled with filter aggregate;

b. upper header means communicating with the upper ends of said filter columns, and having an inlet connected to receive said substantially clarified water;

c. lower header means communicating with the lower ends of said filter columns and having an outlet to discharge the filtered water from the columns;

d. backflush receiving tube means communicating with the upper header means and coupled to means operative to discharge into said main treatment unit during a purge cycle;

e. means for introducing compressed air during purge cycles into the filter aggregate comprising a stand pipe entering each filter column from above the upper end thereof and extending through the aggregate and having an opening substantially at the lower end of each column, pipe means connecting the upper ends of the stand pipes to a source of compressed air, and valve means connected in said pipe means and operative during purge cycles to admit compressed air into the stand pipes;

f. means for backflushing filtered water upwardly in the columns from the lower header means during purge cycles simultaneously with said introduction of compressed air and the upward flow thereof from the opening in each stand pipe; and

g. control means for initiating said purge cycles and opening said valve means.

4,036,758

FLUID FILTER

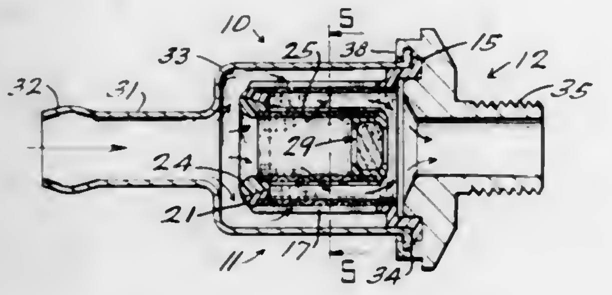
John F. Combest, Findlay, Ohio, assignor to R. L. Kuss & Co., Inc., Findlay, Ohio

Filed Sept. 8, 1976, Ser. No. 721,804

Int. Cl.² B01D *35/06*

U.S. Cl. 210—223 **10 Claims**

1. A fluid filter comprising, in combination, an external housing encompassing an internal filter structure, said housing including a generally hollow shell having an open end and a closed end with a fluid inlet fitting therein and an end bell secured over said open end with a fluid outlet generally opposite said fluid inlet, said internal filter structure including a first hollow filter basket, having an outer diameter less than the inner diameter of said housing and having a peripheral flange on one end secured between the adjacent surfaces of said shell and said end bell to position it axially within said shell between said filter inlet and outlet, and first filter basket further including a circumferential wall of fluid filter media and an opposite end positioned axially toward said fluid inlet, and a second hollow filter basket positioned coaxially within said first basket, said second basket also including a circumferential wall of fluid filter media with a peripheral end flange at the inlet end of said second basket in nested engagement with said opposite end of said first basket to provide a pair of radially spaced apart circumferential filter baskets positioned within said housing between the inlet and outlet thereof, and an impervious radially extending fluid barrier extending across the peripheral outlet end of said second basket whereby fluid entering said housing is caused to flow either radially outwardly through said filter media of said second basket or radially inwardly through the filter media of said basket toward said said fluid outlet.



4,036,759
APPARATUS AND SYSTEM FOR STABILIZING THE DISC ELEMENTS OF A ROTARY CONCENTRATOR FOR SOLIDS-CONTAINING FLUIDS

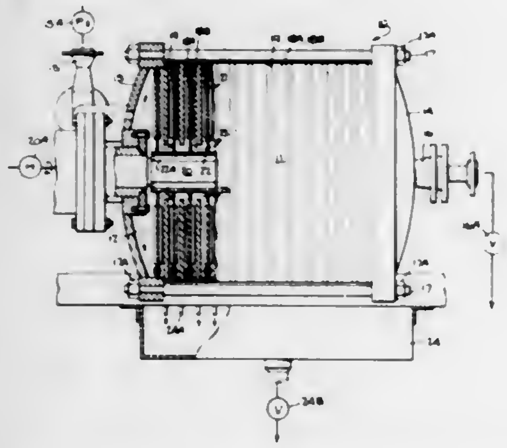
James Donovan, Cambridge, Mass., assignor to Artisan Industries Inc., Waltham, Mass.

Continuation of Ser. No. 596,639, July 17, 1975, Pat. No. 3,989,629. This application Sept. 17, 1976, Ser. No. 724,176

The portion of the term of this patent subsequent to Nov. 2, 1993, has been disclaimed.

Int. Cl.^{2} B01D *25/38*

U.S. Cl. 210—298 **3 Claims**



1. In an apparatus for continuous separation of a solids-containing fluid into a vehicle fluid and a concentrated slurry of solids which includes (1) a housing characterized by an interior surface and a longitudinal axis and having an inlet for introducing a solids-containing fluid into said housing and an outlet for removing a concentrated slurry of solids therefrom; (2) at least two substantially parallel, coaxially disposed, spaced-apart annular elements mounted within said housing on the longitudinal axis thereof and established stationarily with respect thereto between said inlet and said outlet; (3) a rotor shaft extending within said housing along the longitudinal axis thereof and passing coaxially through said annular elements in spaced diametral relation thereto leaving openings for fluid flow between the outer surface of said shaft and the inner circumferential surfaces of said annular elements, said shaft being rotatable with respect to said housing and said annular elements, and (4) a radially extensive rotor element having one side and another, opposite side and an outside edge mounted to said rotor shaft to turn therewith with its outside edge terminating in spaced relation to the interior surface of said housing and positioned between said spaced-apart annular elements to define a flow path for solids-containing fluid from said inlet to said outlet extending across at least one side of one of said spaced-apart annular elements between it and one side of said rotor elements, then between the outside edge of said rotor element and the interior surface of said housing and then between the other, opposite side of said rotor element and the other of said annular elements with at least one of those elements being a filter means comprising a filter chamber having at least one filtering surface serving as a boundary of said flow path with the interior of that chamber being in fluid flow communication with the exterior of said housing for the removal of filtrate vehicle fluid from that chamber, the improvement comprising at least one stabilizing member secured to the inner circumferential surface of at least one of said annular elements and having a portion extending radially from said one element toward said rotor shaft, and means on the rotor shaft for receiving said portion of the stabilizing member in a circular recess the generative center of which is on the longitudinal axis of the rotor shaft.

4,036,760
FLUID FRACTIONATING MEMBRANE APPARATUS

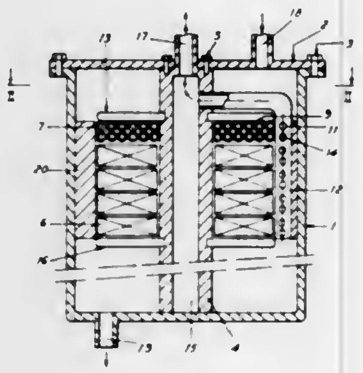
Claude Bardonnet, Lyon; Robert Brun, Bollene, and Michel Pages, St. Martin D'Ardeche, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed July 3, 1975, Ser. No. 592,993

Claims priority, application France, July 5, 1974, 74.23440

Int. Cl.^{2} B01D *31/00*

U.S. Cl. 210—323 R **11 Claims**



1. Fluid fractionating apparatus comprising, in combination:

a. a jacket;

b. at least one core within said jacket;

c. at least one coil comprising at least two continuous porous membrane support elements, each having internally at least one longitudinal channel, each of the at least two continuous support elements being wound uniformly around the at least one core, which thereby acts as a support for the said at least one coil;

d. a membrane covering each said support element externally within said jacket and being adherent to said at least one support element;

e. a manifold extending within said jacket and communicating with the exterior of the apparatus and connected in a leakproof manner to the longitudinal channel at at least one end of each said continuous porous membrane support elements; and

f. a fluid inlet and a fluid outlet for introducing and extracting a fluid to and from said jacket, the said fluid being thus able to flow in the jacket and outside the membrane support elements.

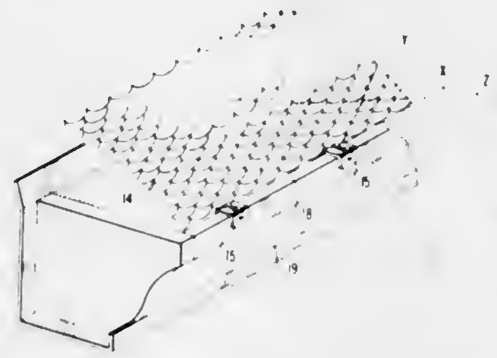
4,036,761
GUTTER GUARD

Armand T. Rankin, New Albany, Ind., assignor to Stone City Products, Inc., Bedford, Ind.

Filed July 22, 1976, Ser. No. 707,779

Int. Cl.^{2} B01D *25/04. 23/00*

U.S. Cl. 210—474 **2 Claims**



1. In combination with a flanged gutter attached to the leading edge of a sloped roof of a building, a screen guard therefor utilizing an elongated screen extending along the length of said gutter and there across, said screen consisting of two diagonally intersecting members forming the apex of a triangle-shaped aperture, and the member constructed and arranged to provide a base for said triangular-shaped opening of said screen, a plurality of substantially U-shaped clips spaced along the length of the flange of said gutter, the upper portion of said clips consisting of a horizontal member with one end resiliently connected to the spring clip, and with at least one rotational node constructed and arranged between the ends of said horizontal member, the third member of said screen forming the base of the triangular-shaped opening therein, located under said rotational node and above the upper surface of the flange of said gutter whereby said screen may be rotated into two rotational positions, one position being located on the edge of the gutter flange nearest the roof and the other position being located directly to the rear of the first node on the outer edge of the flange.

4,036,762
WIRELESS REMOTE-CONTROL SYSTEM FOR A CAMERA OR THE LIKE

Otto Troetscher, Aalen; Erwin Wiedmann, Essingen; Horst Stahl, Oberkochen, and Helmut Forberich, Bad Kreuznach, all of Germany, assignors to Carl Zeiss-Stiftung, Wurttemberg, Germany

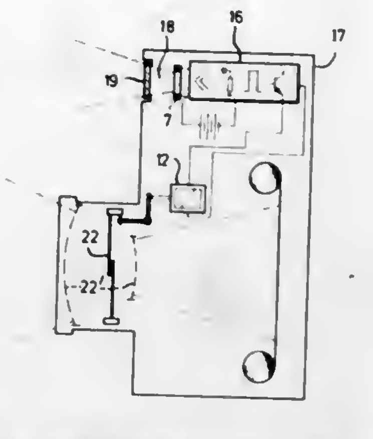
Filed Sept. 15, 1975, Ser. No. 613,426

Claims priority, application Germany, Sept. 17, 1974, 2444355

Int. Cl.^{2} H04B *9/00. 1/06*

U.S. Cl. 250—199 **7 Claims**

1. A wireless system for the remote control of a camera or the like, said camera or the like having a response to radiation of a first spectral character within a predetermined field of view, said system comprising a pulse-generating transmitter of radiation of second spectral character essentially outside said first special character said transmitter including means for the selective control of pulsed radiation thereform, and a receiver having a maximum spectral response substantially matched to the output of said transmitter, said receiver producing an electrical-output camera-control signal in response to detected pulse radiation from said transmitter, and said receiver including means for directionally focusing the received radiation and for fixedly mounting the same to a camera in substantial alignment with the field of view of the camera, the last-defined means establishing for said receiver a field of view of substantially the same angular dimensions as those of said camera field of view, whereby the camera may be remotely controlled upon operation of the transmitter from within the camera field of view.



4,036,763
NOISE AND DRIFT CORRECTING AMPLIFIER CIRCUIT FOR A LIVE-SCAN IMAGING SYSTEM

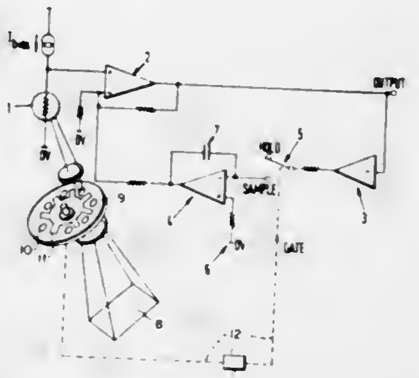
Peter Robert Norman Stephenson, Stevenage, England, assignor to Hawker Siddeley Dynamics Limited, England

Filed Aug. 11, 1975, Ser. No. 603,736

Claims priority, application United Kingdom, Aug. 14, 1974, 35759/74

Int. Cl.^{2} H01J *39/12*

U.S. Cl. 250—214 C **3 Claims**



1. Line-scan imaging apparatus including electrical circuitry automatically correcting for noise and drift, comprising a radiation detector which is repeatedly scanned across an image to build up a raster consisting of a succession of active scan lines with dead times between, a D.C. preamplifier having first and second inputs and receiving and amplifying the detector signal applied thereto on said first input, a further D.C. amplifier having first and second inputs and a feedback capacitor connected between its output and its first input, means applying a reference voltage to the second input of said further D.C. amplifier, means applying the output of said further D.C. amplifier to the second input of said preamplifier, means applying the output of the preamplifier to the first input of said further D.C. amplifier which means include a sample and hold switch that when closed applies the output from the preamplifier to said first input of said further D.C. amplifier but can be opened to remove the preamplifier output from said further amplifier, and means for automatically opening said switch during each line scan and closing said switch during each dead time.

4,036,764

METHOD OF FOAM DRILLING USING A SULFOACETATE FOAMING AGENT

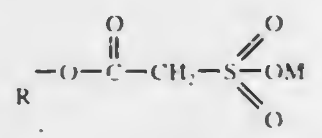
Paul W. Fischer, Whittier, and David S. Pye, Brea, both of Calif., assignors to Union Oil Company of California, Brea, Calif.

Filed Oct. 14, 1975, Ser. No. 621,685

Int. Cl.² C09K *7/08, 7/02*

U.S. Cl. 252—8.5 C **9 Claims**

1. In the method of conducting foam drilling and workover operations in a bore hole penetrating a subterranean formation having a temperature above about 400° F, wherein foam is generated by contacting an aqueous solution of a foaming agent with a gas, and said foam is caused to flow upwardly through the bore hole carrying solid and liquid materials out of the bore hole, the improvement which comprises employing in said aqueous solution as said foaming agent a composition having the formula:



$R{-}O{-}\overset{\overset{O}{\|}}{C}{-}CH_2{-}\overset{O}{\underset{O}{S}}{-}OM$

wherein R is a straight chain alkyl radical having from 10 to 16 carbon atoms; and M is an alkali metal or ammonium cation.

4,036,765

RUN-FLAT TIRE LUBRICANT

Marvin T. Conger, Akron, and Roger N. Beers, Uniontown, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed June 11, 1975, Ser. No. 585,923

Int. Cl.² C10M *3/18, 5/02, 7/08;* **B60C** *5/00*

U.S. Cl. 252—21 **5 Claims**

1. A pneumatic tire run-flat assembly lubricant which is nonflowable below 70° C. and flowable at temperatures higher then 90° C. consisting of a mixture on a by-weight basis of 2 to 60 parts of a fatty acid having from 12 to 24 carbon atoms, 0 to 45 parts of a metal soap of a fatty acid having from 12 to 24 carbon atoms and the metal of said soap being selected from the metals of Group IA, IIA and IIIA of the Periodic Table set forth at Vol. 39 (1957-58) *Handbook of Chemistry and Physics* and 40 to 92 parts of a carrier selected from the group consisting of water, polypropylene ether glycol or triol of 400 to 3500 molecular weight, polyethylene ether glycol or triol of 400 to 3800 molecular weight, polyols of 2 to 4 hydroxyls having a molecular weight of less then 400 and 0 to 20 parts of a powdery pyrogenic silica, with the proviso that when the carrier is water the amount of soap is at least two percent by weight based on the water.

4,036,766

POLYMETHACRYLATE ADDITIVES AND LUBE COMPOSITIONS THEREOF

Roy I. Yamamoto, Wappingers Falls; Abraham Morduchowitz, Monsey, both of N.Y.; Wheeler C. Crawford, Houston, Tex., and Carmen M. Cusano, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

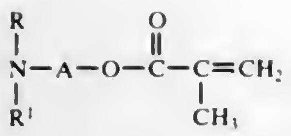
Filed June 14, 1976, Ser. No. 696,150

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **8 Claims**

1. A complex polymethacrylate-liquid poly(alkene-1) product of a polymethacrylate to polyalkene component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate of a molecular weight of between about 5×10⁴ and 10⁶ composed of the following monomeric elements:

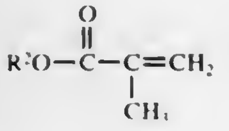
a. between about 1 and 10 wt. % dialkylaminoalkyl methacrylate characterized by the formula:



$\underset{\underset{R^1}{|}}{\overset{\overset{R}{|}}{N}}{-}A{-}O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$ where

where R and R¹ are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

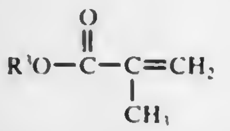
b. between about 15 and 30 wt. % C_1-C_6 alkyl methacrylate characterized by the formula:



$R^2O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R² is alkyl of from 1 to 6 carbons

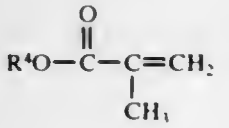
c. between about 40 and 60 wt. % of C_{10}-C_{14} alkyl methacrylate characterized by the formula:



$R^3O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R³ is of from 10 to 14 carbons, and

d. between about 15 and 30 wt. % of C_{16}-C_{20} alkyl methacrylate characterized bythe formula:

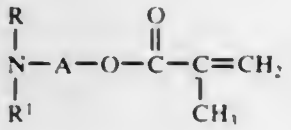


$R^4O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R⁴ is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

2. A mineral oil composition comprising between about 10 and 95 wt. % mineral lubricating oil and between about 0.1 and 90 wt. % of a complex polymethacrylate-polyalkene product of a polymethacrylate component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate interpolymer of a molecular weight of between about 5×10⁴ and 10⁶ composed of the following monomeric elements:

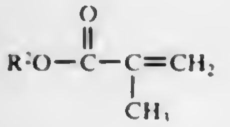
a. between about 1 and 10 wt. % dialkylaminoalkyl methacrylate characterized by the formula:



$\underset{\underset{R^1}{|}}{\overset{\overset{R}{|}}{N}}{-}A{-}O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$ where

where R and R¹ are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

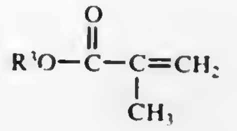
b. between about 15 and 30 wt. %% C_1-C_6 alkyl methacrylate characterized by the formula:



$R^2O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R² is alkyl of from 1 to 6 carbons

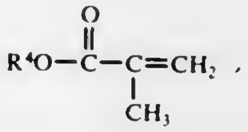
c. between about 40 and 60 wt. % of C_{10}-C_{14} alkyl methacrylate characterized by the formula:



$R^3O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R³ is alkyl of from 10 to 14 carbons

d. between about 15 and 30 wt. % of C_{16}-C_{20} alkyl methacrylate characterized by the formula:



$R^4O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R⁴ is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

4,036,767

POLYMETHACRYLATE ADDITIVES AND LUBRICATING COMPOSITIONS THEREOF

Roy I. Yamamoto, Wappingers Falls; Abraham Morduchowitz, Monsey, both of N.Y.; Wheeler C. Crawford, Houston, Tex., and Carmen M. Cusano, Poughkeepsie, N.Y., assignors to Texaco Inc., New York, N.Y.

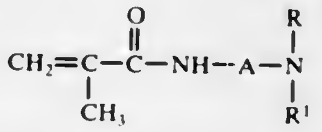
Filed June 14, 1976, Ser. No. 696,151

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 A **6 Claims**

1. A complex polymethacrylate-liquid poly(alkene-1) product of a polymethacrylate to polyalkene component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate of a molecular weight of between about 5×10⁴ and 10⁶ composed of the following monomeric elements:

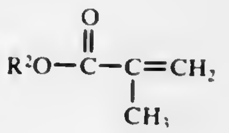
a. between about 1 and 10 wt. % N,N-diaminoalkyl methacrylamide characterized by the formula:



$CH_2{=}\underset{\underset{CH_3}{|}}{C}{-}\overset{\overset{O}{\|}}{C}{-}NH{-}A{-}\underset{\underset{R^1}{|}}{\overset{\overset{R}{|}}{N}}$

R and R¹ are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

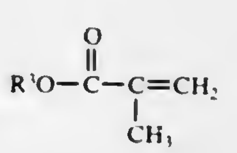
b. between about 15 and 30 wt. % C_1-C_6 alkyl methacrylate characterized by the formula:



$R^2O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R² is alkyl of from 1 to 6 carbons

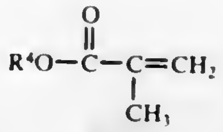
c. between about 40 and 60 wt. % of C_{10}-C_{14} alkyl methacrylate characterized by the formula:



$R^3O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R³ is of from 10 to 14 carbons, and

d. between about 15 and 30 wt. % of C_{16}-C_{20} alkyl methacrylate characterized by the formula:

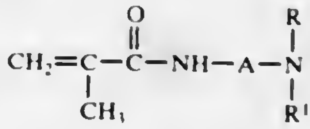


$R^4O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R⁴ is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

2. A mineral oil composition comprising between about 10 and 95 wt. % mineral lubricating oil and between about 0.1 and 90 wt. % of a complex polymethacrylatepolyalkene product of a polymethacrylate to polyalkene component weight ratio of between about 4:1 and 2:3, said liquid poly(alkene-1) of a molecular weight between about 200 and 10,000 and wherein said alkene-1 is of 3 to 12 carbons, said polymethacrylate interpolymer of a molecular weight of between about 5×10⁴ and 10⁶ composed of the following monomeric elements:

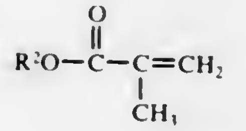
a. between about 1 and 10 wt. % N,N-diaminoalkyl methacrylamide characterized by the formula:



$CH_2{=}\underset{\underset{CH_3}{|}}{C}{-}\overset{\overset{O}{\|}}{C}{-}NH{-}A{-}\underset{\underset{R^1}{|}}{\overset{\overset{R}{|}}{N}}$

R and R¹ are alkyl of from 1 to 2 carbons A is alkanediyl of from 1 to 5 carbons

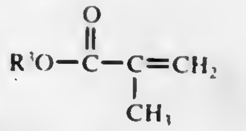
b. between about 15 and 30 wt. % C_1-C_6 alkyl methacrylate characterized by the formula:



$R^2O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R² is alkyl of from 1 to 6 carbons

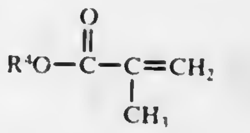
c. between about 40 and 60 wt. % of C_{10}-C_{14} alkyl methacrylate characterized by the formula:



$R^3O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R³ is alkyl of from 10 to 14 carbons

d. between about 15 and 30 wt. % of C_{16}-C_{20} alkyl methacrylate characterized by the formula:



$R^4O{-}\overset{\overset{O}{\|}}{C}{-}\underset{\underset{CH_3}{|}}{C}{=}CH_2$

where R⁴ is alkyl of from 16 to 20 carbons said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid polyalkene component.

4,036,768

POLYMETHACRYLATE AND LUBE COMPOSITION THEREOF

Wheeler C. Crawford, Houston, Tex.; Roy I. Yamamoto, Wappingers Falls, and Carmen M. Cusano, Poughkeepsie, both of N.Y., assignors to Texaco Inc., New York, N.Y.

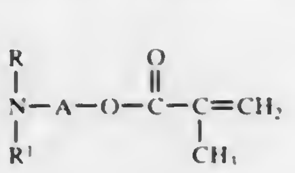
Filed June 14, 1976, Ser. No. 696,152

Int. Cl.² C10M *1/28*

U.S. Cl. 252—51.5 A **6 Claims**

1. A complex polymethacrylate-liquid alkylbenzene product of a polymethacrylate to alkylbenzene component weight ratio of between about 4:1 and 2:3, said liquid alkylbenzene of a molecular weight between about 100 and 5000, said polymethacrylate of a molecular weight of between about 5×10^4 and 10^6 composed of the following monomeric elements:

a. between about 1 and 10 wt. % dialkylaminoalkyl methacrylate characterized by the formula:

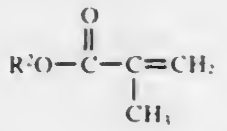


$$\underset{R^{1}}{\overset{R}{N}}-A-O-\overset{O}{\overset{\|}{C}}-\underset{CH_3}{C}=CH_2$$

R and R^1 are alkyl of from 1 to 2 carbons

A is alkanediyl of from 1 to 5 carbons

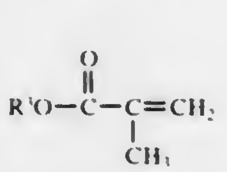
b. between about 15 and 30 wt. % C_1-C_6 alkyl methacrylate characterized by the formula:



$$R^2O-\overset{O}{\overset{\|}{C}}-\underset{CH_3}{C}=CH_2$$

where R^2 is alkyl of from 1 to 6 carbons

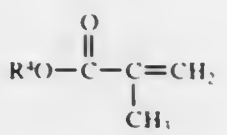
c. between 40 and 60 wt. % of C_{10}-C_{14} alkyl methacrylate characterized by the formula:



$$R^3O-\overset{O}{\overset{\|}{C}}-\underset{CH_3}{C}=CH_2$$

where R^3 is alkyl of from 10 to 14 carbons

d. between about 15 and 30 wt. % of C_{16}-C_{20} alkyl methacrylate characterized by the formula:



$$R^4O-\overset{O}{\overset{\|}{C}}-\underset{CH_3}{C}=CH_2$$

where R^4 is alkyl of from 16 to 20 carbons, said complex product prepared by polymerizing said monomeric elements in the ratios as defined in the presence of said liquid alkylbenzene.

4,036,769

SPERM OIL SUBSTITUTE FROM BLEND OF ALCOHOL-CARBOXYLIC ACID ESTERS WITH LIQUID FAT

Robert L. Zipf, Parma Heights, Ohio, assignor to Werner G. Smith, Inc., Cleveland, Ohio

Filed Apr. 5, 1971, Ser. No. 131,531

Int. Cl.² C10M *1/38*

U.S. Cl. 252—48.6 **9 Claims**

1. A liquid lubricant comprising a blend consisting essentially of:

a. from about 50 percent to about 90 percent by weight of synthetic esters of monohydric alcohols each having 10 to 18 carbon atoms and fatty acids each having 12 to 24 carbon atoms, at least one of said esters containing carbon-to-carbon unsaturation, and

b. from about 10 percent to about 50 percent by weight of a fat liquid at room temperature and selected from the class consisting of animal oils, vegetable oils, fish oils and mixtures thereof, and

c. free fatty acids each having 12 to 24 carbon atoms and being present in an amount such that the acid number of the blend is less than 15 but at least about 5,

said blend having an iodine number from about 50 to about 140, a pour point below 50° F. and a S.U.S. viscosity at 100° F. within the range of about 60 to about 120.

4,036,770

STABILIZATION OF HYDROCRACKED OILS WITH AMINO NITROPHENOLS

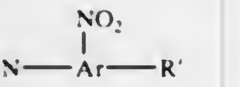
Wilton F. Espenscheid, Princeton; Robert D. Offenhauer, Pennington, and Tsoung Y. Yan, Trenton, all of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 17, 1975, Ser. No. 623,280

Int. Cl.² C10M *1/32*

U.S. Cl. 252—51.5 R **7 Claims**

1. A method of stabilizing a hydrocracked lubricating oil from deterioration caused by light and air comprising adding to said oil a stabilizing amount of a compound of the formula:



$$R_2N-\overset{NO_2}{\overset{|}{Ar}}-R'$$

wherein Ar is phenyl or diphenyl, R is the same or different and is selected from the group consisting of phenyl, hydrogen and alkyl containing from 1 to 18 carbon atoms and R′ is hydrogen or an alkyl containing from 1 to 18 carbon atoms, and wherein the R_2N and NO_2 groups are ortho or para to each other.

4,036,771

LUBRICATING BASES FOR MULTIGRADE OILS

Jacques Denis, Ville d'Avray, and Guy Parc, Rueil Malmaison, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Sept. 5, 1975, Ser. No. 610,769

Claims priority, application France, Apr. 16, 1975, 75.12053

Int. Cl.² C10M *1/24*

U.S. Cl. 252—56 R **52 Claims**

1. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a dimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H - O - R_1)_n OH$, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, and diols having the general formula $HO - R_1' - OH$, in which R_1' is a divalent hydrocarbon radical, and with at least one hydrocarbyl monohydroxyl compound selected from monohydric hydrocarbyl alcohols, monohydric phenols of the formula R_2-OH, oxyalkylenated monohydric hydrocarbyl alcohols, and oxyalkylenated monohydric phenols of the formula R_2—O(R_1—O)$_n$H, wherein R_2 is an aliphatic, alicyclic or aromatic monovalent hydrocarbyl radical, and n' is a number of from 1 to 50, the reagents being employed in proportions which substantially correspond to 2 moles of dimeric acid for 1 mole of dihydroxyl compound and 2 moles of monohydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

12. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 $(CH_2)_x$ to 50% by weight of at least one complex ester composition produced by the esterification of a dimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H— O — R_1)_n$ OH, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, and diols having the general formula $HO — R_1' — OH$, in which R_1' is a divalent hydrocarbon radical, and with at least one hydrocarbyl monohydroxyl compound selected from monohydric hydrocarbyl alcohols, monohydric phenols of the formula R_2—OH, oxyalkylenated monohydric hydrocarbyl alcohols, and oxyalkylenated monohydric phenols of the formula R_2—O(R_1-O)$_n$H, wherein R_2 is an aliphatic, alicyclic or aromatic monovalent hydrocarbyl radical, and n' is a number of from 1 to 50, the reagents being employed in proportions which substantially correspond to 3 moles of dimeric acid for 2 moles of dihydroxyl compound and 2 moles of monohydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

23. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a dimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, and at least one monocarboxylic acid having the general formula R'_2COOH, in which R'_2 is a monovalent hydrocarbon radical with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H — O—R_1)_n OH$, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, the reagents being employed in proportions which substantially correspond to 1 mole of dimeric acid and 2 moles of monocarboxylic acid for 2 moles of dihydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

33. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a trimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula $H — O — R_1)_n OH$, in which R_1 is a 1,2-alkylene radical and n is a number of from 2 to 50, and diols having the general formula $HO — R_1' — OH$, in which R_1' is a divalent hydrocarbon radical, and with at least one monohydroxyl compound selected from monohydric hydrocarbyl alcohols, monohydric phenols of the formula $R_2 — OH$, in which R_2 is an aliphatic, alicyclic or aromatic hydrocarbyl monovalent radical, and oxyalkylenated hydrocarbyl monohydric alcohols or monohydric phenols having the general formula $R_2 — O — R_1 — O)_n H$, in which R_1 and R_2 are as defined above and n' is a number of from 1 to 50, the reagents being employed in proportions which substantially correspond to 2 moles of trimeric acid for 1 mole of dihydroxyl compound and 4 moles of monohydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

43. In a lubricating composition usable as multigrade oil for motor-car engines, and comprising a major proportion of base oil of lubricating viscosity and, in amounts sufficient to effect each additives' attendant function, an additive selected from the group consisting of viscosity index improvers, antioxidants, detergents and mixtures thereof, the improvement which comprises utilizing as the base oil a homogeneous mixture comprising:

a. from 50 to 99% by weight of at least one mineral or synthetic hydrocarbon oil of lubricating viscosity,

b. from 1 to 50% by weight of at least one complex ester composition produced by the esterification of a trimeric acid derived from at least one unsaturated fatty acid which contains from 14 to 22 carbon atoms, and at least one monocarboxylic acid having the general formula R_2' COOH, in which R_2' is a monovalent hydrocarbon radical, with at least one dihydroxyl compound selected from polyalkylene glycols having the general formula H — O — R_1) OH, in which R_1 is a 1,2, alkylene radical and *n* is a number of from 2 to 50, the reagents being employed in proportions which substantially correspond to 1 mole of trimeric acid and 3 moles of monocarboxylic acid for 3 moles of dihydroxyl compound, and

c. from 0 to 40% by weight of at least one light ester selected from esters of monohydric hydrocarbyl alcohols and hydrocarbyl dicarboxylic acids, esters of polyols and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl monocarboxylic acids, esters of polyoxyalkylenated hydrocarbyl monohydric alcohols of a low degree of condensation and hydrocarbyl dicarboxylic acids, and esters of polyoxalkylene glycols of low molecular weight and hydrocarbyl monocarboxylic acids.

4,036,772

ESTERS MADE FROM THE REACTION PRODUCT OF LOW MOLECULAR WEIGHT ETHYLENICALLY UNSATURATED ACYLATING AGENTS AND OXIDIZED ETHYLENE-PROPYLENE INTERPOLYMERS

Casper John Dorer, Jr., Lyndhurst, Ohio, assignor to The Lubrizol Corporation, Wickliffe, Ohio

Filed Mar. 3, 1975, Ser. No. 554,362

Int. Cl.^{2} C10M *1/24*

U.S. Cl. 252—56 R **28 Claims**

1. A composition of matter comprising at least one ester made from:

A. at least one high molecular weight carboxylic acid reagent prepared by reaction of (1) a low molecular weight, ethylenically unsaturated carboxylic acid reagent with (2) an oxidized, degraded ethylene-propylene interpolymer having a molecular weight of at least 700 and obtained by heating a higher molecular weight ethylene-propylene interpolymer at a temperature of at least 100° C. in the presence of oxygen to cause reduction of at least about 5% in the molecular weight of said interpolymer, and

B. at least one mono- or polyhydric alcohol of the formula

$R(OH)_n$

wherein R is a hydrocarbon-based group of one to about forty carbon atoms and n is one to about six.

8. A lubricant composition comprising a major amount of oil and a viscosity improving or sludge dispersing amount of at least one composition as claimed in claim 1.

4,036,773

LUBRICANT COMPOSITIONS CONTAINING CARBOXYLIC ACID ESTERS OF HINDERED HYDROQUINONES

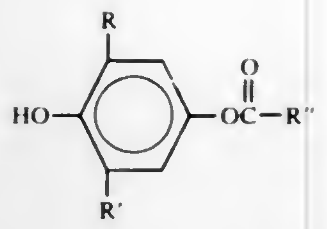
Abraham O. M. Okorodudu, West Deptford, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Filed Dec. 27, 1974, Ser. No. 536,777

Int. Cl.^{2} C10M *1/24*

U.S. Cl. 252—56 R **10 Claims**

1. A lubricant composition comprising a major amount of a mineral lubricating oil, a synthetic lubricating oil or greases thereof and an amount sufficient to impart antioxidant properites thereto of an ester of a hindered hydroquinone, said ester having the formula



wherein R and R' contain from 3 to 20 carbon atoms and are selected from the group consisting of alkyl, cycloalkyl, aryl, aralkyl and alkaryl and R'' contains from 1 to 25 carbon atoms and is the same as R and R'.

4,036,774

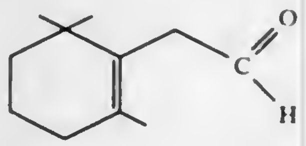
FRAGRANT SOAP COMPOSITIONS CONTAINING ALPHA-SUBSTITUTED ACETALDEHYDE AND KETONE

Anton van Ouwerkerk, Livingston, N.J.; Bernard J. Chant, Rye, and Arthur L. Liberman, Beechhurst, both of N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y. Division of Ser. No. 601,727, Aug. 4, 1975. This application Nov. 11, 1976, Ser. No. 741,141

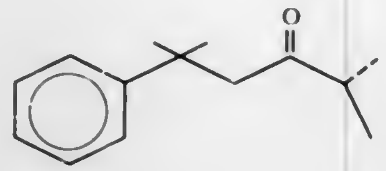
Int. Cl.^{2} C11B *9/00;* **C11D** *3/50, 9/44*

U.S. Cl. 252—132 **2 Claims**

2. A soap consisting essentially of (*i*) a mixture consisting essentially of 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde having the structure:



and at least one phenyl C_6 ketone having the structure:



wherein the dashed line represents a carbon-carbon single bond or a carbon-carbon double bond; and (*ii*) a soap base; the ratio of 2,6,6-trimethyl-1-cyclohexen-1-ylacetaldehyde:phenyl C_6ketone being in the range of from 1:1 up to about 1:5; and the ratio of said mixtures:said soap base being 1:100.

4,036,775

PROCESS FOR THE PRODUCTION OF A MARBLED OR MOTTLED SOAP CAKE AND THE PRODUCT OF SUCH PROCESS

Jutta Trautvetter, Monchen-Gladbach; Albert Weingartz, Moers, and Lothar Werner, Krefeld, all of Germany, assignors to Henkel & Cie G.m.b.H., Dusseldorf-Holthausen, Germany

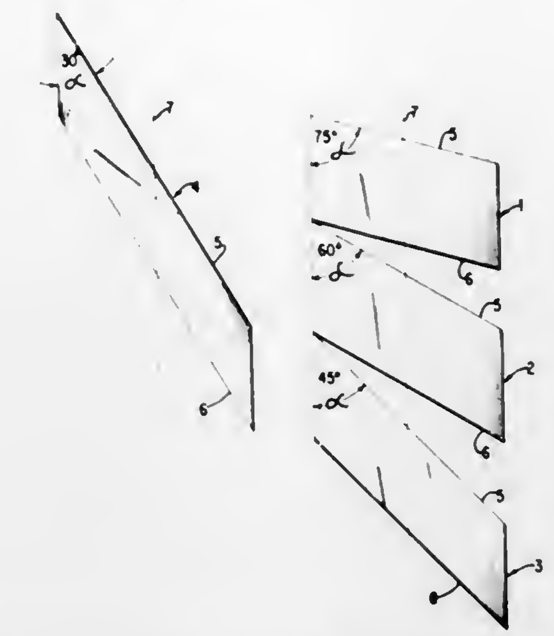
Filed June 23, 1975, Ser. No. 589,795

Claims priority, application Germany, June 28, 1974, 2431048

Int. Cl.^{2} B29C *9/00*

U.S. Cl. 252—134 **4 Claims**

1. A process for the production of a marbled or mottled soap cake or soap bar comprising the steps of extruding and forming a soap strand of the required dimensions, having axially aligned filaments or layers of a different color from the principal color therein, cutting said extruded strand of the required dimensions, having axially aligned filaments or layers of a different color from the principal color into stamping blanks of the desired dimensions, substantially parallel at an angle α of from 75° to 15° to the axis of said extruded strand, stamp molding said stamping blanks at an angle β of from 90° to 30° to the cut surfaces of said stamping blank, and recovering a marbled or mottled soap cake or soap bar.



4. The marbled or mottled soap cake or soap bar produced by the process of claim 1 and having mottled filaments running radially from a center point not on the axis of symmetry to the periphery of said soap cake or soap bar.

4,036,776

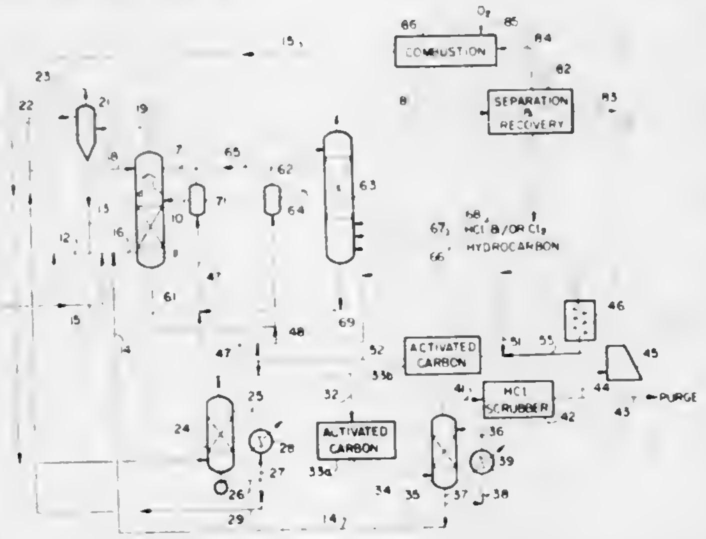
RECOVERY OF CHLORINE VALUES FROM A MELT OXIDATION GAS

Herbert D. Riegel, Maplewood; Harvey D. Schindler, Fairlawn, and Vincent A. Strangio, Glenridge, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Feb. 10, 1976, Ser. No. 656,769

Int. Cl.^{2} C01B *9/02*

U.S. Cl. 252—187 R **9 Claims**



1. In a process for oxidizing in an oxidation reaction zone a molten salt mixture containing a multivalent metal chloride in its higher and lower valence state by contacting the molten salt mixture with gaseous molecular oxygen and aqueous hydrogen chloride at a temperature of from 600° F to 900° F to produce an oxidized melt and recover chlorine values by enriching the higher valent multivalent metal chloride content of the molten salt mixture and recovering the molten salt from the oxidation reaction zone, the improvement comprising:

withdrawing from the oxidation reaction zone an effluent gas containing water vapor and chlorine, said chlorine being present in an amount up to the chlorine vapor pressure of the molten salt mixture;

cooling the effluent gas;

contacting the effluent gas in a chlorine separation zone with activated carbon to convert chlorine to hyrogen chloride, said contacting being effected at a temperature of from 100° F to 250° F and a pressure of from 15 to 100 psia;

Withdrawing from the chlorine separation zone a gas essentially free of chlorine and containing water vapor and hydrogen chloride produced from the chlorine;

recovering aqueous hydrogen chloride from said gas; and

introducing recovered aqueous hydrogen chloride into said oxidation reaction zone.

4,036,777

ION CURRENT MEASURING ARRANGEMENT

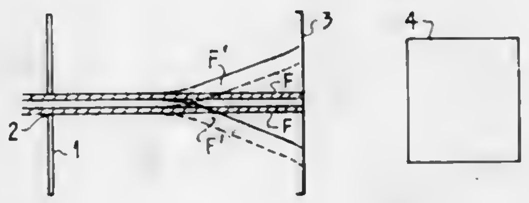
Jean Claude Dubois, and Jean Jacques Le Goux, both of Courbevoie, France, assignors to Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.-.E.C.A.), Courbevoie, France

Filed July 20, 1976, Ser. No. 707,067

Claims priority, application France, July 25, 1975, 75.23338

Int. Cl.^{2} H01J *37/26, 39/36;* **G01N** *27/62*

U.S. Cl. 250—299 **3 Claims**



1. A mass spectrometry ion current measuring arrangement comprising: a diaphragm having a slot for momentarily letting through an ion beam; an electron multiplier having a first dynode located behind said slot; a measuring device for measuring the current supplied by said mutiplier; and means for acting on said beam after it has passed through said slot and before it reaches said dynode so as to expand, at least in the direction parallel to the width of said slot, the zone of said dynode struck by the ions of said beam in the course of at least each one of successive time intervals of duration Δt included in the time interval T during which the whole of said beam passes though said slot.

4,036,778

AQUEOUS, STORAGE-STABLE DISPERSIONS OF WATER-SOLUBLE COMPOUNDS

Frank Lohmann, Arlesheim, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 6, 1976, Ser. No. 655,813

Claims priority, application Switzerland, Feb. 28, 1975, 2564/75

Int. Cl.^{2} D06L *3/12;* **C09K** *11/00*

U.S. Cl. 252—301.21 **5 Claims**

1. An aqueous storage-stable dispersion of a water-soluble optical brightener, which dispersion is free from organic solvents, and which comprises

a. a water-soluble anionic or cationic organic optical brightener selected from triazinylamino-stilbenes, v-triazolyl-stilbenes, distyryl-biphenyls, stilbenyl-naphthotriazoles, benzoxazolyl-stilbenes, bis-benzoxazoles, bis-benzimidazoles, pyrazolines, naphthalimides, benzofurans and distyrylbenzenes,

b. at least one water-soluble salt consisting of the anion of an inorganic or organic, mono- or polybasic acid and the cation of an inorganic, mono- or polyacid base,

c. at least one organic stabilising agent based on
one or more nonionic water-soluble polymers,
one or more nonionic, surface active compounds, or
mixtures thereof, and

d. water,

and wherein the salt concentration is high enough to insure that the water-soluble optical brightener remains essentially undissolved.

4,036,779

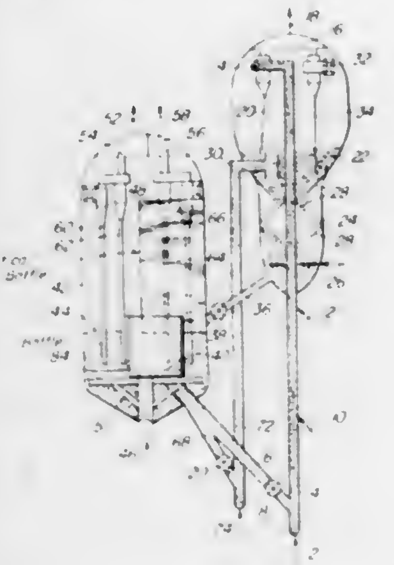
METHOD OF REGENERATING CATALYST IN A SWIRL TYPE REGENERATOR CONTAINING A DILUTE PHASE BAFFLE

Klaus W. Schatz, Philadelphia, Pa., and Paul W. Snyder, Jr., Pitman, N.J., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Oct. 20, 1976, Ser. No. 734,223

Int. Cl.^{2} B01J *21/20, 29/38;* **C10G** *11/18*

U.S. Cl. 252—417 **3 Claims**



1. An improved hydrocarbon conversion catalyst regeneration operation in the presence of fluidizable catalyst particles comprising maintaining a fluid bed of catalyst particles circulating circumferentially in a regeneration zone, said bed comprising a dense phase and a dilute phase, said zone containing in the dense phase an annular section formed by a curved upwardly extending baffle spaced inwardly from the outer wall thereof, the improved method comprising:

introducing catalyst particles obtained from a hydrocarbon conversion operation after stripping thereof into said zone tangentially to said circulating bed of catalyst, the dilute phase of said zone having positioned therein a dilute phase baffle, extending from beneath the dense phase to the cyclone inlet and from the outer wall of the regenerator inwardly to about the center thereof,

passing regeneration gas upwardly through the circulating fluidized particles in said regeneration zone,

recovering gaseous products of regeneration from an upper portion of the regeneration zone, and

withdrawing regenerated catalyst from a lower section of said fluid bed of catalyst.

3. The method of claim 1 wherein the cyclone displegs between the catalyst outlet and inlet are reversed so that catalyst therefrom discharges tangentially to the circumferential circulation.

4,036,780

CATALYST FOR THE PREPARATION OF MALEIC ANHYDRIDE

Hideo Suzuki; Takahisa Sato; Tatsuo Kubota; Shigemi Osaka, and Shigeru Komatsu, all of Himeji, Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Japan

Filed Dec. 1, 1975, Ser. No. 636,746

Claims priority, application Japan, Dec. 2, 1974, 49-136995

Int. Cl.^{2} B01J *27/14;* **C07D** *307/60*

U.S. Cl. 252—437 **14 Claims**

1. A catalyst for the preparation of maleic anhydride by vapor phase catalytic oxidation of benzene with a molecular oxygen containing gas consisting of a porous inert support selected from the group consisting of silicon carbide and alpha alumina having an alkali metal content, calculated as oxide, of at most 0.3% by weight and supported thereon a catalytic substance of a constituent composition consisting of (a) 1 mole of vanadium pentoxide, (b) 0.3 to 1.2 moles of molybdenum trioxide, (c) 0.005 to 0.05 moles of phosphorus pentoxide, (d) 0.03 to 0.2 moles of sodium oxide and (e) 0 to 0.05 moles of potassium oxide.

4,036,781

DEHYDROGENATION CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 515,328, Oct. 16, 1974, abandoned. This application July 7, 1975, Ser. No. 593,726

Int. Cl.^{2} B01J *21/04, 21/10, 23/26, 27/02*

U.S. Cl. 252—439 **3 Claims**

1. A dehydrogenation catalyst consisting essentially of (1) magnesium chromite + selenium oxide, (2) magnesium chromite + selenium oxide + aluminum oxide, or (3) $MgAl_xCr_{2-x}O_4$ = selenium oxide wherein the ratio of Al:Cr is from 0.0004 to 1.2:1 and x is a number of from more than 0 up to less than 1.

4,036,782

GRANULATED ZEOLITE CATALYST AND PROCESS FOR PRODUCING THE CATALYST

Khabib Minachevich Minachev, Leninsky prospekt, 57, kv. 15; Evgeny Sergeevich Mortikov, Leninsky prospekt, 61/1, kv. 34, both of, Moscow; Alexandr Semenovich Leontiev, ulitsa Gagarina, 13, kv. 13, Bashkirskaya ASSR, Salavat; Tamara Stepanovna Papko, Leninsky prospekt, 67, kv. 54, Moscow; Alexei Alexeevich Masloboev-Shvedov, Nagatinskaya naberezhnaya, 16, kv. 75, Moscow, and Nikolai Fedorovich Kononov, ulitsa Garibaldi, 13/54 korpus 2, kv. 41, Moscow, all of U.S.S.R.

Filed Dec. 31, 1974, Ser. No. 537,764

Int. Cl.^{2} B01J *29/06*

U.S. Cl. 252—455 Z **12 Claims**

1. A granulated zeolite catalyst containing cations of metals of Group II of the periodic system with an exchange degree of from 5 to 50% of the theoretical value, hydrogen groups with an exchange degree of from 5 to 50% of the theoretical value and at least one component selected from the group consisting of cations of metals of Group III of the periodic system with an exchange degree of from 20 to 90% of the theoretical value and cations of transition metals of Group IV of the periodic system with an exchange degree of from 9 to 80% of the theoretical value.

2. A process for producing a granulated zeolite catalyst comprising forming the starting zeolite into granules, drying the resulting granules at a temperature ranging from 100° to 150° C and calcining the dried granules at 380°–550° C;treating the calcined granules at a temperature of from 70° to 90° C with at least one material selected from the group consisting of aqueous solutions of salts of metals of Group II of the periodic system and aqueous solutions of ammonium salts; drying the treated granules at a temperature of from 120° to 150° C and calcining the dried granules at a temperature of from 380° to 550° C; treating the granules resulting from the second calcination with at least one component selected from the group consisting of aqueous solutions of salts of metals of Group III of the periodic system and aqueos solutions of salts of transition metals of Group IV of the periodic system at a temperature of from 40° to 90° C; in the case of treating the granules resulting from the first calcination with aqueous solutions of ammonium salts, the granules resulting from the second calcination, in addition to being treated with said at least one component, are also treated with aqueous solutions of salts of metals of Group II of the periodic system; and drying the granules resulting from said operations at a temperature of from 120° to 150° C and calcining the dried granules at a temperature of from 380° to 550° C.

4,036,783

SUPPORTED CATALYST CONTAINING VANADIUM AND TITANIUM

Kurt Blechschmitt, Schifferstadt; Peter Reuter, Bad Duerkheim; Friedrich Wirth, Ludwigshafen; Gert Buerger, Mannheim, and Rolf Seubert, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Feb. 25, 1976, Ser. No. 661,241

Claims priority, application Germany, Mar. 13, 1975, 2510994

Int. Cl.^{2} B01J *21/06, 23/22, 35/02*

U.S. Cl. 252—461 **3 Claims**

1. A supported catalyst comprising an inert, non-porous ring-shaped carrier which has an external diameter of from 7.3 to 8.6 mm, a length of from 5.3 to 7.0 mm and a wall thickness of from 0.1 to 2 mm, and a layer of from 0.05 to 1 mm of an active composition consisting essentially of from 1 to 30 percent by weight of vanadium pentoxide and from 70 to 99 percent by weight of titanium dioxide, applied to the carrier.

4,036,784

METHOD OF PRODUCING AN EXTRUDED CATALYST COMPOSITION

Stanley A. Gembicki, Western Springs, Ill., and Stefan H. Aeschbach, Forch, Switzerland, assignors to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 582,522, May 30, 1975, abandoned. This application Sept. 10, 1976, Ser. No. 722,319

Int. Cl.^{2} B01J *23/16, 23/24, 21/00*

U.S. Cl. 252—465 **17 Claims**

1. An extruded composition prepared by the method which comprises:

a. admixing a finely divided refractory inorganic oxide, a peptizing agent and sufficient water to produce a mixture characterized by a weight loss on ignition at 900° C. of from about 50 to about 70%;

b. maintaining said mixture under shear-mixing conditions, the intensity of said shear-mixing being characterized by an energy input equivalent to from about 15 to about 120 watt-hours per pound of dry refractory inorganic oxide contained in said mixture over a period of from about 0.5 to about 5 minutes;

c. extruding the resulting dough and drying and calcining the extrudate.

4,036,785

CATALYST FOR REDUCTION OF NITROGEN OXIDES IN PRESENCE OF AMMONIA

Masumi Saito, Kobe; Sumio Tani, Neyagawa; Shigeaki Matsui, Higashiosaka, and Shigeaki Kasaoka, Okayama, all of Japan, assignors to Kurashiki Boseki Kabushiki Kaisha, Japan

Filed Aug. 3, 1976, Ser. No. 711,184

Claims priority, application Japan, Aug. 4, 1975, 50-95231

Int. Cl.^{2} B01J *21/06, 23/74*

U.S. Cl. 252—472 **16 Claims**

1. A process for preparing a catalyst for reduction of nitrogen oxides in the presence of ammonia which comprises treating titanium slag having an iron content of about 2 to 8% by weight in terms of FeO on the basis of the weight of the titanium slag with sulfuric acid at a temperature not lower than about 100° C., drying and calcining the resultant product.

4,036,786

FLUORINATED CARBON COMPOSITION AND RESISTOR UTILIZING SAME

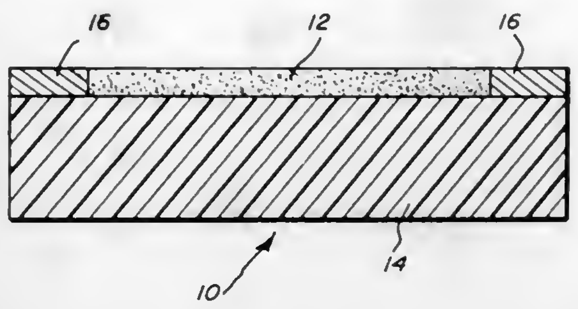
William H. Tiedemann, Cedarburg, Wis., assignor to Globe-Union Inc., Milwaukee, Wis.

Filed Mar. 26, 1976, Ser. No. 670,985

Int. Cl.^{2} H01B *1/06*

U.S. Cl. 252—511 **23 Claims**

3. A composite, electrical resistive element composition characterized by high resistivity, stable temperature coefficient of resistivity, linear voltage response and minimal current noise which comprises a current-conductive component of partially fluorinated carbon having the empirical formula CG_x wherein x has a value of up to **0.2** and an inert, nonreactive, non-conductive binder-filler.



4,036,787

PROCESS FOR THE PRODUCTION OF EPOXY SILICATE COMPOUNDS AND POLYMERS

David H. Blount, 5450 Lea St., San Diego, Calif. 92105

Continuation-in-part of Ser. No. 612,844, Sept. 12, 1975, abandoned, which is a continuation-in-part of Ser. No. 262,485, June 14, 1972, abandoned. This application Apr. 19, 1976, Ser. No. 678,196

Int. Cl.^{2} C08G *77/02*

U.S. Cl. 260—2 S **10 Claims**

1. The process for the production of epoxy silicate polymers by the following steps:

a. adding about 10 parts by weight of a silicic acid gel;

b. mixing therewith 5 to 20 parts by weight of an organic epoxy compound havng at least one epoxy group;

c. mixing therewith a catalytic amount of organic amine compounds; and

d. agitating the mixture until the resulting chemical reaction is complete.

4,036,788

ANIONIC HYDROGELS BASED ON HETEROCYCLIC N-VINYL MONOMERS

Robert Steckler, Del Mar, Calif., assignor to Plastomedical Sciences, Inc., Briarcliff Manor, N.Y.

Filed Feb. 11, 1975, Ser. No. 549,095

Int. Cl.^{2} C08F *220/20*

U.S. Cl. 260—2.1 E **10 Claims**

1. The anionic, polymeric hydrogel produced by simultaneous polymerization and cross-linking in the presence of a free radical polymerization catalyst in an amount of from about 0.05 to about 4 weight percent, based on the total weight of monomers, and at a temperature of from about 20° C. to about 125° C., of a mixture consisting essentially of the following monomers:

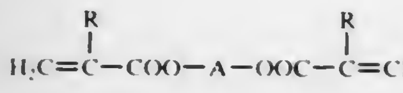
a. about 20 to about 95 weight percent, based on the total weight of monomers, of a heterocyclic N-vinyl monomer selected from the group consisting of N-vinyl lactams, N-vinyl succinimide, N-vinyl diglycoylimide, N-vinyl glutarimide, N-vinyl-3-morpholinone, N-vinyl-5-methyl-3-morpholinone and N-vinyl imidazole;

b. about 50 to 0.05 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated anionic monomer, capable of copolymerizing with (a), and which contains in its molecular structure a sulfonic acid group and is selected from the group consisting of acrylamido aryl sulfonic acids, acrylamido alkyl sulfonic acids, glycidyl acrylate sulfonic acid, glycidyl methacrylate sulfonic acid, and esters of α-methylene carboxylic acids with hydroxysulfonic acids which esters have the formula: $R'' - COO - Q - SO_3M$, wherein

R″ represents a member of the group consisting of vinyl and α substituted vinyl, Q represents a divalent hydrocarbon radical havig its valence bonds on different carbon atoms, and

M is a cation;

c. about 0.2 to about 12 weight percent, based on the total weight of monomers, of a polymerizable cross-linking agent, capable of copolymerizing with (a) and (b) and having the formula:

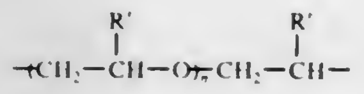


$$\mathrm{H_2C{=}\overset{\displaystyle R}{\overset{|}{C}}{-}COO{-}A{-}OOC{-}\overset{\displaystyle R}{\overset{|}{C}}{=}CH_2}$$

wherein

R represents a member of the group consisting of hydrogen and alkyl of from about 1 to about 4 carbon atoms;

A represents alkylene of from 2 to about 10 carbon atoms or a polyglycol ether group of the formula:



$$\mathrm{-\!\!\left(CH_2{-}\overset{\displaystyle R'}{\overset{|}{C}H}{-}O\right)_{\!n}CH_2{-}\overset{\displaystyle R'}{\overset{|}{C}H}{-}}$$

in which

R′ represents a member of the group consisting of hydrogen and alkyl of 1 to 2 carbon atoms, and

n represents an integer of from 1 to about 20; and

d. from 0 to about 50 weight percent, based on the total weight of monomers, of a monoethylenically unsaturated acrylic monomer capable of copolymerizing with (a), (b) and (c) and capable of polymerizing to a high molecular weight, in excess of 100,000, and selected from the group consisting of acrylamides, methacrylamides, acrylonitrile, methacrylonitrile, alkyl acrylates and methacrylates, and monohydroxy and monoalkoxy polyalkylene glycol acrylates and methacrylates; and

provided that (a) ≧ (d) and (a) + (d) = about 40 to about 95 weight percent.

4,036,789

POLYURETHANE FOAMS PREPARED FROM MIXED POLYALKYLENE GLYCOL POLYPHOSPHOROUS COMPOUNDS

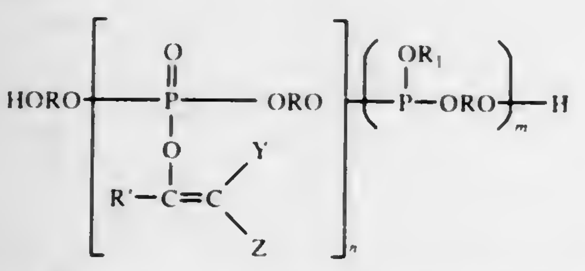
Kyung S. Shim, Irvington, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Division of Ser. No. 389,608, Aug. 20, 1973, Pat. No. 3,878,270, which is a division of Ser. No. 166,289, July 26, 1971, Pat. No. 3,798,290, which is a continuation-in-part of Ser. No. 86,313, Nov. 2, 1970, Pat. No. 3,819,750, which is a continuation-in-part of Ser. No. 63,262, Aug. 6, 1970, abandoned. This application Nov. 19, 1974, Ser. No. 525,239

Int. Cl.^{2} C08G *18/14*

U.S. Cl. 260—2.5 AR **2 Claims**

1. A flame retardant polyurethane foam containing, as a chemically bonded integral part thereof, the residue of a polyalkylene glycol polyphosphorus compound having the formula:



wherein the amount of said compound is from about 5 to 30 percent by weight of said foam and R is a polyalkylene glycol residue defined as that portion remaining after two hydroxyl groups have been removed from a polyalkylene glycol having the formula:

$$HO\!-\!\!(R''O)_x\!-\!H$$

wherein R″ is an alkylene group of from 2 to about 20 carbon atoms, which is straight chain, branch chain or a mixture thereof, and x designates the number of repeating alkylene ether units and is from 2 to about 20; R_1 is a C_1-C_{10} alkyl residue; R′ is selected from the group consisting of hydrogen, C_1-C_4 alkyl, and C_1-C_4 haloalkyl; Y and Z are each selected from the group consisting of hydrogen, halogen, and C_1-C_4 alkyl; and m and n are numbers in the range from 1 to about 25 such that the sum of m and n is in the range from about 2 to about 50.

4,036,790

POLYURETHANE FOAM COMPOSITIONS

Francis D. Thomson, Newark, Ohio, assignor to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed May 8, 1975, Ser. No. 575,897

Int. Cl.^{2} C08G *14/08, 18/28*

U.S. Cl. 260—2.5 AQ **12 Claims**

1. A polyurethane foam composition prepared by a process which comprises reacting an organic polyisocyanate or a polyisocyanate prepolymer with a resin mixture comprising a first polyol formed by reacting an alkylene oxide with a resole, said resole being formed in the presence of an alkaline catalyst by the reaction of phenol, urea and aldehyde.

4,036,791

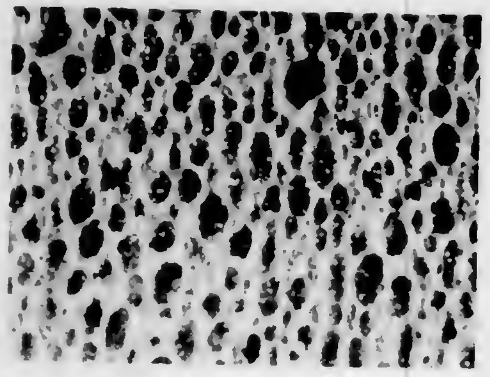
SIMULATED NATURAL SPONGE FROM URETHANE

James Leverètte Guthrie, Ashton, and Donald John Bach, Baltimore, both of Md., assignors to W. R. Grace & Co., New York, N.Y.

Filed May 15, 1975, Ser. No. 577,969

Int. Cl.^{2} C08G *18/06, 18/08, 18/14*

U.S. Cl. 260—2.5 AG **8 Claims**



1. A method for preparation of new improved hydrophilic crosslinked polyurethane foams which simulate natural sponges which comprises reacting a first component comprising isocyanate capped polyoxyethylene polyol having a reaction functionality greater than two, said polyol being substantially void of reactive hydroxy groups and having a molecular weight of from about 200 to about 20,000, with a second component comprising aqueous reactant, the ratio of moles H_2O/-moles NCO groups being about 6.5 to about 390 in said second and first components respectively, in the presence of a liquid defoaming agent and nonionic surfaceactive agent, the nonionic surface-active agent having a high hydrophilic / lyophilic balance in the range of about HLB 14 to about HLB 18, whereas the liquid defoaming agent has a low hydrophilic / lyophilic balance of about HLB 5.5 to about HLB 8, and wherein the concentration of the liquid defoaming agent in the aqueous water phase prior to the foaming reaction is from about 0.3 to about 3.0% by weight of the aqueous phase, and the concentration of the nonionic surface-active agent in the aqueous water phase prior to the foaming reaction is from about 0.05 % to about 0.3% by weight of the aqueous phase.

4,036,792

POLYISOCYANURATE FOAMS PREPARED BY A COCATALYST SYSTEM

Henry S. Hopkins, Jr., Ashland, Ohio, assignor to General Latex and Chemical Corporation, Cambridge, Mass.

Filed July 16, 1975, Ser. No. 596,367

Int. Cl.^{2} C08G *18/18*

U.S. Cl. 260—2.5 AW **20 Claims**

1. In the process of preparing a polyisocyanurate product, which process comprises reacting a polyisocyanate in the presence of a catalytic amount of a trimerization catalyst to provide a polyisocyanurate, the improvement which comprises:

carrying out the reaction in the presence of a trimer cocatalyst system which comprises from about 1 to 15 percent by weight of the product of a dialkylaminoalkyl phenol trimerization catalyst, and from about 1 to 15 weight percent of the dialkylaminoalkyl phenol of a tri C_2-C_3 alkylene diamine to provide a polyisocyanurate of immproved friability properties.

4,036,793

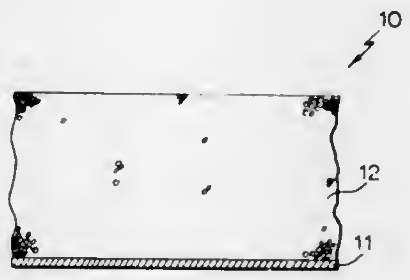
PHENOLIC POLYMER, RELATED PRODUCTS AND PROCESSES THEREOF

Ernest K. Moss, St. Petersburg, Fla., assignor to The Celotex Corporation, Tampa, Fla.

Division of Ser. No. 509,565, Sept. 27, 1974, which is a division of Ser. No. 354,636, April 26, 1973, Pat. No. 3,876,620. This application Sept. 17, 1975, Ser. No. 614,087

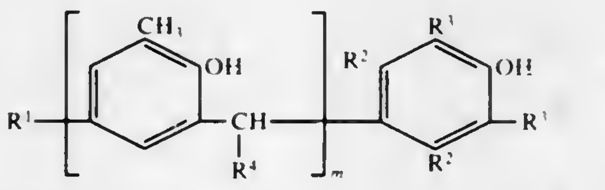
Int. Cl.^{2} C08J *9/14*

U.S. Cl. 260—2.5 F **20 Claims**



1. A cellular material comprising the reaction product of:

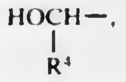
A. an alkylol group containing phenolic polymer of claim 1 of Formula I:



(I)

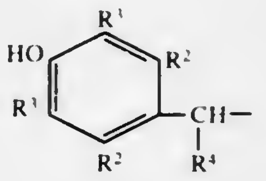
wherein:

a. R^1 is



$$\underset{\displaystyle R^4}{\underset{|}{HOCH}}-,$$

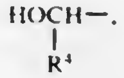
hydrogen or a radical of Formula II:



(II)

b. the R^2's are independently selected from the group consisting of lower alkyl, phenyl, benzyl, halo, nitro and hydrogen,

c. the R^3's are independently selected from the group consisting of



$$\underset{\displaystyle R^4}{\underset{|}{HOCH}}-,$$

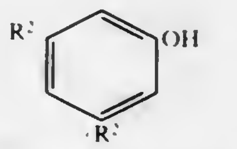
hydrogen, or a radical of Formula II,

d. the R^4's are independently selected from the group consisting of lower alkyl, hydrogen, phenyl, benzyl, or furyl,

e. m is an integer from 2 to 10 inclusive,

f. the phenolic polymer has a molecular weight between 200 and 2000, and

B. a compound of Formula V:



(V)

wherein the weight ratio of B.A is 1:30 to 1:2.

4,036,794

MANUFACTURE OF EXPANDABLE STYRENE POLYMERS

Hans Georg Képpler, Weinheim; Erhard Stahnecker, Heidelberg, and Rolf Moeller, Ludwigshafen, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen am Rhine, Germany

Filed Oct. 8, 1976, Ser. No. 730,826

Claims priority, application Germany, Oct. 30, 1975, 2548524

Int. Cl.^{2} C08J *9/20*

U.S. Cl. 260—2.5 B **9 Claims**

1. In a process for the manufacture of expandable polystyrene particles by suspension polymerization of styrene, with or without a minor amount of one or more other monomers, in the presence of a blowing agent and a suspension stabilizer, the blowing agent being added during or after the polymerization, wherein the suspension polymerization is carried out in the presence of a suspension stabilizer, the improvement wherein the suspension stabilizer has been manufactured by free radical polymerization, in the aqueous phase, of from 90 to 10 parts by weight of styrene, a substituted styrene, an ester of acrylic acid or methacrylic acid with an alcohol of 1 to 8 carbon atoms, a vinyl ester of a saturated monocarboxylic acid of 2 to 12 carbon atoms, a nitrile or amide of acrylic acid or methacrylic acid, vinyl chloride, butadiene or a mixture of two or more thereof, in the presence of from 10 to 90 parts by weight of polyvinylpyrrolidone or of a copolymer of vinylpyrrolidone in which polymerized units of the latter predominate.

4,036,795

AQUEOUS CATIONIC COATING FROM AMINE-EPOXY ADDUCT, POLYAMIDE, AND SEMIBLOCKED POLYISOCYANATE, ACID SALT

Akira Tominaga, Hiratsuka, Japan, assignor to Kansai Paint Co., Ltd., Japan

Filed Sept. 11, 1975, Ser. No. 612,281

Claims priority, application Japan, Sept. 20, 1974, 49-109382

Int. Cl.^{2} C08J *3/06;* C08L *63/02;* C25D *13/06*

U.S. Cl. 260—18 PN **10 Claims**

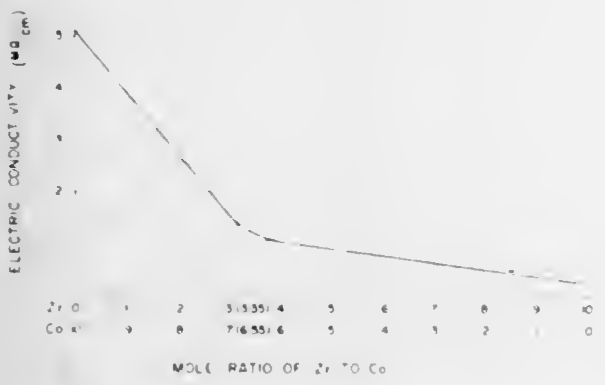
1. A cationic electroporetic coating composition comprising an aqueous medium and a resinous binder dispersed therein, said resinous binder being prepared by contacting at least one starting material with a partially blocked polyisocyanate compound at a temperature of 40° to 130° C in the weight ratio of

from 5 to 9 of the former to from 5 to 1 of the latter, and subsequently by neutralizing the resulting product with an acid, said starting material being at least one selected from the group consisting of:

1. a mixture of a reaction product prepared by reacting an epoxy resin with a basic amino compound having at least one basic amino group, and a polyamide having at least one basic amino group, in the weight ratio of from 1 to 9 of the reaction product to from 9 to 1 of the polyamide, and
2. a further reaction product prepared by mixing said reaction product with said polyamide at a temperature of 50° to 200° C in the weight ratio of from 1 to 9 of the reaction product to from 9 to 1 of the polyamide,

said partially blocked polyisocyanate compound having at least one blocked isocyanate group in the molecule and an average of more than zero to not more than one free isocyanate group per molecule.

4,036,796
PROCESS OF DRYING AND HARDENING FILM-FORMING MATERIAL
Iwakichi Sugiyama, Narashino; Yukihisa Takaoka, Ibaraki, and Kiyoshi Endo, Chiba, all of Japan, assignors to Matsumoto Seiyaku Kogyo Kabushiki Kaisha, Ichikawa, Japan
Filed Jan. 29, 1975, Ser. No. 545,314
Claims priority, application Japan, Jan. 29, 1974, 49-12058
Int. Cl.² C08L *91/00;* **C09F** *9/00*
U.S. Cl. 260—22 CA **9 Claims**



1. A process of drying and hardening a film-forming material which comprises using as a dryer for said film-forming material as alkoxy-radical containing zirconium compound-cobalt carboxylate complex, said alkoxy radical-containing zirconium compound being selected from the group consisting of zirconium tetraalkoxides of the formula:

$Zr\,(OR)_4$

wherein R denotes an alkyl radical having from 2 to 10 carbon atoms and may be of the same kind or of different kinds, and zirconium alkoxychelates of the formula:

$Zr\,(L)_n\,(OR)_m$

wherein R denotes the same radical as defined above, L denotes a chelating ligand selected from the group consisting of β-diketones, hydroxy esters, and ketoesters, and *m* and *n* are integers each of 1 to 3, *m* plus *n* equaling 4, the cobalt carboxylate being a member selected from the group consisting of cobalt salts carboxylic acid having from 6 to 18 carbon atoms, the mole ratio of cobalt to zirconium of said complex being of the order of 2 : 1.

4,036,797
POLYURETHANE PRECURSORS CONTAINING THIXOTROPIC AGENTS
Arthur L. Meader, Jr., Berkeley, Calif., assignor to Chevron Research Company, San Francisco, Calif.
Filed Sept. 10, 1973, Ser. No. 396,040
Int. Cl.² C08L *95/00*
U.S. Cl. 260—28 R **11 Claims**

1. A composition comprising:

A. 18 to 50 weight percent of a polyurethane precursor, said precursor comprising:
  1. a polyol having a molecular weight of 1500 to 5000, and
  2. a chain stiffener having a molecular weight of 62 to 300, wherein the mole ratio of the isocyanate-reactive groups of said low molecular weight chain stiffener to the isocyanate-reactive groups of said polyol is 0.5–4:1,

B. 80 to 30 weight percent of a substantially inert, nonvolatile extender, selected from the group consisting of cutback asphalts, mineral oils, and mixtures thereof,

C. 0.1 to 8 weight percent of a thixotropic agent formed in situ by reacting a mixture of primary mono and diamines wherein the monoamine is a monofunctional monoamine containing 6 to 30 carbon atoms and the diamines are selected from the group consisting of a methyl imine bis(propylamine), ethylene diamine and mixtures thereof, wherein the mol ratio of monoamines to diamines is 20–1:1 diamines, and a polyisocyanate at an NCO/NH ratio of 0.10–1.3:1, and

D 0 to 20 weight percent of an inert filler.

4,036,798
HARDENABLE COMPOSITIONS OF IMPROVED THERMAL STABILITY
Walter Hoppe, Windeck-Schladern; Hans Junger, Troisdorf, and Franz Weissenfels, Siegburg, all of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany
Filed Feb. 3, 1975, Ser. No. 546,832
Claims priority, application Germany, Feb. 14, 1974, 2406992
Int. Cl.² C08K *3/40*
U.S. Cl. 260—28 P **17 Claims**

1. A composition comprising an inorganic oxidic material other than glass powder and 1 to 30 weight percent of glass powder having a particle size of >0 to 100 microns and 1 to 20 weight percent, of a hardenable thermo- or cold-setting phenolic resin, the weights being on the basis of the weight of the inorganic oxidic material.

4,036,799
COMPOSITIONS CONTAINING POLYCHLOROPRENE
Peter Henry Westermann, Dorking, England, assignor to The British Petroleum Company Limited, London, England
Filed Feb. 26, 1976, Ser. No. 661,606
Claims priority, application United Kingdom, Mar. 7, 1975, 9564/75
Int. Cl.² C08L *91/00;* **C08F** *14/02;* **C08C** *19/20*
U.S. Cl. 260—28.5 B **16 Claims**

1. A vulcanizable composition comprising polychloroprene and 3 to 300 parts by weight, per 100 parts of polychloroprene of hardened extract obtained by blowing air at an elevated temperature into a solvent extract of a distillate petroleum fraction boiling in the lubricating oil boiling range and containing a major proportion of aromatic hydrocarbons, said hardened extract having a saturated hydrocarbon content of not more than 10% by weight.

4,036,800
ELECTRODEPOSITION OF AQUEOUS DISPERSIONS OF AMINE FUNCTIONAL URETHANE COPOLYMERS
Kazys Sekmakas, Chicago, and Raj Shah, Schaumburg, both of Ill., assignors to DeSoto, Inc., Des Plaines, Ill.
Filed June 4, 1975, Ser. No. 583,655
Int. Cl.² C08K *3/18;* **C08L** *61/20, 75/04*
U.S. Cl. 260—29.2 TN **23 Claims**

1. An amine functional urethane copolymer dispersible in water with the aid of a solubilizing acid and which is a copolymer of:

A. 5–75% by weight of an ethylenically unsaturated urethane amine free of epoxy groups and formed by reacting a 1,2-epoxy functional urethane in which the urethane groups are ethylenically unsaturated with a monosecondary amine; and

B. the balance consisting essentially of copolymerizable monoethylenically unsaturated monomers.

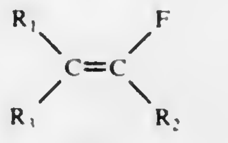
4,036,801
AQUEOUS AMPHOTERIC POLYURETHANE HAVING BLOCKED NCO GROUPS AND PROCESS
Kazuo Matsuda; Hidemasa Ohmura, and Takeyo Sakai, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan
Filed July 14, 1976, Ser. No. 705,267
Claims priority, application Japan, July 31, 1975, 50-93327
Int. Cl.² C08G *18/80;* **C08J** *3/06*
U.S. Cl. 260—29.2 TN **6 Claims**

1. A process for preparing an aqueous amphoteric thermosetting polyurethane emulsion, which comprises:

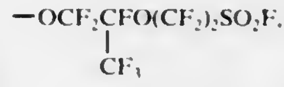
1. reacting, in the liquid phase and in a ketone solvent, at a temperature of from −20° to +70° C, (A) isocyanate-terminated urethane prepolymer prepared by reacting organic polyhydroxyl component havin a molecular weight in the range of from 200 to 10,000 with an excess of organic polyisocyanate, with (B) an excess of polyalkylene polyamine having at least two primary or secondary amino groups, the total mole number of primary and secondary amino groups in the polyalkylene polyamine being greater than the total mole number of isocyanate groups in the isocyanate-terminated urethane prepolymer, the reaction being carried out until the presence of —NCO groups cannot be detected, whereby to form polyurethane-urea-polyamine,
2. reacting, in the liquid phase, the reaction product of step 1 with a blocked polyisocyanate having a single free isocyanate group in the molecule, at a temperature of −20° C to +70° C, for about 0.5 to 2 hours,
3. reacting the reaction product of step 2 with either (I) a compound selected from the group consisting of 1,3-propane sultone, 1,4-butane sultone, β-propiolactone, γ-butyrolactone, ϵ-caprolactone, δ-valerolactone and a compound having the formula $X(CH_2)_nCOONa$, wherein X is halogen and *n* is one or 2, or (II) a compound selected from the group consisting of methyl acrylate, ethyl acrylate, methyl methacrylate, ethyl methacrylate and acrylonitrile, followed by hydrolysis of the reaction product, whereby to render amphoteric the reaction product of step 2, pl 4. adding water to the reaction product of step 3, and
5. treating the product of step 4 to remove the organic solvent therefrom and thereby obtaining an aqueous polyurethane emulsion as a final product.

4,036,802
TETRAFLUOROETHYLENE COPOLYMER FINE POWDER RESIN
Robert Victor Poirier, Vienna, W. Va., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed Sept. 24, 1975, Ser. No. 616,442
Int. Cl.² C08L *27/18*
U.S. Cl. 260—296 F **21 Claims**

1. An aqueous polymer dispersion comprising a dispersion of non-melt-fabricable tetrafluoroethylene polymer particles in water at a solids content of between about 10 and about 65 weight percent; said particles having an average size of between about 0.1 **and** 0.5μ; said particles having at least two portions, an outer portion and an adjacent inner portion, each portion consisting essentially of a copolymer of units of tetrafluoroethylene and at least one comonomer having the formula

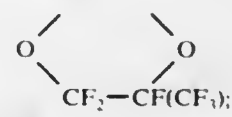

(a)

wherein
- R_1 independently if F or H;
- R_2 independently is F or Cl;
- R_3 can be Cl, $—R_f$, $—OR_f$,$—R'_fH$, $—OR'_fH$, $—R'_fCl$, $—OR'_fCl$, or

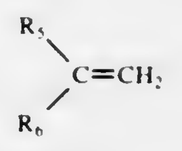


$$—OCF_2CFO(CF_2)_2SO_2F.$$
$$\qquad\;\; | \;\; CF_3$$

Wherein R_f is linear perfluoroalkyl of 1–5 carbon atoms, and R'_f is linear perfluoroalkylene (perfluorinated alkane diradical) of 1–5 carbon atoms in which the designated substituent is an omega substituent; and when R_2 is F, R_1 and R_3 taken together can be



or the formula


(b)

wherein
- R_5 and R_6 are independently $—CF_3$ or $—CClF_2$; said inner copolymer portion containing a higher percentage of said comonomer than the outer copolymer portion; the total comonomer content present in the particle, the amount of comonomer present in the copolymer of each portion, and the amount of each portion within such particles being sufficient to produce on AWG 22 wire a sintered coating having no more than 5 flaws per 100 meters of coated wire when said particles are paste extruded at a reduction ratio of 2840:1, the flaws being detected by subjecting the sintered coated wire to a high voltage spark tester at 2KV and 3000Hz; the copolymers of the inner portion and the outer portion combined containing an amount of comonomer which is low enough to maintain the non-melt-fabricable nature of the polymer particles.

4,036,803
PROCESS FOR PRODUCING FLAME RETARDANT ACRYLIC SYNTHETIC FIBERS

Toshiyuki Kobashi, and Kenichi Masuhara, both of Okayama, Japan, assignors to Japan Exlan Company Limited, Osaka, Japan

Filed Nov. 11, 1975, Ser. No. 630,890

Claims priority, application Japan, Nov. 14, 1974, 49-131832

Int. Cl.^{2} C08L *33/20*

U.S. Cl. 260—29.6 AN **9 Claims**

1. In a process for the production of a flame retardant acrylic synethic fiber by making a spinning solution composed of an inorganic solvent solution of an acrylonitrile polymer with an emulsion of a polymer of a vinyl halide and/or vinylidene halide, and wet spinning the resulting mixed solution, the improvement which comprises using, as said emulsion, an emulsion obtained by polymerizing a vinyl halide and/or vinylidene halide, or a mixture of such monomers with other unsaturated monomers copolymerizable therewith, in an aqueous medium below a pH of 4 using a water-soluble cataylst, in the presence of a water-soluble polymer containing copolymerized monomer units consisting essentially of an ethylenically unsaturated carboxylic acid or a salt thereof and monomer units consisting of an ethylenically unsaturated sulfonic acid or a salt thereof, the ratio of monomeric units of ethylenically unsaturated carboxylic acid or its salt to monomeric units of ethylenically unsaturated sulfonic acid or its salt being 30-80 : 70-20 in weight ratio.

4,036,804
ADHESIVE COMPOSITION

Seizaburo Hirai, Takatsuki; Yoji Mizoe, Kyoto, and Itoh Koji, Amagasaki, all of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed Aug. 11, 1975, Ser. No. 603,629

Claims priority, application Japan, Aug. 12, 1974, 49-92648

Int. Cl.^{2} C08L *11/02, 13/02*

U.S. Cl. 260—29.7 SQ **8 Claims**

1. An adhesive resinous composition for bonding an unvulcanized rubber material onto a metal substrate which comprises (1) an aqueous solution or dispersion of an elastic high molecular weight compound having carboxyl groups in its structure in such amounts that the carboxyl groups are present in amounts of from about 1×10^{-4} to 40×10^{-4} mol per 1 gram of the total resinous content in the composition, (2) a vulcanizing agent in an amount of 0.1 to 10% by weight, based on the weight of the elastic high molecular weight compound and (3) a vulcanizing accelerator to adjust the vulcanization rate of the adhesive composition to that of the unvulcanized rubber in an amount of 0.1 to 10% by weight of the elastic high molecular weight compound; wherein the resinous solid content is present in an amount of from about 1-50% by weight, based on the weight of the adhesive composition.

4,036,805
COLORING OF THE ORGANIC MATERIALS WITH NAPHTHACENEQUINONES

Michihiro Tsujimoto, Tachikawa, and Ichiro Okubo, Hachioji, both of Japan, assignors to Mitsui Toatsu Chemicals, Incorporated, Tokyo, Japan

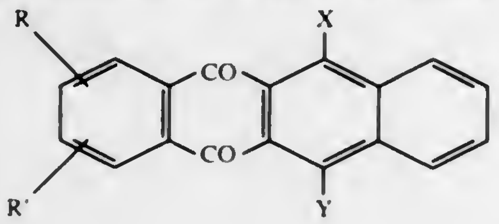
Filed July 16, 1973, Ser. No. 379,482

Claims priority, application Japan, July 28, 1972, 47-75044

Int. Cl.^{2} C08L *77/02, 67/02, 23/08;* **D08P** *1/20*

U.S. Cl. 260—37 N **8 Claims**

1. A method which comprises coloring a synthetic organic high molecular weight compound or cellulose ester with a naphthacenequinone derivative having the formula:



wherein:

X is hydroxyl and Y is hydrogen, chlorine, hydroxyl, lower alkoxy *or lower alkoxy* the alkyl group of which *is* substituted with lower alkoxy or lower alkylthio, phenoxy *or phenoxy* which *is* substituted with methyl *or* methoxy, amino, phenylsulfonylamino *or phenylsulfonylamino* the phenyl group of which *is* substituted with lower alkyl, phenylamino, methyl, cyclohexyl or benzyl, *or X and Y each is simultaneously amino or phenylamino:* and

R and R' each is hydrogen, chlorine *or* methyl, or R and R' together form a benzene ring.

4,036,806
MOLDING COMPOUNDS

Kevin M. Foley, Toledo; Reuben H. Bell, Cincinnati, and Frank P. McCombs, Granville, all of Ohio, assignors to Owens-Corning Fiberglas Corporation, Toledo, Ohio

Filed Oct. 8, 1975, Ser. No. 620,524

Int. Cl.^{2} C08K *3/30*

U.S. Cl. 260—37 N **13 Claims**

1. A molding composition comprising a mixture of a nylon resin and at least one organic cement, wherein the resin is formed in the presence of the cement and wherein the resin and cement have a weight ratio of resin to cement ranging from 1:9 to 9:1 bases on the dry weight of cement and the weight of the resin solids wherein the cement is hydrated or hydraulic cement.

4,036,807
FLUORINE-CONTAINING ORGANOSILICON COMPOUNDS

John Heathcote Atherton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 339,764, March 12, 1973, Pat. No. 3,859,320. This application Sept. 24, 1974, Ser. No. 509,026

Claims priority, application United Kingdom, May 22, 1972, 23888/72

Int. Cl.^{2} C08K *9/06*

U.S. Cl. 260—42.15 **4 Claims**

1. A method of preparing a filled fluorocarbon polymer from a filler and a granular fluorocarbon polymer, both in powder form, comprising treating the filler with a fluorocarbon derivative and agglomerating the filler together with the polymer from an aqueous medium, recovering the drying the agglomerate, the fluorocarbon derivative being an organosilicon compound of the general formula:

$$\left[C_nF_{2n+1}R_aC_mH_{2m}SiR'_bX_cO_{\frac{3-b-c}{2}}\right]_x\left[Z_dH_eSiO_{\frac{4-d-e}{2}}\right]_y$$

where R is a divalent group selected from the group consisting of oxygen, alkylene groups having not more than 8 carbon atoms, polyoxyalkylene diol residues, phenyleneoxy groups and phenyleneoxy groups containing substituents selected from the group consisting of lower alkyl and alkoxy groups and halogen atoms and in the case where R is a phenyleneoxy or a substituted phenyleneoxy group, the group R being optionally linked to the group $C_m H_{2m}$ via a group selected from the group consisting of sulphonamido and carboxyl groups, R^1 is selected from the group consisting of methyl and phenyl groups, X is selected from the group consisting of halogen atoms, lower alkoxy groups, substituted lower alkoxy groups and polyoxyalkylene groups, Z is selected from the group consisting of lower alkyl groups and phenyl, *a* is 0 or 1, *b* is 0, 1 or 2, *c* is 0, 1, 2, or 3, $b + c$ is not greater than 3, *d* is 0, 1, 2 or 3, *e* is 0 or 1 and $d + e$ is not greater than 3, *n* is 8, 10 or 12,

m is 2, 3 or 4, *x* is a positive integer, when $b + c$ is 3, *y* is 0, and when $b + c$ is not greater than 2, *y* is a positive integer.

4,036,808
CONDUCTIVE HYDROGEL CONTAINING 3-IONENE

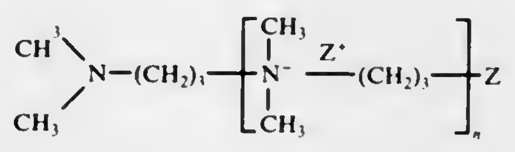
Alan Rembaum, and Shiao-Ping Siao Yen, both of Altadena, Calif., assignors to California Institute of Technology, Pasadena, Calif.

Division of Ser. No. 280,649, Aug. 14, 1972, Pat. No. 3,898,188. This application Dec. 26, 1973, Ser. No. 427,917

Int. Cl.^{2} C08L *29/04, 79/02*

U.S. Cl. 260—42.51 **7 Claims**

1. A conductive composition consisting essentially of a dispersion of 20 to 95 percent by weight of a water-soluble gel forming binder polymer selected from polyvinyl alcohol or polyvinyl alcohol cross-linked to a water-insoluble and water-swellable form by reaction with a coreactive water-soluble polymer and a linear, water-soluble polyelectrolyte of the formula:



where Z is chloro, bromo or iodo and *n* is an integer such that the intrinsic viscosity, *n*, as determined by light scattering in 0.4 KBr is at least 0.2 dl/g as determined by the formula:

$$n = (2.94 \times 10^{-4})\ M^{0.61}$$

where M is molecular weight.

4,036,809
HALOGEN-CONTAINING DIPHOSPHONATES

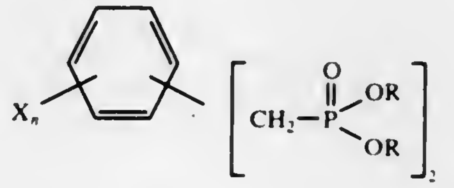
Kestutis A. Keblys, Southfield, Mich., assignor to Ethyl Corporation, Richmond, Va.

Continuation-in-part of Ser. No. 549,518, Feb. 13, 1975, abandoned, which is a division of Ser. No. 351,809, April 16, 1973, abandoned. This application Oct. 2, 1975, Ser. No. 618,890

Int. Cl.^{2} C08K *5/53*

U.S. Cl. 260—45.7 P **3 Claims**

1. As a composition of matter, an unsaturated polyester resin stabilized with a flame retardant amount of a compound having the formula



wherein X is bromine, *n* is 2-4, and each R is alike or different and selected from lower hydrocarbyl groups and, said resin being prepolymer, made by esterification of dihydric alcohol with an acid moiety selected from unsaturated and saturated dicarboxylic acids and anhydrides, crosslinked with an unsaturated monomer.

4,036,810
HALOGEN CONTAINING POLYMERIC RESINS HAVING HEAT AND LIGHT STABILITY

George C. Hopkins, Clarence, N.Y., and D. Bruce Merrifield, Houston, Tex., assignors to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Continuation-in-part of Ser. No. 430,115, Jan. 2, 1974, Pat. No. 3,933,740. This application Nov. 14, 1975, Ser. No. 631,966

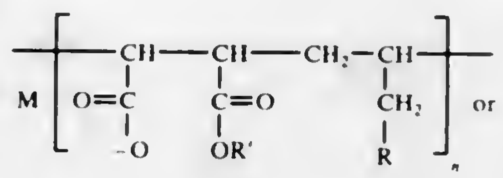
The portion of the term of this patent subsequent to Jan. 20, 1993, has been disclaimed.

Int. Cl.^{2} C08K *5/32, 5/11, 5/09*

U.S. Cl. 260—45.75 W **7 Claims**

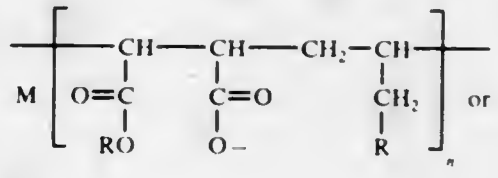
1. A heat and light stable polymer composition comprising a vinyl polymer containing more than 5 weight percent halogen substituent and a stabilizing amount of a metal salt of a polymeric reaction product of an alpha-olefin and maleic anhydride, said metal salt having recurring units of the formula:

(A)



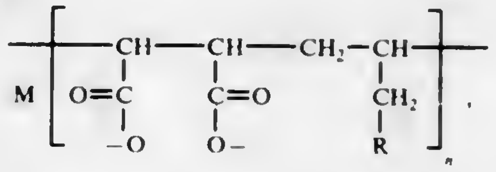
or

(B)



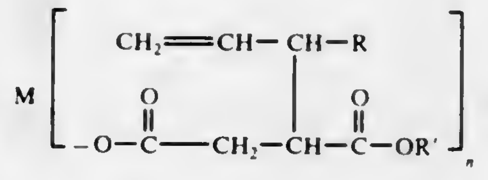
or

(C)



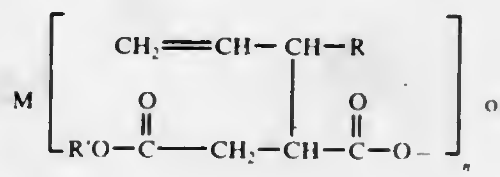
or a metal monomeric organic carboxylate salt represented by the formula:

(D)



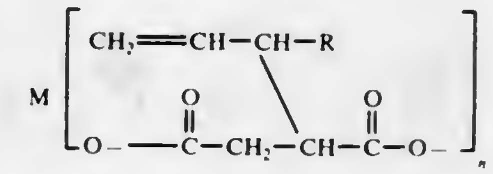
or

(E)



or

(F)



or mixtures thereof wherein M represents a di- or tetravalent metal selected from the group consisting of calcium, zinc, cadmium, barium and tin; *n* is 1 or 2 in formulas (C) and (F) and 2 or 4 in formulas (A), (B), (D), and (E); R is selected from the group consisting of hydrogen, aryl, alkyl, aralkyl, alkaryl and substituted derivatives thereof having 1 to 17 carbon atoms which can be halogenated; and R' is selected from the group consisting of alkali metal cations, ammonium cation, lower alkyl-substituted ammonium cations, hydrogen atom, aryl radicals, alkyl radicals, aralkyl radicals alkaryl radicals and substituted derivatives of said radicals having 1 to 17 carbon atoms which can be halogenated.

4,036,811
FLAME RETARDING POLYAMIDE MOLDING COMPOSITIONS

Siegfried Noetzel, Kelkbeim, Taunus, and Walter Herwig, Neuenhain, Taunus, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

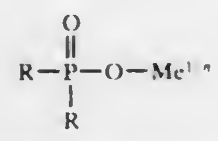
Filed Oct. 6, 1975, Ser. No. 620,141

Claims priority, application Germany, Oct. 7, 1974, 2447727

Int. Cl.² C08K *5/53*

U.S. Cl. 260—45.75 W **7 Claims**

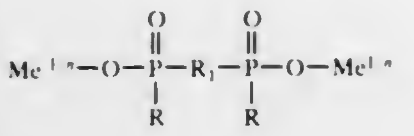
1. A polyamide molding composition consisting essentially of a polyamide and a flameproofing amount of a flame-proofing agent which is a salt of a phosphinic acid of the formula



$$R-\overset{\overset{O}{\|}}{\underset{\underset{R}{|}}{P}}-O-Me^{1/n}$$

I

or a diphosphinic acid of the formula



$$Me^{1/n}-O-\overset{\overset{O}{\|}}{\underset{\underset{R}{|}}{P}}-R_1-\overset{\overset{O}{\|}}{\underset{\underset{R}{|}}{P}}-O-Me^{1/n}$$

II

wherein

Me is selected from alkali metals and metals of the second and third groups of the Periodic System,

n indicates the valency of the metal Me,

R is selected from saturated linear, branched and cyclic alkyl radicals having from 1 to 16 carbon atoms, aryl and aralkyl radicals having from 6 to 16 carbon atoms and mixtures thereof, and

R_1 is selected from saturated linear, branched and cyclic alkylene; arylalkylene; arylene, arylenealkylene and arene-bisalkylene radicals having from 1 to 6 carbon atoms in the alkylene radical and mixtures thereof.

4,036,812
METHOD OF STABILIZING ORGANIC MATERIALS EMPLOYING PYRAZOLE NICKEL COMPLEXES

Lajos Avar, Binningen, and Kurt Hofer, Munchenstein, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

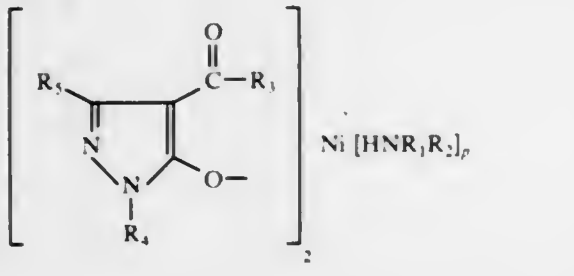
Division of Ser. No. 575,157, May 7, 1975, Pat. No. 3,959,265. This application Dec. 17, 1975, Ser. No. 641,678

Claims priority, application Switzerland, May 13, 1974, 6492/74

Int. Cl.² C08K *5/34*

U.S. Cl. 260—45.75 N **8 Claims**

1. A stabilized composition comprising a natural or synthetic polymeric material susceptible to degradation under the effect of ultraviolet light and incorporated therein, in a sufficient amount to prevent said degradation, a nickel complex of the formula:



wherein either R_1 is hydrogen, alkyl (C_1-C_8) or $—CH_2CH_2OH$

and R_2 is alkyl (C_1-C_{18}); alkyl (C_1-C_{18}) monosubstituted by hydroxy, alkoxy (C_1-C_4), piperidino or morpholino; cyclohexyl; phenylalkyl (C_7 or C_8); phenylalkyl (C_7 or C_8) substituted on the phenyl nucleus by a total of 1 to 3 substituents, each substituent selected from the group consisting of alkyl (C_1-C_4) and hydroxy, with the proviso that there is a maximum of 2 alkyl substituents and a maximum of 1 hydroxy substituent; phenyl; phenyl monosubstituted by alkyl (C_1-C_{12}); phenyl monosubstituted by chloro; phenyl monosubstituted by unsubstituted phenyl or phenyl substituted by a total of 1 to 3 substituents, each substituent selected from the group consisting of alkyl (C_1-C_4) and hydroxy, with the proviso that there is a maximum of 1 hydroxy substituent and a maximum of 2 alkyl substituents;

or R_1 and R_2, together with the —NH— group to which they are bound, form a piperidine, morpholine, pyrrolidine or imidazolidine ring;

R_3 is alkyl (C_1-C_{22}); alkyl (C_1-C_{21})-thio-alkyl (C_1-C_{21}) with C_2-C_{22} in the aggregate thereof; alkyl (C_1-C_4) monosubstituted by chloro; alkyl (C_1-C_4) disubstituted by chloro; cycloalkyl (C_5-C_{12}); cycloalkyl (C_5-C_{11}) alkyl (C_1-C_7) with C_6-C_{12} in the aggregate thereof; phenylalkyl (C_7-C_{12}); phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by hydroxy; phenylalkyl (C_7-C_{12}) disubstituted on the phenyl nucleus by hydroxy; phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by alkyl (C_1-C_{12}); phenylalkyl (C_7-C_{12}) disubstituted on the phenyl nucleus by alkyl (C_1-C_{12}); phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by cycloalkyl (C_5-C_{12}); phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by cycloalkyl (C_5-C_{11})-alkyl (C_1-C_7) with C_6-C_{12} in the aggregate thereof; phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by alkyl (C_1-C_{12}); phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by hydroxy and disubstituted on the phenyl nucleus by alkyl (C_1-C_{12}); phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl (C_5-C_{12}); phenylalkyl (C_7-C_{12}) monosubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl C_5-C_{11})-alkyl (C_1-C_7) with C_6-C_{12} in the aggregate thereof; phenylalkyl (C_7-C_{12}) disubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by alkyl (C_1-C_{12}); phenylalkyl (C_7-C_{12}) disubstituted on the phenyl nucleus by hydroxy and disubstituted on the phenyl nucleus by alkyl (C_1-C_{12}); phenylalkyl (C_7-C_{12}) disubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl (C_5-C_{12}); phenylalkyl (C_7-C_{12}) disubstituted on the phenyl nucleus by hydroxy and monosubstituted on the phenyl nucleus by cycloalkyl (C_5-C_{11})-alkyl (C_1-C_7) with C_6-C_{12} in the aggregate thereof; phenyl; phenyl substituted by a total of 1 to 3 substituents, said substituents having not more than 18 carbon atoms, each substituent being selected from the group consisting of halo, cyano, meta-hydroxy, para-hydroxy, alkyl (C_1-C_{12}), alkoxy (C_1-C_{12}), phenyl, R_6-O and R_6-SO_2, wherein R_6 is phenyl, phenyl monosubstituted by alkyl (C_1-C_8) or phenyl disubstituted by alkyl (C_1-C_8), with the proviso that there is a maximum of 2 halo substituents, a maximum of 1 cyano substituent, only one of substituents meta-hydroxy and para-hydroxy, a maximum of 2 alkyl (C_1-C_{12}) substituents, a maximum of 2 alkoxy (C_1-C_{12}) substituents and only one of substituents R_6—O— and R_6—SO_2—; a heterocyclic ring selected from furyl, thienyl, benzothienyl, indolyl, pyridyl and quinoxalinyl; or a furyl, thienyl, benzothienyl, indolyl, pyridyl or quinoxalinyl ring substituted by a total of one or two substituents, each substituent being selected from the group consisting of halo, alkyl (C_1-C_4) and alkoxy (C_1-C_4);

R_4 and R_5 are each, independently, alkyl (C_1-C_8); phenyl; or phenyl substituted by a total of 1 to 3 substituents, each substituent being selected froom the group consisting of halo and alkyl (C_1-C_4), with the proviso that there is a maximum of 1 halo substituent and a maximum of 2 alkyl (C_1-C_4) substituents; and

p is 1 when the amine ligand is bidentate, and

p is 2 when the amine ligand is monodentate.

4,036,813
COMPOSITION FOR PROMOTING ADHESION OF CURABLE SILICONES TO SUBSTRATES

Bruce Bertolette Hardman, Mechanicville, and William Thomas Madigan, Valley Falls, both of N.Y., assignors to General Electric Company, Waterford, N.Y.

Filed Nov. 26, 1975, Ser. No. 635,618

Int. Cl.² C08G *77/04*

U.S. Cl. 260—46.5 G **12 Claims**

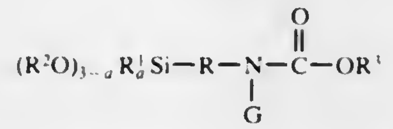
1. A self-bonding, low modulus, one-package room temperature vulcanizing silicone composition, having superior adhesion to substrates, comprising:

i. a silanol chain-stopped diorganopolysiloxane,

ii. a tri- or tetrafunctional, hydroxy-reactive silane or polysilane crosslinker therefor,

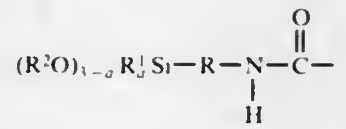
iii. a catalyst capable of promoting the reactions between (i) and (ii), and

iv. a small, effective, adhesion promoting amount of a composition comprising predominantly a compound of the formula:



$$(R^2O)_{3-a}R^1_aSi-R-\underset{\underset{G}{|}}{N}-\overset{\overset{O}{\|}}{C}-OR^3$$

wherein G is hydrogen or a group of the formula:



$$(R^2O)_{3-a}R^1_aSi-R-\underset{\underset{H}{|}}{N}-\overset{\overset{O}{\|}}{C}-$$

wherein R is a divalent radical selected from alkylene-arylene, alkylene and cycloalkylene of up to 8 carbon atoms, R^1 and R^3, independently, are radicals of up to 8 carbon atoms selected from hydrocarbyl or halohydrocarbyl, R^2 is a radical of up to 8 carbon atoms selected from hydrocarbyl, halohydrocarbyl or cyanohydrocarbyl, and *a* is 0 to 3, or a mixture of such compounds.

4,036,814
LIGHTLY CROSS-LINKED HYDROGEL FORMED FROM N-VINYL LACTAM AND HYDROPHOBIC ACRYLIC ESTER COMONOMER

John Gordon Bernard Howes, Hertford Heath; Nicholas Mario da Costa; Rupert Alec Selway, both of Harlow, and William Duncan Potter, Puckeridge, all of England, assignors to Warner-Lambert Company, Morris Plains, N.J.

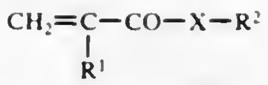
Filed June 25, 1975, Ser. No. 590,037

Claims priority, application United Kingdom, July 4, 1974, 29757/74; Apr. 28, 1975, 17586/75

Int. Cl.² C08F *26/08*

U.S. Cl. 260—47 UA **29 Claims**

1. A lightly crosslinked hydrogen copolymeric material with an uptake of physiological saline of between 65% and 85%, by weight, based on the total weight of gel, said material being formed from (1) at least one water soluble N-vinyl lactam and (2) as a comonomer, not more than 15 mole percent of at least one compound of formula:



$$CH_2=\underset{\underset{R^1}{|}}{C}-CO-X-R^2$$

wherein X is selected from the group consisting of —NH— and —O—; R^1 is sslected from the group consisting of hydrogen and alkyl groups containing from 1 to 4 carbon atoms; and R^2 is selected from the group consisting of (A) substituted and unsubstituted phenyl and naphthyl wherein the substituent groups are selected from the group consisting of benzyl, alkyl containing from 1 to 4 carbon atoms, alkoxy containing from 1 to 4 carbon atoms, halo, phenyl, and alkyl phenyl wherein the alkyl group contains from 1 to 4 carbon atoms; and (B) an alkyl group containing from 1 to 6 carbon atoms wherein the alkyl group is substituted by at least one member selected from the group consisting of substituted phenyl, phenyloxy, naphthyl and naphthyloxy, wherein the substituents are selected from the group consisting of benzyl, alkyl containing from 1 to 4 carbon atoms, alkoxy containing from 1 to 4 carbon atoms, halo, phenyl, and alkylphenyl wherein the alkyl group contains from 1 to 4 carbon atoms, and wherein when said member substituted on the alkyl group is substituted or unsubstituted phenyloxy or naphthyloxy, said member is substituted on a carbon atom of the alkyl group other than the carbon atom adjacent to the —X— group.

4,036,815
AROMATIC POLYMERS PREPARED FROM HALOPHENOLS CONTAINING KETO GROUPS

Ronald George Feasey, Knebworth, and John Brewster Rose, Letchworth, both of England, assignors to Imperial Chemical Industries Limited, London, England

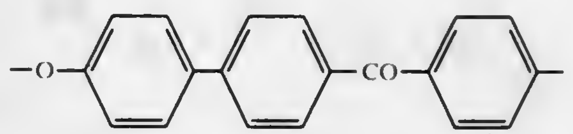
Continuation of Ser. No. 271,209, July 12, 1972, abandoned. This application July 9, 1975, Ser. No. 594,200

Claims priority, application United Kingdom, July 15, 1971, 33312/71

Int. Cl.² C08G *65/38*

U.S. Cl. 260—49 **9 Claims**

1. An aromatic polymer whose molecular chains consist essentially of units of the formula



alone or copolymerised with other units obtained by elimination of alkali metal halide from a member of the group consisting of alkali metal salts of other activated halophenols and mixtures of alkali metal salts of dihydric phenols with activated dihalobenzenoid compounds in which the halogen atoms in the halophenol or dihalobenzenoid compounds are activated by electron-attracting group selected from —CO— and —SO_2 ortho or para to the halogen atom.

4,036,816

PRODUCTION OF NOVEL THERMOSETTING PHENOL-FORMALDEHYDE RESINS BY CONTROLLED ACID REACTION

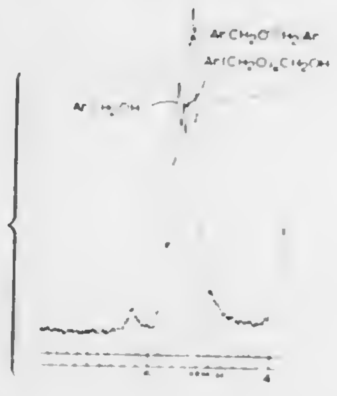
Ramesh C. Vasishth, Burnaby, and Pitchaiya Chandramouli, Richmond, both of Canada, assignors to Cor Tech Research Limited, Richmond, Canada

Continuation of Ser. No. 421,068, Dec. 3, 1973, abandoned. This application Dec. 1, 1975, Ser. No. 636,576

Claims priority, application United Kingdom, Dec. 14, 1972, 57762/72

Int. Cl.² C08G *2/28, 2/30*

U.S. Cl. 260—59 R **16 Claims**



1. A method for the production of a thermosetting phenol-formaldehyde resin, which comprises:

reacting phenol with formaldehyde in an aqueous reaction medium in the presence of a metal carboxylate catalyst therefor to form a thermosetting phenol-formaldehyde resin having benzyl ether linkages and hemiformal groups ortho to the phenolic hydroxyl groups and an infra-red spectrum which displays large absorption at wave numbers of approximately 1230 cm^{-1}, 1050 cm^{-1} and 1010 cm^{-1},

contacting said resin with at least one strong acid to cause a decrease of at lest 35% in the ratio of absorbance at 1010 cm^{-1}, measured from a base line drawn between wave numbers of 1030 cm^{-1} and 950 cm^{-1}, to that at 1230 cm^{-1}, measured from a base line drawn between wave number of 1130 cm^{-1} and 1310 cm^{-1}, to a value less than about 0.1, while leaving substantially unaffected the absorption at wave numbers of 1230 cm^{-1} and 1050 cm^{-1}, and

recovering the resulting thermosetting phenol-formaldehyde resin having a preponderance of benzyl ether linkages ortho to the phenolic hydroxyl groups, having substantially no tendency to cure upon extensive standing at ambient temperature and being capable of rapid cure at elevated temperature.

4,036,817

DIRECTION INDICATOR SWITCH

Norman Wilkinson, Higherford, near Nelson, England, assignor to Lucas Electrical Company Limited, Birmingham, England

Filed July 15, 1975, Ser. No. 596,144

Claims priority, application United Kingdom, July 17, 1974, 31567/74

Int. Cl.² H01H *3/16*

U.S. Cl. 200—61.27 **2 Claims**

1. A turn signal indicator mechanism for a road vehicle, said vehicle including a steering wheel with a striker moving in a fixed orbit in response to rotation of the steering wheel, said mechanism comprising:

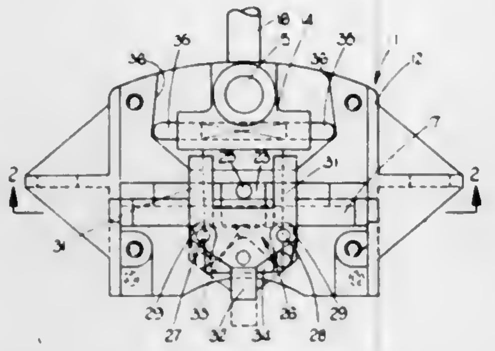
a fixedly mounted body;

a rotor mounted on said body and rotatably movable between a central rest position and first and second operative positions disposed on either side of said central rest position;

detent means, mounted on said body and rotor, for resiliently retaining said rotor in one of said positions;

a detent release member, movable with respect to said detent means, for releasing said detent means; and

pawl means, responsive to said rotor and urged into the orbit of said striker only when said rotor is in one of said operative positions, for operating said detent release member when struck by said moving striker, said pawl means comprising, means for moving about one of a pair of spaced parallel axes, which of said axes being determined by the position of said rotor, means for projecting a portion of said pawl into the orbit of said striker when said rotor is in one of said operative positions, and means for engaging said detent release member.



4,036,818

METHOD OF PREPARING POLYMERS OF POLYPHENYLENE TYPE

Vasily Vladimirovich Korshak, ulitsa Gubkina, 4, kv. 81; Vladimir Alexandrovich Sergeev, Profsojuznaya ulitsa, 34, korpus 4, kv. 26, and Mikhail Mikhailovich Teplyakov, ulitsa Gastello, 37, kv. 3, all of Moscow, U.S.S.R.

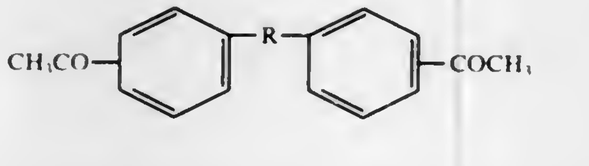
Continuation of Ser. No. 414,773, Nov. 12, 1973, abandoned, which is a continuation of Ser. No. 114,353, Feb. 10, 1971, abandoned. This application Dec. 22, 1975, Ser. No. 643,112

Claims priority, application U.S.S.R., Mar. 16, 1970, 1409968

Int. Cl.² C08G *6/00*

U.S. Cl. 260—63 K **18 Claims**

1. A method for producing phenylene-type polymers comprising polycondensing a compound selected from the group consisting of diacetylbenzenes; diacetylnaphthalenes; diacetyl compounds represented by the formula



where R is a simple bond, $(CH_2)_m$ with $m = 1$–20, O, or S; triacetylbenzene; or 1,3,5-tri(acetylphenyl) benzenes, in the presence of inorganic acid catalysts at a temperature within a range from −40° to 300° C.

4,036,819

UNSATURATED POLYESTER RESINS

Moustafa El-Chahawi, Troisdorf, and Norbert Vollkommer, Pfarrer, both of Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

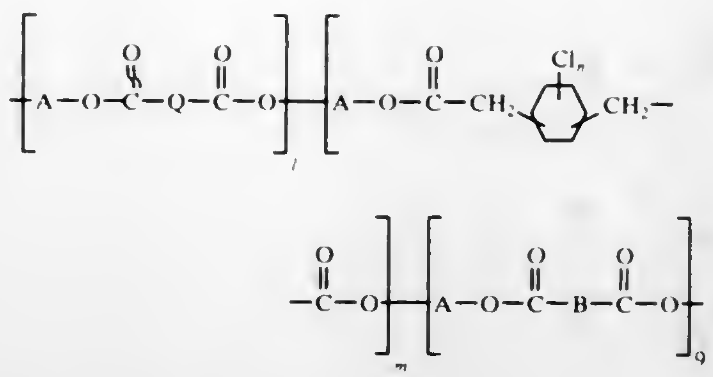
Filed May 15, 1975, Ser. No. 578,049

Claims priority, application Germany, May 21, 1974, 2424673

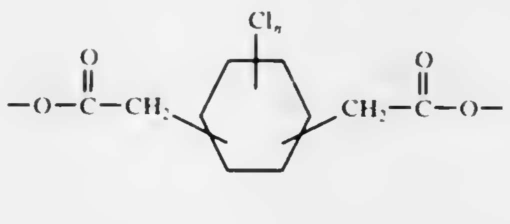
Int. Cl.² C08G *63/54, 63/68*

U.S. Cl. 260—75 H **26 Claims**

1. An unsaturated polyester having recurring units of the formula:



wherein A is an alcoholic moiety, Q is a moiety of other saturated dicarboxylic acids and B is a moiety of an unsaturated dicarboxylic acid, n is 1 to 4, the sum $l + m + q$ is 2 to 20 and l may be 0 or a whole number, said polyester having between 1 and 80 mole percent of a chlorinated phenylene acetic acid moiety whose formula is:



4,036,820

NON-CATALYTIC PROCESS FOR PREPARING RAPID-SETTING RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed July 12, 1976, Ser. No. 704,861

Int. Cl.² C08G *18/28*

U.S. Cl. 260—77.5 AM **8 Claims**

1. A non-catalytic process for preparing rapid-setting polyurethanes having a density of at least about 1 g/cc and a percent elongation of less than about 100, and are demoldable within about 15 minutes, which process comprises:

A. admixing in the absence of a catalyst for urethane formation a first liquid component containing a polyol free of nitrogen atoms and having from about 2 to about 8 hydroxyl groups per molecule and an OH equivalent weight of less than about 200 with a second liquid component containing an aromatic polyisocyanate having an average of at least about 2 NCO groups per molecule with the proviso that when said first liquid component contains a polyol having an average of less than about 2.5 hydroxyl groups per molecule, then said second component contains an aromatic polyisocyanate or mixture of such polyisocyanates wherein the average number of NCO groups per molecule is at least about 2.5;

B. placing the resultant mixture into a suitable mold wherein said mixture solidifies within about 15 minutes to a solid having a density of at least about 1 g/cc and an elongation of less than about 100; and

C. Subsequently demolding the resultant article from the mold; wherein the temperature of said first and second component at the time of mixture is such that the temperature of the resultant mixture is at least about 50° C and is sufficient to provide a peak exotherm temperature of at least about 85° C and less than about 200° C and wherein said first and and second components are admixed in such proportions that the resultant NCO:OH equivalent ratio is from about 0.75:1 to about 1.5:1.

4,036,821

MANUFACTURE OF MODIFIED BASIC POLYAMINOAMIDE WITH AMMONIUM COMPOUND

Lutz Hoppe, and Rudolf Behn, both of Walsrode, Germany, assignors to Wolff Walsrode Aktiengesellschaft, Walsrode, Germany

Filed Oct. 24, 1974, Ser. No. 517,785

Claims priority, application Germany, Oct. 25, 1973, 2353430

Int. Cl.² C08G *69/48*

U.S. Cl. 260—78 SC **4 Claims**

1. A process for the production of a modified basic polyaminoamide resin which comprises the sequential steps of:

a. reacting substantially equimolar portions of a polyfunctional compound selected from the group consisting of epichlorhydrin, dichlorhydrin, or mixtures thereof, with a tertiary amine selected from the group consisting of trimethylamine, triethylamine, tripropylamine, tributylamine, dimethylaniline, dimethylcyclohexylamine, or mixtures of any of said amines, to form an ammonium compound;

b. reacting 0.2 – 1.8 mols of said ammonium compound with each mol of secondary amine group in a water-soluble, basic polyaminoamide which is a condensation product of
   1. a dicarboxylic acid,
   2. a polyalkylenepolyamine, and
   3. an aminocarboxylic acid or a lactam, and

c. reacting the product of step (b) with 0.15 – 0.19 mol of said polyfunctional compound per mol equivalent of secondary amino group in said polyaminoamide.

4,036,822

BEARING MATERIAL

Padma Ambalal Patel, Wembley, and Dennis Stanley Baker, High Wycombe, both of England, assignors to The Glacier Metal Company Limited, Alperton, England

Filed Sept. 30, 1975, Ser. No. 618,157

Claims priority, application United Kingdom, Oct. 2, 1974, 42750/74

Int. Cl.² C08F *28/00*

U.S. Cl. 260—79 **8 Claims**

1. A method of making a bearing lining by curing an arylene sulphide polymer by heating the same in the presence of an oxide of a metal selected from the group consisting of cadmium and manganese, in a proportion between 0.05% and 5.0% by weight of the lining, in which method the heating accelerates the curing and acts of liberate oxygen which assists in achieving cross linking.

4,036,823

BARBITURIC ACID ANTIGENIC CONJUGATES, THEIR PREPARATION, ANTIBODIES AND USE

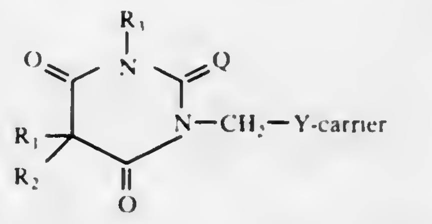
James R. Soares, Santa Monica, Calif., assignor to Biological Developments, Inc., Encino, Calif.

Filed Apr. 28, 1975, Ser. No. 571,974

Int. Cl.² C07G *7/00*

U.S. Cl. 260—112 R **25 Claims**

1. A synthetic antigen comprising a hapten coupled to a carrier which has the following formula:



where Q is selected from the class consisting of O and S; R_1 has from 1 to 3 carbon atoms and is selected from the class consisting of saturated and unsaturated hydrocarbon groups, monohalo substituted hydrocarbon groups, ether groups, thioether groups; R_2 is selected from the class consisting of hydrocarbon groups containing from 1 to 6 carbon atoms; R_3 is selected from the class consisting of H and CH_3; $—CH_2—Y—$ is a residue from a linking agent which has been coupled to the hapten and to the carrier and Y comprises a member selected from the class consisting of a direct bond, saturated and unsaturated straight and branched chain alkylene groups having from 1 to 6 carbon atoms and aromatic groups having from 6 to 14 carbon atoms; and the carrier is macromolecule which confers antigenicity.

4,036,824

DISAZO DYESTUFFS CONTAINING A-O-ALKYLENE-O-SO₃H GROUP

Karl-Ludwig Moritz, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

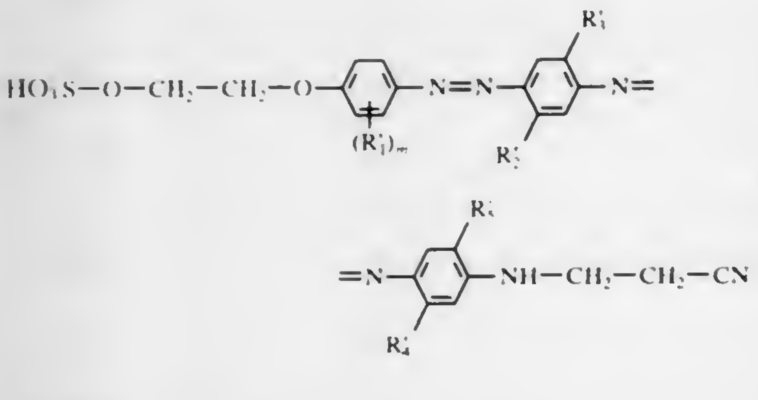
Filed Dec. 2, 1970, Ser. No. 94,523

Claims priority, application Germany, Dec. 4, 1969, 1960816; July 16, 1970, 2035317

Int. Cl.² C09B *31/04, 31/08, 43/18*

U.S. Cl. 260—186 **2 Claims**

1. Disazo dyestuff of the formula



in which

R'_1 is chlorine or methyl;

R'_2 is hydrogen, chlorine, methyl, or methoxy;

R'_3 is hydrogen or methoxy;

R'_4 is hydrogen, chlorine, methyl, formylamino, acetylamino, hydroxyacetylamino, benzoylamino, methoxycarbonylamino, ethoxycarbonylamino, benzenesulfonylamino, toluenesulfonylamino, methylsulfonylamino, or ethylsulfonylamino;

R'_5 is hydrogen, methyl, or methoxy;

and m is a number from 0 to 2.

4,036,825

MONOAZO REACTIVE DYESTUFFS

Hermann Fuchs, Kelkheim, Taunus, and Fritz Meininger, Frankfurt am Main, both of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Germany

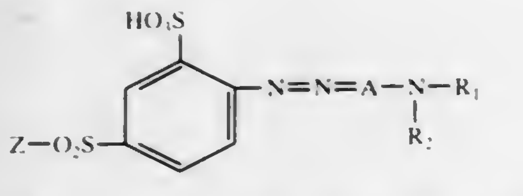
Continuation-in-part of Ser. No. 303,625, Nov. 3, 1972, abandoned. This application Oct. 7, 1976, Ser. No. 730,428

Claims priority, application Germany, Nov. 5, 1971, 2154942

Int. Cl.² C09B *29/06, 29/26, 29/30, 29/38*

U.S. Cl. 260—196 **8 Claims**

1. A monoazo dyestuff in the free acid form of the formula



wherein Z is $—CH_2—CH_2—OSO_3H$ or $—CH=CH_2$, A is phenylene, naphthylene or either phenylene or naphthylene substitued by hydroxy, sulfonic acid, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, halogen, acetylamino, carboxylic acid, carboxylic acid amide, sulfonic acid amide, benzoylamino or trifluoromethyl, the azo and the $—NR_1R_2$ groups being in ortho- or para- position to each other on A, and R_1 and R_2 each is hydrogen, alkyl of 1 to 4 carbon atoms, alkyl of 1 to 4 carbon atoms substituted by hydroxy, cyano, acetoxy, benzyloxy or phenyl, phenyl or phenyl substituted by halogen or lower alkyl.

4,036,826

CATIONIC AZO DYESTUFFS WITH A HYDROXYALKYLATED AMMONIUM GROUP

Gunther Boehmke, Opladen, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

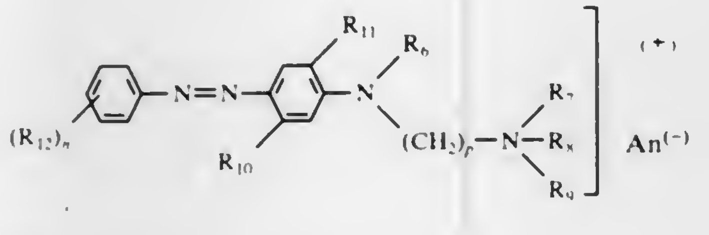
Filed Feb. 26, 1974, Ser. No. 445,833

Claims priority, application Germany, Feb. 26, 1973, 2309528

Int. Cl.² C09B *29/08, 29/26, 29/36, 43/00*

U.S. Cl. 260—205 **6 Claims**

1. Cationic azo dyestuff of the formula



wherein

R_6 denotes methyl, ethyl, propyl, or butyl,

R_7 denotes methyl, ethyl, propyl or butyl,

R_8 denotes methyl, ethyl, propyl or butyl,

R_9 denotes 2-hydroxypropyl, 2-hydroxybutyl, 2-hydroxyethylphenyl, 2-hydroxy-3-methoxy-propyl, 2-hydroxy-3-chloro-propyl, 2-hydroxy-3-ethoxy-propyl, 2-hydroxy-3-propoxy-propyl, 2-hydroxy-3-allyloxy-propyl, 2-hydroxy-3-butoxy-propyl, 2-hydroxy-3-phenoxy-propyl or 2-hydroxy-3-benzoxy-propyl,

R_{10} denotes hydrogen, methyl, ethyl, propyl, butyl, chloro, bromo, methoxy, ethoxy, propoxy, acetylamino, propionylamine or methylsulphonylamino,

R_{11} denotes hydrogen, methyl, ethyl, propyl, butyl, chloro, bromo, mthoxy, ethoxy or propoxy,

R_{12} denotes methyl, ethyl, propyl, butyl, chloro, bromo, cyano, nitro, methoxy, ethoxy, propoxy, methoxycarbonyl or ethoxycarbonyl, acetoxy, acetyl, sulphonamido or carbonamido,

n denotes 1 to 5,

p denotes 2 or 3 and

$An^{(-)}$ denotes an anion.

4,036,827

CONDUCTIVE LIQUID SWITCHES

Donald S. Rich, Flanders, N.J., assignor to Inflo Systems, Inc., Chester, N.J.

Continuation of Ser. No. 345,358, March 27, 1973, which is a continuation-in-part of Ser. No. 197,707, Nov. 11, 1971, and Ser. No. 300,484, Oct. 25, 1972, abandoned. This application June 13, 1975, Ser. No. 586,543

Int. Cl.² H01H *29/02*

U.S. Cl. 200—209 **30 Claims**

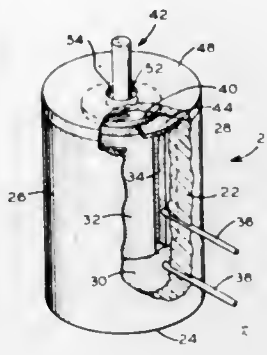
1. An electrical switch comprising:

a. housing means having a cavity therewithin, said cavity is defined by surfaces of said housing;

b. electrically conductive liquid means within said cavity and supported upon a first of said housing surfaces;

c. plunger means within said cavity; at least a part of said plunger means and a part of a second of said housing surfaces defining therebetween at least one passageway, said passageway extending substantially upwardly with respect to said first surface of said housing; and

d. electrical contact means comprising electrical contacts for providing a conductive path from outside of said housing means into said cavity, at least one of said contacts is proximate said passageway;



e. said plunger, upon being depressed from an initial position, displaces at least a part of said liquid;

f. said plunger and said cavity are so dimensioned such that said displaced liquid is substantially restricted to said passageway.

4,036,828

3,4-BIS(4-SUBSTITUTED PIPERAZINYL)-3-CYCLOBUTENE-1,2-DIONES AND RELATED COMPOUNDS

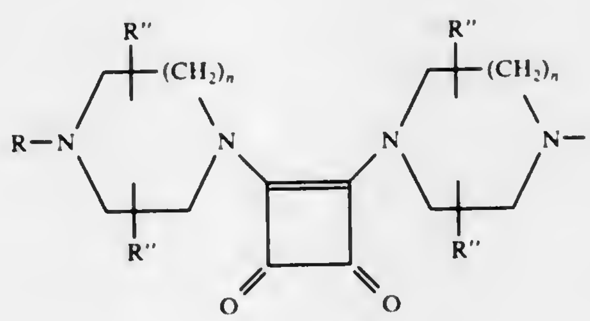
Carl Peter Krimmel, Wauconda, Ill., assignor to G. D. Searle & Co., Chicago, Ill.

Continuation-in-part of Ser. No. 622,808, Oct. 16, 1975, abandoned. This application July 13, 1976, Ser. No. 704,882

Int. Cl.² C07D *295/10, 243/08, 241/02*

U.S. Cl. 260—239 BC **13 Claims**

1. A compound of the formula



wherein R and R′ are the same or different and are alkyl radicals having 1 to 15 carbon atoms; R″ is hydrogen or methyl; and n is one or two.

4,036,829

LACTONYL ESTERS OF PENICILLINS

Harry Ferres, and John Peter Clayton, both of Horsham, England, assignors to Beecham Group Limited, England

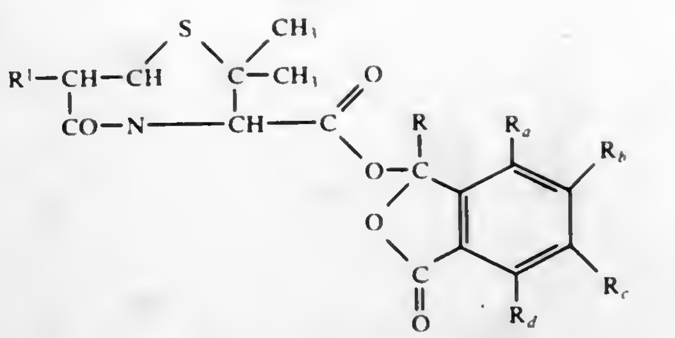
Continuation of Ser. No. 524,776, Nov. 18, 1974, abandoned, which is a continuation of Ser. No. 259,941, June 5, 1972, abandoned. This application Aug. 5, 1976, Ser. No. 712,821

Claims priority, application United Kingdom, June 9, 1971, 19604/71

Int. Cl.² C07D *499/44, 499/46, 499/48, 499/64*

U.S. Cl. 260—239.1 **37 Claims**

1. A compound of formula (I) or a pharmaceutically acceptable acid addition salt of said compound having a basic nitrogen atom:



(I)

wherein R is hydrogen, methyl or phenyl; R_a, R_b, R_c and R_d are selected from hydrogen, lower alkyl, lower alkoxy, halo and nitro; R^1 is an antibacterially active penicillin-completing side chain selected from phenylacetamido, p-hydroxyphenylacetamido; p-heptylphenylacetamido; phenoxyacetamido; α-phenoxypropionamido; α-phenoxybutyramido; 2,6-dimethoxyphenylacetamido; 3-phenyl-5-methyl-isoxazole-4-carbamido; 3-(2-chlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2,6-dichlorophenyl)-5-methyl-isoxazole-4-carbamido; 3-(2-chloro-6-fluorophenyl)-5-methyl-isoxazole-4-carbamido; 2-ethoxy-naphthyl-1-carbamido; o, m or p-aminophenylacetamido; 3-carboxy-quinoxalin-2-carbamido; 2-furylacetamido; 2-thienylacetamido; 3-thienylacetamido; 3-pyridylacetamido; isothiazolylacetamido; 3-hexenamide; 2-biphenylamido; n-hexanamido; n-octanamido; propionamido; α-aminophenylacetamido; α-amino-2-thienylacetamido; α-amino-3-thienylacetamido; α-methyl-aminophenylacetamido; α-amino-2- or -3- or -4-chlorophenylacetamido; α-amino-2-methoxy-phenylacetamido; α-amino-2,4-dichlorophenylacetamido; α-amino-3,4-dichlorophenylacetamido; α-amino-α-methylphenylacetamido; α-amino-4-hydroxyphenylacetamido; α-amino-3-chloro-4-hydroxyphenylacetamido; α-methylphenylacetamido; α-hydroxyphenylacetamido; α-carboxyphenylacetamido; α-(5-tetrazolyl)phenylacetamido; α-quanidino-2-thienylacetamido; α-guanidino-4-hydroxyphenylacetamido α-guanidino-4-hydroxy-2- or -3-methylphenylacetamido; α-carboxy-3-thienylacetamido; α-sulphaminophenylacetamido; α-sulphamino- 3-thienylacetamido; α-(N-methylsulphamino)-phenylacetamido; α-azidophenylacetamido; 1-aminocyclohexylcarbamido; 1-aminocyclopentylcarbamido; 5-amino-5-carboxypentanamido; α-phenoxyphenylacetamido; α-phenyl-β-sulphaminopropionamido; α-sulphophenylacetamido; α-guanidinophenylacetamido; β-amino-β-cyclohexylpropionamido; α-(benzyloxycarbonyl)-phenylacetamido; or 2,2-dimethyl-5-oxo-4-phenyl-1-imidazolidinyl, (hexahydro-1H-azepin-1-yl)methyleneamino or N,N-dimethylformamidino, provided that when R is hydrogen and R^1 is D-α-aminophenylacetamido R_a, R_b, R_c and R_d are not all hydrogen.

4,036,830

PROCESS FOR THE RECOVERY OF PURE ε-CAPROLACTAM FROM AN AQUEOUS SOLUTION THEREOF

Abraham H. de Rooij, Geleen, and Reijer Goettsch, Beek, both of Netherlands, assignors to Stamicarbon B.V., Geleen, Netherlands

Filed Apr. 29, 1976, Ser. No. 681,745

Claims priority, application Netherlands, May 1, 1975, 7505130

Int. Cl.² C07D *201/16*

U.S. Cl. 260—239.3 A **6 Claims**

1. In a process for recovery of pure ε-caprolactam from a contaminated aqueous ε-caprolactam solution obtained by intramolecular conversion of cyclohexanone oxime with the acid catalyst sulfuric acid, oleum or sulfur trioxide including extracting the reaction mixture after dilution with water and treating with ammonia with a water-immiscible organic solvent for the lactam and washing the lactam in organic solvent

for the lactam and washing the lactam in organic solvent with water,

the improvement comprising: adjusting the lactamcontaining aqueous solution obtained in the said washing step to a caprolactam content of about 60 – 75% by weight, extracting the aqueous lactam-laden solution with an organic solvent immiscible with water and selected from the group consisting of benzene, toluene, xylene, chloroform, methylene chloride, 1,2-dichloroethane, trichloroethylene, 1,1,2-trichloroethane and mixtures thereof, and recovering the extracted caprolactam from the organic solvent.

4,036,831

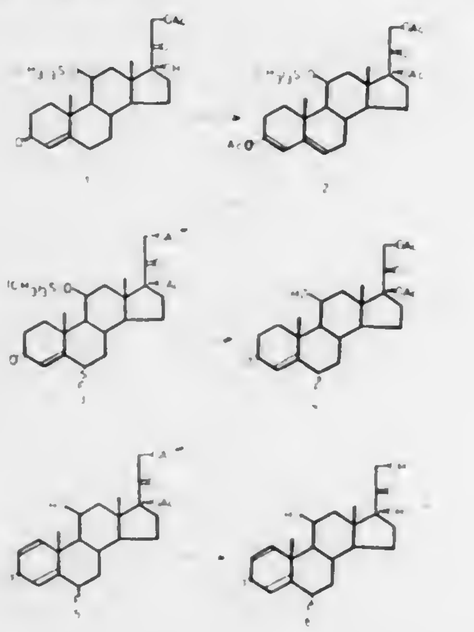
TRIMETHYL SILOXANE STEROID INTERMEDIATES

Bjarte Loken, Rho (Milan); Peter Lindsay MacDonald, and Ettore Bigatti, both of Milan, all of Italy, assignors to Steroid Development Company Establishment, Lugano, Switzerland

Filed Oct. 28, 1975, Ser. No. 626,059

Int. Cl.^{2} C07J *71/00*

U.S. Cl. 260—239.55 D **18 Claims**



1. A process for producing corticoids characterized by at least one of the following substituents:

a. 6αF

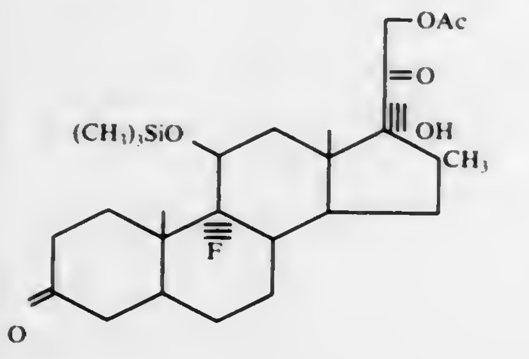
b. 16α,17αhydroxy or isopropylidenedioxy

c. 16αorβmethyl

d. Δ1,4 from an 11β-OH precursor steroid, of the pregnane series which comprises:

1. reacting the 11β-OH precursor steroid with trimethylchlorosilane forming thereby the corresponding 11β-trimethyl-siloxy steroid;
2. carrying out a multi-step reaction sequence incorporating at least one of the (a), (b), (c), (d) substituents into the 11β trimethyl siloxy steroid; and thereafter
3. hydrolyzing off the trimethyl siloxy group to create the 11β-OH group.

16. A steroid according to the following formula:



where 16 CH_3 may be 16αCH_3 or 16βCH_3.

4,036,832

15-SUBSTITUTED-ω-PENTANORPROSTAGLANDINS

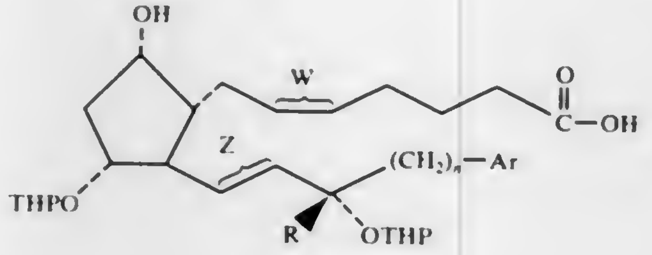
Hans-Jurgen E. Hess, Old Lyme; Michael R. Johnson, Gales Ferry; Jasjit S. Bindra, Groton, and Thomas K. Schaaf, Old Lyme, all of Conn., assignors to Pfizer Inc., N.Y.

Division of Ser. No. 485,599, July 3, 1974, Pat. No. 3,971,826, which is a continuation-in-part of Ser. No. 425,519, Dec. 17, 1973, abandoned, which is a continuation-in-part of Ser. No. 271,220, July 13, 1972, abandoned. This application July 15, 1976, Ser. No. 705,767

Int. Cl.^{2} C07D *407/02, 309/02*

U.S. Cl. 260—240 R **4 Claims**

1. A compound of the structure:



wherein

- Ar is α- or β-naphthyl; phenyl; 3,4-dimethoxyphenyl; 3,4-methylenedioxyphenyl; 3,4,5-trimethoxyphenyl or monosubstituted phenyl wherein said substituent is halo, trifluoromethyl, phenyl, lower alkyl or lower alkoxy;
- R is hydrogen or lower alkyl;
- THP is 2-tetrahydropyranyl;
- *n* is an integer from 1 to 5;
- W is a single bond or a cis double bond;
- and Z is a single bond or trans double bond; with the proviso that when *n* is one and Z is a single bond, W is a single bond.

4,036,833

7-[(5′-N-METHYLTHIOACETAMIDO)-ADIPOAMIDO] CEPHALOSPORIN DERIVATIVES

Toshiyasu Ishimaru, D-14, 2-7, Momoyamadai, Suita, and Mariko Kawabata, 9-4, Tachibanacho-1 chome, Toyonaka, both of Japan

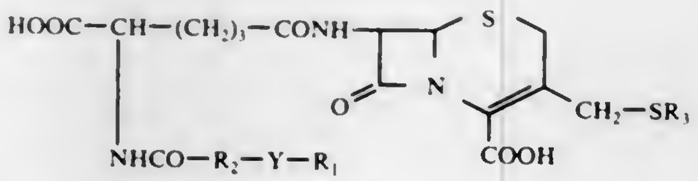
Filed May 27, 1975, Ser. No. 580,965

Claims priority, application Japan, May 28, 1974, 49-61296; July 3, 1974, 49-76771

Int. Cl.^{2} C07D *501/36*

U.S. Cl. 260—243 C **5 Claims**

1. A compound of the formula



wherein

R_1 is a lower alkyl, phenyl or benzyl group, R_2 is a lower alkylene group, Y is a sulfur atom or a sulfinyl group and R_3 is a thiadiazolyl, tetrazolyl or oxadiazolyl group;

or a pharmaceutically acceptable salt or adduct thereof.

4,036,834

DERIVATIVES OF 7-(α-HYDROXY-SUBSTITUTED PYRIDYL CARBOXAMIDO-α PHENYL-ACETAMIDO-3-SUBSTITUTED THIO METHYL Δ^3-CEPHEM-4-CARBOXYLIC ACID

Masuo Murakami, Tokyo; Masaru Iwanami, Yokohama; Ichiro Isaka, Hoya; Yoshinobu Nagano, Niiza; Masaharu Fujimoto, Tokyo, and Tetsuya Maeda, Urawa, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

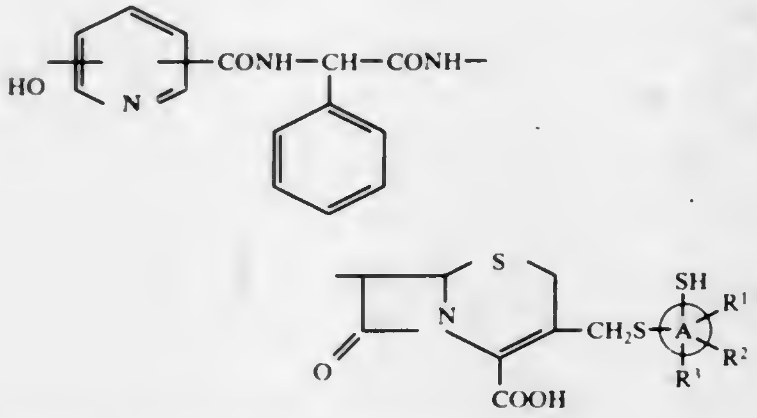
Filed Oct. 8, 1975, Ser. No. 620,552

Claims priority, application Japan, Oct. 11, 1974, 49-116976

Int. Cl.^{2} C07D *501/36*

U.S. Cl. 260—243 C **8 Claims**

1. A 7-(α-hydroxy-substituted pyridylcarboxamido-α-phenylacetamido)-3-substituted thiomethyl-Δ^3-cephem-4-carboxylic acid derivative represented by the formula:



wherein A represents an unsaturated 6-membered ring having one sulfur atom or 2 or 3 nitrogen atoms and the remaining members being carbon atoms and R^1, R^2, and R^3, which may be the same or different, each represents a hydrogen atom, a lower alkyl group, a lower alkylthio group, an amino group, a lower alkanoylamido group, or an oxo group

and a pharmacologically acceptable salt thereof.

4,036,835

PROCESS FOR PREPARING CEPHALOSPORINS

Maurizio Foglio; Giovanni Franceschi, both of Paolo Masi, and Antonino Suarato, Milan, all of Italy, assignors to Societa' Farmaceutici Italia, Milan, Italy

Continuation-in-part of Ser. No. 578,875, May 19, 1975, abandoned. This application Mar. 1, 1976, Ser. No. 662,338

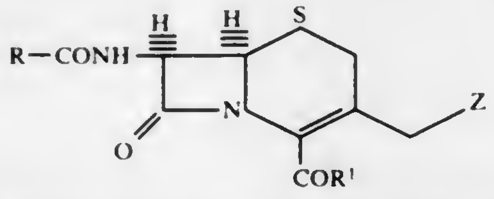
Claims priority, application Italy, May 22, 1974, 23070/74

Int. Cl.^{2} C07D *501/02*

U.S. Cl. 260—243 C **2 Claims**

1. A process for preparing a cephalosporin of structure:

III



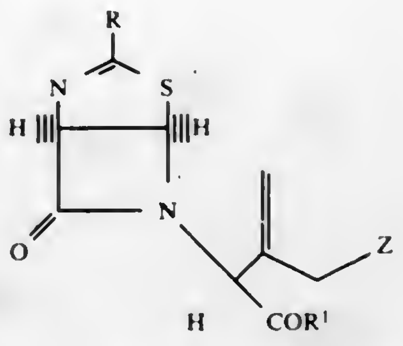
where R is selected from the class consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, cyano-methyl-, thienylmethyl-, naphthyl-methyl-, phenyl-methyl-, phenoxy-methyl-, phenyl-isopropyl-, phenoxy-isopropyl-, pyridyl-4-thiomethyl-, and tetrazolyl-1-methyl-;

R^1 is selected from the class consisting of a hydroxyl, alkoxy having from 1 to 4 carbon atoms, trichloroethoxy-, benzyloxy-, p-methoxy-benzyloxy-, p-nitrobenzyloxy-, benzhydryloxy-, triphenylmethoxy-, phenacyloxy, and p-halophenacyloxy;

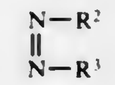
Z is selected from the class consisting of hydrogen, —O—alkyl, —O—CO—alkyl, —Br, —I, —N_3, —NH_2, —O—CO—CH_3, —O—CO—NH_2, and 2-mercapto-5-methyl-1,3,4-thiadiazole;

wherein a compound of structure

(I′)

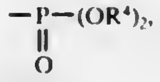


dissolved in acetone or tetrahydrofuran is reacted at a temperature between −20° C and +80° C in the presence of p-toluenesulphonic, sulphuric, trifluoroacetic, formic or oxalic acid, with an azoderivative of the formula



$$\begin{array}{l} N-R^2 \\ \| \\ N-R^3 \end{array}$$

wherein R^2 and R^3 are the same or different and represent CN—, or the radicals —COR^4, —$COOR^4$,

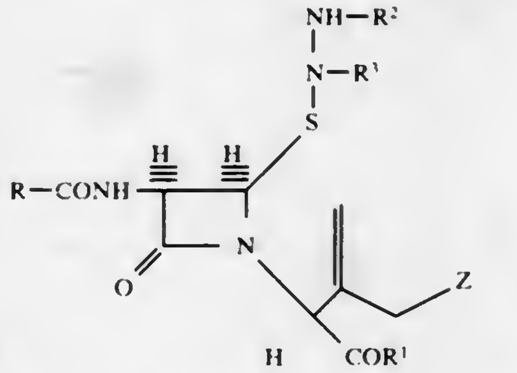


$$\begin{array}{l} -\underset{\underset{O}{\|}}{P}-(OR^4)_2, \end{array}$$

—$CONHR^4$, where R_4 is a lower alkyl having from 1 to 4 carbon atoms,

to give a compound of the structure:

(II′)



in which R, R^1, R^2, R^3 and Z have the meanings given above, and said intermediate (II′), dissolved in benzene, ethyl acetate or dimethylformamide, is reacted at a temperature between −100° C and +120° C with an aluminum or silicon oxide or with potassium or sodium hydroxide, potassium tert. butoxide or lithium methoxide, to finally give the desired compound (III) which is isolated and purified in known manner.

4,036,836

PROCESS FOR PRODUCING 2-PYRROLIDONE

Janice L. Greene, Chagrin Falls, Ohio, assignor to Standard Oil Company, Cleveland, Ohio

Filed June 30, 1975, Ser. No. 591,883

Int. Cl.^{2} C07D *207/26*

U.S. Cl. 260—326.5 FN **5 Claims**

1. In the process for the preparation of 2-pyrrolidone by contacting an aqueous mixture of succinonitrile with hydrogen at elevated temperatures and pressures in the presence of a hydrogenation catalyst, the improvement comprising employing a hydrogenation catalyst consisting essentially of nickel boride.

4,036,837
2 ALKOXYOXAMOYL-PYRAZINES

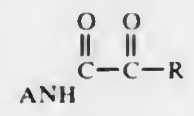
John H. Sellstedt, Pottstown; Charles J. Guinosso, King of Prussia, and Albert J. Begany, Perkiomenville, all of Pa., assignors to American Home Products Corporation, New York, N.Y.

Division of Ser. No. 542,465, Jan. 20, 1975, Pat. No. 3,966,965, which is a continuation-in-part of Ser. No. 344,466, March 23, 1973, abandoned. This application Mar. 23, 1976, Ser. No. 669,796

Int. Cl.² C07D *241/02*

U.S. Cl. 260—250 BN **2 Claims**

1. A compound of the formula:



$$\mathrm{ANH}-\overset{\overset{\displaystyle O}{\|}}{C}-\overset{\overset{\displaystyle O}{\|}}{C}-R$$

in which

A is 2-pyrazinyl and R is alkoxy of 1 to 6 carbon atoms.

4,036,838
PROCESS FOR THE PRODUCTION OF NITRO DERIVATIVES OF AROMATIC COMPOUNDS

Axel Vogel, Cologne; Friedrich Durholz, Remscheid; Rudolf Sundermann, and Guido Skipka, both of Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

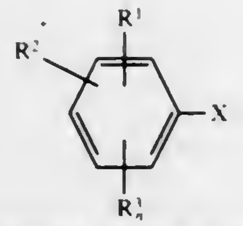
Filed Dec. 30, 1974, Ser. No. 537,624

Claims priority, application Germany, Jan. 9, 1974, 2400887

Int. Cl.² C07D *239/00*

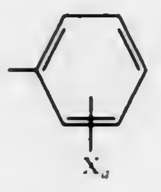
U.S. Cl. 260—251 R **17 Claims**

1. A process for the production of a nitro derivative of an aromatic compound which consists essentially of contacting an aromatic compound of the formula



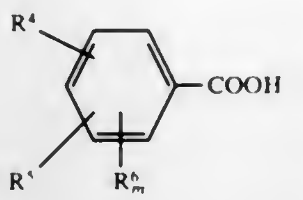
(I)

in which X represents a nitro group, nitrile group, aldehyde group, carboxyl group, carbonamide group, sulfonic or sulfochloride group, an optionally monoalkyl- or dialkyl-substituted sulfonamide group, an alkoxy carbonyl group, an optionally monoalkyl- or dialkyl-substituted amino carbonyl group or an acyl group; R^1 represents hydrogen, halogen, the nitro group or an optionally substituted acyl group; R^2 represents hydrogen, halogen, and alkyl, alkoxy, carbalkoxy or acylamino group or the group



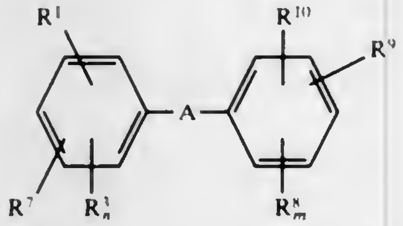
in which X is as above-defined; *a* is 1 or 2, this group optionally being substituted by substituents which are inert under the nitration conditions; R^3 represents an alkyl group; and *n* is the number 0, 1 or 2 where $n = 2$, the two radicals R^3 when they are in the ortho-position to one another, may together also form a divalent, optionally substituted alkylene radical with 3 to 5 carbon atoms, or a compound of the formula

(III)



wherein R^4 represents hydrogen, halogen the nitro group, a phenyl carbonyl or phenyl sulfonyl group optionally substituted by substituents which are inert under the nitration conditions or an optionally substituted acyl group; R^5 represents hydrogen, halogen, nitrophenyl, an alkyl, alkoxy, carbalkoxy or acylamino group; and R^6 represents an alkyl radical; and *m* is the number 0, 1 or 2; where $m = 2$, the two radicals R^6, when they are in the o-position to one another, may together form a divalent, optionally substituted alkylene radical with 3 to 5 carbon atoms or a nitro derivative or an aromatic compound corresponding to the formula

(IV)



in which R^1, R^3 and *n* are as previously defined; R^7 represents hydrogen, halogen, an alkyl group, an alkoxy group, a carbalkoxy group or an acylamino group; A represents a carbonyl (—CO—) or sulfone (—SO_2—) group; and R^8 has one of the meanings above-defined for the radical R^3; R^9 has one of the meanings above-defined for the radical R^7; R^{10} has one of the meanings above-defined for the radical R^1; *m* is the number 0, 1 or 2; where either *n* and *m* are the numbers 1 or 2, one of each radicals R^3 and R^8, when they are in the o-positions to the radical A, may together form a single bound with nitric acid or a nitrating agent in the presence of an aliphatic or cycloaliphatic hydrocarbon having up to 12 carbon atoms monosubstituted or polysubstituted by halogen, the nitro group or an alkyl sulfonyl group or a compound selected from the group consisting of anthraquinone, phenathraquinone, diphenylene sulfone, pyridine-N-oxide, pyrimidine, quinoline, quinoline-N-oxide and isoquinoline, or a derivative thereof, in the presence of a mineral or Lewis acid, said process being conducted while maintaining said aliphatic or cycloaliphatic hydrocarbon in admixture with said aromatic compound until the process is substantially complete and thereafter isolating the nitro derivative of said aromatic compound.

4,036,839
SHAPED ARTICLES OF HYDRAULIC CEMENT COMPOSITIONS HAVING A REFLECTIVE SURFACE

Mark Plunguian, 6912 Columbia Drive, and Charles E. Cornwell, 7104 Marlan Drive, both of, Alexandria, Va. 22307

Continuation-in-part of Ser. No. 591,095, June 27, 1975, Pat. No. 3,995,086. This application Jan. 16, 1976, Ser. No. 649,895

Int. Cl.² B28B *1/16*

U.S. Cl. 264—256 **4 Claims**

1. A method of producing a shaped article with a glossy surface comprising the steps of dispersing in water about 100 parts by weight of a hydraulic cement, selected from the group consisting of portland cement, and gypsum cement; 10-400 parts aggregate; 0.25-2.0 parts of a cement dispersing agent selected from the group of polymers consisting of the alkali metal salts of melamine sulfonic acid partially condensed with formaldehyde, the alkali metal salt of naphthalene sulfonic acid partially condensed with formaldehyde, and about 30-90 percent of the alkali metal salt of a high molecular weight condensation product of naphthalene-sulfonic acid and the balance 70-10 percent being the alkali metal salt of gluconic acid; 0.01-0.1 parts of a cement curing retarder; and 0-10 parts color pigment, all in parts by weight; using the dispersion thus formed to fill a synthetic polymer mold having a glossy, water-repellent surface, or a mold coated with a synthetic polymer, said polymer being selected from the group consisting of polystyrene, polypropylene, and polyacrylic resins; filling the mold with the cementitious composition, curing the casting, and then removing it from the mold.

4,036,840
2-SUBSTITUTED-S-TRIAZOLO[1,5a]PYRIMIDINES

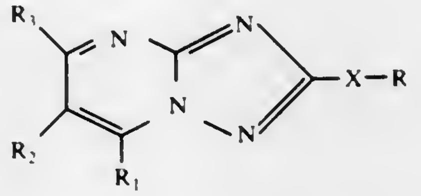
Darrell E. O'Brien, Mission Viejo; Thomas Novinson, Costa Mesa, and Robert H. Springer, Santa Ana, all of Calif., assignors to ICN Pharmaceuticals, Irvine, Calif.

Continuation-in-part of Ser. No. 260,517, June 7, 1972, abandoned. This application May 22, 1975, Ser. No. 579,832

Int. Cl.² C07D *239/00*

U.S. Cl. 260—256.5 R **12 Claims**

1. A compound of the structure



wherein X is thio or sulfonyl; R is C_2-C_6 alkyl, C_3-C_7 branched alkyl, dicarbethoxymethyl, benzyl, substituted benzyl wherein the substitutions are C_1-C_6 alkyl, halogeno, carboxy, hydroxyl or a combination of those substituents, naphthyl and phenethyl; R_1 is C_1-C_6 alkyl; R_2 is H and R_3 is C_1-C_6 alkyl or acetonyl.

4,036,841
INDOLO[2,3α]QUINOLIZINE DERIVATIVES

Csaba Szántay; Lajos Szabo; György Kalaus; Egon Karpati, and Laszlo Szporny, all of Budapest, Hungary, assignors to Richter Gedeon Vegyeszeti Gyar Rt., Budapest, Hungary

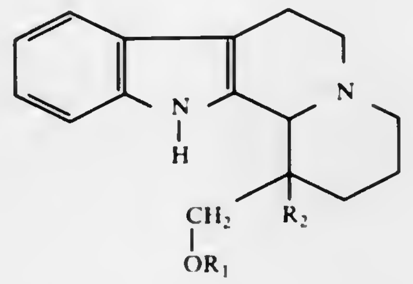
Filed May 6, 1975, Ser. No. 575,038

Claims priority, application Hungary, May 7, 1974, RI 536

Int. Cl.² C07D *459/00*

U.S. Cl. 260—293.53 **5 Claims**

1. A compound of the formula (I),



(I)

wherein R_1 is a lower alkyl carbonyl, benzoyl or benzoyl substituted with lower alkoxy, and R_2 is an alkyl group having 1 to 4 carbon atoms, the optically active enanthiomers and the pharmaceutically acceptable salts thereof.

4,036,842
PROCESS FOR PREPARING POLYCYCLIC HETEROCYCLES HAVING A PYRAN RING

Thomas A. Dobson; Leslie G. Humber, both of Dollard des Ormeaux; Christopher A. Demerson, and Ivo L. Jirkovsky, both of Montreal, all of Canada, assignors to American Home Products Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 311,023, Nov. 30, 1972, abandoned, which is a continuation-in-part of Ser. No. 289,714, Sept. 15, 1972, Pat. No. 3,939,178, which is a continuation-in-part of Ser. No. 148,895, June 1, 1971, Pat. No. 3,843,681. This application Sept. 15, 1975, Ser. No. 613,160

Claims priority, application South Africa, May 16, 1972, 72/3344

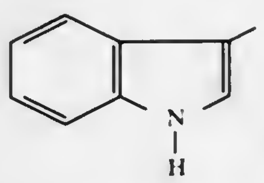
Int. Cl.² C07D *491/14, 491/22*

U.S. Cl. 260—293.58 **11 Claims**

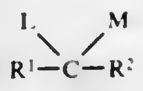
1. A process for preparing a polyclclic heterocycle compound having a pyran ring which comprises reacting in the presence of a Friedel Crafts type catalyst a compound of the formula II:

$B—CH_2CH_2OH$ (II)

wherein B is

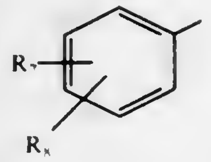


with a compound of the formula III:

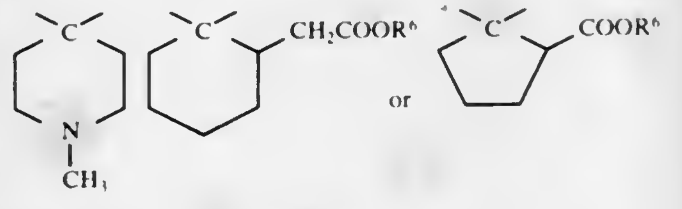


$$R^1—\overset{L\ \ M}{\overset{\diagdown\ \diagup}{C}}—R^2$$

in which L and M each represent lower alkoxy or together represent the ethylenedioxy radical or oxo, and wherein R^1 is hydrogen, lower alkyl, phenyl or p-halophenyl, and R^2 is 2-furyl, 2-thienyl, 2-pyridyl, 3-pyridyl, 4-pyridyl; or R^2 is



wherein R^7 and R^8 are the same or different and each represent halo, hydroxyl, carboxyl, carb(lower)alkoxy, or R^1 and R^2 together with the carbon atoms to which they are both joined to form a radical of the formula



in which R^6 is lower alkyl.

4,036,843

CERTAIN CHLOROAMINO ESTERS OF PYRIDINE CARBOXYLATES AND DERIVATIVES THEREOF

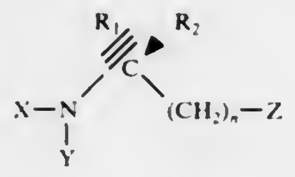
James J. Kaminski, and Nicolae S. Bodor, both of Lawrence, Kans., assignors to INTERx Research Corporation, Lawrence, Kans.

Filed Nov. 14, 1975, Ser. No. 632,012

Int. Cl.² C07D *213/80, 213/79*

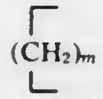
U.S. Cl. 260—294.8 R **20 Claims**

1. A compound having the formula:

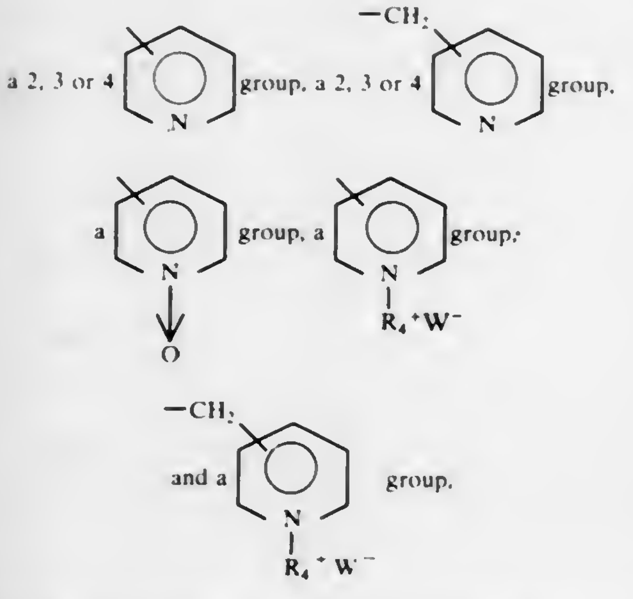


(I)

wherein X and Y each represent a member which may be the same or different selected from the group consisting of H and Cl with the proviso that X and Y cannot represent H simultaneously; R_1 and R_2 each represent a member which may be the same or different selected from the group consisting of an *n*- or branched alkyl group of from 1 to 20 carbon atoms, a phenyl group a naphthyl group and a



group, wherein *m* represents an integer of from 2 to 5; *n* represents an integer of 1 to 8; and Z represents $-OOCR_3$ group, wherein R_3 represents a member selected from the group consisting of



wherein R_4 represents a member selected from the group consisting of H, a benzyl group and a $-(CH_2)_p$ COOH group, wherein *p* represents an integer of 1 to 4, and wherein W— represents a nontoxic pharmaceutically acceptable inorganic or organic anion.

4,036,844

ARYLOXYPYRIDINES

David Edward Thorne, Cranleigh, England, and Kurt Engel, Basel, Switzerland, assignors to Beecham Group Limited, England

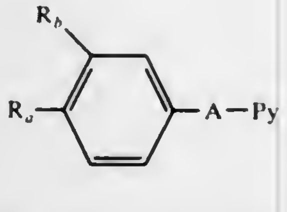
Continuation of Ser. No. 346,252, March 30, 1973, abandoned. This application Oct. 29, 1975, Ser. No. 626,720

Claims priority, application United Kingdom, Apr. 4, 1972, 15280/72; Dec. 23, 1974, 55441/74

Int. Cl.² C07D *213/55*

U.S. Cl. 260—295 R **8 Claims**

1. A compound of the formula



or a pharmaceutically acceptable non-toxic acid addition salt thereof, wherein Py is 3- or 4-pyridyl unsubstituted or meta- or -para-lower alkyl substituted A is [ALK-O] or [ALK-O-ALK] wherein ALK is straight or branched chain alkylene of 1 to 6 carbon atoms, only one of R_a and R_b is hydrogen and the other is selected from the group consisting of carboxy, carboloweralkoxy, cyano and carbamyl.

4,036,845

NOVEL TRANSIENT ACYL DERIVATIVES OF PHENYLBUTAZONE

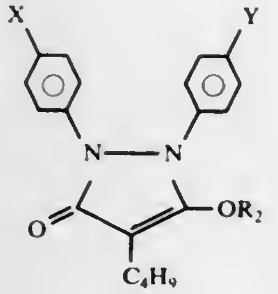
Nicolae S. Bodor, and Kenneth B. Sloan, both of Lawrence, Kans., assignors to Interx Research Corporation, Lawrence, Kans.

Division of Ser. No. 538,903, Jan. 6, 1975, Pat. No. 3,957,803. This application Mar. 8, 1976, Ser. No. 664,698

Int. Cl.² C07D *231/06*

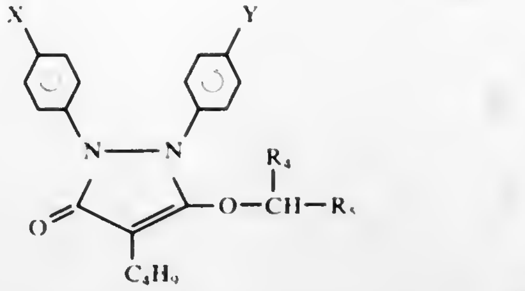
U.S. Cl. 260—295 L **44 Claims**

1. A pro-drug compound of the formula:



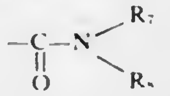
(I)

wherein X and Y each represent a member selected from the group consisting of a hydrogen atom and a $-OR_1$ group, with the proviso that either X or Y is a hydrogen atom and wherein R_2 is a member selected from the same or different groups represented by R_1; and wherein R_1 represents a member selected from the group consisting of a hydrogen atom, a COOM group, wherein M represents an alkali or alkaline earth metal, a $-CO-R_3$ group, wherein R_3 represents a member selected from the group consisting of a straight or branched C_1-C_5 alkyl group, a C_1-C_2 alkoxy group, a phenyl, substituted phenyl group whose substituents are selected from the group consisting of a 2,3, or 4-hydroxy group, a 2,3, or 4-acetyloxy group, and a 2,3, or 4-acetylamino group, a 2,3, or 4-pyridyl group, a 1,2, or 5-imidazolyl group, a residue of an N-protected naturally occurring amino acid, wherein the protective group on the amino group of the amino acid is removable via hydrogenolysis or hydrolysis, and an amino acid residue containing a C_1-C_2 N,N-dialkylamino or C_4-C_5 cycloalkylamino group.



(II)

wherein X or Y represents a member selected from the group consisting of a hydrogen atom and a $-OR_1$ group, wherein R_1 is as defined above with the proviso that either X or Y is a hydrogen atom; wherein R_4 represents a member selected from the group consisting of a hydrogen atom, a C_1-C_5 alkyl group, and a $-CH=CH_2$ group; and wherein R_5 represents a member selected from the group consisting of a $-OOC-R_6$ group, a group, and a $-COOM$ group,



$$-\underset{\underset{O}{\|}}{C}-N\begin{matrix}R_7\\ R_8\end{matrix}$$

wherein M represents an alkali or alkaline earth metal, wherein R_6 represents a member selected from the group consisting of R_4 as defined above, with the proviso that R_6 cannot be a hydrogen atom, and wherein R_7 and R_8 each represent a C_1-C_3 aklyl group.

4,036,846

3-HYDROXY AND 3-ACETOXY-6-TRIPHENYL-METHYLAMINOPENAMS

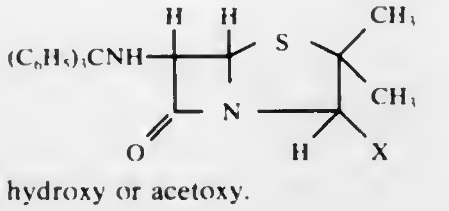
Wayne E. Barth, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 680,423, April 26, 1976, which is a continuation-in-part of Ser. No. 619,634, Oct. 6, 1975, abandoned. This application Oct. 29, 1976, Ser. No. 736,811

Int. Cl.² C07C *499/78*

U.S. Cl. 260—306.7 C **3 Claims**

1. A compound of the formula



wherein X is hydroxy or acetoxy.

4,036,847

HALOGENATED PENAM DERIVATIVES AND THE PREPARATION THEREOF

Takashi Kamiya, Suita; Yoshihisa Saito, Takarazuka; Tsutomu Teraji, Hirakata; Osamu Nakaguti, Osaka; Teruo Oku, Kyoto; Hitoshi Nakamura, and Masashi Hashimoto, both of Toyonaka, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

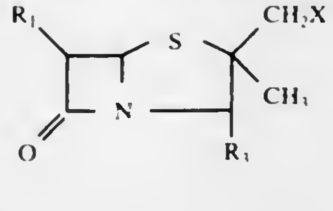
Division of Ser. No. 427,232, Dec. 21, 1973, which is a continuation-in-part of Ser. No. 266,470, June 26, 1972. This application Aug. 5, 1976, Ser. No. 711,965

Claims priority, application Japan, June 24, 1971, 46-46158; Aug. 14, 1971, 46-61776; Aug. 14, 1971, 46-61777; Aug. 18, 1971, 46-62687; Aug. 21, 1971, 46-63885; Aug. 21, 1971, 46-63886

Int. Cl.² C07D *499/42*

U.S. Cl. 260—306.7 C **3 Claims**

1. A penam derivative having the formula:



wherein X represents a halogen atom, and wherein R_1 represents an amino, and R_3 represents a radical selected from the group consisting of carboxy, conventional ester, acid amide, acid anhydride, acid halide, acid azide, and acid salt, or a pharmaceutically acceptable salt thereof.

4,036,848

1-THIADIAZOLYL-5-FURFURYL AND TETRAHYDROFURFURYL AMINOIMIDAZOLIDINONES

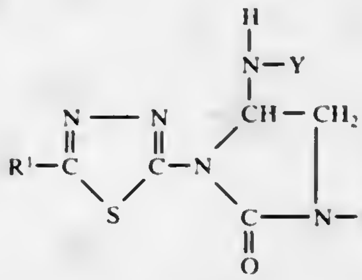
John Krenzer, Oak Park, Ill., assignor to Velsicol Chemical Corporation, Chicago, Ill.

Filed Mar. 15, 1976, Ser. No. 666,717

Int. Cl.² C07D *419/00*

U.S. Cl. 260—306.8 D **8 Claims**

1. A compound of the formula



wherein R^1 is selected from the group consisting of lower alkyl, cycloalkyl of from 3 to 7 carbon atoms, lower alkenyl, lower chloroalkyl, lower bromoalkyl, trifluoromethyl, lower alkoxy, lower alkylthio, lower alkylsulfonyl and lower alkylsulfinyl; R^2 is selected from the group consisting of lower alkyl, lower alkenyl, lower haloalkyl and propargyl

and y is selected from the group consisting of furfuryl and tetrahydofurfuryl.

4,036,849

1-(PARA-SUBSTITUTED-PHENYL)-1H-TETRAZOLES

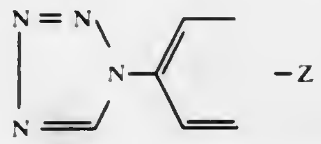
William Vincent Curran, Pearl River, N.Y.; Andrew Stephen Tomcufcik, Old Tappan, N.J., and Adma Schneller Ross, Suffern, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 470,083, May 15, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,562

Int. Cl.² C07D *257/04*

U.S. Cl. 260—308 D **8 Claims**

1. A compound of the formula:



wherein Z is selected from the group consisting of moieties of the formulae:

$-SH$, $-SCH_2X$, $-SOCH_2X$ and $-SO_2CH_2X$

wherein X is selected from the group consisting of hydrogen and chlorine.

4,036,850
1-ARYL-5-ALKYLIDENE,2,4-DIOXO-IMIDAZOLIDINES AND PROCESS THEREFOR

Edgar Enders, Cologne, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

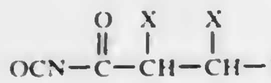
Filed Mar. 5, 1975, Ser. No. 555,661

Claims priority, application Germany, Mar. 26, 1974, 2414613

Int. Cl.² C07D *233/04*

U.S. Cl. 260—309.5 **12 Claims**

1. Process for preparing 1-aryl-5-alkylidene-2,4-dioxomidezolidenes which comprises forming an N-aryl-N'-(2,3-dihalogen alkenoyl)-urea by a process comprising reacting a 2,3-dihalogen alkanoyl isocyanate having the formula



$$\mathrm{OCN-}\overset{\overset{O}{\|}}{\mathrm{C}}-\overset{\overset{X}{|}}{\mathrm{CH}}-\overset{\overset{X}{|}}{\mathrm{CH}}-R_2 \qquad \mathrm{(III)}$$

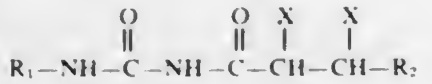
wherein

R_2 is hydrogen, in a solvent at a temperature in the range of from −20 to +50° C with a primary aryl amine of the formula R_1-NH_2

wherein

R_1 is phenyl or naphthyl which may be substituted one or more times by radicals selected from the group of hydrogen, C_1–C_6-alkyl, C_5 or C_6-acycloalkyl, C_1 or C_2-halogen substituted alkyl, C_1–C_6-alkoxy, C_1–C_6 thioalkyl and sulphoxide, C_1–C_6 alkyl sulphone, C_1–C_4 monoalkyl or dialkyl or diarylmonoalkyl, C_1–C_6-acyl amino radical, cyclic amine radical in which the amino nitrogen atom is part of a 5 or 6 membered heterocycle which, in addition, may contain at least one further hetero atom as a ring member, said heterocycle being selected from the group consisting of pyrrolidino, 2-oxopyrrolidino, imidazolino and morpholno; cyano nitro, acetyl, aldehyde, phenyl, phenoxy, halogen phenoxy, nitro phenoxy, phenyl thio, benzyl, anilino, benzyl sulphenyl, phenyl sulphonyl and halogen-benzyl sulphonyl; and converting the urea that results, without intermediate isolation, to the imidazolidine by the process of contacting said N-aryl-N'-(2,3-dihalogen alkanol)-urea with an alkali metal alkoxide in a solvent at a temperature in the range of between 20° C and the boiling point of the solvent.

2. Process for preparing 1-aryl-5-alkylidene-2,4-dioxoimidozolidines which comprises reacting an N-aryl-N'-(2,3-dihalogen alkanoyl)-urea having the formula (II):



$$R_1-\mathrm{NH}-\overset{\overset{O}{\|}}{\mathrm{C}}-\mathrm{NH}-\overset{\overset{O}{\|}}{\mathrm{C}}-\overset{\overset{X}{|}}{\mathrm{CH}}-\overset{\overset{X}{|}}{\mathrm{CH}}-R_2 \qquad \mathrm{(II)}$$

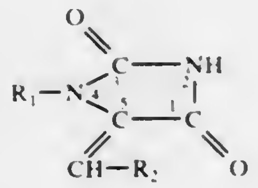
wherein

R_1 and R_2 are as defined in claim **1** and

X is chlorine or bromine,

with an alkali metal alkoxide in a solvent at a temperature in the range of between 20° C and the boiling temperature of the solvent.

12. 1aryl-5-alkylidine-2,4-dioxoimidazolidine having the formula (I):



wherein

R_1 is phenyl, 3,4-dichlorophenyl, 4 **-nitro-phenyl,** 4-chlorophenyl, 4-ethoxy-phenyl, naphthyl, 2,3-dichlorophenyl, -4-chloro-2-methyl-phenyl, 2,4-dimethyl and phenyl and

R_2 represents hydrogen.

4,036,851
1,3-DIPHENYL SUBSTITUTED PYRAZOLINES

Alec Victor Mercer, Bramhope, and John Stephen Oakland, Morley, both of England, assignors to Sandoz Ltd., Basel, Switzerland

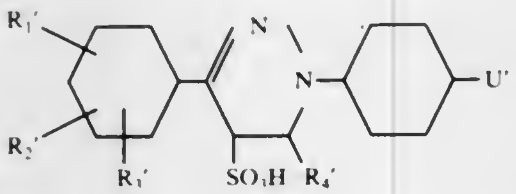
Filed Jan. 23, 1975, Ser. No. 543,325

Claims priority, application United Kingdom, Jan. 29, 1974, 4087/74; May 3, 1974, 19663/74

Int. Cl.² C07D *231/08*

U.S. Cl. 260—310 D **24 Claims**

1. A compound of the formula:



wherein

R_1', R_2' and R_3', independently, are hydrogen, halogen or $C_{1\text{-}4}$ alkyl,

R_4' is hydrogen, $C_{1\text{-}4}$ alkyl or phenyl, and U' is $-COOR_6$, $-CONH_2$, SO_2R_9 or SO_2NH_2 where R_6 and R_9 are $C_{1\text{-}4}$ alkyl.

4,036,852
OPTICAL RESOLUTION OF PHENYL-GLYCINE AMIDE

Wilhelmus H. J. Boesten, Sittard, Netherlands, assignor to Stamicarbon B.V., Geleen, Netherlands

Filed Oct. 20, 1975, Ser. No. 623,928

Claims priority, application Netherlands, Oct. 23, 1974, 7413843

Int. Cl.² C07D *207/24*

U.S. Cl. 260—326.45 **9 Claims**

1. A process for isolating an optically active form of phenylglycine amide, from racemic mixtures of the enantiomers of phenyl-glycine amide, comprising providing a racemic mixture of D- and L-phenyl-glycine amide and an optically active form of 2-pyrrolidone-5-carboxylic acid; treating said racemic mixture with the 2-pyrrolidone-5-carboxylic acid to form the corresponding salts of said optically active 2-pyrrolidone-5-carboxylic acid and said enantiomers; and separating from the mixture an optically active form of phenyl-glycine amide in the form of a salt of said 2-pyrrolidone-5-carboxylic acid.

4,036,853
SEMI-SYNTHETIC OLEANDOMYCIN DERIVATIVES-C$_8$ MODIFICATIONS

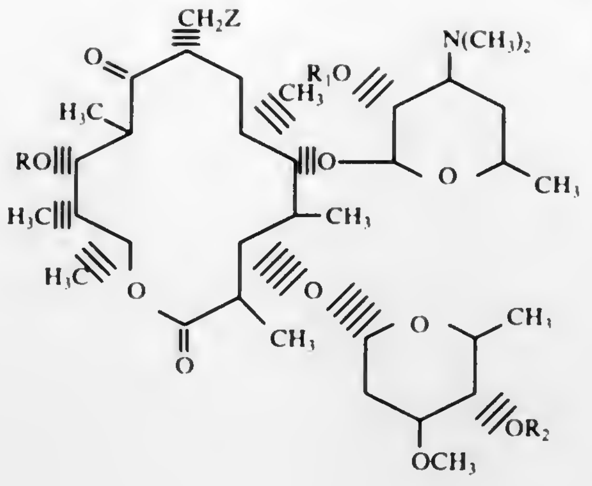
Frank C. Sciavolino, East Lyme, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Aug. 6, 1976, Ser. No. 712,360

Int. Cl.² C07D *313/00*

U.S. Cl. 260—343 **6 Claims**

1. A compound of the structure:



and the pharmaceutically acceptable acid addition salts thereof wherein:

R is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_1 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

R_2 is selected from the group consisting of hydrogen and n-alkanoyl having from two to three carbon atoms;

Z is $-OR_4$;

R_4 is selected from the group consisting of hydrogen and alkanoyl having from two to six carbon atoms.

4,036,854
METHOD FOR PREPARING COUMARIN

Kuo Yuan Chang, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 555,472, March 5, 1975. This application Apr. 26, 1976, Ser. No. 680,244

Int. Cl.² C07D *311/10*

U.S. Cl. 260—343.2 R **4 Claims**

1. A method of preparing coumarin by reacting salicylaldehyde, 1 to about 4 moles of acetic anhydride per mole of salicylaldehyde and an alkali metal acetate wherein the molar concentration of the alkali metal acetate is at or below the concentration of salicylaldehyde in the reaction, said reaction being conducted at temperatures up to 200° C for between about 2 and about 10 hours, the improvement comprising draining the liquid contents of the reactor through a filter medium located at the base of the reactor while passing an inert gaseous medium through said filter, to thereby retain the crystalline alkali metal acetate in the reactor, adding salicylaldehyde and acetic anhydride to the reactor and repeating the conversion thereof to coumarin without prior removal of the alkali metal acetate from the reactor.

4,036,855
PHTHALIDES AND PROCESS FOR PREPARING SAME

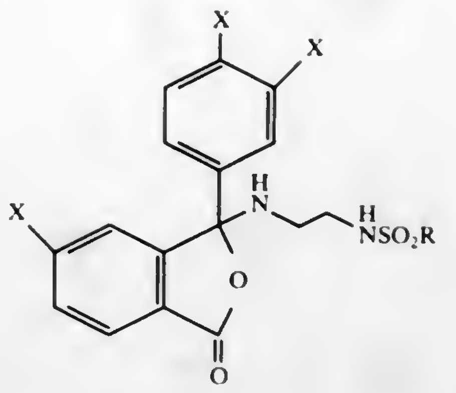
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Division of Ser. No. 409,923, Oct. 26, 1973, Pat. No. 3,943,147, which is a continuation-in-part of Ser. No. 342,879, March 19, 1973, abandoned, which is a continuation-in-part of Ser. No. 333,499, Feb. 20, 1973, abandoned. This application Oct. 29, 1975, Ser. No. 626,784

Int. Cl.² C07D *307/87;* **A01N** *9/28*

U.S. Cl. 260—343.3 R **8 Claims**

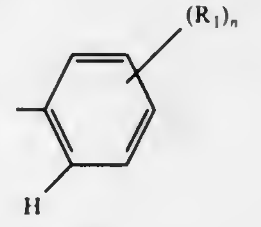
1. A compound of the formula



where

X represent H or halo of atomic weight **19** to **36**, and

R represents lower alkyl, or



where

R_1 represents H, straight chain lower alkyl having 1 to 3 carbon atoms, or halo of atomic weight 35 to 80, and

n is 1 or 2.

4,036,856
CYCLOPENTANONE DERIVATIVES

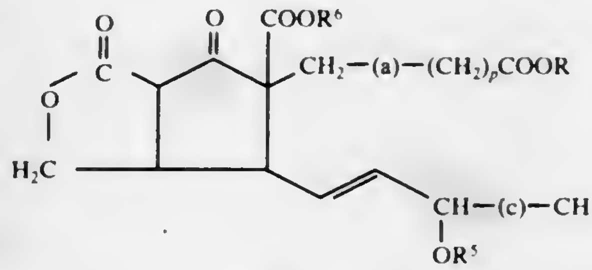
Nedumparambil A. Abraham, Dollard des Ormeaux; Jehan F. Bagli, Kirkland, and Tibor Bogri, Montreal, all of Canada, assignors to Ayerst McKenna and Harrison Ltd., Montreal, Canada

Division of Ser. No. 489,856, July 19, 1974, which is a division of Ser. No. 238,650, March 27, 1972, Pat. No. 3,849,474. This application Nov. 11, 1976, Ser. No. 741,096

Int. Cl.² C07D *307/88*

U.S. Cl. 260—343.3 R **2 Claims**

1. A compound of the formula



in which (a) is CH_2CH_2, *p* is an integer from 2 to 4, (c) is $(CH_2)_q$ wherein *q* is an integer from 1 to 6, R, and R^6 each are lower alkyl and R^5 is hydrogen.

4,036,857
BENZOPYRANS HAVING AN UNSATURATED SIDE CHAIN

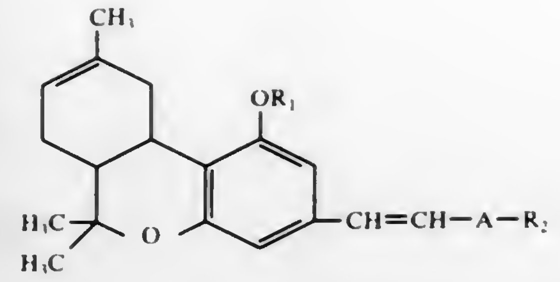
Raj Kumar Razdan, Belmont, and Haldean Cloyce Dalzell, Weston, both of Mass., assignors to Sharps Associates, Cambridge, Mass.

Filed Feb. 2, 1976, Ser. No. 654,158

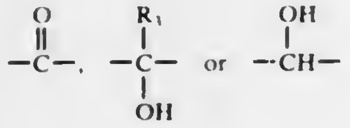
Int. Cl.² C07D *307/83*

U.S. Cl. 260—345.3 **12 Claims**

1. A compound of the formula

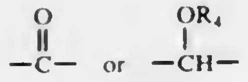


wherein R_1 is hydrogen or lower alkanoyl, R_2 is a C_1 to C_{20} alkyl, aryl-lower alkyl or cycloalkyl-lower alkyl, A represents



$$-\overset{\overset{\displaystyle O}{\|}}{C}-,\quad -\underset{\underset{\displaystyle OH}{|}}{\overset{\overset{\displaystyle R_3}{|}}{C}}-\quad\text{or}\quad -\overset{\overset{\displaystyle OH}{|}}{CH}-$$

when R_1 is hydrogen and R_3 is lower alkyl, and A is



$$-\overset{\overset{\displaystyle O}{\|}}{C}-\quad\text{or}\quad -\overset{\overset{\displaystyle OR_4}{|}}{CH}-$$

when R_1 is lower alkanoyl and R_4 is the same lower alkanoyl represented by R_1.

4,036,858
PROCESS FOR THE PREPARATION OF 7,8-EPOXY-2-METHYLOCTADECANE

Friedrich-Wilhelm Küpper, and Roland Streck, both of Marl, Germany, assignors to Chemische Werke Huls Aktiengesellschaft, Marl, Germany

Filed July 7, 1976, Ser. No. 703,268

Claims priority, application Germany, July 17, 1975, 2531959

Int. Cl.² C07D *301/14*

U.S. Cl. 260—348.5 L. 9 Claims

1. A process for the preparation of cis-7,8-epoxy-2-methyloctadecane, which comprises:

a. metathetically reacting 7-methyl-1-octene and 1-dodecene with a catalytic amount of a metathesis catalyst substantially free of oligomerization and isomerization activity with respect ot said reactants, said catalyst comprising a compound of a metal in Group V A to Group VIII A of the Periodic Table, to form 2-methyl-7-octadecene; and

b. epoxidizing the resultant 2-methyl-7-octadecene to form said cis-7,8-epoxy-2-methyloctadecane.

4,036,859
METHOD FOR THE PREPARATION OF 2-HYDROXYBENZANTHRONE COMPOUNDS

Giuseppe Ribaldone, Gallarate (Varese), and Giamplero Borsotti, Novara, both of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

Filed June 22, 1976, Ser. No. 698,362

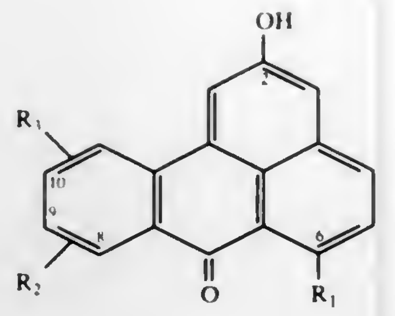
Claims priority, application Italy, June 24, 1975, 24696/75

Int. Cl.² C09B *3/02. 3/04. 1/00*

U.S. Cl. 260—364 10 Claims

1. A process for the preparation of a compound having the general formula:

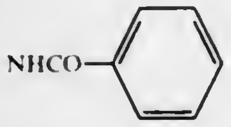
(I)



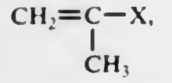
wherein:

R_1 is selected from the class consisting of H and OH; and

R_2 and R_3 are selected from the class consisting of H, Cl, OH, OCH_3 and



characterized in that an anthraquinone-1-diazonium salt is reacted with an olefinic compound of the formula:



$$CH_2{=}\underset{\underset{\displaystyle CH_3}{|}}{C}{-}X,$$

wherein X = CN or $OCOCH_3$, in an alcoholic medium of a lower monovalent alcohol and in the presence of a catalytic quantity of cuprous chloride, at a temperature between 20° and 100° C, and that the reaction intermediate thus obtained is reacted successively with alkali in alcoholic solution to produce said compound.

4,036,860
PRODUCTION OF ANTHRAQUINONE

Heinz Engelbach, Limburgerhof, and Michael Jolyon Sprague, Mannheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

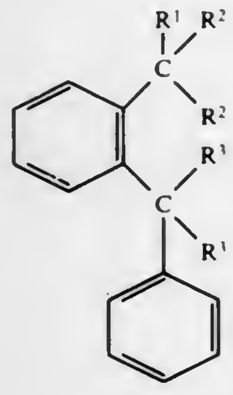
Filed Aug. 25, 1975, Ser. No. 607,356

Claims priority, application Germany, Sept. 7, 1974, 2442911

Int. Cl.² C09B *1/00*

U.S. Cl. 260—369 13 Claims

1. A process for the production of anthraquinone by the oxidation of a diphenylmethane derivative with oxygen in the gaseous phase in the presence of a pentavalent vanadium compound as a catalyst at elevated temperature which comprises oxidizing a diphenylmethane compound of the formula (I):



(I)

in which R^1, R^2 and R^3 are identical or different and each is hydrogen or an aliphatic radical, in the presence of oxygen-containing compounds of

a. vanadium in an amount, calculated as vanadium pentoxide, of from 1 to 70% by weight;

b. titanium in an amount, calculated as titanium dioxide, of from 29 to 95% by weight; and

c. one or more of the metals tellurium, caesium, thallium and antimony each in an amount, calculated as metal oxide, of from 0.01 to 20% by weight, each based on the oxygen-containing compounds and calculated as total amount of metal oxide.

4,036,861
PROCESS FOR PRODUCING A 2-TERTIARY-ALKYL SUBSTITUTED ANTHRAQUINONE

Shizuo Togo; Muneo Ito; Chiharu Nishizawa, and Michio Ohba, all of Tokyo, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed June 17, 1976, Ser. No. 696,835

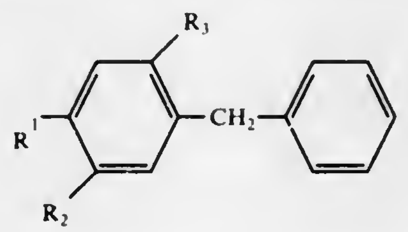
Claims priority, application Japan, June 25, 1975, 50-79281

Int. Cl.² C09B *1/00*

U.S. Cl. 260—369 10 Claims

1. A process for producing a 2-tertiary-alkyl substituted anthraquinone, characterised by carrying out catalytic oxidation of a diphenylmethane compound having the formula

I



wherein R_1 and R_2 are different from each other, and independently hydrogen or tertiary-alkyl having 4 and 5 carbon atoms with the proviso that one of R_1 and R_2 is hydrogen, and R_3 is alkyl having 1 - 3 carbon atoms, in vapor phase in the presence of a catalyst comprising vanadium oxide.

4,036,862
1-AMINO-2-(BROMOPHENOXY-ALKOXY)-4-HYDROXY ANTHRAQUINONE DYESTUFFS

Volker Hederich, Cologne; Hans-Samuel Bien, Burscheid, and Günter Gehrke, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

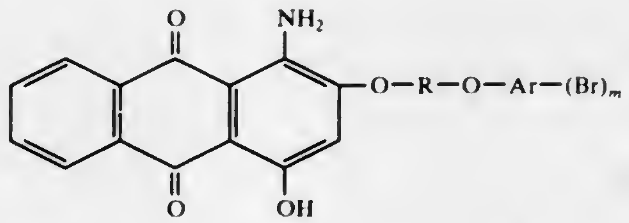
Filed Sept. 30, 1975, Ser. No. 618,247

Claims priority, application Germany, Oct. 5, 1974, 2447610; May 30, 1975, 2524126

Int. Cl.² C07C *97/26*

U.S. Cl. 260—380 4 Claims

1. Mixtures of water-insoluble anthraquinone dyestuff of the formula



wherein

R is straight-chain C_2–C_6-alkylene;

Ar is phenyl or C_1–C_2-alkylphenyl; and

m is 0.2 to 0.8.

4,036,863
TRINAPTHYLMETHANE COMPOUNDS

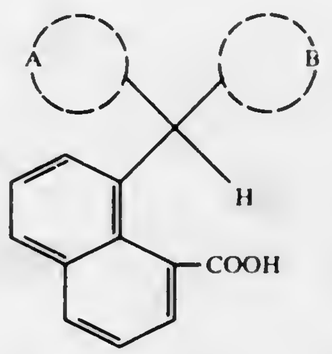
Eva R. Karger, Arlington, and Paul T. MacGregor, Lexington, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Continuation-in-part of Ser. No. 456,870, April 1, 1974, Pat. No. 3,976,662, which is a continuation-in-part of Ser. No. 202,615, Nov. 26, 1971, Pat. No. 3,816,453. This application June 1, 1976, Ser. No. 691,889

Int. Cl.² C07C *39/14, 39/16*

U.S. Cl. 260—386 13 Claims

1. A compound of the formula:



wherein A represent 4′-hydroxy-1′-naphthyl and B represents 4′-hydroxy-1′-naphthyl.

4,036,864
CHEMICAL PROCESS

Derek Harold Richard Barton, London, England, and Robert Henry Hesse, Cambridge, Mass., assignors to Research Institute for Medicine and Chemistry Inc., Cambridge, Mass.

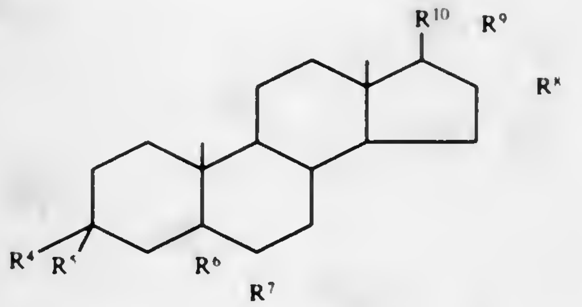
Filed May 27, 1975, Ser. No. 581,283

Int. Cl.² C07J *1/00*

U.S. Cl. 260—397.3 25 Claims

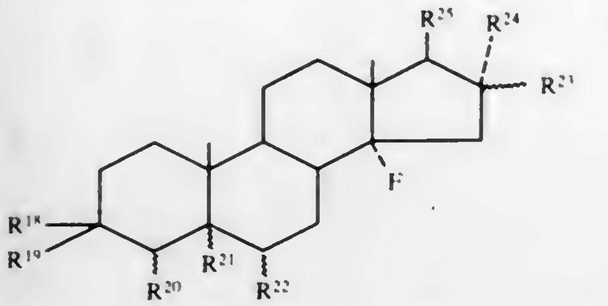
1. A process for the 9α-electrophilic fluorination of a saturated steroid compound containing a hydrogen atom bound to a tertiary carbon atom, wherein said steroid has a formula:

(III)



where R^4 represents protected hydroxy and R^5 represents hydrogen, or R^4 and R^5 together represent a keto or protected keto group, and R^6 and R^7 each represent hydrogen, or R^4 and R^6 together represent a 3,5-cyclo linkage, R^5 represents hydrogen and R^7 represents protected hydroxy; R^8 represents hydrogen, methyl or protected hydroxy; R^9 represents hydrogen, hydroxy or protected hydroxy and R^{10} represents acetyl or substituted acetyl, or R^9 represents hydrogen and R^{10} represents protected hydroxy, or R^9 and R^{10} together represent a keto group; which comprises reacting the said steriod with an electrophilic fluorinating agent selected from the group consisting of molecular fluorine, pentafluorosulphur hypofluorite and lower fluoroalkyl hypofluorites in which the fluoroalkyl moiety contains at least two fluorine atoms per carbon atom, said fluorinating agent being substantially homogeneously dispersed in a liquid medium and said reaction being conducted in the presence of a free radical inhibitor to suppress formation of free fluorine radicals so that said hydrogen atom is electrophilically replaced by a fluorine atom, and recovering the thus-obtained fluoro steroid.

22. A compound having the formula:



(IX)

wherein R^{18} represents hydroxy, nitroxy, acetoxy or trifluoroacetoxy and R^{19} represents hydrogen or R^{18} and R^{19} together represent a keto group, R^{20} represents hydrogen and R^{21} and R^{22} both represent hydrogen, chlorine or bromine or together form a carbon-carbon double bond or an epoxy group, and when R^{18} and R^{19} together represent a keto group R^{20} and R^{21} may together form a carbon-carbon double bond or an epoxy group, R^{22} then being hydrogen, or R^{18} and R^{21} together form a 3,5-cyclo linkage, R^{19} and R^{20} then being hydrogen and R^{22} being acetoxy; R^{23} represents hydrogen or methyl; R^{24} represents hydrogen or hydroxy and R^{25} represents acetoxy, or R^{24} and R^{25} together represent a keto group.

4,036,865

SEMICONTINUOUS PROCESS FOR DEODORIZING OILS

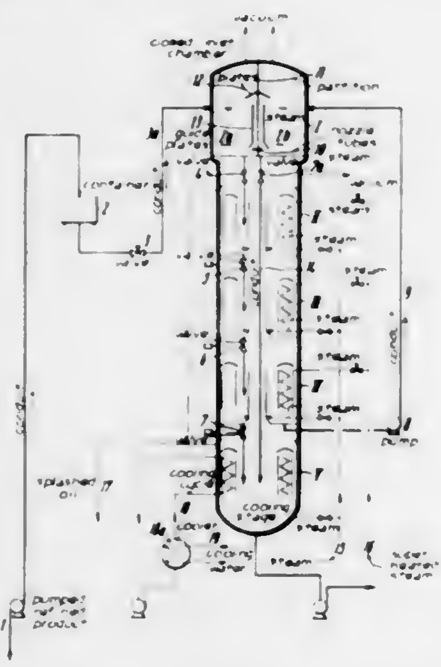
Albert Hartmann, Heusenstamm; Herbert Schilken, Friedberg, and Bernhard Romeiser, Hanau, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main, Germany

Continuation of Ser. No. 485,290, July 2, 1974, abandoned. This application Oct. 28, 1975, Ser. No. 626,337

Claims priority, application Germany, July 18, 1973, 2336639

Int. Cl.² C11B *3/14*

U.S. Cl. 260—428 **3 Claims**



1. A semicontinuous process for deodorizing liquid feed stock containing oil, comprising the steps of:

a. introducing the feed stock initially into a first evacuated chamber having a wall and a partition parallel to but spaced from said wall, introducing steam upwardly into said chamber at the base of said partition and between said partition and a first guide plate, parallel to and between said wall and said partition, to induce a circulation of the feed stock in said chamber, introducing deodorized stock into a second chamber adjacent said evacuated chamber and separated therefrom by said partition, and circulating said deodorized stock in said second chamber by introducing steam upwardly into a space between said partition and a second guide plate parallel to said partition and spaced from said first guide plate by said partition, said circulating deodorized stock indirectly heating said feed stock through said partition in heat exchanging relationship;

b. deodorizing the feed stock by intermittently passing the feed stock heated in step (a) through a succession of heating stages at subatmospheric pressure, each stage having a wall and a partition parallel to but spaced from said wall, while admitting steam at the base of the partition between the wall and the partition in each of said stages to circulate the feed stock therein between the wall and the partition and so as to heat the feed stock in said succession of stages to successively higher temperatures thereby deodorizing said feed stock;

c. withdrawing the feed stock from at least one of said heating stages subsequent to the first heating stage and passing it as said deodorized stock into said second chamber for indirect heat exchange with the initial feed stock in step (a);

d. withdrawing deodorized stock from said second chamber and cooling said withdrawn deodorized stock in a cooling stage; and

e. discharging said cooled deodorized stock from said cooling stage.

4,036,866

PROCESS FOR RECOVERING ORGANOTIN HALIDES

William A. Larkin, Morristown, and Alfred Stoloff, Livingston, both of N.J., assignors to M & T Chemicals Inc., Greenwich, Conn.

Continuation-in-part of Ser. No. 499,503, Aug. 22, 1974, Pat. No. 3,931,264. This application Oct. 14, 1975, Ser. No. 622,374

Int. Cl.² C07F *7/22*

U.S. Cl. 260—429.7 **11 Claims**

1. A method for isolating an organotin halide of the general formula $(CH_3)_aSnX_{4-a}$ or $C_4H_9SnX_3$, wherein a is the integer 2 or 3 and X represents chlorine, bromine or iodine, in substantially pure form from an aqueous medium containing more than about (55%) by weight of said organotin halide in the form of a water-insoluble complex with ammonia or an amine, the method consisting essentially of the following steps:

1. combining said aqueous medium with (a) an amount of a chemically inert water-soluble, inorganic salt sufficient to attain a concentration of from 50 g. of said salt per 100 cc. of water up to the concentration equivalent to a saturated or super-saturated solution of said salt, and (b) a non-oxidizing mineral acid in an amount sufficient to completely decompose said complex;
2. heating the resultant solution to a temperature between ambient and the boiling point of the solution as required to effect a separation of the organotin halide from the aqueous phase;
3. isolating the organotin halide.

4,036,867

ORGANO-ALUMINUM-SILICON REDUCING AGENTS AND PROCESS

Gottfried Piekarski, Burghausen; Anton Hundmeyer, Burghausen; Dieter Kippe, Burghausen, and Siegmund Maier, Emmerting, all of Germany, assignors to Wacker-Chemie GmbH, Munich, Germany

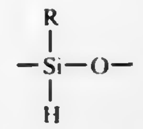
Filed Mar. 24, 1975, Ser. No. 561,026

Claims priority, application Germany, Mar. 27, 1974, 2414875

Int. Cl.² C07F *5/06*

U.S. Cl. 260—448 A **16 Claims**

1. A process for the production of an organo-aluminum-silicon reducing agent consisting essentially of reacting a hydrogenpolysiloxane having a viscosity of from 5 to 100 cST at 25° C and at least two siloxane units having the formula



$$-\underset{\displaystyle H}{\overset{\displaystyle R}{\underset{|}{\overset{|}{Si}}}}-O-$$

wherein R is a member selected from the group consisting of alkyl having from 1 to 6 carbon atoms, cycloalkyl having from 5 to 6 carbon atoms and phenyl, said hydrogenpolysiloxane having the three valences of its silicon atoms on the ends of the polysiloxane chain satisfied by R, hydrogen or, at most, one hydroxyl group per end silicon atom, with a dialkyl aluminum hydride having from 2 to 8 carbon atoms in each of the alkyls, at a temperature not exceeding 80° C and in a molar ratio of from 0.8 to 2 mols of said siloxane units per mol of said dialkyl aluminum hydride, and recovering said organo-aluminum reducing agent.

4,036,868

NITROGEN-CONTAINING COMPOUNDS AND USE THEREOF

John Heathcote Atherton, Manchester, England, assignor to Imperial Chemical Industries Limited, London, England

Continuation-in-part of Ser. No. 329,337, Feb. 5, 1973, abandoned. This application Jan. 17, 1975, Ser. No. 542,048

Claims priority, application United Kingdom, Feb. 7, 1972, 5494/72

Int. Cl.² C07F *7/10, 7/18*

U.S. Cl. 260—448.2 N **16 Claims**

1. Organopolysiloxanes (A) consisting of 0.18 to 14 mole percent of units of the formula:

$$OSi(R)C_dH_{2d}CH_2N(R^{iv})Si(R)O, \qquad (I)$$

0 to 0.1 mole percent of units of the formula:

$$OSi(R)NHCH_2C(R''')=CH_2 \qquad (II)$$

and 0 to 50 mole percent of units of the formula:

$$OSi(R)C_dH_{2d}CH_2NH(R^{iv}) \qquad (III)$$

the remaining units being selected from the group consisting of $R_3SiO_{1/2}$ and $R_eH_fSiO_{(4-e-f)/2}$ units where R is a monovalent hydrocarbon group, R''' is hydrogen or a methyl group, R^{iv} is hydrogen or an alkyl group having up to 6 carbon atoms, d is 2 or 3, e is 1 or 2, f is 0 or 1 and $e + f$ is 2.

4,036,869

2,4-DIISOCYANATO BICYCLO (3,3,0)-OCT-6-ENE

John Crosby; Robert Allan Campbell Rennie, both of Runcorn, England, and Robert Michael Paton, Edinburgh, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 638,655, Dec. 8, 1975. This application Nov. 8, 1976, Ser. No. 740,244

Claims priority, application United Kingdom, Dec. 11, 1974, 53551/74

Int. Cl.² C07C *119/045*

U.S. Cl. 260—453 AP **1 Claim**

1. 2,4-diisocyanato bicyclo (3,3,0)-oct-6-ene.

4,036,870

AMMOXIDATION OF ALKANES

George Augustus Castellion, and William Frank Marzluff, both of Stamford, Conn., assignors to American Cyanamid Company, Stamford, Conn.

Filed July 2, 1971, Ser. No. 159,570

Int. Cl.² C07C *120/14*

U.S. Cl. 260—465.3 **6 Claims**

1. A catalytic process for making α,β-ethylenically-unsaturated lower aliphatic nitrile, said process comprising contacting a gas mixture comprising reactants ammonia, oxygen and lower alkane hydrocarbon having 3 to 4 carbon atoms, with a solid catalyst consisting essentially of mixed bismuth oxide and molybdenum oxide with at least said molybdenum oxide present entirely as a non-crystalline solid phase with phosphoric acid present as fluxing agent in said non-crystalline phase at reaction temperature in the range from about 400°C. to about 600°C. and residence time sufficient to effect the catalytic conversion of the lower alkane hydrocarbon to said nitrile.

4,036,871

11-SUBSTITUTED PROSTAGLANDINS

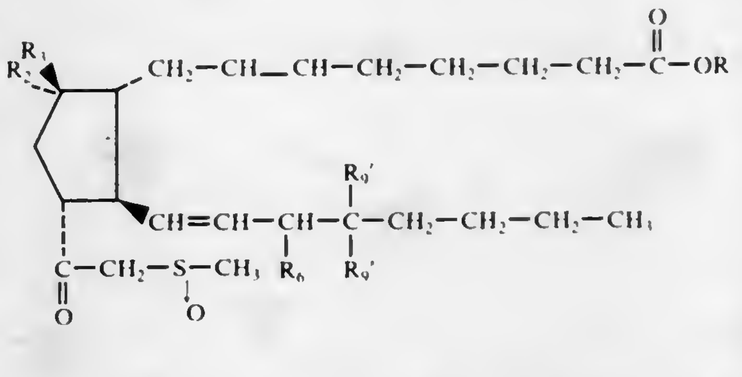
George William Holland, Cedar Grove; Jane Liu Jernow, Verona, and Perry Rosen, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 480,458, June 18, 1974, which is a continuation-in-part of Ser. No. 386,117, Aug. 6, 1973, abandoned. This application Sept. 17, 1975, Ser. No. 614,044

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **3 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_2 is hydroxy; R_3 is hydrogen or taken together with R_2 forms oxo; R_6 is hydroxy, tetrahydropyranyloxy benzyloxy, 4-methoxy-5,6-dihydro-2H-pyranyloxy, benzhydryloxy, trityloxy, trialkylsilyloxy and methoxymethyl; R_9 is hydrogen, lower alkyl or fluoro;

R_9' is hydrogen or lower alkyl; and the dotted carbon to carbon bond can be optionally hydrogenated

or enatiomers or racemates.

4,036,872

CYCLOPENTANE DERIVATIVES

Michael Peter Lear Caton, Upminster; Edward Charles John Coffee, London, and Gordon Leonard Watkins, Hornchurch, all of England, assignors to May & Baker Limited, Dagenham, England

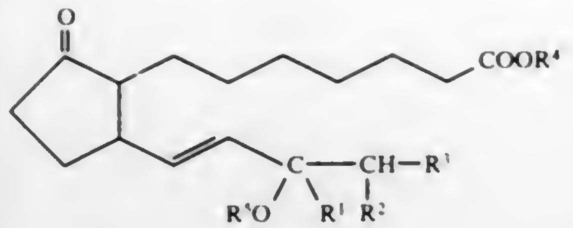
Filed Nov. 12, 1974, Ser. No. 523,015

Claims priority, application United Kingdom, Nov. 13, 1973, 52695/73

Int. Cl.² C07C *177/00*

U.S. Cl. 260—468 D **9 Claims**

1. A cyclopentane derivative of the formula:



wherein R^1 represents alkyl of 1 through 4 carbon atoms, R^2 represents hydrogen or alkyl of 1 through 3 carbon atoms, R^3 represents alkoxy of 3 through 6 carbon atoms, R^4 represents hydrogen or alkyl of 1 through 12 carbon atoms and R^5 represents hydrogen or alkyl of 1 through 4 carbon atoms or a carboxylic acyl group and, where R^4 represents a hydrogen atom, non-toxic pharmaceutically-acceptable salts thereof.

4,036,873
PREPARATION OF ALKYL SUBSTITUTED o-HYDROXYBENZOIC ACID ESTERS

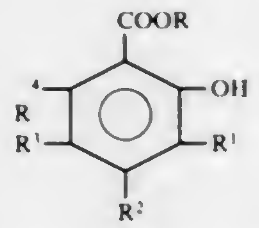
Clarence W. Huffman, Clark, N.J., assignor to IMC Chemical Group, Inc., Newark, N.J.

Filed Mar. 7, 1975, Ser. No. 556,476

Int. Cl.^{2} C07G *69/76*

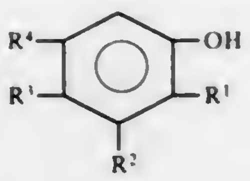
U.S. Cl. 260—473 S **21 Claims**

1. Process for preparing an alkyl substituted o-hydroxy benzoic acid ester of the general formula:



wherein R is a C_1-C_5 alkyl, R^1, R^2, R^3 and R^4 are each selected from hydrogen, or a C_1-C_3 alkyl provided that at least one of R^1, R^2, R^3 and R^4 is selected from C_1-C_3 alkyl, comprising

a. reacting in an aqueous media an alkali metal hydroxide with a phenolic compound having the general formula:



wherein R^1, R^2, R^3 and R^4 are the same as above to form an alkali metal phenolate;

b. transferring said phenolate into an organic carrier to form a substantially anhydrous phenolate-organic carrier mixture;

c. carboxylating said phenolate by contacting said mixture with sufficient CO_2 at substantially atmospheric pressures to form a dialkali metal salt;

d. half-neutralizing said salt by contacting the resultant salt-organic carrier mixture with about one equivalent of a substantially anhydrous inorganic acid per mole of salt; and

e. reacting said salt in said organic carrier with at least about 1 mole of a C_1-C_5 alkyl chloride per mole of salt.

4,036,874
D-HOMOPREGNANES

Leo Alig, Liestal; Andor Fürst, Basel, and Marcel Müller, Frenkendorf, all of Switzerland, assignors to Hoffmann-La Rocbe Inc., Nutley, N.J.

Continuation-in-part of Ser. No. 345,149, March 26, 1973, abandoned. This application Dec. 11, 1975, Ser. No. 639,939

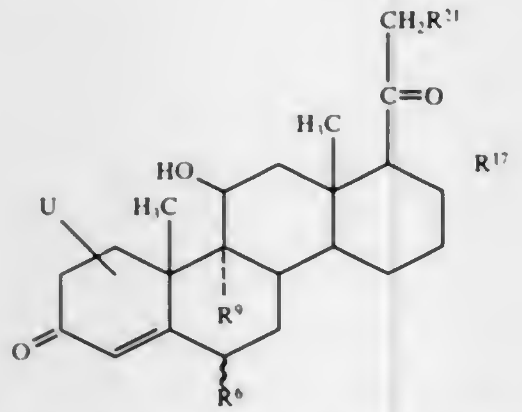
Claims priority, application Switzerland, Mar. 29, 1972, 4666/72

The portion of the term of this patent subsequent to Feb. 17, 1993, has been disclaimed.

Int. Cl.^{2} C07J *63/00*

U.S. Cl. 260—488 B **16 Claims**

1. A compound of the formula



wherein R^6 is hydrogen, fluorine, chlorine or methyl and R^9 is hydrogen, fluorine, chlorine, or bromine with the provisos that R^6 and R^9 simultaneously are not hydrogen and R^6 is a group other than methyl when R^6 is hydrogen when U is hydrogen attached to each of the 1- and 2-positions of the steroid nucleus; R^{17} and R^{21} each independently are hydroxy or alkanoyloxy of up to 6 carbon atoms, and U is hydrogen attached to each of the 1- and 2-positions of the steroid nucleus or an additional single bond between the 1- and 2-positions of the steroid nucleus.

4,036,875
PROCESS FOR THE CONTINUOUS SULPHONATION OF ALKYL AROMATIC HYDROCARBONS

Anders Broström, Goteborg, Sweden, assignor to Berol Kemi AB, Stenungsund, Sweden

Filed June 2, 1975, Ser. No. 583,319

Claims priority, application Sweden, June 5, 1974, 7407422

Int. Cl.^{2} C07C *143/24*

U.S. Cl. 260—505 S **6 Claims**

1. In the process for the continuous sulphonation of an alkyl aromatic hydrocarbon in the liquid phase with sulphur trioxide gas in an elongated reaction zone, the point of introduction of such sulphur trioxide gas being the start of the reaction zone, and the point of withdrawal of the reaction product being the end of the reaction zone, the improvement which comprises limiting the amount of sulphur trioxide introduced initially at the start of the reaction zone into the liquid phase to be sulphonated to not exceeding 7% of the stoichiometric amount required for the desired sulphonated product, and distributing the introduction of the remaining stoichiometric amount of sulphur trioxide gas over from about 20 to about 80% of the remainder of the length of the reaction zone.

4,036,876
18- AND 19-HYDROXYLATED PROSTAGLANDINS

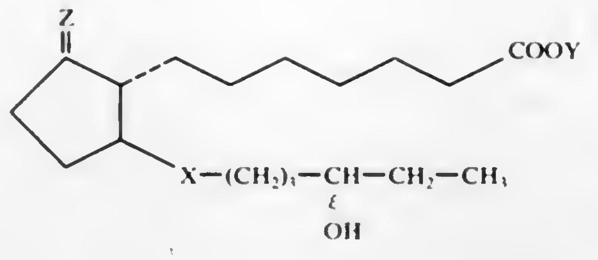
Raymond P. Lanzilotta, San Jose, Calif., assignor to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed July 13, 1973, Ser. No. 379,128

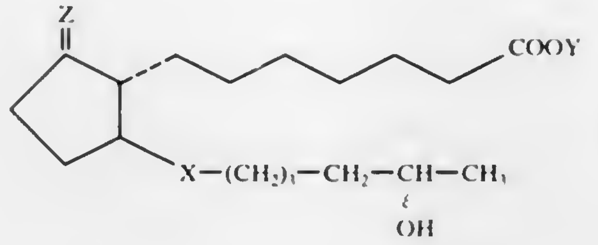
Int. Cl.^{2} C07C *177/00*

U.S. Cl. 260—514 D **5 Claims**

1. The compounds of the formulas:



(I)

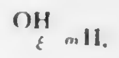


(II)

wherein X is a cis unsaturated carbon-carbon double bond, $-CH=CH-$;

Y is selected from the group consisting of hydrogen, lower alkyl or a pharmaceutically acceptable salt;

Z is selected from the group consisting of keto and



and the wavy line (ξ) is a mixture of the (R) and (S) antimers.

4,036,877
PROCESS FOR THE PRODUCTION OF ALDEHYDES

József Petró; Tibor Máthé, and Antal Tungler, all of Budapest, Hungary, assignors to Budapesti Muszaki Egyetem, Budapest, Hungary

Filed Feb. 12, 1975, Ser. No. 549,143

Int. Cl.^{2} C07C *63/00, 47/52, 47/54*

U.S. Cl. 260—515 R **1 Claim**

1. In a process for the preparation of aldehydes by hydrogenating carboxylic acid chlorides of the general formula RCOCl wherein R stands for phenyl or substituted phenyl group, the substituents being alkyl, halogen, hydroxy, alkoxy, carboxyl, carbonyl or nitro groups, the improvement which comprises conducting the hydrogenating reaction in the presence of an alloy catalyst consisting of at least one element of the platinum group and selected from the group consisting of palladium, platinum, rhodium, and osmium, and at least one element of the groups IB and IIB of the periodic system and selected from the group consisting of copper, silver, gold, cadmium, and mercury, on a carrier selected from the group consisting of activated carbon, silica, alumina and calcium carbonate at a temperature from about 0° to 190° and at a pressure of about 1 to 50 atmospheres.

4,036,878
PROCESS FOR PREPARING UREA

Petrus J.C. Kaasenbrood, Sittard, and Petrus J.M. Van Nassau, Munstergeleen, both of Netherlands, assignors to Unie Van Kunstmestfabrieken, B.V., Utrecht, Netherlands

Continuation of Ser. No. 369,388, June 12, 1973, abandoned. This application Oct. 14, 1975, Ser. No. 622,417

Claims priority, application Netherlands, June 12, 1972, 7207941

Int. Cl.^{2} C07C *126/00*

U.S. Cl. 260—555 A **6 Claims**

1. In a process for synthesizing urea by reacting carbon dioxide and ammonia at a pressure of 80–200 atm. and a temperature of 170°–190° C. in a urea synthesis zone, heating the thus-produced urea synthesis solution and contacting said solution with a stripping gas, thereby forming a gaseous mixture composed primarily of ammonia, carbon dioxide and water vapor, and recirculating said gaseous mixture, said heating and contacting being effected at substantially the same pressure as that maintained in the urea synthesis zone, the improvement comprising:

a. in a first step, increasing the temperature of said urea synthesis solution by said heating to a temperature of 205°–250° C. in a heat exchange zone thereby liberating a mixture of gases prior to contact with said stripping gas, and

b. in a second step, effecting said contacting of the heated synthesis solution of the first step (a) with said stripping gas under substantially adiabatic conditions, thereby removing and expelling the unconverted reactants with said stripping gas.

4,036,879
CATALYSTS FOR THE HYDRATION OF NITRILES OF AMIDES

Clarence E. Habermann, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Continuation-in-part of Ser. No. 91,146, Nov. 19, 1970, abandoned. This application June 6, 1975, Ser. No. 584,315

Int. Cl.^{2} C07C *103/133*

U.S. Cl. 260—561 N **6 Claims**

1. In the process of hydrating a nitrile to the corresponding amide by contacting the nitrile in the presence of water with a catalyst, the improvement comprising using as catalyst reduced silver oxide, reduced nickel-chromium oxide, reduced iron-chromium oxide or mixture thereof.

4,036,880
METHOD OF PREPARING POLYAMINOPOLYPHENYLMETHANES

Edward T. Marquis; Robert M. Gipson, and Lewis W. Watts, Jr., all of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

Filed Sept. 15, 1976, Ser. No. 723,422

Int. Cl.^{2} C07C *85/24*

U.S. Cl. 260—570 D **4 Claims**

1. A method of preparing diaminodiphenylmethane and higher homologues thereof which comprises the step of condensing aniline and formaldehyde in the presence of a molybdenum boride catalyst.

4,036,881
PREPARATION OF POLYALKYLENE POLYAMINES

Michael E. Brennan, and Ernest L. Yeakey, both of Austin, Tex., assignors to Texaco Development Corporation, New York, N.Y.

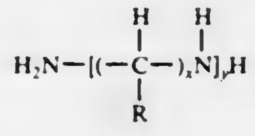
Filed June 2, 1975, Ser. No. 583,017

Int. Cl.^{2} C07C *87/20*

U.S. Cl. 260—583 P **8 Claims**

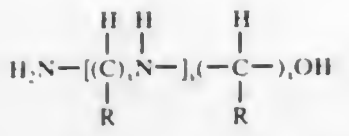
1. A process for preparing predominantly noncyclic polyalkylene polyamines comprising the steps of:

contacting an alkyleneamine compound having two primary amino groups of the general formula:



$$H_2N-[(-\underset{R}{\overset{H}{C}}-)_x\overset{H}{N}]_yH$$

wherein R is a hydrogen or a lower alkyl radical, *x* is a number from 2 to about 6 and *y* is a number from 1 to about 4 with an alkanolamine compound having a primary amino group and a primary or secondary hydroxy group of the general formula:



$$H_2N-[(\underset{R}{\overset{H}{C}})_x\overset{H}{N}-]_y(-\underset{R}{\overset{H}{C}}-)_xOH$$

wherein R is a hydrogen or a lower alkyl radical; *x* is a number from 2 to about 6; and, *y* is a number from 0 to about 3 in the presence of a catalytically effective amount of a phosphorus-containing substance selected from the group consisting of acidic metal phosphates, phosporic acid compounds and their anhydrides, phosphorous acid compounds and their anhydrides, alkyl or aryl phosphate esters, alkyl or aryl phosphite esters, alkyl or aryl substituted phosphorous and phosphoric acids wherein said alkyl groups have from 1 to about 8 carbon atoms and said aryl groups have from 6 to about 20 carbon atoms, alkali metal monosalts of phosphoric acid, the thioanalogs of the foregoing, and mixtures of the above at temperatures of from about 250° to about 350° C under a pressure sufficient to maintain the mixture essentially in liquid phase, and,

recovering said polyalkylene polyamines from the resultant reaction mixture.

4,036,882

AMINE FORMAL POLYMERS AND PROCESS OF MAKING THE SAME

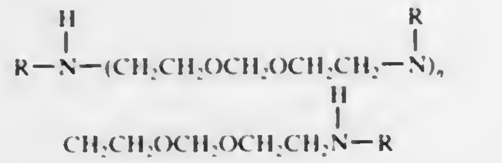
Eugene R. Bertozzi, Yardley, Pa.; Robert Barclay, Jr., Trenton, N.J.; David H. Packer, Yardley, and Daniel J. Smith, Washington Crossing, both of Pa., assignors to Thiokol Corporation, Newtown, Pa.

Filed Feb. 13, 1974, Ser. No. 441,938

Int. Cl.² C07C *93/02, 85/04*

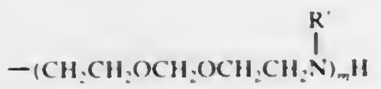
U.S. Cl. 260—584 B **10 Claims**

1. An amine formal polymer of the general formula



$$R-\overset{H}{N}-(CH_2CH_2OCH_2OCH_2CH_2-\overset{R}{N})_n \qquad CH_2CH_2OCH_2OCH_2CH_2\overset{H}{N}-R$$

wherein R is hydrogen, $-CH_2R''$ or



$$-(CH_2CH_2OCH_2OCH_2CH_2\overset{R'}{N})_mH$$

R' is hydrogen or $-CH_2R''$ and R'' is hydrogen, alkyl or hydroxyalkyl, in which the alkyl groups have 1 to 6 carbon atoms, *n* is 1 to 8, *m* is 0 to 8 and R, R' and R'' may be the same or different, said polymer having a primary amine content, expressed as nitrogen, of about 5 to 7% by weight.

4,036,883

MANUFACTURE OF ISOMER-FREE 3-METHYLBUTYLAMINE

Dieter Voges, Mannheim; Siegfried Winderl, Heidelberg-Wieblingen, and Herbert Mueller, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Nov. 21, 1975, Ser. No. 634,232

Claims priority, application Germany, Nov. 27, 1974, 2456006

Int. Cl.² C07C *85/06;* **C07B** *1/00*

U.S. Cl. 260—585 B **4 Claims**

4. A process for the production of pure 3-methylbutylamine-1 which comprises reacting hydrogen and ammonia simultaneously with a hydroformylation reaction mixture derived by the thermal condensation of isobutene and aqueous formaldehyde, said reaction mixture consisting mainly of 2-methylbuten-1-ol-4 and containing minor amounts of isomeric alcohols derived from cis- and trans-butene-2 and n-butene-1 impurities in the isobutene reactant or from hydroformylation of the isobutene at the β-position, said simultaneous reaction of ammonia, hydrogen and said reaction mixture being carried out at about 140° to 240° C. in the presence of a catalyst containing a catalytically active amount of one or more metals from the group consisting of iron, nickel, cobalt, ruthenium, rhodium, platinum and copper.

4,036,884

PROCESS FOR THE MANUFACTURE OF A NEW DERIVATIVE OF ALPHA-PINENE AND NEW MEDICAMENTS BASED ON THIS DERIVATIVE

Raymond Dulou, Paris; Pierre Magnin, Clermont-Ferrand, and Pierre Bechtel, Besancon, all of France, assignors to So. Ci. Bre., Nanterre, France

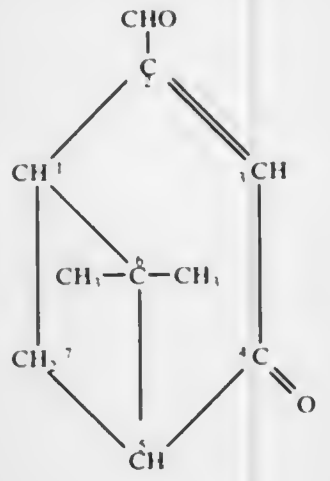
Continuation of Ser. No. 420,149, Nov. 29, 1973, abandoned, which is a continuation of Ser. No. 222,004, Jan. 31, 1972, abandoned. This application Aug. 11, 1975, Ser. No. 603,523

Claims priority, application France, Feb. 4, 1971, 71.03753

Int. Cl.² A61K *31/18;* **C07C** *45/00, 49/00*

U.S. Cl. 260—586 G **1 Claim**

1. The novel chemical compound: 6,6-dimethyl-4-oxo-2-formylbicyclo [3.1.1]hept-2-ene of the formula:



4,036,885

METHOD FOR DECOMPOSING AN AROMATIC ALDEHYDE-HYDROGEN FLUORIDE-BORON FLUORIDE COMPLEX

Susumu Fujiyama; Minoru Takagawa, and Shiro Kajiyama, all of Niigata, Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Division of Ser. No. 468,025, May 8, 1974, Pat. No. 3,962,343. This application Feb. 2, 1976, Ser. No. 654,625

Claims priority, application Japan, May 25, 1973, 48-58333

The portion of the term of this patent subsequent to June 8, 1993, has been disclaimed.

Int. Cl.² C07C *45/24*

U.S. Cl. 260—599 **7 Claims**

1. A method for decomposing an aromatic aldehyde-hydrogen fluoride-boron trifluoride complex, which comprises effecting decomposition of said complex by contacting the complex with benzene as a diluent at a pressure of from about 1 to about 10 atmospheres at a temperature of from about 40° to about 130° C. in such a short time as not to cause a change in the quality of the aromatic aldehyde, separating hydrogen fluoride and boron trifluoride as a gaseous phase from said complex and said aromatic aldehyde as a liquid phase.

4,036,886

PROCESSES FOR PRODUCING 4- AND 5-PHENYL PENTENALS

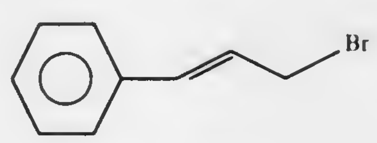
William Lewis Schreiber, Jackson, N.J.; Gerard Joseph Mosciano, Newton, Pa.; Alan O. Pittet, Atlantic Highlands; Manfred Vock, Locust, both of N.J., and Edward Joseph Shuster, New York, N.Y., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Continuation-in-part of Ser. No. 507,542, Sept. 19, 1974, which is a division of Ser. No. 283,632, Aug. 25, 1972, Pat. No. 3,862,340. This application Apr. 12, 1976, Ser. No. 676,393

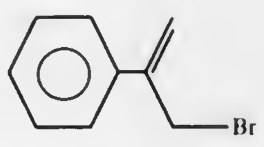
Int. Cl.² C07C *45/00*

U.S. Cl. 260—599 **1 Claim**

1. The process of preparing a phenyl pentenal selected from the group consisting of 5-phenyl-4-pentenal and 4-phenyl-4-pentenal comprising the steps of (i) reacting a phenyl alkenyl bromide selected from the group consisting of phenyl allyl bromide having the structure:



and α-bromomethyl styrene having the structure:



with the lithium salt of a Schiff base of acetaldehyde with an organic amine thereby forming a 4- or 5-phenyl-4-pentenal Schiff base, the temperature range of the reaction between the phenyl alkenyl bromide and the Schiff base being from −70° C up to +30° C, and (ii) subsequently acidifying the resultant 4- or 5-phenyl-4-pentenal Schiff base at a pH of approximately 1 with an acid selected from the group consisting of hydrochloric acid and sulfuric acid.

4,036,887

PREPARATION OF 3-BROMOBENZALDEHYDE

Roger A. Sheldon; Johannes W. van der Meer; Pieter A. Verbrugge, and Albertus J. Mulder, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed May 25, 1976, Ser. No. 689,758

Claims priority, application United Kingdom, June 2, 1975, 23771/75

Int. Cl.² C07C *47/55*

U.S. Cl. 260—599 **2 Claims**

1. A process for preparing 3-bromobenzaldehyde, which comprises treating, under essentially anhydrous and molecular oxygen-free conditions at a temperature below 100° C, a mixture of benzaldehyde and aluminum chloride, said mixture being at least partially in solution in a lower polar chloroalkane, with a solution of bromine chloride in said chloroalkane, slowly, at a controlled rate, the mole ratio of aluminum chloride-to-benzaldehyde being within the range of from 1.2/1 to 1.5/1 and the molar ratio of benzaldehyde-to-bromine chloride being from 1/1 to 1/1.5.

4,036,888

PROCESS FOR THE PRODUCTION OF HYDROXY-PIVALDEHYDE

Pierre Couderc, Bethune, and Serge Hilmoine, Aire-sur-la-Lys, both of France, assignors to Societe Chimique des Charbonnages, Paris, France

Filed Oct. 23, 1975, Ser. No. 625,074

Claims priority, application France, Oct. 30, 1974, 74.36346

Int. Cl.² C07C *47/26*

U.S. Cl. 260—602 **8 Claims**

1. A process for the recovery of hydroxy-pivaldehyde from a mixture containing 42 to 50wt% of hydroxy-pivaldehyde, 28 to 35wt% of isobutyraldehyde, approximately 18wt% of water, approximately 2wt% of triethylamine, and approximately 2wt% of secondary reaction products, said mixture produced by reacting formaldehyde with isobutyraldehyde in an approximate molar ratio of 1:2 in the presence of a catalyst amount of triethylamine, the formaldehyde being in the form of about 40% aqueous solution, the reaction being conducted at a sufficient temperature and for a sufficient time to produce said reaction mixture, the recovery comprising:

a. adding at least one part by weight of water to 1 part of the reaction mixture, distilling the solution obtained under reduced pressure at a temperature below 65° C, to produce a distillate containing isobutyraldehyde, triethylamine and water, and a concentrate of an aqueous solution containing hydroxy-pivaldehyde,

b. cooling the concentrate of the aqueous solution containing hydroxy-pivaldehyde to approximately 15° to 20° C to cause the crystallization of hydroxy-pivaldehyde, filtering off the resultant crystals from the mother liquor, washing the crystals with cold water and then drying the crystals in air, and

c. subjecting the mother liquor from the crystallization to liquid-liquid extraction at ambient temperature using approximately one volume of isobutyraldehyde to 3 volumes of the mother liquor to extract additional hydroxy-pivaldehyde.

4,036,889

PROCESS FOR PREPARING TRIARYLPHOSPHINES

Vilas M. Chopdekar, Parlin, N.J., assignor to M & T Chemicals Inc., Greenwich, Conn.

Filed Aug. 27, 1975, Ser. No. 608,051

Int. Cl.² C07F *9/02*

U.S. Cl. 260—606.5 P **4 Claims**

1. In an improved method for preparing triarylphosphines of the general formula Ar_3P, wherein Ar represents phenyl, naphthyl or anthracenyl, by dispersing molten sodium in a liquid hydrocarbon dilent, combining the resultant dispersion with a monohalogenated aromatic hydrocarbon of the formula ArX, wherein X is chlorine, bromine or iodine, a phosphorus trihalide PX_3, an effective amount of a catalyst, and reacting the resultant mixture at a temperature between ambient and 80°C., the improvement which resides in employing as said catalyst a triarylphosphine dihalide of the formula Ar_3PX_2.

4,036,890

PREPARATION OF ORGANIC HYDROPEROXIDES

Wilhelm Ester, deceased, late of Herne, Germany; Margarete Ester, heir, Herne, Germany; Brigitte Louis nee Ester, heir, Herne, Germany; Wolfgang Ester, heir, Herne, Germany, and Wilhelm Heitmann, Herne, Germany, assignors to Veba-Chemie AG, Gelsenkirchen-Buer, Germany

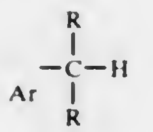
Filed May 11, 1965, Ser. No. 454,963

Claims priority, application Germany, May 13, 1964, 35154

Int. Cl.² C07C *179/02, 179/04*

U.S. Cl. 260—610 B **9 Claims**

1. In the production of organic cyclic hydroperoxides which comprises oxidizing a compound selected from the group consisting of compounds of the formula:



$$Ar-\overset{\displaystyle R}{\underset{\displaystyle R}{\overset{|}{\underset{|}{C}}}}-H$$

wherein Ar is a member selected from the group consisting of phenyl, cyclohexyl and cycloheptyl, which can be substituted by C_{1-5} alkyl and each R is an aliphatic hydrocarbon radical, and compounds of the group consisting of carane, pinane, p-menthane and camphane with an oxygen-containing gas at a temperature of about 80° to 150° C and a pressure of about atmospheric up to about 10 atmospheres; the improvement which comprises halting said oxidation when the concentration of produced hydroperoxide reaches about 1 to less than 5% by weight in the reaction mixture, and recovering said cyclic hydroperoxide.

4,036,891

PROCESS FOR PREPARING PARAFORMALDEHYDE

Jens C. T. Moller, 5245 Hayledge Court, Columbia, Md. 21045, and Ove E. Hansen, Skovgards Alle 261, 3500 Ll. Vaerlose, Denmark

Filed Dec. 29, 1975, Ser. No. 644,944

Int. Cl.² C07C *47/10*

U.S. Cl. 260—615.5 **8 Claims**

1. A process for the production of a powdery, free-flowing paraformaldehyde comprising:

a. forming a particulate formaldehyde product by spraying a concentrated aqueous formaldehyde solution containing from about 75% to about 90% formaldehyde by weight into a spray chamber and contacting the formaldehyde spray with an inert cooling gas flowing through said chamber,

b. removing said particulate product from said spray chamber, said particulate product being at a temperature of from above 40° to about 60° C. and passing said product into the first of a plurality of fluidized beds,

c. simultaneously drying, curing, and concentrating said product in said first bed by fluidizing said product with an inert gas, said gas being at a temperature below the sticking point of said product,

d. passing the concentrated product from said first bed into at least one other fluidized bed connected therewith and further increasing the concentration of paraformaldehyde in the particles of said product by fluidizing said particles with a separate stream of inert gas, said separate inert gas being at a temperature below the sticking point of the powder in said other fluidized bed and at a temperature greater than the temperature of the inert gas in said first bed, and

e. recovering a dry, free-flowing particulate paraformaldehyde from the last bed of said plurality of fluidized beds.

4,036,892

4-EXO-HYDROXY-ENDO-TRICYCLO [5.2.2.0^{2,6}]UNDEC-8-ENE

Yoshiaki Inamoto; Yoshiaki Fujikura; Hiroshi Ikeda, and Naotake Takaishi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

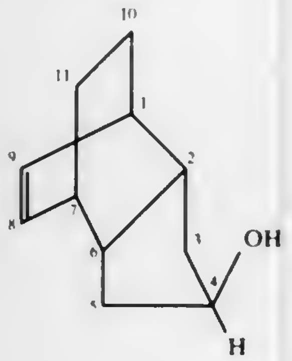
Filed May 7, 1976, Ser. No. 684,395

Claims priority, application Japan, May 26, 1975, 50-62816

Int. Cl.² C07C *35/22*

U.S. Cl. 260—617 F **1 Claim**

1. A compound having the formula



4,036,893

8-EXO-HYDROXY-ENDO-TRICYCLO [5.2.2.0^{2,6}]UNDECANE

Yoshiaki Inamoto; Yoshiaki Fujikura, both of Wakayama; Kiyoshi Tsuchihashi, Kainan, and Naotake Takaishi, Iwade, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

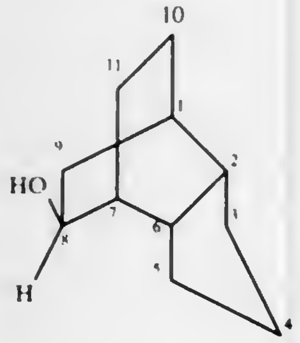
Filed May 21, 1976, Ser. No. 688,566

Claims priority, application Japan, June 20, 1975, 50-75293

Int. Cl.² C07C *35/22*

U.S. Cl. 260—617 F **1 Claim**

1. A compound having the formula



4,036,894

PROCESS FOR PRODUCING HALOGENATED 2,2-BIS-(4-HYDROXYPHENYL)-PROPANE

Herbert Jenkner, Cologne, Germany, assignor to Chemische Fabrik Kalk GmbH, Germany

Filed Mar. 16, 1976, Ser. No. 667,292

Claims priority, application Germany, Mar. 19, 1975, 2511981

Int. Cl.² C07C *39/24, 39/16*

U.S. Cl. 260—619 A **4 Claims**

1. In a process for the production of chlorinated or brominated 2,2-bis-(4-hydroxyphenyl)-propane by conversion of 2,2-bis-(4-hydroxyphenyl)-propane with elemental chlorine or bromine in individual, successive batches at a reaction temperature of from room temperature up to about 90° C. and in an acetic acid reaction medium, wherein hydrogen chloride or hydrogen bromide is formed along with the chlorinated or brominated 2,2-bis-(4-hydroxyphenyl)-propane in each successive batch reaction, and wherein the acetic acid reaction medium is the mother liquor of a preceding batch reaction, the improvement which comprises:

cooling the mother liquor of a preceding batch reaction to room temperature and separating therefrom the chlorinated or brominated 2,2-bis-(4-hydroxyphenyl)-propane formed during the reaction;

adding to said mother liquor an alkaline or alkaline earth acetate in an amount of from 5 to 500% in excess of the amount necessary for the conversion of all free hydrogen halides present in said mother liquor; and

employing said mother liquor as the reaction medium in a new batch.

4,036,895

PROCESS FOR PREPARING 2-METHYLPROPANE-1,3-DIOL

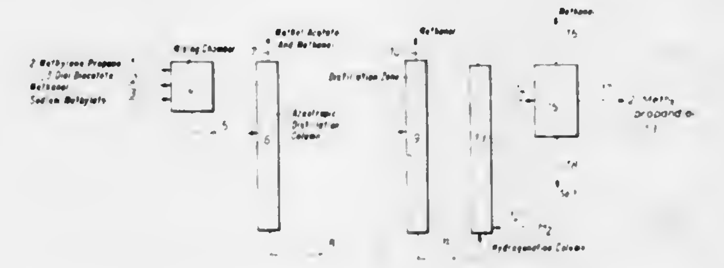
Axel Vogel, Cologne; Wolfgang Biedermann, Krefeld-Bockum; Kurt Halcour; Norbert Schenk, both of Leverkusen, and Wulf Schwerdtel, Leverkusen-Steinbuechel, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Sept. 18, 1974, Ser. No. 507,173

Claims priority, application Germany, Sept. 26, 1973, 2348353

Int. Cl.² C07C *29/00*

U.S. Cl. 260—635 R **9 Claims**



1. A process for preparing 2-methylpropane-1,3-diol which comprises the steps of

a. reacting 2-methylenepropane-1,3-diol diacetate at a temperature of 0° to 200° C with a monohydric C_1–C_4 aliphatic alcohol in excess of from 0.1 to 40 mols per mol of 2-methylenepropane-1,3-diol diacetate over the stoichiometric amount of said alcohol in the presence of a base selected from the group consisting of an alkali C_1–C_4 alcoholate, an alkali metal hydroxide, an alkali metal carbonate and a basic ion exchanger;

b. adjusting thereafter the concentration of said alcohol, either by adding more alcohol or by distilling off excess alcohol, so that the reaction mixture contains from 0.1 to 30 mols of alcohol for each mol of 2-methylenepropane-1,3-diol diacetate initially reacted;

c. and without isolating the resultant 2-methylenepropane-1,3-diol from step (a), thereafter catalytically hydrogenating it to form 2-methanepropane-1,3-diol employing a catalyst which hydrogenation component comprises Raney nickel, Raney nickel-iron, finely divided nickel on a carrier or a noble metal at a temperature of −20° to 180° C.

4,036,896

PRODUCTION OF CHLORO-SUBSTITUTED SATURATED COMPOUNDS

Louis Schmerling, Riverside, Ill., assignor to Universal Oil Products Company, Des Plaines, Ill.

Filed May 6, 1975, Ser. No. 574,988

Int. Cl.² C07C *17/00*

U.S. Cl. 260—648 R **14 Claims**

1. A process for producing a chloro-substituted saturated compound which comprises condensing a saturated hydrocarbon containing at least 3 carbon atoms and a hydrogen atom attached to a secondary or tertiary carbon atom or to a saturated side chain carbon atom which is attached to an aromatic ring hydrocarbon with a chloromonoolefin in which a chlorine atom is attached to a carbon atom other than one of the doubly-bonded carbon atoms in the presence of a free radical-generating catalyst at reaction conditions, and recovering the resultant chloro-substituted saturated compound.

4,036,897

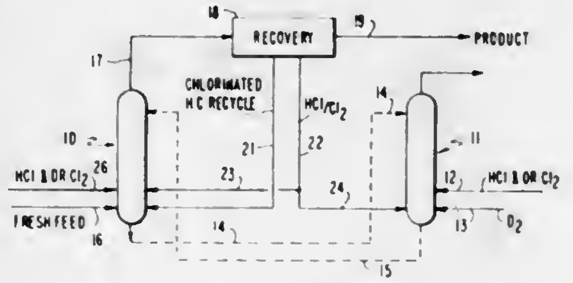
PRODUCTION OF HEXACHLOROCYCLOPENTADIENE

Vincent A. Strangio, Glenridge; Herbert Riegel, Maplewood, and Morgan C. Sze, Upper Montclair, all of N.J., assignors to The Lummus Company, Bloomfield, N.J.

Filed Aug. 4, 1976, Ser. No. 711,632

Int. Cl.² C07C *23/08*

U.S. Cl. 260—648 C **33 Claims**



1. A process for producing hexachlorocyclopentadiene, comprising:

contacting in a hexachlorocyclopentadiene production zone a feed selected from the group consisting of saturated C_5 hydrocarbons, mono-olefinically unsaturated C_5 hydrocarbons and chloro substituted derivatives of such saturated and mono-olefinically unsaturated C_5 hydrocarbons, with a molten salt mixture of cuprous and cupric chloride to produce an effluent containing hexachlorocyclopentadiene.

4,036,898

NOVEL CHLORINATED DICUMENE INITIATORS

Hendrik H. J. Oosterwijk, Diepenveen; Eduard P. Magré, Wiersum, and Wilhelmus M. Beyleveld, Olst, all of Netherlands, assignors to Akzona Incorporated, Asheville, N.C.

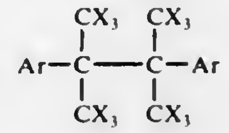
Filed Oct. 14, 1975, Ser. No. 621,985

Claims priority, application Netherlands, Oct. 14, 1974, 7413633

Int. Cl.² C07C *25/22*

U.S. Cl. 260—649 R **1 Claim**

1. An aliphatically chlorinated cumene dimer corresponding to the formula:



$$Ar-\overset{\displaystyle CX_3}{\underset{\displaystyle CX_3}{C}}-\overset{\displaystyle CX_3}{\underset{\displaystyle CX_3}{C}}-Ar$$

wherein Ar is an aryl group and X is hydrogen or chlorine and provided that at least 1 but not more than 5 X groups are chlorine.

4,036,899

SYNTHESIS OF PRENYL CHLORIDE

Joseph Levy, Northbrook, and Nils J. Christensen, Palatine, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Jan. 20, 1976, Ser. No. 650,813

Int. Cl.² C07C *21/00*

U.S. Cl. 260—654 R **9 Claims**

1. A process for the preparation of prenyl chloride which comprises reacting isoprene with aqueous hydrochloric acid in the presence of an alkali metal chloride at reaction conditions, and recovering the resultant prenyl choride.

4,036,900

MOLTEN SALT LIFT GAS SYSTEM FOR PRODUCTION OF CHLORINATED HYDROCARBONS

Vincent A. Strangio, Glenridge, N.J., assignor to The Lummus Company, Bloomfield, N.J.

Filed Sept. 3, 1975, Ser. No. 610,061

Int. Cl.² C07C *17/10, 17/15*

U.S. Cl. 260—659 R **6 Claims**

1. In a process for producing a chlorinated hydrocarbon wherein a molten salt containing a multivalent metal chloride in its higher and lower valence state is contacted with an oxygen containing gas in an oxidation reaction zone to produce the oxychloride of the multivalent metal, molten salt withdrawn from the oxidation reaction zone being introduced into a chlorinated hydrocarbon production zone wherein molten salt is contacted with a hydrocarbon to produce chlorinated hydrocarbon and molten salt withdrawn from the chlorinated hydrocarbon production zone is introduced into the oxidation reaction zone, the improvement comprising:

withdrawing a gas stream from the oxidation reaction zone; directly employing, without compression, a portion of the gas stream withdrawn from the oxidation reaction zone at an initial pressure corresponding to the pressure prevailing in the oxidation reaction zone to lift molten salt withdrawn from the chlorinated hydrocarbon production zone to an elevated height for introduction into an upper portion of the oxidation reaction zone by expansion of said portion of the gas stream from said initial pressure to an expanded pressure to provide a ratio of said initial pressure to said expanded pressure of said portion of the gas stream of at least 1.5; and

employing, without compression, another portion of the gas stream withdrawn from the oxidation reaction zone at an initial pressure corresponding to the pressure prevailing in the oxidation reaction zone for lifting molten salt withdrawn from the oxidation reaction zone to an elevated height for introduction into an upper portion of the chlorinated hydrocarbon production zone by expansion of said another portion of the gas stream from said initial pressure to an expanded pressure to provide an initial pressure toexpanded pressure ratio of at least 1.5.

4,036,901

PROCESS FOR PRODUCING STYRENE

Masato Kawakami, Yokohama; Naoki Andoh, Yokkaichi; Akira Iio, Yokkaichi, and Haruo Yamanouchi, Yokkaichi, all of Japan, assignors to Japan Synthetic Rubber Co., Ltd., Tokyo, Japan

Filed Oct. 24, 1975, Ser. No. 625,380

Claims priority, application Japan, Oct. 28, 1974, 49-123442

Int. Cl.² C07C *15/00, 15/10*

U.S. Cl. 260—669 R **18 Claims**

1. A process for producing styrene by the oxidation of a 4-vinylcyclohexene, which comprises:

contacting 4-vinylcyclohexene in the gas phase at a temperature of 250° - 600° C with a molecular oxygen-containing gas at a contact time of 0.1–10 seconds in the presence of a catalyst composition consisting essentially of:

$$Mo_{12}Bi_{0.1-10}Fe_{0-15}Pb_{0-15}X_{0-10}Y_{0-3}O_n$$

wherein X is at least one element selected from the group consisting of zirconium, cadmium, niobium and antimony; Y is at least one element selected from the group consisting of lithium, sodium, potassium, rubidium, cesium and thallium; and *n* is the number of oxygen atoms sufficient to satisfy the valence requirements of the metallic elements, with the proviso that the sum of the atomic proportions of Fe, Co and/or Pb must range from 1 - 25.

4,036,902

CHEMICAL PROCESS PRODUCING AROMATIC HYDROCARBONS BY DEHYDROCYCLODIMERIZATION OF A C_4 FEEDSTOCK

Reginald Gregory, Camberley, England, assignor to The British Petroleum Company Limited, London, England

Filed June 16, 1976, Ser. No. 696,573

Claims priority, application United Kingdom, June 23, 1975, 26528/75

Int. Cl.² C07C *3/04*

U.S. Cl. 260—673 **8 Claims**

1. A process for producing aromatic hydrocarbons comprising subjecting a C_4 feedstock to dehydrocyclodimerisation at a temperature between about 450° to 700° C in the presence of a catalyst comprising an alumina promoted by zinc or a compound of zinc.

4,036,903

DEHYDROCYCLIZATION WITH AN ACIDIC MULTIMETALLIC CATALYTIC COMPOSITE

George J. Antos, Arlington Heights, Ill., assignor to UOP Inc., Des Plaines, Ill.

Continuation-in-part of Ser. No. 602,935, Aug. 8, 1975, Pat. No. 3,981,795. This application Sept. 7, 1976, Ser. No. 721,137

Int. Cl.² C07C *3/04;* **C10G** *27/08;* **B01J** *23/82*

U.S. Cl. 260—673.5 **29 Claims**

1. A method for dehydrocyclizing a dehydrocyclizable hydrocarbon comprising contacting the hydrocarbon at dehydrocyclization conditions with an acidic catalytic composite comprising a porous carrier material containing, on an elemental basis, about 0.01 to about 2 wt. % platinum group metal, about 0.05 to about 5 wt. % cobalt, about 0.01 to about 5 wt. % bismuth and about 0.1 to about 3.5 wt. % halogen; wherein the platinum group metal, catalytically available cobalt and bismuth are uniformly dispersed throughout the porous carrier material; wherein substantially all of the platinum group metal is present in the elemental metallic state; and wherein substantially all of the catalytically available cobalt is present in the elemental metallic state or in a state which is reducible to the elemental metallic state under dehydrocyclization conditions or in a mixture of these states.

4,036,904

ISOMERIZATION OF ALLENES IN A HYDROCARBON STREAM USING MAGNESIUM OXIDE CATALYST

Daniel J. Strope, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed June 21, 1976, Ser. No. 698,250

Int. Cl.² C07C *7/00, 11/12, 11/14*

U.S. Cl. 260—681.5 R **8 Claims**

1. A process for reducing the amount of allenic impurities in a C-4 stream comprising 1,3-butadiene and at least one allenic impurity which consists of contacting said stream with a catalyst consisting of magnesium oxide at a temperature in the approximate range of 85° to 355° C.

4,036,905

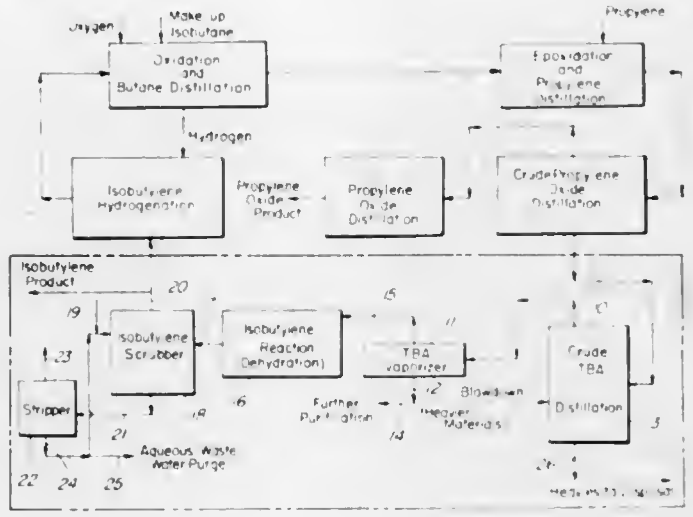
PROCESS FOR THE MANUFACTURE OF PROPYLENE OXIDE

Alan D. Kornfeld, East Windsor, N.J., assignor to Oxirane Corporation, Princeton, N.J.

Filed Apr. 12, 1976, Ser. No. 675,864

Int. Cl.² C07C *1/24*

U.S. Cl. 260—682 **19 Claims**



1. In a process for the production of isobutylene from tertiary butyl alcohol wherein a mixture containing tertiary butyl alcohol is fractionated in a fractionator, the tertiary butyl alcohol so fractionated is vaporized and a fraction containing less volatile impurities is separated from the vaporized tertiary butyl alcohol and is recycled to said fractionator, the vaporized tertiary butyl alcohol is dehydrated in dehydration zone to form isobutylene, the isobutylene is contacted with an aqueous alkali, and an aqueous waste stream is formed,

the improvement which comprises vaporizing up to a maximum of about 85 percent by weight of said fractionated tertiary butyl alcohol and passing said vaporized tertiary butyl alcohol to said dehydration zone.

4,036,906

CURED POLYURETHANE COMPOSITIONS CONTAINING EPOXY RESINS

Anthony F. Finelli, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation of Ser. No. 390,831, Aug. 23, 1973, abandoned, which is a continuation of Ser. No. 207,976, Nov. 24, 1971, abandoned, which is a continuation of Ser. No. 889,300, Dec. 30, 1969, abandoned. This application Mar. 24, 1975, Ser. No. 561,122

Int. Cl.² C08L *63/00*

U.S. Cl. 260—830 P **3 Claims**

1. A cured polyurethane composition characterized by its tensile strength at 25° C. Being resistant to hydrolysis degradation when immersed in distilled water at 158° F. for 14 days prepared by the method which consists of reacting a polyurethane reaction mixture, containing sufficient diamine curative therefor, in the presence of an excess of an epoxy resin, said method consisting essentially of (A) mixing in a solvent, in order to provide a fluid mixture or solution containing about 40 to about 95 percent solids, selected from benzene, xylene, toluene, acetone, methyl ethyl ketone, methyl isobutyl ketone and diisobutyl ketone (1) an epoxy resin derived from epichlorohydrin and a bis phenol and having an epoxide equivalent in the range of about 150 to about 525, (2) a prepolymer of at least one organic diisocyanate and at least one reactive hydrogen-containing polymeric material havng a molecular weight in the range of from about 700 to about 5,000 selected from polyester polyols, polyether polyols and hydroxyl terminated unsaturated polymeric polyols with a hydroxyl functionality of about 2 to about 3 where the ratio of the diisocyanate of the reactive hydrogens of the reactive hydrogen-containing polymeric material is from about 1.1/1 to about 3.5/1, and (3) a primary diamine curative where the ratio of amino groups of the curative to isocyanato groups in excess of the reactive hydrogens of the reactive hydrogen-containing polymeric material is from about 0.5/1 to about 1.1/1 and where the said polyurethane composition contains from about 2 to about 15 weight percent and at least a sufficient amount to give about a 5 to about a 50 equivalent percent excess of epoxide groups relative to the total excess of said amino groups of the curative over the said isocyanato groups, wherein said epoxy resin in contacted with said primary diamine only at or just prior to preparing said reaction mixture, and (B) substantially simultaneously removing the solvent from the mixture and reacting the prepolymer with the diamine curative in the presence of the epoxy resin at a temperature in the range of about 20° C. to about 100° C.

4,036,907

POLY(META-PHENYLENE ISOPHTHALAMIDE) COMPOSITION

John William Turnbull, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company., Wilmington, Del.

Division of Ser. No. 466,016, May 1, 1974, Pat. No. 3,954,703, which is a division of Ser. No. 262,599, June 14, 1972, Pat. No. 3,925,323. This application Nov. 10, 1975, Ser. No. 630,409

Int. Cl.² C08L *77/00*

U.S. Cl. 260—857 L **3 Claims**

1. A composition consisting essentially of a coalescible and densifiable powder of poly(meta-phenylene isophthalamide) having a density of between about 1.0 g./cc. and about 1.30 g./cc. when pressed into a preform and a density when sintered of at least about 1.24 g./cc. and between about 1% and about 75% by weight, based upon the total weight of said composition, of particulate halocarbon resin.

4,036,908

PREPARATION OF VARNISHES BASED ON POLYESTER RESIN

Gilbert Chretien, Chauny; Gerard Ditacroute, Autreville, and Jacques Meyer, Paris, all of France, assignors to Rhone-Poulenc Industries, Paris, France

Filed Mar. 19, 1976, Ser. No. 668,722

Claims priority, application France, Apr. 10, 1975, 75.11199

Int. Cl.² C08L *67/06*

U.S. Cl. 260—863 **11 Claims**

1. A process for the preparation of a polyester resin varnish comprising subjecting one or more polycarboxylic acids, at least one of which is an ethylenically unsaturated carboxylic acid, and one or more polyols, at least one of which is a diol, to polycondensation reaction, dissolving the polycondensation reaction product in a copolymerizable vinyl monomer, stabilizing the solution by the addition of an inhibitor with the copolymerizable monomer or after addition of monomer to the solution, adding a cobalt compound to the stabilized solution as an accelerator for cross-linking, and introducing a magnesium compound before 75% completion of the polycondensation reaction whereby reducing groups are formed in the polycondensate which avoid a green discoloration by reason of the presence of the cobalt compound.

4,036,909
PROCESS FOR THE POLYMERIZATION AND COPOLYMERIZATION OF VINYL AND DIENE COMPOUNDS

Frantisek Hrabak; Vlasta Hynkova, and Milan Bezdek, all of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

Division of Ser. No. 389,533, Aug. 20, 1973, Pat. No. 3,998,910, which is a continuation-in-part of Ser. No. 143,225, May 13, 1971, abandoned. This application Sept. 2, 1975, Ser. No. 609,182

Claims priority, application Czechoslovakia, May 14, 1970, 3332/70

Int. Cl.² C08L *25/06*

U.S. Cl. 260—874 **13 Claims**

1. A process for polymerization or copolymerization of monomeric olefinic conjugated or unconjugated unsaturated organic compound or their combinations comprising the step of providing a mixture consisting of monomeric olefinic unsaturated organic compound and an initiator system comprising (a) an organic peroxide and (b) a polymeric or copolymeric tertiary amine selected from the group consisting of poly(p-dimethylaminostyrene), copolymers of styrene and p-dimethylaminostyrene, poly (N,N-dimethylaminostyrene) and copolymers of styrene and N,N-dimethylaminostyrene, and polymerizing said mixture at a temperature of from about 20° to about 30° C. until completion of the polymerization, said initiator system comprising from 0.01 to 5% by weight based on said organic compound of an organic peroxide selected from the group consisting of diacylperoxides, diarylperoxides and dialkylperoxides and such an amount of amine that the molar ratio between peroxide amine groups is within the range from 10:1 to 1:10.

4,036,910
BLOCK COPOLYMERS AS VISCOSITY INDEX IMPROVERS FOR LUBRICATION OILS

William S. Anderson, Oakland, Calif., assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 884,721, Dec. 12, 1969, Pat. No. 3,763,044. This application Mar. 14, 1973, Ser. No. 342,896

Int. Cl.² C08F *293/00*

U.S. Cl. 260—879 **2 Claims**

1. As a new composition of matter, a block copolymer having the configuration

polystyrene-hydrogenated polyisoprene

wherein the polystyrene block has an average molecular weight between about 5,000 and 50,000 and the hydrogenated polyisoprene block has an average molecular weight between about 10,000 and 1,000,000, at least 50% of the double bonds of the polyisoprene block being reduced by hydrogenation.

4,036,911
PREPARATION OF GRAFT COPOLYMERS

Brian Howard Alfred Smith, Sarnia, Canada, assignor to Polymer Corporation Limited, Sarnia, Canada

Continuation-in-part of Ser. No. 88,517, Nov. 10, 1970, abandoned. This application July 17, 1972, Ser. No. 272,150

Claims priority, application Canada, Dec. 24, 1969, 070816

Int. Cl.² C08L *9/06*

U.S. Cl. 260—880 R **10 Claims**

1. A process for preparing an impact-resistant thermoplastic resin which comprises:

a. dissolving 5–30 parts by weight of a mixture of preformed rubbery polymer A and preformed polymer B in 70–95 parts by weight of a mixture of grafting monomers, the weight ratio of polymer A to polymer B being greater than 1:1,

b. prepolymerizing with agitation the mixture so formed to a conversion of grafting monomers of from about 10% to about 40% whereby a dispersion is formed of a solution of said preformed polymers in a solution of a polymer of said grafting monomers,

c. continuing the polymerization of the residual grafting monomers to at least 50% conversion, said continued polymerization being carried out in bulk or in aqueous suspension, and

d. recovering the thermoplastic resin so formed, wherein polymer A is an 85+% 1,4-content polybutadiene having a cis-1,4 content of at least 35%, and wherein polymer B is a low molecular weight polymer of butadiene-1,3 having at least about 50% of butadiene units in the 1,2-configuration and having an intrinsic viscosity in toluene at 30° C of not more than 1.0 dl/g, and said grafting monomers comprise a first monomer and a second monomer, the first monomer being a styrene or a polymerizable homologue of styrene, and the second monomer being selected from one or more of acrylonitrile polymerizable homologues of acrylonitrile, methyl methacrylate and polymerizable homologues of methylmethacrylate, the weight ratio of said first monomer to said second monomer being in the range of about 10:1 to 1:2.

4,036,912
THERMOPLASTIC POLYMER BLENDS OF EP OR EPDM POLYMER WITH CRYSTALLINE POLYPROPYLENE

Paul Thomas Stricharczuk, Solon, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 6, 1975, Ser. No. 619,806

Int. Cl.² C08L *23/00*

U.S. Cl. 260—897 A **7 Claims**

1. A thermoplastic polymer blend comprising (1) a polymer consisting essentially of interpolymerized units of about 65 percent to about 85 percent by weight of ethylene, about 5 percent to about 35 percent by weight of propylene, and up to about 10 percent by weight of a diene monomer; said polymer having an ethylene sequence index of from about 30/1 to about 70/1 and a melt endotherm value of about 2 to about 15 calories per gram and (2) from about 5 parts to about 200 parts by weight per 100 parts by weight of the EPDM polymer, of a crystalline polypropylene polymer.

4,036,913
PHOSPHORUS COMPOUNDS

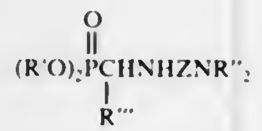
Gail H. Birum, Kirkwood, Mo., assignor to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 385,779, Aug. 6, 1973, Pat. No. 3,954,860. This application July 14, 1975, Ser. No. 595,959

Int. Cl.² C07F *9/32, 9/40, 9/53*

U.S. Cl. 260—938 **7 Claims**

1.



$$(R'O)_2\overset{\overset{\displaystyle O}{\|}}{P}\underset{\underset{\displaystyle R'''}{|}}{C}HNHZNR''_2$$

where

R' is aryl of 6 to 10 carbon atoms,

R'' is hydrogen, alkyl, aryl or haloaryl of 1 to 15 carbon atoms, or no more than one carboalkyloxymethyl group, and where the halogen on the aryl group is bromine, chlorine or fluorine,

R''' is alkyl, alkenyl or aryl of 1 to 15carbon atoms and substituted aryl forms where the substituent is fluorine, chlorine, bromine, nitro, cyano, hydroxyl, alkyloxy or mixtures of such substituents and Z is CO or CS.

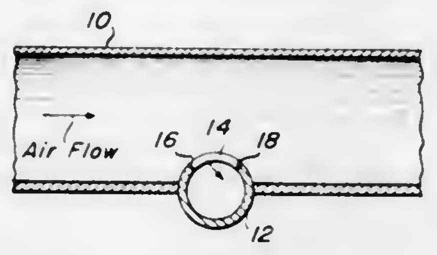
4,036,914
LIQUID FUEL MIXING DEVICE

John Hawryluk, 601 Middlesex Drive, Cinnaminson, N.J. 08077

Filed Aug. 14, 1975, Ser. No. 604,712

Int. Cl.² F02M *29/06*

U.S. Cl. 261—79 R **5 Claims**



1. A fuel-air mixing device, comprising:

a. an elongated conduit through which air is passed and which has a horizontal section,

b. a hollow fuel-air mixing chamber disposed transversely across the horizontal section of the conduit,

c. the mixing chamber extending only slightly into the conduit such that it blocks substantially less than half the cross-sectional area thereof, and having a liquid fuel retaining section in its lower portion,

d. the surface of the mixing chamber in the conduit having a relatively wide central opening disposed transversely to the conduit and through which a portion of the air stream in the conduit passes,

e. the inner wall of the mixing chamber having a generally circular configuration which imparts a circular swirling motion to the air stream passing through the central opening so that it contacts the surface of the fuel in the liquid fuel retaining section.

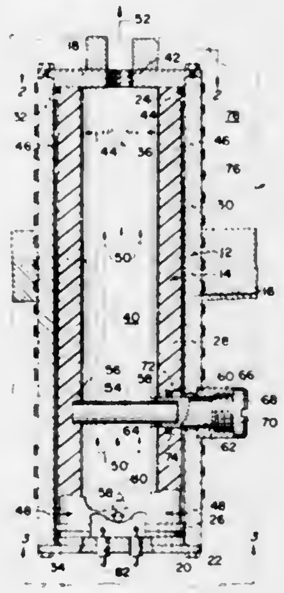
4,036,915
TEMPERATURE-CONTROLLED APPARATUS FOR FLUID PERMEATION OR THE LIKE

Daniel P. Lucero, Triangle, and Alan R. Teets, Springfield, both of Va., assignors to Meloy Laboratories, Inc., Springfield, Va.

Division of Ser. No. 320,624, Jan. 2, 1973, Pat. No. 3,904,849. This application Jan. 3, 1974, Ser. No. 430,572

Int. Cl.² B01F *3/04*

U.S. Cl. 261—104 **7 Claims**



1. Permeation apparatus comprising a cylindrical housing with a metal cylindrical side wall, a hollow cylindrical core with a cylindrical side wall coaxially within said housing, the outer surface of the cylindrical side wall of said core and the inner surface of the cylindrical side wall of said housing delimiting therebetween a thin flow passage for conducting carrier gas between opposite ends of said core over the periphery of said core, the thickness of said flow passage being small compared with the thickness of said housing side wall and said passage having a high ratio of length to thickness, means for admitting carrier gas to one end of said flow passage, means coupling the other end of said flow passage to one end of the interior of said core, closures for said housing at opposite ends thereof, said flow passage being isolated from the interior of the core at said one end of said passage, whereby the carrier gas is constrained to flow along the length of said passage and then to enter the interior of the core at said one end thereof, means for providing an outlet from said core at the opposite end thereof, means for supporting in the interior of said core a permeation fluid container having a wall permeable to fluid in the container, heater means comprising an electrical heater mounted exteriorly of the housing side wall for supplying heat to the exterior of said housing, means including a temperature sensor sensing the temperature of the carrier gas which enters the interior of the core for controlling said heater means to control the temperature in said housing, and insulation means for isolating the exterior of said housing from the ambient.

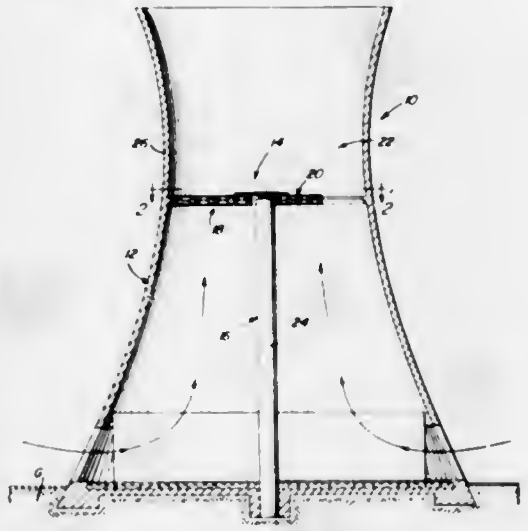
4,036,916
WIND DRIVEN ELECTRIC POWER GENERATOR

Carl F. Agsten, 1539 Bedford Road, Charleston, W. Va. 25314

Filed June 5, 1975, Ser. No. 584,193

Int. Cl.² B01F *3/04;* **F03D** *7/02*

U.S. Cl. 261—109 **7 Claims**



1. In combination with a cooling tower holding a liquid to be cooled and having a hyperbolic veil forming a throat area and a path for fluid flow through the veil, a wind driven electric power generator, comprising, in combination:

a. a support disposed within the veil; and

b. wind generator means mounted on the support within the veil for being actuated by the fluid flow through the veil and generating power, the veil being arranged extending vertically, and the support being a vertically extending, stationary, longitudinal shaft disposed substantially centrally within the veil and extending along the longitudinal extent of the veil, the veil having an inner wall surface, and the wind generator means including a rotor comprising, in combination:

1. a rotor hub rotatably mounted on the shaft in the throat of the veil for rotation about an axis of rotation; and

2. a rotor arm connected to the rotor hub and extending radially from the rotor hub to supportive engagement with the inner wall surface of the veil and forming means for being rotated about the shaft by the fluid flow through the veil, the flow being parallel to the axis of rotation of the rotor hub, wherein the inner wall surface of the veil is provided at the throat of the veil with a circular track defining a center through which passes an axis formed by the longitudinal extent of the shaft, and the circular track being disposed opposite the rotor hub of the rotor, and a trolley mounted on the rotor arm at an end thereof spaced

from the rotor hub, the trolley being arranged engaging the track for supporting the rotor arm during rotation of the rotor.

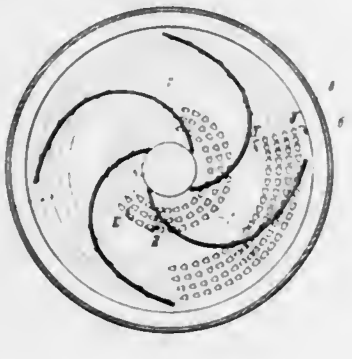
4,036,917
CONTACT PLATE FOR COLUMNS FOR CARRYING OUT MASS TRANSFER PROCESSES BETWEEN GAS AND LIQUID

Ivan Petrovich Slobodyanik, ulitsa Gagarina, 87, kv. 15, Krasnodar, U.S.S.R.

Filed Dec. 4, 1975, Ser. No. 637,828

Int. Cl.^{2} B01D *3/22, 3/26*

U.S. Cl. 261—114 JP **5 Claims**



1. A contact plate for columns for carrying out heat exchange and mass transfer processes between a gas and a liquid, comprising: a disc with slots for the passage of gas; arched deflectors at the edges of said slots, arranged so as to send jets of gas passing through the slots in one direction, tangentially to said disc and at a certain angle to its surface; deflector strips attached to the side of said disc which is intended to receive liquid, said deflector strips being shaped as Archimedean spirals diverging from the center of said disc and bent in the direction of gas jets following their contact with said arched deflectors and extending over at least the major portion of the radial extent of the slots.

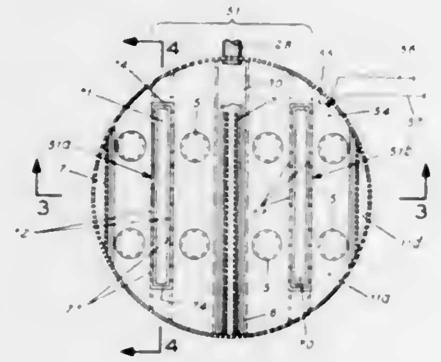
4,036,918
FRACTIONATION TRAY WITH ADJUSTABLE CAPACITY WEIR MEANS

Barry S. Morgan, Concord, and Richard P. Sandell, Orinda, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.

Division of Ser. No. 449,150, March 7, 1974, Pat. No. 3,985,623. This application Mar. 29, 1976, Ser. No. 671,479

Int. Cl.^{2} B01D *47/00;* **C10J** *1/08;* **F02M** *29/04*

U.S. Cl. 261—114 R **3 Claims**



1. An article of manufacture to increase condensate flow interior of a fractionation column at a withdrawal tray adjacent to a fractionating tray connected thereto via a downcomer means having a four-sided, raised lip, rectangularly shaped in cross section, extending above said withdrawal tray defining a vertical opening therethrough comprising, in combination, a four-sided upright barrier wall rectangularly shaped in cross section to match that of said raised lip of said downcomer means, said upright barrier wall further comprising means cooperating to connect and means cooperating to extend it upwardly from said raised lip of said downcomer means and including a series of notches along its top extremity away from said downcomer means, such that condensate flow between said withdrawal and said fractionating trays of said column is directable from locations exterior of said barrier wall through said series of notches along at least two sides thereof to a position interior thereof so that said flow can be measured as a function of back-up depth of said condensate exterior of said barrier wall away from said downcomer means over a range of flow rates associated with efficient column operations.

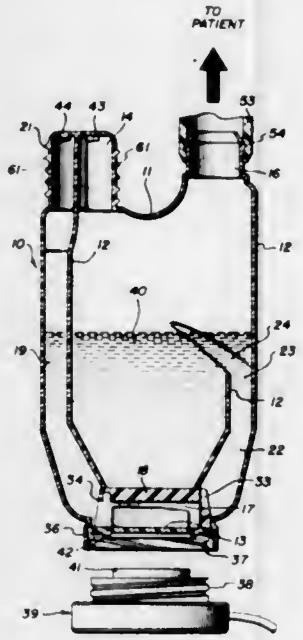
4,036,919
NEBULIZER-HUMIDIFIER SYSTEM

Henry Komendowski, Evanston, and Walter Levine, Lincolnwood, both of Ill., assignors to Inhalation Therapy Equipment, Inc., Chicago, Ill.

Continuation of Ser. No. 483,227, June 26, 1974, abandoned. This application Dec. 17, 1975, Ser. No. 641,626

Int. Cl.^{2} A61M *15/00*

U.S. Cl. 261—122 **12 Claims**



1. An inhalation therapy device for use either in a first, humidifying, or a second, nebulizing, therapeutic mode for delivery of a moisturized gas stream to a patient, said device comprising:

container means for containing a gas stream-moisturizing liquid, said container means including
1. a top element,
2. a bottom element,
3. a continuous sidewall element interconnecting said top and bottom elements,
4. perforated gas stream-diffusing plate means spaced above said bottom element within said container means and defining with said bottom element and said sidewall element a gas stream diffusion chamber within said container means,
5. means in said top element providing a delivery outlet for a moisturized gas stream from within said container means, and
6. passage means in said top element providing
   - a. an outlet for exhausting a gas stream from said container means upon blockage of said delivery outlet means when the device is employed in said first therapeutic mode and
   - b. an inlet for entry of a moisturized gas stream into said container means when the device is employed in said second therapeutic mode; and

conduit means for fluid flow, communicating between said diffusion chamber and a point at said top of said container means adjacent said passage means, and providing
- a. a gas stream conduit when the device is employed in said first therapeutic mode and
- b. a liquid conduit when the device is employed in said second therapeutic mode.

4,036,920
PROCESS FOR THE PREPARATION OF FUEL KERNELS

Oizumi Chihiro, Hachioji, and Uesugi Juno, Nobeoka, both of Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 6, 1976, Ser. No. 683,999

Int. Cl.^{2} G21C *21/00*

U.S. Cl. 264—.5 **13 Claims**

1. A process for the preparation of fuel kernels for coated particle fuels for use in a high-temperature gas-cooled reactor comprising adding β-1,4-glucan powder to at least one compound selected from the group consisting of a thorium compound, an uranium compound and a plutonium compound, granulating the resulting blend in the presence of a dispersion medium to produce small spheres and subjecting the small spheres to drying and heating for firing.

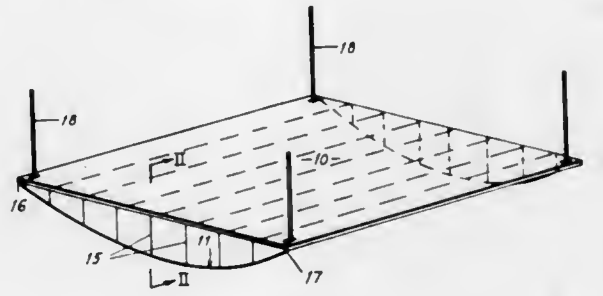
4,036,921
METHOD OF MAKING A CURVED ROOF

Peter Edington Ellen, 16 Cornwall Avenue, Turramurra, New South Wales, Australia

Filed Sept. 8, 1975, Ser. No. 611,510

Int. Cl.^{2} E04B *1/16, 1/132;* **E04G** *21/00*

U.S. Cl. 264—32 **8 Claims**



1. A method of constructing a curved roof structure from a reinforced concrete slab comprising arranging reinforcement elements for a concrete slab in a substantially flat plane, supporting at spaced points a plurality of tension cables extending in at least one direction across the reinforcing elements curving at least a portion of each cable in a substantially parabolic shape, attaching struts of predetermined lengths to spaced points along the tension cables and to the reinforcing elements in accordance with the substantially parabolic shape of the cables, casting a flat concrete slab about the reinforcing elements and thereafter uniformly tensioning the cables thereby reducing curvature thereof and curving the concrete slab to form a curved roof structure capable of resisting applied loads because of its curved shape.

4,036,922
METHOD AND APPARATUS FOR MOULDING HYDRAULIC CEMENT OR THE LIKE MATERIAL

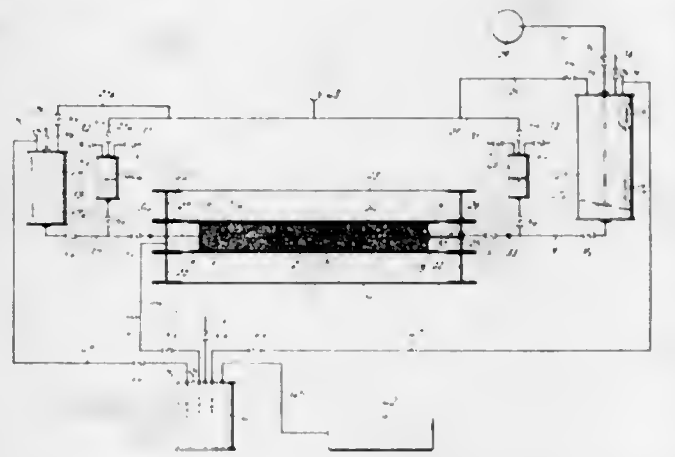
Yasuro Ito; Hideharu Kaga, both of Tokyo; Yasuhiro Yamamoto, Ageo, and Tadayuki Sumita, Tokyo, all of Japan, assignors to Yasuro Ito and Taisei Corporation, both of Tokyo, Japan

Filed Nov. 25, 1974, Ser. No. 526,825

Claims priority, application Japan, Nov. 24, 1973, 48-131189; Mar. 14, 1974, 49-28598; Mar. 20, 1974, 49-30888; July 23, 1974, 49-83787; July 25, 1974, 49-84673; Oct. 9, 1974, 49-115596

Int. Cl.^{2} E04B *1/16*

U.S. Cl. 264—35 **38 Claims**



1. A method of moulding a hydraulic substance comprising aggregate and a cement and water mixture, utilizing an injection zone, a moulding zone and an overflow zone, said overflow zone being separate from the moulding zone, which comprises filling the moulding zone with aggregate, reducing the pressure in the injection zone, in the moulding zone and in the overflow zone to a vacuum, introducing said cement and water mixture into the injection zone, transferring said mixture from the injection zone into the moulding zone in sufficient excess quantity to cause said mixture to overflow from the moulding zone into the overflow zone, returning the overflow zone to at least atmospheric pressure whereby at least a portion of said excess quantity of said mixture in the overflow zone is returned to the moulding zone to eliminate the voids between the aggregate in the moulding zone created by removing the excess water and entrained air under reduced pressure, and replacing said voids with said cement and water mixture to produce a substantially void-free product, said mixture being maintained in sufficient quantity in said overflow zone to avoid the introduction of air into the moulding zone.

4,036,923
METHOD FOR FORMING LARGE REINFORCED FOAMED PLASTIC PANELS

Glen E. W. Saidla, Hampton Falls, N.H., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Mar. 3, 1975, Ser. No. 554,681

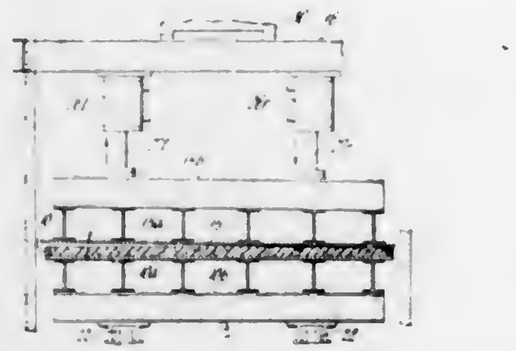
Int. Cl.^{2} B29D *27/04*

U.S. Cl. 264—45.3 **5 Claims**

1. A method of forming a large flat foamed plastic panel from a foamable thermosetting resin reaction mixture which will foam in about 30 seconds after said mixture is formed comprising the steps of:
- a. transporting an open horizontally disposed mold having a raised boundary edge defining a cavity therein beneath the discharge of a mixer while said mixer discharges the foamable mixture into the cavity of said mold within about 30 seconds, the amount of resin mixture discharged being sufficient that upon foaming the foamed resin will fill the mold;
- b. continuing the transport of said mold past the discharge

end of said mixer to place said mold in position within an adjacent molding press having a mold cover therein;

c. lowering said mold cover atop said mold into contact with said raised boundary edge thereby forming a closed flat mold, said lowering being effected progressively beginning first at one corner of the end of the mold first transported into the molding press and continuing diagonally toward the opposite end thereof by a plurality of sequentially activated operators whereby trapping of air thereunder is prevented;



d. holding the mold closed for a time sufficient for foaming and setting of the foamable mixture;

e. raising the cover from contact with the raised boundary edge, said raising being initiated at one corner of said mold and contintuing diagonally to the opposite end thereof by a plurality of sequentially activated operators to progressively peel the cover from said panel whereby damage to the foamed panel is prevented; and

f. returning the opened mold to its initial position.

4,036,924

PROCESS AND DEVICE FOR MOLDING TEXTILE MATERIALS

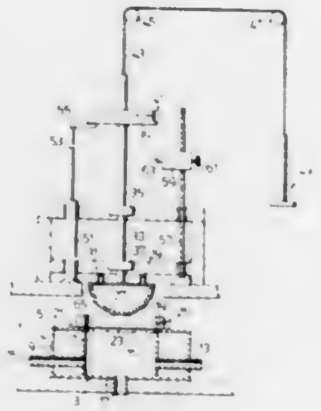
Roshan Lai Shishoo, Askim, and Sara Inga-Lill Alfredsson, Kungsbacka, both of Sweden, assignors to Svenska Textilforskningsinstitutet, Goteborg, Sweden

Filed Jan. 28, 1975, Ser. No. 544,996

Claims priority, application Sweden, Feb. 14, 1974, 7401961

Int. Cl.² B29C *17/04*

U.S. Cl. 264—89 **21 Claims**



1. A process for molding textile fabrics comprising

a. preheating a fabric to the glass transition temperature of its component fibers;

b. subjecting the fabric to sudden deformation by stretching at the glass transition temperature, substantially the entire deformation being carried out within five seconds; and

c. post-heating the fabric without intermediate cooling to a temperature at least equal to the glass transition temperature while maintaining a constant deforming load on the fabric.

4,036,925

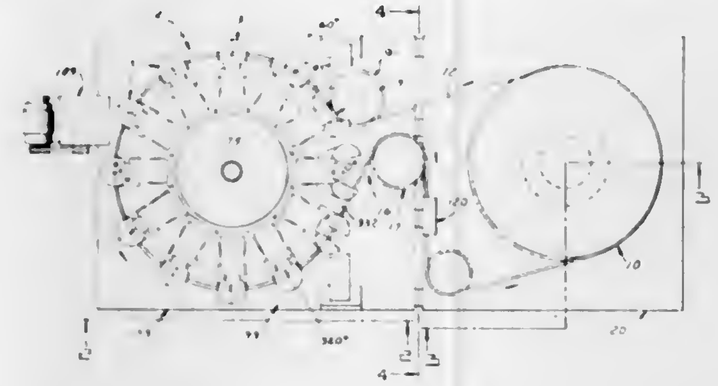
CONTINUOUS STRETCH BLOW MOLDING METHOD

Ivan L. Kauffman, Commerce, and Robert C. Kellogg, Hartland, both of Mich., assignors to Monsanto Company, St. Louis, Mo.

Division of Ser. No. 415,851, Nov. 14, 1973. This application Jan. 7, 1976, Ser. No. 647,069

Int. Cl.² B29C *17/07*

U.S. Cl. 264—94 **9 Claims**



1. A continuous process for forming hollow molecularly oriented articles which comprises repeatedly carrying out the steps of:

a. gravity-dropping molded preforms at molecular orientation temperature through continuously moving open-ended guide chutes onto upwardly disposed moving stretch pin assemblies continuously presented at a loading station and timed to be disposed substantially beneath an open end of a chute as the preform passes vertically downwardly therethrough such that after loading, a closed end is above an open end of each preform;

b. conveying the loaded stretch pin assemblies into operative position between separated sections of continuously and synchronously presented moving molds;

c. closing mold sections on the loaded stretch pin assemblies;

d. distending said preforms upwardly via stretch pin members and circumferentially via pressurized air after closing said sections and while the preforms are at molecular orientation temperature to form said articles;

e. separating the sections to open the continuously moving molds;

f. conveying the stretch pin assemblies with the upwardly disposed articles thereon away from the open molds toward a removal station;

g. removing the articles from the stretch pin assemblies in the removal station while continuing assembly movement generally toward the loading station; and

h. presenting unloaded stretch pin assemblies at the loading station for receipt of additional preforms.

4,036,926

METHOD FOR BLOW MOLDING A CONTAINER HAVING A CONCAVE BOTTOM

Long Fei Chang, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed June 16, 1975, Ser. No. 587,011

Int. Cl.² B29C *17/07*

U.S. Cl. 264—94 **1 Claim**

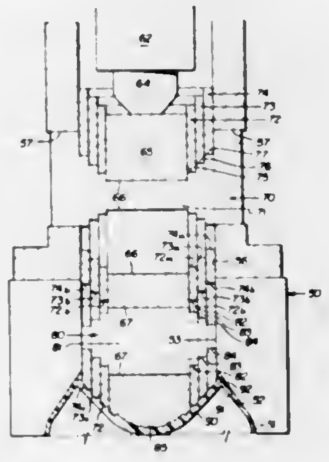
1. In a method of blow molding a plastic container having one concave wall from a thermoplastic material, by the inflation of a thermoplastic parison interiorly of a blow mold into a blown pre-form having the overall configuration and size of the final container with the exception of the configuration of said one wall, the one wall of the pre-form being generally convex and protruding from the remainder of the pre-form, and said one wall being at a formable temperature, the steps of, in the blow mold and while the pre-form remains inflated,

1. contacting the exterior surface of said one convex preform wall with a plurality of independently axially movable, concentric sleeves surrounding a central rod which is also independently axially movable, said rod and said sleeves each having end faces provided with stepped, angularly related surfaces interrupted by radial grooves,

2. moving said rod and said sleeves with the end faces thereof in contact with said convex wall and while retaining the remainder of said pre-form stationary, the rod being moved a greater distance than any of said sleeves and the outer of said sleeves being moved a lesser distance than the inner of said sleeves,

3. the performance of step (2) deflecting the one convex wall to a concave configuration, reducing the amount of protuberance of said one wall from the remainder of the container, and forming an annular support ring having an interior surface communicating with the interior of the container, (4) the performance of step (2) while the preform remains inflated also forcing the exterior surface of the concave wall inwardly of said support ring against the end faces of said rod and said sleeves to form on said wall annular reinforcing ribs and additional radial ribs intersecting said annular ribs, and

5. chilling the one wall in its deflected, concave configuration.



4,036,927

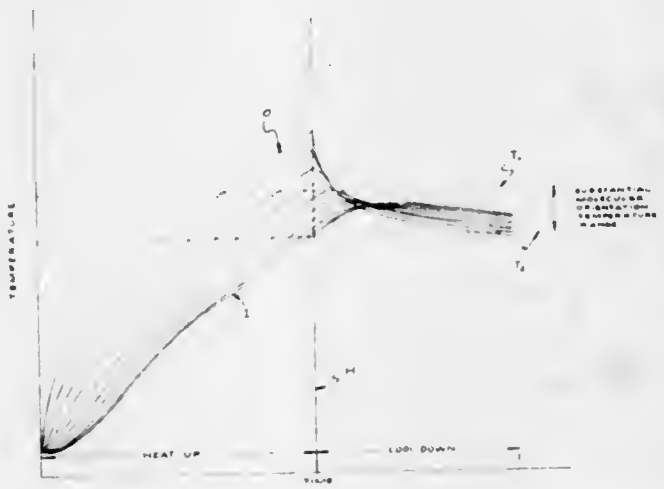
PREPARATION OF MOLECULARLY ORIENTED CONTAINERS USING REHEAT PROCESS

Thomas J. Stolki, West Springfield, Mass., assignor to Monsanto Company, St. Louis, Mo.

Filed Apr. 9, 1975, Ser. No. 566,256

Int. Cl.² B29C *17/07*

U.S. Cl. 264—97 **15 Claims**



1. In the method of forming a molecularly oriented container from a molded preform made of an amorphous thermoplastic resin and having an open end finished neck tubular portion and a closed end body portion which method includes subjecting the preform body to a thermoforming orienting step while in a temperature range at which substantial molecular orientation occurs, the improvement which comprises heating said preform body to said substantial molecular orientation temperature range by first overheating the outside surface of said preform body, by exposing only said outside surface to external heating means, to an average outside surface temperature greater than said substantial molecular orientation temperature range thereby creating a temperature gradient across the wall thickness of said preform body and then cooling said heated preform body until the average outside surface temperature is within said substantial molecular orientation temperature range and the entire preform body is at a temperature within said substantial molecular orientation temperature range and wherein said temperature gradient is significantly reduced.

4,036,928

PROCESS FOR PELLETIZING SORPTIVE MINERAL FINES

Rudolph C. Valenta, Elmhurst, Ill., assignor to Oil-Dri Corporation of America, Chicago, Ill.

Continuation of Ser. No. 510,502, Sept. 30, 1974, abandoned, which is a continuation of Ser. No. 170,270, Aug. 9, 1971, abandoned. This application Mar. 19, 1976, Ser. No. 668,637

Int. Cl.² B01J *2/10*

U.S. Cl. 264—118 **11 Claims**

1. A process for making pellets from sorptive mineral fines having open pore spaces therein, which said fines include mineral particles that will pass through a 20 mesh screen, and said pellets have said open pore spaces therein and have a liquid absorption capacity substantially equal to that of the particular sorptive mineral fines used as the starting material for said pellets, said process comprising:

a. mixing said sorptive mineral fines in a mixing apparatus with water to moisten said mineral fines and to substantially fill with water said open pore spaces within the particles of said mineral fines,

b. transferring said moistened particles from said mixing apparatus to a pelletizing apparatus having a die and cutting means therewith,

c. forcing said moistened mineral particles through said die to compactly form the mineral particles into a coherent mass of material while avoiding the forcing of said water from said pore spaces,

d. cutting said coherent mass from said die to form said material into pellets,

e. transferring said pellets to a dryer, and

f. evaporating the water from said substantially filled pore spaces within said pellets to render said pore spaces open and provide said pellets with an absorption capacity in said open pore spaces approaching that capacity of said sorptive mineral fines starting material.

4,036,929

METHOD OF FORMING DECORATIVE INSERTS IN GRANITE AND THE LIKE

Eugene L. Gould, 309 Market St., Kittanning, Pa. 16201

Filed Feb. 13, 1976, Ser. No. 657,958

Int. Cl.² B29D *3/00*

U.S. Cl. 264—132 **2 Claims**

1. A method of embellishing memorial stones of granite, marble and the like with decorative inserts comprising the steps of:

a. cutting a recess into the face of a memorial stone in the approximate shape of the desired embellishment;

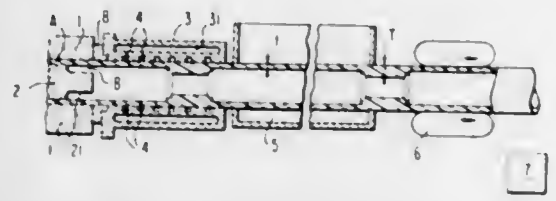
b. placing a moisture and temperature resistant base resin into said recess below the level of said recess and allowing said resin to set;

c. placing a mortar which is elastic over a wide temperature range into said recess over said base resin; and

d. inserting decorative chips into said mortar resin to form a desired embellishment.

4,036,930
METHOD OF MANUFACTURING RESIN TUBES ALTERNATELY HAVING A THICK WALL PORTION AND A THIN WALL PORTION

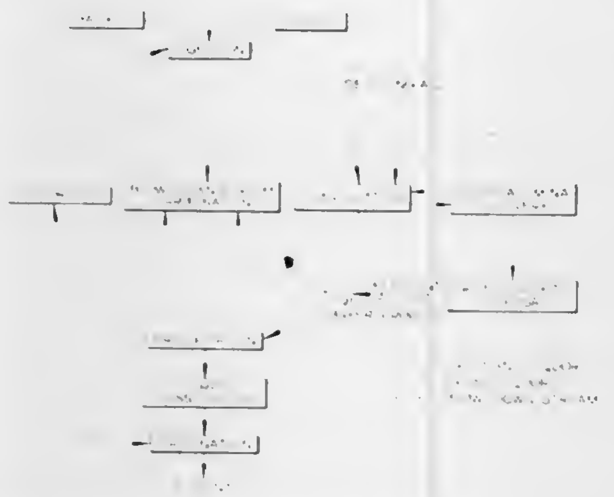
Sadao Murai, Hitakata; Takeshi Kita, Osaka, and Kiyoshi Mochizuki, Joyo, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan
Filed Sept. 24, 1975, Ser. No. 616,525
Claims priority, application Japan, Sept. 25, 1974, 49-110803
Int. Cl.^{2} B29D *23/04*
U.S. Cl. **264—167** **14 Claims**



1. A method of manufacturing resin tubes alternately having a thick wall portion and a thin wall portion comprising: providing an orifice at the tip of an extruding machine of the type which extrudes resin at substantially a uniform speed; forming a tubular opening with an inner and an outer die at the extreme end of the extruding machine for forming said resin into a tube-like member, said tubular opening being divided into at least two stages along the direction of movement of said resin, one of said stages being a small-width opening portion in the inner part of said orifice and the second of said stages being a large-width opening portion at an outlet of said orifice, said large-width opening portion having an end portion open to the tip surface of said orifice; positioning control means in close contact with said tip surface of said orifice for controlling one of the outside and inside diameters of the resin tube to be extruded; and pulling a resin tube extruded at the extreme end of said means at varying speeds including at least a high speed and low speed, whereby said high and low speeds are selected so that when said resin tube is pulled at said high speed, the small-width opening portion is filled with resin but the large-width opening portion is not filled therewith, and when said resin tube is pulled at said low speed, at least the open end portion of the large-width opening portion is filled with the resin.

4,036,931
BAYER PROCESS PRODUCTION OF ALUMINA

Morris L. Roberson; John W. Beck; Jack S. Maples, all of Baton Rouge; Anthony Savariste, Plaquemine, all of La.; Donald J. Donaldson, Orinda, Calif.; David L. Stein, and Allan C. Kelly, both of Pleasanton, Calif., assignors to Kaiser Aluminum & Chemical Corporation, Oakland, Calif.
Filed June 25, 1976, Ser. No. 699,828
Int. Cl.^{2} C01F *7/06*
U.S. Cl. **423—121** **10 Claims**



1. In the Bayer process production of alumina from bauxite by digestion of the bauxite with a caustic solution to produce a sodium aluminate solution and a caustic-insoluble spent bauxite residue, the improvement which comprises selecting for blowdown a Bayer process stream having a pH in excess of about 12, caustic concentration expressed as Na_2CO_3, in excess of about 50 g/l and a dissolved alumina content, expressed as Al_2O_3, in excess of about 20 g/l, treating the stream with CO_2 within the temperature range of about 40°-100° C until substantially all of the dissolved alumina content of the stream is precipitated as sodium dawsonite; separating and recovering the sodium dawsonite from the carbonated blow-down stream which after removal of its sodium dawsonite content is characterized by a pH within the range of about 8.6-9 and an environmentally acceptable dissolved salt content which allows its direct disposal into naural receiving bodies.

4,036,932
METHOD OF PREPARING GALLIUMPHOSPHIDE

Gérard Joseph Poiblaud, Epron-Thaon, France, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Sept. 15, 1975, Ser. No. 613,246
Claims priority, application France, Sept. 18, 1974, 74.31524
Int. Cl.^{2} C09K *11/08;* **C01G** *15/00*
U.S. Cl. **423—299** **8 Claims**

1. In the method of preparing gallium phosphide by contacting, in a closed space subjected to a temperature gradient, liquid gallium with phosphorus vapors and recovering the resultant crystalline gallium phosphide, the improvement wherein a nitrogen compound in the condensed state is placed in said space and is subjected to a temperature higher than its dissociation temperature but below the maximum temperature of liquid gallium, said nitrogen compound liberating nitrogen in said temperature range thereby incorporating a slight amount of nitrogen in the crystal lattice of said gallium phosphide and preventing contamination of said gallium phosphide crystal lattice by sulfur and silicon impurities.

4,036,933
HIGHLY-ACTIVE, FINELY DIVIDED SUPER-DRY SILICON DIOXIDE

Siegmar Läufer, and Waldemar Roy, both of Rheinfelden, Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany
Continuation of Ser. No. 434,577, Jan. 18, 1974, abandoned, which is a division of Ser. No. 175,382, Aug. 26, 1971, Pat. No. 3,859,420, which is a continuation of Ser. No. 886,413, Dec. 18, 1969, abandoned. This application July 10, 1975, Ser. No. 594,710
The portion of the term of this patent subsequent to Jan. 7, 1992, has been disclaimed.
Int. Cl.^{2} C01B *33/16, 33/18*
U.S. Cl. **423—338** **4 Claims**

1. A highly active superdry silica aerogel free of adsorbed water and hydrogen-bonded silanol groups the infrared spectrum of which is characterized by a single narrow intense band at about 3700 cm^{-1} within the range between 4000 and 2000 cm^{-1} indicating within the range between 4000 and 2000 cm^{-1} indicating the presence of free silanol groups and which spectrum is further characterized by the absence of bonds indicating the presence of adsorbed water and hydrogen-bonded silanol groups, the said silica aerogel having been produced by subjecting a pyrogenically produced silica aerogel containing adsorbed water and both free and hydrogen-bonded silanol groups to treatment in a fluidized bed at a temperature between about 700° and 1000° C and at a pressure between 2 torrs and atmospheric pressure for a period between 1 second and a few minutes through which fluidized bed a stream of dried gas that had been preheated to a temperature between 100° and 300° C was passed.

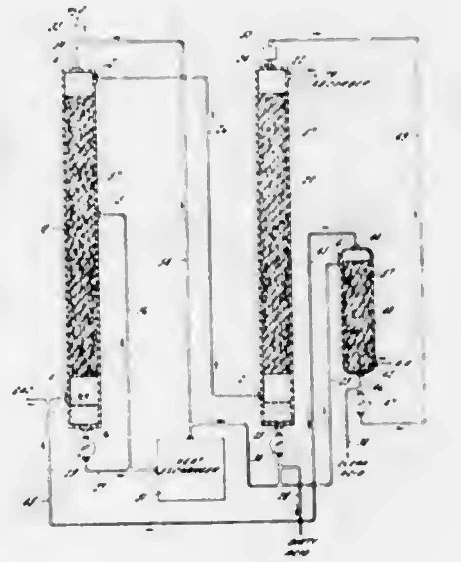
2. A highly-active super-dry silica aerogel free of adsorbed water and hydrogen-bonded silanol groups, the infrared spectrum of which is characterized by a single narrow intense band at about 3700 cm^{-1} within a range between 4000 and 2000 cm^{-1} indicating the presence of free silanol groups and which spectrum is further characterized by the absence of bonds indicating the presence of adsorbed water and hydrogen-bonded silanol groups, said silica aerogel having a surface between 100 and 400 m^2/g.

4,036,934
PREPARATION OF NITRIC ACID

Clifford E. Selin, Salt Lake City, Utah; Wayne A. Proell, Seymour, Ind., and James M. Applegate, Granger, Utah, assignors to American Hydrocarbon Company, Salt Lake City, Utah
Filed June 7, 1976, Ser. No. 693,137
Int. Cl.^{2} C01B *21/40*
U.S. Cl. **423—394** **3 Claims**

1. A continuous process for the preparation of nitric acid comprising:

a. providing a primary reaction zone, a secondary reaction zone and a desorber zone, said primary reaction zone and said secondary reaction zone each having a stripper region, an intermediate concentration region and a gas liberating region;
b. continuously introducing a first stream of aqueous nitric acid containing from about 15 to about 35% at a temperature below about 90° F. into the top of said stripper of said primary reaction zone and continuously introducing a second stream of aqueous nitric acid containing from about 15 to about 35% nitric acid at a temperature in the range of about 150° to about 185° F. into said stripper zone of said primary reaction zone, the rate of introduction of said first stream and said second stream of nitric acid being sufficient to allow maintenance of a predetermined temperature of between about 150° to 185° F. in said gas liberating region of said primary reaction zone;
c. providing a gas seal in said gas liberating region of said primary reaction zone;
d. continuously introducing gaseous ammonia oxidation products including nitrogen oxides and a gaseous oxidizing agent including molecular oxygen into said concentration zone of said primary reactor;
e. reacting the nitrogen oxides and the oxidizing agent in the presence of said first stream in said primary reactor at a temperature below about 90° F. to produce gaseous reaction products including nitrogen dioxide and liquid reaction products including nitric acid which combine with said first stream to enrich the nitric acid content thereof and reacting the ammonia oxidation products and the oxidizing agent in the presence of said second stream in said primary reactor at a temperature of between 120° and about 185° F. to produce gaseous reaction products including nitrogen dioxide and liquid reaction products including nitric acid which combine with said seecond stream to enrich the nitric acid content thereof;
f. maintaining the temperature of said first stream as it passes through the stripper region below about 90° F. to dissolve at least a major amount of the gaseous reaction products entering the stripper region into said first stream;
g. combining said enriched first stream and said enriched second stream;
h. withdrawing said enriched first stream and said second stream of aqueous nitric acid from said reaction zone at a rate allowing maintenance of said predetermined temperature of between about 150° to 185° F. to thereby liberate nitrogen oxides dissolved in said combined streams;



i. continuously separating said combined enriched first and second stream of aqueous nitric acid into a first and a second recycle stream;
j. continuously introducing said first recycle stream into said stripper zone of said primary reaction zone to provide said second stream;
k. continuously_cooling said second recycle stream to a temperature of at least about 90° F;
l. continuously separating said second recycle stream at a temperature of at least about 90° F. into a first cooled recycle stream and a second cooled recycle stream;
m. continuously introducing said first cooled recycle stream into the top of said stripper region of said primary reactor to provide said first stream;
n. continuously introducing said second cooled recycle stream into a desorbing zone spacially removed from said first primary reaction zone;
o. contacting said second cooled recycle stream in said desorber zone with a gas at a temperature of between about 70 to about 85° F. in an amount sufficient to liberate a major amount of the dissolved gaseous reaction products therein;
p. continuously introducing said liberated gaseous reaction products and said contacting gas into said primary reaction zone;

q. withdrawing a desorbed second liquid recycle stream from the liquid in the desorbing zone and separating said desorbed liquid into a product stream and a desorbed recycle stream;
r. cooling said desorbed recycle stream to a temperature of at least about 90° F.;
s. continuously introducing said cooled desorbed recycle stream into the top of said stripping region of said secondary reaction zone to provide a cooled, desorbed stripping liquid therein;
t. withdrawing the remaining gaseous reaction products from said stripper region of said primary reactor and introducing said gaseous reaction products into said concentration zone of said secondary reaction zone;
u reacting said liberated gaseous reaction products in the presence of said stripping liquid in said secondary reaction zone to produce liquid reaction products including nitric acid which combines with said stripping liquid to enrich the nitric acid content thereof;
v. withdrawing said nitric acid enriched stripping liquid and combining said nitric acid enriched stripping liquid with said cooled second recycle stream; and
w. adding water to said stripping zone of said primary reactor, the amount and rate of water added, and product stream separated, being coordinated to provide said first stream introduced into the top of said stripper region of said primary reaction zone with a nitric acid concentration in the range of about 15 to 35% by weight.

4,036,935

COBALT OXIDE-BASED CATALYTIC SUBSTANCES FOR THE OXIDATION OF AMMONIA

Jean-Louis Ray, Fontaine, Saone, and Robert Laugier, Fresnes, both of France, assignors to Rhone-Progil, Courbevoie, France

Division of Ser. No. 451,882, March 18, 1974, Pat. No. 3,962,138. This application Feb. 9, 1976, Ser. No. 656,138
Claims priority, application France, Mar. 20, 1973, 73.09862
Int. Cl.² C01B *21/26*
U.S. Cl. 423—404 4 Claims

1. In the catalytic oxidation of ammonia to produce nitrogen oxides for the production of nitric acid by the oxidation of ammonia and air in the presence of a catalyst, the improvement wherein the oxidation is carried out with a catalyst formed by calcining at a temperature of the order of from 900° C to 1000° C a mixture consisting essentially of 60-95% by weight tricobalt tetraoxide, aluminum oxide in an amount greater than 5% by weight but which does not exceed 15% by weight, and an oxide of a metal selected from the group consisting of thorium, cerium, zinc and cadmium in an amount that does not exceed 25% by weight.

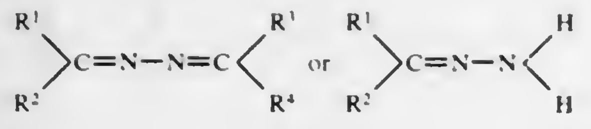
4,036,936

PROCESS FOR PREPARING HYDRAZINE HYDRATE

Hideo Yamaguchi; Hidetoshi Kume, both of Naruto, and Osamu Shibuta, Tokushima, all of Japan, assignors to Otsuka Kagaku Yakuhin Kabushiki Kaisha, Osaka, Japan

Filed Aug. 15, 1975, Ser. No. 604,956
Int. Cl.² C01B *21/16*
U.S. Cl. 423—407 14 Claims

1. In preparing hydrazine hydrate by hydrolyzing ketazine or hydrazone represented by the formula



$$\mathrm{R^1R^2C{=}N{-}N{=}CR^1R^4} \quad \text{or} \quad \mathrm{R^1R^2C{=}N{-}NH_2}$$

wherein

R^1 and R^2 are the same or different and are each alkyl having 1 to 3 carbon atoms, the total number of carbon atoms of R^1 and R^2 being 4 or less than 4, R^3 and R^4 are the same or different and are each alkyl having 1 to 3 carbon atoms, the total number of carbon atoms of R^3 and R^4 being 4 or less than 4, a process comprising the steps of:

1. removing free ketone from ketazine or hydrazone in the form of an aqueous or ketone solution by fractional distillation;
2. hydrolyzing the solution resulting from the fractional distillation by treating said solution in at least two hydrolysis reactors in series, each of the hydrolysis reactors having contact columns at the top thereof;
3. supplying the solution resulting from the hydrolysis treatment in step (2) to the upper portion of a hydrazine hydrate recovery means and recovering hydrazine hydrate from the bottom of the hydrazine hydrate recovery means and obtaining a vapor from the top of said hydrazine hydrate recovery means;
4. contacting the recovered vapor from step (3) in countercurrent manner with the solution contained in the last in the series of hydrolysis reactors and sequentially contacting the thus contacted vapor with the solutions in each of the next preceding hydrolysis reactors;
5. finally removing the vapor from the first of the hydrolysis reactors and introducing the vapor to the fractional distillation step to remove ketones from said vapor;

and wherein during the process, the amount of solution in each of the hydrolysis reactors is not less than the amount of aqueous solution of hydrazine hydrate recovered per hour from step (3) and wherein the solution in each of the hydrolysis reactors has a mole ratio between 2.0 to 1.2, said mole ratio being defined by the following formula:

$$\text{mole ratio} = \frac{\text{total ketone}}{\text{total hydrazine}}$$

$$\text{total ketone} = \begin{bmatrix}\text{number of}\\ \text{moles of free}\\ \text{ketone in}\\ \text{equilibrium}\\ \text{system}\end{bmatrix} + \begin{bmatrix}\text{number of moles}\\ \text{of ketone to}\\ \text{be formed by}\\ \text{complete hydrolysis}\\ \text{of ketazine}\\ \text{or hydrazone}\end{bmatrix}$$

$$\text{total hydrazine} = \begin{bmatrix}\text{number of}\\ \text{moles of free}\\ \text{hydrazine in}\\ \text{equilibrium}\\ \text{system}\end{bmatrix} + \begin{bmatrix}\text{number of}\\ \text{moles of}\\ \text{hydrazine}\\ \text{to be formed}\\ \text{by complete}\\ \text{hydrolysis}\\ \text{of ketazine}\\ \text{or hydrazone}\end{bmatrix}.$$

4,036,937

DIAMOND SYNTHESIS

Alexander Rose Roy, 16 Cecil St., Meredale, Johannesburg, Transvaal, and Anthony Bayliss Clarke, Plot 54, "Vischkuil", P.O. Endicot, Transvaal, both of South Africa

Filed Sept. 13, 1974, Ser. No. 505,982
Claims priority, application South Africa, Sept. 14, 1973, 73/7322
Int. Cl.² C01B *33/06*
U.S. Cl. 423—446 11 Claims

1. In a method of making RD diamond particles wherein a solvent metal is placed in contact with a carbonaceous material in a reaction zone and the contents of the reaction zone are subjected to elevated conditions of temperature and pressure to convert the carbonaceous material into diamond, the elevated conditions of temperature and pressure being maintained for a period suitable for RD diamond growth, the improvement comprising:

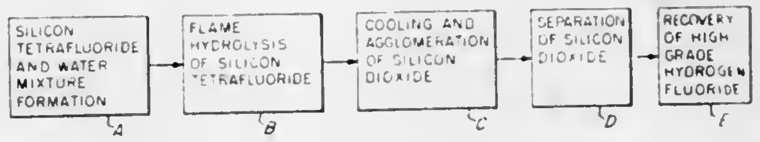
providing the carbonaceous material in the form of a sleeve around a core of the solvent metal, the ratio of the width of the sleeve to the diameter of the core being in the range 1:20 to 1:5, whereby zones of weakness are produced in the sleeve and the solvent metal penetrates the zones of weakness when the contents of the reaction zone are subjected to the elevated conditions of temperature and pressure and elongate RD diamond particles are produced.

4,036,938

PRODUCTION OF HIGH PURITY HYDROGEN FLUORIDE FROM SILICON TETRAFLUORIDE

Richard S. Reed, 715 White Bridge Road, Millington, N.J. 07946

Continuation-in-part of Ser. No. 608,652, Aug. 28, 1975, abandoned, which is a continuation-in-part of Ser. No. 290,121, Sept. 16, 1972, abandoned. This application Oct. 7, 1976, Ser. No. 730,654
Int. Cl.² C01B *7/22, 33/12*
U.S. Cl. 423—483 13 Claims


SILICON TETRAFLUORIDE AND WATER MIXTURE FORMATION
A
FLAME HYDROLYSIS OF SILICON TETRAFLUORIDE
B
COOLING AND AGGLOMERATION OF SILICON DIOXIDE
C
SEPARATION OF SILICON DIOXIDE
D
RECOVERY OF HIGH GRADE HYDROGEN FLUORIDE
E

1. The method of producing commercial grade hydrogen fluoride comprising the steps of

a. forming a mixture of silicon tetrafluoride and water vapor;
b. flame hydrolysing the silicon tetrafluoride at a temperature in the range from about 2100° F to above about 3000° F with a ratio of available water to stochiometric water for flame hydrolysis in the range from above about 1:1 to about 14:1 to convert at least 95% of the silicon tetrafluoride to hydrogen fluoride and silicon dioxide particles with diameters in excess of about 100 millimicrons;
c. cooling the reaction products of the flame hydrolysis by more than 500° F with negligible dilution;
d. agglomerating the silicon dioxide particles and removing them from the reaction products; and
e. recovering hydrogen flueride with a purity in excess of 95%.

4,036,939

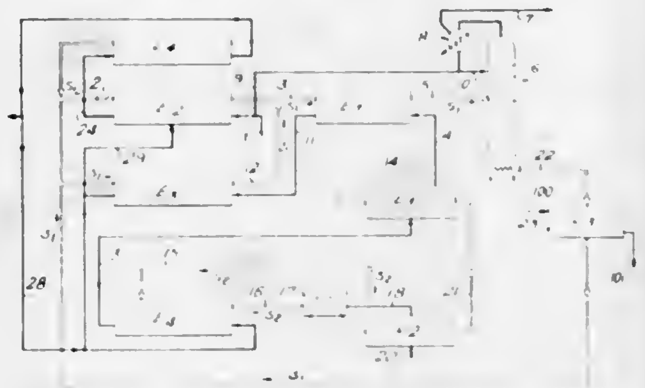
METHOD FOR RECOVERY OF HYDROGEN CHLORIDE FROM DILUTE SOLUTIONS

Jacques Duhayon, Clamart; Michel Jean Jacques, Paris; Pierre Michel, Courbevoie; Maurice Tarnero, Fontenay-aux-Roses, and Edmond Zellner, Gif-sur-Yvette, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed Apr. 24, 1974, Ser. No. 463,715
Claims priority, application France, Apr. 24, 1973, 73.14809
Int. Cl.² C01B *7/08*
U.S. Cl. 423—488 11 Claims

1. A method for recovery of hydrogen chloride contained in an aqueous solution of hydrochloric acid comprising the following steps:

1. extracting hydrogen chloride and water contained in an aqueous solution of hydrochloric acid by counter current circulation contact of said solution with an organic solvent to load said solvent with hydrogen chloride and water,
2. dehydrating said solvent containing said hydrogen chloride and water by circulation in exchange relationship with an aqueous solution concentrated in dehydrating inorganic chloride salt,
3. distilling off hydrogen chloride from said solvent after said dehydration to recover by distillation gaseous hydrogen chloride and leave impure solvent.
4. recovering the impure solvent after distilling off said hydrogen chloride, and
5. to recover hydrogen chloride transferred to said aqueous solution of chloride salt, (a) circulating said aqueous solution of chloride salt from step (2) in exchange relationship with another solvent of the same chemical composition as said organic solvent of step (1), said solution of chloride salt being freed from the hydrogen chloride contained therein by transfer of hydrogen chloride and water to said another solvent, and (b) recycling said another solvent loaded with hydrogen chloride and water to dehydration step (2) along with the loaded solvent from step (1).



4,036,940

RECOVERY OF IODINE

Martin M. McLane, Texas City, and Raymond A. Newsom, Dickinson, both of Tex., assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 29, 1975, Ser. No. 644,497
Int. Cl.² C01B *7/14*
U.S. Cl. 423—503 5 Claims

1. A process for recovery of iodine from a process stream containing iodine or iodine-containing reaction products and a reducing agent which comprises passing said stream while in the vapor state in contact with a treating agent comprising alumina impregnated with the oxides of copper and chromium wherein the amount of copper oxide is from about 5 to about 25 wt.% as Cu and the amount of chromium oxide is from about 1 to about 5 wt.% as chromium, said contacting being effected at a temperature from about 300° to about 500° C, and thereafter regenerating said treating agent by heating it while passing oxygen, air, oxygen — inert gas or air — inert gas mixtures therethrough at a temperature from about 400° to about 600° C for a period from about 1 to about 12 hours.

4,036,941

PREPARATION OF FERRIC SULFATE SOLUTIONS

Bruce K. Boyles, Saxonburg, Pa., and John L. Crow, Jr., Savannah, Ga., assignors to American Cyanamid Company, Stamford, Conn.

Filed Apr. 8, 1976, Ser. No. 675,094
Int. Cl.² C01G *41/14*
U.S. Cl. 423—558 2 Claims

1. A process for recovery of iron from an iron mud containing a mixture of gypsum and ferric hydroxide, which comprises contacting said gypsum and ferric hydroxide mixture with a stoichiometric equivalent based on the ferric hydroxide content of sulfuric acid of a concentration between 93 and 98% for a period of 1 to 12 hours, cooling the reaction mixture to a temperature between 25° and 60° C, removing the undissolved material and recovering the iron as a 25 to 50% ferric sulfate solution.

4,036,942

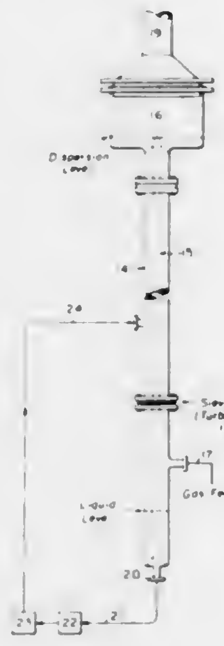
PROCESS FOR THE REMOVAL OF HYDROGEN SULFIDE AND MERCAPTANS FROM LIQUID AND GASEOUS STREAMS

Jacques Pierre Sibeud, Princeton, and Charles David Ruff, Highland Park, both of N.J., assignors to Rhodia, Inc., New York, N.Y.

Division of Ser. No. 166,894, July 28, 1971, abandoned. This application Jan. 22, 1973, Ser. No. 325,482

Int. Cl.^{2} **B01D** *53/34*

U.S. Cl. 423—573 **16 Claims**



1. A cyclic continuous process for the removal of hydrogen sulfide contained in gaseous streams, and the substantially quantitative catalytic conversion thereof to elemental sulfur, while inhibiting the buildup in the system of water-soluble by-products such as sulfates, which comprises contacting the gaseous stream with free oxygen gas and an aqueous solution of a water-soluble polyvalent metal chelate catalyst retaining the metal in soluble form in the aqueous solution, an inorganic alkali in an amount to adjust the pH to within the range from about 6.8 to about 10, and a strongly alkaline free organic amine in an amount within the range from about 0.1% to about 50% sufficient to inhibit water-soluble by-product formation, thereby concurrently forming sulfur and causing polyvalent metal catalyst oxidation and regeneration reactions in the oxidation-reduction metal chelate reaction system to proceed concurrently, while lessening buildup of water-soluble by-products in the catalyst solution; separating the sulfur from the aqueous metal chelate solution; and recycling the regenerated aqueous polyvalent metal chelate catalyst solution thereby recovered to contact another portion of the gaseous stream.

4,036,943

PROCESS FOR REMOVING SULFUR DIOXIDE FROM A GAS AND PRODUCING SULFUR THEREFROM

Marie-José Huron, Orsay; Yves Jacquin, Sevres, and Philippe Renault, Noisy le Roi, all of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Continuation-in-part of Ser. No. 394,336, Sept. 4, 1973, abandoned. This application Nov. 18, 1975, Ser. No. 633,121

Claims priority, application France, Sept. 15, 1972, 72.32926

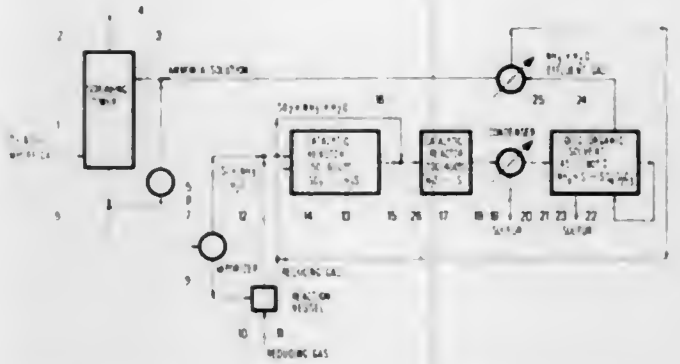
Int. Cl.^{2} **C01B** *17/02, 1/02, 17/50*

U.S. Cl. 423—576 **15 Claims**

1. Process for removing sulfur dioxide from a gas containing the same, wherein

said gas is contacted, in a first step (a), with an aqueous ammonia absorbing solution, so as to absorb sulfur dioxide in the form of ammonium sulfites, then,

in a second step (b), the solution resulting from (a) is heated, so as to decompose the sulfites to a gas containing sulfur dioxide and ammonia, then, in a third step (c), the gas from step (b) is heated at 150°-600° C with gas capable of reducing SO_2 to H_2S, in contact with a catalyst for reducing SO_2 to H_2S so as to produce a gas essentially containing hydrogen sulfide, sulfur dioxide and ammonia in a molar ratio of H_2S to SO_2 of 1.7-2.3, and in a fourth step (d), the gas from (c), which has a molar ratio H_2S/SO_2 of from 1.7:1 to 2.3:1 is contacted at 200°-400° C with a catalyst for the reaction of H_2S and SO_2 to sulfur, and a gas containing free sulfur, ammonia and residual sulfur dioxide and hydrogen sulfide is recovered, and, in a fifth step (e), said gas recovered from step (d) is cooled to about 150° C in contact with an organic solvent in the liquid phase, so as to be made free of residual sulfur without substantial formation of ammonium thiosulfate or sulfate, and the resulting ammonia containing effluent gas is used to reconstitute the absorbing solution of (a).



4,036,944

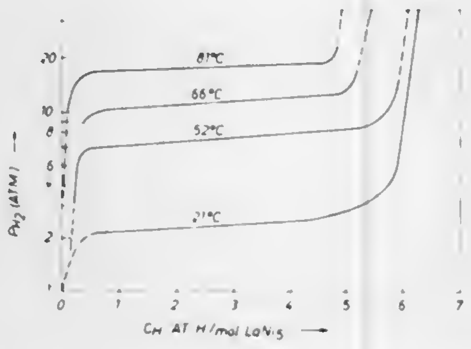
HYDROGEN SORBENT COMPOSITION AND ITS USE

George C. Blytas, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed May 17, 1976, Ser. No. 686,779

Int. Cl.^{2} **C01B** *1/32, 1/35*

U.S. Cl. 423—648 R **10 Claims**



1. A solid hydrogen sorbent composition comprising a sorbent having greater that 50% lanthanum pentanickel alloy and a binder matrix selected from the group consisting of (i) nonhydrogenated block copolymers having at least two monoalkenyl arene polymer end blocks A and at least one elastomeric conjugated diene mid block B, and (ii) selectively hydrogenated block copolymers having at least two monoalkenyl arene polymer end blocks C and at least one substantially completely hydrogenated diene polymer mid block D.

4,036,945

COMPOSITION AND METHOD FOR DETERMINING THE SIZE AND LOCATION OF MYOCARDIAL INFARCTS

Edgar Haber, Weston, Mass., assignor to The Massachusetts General Hospital, Boston, Mass.

Filed May 3, 1976, Ser. No. 682,483

Int. Cl.^{2} **A61K** *29/00, 43/00;* **G01T** *1/161;* **G21H** *5/02*

U.S. Cl. 424—1 **6 Claims**

1. A composition comprising a physiologically acceptable injection vehicle and a member of the group consisting of radioactive labelled antibody for cardiac myosin and radioactive labelled lower molecular weight fragments of said antibody.

4,036,946

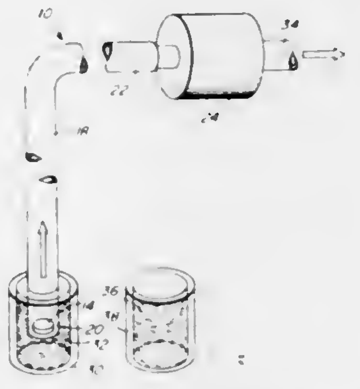
IMMUNOFLUOROMETRIC METHOD FOR MEASURING MINUTE QUANTITIES OF ANTIGENS, ANTIBODIES AND OTHER SUBSTANCES

Marcos Kleinerman, South Point Road, Webster, Mass. 01550

Filed Oct. 20, 1975, Ser. No. 623,567

Int. Cl.^{2} **G01N** *21/52, 33/16*

U.S. Cl. 424—8 **11 Claims**



1. A method for measuring minute quantities of a substance comprising the steps of:

a. immobilizing molecules of an unlabelled reagent on a porous base stratum, said unlabelled reagent having a binding reaction with said substance to be measured;
b. immersing said base stratum into a solution containing said substance to be measured;
c. making said solution containing said substance to be measured flow through said immobilized molecules and said porous base stratum;
d. forming an intermediate layer having a distribution of said substance to be measured on said immobilized unlabelled reagent as said solution containing said substance to be measured flows through said immobilized molecules, particles of said substance to be measured being trapped by said immobilized molecules of said unlabelled reagent;
e. immersing said base stratum with said intermediate layer into a solution containing a labelled reagent;
f. making said solution containing said labelled solution flow through said intermediate layer and said base stratum;
g. forming a layer having a distribution of said labelled reagent on said intermediate layer, said labelled reagent being essentially said unlabelled reagent with a fluorescent label, molecules of said labelled reagent having a fluorescent label attaching to said trapped particles of said substance to be measured as said solution containing said labelled reagent flows through said intermediate layer; and
h. measuring said molecules of said labelled reagent for determining the concentration of said substance to be measured.

4,036,947

O-ALKYL-N-SUBUSTITUTED-S-HALOPHENOXYMETHYL-DITHIOPHOSPHORIC ACID ESTER-AMIDES

Hellmut Hoffmann, Wuppertal; Bernhard Homeyer, Opladen; Ingeborg Hammann, Cologne, and Wilhelm Stendel, Wuppertal, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

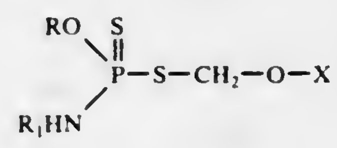
Filed Dec. 8, 1975, Ser. No. 638,875

Claims priority, application Germany, Dec. 10, 1974, 2458329

Int. Cl.^{2} **A01N** *9/36;* **C07F** *9/24*

U.S. Cl. 424—217 **11 Claims**

1. An O-alkyl-N-substituted-S-halopenoxymethyldithiophosphoric acid ester-amide of the formula



$$\begin{array}{l} \mathrm{RO}\quad\ \mathrm{S} \\ \quad\ \diagdown\ \| \\ \qquad\ \mathrm{P{-}S{-}CH_2{-}O{-}X} \\ \quad\ \diagup \\ \mathrm{R_1HN} \end{array}$$

in which

R is alkyl with 1 to 4 carbon atoms,

R_1 is alkyl with 1 to 6 or alkenyl with 2 to 5 carbon atoms and

X is chlorophenyl.

9. An insecticidal, acaricidal or nematocidal composition containing as active ingredients an insecticidally, acaricidally or nematocidally effective amount of a compound according to claim 1 in admixture with a diluent.

4,036,948

L-ASCORBIC ACID TABLETS

Nobuyuki Kitamori, Suita; Tadashi Makino, Takatsuki, and Keiji Hemmi, Toyono, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

Filed Sept. 3, 1975, Ser. No. 610,003

Claims priority, application Japan, July 24, 1975, 50-90742

Int. Cl.^{2} **A61K** *9/32, 9/00, 31/375*

U.S. Cl. 424—32 **9 Claims**

1. L-ascorbic acid granules produced by spray-coating L-ascorbic acid powder, having a size such that it passes through a 200-mesh screen, with a solution of a binder under constant agitation in a fluidized-bed granulating apparatus until the amount of the binder has reached about 2 to about 4 weight percent relative to the L-ascorbic acid.

5. A method for producing L-ascorbic acid granules which comprises spray-coating L-ascorbic powder, having a size such that it passes through a 200-mesh screen, with a solution of a binder under constant agitation in a fluidized-bed granulating apparatus until the amount of the binder has reached about 2 to 4 weight percent relative to the L-ascorbic acid.

4,036,949

CLEAR DENTIFRICE

Daniel Colodney, Piscataway, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Continuation-in-part of Ser. No. 504,798, Sept. 10, 1974, Pat. No. 3,906,090, which is a division of Ser. No. 287,001, Sept. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 139,240, April 30, 1971, abandoned. This application Sept. 8, 1975, Ser. No. 610,962

The portion of the term of this patent subsequent to Sept. 16, 1992, has been disclaimed.

Int. Cl.^{2} **A61K** *7/16*

U.S. Cl. 424—49 **11 Claims**

1. A visually clear dentifrice comprising about 5-30% by weight of a dentally acceptable substantially water-insoluble particulate polishing agent in a gel vehicle having substantially the same refractive index as said polishing agent, said polishing agent being a synthetic amorphous complex alumino-silicate salt of sodium which contains about 0.1 to 3.3% by weight of the polishing agent of alumina, and in which the mole ratio of

silica to alumina is about 45:1 to 1500:1 said polishing agent having a refractive index of about 1.44–1.47, about 5 to 20% by weight of moisture and up to about 10% by weight sodium oxide and said polishing agent being substantially invisible in said gel vehicle.

4,036,950

ORAL PREPARATIONS

Eric Baines, Flixton; Sydney James Forshaw, Failsworth, and Kenneth Harvey, Wilmslow, all of England, assignors to Colgate-Palmolive Company, New York, N.Y.

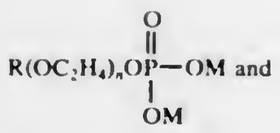
Filed Dec. 31, 1975, Ser. No. 645,744

Claims priority, application United Kingdom, Jan. 15, 1975, 1797/75

Int. Cl.² A61K *7/18, 7/22*

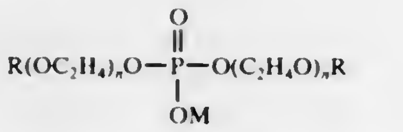
U.S. Cl. 424—54 **15 Claims**

1. An oral preparation comprising a dentally acceptable oral vehicle comprising a water-insoluble polishing material and dispersed in said vehicle a cationic antibacterial agent in amount of about 0.01–5% by weight based on the cationic portion thereof and about 0.05–5% by weight of an anionic phosphate ester surface active agent comprising a mixture of monoester of the formula



$$\mathrm{R(OC_2H_4)_nO}\underset{\substack{|\\ \mathrm{OM}}}{\overset{\substack{\mathrm{O}\\ \|}}{\mathrm{P}}}\mathrm{-OM}\ \text{and}$$

diester of the formula



$$\mathrm{R(OC_2H_4)_nO-}\underset{\substack{|\\ \mathrm{OM}}}{\overset{\substack{\mathrm{O}\\ \|}}{\mathrm{P}}}\mathrm{-O(C_2H_4O)_nR}$$

wherein R is an alkyl group of 10–20 carbon atoms, *n* an integer from 1–6 and M is selected from the group consisting of hydrogen, alkali metal and ammonium, said oral preparation having a pH of at least about 6.

4,036,951

ULTRA-VIOLET FILTRATION WITH CERTAIN AMINOSALICYLIC ACID ESTERS

Alfred Halpern, Great Neck, and Ernest J. Sasmor, Yonkers, both of N.Y., assignors to Synergistics, Inc., New York, N.Y.

Continuation of Ser. No. 340,481, March 12, 1973, abandoned, which is a continuation-in-part of Ser. No. 145,488, May 20, 1971, abandoned. This application Jan. 16, 1976, Ser. No. 649,891

Int. Cl.² A61K *7/44*

U.S. Cl. 424—60 **14 Claims**

1. The method of preventing solar burning in a human or animal comprising applying to the skin of said human or animal a composition containing 0.5 to 25 percent by weight of a compound selected from the group consisting of phenylorthoaminosalicylate, phenylmeta-aminosalicylate, phenyl-para-aminosalicylate and methyl-para-aminosalicylate and a carrier pharmaceutically acceptable for topical application prior to exposing said skin to solar radiation.

4,036,952

ETHYLENEIMINE INACTIVATED MICROORGANISMS

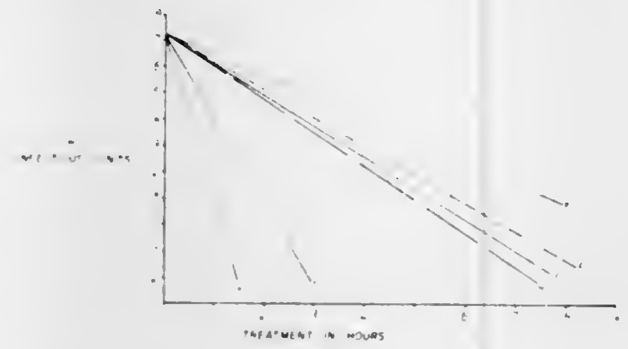
Kurt Bauer; Günther Wittmann; Manfred Mussgay, all of Tuebingen; Eckart Irion, Wuppertal, and Horst Geilhausen, Bensberg, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

Continuation-in-part of Ser. No. 559,970, March 19, 1975, abandoned, which is a division of Ser. No. 444,483, Feb. 21, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,038

Claims priority, application Germany, Feb. 24, 1973, 2309329

Int. Cl.² A61K *39/12*

U.S. Cl. 424—89 **31 Claims**



1. A virus suspension to which ethyleneimine has been added such that the concentration of ethyleneimine is 0.005% to 2% V/V, the residual unused ethyleneimine thereafter being destroyed, whereby the virus is inactivated without impairment to its antigenicity or immunogenicity.

4,036,953

PROCESS FOR PREPARING VACCINE ADJUVANT

Arlette Adam, Palaiseau, France; Frank M. Berger, Princeton, N.J.; Louis Chedid, Paris; Edgar Lederer, Sceaux, both of France, and Jean Francois Petit, Paris, France, assignors to Agence Nationale de Valorisation de la Recherche (ANVAR), Neuilly-sur-Seine, France

Filed Nov. 17, 1972, Ser. No. 307,614

Claims priority, application France, Nov. 19, 1971, 71.41610

Int. Cl.² A61K *39/02;* **C12B** *1/00;* **C12D** *13/02, 13/10*

U.S. Cl. 424—92 **7 Claims**

1. In a process for preparing a water-soluble immunological non-specific adjuvant for enhancing the effect of vaccine, the improvement which comprises

- treating with a murolytic enzyme, in an aqueous solution, a suspension of Mycobacteria or Nocardia cells walls, said cell walls being substantially free of waxes, free lipids, free proteins and of nucleic acids,
- separating the solid residue including cell walls residue from the digested residue and,
- recovering the aqueous portion containing water-soluble immunological adjuvant, the adjuvant having reduced sensitizing action to tuberculin.

4,036,954

STABLE PROSTAGLANDIN E GROUP-CONTAINING FORMULATION

Masuo Murakami, Tokyo; Shigemi Kawahara, Higashikurume; Hiroitsu Kawata; Kiyoshi Okazaki, both of Kawagoe; Jun Sekino, Kashiwa, and Hidemi Shimizu, Ageo, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 21, 1974, Ser. No. 516,217

Claims priority, application Japan, Nov. 2, 1973, 48-123669; June 25, 1974, 49-72585

Int. Cl.² A61K *47/00, 31/215, 31/19*

U.S. Cl. 424—176 **10 Claims**

1. A process of preparing a stable prostaglandin E group-containing formulation which comprises adding to a prostaglandin E group compound an effective amount of at least one member selected from the group consisting of hydroxypropyl cellulose, hydroxyethyl cellulose, carboxymethyl cellulose, water-soluble dextrin and dextran and subjecting the resulting mixture to lyophilization.

7. A process according to claim 1 in which 5 - 250 mg. of said water-soluble dextrin and dextran is added per 0.05 mg. of said prostaglandin E group compound, and 0.1 - 150 mg. of said cellulose derivative is added to 0.05 mg. of said prostaglandin E group compound.

4,036,955

N²-NAPHTHALENESULFONYL-L-ARGININAMIDES AND THE PHARMACEUTICALLY ACCEPTABLE SALTS THEREOF

Shosuke Okamoto; Akiko Hijikata, both of Kobe; Ryoji Kikumoto, Machida; Yoshikuni Tamao, Yokohama; Kazuo Ohkubo, Machida; Tohru Tezuka, Yokohama, and Shinji Tonomura, Tokyo, all of Japan, assignors to Mitsubishi Chemical Industries Ltd. and Shosuke Okamoto, both of, Japan

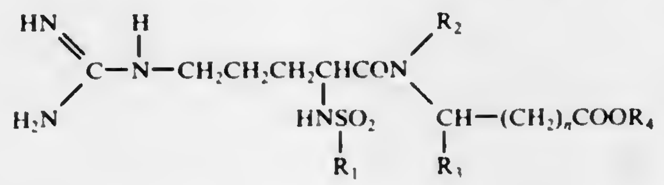
Filed July 22, 1976, Ser. No. 707,536

Int. Cl.² A61K *37/00*

U.S. Cl. 424—177 **10 Claims**

1. An N²-[naphthalenesulfonyl-L-argininamides] Naphthalenesulfonyl-L-argininamide compound having the formula (I):

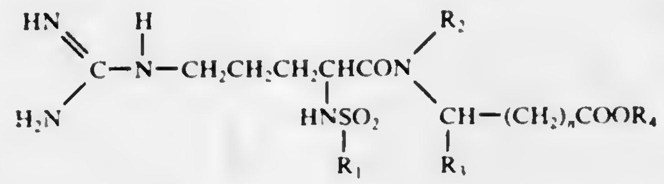
(I)



or a pharmaceutically acceptable salt thereof, wherein R_1 is selected from the group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, hydroxy, nitro, cyano, C_1-C_{10} alkyl, C_1-C_{10} alkoxy and C_2-C_{20} dialkylamino; R_2 is selected from the group consisting of furfuryl, furylmethyl, tetrahydrofurfuryl and tetrahydro-3-furylmethyl; R_3 is hydrogen or C_1-C_5 alkyl; R_4 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_7-C_{12} aralkyl and C_6-C_{10} aryl; and *n* is an integer of 0, 1 or 2.

10. A method of inhibiting activity and suppressing activation of thrombin in vivo, which comprises administering to a patient a pharmaceutically effective amount of an N²-naphthalenesulfonyl-L-compound having the formula (I):

(I)



or the pharmaceutically acceptable salt thereof, wherein R_1 is selected from a group consisting of naphthyl, 5,6,7,8-tetrahydronaphthyl and naphthyl substituted with at least one substituent selected from the group consisting of halo, hydroxy, nitro, cyano, C_1-C_{10} alkyl, C_1-C_{10} alkoxy and C_2-C_{20} dialkylamino; R_2 is selected from the group consisting of furfuryl, 3-furylmethyl, tetrahydrofurfuryl and tetrahydro-3-furylmethyl; R_3 is hydrogen or C_1-C_5 alkyl; R_4 is selected from the group consisting of hydrogen, C_1-C_{10} alkyl, C_7-C_{12} aralkyl and C_6-C_{10} aryl; and *n* is an integer of 0, 1 or 2.

4,036,956

O,S,N-TRI-ALIPHATIC HYDROCARBON-THIONOTHIOLPHOSPHORIC ACID ESTER AMIDES AND PESTICIDAL COMPOSITION AND METHOD

Claus Stölzer, Wuppertal-Vohwinkel; Bernhard Homeyer, Opladen; Ingeborg Hammann, Cologne, and Günter Unterstenhöfer, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

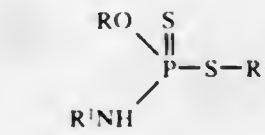
Division of Ser. No. 414,601, Nov. 8, 1973, Pat. No. 3,903,209, which is a division of Ser. No. 160,185, July 6, 1971, Pat. No. 3,793,407. This application Jan. 30, 1975, Ser. No. 545,658

Claims priority, application Germany, July 11, 1970, 2034475

Int. Cl.² A01N *9/36;* **C07F** *9/22*

U.S. Cl. 424—210 **15 Claims**

1. A thionophosphoric acid ester amide of the formula



in which

R and R¹ each is an alkyl or alkenyl radical with up to 6 carbon atoms, optionally substituted with at least one halo, phenyl, cyano, alkoxy, alkylmercapto, phenylmercapto or naphthylmercapto radical, the mercapto radicals being optionally chloro-or cyano-substituted, and

R² is an alkynyl radical with up to 6 carbon atoms optionally substituted with at least one halo, phenyl, alkoxy, alkylmercapto, phenylmercapto or naphthylmercapto radical, the mercapto radicals being optionally chloro-substituted, or an alkyl or alkenyl radical with up to 6 carbon atoms substituted with a cyano radical or substituted with a cyano-substituted alkylmercapto, chloro substituted alkylmercaptor, phenylmercapto or naphthylmercapto radical.

4,036,957

PHENOXY COMPOUNDS IN COMBINATIONS TO SUPPRESS GASTRIC BLEEDING IN ASPIRIN THERAPY

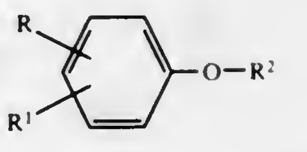
Reevis Stancil Alphin, and John Wesley Ward, both of Richmond, Va., assignors to A. H. Robins Company, Inc., Richmond, Va.

Filed Nov. 18, 1975, Ser. No. 633,044

Int. Cl.² A61K *31/625*

U.S. Cl. 424—232 **3 Claims**

1. The method of treating inflammatory conditions in mammals which comprises administering to said mammals an effective amount of a combination of from about 67 to 95% by weight aspirin and from about 5 to 33% by weight of a phenoxy compound having the formula:



wherein;

R is selected from the group consisting of hydrogen, chlorine, bromine, fluorine, lower-alkyl, lower-alkoxy, or trifluoromethyl,

R¹ is selected from the gruup consisting of hydrogen, chlorine, bromine, fluorine, lower-alkyl or lower-alkoxy,

and R² is $—CH_2—CHCH_2NHCOO$.

4,036,958
INSECTICIDAL AND MITICIDAL ACTIVE ISOTHIURONIUM TRICYCLOHEXYL TIN IMIDE

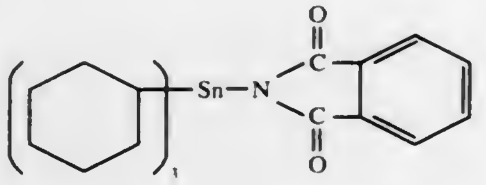
Don R. Baker, Orinda, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Oct. 6, 1975, Ser. No. 619,882

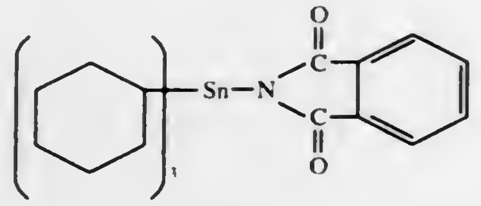
Int. Cl.^{2} A01N *9/00;* **C07D** *209/34*

U.S. Cl. 424—245 **3 Claims**

1. The compound having the formula



2. A method of controlling insects consisting of applying to the habitat thereof an insecticidally effective amount of the compound having the formula



4,036,959
MICROBIOCIDAL CAPPED POLYMERS

Harold A. Green, Havertown, Pa.; John J. Merianos, Jersey City, and Alfonso N. Petrocci, Glen Rock, both of N.J., assignors to Millmaster Onyx Corporation, New York, N.Y.

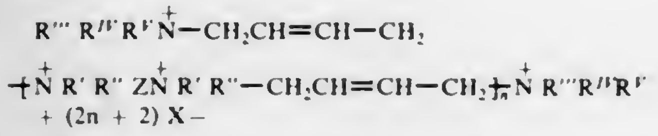
Continuation-in-part of Ser. No. 518,596, Oct. 29, 1974, Pat. No. 3,931,319. This application Oct. 17, 1975, Ser. No. 623,402

The portion of the term of this patent subsequent to Jan. 6, 1993, has been disclaimed.

Int. Cl.^{2} A01N *9/22;* **C07D** *211/06*

U.S. Cl. 424—248.56 **4 Claims**

1. The compound



$$R'''R^{IV}R^{V}\overset{+}{N}-CH_2CH=CH-CH_2\left[\overset{+}{N}R'R''Z\overset{+}{N}R'R''-CH_2CH=CH-CH_2\right]_n\overset{+}{N}R'''R^{IV}R^{V} + (2n+2)X^-$$

wherein R′ and R″ are selected from the group consisting of (a) primary or secondary alkyls having 1 to 20 carbon atoms, (b) hydroxy or dihydroxy derivatives of R′ and R″, (c) benzyl, and (d) benzyl having at least one alkyl group bonded to the benzene ring, with the total sum of alkyl carbon atoms attached to the benzene ring being less than 7; wherein (R‴), (R^{IV}) and (R^{V}), taken together with N, form a heterocyclic amino radical selected from the group consisting of N-lower alkyl morpholino, quinolino, N-lower alkyl pyrrolidino, N-lower alkyl piperidino, N-lower alkyl homopiperidino, N-lower alkyl isoquinolino, and N,N-di-lower alkyl benzylamino; wherein Z consists of 1 to 3 aliphatic divalent radicals, each of which has 2 to 10 carbon atoms with each aliphatic radical containing 0 to 2 double bonds and 0 to 2 hydroxy substituents; wherein X is selected from the group consisting of chlorine and bromine; and wherein *n* is an integer of about 2 to about 30.

3. A method of inhibiting the growth of microorganisms selected from the group consisting of bacteria and fungi which comprises applying to said microorgansims an effective amount for inhibiting said microorganisms of the compound of claim **1**.

4,036,960
1,3-BENZOXAZIN-4-ONE DERIVATIVES AND THEIR USE AS OVICIDES

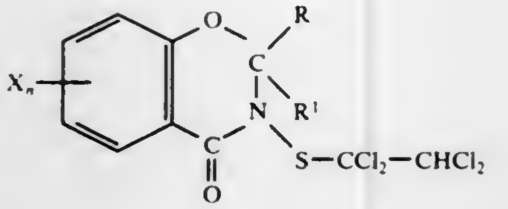
David Cheong King Chan, San Francisco, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Dec. 29, 1975, Ser. No. 645,000

Int. Cl.^{2} A01N *9/00, 9/22;* **C07D** *265/00, 273/00*

U.S. Cl. 424—248.5 **7 Claims**

1. A compound of the formula



wherein X is fluorine, chlorine or bromine, or alkyl of 1 to 3 carbon atoms, *n* is 0, 1 or 2, and R and R^1 are individually hydrogen, methyl or ethyl.

6. An ovicidal composition comprising an ovicidally effective amount of the compound of claim **1** and an inert pesticide carrier.

4,036,961
PHARMACEUTICAL COMPOSITIONS CONTAINING PTERIDINES

Alexander Stuart, Bromley, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

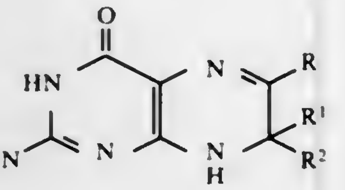
Division of Ser. No. 382,715, July 26, 1973, Pat. No. 3,939,160. This application Oct. 14, 1975, Ser. No. 622,226

Claims priority, application United Kingdom, Aug. 1, 1972, 35815/72; Feb. 1, 1973, 5189/73

Int. Cl.^{2} A01N *9/22;* **A61K** *31/505*

U.S. Cl. 424—251 **16 Claims**

1. A pharmaceutical composition for treating bacterial or protozoal infections comprising a compound of Formula (I), a tautomer form thereof or a pharmaceutically acceptable salt of the compound or its tautomer



(I)

in an amount effective for treating bacterial or protozoal infections and a pharmaceutically acceptable carrier therefore where R is a lower alkyl group substituted with one or more halogen atoms, and R^1 and R^2 are the same or different and each is a lower alkyl group or R^1 and R^2, together with the carbon atom in the pterdine ring structure, form a spirocycloalkyl ring system having 4 to 6 carbon atoms outside the pteridine ring structure.

4,036,962
6,7-METHYLENEDIOXY-1-(2,2,2-TRIFLUOROETHYL)-4(1H)-QUINOLONE-3-CARBOXYLIC ACID AND ITS SALTS AND ESTERS

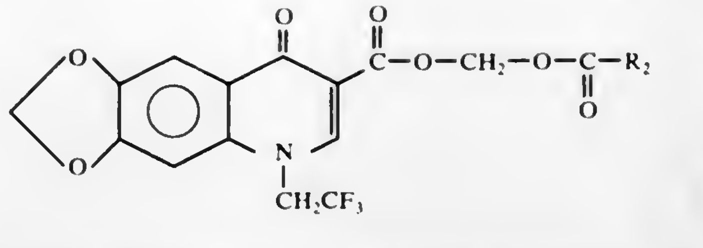
Kyu Tai Lee, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Co., Wilmington, Del.

Continuation-in-part of Ser. No. 496,851, Aug. 12, 1974, abandoned. This application May 16, 1975, Ser. No. 578,137

Int. Cl.^{2} C07D *215/56*

U.S. Cl. 424—258 **6 Claims**

1. A compound of the formula



wherein R$_2$ is tertiary alkyl of 4–10 carbon atoms wherein the carbon adjacent to the carbonyl is the tertiary carbon.

3. A method of treating bacterial infection in a warm-blooded animal which comprises administering to the warm-blooded animal an effective antibacterial amount of a compound of claim **1**.

5. A pharmaceutical composition comprising a suitable pharmaceutical carrier and an effective antibacterial amount of a compound of claim **1**.

4,036,963
DERIVATIVES OF QUINOLINE-8-CARBOXYLIC ACID HAVING PESTICIDAL ACTION

Franco Gialdi, Pavia; Angelo Longoni; Giannantonio Michieli, both of Milan, and Riccardo Ponci, Pavia, all of Italy, assignors to Montedison Fibre S.p.A., Milan, Italy

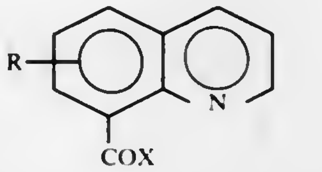
Filed Aug. 5, 1974, Ser. No. 494,976

Claims priority, application Italy, Aug. 6, 1973, 27580/73

Int. Cl.^{2} C07D *215;* **A61K** *31/47*

U.S. Cl. 424—258 **2 Claims**

1. A composition for combatting infestations due to *Macrosiphum solani, Aphis fabae, Leptinotarsa decemlineata, Pieris brassicae,* and *Spodoptera littoralis,* said composition consisting essentially of an aqueous dispersion of at least 0.05% by weight of an insecticide having the formula

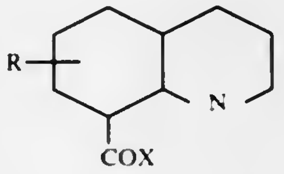


in which

R is selected from the group consisting of H, halogen, and alkyl groups having from 1 to 3 carbon atoms; and

X represents NH$_2$ or OY in which Y is selected from the group consisting of H, alkaline metals, alkaline earth metals; amines, and their quinoline salts with inorganic acids; and n-alkyl quinolinium salts.

2. The method of combatting infestations due to *Macrosiphum solani, Aphis fabae, Leptinotarsa decemlineata, Pieris brassicae,* and *Spodoptera littoralis,* which consists in applying to the habitat of said insects an aqueous dispersion of at least 0.5% of an insecticide having the formula



in which

R is selected from the group consisting of H, halogen, and alkyl groups having from 1 to 3 carbon atoms; and

X represents NH$_2$ or OY in which Y is selected from the group consisting of H, alkaline metals, alkaline earth metals, amines, and their quinoline salts with inorganic acids and n-alkyl quinolinium salts.

4,036,964
ISOCARBOSTYRIL-3-CARBOXYLIC ACID DERIVATIVES FOR THE PROPHYLAXIS OF ASTHMA, HAYFEVER AND RHINITIS

Derek Richard Buckle, Redhill; Barrie Christian Charles Cantello, Horsham, and Harry Smith, Maplehurst near Horsham, all of England, assignors to Beecham Group Limited, England

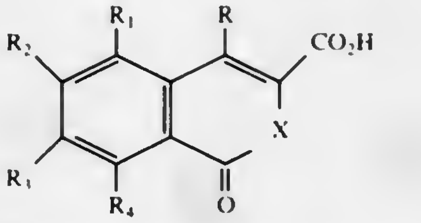
Division of Ser. No. 510,803, Sept. 3, 1974, Pat. No. 3,975,535. This application Dec. 24, 1975, Ser. No. 644,132

Claims priority, application United Kingdom, Oct. 11, 1973, 47485/73

Int. Cl.^{2} A61K *31/47*

U.S. Cl. 424—258 **45 Claims**

1. A pharmaceutical composition in a form suitable for oral, parenteral or insufflation administration to humans which comprises a compound of the formula (I):



(I)

or a pharmaceutically acceptable salt thereof or hydrate thereof, wherein X is NH, R is hydrogen, lower alkyl, cyclopentyl, cyclohexyl or cycloheptyl, R$_1$, R$_2$, R$_3$ and R$_4$ are each hydrogen, lower alkyl, lower alkoxy, cyclohexyl, phenyl, benzyl, halogen, carboxyl, lower alkoxycarbonyl, lower alkanoyloxymethoxycarbonyl, lower α-alkanoyloxyethoxycarbonyl or acetoxy, or R$_1$ and R$_2$, R$_2$ and R$_3$, or R$_3$ and R$_4$ taken together with the carbon atoms to which they are attached form a 1,2-phenylene or 1,2-cyclohexylene ring, in an amount sufficient to be effective for the prophylaxis of asthma, hayfever or rhinitis in combination with a pharmaceutically acceptable diluent or carrier suitable for said administration form.

4,036,965
5-SULFINYL-2-PYRIDINECARBOXYLIC ACIDS

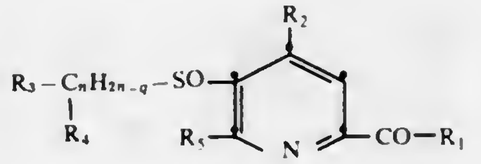
Neville Finch, West Orange, N.J., assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Mar. 4, 1976, Ser. No. 663,939

Int. Cl.^{2} A61K *31/455;* **C07D** *213/32*

U.S. Cl. 424—266 **8 Claims**

1. A compound of the formula



wherein R$_1$ is hydroxy, lower alkoxy, amino, mono- or di-lower alkylamino or hydrazino, R$_2$ is hydrogen, lower alkyl, lower alkoxy or halo, R$_3$ is hydrogen, lower alkoxy, lower alkylsulfinyl, halogeno, amino, mono- or di-lower alkylamino, phenyl or phenyl substituted by one or more than one member selected from the group consisting of lower alkyl, lower alkoxy, halo, trifluoromethyl, cyano, COR$_1$ and amino, R$_4$ is hydrogen, hydroxy or COR$_1$, R$_5$ is hydrogen, lower alkyl, lower alkoxy, halo or COR$_1$, *n* is an integer from 1 to 7, *q* is 1 and which C_nH_{2n-q}-moiety separates R$_3$ being lower alkoxy, lower alkyl-sulfinyl, halogeno, amino, mono- or di-lower alkylamino, and R$_4$ being hydroxy, from the SO-group by at least two carbon atoms, or a therapeutically useful salt thereof.

7. A hypotensive pharmaceutical composition comprising a hypotensively effective amount of a compound as claimed in claim **1**, together with pharmaceutical excipient.

4,036,966

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Krämer, Wuppertal-Barmen; Karl Heinz Büchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

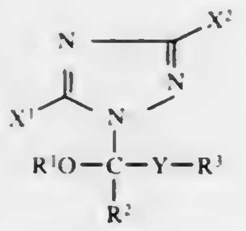
Division of Ser. No. 532,191, Dec. 12, 1974, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Jan. 2, 1976, Ser. No. 646,192

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.^{2} A61K *31/41*

U.S. Cl. 424—269 **24 Claims**

12. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

- X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;
- X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;
- R^1 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;
- R^2 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same of different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;
- R^3 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino, or aralkyl of 6 to 10 carbon atoms in the aryl moiety and 1 or 2 carbon atoms in the alkyl moiety, unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino; and
- Y is CO;

in combination with a pharmaceutically acceptable non-toxic, inert carrier.

4,036,967

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Krämer, Wuppertal; Karl Heinz Büchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

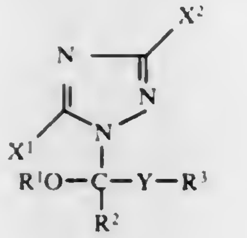
Division of Ser. No. 532,191, Dec. 12, 1974, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Jan. 2, 1976, Ser. No. 645,946

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.^{2} A61K *31/41*

U.S. Cl. 424—269 **28 Claims**

14. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

- X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;
- X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;
- R^1 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;
- R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;
- R^3 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms; and
- Y is $>C=NOH$;

in combination with a pharmaceutically acceptable nontoxic, inert carrier.

4,036,968

PHARMACEUTICAL TABLET

David Cedric Sharland, Worthing, England, assignor to Beecham Group Limited, England

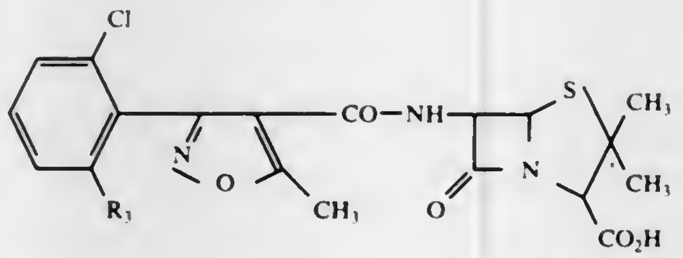
Division of Ser. No. 485,163, July 2, 1974, Pat. No. 3,996,365. This application Dec. 29, 1975, Ser. No. 644,424

Claims priority, application United Kingdom, July 12, 1973, 33214/73

Int. Cl.^{2} A61K *31/43*

U.S. Cl. 424—271 **6 Claims**

1. A pharmaceutical tablet which comprises 10% to 70% urea and an antibacterially effective amount of at least 20% of a penicillin of the formula



wherein R_3 is a hydrogen, chlorine or fluorine atom, or a pharmaceutically acceptable salt thereof.

4,036,969

2,12-DIOXO-7-HYDROXYMETHYL-9-PHENYL-1-AZA-5,8,11-TRIOXOTETRACYCLO[9.2.0.0^{6,13}0.^{6,9}]TRIDECANE

Irene Stirling, Worcester Park, England, assignor to Beecham Group Limited, England

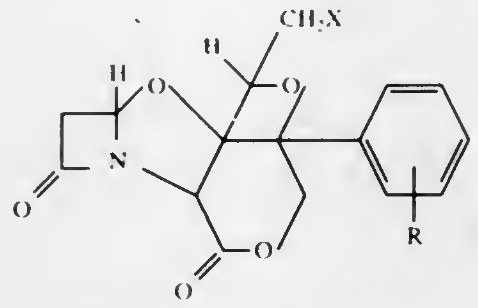
Filed June 11, 1976, Ser. No. 695,102

Claims priority, application United Kingdom, Dec. 15, 1975, 51200/75

Int. Cl.^{2} C07D *498/04;* **A61K** *31/42*

U.S. Cl. 424—272 **3 Claims**

1. A compound of the formula (II):



(II)

wherein R is hydrogen and X is hydroxy.

2. A pharmaceutical composition useful for effecting β-lactamase inhibition in humans and other mammals which comprises a β-lactamase inhibitory amount of the compound of claim **1** in combination with a pharmaceutically acceptable carrier.

4,036,970

IMIDAZOL-1-YL PROPANE DERIVATIVES

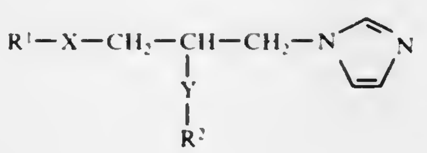
Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 599,743, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,600

Int. Cl.^{2} A61K *31/415;* **C07D** *233/60*

U.S. Cl. 424—273 **43 Claims**

1. A compound of the formula:

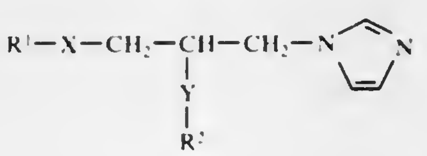


(I)

wherein:

- R^1 and R^2 are independently benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;
- X and Y are independently oxygen or sulfur with the proviso that Y is not oxygen when R^2 is phenyl or substituted phenyl; and the antimicrobial acid addition salts thereof.

41. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula



(I)

wherein:

- R^1 and R^2 independently benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;
- X and Y are independently oxygen or sulfu · with the proviso that Y is not oxygen when R^2 is phenyl and substituted phenyl; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,971

AMIDINO COMPOUNDS

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, and Rodney Christopher Young, Bengeo, all of England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

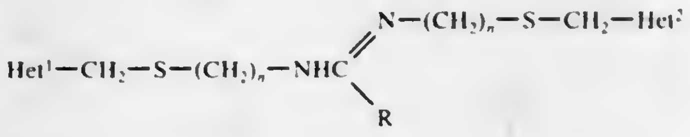
Filed Feb. 19, 1975, Ser. No. 551,220

Claims priority, application United Kingdom, Mar. 12, 1974, 10869/74

Int. Cl.^{2} A61K *31/415;* **C07D** *233/64*

U.S. Cl. 424—273 **7 Claims**

1. A compound of the formula:



$$Het^1-CH_2-S-(CH_2)_n-NHC\begin{array}{l}/\!\!/ N-(CH_2)_n-S-CH_2-Het^2\\ \diagdown R\end{array}$$

wherein Het^1 and Het^2 are independently imidazole which is attached at a ring carbon and which is optionally substituted by lower alkyl or halogen; *n* is 2 or 3; and R is lower alkyl or phenyl optionally substituted by hydroxy or mercapto, or a pharmaceutically acceptable acid addition salt thereof.

7. A method of blocking histamine H_2-receptors, said histamine H_2-receptors being those histamine receptors which are not blocked by mepyramine but are blocked by burimamide, which comprises administering to an animal in need of blocking of said histamine H_2-receptors in an effective amount to block said histamine H_2-receptors a compound of claim **1**.

4,036,972

2-(N-THIENYLMETHYL-PHENYLAMINO)-IMIDAZOLINES-(2) AND SALTS THEREOF

Helmut Stahle; Herbert Koppe; Werner Kummer, and Klaus Stockhaus, all of Ingelheim am Rhein, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

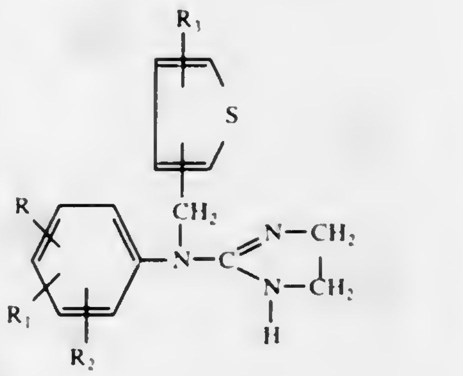
Continuation-in-part of Ser. No. 441,451, Feb. 11, 1974, Pat. No. 3,937,717. This application Aug. 25, 1975, Ser. No. 607,258

Claims priority, application Germany, Feb. 23, 1973, 2308883

Int. Cl.^{2} C07D *409/12;* **A61K** *31/415*

U.S. Cl. 424—273 **11 Claims**

1. a compound of the formula



wherein **R**, R_1 and R_2 are each hydrogen, fluorine, chlorine or bromine, but other than all hydrogen at the same time, and

R_3 is hydrogen, methyl or ethyl,

or a non-toxic, pharmaceutically acceptable acid addition salt thereof.

9. A method of relieving pain in warm-blooded animals, which comprises administering to warm-blooded animals an analgesically effective amount of at least one compound of claim **1.**

4,036,973

IMIDAZOL-1-YL PROPANE DERIVATIVES

Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

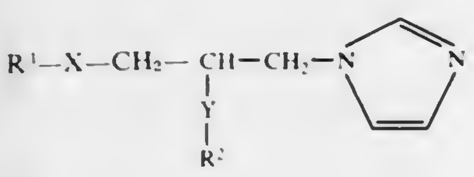
Continuation-in-part of Ser. No. 599,612, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,800

Int. Cl.² A61K *31/415;* **C07D** *233/60*

U.S. Cl. 424—273 **41 Claims**

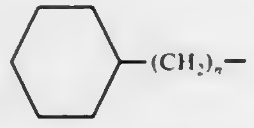
1. A compound of the formula:

(I)



wherein:

one of R¹ and R² is alkyl having 1 to 12 carbon atoms or the group

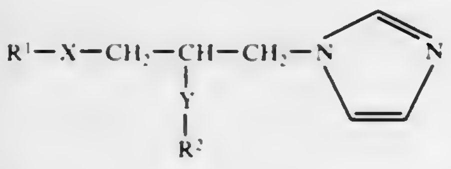


in which *n* is 0 to 3, and the other of R¹ and R² is benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;

X and Y are independently oxygen or sulfur with the proviso that Y is not oxygen when R² is phenyl or substituted phenyl; and the antimicrobial acid addition salts thereof.

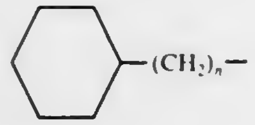
39. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula

(I)



wherein:

one of R¹ and R² is alkyl having 1 to 12 carbon atoms or the group



in which *n* is 0 to 3, and the other of R¹ and R² is benzyl, substituted benzyl, phenyl or substituted phenyl, said substituted benzyl and substituted phenyl substituted on the phenyl ring with one or more substitutents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl;

X and Y are independently oxygen or sulfur with the proviso that Y is not oxygen when R² is phenyl or substituted phenyl; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,974

1-{2'-[R'-THIO(OXY)]-3'-(R²-THIO(OXY)]PROPYL}-IMIDAZOLES

Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

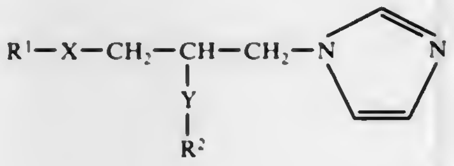
Continuation-in-part of Ser. No. 599,611, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 664,840

Int. Cl.² A61K *31/415;* **C07D** *233/60*

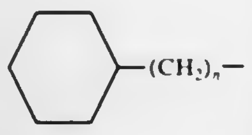
U.S. Cl. 424—273 **28 Claims**

1. A compound of the formula

(I)



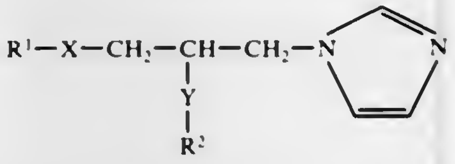
wherein R¹ and R² are independently alkyl having 1 to 12 carbon atoms or the group



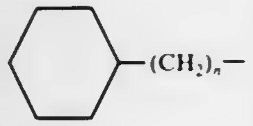
in which *n* is 0 to 3; X and Y are independently oxygen or sulfur; and the antimicrobial acid addition salts thereof.

26. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula

(I)



wherein R¹ and R² are independently alkyl having 1 to 12 carbon atoms or the group



in which *n* is 0 to 3 and X and Y are independently oxygen or sulfur; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,975

1-[2-(1-ADAMANTYL)-2-(R-THIO)ETHYL]IMIDAZOLES AND 1-[2-(1-ADAMANTYL)-2-(R-OXY)ETHYL]IMIDAZOLES

Keith A. M. Walker, Palo Alto, and Stefan Howard Unger, Cupertino, both of Calif., assignors to SXyntex (U.S.A.) Inc., Palo Alto, Calif.

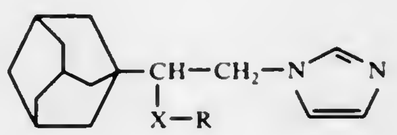
Continuation-in-part of Ser. No. 599,441, July 28, 1975, abandoned. This application Mar. 8, 1976, Ser. No. 665,012

Int. Cl.² A61K *31/415;* **C07D** *233/60*

U.S. Cl. 424—273 **28 Claims**

1. A compound of the formula:

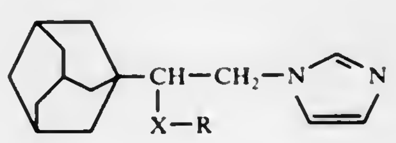
(I)



wherein R is alkyl, cycloalkyl, cycloalkyl lower alkyl, phenyl or phenyl lower alkyl, said phenyl and phenyl lower alkyl optionally substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl and wherein lower alkyl has 1 to 4 carbon atoms, alkyl has 1 to 12 carbon atoms and cycloalkyl has 5 to 7 carbon atoms; X is oxygen or sulfur with the proviso that X is not oxygen when R is phenyl or substituted phenyl; and the antimicrobial acid addition salts thereof.

26. A method of inhibiting the growth of fungi, bacteria or protozoa which comprises applying to a host object containing or subject to attack by fungi, bacteria or protozoa an effective amount of a compound of the formula

(I)



wherein R is alkyl, cycloalkyl, cycloalkyl lower alkyl, phenyl or phenyl lower alkyl, said phenyl and phenyl lower alkyl optionally substituted on the phenyl ring with one or more substituents independently selected from the group consisting of halo, lower alkyl and trifluoromethyl and wherein lower alkyl has 1 to 4 carbon atoms, alkyl has 1 to 12 carbon atoms and cycloalkyl has 5 to 7 carbon atoms; X is oxygen or sulfur with the proviso that X is not oxygen when R is phenyl or substituted phenyl; or an antimicrobial acid addition salt thereof or a composition containing same as an active ingredient.

4,036,976

SUBSTITUTED IMIDAZOLINYLAMINO-INDAZOLES

Peter Neumann, Bern, Switzerland, assignor to Sandoz, Inc., E. Hanover, N.J.

Continuation-in-part of Ser. No. 456,521, April 1, 1974, abandoned. This application Sept. 29, 1975, Ser. No. 617,823

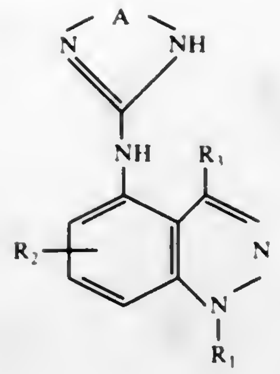
Claims priority, application Switzerland, Apr. 5, 1973, 4916/73

The portion of the term of this patent subsequent to Nov. 12, 1987, has been disclaimed.

Int. Cl.² C07D *403/12;* **A61K** *31/415*

U.S. Cl. 424—273 **29 Claims**

1. A compound of the formula



wherein

R₁ is hydrogen or alkyl of 1 to 3 carbon atoms,

R₂ is hydrogen, halogen, hydroxy, or alkyl, alkoxy or alkylthio each of 1 to 3 carbon atoms, and

R₃ is hydrogen, halogen, alkyl or alkoxy each of 1 to 3 carbon atoms, or hydroxy, and

A is dimethylene, wherein one hydrogen atom may be replaced by hydroxyl or alkyl of 1 to 3 carbon atoms,

or a pharmaceutically acceptable acid addition salt thereof.

25. A method of treating hypertension in animals, which comprises administering to an animal in need of such treatment a therapeutically effective amount of a compound of claim **1.**

4,036,977

POLYCYCLOPHENYLPYRROLIDINES, THEIR COMPOSITIONS AND USE

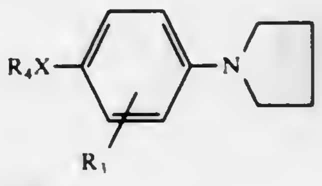
Daniel Lednicer, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 507,462, Sept. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 416,402, Nov. 16, 1973, abandoned. This application May 12, 1975, Ser. No. 576,342

Int. Cl.² C07D *207/06;* **A61K** *31/40, 31/135, 31/325*

U.S. Cl. 424—274 **23 Claims**

1. A compound of the formula

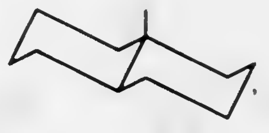


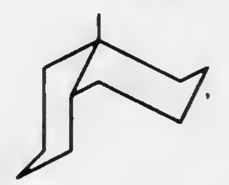
wherein

X is O, S, CH₂, N-lower alkyl or N-lower alkyl carboxyacyl, each alkyl of one to six carbon atoms, inclusive;

R₃ is hydrogen, halogen, methyl, 2,6-dimethyl, 3,5-dimethyl, —CHO, —CH₂OH, —CH(CH₃)OH, —CH₂SCH₃, or pyrrolidino;

R₄ is





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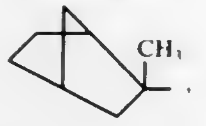
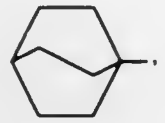
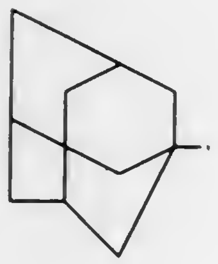
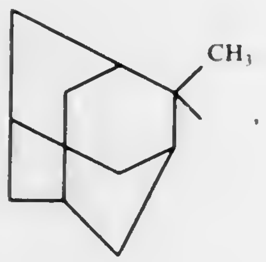
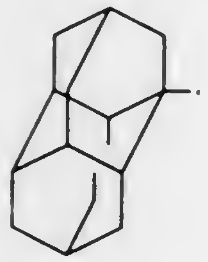
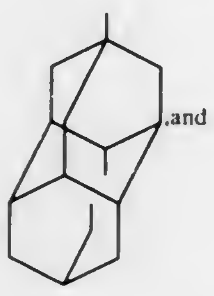


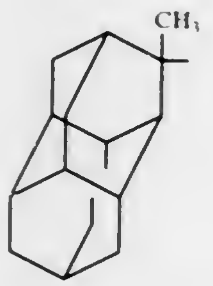












and pharmaceutically acceptable acid addition salts thereof.

4,036,978
ETHANODIBENZOINDOLES

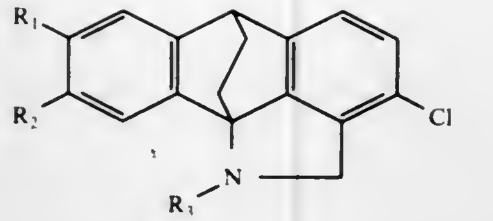
William J. Houlihan, Mountain Lakes, N.J., assignor to Sandoz, Inc., E. Hanover, N.J.

Filed May 6, 1976, Ser. No. 683,920

Int. Cl.² C07D *209/58;* A61K *31/40*

U.S. Cl. 424—274 **4 Claims**

1. A compound of the formula:



where

R₁ and R₂ each independently are hydrogen or straight chain lower alkyl of 1 to 3 carbon atoms and

R₃ is methyi or ethyl or

a pharmaceutically acceptable acid addition salt thereof.

3. A pharmaceutical composition useful in treating inflammation comprising 0,5 to 4,0 grams of a compound of claim **1** or a pharmaceuticaly acceptable acid addition salt thereof in association with a pharmaceutical carrier.

4,036,979
COMPOSITIONS CONTAINING 4,5,6,7-TETRAHYDROBENZ[B]THIEN-4-YL-UREAS OR DERIVATIVES AND METHODS OF ENHANCING GROWTH RATE

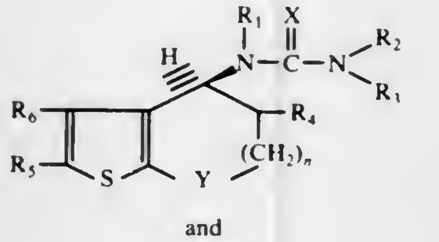
Goro Asato, Titusville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 572,492, April 25, 1975, abandoned, which is a continuation-in-part of Ser. No. 436,826, Jan. 25, 1974, abandoned. This application Apr. 12, 1976, Ser. No. 676,252

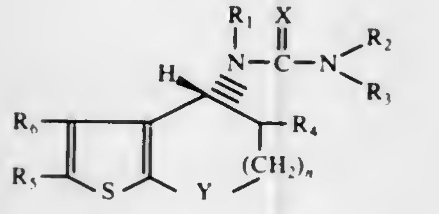
Int. Cl.² A61K *31/38*

U.S. Cl. 424—275 **76 Claims**

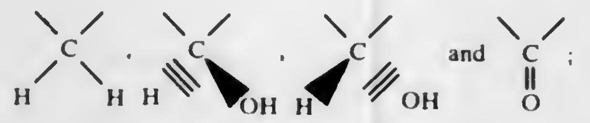
1. A method for improving the feed efficiency and enhancing the growth rate of veterinary homothermic animals which comprises administering to said animals an effective amount of a compound selected from the group consisting of those of the formulae:



and

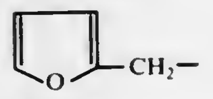


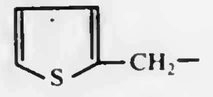
wherein X is oxygen or sulfur; *n* is the integer 1 or 2; Y is a divalent radical selected from the group consisting of those of the formulae:

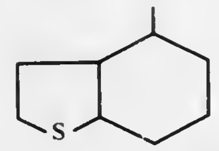


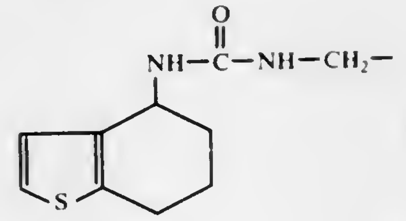
R₁ is hydrogen or alkyl C_1-C_4; R₃ is selected from the group consisting of hydrogen, alkyl C_1–C_4, cycloalkyl C_3–C_6, allyl, 2-propynyl, benzyl and β-phenethyl; R₄ is hydrogen or alkyl C_1–C_4; R₅ is hydrogen, chloro, bromo or iodo; R₆ is hydrogen or alkyl C_1–C_4; R₂ is selected from the group consisting of the substituents listed in the following table:

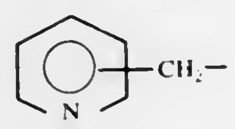
hydrogen
alkyl C_1-C8
cycloalkyl C_3-C6
allyl
2-propynyl
hydroxy
alkoxy C_1-C6
allyloxy
methoxymethyl
phenoxy
$-CH_2-CH(OR)2$
$-CH_2-CF3$
$-CH_2-CN$
$-NH-\ CO_2R$
$-O-CH_2-CO_2H$
$-CO_2C_2H5$

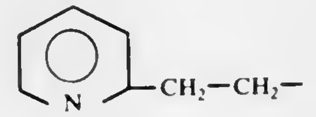


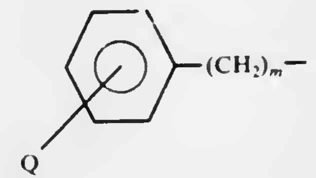








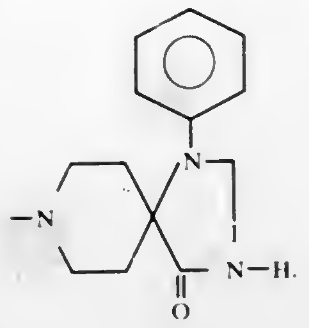




wherein R is alkyl C_1-C_4, *m* is 0, 1 or 2, and Q is selected from the group consisting of the substituents listed in the following table:

m = 0	m = 1	m = 2
4-nitro 3- or 4-methoxy 4-ethoxy 4-chloro 4-butoxy 2,4-dimethyl 2,4-dichloro 2,5-dimethoxy	hydrogen 4-chloro 4-methoxy	hydrogen

and R₂ and R₃ taken together with the associated N(itrogen) is selected from the group consisting of morpholino, piperidino, pyrrolidino, 4-(4-methoxyphenyl)piperazino, 1,2,3,4-tetrahydroquniolino and the moiety of the formula:



4,036,980
ETHER SUBSTITUTED BENZODIOXAN DERIVATIVES

Fritz Schaub, Basel, and Hanspeter Schelling, Oberwil, both of Switzerland, assignors to Sandoz Ltd., Basel, Switzerland

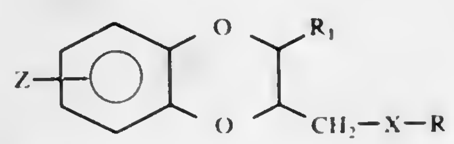
Filed May 28, 1975, Ser. No. 581,509

Claims priority, application Switzerland, June 5, 1974, 7664/74; Apr. 17, 1975, 4908/75

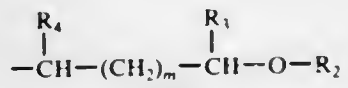
Int. Cl.² C07D *319/08;* A01N *9/28*

U.S. Cl. 424—278 **29 Claims**

1. A compound of the formula



in which R is a group of formula A,



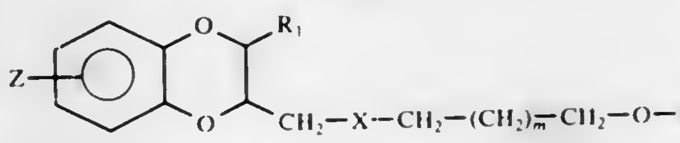
$$-\overset{R_4}{\overset{|}{C}H}-(CH_2)_m-\overset{R_3}{\overset{|}{C}H}-O-R_2 \qquad A$$

wherein R₂ is cyclopentyl or cyclohexyl
each of R₃ and R₄, independently, is hydrogen or C_1-C_4 alkyl,
each of R₅ and R₆, independently, is hydrogen or methyl, *m* is an integer of 1 to 6,
and each of n and p, independently, is an integer 1 or 2,
R₁ is hydrogen or C_1-C_7 alkyl,
X is oxygen or sulphur, and
Z is hydrogen, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_7 alkoxycarbonyl, halogen or nitro, or a group of the formula,

$R_7OOC-CH=CH-$

wherein R₇ is C_1–C_6 alkyl.

4. A compound of the formula:



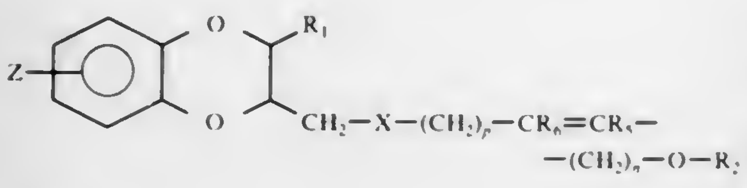
wherein
R₂ is C_1–C_{11} alkyl, a C_3–C_{11} mono- or multi-unsaturated aliphatic hydrocarbon radical, C_5–C_7 cycloalkyl, C_1–C_6 alkyl-C_5–C_7 cycloalkyl or phenyl,
m is 1 to 6,
R₁ is hydrogen or C_1–C_7 alkyl,
X is oxygen or sulfur, and
Z is hydroden, C_1–C_6 alkyl, C_1–C_6 alkoxy, C_1–C_7 alkoxycarbonyl, halo or nitro, or a group of the formula,

$R_7OOC-CH=CH-$

wherein R_7 is C_1-C_6 alkyl.

12. An insecticidal or acaricidal formulation comprising an insecticidally or acaricidally effective amount of a compound according to claim **4** in association with an insecticide or acaricide carrier or diluent.

21. A compound of the formula:



wherein

R_2 is C_1-C_{11} alkyl, a C_3-C_{11} mono- or multi- unsaturated aliphatic hydrocarbon radical, C_5-C_7 cycloalkyl, C_1-C_6 alkyl-C_5-C_7 cycloalkyl or phenyl,

each of

R_5 and R_6 is independently hydrogen or methyl,

each of

n and p is independently 1 or 2,

R_1 is hydrogen or C_1-C_7 alkyl,

X is oxygen or sulfur, and

Z is hydrogen, C_1-C_6 alkyl, C_1-C_6 alkoxy, C_1-C_7 akloxycarbonyl, halo, nitro, or a group of the formula,

$R_7OOC-CH \quad CH-$

wherein R_7 is C_1-C_6 alkyl.

28. A method of combating insects or acarids in a locus which comprises applying to the locus an insectically- or acaricidally-effective amount of a compound of claim **21**.

4,036,981

METHOD FOR TREATING INFLAMMATION

Marvin M. Goldenberg, Norwich, N.Y., assignor to Morton-Norwich Products, Inc., Norwich, N.Y.

Filed July 12, 1976, Ser. No. 704,122

Int. Cl.² A61K ***31/34***

U.S. Cl. 424—285 **1 Claim**

1. A method of treating inflammation which comprises orally administering to a host in need thereof an anti-inflammatorily amount of trans-5-(4-chlorophenyl)-2-furanacrylic acid in acceptable pharmaceutical dosage form.

4,036,982

O-ALKYL-S-ALKYL-O-[2-CARBALKOXY-BENZOFURAN(3)YL]-THIONOTHIOL-PHOSPHORIC ACID ESTERS

Hellmut Hoffmann; Hans-Jochem Riebel, both of Wuppertal, and Ingeborg Hammann, Cologne, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

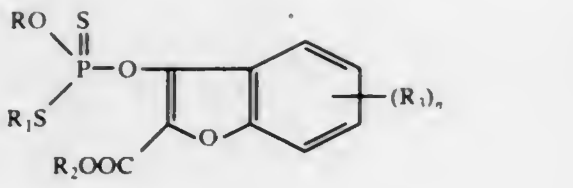
Filed July 30, 1976, Ser. No. 709,979

Claims priority, application Germany, Aug. 16, 1975, 2536502

Int. Cl.² A01N ***9/36;*** **C07D** ***307/85***

U.S. Cl. 424—285 **10 Claims**

1. An O-alkyl-S-alkyl-O-[2-carbalkoxy-benzofuran(3)yl]-thionothiolphosphoric acid ester of the formula



(I)

in which

R, R_1 and R_2 each independently is alkyl with 1 to 6 carbon atoms,

R_3 is halogen, or alkyl or alkoxy with 1 to 4 carbon atoms, and

n is an integer from 0 to 4.

8. An insecticidal composition containing as active ingredient an insecticidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,036,983

FERROCENE COMPOUNDS AND PHARMACEUTICAL COMPOSITION FOR USE IN TREATMENT OF IRON DEFICIENCY IN AN ANIMAL

David Rutherford, Loughborough; Peter Williams, Holmes Chapel, and Richard Anthony Raphael, Loughborough, all of England, assignors to Fisons Limited, London, England

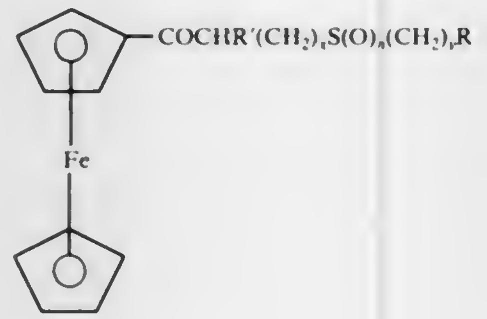
Filed Jan. 7, 1976, Ser. No. 647,133

Claims priority, application United Kingdom, Jan. 15, 1975, 1682/75

Int. Cl.² A01N ***9/00***

U.S. Cl. 424—295 **14 Claims**

1. A compound of formula I,



I

in which

R is a cycloalkyl group,

n is 0, 1 or 2,

R' is hydrogen, phenyl, alkyl C 1 to 6, cycloalkyl C 4 to 6, alkyl-cycloalkyl C 5 to 8, or phenyl-(alkyl C 1 to 6),

x is a whole number from 0 to 8, and

y is a whole number from 0 to 5.

12. A pharmaceutical composition for use in treatment of iron deficiency in an animal comprising a therapeutically effective amount of a compound according to claim **1**, as active ingredient, in combination with a pharmaceutically acceptable adjuvant, diluent or carrier.

4,036,984

SOIL FUNGI INHIBITING AGENT

Hiroki Takahashi; Kiyomi Ozawa; Yoshihiro Iwasawa, all of Funabashi; Masayuki Ogawa, Minami; Shigekatu Okamoto, Minami; Yoshinori Ochiai, Minami, and Eizo Katakura, Minami, all of Japan, assignors to Nissan Chemical Industries, Ltd., Tokyo, Japan

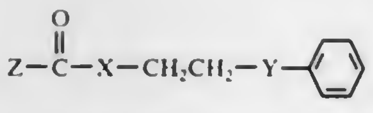
Filed Apr. 28, 1975, Ser. No. 571,925

Claims priority, application Japan, Apr. 30, 1974, 49-048420; Mar. 15, 1975, 50-031416

Int. Cl.² A01N ***9/24***

U.S. Cl. 424—311 **8 Claims**

1. A method of protecting a plant or a crop from damage due to soil fungi which comprises applying to the soil or to the crop plants a fungicidally effective amount of at least one of the followng compounds having the general formula:



wherein Z is selected from the group consisting of hydrogen, alkyl containing 1 to 21 carbon atoms and alkenyl containing 2 to 6 carbon atoms and both X and Y are oxygen.

4,036,985

MONO SUBSTITUTED MALONIC ACID DIAMIDES AND PROCESS OF PREPARING THEM

Jose Amato; Marta Propker; Magdalena Julia Beatriz Pongracz, and Jorge Luis Jose Szabo, all of Humahuaca 4065, Buenos Aires, Argentina

Filed July 16, 1975, Ser. No. 596,354

Int. Cl.² C07C ***103/44***

U.S. Cl. 424—320 **9 Claims**

1. New 2-monosubstituted malonic acid diamides of the formula

$RCH[CONH(CH_2)_3N(CH_3)_2]_2$

wherein R is a member of the group consisting of phenyl, benzyl, and lower alkyl of 1-4 carbons.

4,036,986

FUNGICIDAL N-(4-HALOBENZYL)-N-SEC. ALKYL-N'-PHENYLTHIOUREAS

Yasuo Yamada, Tokyo, Japan; Junichi Saito, Wuppertal, Germany; Tatsuo Tamura, and Yoshio Kurahashi, both of Tokyo, Japan, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

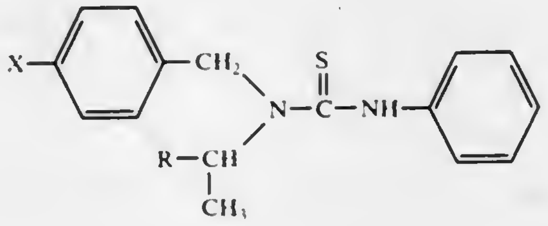
Filed Dec. 24, 1975, Ser. No. 644,242

Claims priority, application Japan, Dec. 24, 1974, 49-147526

Int. Cl.² A01N ***9/12***

U.S. Cl. 424—322 **10 Claims**

1. An N-(4-halobenzyl)-N-sec. alkyl-N'-phenylthiourea of the formula



in which

R is a C_1-C_6 alkyl radical, and

X is a halogen atom.

8. A fungicidal composition containing as the active ingredient a fungicidally effective amount of a compound according to claim **1** in admixture with a diluent.

4,036,987

CONTROL OF NEMATODES AND OTHER HELMINTHS

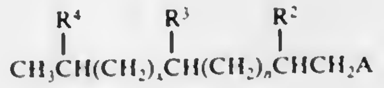
Malcolm J. Thompson, Baltimore; Julius Feldmesser, and William E. Robbins, both of Silver Spring, all of Md., assignors to The United States of America as represented by the Secretary of Agriculture, Washington, D.C.

Filed Nov. 12, 1975, Ser. No. 631,259

Int. Cl.² A01N ***9/20***

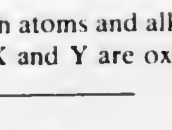
U.S. Cl. 424—325 **21 Claims**

1. A method of controlling plant parasitic nematodes comprising contacting said nematodes with a lethally effective amount of a compound selected from the group consisting of (a) compounds of the formula



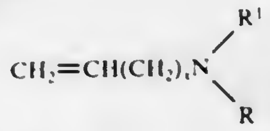
$$CH_3\overset{R^4}{\overset{|}{C}}H(CH_2)_x\overset{R^3}{\overset{|}{C}}H(CH_2)_n\overset{R^2}{\overset{|}{C}}HCH_2A$$

wherein A is



$$-CH_2N\begin{matrix} R^1 \\ R \end{matrix}$$

R and R^1 are selected from the group consisting of H, CH_3, and C_2H_5, and when x and n are each a number 3, each of R^2, R^3, and R^4 are selected individually from the group consisting of H and CH_3, and when x and n are not each a number 3 and the total of x and n is a number from 3 to 26, R^2, R^3, and R^4 are hydrogen; and (b) compounds of the formula



$$CH_2{=}CH(CH_2)_xN\begin{matrix} R^1 \\ R \end{matrix}$$

wherein x is a number from 8 to 30, and R and R^1 are selected individually from the group consisting of H, CH_3, and C_2H_5.

4,036,988

THERAPEUTIC COMPOSITIONS AND METHOD

Herbert Koppe, Ingelheim, Rhine; Albrecht Engelhardt, Mainz, Rhine, and Karl Zeile, Ingelheim, Rhine, all of Germany, assignors to Boehringer Ingelheim G.m.b.H., Ingelheim am Rhein, Germany

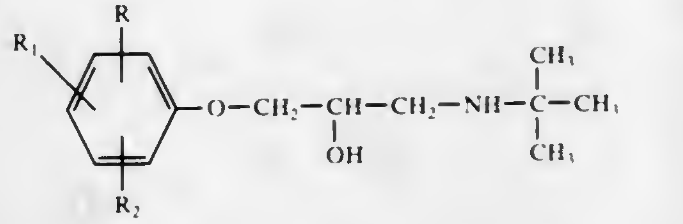
Continuation-in-part of Ser. No. 294,226, Oct. 2, 1972, abandoned, which is a division of Ser. No. 36,676, May 12, 1970, Pat. No. 3,740,444, which is a continuation-in-part of Ser. No. 700,376, Jan. 25, 1968, Pat. No. 3,541,130. This application Feb. 6, 1976, Ser. No. 656,000

Claims priority, application Germany, Feb. 6, 1967, 91070; June 15, 1967, 93025; July 25, 1967, 93645; United Kingdom, June 15, 1967, 27645/67

Int. Cl.² A61K ***31/135***

U.S. Cl. 424—330 **8 Claims**

6. A method of producing bradycardia and suppressing tachycardiac effects of N-isopropyl-noradrenaline in warm-blooded animals which comprises administering to warm-blooded animals a safe and effective amount of at least one compound selected from the group consisting of a racemate of 1-phenoxy-3-hydroxy-3-tert.-butylamino propane of the formula



wherein R is $-(CH_2)_x-NH_2$, where x is an integer from 0 to 3, R_1 and R_2 are halogen its optically active isomer and the non-toxic, pharmaceutically acceptable acid addition salt of said racemate and said optically active isomer.

4,036,989

ANTI-INFLAMMATORY COMPOSITION AND METHOD CONTAINING 2-FLUORO-4-ISOPROPYLBIPHENYL

Bernard J. Armitage, and John S. Nicholson, both of Beeston, England, assignors to The Boots Company Limited, England

Filed May 28, 1974, Ser. No. 473,485

Claims priority, application United Kingdom, June 1, 1973, 26276/73

Int. Cl.^{2} A61K *31/03;* **C07C** *43/20*

U.S. Cl. 424—353 **5 Claims**

1. A therapeutic composition useful in the treatment of inflammation comprising an effective anti-inflammatory amount of the compound 2-fluoro-4-isopropylbiphenyl in admixture with a pharmaceutically-acceptable excipient.

4,036,990

METHOD OF INCREASING THE RATE OF SOLUBILITY OF MATERIALS OF LOW SOLUBILITY

Yoshinobu Nakai, Tokyo; Shin'Ichiro Nakajima, Napashino, and Kiyoshi Sugiyama, Chiba, all of Japan, assignors to FMC Corporation, Philadelphia, Pa.

Filed Mar. 12, 1975, Ser. No. 557,723

Claims priority, application Japan, Sept. 13, 1974, 49-104898

Int. Cl.^{2} A01N *5/00*

U.S. Cl. 424—361 **5 Claims**

1. The method of increasing the rate of solubility of a material of low solubility comprising mixing the material with beta-1, 4 glucan, and pulverizing the mixture.

4,036,991

SKIN TREATMENT WITH EMOLLIENT CIS-6-HEXADECENOIC ACID OR DERIVATIVES

Werner K. Stiefel, Oak Hill, N.Y., assignor to Stiefel Laboratories, Inc., Oak Hill, N.Y.

Filed Jan. 24, 1972, Ser. No. 220,369

Int. Cl.^{2} A61K *7/00, 7/40, 9/06, 31/19*

U.S. Cl. 424—365 **4 Claims**

1. A method of benefically treating human skin which comprises applying to the skin a composition comprising an admixture of an emollient base with a cosmetic or therapeutic constituent, said base having as its essential emollient constituent at least one lipid substance selected from the group consisting of cis-6-hexadecenoic acid, the mono-, di- and triglycerides of cis-6-hexadecenoic acid, mixed glycerides containing cis-6-hexadecenoic as at least one of the fatty chains, the mono- and di- cis-6-hexadecenoic acid esters of ethylene and propylene glycols, and the cis-6-hexadecenoic acid esters of straight chain and branched chain monohydric alcohols, said lipid constituent comprising from about 3% to about 95% by weight of said composition.

4,036,992

CHEWING GUMS OF LONGER LASTING SWEETNESS AND FLAVOR

Bernard J. Bahoshy, Mahopac; Robert E. Klose, West Nyack, both of N.Y., and Harold A. Nordstrom, Reading, Mass., assignors to General Foods Corporation, White Plains, N.Y.

Continuation of Ser. No. 295,313, Oct. 5, 1972, Pat. No. 3,943,258. This application Dec. 29, 1975, Ser. No. 644,707

The portion of the term of this patent subsequent to Mar. 9, 1993, has been disclaimed.

Int. Cl.^{2} A23G *3/30*

U.S. Cl. 426—3 **2 Claims**

1. In a sweetened chewing gum composition which comprises gum base, flavor and a major amount of sugar sweetener which imparts normal sweetness to said gum the improvement which comprises at least 0.1% L-aspartyl-L-phenylalanine methyl ester by weight of the total gum composition whereby the normal sweetness and flavor is extended.

4,036,993

PROCESS FOR PREPARATION OF FISH MEAT EXTRACTS

Izumi Ikeda, and Takashi Takasaki, both of Karatsu, Japan, assignors to Tensei Suisan Company, Limited, Karatsu, Japan

Filed Apr. 16, 1976, Ser. No. 677,696

Claims priority, application Japan, Apr. 25, 1975, 50-49597

Int. Cl.^{2} A23L *1/325*

U.S. Cl. 426—7 **5 Claims**

1. A process for preparing fish meat extracts which comprises the steps of forming an aqueous mixture of uncomminuted fish bodies and water, maintaining said aqueous mixture at elevated temperature between about 50° and 60° C. and a pH between 9 and 10, adding to the heated mixture a first proteinase, said first proteinase being stable in alkaline media, maintaining said mixture with said proteinase at said elevated temperature, for a sufficient period of time to effect a first enzymatic reaction wherein proteins are decomposed to the stage or proteoses, adjusting the pH of the reaction mixture from said first enzymatic reaction to between about 5 and about 6, adding thereto a second proteinase, said second proteinase being stable in acidic media, maintaining the resulting mixture containing said second proteinase admixed therewith at elevated temperature between about 50° and about 60° C., for a sufficient period of time to effect a second enzymatic reaction, heating the products of said second enzymatic reaction to about 90° C. to deactivate said proteinases, separating said products into a plurality of layers including an aqueous fish meat extract layer, and recovering said aqueous fish meat extract layer.

4,036,994

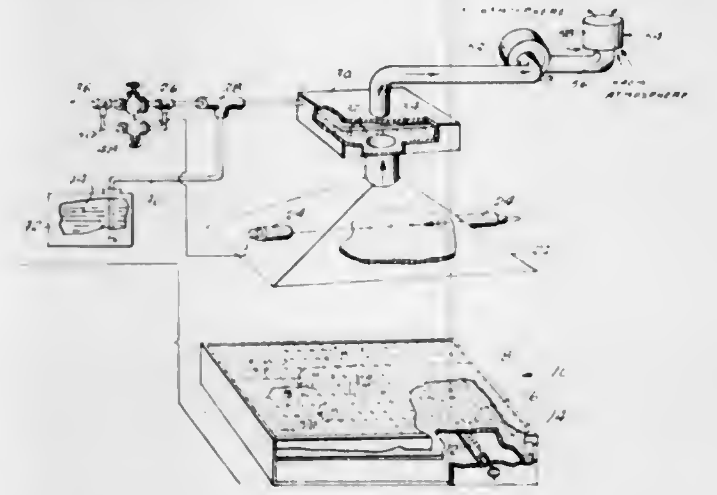
METHOD FOR ABATING ODOR AND SMOKE EMISSIONS IN THE VAPOR EXHAUST FROM A MEAT BROILING GRILL

Frank P. Ear, Nashville, N.C., assignor to H.G.C. Construction & Equipment Company, Inc., Rocky Mount, N.C.

Filed Mar. 21, 1975, Ser. No. 560,593

Int. Cl.^{2} A23L *1/31;* **A47J** *37/06*

U.S. Cl. 426—233 **7 Claims**



1. In a restaurant meat broiling method for a restaurant having a property line bounding the restaurant, in which method meat slabs are to be supported on a grill and cooked from below by heat radiating from a layer of heat radiating bodies which, in turn, are heated from beneath, typically by a gas burner, and

wherein the rising cooking vapor exhaust stream is collected in a hood which connects with a stack for discharging the cooking vapor exhaust stream to the atmosphere,

a method for abating odor and smoke emissions in the cooking vapor exhaust stream, comprising:

running the grill with the heat radiating bodies at a temperature, at the surfaces thereof which are presented toward the meat patties, between 600° F. and 800° F., in order to more completely incinerate meat juices which drop from the meat slabs onto the heat radiating bodies; and

spraying into the cooking vapor exhaust stream, after the said stream is collected in the hood but before said stream is discharged to the atmosphere sufficient quanta of oxidizer for the ordorous aldehydes released by char-broiling meat, to render the discharged stream substantially odorless as sensed at the boundary of the restaurant property,

wherein sufficiency of quanta is determined by initially running the grill at various degrees of saturation expected during meat broiling at the restaurant,

for each of several degrees of increasing saturation, adding to the rate of said spraying until, from the boundary of the restaurant property, the discharged stream is sensed as being substantially odorless,

sensing the degree of opacity of the cooking vapor exhaust stream as it enters the hood,

tabulating the spraying rate for achieving substantially odorless discharge at said boundary versus the degree of saturation of the grill for each of said several degrees and ranking the degree of opacity with the corresponding degrees of increasing saturation of the grill, and

utilizing the tabulation during operation of the grill to select the rate of spraying of oxidizer corresponding to the particular degree of saturation being experienced on the grill and the degree of opacity being experienced as the cooking vapor exhaust stream enters the hood.

4,036,995

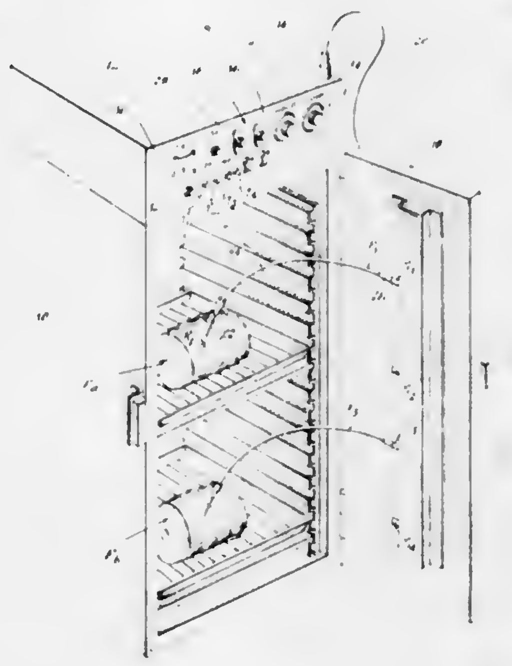
OVEN COOKING MONITOR FOR UNIFORMLY COOKING A PLURALITY OF FOOD ITEMS REQUIRING DIFFERENT COOKING TIMES

Bernard G. Koether, and Allan E. Witt, both of Westport, Conn., assignors to Food Automation Service Techniques, Inc., Stratford, Conn.

Filed Dec. 29, 1975, Ser. No. 644,875

Int. Cl.^{2} A23L *1/00;* **A47J** *37/00*

U.S. Cl. 426—233 **12 Claims**



6. An oven cooking method for automatically controlling the cooking, to a selected degree of doneness, of a plurality of food items requiring different cooking times, to permit food items to be loaded into the oven in random order and removed in the order in which the food items become done, comprising: placing food items into an oven,

inserting a temperature-sensing probe into each food item of a type that provides a signal varying with the temperature sensed by the probe, said temperature sensing probe being connected to said oven,

setting a reference temperature signal to correspond to the desired degree of doneness,

using self-actuating comparison means to compare the sensed temperature signal with the reference temperature signal and to provide an output signal when the sensed and reference signals match, to indicate which probe is associated with the done food items, and to switch the oven to a holding temperature curtailing further cooking of the food items,

removing the done food from the oven and disconnecting the probe for the done food item from the oven, and

in response to the disconnecting of the probe associated with the done food item, said comparison means stopping the indication that a food item is done, and switching the oven again to a cooking temperature to resume cooking of the remaining food items,

whereby cooking of the food items proceeds with each food item attaining the desired degree of doneness with overcooking automatically prevented, and with an indication of the order in which the food items become done and are to be removed.

4,036,996

PROCESS FOR THE PRODUCTION OF AN IMPROVED SIMULATED CASEIN FROM PROTEINACEOUS MIXTURES

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Apr. 26, 1976, Ser. No. 680,096

Int. Cl.^{2} A23J *3/00*

U.S. Cl. 426—254 **13 Claims**

1. A process for producing a proteinaceous mixture of modified plant protein and unmodified protein, said mixture having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

a. making an aqueous slurry of a plant protein material, said plant protein materials containing steam volatile flavor components and at least about 30 percent by weight protein, said slurry having a solids content of from about 3 percent to about 18 percent by weight;
b. adjusting the pH of the aqueous slurry to a pH in the range of from about 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;
c. reacting the alkali metal carbonate with the plant protein by heating the aqueous slurry to a temperature in the range of from 280° F. to 370° F. for from 2.5 to 5 minutes;
d. cooling the reacted protein slurry to a temperature below 130° F.;
e. adding from 0.3 percent to about 1.5 percent by weight peroxide to the slurry, said peroxide being a member selected from the group consisting of hydrogen peroxide, sodium peroxide, potassium peroxide, calcium peroxide, and magnesium peroxide;
f. mixing the peroxide containing slurry;
g. neutralizing the slurry to a pH within the range of from 6.6 to 7.0 by addition thereto of an edible acid;
h. thereafter, removing the steam volatile flavor components from the slurry by heating the slurry;
i. drying the neutralized slurry to remove a substantial portion of the water therein; and
j. admixing from 1 to 15 parts by weight of the substantially dried neutralized slurry with from 1 to 30 parts by weight proteinaceous material not having been modified by reaction with an alkali metal carbonate.

4,036,997

METHOD FOR FREEZE FORMING MEAT PRODUCTS

David L. VerBurg, 4069 Lila Ave., Grandville, Mich. 49418

Division of Ser. No. 431,678, Jan. 9, 1974, Pat. No. 3,924,295. This application June 20, 1975, Ser. No. 588,591

Int. Cl.^{2} A23L *1/31*

U.S. Cl. 426—272 **14 Claims**

1. The method of forming a shaped meat product capable of withstanding subsequent cooking without loss of geometric integrity comprising the steps of: providing chunks of unground fresh meat; forming a tacky exudate on the surface of the meat without further comminution of the same; packing the meat in a mold to fill it; closing the mold to entirely enclose the meat therein while applying little or no compressive forces to it; gradually expanding the meat in the closed mold by slowly subjecting the mold and the meat contained therein to subfreezing temperatures to generate elevated pressures solely by expansion resulting from freezing and by maintaining a constant volume in the mold allowing the pressure exerted upon the meat to increase to that which is necessary to force the meat to fill any voids within the mold and to press the meat chunks tightly together; thereafter continuing to freeze the meat while maintaining the pressure constant by controlled expansion of the mold volume until the entire contents of the mold is frozen, removing the frozen meat as an integrated body from the mold.

4,036,998

HONEY CONTAINING DESSERT COMPOSITION

John Ruff, Banbury, England, assignor to General Foods Limited, Oxon, England

Filed Jan. 21, 1976, Ser. No. 650,830

Claims priority, application United Kingdom, Jan. 31, 1975, 3739/75

Int. Cl.^{2} A23L *1/187*

U.S. Cl. 426—302 **5 Claims**

1. A process for producing a free-flowing powder dessert composition containing real honey which comprises spraying liquid honey globules having an average diameter of less than 300 microns on to an agitating free-flowing powder dessert composition.

4,036,999

TREATMENT OF WHEY

Donald A. Grindstaff, Minnetonka, Minn., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation of Ser. No. 502,262, Aug. 30, 1974, abandoned, which is a continuation of Ser. No. 336,843, Feb. 28, 1973, abandoned. This application Nov. 13, 1975, Ser. No. 631,799

Int. Cl.^{2} A23C *21/00;* **A21D** *2/34*

U.S. Cl. 426—549 **16 Claims**

1. A process for pretreating a raw cheese whey feed containing at least 20% acid cheese whey said percent being by weight based on the total weight of said feed and recovering insoluble solids therefrom which process consists essentially of:

a. adjusting the pH of said raw cheese whey feed to between about 6.5 to about 8.0 by the addition of base, whereby insoluble solids are formed within said raw cheese whey feed;
b. separating said insoluble solids produced by (a) above from said feed and recovering said insoluble solids as sludge; said liquid remaining after said insoluble solids removal also being recovered as a mother liquor; and
c. adding to said insoluble solids obtained by (b) after separation from said feed calcium ion at a concentration between about 0.002 to about 0.010 grams per gram of insoluble solids (dry basis) and heating the mixture to between about 125° F. to 200° F. for at least 1/6 hour.

4,037,000

ICING MIXTURE

Malcolm Leonard Ernest Burge, Thatcham, and Heather Ann Gill, Reading, both of England, assignors to Tate & Lyle Limited, London, England

Filed Oct. 22, 1976, Ser. No. 734,960

Claims priority, application United Kingdom, Oct. 24, 1975, 43749/75

Int. Cl.^{2} A23G *3/00*

U.S. Cl. 426—572 **21 Claims**

1. An icing composition comprising a mixture of (1) sugar comprising powdered sucrose and (2) an aqueous gel of xanthan gum containing up to 10% dry weight of xanthan gum, said mixture containing at least 82% by weight of sugar, said composition containing from 6.0 to 10.5% by weight of free water and from 0.15 to 0.7% by weight of dry xanthan gum.

4,037,001

SALAD DRESSING

France Flowers, 157 W. 73rd St., New York, N.Y. 10023

Filed Apr. 14, 1976, Ser. No. 677,058

Int. Cl.^{2} A23L *1/24*

U.S. Cl. 426—589 **5 Claims**

1. A method of preparing a salad dressing comprising

a. washing, draining, and shredding a portion of a head of raw red cabbage into coarsely-divided cabbage pieces of substantially equal size,
b. adding said cabbage pieces to a mixture of salad dressing ingredients comprising white vinegar, mayonnaise, sugar and salt,
c. agitating said mixture of salad dressing ingredients and cabbage pieces,
d. refrigerating said mixture of salad dressing ingredients and cabbage pieces, and
e. removing the liquid portion of said mixture of salad dressing ingredients and cabbage pieces, thereby providing an edible liquid salad dressing.

4,037,002

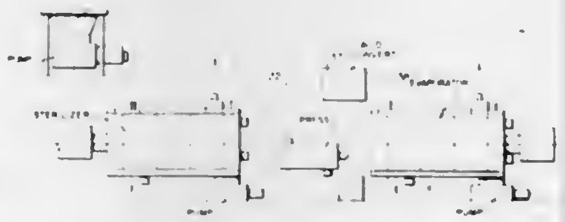
METHOD AND PROCESS FOR TREATING RUMEN CONTENT

Ivan S. Brumagim, 2 Woodlawn Drive, North Warren, Pa. 16365

Continuation-in-part of Ser. No. 384,909, Aug. 2, 1973, abandoned. This application Dec. 31, 1974, Ser. No. 537,833

Int. Cl.^{2} A23K *1/08, 1/10*

U.S. Cl. 426—641 **1 Claim**



1. A process for converting the rumen content of a slaughtered ruminant which contains fibers and separable solids, liquids, including water, which are normally acid, into a useful product, which comprises the following steps:

a. sterilizing said rumen content with agitation by heating said rumen content to a temperature of 212° F by indirect steam heat in a steam sterilizer and exhausting vapors from said sterilizer,
b. mechanically separating said fibers and separable solids from said liquid into a solid material containing approximately 50% moisture and a liquid containing about 5% entrained solids by weight, utilizing said fibers and separable solids as cattle feed,
c. neutralizing the acid in said liquid separated from said fibers and separable solids,
d. concentrating said neutralized liquid to entrained solids containing about 75% moisture by evaporating said liquids at a temperature of less than 425° F with agitation, and forming steam,
e. utilizing said steam from Step (d) as steam from a conventional boiler,
f. mechanically separating said entrained solids from said concentrated material or step D into solids containing about 50% moisture content and liquid, utilizing said entrained solids as cattle feed,
g. returning said liquid from said second mechanical separation step to said second mentioned sterilizing step and mixing said liquid with the said rumen content therein.

4,037,003

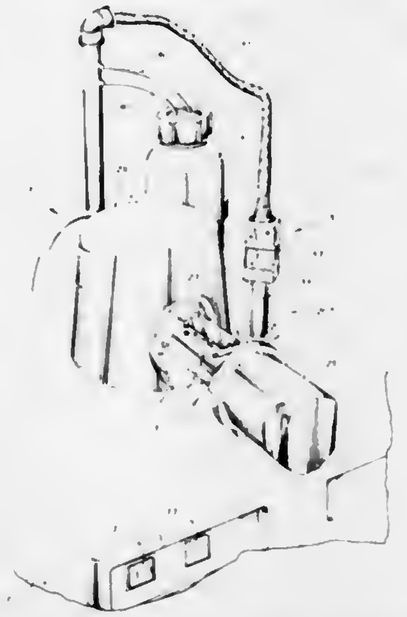
METHOD FOR BLOOD FILM PREPARATION

Francis William Maher, Jr., Milford, and Vladimir Valentine Pirc, Norwalk, both of Conn., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Division of Ser. No. 669,015, March 22, 1976, Pat. No. 4,016,828. This application Jan. 13, 1977, Ser. No. 758,998

Int. Cl.^{2} A01N *1/02;* **B05C** *11/02;* **G01N** *1/28*

U.S. Cl. 427—2 **9 Claims**



1. A method of preparing a blood film on a planar substrate comprising the steps of:

depositing a blood specimen on a substrate;
spinning the substrate at a high angular rate about an axis perpendicular to its plane; and
surrounding the substrate with a flowing curtain of liquid positioned to intercept and collect blood particles and aerosols spun off the substrate.

4,037,004

METHOD FOR PRODUCING THERMOPLASTIC RESIN FILMS OR SHEETS FOR CHELATE COLOR PRINTING

Shiro Nakano, Suita; Norio Kanbe, Amagasaki; Tsugumichi Nakagawa, Hirakata; Akira Nishio, Takatsuki, and Kengo Kitabara, Funabashi, all of Japan, assignors to Sekisui Kagaku Kogyo Kabushiki Kaisha and Tomoegawa Paper Co., Ltd., both of, Japan

Division of Ser. No. 413,509, Nov. 7, 1973, abandoned. This application Oct. 3, 1974, Ser. No. 511,727

Claims priority, application Japan, Nov. 9, 1972, 47-112729; Nov. 9, 1972, 47-112730; Nov. 9, 1972, 47-112731; Nov. 9, 1972, 47-112732

Int. Cl.^{2} B41M *5/12;* **B05D** *5/04*

U.S. Cl. 427—145 **20 Claims**

1. A process for producing a thermoplastic resin film for chelate color printing, which comprises

A. contacting at least one surface of a thermoplastic resin film with a mixed liquid composition comprising:
  i. a liquid capable of dissolving or swelling said thermoplastic resin,
  ii. a liquid having no ability to dissolve or swell said thermoplastic resin, compatible with said liquid (i) and having a faster rate of evaporation than said liquid (i), said liquid (i) being used in an amount of 1 to 100 parts by weight per 100 parts by weight of the liquid (ii), and (iii)
    a. an inorganic compound containing at least one metal atom selected from the group consisting of iron in the trivalent state, vanadium in the tetravalent or pentavalent state, molybdenum in the hexavalent state, titanium in the tetravalent state, and tungsten in the hexavalent state, or
    b. an organic compound capable of forming a chelate compound with the metal atom and developing a color, and
B. evaporating off said liquids (i) and (ii), thereby to form a porous layer of said film on the said contacted surface of the film and to simultaneously form on the porous surface of said layer a chelate color printing layer comprising said inorganic or organic compound (iii), said inorganic compound being present in the said mixed liquid in such amounts that it is deposited on the porous surface of the thermoplastic resin film in amounts of 0.2×10^{-4} to 0.1×10^{-1} mol/m^2 and wherein the organic compound is present in the liquid mixture in such amounts that it is deposited on the thermoplastic resin film in amounts of 0.3×10^{-4} to 0.2×10^{-1} mol/m^2.

4,037,005

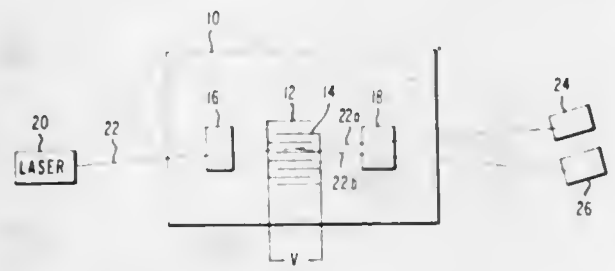
METHOD OF MAKING OPTICAL WAVEGUIDES AND PRODUCT BY THE PROCESS

William Phillips, Princeton, N.J., assignor to RCA Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 442,844, Feb. 15, 1974, abandoned, which is a continuation-in-part of Ser. No. 434,408, Jan. 18, 1974, abandoned. This application Mar. 6, 1975, Ser. No. 555,725

Int. Cl.^{2} B05D *5/06*

U.S. Cl. 427—162 **12 Claims**



3. The method of making an optical waveguide which comprises:

a. depositing a film of niobium on one surface of a polished single crystal of lithium tantalate,
b. oxidizing the niobium,
c. annealing the crystal at an elevated temperature to allow the niobium to diffuse into the crystal, and
d. cooling to room temperature.

4,037,006

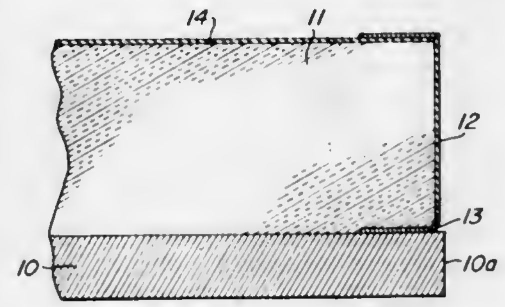
COMPOSITE PANEL-BOARD AND METHOD OF MAKING SAME

Frank William Roberts, 380 E. 7500 S., Midvale, Utah 84047; Richard Allen Roberts, 2551 Milo Way; Waldo Calvin Roberts, 4906 Regency, both of Salt Lake City, Utah 84117, and Robert Howard Blanpied, 519 Barnard, Centerville, Utah 89014

Filed Oct. 12, 1976, Ser. No. 731,369

Int. Cl.^{2} B32B *3/26*

U.S. Cl. 428—71 **15 Claims**



1. A composite panel board, comprising a rigid, gypsum board, base panel having mutually opposite, broad, flat surfaces; a rigid, organic plastic, foam layer formed in-situ on, self-adherant to, and covering one of the broad, flat surfaces of said gypsum board base panel; a visible slot extending along the mutually opposite, side-edge faces of the composite board between the foam layer and the base panel; and a water-vapor-resistant, flame-retardant layer adherant to and covering the otherwise exposed, broad surface of said foam layer.

4,037,007
DOCUMENT AUTHENTIFICATION PAPER

William Albert Wood, Basingstoke, England, assignor to Portals Limited, Basingstoke, England

Filed July 30, 1975, Ser. No. 600,380

Claims priority, application United Kingdom, Aug. 2, 1974, 34276/74

Int. Cl.² D21H *5/10*

U.S. Cl. 428—199 **15 Claims**

1. Paper for use in the production of security documents by printing thereon, which paper incorporates planchettes, said planchettes having incorporated therein or applied thereto a substance which is capable of taking part in a color-forming reaction whereby, when a security document produced from said paper is verified by the application of a reagent or reagents, the said substance changes color by the color-forming reaction, and wherein said paper may additionally comprise one or more substances capable of taking part in a color-forming reaction, said substance not being incorporated in said planchettes.

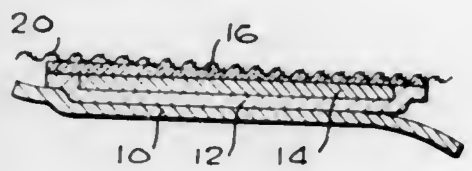
4,037,008
TRANSFER PRINTING PROCESS AND ARTICLE

Dennis H. Tugwell, Anaheim, Calif., assignor to Photo-Lith International, Stanton, Calif.

Continuation-in-part of Ser. No. 143,914, May 17, 1971, abandoned. This application Apr. 3, 1972, Ser. No. 240,371

Int. Cl.² B32B *3/00;* **B44C** *1/16;* **D06Q** *1/00*

U.S. Cl. 428—200 **9 Claims**



1. A transfer lamination having transfer layers for the application of an image onto fabric substrate, said transfer layers consisting of:

a transparent first layer which forms a tough rubbery film which has a high degree of thermal stability and is resilient to yellowing;

at least one image-carrying layer printed on the back of said first layer by a surface-to-surface printing method; and

an adhesive layer forming the back layer of said transfer lamination for adhesive attachment of said transfer lamination to a resilient substrate said adhesive layer forming a tough rubbery film which has a high degree of thermal stability and is resistent to yellowing.

9. In a process for producing a transfer lamination employed to apply an image to a flexible substrate which comprises the steps of forming a first transparent layer, printing an image layer onto the first layer, applying an adhesive layer to the image layer so that the three layers form a transfer lamination which can be adhesively applied to a flexible substrate, and drying and curing said layers, the improvement wherein:

the first transparent layer is formed on a transfer sheet by applying a layer of transparent polyvinyl chloride plastisol heat resistant thermal elastic stretch ink to a release surface of the transfer sheet and partially curing said layer by infrared heating; the image layer is formed on the first layer so as to be visible through the first layer by lithographically printing heat resistant ink which is compatible with the first layer on to said first layer; and the adhesive layer is formed by applying a polyvinyl chloride plastisol heat resistant thermal elastic stretch ink over the first layer and the image layer; said layers being partially cured such that the first layer and adhesive layers are not tacky at room temperature.

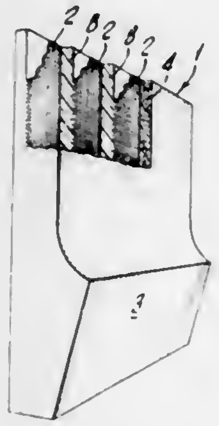
4,037,009
CONDUCTIVE ELASTOMERIC ELEMENTS

John Severinsen, Middletown, N.J., assignor to Metex Corporation, Edison, N.J.

Filed Aug. 11, 1976, Ser. No. 713,331

Int. Cl.² B32B *7/00*

U.S. Cl. 428—241 **20 Claims**



1. An electromagnetic shielding element comprising an elastomer containing a particulate conductive filler and at least one layer of knitted wire mesh in said elastomer.

4,037,010
ORGANIC COMPOSITES WITH IN-SITU FORMED FIBERS AND EXTENSIBLE MATRIX

Leon Brian Keller, Palos Verdes Estates, and Raymond E. Kelchner, Jr., Los Angeles, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Aug. 2, 1976, Ser. No. 711,000

Int. Cl.² B32B *5/02, 5/04*

U.S. Cl. 428—290 **8 Claims**

1. A composite material comprising a coherent, three-dimensional network of structurally interconnected polymeric fibers impregnated with an extensible resin matrix having a pliable resilient nature, which exhibits the propensity for increasing strength and toughness with repeated load cycling.

4,037,011
GLASS FIBER REINFORCED THERMOPLASTIC COMPOSITION AND PROCESS FOR ITS PREPARATION

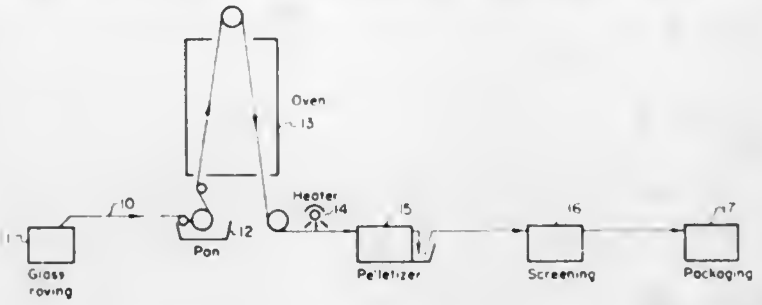
Kiyoshi Hattori; Edward L. Lowery; William H. Chadbourne, and William M. Boyer, all of Evansville, Ind., assignors to Dart Industries Inc., Los Angeles, Calif.

Continuation of Ser. No. 226,418, Feb. 15, 1972, abandoned, which is a division of Ser. No. 48,892, June 15, 1970, abandoned, which is a continuation of Ser. No. 677,969, Sept. 25, 1967, abandoned. This application Feb. 28, 1975, Ser. No. 553,962

Int. Cl.² B32B *5/16;* **D02G** *3/36;* **B44D** *1/02;* **C08F** *1/84*

U.S. Cl. 428—294 **13 Claims**

1. A blending concentrate of glass filaments uniformly predisposed in highly oriented relationship in a thermoplastic resin and having the form of generally rod-shaped granules of at least $\frac{1}{8}$ inch in length said granules being combinable by simple mixing with substantial quantities of unreinforced thermoplastic resin pellets to form dry free-flowing compositions which, on hot molding or shaping, yield superior reinforced articles, said concentrate consisting essentially of about 70 to 90% by weight of glass filaments and about 30 to 10% by weight of a thermoplastic resin chosen from the group consisting of polystyrene, styrene-acrylonitrile copolymer, polyethylene, polypropylene, polycarbonate, polyamide and polyester with a multiplicity of glass filaments extending in essentially parallel alignment throughout the length of each individual granule of said concentrate.



2. A blending concentrate as in ciaim **1** wherein said granules are generally at least $\frac{1}{4}$ inch in length.

4,037,012
TRANSFER MATERIALS

Edward Arthur Tilson, and Raymond Leonard Mayhew, both of Waltham Cross, England, assignors to Caribonum Limited, England

Filed Mar. 16, 1976, Ser. No. 667,523

Int. Cl.² B32B *3/26*

U.S. Cl. 428—304 **8 Claims**

1. Transfer material comprising a base sheet, a layer of porous material bonded to the base sheet and coloured ink contained within the pores of the porous material wherein the porous material comprises a mixture of at least one cellulose ester resin and one or more acrylic resins, the weight ratio of cellulose ester resin to acrylic resin within the range 6:1 to 1:6.

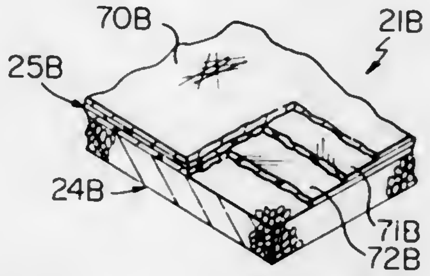
4,037,013
CARPET UNDERLAY COMPRISING FOAMED SCRAP PARTICLES

George R. Sprague, Dyersburg, Tenn., assignor to Dayco Corporation, Dayton, Ohio

Filed Nov. 7, 1975, Ser. No. 629,745

Int. Cl.² B32B *5/24, 5/30*

U.S. Cl. 428—310 **1 Claim**



1. A carpet underlay having an equal cross-section throughout and consisting of first and second layers, said first lyer comprising bonded scrap particles of flexible elastomeric foam material, said second layer bonded against the entire surface of said first layer free of additional adhesive means between layers, said second layer being defined by a plurality of sheets consisting of a sheet of spunbonded polyester fibers and at least one sheet of polyethylene film, said sheet of polyethylene film disposed adjacent said first layer.

4,037,014
SEMICONDUCTOR ABSORBER FOR PHOTOTHERMAL CONVERTER

Jonathan Isaac Gittleman, Trenton, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Oct. 21, 1975, Ser. No. 624,394

Int. Cl.² F24J *3/02;* **F03G** *7/02;* **B32B** *15/16*

U.S. Cl. 428—331 **7 Claims**

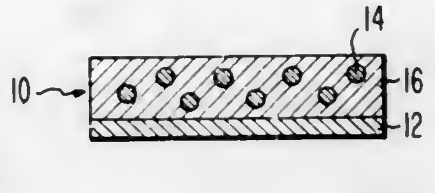
1. An absorber for photothermal conversion comprising:

a reflector;

a layer of electrically insulating material on said reflector;

granular semiconductor particles uniformly dispersed in said layer;

said electrically insulating layer having an index of refraction lower than said semiconductor particles and exhibiting no significant absorption in the infrared radiation region up to about 30 μ; and



said layer also being immiscible with said semiconductor particles.

4,037,015
HEAT INSULATING COATING MATERIAL

Keiichi Koike, Matsudo, and Toshimi Sasaki, Abiko, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Mar. 21, 1975, Ser. No. 560,818

Claims priority, application Japan, Mar. 29, 1974, 49-34427; Mar. 29, 1974, 49-34428

Int. Cl.² B28B *7/36*

U.S. Cl. 428—331 **16 Claims**

12. In an apparatus having a metal surface and a heat-protective coating on said metal surface formed from an inorganic material, the improvement wherein said heat-protective coating is formed by applying the composition of claim **1** to said metal surface and allowing said composition to dry.

4,037,016
ADHESIVE COMPOSITION

Bruce W. Habeck, Cuyahoga Falls, and George W. Feeney, Akron, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Continuation-in-part of Ser. No. 552,687, March 14, 1975, abandoned. This application Mar. 15, 1976, Ser. No. 666,736

Int. Cl.² C08K *5/01;* **C08L** *7/00, 53/02;* **C09J** *7/02*

U.S. Cl. 428—349 **10 Claims**

1. An adhesive composition prepared by mixing in the presence of a volatile organic solvent selected from at least one of the group consisting of toluene, benzene, pentane, hexane, heptane and octane, as well as unreacted hydrocarbons, (1) about 100 parts by weight of a rubber primarily selected from at least one of a natural rubber and synthetic rubber selected from cis-1,4-polyisoprene, cis-1,4-polybutadiene, butyl rubber, ethylene/propylene/non-conjugated diene rubber, aqueous emulsion copolymerized 1,3-butadiene and styrene, and an unvulcanized elastomeric block copolymer having the general configuration A - B - A wherein each A is an independently selected nonelastomeric styrene polymer block having an average molecular weight of about 2,000 to about 100,000 and a glass transition temperature above about 25° C., the total block A content being from about 10 to about 50 percent by weight of the copolymer, and B is an elastomeric conjugated diene polymer block of a diene selected from 1,3-butadiene and isoprene having an average molecular weight from about 25,000 to about 1,000,000 and a glass transition temperature below about 10° C., said copolymer having a tensile strength at 25° C., in excess of about 200 pounds per square inch, and (2) about 60 to about 140 parts by weight of a compatible, thermoplastic tackifying resin containing carbon-to-carbon unsaturation therein and having a softening point in the range of about 60° C. to about 80° C. and drying the resulting composition, said tackifying resin being prepared by the method which comprises (A) reacting in the presence of an aliphatic hydrocarbon solvent and a catalyst selected from aluminum chloride and ethyl aluminum dichloride, a monomer mixture consisting of 60 to about 75 weight percent of a diolefin/olefin mixture of a weight ratio in the range of about 0.6/1 to about 1.4/1 and, correspondingly, about 40 to about 25 weight percent α-methyl styrene, where said diolefin consists of at least about 95 weight percent piperylene and up to about 5 weight percent isoprene based on the diolefin, and where said olefin comprises at least one olefin selected from 2-methyl-2-butene, 2-methyl-2-pentene and 2-methyl-1-pentene and (B) recovering the resin from the polymerization mixture by first neutralizing the catalyst with a material selected from water, lime and at least one alcohol selected from methanol, isopropanol and butanol, followed by stream stripping the filtrate thereof to remove volatiles.

4,037,017

ELECTROCONDUCTIVE PAPER

William Walter Maslanka, London-Britain Township, Chester County, Pa., assignor to Hercules Incorporated, Wilmington, Del.

Filed Dec. 8, 1975, Ser. No. 638,786

Int. Cl.^{2} B32B *27/38, 33/00*

U.S. Cl. 428—413 **3 Claims**

1. In a electroconductive paper base sheet comprising a cellulosic web having disposed on at least one surface thereof an electroconductive layer the improvement wherein the electroconductive layer consists essentially of an electroconductive resin consisting essentially of the diquaternary chloride of the reaction product of (1) a water soluble or water dispersible poly(alkyldiallylamine)-epichlorohydrin base resin having epoxide moieties and (2) a tertiary amine having the formula $R_1R_2R_3N$ where R_1 and R_2 and R_3 are the same or different alkyls having from 1 through 9 carbon atoms in an amount at least stoichiometrically equivalent to the epoxide moieties of the base resin.

4,037,018

CATIONIC AQUEOUS COMPOSITIONS OF POLYMER HAVING AMINE GROUPS, ACID NEUTRALIZED, AND ABIS-MALEIMIDE CROSS-LINKER, COATINGS AND PROCESS

Vincent Daniel McGinniss, Valley City, Ohio, assignor to SCM Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 574,024, May 2, 1975, abandoned, which is a division of Ser. No. 519,409, Oct. 31, 1974, Pat. No. 3,925,181. This application July 2, 1976, Ser. No. 702,340

Int. Cl.^{2} C08J *3/06;* **C08K** *5/34*

U.S. Cl. 428—418 **9 Claims**

1. A coating composition in aqueous dispersion for forming a heat-curable film thereof on a substrate, comprising:

a polymer having at least about 5% by weight pendant primary and/or secondary amine groups, said amine groups being protonated with acid to render said polymer water-dis-persible; and

at least about 5% by weight of said polymer of bis-maleimide cross-linking agent,

said bis-maleimide for cross-linking said polymer through said amine groups by addition polymerization to form a heat-cured film on said substrate.

4,037,019

ACIDIC HYDROSOLS AND PROCESS FOR COATING THEREWITH

John F. Steger, Crystal Lake, Ill., assignor to Morton-Norwich Products, Inc., Chicago, Ill.

Filed Oct. 24, 1975, Ser. No. 625,638

Int. Cl.^{2} D02G *15/00*

U.S. Cl. 428—469 **36 Claims**

1. An acidic hydrosol composition consisting essentially of the initial constituents water, an acid selected from the group consisting of phosphoric acid, nitric acid, hydrochloric acid and acetic acid, a metal silicate selected from the group consisting of alkali metal metasilicates having the formula M_2SiO_3, alkali metal orthosilicates having the formula M_4SiO_4, where M is sodium or potassium, and hydrous magnesium silicate, magnesium compound selected from the group consisting of magnesium oxide and magnesium hydroxide, and a boron compound selected from the group consisting of boric oxide and boric acid, wherein said constituents are present in the following proportions:

Constituent	Percent by Weight
(A) Water	About 43 to about 94
(B) Acid	About 3 to about 51
(C) Alkali metal metasilicate	0 to about 16
(D) Alkali metal orthosilicate	0 to about 16
(E) Hydrous magnesium silicate	0 to about 18
(F) Magnesium compound	0 to about 6.6
(G) Boron compound	0 to about 1

wherein:

when (C) is O, then (D) is at least 1% and (F) is at least about 0.5%;

when (D) is O, then (C) is at least 1% and (F) is at least about 0.5%;

when both (C) and (D) are O, then (E) is at least about 0.9%;

when (C) and (E) are each zero, then (D) is at least 1% and (F) is at least 0.5%;

when (D) and (E) are each zero, then (C) is at least 1% and (F) is at least 0.5%;

when (C) is zero, then (D) is greater than zero but less than 1% when (E) is at least 0.9%;

when (D) is zero, then (C) is greater than zero but less than 1% when (E) is at least 0.9%;

the concentration of acid is at least the stoichiometric quantity required to react with either (C), (D) or (E), or with mixtures thereof to form silicic acid; and the ratio of M_2O to SiO_2 is from about 1:1 to about 2:1 in said alkali metal metasilicates and orthosilicates.

11. A process for depositing an electrically insulating and corrosion resistant coating from an acidic hydrosol onto a substrate which consumes a minor quantity of acid from said hydrosol, said substrate being selected from the group consisting of metals higher than hydrogen in the electromotive series, porcelain, glass, wood, paper, cotton, plastics and hydrateable oxides, said process comprising forming an acidic hydrosol as defined in claim **1**, contacting said hydrosol with said substrate to form a coating thereon and heating said coated substrate to dry said coating thereon.

36. A coated silicon steel sheet having thereon an adhered coating formed from the hydrosol defined in claim **1**.

4,037,020

ADHESIVE COMPRISING POST-CHLORINATED POLYETHYLENE AND POLYVINYL CHLORIDE

Ko Ishii, Takatsuki, and Tadamasa Yoshida, Kobe, both of Japan, assignors to Sumitomo Bakelite Company, Limited, Tokyo, Japan

Division of Ser. No. 428,997, Dec. 27, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 642,959

Claims priority, application Japan, Dec. 27, 1972, 48-129989; Dec. 27, 1972, 48-129990; Dec. 27, 1972, 48-129991; Dec. 27, 1972, 48-129992

Int. Cl.^{2} B32B *27/32, 27/30*

U.S. Cl. 428—518 **21 Claims**

1. A method of adhering polyvinyl chloride and an olefinic polymer which comprises co-extruding three layers of a polyvinyl chloride, an adhesive and an olefinic polymer to produce a three-layered laminate of, in order of layers, polyvinyl chloride, adhesive and olefinic polymer, said adhesive comprising

a. 1 to 99% by weight of post-chlorinated polyethylene having a specific gravity of 1.00 to 1.35, a chlorine content of 5 to 50% and a mean molecular weight of from about 20,000 to 200,000, and

b. 99 to 1% by weight of polyvinyl chloride having a mean degree of polymerization of from about 300 to 2,500.

7. A three-layered composite material prepared by the method according to claim **1**.

4,037,021

PHOTOPOLYMERIZABLE COMPOSITIONS CONTAINING A KETO DIOXOLANE AS THE PHOTOSENSITIZER

William R. Adams, Oakland, N.J., assignor to Sun Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 368,677, June 11, 1973, Pat. No. 3,944,509. This application Nov. 4, 1975, Ser. No. 628,836

Int. Cl.^{2} C08F *2/46, 4/00*

U.S. Cl. 428—522 **8 Claims**

1. A photopolymerizable composition consisting essentially of about 10–99 parts of (a) an ethylenically unsaturated monomeric ester and about 1–90 parts of (b) a photosensitizer selected from the group consisting of 2-trichloromethyl-4-benzoyl-4-phenyl-1, 3-dioxolane, 2-(p-dimethylaminophenyl)-4-benzoyl-4-phenyl-1,3-dioxolane, 2-cinnamyl-4-benzoyl-4-phenyl-1,3-dioxolane, and 2-furyl-4-benzoyl-4-phenyl-1,3-dioxolane.

4,037,022

FUEL CELL

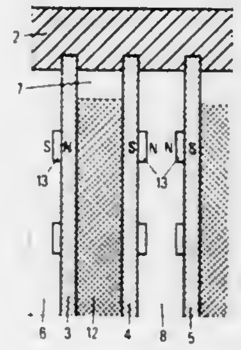
Jacques Cheron, Maisons-Laffitte, France, assignor to Institut Francais du Petrole, France

Filed May 6, 1976, Ser. No. 683,828

Claims priority, application France, May 12, 1975, 75.14941

Int. Cl.^{2} H01M *8/04*

U.S. Cl. 429—10 **9 Claims**



1. A fuel cell comprising a sealed block including a plurality of plates which delimit first compartments receiving a liquid electrolyte, second and third compartments receiving respectively a fluid fuel and a fluid comburent, means feeding said block with said liquid electrolyte, fluid fuel and fluid comburent, and means for subjecting at least some of the plates which delimit the compartments to magnetic attractive forces counteracting the action of pressing forces exerted on said plates by fluid contained in the compartments.

4,037,023

FUEL CELLS

Alain Grehier, Paris, and Jacques Chéron, Maisons-Laffitte, both of France, assignors to Institut Francais du Petrole, France

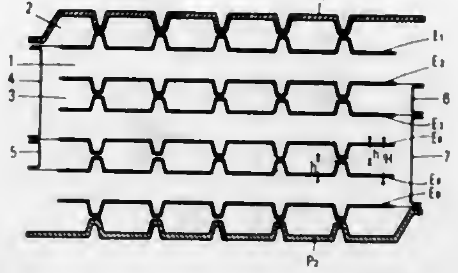
Filed Feb. 12, 1976, Ser. No. 657,535

Claims priority, application France, Feb. 25, 1975, 75.05826

Int. Cl.^{2} H01M *8/00*

U.S. Cl. 429—12 **21 Claims**

1. In an improved fuel cell of the type comprising a fuel cell block formed of a stack of electrodes which delimit between each other first compartments containing an electrolyte and second compartments for the circulation of fluid reactants, said second compartments being located at opposite sides of said first compartments, wherein the improvement comprises each of said electrodes being provided, on its face adjacent to said second compartments, with protrusions, the protrusions of one electrode bear on the protrusions of the adjacent electrode in the stack.



4,037,024

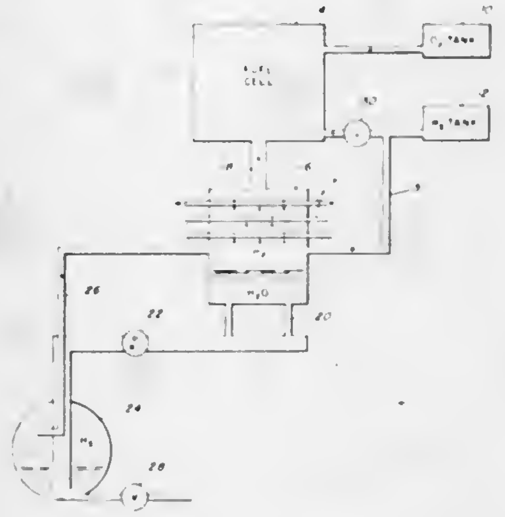
FUEL CELL PRODUCT-WATER MANAGEMENT SYSTEM

Michael B. Landau, West Hartford, Conn., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 9, 1973, Ser. No. 331,133

Int. Cl.^{2} H01M *8/04*

U.S. Cl. 429—17 **4 Claims**



1. A product-water management system for a hydrogen-oxygen fuel cell supplied through feed lines with hydrogen and an oxygen-containing gas, said system comprising:

conduit means for removing steam-carrying hydrogen from the fuel cell;

a condenser connected to said conduit means for converting said steam into water;

a water storage tank;

a tansfer line connecting said storage tank to said condenser;

a continuously operating pump mounted in said transfer line; and

a vent line at least partially mounted within said transfer line connected at one end to said water storage tank and at the other end to said condenser for equalizing the pressures in said condenser and said water storage tank.

4,037,025

HALOGEN FUELED ORGANIC ELECTROLYTE FUEL CELL

Arabinda N. Dey, Needham, and Carl R. Schlaikjer, Arlington, both of Mass., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.

Filed Oct. 20, 1972, Ser. No. 299,557

Int. Cl.^{2} H01M *8/00*

U.S. Cl. 429—29 **11 Claims**

1. A fuel cell comprising a porous cathode element for introducing a cathodic halogen; a source of halogen for said cath-

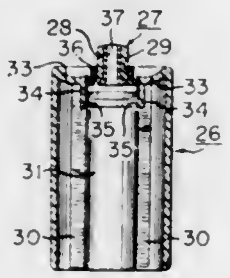
ode; an active metal anode; and an organic electrolyte in contact with said anode and said cathode, said organic electrolyte comprising an anhydrous polar organic liquid solvent having dissolved therein an anhydrous inorganic halide salt of said active metal and sulfur dioxide.

4,037,026

ADAPTER FOR NON-STANDARD SIZED BATTERY

Kenichi Mabuchi, Tokyo, Japan, assignor to Mabuchi Motor Co. Ltd., Tokyo, Japan

Division of Ser. No. 467,305, May 6, 1974, Pat. No. 3,998,516.
This application Dec. 31, 1975, Ser. No. 645,625
Claims priority, application Japan, May 6, 1974, 49-467305
Int. Cl.² H01M *2/10*
U.S. Cl. 429—100 6 Claims



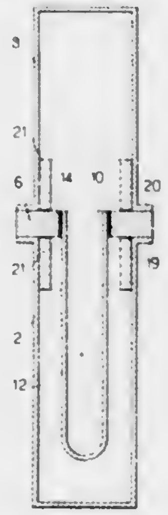
1. An adapter to enable a non-standard sized battery to be operatively placed into a battery compartment designed to house a standard size battery which is larger in diameter than said non-standard size battery, said adapter comprising an elongated, tubular body having a wall integral with one end thereof, a first plurality of fingers integral with said tubular body proximate said one end and extending radially inwardly, a second plurality of resilient fingers extending axially within said tubular body from the radially inner ends of said first plurality of fingers, said second plurality of fingers defining a bore for releasably holding the non-standard size battery and an elongated, conductive member, slidably positioned in said bore with one end of said conductive member being external of said adapter and with the opposite end of said conductive member being adapted to contact a terminal of a non-standard battery positioned within said adapter.

4,037,027

SODIUM-SULPHUR ELECTRIC CELL AND METHOD OF FORMING SAME

Gerard Desplanches, Villejust; Yvon Lazennec, St. Michel sur Orge, and Alain Wicker, Limours, all of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Nov. 4, 1976, Ser. No. 738,981
Claims priority, application France, Nov. 28, 1975, 75.36558
Int. Cl.² H01M *10/36, 10/38*
U.S. Cl. 429—104 17 Claims



1. A method of producing a sodium-sulphur type electric cell, said cell comprising:

a cathode tank for containing a cathode reagent which is liquid at operation temperature and is a material selected from the group consisting of sulphur, phosphorus, selenium and alkaline salts of these substances;

at least one solid electrolyte tube closed at its bottom end, for containing an anode reagent which is liquid at operation temperature, said tube consisting of an alkaline metal and being disposed in said cathode tank so as to be immersed in said cathode reagent, the walls of said tube being made of beta sodium alumina;

a support of an insulating ceramics substance for holding said electrolyte tube in said cathode tank, a glass part connecting said support to said tube;

an anode tank for containing a store of said anode reagent and being disposed above said cathode tank, so that said electrolyte tube opens at its top into said anode tank, said support separating the open ends of said anode tank and of said cathode tank;

said method comprising:

first, forming the connection between said electrolyte tube and said support of an insulating ceramics substance;

and successively disposing said tanks on either side of said support with flanges provided at their open ends and with said tanks substantially concentric with said electrolyte tube;

inserting an O ring respectively between the flanges of the tanks and said ceramics support;

heating the assembly to a temperature close to but lower than the melting point of the material constituting said O rings while maintaining compressive pressure on said flanges;

cooling the assembly down to ambient temperature; and

disposing at least one bushing previously in contact with at least the bottom part of the wall of each of said tanks with said bushings bearing on respective faces of said insulating ceramics support prior to heating said assembly.

11. An electric cell of the sodium-sulphur type, said cell comprising:

a cathode tank for containing a cathode reagent which is liquid at operation temperature and is a material selected from the group consisting of sulphur, phosphorus, selenium and alkaline salts of these substances;

at least one solid electrolyte tube closed at its bottom end for containing an anode reagent which is liquid at operation temperature, said tube consisting of an alkaline metal and being disposed in said cathode tank so as to be immersed in said cathode reagent, the walls of said tube being made of beta sodium alumina;

a support of an insulating ceramics substance for holding said electrolyte tube in said cathode tank,

a glass part connecting said support to said tube,

an anode tank for containing a store of said anode reagent and being disposed above said cathode tank so that said electrolyte tube opens at its top into said anode tank, said support separating the open ends of said anode tank and said cathode tank,

said tanks being initially disposed on either side of said support and including flanges provided at their open ends substantially concentric with said electrolyte tube with an O ring inserted respectively between the flanges of the tanks and said ceramic support, and said tanks being joined to said support by heating the assembly to a temperature close to but lower than the melting point of the material constituting said O rings while maintaining compressive pressure on said flanges and cooling said assembly, and

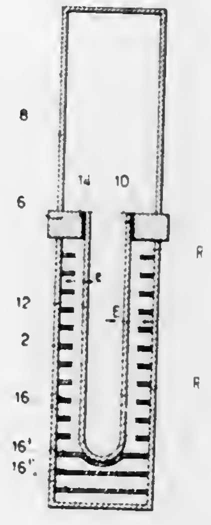
at least one bushing disposed in contact with said at least the internal bottom part of the wall of each of said tanks with said bushings bearing on respective faces of said insulating ceramic support prior to heating said assembly.

4,037,028

SODIUM-SULPHUR TYPE ELECTRIC CELL

Alain Le Méhauté, Gif sur Yvette, and Philippe Bordet, Sartrouville, both of France, assignors to Compagnie Generale d'Electricite, Paris, France

Filed Nov. 4, 1976, Ser. No. 738,995
Claims priority, application France, Nov. 20, 1975, 75.35469
Int. Cl.² H01M *10/36*
U.S. Cl. 429—104 2 Claims



1. An electric cell of the sodiumsulphur type, comprising:

a cathode tank containing a cathode reagent which is liquid at operation temperature and is selected from the group consisting of sulphur, phosphorus, selenium and the alkaline salts of these subsstances,

at least one solid electrolyte tube closed at its bottom end, containing an anode reagent which is liquid at operation temperature and constituted by an alkaline metal, said tube being disposed in said cathode tank so as to be immersed in said cathode reagent, said walls of the tube being made of beta alkaline alumina;

an insulating ceramic support for holding said electrolyte tube in said cathode tank, a glass part forming a connection between said support and said tube;

an anode tank containing a supply of said anode reagent and disposed above said cathode tank with said electrolyte tube opening at its top into said anode tank, said support separating the open ends of said anode tank and of said cathode tank, said cathode tank being fitted with a plurality of washers made of graphite felt for ensuring cathode collection of the generated current with the edges of some of the washers facing the lateral wall of said electrolyte tube being disposed at a predetermined distance from the tube and having at least one other washer bearing against the bottom of said electrolyte tube.

4,037,029

PHOTOELECTROGENERATIVE CELL

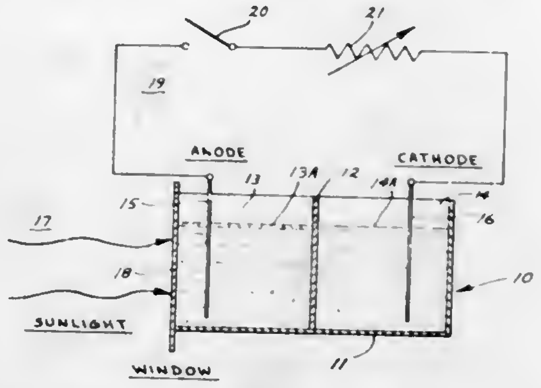
John Harland Anderson, 12920 Nicollet Ave., Burnsville, Minn. 55337

Filed July 16, 1975, Ser. No. 596,352
Int. Cl.² H01M *6/30, 6/36*
U.S. Cl. 429—111 12 Claims

1. Photoelectrogenerative cell means comprising, in combination, cell means including an anode cell and a cathode cell for retaining an anolyte and catholyte respectively, cell isolation means physically separating and ionically coupling said anolyte and said catholyte; means providing for the transmission of solar radiation into said anolyte;

a. said anode cell containing an anolyte comprising an electrolyte in aqueous solution and a particulate photosensitive electrogenerative solid substantially insoluble in said anolyte solution in admixture with said anolyte therein, an anode immersed in said anolyte, said anode being effectively electrolytically inert to said anolyte and to said photosensitive electrogenerative material;

b. said cathode cell containing a catholyte consisting essentially of an electrolyte in aqueous solution and a cathode immersed in said catholyte, said cathode being effectively electrolytically inert to said catholyte; and



c. said cell isolation means comprising electrolytically permeable means electrolytically coupling the respective solutions of said anolyte cell and said catholyte cell.

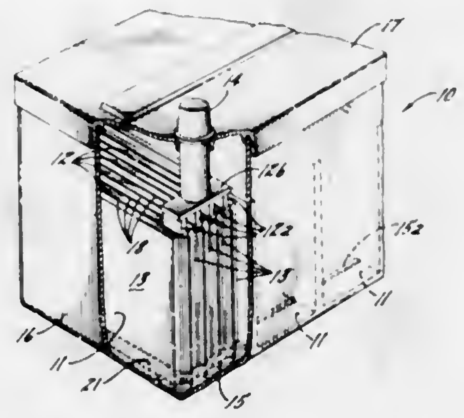
4. The photoelectrogenerative cell means as defined in claim 1 being particularly characterized in that said photosensitive electrogenerative material is an enzyme.

4,037,030

STORAGE BATTERY AND METHOD OF FORMING THE SAME

Anthony Sabatino, St. Paul, Minn., assignor to Gould Inc., Rolling Meadows, Ill.

Filed Mar. 31, 1975, Ser. No. 563,840
Int. Cl.² H01M *2/18*
U.S. Cl. 429—139 8 Claims



1. A storage battery comprising the combination of

a. a plurality of alternately positive and negative plates disposed within an electrolyte in a battery container, said plates resting on the bottom of said container,

b. a battery separator material in the form of envelopes around at least alternate plates with each envelope being sealed along at least the lower portions of the vertical edges of the plate and at least partially open along the lower edge of the plate to form bottom openings to permit access of a bonding material to the lower edge of the plate, and

c. a bonding material adhered to both the bottom wall of the battery container and the lower edges of the plates and extending through the bottom openings formed by said envelopes, said bonding material also sealing said bottom openings to prevent the treeing of active material between positive and negative plates at the bottom of the container.

5. A method of forming a storage battery comprising the steps of

a. forming a layer of liquid bonding material on the bottom of a battery container,

b. placing a plurality of alternately positive and negative plates within said container with the plates resting on the container bottom and with a battery separator material in the form of envelopes around at least alternate plates with each envelope being sealed along at least the lower portions of the vertical edges of the plate and at least partially open along the lower edge of the plate to form bottom openings to permit access of the bonding material to the lower edge of the plate so that the bonding material adheres to both the container bottom and the lower edges of the plates, the bonding material having sufficient depth to seal said openings to prevent the treeing of active material between positive and negative plates on the container bottom, and

c. solidifying the liquid bonding material.

4,037,031

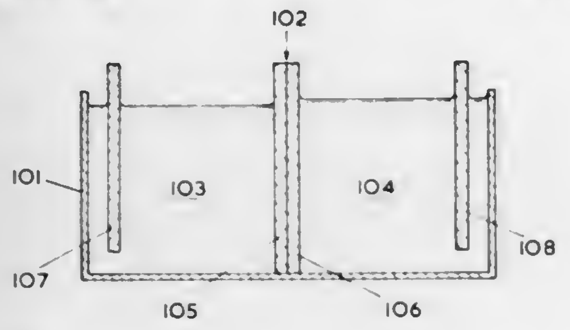
BIPOLAR LEAD ACID BATTERY HAVING TITANIUM AND ZIRCONIUM ELECTRODE SUPPORTS

William Robin Jacob, Newport, England, assignor to Imperial Metal Industries (Kynoch) Limited, Birmingham, England

Filed June 3, 1975, Ser. No. 583,273

Int. Cl.^{2} H01M *10/18*

U.S. Cl. 429—149 **29 Claims**



1. A lead acid battery including at least two cells containing sulphuric acid electrolyte, there being a bipolar electrode comprising an electrically conducting impervious sheet of metal having on one side a first surface of a material selected from the group consisting of titanium and a titanium alloy, and on the other side a second surface of a material selected from the group consisting of zirconium and a zirconium alloy, the sheet forming a barrier wall between two adjacent cells, the first surface forming a support structure for the lead dioxide active mass of the positive electrode of one cell, and the second surface forming the support structure for the lead active mass of the negative electrode of the adjacent cell.

4,037,032

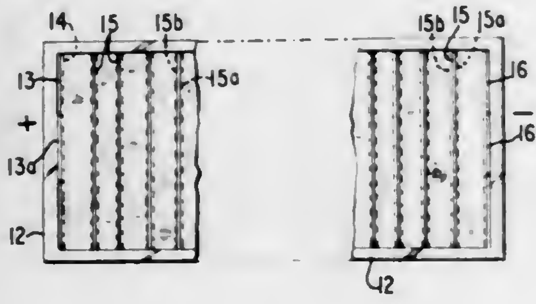
ELECTRIC STORAGE BATTERY WITH VALVE METAL ELECTRODES

Antonio Nidola, Milan, Italy; Vittorio de Nora, Nassau, Bahamas, and Placido M. Spaziante, Milan, Italy, assignors to Diamond Shamrock Technologies S.A., Geneva, Switzerland

Filed May 5, 1976, Ser. No. 683,544

Int. Cl.^{2} H01M *6/16*

U.S. Cl. 429—198 **28 Claims**



1. An electric storage battery comprising a casing, a cover, an aqueous bromide electrolyte containing a bromine sequestering agent, and at least one pair of a cathode and anode, the said cathode being a titanium base having an electrical conducting, electrocatalytic oxide coating thereon containing oxides of a metal selected from the group consisting of ruthenium, rhodium, palladium, osmium, iridium, platinum and mixtures thereof and mixed oxides of at least one of said metals and at least one film forming metal.

24. An electric battery capable of generating a persistant battery voltage and current, said battery including an electrolyte and a titanium electrode comprising an electroconductive substrate having thereon a conductive oxide of a platinum group metal, a reactant stored in electrical contact with said electrode, said reactant being capable of reacting with the electrolyte at the electrode interface to produce ions and promote current flow and a second electrode.

4,037,033

RECHARGEABLE NICKEL-ZINC BATTERY

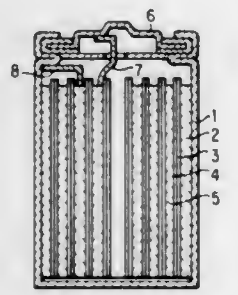
Tsutomu Takamura, Kawasaki; Tamotsu Shirogami, Yamato; Hirokazu Niki, Yokohama, and Kazuo Aizawa, Kawasaki, all of Japan, assignors to Tokyo Shibaura Electric Co. Ltd., Kawasaki, Japan

Filed Jan. 20, 1976, Ser. No. 650,782

Claims priority, application Japan, Jan. 20, 1975, 50-8440

Int. Cl.^{2} H01M *6/04*

U.S. Cl. 429—206 **11 Claims**



1. A rechargeable nickel-zinc battery comprising in combination:

a. a negative electrode prepared by adhering to a current collector sheet, a mixture comprising a fluorine containing resin and a powder which contains 3 to 20 wt. % of at least one member selected from the group consisting of calcium oxide and calcium hydroxide, 1 to 20 wt. % of at least one member selected from the group consisting of bismuth oxide, bismuth hydroxide, cadmium oxide and cadmium hydroxide; the balance being zinc and at least one member selected from the group consisting of zinc oxide and zinc hydroxide, with said sheet structure of fluorine containing resin;

b. a positive electrode having hydrated nickel oxide as the active material and having a theoretical capacity of one-quarter to one half times the theoretical capacity of said negative electrode;

c. a separator which is place between said negative and positive electrodes;

d. a quantity of concentrated alkaline electrolyte of from 1.0 to 1.7 ml per one ampere hour of the theoretical capacity of said negative electrode.

4,037,034

PHOTODEGRADABLE POLYOLEFIN COMPOSITION CONTAINING A DINAPHTHYLPHTHALATE

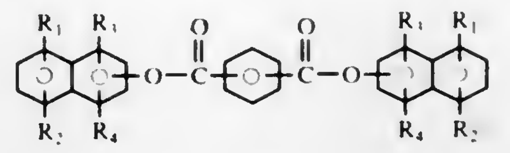
Don A. Plank, Sarnia, Canada, assignor to Exxon Research and Engineering Company, Linden, N.J.

Continuation-in-part of Ser. No. 562,579, March 27, 1975, abandoned. This application Oct. 28, 1976, Ser. No. 736,685

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 526—5 **9 Claims**

1. A plastic composition containing polyolefin having incorporated therein an effective amount of an accelerating agent which is a dinaphthylphthalate compound having the formula:



wherein R_1, R_2, R_3 and R_4 are selected from the group consisting of hydrogen; a straight or branched chain alkyl group having from 1 to 6 carbon atoms; cyano; nitro; lower alkoxy; fluorine; dialkylamino; phenyl; halo-phenyl; benzyl; or halobenzyl.

4,037,035

HYDROPHILIC MODIFIED ACRYLIC POLYMERS PARTICULARLY HYDRODISPERSIBLE OR HYDROSOLUBLE MODIFIED ACRYLIC POLYMERS AND METHOD OF PREPARING THE SAME

Jean-Henri Blanc, Pau; Rene Pornin, Arthez-de-Bearn, and Robert Voirin, Mourenx, all of France, assignors to Societe Nationale Elf Aquitaine (Production), Paris, France

Filed July 23, 1975, Ser. No. 598,185

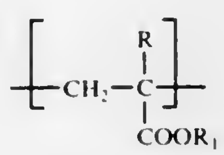
Claims priority, application France, July 26, 1974, 74.26010

Int. Cl.^{2} C08F *8/32, 220/06, 220/14, 220/18*

U.S. Cl. 526—16 **29 Claims**

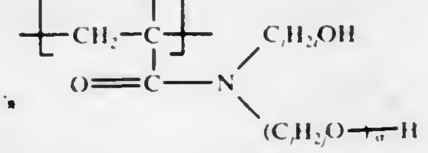
1. modified acrylic polymers dispersible or soluble in water, comprising expressed in mole %:

p % units A having the formula:



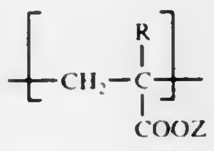
$$\left[-CH_2-\overset{R}{\underset{COOR_1}{C}}-\right]$$

q units B having the formula:



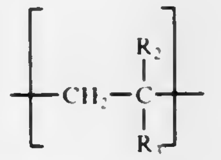
$$\left[-CH_2-\overset{R}{\underset{O=C-N\left\langle{C_iH_{2i}OH \atop (C_jH_{2j}O)_{\alpha}H}\right.}{C}}-\right]$$

r % units C having the formula:



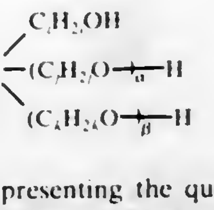
$$\left[-CH_2-\overset{R}{\underset{COOZ}{C}}-\right]$$

and *s* % units D having the formula:



$$\left[-CH_2-\overset{R_2}{\underset{R_3}{C}}-\right],$$

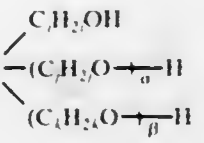
wherein each R designates hydrogen, and methyl or ethyl radicals, R_1 designates hydrogen or an alkyl radical with 1 to 4 carbons, Z designates at least one alkali metal, alkaline earth metal or quaternary ammonium radicals having the formula:



$$H-N\left\langle{C_iH_{2i}OH \atop {(C_jH_{2j}O)_{\alpha}H \atop (C_kH_{2k}O)_{\beta}H}}\right.$$

the proportion of Z representing the quaternary ammonium radicals being between 0% and 10% of the entire amount of Z, while *i, j* and *k*, which may be identical or different, are comprised between 1 and 6, and while α and β are equal to 0 or 1, whereas R_2 represents one atom of hydrogen a methyl radical, R_3 represents one or more monovalent amido, amino, pyridyl or pyrrolidinyl radical, and *p, q, r* and *s* represent integers which are so selected that $5 \leqq p \leqq 99$, $2 \leqq q \leqq 80$, $5 \leqq r \leqq 80$, and $0 \leqq s \leqq 40$, the sum $(p+q+r+s)$ being equal to 100.

7. A method of preparing hydrophile modified acrylic polymers according to claim **1**, comprising the steps of reacting between 50-150° C. an acrylic polymer which is derived from one or more monomers producing units A, with at least one alkanolamine having the formula:



$$N\left\langle{C_iH_{2i}OH \atop {(C_jH_{2j}O)_{\alpha}H \atop (C_kH_{2k}O)_{\beta}H}}\right.$$

wherein *i, j, k* represent numbers comprised between 1 and 6, and wherein α and β, which may identical or different, are equal to 0 or 1, then submitting the product resulting from the aforesaid reaction to alkaline hydrolysis by treating the same with an aqueous alkaline solution of an alkali metal or alkaline earth metal compound, and separating the thus obtained modified acrylic polymer from the hydrolysis medium.

4,037,036

9-(p-VINYLPHENYL)-ACRIDINE POLYMERS

Akio Mukoh; Yasuki Mori, and Hirosada Morishita, all of Hitachi, Japan, assignors to Hitachi, Ltd., Japan

Filed May 23, 1975, Ser. No. 580,316

Claims priority, application United Kingdom, May 24, 1974, 49-57876; Japan, June 28, 1974, 49-73375; July 10, 1974, 49-78238

Int. Cl.^{2} C08F *26/06*

U.S. Cl. 526—46 **6 Claims**

1. A homopolymer for use in a photoconductive material of 9-(p-vinylphenyl)acridine.

3. A copolymer for use in a photoconductive material consisting of a polymer produced by copolymerizing at least 50 mole % of 9-(p-vinylphenyl)acridine and at least one monomer selected from the group consisting of styrene, acrylonitrile, an acrylate, a methacrylate, N-vinylcarbazole, 9-vinylanthracene, 9-vinylacridine, 9-(p-vinylphenyl)-anthracene and vinylacetate.

5. A process for producing a polymer of 9-(p-vinylphenyl)acridine which comprises heating 9-(p-vinylphenyl)acridine alone or together with another polymerizable vinyl monomer selected from the group consisting of styrene, acrylonitrile, an acrylate, a methacrylate, N-vinylcarbazole, 9-vinylanthracene, 9-vinylacridine, 9-(p-vinylphenyl)-anthracene and vinylacetate in the presence of a free radical initiator or an ionic catalyst.

6. A process for producing a polymer of 9-(p-vinylphenyl)acridine which comprises reacting a p-halogenated styrene polymer with a 9-alkali metal-substituted acridine or reacting a p-alkali metal-substituted styrene polymer with a p-halogenated acridine.

4,037,037

NOVEL METHOD OF ORGANIC SYNTHESIS TO FORM A POLYMER-BOUND ACTIVE SPECIES

Avraham Patchornik, Ness-Ziona, and Menahem A. Kraus, Rehovot, both of Israel, assignors to Yeda Research & Development Co. Ltd., Rehovot, Israel

Continuation-in-part of Ser. No. 167,022, July 28, 1971, abandoned. This application Aug. 19, 1974, Ser. No. 498,583

Int. Cl.² C08C *19/12;* **C08F** *8/18;* **C08C** *19/00;* **C08F** *210/00*

U.S. Cl. 526—46 **3 Claims**

1. A method of forming a stable enolate in an inert solvent which comprises covalently bonding a plurality of linking groups to an insoluble cross-linked polymer, covalently bonding an enolizable compound to at least one of said linking groups so as to provide at least one side chain of the enolizable compound covalently bound to the polymer network, and reacting the enolizable compound bound polymer with an enolizing agent in the presence of an inert solvent to provide at least one enolate covalently bound to the polymer network.

4,037,038

RESINS FOR USE AS COATING MATERIAL AND PROCESS FOR PREPARING SAME

Shozo Tsuchiya, Kawasaki, Japan, assignor to Nippon Oil Co., Ltd., Tokyo, Japan

Filed Aug. 2, 1976, Ser. No. 711,047

Claims priority, application Japan, Aug. 5, 1975, 50-94693

Int. Cl.² C08F *236/22*

U.S. Cl. 526—56 **9 Claims**

1. Resins suitable for use as a coating material, consisting essentially of an esterified copolymer of (1) a copolymer of (i) at least one cyclopentadiene compound selected from the group consisting of cyclopentadiene, dicyclopentadiene, tricyclopentadiene, tetracyclopentadiene and lower alkyl substitution products thereof wherein the lower alkyl has 1-3 carbon atoms and (ii) at least one α, β-unsaturated monomer selected from the group consisting of hydroxyalkyl acrylate, hydroxyalkyl methacrylate, glycidyl acrylate, glycidyl methacrylate, allyl glycidyl ether and methallyl glycidyl ether and (2) at least one of acrylic and methacrylic acids.

4,037,039

PROCESS FOR CONTINUOUS XANTHATION AND PRODUCTION OF VISCOSE SPINNING SOLUTION

Charles J. Geyer, Jr., Berwyn, and Ben E. White, Wayne, both of Pa., assignors to Fiber Associates, Inc., Berwyn, Pa.

Filed Sept. 4, 1975, Ser. No. 610,419

Int. Cl.² C08B *9/04*

U.S. Cl. 536—60 **7 Claims**

1. In a process for xanthating alkali cellulose by contacting said alkali cellulose with carbon disulfide, the improvement consisting of continuously feeding alkali cellulose at a predetermined rate first in dry form to a vessel where it is brought into contact for 3-20 minutes with 5-35% of the CS_2 necessary to provide partial xanthation of the cellulose and then, prior to completion of reaction between said CS_2 and said dry cellulose, passing said cellulose on to a vessel containing an alkali hydroxide slurry, immersing said cellulose therein while continuously introducing carbon disulfide into said vessel at a controlled rate, continuously feeding alkali hydroxide solution into said vessel at a controlled rate, and continuously withdrawing a portion of said slurry from the bottom of said vessel at a rate, selected to maintain a preselected minimum residence time of alkali cellulose in said vessel, then passing said withdrawn slurry through a screw extruder mixer, introducing further carbon disulfide and alkali hydroxide solution thereto, as required, to effect further xanthation therein.

4,037,040

REFLUXING WATER-IN-OIL EMULSION PROCESS FOR PREPARING WATER-SOLUBLE POLYELECTROLYTE PARTICLES

Louis E. Trapasso, Watchung, and Charles V. Juelke, Bellemead, both of N.J., assignors to Celanese Corporation, New York, N.Y.

Continuation of Ser. No. 497,354, Aug. 14, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,852

Int. Cl.² C08F *2/32, 236/00*

U.S. Cl. 526—88 **12 Claims**

1. An inverse emulsion polymerization process for the production of finely divided, water-soluble polymeric particles which comprises heating to reflux under vigorous agitation of from about 200 to about 700 rotations per minute a water-in-oil-inverse emulsion of a surfactant, a free radical initiator, at least one water soluble, oil-insoluble ethylenically unsaturated monomer adapted to polymerize under refluxing conditions, oil, and water wherein the percent by weight of oil is higher than the percent by weight of water, said oil and water being adapted to form an azeotropic boiling mixture, to cause said monomer to polymerize within aqueous droplets dispersed in the emulsion to form finely divided particles and to cause water to be simultaneously separated therefrom, and recovering finely divided water-soluble polymeric particles.

4,037,041

PROCESS FOR THE POLYMERIZATION OF ALPHA-OLEFINS, CATALYST EMPLOYED IN SUCH A PROCESS AND METHOD FOR THE PREPARATION THEREOF

Sebastiano Cesca, San Donato Milanese; Alberto Greco, Dresano; Guglielmo Bertolini, Pavia, and Mario Bruzzone, San Donato Milanese, all of Italy, assignors to Snam Progetti, S.p.A., San Donato Milanese, Italy

Filed Mar. 27, 1975, Ser. No. 562,800

Claims priority, application Italy, Mar. 28, 1974, 49831/74

Int. Cl.² C08F *4/02, 10/02*

U.S. Cl. 526—97 **7 Claims**

6. A catalyst system for the polymerization of an alpha olefin consisting of a carrier having a high superficial area selected from the oxides of neodymium, lanthanum and cerium, an aluminum compound represented by the formula AlR_3 or Al_xY_{3-x}, wherein R is an alkyl, aryl or cycloalkyl radical, Y is a halogen or hydrogen and x is a number between 1 and 2, and the combination product of titanium trichloride and an isostructural chloride of another transition metal selected from the group consisting of V, Mn, Co and Fe that is prepared by impregnating said carrier with a solution of a carbonyl of said other transition metal, refluxing the impregnated carrier with titanium tetrachloride to convert said carbonyl into the chloride of said other transition metal and then removing excess titanium tetrachloride.

4,037,042

MANUFACTURE OF OLEFIN POLYMERS

Heinz Mueller-Tamm, Ludwigshafen; Hans Frielingsdorf, Bad Duerkheim; Leonhard Gonsior, Ludwigshafen, and Wolfgang Gruber, Frankenthal, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Sept. 2, 1976, Ser. No. 720,249

Claims priority, application Germany, Sept. 10, 1975, 2540278

Int. Cl.² C08F *4/02, 4/24, 10/00, 10/02*

U.S. Cl. 526—106 **7 Claims**

1. A process for the manufacture of an olefin polymer by polymerization of one or more α-monoolefins of 2 to 8 carbon atoms at from 60° to 160° C and at an olefin pressure of from 0.5 to 40 bars, by means of a silicic acid xerogel/chromium trioxide catalyst which is obtained when

1. a finely divided silicic acid xerogel is first manufactured by
   (1.1) employing a silicic acid hydrogel containing from 10 to 25 percent by weight of solids (calculated as silicon dioxide),
   (1.2) extracting at least 60% of the water contained in the hydrogel from the latter by means of an organic liquid selected from the alkanols of 1 to 4 carbon atoms and the alkanones of 3 to 5 carbon atoms,
   (1.3) drying the resulting dehydrated gel until there is no further loss in weight in the course of 30 minutes at 180° C under 10 mm Hg and
   (1.4) reducing the resulting xerogel to particles having a diameter of from 20 to 2,000 μm,
2. this xerogel is then charged with chromium from a solution, of from 0.05 to 5 percent strength by weight, of chromium trioxide in an alkanone of 3 to 5 carbon atoms or from a solution, of from 0.05 to 15 percent strength by weight, of a chromium compound which under the conditions of stage (3) is converted to chromium trioxide, in an alkanol of 1 to 4 carbon atoms - the solvent in each case not containing more than 20 percent by weight of water - whilst evaporating the solvent, and
3. the resulting product is finally kept at from 400° to 1,100° C for from 10 to 1,000 minutes in an anhydrous stream of gas containing oxygen in a concentration of more than 10 percent by volume,

in which process a catalyst is employed which is manufactured under such conditions that in stage (1) the starting material is a silicic acid hydrogel (1.1) which is substantially spherical, has a particle diameter of from 1 to 8 mm and is obtained by

A. introducing a solution of sodium waterglass or potassium waterglass both longitudinally and tangentially into a vortical stream of an aqueous inorganic acid,
B. spraying droplets of the resulting silicic acid hydrosol into a gaseous medium,
C. allowing the sprayed hydrosol to solidify to a hydrogel in the gaseous medium and
D. freeing the resulting substantially spherical hydrogel from salts by washing, without prior aging.

ELECTRICAL

4,037,043

EXTENDED ARC FURNACE AND PROCESS FOR MELTING PARTICULATE CHARGE THEREIN

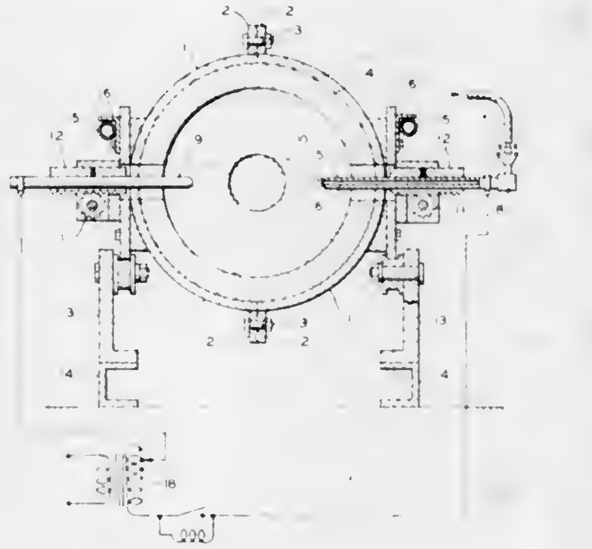
Robert Sidney Segsworth, Toronto, Canada, assignor to Tibur Metals, Ltd., Toronto, Canada

Filed June 2, 1975, Ser. No. 580,838

Claims priority, application Canada, Apr. 16, 1975, 224742

Int. Cl.^{2} H05H *1/00*

U.S. Cl. 13—9 R **8 Claims**



1. A furnace adapted for the heat treatment of metallic or other material comprising

1. a refractory-interlined vessel having one or more openings adapted to receive one or more electrodes extending into the interior of said vessel, a hearth therein adapted to receive said metallic material, an exit for the escape of gas, and a means for removing molten metal;
2. one or more electrodes, at least one of which has an axial opening extending through at least a major portion of the length of said electrode and communicating with the interior of said vessel, said axial opening having a size predetermined to create a stabilized extended arc according to the flow rate and linear velocity of gas flowing through said opening;
3. a means for supplying a selected gas to the axial opening in said electrode or electrodes whereby to feed said gas into the interior of said vessel; and
4. a power supply connected to said electrode adapted to supply sufficient power to produce an extended arc between said electrode and one or more other electrodes or between said electrode and a charge of metallic material in said hearth and modulating said power by controlling the rate of gas flow and/or the gas composition to stabilize the said extended arc.

4,037,044

POWER CONTROL SYSTEM FOR SINGLE PHASE INDUCTION MELTING OR HEATING FURNACE

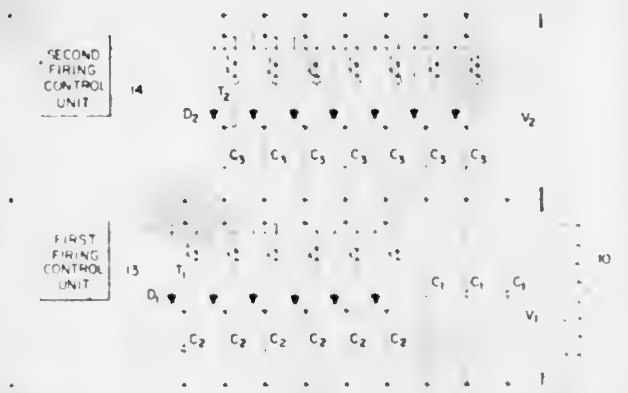
George Havas, Youngstown, Ohio, assignor to Ajax Magnethermic Corporation, Warren, Ohio

Filed Aug. 4, 1975, Ser. No. 601,644

Int. Cl.^{2} H05B *1/02, 5/04*

U.S. Cl. 13—26 **5 Claims**

1. Power control means for a single phase induction melting or heating furnace for operation from a normal line frequency power supply, one line of said power supply being connected to the first terminal of said furnace, said power control means comprising capacitance and a first group of sets of series connected capacitance and semiconductor means all connected in parallel with said furnace and a second group of sets of series connected capacitance and semiconductor means connected in parallel and interposed between another line in said power supply and the second terminal of said furnace, each said semiconductor means within each set of said first and second group comprising diode rectifier means connected to conduct current only in one direction and controlled rectifier means connected in parallel therewith to conduct current only in an opposite direction, said controlled rectifier means of said first group being actuated by a first firing control means adapted to control the transition of each such controlled rectifier means from the non-conducting to the conducting state, the number and size of sets conducting within said first group determining the total amount of capacitance connected in parallel with said furnace and the phase angle between the furnace voltage and the voltage across said second group of sets thereby setting the range of voltage and power available to said furnace, said controlled rectifier means of said second group being actuated by a second firing control means adapted to control the transition of each such controlled rectifier means from the non-conducting to the conducting state, the number and size of sets conducting within said second group determining the total amount of capacitance effectively interposed between said other power supply line and said second furnace terminal, thereby controlling the voltage and power delivered to said furnace within the selected range as set by said phase angle.



4,037,045

APPARATUS FOR COOLING ELECTRICAL DEVICES

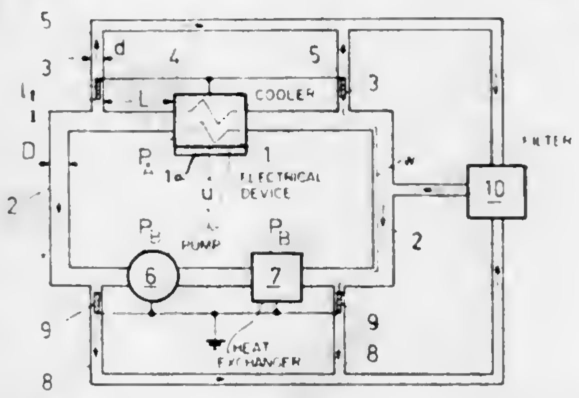
Conrad Beriger, Aarau, and Reinhard Müller, Baden, both of Switzerland, assignors to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 17, 1975, Ser. No. 632,679

Claims priority, application Switzerland, Dec. 6, 1974, 16216/74

Int. Cl.^{2} H01G *3/03*

U.S. Cl. 174—15 R **20 Claims**

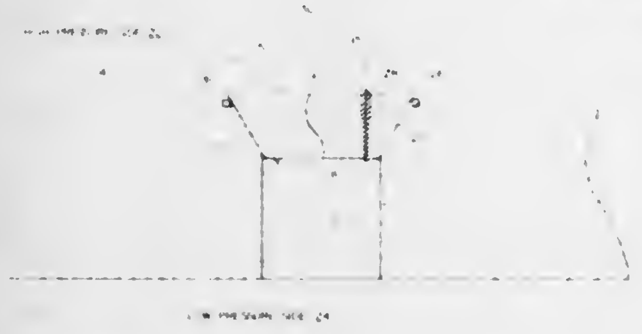


1. An arrangement of at least one electrical device and an apparatus for cooling said at least one electrical device by means of a flowing cooling medium, comprising means including main conduit means defining a main recirculation cooling system for a cooling medium flowing in a predetermined direction through the main conduit means, means defining a branch circulation system including branch conduits branching-off from the main recirculation cooling system and through which flows a portion of the cooling medium, said at least one electrical device to be cooled coacting with the main recirculation cooling system, said electrical device being at a first potential, said means defining the main recirculation cooling system including means for bringing about heat transfer at the cooling medium and being at a second potential, auxiliary electrodes arranged upstream and downstream of the electrical device to be cooled with respect to the predetermined direction of flow of the cooling medium through the main recirculation cooling system, said auxiliary electrodes being located at least partially in the branch conduits which branch-off from the main recirculation cooling system.

4,037,046

ULTRA-HIGH PRESSURE VESSEL ELECTRICAL PASS-THROUGH CONNECTOR

Joseph G. Hoeg, Box A2 Rte. 2, Leonardtown, Md. 20650
Filed May 24, 1976, Ser. No. 689,428
Int. Cl.² H01B *17/26*
U.S. Cl. 174—18 **8 Claims**



1. An electrical pass-through connector for passing conductors through a vessel hole extending from the high pressure side to the low pressure side of a vessel, said vessel hole having a tapered counterbore on said high pressure side, said connector being capable of developing a seal against pressures from said high pressure side of said vessel up to 150,000 PSI, comprising:

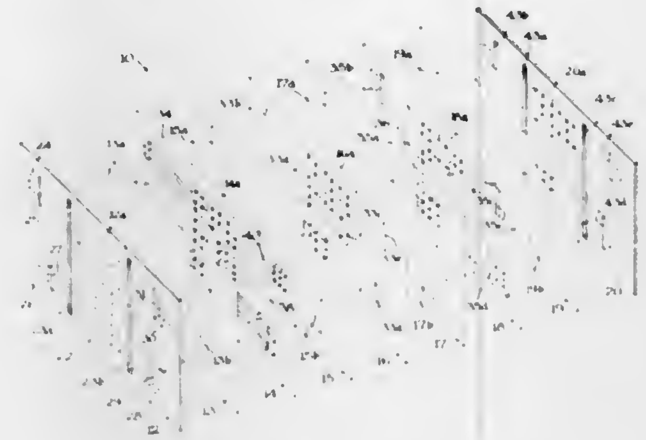
- a small diameter end inserted into said vessel hole from said high pressure side whereby said small diameter end faces said low pressure side;
- a large diameter end extending out of said vessel hole facing said high pressure side;
- tapered side walls tapering between said large and small diameter ends, said taper reciprocally matching said tapered counterbore of said vessel hole whereby said connector will be in reciprocally mating contact with the walls of said tapered counterbore,
- one or more connector holes extending through said connector from said large diameter end to said small diameter end with the diameter of said connector holes being greater at said large diameter end than at said small diameter end, each of said connector holes having a single conductor extending therethrough wherein said connector holes have a diameter which is approximately three times greater at said large diameter end than its diameter at said small diameter end, the remainder of each of said connector holes being filled with a bonding agent;
- wherein said connector is at least an inch in length from said small diameter end to said large diameter end and wherein said connector holes have a diameter 100 mils. greater than said conductor at said large diameter end and 20 mils greater than said conductor at said small diameter end.

4,037,047

MULTILAYER CIRCUIT BOARD WITH INTEGRAL FLEXIBLE APPENDAGES

Glen J. Taylor, Winter Park, Fla., assignor to Martin Marietta Corporation, Orlando, Fla.
Filed Dec. 31, 1974, Ser. No. 537,714
Int. Cl.² H05K *1/14, 3/30*
U.S. Cl. 174—68.5 **12 Claims**

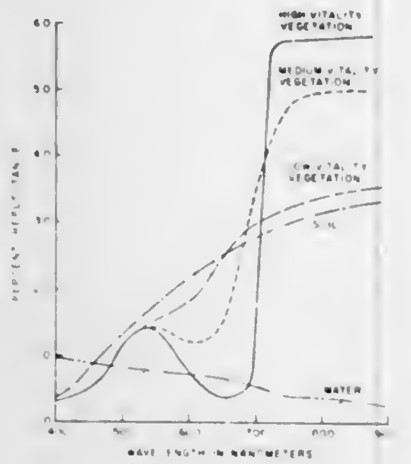
1. As an article of manufacture, a multilayer printed circuit board having an integral flexible web type conductor appendage comprising at least one flexible circuit-containing layer having at least one flexible appendage, a pair of rigid layers aligned in a predetermined manner with said at least one flexible layer and having electrical connections to the circuits on said at least one flexible layer, said rigid layers being bonded to the opposite sides of said at least one flexible layer in all areas except in locations in which said flexible appendage is located, said rigid layers being substantially oversize and holding said flexible appendage substantially rigid during the manufacturing procedure in which holes were drilled in said bonded array and thereafter plated through forming said electrical connections, said rigid layers being slotted at the location representing the beginning of said at least one flexible appendage and generally overlying the flexible circuit-containing layer, to enable the liberation of such flexible appendage subsequent to the plating operation by the utilization of a cutting device moved around the periphery of such appendage.



4,037,048

PROCESS FOR THE INTERPRETATION OF REMOTELY SENSED DATA

John E. Walker, Buffalo, N.Y., assignor to Calspan Corporation, Buffalo, N.Y.
Filed Apr. 19, 1973, Ser. No. 351,414
Int. Cl.² H04N *7/18*
U.S. Cl. 358—113 **10 Claims**



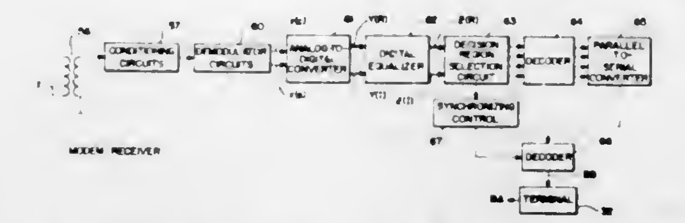
1. A process for the interpretation of remotely sensed data including the steps of:

- sensing data in a plurality of wave bands by means of remote sensors;
- adjusting the sensed data to correct for non-linearity of the remote sensors;
- dividing an adjusted signal at a first selected one of the plurality of wave bands by an adjusted signal at a second selected one of the plurality of wave bands;
- thresholding a signal representing the result of the division;
- displaying the thresholded signal; and
- comparing the displayed signal with original data and interpreting the differences.

4,037,049

MODULATOR AND DEMODULATOR FOR DATA COMMUNICATIONS NETWORK

David L. Lyon, Cambridge, Mass., assignor to Intertel, Inc., Burlington, Mass.
Filed Oct. 18, 1974, Ser. No. 515,878
Int. Cl.² H04L *27/18*
U.S. Cl. 178—67 **11 Claims**



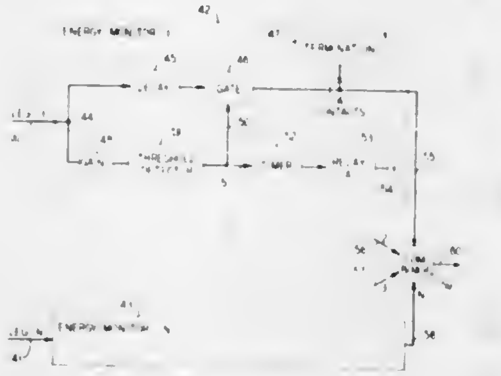
1. A modem for connection between a digital unit and a transmission link, said modem including a receiver for demodulating a modulated carrier signal received from the transmission link and providing digital signals for the digital unit, said receiver comprising:

- A. means responsive to the receipt of the modulated carrier signal for producing first and second coordinate signals which together represent the amplitude and phase of the carrier signal,
- B. means for comparing the coordinte signals and predetermined levels corresponding to boundaries that define both rectangular and non-rectangular decision regions, each of the boundaries being parallel to one of the axes in a single Cartesian coordinate system thereby to select one decision region, each decision region having a digital value, and
- C. means responsive to the digital value of the selected decision region for transmitting the digital signals.

4,037,050

FAULT ISOLATION IN COMMUNICATIONS CIRCUITS

Michael Lefkowitz, Lakewood, and Michael Gordon Taylor, Holmdel, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed May 26, 1976, Ser. No. 690,018
Int. Cl.² H04L *1/00*
U.S. Cl. 178—69 G **6 Claims**



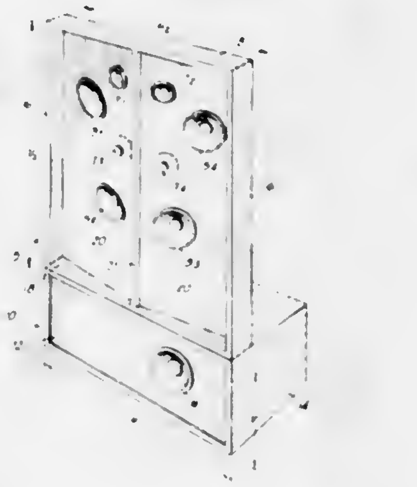
1. In a bridge circuit connecting a plurality of remote communications terminals to a common communications facility extending to a central processing terminal, means for monitoring the energy levels of signals originating at each remote terminal comprising means for detecting an energy level in excess of one or more threshold energy levels,

- gating means responsive to the detection by said detecting means of an energy level exceeding one of said threshold levels for cutting through said remote terminal to said comunications facility,
- timing means responsive to the detection by said detecting means of an energy level exceeding one of said threshold levels for measuring the persistence of continuous energy from a remote terminal beyond a preselected time duration to generate a time-out signal, and
- means responsive to the time-out signal from said timing means for blocking the further transmission of signal energy to said communications facility.

4,037,051

FLAT BAFFLE SPEAKER SYSTEM HAVING IMPROVED CROSSOVER

John A. Fuselier, 4309 Oak Walk N., Cumming, Ga. 30130
Filed Jan. 26, 1976, Ser. No. 652,289
Int. Cl.² H04R *1/22*
U.S. Cl. 179—1 E **11 Claims**



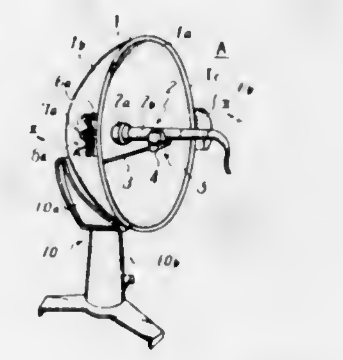
1. The method of balancing frequency crossover of an audio speaker system having a flat baffle squaker and a woofer, said method comprising the steps of

- a. determining the effective baffle diameter of the flat baffle squaker;
- b. determining the impedance of the woofer; and
- c. providing the woofer with series circuit inductance proportional to the product of the determined effective baffle diameter and woofer impedance.

4,037,052

SOUND PICKUP ASSEMBLY

Toshitada Doi, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed July 13, 1976, Ser. No. 704,841
Claims priority, application Japan, July 22, 1975, 50-89498
Int. Cl.² H04R *1/00*
U.S. Cl. 179—1 MF **12 Claims**



1. A sound pickup assembly comprising:

- a. a parabolic sound reflecting member having an open edge;
- b. means for attaching a first sound pickup microphone near the focus of said reflecting member;
- c. dummy external ears mounted to said reflecting member adjacent edge on the side opposite said first microphone; and
- d. means for supporting second and third left and right sound pickup microphones near said dummy external ears.

4,037,053
AUTOMATIC TELEPHONE ANSWERING APPARATUS

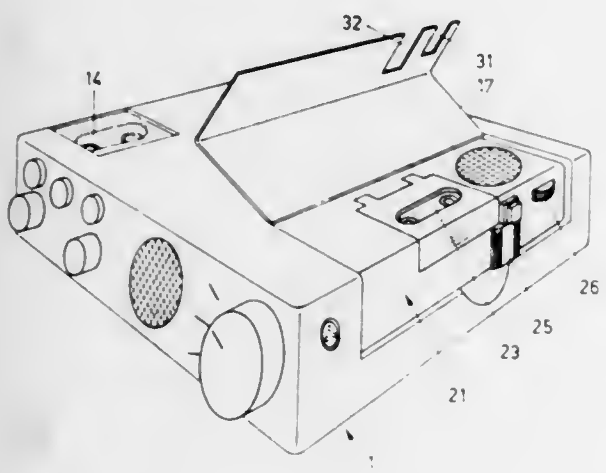
Willy Müeller, Zollikon, Switzerland, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Aug. 15, 1975, Ser. No. 605,039

Claims priority, application Switzerland, Aug. 23, 1974, 11555/74

Int. Cl.² H04M *1/64*

U.S. Cl. 179—6 R **6 Claims**



1. In combination (1) a portable dictating machine having a first housing, first magnetic tape cartridge receiving means in said first housing, a combination microphone and speaker mounted in said first housing for recording and playing back information on a magnetic tape cartridge in said first receiving means therefor, manually operable control means on said first housing movable between first and second positions for effecting a recording function in said first position and a playback function in said second position, auxiliary microphone connection means and auxiliary power receiving connection means mounted on said first housing and (2) a telephone answering apparatus having a second housing, a second magnetic tape cartridge receiving means in said second housing, microphone receiving socket means on said secone housing and second manually operable control means for effecting a recording and a playback of information on a magnetic tape cartridge in said second receiving means, chamber means in said second housing and a closure member therefor, said chamber means having a dimension to receive the entirety of said dictating machine therein and effect a closing of said closure member, said closure member having means defining an opening therein to receive when said closure member is closed said control means on said dictating machine therein only when said control means is in said first position, said telephone answering apparatus including a power supply in said second housing and microphone connection means and power supply connection means in said chamber means and being coupled to the respective ones of said auxiliary microphone connection means and auxiliary power receiving connection means on said dictating machine when said dictating machine is received in said chamber means, said telephone answering apparatus having call detecting means for detecting an incoming telephone call on a telephone line and first switch means for effecting a playback of information on said second magnetic tape to the incoming caller and second switch means responsive to the end of the playback information only when said closure member is closed for effecting a recording of information from the incoming caller on said first magnetic tape.

4,037,054
CIRCUIT ARRANGEMENT FOR MONITORING PCM COUPLERS

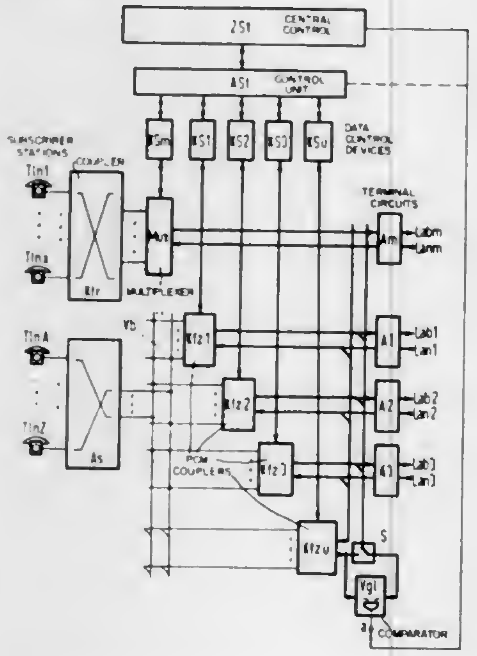
Karlheinz Neufang, Munich, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Continuation of Ser. No. 464,859, April 29, 1974, abandoned, which is a continuation of Ser. No. 218,990, Jan. 19, 1972, abandoned. This application Feb. 21, 1975, Ser. No. 552,000

Claims priority, application Germany, Jan. 19, 1971, 2102371

Int. Cl.² H04J *3/14*

U.S. Cl. 179—15 BF **6 Claims**



1. In an exchange installation of a telecommunication system which operates according to pulse modulation (PCM) techniques, said exchange having a plurality of PCM couplers to which are assigned incoming and outgoing transmission lines for the exchange, said PCM couplers being interconnected such that signals can be interchanged between couplers, a circuit arrangement for monitoring said plurality of couplers comprising:

at least one additional PCM coupler having inputs connected to the inputs to said plurality of couplers,

comparator means having inputs connected, respectively, to the output of said additional coupler and to the outputs of the plurality of couplers for producing an error signal indicative of the differences between the signals produced by said additional coupler and said plurality of couplers and

means for measuring said error signal and determining the condition of said plurality of couplers from said measurement.

4,037,055
STEREOPHONIC DEMODULATOR APPARATUS

Teruo Sato, Yamato, and Hideo Nakamura, Komae, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Dec. 15, 1975, Ser. No. 641,026

Claims priority, application Japan, Dec. 16, 1974, 49-144211

Int. Cl.² H04H *5/00*

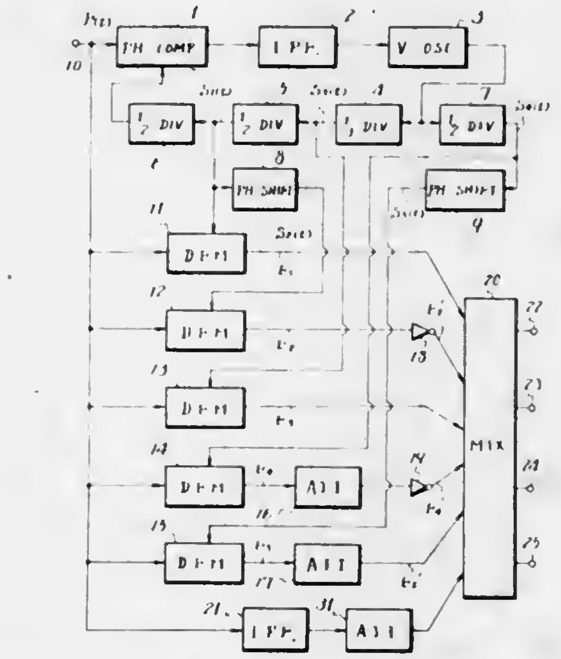
U.S. Cl. 179—15 BT **7 Claims**

1. In a stereophonic demodulator system which demodulates a stereophonic composite signal of the type formed of a main channel including at least two audio information signals, at least one subchannel including a subcarrier of predetermined frequency modulated by said at least two audio information signals, and a pilot subcarrier, and wherein said stereophonic composite signal is susceptible to deterioration due to an accompanying useless signal having a carrier related to said subcarrier of predetermined frequency, apparatus for demodulating said stereophonic composite signal and simultaneously cancelling said useless signal, comprising:

local carrier generating means for generating a first switching carrier whose frequency is equal to said predetermined frequency and a second switching carrier whose frequency is an integral multiple of said predetermined frequency and substantially equal to the frequency of the carrier of said useless signal;

a first demodulating circuit for receiving said stereophonic composite signal and said first switching carrier for demodulating said stereophonic composite signal to produce said one subchannel;

a second demodulating circuit for receiving said stereophonic composite signal and said second switching carrier for demodulating said stereophonic composite signal to produce said useless signal;



separating means for receiving said stereophonic composite signal and separating said main channel therefrom;

and means coupled to said first and second demodulating circuits and said separating means to combine said useless signal with said one subchannel for cancelling a useless signal component produced by said first demodulating circuit and accompanying said one subchannel and for extracting said two audio information signals from said main channel and said one subchannel.

4,037,056
FM MULTIPLEX DEMODULATOR CIRCUIT

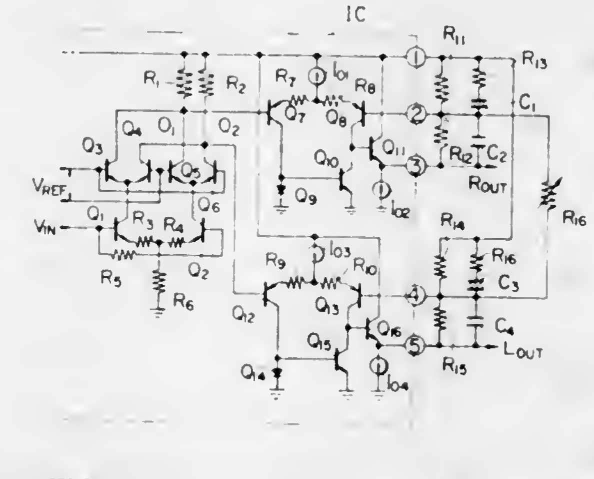
Masanori Ienaka, Fuchu, and Yukio Suzuki, Hinode, both of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 6, 1976, Ser. No. 646,756

Claims priority, application Japan, Jan. 6, 1975, 50-108

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **6 Claims**



1. An FM multiplex demodulator circuit comprising:

an integrated circuit including:

a first terminal to which a power supply voltage is applied, a second terminal to which a reference voltage is applied, third, fourth, fifth and sixth terminals,

a double balance type synchronous detection circuit coupled between said first and second terminals, and having first input to which a subcarrier signal is applied, a second input to which a stereo composite signal is applied, and first and second outputs from which respective channel detection outputs are obtained, first and second load elements being respectively connected between said first and second outputs of said detection circuit and said first terminal, and

first and second negative feedback type differential amplifier circuits coupled between said first and second terminals, having respective first inputs connected to the first and second outputs of said detection circuits, respective second inputs connected to said fifth and sixth terminals and respective outputs for deriving first and second demodulated output signals coupled to said third and fourth terminals; and

a pair of feedback circuits connected between said third and fourth terminals respectively and said first terminal for providing feedback of said first and second demodulated output signals to said first and second negative feedback type differential amplifier circuits respectively, and including respective series circuits each of which comprises first and second resistors connected in series between said first terminal and said respective third and fourth terminals, said fifth and sixth terminals being connected to respective junctures between said first and second resistors in said series circuits.

4,037,057
NOISE-CANCELLING APPARATUS FOR FM STEREO RECEIVER

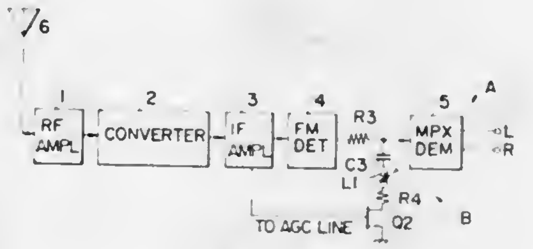
Minoru Ogita, and Juro Hoshi, both of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed July 28, 1975, Ser. No. 599,351

Claims priority, application Japan, Aug. 1, 1974, 49-92146[U]; Oct. 24, 1974, 49-127846[U]; **Oct. 25, 1974, 49-123115**

Int. Cl.² H04H *5/00*

U.S. Cl. 179—15 BT **1 Claim**



1. A noise-cancelling apparatus for use in an FM stereo receiver having an intermediate frequency amplifier circuit, an FM detector and a multiplex demodulator, said apparatus comprising:

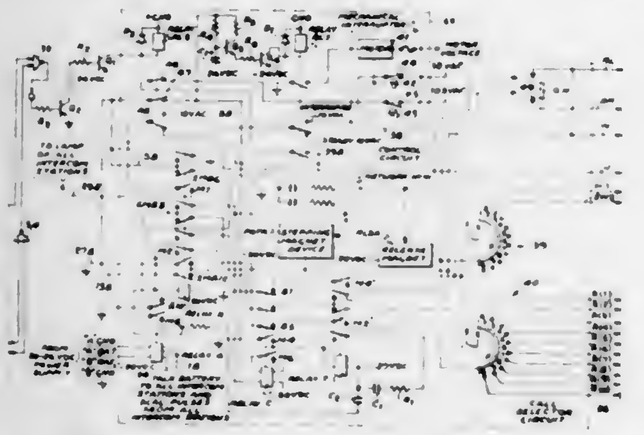
a filter inserted between said FM detector and said multiplex demodulator, and a switching element connected to the filter, said filter including:

a. a resistor connected in series with a signal line between the FM detector and said multiplex demodulator, and

b. a capacitor and an inductance connected in series with said switching element between the signal line and ground, the series connection of the capacitor and the inductance having a resonance frequency substantially equal to a sub-carrier signal frequency; and said switching element including: a field effect transistor having a gate electrode, said electrode being connected to an automatic gain control signal line of said intermediate frequency amplifier circuit.

4,037,058
INTERCOM SYSTEM FOR A KEY TELEPHONE SYSTEM

Robert David Stine, Etters, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed May 6, 1976, Ser. No. 683,877
Int. Cl.² H04M *9/06*
U.S. Cl. 179—99 **11 Claims**



1. An intercom system having a plurality of intercom stations comprising:
- first means to provide a plurality of interrupted ringing signal bursts when one of said plurality of intercom stations goes off-hook and first initiates a call to another of said plurality of intercom stations;
- second means coupled to said first means and said plurality of intercom stations to provide a connection between said one of said plurality of intercom stations and said another of said plurality of intercom stations, said interrupted ringing signal bursts being conducted on said connection to said another of said intercom stations; and
- third means coupled to said first means and said plurality of intercom stations to stop said interrupted ringing signal bursts when said another of said plurality of intercom stations goes off-hook;
- said first means further providing an interrupted voltage for coupling to said other of said plurality of intercom stations to cause a button lamp at said other of said plurality of intercom stations to flash and to provide a steady voltage for coupling to said other of said plurality of intercom stations to cause said button lamp to glow steadily when said other of said plurality of intercom stations goes off-hook.

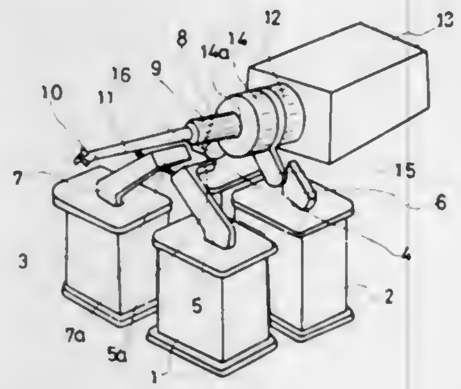
4,037,059
INTERCOM SYSTEM FOR A KEY TELEPHONE SYSTEM

Robert David Stine, Etters, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed May 7, 1976, Ser. No. 684,205
Int. Cl.² H04M *9/00*
U.S. Cl. 179—99 **8 Claims**

1. An intercom system having a plurality of intercom stations comprising:
- first means coupled to said plurality of stations responsive to a call initiating signal from one of said plurality of stations to establish a connection between said one of said plurality of stations to another of said plurality of stations, said call initiating signal being a code identifying said another of said plurality of stations; and
- second means coupled to said plurality of stations and said first means to enable a calling party in the vicinity of said one of said stations to page a called party in the vicinity of said another of said stations through said connection;
- said first means being responsive to a predetermined code of said call initiating signal to connect all of said plurality of stations together to enable said calling party to page said called party at all of said plurality of stations;
- said first means including
  - a call selector circuit coupled to said plurality of stations responsive to said call initiating signal to select a first output lead from a first plurality of output leads and to provide a plurality of control signals, said first output lead corresponding to said code of said another of said plurality of stations and establishing a first portion of said connection,
  - a call routing circuit coupled to said call selector circuit responsive to said plurality of said control signals to connect said first output lead to a second output lead of a second plurality of output leads, said second output lead corresponding to said code of said another of said plurality of stations and establishing a second portion of said connection;
  - a diode matrix coupled to said call routing circuit to provide at least one relay activating signal corresponding to said code of said another of said plurality of stations and establishing a third portion of said connection; and
  - a relay matrix coupled to said diode matrix and said second means, said relay matrix being responsive to said relay activating signal to complete said connection and to enable said calling party to page said called party.

4,037,060
STEREOPHONIC PICKUP CARTRIDGE

Ryuichi Uchida, Fussa; Kaoru Terasaki, Musashino, and Masaru Ogikubo, Kokubunji, all of Japan, assignors to Nippon Atsudenki Kabushiki Kaisha t/a Japan Piezo Co., Ltd., Tokyo, Japan
Filed July 9, 1975, Ser. No. 594,302
Int. Cl.² H04R *11/12*
U.S. Cl. 179—100.41 K **8 Claims**



1. A pick-up cartridge comprising:

A. first and second pairs of coils, each pair of coils being electrically connected in series,

B. each pair of coils being respectively coupled to a pair of pole pieces including pole pieces of respectively first and second types, each pole piece having base portions coupled to said coils,

C. a rod-shaped armature integral with a cantilever having its tip end equipped with a stylus,

D. each pair of pole pieces including one pole piece of the first type having one portion which extends from its associated coil toward the rod-shaped armature and a bent portion which runs approximately parallel to the rod-shaped armature, the bent portion from one pair of pole pieces being arranged symmetrically and displaced by approximately 90° with respect to the bent portion of the pole piece of the first type in the other pair of pole pieces,

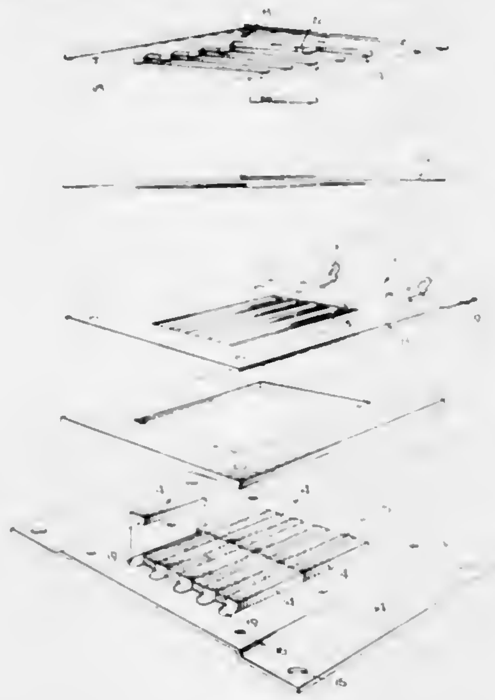
E. a disk-shaped armature installed at the base of the rod-shaped armature and perpendicular to the axis of the rod-shaped armature, the disk-shaped armature including a pair of lugs arranged symmetrically and displaced by approximately 90° with respect to each other,

F. each pole piece of the second type being situated at a short distance from a respective lug, and

G. support means for supporting the armatures so that the rod-shaped armature moves toward and away from the bent portions of the pole pieces of the first type while never coming between the two pole pieces of any pair and so that the lugs of the disk-shaped armature move toward and away from the pole pieces of the second type.

4,037,061
PLANAR PATTERN VOICE COIL AUDIO TRANSDUCER

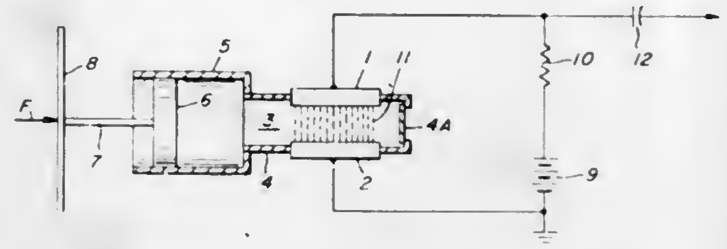
Daniel R. von Recklinghausen, Arlington, Mass., assignor to Electro Audio Dynamics, Inc., Great Neck, N.Y.
Filed Nov. 13, 1975, Ser. No. 631,484
Int. Cl.² H04R *9/00*
U.S. Cl. 179—115.5 PV **2 Claims**



1. An improved audio transducer comprising the combination of:
- a flexible plastic diaphragm;
- a planar electrical conductor positioned on a surface of said diaphragm having spaced parallel portions;
- a magnetic array comprising a row of magnets positioned on and spaced from opposite surfaces of said diaphragm with the magnets of said rows being parallel to one another and to said diaphragm and to said conductor;
- the polarity of adjacent magnets being arranged to form a fringing magnetic field at said parallel portions of said conductor;
- plate-like iron backing members positioned on each side of said diaphragm and each having elongated slots for mounting and for positioning said rows of magnets;
- rigid frame-like spacer means attached to the opposite edges of said diaphragm;
- an additional rigid frame-like spacer member positioned between each of said backing members and said first named spacer means with each one having a thickness corresponding generally to the thickness of the adjacent rows of magnets for positively determining the relative positions of said magnets and said diaphragm;
- said spacer means further comprising planar conductors coupled to said first named conductors on said diaphragm and positioned between said first named spacer means and one of said additional frame-like spacer members;
- one of said iron backing members being imperforate and the other of said iron backing members including perforations for providing an improved high frequency response; and
- damping material positioned between the rows of magnets at the imperforate backing member.

4,037,062
LIQUID CRYSTAL ELECTROMECHANICAL TRANSDUCER

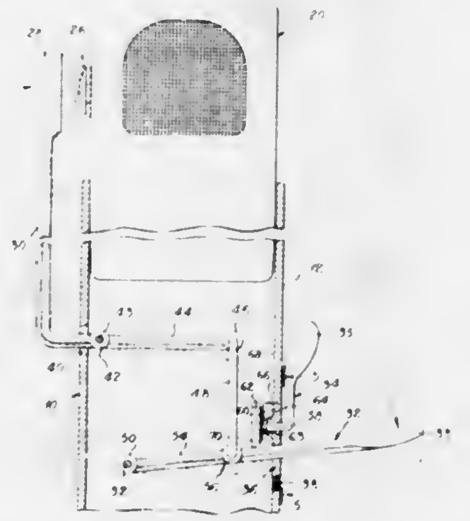
James L. Fergason, 5806 Horning Road, Kent, Ohio 44240
Filed Aug. 19, 1976, Ser. No. 715,707
Int. Cl.² H04R *23/00;* **H02N** *11/00*
U.S. Cl. 179—133 **6 Claims**



1. In a device for converting mechanical movement into an electrical signal, the combination of a layer of nematic liquid crystal material disposed between spaced conductive plates, the nematic liquid crystal material being such that the long axes of its molecules will be substantially normal to the plates with a potential applied across the plates, means for causing said liquid crystal material to flow essentially parallel to the plates in response to mechanical motion, and means coupled to said plates for sensing a change in capacitance between the plates when the liquid crystal material flows therebetween and the long axes of the molecules are deflected from positions normal to the plates.

4,037,063
MICROPHONE HOLDER ASSEMBLY

Gregory McDonald, 21 Columbus Ave., Hillsdale, N.J. 07642
Filed Nov. 2, 1976, Ser. No. 737,943
Int. Cl.² H04M *1/04*
U.S. Cl. 179—147 **8 Claims**



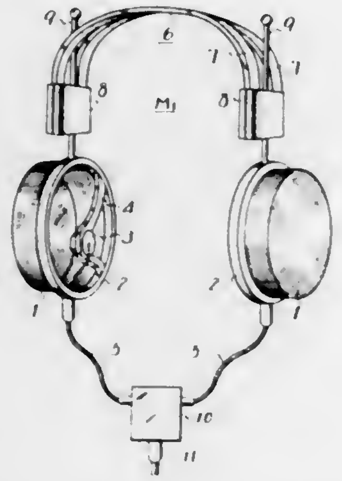
1. A holder for a microphone which comprises:

a. an upright portion, said upright portion having a cutout section at the top thereof, said cutout section shaped to accommodate the dimensions of said microphone and to hold the microphone therein; and

b. activating lever means pivotally connected to said upright portion, said activating means coacting with a switch on said microphone after pivoting in response to the physical urging of the operator to thereby turn the switch on, and thus allow voice transmission via the microphone.

4,037,064
STEREO MICROPHONE APPARATUS

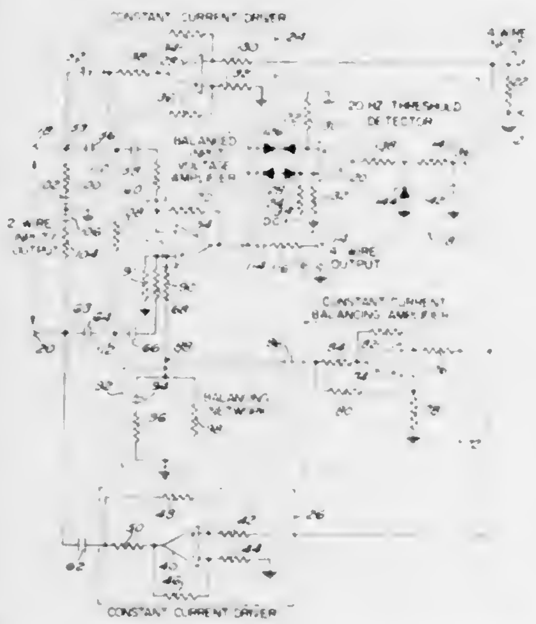
Hiroshi Yasuda, Yokohama, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Oct. 23, 1975, Ser. No. 625,453
Claims priority, application Japan, Oct. 31, 1974, 49-125871; Nov. 1, 1974, 49-126311
Int. Cl.² H04M *1/05;* **H04R** *5/00*
U.S. Cl. 179—156 R **15 Claims**



1. A stereo microphone apparatus comprising:
a. a pair of microphone units;
b. windscreens covering each of said microphone units;
c. means for supporting said microphone units within said windscreens, respectively; and
d. resilient means for connecting said windscreens a predetermined distance apart.

4,037,065
20 Hz RINGDOWN SOLID STATE TWO-WIRE/FOUR-WIRE CONVERTER

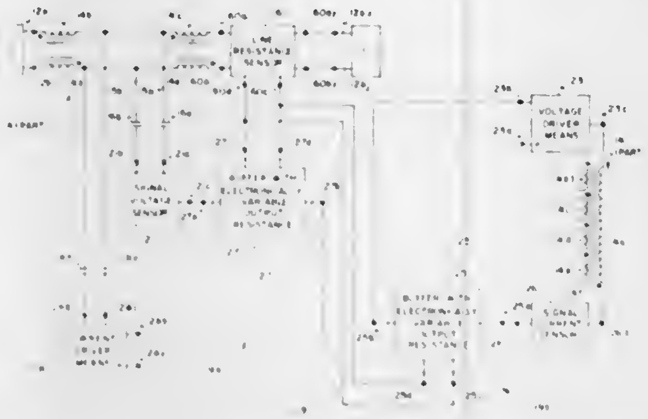
Lawrence P. Nahay, Cinnaminson, N.J., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Oct. 4, 1976, Ser. No. 729,508
Int. Cl.² H04B *1/58*
U.S. Cl. 179—170 NC **4 Claims**



1. A 20 Hz ringdown solid state two-wire/four-wire converter system comprising:
four-wire input terminals, four-wire output terminals and a pair of two-wire input/output terminals;
an inverting solid state constant current driver and a non-inverting solid state constant current driver, said drivers in combination connected to transmit and balance a signal from said four-wire input terminals to said two-wire input/output terminals;
balancing means for use in inhibiting signals from said four-wire input terminals from appearing at said four-wire output terminals, said balancing means connected to said four-wire input terminals;
amplifier means connected at its input to said inverting constant current driver, said non-inverting constant current driver, said balancing means and said pair of two-wire input/output terminals for transmitting signals originating in the converter system at said two-wire input/output terminals and for inhibiting signals originating in the converter system at said four-wire input terminals;
threshold detector means connected to the output of said amplifier means for conducting 20 Hz ringdown signals and rejecting other signals transmitted by said amplifier means; and
said four-wire output terminals connected to said output of said amplifier means for receiving said other signals from said amplifier means.

4,037,066
REPEATER FOR TRANSMISSION LINES

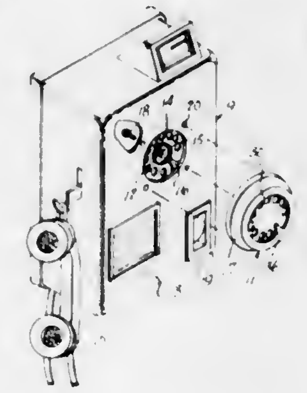
Frederick J. Kiko, Sheffield Village, Ohio, assignor to Lorain Products Corporation, Lorain, Ohio
Division of Ser. No. 560,258, March 20, 1975, Pat. No. 3,989,906. This application July 26, 1976, Ser. No. 708,989
Int. Cl.² H04B *3/16*
U.S. Cl. 179—170 G **13 Claims**



1. In an apparatus for modifying the transmission characteristics of a telephone transmission line, the combination of:
shunt impedance simulating means for generating an impedance simulating current which varies in accordance with the signal voltage across the transmission line;
series impedance simulating means for generating an impedance simulating voltage which varies in accordance with the signal current through the transmission line;
means for applying a signal which varies in accordance with the signal voltage across the transmission line to the shunt impedance simulating means;
means for applying a signal which varies in accordance with the signal current through the transmission line to the series impedance simulating means;
means for applying the impedance simulating current in shunt with the transmission line;
means for applying the impedance simulating voltage in series with the transmission line;
control signal generating means for generating a control signal which varies in accordance with the a-c losses of the transmission line;
the shunt impedance simulating means including first control signal responsive means connected to the control signal generating means, the first signal responsive means exhibiting a controllable impedance which varies the impedance simulating current in accordance with the control signal; and
the series impedance simulating means including second control signal responsive means connected to the control signal generating means, the second signal responsive means exhibiting a controllable impedance which varies the impedance simulating voltage in accordance with the control signal.

4,037,067
ANTI-VANDALISM PROTECTIVE ATTACHMENT DEVICE FOR A PAY TELEPHONE

Yancu Solomovitz B., Casa Numero 61-17 1st Avenue, Caracas, Venezuela
Filed Dec. 24, 1975, Ser. No. 644,330
Int. Cl.² H04R *1/02;* **H04M** *1/26*
U.S. Cl. 179—184 **14 Claims**

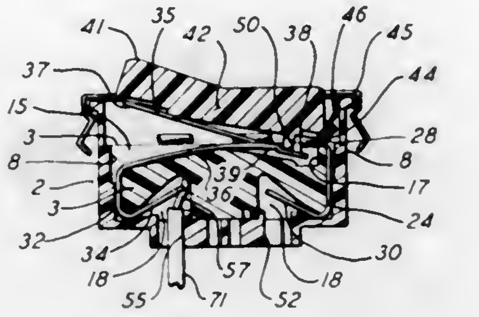


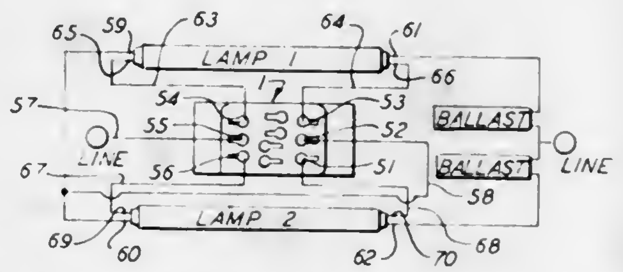
11. An anti-vandalism protective device for a telephone comprising a cover member adapted to be attached to a telephone over its dial said cover member having a front opening, a disc shaped substitute dial rotatably mounted on said cover member in a position to be exposed through and protectively bridging said front opening and to be substantially parallel to the telephone dial when the cover member is attached to the telephone, and a drive element mounted on and projecting rearwardly from the substitute dial and being engageable in a number hole of the telephone dial when the cover member is attached to the telephone.

4,037,068
TWO-STAGE ROCKER SWITCH FOR CONTROLLING A FLUORESCENT LAMP CIRCUIT

Edwin S. Gaynor, 688 Hulls Farm Road, Southport, Conn. 06490
Continuation of Ser. No. 614,168, Sept. 17, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,704
Int. Cl.² H01H *21/00, 1/26, 3/20, 23/26*
U.S. Cl. 200—5 F **10 Claims**

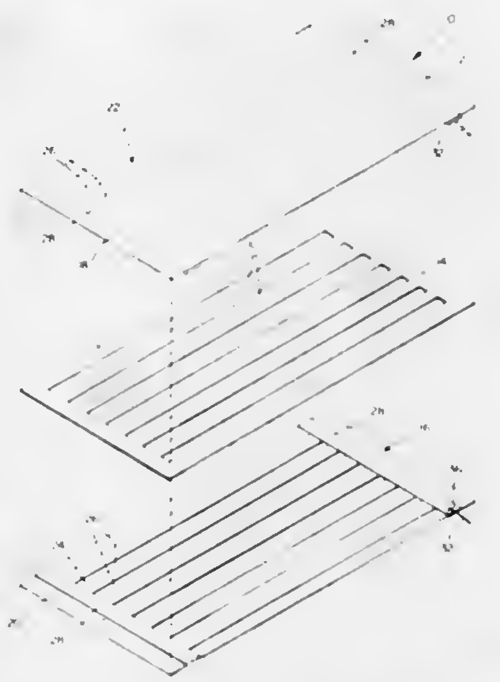
1. A rocker switch assembly comprising:
an open top housing;
a core fitted within the housing for mounting at least one pair of switch contacts;
a pair of normally closed switch contacts located near one end of the core, said pair of normally closed contacts including
a fixed contact positioned in vertically spaced relation to the top surface at the one end of the core,
a movable contact positioned between the fixed contact and the top surface of the core, and
spring biasing means for urging the movable contact upward toward the fixed contact;
a rocker button positioned in the opening of the housing above the core, the rocker button having a protuberance extending from the end of the button corresponding to the one end of the core;
a metal spring catch mounted in the housing for interfering engagement with the protuberance on the rocker button; and
means for supporting the rocker button for limited vertical and pivotal motion about a transverse axis at approximately its midpoint, said means restraining the button against movement in a direction parallel to the top of the housing transverse to the pivot axis, the rocker button acting to depress the movable contact in opposition to the spring biasing means out of conductive contact with the fixed contact when pivoted toward the one end of the core as the protuberance engages the spring catch, the catch bearing against the upper side of the protuberance to hold open the pair of contacts against the force exerted by the biasing means.





4,037,069
MAT SWITCH

Roland Gonzalez, and Raul C. Miguel, both of 135 NE. 134th St., N. Miami, Fla. 33161
Filed Nov. 20, 1975, Ser. No. 633,607
Int. Cl.² H01H *13/16*
U.S. Cl. 200—86 R **1 Claim**



1. A mat switch comprising: top and bottom flexible dielectric sheets on which are respectively formed opposed top and bottom planar complementary electrodes adapted to contact each other in response to pressure on said top sheet; said top and bottom electrodes being formed of spaced apart generally parallel elongated first metal foil bands adhesively secured respectively to said top and bottom sheets, the first bands of said top electrode being in register with the first bands of said

bottom electrode; amiddle dielectric sheet sandwiched between said top and bottom electrodes; said middle sheet having a plurality of spaced apart generally parallel elongated apertures in register with said first bands; said first and second electrodes each further comprising a pair of second metal foil bands running perpendicular to and overlapping the first bands along opposite extremes of said first bands; first and second lead wires; a first metal staple attaching said first lead wire to one of the second bands of said top electrode; and a second metal stapie attaching said second lead wire to one of second bands of said bottom electrode.

4,037,070

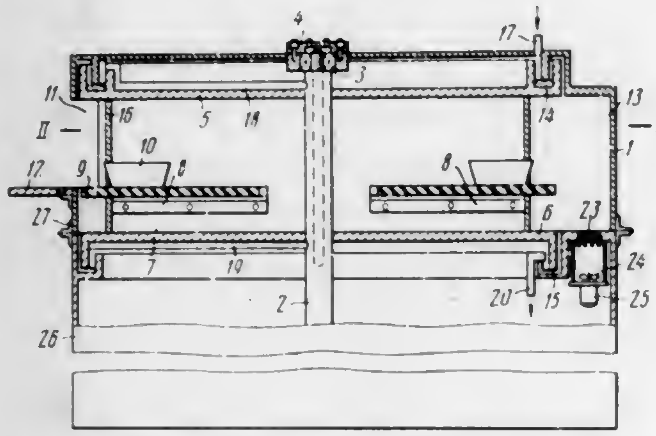
TURNTABLE-TYPE MICROWAVE CONTINUOUS OVEN

Vladimir Pavlovich Kirpichnikov, Sevastopolsky prospekt, 14, kv. 264, Moscow; Jury Veniaminovich Leibin, ulitsa Raevskogo, 3, kv. 36, Leningrad; Samuil Veniaminovich Nekrutman, Lomonosovsky prospekt, 19, kv. 264, Moscow, and Alexandr Nikolaevich Vyshelessky, Petrovsko-Razumovsky proezd, 7, kv. 28, Moscow, all of U.S.S.R.

Continuation of Ser. No. 481,844, June 21, 1974, abandoned. This application June 18, 1975, Ser. No. 587,885

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 A **2 Claims**



1. A turntable type microwave continuous oven with a loading section and a shielded cooking section, comprising: a housing; a microwave electromagnetic oscillator connected to the inner space of said housing for generating electromagnetic oscillation thereinside; a rotor made from current-conducting material positioned inside said housing and in coaxial relationship therewith, the shaft of the rotor carrying two disks installed in a plane perpendicular to that of the shaft rotation; the space confined within said disks being divided by radial partitions rigidly connected to said disks and shaft, which together form sections; dielectric shelves accommodated in said sections for carrying the product being treated about said shaft; said housing being of such cross-sectional shape that in the course of rotation of said rotor a number of said radial partitions which form locking compartments are in contact, through their outer edge, with the inner surface of said housing, while the remaining radial partitions are at a distance from the inner surface of the housing so as to form therewith a working chamber communicating with said microwave electromagnetic oscillator; a loading-unloading opening being arranged between said locking compartments in said housing.

4,037,071

METHOD AND APPARATUS FOR IMPROVED DISTRIBUTION OF MICROWAVE POWER IN A MICROWAVE CAVITY

Harold B. Kaufman, Jr., New York; John H. Meyer, Garden City, and John P. McCarthy, College Point, all of N.Y., assignors to DCA Food Industries Inc., New York, N.Y.

Filed Apr. 19, 1976, Ser. No. 678,253

Int. Cl.² H05B *9/06*

U.S. Cl. 219—10.55 F **13 Claims**

1. A system for distribution of microwave power within a microwave cavity, comprising a source of microwave power, a wave guide coupled to receive microwave power from said source of microwave power and having a microwave outlet port adapted to communicate with the interior of the microwave cavity for introducing microwave power into the interior thereof and means operatively coupled to said wave guide for selectively varying the orientation of the outlet port of said wave guide within said microwave cavity so that the direction in which microwave power is introduced into said microwave cavity can be controlled to produce a varying distribution of microwave power within said microwave cavity.

4,037,072

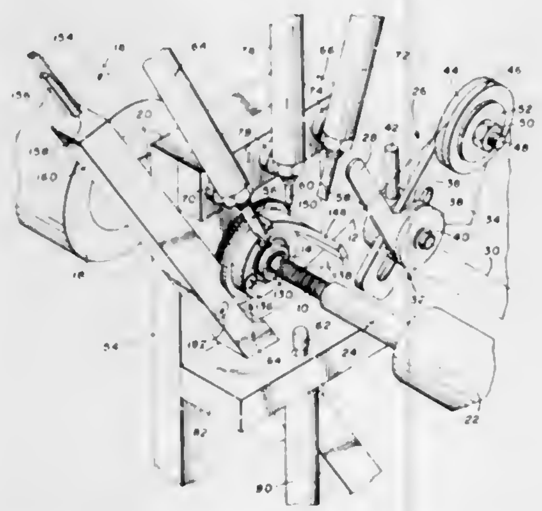
APPARATUS FOR FABRICATING RESISTORS

Paul W. Johnson, Decatur, Ind., assignor to E-Systems, Inc., Dallas, Tex.

Filed Dec. 22, 1975, Ser. No. 643,477

Int. Cl.² B23K *11/10;* **B23B** *5/00;* **H01C** *17/04*

U.S. Cl. 219—56 **17 Claims**



10. Apparatus for fabricating a wire wound resistor on a rotating core, comprising in combination:

- a carriage positioned to move along the longitudinal axis of the rotating core,
- a chuck mounted to said carriage and including:
  - a first supporting member mounted transverse of and coaxial with the longitudinal axis of the rotating core,,
  - a first jaw supported on said first member and extending in a direction along the longitudinal axis of the rotating core,
  - a second supporting member juxtapositioned said first member and mounted coaxial with the longitudinal axis of the rotating core,
  - a second jaw supported on said second member and extending in a direction along a longitudinal axis of the rotating core,
- means for rotating one of said members relative to the other between an open position and a wire gripping position where said first and second jaws are in side-by-side contact,
- welding means mounted to said carriage along an axis transverse of the longitudinal axis of the rotating core and including welding electrodes positionable transversely with respect to the rotating core, and
- shearing means mounted to said carriage along an axis transverse of the longitudinal axis of the rotating core and including cutters transversely positionable with respect to the core.

4,037,073

RESISTANCE WELDING OF SHEET METAL COATED WITH LAYERS

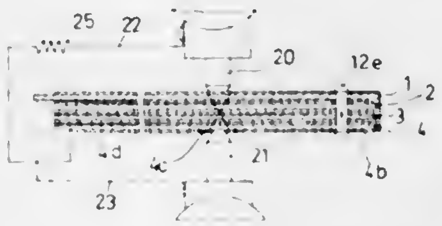
Otto Alfred Becker, 59 Robert-Koch-Strasse, 66 Saarbrucken 6, Germany

Division of Ser. No. 102,950, Dec. 30, 1970, Pat. No. 3,897,593, which is a division of Ser. No. 704,684, Feb. 12, 1968, Pat. No. 3,643,057. This application July 25, 1974, Ser. No. 491,857

Claims priority, application Germany, Feb. 11, 1967, 91162; May 26, 1967, 92707; Apr. 24, 1967, 92210; Feb. 27, 1967, 91404

Int. Cl.² B23K *11/10*

U.S. Cl. 219—92 **5 Claims**



1. A method for resistance welding of a first insulation-coated sheet metal to at least two other insulation-coated sheet metals, comprising:

- establishing a first welding electrode in direct engagement and electrical contact with said first sheet metal;
- spacing a second welding electrode from a second sheet metal with the insulation coating of said second sheet metal between said second sheet metal and said second welding electrode;
- maintaining said electrodes generally alligned with said sheet metals therebetween and insulated from each other;
- establishing a shunt with a resistor from said second electrode to a stripped area of said first sheet metal independently of said second sheet metal;
- effecting electrical contact between said sheet metals at a point spaced from said region to be welded and independently of said shunt;
- while maintaining the above steps, serially passing current from said second welding electrode through said shunt, through said first metal and to said first welding electrode with said second sheet metal being out of the series circuit, and thereby generating sufficient heat to melt said insulation on all sheet metals in the region to be welded between said electrodes; and
- subsequently applying pressure on said electrodes against said sheet metals so that said melted insulation is displaced in the region to be welded, electrical contact between said sheet metals is made, and welding is effected.

4,037,074

APPARATUS FOR THE CONTINUOUS APPLICATION OF A METALLIC COATING TO A METAL STRIP

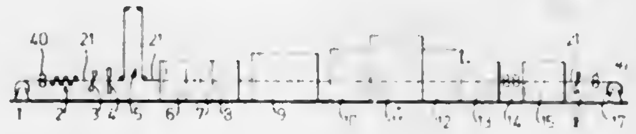
Felix Montbrun, Quai Sadoine, 8, B.4100 Seraing, and Roland Liesenborghs, Avenue du Hetre, 22, B.4200 Sclessin, both of Belgium

Filed Apr. 22, 1975, Ser. No. 570,472

Claims priority, application Belgium, Apr. 22, 1974, 44555

Int. Cl.² B23K *9/00*

U.S. Cl. 219—121 P **5 Claims**



1. Apparatus for the continuous application of a metallic coating to a metal strip, comprising:

- an airtight enclosure,
- means for continuously advancing the metal strip lengthwise of itself through said enclosure
- at least one plasma torch for projecting molten metal onto the continuously advancing metal strip
- a trolley carrying said plasma torch
- fixed rails carrying said trolley and extending parallel to the plane of said metal strip and perpendicular to the longitudinal direction thereof
- means for reciprocating said trolley with said plasma torch, on said rails, within said enclosure across the entire width of said metal strip
- and means for maintaining an inert atmosphere in said enclosure.

4,037,075

IMAGE REPRODUCTION SYSTEMS

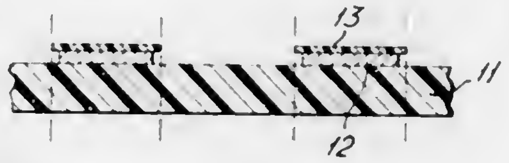
Peter C. Pugsley, Pinner, and Philip R. Kellner, Amersham, both of England, assignors to Crosfield Electronics Limited, London, England

Filed May 16, 1975, Ser. No. 578,143

Claims priority, application United Kingdom, May 16, 1974, 21847/74

Int. Cl.² G03F *1/00*

U.S. Cl. 219—121 LM **2 Claims**



1. A method of preparing a film or plate, for use in the preparation of a printing plate for providing a screened reproduction of an image, comprising the steps of:

- scanning a laser beam over the film or plate, the film or plate comprising a substrate having a plane surface and a coating on which the laser beam is incident, the substrate being substantially less susceptible to the action of the laser beam than the coating;
- modulating the laser beam in an on-off manner with the required screened-image densities of the image to be reproduced, whereby the coating material is selectively removed to leave only image-representing coating dots on the substrate;
- and thereafter correcting the film or plate by subjecting the remaining image-representing coating dots to the action of a chemical agent;
- and in which the said coating comprises a first layer on the substrate and a second layer which is superimposed on the first and is substantially more resistant to attack by the chemical agent than the first layer and thereby protects the underlying surface of the first layer, whereby the said image-representing dots are affected by the chemical agent from their side walls of the said first material inwards and their effective size is reduced.

4,037,076

APPARATUS FOR BALANCING ROTATING BODIES

Benjamin E. Blackaby, Maumee, Ohio, assignor to Teledyne Industries, Inc., Los Angeles, Calif.

Filed Dec. 18, 1975, Ser. No. 642,155

Int. Cl.² B23K *26/00*

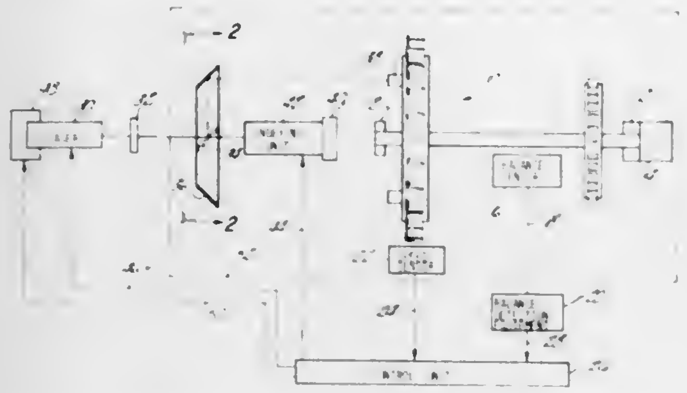
U.S. Cl. 219—121 L **5 Claims**

1. Apparatus for balancing a rotating body comprising:

- means for rotatably mounting said body,
- means for rotating said body,
- means for detecting unbalance of said body and for generating an unbalance signal in response thereto,
- control means for computing the amount and location of compensating material to be removed from said body in

response to said unbalance signal in order to balance said body, and

machining means for removing said amount of compensating material at said location, said machining means further comprising an angled mirror and means for rotating the mirror coaxially with the rotating body, a laser positioned to direct a laser beam axially toward the rotating mirror whereby the mirror reflects the laser beam radially outwardly from the rotational axis of the mirror, means for synchronizing the rotational speed of said mirror to the rotational speed of said body, a stationary annular reflector disposed radially outwardly from and coaxially with said mirror, whereby said mirror reflects said laser beam to said reflector which in turn reflects said laser beam axially toward said rotating body so that said laser beam impinges substantially perpendicularly on said rotating body to thereby remove said compensating material therefrom.



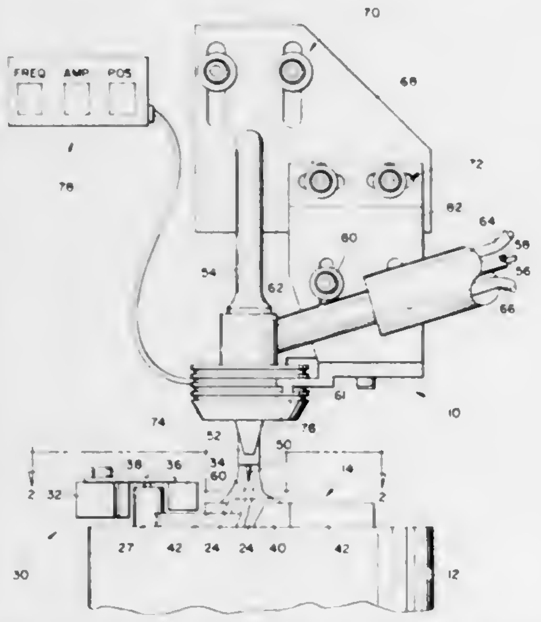
4,037,077
BATTERY WELDING METHOD

Steven H. Harder, Denver, Colo., assignor to The Gates Rubber Company, Denver, Colo.

Filed Aug. 2, 1976, Ser. No. 710,756

Int. Cl.² B23K *9/08*

U.S. Cl. 219—123 **5 Claims**



1. In a method for joining lead parts together in a lead-based battery by passing an electrode arc derived from an inert-gas-shielded, non-consumable electrode across the lead parts to at least partially melt them, and wherein the flow of the melted lead parts is contained by a mold means of sufficiently high thermal conductivity to act as a rapid heat sink, and which surrounds the lead parts, the improvement comprising:

striking the electrode arc substantially directly over the lead parts; and

passing the electrode arc in substantially a straight line over the lead parts longitudinally thereof, in excess of one full pass across the lead parts, at a speed and current to cause the lead parts to flow and weld together and be confined by the mold means.

4,037,078
PROCESS FOR WELDING ALUMINUM AND ALUMINUM ALLOYS IN HORIZONTAL WELDING POSITION

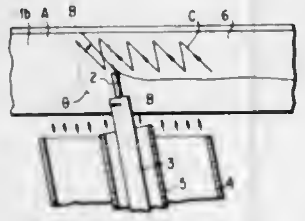
Minoru Oishi; Naoki Okuda, both of Fujisawa; Makoto Tomita, Yokohama; Toshisada Kashimura, Tokyo, and Syozi Koga, Kamakura, all of Japan, assignors to Kobe Steel Ltd., Kobe, Japan

Filed Dec. 31, 1974, Ser. No. 537,698

Claims priority, application Japan, May 23, 1974, 49-58477; July 29, 1974, 49-85993; Sept. 4, 1974, 49-101402; Sept. 4, 1974, 49-101403; Sept. 6, 1974, 49-103377; Sept. 21, 1974, 49-109331

Int. Cl.² B23K *9/00*

U.S. Cl. 219—137 R **7 Claims**



1. A process for welding aluminum and aluminum alloy base metals in a horizontal welding position, wherein the base metals are placed vertically in abutting relationship to form a weld groove which is open in a sidewise direction, which comprises:

advancing a welding electrode to said weld groove such that the top of said electrode describes an oscillating pattern traversing the depth of said weld groove and such that the angle of the welding direction formed by the surface of the molten metal pool created by the advancing electrode and the vertical plane which includes the electrode axis relative to the groove which is maintained greater than 90°.

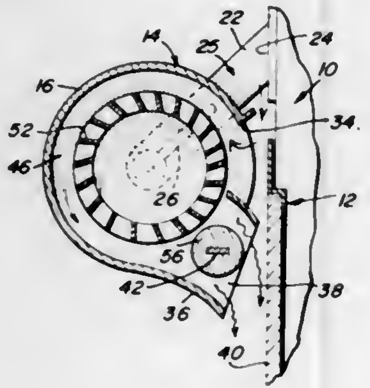
4,037,079
BATHROOM MIRROR DEFOGGER

Joseph M. Armbruster, 3701 N. 29th Ave., Hollywood, Fla. 33020

Filed Aug. 6, 1975, Ser. No. 602,306

Int. Cl.² H05B *1/00;* **E06B** *7/12;* **F24H** *3/04*

U.S. Cl. 219—219 **2 Claims**



1. In combination with an upstanding mirror element supported from an upstanding interior wall and having a viewing surface disposed in an environment rendering said surface at least occasionally subject to the formation of condensation thereon and with said element including a generally horizontal upper marginal edge portion and upstanding opposite side marginal portions between which said upper marginal portion

extends, a defogging apparatus comprising an elongated generally cylindrical horizontal housing extending along and supported outwardly of said upper marginal portion, the side of said housing adjacent said upper marginal portion and facing said wall including an upper elongated horizontal air inlet opening and a lower elongated horizontal air outlet opening with said openings extending longitudinally of said housing and opening toward the plane of said surface, said outlet opening being spaced from said inlet opening by a narrow portion of the peripheral wall of said housing and opening in a direction inclined toward the marginal portion of said mirror element remote from said upper marginal portion, motorized blower means including an elongated blower drum disposed within and housing and operative to draw ambient air into said housing through said inlet opening and to discharge air from said housing through said outlet opening, whereby a curtain of air will be directed upon said viewing surface and thereacross toward said remote marginal portion, a pair of bracket members secured to said wall adjacent and above the opposite ends of said upper marginal portion, said brackets extending outwardly from said wall and including outer portions provided with generally parallel elongated slots extending downwardly and outwardly away from said wall and said viewing surface, said housing extending between said brackets, the opposite end portions of said housing including endwise outwardly projecting threaded pivot pins generally coinciding with the longitudinal center axis of said housing and rotatably aad slidbly received in and through said slots, threaded clamp nuts threaded on the outer ends of said pins outwardly of said outer bracket portions releasably clampingly retaining said housing in adjusted rotated and slidingly shifted positions relative to said brackets, an elongated electrical resistance-type heating element disposed in and extending along said outlet opening between the opposite longitudinal sides thereof, said electrical resistance heating element being adapted to be communicated with a suitable source of electrical potential.

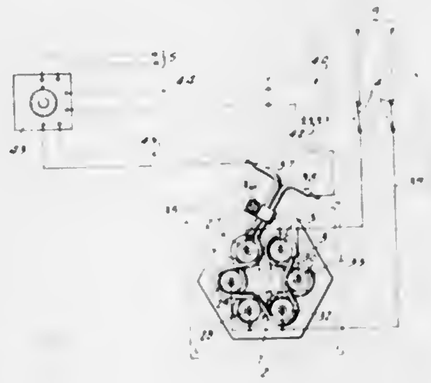
4,037,080
PROTECTION AND CONTROL OF ELECTRIC IMMERSION-TYPE HEATER

Donald R. Owen, 211 N. Lincoln St., Hinsdale, Ill. 60521

Filed Jan. 7, 1976, Ser. No. 647,099

Int. Cl.² F24H *1/00;* **H05B** *1/00*

U.S. Cl. 219—328 **8 Claims**



1. An electrically energized control system for substantially maintaining a predetermined condition in respect to a liquid within a receptacle comprising:

a. an immersion-type heater carried by said receptacle and having an inner portion extending inwardly into said receptacle to contact said liquid and an outer portion extending outwardly from said receptacle,

b. sensor means carried by said outer portion of said heater for sensing an excessive self-generated temperature of said heater caused by an undesirable deviation from said predetermined condition,

c. means controlled by said sensor for effecting return to said predetermined condition, and further characterized by said means controlled by said sensor comprising

an electrical power supply means further comprising a power circuit, an electrical power source, and a power relay, said power source connected to said heater by said power circuit through said power relay and to energize said heater,

a control circuit connecting with said sensor means,

a controller means connected to said control circuit and responsive to an output from said sensor means,

a second electrical power source connected to said controller means to energize said controller, and

a power relay circuit to activate said power relay and connected to said relay and said controller means,

wherein said heater is selectively energized by said power source when said relay is activated by said controller means in response to said sensor.

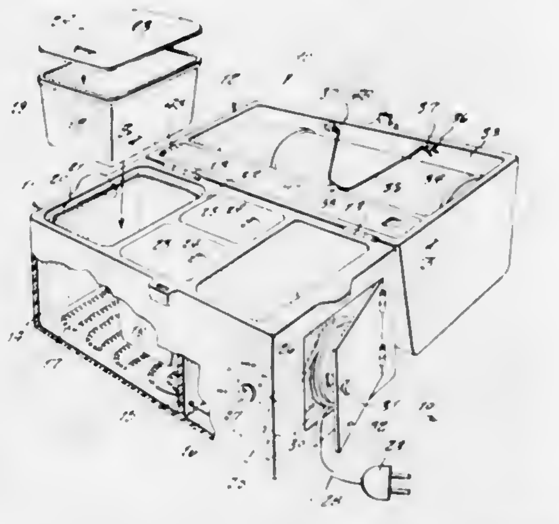
4,037,081
ELECTRO-LUNCH BUCKET

Bobby V. Aldridge, c/o George Spector, 3615 Woolworth Bldg., 233 Broadway, and George Spector, 3615 Woolworth Building, 233 Broadway, both of New York, N.Y. 10007

Filed June 21, 1976, Ser. No. 698,076

Int. Cl.² F27D *11/02;* **A21B** *1/52*

U.S. Cl. 219—387 **1 Claim**

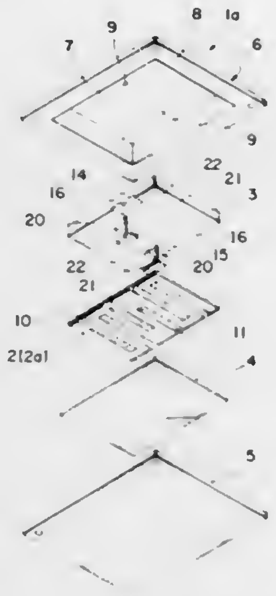


1. An electro-lunch bucket, comprising in combination, a case and hollow compartmented cover pivotally hinged together, said case and cover being of thermally and electrically insulating material, a first compartment in said case for hot food and a second compartment in said case for cold food, said comprtments being separated by an upstanding thermally insulating wall, said first compartment having a bottom wall supporting electric heating coil for heating foods in covered trays mounted in said first compartment, said coil being connected to a heat control unit and switch having means electric lead for connection to an electric power source, said first compartment having an upper opening encompassed by a ledge to support said trays by means of a flange about the tray top cover having a first compartment formed internally of said cover to house a thermosbottle retained from falling out by a pivotable wire clip, and including a second compartment formed in said cover to store silverware and a salt and pepper shaker supported in a cage formed on an underside of a lid of said second compartment of said cover, said lid being pivotally secured on one end to the underside of the cover, whereby said lid and cage may be pivotally move to an open position externally of the cover compartments.

4,037,082
POSITIVE TEMPERATURE COEFFICIENT SEMICONDUCTOR HEATING DEVICE

Minoru Tamada; Takashi Shikama, and Toshikazu Nakamura, all of Yokaichi, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Apr. 30, 1976, Ser. No. 682,041
Int. Cl.^{2} H05B *3/10*
U.S. Cl. 219—541 **6 Claims**



1. A positive temperature coefficient semiconductor (PTCS) heating device comprising:

a. a PTCS body having two opposed flat and mutually parallel faces;

b. a first electrode means having a plurality of strips of metal film electrically connected to each other at one end thereof and being separated from each other along their respective lengths with at least one of said strips being shorter than the other strips and said first electrode means being provided on one of said two opposed faces of said PTCS body;

c. a second electrode means having a plurality of strips of metal film electrically connected to each other at one end thereof and being separated from each other along their respective lengths with at least one of said strips being shorter than the other strips and said second electrode means being provided on said one of said opposed faces in such a manner that the strips of opposite electrodes are alternately disposed on said one face so that adjacent strips of the respective strips are members of different ones of said first and second electrode means;

d. a first terminal of a pair of terminals for applying a predetermined voltage to said first electrode means and provided on the other of said opposed faces at such a position that said first terminal does not overlap, through the PTCS body, with any of the strips of said second electrode means;

e. a second terminal of said pair of terminals, said second terminal electrically connected to said second electrode means and provided on said other of said opposed faces at such a position that said second terminal does not overlap, through the PTCS body, with any of the strips of said first electrode;

f. a lower insulating means provided on a lower face of said two faces of the PTCS body for electrically insulating said electrodes;

g. an upper insulating means provided on an upper face of said two faces of the PTSC body for electrically insulating said terminals;

h. a metallic heat emission plate provided directly below said lower insulating means for emitting heat therefrom obtained from said PTCS heating element through said lower insulating means;

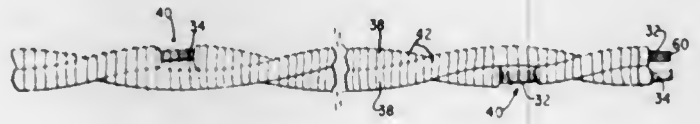
i. a metallic case means for entirely covering said PTCS heating element and said lower and upper insulating means together with said heat emission plate; and

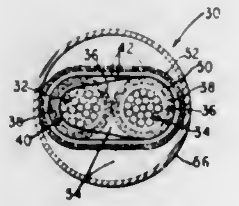
j. a pair of terminal units each having base portions for electrically connecting with corresponding said terminals and a pin portion extending outwardly from said case means through said upper insulating means for connecting to an electrical power supply.

4,037,083
HIGH TEMPERATURE PARALLEL RESISTANCE PIPE HEATER

Joseph E. Leavines, P.O. Box 310, 2 Sierra Circle, New Braunfels, Tex. 78130

Filed May 5, 1976, Ser. No. 683,299
Int. Cl.^{2} H05B *3/10*
U.S. Cl. 219—552 **2 Claims**





1. A high-temperature parallel-resistance pipe heater cable capable of being operated at a temperature level of approximately 600° F on a sustained basis and capable of withstanding temporary occasional heating up to 1,000° F comprising

a pair of flexible electrical conductors, each conductor including a multiplicity of fine strands of nickel-clad copper wire,

a primary layer of micaceous insulation wrapped around each of said conductors,

a secondary insulation layer of fiberglass threads tightly braided over said primary layer, each of said fiberglass threads being coated with an anti-fraying agent,

short sections of both primary and secondary insulation being stripped from both of said conductors to expose short bared segments of the conductor at uniformly spaced intervals along the length of the conductor all of said bared segments being of the same length and being spaced-apart by intervals of the same length,

said insulated conductors being placed side-by-side with the bared segments of one located mid-way between the bared segments of the other,

said insulated conductors being twisted together for holding the bared segments of one mid-way between the bared segments of the other along the length of said twisted pair,

a nickel-alloy resistance wire helically wound around said twisted pair with at least two bights of the resistance wire engaging each of the bared conductor segments occurring along the length of the twisted pair for providing a multiplicity of contact points of high unit area pressure where each of said bights of the nickel-alloy resistance wire presses against the nickel-clad surfaces of the fine copper strands,

a layer of micaceous insulation wrapped over said helically-wound resistance wire,

an outer jacket of fiberglass strands braided tightly over said latter micaceous insulation layer, and

a stainless steel tubular sheath surrounding said fiberglass braided jacket.

4,037,084
DECOMPRESSION PLAN CALCULATOR

Ali A. Seireg, Madison, Wis., and Amr M. S. Baz, Cairo, Egypt, assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Filed Mar. 9, 1976, Ser. No. 665,174
Int. Cl.^{2} G06C *27/00*
U.S. Cl. 235—69 **6 Claims**

1. A decompression plan calculator, comprising:

a. a working depth having numerical markings thereon representing the working depth d_w of a dive;

b. an initial depth scale having numerical markings thereon representing the initial depth d_i of a dive;

c. a difference scale having numerical markings thereon;

d. means for indicating on said difference scale the difference $d_i - d_w$ between a numerical value located on said working depth scale and a numerical value located on said initial depth scale;

e. a decompression stop depth scale having numerical markings thereon representing the depth d_{s1} of a decompression stop;

f. an uptake time scale having numerical markings thereon representing the time t_w spent at the working depth, the numerical markings on said uptake time scale being spaced thereon in proportion to e^{t_w/T_u} where T_u is a selected uptake time constant;

g. means for dividing a reading equal to $d_i - d_w$ on said difference scale by a value equal to e^{t_w/T_u} determined on said uptake time scale, adding the working depth d_w located on said working depth scale to the quotient, substracting a constant K equal to the depth of water equivalent to surface absolute pressure, and for indicating the sum

$$\frac{d_w}{2} + \frac{(d_i - d_w)}{2} e^{-t_w/T_u} - \frac{K}{2}$$

on said decompression stop depth scale, whereby such sum is equal to a safe decompression stop depth d_{s1};

h at least one decompression stop time scale having numerical markings thereon representing the amount of time t_1 that the diver must spend at the decompression stop depth d_{s1} in order to safely surface;

i. means for indicating on said decompression stop time scale a time reading t_1 corresponding to a decompression stop reading d_{s1} on said decompression stop scale wherein t_1 and d_{s1} are related such that the reading t_1 is approximately equal to

$$T_e \ln\left[\frac{K + d_{s1}}{K(s-1) - d_{s1}}\right]$$

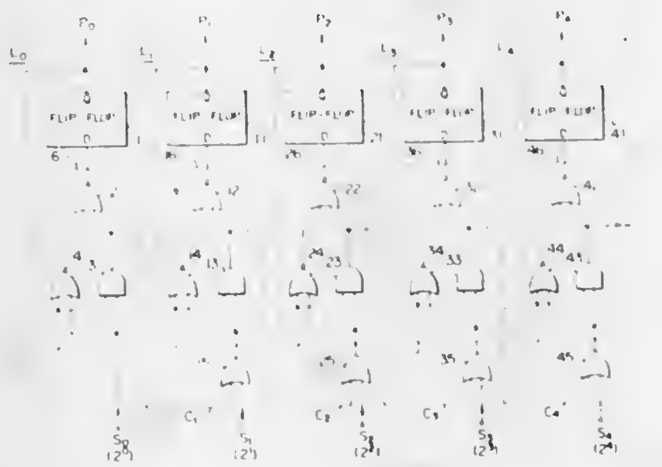
where T_e

is selected time constant of eimination not equal to T_u, and where S is a chosen supersaturation ratio.

4,037,085
COUNTER

Kazuo Minorikawa, Tokyo, Japan, assignor to Hitachi, Ltd., Japan

Filed Aug. 17, 1976, Ser. No. 715,152
Claims priority, application Japan, Aug. 27, 1975, 50-103029
Int. Cl.^{2} H03K *21/36*
U.S. Cl. 235—92 LG **2 Claims**



1. A counter comprising a plurality of logic units each representative of one of the digits of information data being stored in the counter, each said logic unit except that representative of the least significant digit including an OR circuit having an input terminal for receiving a control input signal for the associated digit, an exclusive OR circuit having an input terminal connected with the output of said OR circuit and a flip-flop circuit having an input terminal connected with the output of said exclusive OR circuit, the output of said flip-flop circuit being indicative of the value of the associated digit, said exclusive OR circuit having another input terminal connected with the output of said flip-flop circuit, the logic unit representative of the least significant digit including another exclusive OR circuit having an input terminal for receiving a control input signal for the least significant digit and another flip-flop circuit having an inpat terminal connected with the output of said another exclusive OR circuit, the output of said another flip-flop circuit indicative of the value of the least significant digit, said another exclusive OR circuit having another input terminal connected with the output of said another flip-flop circuit, the OR circuit of each of said logic units having another input terminal to which a carry signal from the logic unit representative of the next lower order digit is supplied.

4,037,086
VERTICAL NAVIGATION GUIDANCE SYSTEM

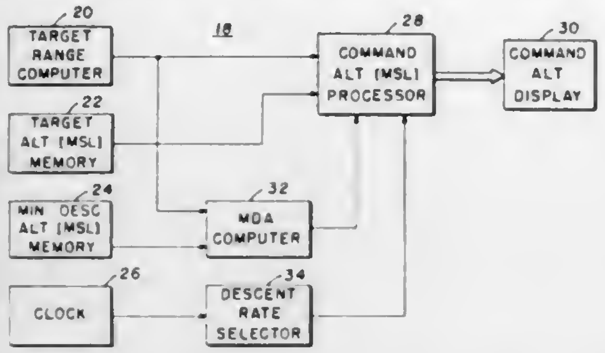
George B. Foster, Worthington, and Paul Douglas Gibbs, Blacklick, both of Ohio, assignors to Air Data, Inc., Worthington, Ohio

Filed June 5, 1974, Ser. No. 476,514
Int. Cl.^{2} G06F *15/50;* G01C *21/20*
U.S. Cl. 235—150.22 **15 Claims**

1. A vertical navigation guidance computer comprising means for receiving first signal representing the range from an aircraft to a target location; means for generating a second signal representative of a desired descent rate; means for generating a third signal representing the altitude of the target location above the mean sea level; processing means responsive to said first, second, and third signals for generating a command altitude value in accordance with the equation:

$$C.A. = R \tan(a) + A$$

where C.A. is the command altitude, R is the range, (a) is a desired descent angle, and A is the altitude above mean sea level of the target location; means to display the generated



value of C.A. and means to generate a fourth signal representing a pre-determined minimum altitude above the target and means responsive to the command altitude being less than the minimum descent altitude to provide an alarm signal.

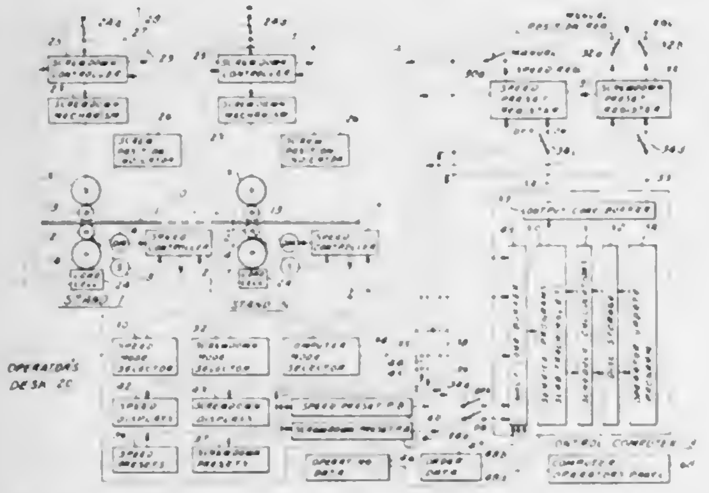
4,037,087
ROLLING MILL CONTROL METHOD AND APPARATUS HAVING OPERATOR UPDATE OF PRESETS

John G. Foulds, Bethlehem, Pa., assignor to Bethlehem Steel Corporation, Bethlehem, Pa.

Filed May 27, 1976, Ser. No. 690,748

Int. Cl.² B21B *37/12;* G06F *9/06*

U.S. Cl. 235—151.1 **28 Claims**



1. A method of controlling a rolling mill having a presettable operating parameter, which method comprises:

a. establishing a rolling schedule after receiving input data.

b. presetting the mill operating parameter to a reference level obtained from the rolling schedule and operating the mill parameter at said reference level during an automatic mode of operation,

c. calculating a modifier for the preset reference level during mill operation in response to an operator updating the parameter preset device, the same preset device being used for a second mode of mill operation, and

d. subsequently adjusting the mill operating parameter reference level proportional to the calculated modifier.

4,037,088
WIDE LOAD RANGE SYSTEM FOR TRANSFERRING TURBINE OR PLANT OPERATION BETWEEN COMPUTERS IN A MULTIPLE COMPUTER TURBINE AND POWER PLANT CONTROL SYSTEM

Guy E. Davis, Martinez, Calif.; Francesco Lardi, Pittsburgh, and William D. Ghrist, III, Washington, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 6, 1973, Ser. No. 413,273

Int. Cl.² F01D *17/02;* G05B *15/00;* G06F *15/06*

U.S. Cl. 235—151.21 **7 Claims**

1. A control system for an electric power plant having at least one steam turbine and a steam generator, said control system comprising multiple digital computers including at least a first digital computer and a second digital computer, means for generating input signals representing predetermined process variables associated with said steam generator, means for generating input signals representing turbine load and other predetermined process variables associated with said steam turbine, means for coupling the input signals to both of said computers each of said computers having means for controlling its sequential programmed operation and including substantially identical means for generating control outputs for operating controllable elements of said steam generator and throttle and governor valves of said steam turbine as a function of the input signals, means for sensing predetermined control system malfunctions, said control output generating means including a load control for operating said turbine governor valves in response to a load reference and a representation of actual turbine load during turbine load operation, means for coupling the outputs of one of said computers to operate the steam generator controllable elements and the turbine valves, means for substantially conforming the structure of the other computer to the structure of said one computer in real time including means for generating control outputs in the other computer substantially equal to those from said one computer, and means for executing a transfer in the control of the steam generator and the turbine from said one computer to said other computer substantially without disturbing the power generation when said sensing means detects a control system malfunction.

4,037,089
INTEGRATED PROGRAMMABLE LOGIC ARRAY

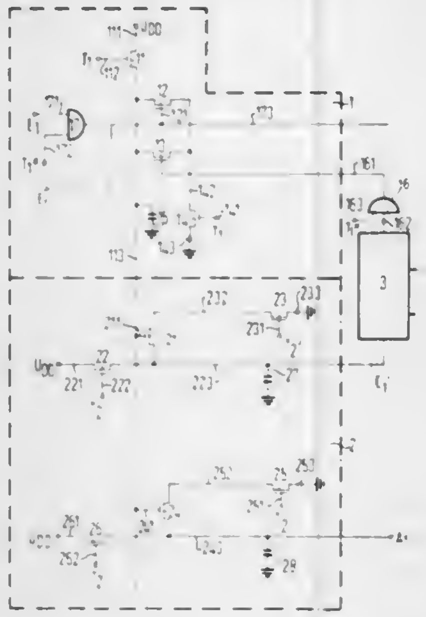
Karlheinrich Horninger, Eglharting, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Nov. 20, 1975, Ser. No. 633,959

Claims priority, application Germany, Nov. 21, 1974, 2455178

Int. Cl.² G11C *15/00;* H03K *19/08*

U.S. Cl. 235—152 **19 Claims**



1. An integrated circuit programmable logic array, comprising an AND matrix with row lines and column lines, a plurality of inputs connected to the row lines of the AND matrix and a plurality of outputs connected to column lines of the AND matrix; an OR matrix with row lines and column lines, said column lines being connected to receive inputs from the outputs of said AND matrix and a plurality of outputs connected with row lines of the OR matrix, said AND matrix and said OR matrix each having switching transistors interconnecting said row lines and column lines in accordance with the programming of the matrixes; a column transistor for each column line of said AND matrix, means for connecting a first source of electrical potential to each of said column lines of said AND matrix through its respective column transistor when said column transistor is rendered conductive, said switching transistors of said AND matrix being connected to said column lines and operative to individually connect a second source of electrical potential to said column lines when said AND matrix transistors are rendered conductive by a signal applied to their row lines, a storage capacitor connected with each of said column lines, said switching transistors of said OR matrix being connected to the row lines of said OR matrix and operative to individually connect said row lines to a third source of electrical potential when said OR gate switching transistors are rendered conductive by signals on their respective column lines, said OR matrix including a row transistor for each row line of said OR matrix, means for connecting a fourth source of electrical potential to each of said row lines of said OR matrix through its respective now transistor when said row transistor is rendered conductive, a storage capacitor connected with each of the rows of said OR matrix; a plurality of control transistors, each interconnected between a plurality of said switching transistors and a source of electrical potential for selectively rendering said switching transistors non-conductive; and a delaying feedback circuit connected between an output of said OR matrix and input of said AND matrix, whereby data from an output of said OR matrix is logically linked with data subsequently present on the inputs of said AND matrix, both of said matrixes and said feedback circuit being constructed of dynamically operated storage elements, said feedback circuit including feedback switching transistor in said OR matrix for interconnecting a column line with a feedback row line of said OR matrix, said first feedback switching transistor being connected for selectively connecting its respective row with said third source of potential in response to a signal on said column line, said feedback row line of said OR matrix being connected to the input of said feedback circuit, and including a second feedback switching transistor in said AND matrix for interconnecting a column line with the output of said feedback circuit, said second feedback switching transistor being connected for selectively connecting its respective column line with said second source of electrical potential in response to a signal from said feedback circuit.

4,037,090
MULTIPHASE CLOCKING FOR MOS

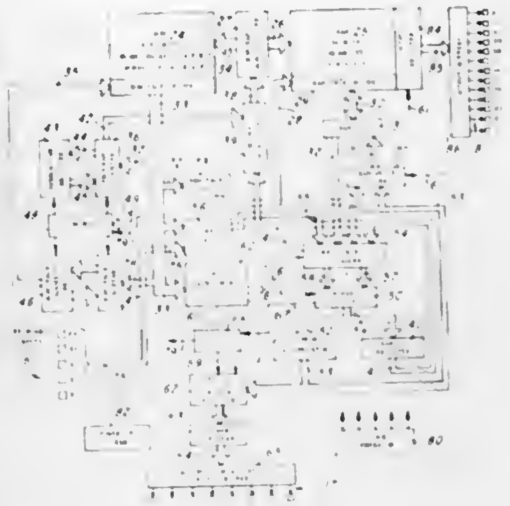
Joseph H. Raymond, Jr., Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

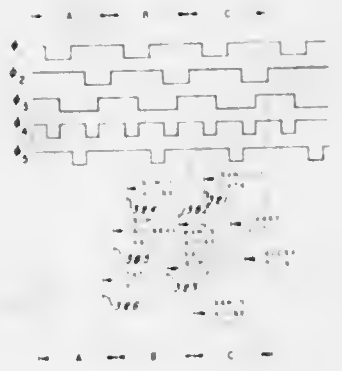
Continuation of Ser. No. 525,246, Nov. 19, 1974, abandoned. This application Aug. 9, 1976, Ser. No. 713,062

Int. Cl.² G06F *1/04*

U.S. Cl. 235—152 **22 Claims**

18. An electronic digital system implemented in large scale integrated semiconductor means, comprising: data storage means including a plurality of memory cells; addressing means for accessing the data storage means; program instruction storage means; addressing means for accessing the instruction storage means; arithmetic means for performing arithmetic operations on a plurality of parallel data bits applied thereto; control means receiving instruction words from the instruction storage means and generating command signals for defining the operation of the system; timing means in the system defining a recurring machine cycle of a given length during which the data storage means is accessed, the instruction storage means delivers an instruction word to the control means, the control means generates commands from such instruction word, and the arithmetic means receives an input, the improvement wherein the timing means includes means for generating multiple clock voltages within each machine cycle, including a first clock voltage having a first interval during which the data storage means is accessed, a second clock voltage having a second interval during which the instruction storage means delivers an instruction word to the control means, the first and second intervals not overlapping, and a third clock voltage having two distinct pulse intervals in each machine cycle with one pulse interval occurring during part of said first interval and the other pulse interval occurring during part of said second interval, the third clock voltage being used in said addressing means for the instruction storage means.





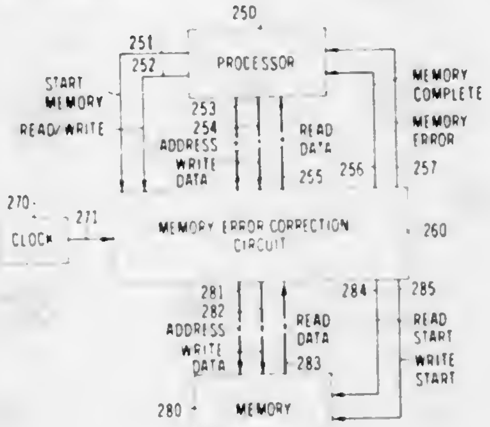
4,037,091
ERROR CORRECTION CIRCUIT UTILIZING MULTIPLE PARITY BITS

Hugo Jacob Beuscher, Glen Ellyn, Ill., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1976, Ser. No. 673,464

Int. Cl.² G06F *11/10;* G11C *29/00*

U.S. Cl. 235—153 AM **13 Claims**



1. A method for correcting errors in a memory comprising one or more words and applying the corrected words to a destination circuit where each data word in said memory comprises:

a plurality of data bits and a plurality of parity bits; and said method is practiced in an error correcting circuit comprising:

read and write circuitry for said memory;

parity check means;

complementing means; and

output circuitry for transmitting corrected words to a destination circuit;

said method comprising the following steps:

a. reading the contents of a selected word location from said memory and applying said contents to said parity check means,

b. complementing said contents of said memory, applying said complemented contents of said destination circuit and stopping if the output of said parity check means indicates that all of said plurality of parity bits are bad,

c. performing the following steps if the output of said parity check means indicates that at least one but not all of said plurality of parity bits are bad:

1. complementing said contents,
2. writing said complemented contents into said selected word location of said memory,
3. repeating steps a) through b).

4,037,092

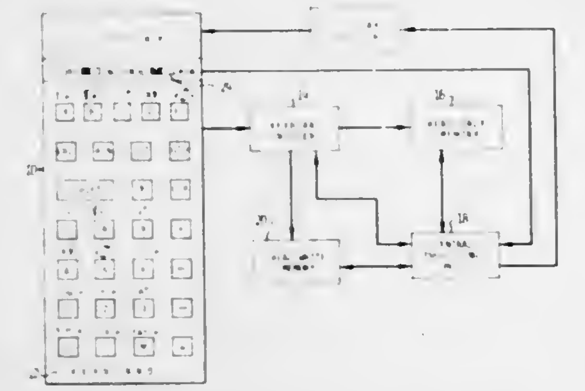
CALCULATOR HAVING PREPROGRAMMED USER-DEFINABLE FUNCTIONS

Thomas E. Osborne, San Francisco, and Richard Kent Stockwell, Palo Alto, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Nov. 26, 1973, Ser. No. 419,153

Int. Cl.² G06F *15/02*

U.S. Cl. 235—156 **6 Claims**



1. A calculator having electronic circuits comprising:

a keyboard having a plurality of keys including a user-definable function key;

encoder means connected to the keyboard for generating a plurality of coded signals representing manipulative functions and alphanumeric characters including those functions and characters corresponding to the keys in the keyboard;

a read-write memory connected to the encoder means for storing coded signals;

computing means connected to the encoder means and the read-write memory for processing coded signals stored in the read-write memory in response to a predetermined coded signal corresponding to the user-definable function key;

power means connected to the electronic circuits including the encoder means, the read-write memory and the computing means for causing electrical power to be applied to the electronic circuits; and

preprogram means connected to the read-write memory and the power means for establishing, in response to the application of power to the electronic circuits, a program of one or more coded signals in the read-write memory that can be processed in the computing means in response to the generation of the predetermined coded signal.

4,037,093

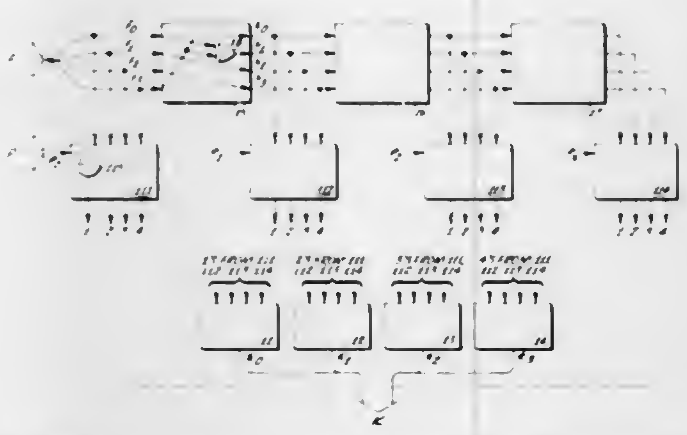
MATRIX MULTIPLIER IN GF(2^m)

Gordon E. Gregg, Tempe; Thomas H. Howell, and Leonard Rabins, both of Scottsdale, all of Ariz., assignors to Honeywell Information Systems, Inc., Phoenix, Ariz.

Filed Dec. 29, 1975, Ser. No. 644,776

Int. Cl.² G06F *7/52*

U.S. Cl. 235—164 **5 Claims**



1. An apparatus for multiplying arbitrary field elements F(x) and P (x) (where $F(x)=f_ix^i$, $P(x)=P_ix^i$ for i from 0 to $m-1$) in a Galois field GF(2^m), where $g(x)-g_ix^i$ ($i=0$ to m) is a generator polynomial for said Galois field, comprising:

$m-1$ ordered multiplying means, the first of said ordered multiplying means responsive to signals representing field elements of $F(x)$, the remainder of said ordered multiplying means responsive to output signals from the preceding one of said ordered multiplying means, each of said multiplying means multiplying its output by x and producing a result modulo $g(x)$;

m ordered logical means, the ith of said logical means coupled to the $(i-1)$ of said multiplying means and having input signals $x^iF(x)$, ith logical means gating its input by p_i and producing a partial product of PxG; and PxF from

m summing means responsive to said m logical means for receiving said partial products, said summing means generating signals corresponding to the product $P+F$ modulo $g(x)$, each member of said summing means responsive to a corresponding component of a partial product of each of said logical means.

4,037,094

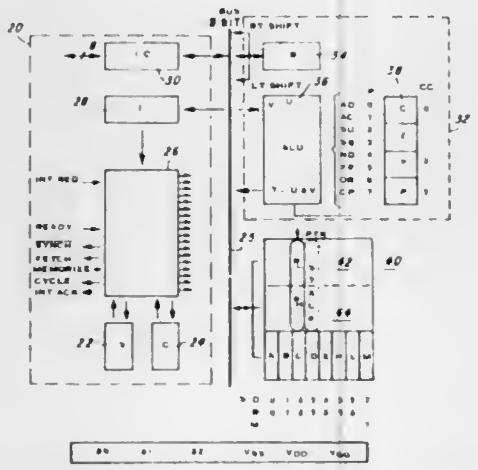
MULTI-FUNCTIONAL ARITHMETIC AND LOGICAL UNIT

Jerry L. Vandierendonck, Houston, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Aug. 31, 1971, Ser. No. 176,664

Int. Cl.² G06F *7/48*

U.S. Cl. 235—175 **1 Claim**



1. In a calculating system which includes data storage means for storing data which is to be arithmetically processed, and wherein arithmetic operations which can be effected by the calculating system are respectively defined by preselected combinations of binary bits in instruction words, an arithmetic logic unit comprising:

logic control means for receiving each instruction and generating, responsive thereto, a discrete output enable signal corresponding to the arithmetic operation defined by said instruction;

arithmetic logic means connected to receive said output enable signal, said arithmetic logic means including a plurality of logic gates selectively coupled to said storage means for accessing data stored therein, said arithmetic logic means for executing an arithmetic operation, the arithmetic logic means being responsive to said enable signal to effect the selected arithmetic operation on said data accessed from said storage means, said arithmetic logic means integrated on a single semiconductor chip adjacent said storage means and said logic control means, and selectively interconnected therewith by a single parallel bus system; and

logic means for selectively connecting said storage means, said logic control means, and said arithmetic logic means to said bus system for controlling transmittal of data therebetween.

4,037,095

SIGNAL STABILIZING CIRCUITS

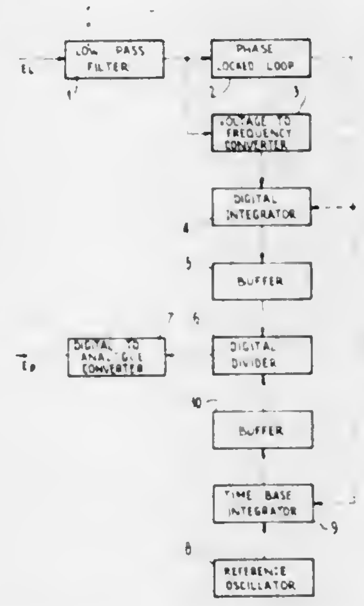
Edward Morris Howells, Abernethy, and Cheung Yun Chan, Mount Hutton, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Melbourne, Australia

Filed Sept. 17, 1975, Ser. No. 614,157

Claims priority, application Australia, Sept. 18, 1974, 8949/74

Int. Cl.² G06G *7/18*; H03K *5/00*

U.S. Cl. 235—183 **9 Claims**



1. A signal processing circuit for removing unwanted cyclic and/or random components from a composite d.c./cyclic signal, said circuit comprising means for connecting a source of said composite signal to:

a. means for determining the period of the signal; and

b. means for integrating said signal over its period; and

means joined to the period determining means and to the integrating means for dividing the integrated composite signal by the period thereof to produce the average of the composite signal over one period.

4,037,096

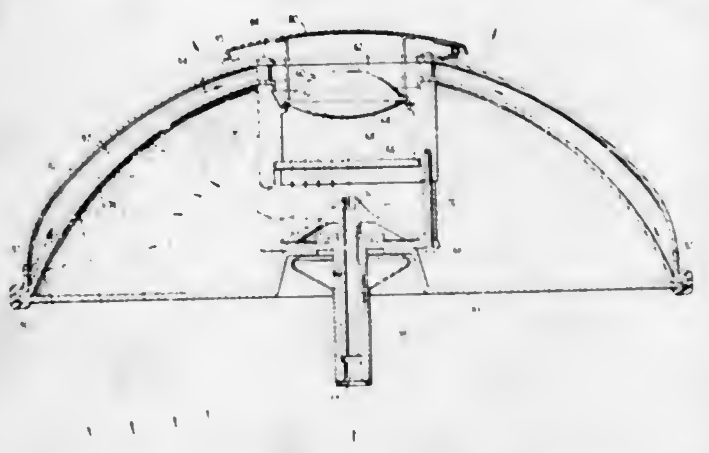
ILLUMINATOR APPARATUS USING OPTICAL REFLECTIVE METHODS

Thomas Brendgord, and Kenneth J. Fisher, both of Erie, Pa., assignors to American Sterilizer Company, Erie, Pa.

Filed Aug. 9, 1974, Ser. No. 496,166

Int. Cl.² A61G *13/00*; F21V *33/00*

U.S. Cl. 240—1.4 **10 Claims**



1. Illuminator apparatus for surgical lighting and similar lighting requirement uses comprising

a luminaire having a reflective optical system which is free of refracting means and which projects light in a pattern which is converging in axial cross section and substantially symmetrical about the principal axis of projected rays,

such principal axis of projected rays being coextensive with the axis of symmetry of the luminaire,

the luminaire comprising

light source means contiguous to the axis of symmetry and substantially symmetrically disposed with respect to the axis of symmetry,

optical means establishing a plurality of light reflection paths and projecting light rays in a forward direction toward an area to be illuminated which is substantially transverse to such principal axis,

internal frame means for positioning and supporting the light source means and optical means, and

external shell means for the luminaire,

the optical means comprising

source reflector means operationally associated with the light source means,

such source reflector means being at least partially circumscribing of the light source means to receive light rays directly from the light source means,

the source reflector means reflecting light rays to have a major directional component which is substantially axial of the luminaire,

a light reflecting surface forming part of a transversely-directing light reflector means and located to receive light rays reflected by the source reflector means and reflect substantially all frequencies of such impinging light rays to have a major directional component which is substantially transverse to the axis of symmetry,

the light reflecting surface of the transversely-directing reflector means comprising a double curved reflecting surface of curved conical-like cross sectional configuration with the apex of such curved conical-like configuration oriented toward the light source means,

such double curved reflecting surface of the transversely-directing reflector means comprising the surface of revolution of an arc about the axis of symmetry presenting its concave side in confronting relationship to the light source means,

such transversely-directing reflector means and the source reflector means being located along the axis of symmetry in proximate relationship within the external shell means of the luminaire with the source reflector means and the transversely-directing reflector means being on axially opposite sides of the light source means,

the source reflector means having a double curved reflecting surface located in surrounding relationship to the light source means and opening toward the transversely-directing reflector means with the transversely-directing reflector means receiving reflected light rays from the light source means,

such source reflector means and transversely-directing reflector means each being disposed in substantially transverse relationship to and substantially symmetrical relationship with the axis of symmetry establishing a light path between the source reflector means and the transversely-directing reflector means which is contiguous to and circumscribes the axis of symmetry, and

radially-spaced reflector means within the external shell means of the luminaire having light reflection surface means of double-curved curvilinear configuration radially spaced from and in circumscribing relationship to the transversely-directing reflector means and in circumscribing relationship to a major portion of the light path between the source reflector means and the transversely-directing reflector means,

such radially-spaced reflector means being disposed substantially symmetrically with relation to the axis of symmetry in a position to receive solely light rays reflected from the transversely-directing reflector means, such light rays being reflected in angled relation to each other toward the radially-spaced reflector means so as to cross in focal relationship intermediate such transversely-directing reflector means and such circumscribing radially-spaced reflector means,

the radially spaced reflector means reflecting such light rays with a major component in a forward direction toward the area to be illuminated in angled relation toward the principal axis, forming a converging pattern of light rays in axial cross-section,

such angled reflection of light rays from the circumscribing radially-spaced reflector means reducing shadow formation within the converging pattern of light rays and establishing with such transversely-directing reflector means a zone having a conical configuration in axial cross-section and located along the principal axis contiguous to the illuminator and extending in the forward direction with its apex toward the area to be illuminated,

such conical configuration zone being free of reflected light rays projected from the radially-spaced reflector, and

being characterized by shadow-free properties with respect to reflected light rays projected by the radially-spaced reflector means.

4,037,097
COLOR CHANGER FOR SPOTLIGHTS

Allen M. Stillman, and Theodore Stillman, both of 1954 E. 26th St., Brooklyn, N.Y. 11229
Filed Apr. 4, 1975, Ser. No. 565,072
Int. Cl.² F21P *5/04;* F21V *11/18, 9/08;* G02R *7/00*
U.S. Cl. 240—3.1 **7 Claims**

1. A slide changer mechanism for use with a light source comprising:

at least one slide,

a respective individually energizable actuator means for each said slide,

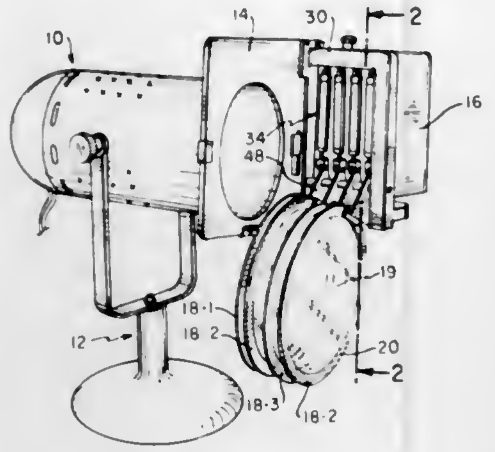
a respective, pivotally mounted crank means for each said actuator means and its corresponding slide,

means for attaching each slide to its respective crank means,

each of said actuator means comprising a pneumatically operated cylinder having a bi-directional linearly moving piston having a free end, means for pivotally connecting a said crank means to the free end of its respective piston,

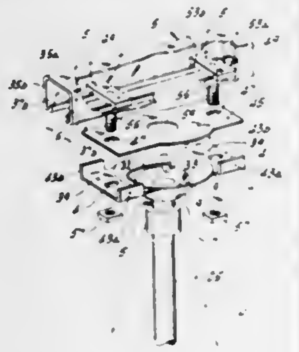
means for selectively providing fluid to each said pneumatic cylinder to cause its piston to move in one direction or the other,

and means for mounting each said cylinder with respect to its respective crank means to provide free rotation of said crank means in both directions about its pivot mounting as the piston of the pneumatic cylinder is moved.



4,037,098
SWIVEL CONNECTOR

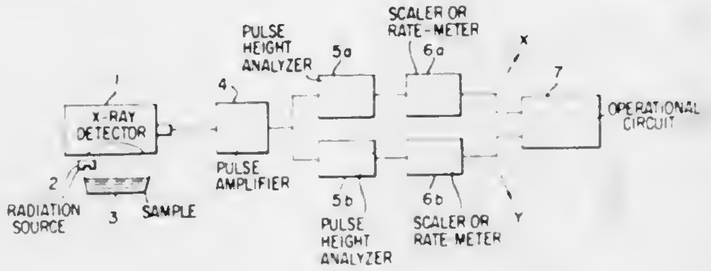
Joseph W. Kowalski, Florissant, Mo., assignor to B-Line Systems, Inc., Highland, Ill.
Filed Sept. 5, 1975, Ser. No. 610,644
Int. Cl.² F21S *1/06, 3/06*
U.S. Cl. 240—78 R **8 Claims**



1. A swivel assembly for mounting a lighting fixture or the like comprising a body member of relatively stiff sheet metal which has a generally spherical dome portion formed therein with the inner surface of said dome constituting a generally spherical concave surface, an opening through said body member at the center of said spherical dome portion, a swivel member having a part-spherical end portion larger than said opening, the outer surface of said end portion constituting a convex spherical surface portion of said swivel member, and a stem extending through said opening, said end portion being socketed in the concave surface of said dome for sliding movement of the end portion of the swivel member relative to the dome whereby said stem may swing in a conical path relative to said body member and for axial movement into said opening away from said inner surface of said dome, said stem being adapted to have a length of conduit or the like secured thereto, said swivel member having a passage therethrough for the reception of one or more wires which pass through the conduit so as to supply power to the lighting fixture, and means for limiting rotation of the swivel member about its longitudinal axis relative to said body member, said means for limiting rotation comprising a slot in said body member dome portion extending in generally meridional direction along said spherical dome portion from the edge of said opening therein and a pin secured to said end portion of said swivel member and extending out beyond the outer surface thereof for reception in said slot when said end portion is socketed in said dome portion.

4,037,099
FLUORESCENT X-RAY SULFUR ANALYZER

Minoru Oda, and Shinji Badono, both of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 13, 1975, Ser. No. 631,702
Claims priority, application Japan, Nov. 22, 1974, 49-134479
Int. Cl.² G01N *23/00*
U.S. Cl. 250—272 **3 Claims**



1. A fluorescent X-ray sulfur analyzer comprising:

a radiation source for irradiating a sulfur containing hydrocarbon sample with X-rays or γ-rays,

a radiation detector for detecting the radiation generated from the sulfur containing hydrocarbon sample irradiated by the X-rays or γ-rays,

a first analyzer connected to the output of the radiation detector for selecting only fluorescent X-ray pulses from the output of the radiation detector,

a first pulse rate measuring device connected to the output of the first analyzer for measuring the pulse rate of the pulses selected by the first analyzer,

a second analyzer connected to the output of the radiation detector for selecting only pulses of compton scattered rays from the output of the radiation detector,

a second pulse rate measuring device connected to the output of the second analyzer for measuring the pulse rate of the pulses selected by the second analyzer, and

an operational circuit connected to the output of the first pulse rate measuring device and connected to the output of the second pulse rate measuring device for compensating for the error caused by the variation of the carbon-hydrogen ratio to realize an accurate weight content of the sulfur in the sulfur containing hydrocarbon sample by performing the function

$$\frac{S}{\rho} = \frac{X(2.017 - 0.095Y)}{(15.8X + 0.905)Y - (0.7X - 1)}$$

wherein S/ρ is the sulfur mass per unit weight of the sulfur containing hydrocarbon sample, X is the output signal of the first pulse rate measuring device and Y is the output signal of the second pulse rate measuring device.

4,037,100
ULTRA-SENSITIVE SPECTROMETER FOR MAKING MASS AND ELEMENTAL ANALYSES

Kenneth H. Purser, Manchester, Mass., assignor to General Ionex Corporation, Ipswioh, Mass.
Filed Mar. 1, 1976, Ser. No. 662,968
Int. Cl.² B01D *59/44;* G01K *1/08;* H01J *23/00*
U.S. Cl. 250—281 **4 Claims**

1. An ultra-sensitive spectrometer for mass and elemental analysis comprising in combination:

a thin target,

means for directing a focussed beam of charged particles of the material to be analyzed through said thin target,

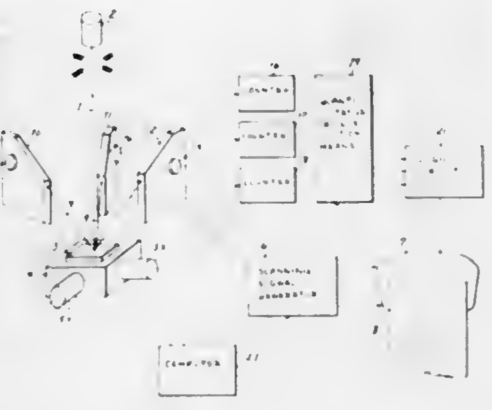
whereby said particles are dissociated into positively charged components,

means for accelerating said components comprising a substantially constant electric field, whereby said components acquire additional kinetic energy the quantity of which depends upon their charge,

and means for filtering, detecting and measuring kinematic characteristics of said components.

4,037,101
METHOD AND APPARATUS FOR ANALYZING FINE GRAINED SUBSTANCES

Kimio Okumura; Tatsunori Soya; Yosuke Kauchi, all of Kawasaki, and Hideyuki Ohi, Akishima, all of Japan, assignors to Agency of Industrial Science & Technology and Nihon Denshi Kabushiki Kaisha, both of Tokyo, Japan
Filed Nov. 19, 1975, Ser. No. 633,233
Claims priority, application Japan, Nov. 29, 1974, 49-138059
Int. Cl.² G01N *23/04*
U.S. Cl. 250—310 **5 Claims**



1. In a method of analyzing the fine texture of a specimen comprising the steps for

a. irradiating the specimen surface with a fine diameter electron beam,

b. scanning the irradiating position two-dimensionally over a given area on said specimen surface,

c. measuring the characteristic x-rays produced as a result of beam irradiaton corresponding to certain elements,

d. calculating the content ratios of each element from the results of said characteristic x-ray measurement,

the improvement comprising the steps for

e. generating signals from the content ratios of said elements which are indicative of the chemical phase at the point being irradiated, and

f. displaying said signals to-dimensionally in synchronism with said scanning of the irradiating position.

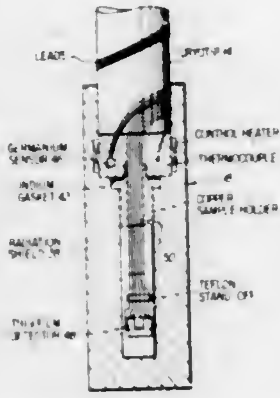
4,037,102
THIN-FILM SUPERCONDUCTOR DEVICE

John A. Hoyle, Huntsville, Ala.; Robert R. Humphris, and John W. Boring, both of Charlottesville, Va., assignors to University of Virginia, Charlottesville, Va.

Filed Sept. 29, 1975, Ser. No. 617,580

Int. Cl.² G01T *1/24*

U.S. Cl. 250—336 **20 Claims**



1. A thin-film superconductive apparatus sensitive to extremely small quantities of thermal energy comprising:
  a superconductive thin-film forming a narrow strip of non-uniform volume per unit length,
  said narrow strip including a main portion having a first average volume per unit length and a channel portion having a second average effective volume per unit length, said second average volume being less than said first average volume;
  bias circuit means coupled to said thin-film for passing a bias current through said film,
  temperature control means cooperating with said film for maintaining the temperature thereof within a predetermined superconductive range; and,
  monitoring circuit means coupled to said film for sensing changes in the resistance of said film.

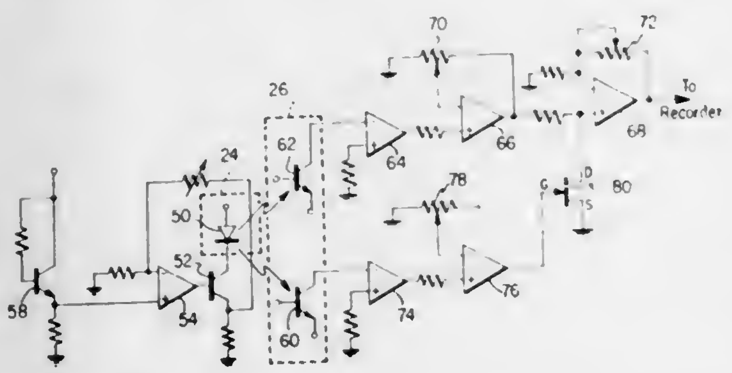
4,037,103
DIAMETER MEASURING SYSTEM FOR CYLINDRICAL OBJECTS

Joseph Ryden, Jr., Richland, Wash., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Aug. 7, 1975, Ser. No. 602,513

Int. Cl.² G01N *21/30;* **G01J** *1/00*

U.S. Cl. 250—341 **11 Claims**



1. A system for the rapid and accurate measurement of a physical parameter such as the diameter of objects, comprising in combination: a diameter measurement station comprising emitter means for impinging a beam of energy on receiver means aligned diametrically opposite said emitter means, said emitter means comprising an infrared diode, said receiver means having an output proportional to the amount of beam energy received thereby; means for translating said objects in a transport channel past said emitter and receiver means arranged on opposite sides of the translating means; and electronic circuit means for receiving the output of said receiver means and compensating for temperature variations in the outputs of said emitter and receiver means and providing an output signal representative of said parameter of said objects, said electronic circuit means comprises transistor amplifier means and an output transistor connected to the output of said amplifier means and including said infrared diode in its collector circuit and feedback circuit means connected between the emitter of said transistor and the input of said amplifier means; said receiver means comprising first and second phototransistors responsive to said infrared diode and connected in first and second amplifying channels, said second amplifying channel providing a signal to compensate for variations in the signal processed by said first amplifying channel due to temperature variations in the output from said first phototransistor.

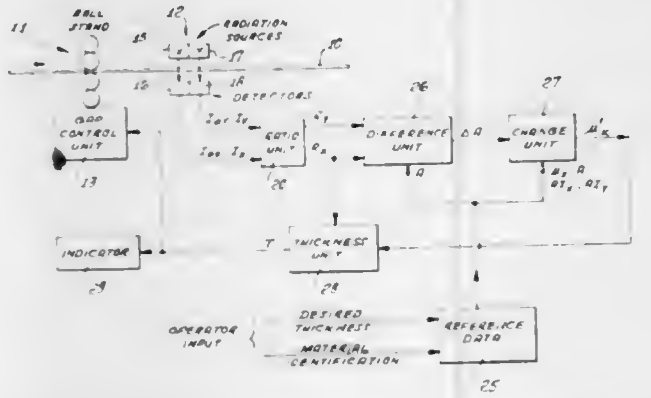
4,037,104
DUAL BEAM X-RAY THICKNESS GAUGE

John J. Allport, Santa Clara, Calif., assignor to Nucleonic Data Systems, Inc., Irvine, Calif.

Filed Apr. 29, 1976, Ser. No. 681,571

Int. Cl.² G01M *23/00*

U.S. Cl. 250—359 **5 Claims**



1. In a system for continuously measuring the thickness of a strip of sheet metal while the composition of the material changes as it moves past a gauging station, the combination of:
  source means for generating radiation in first and second energy bands;
  detector means positioned for receiving radiation from said source means in each of said bands with the sheet to be measured positionable therebetween, providing as outputs data for a first sheet transmission ratio of radiation flux in the first band transmitted through the sheet to flux transmitted through the air in absence of the sheet, and a second sheet transmission ratio of radiation flux in the second band transmitted through the sheet to flux transmitted through air in absence of the sheet;
  reference means having as inputs the desired thickness and identification of the material of the sheet to be measured and providing as an output radiation absorption data in each of said energy bands for the nominal composition of the material;
  first means for determining as an output the difference between the nominal and measured composition absorption coefficient ratios of the material as the sheet moves between said source and detector means;
  means for connecting the outputs of said detector and reference means to said first means as inputs;
  second means for calculating the thickness of the sheet as a function of the sheet transmission ratio and sheet absorption coefficient in said first energy band;
  means for connecting the output of said detector means and the sheet absorption coefficient for said first energy band to said second means as inputs;
  third means for changing the value of the sheet absorption coefficient for said first energy band as a function of the ratio difference determined by said first means; and
  means for connecting the outputs of said reference and first means to said third means as inputs.

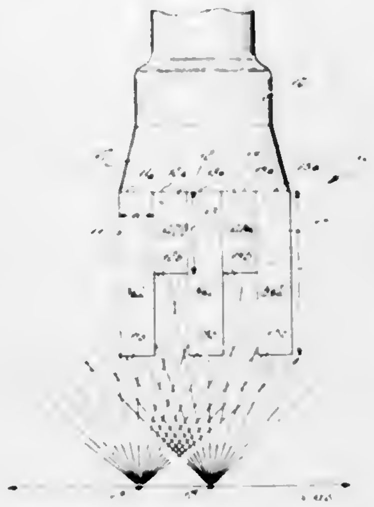
4,037,105
RADIATION DETECTOR WITH ARRAY OF DIFFERENT SCINTILLATORS

Gerard R. Laurer, One N. Main St., Monroe, N.Y. 10950

Filed June 1, 1976, Ser. No. 691,572

Int. Cl.² G01T *1/20*

U.S. Cl. 250—367 **3 Claims**



1. An array of scintillators adapted for use without a collimator and in combination with a single photomultiplier tube for detecting the location of a source of electromagnetic radiation, comprising superposed scintillator crystals of three respective different types in their response to electromagnetic radiation, three crystals of a first type being alternated with one crystal each of second and third types, an edge of each of the crystals being exposed at two opposed sides of the array, a first of said opposed sides being adapted to face a photomultiplier tube and the other of said opposed sides being adapted to receive radiation from said source, the respective edges of the second and third types of crystals at the radiation receiving side of the array being in a first plane and the respective edges of the first type of crystals at the radiation receiving side of the array being in a second plane spaced from the first plane.

4,037,106
IONIZATION-TYPE FIRE OR SMOKE SENSING SYSTEM

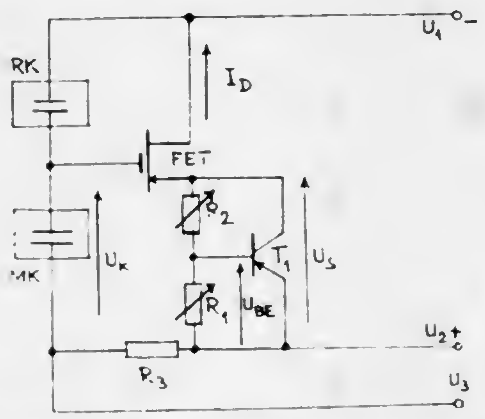
Andreas Scheidweiler, Stafa-Uerikon, and Otto Meier, Hombrechtikon, both of Switzerland, assignors to Cerberus AG, Mannedorf, Switzerland

Filed June 24, 1976, Ser. No. 699,333

Claims priority, application Switzerland, July 25, 1975, 9710/75

Int. Cl.² G08C *1/00*

U.S. Cl. 250—381 **9 Claims**



1. Ionization-type fire or smoke sensing system having
  a source of electrical supply (U1, U2):
  a measuring ionization chamber (MK);
  a series resistance element (RK) connected in series with the measuring ionization chamber (MK):
  a field effect transistor (FET) connected to the measuring ionization chamber, said FET having a conduction threshold voltage which is just above the level of the output voltage (U_A) of the measuring ionization chamber (MK) when smoke or fire aerosols are absent, so that, upon presence of smoke or fire aerosols, the output voltage of the chamber will rise and the FET will become conductive to provide an output signal;
  and temperature control means (T1, R1, R2) to render the circuit combination of the ionization chamber (MK) and the FET essentially independent of temperature within a given range, comprising
  a transistor (T1) having its collector-emitter path connected in the source supply path of the FET;
  and a voltage divider (R1, R2) connected in parallel with the collector-emitter path of the transistor (T1), the tap point of the voltage divider being connected to the base of the transistor (T1):
  to provide a temperature compensation characteristic which has the same relative control direction as the temperature characteristic of the measuring ionization chamber (MK) and dimensioned with respect to the FET to maintain the conduction threshold thereof essentially independent of temperature within said range.

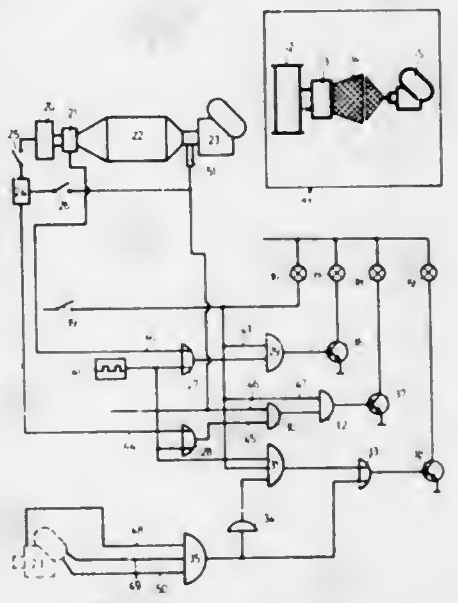
4,037,107
X-RAY DIAGNOSING APPARATUS WITH SEVERAL PHOTOGRAPHING SYSTEMS SELECTIVELY CONNECTABLE TO A COMMON GENERATOR

Herbert Lutz, Seukendorf, and Manfred Pfeiler, Erlangen, both of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Continuation-in-part of Ser. No. 446,689, Feb. 28, 1974, abandoned. This application Nov. 11, 1975, Ser. No. 630,787

Int. Cl.² H05G *1/00*

U.S. Cl. 250—402 **3 Claims**



1. An X-ray diagnosing apparatus for several photographing systems selectively connected to a common generator, each of said systems comprising an X-ray tube, means connecting said X-ray tube to said generator, auxiliary devices for producing exposures, an operating desk for each photographing system having an indicating area, separate signaling lamps for said X-ray tube and said auxiliary devices within said indicating area and connecting means connecting said signaling lamps with the high-voltage generator for said X-ray tube and said auxiliary devices and operating said lamps to indicate operational readiness and trouble-free operation of said X-ray tube and said auxiliary devices in said indicating area, said auxiliary devices comprising film camera means, said indicating area having pictures representing the X-ray tube and the film camera means, one of said signaling lamps being adapted to illuminate the picture representing the X-ray tube and another of

said signaling lamps being adapted to illuminate the picture representing said film camera means.

4,037,108
ION SOURCE WITH CAPABILITY OF CHANGING BETWEEN OPERATION MODES

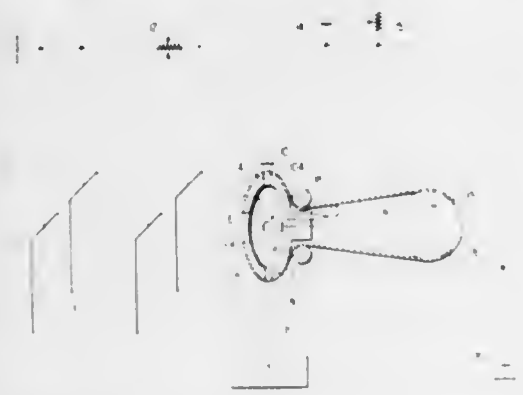
Helmut Jordan, Njupkarrsvagen 94, Tyreso, and Curt Sivers, Heleneborgsgatan 12, Stockholm, both of Sweden

Filed Mar. 9, 1976, Ser. No. 665,290

Claims priority, application Sweden, Apr. 3, 1975, 7503809

Int. Cl.² H01J *27/00*

U.S. Cl. 250—427 **4 Claims**



1. Ion source consisting of a cavity and means for supplying the gas to be ionized, an output slot for the ions generated in the ion source and at least one slot through which ionizing particles or radiation can impinge into the cavity, characterized in, that a displaceable band is stretched across the slots of the ion source, whereby the band is provided with a number of combinations of holes so that by suitable adjustment of the band different combinations of slots can be opened and/or be given different widths.

4,037,109
SAMPLE CELL

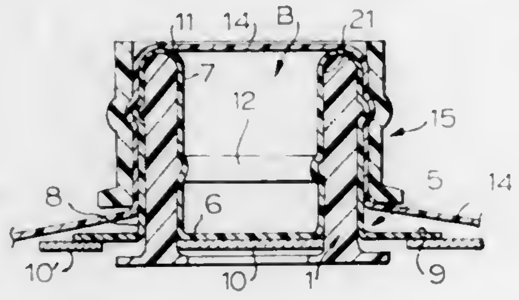
Yoshinori Hosokawa; Yoshihiro Wakiyama, and Yazyuro Nomura, all of Kyoto, Japan, assignors to Horiba, Ltd., Kyoto, Japan

Filed Nov. 24, 1975, Ser. No. 634,739

Claims priority, application Japan, Nov. 26, 1974, 49-144688[U]

Int. Cl.² G01N *23/10*

U.S. Cl. 250—444 **4 Claims**



1. A sample cell comprising a disposable inner frame cover **(5)** formed by bending a plastic film, said cover having a bottom part **(6)**, an uprising part **(7)**, a connection part **(11)**, a turndown part **(8)** and a flange part **(9)**; said uprising part **(7)**, connection part **(11)** and turndown part **(8)** of said inner frame cover being covered onto a cylindrical shaped inner frame **(1)**; a disposable plastic radiation-permeable sheet **(14)** covering the upper side of said inner frame cover and a cylindrical shaped outer frame **(15)** fitted onto the upper side of said inner frame cover over said radiation sheet **(14)**; said sample cell being characterized in that a sample to be analyzed by X-ray analysis only contacts the disposable inner frame cover **(5)** and the disposable radiation-permeable sheet **(14)** so that such disposable parts can be discarded after each analysis and replaced by clean disposable parts, thereby avoiding the necessity of washing the sample cell.

4,037,110
YTTRIUM INDIUM PHOSPHATE X-RAY PHOSPHORS, METHOD OF PREPARATION AND X-RAY INTENSIFYING SCREEN CONTAINING SAME

Francis N. Shaffer, Towanda, and James E. Mathers, Ulster, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,500

Int. Cl.² C09K *11/46*

U.S. Cl. 250—483 **8 Claims**

1. An X-ray phosphor composition consisting essentially of a material having the formula:

$$Y_{1-x}In_xPO_4$$

wherein X has a value of from about 0.005 to about 0.2.

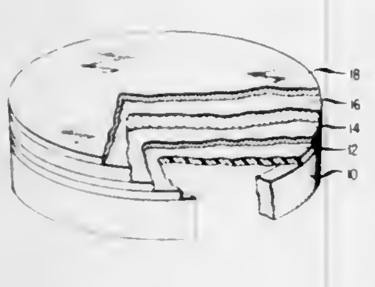
4,037,111
MASK STRUCTURES FOR X-RAY LITHOGRAPHY

Gerald Allan Coquin; Juan Ramon Maldonado, both of Berkeley Heights; Dan Maydan, Short Hills, and Sasson Roger Somekh, Berkeley Heights, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 8, 1976, Ser. No. 693,939

Int. Cl.² B01J *17/00;* G02B *5/00;* G21F *5/04*

U.S. Cl. 250—505 **22 Claims**



1. A mask structure for X-ray lithography comprising a dimensionally stable support member, an X-ray-transparent film stretched over and bonded to said support member, and means including stress-compensating constituents for forming a very-low-stress X-ray-absorptive pattern on said substrate.

4,037,112
APPARATUS FOR CROSSLINKING ULTRAVIOLET LIGHT CURABLE COATINGS

Warren J. Ramler, Elmhurst, and James K. Lackore, Joliet, both of Ill., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Filed Mar. 25, 1975, Ser. No. 561,747

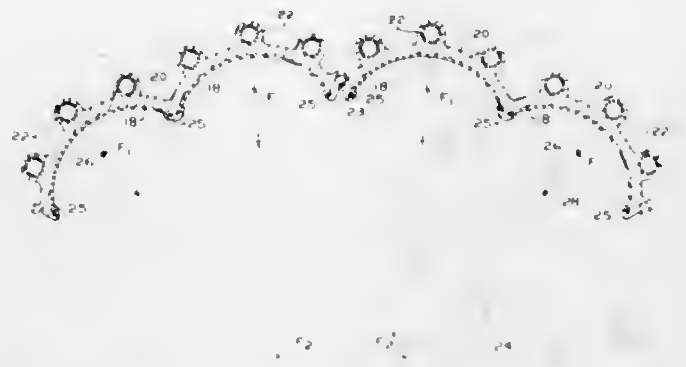
Int. Cl.² B01K *1/00*

U.S. Cl. 250—527 **7 Claims**

1. In an ultraviolet light processor for exposing substrates coated with an ultraviolet light curable coating composition to ultraviolet light to cure said coating, said ultraviolet light processor having a substantially symmetrical reflector comprising four substantially elliptical cylindrical reflectors for reflecting ultraviolet light from four generally linear parallel sources of ultraviolet light located at the first foci of said reflectors to the second foci thereof, wherein:

a. said reflector system has a plane of symmetry generally parallel to said four generally parallel first foci;
b. said second foci are more remotely located from said reflectors than said first foci;
c. the second foci of two of said reflectors are superimposed to form a first common focus;

d. the second foci of the other two of said reflectors are superimposed to form a second common focus;
e. said common foci are located in a plane perpendicular to said plane of symmetry;
f. said common foci are spaced apart by a distance in the range of from about 10 percent to about 50 percent of the distance between the two extreme first foci;



g. the eccectricity of said substantially elliptical cylindrical reflectors is in the range of from 0.2 to about 0.9;

the improvement comprising means for passing said coated substrate under said reflector system in an average direction which is generally parallel to said first foci such that the mean position of said coating is located more remotely from said reflectors than said plane containing said common foci.

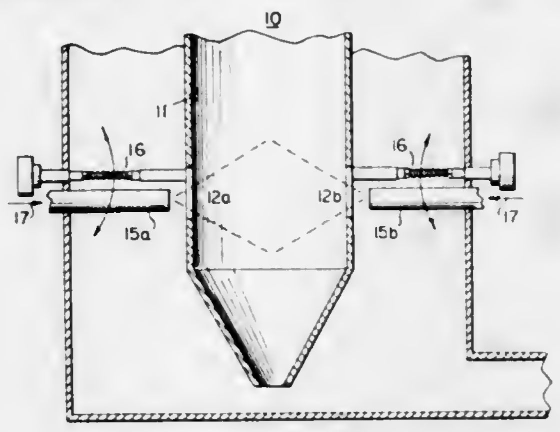
4,037,113
FLAME DETECTOR

William J. Moore, Dallas, Tex., assignor to Forney Engineering Company, Carrollton, Tex.

Continuation of Ser. No. 567,450, April 11, 1975, abandoned, which is a continuation-in-part of Ser. No. 451,636, March 15, 1974, abandoned. This application Oct. 26, 1976, Ser. No. 735,477

Int. Cl.² G01N *21/58*

U.S. Cl. 250—554 **6 Claims**



1. A flame detector device for a boiler furnace comprising:
a movable mounted burner;
a radiation sensitive means outside of said furnace and responsive when energized by incident radiation of a selected energy band width to produce a signal indicative of the existence of a flame;
a lens of quartz material;
a lens housing supporting said lens, said lens housing being connected with said burner so that said lens is focused on the combustion zone of said burner;
a flexible tube connected at one end to said housing and at the other end to said radiation sensitive means;
and a fiber optics bundle extending through said flexible tube for conveying the collected radiation from said lens to said radiation sensitive means, said fiber optics bundle comprising fibers of extruded unclad quartz material capable of conveying radiation without significant loss thereof.

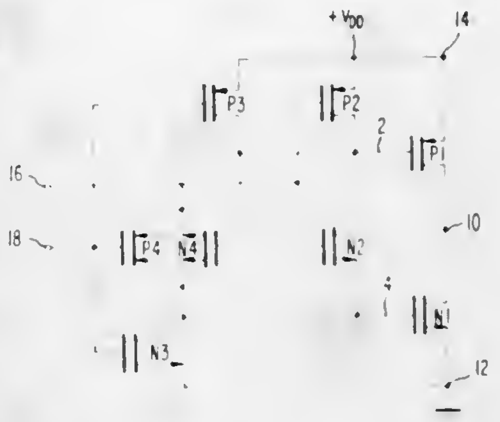
4,037,114
TRI-STATE LOGIC CIRCUIT

Roger Green Stewart, Neshanic Station, and Marceano Seixo de Melo Paulino, Bound Brook, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Oct. 23, 1975, Ser. No. 625,038

Int. Cl.² H03K *19/08, 19/38*

U.S. Cl. 307—205 **5 Claims**



1. In combination:
first and second points for the application therebetween of an operating potential;
first and second transistors of first and second conductivity type, respectively, each transistor having a conduction path and a control electrode; means connecting their conduction paths in series between said first and second points;
an output terminal connection between the conduction paths of said first and second transistors;
a data input terminal, and a control input terminal;
third and fourth transistors of said first conductivity type having their conduction paths connected in parallel between the control electrode of said first transistor and said first point;
fifth and sixth transistors of said second conductivity type having their conduction paths connected in series between the control electrode of said first transistor and said second point; means connecting the control electrode of said second transistor to the junction of the conduction paths of said fifth and sixth transistors;
means connecting the control electrodes of said third and fifth transistors to said control input terminal;
means connecting the control electrodes of said fourth and sixth transistors to said data input terminal; and
a seventh transistor of said second conductivity type having its conduction path connected between the control electrode of said second transistor and said control input terminal; and
means connecting the control electrode of said seventh transistor to the control electrode of said first transistor.

4,037,115
BIPOLAR SWITCHING TRANSISTOR USING A SCHOTTKY DIODE CLAMP

Charles Meng-Yuan Lee, Berkeley Heights, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed June 25, 1976, Ser. No. 699,950

Int. Cl.² H03K *19/40, 5/08*

U.S. Cl. 307—214 **2 Claims**

1. A circuit arrangement comprising
a first terminal to be maintained at a reference potential,
a second terminal to be maintained at an operating potential,
an input terminal to be supplied with an input signal,
an output terminal at which an output signal will be developed,
a first junction transistor,
means for coupling the input terminal to the base of the first transistor,
a first and a second Shottky diode connected back-to-back between the collector and base of the first transistor,

means for resistively coupling the node between said two diodes to the second terminal,

a second and a third junction transistor,

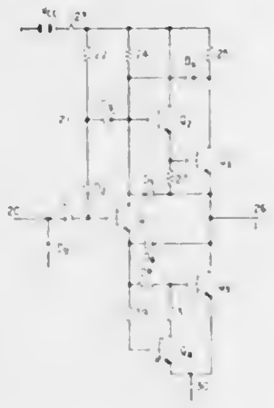
the base of said second transistor connected to the collector of the first transistor and resistively coupled to the second terminal,

the collector of said second transistor connected to the second terminal,

the emitter of said second transistor being connected to the base of the third transistor and resistively coupled to the output terminal,

the collector of said third transistor being resistively coupled to the second terminal,

the emitter of said third transistor being connected to the output terminal,



a third Schottky diode having its anode connected to the base of the second transistor and its cathode to the collector of the third transistor,

a fourth Schottky transistor having its base resistively coupled to the emitter of the first transistor, its emitter connected to the first terminal,

a fifth junction transistor having its emitter connected to the first terminal, its collector connected to the output terminal, and its base resistively coupled to the collector of the fourth transistor and resistively coupled to the emitter of the first transistor,

and a fourth Schottky diode having its anode connected to the emitter of the first transistor and its cathode to the output terminal whereby it is resistively connected between the collector and base of the fifth transistor.

4,037,116
UP/DOWN SWITCH AND SWITCHING SIGNAL GENERATOR

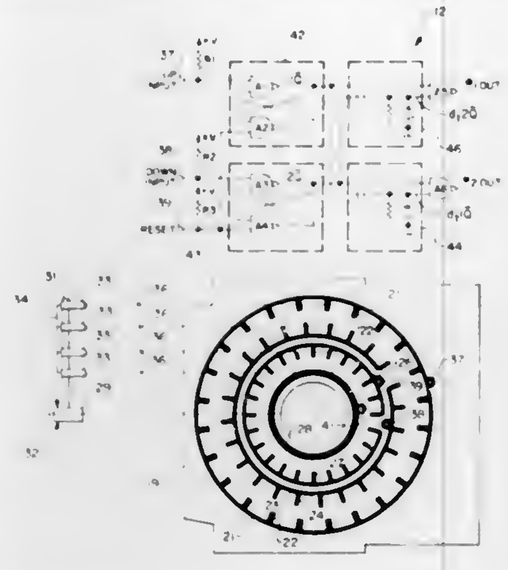
Takuo Hodama, Watsonville, Calif., assignor to SBE Incorporated, Watsonville, Calif.

Filed Aug. 16, 1976, Ser. No. 715,130

Int. Cl.² H03K *17/18,* **H01H** *19/58*

U.S. Cl. 307—247 A **10 Claims**

1. An electromechanical switch for selective switching in first and second opposing directions comprising a switch actuating member for manual engagement, a plurality of switch contacts mounted for movement by said switch actuating member, a plurality of matching switch contacts being disposed for electrical contact with ones of said switch contacts in first and second predetermined sequence in accordance with the first and second opposing direction selection, said matching switch contacts providing a first direction advance signal, a second direction advance signal and a reset signal when in electrical contact with said ones of said switch contacts, first and second latches coupled to receive said first and second direction advance signals respectively and said reset signal, and providing first and second latch outputs responsive thereto, first and second gates coupled to each receive said first and second latch outputs, said first gate providing a first switch output with said second gate being disabled when said first predetermined sequence of switch contact occurs, and said second gate providing a second switch output with said first gate being disabled when said second predetermined sequence of switch contact occurs, said first and second latches being reset by said reset signal.



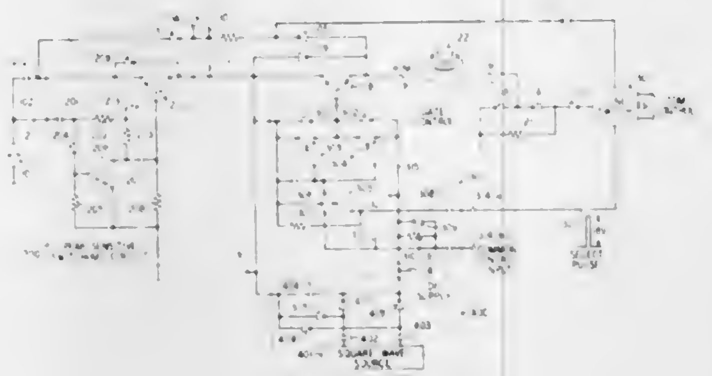
4,037,117
PEAK SHUT-OFF ELECTRONIC SWITCH

Robert Lawrence Carbrey, Boulder, Colo., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 15, 1976, Ser. No. 666,793

Int. Cl.² H03K *17/72*

U.S. Cl. 307—252 N **18 Claims**



1. A switching circuit for interrupting cyclically varying signals comprising

at least one first switching device connected in series with a second switching device each first and second switching device having at least first, second and third terminals, the first terminal of each first switching device connected to the second terminal of the second switching device, each first switching device conducting an electric current in one direction along an internal electrical path between its first and second terminals which electrical conduction is initiated by application of enabling signals to the third terminal and discontinued by application of disabling signals to the third terminal when the electric current flowing through the internal electrical path is below a predetermined level, and

a circuit for periodically opening the second switching device during a fraction of a cycle of preselected polarity of the cylically varying signals to ensure discontinuation of the electric current flowing through the first switching device in response to the disabling signals.

4,037,118
CIRCUIT ARRANGEMENT FOR ELECTRONICALLY APPLYING AN ALTERNATING VOLTAGE

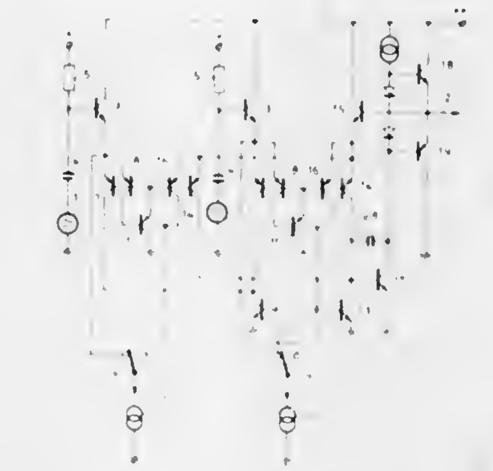
Gunter Sieborger; Ernst August Kilian, and Gerhard Jonkuhn, all of Hamburg, Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 5, 1976, Ser. No. 655,513

Claims priority, application Germany, Feb. 13, 1975, 2506034

Int. Cl.² H03K *17/16. 17/60*

U.S. Cl. 307—255 **6 Claims**



1. A circuit arrangement for selectably connecting at least one AC input source to a common output point, which comprises:

input circuit means connected to said AC input source for providing an AC output signal proportional thereto and a DC bias signal;

a DC control current source;

output circuit means for providing said common output point;

damping network means connected between said input circuit means and said output circuit means for selectably connecting said AC output signal to said output circuit means while maintaining said DC bias signal substantially constant; and

switching means having active and passive switching states for selectably connecting the DC control current source to said damping network means and said input circuit means, said switching means connecting said current source to said damping means when in the active state to cause the AC output signal and the DC bias signal to be applied to said output circuit means, and said switching means connecting said current source to said input circuit means in the passive state to cause only the DC bias signal to be applied to said output circuit means while the damping network means maintains said DC bias signal substantially constant.

4,037,119
CHARGE TRANSFER DELAY CIRCUIT FOR ANALOG SIGNALS

Hermannus Schat, Freiburg, Germany, assignor to ITT Industries, Inc., New York, N.Y.

Filed June 18, 1975, Ser. No. 588,072

Claims priority, application Germany, June 25, 1974, 2430349

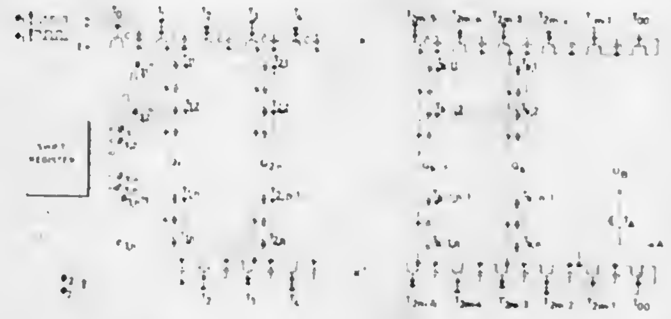
Int. Cl.² H03K *5/13;* **G11C** *19/00;* **H03K** *3/353*

U.S. Cl. 307—293 **4 Claims**

1. A charge transfer delay circuit for delaying analog signals wherein there is provided a first longitudinal chain (K) of series-connected indentical stages operated in such a way that in a first clock phase, the even-numbered stages, switched by a first clock signal, contain an analog signal voltage value, while the odd-numbered stages, switched by a second clock signal, contain a neutral voltage value, whereas during the following clock phase, the odd-numbered stages contain an analog signal voltage value and the even-numbered stages contain a neutral voltage value comprising:

a plurality of transversal chains (Q_1, Q_{2n}, Q_{k-1}, Q_k) each comprising an identical number (n) of series-connected stages, each of said plurality of transversal chains connected to a different alternate stage of said first longitudinal chain;

an *n* stage shift register for generating and applying *n* auxiliary clock signal ($\phi_{s,1}$, $\phi_{s,2}$, $\phi_{s,n-1}$, $\phi_{s,n}$), one to each of the *n* stages of said plurality of transversal chains, all stages in the transversal chains occupying a similar position in its respective chain being coupled to the same stage of said n-stage shift register, for activating the *n* stages of said first plurality of transversal chains, one at a time in turn;



a second longitudinal chain (K′) of series-arranged identical stages, alternate stages of which are coupled to a different one of said plurality of transversal chains; and

means for applying a third clock signal to the even stages of said second longitudinal chain and a fourth clock signal to the odd numbered stages of said second longitudinal chain.

4,037,120
ELECTRONIC DIPOLE FOR LOOPING A TELEPHONE LINE

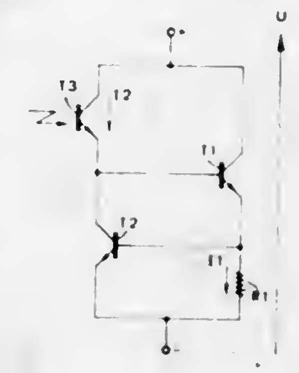
Joel Serge Colardelle, Creteil; Marie Helene Comte, Jouy-en-Josas, and Claude Paul Henri Lerouge, Maurepas, all of France, assignors to International Standard Electric Corporation, New York, N.Y.

Filed May 3, 1976, Ser. No. 682,763

Claims priority, application France, June 27, 1975, 75.20202

Int. Cl.² H03K *17/00*

U.S. Cl. 307—311 **2 Claims**



1. An electronic dipole for the looping of a telephone line, operating at constant current even for low voltages applied to its terminals, including a first transistor whose collector is connected directly to a first terminal of the line and whose emitter is connected to the second terminal of the line through a resistor, and a second transistor whose collector and base are connected respectively to the base and emitter of the first transistor and whose emitter is connected to the second terminal of the line, and wherein a circuit through which a constant current flows is coupled between the collector and the base of the first transistor, wherein the said circuit allowing a constant current to flow consists of a phototransistor having an emitter, a base and a collector electrode and controlled by electroluminescent diode, and wherein a resistor is placed between the emitter of the phototransistor and the base of the first transis-

tor, and wherein a capacitor is placed between the base of the phototransistor and the base of the first transistor.

4,037,121
PIEZOELECTRICALLY DRIVEN TUNING FORK WITH HARMONIC SUPPRESSION

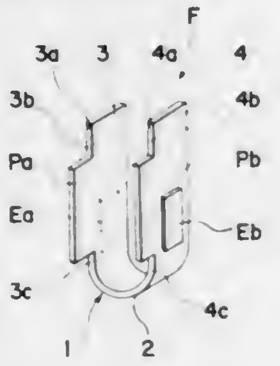
Takeshi Nakamura, and Hiroshi Nishiyama, both of Hakui, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 26, 1976, Ser. No. 670,955

Claims priority, application Japan, Mar. 31, 1975, 50-39663

Int. Cl.² H01L *41/04*

U.S. Cl. 310—8.2 **25 Claims**



1. An electrically driven tuning fork for use in electrical and electronic equipment which comprises a tuning fork vibrator having two prongs and electrical elements applied to said prongs for driving said tuning fork vibrator, said prongs having inner and outer surfaces defined between side edges thereof;

said tuning fork vibrator including projections formed on said prongs and extending over substantially the length of said prongs, except over node portions of fundamental harmonic oscillation thereof, said projections acting to stiffen said prongs so as to suppress higher harmonic oscillation in said tuning fork vibrator

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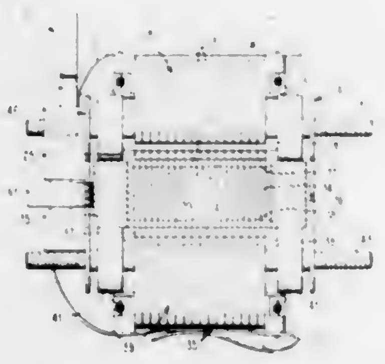
4,037,122
LINEAR ACTUATOR

Gilbert Belmont Bonner, and Joseph Leo Dessel, both of Endicott, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed June 1, 1976, Ser. No. 691,931

Int. Cl.² H02K *33/00*

U.S. Cl. 310—14 **6 Claims**



1. A linear actuator comprising in combination

an elongate magnetic motor bar having parallel guide surfaces,

a motor element inductively co-operable with said motor bar to produce relative motion therebetween in the direction of the longitudinal axis of said motor bar,

said motor element comprising

a first magnetic structure inductively co-operable with said motor bar to cause said relative motion,

first roller means attached to said first magnetic structure,

said first roller means engaging a first of said guide surfaces during said relative motion and maintaining a fixed air gap between said first magnetic structure and said guide surface,

a second magnetic structure inductively co-operable with said motor bar to cause said relative motion jointly with said first magnetic structure,

second roller means attached to said second magnetic structure,

said second roller means engaging a second of said guide surfaces during said relative motion and maintaining a fixed air gap between said second magnetic structure and said second guide surface,

and a support structure connecting said first magnetic structure to said second magnetic structure so as to maintain said first and second roller means in continuous contact with said guide surfaces,

said support structure being expandable in the direction perpendicular to said direction of motion to compensate for variations in the thickness of said motor bar.

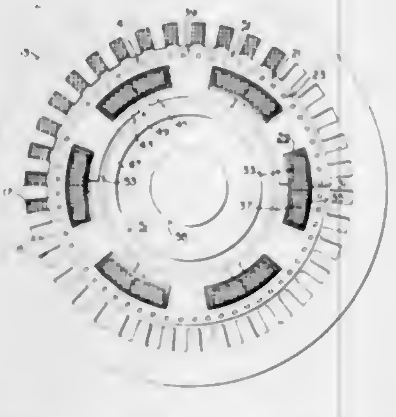
4,037,123
DYNAMOELECTRIC MACHINE WITH A SUPERCONDUCTIVE FIELD WINDING THAT CAN OPERATE IN EITHER A SYNCHRONOUS OR AN ASYNCHRONOUS MODE

Cecil J. Mole, Monroeville, and Henry E. Haller, III, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 327,520, Jan. 29, 1973, Pat. No. T925,001. This application July 17, 1975, Ser. No. 596,776

Int. Cl.² H02K *9/00*

U.S. Cl. 310—52 **12 Claims**



1. In a dynamoelectric machine having an armature and a field structure mounted for relative motion therebetween, an improved field structure comprising:

conductors spaced from the armature;

a plurality of first portions of ferromagnetic material;

a superconductive winding wound about said first portions of ferromagnetic material to form a plurality of magnetic poles;

insulating means thermally isolating said superconductive winding from said poles and from ambient conditions;

second portions of ferromagnetic material positioned between said superconductive winding and said conductors and interconnecting adjacent pairs of said poles to provide a first magnetic flux path therebetween;

third portions of ferromagnetic material forming a second magnetic flux path between adjacent pairs of said poles on the side of said superconductive winding away from said conductors; and

an area of nonferromagnetic material located in said second magnetic flux path.

4,037,124
COOLING ARRANGEMENT FOR THE ROTOR OF AN ELECTRIC MACHINE

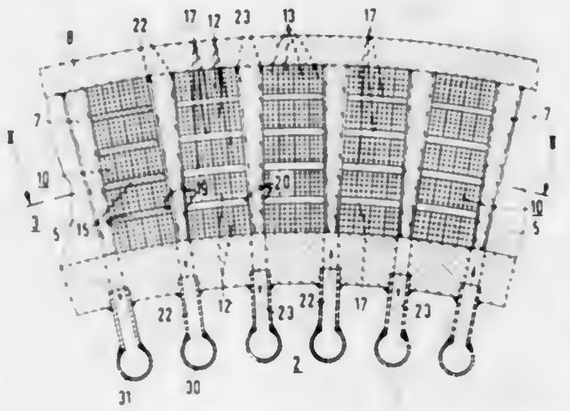
Dieter Kullmann, Langenzenn; Peter Henninger, Erlangen, and Lutz Intichar, Nurnberg, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Aug. 18, 1975, Ser. No. 605,536

Claims priority, application Germany, Aug. 21, 1974, 2440132

Int. Cl.² H02K *9/00*

U.S. Cl. 310—52 **12 Claims**



1. In a cooling arrangement for the forced cooling of the rotor of an electric machine both during standstill and rotation, which rotor has a plurality of longitudinal slots each having disposed therein a winding section of a superconductive excitation winding which is to be cooled to a superconducting temperature, each winding section being provided with at least one coolant feed line and one associated coolant discharge line, the coolant feed and discharge lines being connected to corresponding supply and collection lines which extend through the interior space enclosed by the excitation winding, the improvement comprising:

a. the coolant feed lines and coolant discharge lines comprising a multiplicity of at least approximately radially extending coolant feed lines and coolant discharge lines incrementally spaced over the entire axial length of each winding section, each coolant discharge line circumferentially separated from its associated coolant feed line; and

b. means forming at least one cooling canal between each coolant feed line and its associated coolant discharge line extending at least approximately in the circumferential direction of the rotor, said means separating said cooling canals such that there is no direct connection to the cooling canals extending between neighboring axially spaced coolant feed lines and discharge lines.

4,037,125
SMALL-SIZED DIRECT CURRENT ROTARY ELECTRIC APPLIANCE

Kanemasa Aoki, Yokohama, Japan, assignor to Canon Kabushiki Kaisha and Canon Seiki Kabushiki Kaisha, both of Tokyo, Japan

Filed Oct. 7, 1975, Ser. No. 620,380

Claims priority, application Japan, Oct. 11, 1974, 49-116978

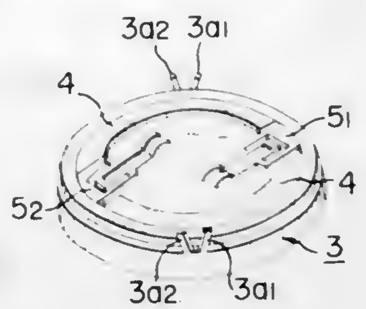
Int. Cl.² H02K *13/00*

U.S. Cl. 310—248 **6 Claims**

1. A brush for use in a small-sized, direct current rotary electric machine, comprising:

a. a first thin, planar elastic member made of an electrically conductive material formed in a substantially elongated U-shape of narrow width, and having a contact portion formed at the open end thereof arranged to be in contact with a commutator in said rotary electric machine; and

b. a second thin, planar elastic member made of an electrically conductive material in a substantially elongated U-shape having a width broader than the width of said first elastic member, the open end part of which is flexibly connected to said first elastic member at the center side portions of said first elastic member so that same may pivotally swing like a balancing toy with respect to the open end part of said second elastic member, the other end of said second elastic member being arranged to be fixedly maintained at a brush holding position of said rotary electric machine.



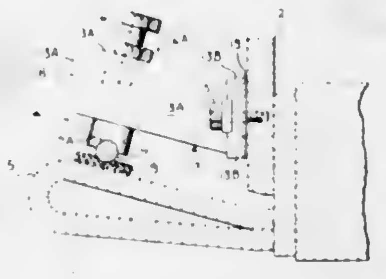
4,037,126
TIELESS BRACING FOR SUPPORTING END TURNS OF A DYNAMOELECTRIC MACHINE

Thomas E. Brennan, Voorheesville; Robert H. Hartmann, Gansevoort, and Robert M. McCoy, Schenectady, all of N.Y., assignors to General Electric Company, Schenectady, N.Y.

Filed Apr. 20, 1976, Ser. No. 678,601

Int. Cl.² H02K *3/46*

U.S. Cl. 310—260 **13 Claims**



1. Tieless bracing means for winding end turns of a dynamoelectric machine comprising a radially expandable and contractable split metal annulus, spreader means mounted on said annulus, said spreader means being operable to hold the ends of said annulus in a predetermined spaced relationship with one another, a ring of compressible material positioned in engagement with the inner side of said annulus around substantially the entire circumference thereof, in combination with a dynamoelectric machine frame having a stator mounted therein with insulated stator winding end turns extending beyond the ends of the stator core laminations, and a plurality of adjustable annulus-positioning means mounted on said frame at angularly spaced points radially outward from the end turns, each of said positioning means comprising:

a. a generally T-shaped bracket mounted on the frame with the trunk of the bracket generally parallel to the closest stator winding end turns and spaced therefrom, said trunk of the bracket including first wall means defining a cup-shaped recess in the side of the bracket closest to the stator winding ends, and second wall means defining a threaded aperture extending through the bracket from the bottom of said recess to the radially outermost side of the bracket, and a threaded bolt rotatably threaded into said threaded aperture with the head of the bolt projecting from the outer surface of the bracket,

b. a dowel having a transverse groove across its inner face slidably mounted within the cup-shaped recess, said transverse groove being positioned to partially encompass an outer surface portion of said metal annulus to hold it against said ring of compressible material, and

c. fastening means mounted on each threaded bolt to secure it in a desired operating position after the respective bolts have been rotated to force their inner ends against the dowels associated therewith to locate the annulus in a desired predetermined position with respect to the stator winding end turns.

4,037,127

X-RAY TUBE

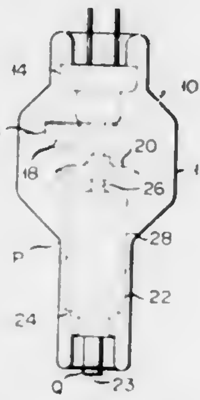
Shinichi Kawai, Yokohama; Shigeo Maeyama, Fujisawa, and Tokihiko Shidara, Yokohama, all of Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Filed Nov. 30, 1976, Ser. No. 746,061

Claims priority, application Japan, Dec. 5, 1975, 50-164294[U]

Int. Cl.^{2} H01J *35/04*

U.S. Cl. 313—60 8 Claims



1. An X-ray tube comprising an anode including a target giving off X-rays when electrons emitted from the filament of a cathode strike the target and supporting means for supporting the target and being subject to transfer of the heat produced on the target due to the strike of electrons thereon, wherein black chromium plating is applied to the anode except the electron striking surface of the target.

4,037,128

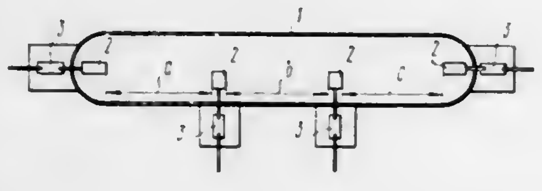
THREE-PHASE DISCHARGE LAMP

Izrail Aronovich Levin, 16 Parkovaya ulitsa 55, korpus 2, kv. 43; Jury Pavlovich Potemkin, ulitsa Ljublinskaya 17, stroenie 3, kv. 32; Igor Pavlovich Slobodskoi, Pechatnikov pereulok 13, kv. 28; Alexandr Mikhailovich Troitsky, Tsvetnoi bulvar 22, kv. 64, and Ivan Vasilievich Sapozhnikov, ulitsa Baikalskaya 42, korpus 2, kv. 22, all of Moscow, U.S.S.R.

Filed Sept. 12, 1975, Ser. No. 612,919

Int. Cl.^{2} H01J *61/06*

U.S. Cl. 313—188 26 Claims



1. A three-phase discharge lamp, comprising: a bulb having a longitudinal axis; inert gas filling said bulb; four main electrodes fastened in said bulb; three discharge gaps formed by said four main electrodes, said discharge gaps, disposed in sequence along said axis of said bulb.

4,037,129

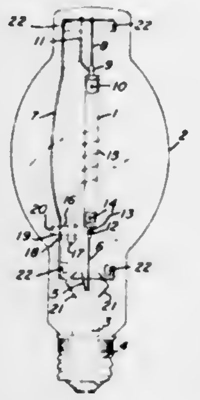
HIGH PRESSURE SODIUM VAPOR LAMP HAVING LOW STARTING VOLTAGE

Alexander T. Zack, Danvers, and John J. Gutta, Salem, both of Mass., assignors to GTE Sylvania Incorporated, Danvers, Mass.

Filed Mar. 10, 1976, Ser. No. 665,479

Int. Cl.^{2} H01J *65/00*

U.S. Cl. 313—201 4 Claims



1. In a high pressure arc discharge lamp comprising an arc tube disposed within an outer jacket, the arc tube having an electrode at each end, the improvement which comprises a multiple turn wire starting aid coiled around the arc tube intermediate the electrodes and electrically connected to only one of the electrodes, the coiled starting aid extending longitudinally along the arc tube a distance that is at least 10 % of the arc length.

4,037,130

GAS DISCHARGE DISPLAY DEVICE

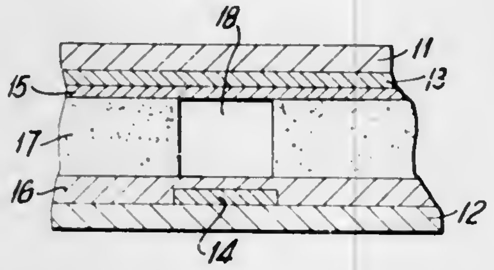
Takao Mimitsuka, and Tunekiyo Iwakawa, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,211

Claims priority, application Japan, May 21, 1974, 49-56872

Int. Cl.^{2} H01J *61/30*

U.S. Cl. 313—220 5 Claims



1. A gas discharge display device comprising:
a pair of insulating plates spaced from each other in substantially parallel relation, each of said plates having an inside surface facing that of the other plate and at least one of said plates being transparent;
a first group of at least one electrode disposed on the inside surface of one of said insulating plates, a second group of at least one electrode disposed on the inside surface of the other of said insulating plates, said first and second groups of electrodes being disposed traverse to each other to form a uniform discharge gap;
a first dielectric layer covering said first group of electrodes and a second dielectric layer covering said second group of electrodes;
a thin flat member disposed between said insulating plates to give said substantially parallel relation therebetween, said member being made entirely of a porous dielectric material and having an aperture of a shape substantially identical to said discharge gap; and
an ionizable gas filling said discharge gap.

4,037,131

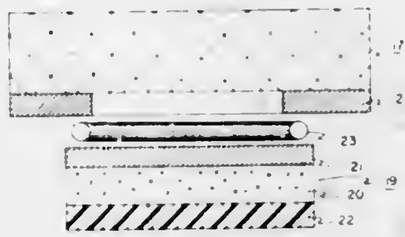
RETINA FOR PYROELECTRIC VIDICON

Wellman L. Clark, Springfield; John T. Cox, Alexandria; Gerald Klauber, Fredericksburg; Ferdinand C. Petito; John B. Ramsey, Jr., both of Alexandria, and John E. Waylonis, Fairfax Station, all of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 7, 1976, Ser. No. 647,271

Int. Cl.^{2} H01J *31/49, 29/45*

U.S. Cl. 313—388 4 Claims



1. In an optical system, wherein a wafer of pyroelectric material chosen from the group comprising Triglycine Sulphate, Triglycine Tetrafluoroberyllate, Deuterated Triglycine Tetrafluoroberyllate, Lithium Tantallate, Lithium Niobate, and Lead Lanthanum Ziroconate is coated on one broad side with a thin layer of conductive material and an electronic means coupled to said thin layer is provided to scan the remaining broad side of said wafer with an electron beam whereby a thermal image induced on said one side is detected; the improvement comprising:
a layer of dielectric material on said remaining side of said wafer having a secondary emission coefficient greater than one and a sheet resistance greater than 10^{12} ohm/-square.

4,037,132

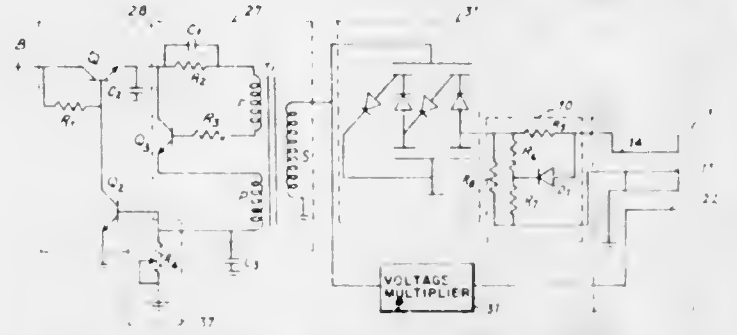
IMAGE TUBE POWER SUPPLY

Alan W. Hoover, Hollins, Va., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.

Filed Jan. 6, 1976, Ser. No. 646,799

Int. Cl.^{2} H01J *31/26*

U.S. Cl. 315—10 4 Claims



1. A controlled device brightness power supply for image tubes of the type containing a micro-channel plate electron multiplier and a phosphor screen comprising:
oscillator means for providing A.C. power when coupled with a source of D.C. power;
rectifier means coupled with said oscillator for providing D.C. power to the tube;
power sensing means consisting of a resistive element electrically coupled in series between said D.C. power source and said oscillator for detecting changes in tube operating power corresponding to changes in the tube input illumination and reducing the microchannel plate electron multiplier voltage to provide a constant illumination at the phosphor screen; and
control circuit means electrically coupled with the power sensor and oscillator in feed-back relation for controlling the A.C. power in repsonse to the changes in the tube operating power consisting of at least one transistor electrically coupled between the oscillator and the D.C. power source to control the conduction through the oscillator.

4,037,133

COMPENSATION OF CATHODE RAY TUBE FOR MOIRE

John Joseph Sennik, Kitchener, Canada, assignor to Electrohome Limited, Kitchener, Canada

Filed Apr. 12, 1976, Ser. No. 676,307

Int. Cl.^{2} H01J *29/56*

U.S. Cl. 315—31 TV 4 Claims

1. In a video signal receiving apparatus of a type having a cathode ray tube with a focus electrode, and means for supplying a DC voltage to said focus electrode, said DC voltage varying in response to changes in the beam current of said cathode ray tube in a direction to maintain the electron beam of said cathode ray tube focused, the improvement comprising means responsive to said DC voltage reaching a critical level where a further increase thereof will result in moire for maintaining said DC voltage below said critical level despite any additional changes in said beam current tending to increase said DC voltage above said critical level.

4,037,134

INSTALLATION FOR AUTOMATIC CONTROL OF THE LIGHT DISTANCE WITH MOTOR VEHICLE HEADLIGHTS

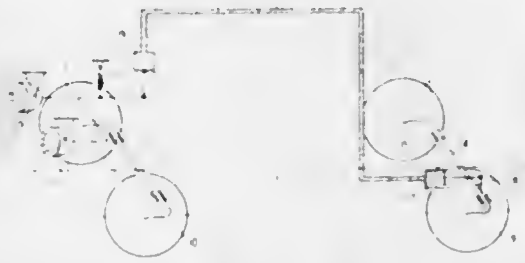
Bernd Löper, Korb, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

Filed Dec. 19, 1975, Ser. No. 642,569

Claims priority, application Germany, Dec. 20, 1974, 2460426

Int. Cl.^{2} B60Q *1/12*

U.S. Cl. 315—78 12 Claims

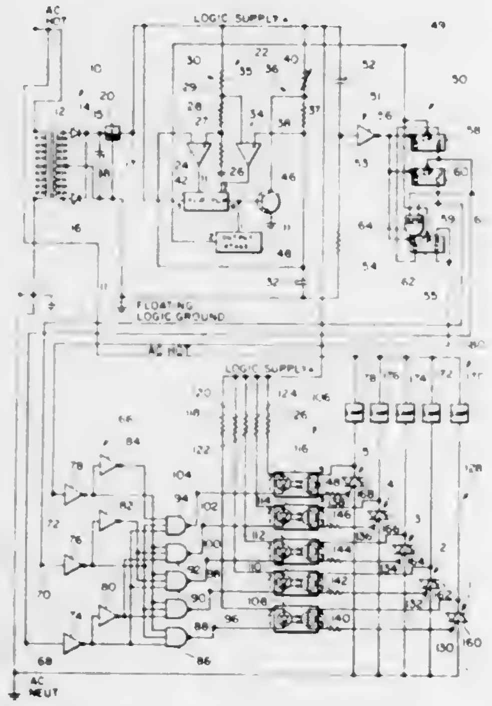


1. An installation for automatically controlling motor vehicle headlights in dependence on the positional changes of the vehicle body of a motor vehicle, comprising detection means for detecting a one-sided positional change of the vehicle body, and control means responsive to said detection means for controlling the light projection distance of the headlights, when driving through a curve resulting in a one-sided positional change of the vehicle body, in such a manner that when driving through a curve located on the outside in relation to the oppositely directed traffic, the light projection distance is

decreased and when driving through a curve located on the inside in relation to the oppositely directed traffic, the light projection distance is increased.

4,037,135
SOLID STATE TIMER-STEPPER WITH SOFT SWITCH-ON AND SWITCH-OFF LOAD CONTROL

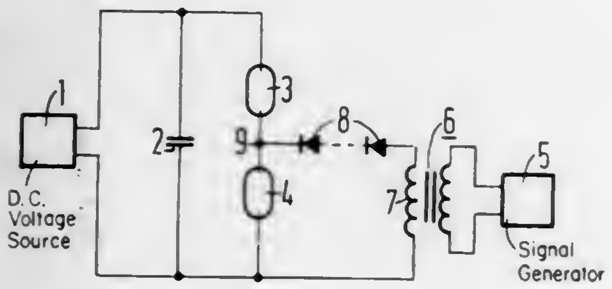
William E. Novey, Newhall, Calif., assignor to Eli Bridge Company, Jacksonville, Ill.
Filed June 3, 1976, Ser. No. 692,279
Int. Cl.² G05F *1/00;* H05B *37/02, 39/02*
U.S. Cl. 315—194 **5 Claims**



1. In a solid-state timer-stepper of the class wherein a pulse generator provides a train of incoming pulses to a counter which puts out BCD signals to a decoder for conversion into a digital format suitable for sequentially switching triacs arranged in multiple-segment load circuits, the combination with the gate circuits of said triacs of phase-shift network means having inputs electrically connected to the output from said decoder and outputs electrically connected to the gate circuits of said triacs for gating said triacs at increasing phase angles after application of the output from the decoder, and decreasing phase angles after removal of the output therefrom; whereby soft switching of the triacs is simulated.

4,037,136
CIRCUIT ARRANGEMENT FOR IGNITING AT LEAST ONE GAS DISCHARGE FLASH LAMP

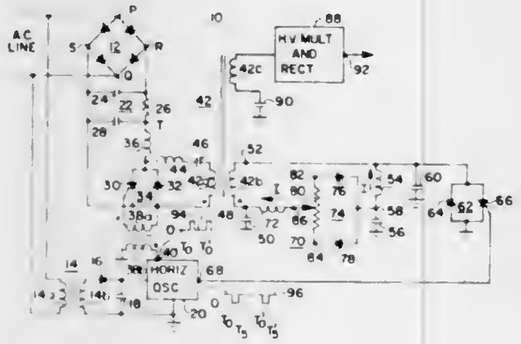
Ernst-Ludwig Hoene, Singapore, Singapore, assignor to Heimann GmbH, Germany
Filed Aug. 27, 1975, Ser. No. 608,158
Claims priority, application Germany, Sept. 19, 1974, 2444893
Int. Cl.² H05B *37/00, 37/00, 41/14*
U.S. Cl. 315—241 P **2 Claims**



1. A flash arrangement comprising:
- at least one first gas discharge flash lamp;
- a flash capacitor;
- a voltage source connected to charge said flash capacitor;
- an electronic switch comprising a second flash lamp connected in series with said first flash lamp;
- the series combination connected across said flash capacitor, said second flash lamp including a gas discharge path, each of said flash lamps comprising only main electrodes, a main electrode of each flash lamp connected to a main electrode of the other flash lamp to define a junction; and
- an ignition pulse generator connected to the junction of the two interconnected main electrodes.

4,037,137
CENTERING CIRCUIT FOR A TELEVISION DEFLECTION SYSTEM

Wolfgang Friedrich Wilhelm Dietz, New Hope, Pa., assignor to RCA Corporation, New York, N.Y.
Filed Feb. 26, 1975, Ser. No. 553,400
Int. Cl.² H01J *29/54*
U.S. Cl. 315—398 **6 Claims**

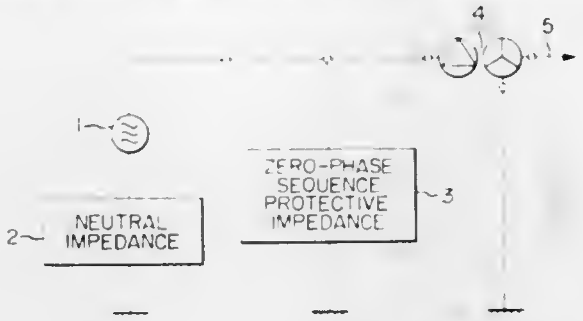


1. A deflection system including a centering circuit, comprising:
- a first series combination comprising a transformer winding and a first capacitor and having a first junction therebetween;
- a second series combination comprising a deflection winding and a second capacitor and having a second junction therebetween;
- means coupled to said first and second series combinations for supplying energy to said first and second series combinations during a first time interval of a deflection cycle and for providing an efficient path for current flow between said first capacitor and said transformer winding and between said second capacitor and said deflection winding during a second time interval of said deflection cycle for developing a first alternating current voltage at said first junction and a second alternating current voltage at said second junction, said first and second voltages being substantially of opposite phase; and
- centering means including unilateral conducting means coupled to said first junction and to said second junction for rectifying the difference between said first and second voltages for providing the sole source for a predetermined polarity and magnitude of average current flow through said deflection winding during said deflection cycle.

4,037,138
ZERO-PHASE SEQUENCE PROTECTIVE DEVICE FOR FAULTS WITHIN ARMATURE OF THREE-PHASE SYNCHRONOUS MACHINE

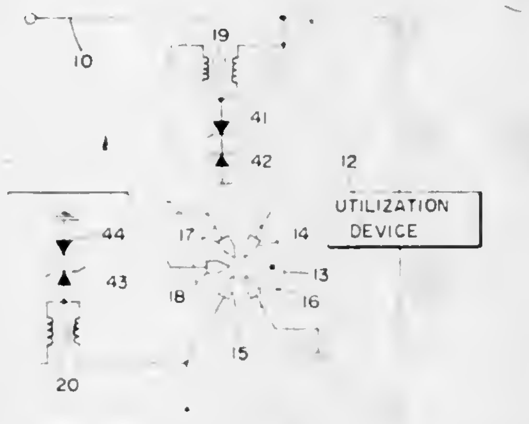
Koreyasu Kobayashi, Tagajyo, Japan, assignor to Koreyasu Kobayashi, Japan
Filed Oct. 1, 1975, Ser. No. 618,559
Claims priority, application Japan, Oct. 3, 1974, 49-114374
Int. Cl.² H02H *7/08*
U.S. Cl. 317—13 R **5 Claims**

1. In a three-phase electrical power system, a three-phase synchronous machine having three Y-connected armature windings interconnected at a common point, and a neutral impedance coupling said common point to a neutral point, said windings being connected to corresponding phases of said system; and three protective impedance elements, each element being connected between said neutral point and a corresponding phase of said system, each of said impedance elements having a value such that for each particular phase of said system the values of (i) the zero-phase symmetrical component sequence impedance of the particular armature winding associated with said particular phase, (ii) said neutral impedance, and (iii) the impedance of the protective impedance element connected to said particular phase, combine to provide a series resonant circuit and to exhibit parallel resonance to any fault from said particular armature winding to said neutral point.



4,037,139
LIGHTNING ARRESTER

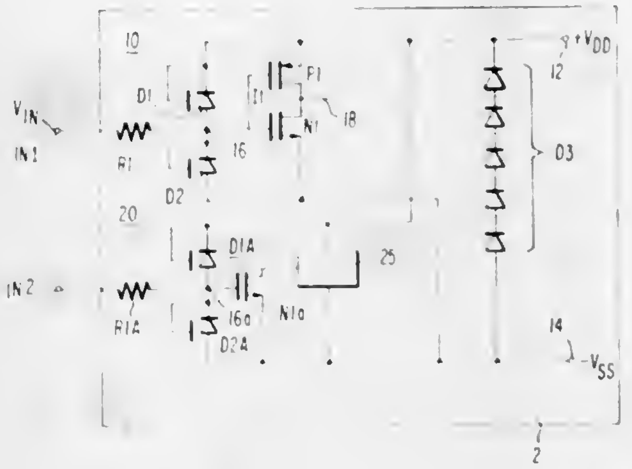
Roy I. Crask, Edina, and William D. Egerer, Minneapolis, both of Minn., assignors to Buckbee-Mears Company, St. Paul, Minn.
Filed Mar. 17, 1975, Ser. No. 558,670
Int. Cl.² H02H *3/22*
U.S. Cl. 361—58 **10 Claims**



1. For a lightning protector for a pair of electrical signal lines coupled to a utilization device, in combination: a gas-filled discharge tube having five electrodes, one of said electrodes adapted for electrical connection to one of said signal lines, another of said electrodes adapted for electrical connection to the other of said signal lines, and a third electrode being electrically grounded; a first step-up transformer having one end of its primary connected to said one electrode and one end of its secondary connected to a fourth electrode and the other end of its secondary and primary connected only to a reference potential level; and another step-up transformer having one end of its primary connected to said another electrode and one end of its secondary connected to a fifth electrode and the other end of its primary and secondary connected only to a reference potential level other than electrical ground.

4,037,140
PROTECTION CIRCUIT FOR INSULATED-GATE FIELD-EFFECT TRANSISTORS (IGFETS)

Sargent Sheffield Eaton, Jr., Phillipsburg, N.J., assignor to RCA Corporation, New York, N.Y.
Filed Apr. 14, 1976, Ser. No. 676,808
Int. Cl.² H02H *3/20*
U.S. Cl. 361—56 **10 Claims**



1. For use with an insulated-gate field-effect transistor (IGFET) having first and second regions defining the ends of a conduction channel and having a gate electrode insulated from and overlying said conduction channel, a protection circuit comprising:
- first and second terminals for the application of an operating potential therebetween;
- means coupling said first region to said first terminal and means coupling said second region to said second terminal;
- first and second diodes and a diode means each of said diodes and diode means having a forward voltage drop (V_f) when conducting current in the forward direction and having a reverse breakdown voltage drop (V_R) when conducting current in the reverse direction, wherein the V_f of each one of said diodes and diode means is significantly less than its V_R, and
- wherein the V_R of said first and second diodes is greater than the V_R of said diode means plus the V_f of one said first and second diodes;
- means connecting said first diode between said gate electrode and said first terminal poled to conduct current in the forward direction from said gate into said first terminal when the potential at said gate electrode exceeds the potential at said first terminal by more than the V_f of said first diode;
- means connecting said second diode between said gate electrode and said second terminal poled to conduct current in the forward direction from said second terminal into said gate when the potential at said gate electrode is less than the potential at said second terminal by more than the V_f of said second diode; and
- means connecting said diode means between said first and second terminals for conducting current in the forward direction from said second terminal into said first terminal when the potential at said second terminal exceeds the potential at said first terminal by more than the V_f of said diode means and for conducting current in the reverse direction from said first terminal to said second terminal when the potential at said first terminal exceeds the potential at said second terminal by more than the V_R of said diode means.

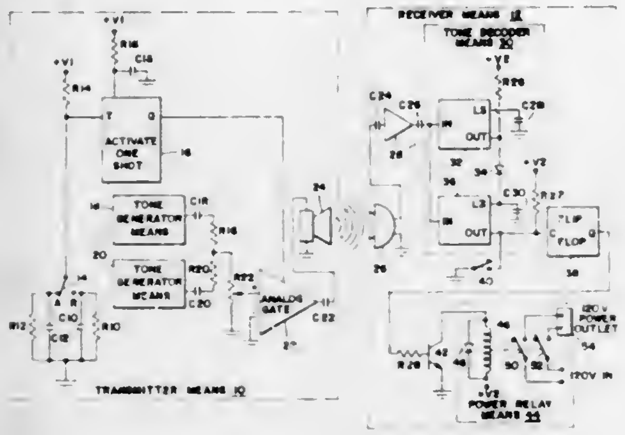
4,037,141
ENERGY CONSERVATION SYSTEM

Robert L. Fichtner, Livermore, Calif., assignor to Select Energy Systems, Inc., Moraga, Calif.

Filed July 1, 1976, Ser. No. 701,533

Int. Cl.^{2} H01H *47/20*

U.S. Cl. 361—182 **14 Claims**



1. An energy conservation system comprising:
ultrasonic sound transmitter means;
a key unit;
a key unit receptacle arranged to receive said key unit and to signal said ultrasonic sound transmitter means upon said initial insertion of said key unit into said receptacle, said transmitter acting in response thereto to output a sound signal having a plurality of frequency tones therein;
power outlet means; and
ultrasonic sound receiver means including means for controlling the coupling of power to said power outlet means, said receiver means, upon sensing said output sound signal of said transmitter means, acting in response thereto to couple power to said power outlet means.

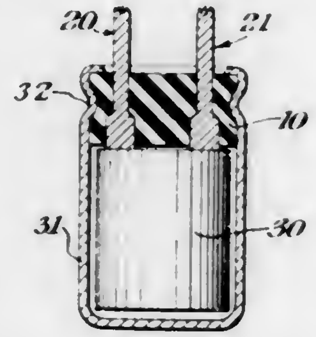
4,037,142
ELECTROLYTIC CAPACITOR PACKAGE HAVING A GROMMET WITH TAPERED LEAD HOLES

Ralph B. Poole, Hillsville, Va., assignor to Sprague Electric Company, North Adams, Mass.

Filed Jan. 29, 1976, Ser. No. 653,563

Int. Cl.^{2} H01G *9/00*

U.S. Cl. 361—433 **7 Claims**



1. A sealed electrolytic capacitor package comprising:
an electrolytic capacitor section;
a metal housing containing said capacitor section and having an open end;
an elastomeric grommet being mounted in and sealed to said open end of said housing, said grommet having in the unstressed condition at least two round tapered holes therein extending from the inner face to the outer face of said grommet, the largest diameter of each said tapered hole being at said inner face;
at least two metal leads, each one of said leads being sealed in one of said at least two holes, respectively, said each one lead having a round middle portion of diameter commensurate with said largest diameter of said one hole, said each one lead having a round wire end portion of fixed diameter smaller than said diameter of said middle lead portion and larger than the unstressed diameter of said one tapered hole at said outer grommet face, the junction of said middle and said wire end lead portions being contained within said one hole, said wire end portion extending outwardly from said grommet and said middle lead portion being connected to said capacitor section to provide electrical access thereto from the outside of said sealed electrolytic capacitor package.

4,037,143
MEANS IN A MOTOR-DRIVEN RAIL-VEHICLE

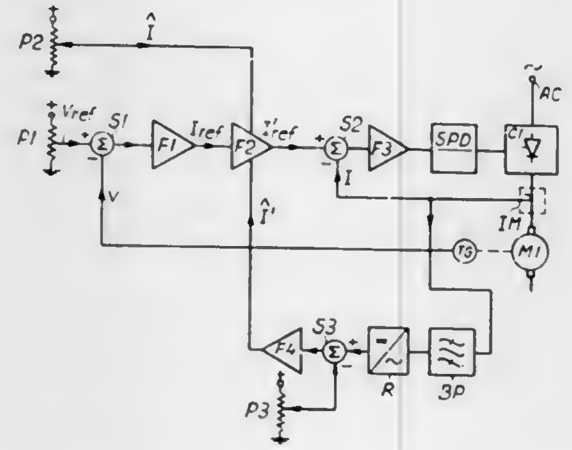
Bo Söderberg, Koping, Sweden, assignor to Asea Aktiebolag, Vasteras, Sweden

Filed Jan. 14, 1975, Ser. No. 541,041

Claims priority, application Sweden, Sept. 6, 1974, 7411269

Int. Cl.^{2} H02P *5/52*

U.S. Cl. 318—52 **9 Claims**



1. In a motor-driven vehicle having at least one drive system which comprises an electric drive motor and drive wheels, an oscillation sensing member which includes means to sense oscillations of an electrical quantity within the frequency range of natural oscillation of the drive system and to form a signal corresponding to the amplitude of said oscillations, means for controlling the torque of said electrical drive motor in response to said signal; and
said control means including means to partially reduce the torque of said electric drive motor in response to oscillations within such natural frequency range.

4,037,144
CONTROL DEVICE FOR USE IN SHUNT MOTOR

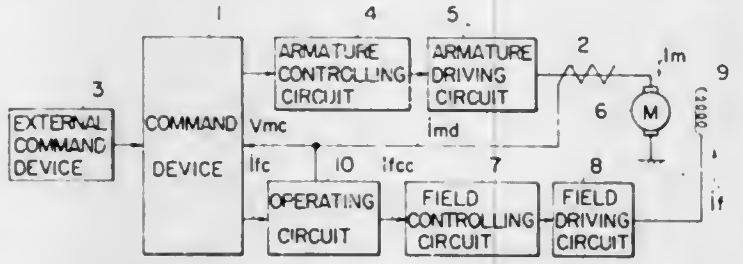
Tsutomu Ohmae; Hideo Yano, and Toshio Suzuki, all of Hitachi, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Mar. 28, 1975, Ser. No. 562,983

Claims priority, application Japan, June 13, 1974, 49-66525

Int. Cl.^{2} H02P *5/16*

U.S. Cl. 318—338 **4 Claims**



1. A speed control device for use in a shunt motor comprising:
means for generating an armature command signal pattern to control the speed of said shunt motor, the amplitude of said signal pattern increasing in response to the operating speed of said motor during a first range of operating speeds of said motor and being substantially constant during a second range of operating speeds of said motor;
means for generating a field current command signal pattern to control the speed of said shunt motor, the amplitude of said field current command signal pattern being substantially constant during said first range of operating speeds of said motor and decreasing in response to the operating speed of said motor during said second range of operating speeds of said motor;
means for controlling the armature voltage of said motor in response to said armature voltage command signal pattern;
means for controlling the field current of said motor in response to said field current command signal pattern;
means for detecting the armature current of said motor; and
operating means for receiving the armature current detected and said field current command signal pattern and generating a field current control signal by varying the amplitude of said field current command signal pattern in response to said detected armature current.

4,037,145
MULTIPLE FREQUENCY CHOPPER CONTROL

Ronald Barry Bailey, and Thomas Detlor Stitt, both of Erie, Pa., assignors to General Electric Company, Erie, Pa.

Filed Dec. 8, 1975, Ser. No. 638,520

Int. Cl.^{2} H02P *5/06*

U.S. Cl. 318—341 **9 Claims**

1. A frequency control system for a chopper circuit including controllable switching means for metering power from a DC source to a DC load, said control system comprising:
a. gating control for controlling the duty factor of the switching means as a function of a current command signal, said gating control means being connected to supply periodic ON and OFF commands to the chopper circuit at a controlled repetition rate for controlling said duty factor,
b. means for generating a first signal representative of current in the load; and
c. means coupling said first signal to said gating control means, said gating control means being responsive to said first signal to change the repetition rate of said periodic ON and OFF commands as a function of said first signal.

4,037,146
OUTPUT SELECTION CONTROL SYSTEM

Yoshihiko Kondo, Nagoya, Japan, assignor to Nippondenso Co., Ltd., Kariya, Japan

Filed Jan. 27, 1976, Ser. No. 652,854

Claims priority, application Japan, Jan. 29, 1975, 50-12710

Int. Cl.^{2} H02P *7/00*

U.S. Cl. 318—444 **5 Claims**

1. An output selection control system comprising:
a d.c. power source (1);
an operating switch (4) including a movable contact (5) connected to said d.c. power source and first, second and third fixed contacts (*6a, 6b, 6c*) operatively engageable with said movable contact (5), respectively;
a memory circuit (7) connected to said first fixed contact (*6a*) for memorizing that said movable contact (5) has been engaged with said first fixed contact (*6a*), said memory circuit (7) including an output terminal;
a trigger circuit (8) connected to said second fixed contact (*6b*) and said memory circuit (7) for causing said memory circuit (7) to generate a first signal at said output terminal thereof only when said movable contact (5) is engaged with said second fixed contact (*6b*) while said memory circuit (7) memorizes that said movable contact (5) of said operating switch (4) has been engaged with said first fixed contact (*6a*); and
a preference circuit (9) connected to said third fixed contact (*6c*) and said memory circuit (7) for clearing the memory stored in said memory circuit (7) when said movable contact (5) of said operating switch (4) is engaged with said third fixed contact (*6c*), said preference circuit (9) having an output terminal;
whereby said memory circuit (7) generates at the output terminal thereof a second signal different from said first signal when said movable contact (5) is engaged with said second fixed contact (*6b*) while said memory has been cleared.

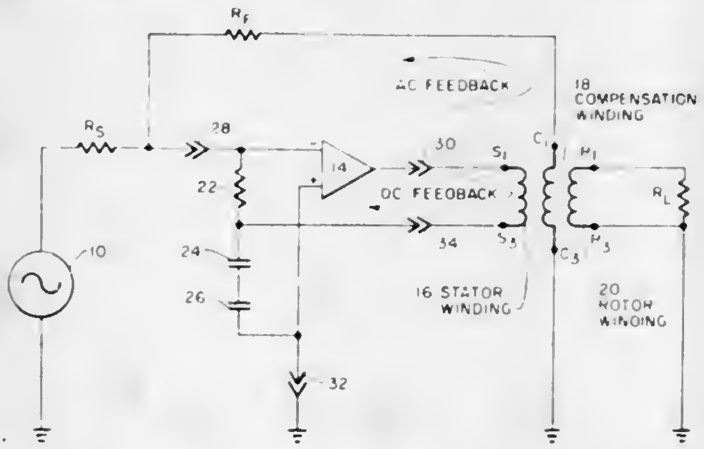
4,037,147
ISOLATION AMPLIFIER FOR RESISTIVE AND INDUCTIVE LOADS

Robert Neal Smith, Camarillo, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 26, 1976, Ser. No. 661,479

Int. Cl.^{2} H02P *7/68*

U.S. Cl. 318—632 **4 Claims**

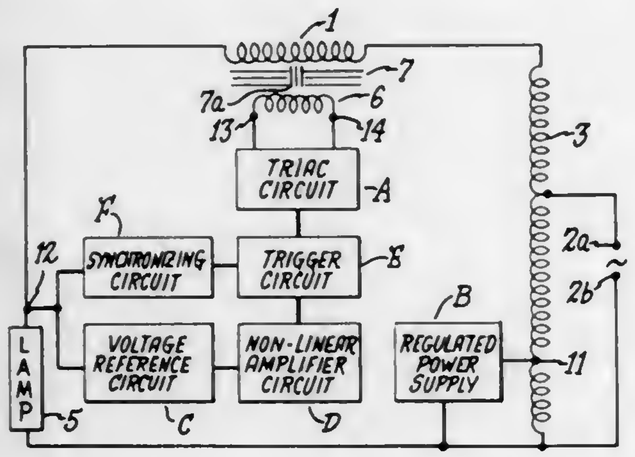


1. Isolation amplifier circuitry for use with inductive loads comprising:
a. differential amplification means for producing an amplified signal;
b. a stator winding connected to said differential amplification means for producing a flux field which varies with said amplified signal;

c. D.C. feedback resistive means connected to said stator winding for feeding back D.C. potentials from said stator winding to the input of said differential amplification means to prevent said differential amplification means from going into saturation;
d. compensation winding means for detecting said flux field produced by said stator winding and producing an A.C. signal which varies with said detected flux field;
e. A.C. feedback resistive means connected to said compensation winding means for feeding back said A.C. signal produced in said compensation winding to said input of said differential amplification means to adjust overall gain of said circuitry; wherein said A.C. signal produced by said compensation winding is representative of an A.C. signal produced by a rotor winding and delivered to a load connected to said rotor winding such that said gain of said overall circuitry is properly adjusted for said load.

4,037,148
BALLAST CONTROL DEVICE

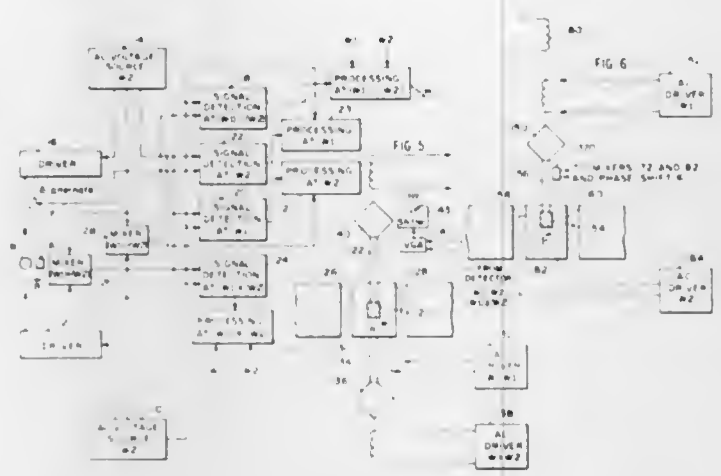
Michael Owens, and Wayne Ray Neal, both of Hendersonville, N.C., assignors to General Electric Company, New York, N.Y.
Filed Aug. 15, 1975, Ser. No. 605,027
Int. Cl.² G05F *1/66*
U.S. Cl. 323—17 **4 Claims**



1. Ballast control circuit comprising, in combination, a source of alternating current, direct current supply means connected to said alternating current source, variable impedance means connected in series with said alternating current source, a load connected in series with said alternating current source and said variable impedance means, switch means connected to said variable impedance means and operable at a predetermined phase interval for controlling current to said variable impedance means and thereby controlling power to said load, actuating means connected to said switch means for turning on said switch means, control means connected to said actuating means for controlling the phase interval of operation of said switch means and for maintaining constant power to said load with variations in load voltage, synchronizing means connected to said actuating means for re-starting said phase interval at zero load voltage, said actuating means, control means and synchronizing means connected to said direct current supply means, and voltage reference means connected to said control means and responsive to the voltage of said load for controlling the operation of said control means, said control means comprising a non-linear amplifier circuit having decreasing voltage output in response to increasing voltage of said load until a predetermined load voltage is reached, after which the voltage output of said non-linear amplifier circuit increases with increasing load voltage.

4,037,149
MULTIPLE MODE MAGNETOMETERS

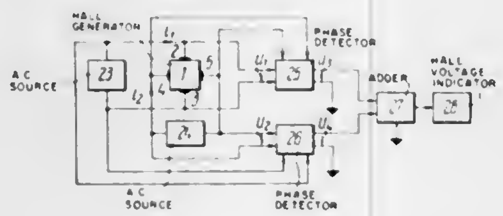
Simon Foner, 31 Payson Terrace, Belmont, Mass. 02178
Filed Dec. 18, 1975, Ser. No. 641,741
Int. Cl.² G01R *33/12*
U.S. Cl. 324—34 R **59 Claims**



21. A magnetometer for measuring the magnetic moment of a sample comprising:
means for applying a driving force to said sample;
sensor means for providing an output indication of the magnetic moment of said sample;
means for applying a driving signal to said sensor means whereby said output indication comprises a signal responsive to said driving signal modulated by a function of the force on said sample.

4,037,150
METHOD OF AND APPARATUS FOR ELIMINATING THE EFFECT OF NON-EQUIPOTENTIALITY VOLTAGE ON THE HALL VOLTAGE

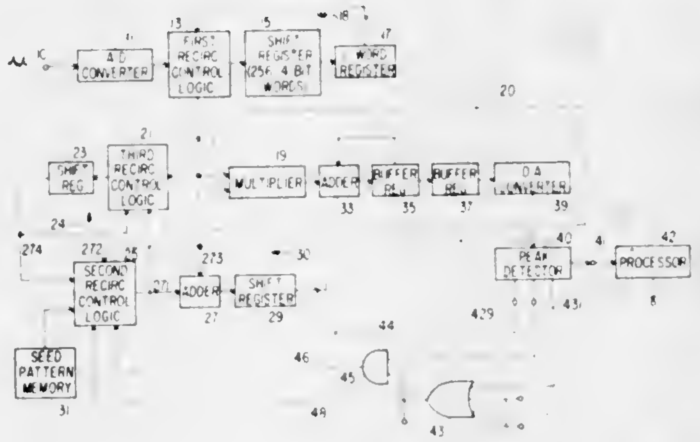
Sergei Glebovich Taranov, Brest Litovsky Prospekt, 2, kv. 107; Voldmir Vasilievich Braiko, ulitsa Vernadskogo, 75, kv. 18a; Anatoly Danilovich Nizhensky, ulitsa Kapitanovskaya, 14, kv. 25/3; Vladimir Petrovich Belousov, ulitsa Vernadskogo, 61, kv. 3/1, all of Kiev; Dmitry Vasilievich Kovalchuk, ulitsa Chekistov, 4a, kv. 6, Zhitomir; Isaak Pavlovich Grinberg, ulitsa Gorkogo, 42, kv. 12, Zhitomir; Eugeny Eustafievich Laschuk, ulitsa Chekistov, 4a, kv. 7, Zhitomir; July Modestovich Panchishin, Brest-Litovsky Prospekt, 39, and Jury Trofimovich Chigirin, Brest-Litovsky Prospekt, 102, both of Kiev, all of U.S.S.R.
Continuation of Ser. No. 365,155, May 30, 1973, abandoned. This application Apr. 25, 1975, Ser. No. 571,599
Int. Cl.² G01R *33/06*
U.S. Cl. 324—45 **2 Claims**



1. A method of eliminating the effect of a non-equipotentiality voltage on the voltage of a Hall generator, wherein a Hall generator, serving to measure and convert magnetic induction and comprising two pairs of opposite electrodes: the first and second pair, is fed with current through the first of said pairs of electrodes whereas the output signal is obtained from across the second of said pair of electrodes and, simultaneously, said generator is fed with current equal in magnitude to but differing in frequency from the above-mentioned current through the second of said pairs of electrodes, whereas the output signal obtained from the first of said pairs of electrodes; the output signal at the second pair of electrodes being detected at the frequency of the signal applied to the first pair of electrodes, whereas the output signal at the first pair of electrodes is detected at the frequency of the signal applied to the second pair of electrodes; the true magnitude of the Hall voltage is assessed from the arithmetic mean of the magnitudes of the two detected signals.

4,037,151
APPARATUS FOR MEASURING THE PERIOD AND FREQUENCY OF A SIGNAL

Yasuhito Takeuchi, Kunitachi, Japan, assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Feb. 27, 1976, Ser. No. 662,058
Int. Cl.² G01R *23/02*
U.S. Cl. 324—78 R **12 Claims**



1. An apparatus for measuring the period and frequency of a substantially periodic input signal waveform having random components by cross-correlating the input signal waveform with a reference waveform that is modified by the input signal waveform, said apparatus comprising:
first memory means disposed to receive the input signal waveform to be measured and to store selected sections of said input signal waveform.
second memory means coupled to said first memory means for storing a section of the reference waveform;
cross-correlator means coupled to said first and second memory means for repeatedly cross-correlating sections of the stored input signal waveform with said section of the stored reference waveform to produce a cross-correlation waveform;
peak-detector means coupled to said cross-correlator means for measuring the occurrence in time of relevant peaks of the cross-correlation waveform and producing an output signal indicative of such occurrences;
processing means coupled to receive the output signal of said peak detector means for deriving the period and frequency of said input signal waveform from said output signal, and
updating means coupled to said first and second memory means and to said peak detector means for periodically modifying the contents of the second memory means in accordance with sections of the input signal waveform stored in the first memory means.

4,037,152
FREQUENCY INDICATING SYSTEM

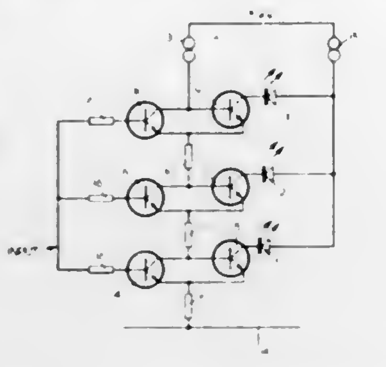
Russell W. Griffith, Dallas, Tex., assignor to United Technology Laboratories, Inc., Garland, Tex.
Filed Nov. 2, 1970, Ser. No. 85,837
Int. Cl.² G01R *23/14*
U.S. Cl. 324—79 R **10 Claims**

1. Frequency indicating system of the type including a plurality of processing channels for measuring the frequency of a received input signal of unknown frequency, each channel comprising:
a. first harmonic generating means for producing a first set of output signals, the frequencies of said output signals having harmonic relationships,
b. second harmonic generating means for producing a second set of output signals, the frequencies of said output signals having harmonic relationships, the fundamental frequency of the second set being offset from the fundamental frequency of the first set by a predetermined amount,
c. first and second mixer means respectively coupled to the outputs of said first and second harmonic generating means for combining said received input signal with said first and second set of output signals, thereby to produce a first and second series of output signals respectively from said first and second mixer means, each of said series of output signals having frequencies representing the difference between the frequency of said received input signal and the harmonic frequencies of said first and second set of outputs signals,
d. first and second filter means respectively coupled to the outputs of said first and second mixer means for passing only output signals from each of said mixer means representing the difference between the frequency of said received input signal and a specific one of the said harmonic frequencies,
e. third mixer means coupled to the outputs of said first and second filter means for combining the output signals passed by said first and second filter means, thereby to produce an output signal from said third mixer means having a frequency proportional to said specific harmonic, and
f. signal processing means for indicating the relative magnitude of the frequencies between the output signal from said first filter means and the output signals from said second filter means and producing an output signal dependent upon said relative magnitude indication.

4,037,153
DIGITAL METERS

Gideon Kalanit, New Malden, England, assignor to Communications Patents Limited, London, England
Filed Dec. 2, 1975, Ser. No. 637,054
Claims priority, application United Kingdom, Dec. 3, 1974, 52174/74
Int. Cl.² G01R *19/00, 19/16*
U.S. Cl. 324—122 **11 Claims**

1. A meter for presenting a digital display representative of an analogue input signal, the meter comprising a first constant current source, a plurality of series connected control circuits each comprising a switch arranged to draw current from said first source, a second constant current source connected to a respective switch in each control circuit so that only when the switch is closed a current may flow from the second source to a respective control circuit, individual display means for indicating each control circuit when a predetermined current flows from the second source, and an input signal circuit pro-



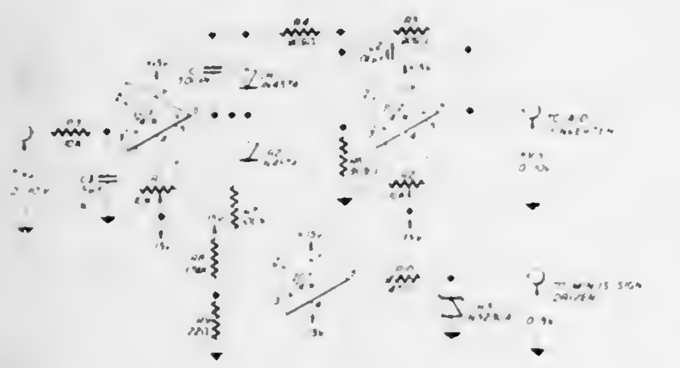
viding said analogue signal to each control circuit to close not more than two adjacent ones of the control circuit switches in said series to enable current to flow thereinto from the second source thereby to operate not more than two adjacent ones of said individual display means.

4,037,154

CIRCUIT FOR CALIBRATING INSTRUMENTS

Morteza M. Chamran, Elmhurst, and Allen R. Nemec, Naperville, both of Ill., assignors to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed Sept. 15, 1976, Ser. No. 723,372
Int. Cl.^{2} G01R *1/30, 1/02*
U.S. Cl. 324—123 R **10 Claims**



1. A circuit permitting an operator to accurately calibrate an instrument to produce a zero reading when the input is zero comprising, in combination:

a first amplifier for receiving a signal whose amplitude is to be indicated;

a feedback circuit coupled to said first amplifier so that said first amplifier operates in stable mode when the input to said first amplifier is above a first given magnitude and operates in oscillation mode when the input to said first amplifier is below said first given magnitude thereby producing oscillations at the amplifier output;

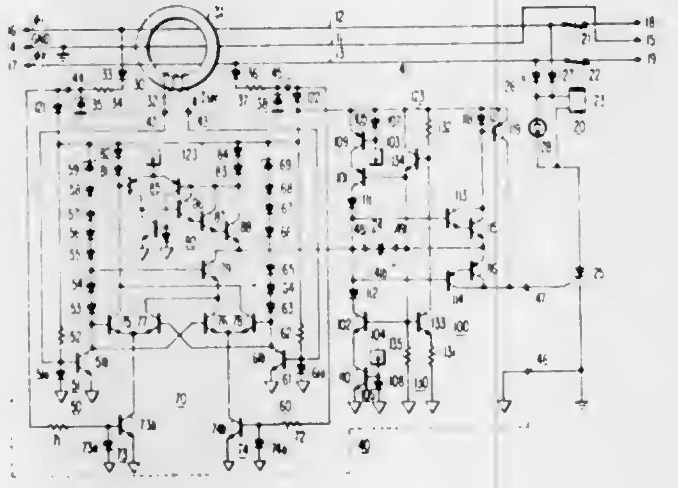
a comparator coupled to the output of said first amplifier for producing an output at one level when said first amplifier output is above a second given level and for producing an output at a second level when said first amplifier output is below said second given level, said comparator output being at either said level when said first amplifier operates in stable mode and being an oscillating signal between said two levels when said first amplifier operates in oscillation mode.

4,037,155

CURRENT-RESPONSIVE THRESHOLD DETECTION CIRCUITRY

Adel Abdel Aziz Ahmed, Annandale, N.J., assignor to RCA Corporation, New York, N.Y.

Division of Ser. No. 461,268, April 15, 1974, Pat. No. 3,953,767. This application Mar. 21, 1975, Ser. No. 560,721
Int. Cl.^{2} G01R *19/16, 31/02;* **G03K** *5/20*
U.S. Cl. 324—133 **9 Claims**



1. A current-responsive threshold detector comprising:

an input terminal for accepting input current;

a reference voltage node;

means for applying a first current to said input terminal;

means for applying a second current to said input terminal that is of opposite polarity to said first current and of sufficient amplitude to counteract such of said first current as is not counteracted by an input current, said means including

a first transistor having base and emitter electrodes with a base-emitter junction therebetween and having a collector electrode,

means connecting said first transistor base electrode to said reference voltage node,

means for applying a forward bias current to the base-emitter junction of said first transistor, and

a first semiconductor rectifier element connected between said first transistor collector electrode and said input terminal and poled for conducting the normal collector current of said first transistor, which collector current corresponds to said second current;

impedance means connecting said input terminal to said reference voltage node for developing a potential thereacross responsive to input current exceeding the value required to completely counteract said first current; and

a voltage-responsive threshold detector connected to be responsive to the potential across said impedance means responsive to input current exceeding the value to completely counteract said current.

4,037,156

POWER SUPPLY TESTING APPARATUS

Roger Hubert Goujon; Jacques Pierre Raymond Raphael Menard, and Georges Claude Andre Pagny, all of Angers, France, assignors to Compagnie Honeywell Bull (Societe Anonyme), Paris, France

Filed Apr. 15, 1976, Ser. No. 677,254
Claims priority, application France, Apr. 30, 1975, 75.13698
Int. Cl.^{2} G01R *31/00*
U.S. Cl. 324—158 R **18 Claims**

1. An equipment for testing DC power supplies, comprising:

i. a controller for setting the characteristic parameters of AC current supplied by a main supply to the power supply to be tested, said controller being connected between the electrical supply and inputs of the power supply to be tested,

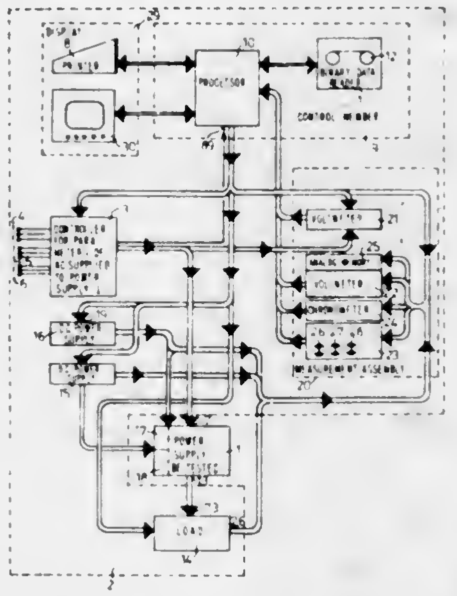
ii. at least one programmable load connected to output terminals of the power supply to be tested,

iii. fixed auxiliary power supplies for feeding DC current to the controller for controlling and starting the power supply to be tested,

iv. programmable auxiliary power supplies for supplying a primary DC current to the power supply to be tested,

v. an assembly for measuring the values of input and output currents supplied to and derived from the power supply,

vi. a control member, said control member including means for supplying control signals to: (a) the controller so that the controller can set the parameters of the AC current supplied by the electrical supply, (b) the programmable auxiliary supplies so that the programmable supplies can derive variable DC output voltages, (c) the measuring assembly so that measurements can be derived from differing terminals in the equipment, and (d) the load, so that different impedance values can be set in the load, and vii) an assembly responsive to the control signals and signals indicative of measurements received by the measuring assembly for displaying the measurements made by the measuring assembly and the controls generated by the control member.

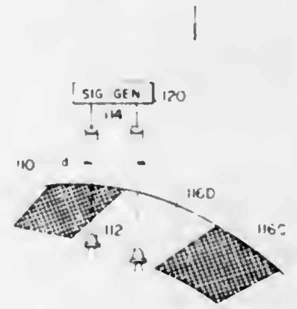


4,037,157

ELECTRO-OPTICAL SPEED TRANSDUCER

Eugene Campbell, Arvada, Colo., assignor to The United States of America as represented by the Secretary of the Interior, Washington, D.C.

Filed Apr. 5, 1976, Ser. No. 673,558
Int. Cl.^{2} G01P *3/36*
U.S. Cl. 324—175 **11 Claims**



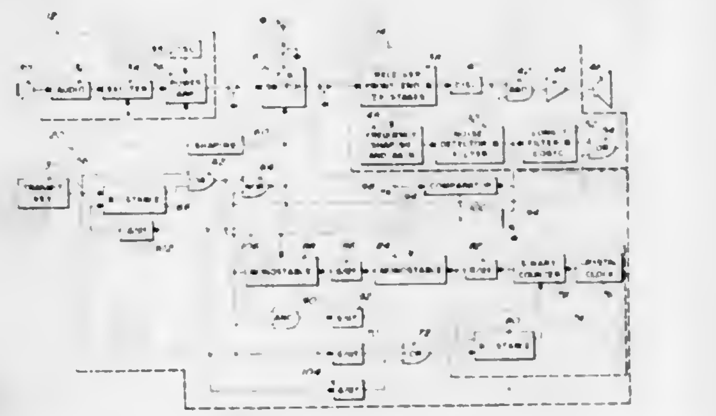
1. A speed transducer for measuring the speed of a moving surface, said transducer comprising motion detecting means comprising at least one light source, a pair of first and second photodetectors spaced from said light source and from one another for detecting light radiated by said light source along first and second light paths, respectively, each of said photodetectors producing an output when said light impinges thereon, and light chopping means, coupled to the moving surface, for alternately completing and breaking said light paths such that said second light path is completed before said first light path is broken; and said transducer further comprising means for combining said photodetector outputs such that a pulse is produced having a duration which is determined by the time interval between completion of said first light path and completion of said second light path and which is thus related to the speed of the moving surface.

4,037,158

TWO-WAY FM RADIO SYSTEM OPERATING ON A SINGLE CHANNEL AND PROVIDING SIMULATED DUPLEX OPERATION

Bruce Charles Eastmond, Downers Grove, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 512,749, Oct. 7, 1974, abandoned. This application Mar. 31, 1976, Ser. No. 672,359
Int. Cl.^{2} H04B *1/44, 1/54*
U.S. Cl. 325—22 **12 Claims**



1. A control system for two-way apparatus having a transmitter and receiver both operable at a predetermined frequency, and an antenna suitable for transmitting to or receiving, at said frequency, remote transmitter and receiver apparatus which includes a similar control system, such control system including in combination:

means for actuating the system to the transmit mode including means for activating the transmitter and means coupling the transmitter to the antenna,

means operable in the transmit mode to periodically deactivate the transmitter and couple the receiver to the antenna for brief sampling intervals,

means for detecting the presence of a transmitted signal by said remote transmitter at the predetermined frequency during the sampling intervals,

latching means inhibiting transmission in response to a detected signal and locking the system to the receive mode,

means operable to override the latching means for continued operation in the transmit mode,

blanking means for muting the audio output of the receiver, and

means for detecting the sampling period of said remotely located transmitter and, in response thereto, causing the blanking means to mute the audio output of the receiver during each sampling period.

4,037,159

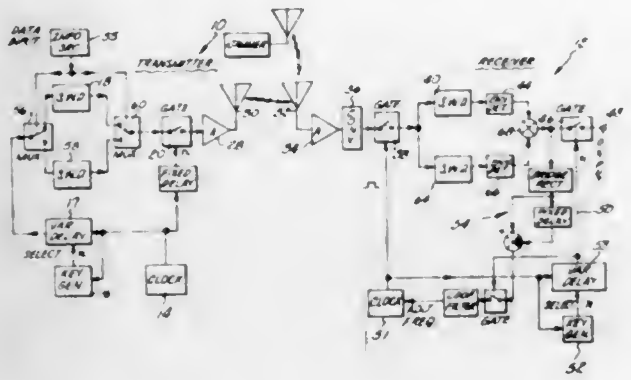
CHIRP COMMUNICATION SYSTEM

Albert R. Martin, Melbourne Beach, Fla., assignor to Harris Corporation, Cleveland, Ohio

Filed Nov. 1, 1974, Ser. No. 520,060
Int. Cl.^{2} H04B *15/00;* **H03H** *7/10, 7/30*
U.S. Cl. 325—30 **13 Claims**

1. Apparatus for communicating between stations comprising means including a surface wave device for producing an information bearing chirp signal starting at any one of a plurality of initial frequencies in a range, and means for transmitting said chirp signal, means for receiving said chirp signal including a unitary matched surface wave device serving as an uni-

tary distributed filter means having time invariant parameters for compressing chirp signals starting at any of said initial



frequencies in said range, and means responsive to said compressed chirp signals for recovering the information content therefrom.

4,037,160
METHOD AND APPARATUS FOR ADJUSTING AND READJUSTING AN AUTOMATIC CORRECTOR FOR A DATA SIGNAL TRANSMISSION SYSTEM

Predrag Miloradovic, Kilchberg, and Hans Schaffhauser, Stadel, both of Switzerland, assignors to Gretag Aktiengesellschaft, Regensdorf, Switzerland

Filed Nov. 25, 1975, Ser. No. 635,110

Claims priority, application Switzerland, Dec. 6, 1974, 16268/74; Germany, Dec. 16, 1974, 2459455

Int. Cl.^{2} H03H *7/36*

U.S. Cl. 325—42 **15 Claims**

1. A method for establishing optimum attenuator settings in a transversal equalizer intended for correction of distortion imposed upon pulse-amplitude-modulated communication signals in passage through a transmission medium comprising in a first phase:

a. generating a first reference signal sequence at the transmitting end of said transmission medium, transmitting it to the receiving end of the latter and feeding it to the transversal equalizer,

b. generating at the receiving end a second reference signal sequence identical with the first reference signal sequence,

c. deriving a first error signal from a comparison of a first signal of said second reference signal sequence and a corresponding signal of a first output signal sequence produced by said transversal equalizer when fed with said first reference signal sequence,

d. adjusting the attenuator settings in response to said error signal and thereby imparting to the error signal at least two different weights for the adjustment of at least two respective numbers of attenuator settings, and

e. repeating the steps c) and d) with subsequent signals of the respective signal sequences thus incrementally readjusting the attenuator settings in order that said output signal sequence and said second reference signal sequence at least approximatively converge; and in a second phase:

f. transmitting communication signals through the transmission medium and feeding them to the transversal equalizer,

g. deriving by threshold detecting third reference signals from a second output signals produced by said transversal equalizer when fed with the communication signals,

h. deriving second error signals from a comparison of subsequent second output signals and the corresponding third reference signals, and

i. readjusting the attenuator settings in response to said second error signals in order to compensate for alterations of the transmission system.

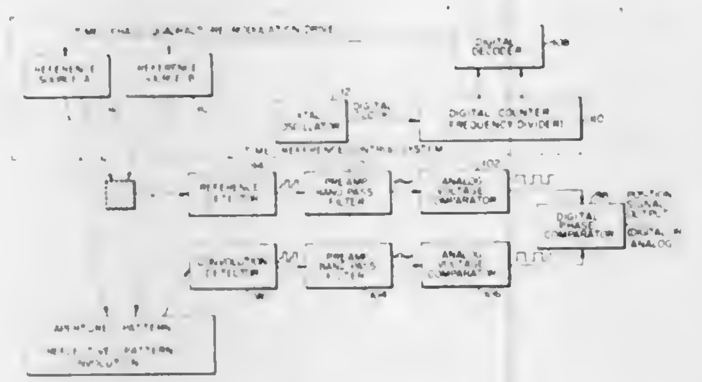
4,037,161
RATIO DETECTOR

William E. Westell, Weston, Mass., assignor to Baird-Atomic, Inc., Bedford, Mass.

Division of Ser. No. 490,698, July 22, 1974, Pat. No. 3,951,548. This application Dec. 3, 1975, Ser. No. 637,326

Int. Cl.^{2} H03D *13/00;* G06J *1/00*

U.S. Cl. 328—133 **1 Claim**



1. A device for processing data, said device comprising:

a. source means for generating a first signal;

b. reference means communicating with said source means for receiving said first signal and for generating a second signal having a reference component and a quadrature component;

c. convolution means communicating with said source means for receiving said first signal and for generating a third signal having a reference component and a quadrature component, said third signal constituting a convolution of said first signal;

d. first processing means operatively connected to said reference means for receiving said second signal, said first processing means generating a fourth signal constituting a resultant of said second signal reference and quadrature components generated by said reference means;

e. second processing means operatively connected to said convolution means for receiving said third signal, said second processing means generating a fifth signal representing a resultant of said third signal reference and quadrature components generated by said convolution means; and

f. comparator means operatively connected to said first and second processing means, said fourth signal and fifth signal applied to said comparator means, said comparator means comparing said fourth signal and said fifth signal and generating a sixth signal representing the difference in phase of said fourth signal and said fifth signal.

4,037,162
PSEUDO SAMPLING

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 27, 1975, Ser. No. 581,258

Int. Cl.^{2} H03K *5/00*

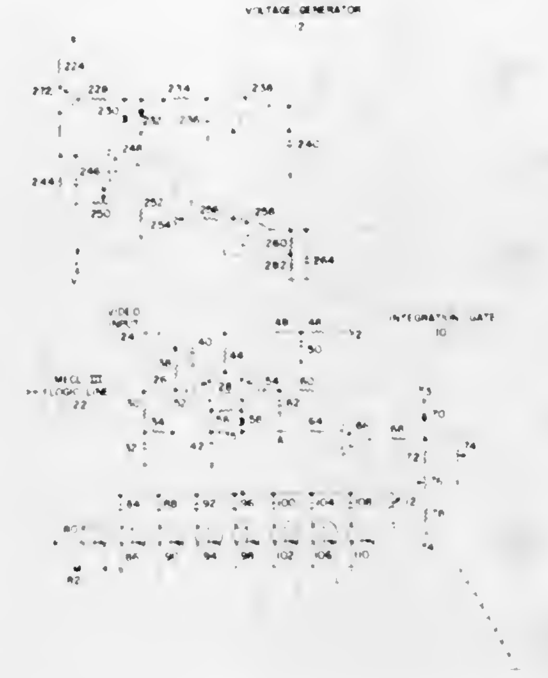
U.S. Cl. 328—151 **8 Claims**

1. In a system for sampling an electrical signal as a means for interrogating it, the improvement of pseudo-sampling said signal by sampling the value of it at discrete portions of finite width instead of instantaneously sampling said signal at discrete portions of infinitely narrow width, and by compensating the sampled value with an attenuation figure to obtain the true signal value comprising:

means for sampling the value of said signal wherein the sample period is of finite duration, and providing a separate result for each portion sampled;

means for modifying each said result by compensating for relative attenuation induced by the utilization of said sample means, wherein said relative attenuation is given by $\alpha(f) = 2 \sin (f\,\pi/2)/\pi f$, and wherein f is twice the

frequency of the signal sampled times the duration of the sample period;



such that the modified results can be investigated as a means for interrogating said signal.

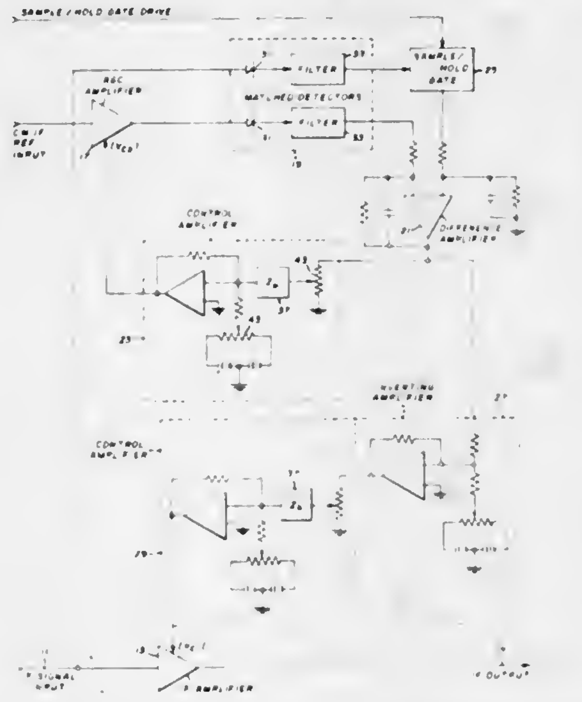
4,037,163
AUTOMATIC GAIN CONTROL CIRCUIT

John F. Nicholas, Liverpool, N.Y., assignor to General Electric Company, Syracuse, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,566

Int. Cl.^{2} H04B *1/16;* H03B *3/02;* H03K *3/00*

U.S. Cl. 328—175 **3 Claims**



1. For use in a pulse radar system, an automatic gain control circuit comprising:

a. first and second controlled-gain amplifiers having similar control voltage versus gain characteristics,

b. first and second IF signal sources, said first source applying a reference signal as the input to said first controlled-gain amplifier and said second source applying the radar received signal as the input to said second controlled-gain amplifier;

c. first and second matched detectors, said first detector having as the input thereto the output of said first controlled-gain amplifier, and said second detector having as the input thereto said radar received signal;

d. sample-and-hold circuit means for sampling the output of said second detector at a rate related to the radar pulse rate and holding the sampled output between samplings;

e. a difference amplifier providing as its output a voltage varying in direct relation with the difference in outputs of said first detector and of said sample-and-hold circuit;

f. an inverting amplifier having as its input the output of said difference amplifier; and

g. first and second control amplifiers, said first control amplifier being connected to receive the output of said difference amplifier and to control said first controlled-gain amplifier in accordance therewith, said second controlled amplifier being connected to receive the output of said inverting amplifier and to control said second gain-controlled amplifier in accordance therewith.

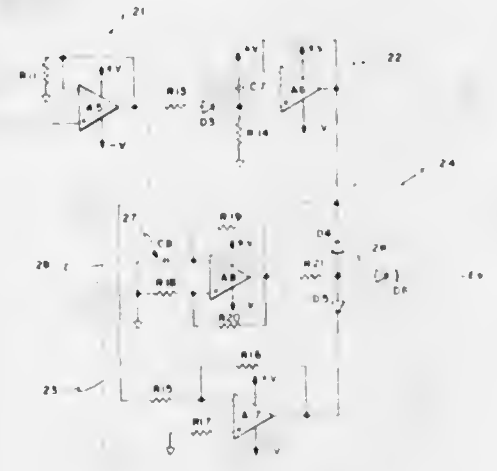
4,037,164
EXPONENTIAL DECAY WAVE FORM GENERATOR AND METHOD

Shailer T. Pickton, Lafayette, and Gordon B. Dean, Martinez, both of Calif., assignors to Systron Donner Corporation, Concord, Mass.

Filed Feb. 18, 1976, Ser. No. 659,139

Int. Cl.^{2} H03K *4/04*

U.S. Cl. 328—187 **22 Claims**



1. A wave form generator responsive to an input command signal, comprising an input amplifier having a high input impedance, and a low output impedance, for receiving the input command signal at the input thereof and providing an output therefrom, an exponential signal generator coupled to said output from said input amplifier and producing an exponential signal envelope at the output thereof, means coupled to said exponential signal generator output and providing a reverse polarity exponential signal envelope at the output thereof, an astable element coupled to receive said exponential and inverse exponential signal envelopes providing an exponentially decaying alternating output at a predetermined frequency at the output thereof.

4,037,165
SYNCHRONOUS SIGNAL GENERATING SYSTEM WITH PHASE-LOCKED LOOP CIRCUIT

Minoru Ogita, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 31, 1976, Ser. No. 672,629

Claims priority, application Japan, Apr. 1, 1975, 50-38557

Int. Cl.^{2} H03D *3/00*

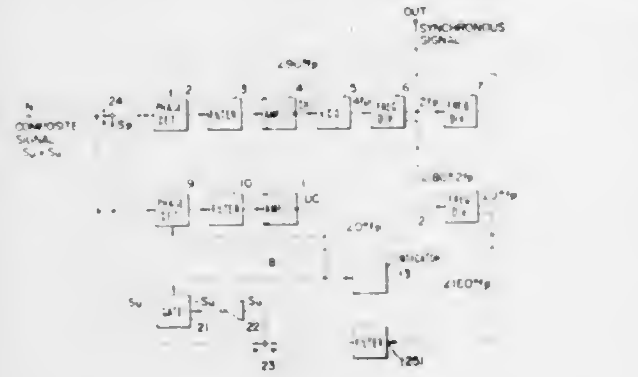
U.S. Cl. 329—124 **6 Claims**

5. A system for use in an FM receiver and for generating a synchronous signal which is synchronous with a first signal contained in a composite signal consisting of said first signal and a second signal having a frequency different from that of said first signal, characterized in that said first signal is a pilot signal and that said second signal includes a main-channel signal and a sub-channel signal.

said system comprising:

a phase-locked loop circuit which, upon receipt of at least said first signal through a first means, is locked with said first signal received and which thereby generates said synchronous signal,

second means for receiving at least said composite signal for thereby generating a cancelling signal, and



a gate connected in series between said first means and second means and being rendered conductive upon receipt of said composite signal to thereby deliver, as said cancelling signal, the output of said second means to said first means,

said first means receiving said composite signal and said cancelling signal to thereby cancel, by said cancelling signal, said second signal contained in said composite signal, whereby said first signal carrying substantially none of said second signal is delivered by said first means to said phase-locked loop circuit.

4,037,166

BIASING ARRANGEMENT FOR PUSH-PULL AMPLIFIER

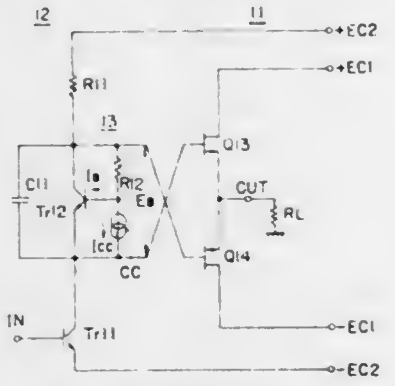
Kenji Yokoyama, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Filed Mar. 16, 1976, Ser. No. 667,438

Claims priority, application Japan, Mar. 19, 1975, 50-33152; Mar. 19, 1975, 50-36734[U]; Mar. 19, 1975, 50-36735[U]

Int. Cl.² H03F *3/18*

U.S. Cl. 330—13 **8 Claims**



1. A biasing arrangement for a push-pull amplifier, comprising:

a first transistor for driving a pair of field effect transistors forming said push-pull amplifier;

a second transistor connected in series in the collector circuit of said first transistor, the voltage between the collector and the emitter of said second transistor being applied to the gate electrodes of said field effect transistors as the gate bias voltage for these field effect transistors;

a first resistor connected between the collector and the base of said second transistor, and

a constant current source connected to the base of said second transistor for causing a substantially constant current to flow through said first resistor, the constant current having such a value that it develops, across said first resistor, a voltage sufficiently large and stabilized as compared with the voltage developed between the base and the emitter of said second transistor.

4,037,167

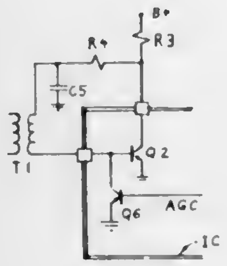
AUTOMATIC GAIN CONTROL AMPLIFIER

Kingsley N. Hastings, 1590 York Ave., New York, N.Y. 10028

Division of Ser. No. 604,175, Aug. 13, 1975, abandoned. This application Sept. 20, 1976, Ser. No. 725,153

Int. Cl.² H03G *3/30*

U.S. Cl. 330—29 **3 Claims**



1. An automatic gain control amplifier comprising:

a. at least one transistor amplifier having a base, collector, and emitter, said collector being connected to a D.C. supply voltage through a collector resistor, said emitter being connected to ground;

b. a tuned circuit including transformer means for applying a signal of a predetermined frequency to said base;

c. a biasing resistor coupled between said collector and said tuned circuit, said biasing resistor being much larger than said collector resistor;

d. transistor means coupled between the base of said transistor amplifier and ground for controlling the gain of said amplifier in response to a gain control signal; and

e. capacitor means in the base circuit of said amplifier coupled between said transformer means and ground for providing an A.C. path to ground.

4,037,168

TRANSISTORIZED UHF POWER AMPLIFIER COMPRISING A FERROELECTRIC SHEET BETWEEN A CONDUCTIVE BASE PLATE AND A CONDUCTIVE PATTERN

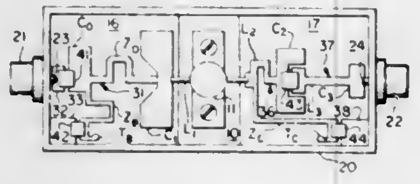
Hidehiko Katoh; Yuji Kajiwara, and Hideo Takamizawa, all of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Sept. 9, 1976, Ser. No. 721,756

Claims priority, application Japan, Sept. 10, 1975, 50-110200

Int. Cl.² H03F *3/04, 3/60*

U.S. Cl. 330—31 **7 Claims**



1. In a transistorized high-frequency power amplifier comprising an electroconductive base plate, a power transistor on said base plate, at least one pattern of an electroconductive material operatively connected to said transistor, and a sheet of a material below said pattern in direct contact with said base plate, the improvement wherein said material is a ferroelectric material represented by the formula:

$(1-x)BaO.xTiO_2$,

where *x* represents a constant that is not less than about 0.7 and that is less than 1.0.

4,037,169

TRANSISTOR AMPLIFIER

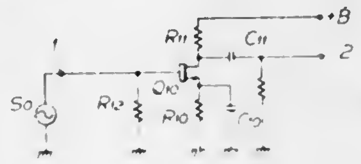
Tadao Suzuki, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan

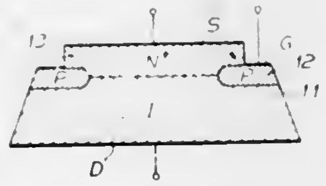
Filed May 20, 1975, Ser. No. 579,043

Claims priority, application Japan, May 21, 1974, 49-57645[U]

Int. Cl.² H03F *3/16*

U.S. Cl. 330—35 **5 Claims**





1. A transistor amplifier comprising an input terminal for receiving audio signals to be amplified, an output terminal for delivering the amplified audio signals, a field effect transistor for amplifying said audio signals and including gate, source and drain electrodes, an intrinsic semiconductor region in said field effect transistor to which one of said electrodes is connected so that a vertical channel is formed in said field effect transistor whereby its drain current does not become saturated when its drain voltage is increased so as to exhibit triode-type characteristics, means defining a reference potential, a resistor and capacitor connected in a parallel circuit between said source electrode and said reference potential, means connecting said gate electrode directly to said input terminal, and means connecting said drain electrode to said output terminal.

4,037,170

DIFFERENCE AMPLIFIER HAVING EXTENDED COMMON MODE RANGE

Glenn L. Richards, Rochester, N.Y., assignor to Stromberg-Carlson Corporation, Rochester, N.Y.

Filed Apr. 5, 1976, Ser. No. 673,827

Int. Cl.² H03F *3/45*

U.S. Cl. 330—69 **5 Claims**

1. A differential input-to-single ended output buffer circuit which operates to reject a common mode signal while passing a differential signal, comprising:

a. a pair of circuit input terminals for receiving a differential input signal upon which may be superimposed an undesired common mode signal, said terminals comprising first and second circuit input terminals,

b. an operational amplifier having a non-inverting input, an inverting input, and an output, said operational amplifier exhibiting a characteristic of rejecting a common mode signal applied between said non-inverting and said inverting input provided said common mode signal is within a predetermined signal range,

c. a first voltage divider connected to said first circuit input terminal, said first voltage divider comprising first and second serially connected impedances and being so construed and arranged to apply the signal present at the node between said impedances to the non-inverting input of the operational amplifier to eliminate said undesired common mode signal,

d. feedback means connected between the output of the operational amplifier and the inverting input of the operational amplifier, and

e. a second voltage divider connected to said second circuit input terminal, said second voltage divider comprising third and fouth serially connected impedances and being so constructed and arranged to directly apply the signal present at the node between said impedances to the inverting input terminal of the operational amplifier, whereby the predetermined range of common mode signals which are rejected by the operational amplifier is extended

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4,037,171

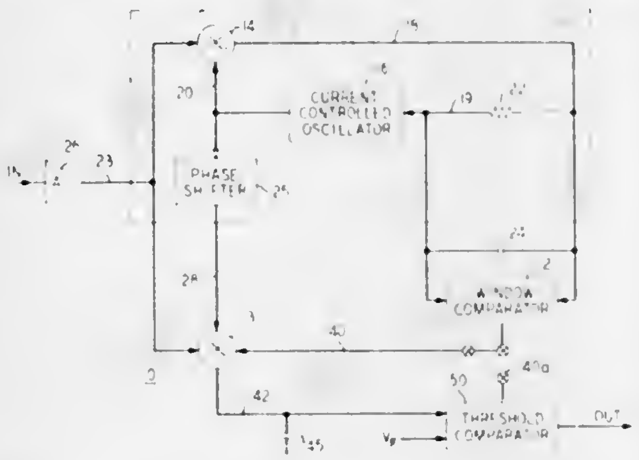
HIGH SPEED TONE DECODER UTILIZING A PHASE-LOCKED LOOP

Robert Roger Cordell, Tinton Falls, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Feb. 17, 1976, Ser. No. 658,728

Int. Cl.² H03B *3/04*

U.S. Cl. 331—14 **14 Claims**



1. A tone decoder circuit comprising

a controllable oscillator connected in a phase-locked loop for generating signals having a frequency determined by a control signal produced within the loop, the phase-locked loop having a capture range,

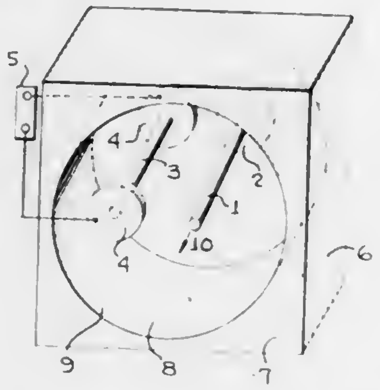
a synchronous detector, responsive to an input signal of the tone decoder and to a first signal from the controlled oscillator, for producing a signal having a magnitude dependent upon the magnitudes of the input signal and the first signal from the controllable oscillator, and

means, connected to the loop and responsive to the control signal within the loop, for monitoring when the generated signal is within a predetermined frequency range substantially narrower than the capture range of the phase-locked loop, the monitoring means applying a signal to the synchronous detector for inhibiting the output of the synchronous detector when the first signal from the controlled oscillator is outside of the predetermined frequency range.

4,037,172
PLASTIC LASER MATERIALS

Nicolae Filipescu, Arlington, Va.; Nelson McAvoy, Silver Spring; Morton R. Kagan, Potomac, both of Md., and Francis A. Serafin, Alexandria, Va., assignors to American Standard, Inc., New York, N.Y.

Filed Sept. 17, 1963, Ser. No. 309,560
Int. Cl.^{2} H01S *3/16*
U.S. Cl. 331—94.5 E **21 Claims**

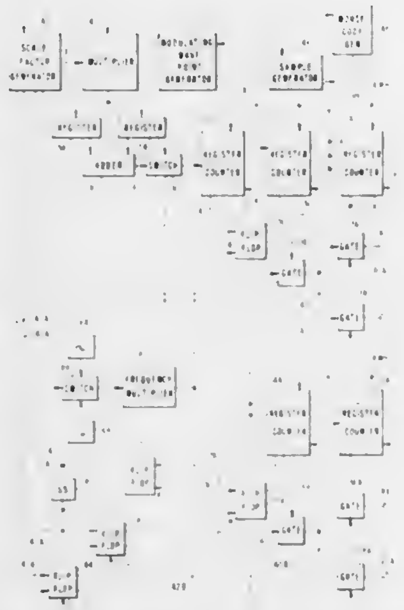


1. An optical maser material comprising a solid polymeric matrix having uniformly distributed therein a rare earth metal chelate.

4,037,173
MULTIPLE CARRIER MODULATION SYNTHESIS

Donald J. Toman, Pleasantville, N.Y., assignor to Tull Aviation Corporation, Armonk, N.Y.

Filed July 27, 1976, Ser. No. 708,923
Int. Cl.^{2} G01S *1/16. 1/18;* H03K *7/08*
U.S. Cl. 332—9 R **23 Claims**

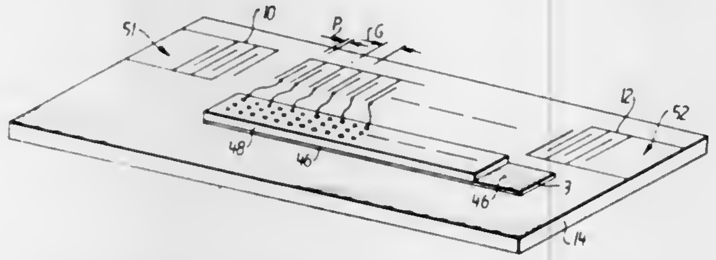


1. A method for synthesizing the production of modulated radio carrier waves from at least two radio carriers including
continuously storing the same group of different digital sample point values signifying various modulation levels required for each of said radio carriers at successive points in time to suggest the presence of at least one modulation signal waveform for each of said carriers,
gating the first of said carriers on and off,
gating the second of said carriers on only during the off periods of the first carrier,
reading out said sample point values in timed sequence,
transferring and applying said digital sample point values to modify said carrier waves in timed sequence by modification of each carrier by one sample point value during each period when each carrier wave is gated on to thus produce modified carriers,
the modifications of each of said carriers being such as to be recognized by a receiver as modulation by a respective waveform modulation signal.

4,037,174
COMBINED ACOUSTIC SURFACE WAVE AND SEMICONDUCTOR DEVICE PARTICULARLY SUITED FOR SIGNAL CONVOLUTION

Robert A. Moore, Arnold, and Herbert Warren Cooper, Hyattsville, both of Md., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 10, 1973, Ser. No. 423,650
Int. Cl.^{2} H03H *9/26. 9/32. 7/28;* H03K *5/20*
U.S. Cl. 333—30 R **5 Claims**

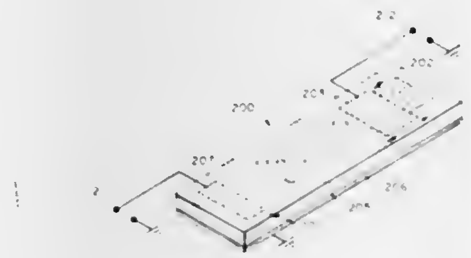


1. Apparatus comprising:
means carried at spaced locations along a surface of an acoustic substrate for detecting surface waves propagated along said substrate and for providing output signals related to the surface waves detected at said locations,
semiconductor means operatively connected to said detecting means for arithmetically combining said output signals,
said detecting means comprises a plurality of generally parallel, spaced, electrically conductive sampling fingers disposed on a surface of said substrate normal to a propagation path of said surface waves,
said semiconductor means comprises a plurality of semiconductor diodes each having one like electrode operatively connected to at least one of said sampling fingers, the other like electrode of each of said diodes being operatively connected to a common output terminal,
wherein said semiconductor diodes are Schottky barrier diodes formed through a sheet of substrate material, said common output terminal comprising a sheet of electrically conductive material having one surface disposed in contact with one surface of said sheet of substrate material and in electrical contact with said other like electrode of each of said diodes.

4,037,175
VARIABLE DELAY DEVICE

Robert Kansy, Fort Wayne, Ind., and Jon Culton, Champaign, Ill., assignors to University of Illinois Foundation

Filed Jan. 2, 1974, Ser. No. 430,149
Int. Cl. H03h *9/26. 9/30;* H01v *7/02*
U.S. Cl. 333—30 R **6 Claims**



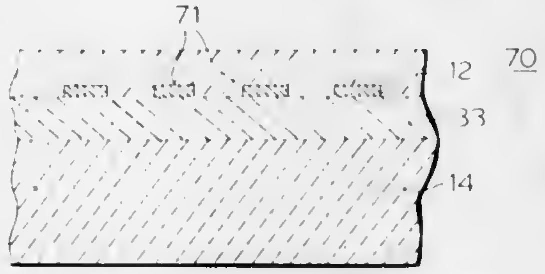
1. A surface wave variable delay device comprising:
an unpoled ferroelectric substrate having a first transducer thereon;

a substantially sinusoidal poled region at said surface and spaced from said first transducer;
a metal plate slidably disposed over said poled region; and
a metal electrode disposed on the opposing surface of said substrate, said plate and said electrode comprising a second transducer whose effective position is movable with respect to said first transducer.

4,037,176
MULTI-LAYERED SUBSTRATE FOR A SURFACE-ACOUSTIC-WAVE DEVICE

Shusuke Ono, Takatsuki; Kiyotaka Wasa, Nara, and Shigeru Hayakawa, Hirakata, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Mar. 16, 1976, Ser. No. 667,374
Claims priority, application Japan, Mar. 18, 1975, 50-33417; Mar. 18, 1975, 50-33419; June 18, 1975, 50-74873
Int. Cl.^{2} H03H *9/30. 9/02;* H01L *27/20;* H03H *9/26*
U.S. Cl. 333—30 R **17 Claims**

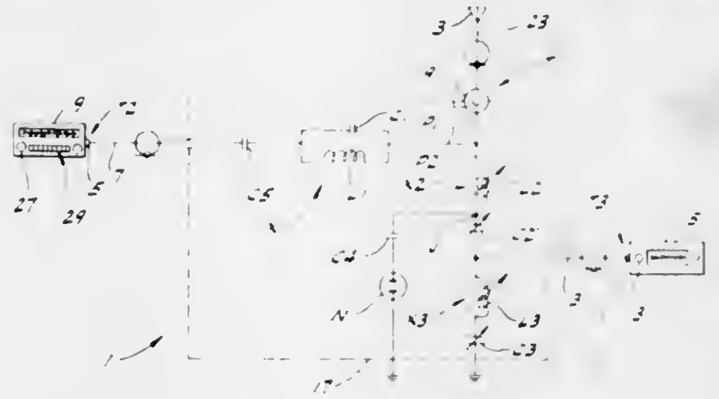


1. A multi-layered substrate for a surface-acoustic-wave device, comprising, in the following order, a base, an intermediate layer and a piezoelectric layer, the temperature coefficient of a surface-acoustic-wave phase velocity in said piezoelectric layer being different from that in said base, said piezoelectric layer having a layer thickness less than the wave length of said surface-acoustic-wave, the sign of the temperature coefficient of said intermediate layer being different from that of said piezoelectric layer or said base, said piezoelectric layer and said intermediate layer being made of zinc oxide and silicon oxide, respectively.

4,037,177
RADIO-FREQUENCY COUPLER

Elasco A. Tyrey, 239 Estridge, St. Louis, Mo. 63137

Filed Mar. 3, 1976, Ser. No. 663,632
Int. Cl.^{2} H03H *7/10. 7/38. 7/46. 7/14*
U.S. Cl. 333—32 **9 Claims**

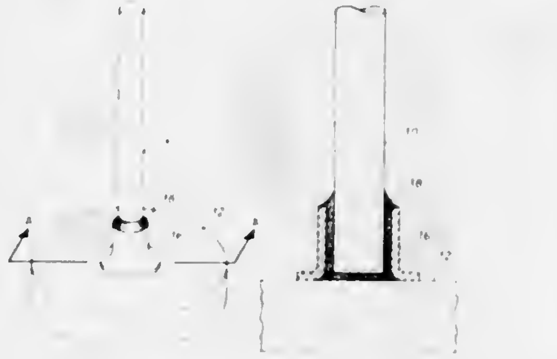


1. A radio-frequency coupler comprising:
a first terminal for interconnection with a conventional automobile receiving antenna used for receiving rf transmissions within a first band of radio frequencies, a second terminal for interconnection with a receiver operating within the first band of radio frequencies and a third terminal for interconnection with a transceiver operating within a second band of radio frequencies different from the first band;
first and second rf transmission paths, the first rf transmission path extending between the first terminal and the second terminal and the second rf transmission path extending between the first terminal and the third terminal;
a first resonant circuit connected in the first rf transmission path and tuned to offer a first impedance to rf transmissions within the first band of frequencies but a second and higher impedance to rf transmissions within the second band of frequencies thereby to pass rf transmissions in the first band but substantially block those in the second band;
a second resonant circuit connected in the second rf transmission path and tuned to resonate at a frequency within the second frequency band thereby to offer a first impedance to rf transmissions within the first band of frequencies but a second and lower impedance to rf transmissions within the second band of frequencies so that rf transmissions within the second band are passed but those within the first band are substantially blocked, and
a third resonant circuit connected between the third terminal and electrical ground and tuned to resonate at a frequency outside the second band of frequencies whereby the second and third resonant circuits form a series-connected path between the first terminal and electrical ground and the impedance of the third resonant circuit at the second band of frequencies allows maximum rf energy within the second band of frequencies to be transferred between the antenna and the transceiver thereby permitting the conventional automobile receiving antenna normally used only for receiving rf transmissions within the first frequency band to also be used for sending and receiving rf transmissions within the second frequency band.

4,037,178
MEANS FOR ATTACHING A FERRITE TRANSDUCER TO A DISK RESONATOR

Lee G. Cornett, Villa Park, and Wesley D. Peterson, Santa Ana, both of Calif., assignors to Rockwell International Corporation, El Segundo, Calif.

Filed Apr. 5, 1976, Ser. No. 673,552
Int. Cl.^{2} H03H *9/02*
U.S. Cl. 333—71 **11 Claims**



1. Means for attaching a ferrite transducer rod to a disk resonator, comprising:
a bonding adhesive, and
an annular housing affixed to the disk for receiving the rod while said adhesive is deposited in said housing.

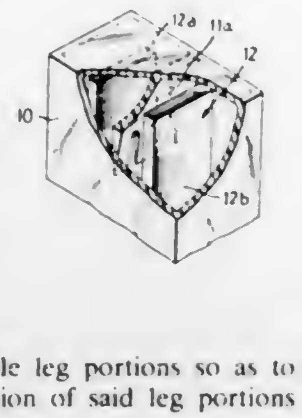
4,037,179
MECHANICAL FILTER DEVICE

Toshio Terayama, Tokyo, Japan, assignor to Kabushiki Kaisha Daini Seikosha, Japan

Filed July 11, 1975, Ser. No. 595,143
Claims priority, application Japan, July 15, 1974, 49-80948
Int. Cl.^{2} H03H *9/02*
U.S. Cl. 333—71 **15 Claims**

6. A mechanical filter device comprising: a casing; a tuning

fork mounted to undergo vibration within said casing and having a set of vibratable leg portions; and dampening means connected to said casing and extending between adjoining ones of said vibratable leg portions so as to effectively dampen abnormal vibration of said leg portions caused by external shock or impact.



4,037,180
ELECTRO-MECHANICAL FILTER

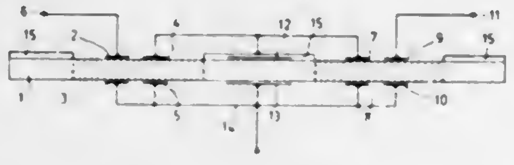
Willem Reindert De Wild, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Feb. 17, 1976, Ser. No. 658,170

Claims priority, application Netherlands, Mar. 6, 1975, 7502640

Int. Cl.^{2} H03H *9/02, 9/26, 9/32*

U.S. Cl. 333—72 **6 Claims**



1. An electromechanical filter, comprising a wafer of a piezoelectric material having input and output electrodes arranged thereon so that in operation an electrical input signal applied to the input electrodes produces in the piezoelectric material a corresponding mechanical vibration which is reconverted into an electrical output signal at the output electrodes, the transmission characteristic of the input to output signals exhibiting a specific frequency dependence which is determined by the mechanical resonance properties of the wafer, and an acoustic damping material disposed on the wafer outside the area where the input and output electrodes are situated and comprising an elastic base material throughout which a powder of a material of substantially higher specific gravity is mixed.

4,037,181
ACOUSTIC SURFACE WAVE FILTER DEVICES

Hideharu Ieki; Hideki Ishiyama, and Atushi Inoue, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

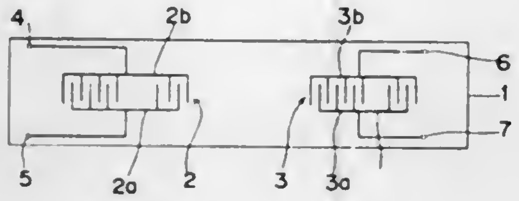
Filed Mar. 12, 1976, Ser. No. 666,303

Claims priority, application Japan, Mar. 12, 1975, 50-30300; June 11, 1975, 50-79944[U]; Dec. 9, 1975, 50-168768[U]; Dec. 12, 1975, 50-148638; Dec. 27, 1975, 50-158969

Int. Cl.^{2} H03H *9/02, 9/26, 9/32;* **H01L** *41/04*

U.S. Cl. 333—72 **5 Claims**

1. An acoustic surface wave filter device for use in video IF stages in television receivers and the like, which comprises a substrate of a piezoelectric material and a spaced pair of input and output transducers formed on said substrate, one of said transducers comprising a pair of interleaved-comb-type electrodes with a plurality of constant length and uniformly spaced electrode elements and having a frequency response curve wherein attenuation poles at the both sides of the main lobe thereof, respectively, occur at frequencies corresponding to the upper adjacent-channel picture IF carrier frequency and to the lower adjacent-channel sound IF carrier frequency, the other of said transducers comprising a pair of interleaved-comb-type electrodes and having a frequency response curve wherein the attenuation poles at the both sides of the main lobe, respectively, occur at a frequency higher than the lower adjacent-channel sound IF carrier frequency and at a frequency between the upper adjacent-channel picture IF carrier frequency and the sound If carrier frequency of the associated channel.



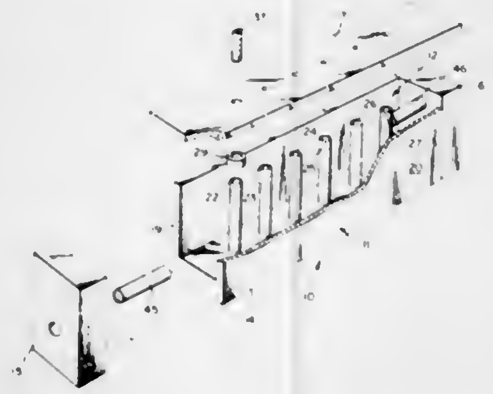
4,037,182
MICROWAVE TUNING DEVICE

Gary L. Burnett, Anaheim, and George I. Tsuda, Fullerton, both of Calif., assignors to Hughes Aircraft Company, Culver City, Calif.

Filed Sept. 3, 1976, Ser. No. 720,340

Int. Cl.^{2} H01P *1/20, 7/00*

U.S. Cl. 333—73 R **3 Claims**



1. A tunable microwave device, comprising:
housing means having first and second walls,
a resonator rod for providing a predetermined resonance, one end of said resonator rod being mounted to said first wall of said housing means, the second end of said resonator rod having a recess;
alignment means being disposed between the second end of said resonator rod and said second wall of said cavity means for supporting said second end of said resonator rod and for providing capacitance between said resonator rod and said cavity means; and
tuning means for providing capacitance being incrementally insertable into said recess in said resonator rod.

4,037,183
REPLACEABLE SOLID STATE TRIP UNIT

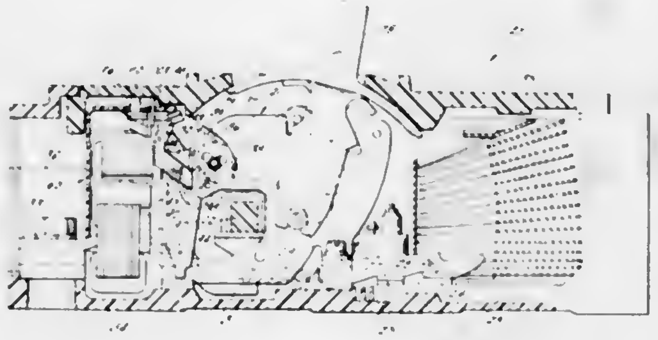
George Gaskill, Hatboro, Pa., assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Mar. 29, 1976, Ser. No. 671,077

Int. Cl.^{2} H01H *73/00;* **H02H** *3/08*

U.S. Cl. 335—6 **10 Claims**

1. A removable and replaceable automatic multipole trip unit assembly for a multipole circuit breaker, said assembly including an insulating base comprising a front wall; for each pole of said trip unit a main conductor extending through said wall at the bottom thereof and projecting forward and rearward thereof; an input transformer comprising a first multi-turn secondary and a single turn primary provided by said conductor, an output transformer comprising a multi-turn primary fed by said secondary and a second multi-turn secondary having more turns than said multi-turn primary; mechanical latch means secured to said base in position for cooperation with a trip free circuit breaker contact operating mechanism disposed forward of said wall; controllable means for releasing said latch; solid-state control means having an input fed by all of said second secondaries and an output operatively connected to said controllable means for activation thereof to release said latch when predetermined current conditions are present in any of said main conductors; all of said input transformers positioned in a first row disposed behind said wall; all of said controllable means positioned in a second row disposed behind said wall row above said first row; said control means positioned behind said wall; said second row being between said control means and said first row.



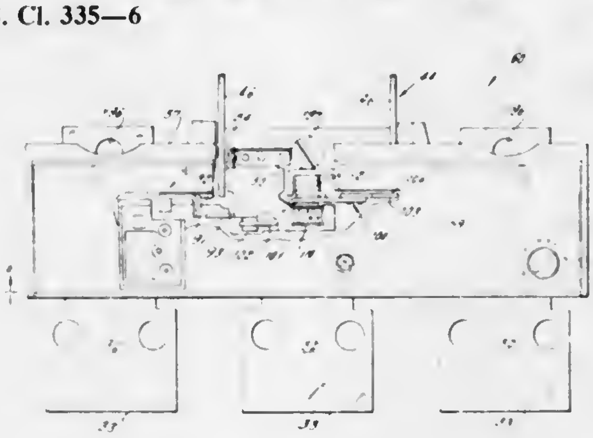
4,037,184
LOCKOUT AND COVER INTERLOCK FOR CIRCUIT BREAKER

Francis W. Kempisty, Jr., and John L. Lundgren, both of Philadelphia, Pa., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 9, 1976, Ser. No. 675,261

Int. Cl.^{2} H01H *83/00, 33/48*

U.S. Cl. 335—6 **7 Claims**



1. A multi-pole molded case circuit breaker including cooperating contact means; an operating mechanism for opening and closing said contact means; latch means for maintaining said mechanism in a reset condition; solid state trip means including circuitry for processing fault signals derived from currents flowing through said circuit breaker; said trip means including a removable and replaceable first means including an element of said circuitry which controls rating characteristics thereof; a housing wherein said contact means, said mechanism, said latch means and said trip means are disposed; interlock means biased to a first position in operative engagement with said latch means to release the latch and thereby trip said mechanism; said housing including cover means which when in a closed position operating said interlock means to a second position wherein said latch means is permitted to be returned to a latching position; lockout means biased to a first position in operative engagement to block movement of said latch means to its said latching position; said first means when operatively connected in said circuitry operating said lockout means to a second position wherein said latch means is permitted to be returned to said latching position.

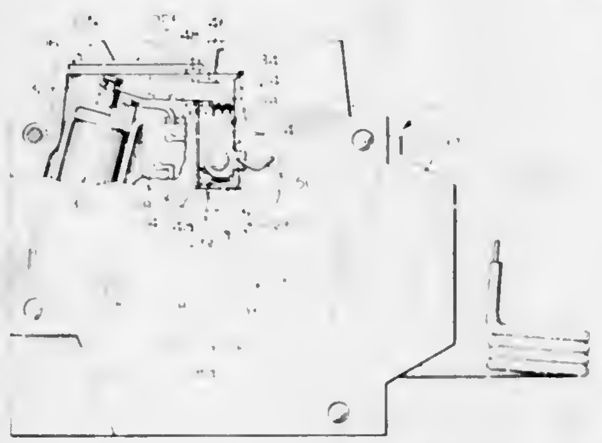
4,037,185
GROUND FAULT CIRCUIT BREAKER WITH TRIP INDICATION

Keith W. Klein, Simsbury, Conn., assignor to General Electric Company, New York, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,904

Int. Cl.^{2} H01H *83/02*

U.S. Cl. 335—18 **9 Claims**



1. A circuit interrupting device comprising, in combination:
A a molded case;
B. a trip unit disposed within said case and operative in response to an overcurrent condition to initiate interruption of a circuit protected by the device;
C. an electronic module positioned within said case and sensitive to ground leakage current occasioned by a ground fault on the circuit;
D. a trip solenoid position within said case and electrically connected for energization under the control of said module in the event of a ground fault;
E. linkage interconnecting said solenoid and said trip unit, said linkage articulated by said solenoid upon energization thereof to induce operation of said trip unit to initiate circuit interruption;
F. mechanical trip indicator means movable between first and second indicating positions under the control of said trip solenoid, whereby to indicate by virtue of its position following a circuit interruption whether an overcurrent condition or a ground fault condition was responsible; and
G detent means acting on said trip indicator means to releasably sustain said trip indicator means in the one of its first and second indicating positions assumed under the control of said trip solenoid following a circuit interruption.

4,037,186
CONNECTING AND SWITCHING SYSTEM, AND SWITCHING APPARATUS SUITABLE FOR USE THEREIN

James E. Palmer, Moorestown; Donald C. Lavallee, Haddon Heights, and George Huber, Mount Laurel, all of N.J., assignors to Spectron Corporation, Mount Laurel, N.J.

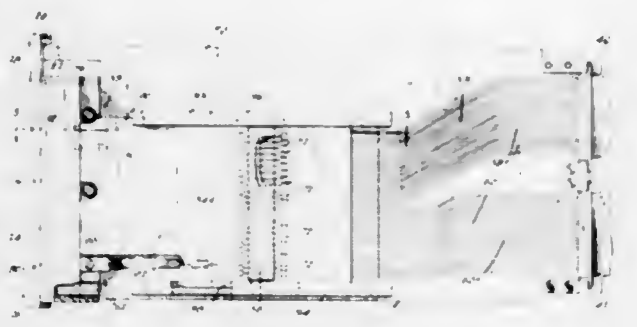
Filed Feb. 9, 1976, Ser. No. 656,597

Int. Cl.^{2} H01R *33/30;* **H01H** *5/02*

U.S. Cl. 335—206 **15 Claims**

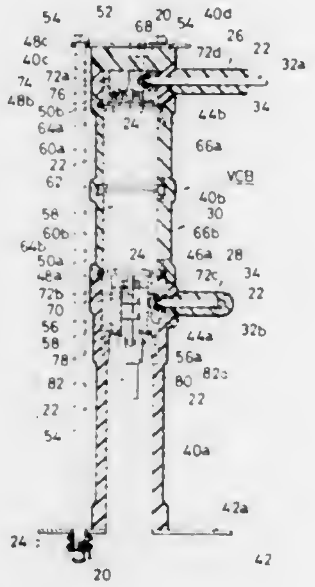
1. In connecting apparatus of the class comprising: a first plurality of separate conductors; a second plurality of separate conductors; switch means connected between said first plurality of conductors and said second plurality of conductors; a third plurality of separate conductors; quick-disconnect connector means for temporarily connecting said third plurality of

conductors to said first plurality of conductors when said connector means is in a first position; and switch actuating means for actuating said switch means between its closed and open states to disconnect said first plurality of conductors from said second plurality of conductors when said connector means is in said first position and to connect said first plurality of conductors to said second plurality of conductors at other times;



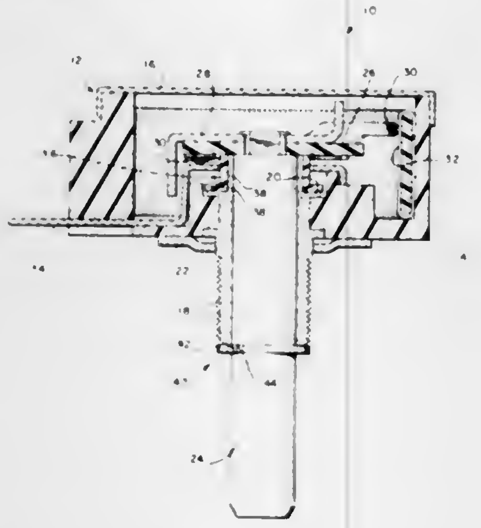
the improvement wherein said switch means are magnetically actuatable, and said switch actuating means comprise magnet means positioned adjacent said switch means and means responsive to placing of said connector means into said first position for controlling the effect of said magnet means to actuate said switch means from one of said states to the other.

4,037,187
METAL CLAD INSULATING CIRCUIT BREAKER
Hitoshi Himi, Tokyo, Japan, assignor to Kabushiki Kaisha Meidensha, Tokyo, Japan
Filed Dec. 4, 1974, Ser. No. 529,484
Claims priority, application Japan, Dec. 10, 1973, 48-139173
Int. Cl.^{2} H01H *61/00*
U.S. Cl. 337—121 12 Claims



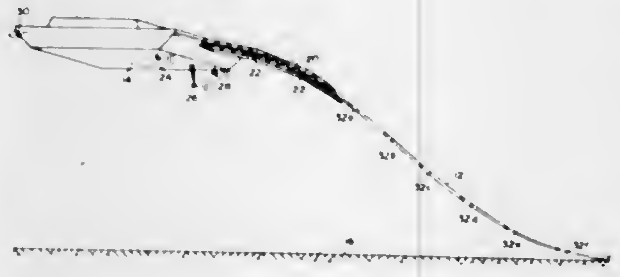
1. A circuit breaker arrangement comprising a casing of solid insulating material with a plurality of solid insulating material units, a breaker unit within said casing and having a movable and a fixed contact therein, two insulated electric conductors joined to said casing, and fastening means for fastening said plural solid insulating material units into a body, each of said conductors being electrically connected respectively to said fixed and movable contacts of said breaker unit, said conductors including an elongated electric conductor and a solid insulating material layer formed therearound; a first solid insulating unit with a solid insulated supporting member including a first connecting member and a taper on a one open end portion, the circumferential surface thereof having a tapered cavity, an interrupting member and voltage dividing capacitors, a second solid insulating unit enveloping said interrupting member and voltage dividing capacitors and being joined to said first solid insulating unit, a third solid insulating unit including a second connecting member and joined to said second solid insulating unit, a fourth solid insulating unit for fixing said second connecting member to said third solid insulating unit therein, first and second connecting jacket members for connecting between said first and second connecting members respectively, and fastening means for fastening said four solid insulating units into a body.

4,037,188
THRUST BUSHING FOR VARIABLE RESISTANCE CONTROL
Robert L. Frey, and Lee R. George, both of Frankfort, Ind., assignors to P. R. Mallory & Co., Inc., Indianapolis, Ind.
Filed July 23, 1975, Ser. No. 598,171
Int. Cl.^{2} H01C *10/34*
U.S. Cl. 338—174 2 Claims



1. In a variable resistance control wherein electrical contact means is carried by a rotor and rotates therewith while electrically bridging a resistance element and a collector within a housing, said rotor carried by a shaft rotating within and extending through a bushing, said bushing fixedly carried by said housing, the improvement comprising:
a. stop means carried by said shaft and engaging an end of said bushing, and
b. a molded one piece hat washer surrounding said shaft and trapped between said rotor and said bushing and having a flange engaging a lapped over portion of an opposed end of said bushing.

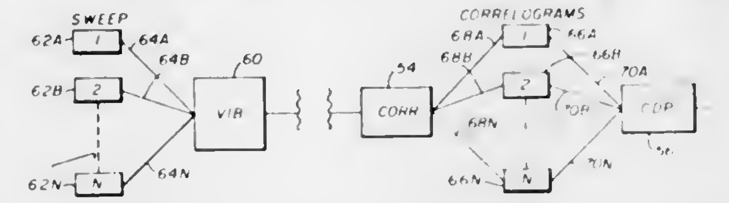
4,037,189
METHOD AND APPARATUS FOR DETERMINING THE PROFILE OF AN UNDERWATER PIPELINE
Duncan Bell, Stanwood; Jack L. Odell; David E. Olson, both of Everett, and Allen E. Peirce, Lynnwood, all of Wash., assignors to Western Gear Corporation, Everett, Wash.
Filed Oct. 20, 1975, Ser. No. 623,584
Int. Cl.^{2} G01S *5/18*
U.S. Cl. 340—6 R 27 Claims



1. A method for providing an indication of the position of an underwater pipeline extending from a pipe laying vessel to an

ocean with respect to a reference plane equidistant from first and second spaced apart reference points, said method comprising:
providing first and second acoustic transmitter means at said first and second reference points, respectively, for selectively transmitting respective acoustic signals, said reference points being fixedly located with respect to said vessel beneath the water surface;
securing a plurality of acoustic receiver means to said pipeline at spaced-apart points along the length thereof for generating respective acknowledgement signals responsive to detection of such an acoustic signal by each of said receivers;
providing a common information link between said receiver means and said vessel for conveying said acknowledgment signals from said receiver means to said vessel, said information link being an electrical conductor extending between said vessel and all of said receiver means;
actuating said first transmitter means;
measuring the elapsed times from transmission of said acoustic signal from said first transmitter means to receipt of acknowledgment signals through said information link from each of said receiver means;
calculating the distance from said first transmitter means to each of said receiver means corresponding to each of said elapsed time measurements;
actuating said second transmitter means;
measuring the elapsed times from transmission of said acoustic signal from said second transmitter means to receipt of acknowledgment signals through said information link from each of said receiver means;
calculating the distance from said second transmitter means to each of said receiver means corresponding to each of said elapsed time measurements; and
processing said distance calculations to provide a visual indication of the position of said pipeline with respect to said reference plane.

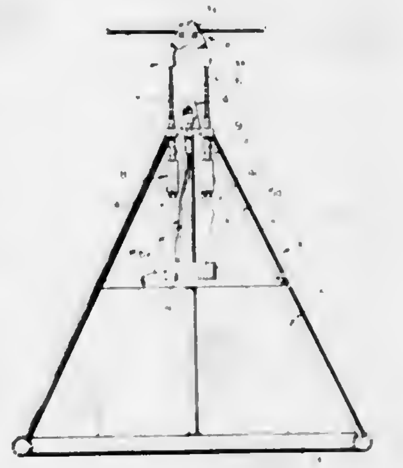
4,037,190
METHOD OF VIBRATORY SEISMIC PROSPECTING FOR MINIMUM CORRELATION NOISE
Lincoln A. Martin, Altadena, Calif., assignor to Geophysical Systems Corporation, Pasadena, Calif.
Continuation-in-part of Ser. No. 617,858, Sept. 29, 1975. This application Sept. 29, 1975, Ser. No. 617,858
Int. Cl.^{2} G01V *1/36*
U.S. Cl. 340—15.5 TA 16 Claims



1. In a seismic recording and processing system in which at least one vibratory source is used to generate a seismic wave in the earth, and where a plurality of repetitions of the source are made, the improved method of operation directed to minimizing the correlation noise on the record, comprising the steps of;
a. operating said at least one vibratory source with a first variable frequency reference sweep signal comprising a vibratory signal of selected starting and ending frequencies (terminal frequencies);
b. detecting the first received signal resulting from said first sweep;
c. correlating said first received signal with said first sweep to form a first correlogram;
d. repeating steps (a), (b), (c) at least a second time with a second reference sweep signal having at least one terminal frequency which is different from that of said first reference sweep signal, to provide at least a second correlogram; and
e. stacking said first and said at least second correlograms to provide a first stacked record.

13. In a seismic recording and processing system in which at least one vibratory source is used to generate a seismic wave in the earth, and where a plurality of repetitions of the source are made, the improved method of operation directed to minimizing the correlation noise on the record, comprising the steps of;
a. operating said at least one vibratory source with a first selected variable frequency reference sweep signal comprising a vibratory signal of selected band width and terminal frequencies, and having a first selected time duration;
b. detecting the first received signal resulting from said first sweep;
c. correlating said first received signal with said first sweep to form a first correlogram;
d. repeating steps (a), (b) and (c) at least a second time with a reference sweep signal having a different time duration than said first sweep; and
e. stacking said first and said at least second correlograms to provide a first stacked record.

4,037,191
AIRCRAFT WARNING MARKER ASSEMBLY FOR POWER LINES
Richard Deane, Rossland, and Aage C. Sylvest, Castlegar, both of Canada, assignors to Cominco Ltd., Vancouver, Canada
Filed Oct. 4, 1976, Ser. No. 729,607
Int. Cl.^{2} G08G *5/00;* B64F *1/18*
U.S. Cl. 340—28 8 Claims



1. A warning marker assembly for attachment to a power transmission line comprising a clamp that rigidly fastens to the power line and supports an inverted U-shaped flexible steel cable having two ends which hang down in parallel and each pass through an insulating tube and vibrations absorbing means, each of said ends having an abutment to support the insulating tube and vibration absorbing means, said assembly also including a truncated cone-shaped structure having an electrically conductive framework including a top plate supported by said vibration absorbing means, a bottom ring, and a plurality of ribs interconnecting the top plate and bottom ring, said framework supporting a plurality of plastic panels each extending between adjacent ribs and fitting into slots in said ribs, said assembly including an electrically conductive connection between the cable and the electrically conductive framework.

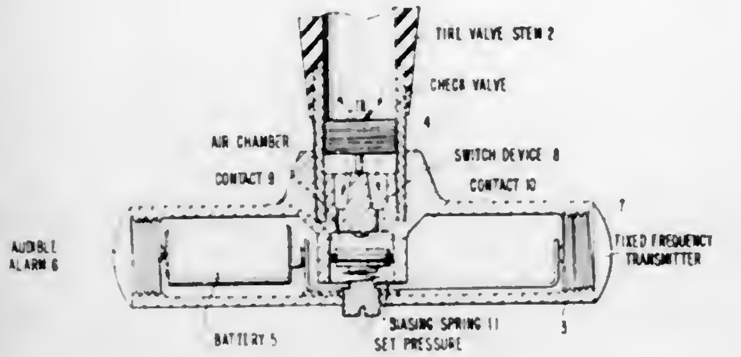
4,037,192
FLAT TIRE INDICATING DEVICE

Burt L. Cowit, Morganville, N.J., assignor to The Raymond Lee Organization, Inc., New York, N.Y., a part interest

Filed July 19, 1976, Ser. No. 706,900

Int. Cl.^{2} B60C *23/04*

U.S. Cl. 340—58 **1 Claim**



1. a flat tire indicating device for indicating when a tire has lost at least a predetermined air pressure, said tire having a rim and a tire valve with an externally threaded valve stem having an axis, said flat tire indicating device comprising

a substantially elongated housing having an internally threaded part threadedly coupled to the valve stem of a tire, said housing extending substantially perpendicularly to the axis of the valve stem and substantially symmetrical thereto whereby said housing is positioned along the rim of the tire;

battery means in the housing;

audible alarm means in the housing;

radio transmitter means in the housing;

air-operated switch means in the housing and in operative proximity with the valve stem having an open condition when the tire pressure is above the predetermined air pressure and a closed condition when the tire pressure is reduced to one below the predetermined air pressure, said switch means having movable electrical contact means controlled in position by the pressure of air in the tire and spring biasing means for adjustment to the predetermined air pressure.

circuit means electrically connecting the battery means, alarm means, transmitter means and switch means in a circuit whereby when the switch means is moved to its closed condition the battery means actuates the alarm means and transmitter means; and

radio receiver means for receiving a signal transmitted by the transmitter means thereby indicating that the tire is flat

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4,037,193
LIQUID LEVEL ALARM APPARATUS FOR A TANK OF A VEHICLE

Hiroshi Uemura, Toyota, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Continuation of Ser. No. 420,059, Nov. 29, 1973, abandoned. This application Sept. 4, 1975, Ser. No. 610,239

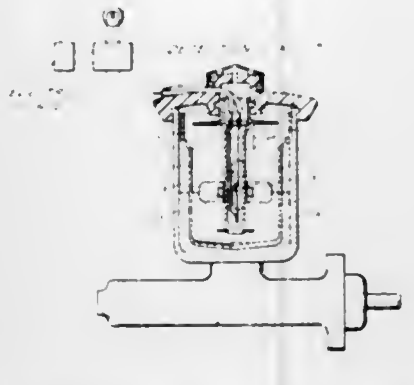
Claims priority, application Japan, July 24, 1973, 48-82663

Int. Cl.^{2} B60T *17/22*

U.S. Cl. 340—59 **3 Claims**

1. A liquid low level alarm apparatus for a vehicle tank of the type that includes a buoyant member for floating on the liquid in the tank, a permanent magnet carried by the buoyant member, a reed switch positioned vertically in the tank at a predetermined level and having a pair of contacts movable from a first position to a second position in response to proximity of the magnet, an elongated upright case enclosing the switch, the buoyant member slidably engaging the case for guidance thereby in free up and down movement in response to changes of liquid level in the tank, upper and lower stops fixed to the case for limiting the upward and downward movement of the buoyant member to a range that includes a predetermined minimum liquid level, an electric source, and an alarm connected in circuit with the switch and the electric source for actuation when the switch contacts are in a preselected one of the first and second positions, wherein the improvement comprises:

the case and buoyant member being attached to a removable cap for the tank to permit easy removal whenever the tank is refilled;



the reed switch and the stops being positioned relative to the predetermined minimum liquid level such that the contacts are closed when the liquid in the tank is above said level and the contacts are open when the liquid in the tank is below said level, and

a detection circuit connected to the switch, the electrical source, and the alarm for causing the alarm to operate when the switch contacts are open.

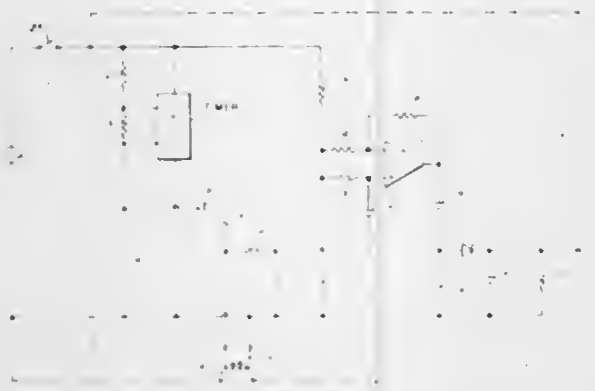
4,037,194
CURRENT SENSING ALARM CIRCUIT FOR A MOTOR VEHICLE

Willis G. Boyden, and Richard A. Shaw, both of 932 Wash St., Norwood, Mass. 02062

Filed Dec. 17, 1975, Ser. No. 641,662

Int. Cl.^{2} B60R *25/10*

U.S. Cl. 340—63 **7 Claims**



1. An alarm circuit for a motor vehicle for sensing the current drawn by the vehicle battery comprising:

a ring of ferromagnetic material having one of the cables associated with the battery coupled therethrough,

at least one turn of wire forming a coil wound about the ring,

oscillator means coupled to the coil or establishing an alternating signal therein of a maximum peak-to-peak magnitude when the battery cable has no current flowing therein,

means including the vehicle battery for providing operating power for the oscillator means,

integrator means coupled from the coil for providing a level signal of a magnitude corresponding to the peak-to-peak magnitude of the alternating signal coupled from the coil,

and means coupled from the integrator means and responsive to a decrease in peak-to-peak voltage across the coil occasioned by current being drawn by the battery for generating an alarm.

4,037,195
VEHICULAR SIGNAL LIGHT CONTROL SYSTEM

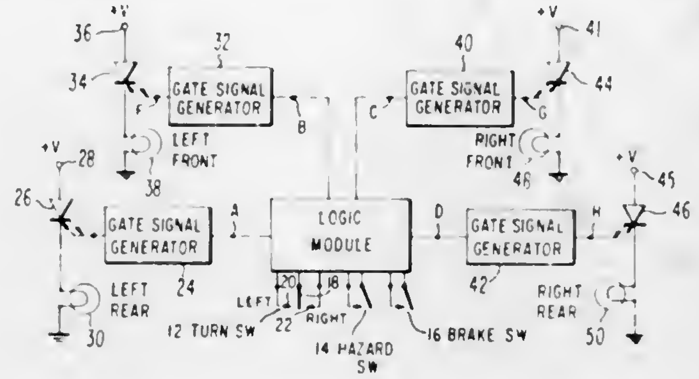
Jack Edward Wojslawowicz, Bayonne, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Dec. 16, 1976, Ser. No. 751,172

Claims priority, application United Kingdom, Jan. 26, 1976, 2968/76

Int. Cl.^{2} B60Q *1/00*

U.S. Cl. 340—66 **9 Claims**



1. An electronic signal light control systems for selectively controlling the conduction of current to first through fourth signal lamps at the left front, right front, left rear, and right rear locations of a vehicle, respectively, comprising:

turn switch means normally in a neutral condition, being manually operable to a left turn condition, for operating said control system to blink the first and third signal lamps, or to a right turn condition, for operating said control system to blink said second and fourth lamps;

hazard switch means normally in a neutral condition, being manually operable to an emergency condition, for operating said control system to blink said first through fourth signal lamps;

brake switch means normally in a neutral condition, being operable to a braking condition in response to actuation of the brakes of said vehicle, for operating said control system to turn on said third and fourth signal lamps;

flasher means responsive to the emergency condition of said hazards switch means, for producing a pulse train of alternate logic signals, or responsive to the left or right turn conditions of said turn switch means, for producing the pulse train;

first digital logic network means responsive to the pulse train of said flasher means and to the left turn condition of said turn switch means, for providing left front and left rear lamp drive signals, said first digital logic network means responsive to said pulse train and to the right turn condition of said turn switch means, for providing right front and right rear lamp drive signals, each one of the drive signals having alternate and successive first and second levels of voltage;

second digital logic network means responsive to the emergency condition of said hazard switch means and to the pulse train of said flasher means, for providing concurrently said left front, left rear, right front, and right rear lamp drive signals, each having alternate and successive first and second levels of voltage;

third digital logic network means responsive to the braking condition of said brake switch means, for providing said right and left rear lamp drive signals each at the first level of voltage; and

first through fourth current control means, each having a respective main current path for selectively conducting current to said first through fourth lamps, respectively, and a respective control electrode for receiving said left front, right front, left rear and right rear lamp drive signals, respectively, the main current path of each one of said first through fourth current control means having a relatively high impedance in response to intervals of its respective lamp drive signal that are at the second level of voltage, the main current path of each one of said first through fourth current control means having a relatively low impedance in response to intervals of its respective lamp drive signal that are at the first level of voltage thereby permitting current to be conducted to its associated one of said first through fourth lamps.

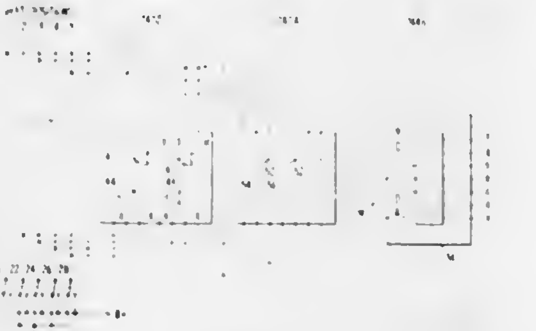
4,037,196
GEARSHIFT POSITION INDICATOR

Steven B. Atkinson, and James E. Reed, both of Cumberland, Md., assignors to Steven B. Atkinson, Cumberland, Md.

Filed Jan. 14, 1977, Ser. No. 759,582

Int. Cl.^{2} B60Q *1/26*

U.S. Cl. 340—70 **10 Claims**



1. Apparatus for indicating the position of a gearshift mechanism of a transmission, comprising:

a transmission housing;

a plurality of shift bars contained in and movable within said housing, wherein said shift bars are movable into different positions for selecting one gear from among the plurality of gears of the transmission;

a plurality of switch means mounted in said housing for selective engagement with said forward-speed shift bars when said shift bars are moved into position representing a selected gear;

coding means coupled to said switch means for generating a plurality of binary-coded signals, wherein each of said binary-coded signals uniquely represents one of a plurality of possible gearshift positions detected by the engagement of at least one of said shift bars with a corresponding switch means;

decoder/driver means coupled to the output of said coding means for decoding the binary-coded signal generated by said coding means; and

digital display means coupled to said decoder/driver means for displaying a digital indication of the selected gear position depending on the decoded output signal of said decoder/driver means.

4,037,197
AUTOMOBILE HIGH BEAM GLARE WARNING DEVICE

Aurele Courty, 471 St. Madeleine Street, Montreal, Quebec, Canada

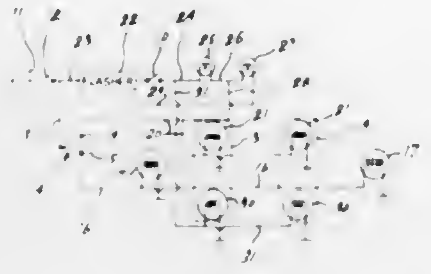
Filed Feb. 5, 1976, Ser. No. 655,378

Int. Cl.^{2} B60Q *1/46, 1/26*

U.S. Cl. 340—107 **2 Claims**

1. A signalling system to equip an automobile fitted with an electrical circuit including high beam and low beam head lamps and a dim switch having a low beam contact and a high beam contact to selectively energize said head lamps, this system adapted to signal to the driver of a following automobile which of the high beam and low beam of the preceding automobile are on and to give a flashing warning to the driver of the following automobile that the high beam of the following automobile causes glare to the driver of the preceding automobile, said system comprising in addition to the usual parking and direction indicating lights, low beam information panel and high beam information panel mounted at the back of the preceding automobile, first and second light bulbs for

illuminating said low beam information panels, third light bulbs for illuminating said high beam information panels, an electrical circuit for selectively energizing said first light bulbs including a flasher device and a manually-operated switch series-connected in the circuit of the first light bulbs to cause intermittent illumination of said low beam panels to signal to the driver of the following automobile that the high beams of said following automobile are causing a glare to the driver of the preceding automobile, the low beam and high beam contacts of said dim switch being connected to said second light bulbs and to said third light bulbs, respectively, so as to illuminate in a continuous manner the low beam information panels and the high beam information panels, respectively, to indicate to the driver of the following automobile which of the high beam and low beam of the preceding automobile are on.



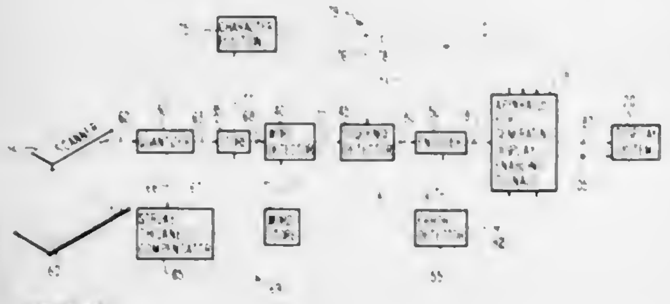
4,037,198
APPARATUS FOR GENERATING DISPLAY ENABLING SIGNALS

Albert M. Essenmacher, Livonia; Thomas R. Krause, Troy, and James Dishaw, Allen Park, all of Mich., assignors to Burroughs Corporation, Detroit, Mich.

Filed Oct. 2, 1975, Ser. No. 618,789

Int. Cl.² G06K *9/00*

U.S. Cl. 340—146.3 ED **42 Claims**



1. A method for generating display enabling signals for display, the method being operative to receive a processed data stream as identified from an unprocessed data stream read from characters on an encoded document, comprising the steps of:

a. receiving the unprocessed data stream as read for outputting in one of a real time state and a delay time state a video signal for display when one of a hardware mode and a software mode is selected to respond to a predetermined segment in the unprocessed data stream, and for outputting control signals when in a delay time state indicative of the predetermined segment to be captured in the unprocessed data stream; and

b. obtaining the processed data stream for outputting the processed data stream as a video signal for display in one of a real time state and a delay time state as controlled by delay time state signals thus enabling capture of analogous sections of the unprocessed and processed data streams as read and identified.

4,037,199
APPARATUS FOR SENSING, TRANSMITTING AND DISPLAYING SIGNAL STATES

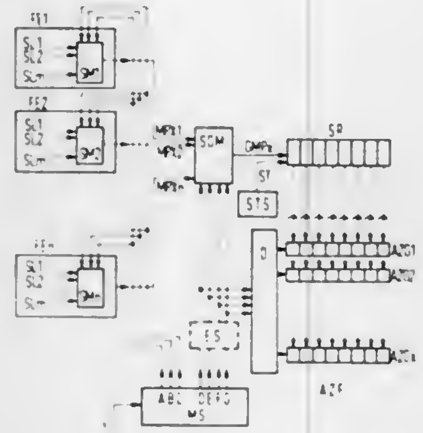
Günther Rozehnal, Oberhaching, Furth, and Hartmut Wedler, Munich, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed Nov. 18, 1975, Ser. No. 632,912

Claims priority, application Germany, Dec. 20, 1974, 2455055

Int. Cl.² H04J *3/00*

U.S. Cl. 340—150 **5 Claims**



1. Apparatus for sensing, communicating and displaying signal states occurring in a plurality of functional units, comprising:

a plurality of signal multiplexer means, one of which is coupled to each said functional unit for sensing the signal states occurring in that functional unit,

group multiplexer means having inputs connected to time division multiplex (TDM) trunks which are connected to outputs of said signal multiplexer means,

a group TDM trunk connected to the output of said group multiplexer means,

multiplexer control means including means for supplying first encoded selection signals to said plurality of signal multiplexer means for selecting signal lines to be sensed such that signal states from corresponding signal lines from said functional units are sensed at the same time and coupled to said group multiplexer means in parallel and including means for supplying second encoded selection signals for the selection of any of said TDM trunks to be connected through said group multiplexer means to said group TDM trunk in any desired sequence, each said TDM trunk being so connected for the duration of a sampling phase,

display means including shift register means for receiving the output of said group TDM trunk, and

timing means for supplying timing pulses to said shift register means, said timing pulses being interrupted upon acceptance of sensed signal states for the duration of a display phase.

4,037,200
BRAILLE DISPLAY SWITCHING MATRIX AND CIRCUIT UTILIZING THE SAME

Terrence V. Cranmer, 523 Pawnee Trail, Frankfort, Ky. 40601

Continuation-in-part of Ser. No. 515,363, Oct. 16, 1974. This application Oct. 28, 1975, Ser. No. 626,257

Int. Cl.² H04Q *5/14*

U.S. Cl. 340—166 R **2 Claims**

1. In an improved electronic instrument of the type comprising a digital logic circuit having a decimal digital data source, the improvement of which comprises

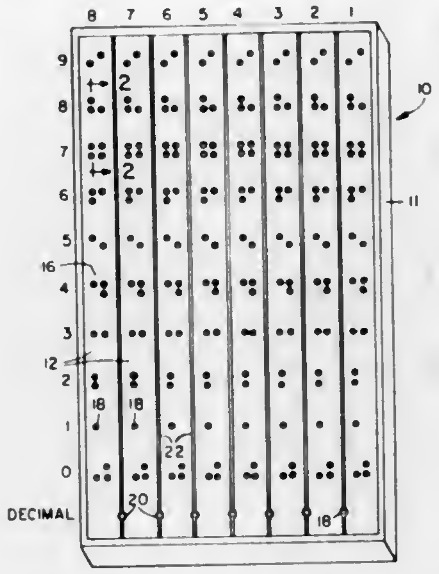
a touch controlled switching matrix comprising

an electrically conductive substrate,

at least one series of raised electrically conductive terminals disposed on said substrate and divided into coded groups, each of said groups being representative of a different digit in the decimal system from 0 through 9, and

means for insulating said terminals from said substrate in such a manner as to permit any selected one of said groups to be shorted with a finger to said substrate, each of said groups being electrically connected to said data source,

means for generating an audible signal responsively connected to said substrate for generating said signal when one of said groups bearing a signal from said data source is shorted with a finger to said substrate.



4,037,201
DIGITAL RADIO CONTROL

Colin Barns Willmott, Des Plaines, Ill., assignor to Chamberlain Manufacturing Corporation, Chicago, Ill.

Filed Nov. 24, 1975, Ser. No. 634,504

Int. Cl.² H04B *1/00;* **H04Q** *9/00*

U.S. Cl. 340—167 R **10 Claims**

1. A coding system for a transmitter and receiver so that a selected receiver will respond to a particular transmitter comprising a transmitter capable of transmitting a RF signal in a binary code having pulses having time lengths T1 and T2 of different times, means at said transmitter for setting said binary code to a selected combination, a receiver tuned to said RF signal, and including code comparing means receiving the incoming binary code, means at said receiver for setting a binary code to a selected combination supplying an input to said code comparing means, output means actuated by said comparing means if said means for setting a binary code at the transmitter and receiver are set to the same code combination, wherein said means at said transmitter for setting said binary code includes a plurality of two position switches, an encoder including a five stage ring counter with the outputs of each stage connected to the inputs of the following stage and connected to said plurality of two position switches, a flip-flop connected to said ring counter to drive it, an on-off switch connected to said flip-flop circuit, a pair of resistors and a capacitor connected to said flip-flop circuit to control the timing of the transmitted pulses, and an RF oscillator receiving the output of said encoder and keyed to oscillate thereby to cause it to radiate said binary code signal.

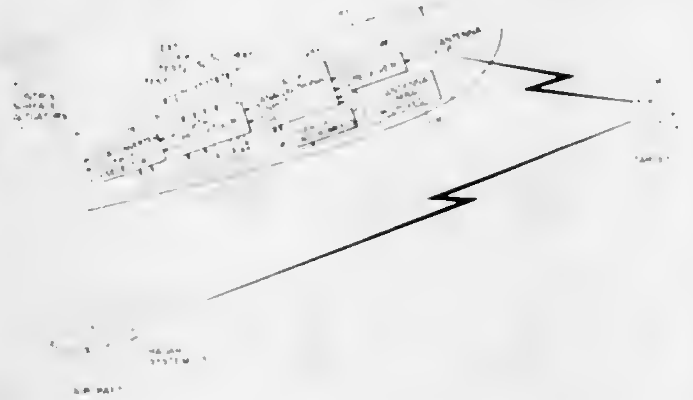
4,037,202
MICROPROGRAM CONTROLLED DIGITAL PROCESSOR HAVING ADDRESSABLE FLIP/FLOP SECTION

John Terzian, Winchester, Mass., assignor to Raytheon Company, Lexington, Mass.

Filed Apr. 21, 1975, Ser. No. 570,114

Int. Cl.² F41G *7/00;* **G06F** *9/12, 11/04, 15/50*

U.S. Cl. 364—200 **4 Claims**



1. In a digital processor wherein a macroinstruction memory stores a repertoire of macroinstructions, each one of such macroinstructions corresponding to a set of microinstructions; a microinstruction memory stores sets of such microinstructions; a register means stores a digital control word; a source decoder means couples data from one of a plurality of data sources to an input bus selectively in accordance with the stored digital control word; an arithmetic section processes data on such input bus in accordance with the stored digital control word and passes such processed data to an output bus; and a destination decoder means couples processed data on such output bus to one of a plurality of destinations selectively in accordance with the stored digital word, the improvement comprising:

a. a first input means connected to the microinstruction memory for coupling a selected one of the microinstructions in parallel form to such register means;

b. a second input means for coupling binary signals in serial form from a source external to the processor to the register means;

c. control signal means for enabling such register means to store, selectively in accordance with a control signal, as the stored digital word, either the microinstruction coupled by the first input means or the binary signals coupled by the second input means;

d. a condition selector means, coupled to the register means and to a plurality of binary signal sources, for coupling one of such binary signal sources onto a condition true line selectively in accordance with the stored digital word; and, including gate means, responsive to the binary signal source on the condition true line, for enabling or inhibiting, selectively in accordance with the binary signal on the condition true line, the processed data on the output bus to pass to the selected one of the destinations; and

e. a plurality of flip/flops; a flip/flop selector having a plurality of inputs coupled to the plurality of flip/flops; and, means for coupling a selected one of such flip/flops through the flip/flop selector to enable such selected one of such flip/flops to serve as one of the plurality of binary signal sources.

4,037,203
HIGH SPEED DIGITAL INFORMATION STORAGE SYSTEM

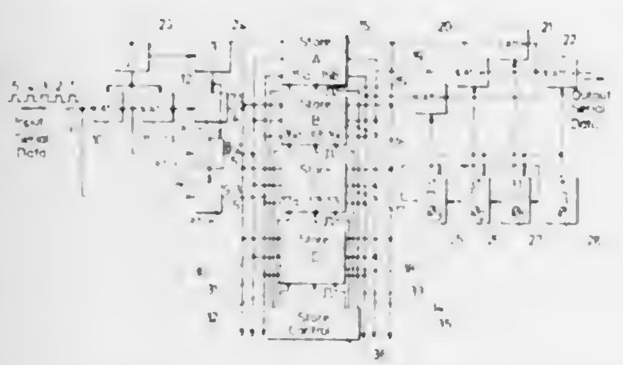
Anthony Donald Stalley, Fleet, England, assignor to Quantel Limited, England

Filed Aug. 27, 1975, Ser. No. 608,082

Claims priority, application United Kingdom, Sept. 3, 1974, 38458/74

Int. Cl.² G06F *5/04*

U.S. Cl. 364—900 **6 Claims**



1. A high speed digital information storage system comprising:-

a. converter means for receiving successive samples of incoming serial data on a single path and for providing *n* successive samples of the serial data on *n* parallel paths coincident in time;

b. holding means connected to said converter means for holding the *n* successive samples on said parallel paths for a period *n* times greater than the data repetition period to effectively reduce the data rate prior to storage;

c. storage means connected to said holding means for storing the serial data held in said holding means;

d. clocking means connected to said holding and storage means for clocking in unison said holding means and said storage means at one *n*th of the serial data rate;

e. skewing means connected to said storage means for sequentially holding *n* coincident data samples on *n* parallel paths read out from the storage means; and

f. remultiplexing means connected to said skewing means for receiving the *n* successive samples from the skewing means and for providing the successive samples on a single path.

4,037,204
MICROPROCESSOR INTERRUPT LOGIC

Thomas H. Bennett; Earl F. Carlow, both of Scottsdale; Anthony E. Kouvoussis, Phoenix, all of Ariz.; Rodney H. Orgill; Charles Peddle, both of Norristown, Pa., and Michael F. Wiles, Phoenix, Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Division of Ser. No. 519,150, Oct. 30, 1974, abandoned. This application Sept. 17, 1975, Ser. No. 614,290

Int. Cl.² G06F *9/18*

U.S. Cl. 364—200 **2 Claims**

1. A microprocessor comprising:

a data bus means for transferring digital information;

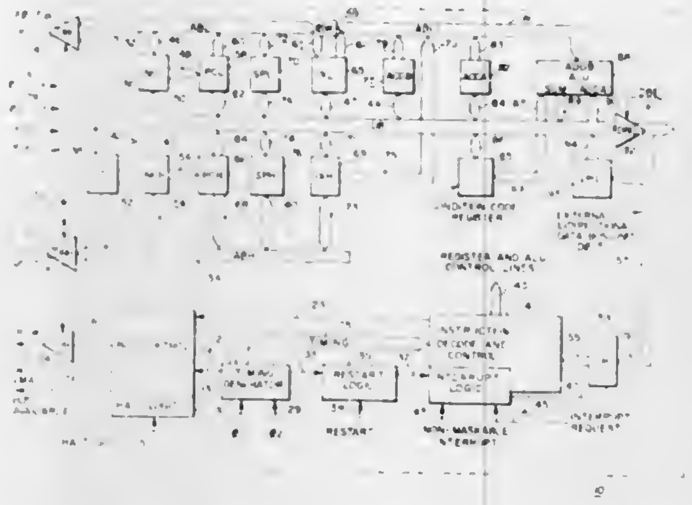
an interrupt request input conductor for conducting an interrupt request input signal representative of an interrupt request;

instruction register means coupled to said data bus means for temporarily storing any one of a plurality of software instructions, including a first instruction having a fixed code, received by said data bus means;

gating means for operatively coupling said data bus means to said instruction register means;

instruction decode means responsive to the contents of said instruction register means for controlling execution of said instruction;

interrupt means responsive to both said interrupt request input signal and to said first instruction coupled to said gating means for producing a signal for inhibiting loading of the next instruction to be executed in response to either said interrupt request input signal or said first instruction; and



said gating means including means responsive to said signal coupled to said instruction register means for forcing a second code having a plurality of bits which are the same as corresponding bits of said first code into said instruction register means in response to said interrupt request input signal.

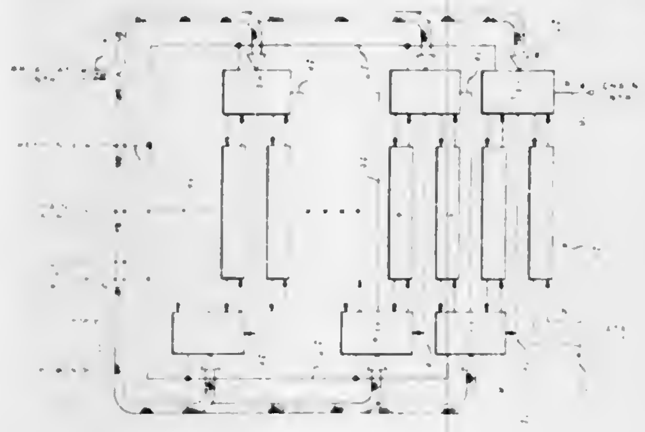
4,037,205
DIGITAL MEMORY WITH DATA MANIPULATION CAPABILITIES

Murray Edelberg, Carlisle, and Lloyd R. Schissler, Jamaica Plain, both of Mass., assignors to Sperry Rand Corporation, New York, N.Y.

Filed May 19, 1975, Ser. No. 578,685

Int. Cl.² G06F *1/00*

U.S. Cl. 364—900 **23 Claims**



1. Digital memory apparatus for storing and processing digital data comprising

a plurality of circulating storage loop means for storing and circulating said digital data therein,

a plurality of data processing circuit means,

each said data processing circuit means being serially coupled in each of two said circulating storage loop means,

each said circulating storage loop means being serially coupled through two said data processing circuit means at different points of said loop means respectively, and

means for coupling data manipulation control signals including a mode defining signal and key field defining signals to said plurality of data processing circuit means,

each said data processing circuit means including comparator means responsive to said data manipulation control signals and to said digital data circulating in at least one of said two storage loop means associated therewith for performing comparisons with respect to said digital data in accordance with said control signals and loop control means coupled to said comparator means and serially coupled in said two loop means associated therewith for selectively effecting isolating and data interchanging connections between said two loop means,

wherein said data processing circuit means performs a plurality of data manipulation operations with respect to said digital data in response to said data manipulation control signals as said digital data serially circulates through said data processing circuit means.

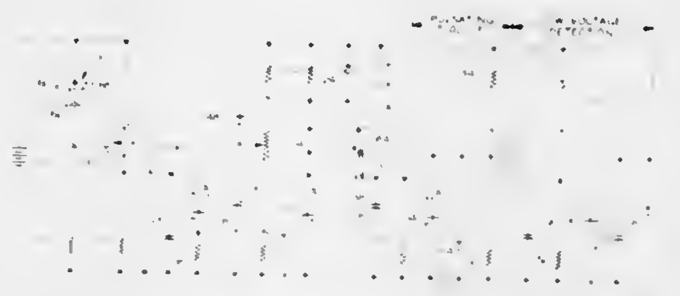
4,037,206
IONIZATION SMOKE DETECTOR AND ALARM SYSTEM

John Dobrzanski, New Britain; Edward Boyd Gardner, Bloomfield, and Ernest V. Hart, West Hartford, all of Conn., assignors to Emhart Industries, Inc., Hartford, Conn.

Continuation of Ser. No. 542,914, Jan. 22, 1975, which is a division of Ser. No. 409,647, Oct. 25, 1973. This application Apr. 9, 1976, Ser. No. 675,510

Int. Cl.² G08B *17/10, 19/00*

U.S. Cl. 340—237 S **11 Claims**



1. A non-latching, pulsating smoke alarm system employing an ionization chamber as the sensing element and a switching device responsive to the sensing element for turning the alarm on and off comprising:

coupling means interposed between the sensing element and the switching device for triggering the switching device and turning the alarm on in the presence of a smoke condition;

deactivating means for resetting the switching device and shutting the alarm off a predetermined time after the alarm is turned on; and

recycling means including the coupling means for again triggering the switching device and turning the alarm on an interval after the alarm is turned off in response to the sensing element detecting a continuing smoke condition.

4,037,207
SYSTEM FOR CONTROLLING ADDRESS KEYS UNDER INTERRUPT CONDITIONS

Richard Eugene Birney; William Steese Osborne, and Lynn Allan Graybiel, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,226

Int. Cl.² G06F *9/20*

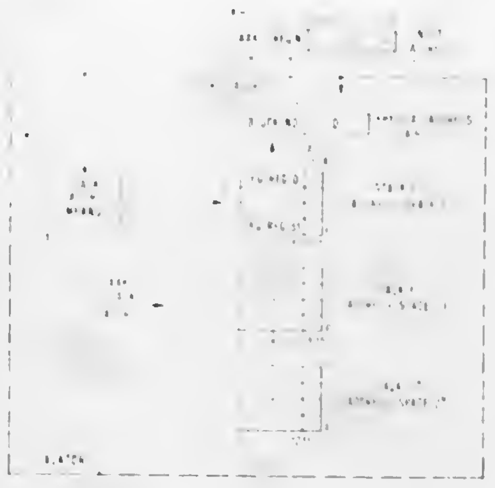
U.S. Cl. 364—200 **9 Claims**

1. An interrupt addressability control system for connecting an addressability used by a supervisor program to an addressability being used by a processor when it is interrupted, comprising

an address key register (AKR) in a processor for storing a plurality of address keys, the AKR having at least a source operand key section and an instruction fetch key section, key selection means for selecting one section of the AKR and outgating an address key stored therein as an active address key (AAK),

check interrupt generating means in the processor,

means for storing each processor AAK as a last AAK, the last AAK defining an interrupted addressability occuring upon an interrupt signal being provided by the check interrupt generating means,



key gating means for transferring the last AAK into the source operand key section when an interrupt is signalled by the check interrupt generating means, and

means for loading from storage a supervisor program key into the instruction fetch key section,

whereby the processor then has available in the address key register both the supervisor program addressability and the processor interrupted addressability.

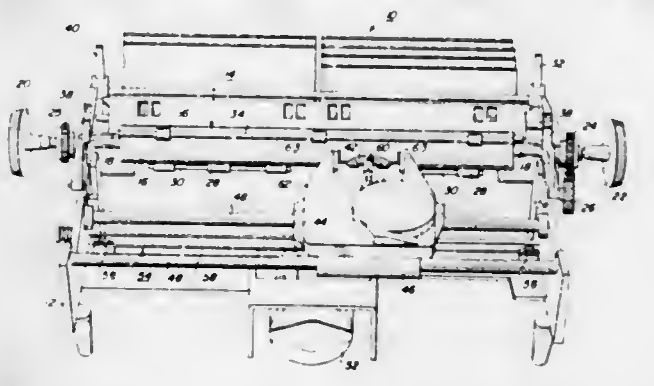
4,037,208
HAMMER INTENSITY SELECTION APPARATUS FOR SERIAL PRINTER

Alfred G. Osterlund, Los Gatos, and Frank D. Ruble, Fremont, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,949

Int. Cl.² G06F *3/12, 9/16;* **B41J** *9/00*

U.S. Cl. 364—900 **10 Claims**



1. In a serial printer comprising a carriage, a print member rotatably mounted to said carriage and including a plurality of character elements of a predetermined font style, drive means coupled to said print member for rotating said print member to a desired rotational position order to place a selected character element at a printing position adjacent a record medium to be printed upon, print hammer means mounted to said carriage and capable when enabled of impacting the character element located at said printing position with a desired level of force, and hammer control apparatus coupled to said print hammer means for enabling said print hammer means when said selected character element has been rotated to said desired rotational position, said hammer control apparatus comprising:

means responsive to a first signal representative of said selected character element to be impacted for generating a second signal proportional to a desired level of force with which said selected character element is to be impacted by said print hammer means when said plurality of character elements are defined in any one of at least two different font styles, one of which being said predetermined font style;

means coupled to said means for generating a second signal for multiplying said second signal by a constant identifying said predetermined font style to form a third signal representative of the desired level of force with which said selected character element is to be impacted; said means for multiplying including switch means capable of selectively attenuating said second signal by a predetermined amount for each of said at least two different font styles; said switch means including,

a manually operable switch having a common contact and at least two selectable contacts,

an amplifier having first and second inputs and an output,

first impedance means for coupling the first input of said amplifier to said means for generating said second signal and to said common contact,

second impedance means for coupling the second input of said amplifier to one of said selectable contacts, and

means coupled to the output of said amplifier for generating said third signal;

means coupled to said print member for detecting when said selected character element has been rotated to said desired rotational position; and

means responsive to such detection for coupling said third signal to said print hammer means thereby enabling said print hammer means to impact said selected character element with said desired level of force.

4,037,209

DATA PROCESSING SYSTEM FOR CONVERTING FROM LOGICAL ADDRESSES TO PHYSICAL ADDRESSES

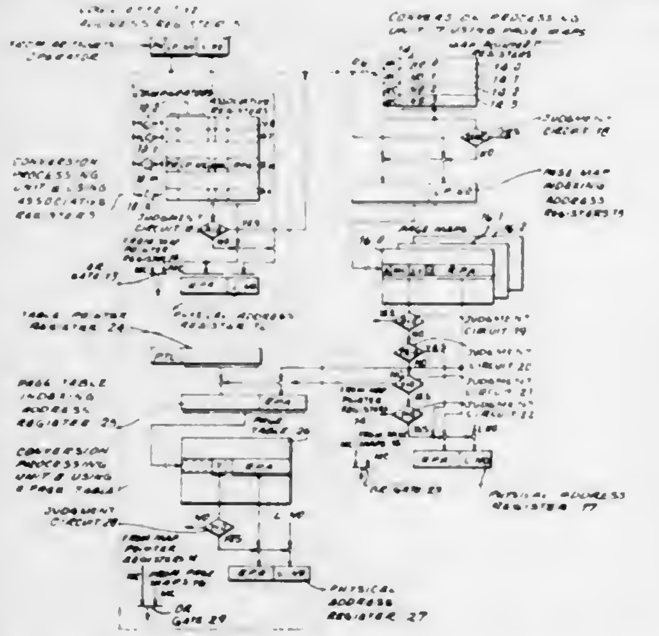
Ichiro Nakajima; Isao Sanaka; Tsuginori Takeda, all of Kawasaki; Hiroyuki Koarai, Sagamihara; Toru Ando, Kawasaki; Tetsuhiko Ifuku, Yokohama, and Hatsuo Murano, Kawasaki, all of Japan, assignors to Fujitsu Ltd., Kawasaki, Japan

Filed Nov. 24, 1975, Ser. No. 634,844

Claims priority, application Japan, Nov. 30, 1974, 49-138067

Int. Cl.^{2} G06F *7/04*

U.S. Cl. 364—200 **2 Claims**



1. A data processing system for converting from logical addresses to physical addresses, said data processing system having address converting means for converting logical addresses of a program to physical addresses of a memory device, said memory device having a plurality of memory areas, said address converting means being commonly utilizable for a plurality of applications with desired corresponding logical addresses and capable of providing access to the memory device in accordance with physical addresses obtained by said address converting means, said address converting means comprising first address converting means having entries corresponding to the logical addresses of the program on a 1:1 basis, said first address converting means storing physical addresses corresponding to said logical addresses, each entry of the first address converting means having data indicating whether or not the memory area of the memory device corresponding to physical addresses stored in said entry is commonly used for applications, and second address converting means having unique entries each commonly selected by any one of the logical addresses corresponding to each memory area of the memory device commonly used, said second address converting means storing physical addresses corresponding to the memory areas of said memory device commonly used, an entry of the second address converting means being indexed by a physical address stored in an entry of the first address converting means, which entry of the first address converting means includes data indicating that the corresponding memory area is commonly used.

4,037,210

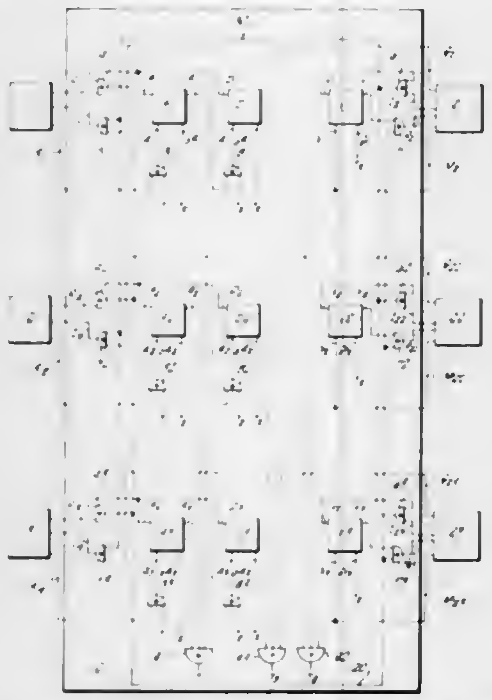
COMPUTER-PERIPHERAL INTERFACE

Richard Stanton Sharp, Santa Barbara, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 392,861, Aug. 30, 1973, abandoned. This application Jan. 29, 1976, Ser. No. 653,497

Int. Cl.^{2} G06F *3/00, 15/16*

U.S. Cl. 364—900 **4 Claims**



1. In association with a plurality of processing units and a plurality of peripheral units, each of said processing units including means for emitting an access-request signal and the address of a particular peripheral unit and each of said peripheral units including means for emitting a ready-to-transmit signal in response to receipt of an address corresponding thereto followed by information signals and a transmit-complete signal, an interface unit comprising:

a read bus for transmitting signals from a selected processing unit to one or more of said peripheral units;

a write bus for transmitting signals from a selected peripheral unit to a selected processing unit;

first means for generating a not-busy signal only when said write bus is not in use and regardless of whether any use is currently being made of said read bus, said first means further including means jointly responsive to said not-busy signal and to an access-request signal from a selected processing unit for connecting only said selected processing unit to said write bus for transmission of a peripheral address provided thereby;

second means for connecting each peripheral unit which is not in use to said write bus for receiving the peripheral address transmitted by a selected processing unit, said second means being responsive to a ready-to-transmit signal from the selected peripheral unit corresponding to said peripheral address for disconnecting said selected processing unit and only said selected peripheral unit from said write bus and for connecting only said selected peripheral unit and only said selected processing unit to said read bus, thereby providing for transmitting information signals from said selected peripheral unit to said selected processing unit along said read bus, while freeing said write bus for connection thereto of another processing unit for transmission of an access-response-signal provided thereby to the peripheral units remaining connected to said write bus; and

third means responsive to a transmit-complete signal from said selected peripheral unit for disconnecting said selected processing unit and said selected peripheral unit from said read bus and for re-connecting said selected peripheral unit to said write bus.

4,037,211

ADDRESS EXTENDING CONTROL UNIT

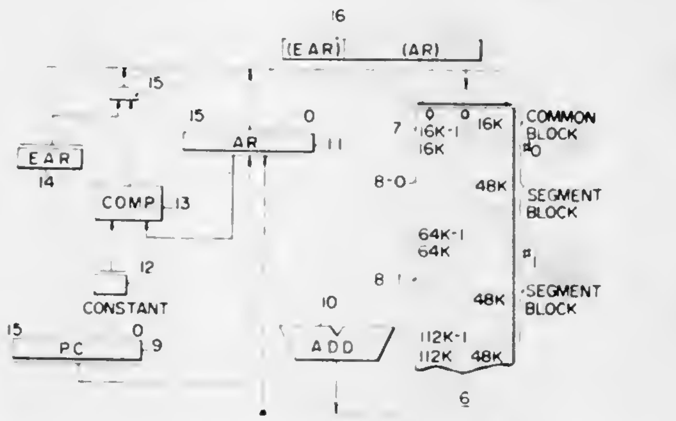
Hiroaki Ikuta, Yokohama; Yoshikazu Naruke, Kawasaki; Yoshio Nagasawa, Tokyo, and Masanori Yakushi, Kawasaki, all of Japan, assignors to Panafacom Limited, Japan

Filed Dec. 18, 1975, Ser. No. 641,812

Claims priority, application Japan, Dec. 18, 1974, 49-145417

Int. Cl.^{2} G11C *8/00*

U.S. Cl. 364—200 **10 Claims**



1. In a data processing system provided with an address register having a content of fixed number of bits and a memory having a memory storage area larger than the storage area addressable with the content of said address register; an address extending control unit for enabling the addressing of a predetermined address in a predetermined area of said memory, as selectively indicated by a corresponding data input to said control unit, said control unit comprising:

comparing means connected to said address register for comparing the content thereof in magnitude with a settable predetermined value and for providing an output signal when the content of said address register is larger than said settable predetermined value;

an address extending address register responsive to said corresponding data input to said control unit for holding a content indicating said selected predetermined area of the memory; and

control means connected to said address register, said comparing means and said address extending register, and responsive to said output signal for appending the content of the address extending address register to the content of the address register so as to provide as a control output an increased number of bits greater than said fixed number, whereby said predetermined address in said predetermined area of the memory is selected.

4,037,212

INFORMATION PROCESSING SYSTEM

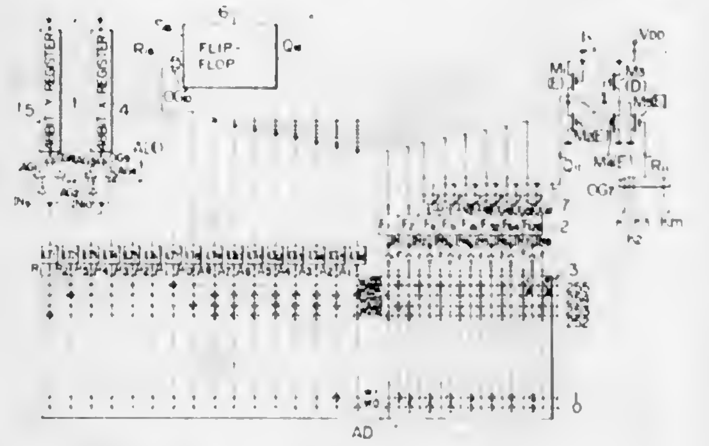
Kosei Nomiya, Tokyo; Takao Tsuiki, Kokubunji; Takeshi Kobayashi, and Shinkichi Hotta, both of Kodaira, all of Japan, assignors to Hitachi, Ltd., Japan

Filed Jan. 20, 1976, Ser. No. 650,764

Claims priority, application Japan, Jan. 31, 1975, 50-12581

Int. Cl.^{2} G11C *7/00, 17/00*

U.S. Cl. 364—200 **9 Claims**



1. In an information processing system including:

a memory in which a microprogram for processing information is stored;

an address register for designating the addresses of program information stored in said memory;

a plurality of storage circuits coupled to said memory and selectively receiving program information stored in said memory; and

means, coupled to said storage circuits and said address register, for setting the contents of said storage circuits at prescribed values upon the turn-on of said system;

the improvement wherein said means comprises

first means for generating a first prescribed signal upon the turn-on of said system,

second means, coupled to said first means and said address register, for coupling said first prescribed signal to a plurality of selected bit positions of said address register corresponding to a plurality of selected addresses of said memory, and

wherein said plurality of selected addresses of said memory have been programmed to store said prescribed values for setting the contents of said storage circuits, and

third means, coupled to said address register, for selectively addressing individual ones of the bit positions of said plurality of selected bit positions of said address register, and thereby causing the contents of the individual ones of said selected addresses of said memory to be coupled to respective ones of said plurality of storage circuits.

4,037,213

DATA PROCESSOR USING A FOUR SECTION INSTRUCTION FORMAT FOR CONTROL OF MULTI-OPERATION FUNCTIONS BY A SINGLE INSTRUCTION

James Damon Atkins, Chapel Hill; Charles Allen Murphy, Raleigh, both of N.C., and Lewis Everett Stotts, Kennesaw, Ga., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 23, 1976, Ser. No. 679,583

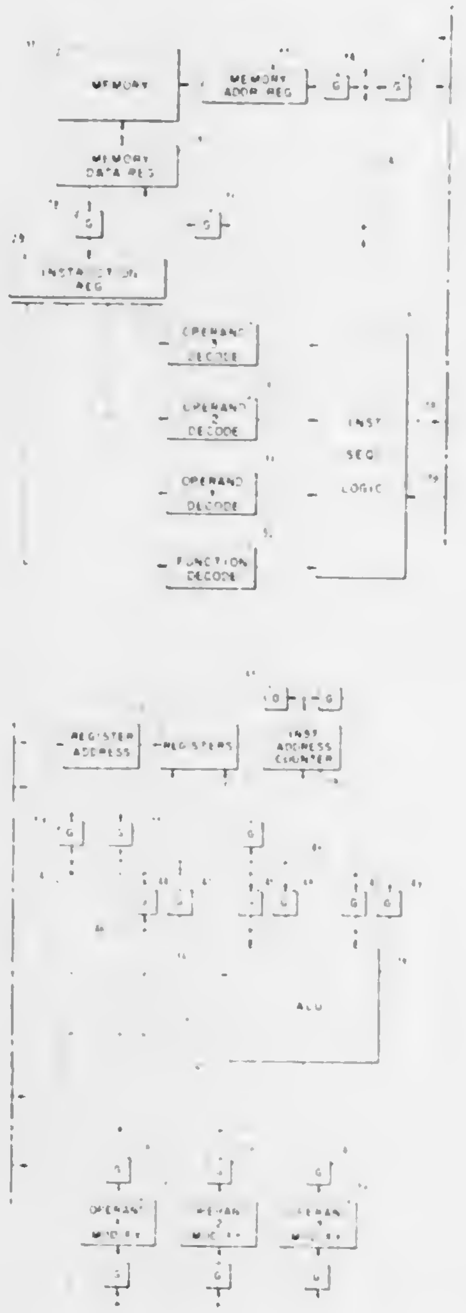
Int. Cl.^{2} G06F *9/00*

U.S. Cl. 364—200 **3 Claims**

1. In a data processor of the type having a storage device comprising a plurality of addressable storage locations for retaining instructions and operands and a plurality of registers for storing the addresses of operands stored in said device, the combination of

a multi-section instruction register connected to receive an instruction from said storage device for control of said processor, said instruction including a first part to identify the function to be performed by said processor, a second part to specify the lengths of the operands to be processed, a third and a fourth part to identify two of said registers storing operand addresses, a fifth part and a sixth part of said instruction, each associated with one of said third and fourth parts to control modification of the address data in said identified operand address registers and a last part to identify still another one of said operand address storing registers containing operation terminating conditions,

a plurality of decoders, one connected to each section of said instruction register and settable in accordance with the operand length data stored in the second part of said multi-section instruction register,



an instruction sequencing unit connected to the decoder for said first part of said instruction and operating to control the functions of said data processor,

means connected to said decoders for said third and said fourth parts of said instruction to select said two registers to determine the storage locations of a pair of operands,

an address modification unit for each of said identified operand address registers and for said identified register containing operand terminating conditions, said modification units for said operand address registers being connected to transfer address data to and from the associated one of said registers, and

control connections from each of said decoders for said fifth, sixth, and last parts of said instruction register to the associated one of said modification units to determine the modification to be performed therein.

4,037,214

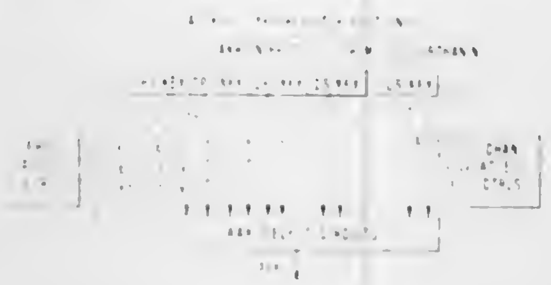
KEY REGISTER CONTROLLED ACCESSING SYSTEM

Richard Eugene Birney; Michael Ian Davis, and Robert Allen Hood, all of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,984

Int. Cl.^{2} G06F *13/00*

U.S. Cl. 364—200 **7 Claims**



1. A protected storage system having a processor using a plurality of storage protect keys, the processor comprising

storage access sensing means in the processor for sensing different types of machine-identifiable storage requests, including means for sensing instructions access requests for generating an instruction access type signal, and means for sensing operand access requests for generating at least one type of operand access signal,

a plurality of key register sections respectively corresponding to the access types of machine-identifiable storage requests sensed by the storage access sensing means,

key selection means actuated by each access type sensed by the storage access sensing means for outputting a key in a corresponding key register section,

means for storing relocatable addresses corresponding to storage areas assigned to respective keys, and

means for selecting one of the means for storing relocatable addresses in response to a key outputted from a selected key register section,

whereby the outputted key uniquely selects a corresponding storage area in the protected storage system for fetching or storing the instruction or operand required by a corresponding request for storage access.

4,037,215

KEY CONTROLLED ADDRESS RELOCATION TRANSLATION SYSTEM

Richard Eugene Birney; Michael Ian Davis; Robert Allen Hood; Lynn Allan Graybiel, all of Boca Raton, Fla.; Samuel Kahn, Mountain View, Calif., and William Steese Osborne, Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,222

Int. Cl.^{2} G06F *9/20*

U.S. Cl. 364—200 **4 Claims**

1. A protected relocatable storage system using a plurality of address keys assignable in any order to areas of physical storage, the physical storage areas being assignable to the address keys to comprehend up to all of an overall physical main memory used by the storage system, comprising

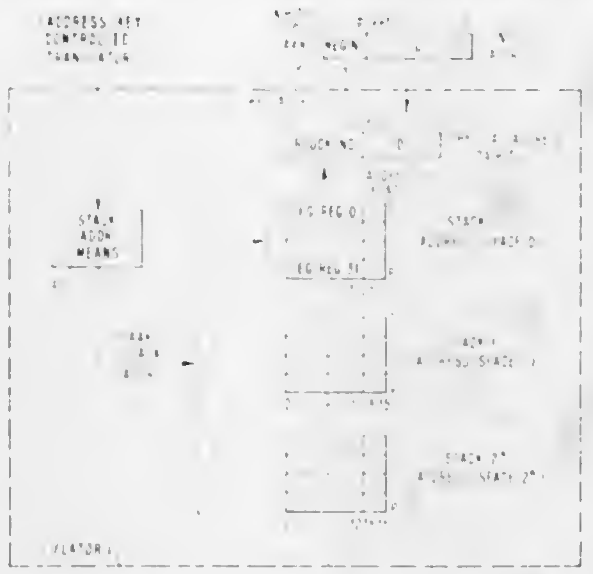
storage access request means in a processor for sensing and signalling each type of storage access request made by the processor, the request type signals including an instruction fetch signal and at least one type of operand fetch signal,

key register means having at least an instruction address key section and an operand address key section,

key selection means being actuatable by the instruction fetch signal or the operand fetch signal when a storage access is

granted for a requesting signal to outgate the content of a selected key register section in the key register means as an active address key,

address translation means receiving the active address key as an implicit high-order part of a logical machine address for a storage access request, which logical machine address comprises the active address key concatenated with an explicit program-derived logical address which is either an instruction counter logical address or a logical operand address, the address translation means converting the logical machine address into a physical storage address



for locating an addressable unit in a physical storage area identified by the active address key,

physical storage means accessing the addressable unit at the physical storage address,

whereby changing the key in any key register section changes the location in the physical storage means of all addressable units assigned to the key without changing the logical location of any instruction in any program or any operand address specified in an instruction, and whereby the keys are transparent to the program-derived logical addresses.

4,037,216

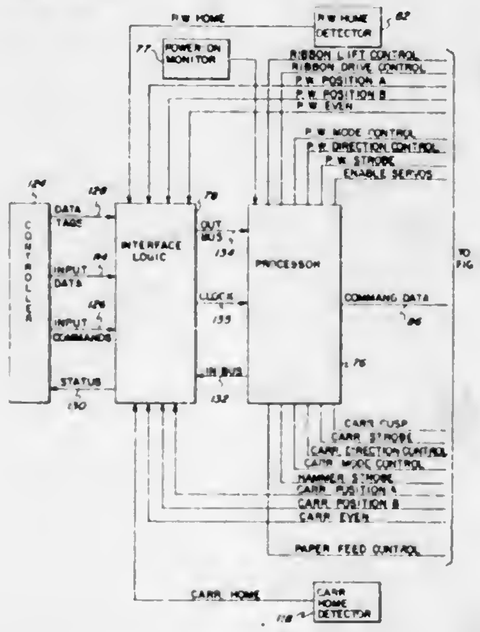
POSITION RETRY APPARATUS FOR SERIAL PRINTER

Louis H. Chang, and John C. Fravel, both of San Jose, Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,950

Int. Cl.^{2} G06F *3/12, 9/16;* B41J *9/00*

U.S. Cl. 364—900 **16 Claims**



1. In a serial printer comprising a carriage, a print member rotatably mounted to said carriage and including a plurality of character elements, drive means coupled to said print member for rotating said print member in a desired direction and at a desired speed, and control apparatus coupled to said drive means fo generating a control signal to control the direction and speed of rotation of said print member, said control apparatus comprising:

means coupled to said print member for generating a first signal indicative of the rotational movement of said print member;

means responsive to a second signal indicative of a command to position the print member at a first predetermined rotational position for applying a predetermined control signal to the drive means to rotate the print member in a predetermined direction and at a predetermined speed;

means operatively associated with said print member for generating a third signal each time a predetermined portion of said print member is rotated past a predetermined reference location;

means coupled to said means for generating a first signal and to said means for generating a third signal for comparing said first signal with a predetermined third signal representative of a predetermined number of rotations of said print member past said predetermined reference location; and

means coupled to said means for comparing and responsive to said first and predetermined third signals bearing a first relationship for disabling said means for applying in order to stop the print member at said first predetermined rotational position, and responsive to said first and third predetermined signals bearing a second relationship for enabling said means for applying to continue to apply said predetermined control signal to said drive means in order to continue to rotate said print member in said predetermined direction and at said predetermined speed.

4,037,217

READ-ONLY MEMORY USING COMPLEMENTARY CONDUCTIVITY TYPE INSULATED GATE FIELD EFFECT TRANSISTORS

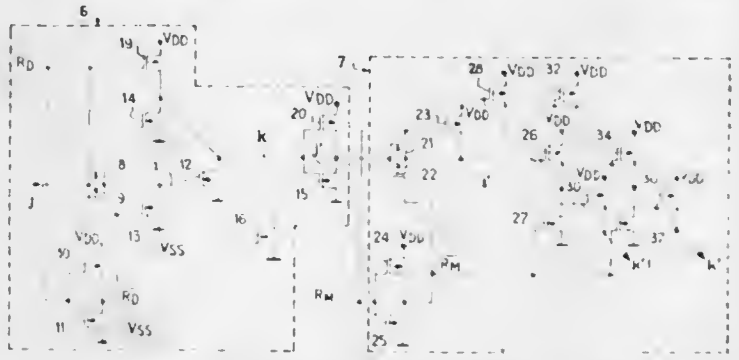
Giuseppe Savarese, Antibes, France, assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Sept. 12, 1975, Ser. No. 612,968

Claims priority, application France, Sept. 19, 1974, 74.31620

Int. Cl.^{2} G11C *17/00, 11/40*

U.S. Cl. 340—173 SP **7 Claims**



1. A read-only semiconductor memory comprising insulated gate field effect transistors and including a decoder matrix and a storage memory matrix, wherein said decoder matrix and said storage memory matrix each comprises complementary conductivity type insulated gate field effect transistors;

said decoder matrix including a plurality of intersecting rows and columns with each intersection defined by a single insulated gate field effect transistor said intersection transistors all having the same channel conductivity type, each row of said decoder matrix including a plurality of said first transistors and complementary conductivity type insulated gate field effect transistor gate means connecting the gates of said row transistors to a respectively corresponding address input, means connecting an interrogation input for said decoder matrix directly to the gate of one of the transistors of said transfer gate means and means including a complementary conductivity type insulated gate field effect transistor inverter means for connecting said interrogation inputs to the gate of the other transfer gate transistor; each said row transistor also forming part of a different column of said decoder matrix and including a channel connected in common with the channels of other transistors of said column, said other transistors forming part of the other rows of said decoder matrix; for each column of said decoder matrix a single precharge insulated gate field effect transistor of opposite channel conductivity type from that of said intersection transistors connecting the channels of the transistors of that said column to a d.c. supply line; and

means connecting the columns of said decoder matrix to respective rows of said storage memory matrix, said storage memory matrix comprising a plurality of intersecting rows and columns with each intersection defined by a single insulated gate field effect transistor, said storage memory matrix intersection transistors all having the same conductivity type, and for each column of the storage memory matrix a single load transistor of opposite conductivity type from that of said storage memory matrix intersection transistors.

4,037,218

READ ONLY MEMORY MODULE

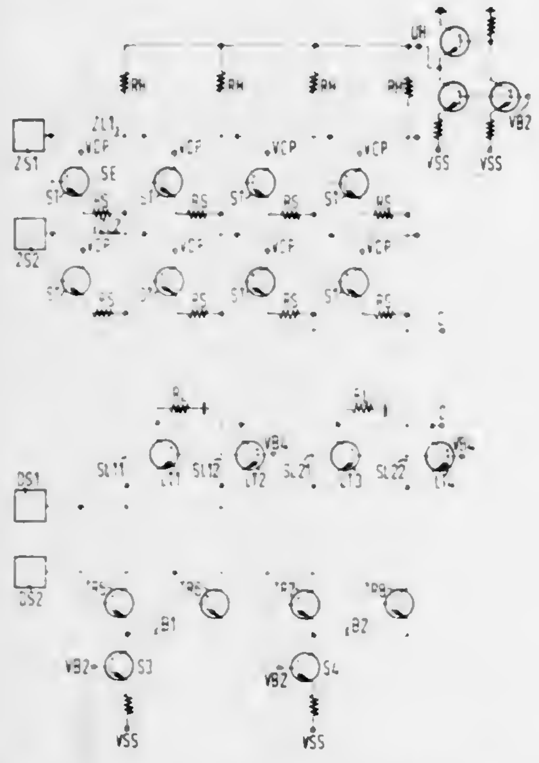
Ingo Gröeger, and Jüergen Scharbert, both of Munich, Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed Jan. 23, 1976, Ser. No. 651,909

Claims priority, application Germany, Feb. 7, 1975, 2505245

Int. Cl.² G11C *13/00*

U.S. Cl. 340—173 R **2 Claims**



1. A read only memory module comprising a plurality of row lines, a plurality of column lines intersecting said row lines, a plurality of storage elements connecting the intersections of respective row lines and column lines, said row lines and column lines having potentials selectively applied thereto for reading information from said storage elements, a plurality of auxiliary resistors each connected to a respective column line, and an auxiliary voltage source connected to each of said auxiliary resistors, the value of the auxiliary voltage of said auxiliary voltage source being more negative than the voltage on a selected row line during a reading operation, and the value of each auxiliary resistor being sufficiently large that the current on a selected column line flowing via the respective auxiliary resistor and the selected column line is small with respect to the read current flowing in the column line.

4,037,219

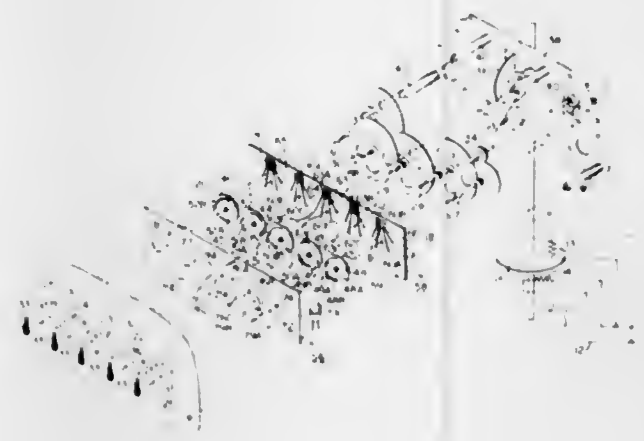
METER DIAL ENCODER FOR REMOTE METER READING

Arthur M. Lewis, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Dec. 30, 1975, Ser. No. 645,165

Int. Cl.² G08C *19/16*

U.S. Cl. 340—204 **4 Claims**



1. An optical meter dial encoder for a multi-dial register driven by a meter movement with each dial having 10 numerical markings, said encoder comprising:

plural pointer shafts each extending through one of said dials, said shafts being interconnected for continuous rotations in a progressively increasing ratio of one-to-10;

plural code discs each including a single circular track pattern wherein each one of the code discs is connected to a separate one of the pointer shafts for continuous rotation therewith, each single track pattern being defined by four alternately opaque and transparent arcuate code segments, the pattern segments being symmetrically disposed so as to commence at angles of **0°**, **54°**, **108°** and **234°**, respectively, around each pattern; and

an optical pattern sensing assembly including plural groups of five equally circumferentially spaced optical sensing positions with each position having an associated optical sensor, said sensing assembly further including plural groups of five point light sources with each group of sensing positions being in optical communication with both a separate one of said plural patterns and a separate group of point light sources for producing five bit binary coded sensor output signals, each of said four pattern segments defining 20 equally arcuate binary indicia sectors with two of the segments each defining three of the sectors and the remaining two segments each defining seven of the sectors adjacent a group of sensing positions to produce 20 different five bit output signals indicating twenty equally arcuate positions of an associated pointer shaft, said pattern segments being effective to alternately produce said sensor output signals in either a two or a three out of five binary coded format for distinguishing between 10 definite numeral indicating positions of a pointer shaft and 10 intermediate positions thereof, and said pattern segments being further effective to produce a change at only one of the sensors of a group when the associated pattern is moved through angular increments equal to one of the indicia sectors.

4,037,220

CIRCUIT ARRANGEMENT FOR MONITORING INTERRUPTIONS IN TWO CLOSED-CIRCUIT LOOPS

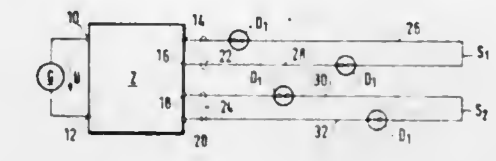
Hartwig Beyersdorf, Konsulweg 29, Scharbeutz, Germany (D-2409)

Filed Oct. 7, 1975, Ser. No. 620,276

Claims priority, application Germany, Oct. 31, 1974, 2451907

Int. Cl.² G01D *4/10;* G01R *31/02*

U.S. Cl. 340—256 **38 Claims**



1. A circuit arrangement for monitoring interruptions of circuit continuity in each of two closed-circuit loops laid in at least one cable, one end of each loop being provided for connection to one pole of a voltage source, the other end of each loop being connected, via a respective resistance network to the other pole of the voltage source, the networks also deriving potentials for controlling an electronic switching element, which potentials are derived in the event of an interruption in at least one of said loops, and the electronic switching element having its control signal path connected between points in the resistance networks from which said control potentials are derived thereby to derive a signal indicative of interruptions of circuit continuity.

4,037,221

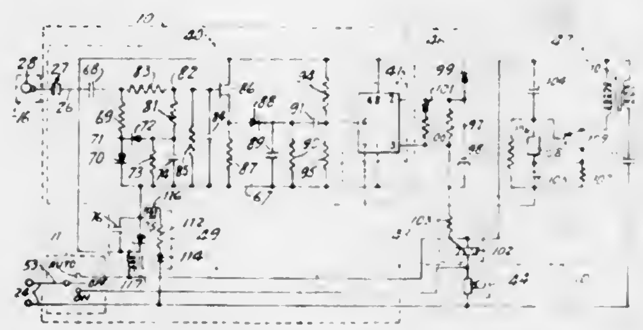
TOUCH CONTROLLED SWITCH ASSEMBLY

Jerry L. Alexander, 1596 13th Ave., Village of St. Paul Park, Minn. 55071

Continuation-in-part of Ser. No. 470,537, May 16, 1974, Pat. No. 3,965,465. This application June 6, 1975, Ser. No. 584,251

Int. Cl.² G08B *13/26;* H01H *36/00*

U.S. Cl. 340—258 C **14 Claims**



1. A switch assembly including:

switch means having an input and adapted for being switched from a first state to a second state when a triggering signal having an intensity exceeding a predetermined level is applied at said input;

a network coupled to the input of said switch means and adapted to electrically couple the input of said switch means to a touch plate such that when said switch assembly is energized by a conventional alternating electrical power source, there is at said touch plate an incoming signal comprising a continuously received alternating electrical noise component which may be of constant or slowly changing amplitude depending upon the ambient conditions at the touch plate and which incoming signal is instantaneously changed when an individual contacts the touch plate, wherein said network comprises:

means adapted for referencing the incoming signal to a predetermined reference voltage;

means adapted for integrating a portion of said referenced incoming signal having a time constant such that there is produced a direct current signal of one polarity relative to said predetermined reference voltage and of slightly less potential than the peak to peak potential of the incoming signal when the incoming signal is of constant or slowly changing amplitude such as is produced by the electrical noise component alone and such that a disproportionately small change is produced in the direct current signal when the incoming signal is instantaneously changed in potential such as is caused by an individual's contacting the touch plate;

means for summing said referenced incoming signal and said direct current signal to produce a summed signal; and

means for passing as a triggering signal to said switch means only instantaneous changes in portions of said summed signal of polarity opposite said one polarity.

4,037,222

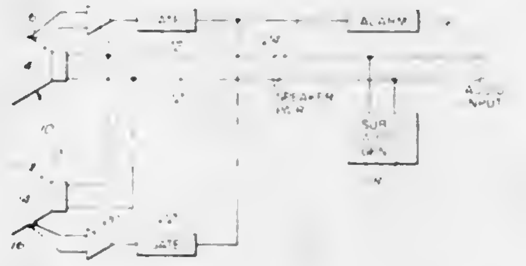
SUPERVISION OF TRANSDUCERS

Elias E. Solomon, Duxbury, Mass., assignor to Gulf & Western Manufacturing Company (Systems), New York, N.Y.

Filed Oct. 2, 1975, Ser. No. 618,760

Int. Cl.² G08B *21/00*

U.S. Cl. 340—261 **15 Claims**



1. A system for monitoring the operation of at least one loud speaker means which has connected thereto an input signal line upon which audio signals are impressed for transmission to the speaker means, said system comprising;

means for coupling an alternating supervisory signal on the input signal line,

vibration sensitive transducer means directly responsive to mechanical deflections of the cone of the speaker and means for mounting the transducer means to the cone of the speaker means whereby the transducer means is responsive to the vibrations of the speaker means for providing an electrical alternating signal corresponding to the frequency of vibration of the speaker means,

and detection means coupled from the transducer means and responsive to the absence of the electrical alternating signal for generating an alarm condition indicative of the inoperability of the speaker means or input signal line.

4,037,223

AUDIBLE ALARM SYSTEM FOR AN ELECTRICAL OUTLET

Domenick Tucci, Mount Kisco, and Lewis Cantalupi, Yonkers, both of N.Y., assignors to Tucci Corporation, Harrison, N.Y.

Filed Apr. 1, 1975, Ser. No. 564,131

Int. Cl.² G08B *21/00*

U.S. Cl. 340—280 **8 Claims**

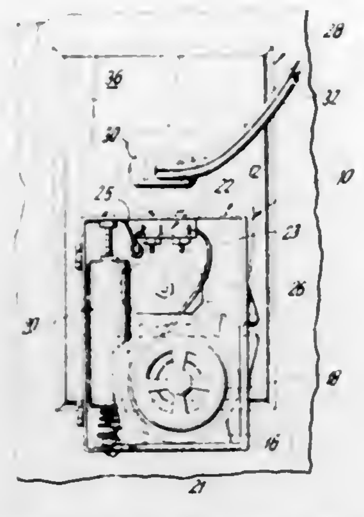
1. An audible alarm system for electrical outlets, comprising:

a housing dimensioned to prevent access to the plug socket of an electrical outlet upon mounting thereon;

means coupled to said housing for insertion into the plug socket for mounting said housing on said plug socket;

alarm means in said housing for providing an audible alarm; and

pressure responsive switch means having an outwardly extending portion capable of being engaged and depressed by the electrical outlet upon mounting onto the plug socket to open the circuit to the alarm means and deactivate the same and during withdrawal of said housing from the plug socket, said outwardly extending member moving to close said pressure responsive switch means and



therefore the circuit to the alarm means to provide an audible alarm.

4,037,224

SIGNAL STORING AND READ-OUT ARRANGEMENT OF VIDEO DISPLAY SYSTEM WITH A CROSSED-GRID FLAT DISPLAY PANEL

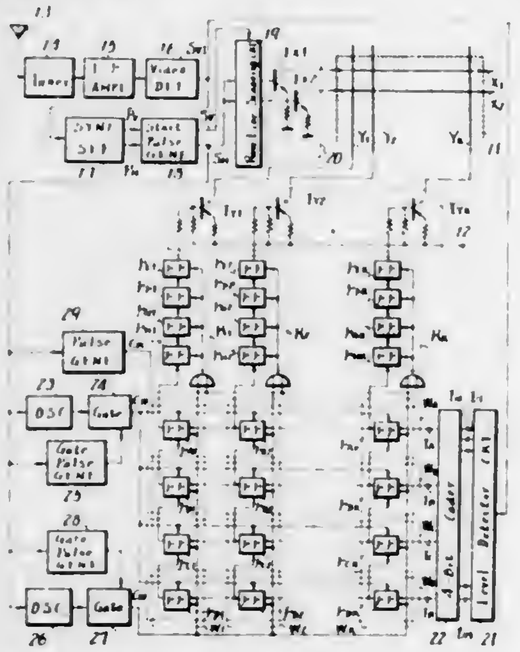
Yoshifumi Amano, Zushi, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Aug. 20, 1975, Ser. No. 606,107

Claims priority, application Japan, Aug. 29, 1974, 49-99236

Int. Cl.^{2} G06F ***3/14***

U.S. Cl. 340—324 M **2 Claims**



1. A video display system comprising:
- A. a display panel including a group of first parallel electrodes and a group of second parallel electrodes substantially perpendicular to said first electrodes;
- B. a group of first driving circuits connected to said first parallel electrodes respectively;
- C. a group of second driving circuits connected to said second electrodes respectively;
- D. a video signal source for supplying a video signal;
- E. a sync. separator connected to said video signal source for separating horizontal and vertical synchronizing signals from said video signal;
- F. means supplied with said horizontal synchronizing signals for driving said first driving circuits sequentially in synchronism with said horizontal synchronizing signals;
- G. signal level detecting means connected to said video signal source for detecting the level of the video signal and providing a corresponding digitally coded output signal of *n* bits where *n* is a positive integer;
- H. a group of first memory circuits connected to said second driving circuits respectively, each of the first memory circuits including *n*-bit memory devices serially connected to form a shift register, and having a single input terminal and a single output terminal which is connected to the corresponding one of said second driving circuits;
- I. a group of second memory circuits connected to the input terminals of said first memory circuits respectively, each of the second memory circuits consisting of *n*-bit memory devices;
- J. first control means connected between said level detecting means and said second memory circuits for transmitting the digitally coded output signal of the former sequentially to the latter during an effective picture period of a horizontal scanning period;
- K. second control means connected between said first and second memory circuits for transmitting signals from the latter to the former in a short interval after said effective picture period and prior to the next effective picture period; and
- L. third control means connected with said first memory circuits for reading out signals of the first memory circuits from lower bits to higher bits with different intervals corresponding to the weight of the digitally coded signal and driving the second driving circuits with the signals read out from the first memory circuits.

4,037,225

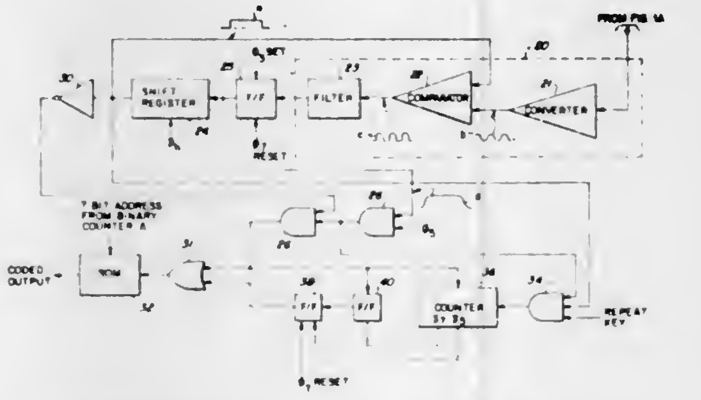
KEYBOARD ENCODING SYSTEM WITH ELECTRONIC HYSTERESIS

Wilbur E. DuVall, Victorville, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Nov. 25, 1975, Ser. No. 634,976

Int. Cl.^{2} G08C ***1/00***

U.S. Cl. 340—365 E **1 Claim**



1. A switching device encoding system comprising:
a voltage source,
an array of switching devices, each of which has a low impedance in a closed state and a high impedance in an open state,
signal amplitude sensing means,
first means coupled to said array, to said voltage source and to said signal amplitude sensing means for continuously, cyclically addressing in a predetermined sequence each switching device of said array such that each of said switching devices of said array couples said voltage source to said signal amplitude sensing means, whereby a signal of one amplitude is supplied to said signal amplitude sensing means when a closed switching device is coupled to said voltage source and said signal amplitude sensing means and a signal of a different amplitude is supplied to said signal amplitude sensing means when an open switching device is coupled to said voltage source and said signal amplitude sensing means,
said signal amplitude sensing means providing an output signal of a high value when the input signal supplied thereto is above a certain amplitude,
storage means coupled to said signal amplitude sensing means for storing the state of each of said switching devices during the previous scan cycle,
feedback means coupled between said storage means and said signal amplitude sensing means for increasing the sensitivity of said signal amplitude sensing means if a switching device currently being sensed was in a closed state the previous scan cycle, and
logic means coupled to the output of said storage means and to the output of said signal amplitude sensing means, said logic means providing an output signal only when the output of said storage means and the output of said signal amplitude sensing means are different.

4,037,226

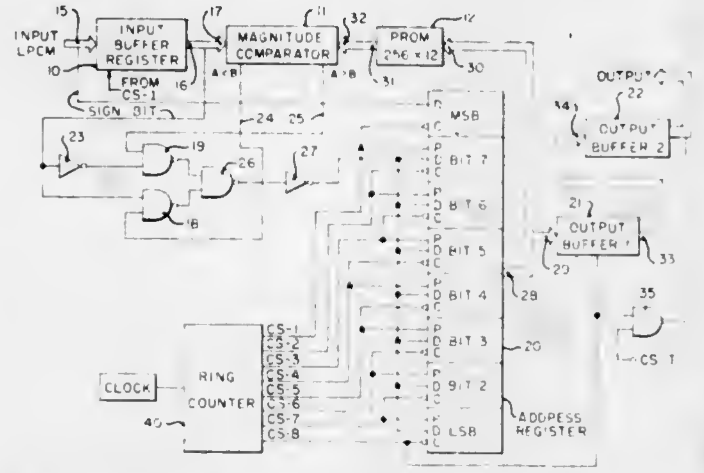
PULSE CODE MODULATION COMPRESSOR

William L. Betts, and Robert T. Greene, both of St. Petersburg, Fla., assignors to NCR Corporation, Dayton, Ohio

Filed Jan. 7, 1976, Ser. No. 647,298

Int. Cl.^{2} H04L ***3/00***

U.S. Cl. 340—347 DD **5 Claims**



1. A pulse code modulation compressor for companding pulse code modulation signals having a sign bit, comprising:
- A. a magnitude comparator for comparing pulse code modulation signals having first and second inputs and decision outputs;
- B. a first shift register connected to said first comparator input and having an input;
- C. a memory having an address input and a pulse code modulation output programmed to convert compressed pulse code modulation signals to linear pulse code modulation signals, said memory output connected to said second comparator input;
- D. a second shift register having a single stage set of bit cells equal in number to the number of bits in a compressed pulse code modulation word and a sign bit cell to be processed, said word bit cells connected to said comparator decision outputs;
- E. a logic circuit connected between said magnitude comparator and said second shift register comprising:
  - 1. a first NAND gate having one input terminal connected to the sign bit at said magnitude comparator first input and another input connected to one said magnitude comparator decision output;
  - 2. a second NAND gate connected through an inverter to said sign bit at said magnitude comparator first input and having another input connected to another of said magnitude comparator decision outputs;
  - 3. a third NAND gate having an input connected to said first NAND gate and a second input connected to said second NAND gate and having an output connected to each bit cell of said address register except the most significant bit cell through a second inverter; and
- F. clock means connected to said second register to provide a series of successively more accurate memory address pulse code modulation words in said second register.

4,037,227

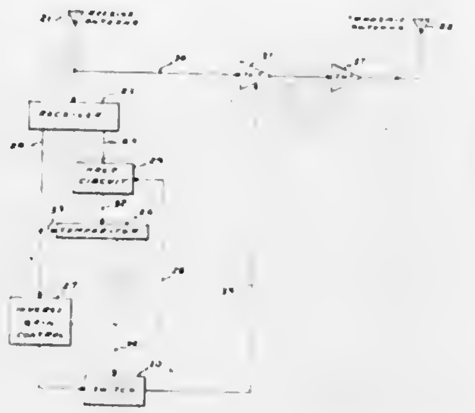
CONTROLLED DECEPTION JAMMING DEVICE

Charles R. Kline, Ellicott City, Md., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 11, 1966, Ser. No. 541,856

Int. Cl.^{2} G01S ***7/38;*** **H04K** ***3/00***

U.S. Cl. 343—18 E **3 Claims**



1. A method of creating a deceptive angle indication in a radar of the sequentially lobing angle tracking type, which method comprises: receiving the lobe tracking radar signals at a normal level; detecting the lobing modulation of the radar; shifting the phase of the modulation 180 degrees; retransmitting at a high level the radar signal with the phase shifted modulation; attenuating the initially received radar signal a predetermined amount; storing the attenuated signal; comparing over a period of time the stored signal level with the signal level being received; terminating the retransmitting of the phase shifted signals when the stored signal level and the received signal levels are approximately equal; and beaconing the received radar signal after the termination of transmitting the phase shifted signal.

4,037,228

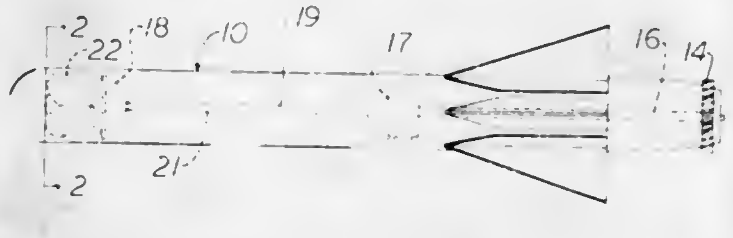
SYSTEM FOR AUGMENTING THE VISUAL AND RADAR CHARACTERISTICS OF AN AIRBORNE TARGET

Walter B. Pearson, Birmingham, Ala., assignor to Hayes International Corporation, Birmingham, Ala.

Filed Apr. 20, 1976, Ser. No. 678,615

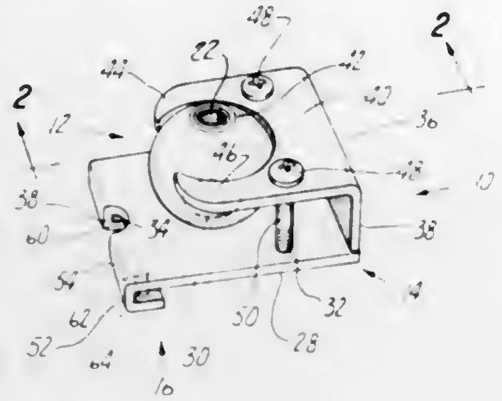
Int. Cl.^{2} H01Q ***15/18***

U.S. Cl. 343—18 C **9 Claims**



1. A system for augmenting the visual and radar characteristics of an airborne target in a common sector comprising,
- a. an elongated target body,
- b. a visible light source mounted in line within the confines of said target body and adapted to emit a beam of light axially of said body in at least one direction,
- c. a radar reflector mounted within the confines of said target body coaxially with and forwardly of said light source as viewed in the direction of travel of light from said light source so that said radar reflector is in the path of light propogating from said light source with said radar reflector being substantially transparent to light from said light source and reflective to radar wavelengths.

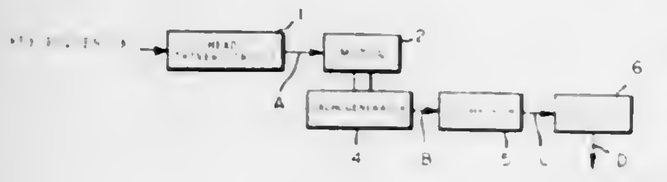
4,037,229
ANTENNA MOUNT
Thomas H. Dunk, 2470 Hunter Road, Brighton, Mich. 48116
Filed Feb. 9, 1976, Ser. No. 656,647
Int. Cl.² H01Q *1/32*
U.S. Cl. 343—715 **7 Claims**



1. An antenna mount, comprising:
a. means for receiving an antenna,
b. means for securely retaining the antenna-receiving means, the retaining means comprising:
  1. a base plate, the base plate having a seat defined therein for seatingly receiving a portion of the antenna-receiving means,
  2. a top member spaced apart from the base plate and being substantially parallel thereto, the top member having a C-shaped cut-out section which engages the periphery of another portion of the antenna-receiving means to hold the antenna-receiving means in position, and
  3. means for detachably interconnecting the base plate and the top member comprising a sidewall integral with the top member and abutting the base plate with adjustable fastening means spaced from said sidewall, and

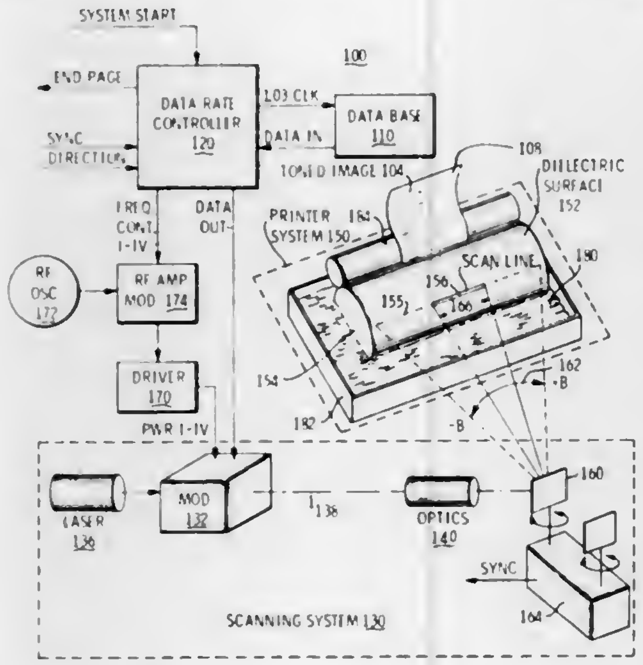
wherein the antenna-receiving means is rotatable while retained by the retaining means, to permit proper orientation of an antenna.

4,037,230
TIMING CIRCUIT FOR INK JET SYSTEM PRINTER
Isao Fujimoto, Kunitachi; Takeshi Kasubuchi, and Masahiko Aiba, both of Nara, all of Japan, assignors to Nippon Telegraph and Telephone Public Corporation, Tokyo and Sharp Kabushiki Kaisha, Osaka, both of, Japan
Continuation-in-part of Ser. No. 450,415, March 12, 1974, abandoned. This application Dec. 18, 1975, Ser. No. 641,996
Claims priority, application Japan, Mar. 12, 1973, 48-28687
Int. Cl.² G01D *15/24*
U.S. Cl. 346—75 **3 Claims**



1. A print timing circuit for use in an ink jet system printer having a travelling printing head intermittently driven by a rotary motor in correlated response to intermittently applied input signals comprising: means for detecting the rotational velocity of the motor driving the said printing head of the ink jet system printer subsequent to the occurrence of each said intermittent input signal and means responsive to said detecting means for generating printing start signals for each of said intermittent input signals only when the rotational velocity of said motor and the resulting velocity of the printing head reaches a constant value.

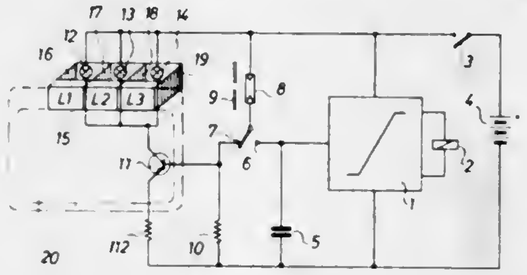
4,037,231
VARIABLE CLOCK RATE RESONANT PRINTER WITH NONLINEAR CORRECTION
Douglas Wright Broyles, San Jose, and Troy Cecil Stark, Campbell, both of Calif., assignors to The Singer Company, Binghamton, N.Y.
Filed Dec. 15, 1975, Ser. No. 640,996
Int. Cl.² G06K *15/12*
U.S. Cl. 346—108 **17 Claims**



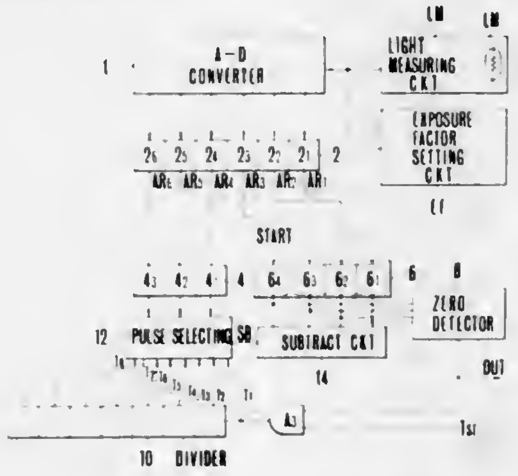
1. A digital system for recording digital input data onto an energy-responsive recording medium by scanning the recording medium with a modulated energy beam, comprising:
a mechanical oscillator means having a sinusoidal displacement characteristic;
energy-directing means responsive to the sinusoidal displacement of the oscillator means for causing the energy beam to scan in a predetermined pattern across the recording medium at a sinusoidally varying rate; .
controller for coordinating the data flow rate of the input data to approximately match the sinusoidal velocity of the energy beam across the recording medium by establishing a periodic series of constant data flow rates which are in effect for predetermined portions of the sinusoidal velocity function; and
modulator means responsive to the input data from the controller for modulating the energy beam prior to scanning by the energy-directing means.

4,037,232
VISUAL EXPOSURE INDICATOR IN PHOTOGRAPHIC APPARATUS
Karl Wagner, Ottobrunn, and Bernhard von Fischern, Munich, both of Germany, assignors to AGFA-Gevaert, A.G., Leverkusen, Germany
Continuation of Ser. No. 59,998, July 31, 1970, abandoned. This application Jan. 18, 1973, Ser. No. 324,896
Int. Cl.² G03B *17/20*
U.S. Cl. 354—23 R **5 Claims**

1. In a photographic camera, in combination, light-sensing means for sensing the prevailing scene brightness and for generating a light-dependent voltage having at least a first voltage value, a second voltage value greater than said first value, and a third voltage value greater than said second value, corresponding respectively to first, second and third levels of scene brightness; an automatic exposure control unit operative for automatically selecting as a function of prevailing scene brightness any one of a plurality of exposure values including a first, a second and a third exposure value respectively corresponding to said first, second and third levels of scene brightness; and at least a first, a second and a third light source means comprising respective light sources connected in parallel and each having a first condition and a second condition, one of said conditions being an illuminating condition and the other of said conditions being a non-illuminating condition, each connected to said light-sensing means for simultaneous receipt of said light-dependent voltage, and said first, second and third light source means being operative for assuming said first condition whenever and while said light-dependent voltage exceeds said first, second and third voltage values, respectively, whereby while said automatic exposure control unit selects said first exposure value said first light source means is in said first condition and said second and third light source means are in said second condition, and while said automatic exposure control unit selects said second exposure value said first and second light source means are in said first condition and said third light source means is in said second condition, and while said automatic exposure control unit selects said third exposure value said first, second and third light source means are all in said first condition, said light-sensing means comprising impedance means connected to said light sources for varying the impedance in the current path of said light sources as a function of prevailing scene brightness, comprising a transistor having a collector-emitter path connected in series with the parallel combination of said light sources, and having a base constituting an input of said impedance means, said light-sensing means further comprising a light-sensitive resistor, a voltage source, and an additional resistor in series with said light-sensitive resistor and forming therewith a voltage divider connected across said voltage source and having a tap connected to said input of said impedance means.

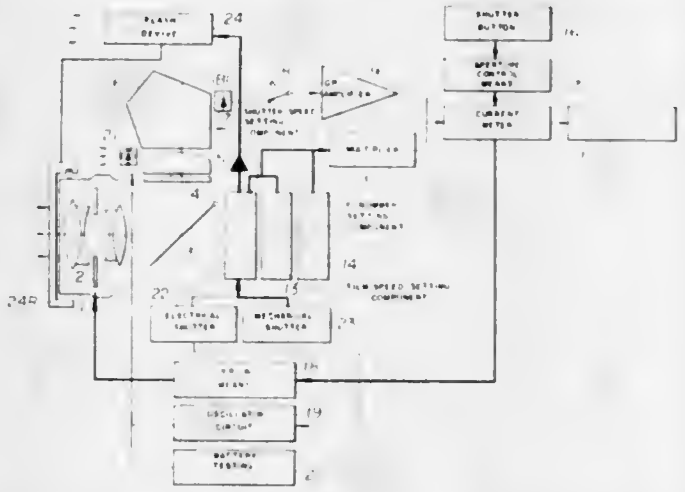


4,037,233
EXPOSURE CONTROL DEVICE FOR A CAMERA
Nobuhiko Shinoda, Tokyo; Tadashi Ito; Fumio Ito, both of Yokohama; Yukio Mashimo, Tokyo, and Nobuaki Sakurada, Yokohama, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Aug. 21, 1975, Ser. No. 606,572
Claims priority, application Japan, Aug. 27, 1974, 49-98660
Int. Cl.² G03B *7/08*
U.S. Cl. 354—23 D **9 Claims**



1. An electric shutter control device comprising:
a. photosensitive means for converting the intensity of light into a first electrical signal corresponding to the intensity;
b. an analog-to-digital converter for converting said first electrical signal to a digital signal of *n* bits, wherein *n* is an integer;
c. register means including an integral part register which stores an integral part of said digital signal of *n* bits and a fractional part register which stores a fractional part of the digital signal of *n* bits;
d. a frequency divider for forming a plurality of first control signals having frequencies differentiated from each other by a multiplier **1/2k**, wherein *k* is an integer;
e. a selecting circuit responsive to the content of said integral part register for selecting one of said control signals from said frequency divider;
f. a detecting circuit to said selecting circuit and said register means for detecting the content of the fractional part register and producing a second control signal when a predetermined relationship occurs between the number of pulses of the first control signal and the content of the fractional part register; and
g. shutter control means responsive to the second control signal from said detecting circuit from controlling the period of actuation of the shutter.

4,037,234
EXPOSURE CONTROL SYSTEM STABILIZED AGAINST TEMPERATURE VARIATION
Tokuichi Tunekawa, Yokohama; Soichi Nakamoto, Machida, and Tetsuya Taguchi, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 463,721, April 24, 1974, abandoned. This application Dec. 30, 1975, Ser. No. 645,356
Claims priority, application Japan, Apr. 28, 1973, 48-48673; June 28, 1973, 48-73200
Int. Cl.² G03B *7/08*
U.S. Cl. 354—24 **6 Claims**



1. An exposure control apparatus comprising:
a photovoltaic cell positioned to sense the level of luminance of an object to be photographed;
a logarithmic converter circuit connected to said photovoltaic cell, comprising operational amplifier means for amplifying the output of said cell and logarithmic converter means for logarithmically compressing the amplified output of said photovoltaic cell, said logarithmic converter means having a negative temperature coefficient, said logarithmic converter circuit having an output level which takes on a value which varies as a constant ratio of the value corresponding to the output of the photovoltaic cell depending on temperature, and wherein the amount of variation of the converter output level dependent upon temperature takes on different values depending on the output of the photovoltaic cell at a prescribed temperature;
a source of electrical power;
voltage stabilizer means connected between said power source and said amplifier means for supplying a standard

voltage to said amplifier means, comprising temperature correction means for changing the standard voltage corresponding to ambient temperature, said change taking on a constant value at a certain temperature whereby the standard voltage is changed proportionally with the ambient temperature and the output of said logarithmic converter circuit varies in accordance with the change of the standard voltage;

electric resistance means coupled to the output terminal of said logarithmic converter circuit, said resistance means having a positive temperature coefficient, for correcting the output of said logarithmic converter; and

indicating means coupled to said electric resistance means to indicate the value corresponding to the output of said photovoltaic cell;

whereby the amount of variation of the logarithmic converter circuit dependent on temperature is substantially totally compensated by the simultaneous action of the variation of the standard voltage and the variation of the resistance value of the resistance means.

4,037,235

EXPOSURE INDICATING DEVICE FOR USE IN MULTIPLE EXPOSURE CONTROL CAMERAS

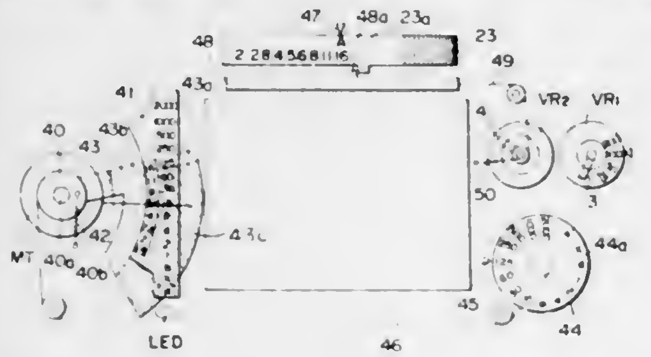
Hiroshi Ueda, Nara, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Dec. 2, 1975, Ser. No. 636,963

Claims priority, application Japan, Dec. 4, 1974, 49-138508

Int. Cl.² G03B *7/08, 17/20*

U.S. Cl. 354—38 **11 Claims**



1. An exposure indicating device for a camera of the type having a multiple exposure control system for automatically controlling shutter speed in accordance with scene brightness measured through a manually or automatically adjusted diaphragm aperture adapted to be adjusted from a fully closed setting to a fully open setting, said indicating device comprising:

- shutter speed setting means settable to an automatic shutter speed control position or to one of a plurality of manually selected positions;
- light responsive circuit means for generating a first output representative of scene brightness measured through the diaphragm aperture;
- means for setting the film speed value;
- adjusting means for adjusting said first output in accordance with said film speed value setting and generating a second output as a result thereof;
- diaphragm value presetting means settable to one of a plurality of manually selected positions with the diaphragm aperture fully open;
- second adjusting means responsive to the setting of said diaphragm presetting means for generating a third output including said second output;
- an indicating means actuated in response to said third output,
- a first scale member including a shutter speed scale, said indicating means indicating the shutter speed to be effected on said shutter speed scale with the preset diaphragm aperture;
- a second scale member movable relative to said first scale member and said indicating means in accordance with the position of said shutter speed setting means and including a first portion for indicating the set shutter speed on said shutter speed scale, said second scale member further including a diaphragm scale, said indicating means also indicating the diaphragm aperture to be automatically determined with said set shutter speed.

4,037,236

SWITCHING CIRCUIT FOR ELECTRIC SHUTTER

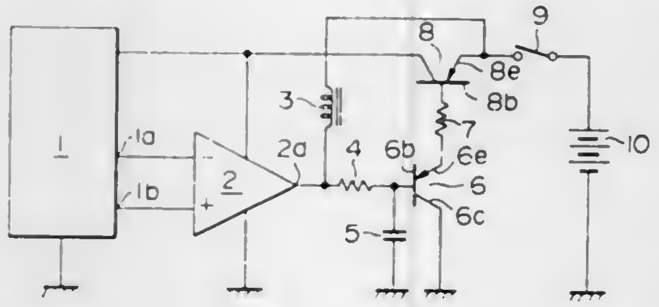
Saburo Numata, and Shinichiro Fujino, both of Urawa, Japan, assignors to Fuji Photo Optical Co., Ltd., Omiya, Japan

Filed Nov. 10, 1975, Ser. No. 630,432

Claims priority, application Japan, Nov. 8, 1974, 49-128766

Int. Cl.² G03B *7/08*

U.S. Cl. 354—51 **1 Claim**



1. In a photographic camera including an automatic shutter speed control means comprising a power source, a power switch connected therewith which is closed upon depression of a shutter release button and held in its closed position until the shutter release is completed, a shutter speed control circuit which measures the scene brightness and provides an output voltage which rises up at a rate corresponding to the scene brightness measured thereby, and an electromagnet for holding a trailing shutter blind connected between said power switch and the output of said shutter speed control circuit, said electromagnet being energized while the output voltage of said shutter speed control circuit is below a predetermined level and deenergized when the output reaches the predetermined level, whereby the shutter speed is controlled by the rate at which the output voltage, rises, a switching circuit connected between said power switch and said shutter speed control circuit for electrically connecting the power switch to the circuit when turned on, said switching circuit being turned on when said power switch is closed and when the output of said shutter speed control means is below said predetermined level and turned off when said power switch is opened or when power switch is closed and the output of said shutter speed control circuit is not lower than said predetermined level, whereby the switching circuit is turned off upon deenergization of said electromagnet, said switching circuit comprising a first transistor, the emitter thereof being connected with the power switch, the collector thereof being connected with said shutter speed control circuit for supplying power to the latter when turned on, and a second transistor, the emitter thereof being connected with the base of said first transistor, the collector thereof being grounded, the base thereof being grounded by way of a capacitor and connected with the output of said shutter speed control circuit.

4,037,237

EXPOSURE CONTROL APPARATUS

Robert J. Maigret, Warwick, R.I., assignor to Eastman Kodak Company, Rochester, N.Y.

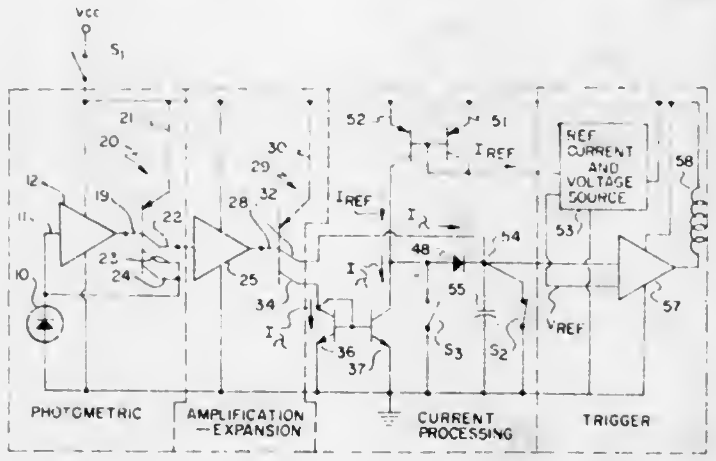
Filed Nov. 12, 1975, Ser. No. 631,272

Int. Cl.² G03B *7/08*

U.S. Cl. 354—51 **4 Claims**

4. An exposure control circuit for a photographic camera, comprising:

- photometric means responsive to scene light for producing a photocurrent proportional to scene brightness;
- means for expanding said photocurrent including a multicollector PNP transistor having a base to which said photocurrent is supplied and first and second collectors for supplying two equal currents which are proportional to said photocurrent;
- means for generating a reference current proportional to a predetermined level of scene brightness;
- a diode having an anode terminal and a cathode terminal, said first collector being connected to said cathode terminal;
- a first current mirror having an input connected to said reference current generating means an output connected to said anode terminal of said diode, said first current mirror being responsive to said reference current for supplying a current equal to said reference current to said anode terminal of said diode;
- a second current mirror having an input connected to said second collector and an output connected to said anode of said diode, said second current mirror being responsive to said current proportional to said photocurrent for attempting to draw a current equal to said current proportional to said photocurrent from said anode of said diode;
- means connected to said cathode terminal of said diode for integrating the current thereat; and
- trigger means connected to said integrating means and responsive to said integrated current for controlling an exposure.



4,037,238

STILL POCKET CAMERA

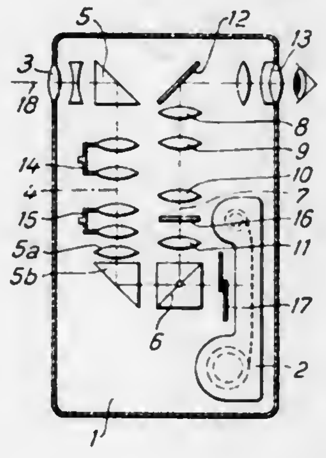
Ludwig Leitz, Wetzlar, Germany, and Walter Mandler, Midland, Canada, assignors to Ernst Leitz G.m.b.H., Wetzlar, Germany

Filed Sept. 5, 1975, Ser. No. 610,689

Claims priority, application Germany, Sept. 21, 1974, 2445289

Int. Cl.² G03B *19/12;* **G02B** *15/00*

U.S. Cl. 354—152 **18 Claims**



1. In a photographic mirror reflex still pocket camera having a picture taking objective, an optical axis thereof defining the picture taking direction, means in said camera for inserting a film cassette, a film plane in said cassette, and shutter means disposed in front of said film plane, the improvement comprising:

- a. first means for deflecting said optical axis parallel to said film plane and transverse to said picture taking direction defining a first deflected optical axis:
- b. a zoom means located along said first deflected optical axis;
- c. second means for deflecting said first deflected optical axis defining a second deflected optical axis, said second deflected optical axis being directed perpendicularly to the center of said film plane; and
- d. beam splitting means arranged in the path of said second deflected optical axis for deflecting a portion of the light rays defining said second deflected optical axis, said portion defining a view beam path.

4,037,239

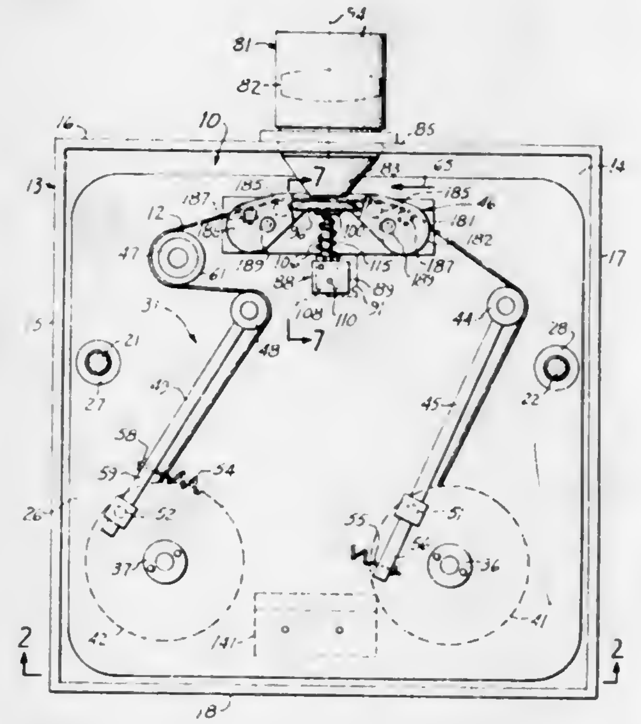
MICROFILM CAMERA AND PHOTOGRAPHIC FILM HANDLING APPARATUS WITH AN ACTUABLE FILM CLAMPING DEVICE

John Jamieson, Los Gatos; Henry F. Price, Laguna Niguel, and William O. Butts, Irvine, all of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 26, 1974, Ser. No. 536,701

Int. Cl.² G03B *27/44, 17/00*

U.S. Cl. 354—203 **33 Claims**



1. In a camera for photographing information on microfilm, the improvement comprising in combination:

- means defining an image aperture;
- means including a lens system for projecting an image of said information along an optical path through said image aperture;
- means for selectively clamping microfilm against said image aperture defining means;
- means connected to said image aperture defining means and said clamping means for mounting and restraining said image aperture defining means and said clamping means against lateral movement relative to said optical path;
- a carriage;
- means for moving said carriage relative to said image aperture defining means, projecting means and clamping means; and
- means on said carriage for advancing microfilm between said image aperture defining means and clamping means.

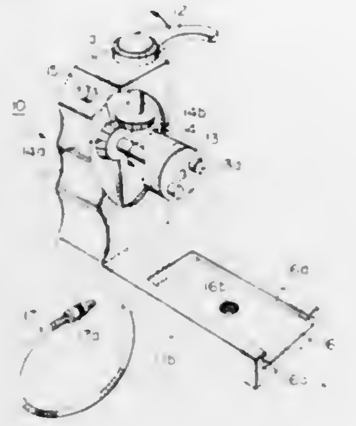
4,037,240
GRIP FOR A CAMERA

Yoshikazu Ando, Musashino, and Junichi Yokozato, Kawagoe, both of Japan, assignors to Zenza Bronica Industries, Inc., Tokyo, Japan

Filed July 23, 1976, Ser. No. 708,082

Int. Cl.² G03B *1/00, 29/00*

U.S. Cl. 354—212 **9 Claims**



1. A grip for a camera removably attached to a camera which has a film wind-up knob on the right side thereof comprising a grip body removably attached to the camera body on the right side thereof, a rotatable member engageable with a film wind-up knob of the camera for transmitting the rotation thereof in one direction to the knob, a film wind-up lever rotatably mounted on the grip body, and transmission means provided in the grip body for transmitting the rotation of the film wind-up lever to the rotatable member.

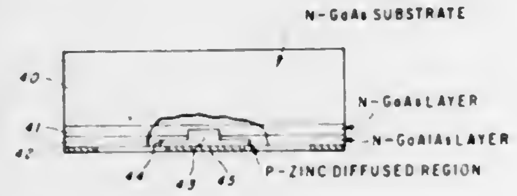
4,037,241
SHAPED EMITTERS WITH BURIED-JUNCTION STRUCTURE

Eugene Gustav Dierschke, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Oct. 2, 1975, Ser. No. 618,978

Int. Cl.² H01L *33/00*

U.S. Cl. 357—17 **6 Claims**



1. A light emitting semiconductor device comprising a monocrystalline III-V compound substrate having a first surface layer of n-type III-V material thereon, said first layer having a first bandgap energy;

a second layer of n-type III-V material covering said first layer, said second layer having a higher bandgap energy than said first layer;

a p-type region within said first and second layers extending from the surface of said second layer completely through the thickness of said second layer and only partially through the thickness of said first layer, thereby forming a light emitting pn junction;

said p-type region being wholly surrounded at the surface by said second n-type surface layer and having a stepped geometry such that the area of said pn junction within said first n-type layer is substantially smaller than the area of said pn junction within said second n-type layer; and

means forming an ohmic contact with said p-type region, said means having an area of contact with said p-type region, said area of contact being substantially larger than the area of said pn junction confined within said first n-type surface layer.

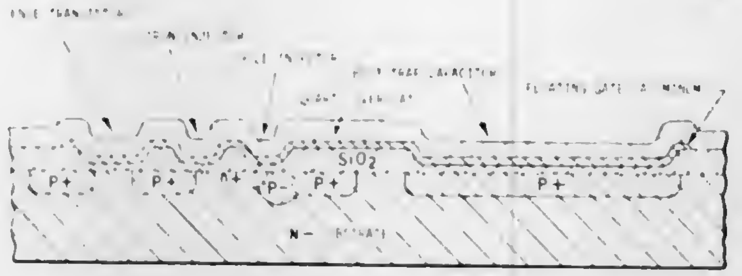
4,037,242
DUAL INJECTOR, FLOATING GATE MOS ELECTRICALLY ALTERABLE, NON-VOLATILE SEMICONDUCTOR MEMORY DEVICE

William Milton Gosney, McKinney, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Filed Dec. 29, 1975, Ser. No. 644,982

Int. Cl.² H01L *29/78, 27/02;* **G11B** *13/00;* **G11C** *11/44*

U.S. Cl. 357—23 **6 Claims**



1. A semiconductor memory device having a monocrystalline semiconductor substrate of one conductivity type, an electrically isolated floating gate conductor overlying said substrate, electron injection means in said substrate at least partially underlying said gate, hole injection means in said substrate spaced from said electron injector means and at least partially underlying said gate, and means for sensing the presence or absence of charge on said gate, wherein said hole injection means comprises an $n+/p-$ junction.

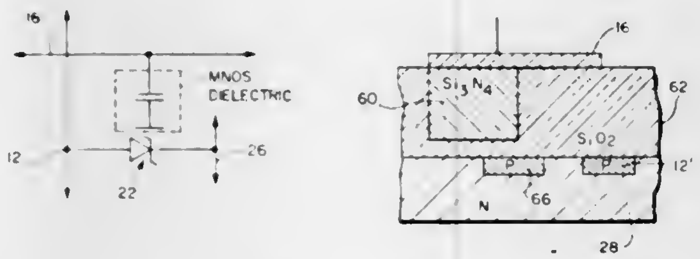
4,037,243
SEMI CONDUCTOR MEMORY CELL UTILIZING SENSING OF VARIATIONS IN PN JUNCTION REVERSE CURRENT CONTROLLED BY STORED DATA

Charles R. Hoffman, Tempe, and Michael W. Powell, Mesa, both of Ariz., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 484,487, July 1, 1974, abandoned. This application Aug. 23, 1976, Ser. No. 716,394

Int. Cl.² H01L *29/78, 27/02, 29/34*

U.S. Cl. 357—23 **7 Claims**



1. A junction memory cell comprising:

a body of semiconductor of a first conductivity type having a surface;

a first region of a second conductivity type in said body at said surface forming a PN junction with said body;

dielectric means on said surface, said dielectric means including a first dielectric layer of a first dielectric material on said surface covering a junction between said body and said first region, said dielectric means also including a second dielectric layer of a second type dielectric material on said first dielectric layer;

gate electrode means located on said second dielectric layer for controlling a reverse junction current generated by said PN junction responsive to charge representative of a logical 1 or a logical 0 stored in said dielectric means;

data input means coupled to said gate electrode means for effecting writing said logical 1 or said logical 0 into said dielectric means; and

sensing output means coupled to said second region for effecting sensing said reverse junction current during reading of said junction memory cell.

4,037,244
AVALANCHE PHOTODIODE

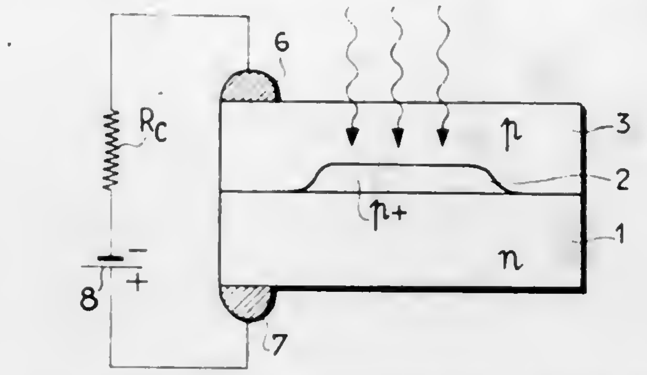
Baudouin de Cremoux, Paris, France, assignor to Thomson-CSF, Paris, France

Filed May 7, 1976, Ser. No. 684,382

Claims priority, application France, May 16, 1975, 75.15437

Int. Cl.² H01L *27/14, 29/161*

U.S. Cl. 357—30 **8 Claims**



1. An avalanche photodiode for detecting incident radiation of a predetermined wavelength comprising superimposed, a first layer of a first type of conductivity and a second layer of a second type of conductivity opposite to the first, said layers having respective superimposed central portions, and inserted in one of said central portions a third layer forming a rectifying junction with said first layer, said third layer having a high impurity concentration, so that the electrical avalanche phenomenon is localized preferentially in said third layer for reverse biasing predetermined voltage values applied to said diode.

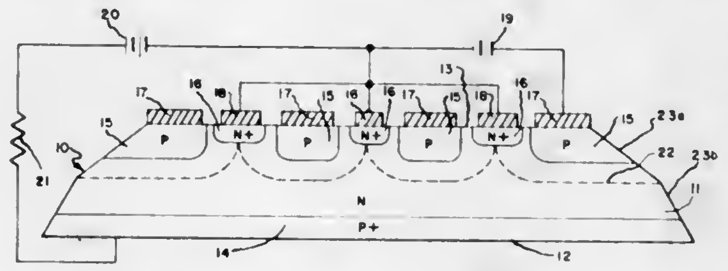
4,037,245
ELECTRIC FIELD CONTROLLED DIODE WITH A CURRENT CONTROLLING SURFACE GRID

Armand P. Ferro, Schenectady, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Filed Nov. 28, 1975, Ser. No. 636,070

Int. Cl.² H01L *29/00, 29/74, 29/80, 29/747*

U.S. Cl. 357—38 **13 Claims**



1. A three-electrode semiconductor current controlling device comprising:

a semiconductor substrate of N-type conductivity, said substrate having opposed major surfaces;

an anode region of P-type conductivity formed in one major surface;

a plurality of gate regions of P-type conductivity formed in the other major surface, said gate regions comprising an interconnecting grid structure of P-type conductivity;

a plurality of interconnecting cathode regions of N-type conductivity of higher impurity concentration than said substrate, each of said cathold regions formed in said other major surface and in the interstices defined by said interconnecting grid structure;

anode, gate and cathode electrodes respectively overlying said anode, gate and cathode regions and making low ohmic contact therewith; and

means for controlling the flow of electrical current between said anode and cathode electrodes, said means including the formation of depletion regions in said substrate around each gate region, the intersection of adjacent depletion regions causing the termination of current flow between said anode and cathode electrodes.

4,037,246
HIGH-POWER SEMICONDUCTIVE DEVICES

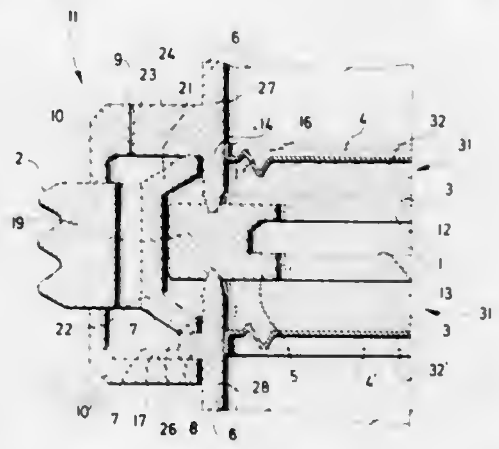
Michal Pellant; Oldrich Pokorny; Pavel Reichel; Jaroslav Zuna; Pavel Kafunek, and Jindrich Kratina, all of Prague, Czechoslovakia, assignors to CKD Praha, oborovy podnik, Prague, Czechoslovakia

Filed July 16, 1975, Ser. No. 596,437

Claims priority, application Czechoslovakia, Sept. 5, 1974, 6116/74

Int. Cl.² H01L *23/48, 23/02, 25/04*

U.S. Cl. 357—82 **4 Claims**



1. In a high-power semiconductive device including an active semiconductive element symmetrically disposed about a first axis, the elements containing at least one P-N junction and including at least first and second axially spaced, opposed terminal regions associated with such junction, mutually insulated means for supplying current to and receiving current from the first and second terminal regions, and means including a conductive liquid for providing conductive contact between the current supplying and receiving means and the respective terminal regions of the element, the improvement wherein the device further comprises an annular insulation ring coaxial with and surrounding the element, the radially inner surface of the insulating ring being disposed in intimate contact with the outer periphery of the element intermediate the axially opposite surfaces of the ring; wherein the current supplying and receiving means comprises first and second conductive tubes coaxial with and disposed on axially opposite sides of the element, the boundary walls of the first and second tubes being aligned with the opposed axial surfaces of the insulating ring, the inner ends of the first and second tubes being of reduced width and disposed in intimate contact with the axially opposite surfaces of the insulating ring; and wherein the device further comprises a pair of thin conductive plates extending across and substantially closing the interior of the respective first and second tubes in spaced relation to the ends of the tubes to individually define, with the associated ends of the tubes and the opposed terminal regions of the elements, first and second mutually insulated closed chambers, the conductive liquid filling each of the closed chambers.

4,037,247
STILL COLOR TELEVISION SIGNAL RECORDING AND REPRODUCING APPARATUS

Yoshinori Tanaka, Yokohama, and Hisaaki Narahara, Musashino, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed June 15, 1976, Ser. No. 696,408

Claims priority, application Japan, June 23, 1975, 50-77354

Int. Cl.² H04N *9/02*

U.S. Cl. 358—4 **6 Claims**

1. A still color television signal recording and reproducing apparatus comprising:

a. a color television signal source;

b. a storage tube having horizontal and vertical deflection means;

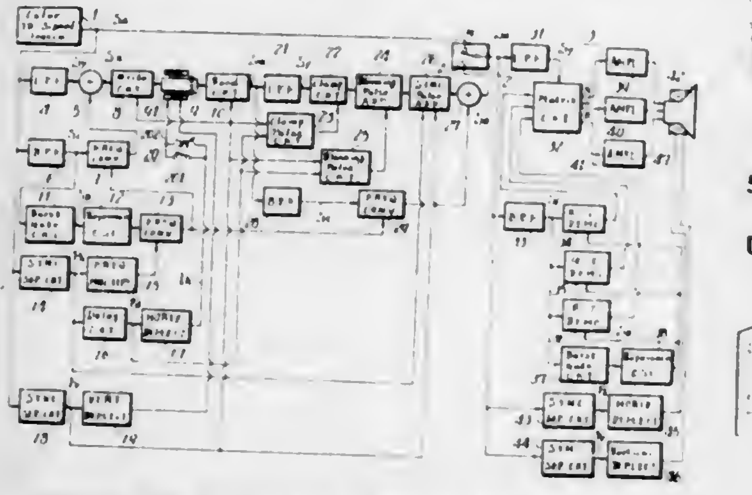
c. WRITE circuit means connected to said signal source for applying a field of a color television signal to said storage tube when operated;

d. READ circuit means connected to said storage tube for reading out a color video signal from the latter when operated;

e. a color picture reproducing means connected to said READ circuit means for receiving said color video signal therefrom;

f. a horizontal deflection circuit connected to said signal source for supplying a horizontal deflection signal to the horizontal deflection means of said storage tube; and

g. a vertical deflection circuit connected to said signal source for supplying a vertical deflection signal to the vertical deflection means of said storage tube; wherein a compensation circuit is connected to said horizontal deflection circuit for making the horizontal scanning size of the READ period substantially equal to that of the WRITE period for said storage tube; and said color picture reproducing means includes a reference oscillator which receives a color burst component from the color video signal derived from said READ circuit means and is phase-locked to said color burst component in order to demodulate a plurality of color component signals from said color video signal.



4,037,248

SYSTEM FOR CODING AND/OR DECODING COLOR TELEVISION SIGNAL INCLUDING LUMINANCE AND CHROMINANCE INFORMATION

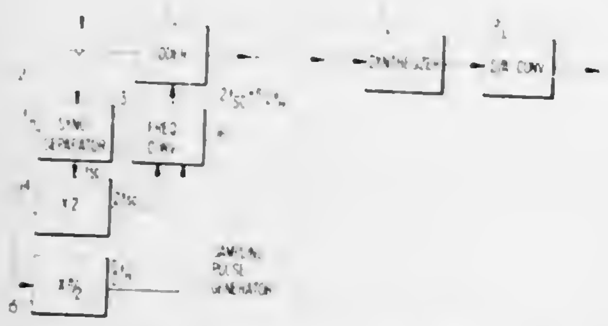
Yukihiko Iijima, and Tatsuo Ishiguro, both of Tokyo, Japan, assignors to Nippon Electric Company Limited, Tokyo, Japan

Filed Feb. 26, 1976, Ser. No. 661,679

Claims priority, application Japan, Feb. 28, 1975, 50-25355

Int. Cl.^{2} H04N *9/02*

U.S. Cl. 358—13 **16 Claims**



1. A system for coding a composite color television signal including a luminance signal and carrier chrominance signals, said carrier chrominance signals being formed by modulating a subcarrier wave by chrominance information, the subcarrier frequency of said subcarrier wave being *m*/2 (*m* stands for an odd number) of the horizontal scanning frequency of said television signal, the phases of said subcarrier waves between two adjacent scanning periods being 180° away from each other, said coding system comprising:

means for producing sampling pulses of a repetition frequency lower than the Nyquist frequency of said television signal;

means for sampling and coding said television signal in response to said sampling pulses; and

means for controlling said sampling pulses in such manner that the samples of said television signal are taken at points about 180° of said subcarrier wave away from each other in each scanning line and also about 90° of said subcarrier wave away from the samples taken in adjacent scanning lines.

4,037,249

REPRODUCTION OF COLORED IMAGES

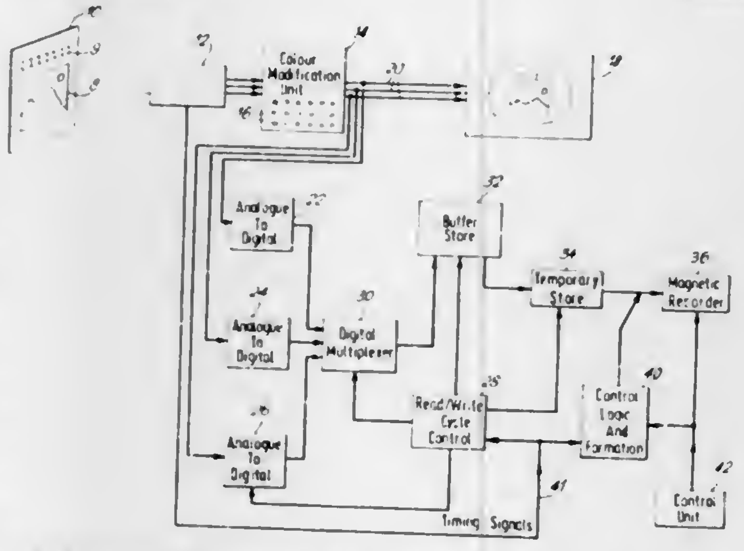
Peter C. Pugsley, Pinner, England, assignor to Crosfield Electronics Limited, London, England

Filed Dec. 16, 1975, Ser. No. 641,378

Claims priority, application United Kingdom, Dec. 18, 1974, 54670/74

Int. Cl.^{2} H04N *1/46*

U.S. Cl. 358—76 **7 Claims**



1. A method of reproducing coloured originals, in which an original is scanned by means of an analysing scanner to obtain electric signals the values of which at any instant correspond to colour-component densities of a scanned element of the original and in which the resulting electric signals are applied through a colour-modifying means to a reproducing scanner to make colour separations, the method further comprising the steps of:

generating colour-component electric signals representing the effect of scanning a set of standard colour patches with the analysing scanner, as well as colour-component electric signals corresponding to a scanning of the original;

applying the said colour component signals representing the colour patches and original to a display system having a known colour calibration through a display adjustment unit, by means of which an operator can adjust the signals as required and thereby adjust the coloured reproduction on the display system;

sampling the adjusted display signals fed to the display system to obtain signal samples representing the displayed standard colour patches;

adjusting the said colour-modifying means in accordance with the values of the colour-patch display sample signals in such a manner that the use of signals representing the effect of scanning the said standard colour patches, after their modification by the colour-modifying means, to control the reproducing scanner would result in colour separations leading to a reproduction of the standard colour patches which simulated the appearance of these patches in the adjusted colour reproduction on the display system;

and thereafter applying signals, resulting from scanning the original, through the adjusted colour-modifying means to the reproducing scanner to make colour separations from the original.

4,037,250

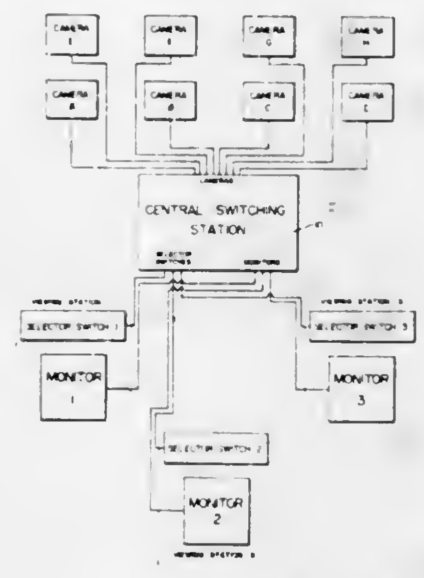
VIDEO SWITCHER

Everett G. McGahan, and Charles L. Melanko, both of 2185 N. West St., Lima, Ohio 45805

Filed Aug. 22, 1974, Ser. No. 499,623

Int. Cl.^{2} H04H *5/22*

U.S. Cl. 358—108 **12 Claims**



1. A video surveillance apparatus comprising:

a. a plurality of video cameras;

b. a plurality of video viewing stations, each station equipped with a video monitor and a remote selector switch comprising means for controlling the exhibition of video signals from any selected camera; and

c. a central Master Video Switcher in direct electronic communication with each of said cameras, said monitors, and said remote selector switches, said central Video Switcher including a plurality of electrical switching means each associated with a different one of said viewing stations, each of said electrical switching means being remotely controlled by the selector switch of an associated viewing station for connecting in selected random access any selected one of said video cameras to the monitor of its associated viewing station independently of any connection between said camera or any other camera with any other viewing station.

4,037,251

DATA CARRIER OPTICALLY READ OUT BY TRANSMISSION, AND METHOD OF MANUFACTURING SAID DATA CARRIER

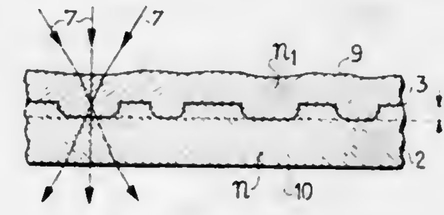
Claude Bricot; Bernard Carre; Jean Claude Dubois; Francois Le Carvennec; Jean Claude Lehureau, and Claude Puech, all of Paris Cedex, France, assignors to Thomson-Brandt, Paris, France

Filed May 13, 1975, Ser. No. 577,106

Claims priority, application France, May 15, 1974, 74.16875

Int. Cl.^{2} H04N *5/76*

U.S. Cl. 358—128 **15 Claims**



1. A method of manufacturing a data carrier optically readable by transmission using a predetermined optical radiation, which comprises:

forming on at least one of the faces of a substrate transparent vis-a-vis said optical radiation a relief impression made of a succession of diffractive elements in the form of alternate peaks and troughs arranged along a track of substantially constant width; said succession of diffractive elements being of non uniform length and spacing along the axis of said track, and covering said relief impression with at least one protective layer transparent vis-a-vis said optical radiation; the upper face of said protective layer being substantially smooth and the lower face of said protective layer being immediately adjacent said relief impression to create a refractive boundary having the profile of said relief impression and thereby causing diffractive spreading of said optical radiation by said diffractive elements.

4,037,252

APPARATUS FOR READING A DISC-SHAPED RECORD CARRIER WITH PLURAL SCANNING SPOTS FOR STABLE RADIAL TRACKING

Peter Johannes Michiel Janssen, Emmasingel, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

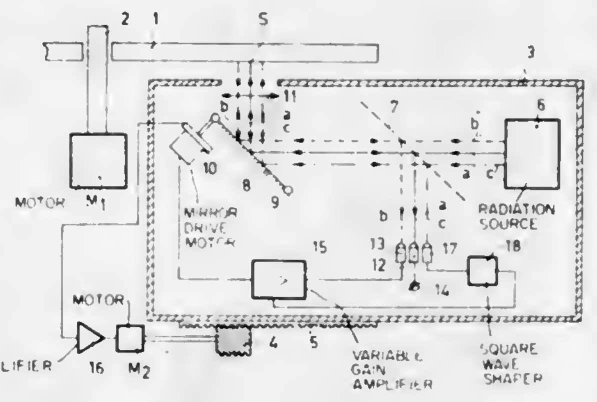
Continuation of Ser. No. 442,501, Feb. 14, 1974, abandoned.

This application Oct. 17, 1975, Ser. No. 623,550

Claims priority, application Netherlands, Nov. 10, 1973, 7315419

Int. Cl.^{2} H04N *5/76*

U.S. Cl. 358—128 **13 Claims**



1. An apparatus for reading a discshaped record carrier on which signals are stored in substantially circular adjacent tracks, which apparatus comprises a radiation source which emits a radiation beam, a read detector, directing means for projecting said radiation onto the record carrier as a read spot of radiation at a scanning point on the record carrier, for transferring the information contained in the scanninng point of the record carrier to the read detector and for radially positioning the read beam on the record carrier, said directing means being capable of scanning said radiation beam across several adjacent tracks of said record carrier, a control system in said directing system for controlling the radial position of the information contained in the scanning point of the desired track on the read detector, which control system includes a drive means for the directing system and a first measuring system for measuring the radial position of the scanning point and for supplying a corresponding first control signal to the drive means, which first measuring system further comprises means for projecting a first pattern of radiation spots on the record carrier, a first measuring detector means for supplying a first control signal, which during a radial movement of the scanning point over a number of track distances includes a periodic a.c. component whose period equals the distance between adjacent tracks divided by the speed of the radial movement of the scanning point, the control system being stable for one half period of the said a.c. component and being unstable for the other half period of the control system, a second measuring system, said second measuring system comprising a second measuring detector, means for projecting a second pattern of radiation spots

onto the record carrier and for imaging the second pattern onto said second measuring detector, said second pattern of radiation spots being radially shifted with respect to said first pattern of radiation spots, means connected to said second measuring detector for supplying a second control signal, which upon radial movement of the scanning point over a number of track distances contains a periodic a.c. component whose period equals the track distance divided by the speed of the radial movement of the scanning point, but which a.c. component as a result of said radially shifted position of the second pattern of radiation spots relative to that of the first pattern of radiation spots exhibits a phase shift of substantially a quarter period relative to the a.c. component of the first control signal, processing means for deriving a third control signal from said second control signal, said third control signal indicating said unstable half periods of said control system, a control unit, said control system having a variable transfer function which is controlled by said control unit which receives said third control signal which is derived from the second control signal, said control unit upon a movement of the scanning point over a number of track distances alters the transfer function of said control system in response to said instability indications of said third control signal, whereby said control system is stabilized.

4,037,253
PRESSURE SENSITIVE SIGNAL REPRODUCING SYSTEM FOR A VIDEODISC

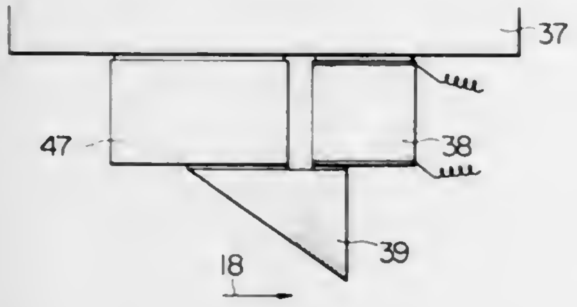
Tadashi Nagaoka, Nishinomiya, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed May 27, 1975, Ser. No. 580,946

Claims priority, application Japan, June 11, 1974, 49-66900; June 11, 1974, 49-66901; June 11, 1974, 49-66915; June 11, 1974, 49-66917; Mar. 10, 1975, 50-29369; Mar. 10, 1975, 50-29370

Int. Cl.² H04N *5/76;* G11B *3/10, 11/06*

U.S. Cl. 358—128 **9 Claims**



1. A signal reproducing device for use with a uniformly rigid record medium formed with a guide groove having an uneven pattern formed on at least the bottom thereof with projections of the signal segment being located at intervals corresponding to a modulated recorded signal, said device comprising:

an elastic support member,

a scanning member including a first surface substantially parallel to said record medium, a trailing surface inclined at a first angle with respect to said record medium and a leading surface inclined at a second angle with respect to said record medium, the line forming the intersection of said trailing surface and said leading surface forming a trailing edge extending transverse to said guide groove, and

a mechanical-electrical transducing element interposed between said elastic support member and said scanning member, said trailing edge pressing said record medium along said guide groove without substantial deformation of said record medium, changes in the inclination angle of said scanning member with respect to said record medium caused when said trailing edge engages with or disengages from said projections being detected by said mechanical electrical transducing element to produce a reproduced electrical signal.

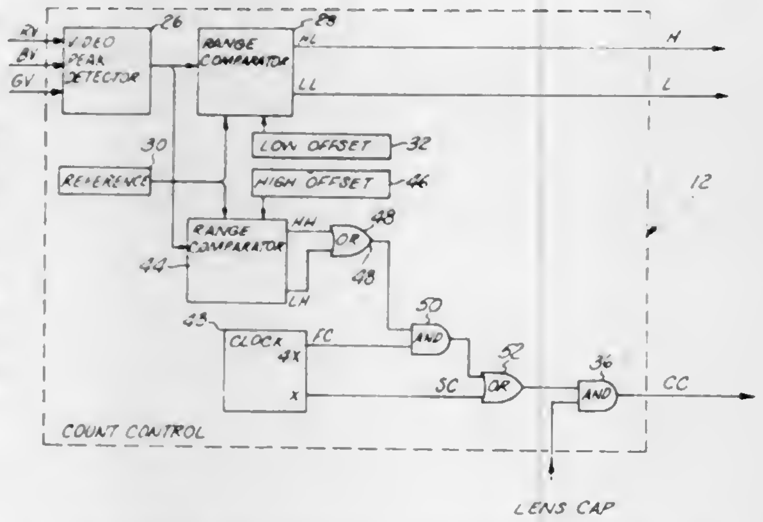
4,037,254
AUTOMATIC DIGITAL IRIS CORRECTION

John F. Monahan, Quincy, Ill., assignor to Harris Corporation, Cleveland, Ohio

Filed Dec. 10, 1975, Ser. No. 639,470

Int. Cl.² H04N *5/193*

U.S. Cl. 358—228 **6 Claims**



1. Automatic digital aperture control apparatus for a television camera having at least one video output signal and comprising;

peak detection means responsive to said at least one video output signal for providing a peak signal having a value which varies with the intensity of said video output signal;

count control means for producing a first command signal when said peak signal rises above a first upper limit, and a second command signal when said peak signal falls below a first lower limit;

a source of first clock pulses having a first pulse repetition rate;

bidirectional digital counting means for counting clock pulses in a first or second direction in response to said first and second command signals, said counting means providing a digital output signal having a value in dependence upon the pulse count difference between the number of clock pulses counted in said first direction and those counted in said second direction;

digital to analog converting means for converting said digital output signal to a corresponding analog signal having a value in accordance with said pulse count difference;

aperture control means for controlling the amount of light admitted to said television camera in response to said analog signal;

a source of second clock pulse having a second pulse repetition rate greater than said first pulse repetition rate;

gating means responsive to a third command signal for gating said second clock pulses to said counting means and for otherwise gating said first clock pulses to said counting means; and,

means for providing said third command signal when said peak signal rises above a second upper limit greater than said first upper limit or falls below a second lower limit smaller than said first lower limit.

4,037,255
IMPLOSION PROTECTION SYSTEM FOR COLOR CRT BULB HAVING A BONDED FUNNEL FRAME

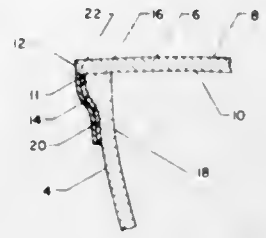
Monty B. Hill, Chicago, Ill., assignor to Zenith Radio Corporation, Glenview, Ill.

Filed Dec. 11, 1975, Ser. No. 639,741

Int. Cl.² H01J *29/87*

U.S. Cl. 358—246 **8 Claims**

1. A color television picture tube having a glass bulb with an approximately rectangular, flangeless, curved faceplate having a convex front surface through which television pictures are viewed, a concave rear surface with a phosphor screen deposited on a portion thereof, the glass bulb also having a funnel having a convex seal land which mates with the concave inner surface of the faceplate to define a contoured sealing interface, said tube including a low cost funnelbond implosion protection system comprising:



a high tensile strength frame which surrounds and hugs a portion of said funnel adjacent to said faceplate; and

a cement between said frame and said funnel, said cement and said frame binding up said funnel portion to provide implosion protection.

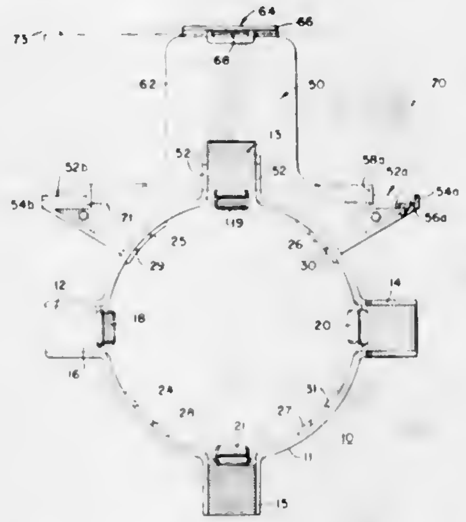
4,037,256
CONVERGENCE CIRCUIT MOUNTING DEVICE

Thomas A. Costa, Mount Prospect, Ill., assignor to Admiral Corporation, Schaumburg, Ill.

Filed May 5, 1976, Ser. No. 683,329

Int. Cl.² H04N *5/655*

U.S. Cl. 358—248 **9 Claims**



1. In a television receiver, a device for releasably positioning a control panel with respect to a cathode ray tube (CRT) of the receiver, said control panel having a circuit of said TV receiver disposed thereon, said positioning device comprising:

a. an annular member adapted to be disposed about said CRT; and

b. means associated with said annular member for releasably securing said control panel to said device and in a predetermined relationship with respect to the CRT.

4,037,257
DATA CLOCK SEPARATOR WITH MISSING CLOCK DETECT

Srinivasan V. Chari, Foster City, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1976, Ser. No. 654,489

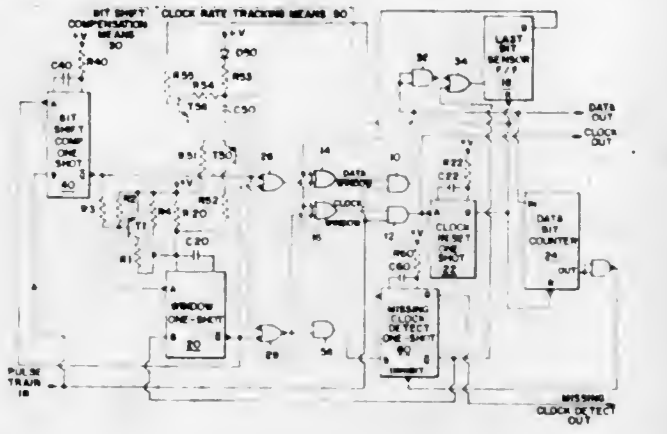
Int. Cl.² G11B *5/09*

U.S. Cl. 360—51 **20 Claims**

1. A method for varying the on-time of an electronic window one-shot that is triggered by pulses on an input pulse train to thereby generate timed output pulses, wherein the normal output pulse width of said one-shot is set by a predetermined value of resistance and capacitance in an RC network connected to said one-shot, said method comprising the steps of:

a. detecting a condition for which a different pulse width is desired;

b. triggering a second one-shot, in response to the detected condition, to generate a second timed pulse;



c. activating an electronic switch in response to the second pulse; and

d. using said switch to charge the time constant value of the timing network of said window one-shot to thereby change the output pulse width of said window one-shot.

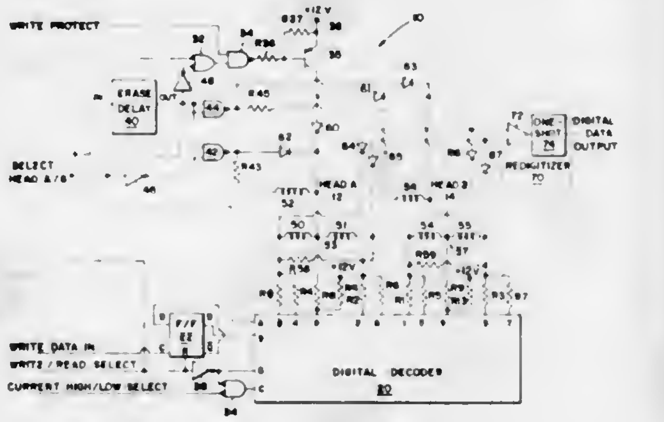
4,037,258
READ/WRITE APPARATUS FOR MAGNETIC RECORDERS

Srinivasan V. Chari, Foster City, Calif., assignor to Xerox Corporation, Stamford, Conn.

Filed Feb. 2, 1976, Ser. No. 654,491

Int. Cl.² G11B *15/12*

U.S. Cl. 360—63 **12 Claims**



1. In a read/write apparatus for magnetic recorders including a magnetic recording and reproducing head having at least one winding for converting electric signals into magnetic flux variations that may be recorded on a magnetic recording medium movable relative to said head and for converting said magnetic flux variations so recorded back into electric signals, the improvement comprising:

control means for generating a signal to be recorded, said control means including a digital decoder capable of numeric base transformations and having a plurality of inputs for receiving function control and data input signals and plurality of outputs normally at a first voltage state, wherein a predetermined number of said outputs will assume a second voltage state in response to the particular function control and data input signals applied at its inputs; and

write means for generating said electric signals, said write means including a voltage source coupled to said head and capable of being applied across said winding when at least a predetermined one of said outputs is at its second voltage state, whereby current of a predetermined magnitude is made to flow through said winding.

4,037,259

METHOD AND EQUIPMENT FOR SWITCHING THE OPERATING CONDITIONS OF A TAPE-RECORDER

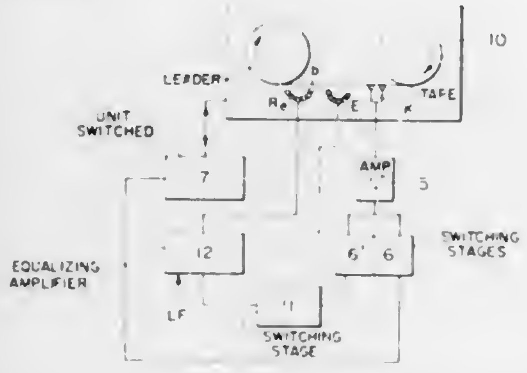
Fritz Hammon; Georg Schnell, and Karl-Juergen Reimer, all of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Continuation-in-part of Ser. No. 382,344, July 25, 1973, abandoned. This application Oct. 3, 1975, Ser. No. 619,232

Claims priority, application Germany, July 26, 1972, 2236593

Int. Cl.² G11B *5/47*

U.S. Cl. 360—66 **8 Claims**



1. Apparatus for controlling the operating of a magnetic tape transport device, the device having a magnetic signal transducer and an electronic equalizing circuit capable of being switched to a first operating state for providing a first bias to said transducer for use with tapes having a first magnetic coating resistance value and a first coercivity, and to a second operating state for providing a second bias to said transducer for use with tapes having a second magnetic coating resistance value and a second coercivity, comprising:

means for detecting the resistance value between two adjacent points on the tape and for switching said circuit, said means having a threshold level corresponding to a predetermined resistance value in between said first and second resistance values, whereby said means switches said circuit to said first operating state when the detected resistance value is below said threshold level and to said second operating state when the detected resistance value is above said threshold level.

4,037,260

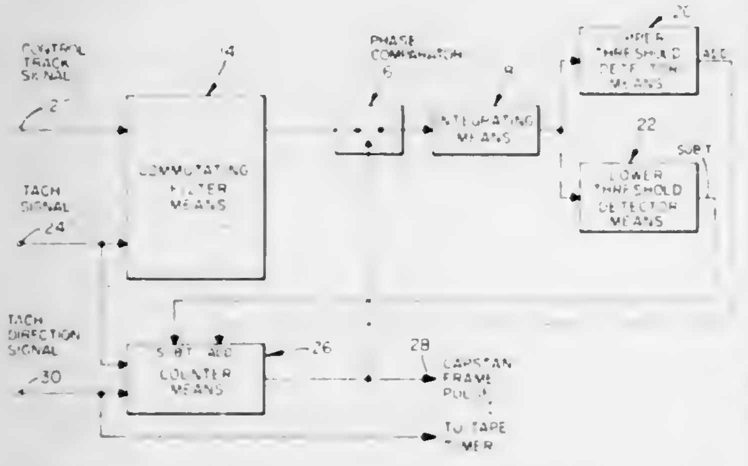
TAPE TIMER ERROR CORRECTOR CIRCUIT FOR TAPE RECORDER/REPRODUCERS

Edwin S. Busby, Jr., Menlo Park, and Reginald W. Oldershaw, Los Altos, both of Calif., assignors to Ampex Corporation, Redwood City, Calif.

Filed Mar. 19, 1976, Ser. No. 668,678

Int. Cl.² G11B *15/52. 15/54*

U.S. Cl. 360—73 **10 Claims**



1. An error corrector circuit for generating precise frame pulses for a tape timer circuit in a tape recorder/reproducer having a tape, a multiple frequency tape control track recorded thereon indicative of the precise transport of tape past head means, and a capstan tach for deriving a tach signal indicative of the rotation of a capstan against the tape, comprising the combination of;

first means coupled to the control track and responsive to the capstan tach for generating a filtered control track signal of selected frequency at any speed of tape motion;

second means disposed to receive the capstan tach signal for generating a capstan tach clock of the same frequency as that of the filtered control track signal and definitive of the frame rate pulses used to drive the tape timer circuit;

phase comparison means coupled to receive the filtered control track signal to provide a phase comparison thereof with the tach clock; and

third means coupled to the phase comparison means for detecting any phase deviations between the tach clock and the filtered control track signal and for correspondingly updating the second means and thus the frame pulses in response to the phase comparison.

4,037,261

TAPE RECORDER WITH HEAD POSITIONING MECHANISM

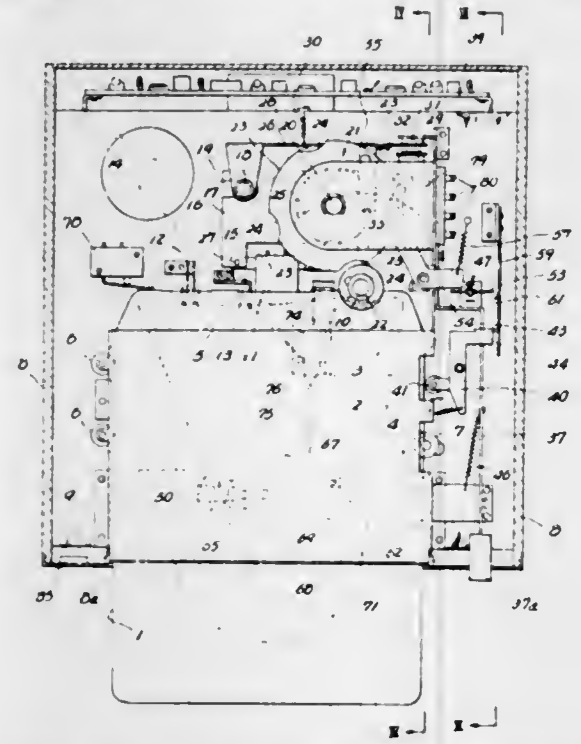
Masami Shin, Mubanchi Kurojinishi Nakagawa-cho, Nakagun, Tokushima, and Kanji Tamaki, 32 Nakagawahara Yokomicho, Anan, Tokushima, both of Japan

Filed Apr. 28, 1975, Ser. No. 571,951

Claims priority, application Japan, May 3, 1974, 49-62120

Int. Cl.² G11B *5/54. 21/08. 23/18*

U.S. Cl. 360—78 **2 Claims**



1. A tape recorder comprising a case for accommodating a magnetic tape cartridge in a playable condition, the magnetic tape cartridge having a plurality of channels, a flexible roll linked to a capstan shaft for forwarding the magnetic tape at a uniform speed, and a rotary body having a first cam, a second cam and a channel switch cam, said first cam adjoining the flexible roll to transfer torque of the capstan, said second cam locating the first cam and adjoining the first cam to the flexible roll, the channel switch cam switching adjoining position of a magnetic head to the magnetic tape wherein the torque of the capstan shaft is transferred to the rotary body through the flexible roll thereby achieving channel switch operations of the magnetic head, said first cam being shaped in a circle and being provided with a plurality of hollows of the same numbers as the channels in the magnetic tape, said second cam being provided with a plurality of notches of the same number as the channels in the magnetic tape, said notches being cooperated with a locating plate for stopping and supporting the rotary body at desired channel position, whereby the channel switch cam may be maintained at position corresponding to selected channel position of the magnetic head by stopping the hollow of the first cam at opposite position to the flexible roll.

4,037,262

SOLENOID OPERATED TRANSCRIBER MECHANISM

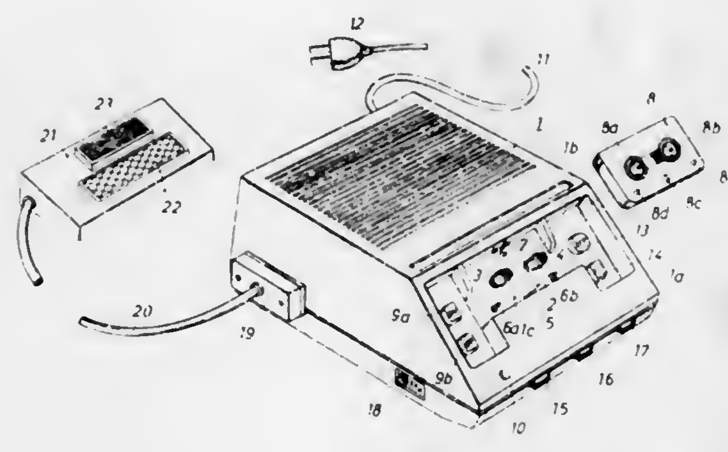
Minoru Kabayashi, Hachioji, and Kazumi Miyazi, Fuchu, both of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan and Lanier Business Products Company, Atlanta, Ga.

Filed July 12, 1976, Ser. No. 704,445

Claims priority, application Japan, July 16, 1975, 50-99217[U]; Sept. 30, 1975, 50-133956[U]

Int. Cl.² G11B *15/10*

U.S. Cl. 360—96 **4 Claims**



1. In a transcriber having a control circuit provided with a main switch adopted to turn either on or off an electrical connection with a power source, a pinch roller, a capstan, a reproducing magnetic head, a winding shaft, and a rewinding shaft, the improvement comprising:

a sliding plate movable in response to the on-off operation of said main switch,

a connection lever operatively connected to said sliding plate,

a pinch roller supporting lever operatively connected to said connection lever and supporting said pinch roller,

a head supporting member operatively connected to said connection lever and supporting said reproducing magnetic head,

whereby when said main switch has been turned on, said sliding plate and connection lever are moved each by a prescribed amount, and in accordance with this movement said pinch roller supporting lever and head supporting member are moved to permit said pinch roller and magnetic head to be brought to a condition ready for operation,

a playback solenoid,

playback switching means for energizing and deenergizing said playback solenoid,

a pushing member moved by energization of said playback solenoid to move said connection lever, thereby to cause said pinch roller and magnetic head to be brought to an operative position,

a selectively rotating mechanism for rotating said winding shaft by energizing of said playback solenoid,

a backspace solenoid operatively associated with said playback solenoid,

back-space switching means for energizing and deenergizing said backspace solenoid,

whereby when said backspace solenoid is energized, said playback solenoid is deenergized to permit said pinch roller and magnetic head to be brought to a condition ready for operation through said connection lever and said selectively rotating mechanism is caused to rotate said rewinding shaft.

4,037,263

ARRANGEMENT FOR THE DIRECT CONVERSION OF ITEMS OF DATA STORED IN MAGNETIC FORM INTO OPTICAL SIGNALS

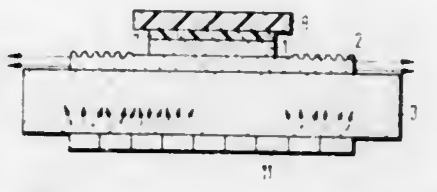
Peter Moeckel, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany

Filed July 21, 1975, Ser. No. 597,682

Claims priority, application Germany, July 23, 1974, 2435415

Int. Cl.² G02B *5/14*

U.S. Cl. 360—114 **6 Claims**



1. An arrangement for directly converting magnetically stored data of a moving record adjacent thereto into optical signals, comprising:

a wave guide laser having an index of refraction n_2;

a transparent substrate having an index of refraction n_3 and carrying said wave guide laser thereon; and

a magneto-optical modulator carried on said wave guide laser adjacent the moving record and having an index of refraction n_1, the indices of refraction having the relationships

$$n_1 > n_2 > n_3$$

4,037,264

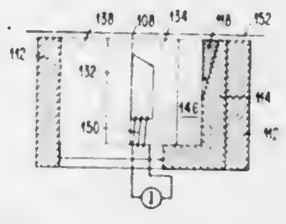
MAGNETIC HEAD HOUSING WITH WEDGE LOCKING MEANS

John Allen Barkley; Neil Lloyd Robinson, and Frank Boyd Shelledy, all of Boulder County, Colo., assignors to International Business Machines Corporation, Armonk, N.Y.

Continuation-in-part of Ser. No. 616,975, Sept. 26, 1975, abandoned. This application Dec. 8, 1976, Ser. No. 748,422

Int. Cl.² G11B *5/105*

U.S. Cl. 360—129 **16 Claims**



1. A magnetic head structure comprising:

a shell defining an opening including an inner wall surface;

a first rigid transducer element located within said shell, said element including a surface portion abutting the inner wall surface of said shell, said element also including a second surface portion generally opposed to its first surface portion;

a second rigid transducer element located within said shell, said element including a first surface portion juxtaposed to said second surface portion of said first element, an insulating layer between the second surface of the first element and the first surface of said second element and in contact with both said surfaces, said second element also including a second surface portion generally opposed to its first surface, said juxtaposed surface portions of said first and second transducer elements defining a transducing gap;

transducer elements positioniong and locking means including a wedge follower surface located within said shell, and a wedge, said wedge and said wedge follower surface carrying means located within said shell, each including a first face portion in abutting and sliding relationship to one another and each having a second surface portion generally opposed to their respective first surface portions, said second surface portions also generally opposed to said transducing gap and said inner wall surface of said shell respectively, said positioning elements engaging said second transducer element and a portion of said shell inner wall surface to transmit a lateral force positioning and locking all of said elements within the inner wall surfaces of said shell and wherein the wedge in generally planar and the wedge angle of said wedge is θ and is defined by the formula tan $\theta \leqq$ the coefficient of friction between the wedge and wedge follower abutting surfaces.

4,037,265

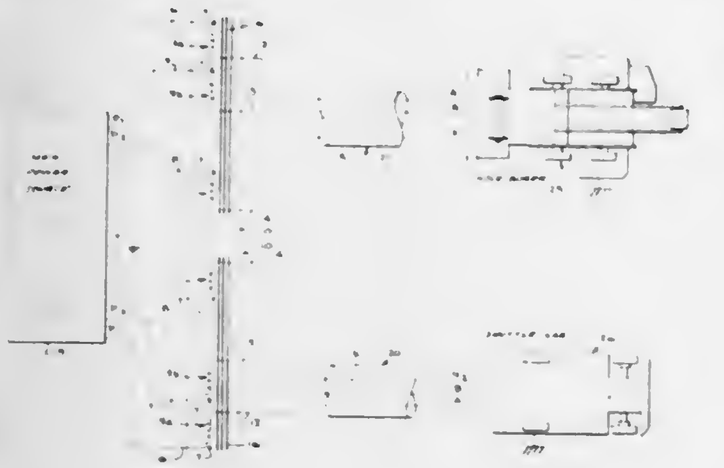
ARC PREVENTING POWER SUPPLY SYSTEM

Henry D. Smith, Bluefield, W. Va., assignor to Pemco Corporation, Tazewell County, Va.

Filed Nov. 25, 1975, Ser. No. 635,386

Int. Cl.^{2} H02H *3/16*

U.S. Cl. 361—58 **8 Claims**



1. In a power system for supplying electrical power from a main source of power to at least two separate loads each having a conductive external housing, wherein the system employs an inductive reactor in series with a grounding conductor connected between a conductive external housing and earth ground, the improvement comprising means for substantially balancing out or cancelling the self-inductance of said reactor upon the occurrence of a short circuit causing current to flow through said reactor.

4,037,266

VOLTAGE SURGE PROTECTOR

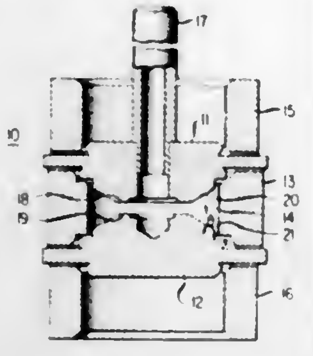
John Hershel English, North Plainfield; James Edward Griffiths, Murray Hill, both of N.J., and Paul Zuk, Allentown, Pa., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Dec. 29, 1975, Ser. No. 645,073

Int. Cl.^{2} H02H *3/22*

U.S. Cl. 361—120 **2 Claims**

1. An overvoltage surge protector comprising a first electrode and a second electrode and a housing for maintaining the first electrode and the second electrode in spaced relationship to one another and electrically insulated from one another, the said electrodes each possessing a broad face defining a gap therebetween wherein the broad face of at least one of the electrodes is so contoured as to provide a narrow gap portion adapted for initiating the protective discharge and a wider gap portion adapted for receiving and sustaining the protective discharge, whereby an arc is initiated in the narrow gap portion and transfers to the wider gap portion during the protective discharge, wherein at least one of said electrodes, at said broad face, includes a flat inner portion at least 0.5 square millimeters in area, defining a uniformly spaced gap and a tapered outer portion defining an outwardly increasing gap, surround the inner portion and wherein the tapered outer portion defines a frustrum of a cone with a slope of 5° to 15°.



4,037,267

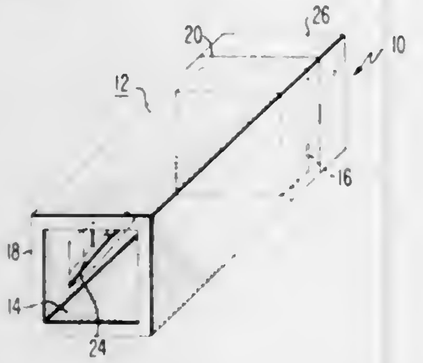
PACKAGE FOR SEMICONDUCTOR COMPONENTS

Thaddeus William Kisor, Flemington, N.J., assignor to RCA Corporation, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,268

Int. Cl.^{2} H05F *3/02*

U.S. Cl. 361—220 **9 Claims**



1. A package for semiconductor components comprising:

a hollow body having openings at a first end and a second end;

at least one protrusion extending into said opening at said first end of said body, said protrusion being an integral portion of said body and preventing the ingress or egress of said components through said opening at said first end; and

a coating of anti-static material covering said body.

4,037,268

METHOD AND APPARATUS FOR GENERATING A NEGATIVE CHARGE EFFECT IN AN ENVIRONMENT

James Cyril Gallagher, Encino, Calif., assignor to Apsee, Inc., San Diego, Calif.

Continuation of Ser. No. 431,099, Jan. 7, 1974, abandoned, which is a continuation-in-part of Ser. No. 787,872, Dec. 30, 1968, abandoned, which is a continuation-in-part of Ser. No. 394,103, Sept. 2, 1964, abandoned, which is a continuation of Ser. No. 251,616, Jan. 15, 1963, abandoned. This application Mar. 12, 1975, Ser. No. 557,869

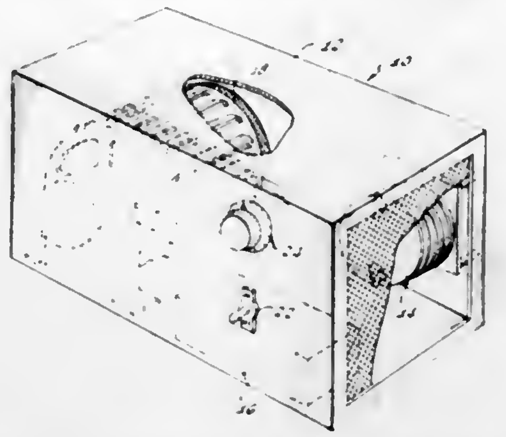
Int. Cl.^{2} H01J *3/04*

U.S. Cl. 361—231 **8 Claims**

1. An electrical discharge generator comprising:

at least two electrode units each having an electrically conductive plate covered by a dielectric material, said electrode units being in a spaced parallel relationship and the facing surfaces of said electrode units having high coefficients of secondary electron emission; and

means for applying an electrical potential between said electrode units, said electrical potential being sufficient to generate a glow type of discharge between said facing surfaces.



4,037,269

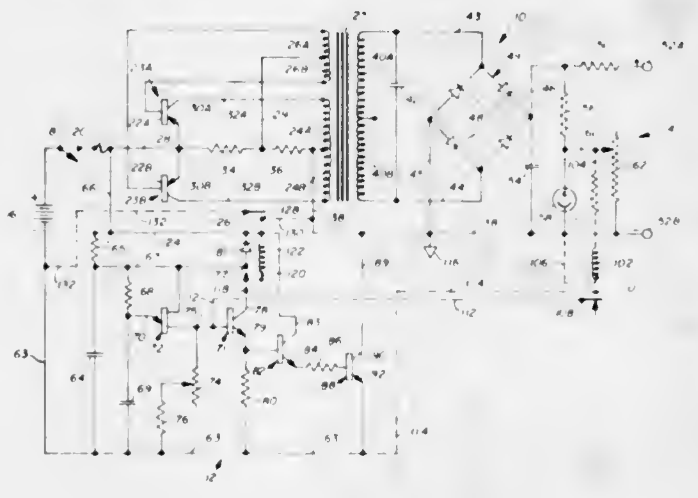
APPARATUS FOR CHARGING FIELD ELECTRICAL CABLES

Paul M. Ferguson, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.

Filed Mar. 16, 1976, Ser. No. 667,407

Int. Cl.^{2} H05C *1/04*

U.S. Cl. 361—232 **16 Claims**



1. In a cable having at least one conductor under a jacket, said conductor having low and variable capacitive impedance to ground, and means for applying a series of time-spaced high potential pulses to said conductor, for the purpose of discouraging animals from biting into said cable, comprising:

a cable charger for generating said high potential pulses to be applied to said at least one conductor, comprising:

a. a source of electrical power;

b. power conversion means responsive to said source of power for generating said series of time-spaced high potential pulses of selected magnitude;

c. power connecting means connected between said power source and said power conversion means;

d. timing means to enable said power connecting means at first selected time intervals to apply said power source to said energy conversion means;

e. said high potential pulses of a form that increase in magnitude of potential with time;

f. means to determine the instantaneous magnitude of said high potential pulses; and

g. responsive to said instantaneous magnitude of said high potential pulses, means to disable said power connecting means to remove said power source from said power conversion means.

4,037,270

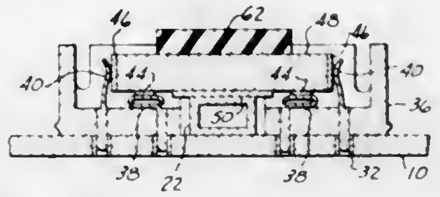
CIRCUIT PACKAGING AND COOLING

Gerald L. Ahmann, St. Paul; Douglas M. Carlson, Anoka; Warren B. Marquardt, Stillwater; Richard E. Offerdahl, Shoreview; Roger A. Paulson, and Anthony A. Vacca, both of New Brighton, all of Minn., assignors to Control Data Corporation, Minneapolis, Minn.

Filed May 24, 1976, Ser. No. 689,215

Int. Cl.^{2} H05K *7/20*

U.S. Cl. 361—385 **11 Claims**



1. A circuit assemblage comprising, in combination: a circuit board; a plurality of groups of electrical connectors supported on said circuit board; fluid conduit means supported on a surface of said board and extending through each of said groups of connectors, said conduit means being constructed of a thermally conductive material and being adapted to carry a coolant; a plurality of carrier means each supporting a plurality of electrical contacts, each of electrical contacts of each of said carrier means being assembled to respective connectors of respective groups of connectors so that each of said carrier means is juxtapositioned to the portion of said conduit means extending through the respective group of connectors; a plurality integrated circuit means, each supported by a respective one of said carrier means, said circuit means each including a plurality of electrical contacts so disposed on arranged as to establish electrical connection to individual contacts of the respective carrier means, said circuit means further including a heat dissipating bar disposed and arranged as to establish thermal contact to the respective portion of said conduit means; and fastener means fastened to each of said carrier means, said fastener means including bias means for biasing the respective circuit means so that the respective heat dissipating bar bears against the respective portion of said conduit means, and the respective contacts on said circuit means bears against respective contacts on the carrier means.

4,037,271

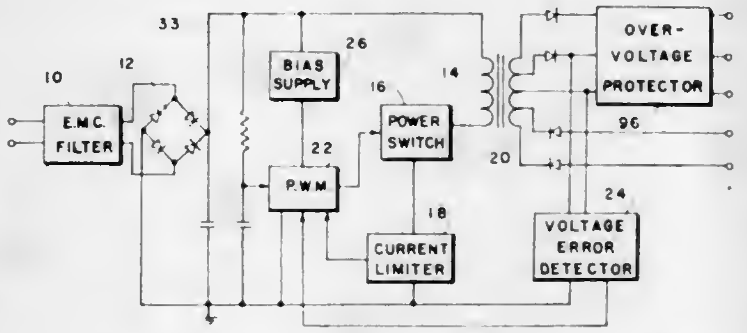
SWITCHING REGULATOR POWER SUPPLY

Richard A. Keller, Palo Alto, Calif., assignor to Boschert Associates, Sunnyvale, Calif.

Filed Dec. 3, 1976, Ser. No. 747,229

Int. Cl.^{2} H02M *3/335*

U.S. Cl. 363—21 **7 Claims**



1. A switching regulator power supply for converting electrical power at an unregulated voltage into regulated D.C. at desired voltage levels, said supply comprising:

rectifying means coupled to receive the electrical power for rectifying said power to produce an unregulated D.C. voltage and a ground reference;

a power conversion transformer having a primary winding and a center-tapped secondary winding, the first end of said primary winding being coupled to the unregulated D.C. voltage output of said rectifying means;

electrical switching means coupled between the second end of said primary winding and said ground reference; and

a pulse-width modulator coupled between said unregulated D.C. voltage and ground reference and coupled to control the operation of said electrical switching means, said pulse-width modulator including an oscillator having a duty cycle, the ON-time of which is determined by amplitude of said unregulated D.C. voltage and the OFF-time of which is substantially longer than that of the said ON-time.

DESIGN PATENTS

GRANTED JULY 19, 1977

ERRATA

For CLASS	See PATENT NO.
014-076	245,065
048-033	245,110
014-068	245,111
014-060	245,112
014-060	245,113
030-014	245,114
030-037	245,115
024-032	245,118
024-058	245,119
024-060	245,120
029-006	245,121
024-008	245,122
024-017	245,123
028-035	245,124

DESIGNS

JULY 19, 1977

245,046

SLIDER BODY FOR A SLIDE FASTENER

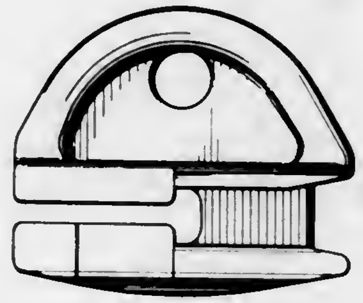
Stanley E. Weikal, Meadville, Pa., assignor to Textron, Inc., Providence, R.I.

Filed Aug. 6, 1975, Ser. No. 602,351

Term of patent 14 years

Int. Cl. D2—*07*

U.S. Cl. D2—415



245,047

DISPLAY STAND FOR CONFECTIONARY PRODUCTS

Amilcare Dogliotti, Neive (Cuneo), Italy, assignor to P. Ferrero & C. S.p.A., Alba (Cuneo), Italy

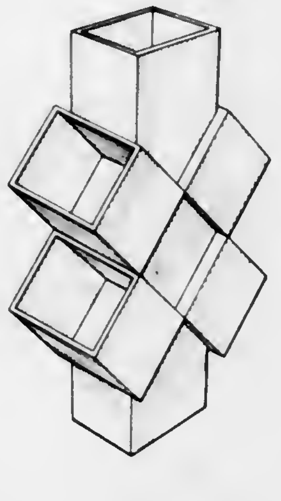
Filed Mar. 31, 1976, Ser. No. 672,213

Claims priority, application Italy, Oct. 8, 1975, 53398/75

Term of patent 14 years

Int. Cl. D20—*02;* D6—*04*

U.S. Cl. D6—25



245,048

ROTATABLE HOLDER FOR INDIVIDUALLY DISPENSING PAPER CUPS OR THE LIKE

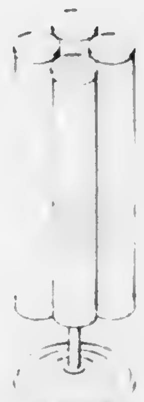
Albert E. Pool, Fort Worth, Tex., assignor to Modular Engineering Corporation, Atlanta, Ga.

Filed June 1, 1976, Ser. No. 691,522

Term of patent 14 years

Int. Cl. D6—*04;* D9—*99*

U.S. Cl. D6—25



245,049

EYEGLASS LENS DISPLAY UNIT

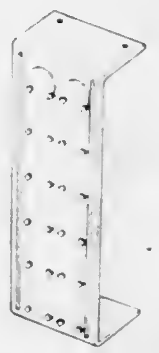
Richard S. Dunchock, Northville, Mich., assignor to Optarac Corporation, Hollywood, Fla.

Filed Feb. 5, 1976, Ser. No. 655,471

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—85



245,050
DISPLAY UNIT

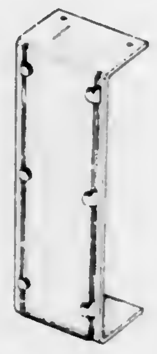
Richard S. Dunchock, Northville, Mich., assignor to Optarac Corporation, Hollywood, Fla.

Continuation-in-part of Ser. No. 498,542, Aug. 19, 1974. This application Feb. 5, 1976, Ser. No. 655,402

Term of patent 14 years

Int. Cl. D20—*02*

U.S. Cl. D6—85



245,051
TELEVISION SUPPORT

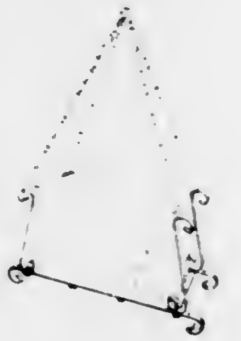
Ismael Gomberoff, P.O. Box 262, Lynden, Wash. 98264

Filed July 9, 1975, Ser. No. 594,339

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—85



245,052
PLANTER

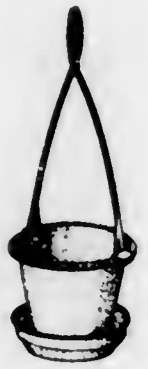
Marion R. Mulford, Maitland, Fla., assignor to 4-M Enterprises

Filed Apr. 26, 1976, Ser. No. 680,574

Term of patent 14 years

Int. Cl. D11—*02*

U.S. Cl. D6—113



245,053
TENNIS RACKET HOLDER

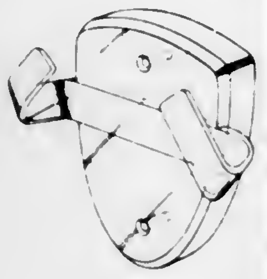
George M. Domansky, 5037 Montclair Road, Stone Mountain, Ga. 30087

Filed Nov. 9, 1976, Ser. No. 740,233

Term of patent 7 years

Int. Cl. D6—*04*

U.S. Cl. D6—114



245,054
DESK OR SIMILAR ARTICLE

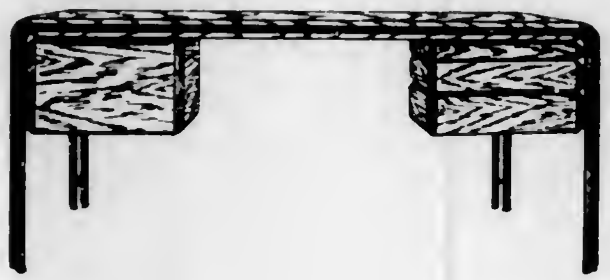
Roger K. Leib, 11740 Wilshire Blvd., Los Angeles, Calif. 90025

Filed Oct. 20, 1975, Ser. No. 624,046

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—161



245,055
BOOK SUPPORT STAND OR SIMILAR ARTICLE

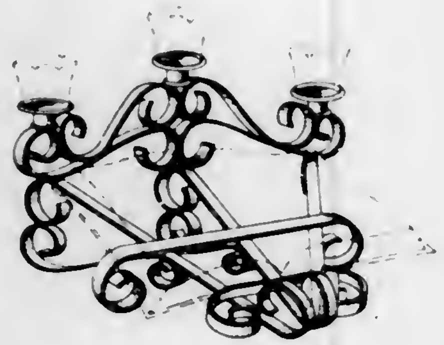
Linda C. Brown, 1940 Cameo, Clovis, N. Mex. 88101

Filed Dec. 2, 1975, Ser. No. 636,965

Term of patent 14 years

Int. Cl. D6—*99*

U.S. Cl. D6—184



245,056
RECORD STAND

Ole Winther, Kopenhamn, Denmark, assignor to Esselte Obergs AB, Stockholm, Sweden

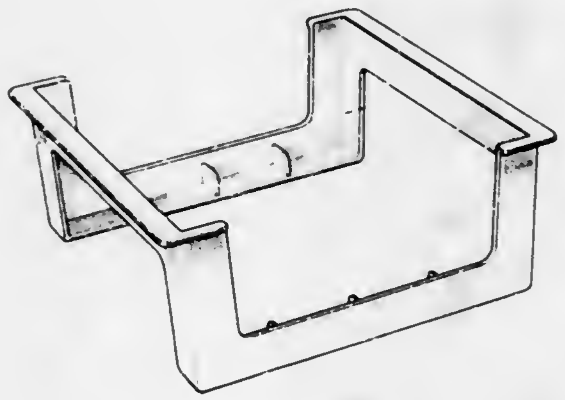
Filed Nov. 4, 1975, Ser. No. 628,702

Claims priority, application Sweden, May 7, 1975, 75984

Term of patent 14 years

Int. Cl. D6—*04*

U.S. Cl. D6—185



245,057
BEDSPREAD/BLANKET

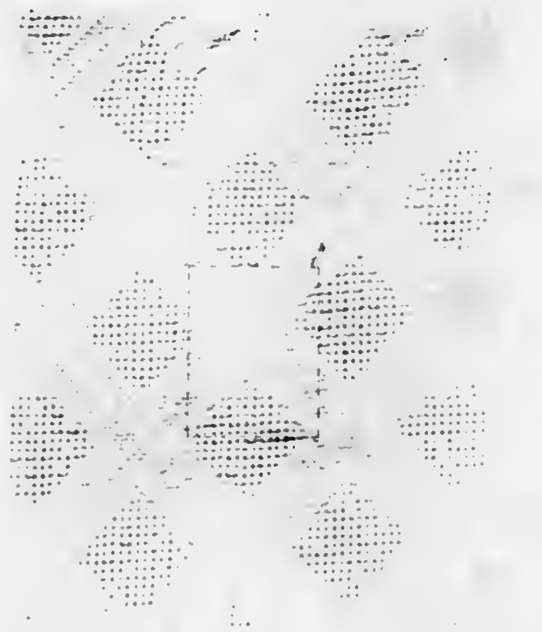
Adolphe Couturier, Dalton, Ga., assignor to Crown Crafts, Inc., Calhoun, Ga.

Continuation-in-part of Ser. No. 680,053, April 26, 1976, abandoned. This application Oct. 5, 1976, Ser. No. 729,791

Term of patent 14 years

Int. Cl. D6—*13*

U.S. Cl. D6—263



245,058
CARAFE OR SIMILAR ARTICLE

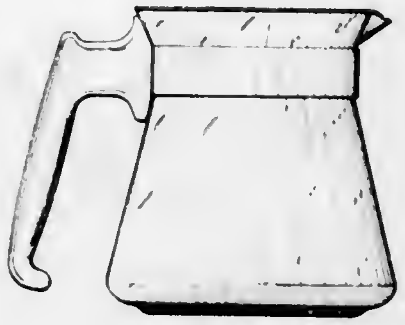
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company

Filed July 28, 1975, Ser. No. 599,416

Term of patent 14 years

Int. Cl. D7—*01*

U.S. Cl. D7—64



245,059
CREPE PAN

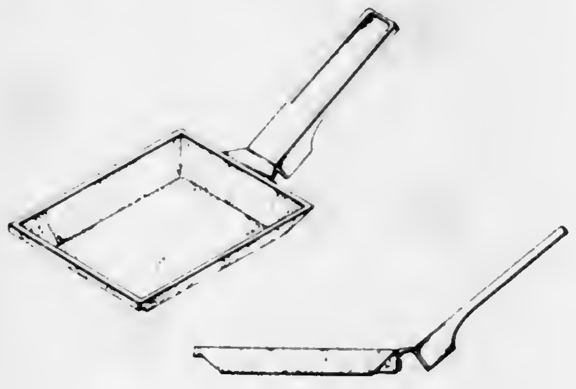
Robert S. Bardin, 409 Onda, Newport Beach, Calif. 92660

Filed Nov. 10, 1975, Ser. No. 630,692

Term of patent 14 years

Int. Cl. D7—*02*

U.S. Cl. D7—95



245,060
GRANULAR COFFEE DISPENSER ATTACHMENT FOR A BEVERAGE MAKER OR SIMILAR ARTICLE

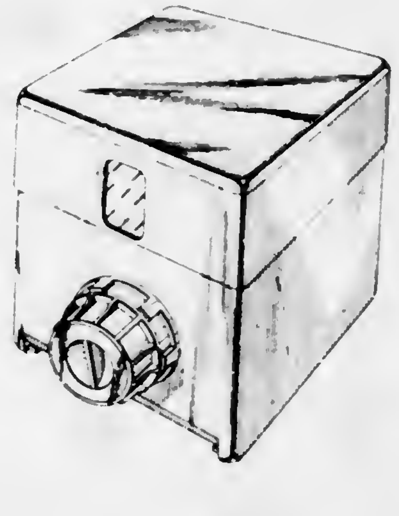
Max C. Hauenstein, Monroe, Conn., assignor to General Electric Company

Filed July 28, 1975, Ser. No. 599,417

Term of patent 14 years

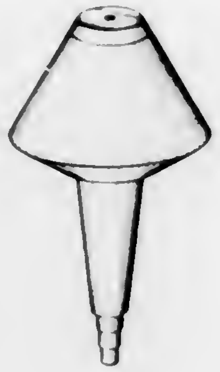
Int. Cl. D7—*04*

U.S. Cl. D7—129



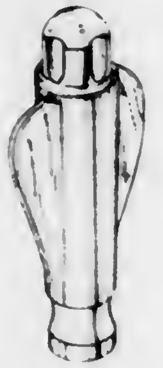
245,061
PLANT FEEDING DEVICE

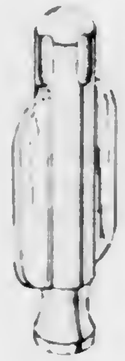
Philip B. Knapp, Lynbrook, N.Y., assignor to Hortigro, Inc., Lynbrook, N.Y.
Filed Nov. 12, 1975, Ser. No. 630,991
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D8—1

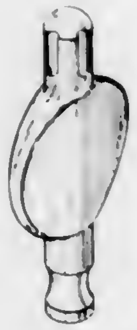


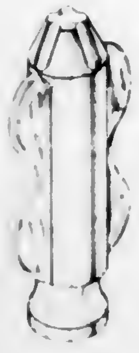
245,062
TOOL HANDLE PARTICULARLY USEFUL FOR SCREWDRIVERS

Frank M. Grame, 6606 S. Lincoln St., Littleton, Colo. 80120
Filed Mar. 22, 1976, Ser. No. 669,182
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83



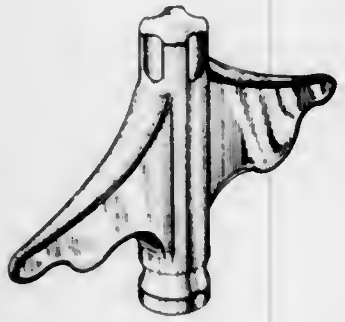






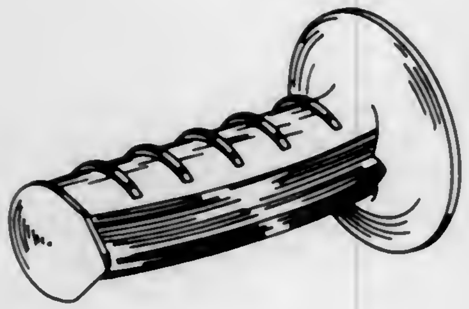
245,063
TOOL HANDLE PARTICULARLY USEFUL FOR SCREWDRIVERS

Frank M. Grame, 6606 S. Lincoln St., Littleton, Colo. 80120
Filed Mar. 5, 1976, Ser. No. 664,243
Term of patent 14 years
Int. Cl. D8—*04*
U.S. Cl. D8—83



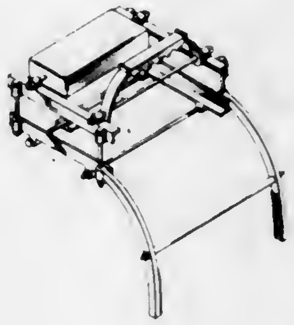
245,064
HAND GRIP

Preston L. Petty, 403 N. Main St., Newberg, Oreg. 97132
Filed Feb. 12, 1976, Ser. No. 657,594
Term of patent 14 years
Int. Cl. D8—*06*
U.S. Cl. D8—303



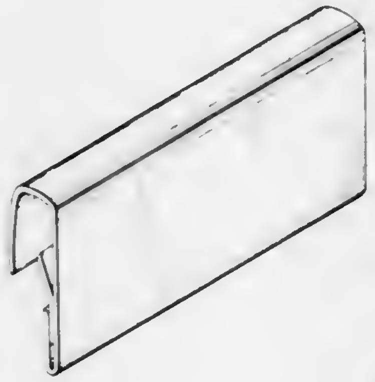
245,065
PORTABLE MOUNT FOR CITIZEN BAND RADIOS

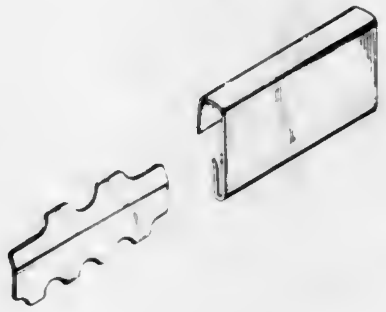
Edward T. Zick, 329 Dixieway North, South Bend, Ind. 46637
Filed July 26, 1976, Ser. No. 708,891
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D14—76



245,066
DISPLAY DEVICE FOR ATTACHMENT TO WIRE RACKS, OR SIMILAR ARTICLE

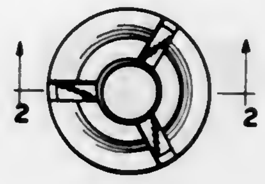
Ronald H. Taub, 1154 Sheridan Road, Highland Park, Ill. 60035
Filed Oct. 12, 1976, Ser. No. 731,844
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—361





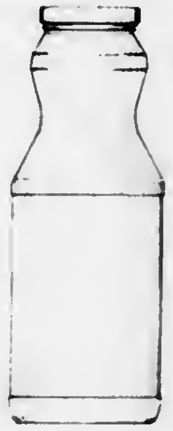
245,067
TAMPER RESISTANT NUT

Chester P. Coldren, Canton, Ohio, assignor to Eaton Corporation
Filed June 19, 1975, Ser. No. 588,280
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—397



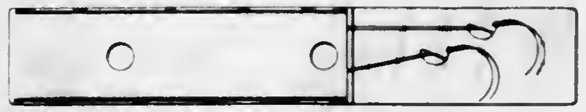
245,068
BOTTLE

Salvatore Ruriani, Elmira, N.Y., assignor to Excello Food Products, Inc., Melrose Park, Ill.
Filed July 3, 1975, Ser. No. 593,005
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—96



245,069
SUTURE PACKAGE

Harvey B. Mandel, N. Brunswick, and Michael Schuler, Edison, both of N.J., assignors to Ethicon, Inc., Somerville, N.J.
Filed Oct. 20, 1975, Ser. No. 623,862
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



245,070
PACKAGING TRAY FOR MEAT OR THE LIKE

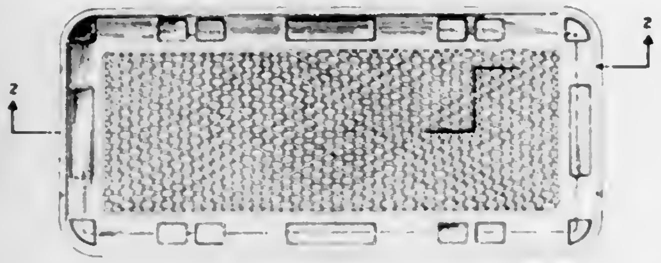
Wayne L. Congleton, Walnut, Calif., assignor to Dolco Packaging Corporation, Burbank, Calif.

Filed Oct. 15, 1975, Ser. No. 622,542

Term of patent 14 years

Int. Cl. D9—*03*

U.S. Cl. D9—219



245,071
COMBINED TAPE MEASURE, FLASHLIGHT, MAGNIFIER AND MULTIPURPOSE TOOL HOLDER

Woo Hou Kong, 146 Wai Yip Street, (5th Floor), Unit E, Kwun Tong, Kowloon, Hong Kong

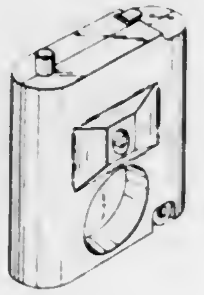
Filed Aug. 19, 1975, Ser. No. 605,826

Claims priority, application United Kingdom, Jan. 16, 1975, 969455/75

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—62



245,072
CALIPERS

Kouzo Shibukawa, Kawasaki, Japan, assignor to Mitutoyo Manufacturing Company, Ltd., Tokyo, Japan

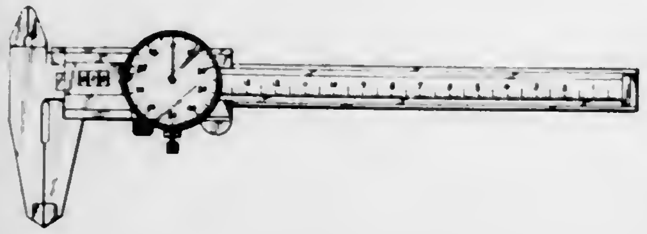
Filed Sept. 24, 1975, Ser. No. 616,223

Claims priority, application Japan, Dec. 23, 1974, 49-44795

Term of patent 14 years

Int. Cl. D10—*04*

U.S. Cl. D10—73



245,073
KNOB FOR TURNS-COUNTING DIAL

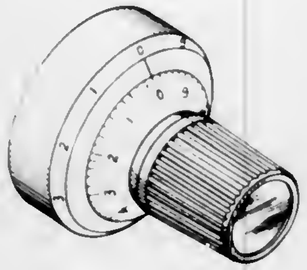
Anthony E. Taylor, P.O. Box D, La Verne, Calif. 91750

Filed Mar. 29, 1976, Ser. No. 671,142

Term of patent 14 years

Int. Cl. D10—*07*

U.S. Cl. D10—103



245,074
DIGITAL WATCH DIAL

Susumu Karibe, Matsudo; Midori Miyata, and Eiichi Osawa, both of Tokyo, all of Japan, assignors to Kabushiki Kaisha Daini Seikosha, Japan

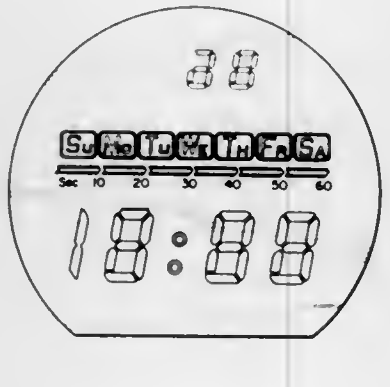
Filed Aug. 11, 1975, Ser. No. 603,307

Claims priority, application Japan, Feb. 19, 1975, 50-6653

Term of patent 14 years

Int. Cl. D10—*07*

U.S. Cl. D10—124



245,075
DISPLAY CART FOR FOOD, PARTICULARLY SOFT PRETZELS, AND THE LIKE

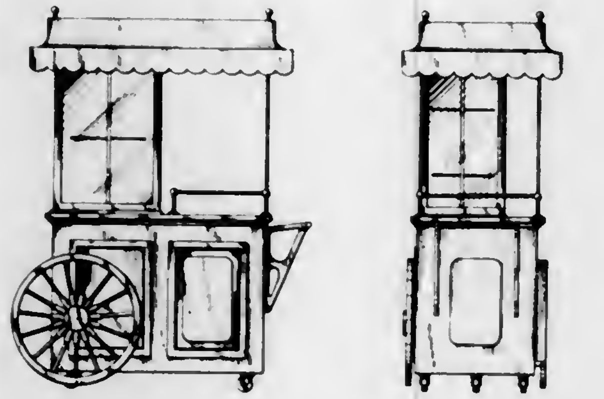
Charles K. Austin, Wheat Ridge, Colo., assignor to King Pretzel Corporation, Lakewood, Colo.

Filed Apr. 7, 1976, Ser. No. 674,382

Term of patent 14 years

Int. Cl. D12—*02*

U.S. Cl. D12—22



245,076
SELF PROPELLED CRANE

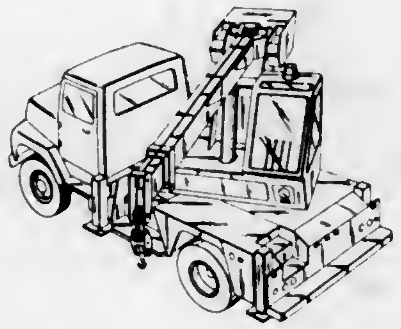
John W. Haswell, Belleville, Mich., assignor to Master Craft Engineering, Inc., Belleville, Mich.

Filed Apr. 2, 1976, Ser. No. 672,869

Term of patent 14 years

Int. Cl. D12—*05*

U.S. Cl. D12—57



245,077
MOTORCYCLE

Malcolm Adam Newell, Calne, England, assignor to Quasar Motorcycles Limited, Calne, England

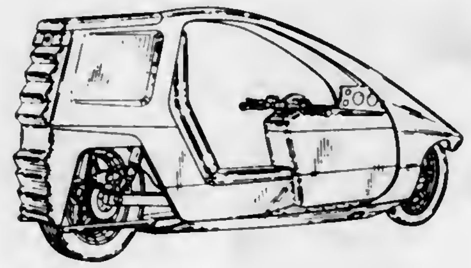
Filed Feb. 20, 1976, Ser. No. 659,734

Claims priority, application United Kingdom, Aug. 22, 1975, 972317/75

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—110



245,078
CYCLE BACK REST

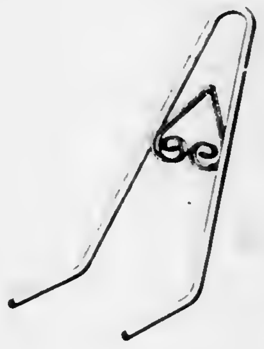
Elmer L. Greene, Middleburg, Fla., assignor to Florida Cycle Supply Company

Filed Sept. 22, 1975, Ser. No. 615,746

Term of patent 14 years

Int. Cl. D12—*11*

U.S. Cl. D12—119



245,079
HOUSING FOR A PORTABLE RADIO COMMUNICATION UNIT

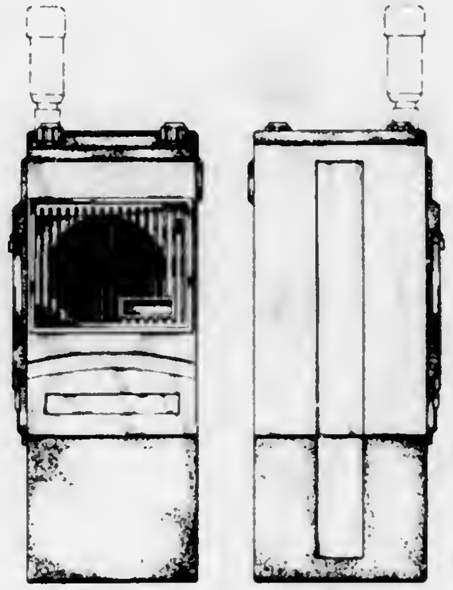
Arthur W. Judd, Seminole County, and Walter C. Simciak, Longwood, both of Fla., assignors to Scope Incorporated, Reston, Va.

Filed Oct. 19, 1976, Ser. No. 733,931

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—68



245,080
MICROFILM READER/PRINTER OR THE LIKE

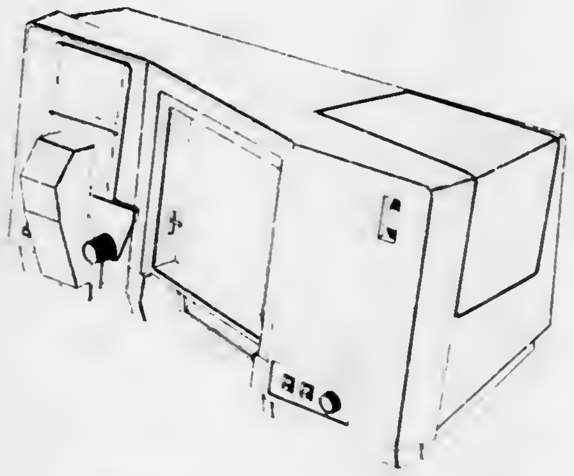
Andrew V. McClare, Rochester, and Edward B. Schoonmaker, East Rochester, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,587

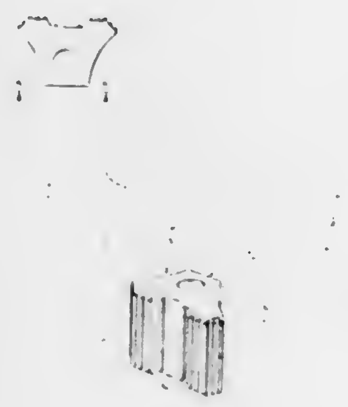
Term of patent 14 years

Int. Cl. D16—*03*

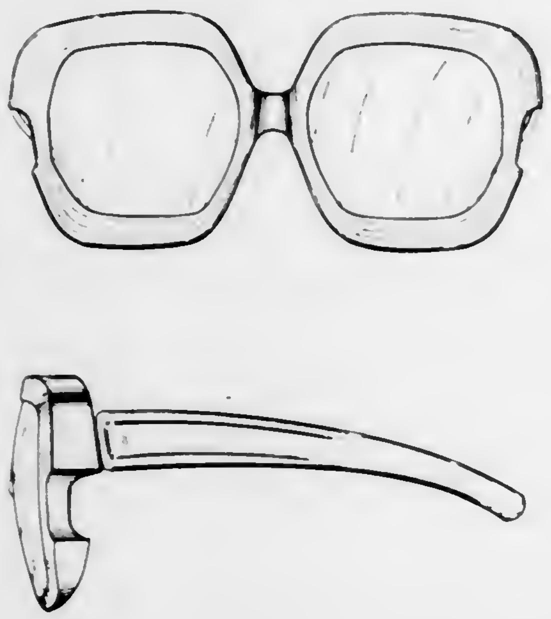
U.S. Cl. D16—28



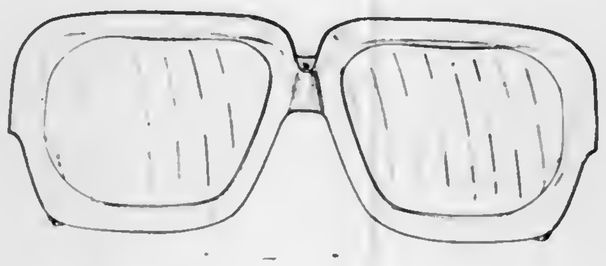
245,081
ZOOM OR FOCUS CONTROL KNOB FOR BINOCULARS
James Gerdom, 9200 Cody, Overland Park, Kans. 66214
Filed July 12, 1976, Ser. No. 704,188
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—59



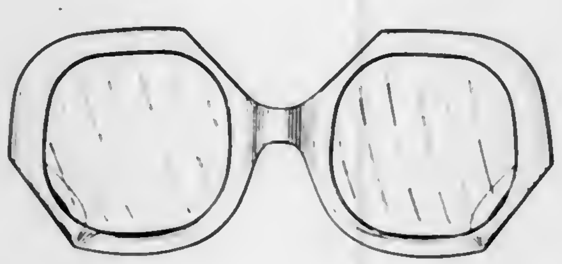
245,082
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed Oct. 14, 1975, Ser. No. 622,112
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



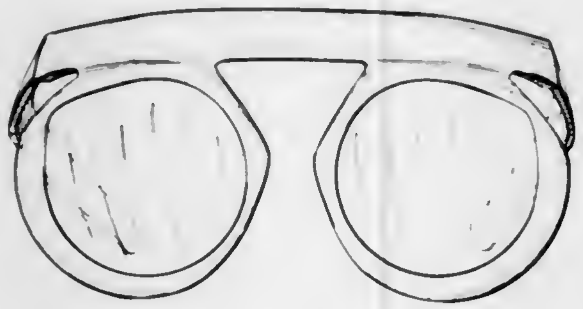
245,083
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,688
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



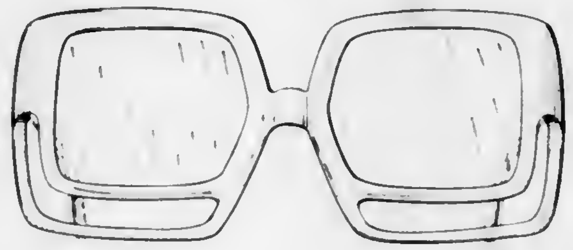
245,084
EYEGLASS FRAME
Hilde Zimmerman, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,689
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



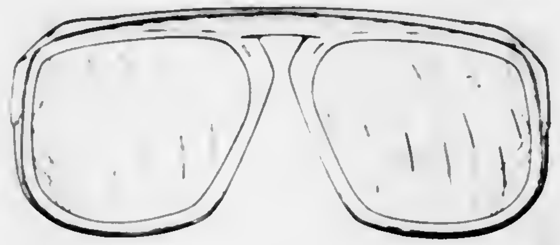
245,085
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,690
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



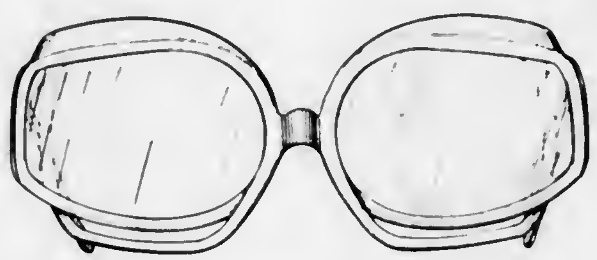
245,086
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,779
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



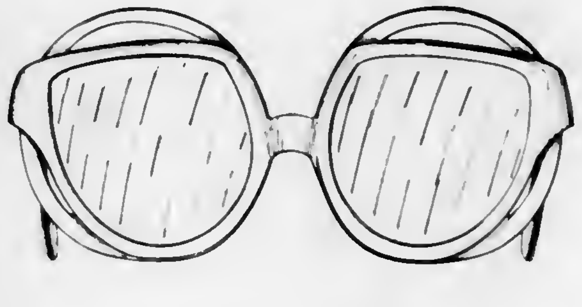
245,087
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,851
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



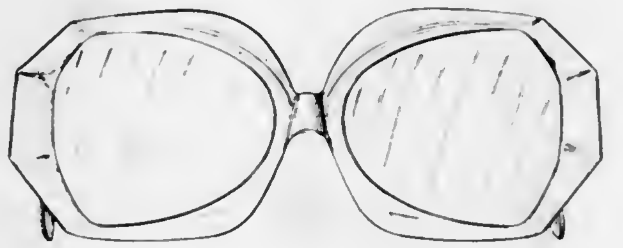
245,088
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,852
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



245,089
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,853
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65

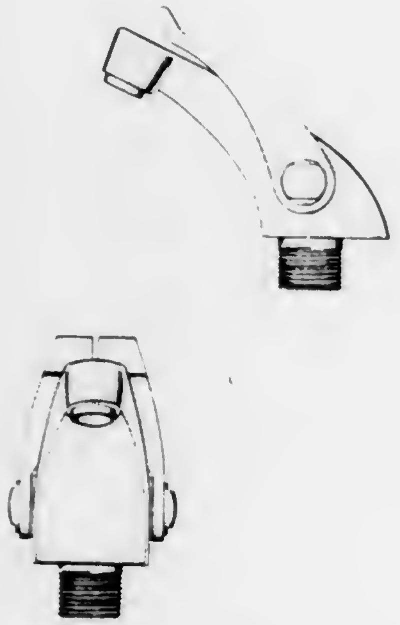


245,090
EYEGLASS FRAME
Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed July 6, 1976, Ser. No. 702,869
Term of patent 14 years
Int. Cl. D16—*06*
U.S. Cl. D16—65



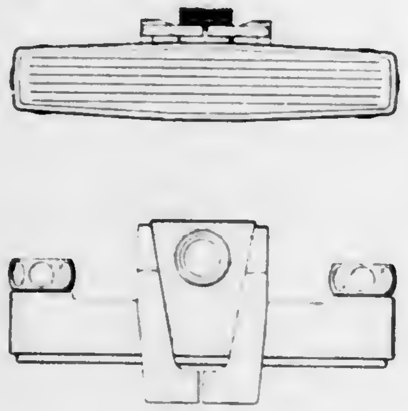
245,091
FAUCET

Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway
Filed Nov. 12, 1975, Ser. No. 631,465
Claims priority, application Norway, May 16, 1975, 7556653
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—25



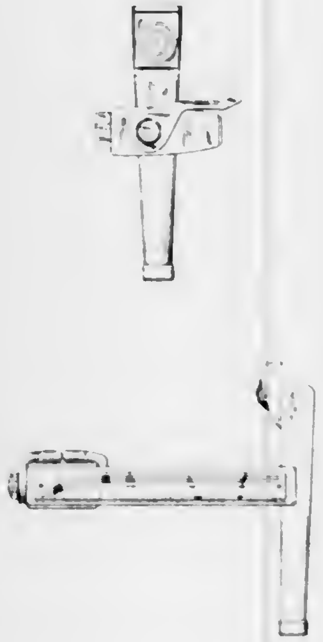
245,092
FAUCET

Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway
Filed Nov. 13, 1975, Ser. No. 631,602
Claims priority, application Norway, May 16, 1975, 7556657
Term of patent 3½ years
Int. Cl. D23—*0*
U.S. Cl. D23—26



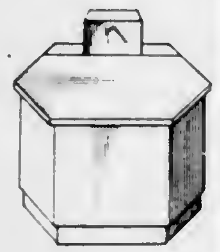
245,093
COMBINED FAUCET AND HAND SHOWER

Gustav Saether, Leksvik, Norway, assignor to Lyng Industrier A-S Leksvikarmatur, Leksvik, Norway
Filed Nov. 14, 1975, Ser. No. 632,163
Claims priority, application Norway, July 24, 1975, 7556826
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—26



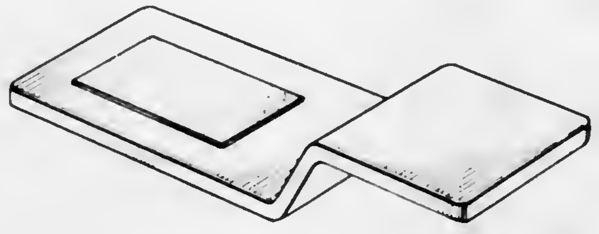
245,094
BIDET BOX

Simone Arial Zieman, Apt. 206, 161 Augusta Street, Ottawa, Ontario, Canada (K1N 8B6)
Filed Jan. 29, 1976, Ser. No. 653,390
Claims priority, application Canada, Nov. 18, 1975, 181175
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—51



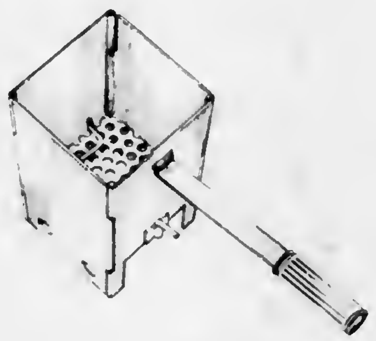
245,095
SANITARY TOILET SEAT LIFTER

Robert J. Murray, 860 Moraga Drive, Apt. 2, Bel Air, Calif. 90049
Filed Nov. 19, 1975, Ser. No. 633,254
Term of patent 14 years
Int. Cl. D23—*02*
U.S. Cl. D23—71



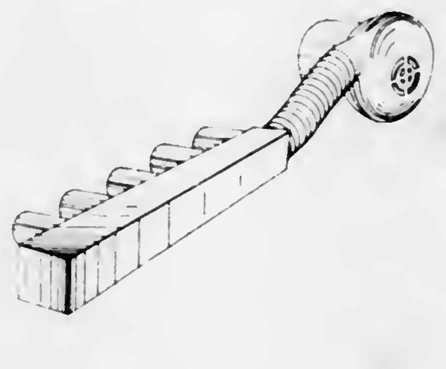
245,096
COLLAPSIBLE CHARCOAL LIGHTER

C. Arthur Heidelbach, 12 Simpson St., Geneva, Ill. 60134
Filed Aug. 11, 1976, Ser. No. 713,418
Term of patent 14 years
Int. Cl. D23—*99*
U.S. Cl. D23—90.1



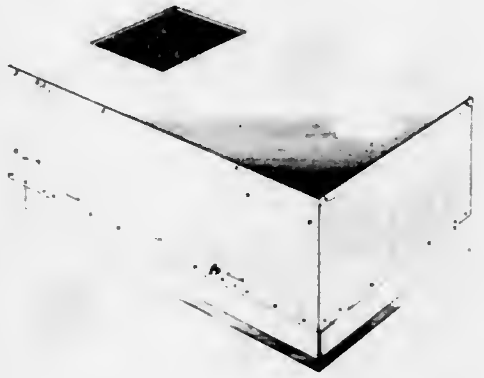
245,097
HOUSING FOR HEAT DISPENSER FOR A TUBULAR FIREPLACE HEATER

Donald A. Boyd, Euclid, Ohio, assignor to Production Experts, Inc., Cleveland, Ohio
Filed Apr. 28, 1975, Ser. No. 572,148
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—127



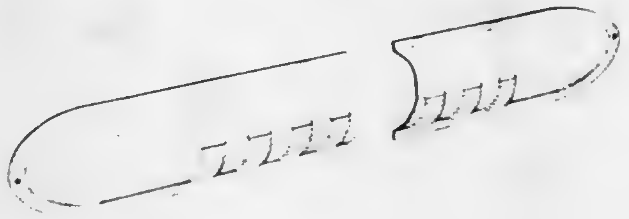
245,098
ROOF-MOUNTED BUILDING FRESH AIR VENTILATOR

Herbert M. Kay, Waco, Tex., assignor to Command-Aire Corporation, Waco, Tex.
Filed Mar. 17, 1975, Ser. No. 559,068
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—153



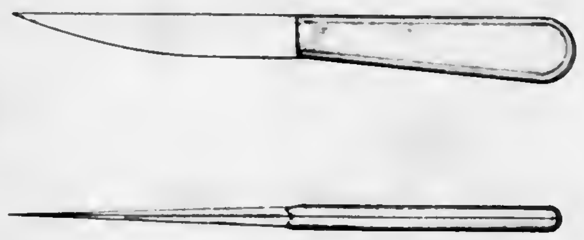
245,099
VENTILATOR FOR A VEHICLE, HOUSING STRUCTURE OR THE LIKE

Wilfred W. Wilson, 1055 Bloor St. E. Penthouse 12, Mississauga, Ontario, Canada
Filed Apr. 10, 1975, Ser. No. 566,728
Term of patent 14 years
Int. Cl. D23—*04*
U.S. Cl. D23—164



245,100
INTERDENTAL CLEANSER AND STIMULATOR

Bernard Russell Venning, 11 Russell Ave., Plymouth, Devon, England
Filed Sept. 30, 1974, Ser. No. 511,297
Claims priority, application United Kingdom, Mar. 28, 1974, 966/74
Term of patent 3½ years
Int. Cl. D24—*99, 02*
U.S. Cl. D24—10

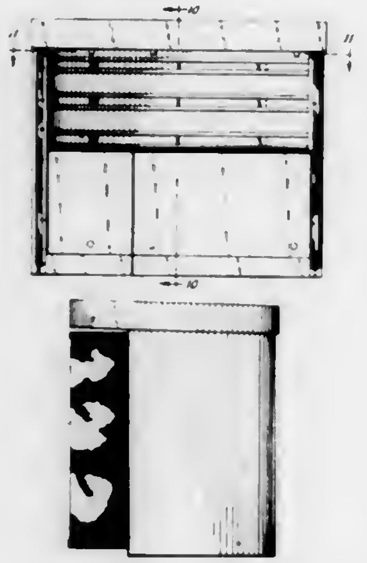


245,101

COMBINED NEWSSTAND AND REMOVABLE WINDSCREENS

Robert A. Spillman; Charles H. Klein, both of Bethlehem; Frederick C. Savage, and Edwin M. Simon, both of Philadelphia, all of Pa., assignors to Bulletin Company, Philadelphia, Pa.
Filed Sept. 8, 1975, Ser. No. 611,316
Term of patent 14 years
Int. Cl. D25—*03*

U.S. Cl. D25—16

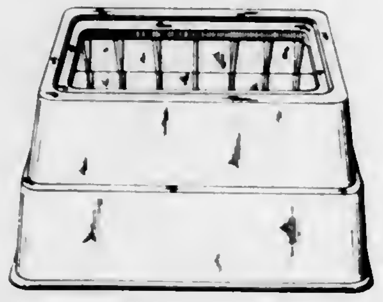


245,102

UNDERGROUND UTILITY HOUSING

Walter H. Gross, Campbell, Tex., assignor to Burton B. Jones, Midland, Tex., a part interest
Filed Jan. 30, 1976, Ser. No. 653,642
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D25—36

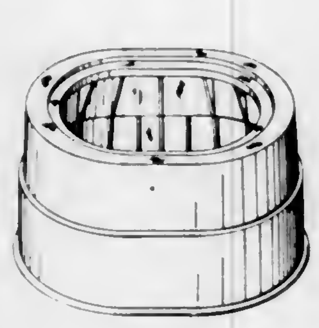


245,103

UNDERGROUND UTILITY HOUSING

Walter H. Gross, Campbell, Tex., assignor to Burton B. Jones, Midland, Tex., a part interest
Filed Jan. 30, 1976, Ser. No. 653,643
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D25—36

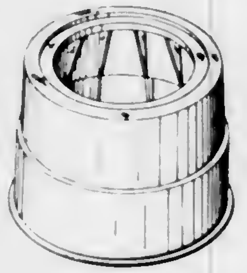


245,104

UNDERGROUND UTILITY HOUSING

Walter H. Gross, Campbell, Tex., assignor to Burton B. Jones, Midland, Tex., a part interest
Filed Jan. 30, 1976, Ser. No. 653,644
Term of patent 14 years
Int. Cl. D25—*02*

U.S. Cl. D25—36

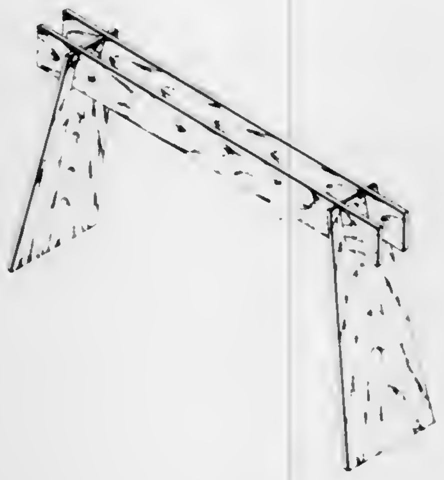


245,105

SAW HORSE

Richard J. Rader, 3005 S. Harbor, Santa Ana, Calif. 92704
Filed Nov. 20, 1975, Ser. No. 630,690
Term of patent 14 years
Int. Cl. D8—*99*

U.S. Cl. D25—67

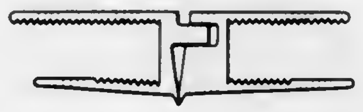


245,106

PANEL MEMBER FOR MOUNTING WALL AND CEILING PANELS

Lloyd J. Scheid, 4404 Grimes Place, Encino, Calif. 91316
Filed Mar. 4, 1976, Ser. No. 663,777
Term of patent 14 years
Int. Cl. D25—*01*

U.S. Cl. D25—76

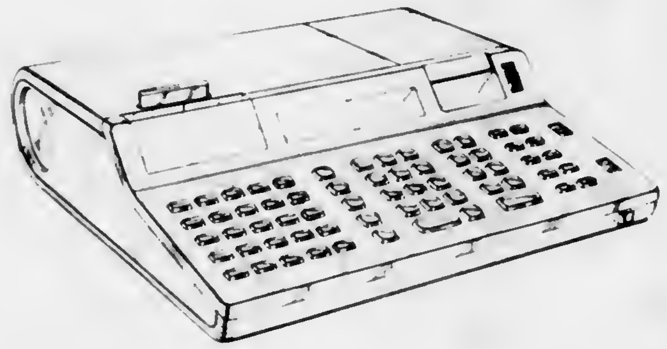


245,107

ELECTRONIC CALCULATOR

Barry R. Mathis, Loveland, Colo., assignor to Hewlett-Packard Company, Palo Alto, Calif.
Filed Oct. 1, 1975, Ser. No. 618,670
Term of patent 14 years
Int. Cl. D18—*01*

U.S. Cl. D64—11 B

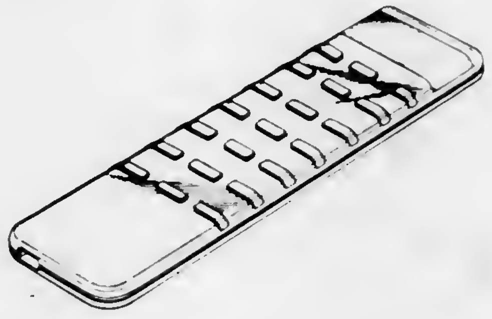


245,108

CALCULATOR

John Hunter Pemberton, Cambridge, England, assignor to Sinclair Radionics Limited, Huntingdon, England
Filed May 6, 1976, Ser. No. 683,748
Claims priority, application United Kingdom, Nov. 10, 1975, 973165/75
Term of patent 14 years
Int. Cl. D18—*01*

U.S. Cl. D64—11 B

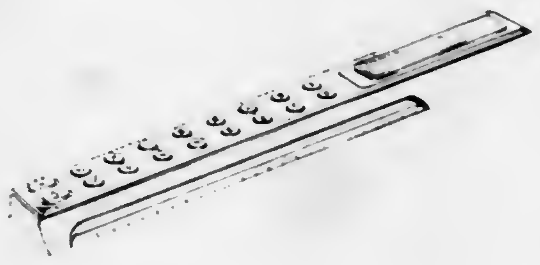


245,109

DESK TOP CALCULATOR WITH SCALE

Eiichi Yoshioka, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed June 9, 1976, Ser. No. 694,175
Claims priority, application Japan, Dec. 10, 1975, 50-48579
Term of patent 14 years
Int. Cl. D18—*01*; D10—*04*

U.S. Cl. D64—11 B

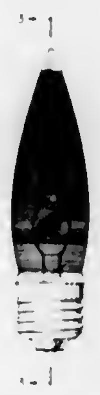


245,110

LAMP

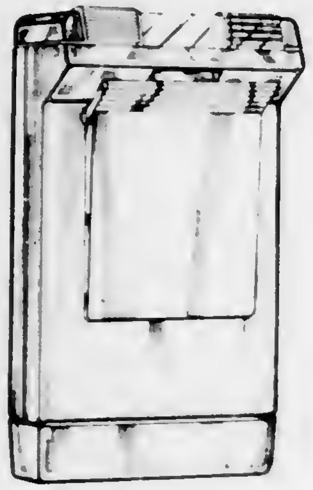
Hideo Moriyama, Tokyo, Japan, assignor to Moriyama Sangyo Kabushiki Kaisha, Tokyo, Japan
Filed May 20, 1976, Ser. No. 688,245
Claims priority, application Japan, Dec. 3, 1975, 50-47589
Term of patent 14 years
Int. Cl. D26—*04*

U.S. Cl. D48—33



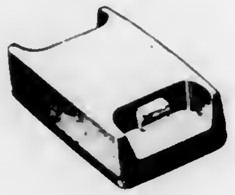
245,111
STAFF LOCATOR

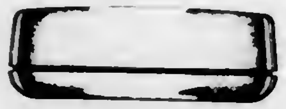
Peter Maddock, Sollentuna, Sweden, assignor to Telefonaktiebolaget L M Ericsson, Stockholm, Sweden
Filed July 28, 1975, Ser. No. 599,609
Claims priority, application Sweden, Feb. 10, 1975, 7500031
Term of patent 7 years
Int. Cl. D14—*03*
U.S. Cl. D14—68



245,112
TELEPHONE STATION SET BASE

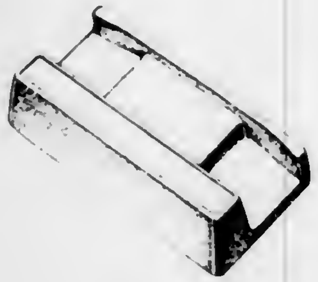
Joseph Robert Everhart, Holmdel; Donald Michael Genaro, Haworth; John Hale Liebe, Colts Neck, all of N.J.; Gordon Elliot Sylvester, Jamaica, N.Y.; Alvin Richard Tilley, Red Bank, and James Thomas Walker, Matawan, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 30, 1976, Ser. No. 718,854
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60

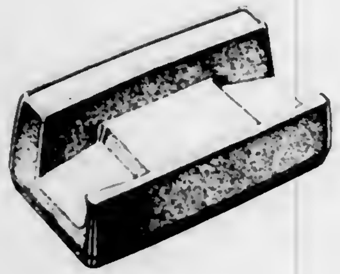




245,113
TELEPHONE STATION SET BASE

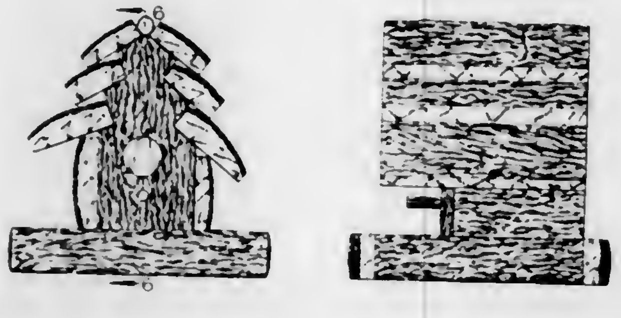
Donald Michael Genaro, Haworth, N.J.; Gordon Elliot Sylvester, Jamaica, N.Y., and Alvin Richard Tilley, Red Bank, N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Aug. 30, 1976, Ser. No. 718,855
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—60





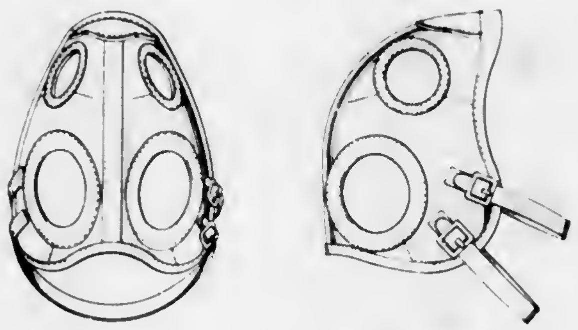
245,114
BIRD FEEDER

Roland D. Vaughn, 6321 NW. 110th St., Hialeah, Fla. 33012
Filed Dec. 3, 1976, Ser. No. 747,471
Term of patent 14 years
Int. Cl. D30—*03*
U.S. Cl. D30—14



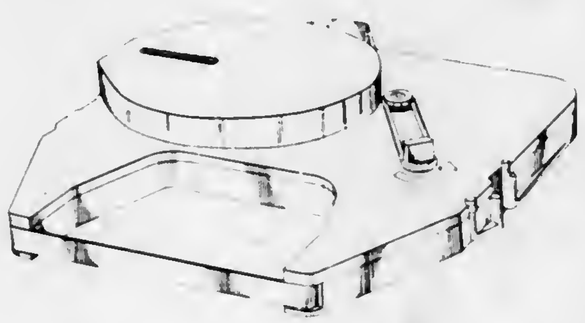
245,115
PROTECTIVE MASK FOR A HORSE

Allen Dale Centers, deceased, late of Arcadia, Calif., by Alta A. Centers, administratrix, 222 E. Foothill Blvd., Arcadia, Calif. 91006
Filed Aug. 20, 1975, Ser. No. 606,288
Term of patent 14 years
Int. Cl. D30—*01*
U.S. Cl. D30—37



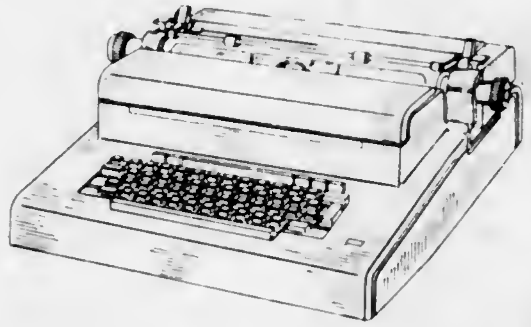
245,116
RIBBON CARTRIDGE

Richard D. Trezise, Newark, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Aug. 25, 1975, Ser. No. 607,656
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



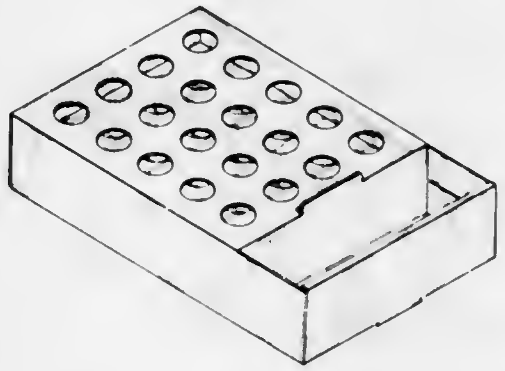
245,117
TYPEWRITING MACHINE

Ettore Sottsass, Milan, Italy, assignor to Ing. C. Olivetti & C., S.p.A., Ivrea (Torino), Italy
Filed Sept. 24, 1975, Ser. No. 616,377
Claims priority, application Italy, Mar. 27, 1975, 52988/75
Term of patent 14 years
Int. Cl. D18—*01*
U.S. Cl. D64—11 A



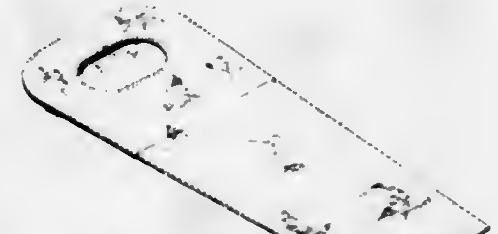
245,118
TRANSPORT RACK FOR SPECIMEN TUBES

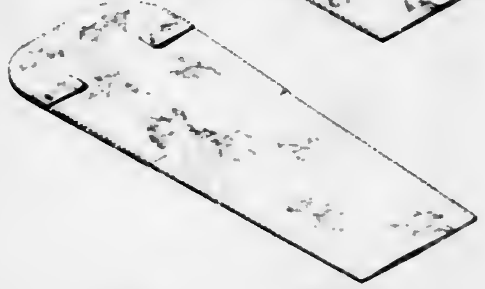
George Norman Heaton, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed July 21, 1975, Ser. No. 597,358
Term of patent 14 years
Int. Cl. D24—*01;* D9—*99*
U.S. Cl. D24—32



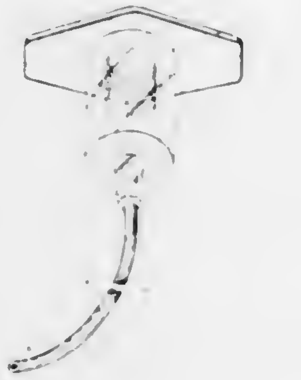
245,119
OSTOMY APPLIANCE COVER

Eugene L. Harris, 1717 W. Romneya No. E, Anaheim, Calif. 92801
Filed Nov. 6, 1975, Ser. No. 629,407
Term of patent 14 years
Int. Cl. D2—*02;* D24—*02*
U.S. Cl. D24—58

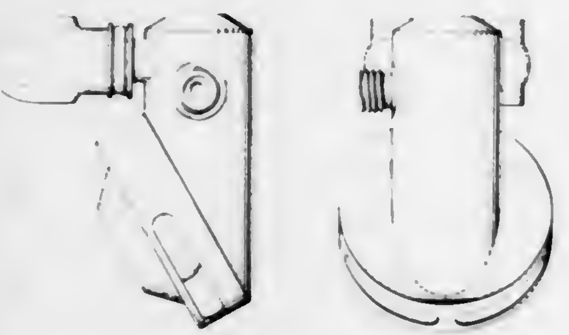




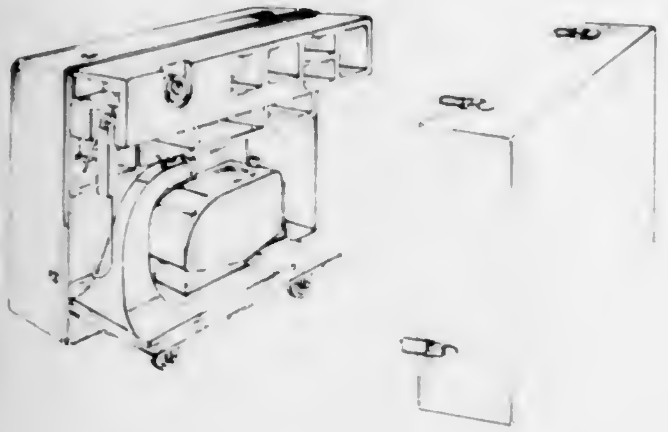
245,120
COMBINED SYRINGE-LARYNGOTRACHEAL CANNULA
Dean Richard Katerndahl, Wheaton, Ill., assignor to Abbott Laboratories, North Chicago, Ill.
Filed Sept. 9, 1974, Ser. No. 504,575
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—60



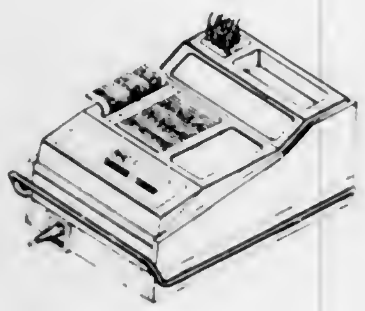
245,121
HOUSING FOR THE DEMAND REGULATOR OF A BREATHING APPARATUS
Raymond A. Christianson, P.O. Box 1513, Manhattan Beach, Calif. 90266
Filed Aug. 14, 1975, Ser. No. 605,019
Term of patent 14 years
Int. Cl. D29—*02*
U.S. Cl. D83—1 I.



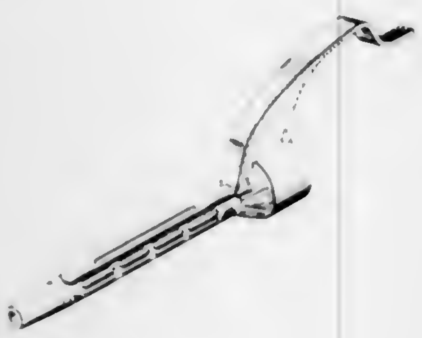
245,122
ENCLOSABLE MOBILE BLOOD COLLECTION APPARATUS
Evan W. Rosen, Tucson, Ariz., assignor to Engineering & Research Associates, Inc., Tucson, Ariz.
Filed Sept. 11, 1975, Ser. No. 612,287
Term of patent 14 years
Int. Cl. D24—*02*
U.S. Cl. D24—8



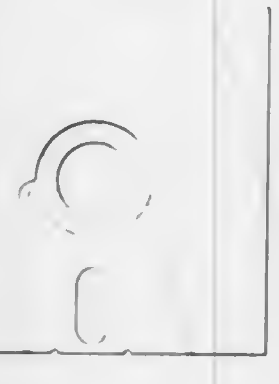
245,123
ELECTROCARDIOGRAPH
Gerald J. Reiser, 1820 W. Edgerton Ave., Milwaukee, Wis. 53221
Filed Oct. 1, 1976, Ser. No. 728,641
Term of patent 14 years
Int. Cl. D24—*01*
U.S. Cl. D24—17



245,124
CURLING IRON ATTACHMENT
Martin Jay Wolff, West Haven, Conn., assignor to Sperry Rand Corporation, Bridgeport, Conn.
Filed Jan. 12, 1976, Ser. No. 648,187
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—35



245,125
FLEXIBLE MAGNETIC DISC CARTRIDGE
Albert S. Chou, 15208 Stratford Court, Monte Sereno; Donald J. Massaro, 121 Altura Vista, and Harold C. Medley, 18631 Blythswood Drive, both of Los Gatos, all of Calif. 95030
Filed June 1, 1976, Ser. No. 691,406
Term of patent 14 years
Int. Cl. D14—*99*
U.S. Cl. D14—10



LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JULY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name
(in accordance with city and telephone directory practice).

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A. H. Robins Company, Inc.: *See*—
  Alphin, Reevis Stancil; and Ward, John Wesley, 4,036,957, Cl. 424-232.000.
A. R. I. Propaflor Limited: *See*—
  Harvey, Ronald William Stanley, 4,035,967, Cl. 52-126.000.
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  Morais, Carroll F., 4,036,057, Cl. 73-88.00R.
Action Packaging Corporation: *See*—
  Kugler, Robert J., 4,036,363, Cl. 206-526.000.
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Adams, Kenneth Waldock. Medicinal insert instrument. 4,036,230, Cl. 128-269.000.
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  Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 4,036,660, Cl. 106-90.000.
Adams, William R., to Sun Chemical Corporation. Photopolymerizable compositions containing a keto dioxolane as the photosensitizer 4,037,021, Cl. 428-522.000.
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  Costa, Thomas A., 4,037,256, Cl. 358-248.000.
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  Aisaka, Noboru; Shindo, Tadashi; and Kawakami, Tatsuya, 4,036,034, Cl. 66-50.00R.
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  Okumura, Kimio, Soya, Tatsunori, Kauchi, Yosuke, and Ohi, Hideyuki, 4,037,101, Cl. 250-310.000.
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  Hellmig, Ehrhard, and Ranz, Erwin, 4,036,646, Cl. 96-74.000.
  Wagner, Karl; and von Fischern, Bernhard, 4,037,232, Cl. 354-23.00R.
Agsten, Carl F. Wind driven electric power generator. 4,036,916, Cl. 261-109.000.
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  Foster, George B.; and Gibbs, Paul Douglas, 4,037,086, Cl. 235-150.220.
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  Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, 4,037,033, Cl. 429-206.000.
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  Pehrsson, Anders Lennart, 4,036,163, Cl. 115-34.00R.
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  Braun, Johannes, and Sturm, Winfried, 4,035,981, Cl. 53-21.00R.
Aldorfer, Louis. Vacuum-operated reciprocating engine. 4,036,016, Cl. 60-325.000.
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Alexander, Merwin K., Meyer, Daniel J.; and Cohen, Philip, to Optical Associates, Inc. Instrument swivel bracket. 4,036,459, Cl. 248-11.000.
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Algier, Joseph C. Dining table service assembly 4,036,150, Cl. 108-50.000.
Alig, Leo, Furst, Andor; and Muller, Marcel, to Hoffmann-La Roche Inc. D-homopregnanes. 4,036,874, Cl. 260-488.00B.
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Alto Corporation: *See*—
  White, David Laverne, 4,036,352, Cl. 198-778.000.
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  Theeuwes, Felix, 4,036,228, Cl. 128-260.000.
  Zaffaroni, Alejandro; Michaels, Alan S.; and Theeuwes, Felix, 4,036,227, Cl. 128-260.000.
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- arrangement of video display system with a crossed-grid flat display panel. 4,037,224, Cl. 340-324.00M
- Amato, Jose; Propker, Marta; Pongracz, Magdalena Julia Beatriz, and Szabo, Jorge Luis Jose. Mono substituted malonic acid diamides and process of preparing them. 4,036,985, Cl. 424-320.000.
- Amberg, Stephen W.; and Landers, Frank S., to Owens-Illinois, Inc. Film-lined foam plastic receptacles and laminated materials and methods for making the same. 4,036,675, Cl. 156-245.000.
- Ambrose, Everett J., to Monsanto Company. Unitized palletless load and method of forming same. 4,036,364, Cl. 206-526.000.
- AMC Industries, Inc.: *See—*
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- American Air Filter Company, Inc.: *See—*
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- American Cyanamid Company: *See—*
  - Asato, Goro, 4,036,979, Cl. 424-275.000
  - Boyles, Bruce K.; and Crow, John L., Jr., 4,036,941, Cl. 423-558.000
  - Castellion, George Augustus; and Marzluff, William Frank, 4,036,870, Cl. 260-465.300.
  - Curran, William Vincent; Tomcufcik, Andrew Stephen, and Ross, Adma Schneller, 4,036,849, Cl. 260-308.00D
  - Lassiter, Marvin Stevens, Sr., 4,036,752, Cl. 210-46.000.
- American Hoist & Derrick Company: *See—*
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- American Sterilizer Company: *See—*
  - Brendgord, Thomas, and Fisher, Kenneth J., 4,037,096, Cl. 240-1.400
- Ammann, Paul R.; and Kim, Jonathan J., to Kennecott Copper Corporation. Pyrometallurgical process for smelting nickel and nickel-copper concentrates including slag treatment. 4,036,636, Cl. 75-74.000.
- AMP Incorporated: *See—*
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- Anderson, John C., to International Harvester Company. Gear adjusting, locking, and pre-loading means. 4,036,076, Cl. 74-409.000
- Anderson, John H.; and Waters, Elmer D., to McDonnell Douglas Corporation. Permafrost stabilizing heat pipe assembly. 4,036,286, Cl. 165-45.000.
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- Ando, Yoshikazu; and Yokozato, Junichi, to Zenza Bronica Industries, Inc. Grip for a camera. 4,037,240, Cl. 354-212.000.
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  - Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,711, Cl. 204-52.00R.
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- Bagley, Charles Stuart. Method and apparatus for producing a directed, high-velocity stream of compressible fluid. 4,036,020, Cl. 60-644.000.
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- Bailey, John M., to Caterpillar Tractor Co. Unit fuel injector. 4,036,195, Cl. 123-139.0AK.
- Bailey, Ronald Barry; and Stitt, Thomas Detlor, to General Electric Company. Multiple frequency chopper control. 4,037,145, Cl. 318-341.000.
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  - Meadowcraft, Ronald Ross; and Bain, Alastair Stewart, 4,036,691, Cl. 176-68.000.
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- Bajorek, Jay E.; and Newman, Albert L., to Questor Corporation. Tubular spindle cover. 4,035,978, Cl. 52-727.000.
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- Baker, Don R., to Stauffer Chemical Company. Insecticidal and miticidal active isothiuronium tricyclohexyl tin imide. 4,036,958, Cl. 424-245.000.
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  - Pallos, Ferenc M.; and Baker, Don R., 4,036,628, Cl. 71-86.000.
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  - Byrns, John, 4,036,616, Cl. 55-498.000.
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  - Miller, Edward C., 4,036,047, Cl. 72-347.000.
- Ballas, George C.; and Geist, Thomas N., to Weed Eater, Inc. Rotary cutting assembly. 4,035,912, Cl. 30-276.000.
- Balz, Gunther W., to Roto-Finish Company. Finishing apparatus having part-isolating means which confines or maintains contents in individual compartments and is carried along by said contents. 4,035,960, Cl. 51-163.100.
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  - Becker, Willi, 4,036,565, Cl. 417-420.000.
- Bamberg, Walter H., to Cryogenic Technology, Inc. Lost-motion refrigeration drive system. 4,036,027, Cl. 62-6.000.
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  - Darsie, Burns; and Schewe, Richard A., 4,036,262, Cl. 139-11.000.
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- Barnes, Gerald O., and Horne, Charles E. Fuel dispensing arrangement. 4,036,403, Cl. 222-23.000.
- Barnes, J. Haywood, to Oldham, Edwin W.; and Oldham, Vern L., part interest to each. Low friction meat extruder and cutter means therefor. 4,036,442, Cl. 241-82.500.
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- Barth, Wayne E., to Pfizer Inc. 3-Hydroxy and 3-acetoxy-6-triphenylmethylaminopenams. 4,036,846, Cl. 260-306.70C.
- Barton, Derek Harold Richard, and Hesse, Robert Henry, to Research Institute for Medicine and Chemistry Inc. Chemical process. 4,036,864, Cl. 260-397.300.
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  - Blechschmitt, Kurt; Reuter, Peter; Wirth, Friedrich, Buerger, Gert; and Seubert, Rolf, 4,036,783, Cl. 252-461.000.
  - Engelbach, Heinz; and Sprague, Michael Jolyon, 4,036,860, Cl. 260-369.000.
  - Hammon, Fritz; Schnell, Georg, and Reimer, Karl-Juergen, 4,037,259, Cl. 360-66.000.
  - Keppler, Hans Georg; Stahnecker, Erhard; and Moeller, Rolf, 4,036,794, Cl. 260-2.50B.
  - Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gonsior, Leonhard; and Gruber, Wolfgang, 4,037,042, Cl. 526-106.000.
  - Voges, Dieter, Winderl, Siegfried, and Mueller, Herbert, 4,036,883, Cl. 260-585.00B.
  - Wolf, Hans; Gerendas, Jozsef; and Wilhelm, Ernst, 4,036,587, Cl. 8-92.000.
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  - Servais, Ronald A.; Bauer, Paul T.; and Meckstroth, Alan F., 4,036,519, Cl. 296-1.00S.
- Baugh, Benton F., to Vetco Offshore Industries, Inc. Multi-pressure, single line supply system. 4,036,247, Cl. 137-236.000.
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  - Boehmke, Gunther, 4,036,826, Cl. 260-205.000.
  - Enders, Edgar, 4,036,850, Cl. 260-309.500.
  - Hederich, Volker; Bien, Hans-Samuel; and Gehrke, Gunter, 4,036,862, Cl. 260-380.000.
  - Hoffmann, Hellmut; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,036,947, Cl. 424-217.000.
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  - Knickel, Birger; Binsack, Rudolf; Rudolph, Hans; Rosenkranz, Hans Jurgen; and Bottenbruch, Ludwig, 4,036,748, Cl. 210-23.00H.
  - Lohwasser, Hermann; Nogaj, Alfred; and Reinehr, Ulrich, 4,035,884, Cl. 28-281.000.
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  - Moritz, Karl-Ludwig, 4,036,824, Cl. 260-186.000.
  - Rademachers, Jacob; Erfurth, Henning, and Hund, Franz, 4,036,662, Cl. 106-300.000.
  - Stolzer, Claus; Homeyer, Bernhard; Hammann, Ingeborg; and Unterstenhofer, Gunter, 4,036,956, Cl. 424-210.000.

Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl. 260-251.00R
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Becker, Otto Alfred. Resistance welding of sheet metal coated with layers. 4,037,073, Cl. 219-92.000.
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Lee, Charles Meng-Yuan, 4,037,115, Cl. 307-214.000.
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Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., to Motorola, Inc. Microprocessor interrupt logic. 4,037,204, Cl. 364-200.000.
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Kaminski, James J.; and Bodor, Nicolae S., 4,036,843, Cl. 260-294.80R.
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Hanson, Carl V., and Whitener, Philip C., 4,036,257, Cl. 137-614.060.
Scharrer, George S., 4,036,452, Cl. 244-1.00N.
Whitener, Philip C., 4,036,455, Cl. 244-118.00R.
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Strow, Lawrence Evans, and Bolth, Franklin Anderson, 4,036,746, Cl. 209-166.000.
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Bonner, Gilbert Belmont, and Dessel, Joseph Leo, to International Business Machines Corporation. Linear actuator. 4,037,122, Cl. 310-14.000.
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Boyles, Bruce K.; and Crow, John L., Jr., to American Cyanamid Company. Preparation of ferric sulfate solutions. 4,036,941, Cl. 423-558.000.

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Breslow, Jeffrey D., to Marvin Glass & Associates Game apparatus 4,036,493, Cl 273-1 00M
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Bright, James A., to General Motors Corporation. Refuse compactor-incinerator disposer. 4,036,152, Cl. 110-8 00E.
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British Cast Iron Research Association: *See—*
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Brostrom, Anders, to Berol Kemi AB. Process for the continuous sulphonation of alkyl aromatic hydrocarbons. 4,036,875, Cl. 260-505.00S.
Broughton, Donald B., to UOP Inc. Process for separating normal and isoparaffins. 4,036,745, Cl. 208-310.00Z.
Brown, David Keith; Dabill. David William; Firth, Jack Graham, Jones, Alan; and Jones, Thomas Alwyn, to National Research Development Corporation Detection of carbon monoxide. 4,036,592, Cl. 23-232.00E.
Brown, Francis Barton: *See—*
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Brown, George E.; and Farkas, Daniel F., to United States of America, Agriculture. System for treating particulate material with gaseous media. 4,035,925, Cl. 34-8.000.
Brown, Michael Trevenen; and Rodway, William George, to Imperial Chemical Industries Limited. Process for preparing a friable tetrafluoroethylene polymer powder from unsintered coagulated dispersion grade tetrafluoroethylene polymer. 4,036,718, Cl. 204-159.200.
Brown, Patrick M., to Foote Mineral Company. Process for the production of high purity lithium hydroxide. 4,036,713, Cl. 204-98.000.
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Bucalo, Louis. Fluid-collecting and microorganism-detecting devices. 4,036,214, Cl. 128-2.00F.
Bucco, Mario P.; and Van Valkenburg, Alvin, to Mearl Corporation, The. Foamed mastic composition, building articles coated therewith, and method of preparing same. 4,036,656, Cl. 106-88.000.
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Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,967, Cl. 424-269.000.
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Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, to Beecham Group Limited. Isocarbostyril-3-carboxylic acid derivatives for the prophylaxis of asthma, hayfever and rhinitis. 4,036,964, Cl. 424-258.000.
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Burge, David A. Toy construction set having interconnectible components with interfitting formations. 4,035,947, Cl. 46-25.000.

Burge, Malcolm Leonard Ernest; and Gill, Heather Ann, to Tate & Lyle Limited Icing mixture. 4,037,000, Cl. 426-572.00J.
Burger, Charles H. Interchangeable lane bowling calculator. 4,035,931, Cl. 35-29.00F.
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Burnett, David Boom gate. 4,035,955, Cl. 49-280.000.
Burnett, Gary L.; and Tsuda, George I., to Hughes Aircraft Company Microwave tuning device. 4,037,182, Cl 333-73.00R.
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Burson, Bob O., to R. E. Phelon Company, Inc. Single core condenser discharge ignition system. 4,036,201, Cl. 123-148.0CC.
Burtenshaw, Raymond Alfred Frank, to Colt International Limited. Ventilators. 4,036,120, Cl. 98-43.00R.
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Holton, Harry Hutchinson, 4,036,681, Cl. 162-65.000.
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Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased, 4,036,6[illegible]0, Cl. 96-114 100.
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Casagrande, Bruno Telescopic columns of machines for making foundations, and the telescopic columns thereby derived. 4,035,969, Cl. 52-111.000.
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Castone Development Corporation: *See—*
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Habiger, Cyril W., 4,036,321, Cl. 180-6.480.
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Caton, Michael Peter Lear; Coffee, Edward Charles John; and Watkins, Gordon Leonard, to May & Baker Limited. Cyclopentane derivatives 4,036,872, Cl. 260-468 00D.
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- Chant, Bernard J.: *See—*
  - van Ouwerkerk, Anton; Chant, Bernard J.; and Liberman, Arthur L., 4,036,774, Cl. 252-132.000
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- Chateau, Louis Jean, to Ducellier & Cie. Device for protecting an ignition device for motor vehicles 4,036,199, Cl. 123-148.00E.
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- Chedid, Louis: *See—*
  - Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000
- Chemetron Corporation: *See—*
  - Sieradzki, Benjamin, and Giese, John David, 4,036,477, Cl. 259-41.000
- Chemische Fabrik Kalk GmbH: *See—*
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- Cheng, Shih-che; and Kaufman, Jay Stephen, to General Atomic Company. Heat exchanger tube bundle support system. 4,036,289, Cl. 165-82.000.
- Cheron, Jacques, to Institut Francais du Petrole. Fuel cell. 4,037,022, Cl. 429-10.000
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  - Chan, David Cheong King, 4,036,960, Cl. 424-248.500.
  - Meader, Arthur L., Jr., 4,036,797, Cl. 260-28.00R.
  - Morgan, Barry S., and Sandell, Richard P., 4,036,918, Cl. 261-114.00R.
  - Roselius, Ronald R., and Edeleanu, Alexander G., 4,036,735, Cl. 208-89.000.
  - Schmidt, Robert J., deceased, and Graf, Peter E., 4,036,661, Cl. 106-273.00N
- Chigirin, Jury Trofimovich: *See—*
  - Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich, and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.
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- Chopdekar, Vilas M., to M & T Chemicals Inc. Process for preparing triarylphosphines. 4,036,889, Cl. 260-606.50P.
- Choporis, Peter N.; and Choporis, Robert N. Portable conditioned air breathing pipe. 4,036,224, Cl. 128-212.000.
- Choporis, Robert N.: *See—*
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- Chretien, Gilbert; Ditacroute, Gerard; and Meyer, Jacques, to Rhone-Poulenc Industries. Preparation of varnishes based on polyester resin 4,036,908, Cl. 260-863.000.
- Christensen, Craig M., to Noctua, Inc. Laser doppler velocimeter 4,036,557, Cl. 356-28.000.
- Christensen, Nils J.: *See—*
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- Christiana Metals Corporation: *See—*
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- Chromalloy American Corporation: *See—*
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- Ciba-Geigy Corporation: *See—*
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- Clark, Dwaine H. Motorcycle chain guide and tensioner. 4,036,069, Cl. 74-242.1TA.
- Clark Equipment Company: *See—*
  - Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, 4,036,372, Cl. 212-144.000.
- Clark, Leslie: *See—*
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- Clarke, Anthony Bayliss: *See—*
  - Roy, Alexander Rose; and Clarke, Anthony Bayliss, 4,036,937, Cl. 423-446.000
- Clay, Byron Jan; Wall, Michael Lhotellier; and Cunningham, James Robert. Steam distillation apparatus convertible to two separate modes of operation. 4,036,701, Cl. 202-204.000.
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- Clem, William E.; and Nolan, John F., to Anchor Hocking Corporation. Universal head and intermediate grid for case packers. 4,035,986, Cl. 53-61.000.
- Clement, Warren J., to Sprague Electric Company. Wet electrolyte valve metal capacitor with a free-form encapsulant. 4,035,905, Cl. 29-570.000.
- Clenet, Alain Jean-Marie. Truck cover assembly. 4,036,521, Cl. 296-100.000.
- Cliff, Thomas Charles, to United Gas Industries Limited. Thermal system. 4,036,059, Cl. 73-368.000.
- Clifton, Brian: *See—*
  - Fell, Roger; and Clifton, Brian, 4,036,051, Cl. 73-193.00R.
- Coal Industry (Patents) Limited: *See—*
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- Cocanour, Paul M.: *See—*
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- Coffee, Edward Charles John: *See—*
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- Colgate-Palmolive Company: *See—*
  - Baines, Eric; Forshaw, Sydney James; and Harvey, Kenneth, 4,036,950, Cl. 424-54.000.
  - Colodney, Daniel, 4,036,949, Cl. 424-49.000.
- Collinson, Alfred Edward: *See—*
  - Betts, Colin; Collinson, Alfred Edward; and Hart, David Frederick, 4,036,690, Cl. 176-40.000
- Colodney, Daniel, to Colgate-Palmolive Company. Clear dentifrice. 4,036,949, Cl. 424-49.000.
- Colt International Limited: *See—*
  - Burtenshaw, Raymond Alfred Frank, 4,036,120, Cl. 98-43.00R.
- Combest, John F., to R. L. Kuss & Co., Inc. Fluid filter. 4,036,758, Cl. 210-223.000.
- Cominco Ltd.: *See—*
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- Commissariat a l'Energie Atomique: *See—*
  - Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 4,036,553, Cl. 350-160.0LC.
  - Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939, Cl. 423-488.000.
- Communications Patents Limited: *See—*
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- Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.E.C.A.): *See—*
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- Compagnie Generale d'Electricite: *See—*
  - Desplanches, Gerard; Lazennec, Yvon, and Wicker, Alain, 4,037,027, Cl. 429-104.000
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- Compagnie Industrielle des Telecommunications Cit-Alcatel: *See—*
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- Comte, Marie Helene: *See—*
  - Colardelle, Joel Serge; Comte, Marie Helene; and Lerouge, Claude Paul Henri, 4,037,120, Cl. 307-311.000.
- Concast AG: *See—*
  - Rohrig, Adalbert; Willim, Fritz; and Hannah, Brian, 4,036,280, Cl. 164-82.000.
- Conger, Marvin T.; and Beers, Roger N., to Goodyear Tire & Rubber Company, The. Run-flat tire lubricant. 4,036,765, Cl. 252-21.000.
- Congoleum Corporation: *See—*
  - Murphy, Robert E. J.; Haemer, Laurence F.; and Scholl, Edward C., 4,036,673, Cl. 156-71.000.
- Conkey, James Elliott, to Kibbey Machine Company, Incorporated. Machine of cutting cores of vegetables. 4,036,123, Cl. 99-538.000.
- Consolidated Valve Industries, Inc.: *See—*
  - Dashner, James W., 4,036,250, Cl. 137-476.000.
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- Continental Copper & Steel Industries, Inc.: *See—*
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- Continental Oil Company: *See—*
  - Hawthorne, Arthur L.; and Hazen, David R., 4,036,529, Cl. 299-19.000.
- Control Data Corporation: *See—*
  - Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.
- Cook, Albert M.: *See—*
  - Hillsman, Deane; Cook, Albert M.; and Simes, James G., 4,036,221, Cl. 128-145.600.
- Cooper, Herbert Warren: *See—*
  - Moore, Robert A.; and Cooper, Herbert Warren, 4,037,174, Cl. 333-30.00R.
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- Cor Tech Research Limited: *See—*
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- Cordell, Robert Roger, to Bell Telephone Laboratories, Incorporated. High speed tone decoder utilizing a phase-locked loop. 4,037,171, Cl. 331-14.000.
- Cornell, Richard Henry, to General Electric Company. Fuel supply and distribution system. 4,036,246, Cl. 137-118.000.
- Cornett, Lee G.; and Peterson, Wesley D., to Rockwell International Corporation. Means for attaching a ferrite transducer to a disk resonator. 4,037,178, Cl. 333-71.000.
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- Costa, Thomas A., to Admiral Corporation. Convergence circuit mounting device. 4,037,256, Cl. 358-248.000.
- Cotton Incorporated: *See—*
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- Couderc, Pierre; and Hilmoine, Serge, to Societe Chimique des Charbonnages. Process for the production of hydroxy-pivaldehyde. 4,036,888, Cl. 260-602.000.
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- Courtwright, Robert M., to Hauserman, Inc. Knock-down drawer construction. 4,036,542, Cl. 312-330.00R.
- Courty, Aurele. Automobile high beam glare warning device. 4,037,197, Cl. 340-107.000.
- Cowan, Arnold A.: *See—*
  - Thompson, John T.; and Cowan, Arnold A., 4,036,335, Cl. 188-319.000.
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- Cowit, Burt L., to Raymond Lee Organization, Inc., The, a part interest. Flat tire indicating device. 4,037,192, Cl. 340-58.000.
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- Craig, Burnie M., to Fond, Loren S. Elastomeric cartridge with slitted nozzle tip. 4,036,412, Cl. 222-490.000
- Crane, Jack W.; and Mast, Aquila D. Crop material roll forming method and machine. 4,035,999, Cl. 56-341.000.
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- Crask, Roy L.; and Egerer, William D., to Buckbee-Mears Company. Lightning arrester. 4,037,139, Cl. 361-58.000.
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  - Yamamoto, Roy I.; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,766, Cl. 252-51.50A.
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- Cresswall, Thomas A., to Cresswall, Thomas A. Method and apparatus for inserting soft prosthesis. 4,035,850, Cl. 3-36.000.
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  - Morlet, Jean G.; Honnorat, Yves C.; and Raisson, Gerard D., 4,036,568, Cl. 425-8.000.
- Criblez, Roger, to Hatebur Umformmaschinen AG. Device for shearing rod sections on an automatic multi-stage cross-fed press. 4,036,089, Cl. 83-198.000.
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  - Pugsley, Peter C., 4,037,249, Cl. 358-76.000
- Cross, Christopher G.: *See—*
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  - Boyles, Bruce K.; and Crow, John L., Jr., 4,036,941, Cl. 423-558.000.
- Crown Zellerbach Corporation: *See—*
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- Cruzan, Charles G., to Phillips Petroleum Company. Sample dilution 4,036,062, Cl. 73-422.0GC
- Cruzen, Harry F.; and Gresham, Robert W., to Besser Company. Cementitious product making system with product height gauging mechanism. 4,036,570, Cl. 425-141.000.
- Cryogenic Technology, Inc.: *See—*
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  - Leonard, Kenneth R.; and DeHaan, James R., 4,036,617, Cl. 62-55.000
  - Leonard, Kenneth R.; and Loudon, John D., 4,036,618, Cl. 62-55.000
- Culton, Jon: *See—*
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- Cunningham, James Robert: *See—*
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  - Crawford, Wheeler C.; Yamamoto, Roy I.; and Cusano, Carmen M., 4,036,768, Cl. 252-51.50A
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- Cusato, Anthony J., to Dentronix, Inc. Direct bonding bracket positioning and mounting tool. 4,035,919, Cl. 32-66.000.
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- Czelen, John Cas. Contact lens cases. 4,036,357, Cl. 206-5.100.
- Dabill, David William: *See—*
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- Dacor Corporation: *See—*
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- da Costa, Nicholas Mario: *See—*
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- Dahl, Norman C. Process for the precise work-hardening of bolts. 4,035,858, Cl. 10-27.00H.
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  - Beeskow, Bruno; Worner, Gunter; and Schrape, Peter, 4,036,341, Cl. 192-106.200.
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  - Hufendiek, Ernst-Wilhelm, 4,036,340, Cl. 192-.084.
  - Loper, Bernd, 4,037,134, Cl. 315-78.000.
  - Schreiber, Winfried, 4,036,449, Cl. 242-107.000.
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- Daiwa Boseki Kabushiki Kaisha: *See—*
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- Dalenberg, Paul N.: *See—*
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- D'Alessio, Frank P.; and Koenig, Erl A., to G P I. Safety ski binding. 4,036,510, Cl. 280-613.000.
- Dalton, Thomas B., to Westran Corporation. Valve 4,036,467, Cl. 251-14.000
- Dalzell, Haldean Cloyce: *See—*
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- Daniels, David, to General Foods Corporation. Vacuum pocket-opening turret. 4,035,988, Cl. 53-183.000.
- Darsie, Burns, and Schewe, Richard A., to Barber-Colman Company. Triaxial weaving machine with warp strand guides. 4,036,262, Cl. 139-11.000.
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- D'Attilio, Americo P : *See—*
  - Clark, Calvin M., and D'Attilio, Americo P., 4,036,560, Cl 408-204.000.
- Davey Tree Expert Company, The: *See—*
  - Funk, Roger Calvin, 4,036,627, Cl. 71-29.000.
- Davidson, James John Alexander, to W. R. Grace & Co. Sealing gaskets for container closures 4,036,388, Cl. 215-341.000.
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- Davis, Michael Ian: *See—*
  - Birney, Richard Eugene; Davis, Michael Ian; and Hood, Robert Allen, 4,037,214, Cl. 364-200.000.
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  - Davis, Albert Sidney; Davis, Robert William; and Weber, Joseph Paul, 4,036,260, Cl. 138-94.300.
- Dawson, John Victor: *See—*
  - Evans, Edward Raymond; and Dawson, John Victor, 4,036,641, Cl. 75-130.00A.
- Dayco Corporation: *See—*
  - Sprague, George R., 4,037,013, Cl. 428-310.000.
- DCA Food Industries Inc.: *See—*
  - Kaufman, Harold B., Jr.; Moyer, John H.; and McCarthy, John P., 4,037,071, Cl. 219-10.55F.
- De La Rue Giori S.A.: *See—*
  - Giori, Gualtiero, 4,036,130, Cl. 101-170.000.
- Dean, Gordon B.: *See—*
  - Pickton, Shailer T.; and Dean, Gordon B., 4,037,164, Cl. 328-187.000.
- Dean, Michael F.; and Blize, Roy L., to Chromalloy American Corporation. Diffusion coating of magnesium in metal substrates. 4,036,602, Cl. 428-621.000.
- DeAnda, Cesar C.: *See—*
  - Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647, Cl. 96-76.00C.
- Deane, Richard; and Sylvest, Aage C., to Cominco Ltd. Aircraft warning marker assembly for power lines. 4,037,191, Cl. 340-28.000
- DeAngelis, Armand: *See—*
  - Laliberte, Albert J.; and DeAngelis, Armand, 4,036,168, Cl. 118-8.000.
- de Cremoux, Baudouin, to Thomson-CSF. Avalanche photodiode. 4,037,244, Cl. 357-30.000.
- Dedolph, Richard R., to Gravi-Mechanics Co. Container of stabilized media with growing plant therein and method of making the same. 4,035,951, Cl. 47-66.000.
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  - Krohn, David A.; and Deeg, Emil W., 4,036,624, Cl. 65-30.00R.
- Deffeyes, Robert J., to Graham Magnetics Incorporated. Package having dessicant composition. 4,036,360, Cl. 206-204.000.
- Deffner, John F., to Visual Marketing Incorporated. Audio-visual display device. 4,035,941, Cl. 40-219.000.
- Deficis, Alain, to Agence Nationale de Valorisation de la Recherche (ANVAR) Temperature measuring process and probe. 4,036,060, Cl. 73-368.000.
- DeHaan, James R.: *See—*
  - Leonard, Kenneth R.; and DeHaan, James R., 4,036,617, Cl. 62-55.000.
- De Haeck, Robert Jean, to La Soudure Electrique Autogene, Procedes Arcos, S.A Flux for the submerged arc welding of ordinary, semi-alloyed or special steels. 4,036,671, Cl 148-24.000.
- Deiwick, Horst: *See—*
  - Manthey, Willi; and Deiwick, Horst, 4,036,243, Cl. 134-76.000.
- Delessert, Georges: *See—*
  - Matthey, Henri; and Delessert, Georges, 4,036,458, Cl. 242-201.000.
- Dellenberg, Hugo, to Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung. Apparatus for removing the drillings from the drilling site of a drill. 4,036,308, Cl. 173-75.000.
- DeLuca, Raymond F.: *See—*
  - Jespersen, Paul W.; and DeLuca, Raymond F., 4,036,406, Cl 222-181.000.
- DeLuish, Kenneth R., to HYCALOG Inc. Well jar. 4,036,312, Cl. 175-302.000
- DeMarco, Thomas M., to NFE International, Ltd. Pressure relief means for industrial vacuum. 4,036,614, Cl. 55-310.000.
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  - Dobson, Thomas A ; Humber, Leslie G.; Demerson, Christopher A., and Jirkovsky, Ivo L., 4,036,842, Cl 260-293.580.
- Demetrescu, Teodor: *See—*
  - Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.
- de Mul, Erik Francois Johannes. Dental instrument. 4,035,918, Cl. 32-54.000
- Denis, Jacques; and Parc, Guy, to Institut Francais du petrole. Lubricating bases for multigrade oils. 4,036,771, Cl. 252-56.00R.
- de Nora, Vittorio: *See—*
  - Nidola, Antonio; de Nora, Vittorio; and Spaziante, Placido M., 4,037,032, Cl. 429-198.000.
- Dentronix, Inc.: *See—*
  - Cusato, Anthony J., 4,035,919, Cl. 32-66.000.
- DeRees, Delbert D.; and Pinsonneault, Jacques Emile, to American Motors Corporation. Vehicle body roof construction. 4,036,522, Cl. 296-154.000.
- de Rooij, Abraham H.; and Goettsch, Reijer, to Stamicarbon B.V. Process for the recovery of pure ε-caprolactam from an aqueous solution thereof. 4,036,830, Cl. 260-239.30A.
- DeRosa, John A.: *See—*
  - Fratoli, Anthony V.; and DeRosa, John A., 4,036,634, Cl. 75-.50A.
- Derrick, Danny O'Brian: *See—*
  - Ruff, George Robert; and Derrick, Danny O'Brian, 4,036,325, Cl. 182-46.000.
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- DeSoto, Inc.: *See—*
  - Sekmakas, Kazys; and Shah, Raj, 4,036,800, Cl. 260-29.2TN.
- Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, to Compagnie Generale d'Electricite. Sodium-sulphur electric cell and method of forming same. 4,037,027, Cl. 429-104.000.
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  - Bonner, Gilbert Belmont; and Dessel, Joseph Leo, 4,037,122, Cl. 310-14.000.
- De Steur, Hubert: *See—*
  - Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.
- Deutsch, Jean-Claude: *See—*
  - Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 4,036,553, Cl. 350-160.01.C.
- Deutsche Gold- und Silber-Scheideanstalt vormals Roessler: *See—*
  - Laufer, Siegmar; and Roy, Waldemar, 4,036,933, Cl. 423-338.000.
- De Vogelaere, Marc: *See—*
  - Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.
- De Walt, Maurice P., to Continental Copper & Steel Industries, Inc. Tool steel 4,036,670, Cl. 148-12.100.
- De Wild, Willem Reindert, to U.S Philips Corporation. Electromechanical filter. 4,037,180, Cl. 333-72.000.
- Dey, Arabinda N., to P R Mallory & Co., Inc. Method of making a miniature concentric battery. 4,035,909, Cl. 29-623.200.
- Dey, Arabinda N.; and Schlaikjer, Carl R., to P. R. Mallory & Co., Inc. Halogen fueled organic electrolyte fuel cell. 4,037,025, Cl 429-29.000.
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  - Babinsky, Andrew D; and Benezra, Leo L., 4,036,717, Cl 204-153.000.
  - Babinsky, Andrew D., 4,036,728, Cl. 204-283.000.
- Diamond Shamrock Technologies S A : *See—*
  - Nidola, Antonio; de Nora, Vittorio; and Spaziante, Placido M., 4,037,032, Cl 429-198.000.
- Dickey, Charles M.: *See—*
  - Korr, Abraham L.; Walker, Evan Harris; Dickey, Charles M.; and Bushey, Bransby W., 4,036,140, Cl. 102-38.000.
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- Dierschke, Eugene Gustav, to Texas Instruments Incorporated. Shaped emitters with buried-junction structure. 4,037,241, Cl. 357-17.000.

- Diesel Kiki Co.: *See—*
  - Nakayama, Kenji, 4,036,192, Cl. 123-139.0AT.
- Diesel Kiki Kabushiki Kaisha: *See—*
  - Kobayashi, Masayoshi; and Kimura, Takeo, 4,036,193, Cl. 123-139.0AB.
- Dietrich, Hans, to Losinger AG of Bern. Method and means of extracting a soil anchor consisting of a prestressed steel tendon. 4,036,137, Cl. 102-23.000.
- Dietz, Wolfgang Friedrich Wilhelm, to RCA Corporation. Centering circuit for a television deflection system. 4,037,137, Cl. 315-398.000
- Dishaw, James: *See—*
  - Essenmacher, Albert M.; Krause, Thomas R.; and Dishaw, James, 4,037,198, Cl. 340-146.3ED.
- Ditacroute, Gerard: *See—*
  - Chretien, Gilbert; Ditacroute, Gerard; and Meyer, Jacques, 4,036,908, Cl 260-863.000
- Dixie-Narco, Inc.: *See—*
  - Burton, Paul F., 4,036,621, Cl 62-394.000.
  - Oden, Kenneth W., 4,036,400, Cl. 221-67.000.
- Dixon, Cal L.; and Ross, Charles E., to Kaiser Aluminum & Chemical Corporation. Storage rack and hanger assembly. 4,036,366, Cl. 211-4.000.
- Dixon, Robert L.; and Maxsted, Malcolm D., to Smith International, Inc. Mounting for inboard cutters on a raise drill. 4,036,313, Cl. 175-344.000.
- Dixon, Robert L.; and Allison, Robert E., to Smith International, Inc. Hole opener with improved rotary cutter mounting. 4,036,314, Cl. 175-364.000.
- DMI Inc.: *See—*
  - Kinzebaw, Jon E., 4,036,306, Cl. 172-287.000.
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- Dobrzanski, John; Gardner, Edward Boyd; and Hart, Ernest V., to Emhart Industries, Inc. Ionization smoke detector and alarm system. 4,037,206, Cl. 340-237.00S
- Dobson Park Industries, Ltd.: *See—*
  - Phillips, Reginald Andrew, 4,036,108, Cl. 91-165.000.
- Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A ; and Jirkovsky, Ivo L., to American Home Products Corporation. Process for preparing polycyclic heterocycles having a pyran ring 4,036,842, Cl. 260-293.580
- Dockery, Denzel J. Aquarium filter assembly 4,036,756, Cl 210-169.000.
- Dodge, Larry H.; and Economidy, Byron G., to Sherwood Medical Industries Inc. Thoracic drainage unit with defoaming means. 4,036,231, Cl. 128-276.000.
- Doi, Toshitada, to Sony Corporation. Sound pickup assembly. 4,037,052, Cl. 179-1.0MF.
- Doll, Henri Georges, to Doll Research, Inc. Apparatus and method for eliminating perturbations of a kinetic origin in the blood flow waveform. 4,036,215, Cl. 128-2.05F
- Doll Research, Inc.: *See—*
  - Doll, Henri Georges, 4,036,215, Cl. 128-2.05F.
- Dompas, Leon Eugenie Daniel. Structure having vertical bearer walls and horizontal ceilings. 4,035,966, Cl. 52-73.000.
- Donaldson, Donald J.: *See—*
  - Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.
- Donovan, James, to Artisan Industries Inc. Apparatus and system for stabilizing the disc elements of a rotary concentrator for solids-containing fluids. 4,036,759, Cl. 210-298.000.
- Dooley, Joseph L.; and Yelke, Edward. Engine monitoring apparatus 4,036,050, Cl. 73-119.00A.
- Dorer, Casper John, Jr., to Lubrizol Corporation, The. Esters made from the reaction product of low molecular weight ethylenically unsaturated acylating agents and oxidized ethylene-propylene interpolymers. 4,036,772, Cl. 252-56.00R.
- Dorner, Heinrich; Jungmann, Axel; and Scholz, Manfred, to Siemens Aktiengesellschaft. Nuclear reactor installation. 4,036,700, Cl. 176-87.000.
- Dorr-Oliver Incorporated: *See—*
  - Nauta, Robin Gustav, 4,036,153, Cl. 110-8.00F.
- Douce, Donald R.; and Buford, Wesley E. Automatic take-up winch. 4,036,476, Cl. 254-172.000.
- Dover Corporation: *See—*
  - Wilder, Paul R.; and Wood, Chester W., 4,036,259, Cl. 137-801.000.
  - Wilson, Fred A., 4,036,255, Cl. 137-587.000.
- Dow Chemical Company, The: *See—*
  - Best, John S., 4,036,285, Cl. 165-45.000.
  - Chang, Kuo Yuan, 4,036,854, Cl. 260-343.20R.
  - Habermann, Clarence E., 4,036,879, Cl 260-561.00N.
  - Olstowski, Franciszek, 4,036,820, Cl. 260-77.5AM.
  - Stude, Duane L., 4,036,659, Cl. 106-90.000.
- Downey, Richard W. Sleeving form for masonry material. 4,035,976, Cl 52-577.000
- Dragerwerk Aktiengesellschaft: *See—*
  - Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.
- Drankovsky, Ivan Karpovich: *See—*
  - Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich; Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich, 4,036,425, Cl. 233-2.000.
- Dreher, Alfred J., to Dreher, Alfred J. Apparatus with reversing linear traverse mechanism for spraying material. 4,036,437, Cl. 239-186.000.
- Dreissen, Hubert H.: *See—*
  - Basten, Albert T.; and Dreissen, Hubert H., 4,036,441, Cl. 241-20.000
- Dreker, Raimund, Endras, Gerhard; and Langerbein, Bernhard, to Bergwerksverband GmbH Device for closing off a mine gallery especially for use to prevent spreading of underground explosions. 4,036,024, Cl 61-42.000.
- Dresser Industries, Inc.: *See—*
  - Eddy, Kenneth Harmon, and McGill, Kenneth Harmon, 4,036,508, Cl. 280-492.000.
- Dubois, Jean Claude; and Le Goux, Jean Jacques, to Compagnie d'Applications Mecaniques a l'Electronique au Cinema et a l'Atomistique (C.A.M.E.C.A). Ion current measuring arrangement. 4,036,777, Cl. 250-299.000.
- Dubois, Jean Claude: *See—*
  - Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.
- Duca, Mihail; Vasiliu, Dan, Demetrescu, Teodor, Cimpoias, Ion, Linca, Ion, Breazu, Stefan; Antonescu, Virgil, and Cojocaru, Iosif, to Institutul de Cercetari si Proiectari de Masini Agricole - ICPMA. Device for automatic adjustment of the position of the cutting platform of a grain harvesting machine 4,035,997, Cl. 56-209.000.
- Ducellier & Cie. *See—*
  - Chateau, Louis Jean, 4,036,199, Cl. 123-148.00E.
- Dugge, Richard H., to ACF Industries, Incorporated Hopper having means for directing blasts of gas to a discharge outlet or the hopper. 4,036,408, Cl 222-193.000
- Duhayon, Jacques, Jacques, Michel Jean, Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, to Commissariat a l'Energie Atomique. Method for recovery of hydrogen chloride from dilute solutions. 4,036,939, Cl. 423-488.000
- Dulou, Raymond, Magnin, Pierre, and Bechtel, Pierre, to So. Ci. Bre. Process for the manufacture of a new derivative of alpha-pinene and new medicaments based on this derivative. 4,036,884, Cl 260-586.00G.
- Dunk, Thomas H. Antenna mount. 4,037,229, Cl 343-715.000.
- Du Pont de Nemours, E. I., and Company *See—*
  - Dhingra, Ashok Kumar, 4,036,599, Cl 428-608.000.
  - Hannover, Finn, 4,036,514, Cl 285-222.000.
  - Jacobson, Howard Wayne, 4,036,653, Cl 106-47.00R
  - James, Daniel Shaw; and Witterholt, Vincent Gerard, 4,036,585, Cl 8-1.0XA
  - Lee, Kyu Tai, 4,036,962, Cl. 424-258.000
  - Poirier, Robert Victor, 4,036,802, Cl. 260-296.00F.
  - Rowe, Marvin Herbert, 4,036,586, Cl. 8-37.000
  - Schwalenstocker, Henry John, Jr., 4,036,649, Cl. 96-107.000.
  - Spitzer, Robert, 4,036,714, Cl. 204-99.000.
  - Straub, John Frederick, 4,036,206, Cl. 126-270.000.
  - Turnbull, John William, 4,036,907, Cl 260-857.00L.
- Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, to Smith Kline & French Laboratories Limited Amidino compounds 4,036,971, Cl 424-273.000.
- Durholz, Friedrich: *See—*
  - Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl 260-251.00R
- Durland, Douglas Howard; and McGilvray, Malcolm Canmore, Jr., to Beckman Instruments, Inc. Fluid pressure operated eddy current brake for air driven centrifuge. 4,036,428, Cl. 233-23.00R.
- Durum, Metin Mustafa, to Borg-Warner Corporation. Universal joint. 4,036,032, Cl. 64-21.000
- DuVall, Wilbur E., to Xerox Corporation. Keyboard encoding system with electronic hysteresis. 4,037,225, Cl. 340-365.00E.
- Dvoracek, Pavel: *See—*
  - Malasek, Jaromir, Kuda, Vladimir; Dvoracek, Pavel; and Horn, Vladimir, 4,036,265, Cl 139-190.000.
- Dynamit Nobel Aktiengesellschaft: *See—*
  - El-Chahawi, Moustafa; and Vollkommer, Norbert, 4,036,819, Cl. 260-75.00H.
  - Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, 4,036,798, Cl. 260-28.00P.
- Dynamit Nobel Aktiengesellschaft and Impex-Essen Vertrieb Von Werkzeugen GmbH: *See—*
  - Gawlick, Heinz; Rammensee, Horst, Mack, Karl; and Schneider, Fritz, 4,036,103, Cl. 89-35.00R
- E-Systems, Inc.: *See—*
  - Johnson, Paul W., 4,037,072, Cl 219-56.000.
- Ear, Frank P., to H.G C. Construction & Equipment Company, Inc. Method for abating odor and smoke emissions in the vapor exhaust from a meat broiling grill. 4,036,994, Cl. 426-233.000
- Eastman Kodak Company: *See—*
  - Baden, Harry C.; Bard, Charleton C.; and Brugger, Donald J., 4,036,715, Cl. 204-109.000.
  - Maigret, Robert J., 4,037,237, Cl. 354-51.000
- Eastmond, Bruce Charles, to Motorola, Inc. Two-way FM radio system operating on a single channel and providing simulated duplex operation. 4,037,158, Cl. 325-22.000.
- Easton, Harlan. Branding iron with quickly changeable characters. 4,036,128, Cl. 101-9.000.
- Eaton, Sargent Sheffield, Jr., to RCA Corporation. Protection circuit for insulated-gate field-effect transistors (IGFETS). 4,037,140, Cl. 361-56.000.
- Ebauches S.A.: *See—*
  - Ramet, Gilbert, 4,036,171, Cl. 118-49.100.
- Ebco Industries, Ltd.: *See—*
  - Eppich, Helmut, 4,036,430, Cl. 235-61.11E.

Eckels, Robert Edward Electrically initiated fuse ignitor 4,036,139, Cl 102-28.00R

Ecker, Hans, to Hochtemperatur-Reaktorbau GmbH Heat exchanger assembly designed as a longitudinal counterflow device. 4,036,294, Cl 165-154.000

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Edelberg, Murray, and Schissler, Lloyd R., to Sperry Rand Corporation Digital memory with data manipulation capabilities 4,037,205, Cl 364-900.000

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Roselius, Ronald R., and Edeleanu, Alexander G., 4,036,735, Cl 208-89.000

Edge, George S., to Amerada Hess Corporation Gangway system 4,035,861, Cl 14-71.100

Effenberger, Hubert, and Seeger, Walter, to Glaser, Gunther, and Effenberger, Hubert Time-keeping apparatus 4,036,006, Cl 58-23.00R

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Eidschun, Charles Douglas, Jr Method for metal exchange 4,036,705, Cl 204-15.000

Eisenberg, Stephanie, to Nash Metalware Co Inc Expandable rack 4,036,369, Cl 211-88.000.

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El-Chahawi, Moustafa, and Vollkommer, Norbert, to Dynamit Nobel Aktiengesellschaft Unsaturated polyester resins 4,036,819, Cl 260-75.00H

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Electrohome Limited *See—*

Sennik, John Joseph, 4,037,133, Cl 315-31.0TV

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Holmes, Charles Chamberlain; Skinner, Wallace, and Mattocks, George Roland, 4,036,625, Cl 65-134.000

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Huppi, Xaver Johann, 4,036,610, Cl 55-112.000

Eli Bridge Company *See—*

Novey, William E., 4,037,135, Cl 315-194.000

Ellefson, Larry P., to Interface Mechanisms, Inc Label stripping apparatus for label printers 4,036,132, Cl 101-288.000.

Ellen, Peter Edington Method of making a curved roof 4,036,921, Cl 264-32.000

Elliott, William S *See—*

Strehoff, William P., Elliott, William S., and Johnson, Dale, 4,036,065, Cl 73-432.00R

Elmore, Donald Fenton, to Harris Corporation Dampener 4,036,131, Cl 101-247.000

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Williams, Merton S., 4,035,921, Cl 33-126.70R

Enders, Edgar, to Bayer Aktiengesellschaft 1-Aryl-5-alkylidene,2,4-dioxo-imidazolidines and process therefor 4,036,850, Cl 260-309.500

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Hasegawa, Noriko, Kobayashi, Hajime, Endo, Ichiro, and Kinjo, Kikuo, deceased, 4,036,650, Cl 96-114.100

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Sugiyama, Iwakichi, Takaoka, Yukihisa, and Endo, Kiyoshi, 4,036,796, Cl 260-22.0CA

Endras, Gerhard *See—*

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Engelbach, Heinz, and Sprague, Michael Jolyon, to BASF Aktiengesellschaft. Production of anthraquinone 4,036,860, Cl 260-369.000

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Koppe, Herbert, Engelhardt, Albrecht, and Zeile, Karl, 4,036,988, Cl. 424-330.000

Engelhardt, Bernard H., and Mintz, Marcus, to Engelhardt, Bernard J Liquid level measuring apparatus 4,036,055, Cl 73-312.000

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Engelhardt, Bernard H., and Mintz, Marcus, 4,036,055, Cl 73-312.000.

Engler, Edward Martin; Kaufman, Frank Benjamin, and Scott, Bruce Albert, to International Business Machines Corporation. Highly conductive printing medium containing a halogenated hydrocarbon photoactivator and a tetrathiafulvalene or a related compound thereof 4,036,648, Cl. 96-90.00R

English, John Hershel; Griffiths, James Edward, and Zuk, Paul, to Bell Telephone Laboratories, Incorporated Voltage surge protector. 4,037,266, Cl 361-120.000.

Ennis, George E.; Ennis, George Thomas; and Nugent, John W. In-out automatic vehicle washing apparatus. 4,035,862, Cl 15-53.0AB

Ennis, George Thomas: *See—*

Ennis, George E.; Ennis, George Thomas; and Nugent, John W., 4,035,862, Cl 15-53.0AB

Epperson, Lee W. Clip for rendering a bola tie usable as a pendant 4,035,873, Cl 24-49.00S.

Eppich, Helmut, to Ebco Industries, Ltd. Manually operable card reader 4,036,430, Cl 235-61.11E.

Erfurth, Henning: *See—*

Rademachers, Jacob, Erfurth, Henning; and Hund, Franz, 4,036,662, Cl 106-300.000

Erickson, John W, Budrys, Vitolis, and Brown, Francis Barton, to Kobe, Inc. Combination pitot pump and centrifugal separator 4,036,427, Cl 233-10.000

Eriksson, Stig-Lennart, and Gustafsson, Manfred Wallace, to Sandvik Aktiebolag. Toolholder 4,035,890, Cl 29-96.000.

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Escher Wyss G m b.H., *See—*

Biondetti, Mario, 4,036,683, Cl. 162-274.000.

Espenscheid, Wilton F.; Offenhauer, Robert D.; and Yan, Tsoung Y., to Mobil Oil Corporation. Stabilization of hydrocracked oils with amino nitrophenols 4,036,770, Cl 252-51.50R.

Espino, Ramon L.: *See—*

Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., 4,036,732, Cl 208-11.0LE.

Essenmacher, Albert M., Krause, Thomas R.; and Dishaw, James, to Burroughs Corporation Apparatus for generating display enabling signals. 4,037,198, Cl 340-146.3ED

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Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir, Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl 260-610.00B

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Pouey, Michel, 4,036,558, Cl 356-79.000

Ethyl Corporation *See—*

Keblys, Kestutis A., 4,036,809, Cl 260-45.70P.

Eue, Ludwig *See—*

Westphal, Kurt, Meiser, Werner, Eue, Ludwig; and Hack, Helmuth, 4,036,632, Cl. 71-93.000.

Evans, Edward Raymond, and Dawson, John Victor, to British Cast Iron Research Association. Cast iron. 4,036,641, Cl. 75-130.00A

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Eveland, Melborne D Dental apparatus 4,035,916, Cl 32-32.000.

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Paules, Eugene H., 4,035,982, Cl 53-22.00B

Excor, Inc. *See—*

Thorsell, Roland H., 4,036,093, Cl 83-471.300.

Exxon Research and Engineering Company: *See—*

Irani, Cyrus A., Funk, Edward W., Gomez, Ernesto, and Espino, Ramon L., 4,036,732, Cl. 208-11.0LE

Jaros, Stanley E.; and Metrailer, William J., 4,036,750, Cl 210-27.000

Manne, Richard S; Bethea, Sam R; and Kelso, Edward A., 4,036,734, Cl 208-57.000

Plank, Don A., 4,037,034, Cl 526-5.000.

Ryden, Joseph, Jr., 4,037,103, Cl. 250-341.000.

Saidla, Glen E. W., 4,036,923, Cl 264-45.300

Wristers, Jos, Siskin, Michael, and Porcelli, Joseph J., 4,036,737, Cl 208-108.000

Wristers, Jos, 4,036,738, Cl 208-108.000.

Fabrique Nationale Herstal S A en abrege FN *See—*

Gevers, Georges A., 4,035,944, Cl. 42-75.00B

Farfaglia, Silvio T., to Phillips Petroleum Company Heating the end of a tubular member 4,035,926, Cl. 34-34.000.

Farkas, Daniel F *See—*

Brown, George E; and Farkas, Daniel F., 4,035,925, Cl. 34-8.000

Faul, Thomas L., to Otaco Limited Transportation seating construction and system 4,036,527, Cl 297-454.000

Faure, Jean-Christian, to Societe d'Assistance Technique pour Produits Nestle S A Freeze-drying of solid, liquid or paste-like products 4,035,924, Cl 34-5.000

Favor, Robert R *See—*

Bell, Rex D., and Favor, Robert R., 4,035,993, Cl 56-13.100.

Feasey, Ronald George, and Rose, John Brewster, to Imperial Chemical Industries Limited Aromatic polymers prepared from halophenols containing keto groups 4,036,815, Cl 260-49.000

Feaster, William Wardock Preparing blood and like samples. 4,036,387, Cl. 215-309.000.

Feeney, George W *See—*

Habeck, Bruce W., and Feeney, George W., 4,037,016, Cl. 428-349.000.

Fegan, Frank Joseph; and Smith, William Harold, to Peace Medical. Gas dilution device. 4,036,253, Cl 137-556.000

Fehler, Adolf, and Kirschey, Gunter, to Motoren- und Turbinen-Union Munchen GmbH Combustion chamber for gas turbine power plants having devices for the gaseous processing of the fuel being introduced therein 4,036,582, Cl 431-352.000.

Feit, Eugene David, and Schwartz, Newton, to Bell Telephone Laboratories, Incorporated. Technique for nucleating b.c.c. tantalum films on insulating substrates 4,036,708, Cl 204-38.00A

Feld, Jerome H. Fabric spreading carriage for face up, one way operation having fabric clamping cutting assembly 4,036,090, Cl 83-282.000.

Feldman, Edward; and Lupinacci, George, to Sweda International, Inc Combined mechanism for impacting a print member and advancing a printing ribbon. 4,036,349, Cl 197-151.000.

Feldmesser, Julius. *See—*

Thompson, Malcolm J., Feldmesser, Julius; and Robbins, William E., 4,036,987, Cl. 424-325.000.

Felip Sugranes, Jose, to Foret, S A Rotary furnace for the continuous manufacture of solid alkaline silicates 4,036,583, Cl. 432-117.000

Fell, Roger; and Clifton, Brian. Heat meters 4,036,051, Cl 73-193.00R

Fergason, James L. Liquid crystal electromechanical transducer 4,037,062, Cl. 179-133.000.

Ferguson, Paul M., to Tesco Engineering Company. Apparatus for charging field electrical cables. 4,037,269, Cl. 361-232.000.

Ferguson, Richard, and Troutman, Kenneth W., to Terrell Machine Company, The. Loom bobbin stripper. 4,035,882, Cl 28-294.000

Fermi, Rudy: *See—*

Kocsis, Alex; Kasner, Gerald, Fermi, Rudy; Bratton, David, and Pickard, John, 4,036,133, Cl 101-415.100.

Fernandez, Carlos M. Cruz; Valdes, Rogelio Rodriguez, and Alberto, Delfin Perez. Harvester combine. 4,035,996, Cl. 56-13.900.

Ferr, Donald H.: *See—*

Holm, LeRoy W.; and Ferr, Donald H., 4,036,300, Cl 166-273.000

Ferres, Harry; and Clayton, John Peter, to Beecham Group Limited Lactonyl esters of penicillins. 4,036,829, Cl. 260-239.100.

Ferro, Armand P., to General Electric Company. Electric field controlled diode with a current controlling surface grid 4,037,245, Cl 357-38.000.

Ferro Manufacturing Corporation *See—*

Pickles, Joseph, 4,035,866, Cl. 16-146.000.

Fiat Societa per Azioni: *See—*

Bigliani, Umberto; and Jacoel, Rafael, 4,036,190, Cl. 123-117.00D

Fiber Associates, Inc.: *See—*

Geyer, Charles J., Jr.; and White, Ben E., 4,037,039, Cl. 536-60.000

Fiber Industries, Inc.: *See—*

Bond, Norman John, 4,035,883, Cl. 28-220.000.

Lowder, F. Ray; and Gibbon, John D., 4,036,003, Cl. 57-140.00R

Fibre-Metal Products Co., The: *See—*

Prince, Jack M.; and Yang, Dai Chung, 4,035,847, Cl 2-416.000

Fichtner, Robert L., to Select Energy Systems, Inc. Energy conservation system. 4,037,141, Cl. 361-182.000.

Filipescu, Nicolae; McAvoy, Nelson; Kagan, Morton R.; and Serafin, Francis A., to American Standard, Inc. Plastic laser materials. 4,037,172, Cl. 331-94.50E.

Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, to Sterling Glove Machinery Ltd. Glove turning and blocking process and apparatus. 4,036,415, Cl 223-40.000.

Filss, Peter, to Kernforschungsanlage Julich Gesellschaft mit beschrankter Haftung Apparatus for purifying gases. 4,036,597, Cl 23-284.000.

Finch, Neville, to Ciba-Geigy Corporation 5-Sulfinyl-2-pyridinecarboxylic acids. 4,036,965, Cl. 424-266.000

Finelli, Anthony F., to Goodyear Tire & Rubber Company, The Cured polyurethane compositions containing epoxy resins 4,036,906, Cl. 260-830.00P.

Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C.: *See—*

Freddi, Tomaso, 4,036,607, Cl. 51-165.00R

Finn, David S., to Towmotor Corporation. Inching valve with means preventing high pressure inching. 4,036,342, Cl 192-109.00F.

Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Compamie *See—*

Schroder, Klaus Dieter, 4,035,864, Cl 16-35.00R

Firth, Jack Graham: *See—*

Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592, Cl 23-232.00E.

Fischer, Albert Swimming pool brush guide. 4,035,863, Cl 15-160.000

Fischer, Artur Structural element 4,035,977, Cl 52-586.000.

Fischer, Paul W; and Pye, David S., to Union Oil Company of California. Method of foam drilling using a sulfoacetate foaming agent 4,036,764, Cl 252-8.50C

Fischer & Porter Co *See—*

Searle, John L., 4,036,052, Cl 73-194.0EM.

Fishbein, Harry, to Swisstone Corporation Musical toy 4,035,948, Cl. 46-189.000.

Fisher, Kenneth J *See—*

Brendgord, Thomas, and Fisher, Kenneth J., 4,037,096, Cl 240-1.400

Fisons Limited *See—*

Rutherford, David, Williams, Peter; and Raphael, Richard Anthony, 4,036,983, Cl 424-295.000

Fleagle, Joseph E., to Wagner Electric Corporation Time delayed actuation of wheel slip control system for automotive vehicles and the like 4,036,537, Cl 303-106.000.

Fleming, William T., to Walter Kidde & Company, Inc. Remote high temperature indicating apparatus. 4,036,166, Cl 116-114.500

Flinth, Rune, and Kjell, Nordstrom, to Transcale AB. Weighing system. 4,036,315, Cl. 177-1.000.

Florczak, Henry. Stand-off arrangement for levels. 4,035,923, Cl. 33-374.000.

Flowers, France. Salad dressing. 4,037,001, Cl. 426-589.000.

Floyd, James R; Dalenberg, Paul N.; and Slivensky, Robert B., to Wickes Corporation, The. Mechanical seals 4,036,505, Cl. 277-96.200.

Flymo Societe Anonyme: *See—*

Arnblock, Lennart Oswald, 4,035,995, Cl. 56-11.600.

FMC Corporation *See—*

Gerlach, Carl J.; and Vande Castle, Jerome, 4,035,984, Cl 53-28.000.

McClintic, Wayne L.; and Sheetz, Charles E., 4,036,375, Cl. 214-6.00F

McKeon, John F.; and Lambert, Roy E., 4,036,072, Cl. 74-245.00R

Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Sugiyama, Kiyoshi, 4,036,990, Cl. 424-361.000.

Foglio, Maurizio; Franceschi, Giovanni; and Suarato, Antonino, to Societa' Farmaceutici Italia Process for preparing cephalosporins 4,036,835, Cl. 260-243.00C.

Foley, Kevin M., Bell, Reuben H., and McCombs, Frank P., to Owens-Corning Fiberglas Corporation. Molding compounds. 4,036,806, Cl 260-37.00N.

Fond, Loren S., *See—*

Craig, Burnie M., 4,036,412, Cl. 222-490.000

Fonderie F. lli Perani S.p.A.: *See—*

Perani, Giuseppe, 4,036,287, Cl. 165-55.000.

Foner, Simon Multiple mode magnetometers 4,037,149, Cl 324-34.00R.

Food Automation Service Techniques, Inc.: *See—*

Koether, Bernard G; and Witt, Allan E., 4,036,995, Cl. 426-233.000.

Foote Mineral Company: *See—*

Brown, Patrick M., 4,036,713, Cl. 204-98.000

Forberich, Helmut *See—*

Troetscher, Otto, Wiedmann, Erwin, Stahl, Horst, and Forberich, Helmut, 4,036,762, Cl 250-199.000.

Ford Motor Company: *See—*

Andre, Lee R., 4,036,319, Cl 188-282.000

Foret, S A., *See—*

Felip Sugranes, Jose, 4,036,583, Cl 432-117.000

FORGEAL, societe pour le Forgeage et l'Estampage des Alliages Legers: *See—*

Lucas, Roger; and Auberger, Jacques, 4,035,891, Cl 29-159.010.

Forman, Wallace: *See—*

Jacobson, Leo, and Forman, Wallace, 4,036,361, Cl 206-386.000

Forney Engineering Company: *See—*

Moore, William J., 4,037,113, Cl 250-554.000

Forrest, Robert, to Forrest Tool & Die Limited Lawn aerating attachments for shoes and boots 4,035,935, Cl 36-136.000

Forrest Tool & Die Limited: *See—*

Forrest, Robert, 4,035,935, Cl 36-136.000

Forshaw, Sydney James *See—*

Baines, Eric, Forshaw, Sydney James, and Harvey, Kenneth, 4,036,950, Cl 424-54.000

Foseco International Limited *See—*

Asahara, Hidetoshi, 4,036,282, Cl 164-123.000

Washbourne, Colin, 4,036,324, Cl 181-42.000

Foster, George B.; and Gibbs, Paul Douglas, to Air Data, Inc Vertical navigation guidance system 4,037,086, Cl 235-150.220

Foulds, John G., to Bethlehem Steel Corporation Rolling mill control method and apparatus having operator update of presets. 4,037,087, Cl 235-151.100

Fraioli, Anthony V.; and DeRosa, John A., to Minerec Corporation Oxidation and sinter-resistant metal powders 4,036,634, Cl 75-.50A

Franceschi, Giovanni *See—*

Foglio, Maurizio; Franceschi, Giovanni; and Suarato, Antonino, 4,036,835, Cl 260-243.00C

Francis, Philip E. Air conditioning unit for automobiles 4,036,029, Cl. 62-243.000

Francis, Robert Arthur Pipe joints 4,036,512, Cl 285-111.000

Fravel, John C *See—*

Chang, Louis H.; and Fravel, John C., 4,037,216, Cl 364-900.000.

Freddi, Tomaso, to Finike Italiana Marposs-Soc. In Accomandita Semplice di Mario Possati & C. Method and relevant apparatus to check the rotation of mechanical workpieces being machined on grinders. 4,036,607, Cl 51-165.00R

French, Gordon B., to Occidental Oil Shale, Inc Method of loading blast hole with explosive 4,036,099, Cl. 86-20.00C

Fresard, Marcel, Baruffa, Olindo; and Gabriel, Jean-Pierre, to Mefina S.A Sewing machine. 4,036,158, Cl. 112-258.000.

Frey, Robert L.; and George, Lee R., to P. R Mallory & Co., Inc. Thrust bushing for variable resistance control 4,037,188, Cl 338-174.000

Fried Krupp Gesellschaft mit beschrankter Haftung *See—*

Weber, Heinz, 4,036,377, Cl. 214-512.000.

Friedericy, Johan A.; and Towgood, Dennis A., to Garrett Corporation, The. Multi-rim flywheel. 4,036,080, Cl. 74-572.000.

Frielingsdorf, Hans *See—*

Mueller-Tamm, Heinz, Frielingsdorf, Hans, Gonsior, Leonhard; and Gruber, Wolfgang, 4,037,042, Cl. 526-106.000

Frito-Lay, Inc.: *See—*

Priebe, William F., 4,036,664, Cl. 127-69.000.

- Froberg, Rolf Bo: *See—*
  - Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo; and Ornelius, Erik Vilhelm Bernhard, 4,036,658, Cl. 106-90.000.
- Frye, Robert C.: *See—*
  - Tasch, Al F.; and Frye, Robert C., 4,035,906, Cl. 29-578.000.
- Fuchs, Hermann; and Meininger, Fritz, to Hoechst Aktiengesellschaft Monoazo reactive dyestuffs. 4,036,825, Cl. 260-196.000.
- Fugere, Albert Lee; and Kelly, Michael Joseph. Protective gaiter. 4,035,860, Cl. 12-142.00W.
- Fuji Photo Optical Co., Ltd.: *See—*
  - Numata, Saburo; and Fujino, Shinichiro, 4,037,236, Cl. 354-51.000.
- Fujikura, Yoshiaki: *See—*
  - Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,036,892, Cl. 260-617.00F.
  - Inamoto, Yoshiaki; Fujikura, Yoshiaki, Tsuchihashi, Kiyoshi; and Takaishi, Naotake, 4,036,893, Cl. 260-617.00F.
- Fujimoto, Isao; Kasunuchi, Takeshi; and Aiba, Masahiko, to Nippon Telegraph and Telephone Public Corporation; and Sharp Kabushiki Kaisha. Timing circuit for ink jet system printer. 4,037,230, Cl. 346-75.000.
- Fujimoto, Masaharu: *See—*
  - Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu, and Maeda, Tetsuya, 4,036,834, Cl. 260-243.00C.
- Fujino, Shinichiro: *See—*
  - Numata, Saburo; and Fujino, Shinichiro, 4,037,236, Cl. 354-51.000.
- Fujisawa Pharmaceutical Co., Ltd.: *See—*
  - Kamiya, Takashi; Saito, Yoshihisa, Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi, and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.
- Fujitsu Ltd.: *See—*
  - Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000
- Fujiyama, Susumu; Takagawa, Minoru; and Kajiyama, Shiro, to Mitsubishi Gas Chemical Company, Inc. Method for decomposing an aromatic aldehyde-hydrogen fluoride-boron fluoride complex. 4,036,885, Cl. 260-599.000
- Fukuta, Shunji: *See—*
  - Kato, Hisao, Yagi, Hideo; and Fukuta, Shunji, 4,036,721, Cl. 204-181.000
- Fukuzawa, Kokichi. *See—*
  - Mukai, Osamu; Miyatani, Akira, Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R
- Funaki, Takashi, to Kabushiki Kaisha Sankyo Seiki Seisakusho. Symbol indication drum 4,036,134, Cl 101-426.000.
- Funk, Edward W.. *See—*
  - Irani, Cyrus A., Funk, Edward W.; Gomez, Ernesto, and Espino, Ramon L., 4,036,732, Cl 208-11.0LE.
- Funk, Roger Calvin, to Davey Tree Expert Company, The. High analysis fertilizer 4,036,627, Cl 71-29.000.
- Furst, Andor *See—*
  - Alig, Leo; Furst, Andor, and Muller, Marcel, 4,036,874, Cl. 260-488.00B
- Furumi, Yoshinori. *See—*
  - Yamada, Koichi; Hashimoto, Tadanori, and Furumi, Yoshinori, 4,036,655, Cl 106-77.000
- Fuselier, John A. Flat baffle speaker system having improved crossover 4,037,051, Cl. 179-1.00E.
- G. D. Searle & Co.: *See—*
  - Krimmel, Carl Peter, 4,036,828, Cl. 260-239.0BC.
- G P I. *See—*
  - D'Alessio, Frank P., and Koenig, Erl A., 4,036,510, Cl. 280-613.000.
- G S & H Equipment Corporation. *See—*
  - Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude! 4,035,998, Cl. 56-27.500.
- Gabriel, Jean-Pierre: *See—*
  - Fresard, Marcel; Baruffa, Olindo; and Gabriel, Jean-Pierre, 4,036,158, Cl. 112-258.000.
- GAF Corporation: *See—*
  - Viro, Felix, and Mourning, Michael C., 4,036,643, Cl. 96-29.00D.
- Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, to Andco Incorporated. Method and apparatus for electrochemical contaminant removal from liquid media. 4,036,726, Cl. 204-231.000.
- Gallagher, James Cyril, to Apsee, Inc. Method and apparatus for generating a negative charge effect in an environment. 4,037,268, Cl. 361-231.000.
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- Gandy, Dale: *See—*
  - Gandy, Mack C., 4,036,182, Cl. 123-3.000.
- Gandy, Mack C., to Gandy, Dale, a part interest. Gasoline refractionator for internal combustion engines. 4,036,182, Cl. 123-3.000.
- Gane, Gordon R.; and Hoffmann, Lawrence C., Jr., to Kaiser Aluminum & Chemical Corporation. Easy open end. 4,036,159, Cl. 113-1.00F.
- Ganellin, Charon Robin: *See—*
  - Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,036,971, Cl 424-273.000.
- Gangadharan, Tyagaraja: *See—*
  - Chopra, Gopal Mohan; Gangadharan, Tyagaraja; and Sinha, Ram Narain, 4,036,138, Cl. 102-24.00R.
- Ganiaris, Neophytos, to Struthers Patent Corporation. Freezer concentration. 4,036,619, Cl. 62-123.000.
- Gardner, Edward Boyd: *See—*
  - Dobrzanski, John; Gardner, Edward Boyd; and Hart, Ernest V., 4,037,206, Cl. 340-237.00S.
- Gardner, Patrick J.; and Myers, Hugh T., Sr. Means for handling hides during and after hide-pulling operation. 4,035,868, Cl. 17-21.000.
- Garrett Corporation, The: *See—*
  - Friedericy, Johan A.; and Towgood, Dennis A., 4,036,080, Cl. 74-572.000.
- Garto, Anthony: *See—*
  - Garto, Joseph Benjamin; and Garto, Anthony, 4,036,497, Cl. 273-101.000.
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- Gaskill, George, to I-T-E Imperial Corporation. Replaceable solid state trip unit. 4,037,183, Cl. 335-6.000.
- Gaston County Dyeing Machine Company: *See—*
  - Aurich, Christoph W.; Sturkey, William Cleere; and Turner, James Keith, 4,036,038, Cl. 68-5.00C.
- Gasul, Mordecai: *See—*
  - Boyko, Daniel; Wallach, David; and Gasul, Mordecai, 4,035,900, Cl. 29-795.000.
- Gates Rubber Company, The: *See—*
  - Harder, Steven H., 4,037,077, Cl. 219-123.000.
- Gawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, to Dynamit Nobel Aktiengesellschaft and Impex-Essen Vertrieb Von Werkzeugen GmbH. Magazine apparatus for propellant charges and method of making same. 4,036,103, Cl. 89-35.00R.
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- Gebruder Heller Verwaltungsgesellschaft mit beschrankter Haftung: *See—*
  - Dellenberg, Hugo, 4,036,308, Cl. 173-75.000.
- Gebruder Vieler GmbH: *See—*
  - Michel, Karl, 4,036,371, Cl. 211-182.000.
- Gehrke, Gunter: *See—*
  - Hederich, Volker; Bien, Hans-Samuel; and Gehrke, Gunter, 4,036,862, Cl. 260-380.000.
- Geiger, Hans: *See—*
  - Gsell, Siegbert; Geiger, Hans; and Maierhofer, Hans-Jurgen, 4,036,266, Cl. 139-304.000.
- Geilhausen, Horst: *See—*
  - Bauer, Kurt; Wittmann, Gunther; Mussgay, Manfred; Irion, Eckart; and Geilhausen, Horst, 4,036,952, Cl. 424-89.000.
- Geist, Thomas N.: *See—*
  - Ballas, George C.; and Geist, Thomas N., 4,035,912, Cl. 30-276.000.
- Gembicki, Stanley A.; and Aeschbach, Stefan H., to UOP Inc. Method of producing an extruded catalyst composition. 4,036,784, Cl. 252-465.000.
- General Atomic Company: *See—*
  - Cheng, Shih-che; and Kaufman, Jay Stephen, 4,036,289, Cl. 165-82.000.
- General Electric Company: *See—*
  - Bailey, Ronald Barry; and Stitt, Thomas Detlor, 4,037,145, Cl. 318-341.000.
  - Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., 4,037,126, Cl. 310-260.000.
  - Cornell, Richard Henry, 4,036,246, Cl. 137-118.000.
  - Ferro, Armand P., 4,037,245, Cl. 357-38.000.
  - Ham, Emmett P.; and Johnson, Albert S., Jr., 4,036,045, Cl. 72-165.000.
  - Hardman, Bruce Bertolette; and Madigan, William Thomas, 4,036,813, Cl. 260-46.50G.
  - Herman, Richard M., 4,036,578, Cl. 431-98.000.
  - Kindig, Alan L., 4,035,910, Cl. 29-628.000.
  - Klein, Keith W., 4,037,185, Cl. 335-18.000.
  - Kowach, Ronald A.; and Rowen, William I., 4,036,164, Cl. 115-37.000.
  - Nicholas, John F., 4,037,163, Cl. 328-175.000.
  - Nolan, John M., 4,036,344, Cl. 192-48.300.
  - Owens, Michael; and Neal, Wayne Ray, 4,037,148, Cl. 323-17.000.
- General Energy Devices: *See—*
  - Bouse, Clyde W., 4,036,207, Cl. 126-271.000.
- General Foods Corporation: *See—*
  - Bahoshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., 4,036,992, Cl 426-3.000.
  - Daniels, David, 4,035,988, Cl. 53-183.000.
- General Foods Limited: *See—*
  - Ruff, John, 4,036,998, Cl. 426-302.000.
- General Ionex Corporation: *See—*
  - Purser, Kenneth H., 4,037,100, Cl 250-281.000.
- General Latex and Chemical Corporation: *See—*
  - Hopkins, Henry S., Jr., 4,036,792, Cl. 260-2.5AW.
- General Motors Corporation: *See—*
  - Benasutti, Louis D.; and Sucro, Jost S., 4,036,620, Cl. 62-338.000.
  - Bright, James A., 4,036,152, Cl. 110-8.00E.
  - Galonska, David A.; McCarthy, James B.; and Rutkiewicz, Joseph A., 4,036,110, Cl 91-375.00A.
  - McQuinn, Ted M., 4,036,083, Cl. 74-867.000.
- Genese, Joseph Nicholas, to Abbott Laboratories. Aspiration device. 4,036,232, Cl. 128-278.000.

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  - Martin, Lincoln A., 4,037,190, Cl. 340-15.5TA.
- George, Albert L. Variable speed fan drive system. 4,036,432, Cl. 236-35.000.
- George, Brian Victor: *See—*
  - Rickard, Allan Robert; and George, Brian Victor, 4,036,687, Cl 176-37.000.
- George, Lee R.: *See—*
  - Frey, Robert L.; and George, Lee R., 4,037,188, Cl. 338-174.000
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  - Jespersen, Paul W.; and DeLuca, Raymond F., 4,036,406, Cl. 222-181.000.
- Gerdes, Theodor, to Blau KG Fabrik fur Kraftfahrzeugteile. Gas cap with automatic pressure compensation. 4,036,399, Cl. 220-303.000
- Gerendas, Jozsef: *See—*
  - Wolf, Hans; Gerendas, Jozsef; and Wilhelm, Ernst, 4,036,587, Cl. 8-92.000.
- Gergely, Franz Julius. Wall of building blocks and method of constructing it. 4,035,975, Cl. 52-284.000.
- Gerlach, Carl J.; and Vande Castle, Jerome, to FMC Corporation. Wrapping method and apparatus. 4,035,984, Cl. 53-28.000.
- Gesellschaft fur Kernforschung m b H.: *See—*
  - Weimar, Peter; and Bauer, Franz, 4,036,601, Cl. 428-663.000.
- Gesing, Horst: *See—*
  - Schimmer, Rigobert; Gesing, Horst; Beerwerth, Wolfgang, and Messerschmidt, Jurgen, 4,036,485, Cl. 269-285.000.
- Getzin, Allan R.: *See—*
  - Bennett, Robert L.; Parrott, Orville C.; Getzin, Allan R.; and McClain, A. Ervin, 4,036,611, Cl. 55-149.000.
- Gevers, Georges A., to Fabrique Nationale Herstal S.A. en abrege FN Gun barrels. 4,035,944, Cl. 42-75.00B.
- Geyer, Charles J., Jr.; and White, Ben E., to Fiber Associates, Inc. Process for continuous xanthation and production of viscose spinning solution. 4,037,039, Cl. 536-60.000
- Geyer, Hermann; Baab, Albert; and Himmelsbach, Paul, to Jos. Schneider & Co. Optische Werke Kreuznach. Molding apparatus for making iris leaf. 4,036,571, Cl. 425-556.00R.
- GF Business Equipment, Inc.: *See—*
  - Howk, Victor G., 4,036,525, Cl 297-353.000.
- Ghrist, William D., III: *See—*
  - Davis, Guy E.; Lardi, Francesco; and Ghrist, William D., III, 4,037,088, Cl. 235-151.210.
- Gialdi, Franco; Longoni, Angelo; Michieli, Giannantonio; and Ponci, Riccardo, to Montedison Fibre S.p.A. Derivatives of quinoline-8-carboxylic acid having pesticidal action. 4,036,963, Cl. 424-258.000.
- Gibbon, John D.: *See—*
  - Lowder, F. Ray; and Gibbon, John D., 4,036,003, Cl. 57-140.00R.
- Gibbs, Paul Douglas: *See—*
  - Foster, George B.; and Gibbs, Paul Douglas, 4,037,086, Cl. 235-150.220.
- Gidlof, Lars F. Method and apparatus for use in setting a counter. 4,036,431, Cl. 235-92.0PE.
- Giese, John David: *See—*
  - Sieradzki, Benjamin; and Giese, John David, 4,036,477, Cl 259-41.000.
- Gilbert, Robert B. Encapsulated transmission unit. 4,036,068, Cl. 74-230.17E.
- Gilby, Anthony C., to Wilks Scientific Corporation Method of forming dual mirrors. 4,035,963, Cl 51-324.000.
- Gilford Instrument Laboratories, Inc.: *See—*
  - Hydo, Steven J., 4,036,064, Cl. 73-425.600.
- Gill, Glenn G.: *See—*
  - Cycowicz, Izchak; and Gill, Glenn G., 4,035,852, Cl 5-13.000.
- Gill, Heather Ann: *See—*
  - Burge, Malcolm Leonard Ernest, and Gill, Heather Ann, 4,037,000, Cl. 426-572.00J.
- Gillard, Claude; and Mauroy, Marcel, to Soram S A Automatic electronic apparatus for measuring the bronchial resistance and the elastance of the pulmonary tissue. 4,036,222, Cl. 128-2.080.
- Gillemot, George W.: *See—*
  - Thompson, John T.; and Gillemot, George W., 4,036,546, Cl 339-95.00R.
- Giori, Gualtiero, to De La Rue Giori S.A. Intaglio printing plate manufacture. 4,036,130, Cl. 101-170.000.
- Gipson, Robert M.: *See—*
  - Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., 4,036,880, Cl. 260-570.00D.
- Girault, Pierre: *See—*
  - Perronnet, Jacques; and Girault, Pierre, 4,036,633, Cl. 71-106.000.
- Girling Limited: *See—*
  - Brown, Peter William, 4,036,334, Cl. 188-264.00A.
- Gittleman, Jonathan Isaac, to RCA Corporation. Semiconductor absorber for photothermal converter. 4,037,014, Cl 428-331.000.
- GKN Somerset Wire Limited: *See—*
  - Davies, Peter Gough; Jones, Keith Thomas, and Salmon, Brian, 4,036,046, Cl. 72-286.000.
- Glacier Metal Company Limited, The: *See—*
  - Patel, Padma Ambalal; and Baker, Dennis Stanley, 4,036,822, Cl 260-79.000.
- Glaser, Gunther: *See—*
  - Effenberger, Hubert; and Seeger, Walter, 4,036,006, Cl. 58-23.00R.
- Glass, Benjamin G. Turbine. 4,036,584, Cl. 415-90.000.
- Globe-Union Inc.: *See—*
  - Tiedemann, William H., 4,036,786, Cl. 252-511.000.
- Gluck, Walter, to Metallgesellschaft Aktiengesellschaft. Tensioning device for corona-discharge electrodes. 4,035,886, Cl. 29-25.190
- Gmach, John L. T. B.: *See—*
  - Wyeth, Harold G.; and Gmach, John L. T. B., 4,035,851, Cl. 4-99.000.
- Godfrey, William H.; and Woessner, Neal L., to Caterpillar Tractor Co. Securing-unloading apparatus for flatcar carried wheeled vehicles. 4,036,379, Cl. 214-152.000.
- Goettsch, Reijer: *See—*
  - de Rooij, Abraham H.; and Goettsch, Reijer, 4,036,830, Cl. 260-239.30A.
- Goldberg, Burton D. Novelty disc manipulating device. 4,036,498, Cl. 273-101.000.
- Golden, Martin P.; Tilbrook, Roger W.; and Heylmun, Neal F., to United States of America, Energy Research and Development Administration. Apparatus for controlling molten core debris. 4,036,688, Cl. 176-38.000.
- Goldenberg, Marvin M., to Morton-Norwich Products, Inc. Method for treating inflammation. 4,036,981, Cl. 424-285.000.
- Golick, Martin Lance. Puzzle game. 4,036,503, Cl. 273-153.00S.
- Gomez, Ernesto: *See—*
  - Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., 4,036,732, Cl. 208-11.0LE.
- Gonsior, Leonhard. *See—*
  - Mueller-Tamm, Heinz; Frielingsdorf, Hans; Gonsior, Leonhard; and Gruber, Wolfgang, 4,037,042, Cl. 526-106.000.
- Gonzalez, Roland; and Miguel, Raul C. Mat switch. 4,037,069, Cl. 200-86.00R.
- Goodheim, Harold, to United States of America, Government. Means for applying zinc stearate coatings to the bore surfaces of ferrous alloy tubes. 4,036,170, Cl 118-73.000.
- Goodyear Tire & Rubber Company, The: *See—*
  - Conger, Marvin T.; and Beers, Roger N., 4,036,765, Cl. 252-21.000
  - Finelli, Anthony F., 4,036,906, Cl. 260-830.00P.
  - Habeck, Bruce W., and Feeney, George W., 4,037,016, Cl. 428-349.000.
- Goof, Sven Karl Lennart. Rod shaped hand-tool. 4,036,311, Cl. 173-169.000.
- Gordon, Robert L., to International Paper Company. Expandable package. 4,036,423, Cl. 229-43.000.
- Gosney, William Milton, to Texas Instruments Incorporated. Dual injector, floating gate MOS electrically alterable, non-volatile semiconductor memory device. 4,037,242, Cl. 357-23.000.
- Goteborgs Analyslaboratorium AB: *See—*
  - Hulthe, Peter, 4,036,716, Cl 204-147.000.
- Goujon, Roger Hubert; Menard, Jacques Pierre Raymond Raphael; and Pagny, Georges Claude Andre, to Compagnie Honeywell Bull (Societe Anonyme). Power supply testing apparatus. 4,037,156, Cl 324-158.00R.
- Gould, Eugene L. Method of forming decorative inserts in granite and the like. 4,036,929, Cl. 264-132.000.
- Gould Inc.: *See—*
  - Sabatino, Anthony, 4,037,030, Cl 429-139.000
- Goulet, Roger T., to Cambridge Filter Corporation. Fluid pressure sensing apparatus. 4,036,054, Cl. 73-212.000.
- Graf, Peter E.. *See—*
  - Schmidt, Robert J., deceased, and Graf, Peter E., 4,036,661, Cl. 106-273.00N
- Graham Magnetics Incorporated *See—*
  - Deffeyes, Robert J., 4,036,360, Cl 206-204.000.
- Graizzaffi, Carmelo C. Remote control device for key actuated systems. 4,036,040, Cl 70-431.000
- Gravi-Mechanics Co. *See—*
  - Dedolph, Richard R., 4,035,951, Cl. 47-66.000.
- Graybiel, Lynn Allan. *See—*
  - Birney, Richard Eugene, Osborne, William Steese; and Graybiel, Lynn Allan, 4,037,207, Cl. 364-200.000.
  - Birney, Richard Eugene; Davis, Michael Ian, Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel, and Osborne, William Steese, 4,037,215, Cl 364-200.000.
- Greco, Alberto: *See—*
  - Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,037,041, Cl. 526-97.000.
- Green, Elward Howard, to Newman-Green, Inc. Spray head for nebulization of fluids. 4,036,439, Cl 239-466.000.
- Green, Harold A.; Merianos, John J., and Petrocci, Alfonso N., to Millmaster Onyx Corporation. Microbiocidal capped polymers 4,036,959, Cl. 424-248.560.
- Greene, Janice L., to Standard Oil Company. Process for producing 2-pyrrolidone. 4,036,836, Cl. 260-326.5FN
- Greene, Robert T.: *See—*
  - Betts, William L.; and Greene, Robert T., 4,037,226, Cl. 340-347.0DD.
- Greenwood, Donald L. Pin fastener. 4,036,097, Cl 85-5.0CP
- Gregg, Gordon E.; Howell, Thomas H., and Rabins, Leonard, to Honeywell Information Systems, Inc Matrix multiplier in $GF(2^m)$ 4,037,093, Cl. 235-164.000.
- Gregory, Ralph R., to National Upper Cervical Chiropractic Research Association, Inc. Process for determining vertebrae locations in humans. 4,036,213, Cl. 128-2.00S.
- Gregory, Reginald, to British Petroleum Company Limited, The. Chemical process producing aromatic hydrocarbons by dehydrocyclodimerization of a C_4 feedstock. 4,036,902, Cl. 260-673.000.
- Grehier, Alain, and Cheron, Jacques, to Institut Francais du Petrole. Fuel cells. 4,037,023, Cl. 429-12.000.
- Greive, Aloys, to Hamel GmbH Zwirnmaschinen Yarn twisting apparatus with sound and wind shielding. 4,036,000, Cl. 57-1.00R.

Gresham, Robert W.: *See—*
  Cruzen, Harry F.; and Gresham, Robert W., 4,036,570, Cl 425-141.000.
Gretag Aktiengesellschaft: *See—*
  Miloradovic, Predrag; and Schaffhauser, Hans, 4,037,160, Cl. 325-42.000.
Griffith, Russell W., to United Technology Laboratories, Inc. Frequency indicating system. 4,037,152, Cl. 324-79.00R.
Griffiths, James Edward: *See—*
  English, John Hershel; Griffiths, James Edward, and Zuk, Paul, 4,037,266, Cl. 361-120.000.
Grinberg, Isaak Pavlovich: *See—*
  Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich, Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.
Grindstaff, Donald A., to Stauffer Chemical Company. Treatment of whey. 4,036,999, Cl. 426-549.000.
Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, to G S & H Equipment Corporation. Tractor mounted tobacco combine for defoliation and subsequent transportation of tobacco leaves 4,035,998, Cl. 56-27.500
Griner, Wade: *See—*
  Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, 4,035,998, Cl. 56-27.500
Grischkowsky, Daniel Richard: *See—*
  Bennett, Robert James; and Grischkowsky, Daniel Richard, 4,036,554, Cl. 350-160.00R
Groeger, Ingo, and Scharbert, Juergen, to Siemens Aktiengesellschaft. Read only memory module. 4,037,218, Cl. 340-173.00R
Groff, James Wilson. Teaching machine. 4,035,929, Cl 35-8.00A.
Grolla, Herbert, to Heinrich Wagner Maschinenfabrik. Rail conveyor for foundry molding boxes 4,036,283, Cl 164-160.000.
Gruber, Wolfgang: *See—*
  Mueller-Tamm, Heinz, Frielingsdorf, Hans; Gonsior, Leonhard, and Gruber, Wolfgang, 4,037,042, Cl 526-106.000.
Gsell, Siegbert, Geiger, Hans, and Maierhofer, Hans-Jurgen, to Lindauer Dornier Gesellschaft mbH Take-up motion for looms. 4,036,266, Cl 139-304.000
GTE Sylvania Incorporated: *See—*
  Shaffer, Francis N., and Mathers, James E., 4,037,110, Cl. 250-483.000
  Zack, Alexander T.; and Gutta, John J., 4,037,129, Cl. 313-201.000.
Guenther, William D., to Dana Corporation. Stratified charge engine. 4,036,184, Cl. 123-75.00B
Guerrini, Giampaolo, to Ing C. Olivetti & C., S.p.A Ufficio Brevetti Fixing device for a type-carrier disk. 4,036,348, Cl. 197-53.000.
Guild, Charles L. Composite pile having the inside diameter of the tip less than that of the pile and mandrel for driving the same. 4,036,025, Cl. 61-53.720.
Guillais, Jean-Claude: *See—*
  Arjalies, Georges; and Guillais, Jean-Claude, 4,036,337, Cl 191-1.00A.
Guinosso, Charles J.: *See—*
  Sellstedt, John H., Guinosso, Charles J., and Begany, Albert J., 4,036,837, Cl. 260-250.0BN.
Guitard, Arthur Herbert: *See—*
  Chan, Lock-Lim, and Guitard, Arthur Herbert, 4,036,682, Cl. 162-167.000.
Gulf Research & Development Company: *See—*
  Hartle, Robert J., 4,036,605, Cl 44-68.000
  Readal, Thomas C.; McKinney, Joel D.; and Titmus, Robert A., 4,036,740, Cl 208-120.000
Gulf & Western Manufacturing Company (Systems): *See—*
  Solomon, Elias E., 4,037,222, Cl 340-261.000.
Gulotta, Joseph A.: *See—*
  Sieger, John S.; and Gulotta, Joseph A., 4,036,626, Cl. 65-182.00R
Gundersen, Marius, to Vefi A/S. Device for stamping soil into groups of growth pots. 4,036,126, Cl 100-210.000.
Gundzik, Richard M.; and Logan, Forrest E., to Occidental Petroleum Corporation. Method and apparatus for condensing pyrolysis oils. 4,036,608, Cl. 55-89.000.
Gupta, Rash B., to Westinghouse Electric Corporation Multiple valve sequential control for a combined cycle power plant. 4,036,011, Cl. 60-39.18B.
Gustafsson, Manfred Wallace: *See—*
  Eriksson, Stig-Lennart; and Gustafsson, Manfred Wallace, 4,035,890, Cl. 29-96.000.
Guthrie, James Leverette; and Bach, Donald John, to W. R. Grace & Co. Simulated natural sponge from urethane. 4,036,791, Cl. 260-2.5AG.
Gutta, John J.: *See—*
  Zack, Alexander T.; and Gutta, John J., 4,037,129, Cl. 313-201.000
Guttmann, Friedrich-Wilhelm, to Klockner-Humboldt-Deutz Aktiengesellschaft. Apparatus for separating particles from a gas stream. 4,036,612, Cl. 55-282.000.
H.G.C. Construction & Equipment Company, Inc.: *See—*
  Ear, Frank P., 4,036,994, Cl. 426-233.000.
H. J. Langen & Sons Ltd.: *See—*
  Langen, Christianus Petrus, 4,036,122, Cl 99-533.000
Habeck, Bruce W.; and Feeney, George W., to Goodyear Tire & Rubber Company, The. Adhesive composition. 4,037,016, Cl. 428-349.000.
Haber, Edgar, to Massachusetts General Hospital, The. Composition and method for determining the size and location of myocardial infarcts. 4,036,945, Cl. 424-1.000.
Habermann, Clarence E., to Dow Chemical Company, The. Catalysts for the hydration of nitriles of amides. 4,036,879, Cl 260-561.00N.
Habiger, Cyril W., to Caterpillar Tractor Co. Single lever steering control for hydraulic drive vehicles. 4,036,321, Cl. 180-6.480.
Hack, Helmuth: *See—*
  Westphal, Kurt; Meiser, Werner; Eue, Ludwig; and Hack, Helmuth, 4,036,632, Cl. 71-93.000.
Haemer, Laurence F.: *See—*
  Murphy, Robert E. J.; Haemer, Laurence F.; and Scholl, Edward C., 4,036,673, Cl. 156-71.000.
Haferkorn, Herbert: *See—*
  Ibing, Gunter; and Haferkorn, Herbert, 4,036,594, Cl. 23-264.000.
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Halcour, Kurt: *See—*
  Vogel, Axel; Biedermann, Wolfgang; Halcour, Kurt; Schenk, Norbert; and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.
Hale, Robert A.: *See—*
  Jones, Vercoe C.; and Hale, Robert A., 4,036,148, Cl. 104-166.000.
Hall, James B.: *See—*
  Walraven, Thomas A.; Thomas, John G.; and Hall, James B., 4,036,397, Cl. 220-268.000.
Hallam, Harry, to A Campton & Sons Company Limited. Wrapping machine. 4,035,990, Cl. 53-222.000.
Haller, Henry E., III: *See—*
  Mole, Cecil J.; and Haller, Henry E., III, 4,037,123, Cl. 310-52.000.
Halpern, Alfred; and Sasmor, Ernest J., to Synergistics, Inc. Ultra-violet filtration with certain aminosalicylic acid esters. 4,036,951, Cl. 424-60.000.
Ham, Emmett P.; and Johnson, Albert S., Jr., to General Electric Company. Calibrated adjustable roll straightener for wire. 4,036,045, Cl. 72-165.000.
Hamaker, Weston: *See—*
  Allen, Timothy Darrell; and Hamaker, Weston, 4,036,471, Cl. 254-28.000.
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  Greive, Aloys, 4,036,000, Cl. 57-1.00R.
Hamilton, Edna L., joint tenancy for the estate: *See—*
  Hamilton, William L., deceased, 4,036,196, Cl. 123-140.00R.
Hamilton, William L., deceased (by Hamilton, Edna L., joint tenancy for the estate), to Allis-Chalmers Corporation. Spring loaded lever to operate control rack of fuel injector. 4,036,196, Cl. 123-140.00R.
Hammann, Ingeborg: *See—*
  Hoffmann, Hellmut; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,036,947, Cl. 424-217.000.
  Hoffmann, Hellmut; Riebel, Hans-Jochem; and Hammann, Ingeborg, 4,036,982, Cl. 424-285.000.
  Stolzer, Claus; Homeyer, Bernhard; Hammann, Ingeborg; and Unterstenhofer, Gunter, 4,036,956, Cl. 424-210.000.
Hammon, Fritz; Schnell, Georg; and Reimer, Karl-Juergen, to BASF Aktiengesellschaft. Method and equipment for switching the operating conditions of a tape-recorder. 4,037,259, Cl. 360-66.000.
Hannah, Brian: *See—*
  Rohrig, Adalbert; Willim, Fritz; and Hannah, Brian, 4,036,280, Cl. 164-82.000.
Hannover, Finn, to Du Pont de Nemours, E. I., and Company. Pipe fitting. 4,036,514, Cl. 285-222.000.
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  Karcher, Thomas D.; and Silagy, Richard J., 4,036,515, Cl. 285-315.000.
Hansen, Ove E.: *See—*
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Hanson, Carl V.; and Whitener, Philip C., to Boeing Company, The. Liquid cargo loading apparatus. 4,036,257, Cl. 137-614.060.
Hanson, Richard Eric, to United States of America, Army. Method for determining engine moment of inertia. 4,036,049, Cl. 73-116.000.
Hara, Katsunosuke: *See—*
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Harada, Shunichi: *See—*
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Harand, Elmar; Richter, Gerd; and Tschopel, Gunter, to Kraftwerk Union Aktiengesellschaft Primary coolant pump for nuclear reactors. 4,036,561, Cl. 415-18.000.
Harbulak, Edward P., to M & T Chemicals Inc. Electroplating nickel, cobalt, nickel-cobalt alloys and binary or ternary alloys of nickel, cobalt and iron. 4,036,709, Cl. 204-43.00T.
Harder, Steven H., to Gates Rubber Company, The. Battery welding method 4,037,077, Cl 219-123.000.
Hardman, Bruce Bertolette, and Madigan, William Thomas, to General Electric Company. Composition for promoting adhesion of curable silicones to substrates. 4,036,813, Cl 260-46.50G.
Harrington Manufacturing Company: *See—*
  Jordan, Bertram L.; Mitchell, John D.; and Sessoms, J. C., Jr., 4,036,454, Cl 294-5.500.
Harris Corporation: *See—*
  Elmore, Donald Fenton, 4,036,131, Cl. 101-247.000.
  Martin, Albert R., 4,037,159, Cl. 325-30.000.
  Monahan, John F., 4,037,254, Cl 358-228.000.
Hart, David Frederick: *See—*
  Betts, Colin, Collinson, Alfred Edward, and Hart, David Frederick, 4,036,690, Cl 176-40.000.

Hart, Ernest V.: *See—*
  Dobrzanski, John; Gardner, Edward Boyd, and Hart, Ernest V., 4,037,206, Cl. 340-237.00S.
Hartle, Robert J., to Gulf Research & Development Company. Chelates of cerium (IV), their preparation and gasoline containing said chelates. 4,036,605, Cl. 44-68.000.
Hartmann, Albert; Schilken, Herbert; and Romeiser, Bernhard, to Metallgesellschaft Aktiengesellschaft. Semicontinuous process for deodorizing oils. 4,036,865, Cl 260-428.000
Hartmann, Robert H.: *See—*
  Brennan, Thomas E.; Hartmann, Robert H.; and McCoy, Robert M., 4,037,126, Cl. 310-260.000.
Hartwick, William F.; and Melcher, Charles H., to Cooper Industries, Inc. Fluid compressor valve. 4,036,251, Cl. 137-512.100
Harvey, Kenneth: *See—*
  Baines, Eric; Forshaw, Sydney James, and Harvey, Kenneth, 4,036,950, Cl. 424-54.000.
Harvey, Peter, to MacPherson Powders Limited. Apparatus for coating articles. 4,036,169, Cl. 118-66.000.
Harvey, Ronald William Stanley, to A. R. I. Propaflor Limited. Raised floor panels. 4,035,967, Cl. 52-126.000.
Harvey, William R., to Lexsuco, Inc. Roofing nail applicator. 4,036,422, Cl. 227-110.000.
Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased (Kinjo, legal representative; by Ayako), to Canon Kabushiki Kaisha. Heat developable photosensitive material containing compounds of sulfur. 4,036,650, Cl. 96-114.100.
Hashimoto, Masashi: *See—*
  Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.
Hashimoto, Shigeki: *See—*
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  Yamada, Koichi; Hashimoto, Tadanori; and Furumi, Yoshinori, 4,036,655, Cl. 106-77.000.
Haslett, Glen M.; and Boggs, Roger L., to Caterpillar Tractor Co. Track shoe back-bend bumper. 4,036,538, Cl. 305-47.000.
Hastings, Kingsley N. Automatic gain control amplifier. 4,037,167, Cl 330-29.000.
Hata, Yoshitaka; Shioyama, Giichi; and Minami, Hidehiro, to Nissan Motor Co., Ltd. Multi-cylinder internal combustion engine. 4,036,015, Cl. 60-282.000.
Hatakeyama, Junichi: *See—*
  Matsumoto, Kuniaki; Hatakeyama, Junichi; and Okamoto, Masaharu, 4,036,023, Cl. 61-25.000.
Hatch, Ronald Frank, to St. Regis-Aci Pty. Limited. Sack making equipment. 4,036,115, Cl. 93-8.00R.
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  Criblez, Roger, 4,036,089, Cl. 83-198.000.
Hathaway, Lucille. Drainage device for ear irrigation. 4,036,235, Cl. 128-292.000.
Hattori, Kiyoshi; Lowery, Edward L.; Chadbourne, William H.; and Boyer, William M., to Dart Industries Inc. Glass fiber reinforced thermoplastic composition and process for its preparation. 4,037,011, Cl. 428-294.000.
Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, to Nippon Soken, Inc. Air-fuel mixture ratio correcting system for carburetor. 4,036,186, Cl. 123-32.0EA.
Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., to Service Equipment Design Co., Inc. Thread protector for oil-well pipe and bladder incorporated therein. 4,036,261, Cl. 138-96.00T.
Hauk, Thomas D.: *See—*
  Hauk, Ernest D.; Hauk, Thomas D.; and Carstensen, Kenneth J., 4,036,261, Cl. 138-96.00T.
Hauni-Werke Korber & Co., KG: *See—*
  Schubert, Bernhard; and Blidung, Otto, 4,036,119, Cl 93-77.0FT
Haury, Donald Richard: *See—*
  Carey, Charles Henry; and Haury, Donald Richard, 4,036,448, Cl. 242-81.000.
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  Courtwright, Robert M., 4,036,542, Cl. 312-330.00R.
Havas, George, to Ajax Magnethermic Corporation. Power control system for single phase induction melting or heating furnace 4,037,044, Cl. 13-26.000.
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  Kieferle, Wolfgang, 4,036,482, Cl 266-252.000.
Hawker Siddeley Dynamics Limited: *See—*
  Stephenson, Peter Robert Norman, 4,036,763, Cl 250-214.00C
Hawryluk, John. Liquid fuel mixing device. 4,036,914, Cl 261-79.00R.
Hawthorne, Arthur L.; and Hazen, David R., to Continental Oil Company. Support system for a unitized pair of auger conveyors 4,036,529, Cl. 299-19.000.
Hay, Donald A. Building construction system 4,035,971, Cl 52-236.600
Hayakawa, Shigeru: *See—*
  Ono, Shusuke; Wasa, Kiyotaka; and Hayakawa, Shigeru, 4,037,176, Cl. 333-30.00R
Hayamizu, Yoshisada: *See—*
  Yamashita, Nobuo; Hayamizu, Yoshisada; Nagai, Yoshitaka; Imai, Toshihiro; and Matsuo, Kazumasa, 4,036,218, Cl 128-4.000
Hayashi, Kenji: *See—*
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Hayashi, Tsutomu; Kawaguchi, Takeshi; and Maeda, Noriyuki, to Honda Giken Kogyo Kabushiki Kaisha. Vehicle anti-skid brake control apparatus. 4,036,331, Cl. 188-187.000.
Hayes International Corporation: *See—*
  Pearson, Walter B., 4,037,228, Cl 343-18.00C.
Hayes, John C.: *See—*
  Pollitzer, Ernest L.; and Hayes, John C., 4,036,741, Cl. 208-139.000.
Hayes, Robert William, to Hayes-Te Equipment Corporation. Fireplace stove 4,036,205, Cl 126-126.000.
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  Hayes, Robert William, 4,036,205, Cl 126-126.000.
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  Hawthorne, Arthur L.; and Hazen, David R., 4,036,529, Cl. 299-19.000.
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Hedman, Bengt, to Bergsvik och Ala Aktiebolag. Studded chain link 4,036,010, Cl. 59-84.000
Heimann GmbH: *See—*
  Hoene, Ernst-Ludwig, 4,037,136, Cl 315-241.00P
Heimlicher, Paul; and Von Hein, Eduard, to Maschinenfabrik Wifag. Sheet folding apparatus. 4,036,487, Cl. 270-71.000.
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  Grolla, Herbert, 4,036,283, Cl. 164-160.000
Heintzelman, Leo. Mist separator. 4,036,615, Cl. 55-442.000.
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  Ester, Wilhelm, deceased, Ester, Margarete, heir; Louis nee Ester, Brigitte, heir, Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.
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Hellmig, Ehrhard; and Ranz, Erwin, to AGFA-Gevaert, A G. Color correction of unwanted side densities in light-sensitive color photographic elements. 4,036,646, Cl. 96-74.000
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  Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, 4,036,948, Cl. 424-32.000
Henderson, Eldon V. Wheels and assembly for a boat. 4,036,507, Cl 280-414.00A.
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  Trautvetter, Jutta; Weingartz, Albert, and Werner, Lothar, 4,036,775, Cl. 252-134.000
Henning, Dale A., and Raimbolt, Jack D., to B. F. Goodrich Company, The. Disc brake. 4,036,330, Cl. 188-72.800.
Henninger, Peter: *See—*
  Kullmann, Dieter; Henninger, Peter, and Intichar, Lutz, 4,037,124, Cl. 310-52.000
Hensel, Paul Christopher; and Spiers, Ronald Geoffrey, to Post Office, The. Severing apparatus. 4,036,419, Cl. 225-96.500
Hephner, Marie K.: *See—*
  Stambaugh, Sherwood C.; and Hephner, Marie K., 4,036,367, Cl. 211-37.000
Hercules Incorporated: *See—*
  Hurley, Eldon Kenneth, 4,036,100, Cl. 86-20.00C.
  Maslanka, William-Walter, 4,037,017, Cl. 428-413.000.
Herman, Richard M., to General Electric Company. Photoflash array and method of construction. 4,036,578, Cl. 431-98.000
Hertel, Karl. Cutting tools. 4,035,887, Cl 29-95.00R
Herwig, Walter: *See—*
  Noetzel, Siegfried; and Herwig, Walter, 4,036,811, Cl. 260-45.75W.
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., to Pfizer Inc. 15-Substituted-ω-pentanorprostaglandins. 4,036,832, Cl. 260-240.00R
Hesse, Robert Henry: *See—*
  Barton, Derek Harold Richard; and Hesse, Robert Henry, 4,036,864, Cl 260-397.300
Hewlett-Packard Company: *See—*
  Osborne, Thomas E.; and Stockwell, Richard Kent, 4,037,092, Cl 235-156.000.
  Takeuchi, Yasuhito, 4,037,151, Cl. 324-78.00R.
Heye, Hermann: *See—*
  Schaar, Lothar, 4,036,094, Cl 83-623.000
Heylmun, Neal F.: *See—*
  Golden, Martin P.; Tilbrook, Roger W.; and Heylmun, Neal F., 4,036,688, Cl. 176-38.000.
Hijikata, Akiko: *See—*
  Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl. 424-177.000.
Hill, Monty B., to Zenith Radio Corporation. Implosion protection system for color CRT bulb having a bonded funnel frame. 4,037,255, Cl. 358-246.000
Hills, William H.; and Borgman, Milton H., to Carisbrook Industries Inc. Apparatus for drawing and crimping yarn. 4,035,880, Cl 28-220.000.
Hillsman, Deane; Cook, Albert M.; and Simes, James G., to Sutter

- Hospitals Medical Research Foundation. Respirator. 4,036,221, Cl 128-145.600.
- Hilmoine, Serge: See—
  - Coudere, Pierre; and Hilmoine, Serge, 4,036,888, Cl 260-602.000.
- Hilti Aktiengesellschaft: See—
  - Storck, Friedrich; Kunesch, Rudolf, and Missbach, Gernot, 4,036,460, Cl. 248-59.000.
- Himi, Hitoshi, to Kabushiki Kaisha Meidensha. Metal clad insulating circuit breaker. 4,037,187, Cl. 337-121.000.
- Himmelsbach, Paul: See—
  - Geyer, Hermann; Baab, Albert; and Himmelsbach, Paul, 4,036,571, Cl. 425-556.00R.
- Hine, Louis P., Jr., to Westinghouse Electric Corporation. Refrigeration condenser. 4,036,292, Cl. 165-122.000.
- Hintze, Rudolf. Air conditioning apparatus and method for making the same, particularly for automotive vehicles. 4,035,894, Cl 29-157.30R
- Hirai, Seizaburo; Mizoe, Yoji; and Koji, Itoh, to Nippon Paint Co., Ltd. Adhesive composition. 4,036,804, Cl. 260-29.7SQ
- Hirose, Kazuhiro: See—
  - Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, 4,036,008, Cl. 58-85.500.
- Hitachi, Ltd.: See—
  - Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuka, Shigemichi, 4,036,041, Cl. 72-8.000
  - Ienaka, Masanori; and Suzuki, Yukio, 4,037,056, Cl. 179-15.0BT.
  - Kobayashi, Sadao, 4,036,672, Cl. 148-175.000.
  - Koike, Keiichi; and Sasaki, Toshimi, 4,037,015, Cl. 428-331.000.
  - Kubota, Hitoshi; Nishi, Takayuki; and Kobayashi, Takashi, 4,036,042, Cl 72-9.000.
  - Matsumoto, Kuniaki; Hatakeyama, Junichi, and Okamoto, Masaharu, 4,036,023, Cl 61-25.000.
  - Minorikawa, Kazuo, 4,037,085, Cl. 235-92.0LG.
  - Mukoh, Akio; Mori, Yasuki; and Morishita, Hirosada, 4,037,036, Cl 526-46.000.
  - Nomiya, Kosei; Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, 4,037,212, Cl. 364-200.000.
  - Takata, Yoshinori, 4,036,704, Cl. 204-1.00T
- Hochtemperatur-Reactorbau GmbH: See—
  - Baumgaertner, Heinrich, 4,036,689, Cl. 176-39.000.
- Hochtemperatur-Reaktorbau GmbH: See—
  - Ecker, Hans, 4,036,294, Cl 165-154.000
- Hochwalt, John R., to United States of America, Air Force. Protective flight helmet. 4,035,845, Cl 2-6.000
- Hodama, Takuo, to SBE Incorporated. Up/down switch and switching signal generator. 4,037,116, Cl 307-247.00A
- Hoechst Aktiengesellschaft: See—
  - Fuchs, Hermann; and Meininger, Fritz, 4,036,825, Cl. 260-196.000
  - Mitzlaff, Michael, 4,036,712, Cl 204-59.00R
  - Noetzel, Siegfried, and Herwig, Walter, 4,036,811, Cl. 260-45.75W
- Hoeg, Joseph G. Ultra-high pressure vessel electrical pass-through connector. 4,037,046, Cl 174-18.000
- Hoene, Ernst-Ludwig, to Heimann GmbH. Circuit arrangement for igniting at least one gas discharge flash lamp. 4,037,136, Cl. 315-241.00P.
- Hofberger, Gerald F: See—
  - Loftus, Edward J., and Hofberger, Gerald F., 4,036,513, Cl. 285-179.000.
- Hofer, Kurt: See—
  - Avar, Lajos, and Hofer, Kurt, 4,036,812, Cl 260-45.75N
- Hoff, Ivar. Garage door assemblies. 4,035,954, Cl 49-203.000.
- Hoff, Stephen J., to Hoffco, Inc. Lawn mower blade control apparatus. 4,035,994, Cl. 56-11.300.
- Hoffco, Inc.: See—
  - Hoff, Stephen J., 4,035,994, Cl. 56-11.300.
- Hoffman, Charles R.; and Powell, Michael W., to Motorola, Inc. Junction breakdown memory cells. 4,037,243, Cl. 357-23.000
- Hoffman, Neil R.; and Jansen, Johannes H., to Brake Engineering, Inc. Disc brake apparatus suitable for bicycles. 4,036,328, Cl. 188-26.000.
- Hoffmann, Hellmut; Homeyer, Bernhard, Hammann, Ingeborg, and Stendel, Wilhelm, to Bayer Aktiengesellschaft. O-Alkyl-N-subustituted-S-halophenoxymethyl-dithiophosphoric acid ester-amides. 4,036,947, Cl. 424-217.000
- Hoffmann, Hellmut; Riebel, Hans-Jochem; and Hammann, Ingeborg, to Bayer Aktiengesellschaft. O-Alkyl-S-alkyl-O-[2-carbalkoxy-benzofuran(3)yl]-thionothiol-phosphoric acid esters. 4,036,982, Cl. 424-285.000.
- Hoffmann-La Roche Inc.: See—
  - Alig, Leo; Furst, Andor; and Muller, Marcel, 4,036,874, Cl 260-488.00B.
  - Holland, George William; Jernow, Jane Liu; and Rosen, Perry, 4,036,871, Cl. 260-468.00D
- Hoffmann, Lawrence C., Jr.: See—
  - Gane, Gordon R.; and Hoffmann, Lawrence C., Jr., 4,036,159, Cl. 113-1.00F.
- Hoffmann, Rudolf. Continuous casting apparatus for slabs. 4,036,284, Cl. 164-280.000.
- Hogland, Gerald Hugh: See—
  - Reba, Imants; Hogland, Gerald Hugh; and Wolthausen, Edward Clair, 4,035,870, Cl. 19-155.000.
- Hokkaido Sugar Co., Ltd.: See—
  - Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl. 195-11.000.
- Hokuetsu Kogyo Co., Ltd.: See—
  - Sato, Goro, 4,036,567, Cl. 418-105.000.
- Holben, Eugene F.: See—
  - Hublitz, Arthur T.; and Holben, Eugene F., 4,036,256, Cl 137-595.000.
- Holland, George William; Jernow, Jane Liu; and Rosen, Perry, to Hoffmann-La Roche Inc. 11-Substituted prostaglandins. 4,036,871, Cl 260-468.00D
- Hollis and Company: See—
  - McKnight, Oliver R.; and Seaman, William M., Jr., 4,036,071, Cl. 74-243.00R.
- Holm, LeRoy W., and Ferr, Donald H., to Union Oil Company of California. Micellar flooding process. 4,036,300, Cl. 166-273.000.
- Holman, George B.: See—
  - Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,036,301, Cl 166-293.000.
- Holmes, Charles Chamberlain; Skinner, Wallace; and Mattocks, George Roland, to Elemelt Limited. Method of and furnace for batch charging into a glass melting furnace. 4,036,625, Cl. 65-134.000
- Holton, Harry Hutchinson; and Segall, Gordon Hart, to Canadian Industries, Ltd. Delignification of lignocellulosic material with a soda pulping liquor containing a Diels Alder adduct of benzoquinone or naphthoquinone in admixture with a nitro aromatic compound. 4,036,680, Cl. 162-65.000.
- Holton, Harry Hutchinson, to Canadian Industries, Ltd. Delignification of lignocellulosic material with an alkaline pulping liquor containing a Diels Alder adduct of benzoquinone or naphthoquinone. 4,036,681, Cl. 162-65.000.
- Homeyer, Bernhard: See—
  - Hoffmann, Hellmut; Homeyer, Bernhard; Hammann, Ingeborg; and Stendel, Wilhelm, 4,036,947, Cl. 424-217.000.
  - Stolzer, Claus; Homeyer, Bernhard; Hammann, Ingeborg; and Unterstenhofer, Gunter, 4,036,956, Cl 424-210.000.
- Honda Giken Kogyo Kabushiki Kaisha: See—
  - Hayashi, Tsutomu; Kawaguchi, Takeshi; and Maeda, Noriyuki, 4,036,331, Cl. 188-187.000.
- Honda, Takeo; and Matsushima, Hisatomo, to Victor Company of Japan, Limited. Wire connector. 4,036,549, Cl. 339-275.00R
- Honeywell Information Systems, Inc.: See—
  - Gregg, Gordon E.; Howell, Thomas H.; and Rabins, Leonard, 4,037,093, Cl. 235-164.000.
- Honma, Keisuke: See—
  - Nakazato, Tetsuo; Kamon, Shunji; Tokuda, Koichi; and Honma, Keisuke, 4,035,987, Cl. 53-133.000.
- Honnorat, Yves C.: See—
  - Morlet, Jean G.; Honnorat, Yves C.; and Raisson, Gerard D., 4,036,568, Cl. 425-8.000.
- Hood, Robert Allen: See—
  - Birney, Richard Eugene; Davis, Michael Ian; and Hood, Robert Allen, 4,037,214, Cl. 364-200.000.
  - Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, 4,037,215, Cl. 364-200.000.
- Hoogvelt, Jack: See—
  - Hoogvelt, Roy; and Hoogvelt, Jack, 4,036,398, Cl. 220-270.000.
- Hoogvelt, Roy; and Hoogvelt, Jack, to Raymond Lee Organization, Inc., The, a part interest. Container with removable ring and utensil carrying lid. 4,036,398, Cl. 220-270.000.
- Hooker Chemicals & Plastics Corporation: See—
  - Hopkins, George C.; and Merrifield, D. Bruce, 4,036,810, Cl. 260-45.75W
- Hoover, Alan W., to International Telephone and Telegraph Corporation. Image tube power supply. 4,037,132, Cl. 315-10.000.
- Hopkins, George C.; and Merrifield, D. Bruce, to Hooker Chemicals & Plastics Corporation. Halogen containing polymeric resins having heat and light stability. 4,036,810, Cl. 260-45.75W.
- Hopkins, Henry S., Jr., to General Latex and Chemical Corporation. Polyisocyanurate foams prepared by a cocatalyst system. 4,036,792, Cl. 260-2.5AW.
- Hopkins, Jeffrey E.; and Bennett, Bobby B., to Hopkins, Jeffrey E. Paint can and brush receptacle. 4,036,463, Cl. 248-210.000.
- Hoppe, Lutz, and Behn, Rudolf, to Wolff Walsrode Aktiengesellschaft. Manufacture of modified basic polyaminoamide with ammonium compound. 4,036,821, Cl 260-78.0SC.
- Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, to Dynamit Nobel Aktiengesellschaft. Hardenable compositions of improved thermal stability. 4,036,798, Cl 260-28.00P.
- Hori, Masatake; and Kikuchi, Shintaro, to Takeda Chemical Industries, Ltd. Adsorbent for recycling artificial kidney. 4,036,747, Cl. 210-22.00A
- Horiba, Ltd: See—
  - Hosokawa, Yoshinori, Wakiyama, Yoshihiro; and Nomura, Yazyuro, 4,037,109, Cl. 250-444.000.
- Horn, Vladimir: See—
  - Malasek, Jaromir; Kuda, Vladimir; Dvoracek, Pavel, and Horn, Vladimir, 4,036,265, Cl. 139-190.000
- Horne, Charles E.: See—
  - Barnes, Gerald O.; and Horne, Charles E., 4,036,403, Cl 222-23.000.
- Horninger, Karlheinrich, to Siemens Aktiengesellschaft. Integrated programmable logic array. 4,037,089, Cl 235-152.000.
- Hoshi, Juro: See—
  - Ogita, Minoru, and Hoshi, Juro, 4,037,057, Cl. 179-15.0BT.
- Hosokawa, Yoshinori; Wakiyama, Yoshihiro; and Nomura, Yazyuro, to Horiba, Ltd. Sample cell. 4,037,109, Cl. 250-444.000
- Hotta, Shinkichi: See—
  - Nomiya, Kosei; Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, 4,037,212, Cl. 364-200.000.

- Houk, Richard D., to Samuel Moore and Company. Transmission modulator valve control. 4,036,066, Cl. 74-55.000.
- Houlihan, William J., to Sandoz, Inc. Phthalides and process for preparing same. 4,036,855, Cl. 260-343.30R.
- Houlihan, William J., to Sandoz, Inc. Ethanodibenzoindoles. 4,036,978, Cl. 424-274.000.
- Hovnanian, John. Board game apparatus. 4,036,501, Cl. 273-131.00K.
- Howard, Homer E. Ignition system with programmable dwell. 4,036,198, Cl. 123-146.50A.
- Howell, Thomas H.: See—
  - Gregg, Gordon E.; Howell, Thomas H.; and Rabins, Leonard, 4,037,093, Cl. 235-164.000.
- Howells, Edward Morris; and Chan, Cheung Yun, to Broken Hill Proprietary Company Limited, The. Signal stabilizing circuits. 4,037,095, Cl. 235-183.000.
- Howes, John Gordon Bernard; da Costa, Nicholas Mario; Selway, Rupert Alec; and Potter, William Duncan, to Warner-Lambert Company. Lightly cross-linked hydrogel formed from N-vinyl lactam and hydrophobic acrylic ester comonomer. 4,036,814, Cl. 260-47.0UA
- Howk, Victor G., to GF Business Equipment, Inc. Backrest adjustment mechanism. 4,036,525, Cl. 297-353.000.
- Hoyle, John A.; Humphris, Robert R.; and Boring, John W., to University of Virginia. Thin-film superconductor device. 4,037,102, Cl 250-336.000.
- Hrabak, Frantisek; Hynkova, Vlasta; and Bezdek, Milan, to Ceskoslovenska akademie ved. Process for the polymerization and copolymerization of vinyl and diene compounds. 4,036,909, Cl. 260-874.000.
- Hrivnak, Andrew N. Assembly spike for athletic shoe. 4,035,934, Cl. 36-67.00D.
- Huber, George: See—
  - Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,037,186, Cl. 335-206.000.
- Huber, Joseph B.; and Brown, Thomas A., to Kennametal Inc. Arrangement for shearing blades with cemented hard carbide inserts. 4,036,095, Cl. 83-674.000.
- Hubschmann, Karl-Wolfgang, to Motoren-Werke Mannheim AG. Rolling diaphragm sealing devices. 4,036,112, Cl. 92-80.000.
- Huckfeldt, Gebhard R. Knitted textile casing for sausages. 4,036,037, Cl. 66-170.000.
- Huddle, Carl F., to Tension Structures Co. Vertical arch shelter. 4,036,244, Cl. 135-4.00R.
- Hufendiek, Ernst-Wilhelm, to Daimler-Benz Aktiengesellschaft. Commercial vehicle driven by an injection internal combustion engine having a transmission with hydrodynamic coupling or with a hydrodynamic torque converter. 4,036,340, Cl. 192-.084
- Huffman, Clarence W., to IMC Chemical Group, Inc. Preparation of alkyl substituted o-hydroxybenzoic acid esters. 4,036,873, Cl. 260-473.00S.
- Hughes Aircraft Company: See—
  - Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647, Cl. 96-76.00C.
  - Burnett, Gary L.; and Tsuda, George I., 4,037,182, Cl. 333-73.00R.
  - Keller, Leon Brian; and Kelchner, Raymond E., Jr., 4,037,010, Cl. 428-290.000.
- Hujita, Masami: See—
  - Igashira, Toshihiko; Yamaguchi, Shunzo; and Hujita, Masami, 4,036,183, Cl. 123-8.130.
- Hukui, Koichiro: See—
  - Ishi, Hirohisa; Hukui, Koichiro; and Inoue, Norikatsu. 4,035,908, Cl. 29-597.000.
- Hulthe, Peter, to Goteborgs Analyslaboratorium AB. Method to prevent the formation of incrustations on working electrodes in electrode steam generators or the like and a means for performing the method. 4,036,716, Cl. 204-147.000.
- Humber, Leslie G.: See—
  - Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,036,842, Cl. 260-293.580.
- Humphris, Robert R.: See—
  - Hoyle, John A.; Humphris, Robert R.; and Boring, John W., 4,037,102, Cl. 250-336.000.
- Hund, Franz: See—
  - Rademachers, Jacob; Erfurth, Henning; and Hund, Franz, 4,036,662, Cl. 106-300.000.
- Hundmeyer, Anton: See—
  - Piekarski, Gottfried, Hundmeyer, Anton; Kippe, Dieter; and Maier, Siegmund, 4,036,867, Cl. 260-448.00A.
- Hunt, Edward F.: See—
  - Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., 4,035,983, Cl. 53-28.000.
- Huntingdon Industries Incorporated: See—
  - Ullman, John E., 4,036,362, Cl. 206-432.000.
- Huppi, Xaver Johann, to Elex A.G. Rapping shaft drive assembly for electrostatic precipitators. 4,036,610, Cl. 55-112.000.
- Hurley, Eldon Kenneth, to Hercules Incorporated. Apparatus and method for loading fluent explosives in upwardly extending boreholes. 4,036,100, Cl. 86-20.00C.
- Huron, Marie-Jose; Jacquin, Yves; and Renault, Philippe, to Institut Francais du Petrole. Process for removing sulfur dioxide from a gas and producing sulfur therefrom. 4,036,943, Cl. 423-576.000.
- Husch, Wilhelm: See—
  - Bohmer, Eberhard; and Husch, Wilhelm, 4,036,483, Cl. 266-281.000.
- Hyars, Claude: See—
  - Griner, Henry; Griner, Wade; Sweat, Tommy; and Hyars, Claude, 4,035,998, Cl. 56-27.500.
- Hyatt, Gilbert Peter: See—
  - Lee, Harry Thomas; and Hyatt, Gilbert Peter, 4,036,178, Cl. 119-51.00R.
- HYCALOG Inc.: See—
  - DeLuish, Kenneth R., 4,036,312, Cl. 175-302.000.
- Hydaroll Limited: See—
  - Webb, John Edmund Richard, 4,036,345, Cl. 193-35.0SS.
- Hydo, Steven J., to Gilford Instrument Laboratories, Inc. Pipette device. 4,036,064, Cl. 73-425.600.
- Hydril Company: See—
  - Mott, James D.; and Miyagishima, Tosh, 4,036,296, Cl. 166-322.000.
- Hyldon, Roy G.: See—
  - Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,036,996, Cl 426-254.000.
- Hynkova, Vlasta: See—
  - Hrabak, Frantisek; Hynkova, Vlasta, and Bezdek, Milan, 4,036,909, Cl. 260-874.000
- I-T-E Imperial Corporation: See—
  - Gaskill, George, 4,037,183, Cl. 335-6.000.
  - Kempisty, Francis W., Jr.; and Lundgren, John L., 4,037,184, Cl. 335-6.000.
- Ibing, Gunter; and Haferkorn, Herbert, to veba-Chemie AG. Apparatus for recovering higher melting organic materials via fractional sublimation. 4,036,594, Cl. 23-264.000.
- Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuka, Shigemichi, to Hitachi, Ltd. Gage control system for rolling mill. 4,036,041, Cl. 72-8.000.
- ICN Pharmaceuticals: See—
  - O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H., 4,036,840, Cl. 260-256.50R.
- Ide, Allan R. Cargo transport system. 4,036,376, Cl. 214-14.000.
- Ide, Hideaki: See—
  - Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000.
- Ieki, Hideharu; Ishiyama, Hideki; and Inoue, Atushi, to Murata Manufacturing Co., Ltd. Acoustic surface wave filter devices. 4,037,181, Cl. 333-72.000.
- Ienaka, Masanori; and Suzuki, Yukio, to Hitachi, Ltd. FM multiplex demodulator circuit. 4,037,056, Cl. 179-15.0BT.
- Ifuku, Tetsuhiko: See—
  - Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru, Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.
- Igashira, Toshihiko; Yamaguchi, Shunzo; and Hujita, Masami, to Nippon Soken, Inc. Rotary piston engine. 4,036,183, Cl. 123-8.130.
- Iijima, Hiroshi: See—
  - Aoyama, Kozo; Iijima, Hiroshi; and Kikuchi, Shizuo, 4,035,985, Cl. 53-30.00R.
- Iijima, Yukihiko; and Ishiguro, Tatsuo, to Nippon Electric Company Limited. System for coding and/or decoding color television signal including luminance and chrominance information. 4,037,248, Cl 358-13.000.
- Iio, Akira: See—
  - Kawakami, Masato; Andoh, Naoki; Iio, Akira; and Yamanouchi, Haruo, 4,036,901, Cl. 260-669.00R.
- Ikeda, Hiroshi: See—
  - Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,036,892, Cl. 260-617.00F.
- Ikeda, Isumi; and Takasaki, Takashi, to Tensei Suisan Company, Limited. Process for preparation of fish meat extracts. 4,036,993, Cl. 426-7.000.
- Ikuta, Hiroaki, Naruke, Yoshikazu; Nagasawa, Yoshio; and Yakushi, Masanori, to Panafacom Limited. Address extending control unit. 4,037,211, Cl. 364-200.000.
- Iles, Roger F.: See—
  - Brook, Greville B.; Brooks, Peter L.; and Iles, Roger F., 4,036,669, Cl. 148-11.50C.
- Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich, Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich. Rotor for a centrifuge. 4,036,425, Cl. 233-2.000.
- Illing, Henry, to Kieley & Mueller, Inc. Cantilevered ball valve. 4,036,470, Cl. 251-309.000.
- Imafuku, Shinsaku: See—
  - Meguro, Shinichi; Imafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl. 195-11.000.
- Imai, Toshihiro: See—
  - Yamashita, Nobuo; Hayamizu, Yoshisada; Nagai, Yoshitaka; Imai, Toshihiro; and Matsuo, Kazumasa, 4,036,218, Cl 128-4.000.
- IMC Chemical Group, Inc.: See—
  - Huffman, Clarence W., 4,036,873, Cl. 260-473.00S.
- Imperial Chemical Industries Limited: See—
  - Atherton, John Heathcote, 4,036,807, Cl. 260-42.150.
  - Atherton, John Heathcote, 4,036,868, Cl. 260-448.20N.
  - Brown, Michael Trevenen; and Rodway, William George, 4,036,718, Cl. 204-159.200.
  - Crosby, John; Rennie, Robert Allan Campbell, and Paton, Robert Michael, 4,036,869, Cl 260-453.0AP.
  - Feasey, Ronald George; and Rose, John Brewster, 4,036,815, Cl. 260-49.000.
- Imperial Metal Industries (Kynoch) Limited: See—
  - Jacob, William Robin, 4,037,031, Cl. 429-149.000.
- Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, to Kao Soap Co., Ltd. 4-Exo-hydroxy-endo-tricyclo [5.2.2.$0^{2,6}$]undec-8-ene. 4,036,892, Cl. 260-617.00F.
- Inamoto, Yoshiaki; Fujikura, Yoshiaki; Tsuchihashi, Kiyoshi; and

- Takaishi, Naotake, to Kao Soap Co., Ltd. 8-Exo-hydroxy-endo-tricyclo [5.2.2.0^{2,6}]undecane. 4,036,893. Cl. 260-617.00F.
- Indian Explosives Limited: *See*—
  - Chopra, Gopal Mohan; Gangadharan, Tyagaraja; and Sinha, Ram Narain. 4,036,138. Cl. 102-24.00R.
- Indian Head Inc.: *See*—
  - Pate, Harold T., and Borsh, Richard J., 4,036,389. Cl. 220-3.800.
- Inficon Leybold-Heraeus Inc.: *See*—
  - Lu, Chih-shun, 4,036,167. Cl. 118-7.000.
- Inflo Systems, Inc.: *See*—
  - Rich, Donald S., 4,036,827. Cl. 200-209.000.
- Ing. C. Olivetti & C., S.p.A. Ufficio Brevetti: *See*—
  - Guerrini, Giampaolo, 4,036,348. Cl. 197-53.000.
- Inhalation Therapy Equipment, Inc.: *See*—
  - Komendowski, Henry; and Levine, Walter, 4,036,919. Cl. 261-122.000.
- Inoue, Atushi: *See*—
  - Ieki, Hideharu; Ishiyama, Hideki; and Inoue, Atushi, 4,037,181. Cl. 333-72.000.
- Inoue, Norikatsu: *See*—
  - Ishi, Hirohisa; Hukui, Koichiro; and Inoue, Norikatsu, 4,035,908. Cl. 29-597.000.
- Institut Francais du Petrole: *See*—
  - Cheron, Jacques, 4,037,022. Cl. 429-10.000.
  - Denis, Jacques; and Pare, Guy, 4,036,771. Cl. 252-56.00R.
  - Grehier, Alain; and Cheron, Jacques, 4,037,023. Cl. 429-12.000.
  - Huron, Marie-Jose; Jacquin, Yves, and Renault, Philippe, 4,036,943. Cl. 423-576.000.
- Institutul de Cercetari si Proiectari de Masini Agricole - ICPMA: *See*—
  - Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997. Cl. 56-209.000.
- Intel Corporation: *See*—
  - Yih, James Shou-Chen, 4,036,550. Cl. 350-160.0LC.
- Interface Mechanisms, Inc.: *See*—
  - Ellefson, Larry P., 4,036,132. Cl. 101-288.000.
- International Business Machines Corporation: *See*—
  - Atkins, James Damon; Murphy, Charles Allen; and Stotts, Lewis Everett, 4,037,213. Cl. 364-200.000.
  - Barkley, John Allen; Robinson, Neil Lloyd; and Shelledy, Frank Boyd, 4,037,264. Cl. 360-129.000.
  - Bennett, Robert James; and Grischkowsky, Daniel Richard, 4,036,554. Cl. 350-160.00R.
  - Birney, Richard Eugene; Osborne, William Steese; and Graybiel, Lynn Allan, 4,037,207. Cl. 364-200.000.
  - Birney, Richard Eugene; Davis, Michael Ian; and Hood, Robert Allen, 4,037,214. Cl. 364-200.000.
  - Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, 4,037,215. Cl. 364-200.000.
  - Bonner, Gilbert Belmont; and Dessel, Joseph Leo, 4,037,122. Cl. 310-14.000.
  - Engler, Edward Martin; Kaufman, Frank Benjamin; and Scott, Bruce Albert, 4,036,648. Cl. 96-90.00R.
  - Kaplan, Leon H.; Lounsbury, John Baldwin; and Zimmerman, Steven Michael, 4,036,644. Cl. 96-36.000.
  - Knight, Arthur Holt; and Underhill, Thomas Travis, 4,036,556. Cl. 355-14.000.
  - Nielsen, Thomas Christian; and Sirico, James Louis, 4,036,381. Cl. 214-310.000.
  - Schwartz, Bradford Clyde; Silkensen, Ralph Donald; and Steving, Gerald, 4,036,723. Cl. 204-192.0EC.
- International Flavors & Fragrances Inc.: *See*—
  - Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,036,886. Cl. 260-599.000.
  - van Ouwerkerk, Anton; Chant, Bernard J.; and Liberman, Arthur L., 4,036,774. Cl. 252-132.000.
- International Harvester Company: *See*—
  - Anderson, John C., 4,036,076. Cl. 74-409.000.
- International Paper Company: *See*—
  - Gordon, Robert L., 4,036,423. Cl. 229-43.000.
- International Research and Development Company Limited: *See*—
  - Pinder, Russell Stuart; and Clark, Leslie, 4,036,645. Cl. 136-89.00C.
- International Standard Electric Corporation: *See*—
  - Colardelle, Joel Serge; Comte, Marie Helene; and Lerouge, Claude Paul Henri, 4,037,120. Cl. 307-311.000.
- International Telephone and Telegraph Corporation: *See*—
  - Hoover, Alan W., 4,037,132. Cl. 315-10.000.
  - Scherrer, Raymond E., 4,036,706. Cl. 204-15.000.
  - Stine, Robert David, 4,037,058. Cl. 179-99.000.
  - Stine, Robert David, 4,037,059. Cl. 179-99.000.
- Intertel, Inc.: *See*—
  - Lyon, David L., 4,037,049. Cl. 178-67.000.
- Interx Research Corporation: *See*—
  - Bodor, Nicolae S.; and Sloan, Kenneth B., 4,036,845. Cl. 260-295.00L.
  - Kaminski, James J.; and Bodor, Nicolae S., 4,036,843. Cl. 260-294.80R.
- Intichar, Lutz: *See*—
  - Kullmann, Dieter; Henninger, Peter; and Intichar, Lutz, 4,037,124. Cl. 310-52.000.
- Irani, Cyrus A.; Funk, Edward W.; Gomez, Ernesto; and Espino, Ramon L., to Exxon Research and Engineering Company. Tar sands extraction process. 4,036,732. Cl. 208-11.0LE.
- Irion, Eckart: *See*—
  - Bauer, Kurt; Wittmann, Gunther; Mussgay, Manfred; Irion, Eckart; and Geilhausen, Horst, 4,036,952. Cl. 424-89.000.
- Isaka, Ichiro: *See*—
  - Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834. Cl. 260-243.00C.
- Ishi, Hirohisa; Hukui, Koichiro; and Inoue, Norikatsu, to Sony Corporation. Method of manufacturing electric motor commutator. 4,035,908. Cl. 29-597.000.
- Ishida, Akinori: *See*—
  - Ito, Ayao; and Ishida, Akinori, 4,036,217. Cl. 128-2.080.
- Ishiguro, Tatsuo: *See*—
  - Iijima, Yukihiko; and Ishiguro, Tatsuo, 4,037,248. Cl. 358-13.000.
- Ishii, Ko; and Yoshida, Tadamasa, to Sumitomo Bakelite Company, Limited. Adhesive comprising post-chlorinated polyethylene and polyvinyl chloride. 4,037,020. Cl. 428-518.000.
- Ishimaru, Toshiyasu; and Kawabata, Mariko. 7-[(5'-N-methylthioacetamido)-adipoamido] cephalosporin derivatives. 4,036,833. Cl. 260-243.00C.
- Ishiyama, Hideki: *See*—
  - Ieki, Hideharu; Ishiyama, Hideki; and Inoue, Atushi, 4,037,181. Cl. 333-72.000.
- Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, to Kabushiki Kaisha Komatsu Seisakusho. Automatic article working system. 4,035,904. Cl. 29-563.000.
- Ishizuka, Haruo. Diaper supplement insert. 4,036,234. Cl. 128-287.000.
- Ito, Ayao; and Ishida, Akinori, to Tokyo Shibaura Electric Co., Ltd. Device for measuring a respired amount of air. 4,036,217. Cl. 128-2.080.
- Ito, Fumio: *See*—
  - Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, 4,037,233. Cl. 354-23.00D.
- Ito, Muneo: *See*—
  - Togo, Shizuo; Ito, Muneo; Nishizawa, Chiharu; and Ohba, Michio, 4,036,861. Cl. 260-369.000.
- Ito, Tadashi: *See*—
  - Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, 4,037,233. Cl. 354-23.00D.
- Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, to Ito, Yasuro; and Taisei Corporation. Method and apparatus for moulding hydraulic cement or the like material. 4,036,922. Cl. 264-35.000.
- ITT Industries, Inc.: *See*—
  - Schat, Hermannus, 4,037,119. Cl. 307-293.000.
- Ivin, Jury Filoretovich; Levischev, Arkady Nikolaevich; and Sokolov, Vasily Ivanovich. Bowl of centrifugal separator. 4,036,429. Cl. 233-27.000.
- Iwakawa, Tunekiyo: *See*—
  - Mimitsuka, Takao; and Iwakawa, Tunekiyo, 4,037,130. Cl. 313-220.000.
- Iwanami, Masaru: *See*—
  - Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834. Cl. 260-243.00C.
- Iwasawa, Yoshihiro: *See*—
  - Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984. Cl. 424-311.000.
- Iwata, Akiyoshi: *See*—
  - Lorenzini, Robert E.; Iwata, Akiyoshi; and Lorenz, Karl, 4,036,595. Cl. 23-273.0SP.
- Iwata, Toshiharu: *See*—
  - Hattori, Tadashi; Takada, Shigetaka; Hayashi, Kenji; and Iwata, Toshiharu, 4,036,186. Cl. 123-32.0EA.
- J. M. Huber Corporation: *See*—
  - Williams, Lloyd E.; and Almagro, Guillermo A., 4,036,663. Cl. 106-308.00B.
- J. R. Schneider Co., Inc.: *See*—
  - King, Robert Daniel, 4,036,589. Cl. 23-230.00B.
- J. R. Short Milling Co.: *See*—
  - Woonton, Kent; Short, Jeffrey R., III; and Roach, Kenneth N., 4,036,277. Cl. 164-16.000.
- Jackson, Byron L.: *See*—
  - Wagner, Joseph P.; and Jackson, Byron L., 4,036,433. Cl. 236-100.000.
- Jacob, William Robin, to Imperial Metal Industries (Kynoch) Limited. Bipolar lead acid battery having titanium and zirconium electrode supports. 4,037,031. Cl. 429-149.000.
- Jacobson, Howard Wayne, to Du Pont de Nemours, E. I., and Company. Amorphous silicon nitride composition containing carbon, and vapor phase process. 4,036,653. Cl. 106-47.00R.
- Jacobson, Leo; and Forman, Wallace. Collapsible container. 4,036,361. Cl. 206-386.000.
- Jacoel, Rafael: *See*—
  - Bighiani, Umberto; and Jacoel, Rafael, 4,036,190. Cl. 123-117.00D.
- Jacques, Michel Jean: *See*—
  - Duhayon, Jacques; Jacques, Michel Jean; Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939. Cl. 423-488.000.
- Jacquin, Yves: *See*—
  - Huron, Marie-Jose; Jacquin, Yves; and Renault, Philippe, 4,036,943. Cl. 423-576.000.
- Jakobs, Willy; and Kryczun, Alfred, to Klockner-Humboldt-Deutz Aktiengesellschaft. Centrifugal separation of mixtures of at least partially molten metals, metal compounds and/or metal-containing slags into individual constituents. 4,036,480. Cl. 266-204.000.

- Jakobs, Willy; and Wilkens, Kurt, to Klockner-Humboldt-Deutz Aktiengesellschaft. Device for the production of carbon bodies. 4,036,574. Cl. 425-432.000.
- James, Daniel Shaw; and Witterholt, Vincent Gerard, to Du Pont de Nemours, E. I., and Company. Bleedfast phthalocyanine dyes for paper. 4,036,585. Cl. 8-1.0XA.
- Jamieson, John; Price, Henry F.; and Butts, William O., to Bell & Howell Company. Microfilm camera and photographic film handling apparatus with an actuable film clamping device. 4,037,239. Cl. 354-203.000.
- Jansen, Johannes H.: *See*—
  - Hoffman, Neil R.; and Jansen, Johannes H., 4,036,328. Cl. 188-26.000.
- Janssen, Peter Johannes Michiel, to U.S. Philips Corporation. Apparatus for reading a disc-shaped record carrier with plural scanning spots for stable radial tracking. 4,037,252. Cl. 358-128.000.
- Januschkowetz, Herbert; and Laub, Hans, to Siemens Aktiengesellschaft. Method for metallizing thermosetting plastics. 4,036,707. Cl. 204-20.000.
- Japan Exlan Company Limited: *See*—
  - Kobashi, Toshiyuki; and Masuhara, Kenichi, 4,036,803. Cl. 260-29.6AN.
- Japan Synthetic Rubber Co., Ltd.: *See*—
  - Kawakami, Masato; Andoh, Naoki; Ito, Akira; and Yamanouchi, Haruo, 4,036,901. Cl. 260-669.00R.
- Japan Tobacco & Salt Public Corporation, The: *See*—
  - Okumoto, Yutaka, 4,036,238. Cl. 131-21.00B.
- Jaros, Stanley E.; and Metrailer, William J., to Exxon Research and Engineering Company. Use of activated fluid coke to remove organic contaminants from waste waters. 4,036,750. Cl. 210-27.000.
- Jauch, Christian M. J., to Spartus Corporation. Clock with striking mechanism. 4,036,004. Cl. 58-9.000.
- Jauch, Christian M. J., to Spartus Corporation. Clock with hour and quarter hour striking mechanism. 4,036,005. Cl. 58-9.000.
- Jehle, Fritz: *See*—
  - Becker, Dietmar; Jehle, Fritz; Schonthaler, Rubi; and Willenbacher, Erich, 4,036,156. Cl. 112-121.260.
- Jencks, Craig S., to United States of America, Navy. Inflatable pressure compensated helmet stabilization system. 4,035,846. Cl. 2-413.000.
- Jenkins, Roy. Methods of and means for measuring liquid flow. 4,036,053. Cl. 73-204.000.
- Jenkner, Herbert, to Chemische Fabrik Kalk GmbH. Process for producing halogenated 2,2-bis-(4-hydroxyphenyl)-propane. 4,036,894. Cl. 260-619.00A.
- Jenney, Joe A.: *See*—
  - Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647. Cl. 96-76.00C.
- Jernow, Jane Liu: *See*—
  - Holland, George William; Jernow, Jane Liu; and Rosen, Perry, 4,036,871. Cl. 260-468.00D.
- Jespersen, Paul W.; and DeLuca, Raymond F., to Georgia-Pacific Corporation. Dispenser for liquids. 4,036,406. Cl. 222-181.000.
- Jesson, Leslie William Digby, to Bentley Engineering Company, Ltd., The. Plural cam tracks for rockable jacks. 4,036,033. Cl. 66-14.000.
- Jirkovsky, Ivo L.: *See*—
  - Dobson, Thomas A.; Humber, Leslie G.; Demerson, Christopher A.; and Jirkovsky, Ivo L., 4,036,842. Cl. 260-293.580.
- John Zink Company: *See*—
  - Reed, Robert D.; Schwartz, Robert E.; and Noble, Roger K., 4,036,580. Cl. 431-202.000.
- Johnson, Albert S., Jr.: *See*—
  - Ham, Emmett P.; and Johnson, Albert S., Jr., 4,036,045. Cl. 72-165.000.
- Johnson, Dale: *See*—
  - Strehoff, William P.; Elliott, William S.; and Johnson, Dale, 4,036,065. Cl. 73-432.00R.
- Johnson, Michael R.: *See*—
  - Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,036,832. Cl. 260-240.00R.
- Johnson, Paul W., to E-Systems, Inc. Apparatus for fabricating resistors. 4,037,072. Cl. 219-56.000.
- Johnson, Philip L. Truck for transport of airplane by its nose landing wheel. 4,036,384. Cl. 214-334.000.
- Jones, Alan: *See*—
  - Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592. Cl. 23-232.00E.
- Jones, Joseph K.: *See*—
  - Wilkes, Lambert H.; Underbrink, Gary L.; and Jones, Joseph K., 4,035,869. Cl. 19-80.0CR.
- Jones, Keith Thomas: *See*—
  - Davies, Peter Gough; Jones, Keith Thomas; and Salmon, Brian, 4,036,046. Cl. 72-286.000.
- Jones, Robert E. Method and apparatus for handling brick for inspection and feeding. 4,036,350. Cl. 198-420.000.
- Jones, Thomas Alwyn: *See*—
  - Brown, David Keith; Dabill, David William; Firth, Jack Graham; Jones, Alan; and Jones, Thomas Alwyn, 4,036,592. Cl. 23-232.00E.
- Jones, Vereoe C.; and Hale, Robert A., to SI Handling Systems, Inc. Vehicle and track system. 4,036,148. Cl. 104-166.000.
- Jones, W. Carl: *See*—
  - Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., 4,036,450. Cl. 242-129.000.
- Jonkuhn, Gerhard: *See*—
  - Sieborger, Gunter; Kilian, Ernst August; and Jonkuhn, Gerhard, 4,037,118. Cl. 307-255.000.
- Jordan, Bertram E.; Mitchell, John D.; and Sessoms, J. C., Jr., to Harrington Manufacturing Company. Bulk tobacco container. 4,036,454. Cl. 294-5.500.
- Jordan, Helmut; and Sivers, Curt. Ion source with capability of changing between operation modes. 4,037,108. Cl. 250-427.000.
- Josef Bautz GmbH: *See*—
  - Moosbrucker, Karl; and Rauch, Hans, 4,035,992. Cl. 56-1.000.
- Jos. Schneider & Co. Optische Werke Kreuznach: *See*—
  - Geyer, Hermann; Baab, Albert; and Himmelsbach, Paul, 4,036,571. Cl. 425-556.00R.
- Jost, Eduard. Door brace. 4,036,518. Cl. 292-339.000.
- Joutseno-Pulp Osakeyhtio: *See*—
  - Makila, Eino; Virtanen, Unto; and Savinainen, Kyosti, 4,036,440. Cl. 241-20.000.
- Juelke, Charles V.: *See*—
  - Trapasso, Louis E.; and Juelke, Charles V., 4,037,040. Cl. 526-88.000.
- Junger, Hans: *See*—
  - Hoppe, Walter; Junger, Hans; and Weissenfels, Franz, 4,036,798. Cl. 260-28.00P.
- Jungmann, Axel: *See*—
  - Dorner, Heinrich; Jungmann, Axel; and Scholz, Manfred, 4,036,700. Cl. 176-87.000.
- Junkins, Ernest M. Automatic guiding apparatus for sewing machine. 4,036,155. Cl. 112-121.150.
- Juno, Uesugi: *See*—
  - Chihiro, Oizumi; and Juno, Uesugi, 4,036,920. Cl. 264-.500.
- JWI Ltd.: *See*—
  - MacBean, Donald George, 4,035,872. Cl. 24-31.00H.
- K & F Manufacturing Company, Inc.: *See*—
  - Koesis, Alex; Kasner, Gerald; Fermi, Rudy; Bratton, David; and Pickard, John, 4,036,133. Cl. 101-415.100.
- Kaasenbrood, Petrus J.C.; and Van Nassau, Petrus J.M., to Unie Van Kunstmestfabrieken, B.V. Process for preparing urea. 4,036,878. Cl. 260-555.00A.
- Kabayashi, Minora; and Miyazi, Kazumi, to Olympus Optical Co., Ltd., and Lanier Business Products Company. Solenoid operated transcriber mechanism. 4,037,262. Cl. 360-96.000.
- Kabushiki Kaisha Daini Seikosha: *See*—
  - Terayama, Toshio, 4,037,179. Cl. 333-71.000.
- Kabushiki Kaisha Komatsu Seisakusho: *See*—
  - Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, 4,035,904. Cl. 29-563.000.
- Kabushiki Kaisha Meidensha: *See*—
  - Hini, Hitoshi, 4,037,187. Cl. 337-121.000.
- Kabushiki Kaisha Mino Seisakusho: *See*—
  - Mino, Masao, 4,036,447. Cl. 242-43.200.
- Kabushiki Kaisha Oshikiri Kikai Seisaku-Sho: *See*—
  - Oshikiri, Tatsuo, 4,036,569. Cl. 425-140.000.
- Kabushiki Kaisha Sankyo Seiki Seisakusho: *See*—
  - Funaki, Takashi, 4,036,134. Cl. 101-426.000.
- Kabushiki Kaisha Takeeclu Koumusho: *See*—
  - Asayama, Kingo, 4,036,026. Cl. 61-56.500.
- Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See*—
  - Kobayashi, Akira, 4,036,002. Cl. 57-58.890.
  - Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, 4,036,001. Cl. 57-52.000.
- Kafunek, Pavel: *See*—
  - Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, 4,037,246. Cl. 357-82.000.
- Kaga, Hideharu: *See*—
  - Ito, Yasuro; Kaga, Hideharu; Yamamoto, Yasuhiro; and Sumita, Tadayuki, 4,036,922. Cl. 264-35.000.
- Kagan, Morton R.: *See*—
  - Filipescu, Nicolae; McAvoy, Nelson; Kagan, Morton R.; and Serafin, Francis A., 4,037,172. Cl. 331-94.50F.
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  - Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan; Kahn, Samuel; and Osborne, William Steese, 4,037,215. Cl. 364-200.000.
- Kaiser Aluminum & Chemical Corporation: *See*—
  - Dixon, Cal L.; and Ross, Charles E., 4,036,366. Cl. 211-4.000.
  - Gane, Gordon R.; and Hoffmann, Lawrence C., Jr., 4,036,159. Cl. 113-1.00F.
  - Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931. Cl. 423-121.000.
  - Taggart, Lewis W., 4,035,903. Cl. 29-458.000.
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  - Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuka, Shigemichi, 4,036,041. Cl. 72-8.000.
- Kajiwara, Yuji: *See*—
  - Katoh, Hidehiko; Kajiwara, Yuji; and Takamizawa, Hideo, 4,037,168. Cl. 330-31.000.
- Kajiyama, Shiro: *See*—
  - Fujiyama, Susumu; Takagawa, Minoru; and Kajiyama, Shiro, 4,036,885. Cl. 260-599.000.
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Tominaga, Akira. 4,036,795, Cl. 260-18.0PN.

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Kaiser, Seymour M. Locking arrangement for cabinets. 4,036,541, Cl. 312-138.00R.

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Kaufman, Jay Stephen: *See*—

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Kaufmann, Frank H., to Steel Heddle Manufacturing Company. Heddle frame. 4,036,263, Cl. 139-91.000.

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Orita, Nobuhiro; Yabe, Koichi; and Kawanami, Akifumi. 4,036,751, Cl. 210-35.000.

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Sietmann, Vernon H.; Smith, Raymond L.; and Keese, Larry S., 4,035,928, Cl. 34-174.000.

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Kelchner, Raymond E., Jr.: *See*—

Keller, Leon Brian, and Kelchner, Raymond E., Jr., 4,037,010, Cl. 428-290.000.

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Keller, Richard A., to Boschert Associates. Switching regulator power supply. 4,037,271, Cl. 363-21.000.

Kelley, John Sherburne, to USM Corporation. Method of making weakening lines in sheet metal. 4,036,160, Cl. 113-121.00C.

Kelley, Philip. Clear view coin wrap. 4,036,358, Cl. 206-.820.

Kellner, Philip R.: *See*—

Pugsley, Peter C., and Kellner, Philip R., 4,037,075, Cl. 219-121.0LM.

Kellner, Sam J. Adjustable stand. 4,036,465, Cl. 248-463.000.

Kellogg, Robert C.: *See*—

Kauffman, Ivan L., and Kellogg, Robert C., 4,036,573, Cl. 425-529.000.

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Kelly, Allan C.: *See*—

Roberson, Morris I.; Beck, John W.; Maples, Jack S.; [illegible], Anthony; Donaldson, Donald J.; Stein, David L., and Kelly, Allan C. 4,036,931, Cl. 423-121.000.

Kelly, Donald V. Helical expansion condenser. 4,036,290, Cl. 165-105.000.

Kelly, Michael Joseph: *See*—

Fugere, Albert Lee, and Kelly, Michael Joseph. 4,035,860, Cl. 12-142.00W.

Kelp, Fritz, to Kraftwerk Union Aktiengesellschaft. Power plant including a cooling tower surrounding the power plant site. 4,036,021, Cl. 60-692.000.

Kelso, Edward A.: *See*—

Manne, Richard S.; Bethea, Sam R.; and Kelso, Edward A., 4,036,734, Cl. 208-57.000.

Keltjens, Heinz: *See*—

Wolters, Hans Richard, and Keltjens, Heinz. 4,036,258, Cl. 137-614.040.

Kemper, Kenneth E. Traction augmenting road grips. 4,036,273, Cl. 152-225.00R.

Kempisty, Francis W., Jr.; and Lundgren, John L., to I-T-E Imperial Corporation. Lockout and cover interlock for circuit breaker. 4,037,184, Cl. 335-6.000.

Kennametal Inc.: *See*—

Huber, Joseph H., and Brown, Thomas A., 4,036,095, Cl. 83-674.000.

McCreery, James F., 4,035,889, Cl. 29-96.000.

Kennecott Copper Corporation: *See*—

Ammann, Paul R., and Kim, Jonathan J., 4,036,636, Cl. 75-74.000.

Kennedy, Richard T.; Quitschau, Algird R.; and Kettelson, Ernest S., to Square D Company. Weatherproof junction box cover assembly. 4,036,396, Cl. 220-242.000.

Keppler, Hans Georg; Stahnecker, Erhard; and Moeller, Rolf, to BASF Aktiengesellschaft. Manufacture of expandable styrene polymers. 4,036,794, Cl. 260-2.50B.

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Filss, Peter. 4,036,597, Cl. 23-284.000.

Kettelson, Ernest S.: *See*—

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Key, Edward H. Energy-efficient valve gear. 4,036,185, Cl. 123-90.250.

Keyser, David R.; and Zavod, Pierce H., to United States of America, Navy. Igniter. 4,036,581, Cl. 431-267.000.

Kibbey Machine Company, Incorporated: *See*—

Conkey, James Elliott. 4,036,123, Cl. 99-538.000.

Kieferle, Wolfgang, to Hawera probst Kommanditgesellschaft Hartmetall-Werkzeugfabric Ravensburgh. Apparatus for hardening workpieces of steel. 4,036,482, Cl. 266-252.000.

Kieley & Mueller, Inc.: *See*—

Illing, Henry. 4,036,470, Cl. 251-309.000.

Kiernan, James T. Electrical game device. 4,036,500, Cl. 273-130.0AB.

Kiko, Frederick J., to Lorain Products Corporation. Repeater for transmission lines. 4,037,066, Cl. 179-170.00G.

Kikuchi, Shintaro: *See*—

Hori, Masatake, and Kikuchi, Shintaro. 4,036,747, Cl. 210-22.00A.

Kikuchi, Shizuo: *See*—

Aoyama, Kozo; Iijima, Hiroshi; and Kikuchi, Shizuo. 4,035,985, Cl. 53-30.00R.

Kikuchi, Yasubee, to Usui Kokusai Sangyo Kabushiki Kaisha. Temperature sensitively actuated hydraulic coupling for driving fans. 4,036,339, Cl. 192-58.00B.

Kikumoto, Ryoji: *See*—

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji. 4,036,955, Cl. 424-177.000.

Kilian, Ernst August: *See*—

Sieborger, Gunter; Kilian, Ernst August; and Jonkuhn, Gerhard, 4,037,118, Cl. 307-255.000.

Kim, Jonathan J.: *See*—

Ammann, Paul R.; and Kim, Jonathan J., 4,036,636, Cl. 75-74.000.

Kim, Sung Bong. Camping pack. 4,035,855, Cl. 5-343.000.

Kimura, Hajime; Yoshihara, Takahisa; and Harada, Shunichi, to Kawasaki Steel Corporation. Steel substrate electroplated with Al powder dispersed in Zn. 4,036,600, Cl. 428-555.000.

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Kobayashi, Masayoshi, and Kimura, Takeo. 4,036,193, Cl. 123-139.0AB.

Kindig, Alan L., to General Electric Company. Methods and apparatus for use in making electrical interconnections. 4,035,910, Cl. 29-628.000.

King, Francis X., Jr.: *See*—

Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., 4,035,983, Cl. 53-28.000.

King, Robert Daniel, to J. R. Schneider Co., Inc. Determining the concentration of a biocide additive in a liquid. 4,036,589, Cl. 23-230.0GB.

Kinjo, legal representative, by Ayako: *See*—

Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased. 4,036,650, Cl. 96-114.100.

Kinjo, Kikuo, deceased: *See*—

Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased. 4,036,650, Cl. 96-114.100.

Kinoshita, Haruo: *See*—

Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Harue; Kajiwara, Toshiyuki; and Matsuka, Shigemichi. 4,036,041, Cl. 72-8.000.

Kinzebaw, Jon E., to DMI Inc. Multi-unit adjustable plow pulled by vehicle and having steering wheel turnable only on adjustment of plow. 4,036,306, Cl. 172-287.000.

Kinzenbaw, Jon E., to DMI Inc. Gang plow. 4,036,305, Cl. 172-283.000.

Kippe, Dieter: *See*—

Piekarski, Gottfried; Hundmeyer, Anton; Kippe, Dieter; and Maier, Siegmund. 4,036,867, Cl. 260-448.00A.

Kirkland, Kerry G.; Masciopinto, Anthony J.; and Owens, James H., to Armco Steel Corporation. Method and apparatus for connecting flowlines to underwater installations. 4,036,295, Cl. 166-.600.

Kirpichnikov, Vladimir Pavlovich; Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; and Vyshelessky, Alexandr Nikolaevich. Turntable-type microwave continuous oven. 4,037,070, Cl. 219-10.55A.

Kirschey, Gunter: *See*—

Fehler, Adolf, and Kirschey, Gunter. 4,036,582, Cl. 431-352.000.

Kisor, Thaddeus William, to RCA Corporation. Package for semiconductor components. 4,037,267, Cl. 361-220.000.

Kita, Takeshi: *See*—

Murai, Sadao; Kita, Takeshi; and Mochizuki, Kiyoshi. 4,036,930, Cl. 264-167.000.

Kitahara, Kengo: *See*—

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Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, to Takeda Chemical Industries, Ltd. L-ascorbic acid tablets. 4,036,948, Cl. 424-32.000.

Kitano, Akitoshi. Elliptic gear wheel. 4,036,073, Cl. 74-393.000.

Kjell, Nordstrom: *See*—

Flinth, Rune; and Kjell, Nordstrom. 4,036,315, Cl. 177-1.000.

Klapdar, Wilhelm; Richter, Helmut; Spetzler, Edgar; and Wendorff, Jochen, to Thyssen Niederrhein AG Hutten- und Walzwerke. Process for making a steel melt for continuous casting. 4,036,635, Cl. 75-49.000.

Klauber, Gerald: *See*—

Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,037,131, Cl. 313-388.000.

Klein, Keith W., to General Electric Company. Ground fault circuit breaker with trip indication. 4,037,185, Cl. 335-18.000.

Kleinerman, Marcos. Immunofluorometric method for measuring minute quantities of antigens, antibodies and other substances. 4,036,946, Cl. 424-8.000.

Kleynjan, Cornelis: *See*—

Brink, Andries; Kleynjan, Cornelis; and Beukes, Quintin John, 4,036,730, Cl. 208-8.000.

Kline, Charles R., to United States of America, Air Force. Controlled deception jamming device. 4,037,227, Cl. 343-18.00E.

Klockner-Humboldt-Deutz Aktiengesellschaft: *See*—

Guttmann, Friedrich Wilhelm, 4,036,612, Cl. 55-282.000.

Jakobs, Willy, and Kryczun, Alfred, 4,036,480, Cl. 266-204.000.

Jakobs, Willy, and Wilkens, Kurt, 4,036,574, Cl. 425-432.000.

Klockner-Werke AG: *See*—

Bohmer, Eberhard, and Husch, Wilhelm. 4,036,483, Cl. 266-281.000.

Klose, Robert E.: *See*—

Baboshy, Bernard J.; Klose, Robert E.; and Nordstrom, Harold A., 4,036,992, Cl. 426-3.000.

Kloster, Kenneth Donald. Spring compressor tool. 4,036,473, Cl. 254-10.500.

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Knight, Arthur Holt, and Underhill, Thomas Travis, to International Business Machines Corporation. Preconditioning image transfer areas in document reproduction machines. 4,036,556, Cl. 355-14.000.

Knight, Roy George, to Scott Bonnar Limited. Slack belt clutch. 4,036,070, Cl. 74-242.700.

Knodler, Reinhard: *See*—

Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.

Koarai, Hiroyuki: *See*—

Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuemori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murai, Hatsuo. 4,037,209, Cl. 364-200.000.

Kobashi, Toshiyuki, and Masuhara, Koichi, to Japan Exlan Company Limited. Process for producing flame retardant acrylic synthetic fibers. 4,036,803, Cl. 260-29.6AN.

Kobayakawa, Masaki: *See*—

Matsushita, Katsuyuki; Murayama, Hideo; Yawata, Kazufumi; and Kobayakawa, Masaki. 4,035,885, Cl. 29-25.140.

Kobayakawa, Masanao: *See*—

Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, 4,036,001, Cl. 57-52.000.

Kobayashi, Akira, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho and Daiwa Boseki Kabushiki Kaisha. Dirt removal in spinning device. 4,036,002, Cl. 57-58.890.

Kobayashi, Gai, and Shikano, Yoshiro, to Mitsubishi Denki Kabushiki Kaisha. Cooling device for electric devices. 4,036,291, Cl. 165-105.000.

Kobayashi, Hajime: *See*—

Hasegawa, Noriko; Kobayashi, Hajime; Endo, Ichiro; and Kinjo, Kikuo, deceased. 4,036,650, Cl. 96-114.100.

Kobayashi, Hisanori, to Nippondenso Co., Ltd. Fuel injection system. 4,036,194, Cl. 123-139.0AW.

Kobayashi, Koreyasu, to Kobayashi, Koreyasu. Zero phase sequence protective device for faults within armature of three-phase synchronous machine. 4,037,138, Cl. 317-13.00R.

Kobayashi, Masayoshi, and Kimura, Takeo, to Diesel Kiki Kabushiki Kaisha. Electronically controlled fuel injection pump. 4,036,193, Cl. 123-139.0AB.

Kobayashi, Sadao, to Hitachi, Ltd. Method of making a junction type field effect transistor. 4,036,672, Cl. 148-175.000.

Kobayashi, Shigeru: *See*—

Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigeru, 4,036,326, Cl. 184-27.00R.

Kobayashi, Takashi: *See*—

Kubota, Hitoshi; Nishi, Takayuki; and Kobayashi, Takashi, 4,036,042, Cl. 72-9.000.

Kobayashi, Takeshi: *See*—

Nomiya, Kosei; Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, 4,037,212, Cl. 364-200.000.

Kone, Inc.: *See*—

Erickson, John W.; Hadrys, Vitolis; and Brown, Francis Barton, 4,036,427, Cl. 233-10.000.

Kobe Steel Ltd.: *See—*

Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl. 219-137.00R.

Yamaguchi, Yoshihiro; Matsushita, Tomiharu; Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000

Kobelt, Volkmar. Fastener arrangements for joining or separating material edges or surfaces. 4,035,875, Cl. 24-203.00R.

Kocsis, Alex; Kasner, Gerald; Fermi, Rudy; Bratton, David; and Pickard, John, to K & F Manufacturing Company, Inc. Printing plate clamping assembly. 4,036,133, Cl. 101-415.100.

Kodama, Hachio: *See—*

Ozaki, Hiromi; Yamane, Mamoru; Yoshikai, Haruo; and Kodama, Hachio, 4,036,736, Cl. 208-106.000

Koenig, Erl A.: *See—*

D'Alessio, Frank P., and Koenig, Erl A., 4,036,510, Cl. 280-613.000.

Koether, Bernard G.; and Witt, Allan E., to Food Automation Service Techniques, Inc. Oven cooking monitor for uniformly cooking a plurality of food items requiring different cooking times. 4,036,995, Cl. 426-233.000.

Koga, Syozi: *See—*

Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl. 219-137.00R

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Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.

Koike, Keiichi, and Sasaki, Toshimi, to Hitachi, Ltd. Heat insulating coating material. 4,037,015, Cl. 428-331.000

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Hirai, Seizaburo; Mizoe, Yoji; and Koji, Itoh, 4,036,804, Cl. 260-29.7SQ

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Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,036,780, Cl. 252-437.000

Komendowski, Henry, and Levine, Walter, to Inhalation Therapy Equipment, Inc. Nebulizer-humidifier system. 4,036,919, Cl. 261-122.000

Komura, Ikuo: *See—*

Tamai, Hideo; Morita, Takayuki; Kobayakawa, Masanao; and Komura, Ikuo, 4,036,001, Cl. 57-52.000.

Kondo, Fusao: *See—*

Ogoshi, Toshiaki; Miyawaki, Yozo; Kondo, Fusao; and Sakurai, Susumu, 4,036,596, Cl. 23-283.000.

Kondo, Taizo: *See—*

Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, 4,035,904, Cl. 29-563.000.

Kondo, Toshiyuki, and Nagashima, Takashi, to Aisin Seiki Kabushiki Kaisha. Anti-skid control apparatus with booster device and pressure reducing device. 4,036,534, Cl. 303-6.00R.

Kondo, Yoshihiko, to Nippondenso Co., Ltd. Output selection control system. 4,037,146, Cl. 318-444.000.

Kononov, Nikolai Fedorovich: *See—*

Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.

Konopeskas, Leon A. Fluid displacement apparatus. 4,036,566, Cl. 418-68.000

Konotsune, Takuo, and Kawakubo, Katsuhiko, to Sankyo Company Limited. Pyrazolone derivatives and their use as herbicides. 4,036,631, Cl. 71-92.000

Koppe, Herbert; Engelhardt, Albrecht; and Zeile, Karl, to Boehringer Ingelheim G.m.b.H. Therapeutic compositions and method. 4,036,988, Cl. 424-330.000.

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Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 4,036,972, Cl. 424-273.000

Koreska, Rudolf Johan. Profile rail. 4,035,979, Cl. 52-737.000.

Kornfeld, Alan D., to Oxirane Corporation. Process for the manufacture of propylene oxide. 4,036,905, Cl. 260-682.000.

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Korshak, Vasily Vladimirovich; Sergeev, Vladimir Alexandrovich; and Teplyakov, Mikhail Mikhailovich. Method of preparing polymers of polyphenylene type. 4,036,818, Cl. 260-63.00K.

Kouvoussis, Anthony E.: *See—*

Bennett, Thomas H.; Carlow, Earl F.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000.

Kovalchuk, Dmitry Vasilievich: *See—*

Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.

Kowach, Ronald A.; and Rowen, William I., to General Electric Company. Twin controllable pitch propellers operated from single prime mover. 4,036,164, Cl. 115-37.000.

Kowalski, Joseph W., to B-Line Systems, Inc. Swivel connector. 4,037,098, Cl. 240-78.00R.

Kozak, Theodore Fredrick, to Union Carbide Corporation. Flexible waist diaper. 4,036,233, Cl. 128-287.000.

Kraft, Uno Ingemar, to Svenska Aktiebolaget Bromsregulator. Force limiting device for a parking brake actuator arranged in series with a service brake actuator. 4,036,533, Cl. 303-6.00A.

Kraftwerk Union Aktiengesellschaft: *See—*

Harand, Elmar; Richter, Gerd; and Tschopel, Gunter, 4,036,561, Cl. 415-18.000.

Kelp, Fritz, 4,036,021, Cl. 60-692.000.

Kumpf, Hermann, 4,035,974, Cl. 52-249.000.

Kramer, Wolfgang: *See—*

Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,966, Cl. 424-269.000.

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Kratina, Jindrich: *See—*

Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, 4,037,246, Cl. 357-82.000

Kraus, Menahem A.: *See—*

Patchornik, Avraham; and Kraus, Menahem A., 4,037,037, Cl. 526-46.000

Krause, Thomas R.: *See—*

Essenmacher, Albert M.; Krause, Thomas R.; and Dishaw, James, 4,037,198, Cl. 340-146.3ED.

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Krimmel, Carl Peter, to G. D. Searle & Co. 3,4-Bis(4-substituted piperazinyl)-3-cyclobutene-1,2-diones and related compounds. 4,036,828, Cl. 260-239.0BC.

Krohn, David A.; and Deeg, Emil W., to American Optical Corporation. Heat treatment method for making photochromic gradient lenses. 4,036,624, Cl. 65-30.00R

Kryczun, Alfred: *See—*

Jakobs, Willy; and Kryczun, Alfred, 4,036,480, Cl. 266-204.000.

Kubota, Hitoshi; Nishi, Takayuki; and Kobayashi, Takashi, to Hitachi, Ltd. Apparatus for adjusting biasing force of leaf spring. 4,036,042, Cl. 72-9.000.

Kubota, Kenichi: *See—*

Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.

Kubota Ltd.: *See—*

Yoshimori, Ikuo; Nanao, Teruaki; and Sugino, Toshio, 4,036,248, Cl. 137-271.000.

Kubota, Tatsuo: *See—*

Suzuki, Hideo; Sato, Takahisa; Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,036,780, Cl. 252-437.000.

Kuda, Vladimir: *See—*

Malasek, Jaromir; Kuda, Vladimir; Dvoracek, Pavel; and Horn, Vladimir, 4,036,265, Cl. 139-190.000.

Kuehn, Andrew, III, to Systematics, Inc. Capacitor discharge ignition circuit. 4,036,200, Cl. 123-148.00E.

Kugler, Robert J., to Action Packaging Corporation. Automatic filling of bags. 4,036,363, Cl. 206-526.000.

Kullmann, Dieter; Henninger, Peter; and Intichar, Lutz, to Siemens Aktiengesellschaft. Cooling arrangement for the rotor of an electric machine. 4,037,124, Cl. 310-52.000.

Kumai, Teruo: *See—*

Sami, Hiroshi; Taira, Kaoru; and Kumai, Teruo, 4,036,188, Cl. 123-41.310.

Kumar, Surinder: *See—*

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., 4,036,996, Cl. 426-254.000.

Kume, Hidetoshi: *See—*

Yamaguchi, Hideo; Kume, Hidetoshi; and Shibuta, Osamu, 4,036,936, Cl. 423-407.000.

Kummer, Werner: *See—*

Stahle, Helmut; Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 4,036,972, Cl. 424-273.000.

Kumpf, Hermann, to Kraftwerk Union Aktiengesellschaft. Pressure tank for nuclear reactors with concrete enclosure. 4,035,974, Cl. 52-249.000.

Kunegin, Vladimir Ivanovich: *See—*

Petreev, Anatoly Mikhailovich; Lipin, Anatoly Alexeevich; Rabko, Vladimir Davydovich; Suxov, Gennady Ilich; Kunegin, Vladimir Ivanovich; and Kurdjukov, Alexandr Safronovich, 4,036,309, Cl. 173-103.000

Kunesch, Rudolf: *See—*

Storck, Friedrich; Kunesch, Rudolf; and Missbach, Gernot, 4,036,460, Cl. 248-59.000

Kunz, Hugo. Pressure piston for a die-casting machine. 4,036,113, Cl. 92-111.000.

Kupper, Friedrich-Wilhelm, and Streck, Roland, to Chemische Werke Huls Aktiengesellschaft. Process for the preparation of 7,8-epoxy-2-methyloctadecane. 4,036,858, Cl. 260-348.50L.

Kurahashi, Yoshio: *See—*

Yamada, Yasuo; Saito, Junichi; Tamura, Tatsuo; and Kurahashi, Yoshio, 4,036,986, Cl. 424-322.000.

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Saito, Masumi; Tani, Sumio; Matsui, Shigeaki; and Kasaoka, Shigeaki, 4,036,785, Cl. 252-472.000

Kurdjukov, Alexandr Safronovich: *See—*

Petreev, Anatoly Mikhailovich; Lipin, Anatoly Alexeevich; Rabko, Vladimir Davydovich; Suxov, Gennady Ilich; Kunegin, Vladimir Ivanovich; and Kurdjukov, Alexandr Safronovich, 4,036,309, Cl. 173-103.000

Kurita Water Industries Ltd.: *See—*

Orita, Nobuhiro; Yabe, Koichi; and Kawanami, Akifumi, 4,036,751, Cl. 210-35.000.

L. Schuler GmbH: *See—*

Braun, Hans, 4,036,087, Cl. 83-79.000.

La Soudure Electrique Autogene, Procedes Arcos, S.A.: *See—*

De Haeck, Robert Jean, 4,036,671, Cl. 148-24.000.

Labbe, Francis A. M.: *See—*

Preston, Edward G.; Rakowicz, Jan A.; and Labbe, Francis A. M., 4,036,239, Cl. 131-109.00R.

Labenz, James W. Fabric repair tool. 4,036,674, Cl. 156-98.000.

Labrunie, Guy: *See—*

Borel, Joseph; Deutsch, Jean-Claude; Labrunie, Guy; and Robert, Jacques, 4,036,553, Cl. 350-160.0LC.

Lackore, James K.: *See—*

Ramler, Warren J.; and Lackore, James K., 4,037,112, Cl. 250-527.000.

Lair, James O.: *See—*

Skinner, Everett B.; and Lair, James O., 4,036,456, Cl. 244-122.0AD

Laliberte, Albert J., and DeAngelis, Armand, to Omnitech Inc. Apparatus for coating articles. 4,036,168, Cl. 118-8.000.

Lambert, Edmund Baker, to Creative Learning, Inc. Time selective information dissemination system for use in sleep teaching. 4,035,930, Cl. 35-22.00R

Lambert, Everette M. Lap seam folder and wide width sealer. 4,036,678, Cl. 156-461.000

Lambert, Roy E.: *See—*

McKeon, John F.; and Lambert, Roy E., 4,036,072, Cl. 74-245.00R

Lambiotte, Edward J.: *See—*

Nethercutt, Henry W.; and Lambiotte, Edward J., 4,035,911, Cl. 30-131.000.

Landau, John Vernon, Jr.: *See—*

Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.

Landau, Michael B., to United States of America, Navy. Fuel cell product-water management system. 4,037,024, Cl. 429-17.000.

Landers, Frank S.: *See—*

Amberg, Stephen W.; and Landers, Frank S., 4,036,675, Cl. 156-245.000.

Langen, Christianus Petrus, to H. J. Langen & Sons Ltd. Apparatus for treating meat, more particularly ham meat. 4,036,122, Cl. 99-533.000

Langendorf, Heinrich. Truck with tiltable body. 4,036,528, Cl. 298-17.00S.

Langerbein, Bernhard: *See—*

Dreker, Raimund; Endras, Gerhard; and Langerbein, Bernhard, 4,036,024, Cl. 61-42.000.

Langlais, Jules. Fluid metering device. 4,036,409, Cl. 222-249.000.

Lanier Business Products Company: *See—*

Kabayashi, Minoru; and Miyazi, Kazumi, 4,037,262, Cl. 360-96.000.

Lanzilotta, Raymond P., to Syntex (U.S.A.) Inc. 18- and 19-Hydroxylated prostaglandins. 4,036,876, Cl. 260-514.00D.

Lardi, Francesco: *See—*

Davis, Guy E.; Lardi, Francesco; and Ghrist, William D., III, 4,037,088, Cl. 235-151.210.

Larkin, William A.; and Stoloff, Alfred, to M & T Chemicals Inc. Process for recovering organotin halides. 4,036,866, Cl. 260-429.700.

Larko, Robert C.: *See—*

Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., 4,036,478, Cl. 266-133.000.

Larsen, Ole Jeppe Fjord. Method of producing and protecting deposits of sedimentary material on floors of bodies of water. 4,036,022, Cl. 61-3.000.

Laschuk, Eugeny Eustafievich: *See—*

Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.

Lassanske, George G., to Outboard Marine Corporation. Variable speed power transmission including means for minimizing backlash. 4,036,075, Cl. 74-409.000.

Lassiter, Marvin Stevens, Sr., to American Cyanamid Company. Dewatering clay slurries. 4,036,752, Cl. 210-46.000.

Laub, Hans: *See—*

Januschkowetz, Herbert, and Laub, Hans, 4,036,707, Cl. 204-20.000.

Laufer, Siegmar; and Roy, Waldemar, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Highly-active, finely divided super-dry silicon dioxide. 4,036,933, Cl. 423-338.000.

Laugier, Robert: *See—*

Ray, Jean-Louis, and Laugier, Robert, 4,036,935, Cl. 423-404.000.

Laurer, Gerard R. Radiation detector with array of different scintillators. 4,037,105, Cl. 250-367.000.

Lavallee, Donald C.: *See—*

Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,037,186, Cl. 335-206.000

Lazennec, Yvon: *See—*

Desplanches, Gerard; Lazennec, Yvon; and Wicker, Alain, 4,037,027, Cl. 429-104.000

Leavines, Joseph E. High temperature parallel resistance pipe heater. 4,037,083, Cl. 219-552.000

Le Carvennec, Francois: *See—*

Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.

Lederer, Edgar: *See—*

Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000.

Lederhaas, Josef: *See—*

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Lednicer, Daniel, to Upjohn Company, The. Polycyclophenylpyrrolidines, their compositions and use. 4,036,977, Cl. 424-274.000.

Lee, Barry Thomas; and Hyatt, Gilbert Peter. Electronic lock and key system. 4,036,178, Cl. 119-51.00R.

Lee, Charles Meng-Yuan, to Bell Telephone Laboratories, Incorporated. Bipolar switching transistor using a Schottky diode clamp. 4,037,115, Cl. 307-214.000.

Lee, Kyu Tai, to Du Pont de Nemours, E. I., and Company. 6,7-Methylenedioxy-1-(2,2,2-trifluoroethyl)-4(1H)-quinolone-3-carboxylic acid and its salts and esters. 4,036,962, Cl. 424-258.000

Lee, Poy. Sure grip winter tire traction device. 4,036,272, Cl. 152-210.000.

Lee, Pui Kum; and Strehlow, Wolfgang H., to Minnesota Mining and Manufacturing Company. Retroreflective material made by recording a plurality of light interference fringe patterns. 4,036,552, Cl. 350-97.000.

Lefkowitz, Michael; and Taylor, Michael Gordon, to Bell Telephone Laboratories, Incorporated. Fault isolation in communications circuits. 4,037,050, Cl. 178-69.00G

Le Goux, Jean Jacques: *See—*

Dubois, Jean Claude; and Le Goux, Jean Jacques, 4,036,777, Cl. 250-299.000.

Lehureau, Jean Claude: *See—*

Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl. 358-128.000.

Leibin, Jury Veniaminovich: *See—*

Kirpichnikov, Vladimir Pavlovich; Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; and Vyshelessky, Alexandr Nikolaevich, 4,037,070, Cl. 219-10.55A.

Leitz, Ludwig; and Mandler, Walter, to Ernst Leitz G.m.b.H. Still pocket camera. 4,037,238, Cl. 354-152.000.

Le Mehaute, Alain; and Bordet, Philippe, to Compagnie Generale d'Electricite. Sodium-sulphur type electric cell. 4,037,028, Cl. 429-104.000.

Lemonnier, Jean: *See—*

Bush, John H.; and Lemonnier, Jean, 4,036,698, Cl. 195-103.50M.

Lenk, Arthur: *See—*

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Leonard, Kenneth R.; and DeHaan, James R., to Cryogenic Technology, Inc. Support system for an elongated cryogenic envelope. 4,036,617, Cl. 62-55.000.

Leonard, Kenneth R.; and Loudon, John D., to Cryogenic Technology, Inc. Flexible cryogenic envelope. 4,036,618, Cl. 62-55.000

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Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.

Leroi, Jean-Claude; and Vachet, Francois, to Rhone-Poulenc Industries. Method of separating chlorinated aliphatic hydrocarbons with 1 to 3 carbon atoms from mixtures thereof by extractive distillation. 4,036,703, Cl. 203-57.000.

Lerouge, Claude Paul Henri: *See—*

Colardelle, Joel Serge; Comte, Marie Helene; and Lerouge, Claude Paul Henri, 4,037,120, Cl. 307-311.000.

Les Traitements de Surface Nobel-Bozel: *See—*

Arjalies, Georges; and Guillais, Jean-Claude, 4,036,337, Cl. 191-1.00A

Lester, Thomas J., to Lester Tire Company, The. Method of making composite motorcycle wheel. 4,035,895, Cl. 29-159.030.

Lester Tire Company, The: *See—*

Lester, Thomas J., 4,035,895, Cl. 29-159.030.

Lettau, Hans: *See—*

Hetzmeir, Helmut; and Lettau, Hans, 4,036,685, Cl. 176-19.0LD.

Levin, Izrail Aronovich; Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich; Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich. Three-phase discharge lamp. 4,037,128, Cl. 313-188.000

Levine, David W.; Thilly, William G.; and Wang, Daniel I. C., to Massachusetts Institute of Technology. Treatment of cell culture microcarries. 4,036,693, Cl. 195-1.800.

Levine, Walter: *See—*

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Levischev, Arkady Nikolaevich: *See—*

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Levy, Barnett. Indicator device. 4,036,502, Cl. 273-142.00J.

Levy, Joseph; and Christensen, Nils J., to UOP Inc. Synthesis of prenyl chloride. 4,036,899, Cl. 260-654.00R.

Lewis, Arthur M., to Westinghouse Electric Corporation. Meter dial encoder for remote meter reading. 4,037,219, Cl. 340-204.000.

Lexsuco, Inc.: *See—*

Harvey, William R., 4,036,422, Cl. 227-110.000.

Liberman, Arthur L.: *See—*

van Ouwerkerk, Anton; Chant, Bernard J.; and Liberman, Arthur L., 4,036,774, Cl. 252-132.000.

Licentia Patent-Verwaltungs-G.m.b.H.: *See—*

Schimmer, Rigobert; Gesing, Horst; Beerwerth, Wolfgang; and Messerschmidt, Jurgen, 4,036,485, Cl. 269-285.000.

Volkner, Wolfgang; and Schmedemann, Helmuth, 4,036,457, Cl. 244-134.00D.

Liesenborghs, Roland: *See—*

Montbrun, Felix, and Liesenborghs, Roland, 4,037,074, Cl. 219-121.00P.

Liljendahl, Sven Algot Joel. Quickly attachable button. 4,035,874, Cl. 24-90.00E.

Linca, Ion: *See—*

Duca, Mihail; Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl. 56-209.000.

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Gsell, Siegbert; Geiger, Hans; and Maierhofer, Hans-Jurgen, 4,036,266, Cl. 139-304.000.

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Schmitt, Arnold J.; and Linkletter, Merle G., 4,036,684, Cl. 162-290.000.

Linn, Donald F.; Schmidt, Frederick C.; and Yanko, John P., to Lipe-Rollway Corporation. Sealed oil-filled clutch. 4,036,338, Cl. 192-13.00R.

Lion Fat & Oil Co., Ltd.: *See—*

Ogoshi, Toshiaki; Miyawaki, Yozo; Kondo, Fusao; and Sakurai, Susumu, 4,036,596, Cl. 23-283.000.

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Linn, Donald F.; Schmidt, Frederick C.; and Yanko, John P., 4,036,338, Cl. 192-13.00R.

Lipilov, Alexandr Sergeevich: *See—*

Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl. 90-24.00F.

Lipin, Anatoly Alexeevich: *See—*

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Little, Thomas Hamilton, to Pennwalt Corporation. Method of cleaning a centrifuge. 4,036,426, Cl. 233-7.000.

Livingston, Richard W. Coin operated vacuum apparatus. 4,036,346, Cl. 194-9.00T.

Lockwood, Frank J. Pinwheel for paper feeding. 4,036,420, Cl. 226-87.000.

Loews Theatres, Inc.: *See—*

Berry, R. Arlen; and Thompson, Albert W., 4,036,380, Cl. 214-305.000.

Loftus, Edward J., and Hofberger, Gerald F., to Hofberger, Gerald F. Pipe fitting. 4,036,513, Cl. 285-179.000.

Logan, Forrest E.: *See—*

Gundzik, Richard M., and Logan, Forrest E., 4,036,608, Cl. 55-89.000.

Lohmann, Frank, to Ciba-Geigy Corporation. Aqueous, storage-stable dispersions of water-soluble compounds. 4,036,778, Cl. 252-301.210.

Lohwasser, Hermann; Nogaj, Alfred; and Reinehr, Ulrich, to Bayer Aktiengesellschaft. Process for the production of bulk yarns. 4,035,884, Cl. 28-281.000.

Loken, Bjarte; MacDonald, Peter Lindsay; and Bigatti, Ettore, to Steroid Development Company Establishment. Trimethyl siloxane steroid intermediates. 4,036,831, Cl. 260-239.55D.

Longoni, Angelo: *See—*

Gialdi, Franco; Longoni, Angelo; Michieli, Giannantonio; and Ponci, Riccardo, 4,036,963, Cl. 424-258.000.

Loper, Bernd, to Daimler-Benz Aktiengesellschaft. Installation for automatic control of the light distance with motor vehicle headlights. 4,037,134, Cl. 315-78.000.

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Kiko, Frederick J., 4,037,066, Cl. 179-170.00G.

Lorenz, Karl: *See—*

Lorenzini, Robert E.; Iwata, Akiyoshi; and Lorenz, Karl, 4,036,595, Cl. 23-273.0SP.

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Losinger AG of Bern: *See—*

Dietrich, Hans, 4,036,137, Cl. 102-23.000.

Loudon, John D.: *See—*

Leonard, Kenneth R.; and Loudon, John D., 4,036,618, Cl. 62-55.000.

Louis nee Ester, Brigitte, heir: *See—*

Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.

Lounsbury, John Baldwin: *See—*

Kaplan, Leon H.; Lounsbury, John Baldwin; and Zimmerman, Steven Michael, 4,036,644, Cl. 96-36.000.

Loveland, Steven: *See—*

Campbell, Roy L.; and Loveland, Steven, 4,036,210, Cl. 128-2.00F.

Lowder, F. Ray; and Gibbon, John D., to Celanese Corporation; and Fiber Industries, Inc. Poly(ethylene terephthalate) fibrillated tape sewing thread. 4,036,003, Cl. 57-140.00R.

Lowe, Gerald W. Combination foldable golf club carrier and score keeping device. 4,036,416, Cl. 224-45.00R.

Lowe, William L.: *See—*

Rao, Kamlaker P.; Lowe, William L.; and Nephew, O. Thomas, 4,036,372, Cl. 212-144.000.

Lowery, Edward L.: *See—*

Hattori, Kiyoshi; Lowery, Edward L.; Chadbourne, William H.; and Boyer, William M., 4,037,011, Cl. 428-294.000.

Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., to Southwire Company. Method and apparatus for paying out wire. 4,036,450, Cl. 242-129.000.

Lu, Chih-shun, to Inficon Leybold-Heraeus Inc. Apparatus for monitoring vacuum deposition processes. 4,036,167, Cl. 118-7.000.

Lubrizol Corporation, The: *See—*

Dorer, Casper John, Jr., 4,036,772, Cl. 252-56.00R.

Lucas Electrical Company Limited: *See—*

Wilkinson, Norman, 4,036,817, Cl. 200-61.270.

Lucas, Harold P., to Lucas, Harold P. Method of panel re-facing building walls. 4,035,980, Cl. 52-745.000.

Lucas, Roger; and Auberger, Jacques, to FORGEAL, societe pour le Forgeage et l'Estampage des Alliages Legers. Method of forging and press-forming aluminum wheel. 4,035,891, Cl. 29-159.010.

Lucero, Daniel P.; and Teets, Alan R., to Meloy Laboratories, Inc. Temperature-controlled apparatus for fluid permeation or the like. 4,036,915, Cl. 261-104.000.

Luebbers, Willi, to Nico-Pyrotechnik Hanns-Juergen Diederichs KG. Percussion fuse assembly. 4,036,145, Cl. 102-73.00R.

Luke, John Anthony, to Brown & Williamson Tobacco Corporation. Apparatus for cigarette filter manufacture. 4,036,114, Cl. 93-1.00C.

Lummus Company, The: *See—*

Riegel, Herbert D.; Schindler, Harvey D.; and Strangio, Vincent A., 4,036,776, Cl. 252-187.00R.

Strangio, Vincent A.; Riegel, Herbert; and Sze, Morgan C., 4,036,897, Cl. 260-648.00C.

Strangio, Vincent A., 4,036,900, Cl. 260-659.00R.

Lund, David Yngve Mikael: *See—*

Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo; and Ornelius, Erik Vilhelm Bernhard, 4,036,658, Cl. 106-90.000.

Lund, Glenn A. L.: *See—*

Soderlind, Richard Leroy; and Lund, Glenn A. L., 4,036,438, Cl. 239-288.500.

Lundgren, John L.: *See—*

Kempisty, Francis W., Jr., and Lundgren, John L., 4,037,184, Cl. 335-6.000.

Lundmark, Anders Gunnar Rudolf: *See—*

Sjostrand, Fritiof Stig; Lundmark, Anders Gunnar Rudolf; and Ekstrom, Gosta Ivar, 4,036,085, Cl. 81-52.300.

Lupinacci, George: *See—*

Feldman, Edward, and Lupinacci, George, 4,036,349, Cl. 197-151.000.

Lutz, Herbert, and Pfeiler, Manfred, to Siemens Aktiengesellschaft. X-ray diagnosing apparatus with several photographing systems selectively connectable to a common generator. 4,037,107, Cl. 250-402.000.

Lutz, Horst: *See—*

Dahm, Wolfram; Lederhaas, Josef; Merkle, Roland; Lutz, Horst; Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, 4,036,755, Cl. 210-168.000.

Luukonen, Leroy D.; and Tieděn, Arthur E. Attachment to pole skidder vehicle for loading, hauling, and stacking cut logs. 4,036,378, Cl. 214-92.000.

Lux, Joseph W., and Varanelli, John M., to Robertshaw Controls Company. Apparatus for joining two abutting metal members together and method of making such apparatus. 4,035,901, Cl. 29-243.500.

Lyon, David L., to Intertel, Inc. Modulator and demodulator for data communications network. 4,037,049, Cl. 178-67.000.

Lyon, Warren Charles: *See—*

Barr, Harold N.; Lyon, Warren Charles; and Bustard, Thomas S., 4,036,665, Cl. 136-202.000.

Lyons, Bernard J., to Raychem Corporation. Irradiatable polymer composition with improved oxidation resistance. 4,036,719, Cl. 204-159.140.

M. E. Cunningham Company: *See—*

Speicher, Edwin W., 4,036,127, Cl. 101-5.000.

M & T Chemicals Inc.: *See—*

Chopdekar, Vilas M., 4,036,889, Cl. 260-606.50P.

Harbulak, Edward P., 4,036,709, Cl. 204-43.00T.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,710, Cl. 204-52.00R.

Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,711, Cl. 204-52.00R.

Larkin, William A.; and Stoloff, Alfred, 4,036,866, Cl. 260-429.700.

Maalouf, George E., to Moore Business Forms, Inc. Carbonless manifold business forms. 4,036,511, Cl. 282-27.500.

Mabuchi, Kenichi, to Mabuchi Motor Co. Ltd. Adapter for non-standard sized battery. 4,037,026, Cl. 429-100.000.

Mabuchi Motor Co. Ltd.: *See—*

Mabuchi, Kenichi, 4,037,026, Cl. 429-100.000.

MacBean, Donald George, to JWI Ltd. Method of closing fabric seams. 4,035,872, Cl. 24-31.00H.

MacDonald, Peter Lindsay: *See—*

Loken, Bjarte; MacDonald, Peter Lindsay; and Bigatti, Ettore, 4,036,831, Cl. 260-239.55D.

MacGregor, Paul T.: *See—*

Karger, Eva R., and MacGregor, Paul T., 4,036,863, Cl. 260-386.000.

Mack, Karl: *See—*

Gawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, 4,036,103, Cl. 89-35.00R.

MacPherson Powders Limited: *See—*

Harvey, Peter, 4,036,169, Cl. 118-66.000.

Madigan, William Thomas: *See—*

Hardman, Bruce Bertolette; and Madigan, William Thomas, 4,036,813, Cl. 260-46.50G.

Madl, Josef, and Schober, Hans. Device for forming trim patterns in fur. 4,035,913, Cl. 30-287.000.

Maeda, Noriyuki: *See—*

Hayashi, Tsutomu; Kawaguchi, Takeshi; and Maeda, Noriyuki, 4,036,331, Cl. 188-187.000.

Maeda, Tetsuya: *See—*

Murakami, Masuo; Iwanami, Masaru; Isaka, Ichiro; Nagano, Yoshinobu; Fujimoto, Masaharu; and Maeda, Tetsuya, 4,036,834, Cl. 260-243.00C.

Maeyama, Shigeo: *See—*

Kawai, Shinichi; Maeyama, Shigeo; and Shidara, Tokihiko, 4,037,127, Cl. 313-60.000.

Magnin, Pierre: *See—*

Dulou, Raymond; Magnin, Pierre; and Bechtel, Pierre, 4,036,884, Cl. 260-586.00G.

Magre, Eduard P.: *See—*

Oosterwijk, Hendrik H. J.; Magre, Eduard P.; and Beyleveld, Wilhelmus M., 4,036,898, Cl. 260-649.00R.

Maher, Francis William, Jr., and Pirc, Vladimir Valentine, to Perkin-Elmer Corporation, The. Method for blood film preparation. 4,037,003, Cl. 427-2.000.

Maida, Osamu, to Nippon Kogaku K.K. Electromagnetic trigger device in motor-driven camera capable of time exposure. 4,036,555, Cl. 352-169.000.

Maier, Daniel F., and Sheldon, John D., to Outboard Marine Corporation. Marine propulsion device having increased reverse thrust. 4,036,162, Cl. 115-17.000.

Maier, Siegmund: *See—*

Piekarski, Gottfried; Hundmeyer, Anton; Kippe, Dieter; and Maier, Siegmund, 4,036,867, Cl. 260-448.00A.

Maierhofer, Hans-Jurgen: *See—*

Gsell, Siegbert; Geiger, Hans; and Maierhofer, Hans-Jurgen, 4,036,266, Cl. 139-304.000.

Maigret, Robert J., to Eastman Kodak Company. Exposure control apparatus. 4,037,237, Cl. 354-51.000.

Majima, Tsuyoshi, and Hara, Katsunosuke, to NGK Insulators, Ltd. Pyrolysis process for treating sewage sludge containing chromium. 4,036,753, Cl. 210-63.00R.

Makila, Eino; Virtanen, Unto; and Savinainen, Kyosti, to Joutseno-Pulp Osakeyhtio. Method and apparatus for the treatment of waste wood, such as stumps and snag, to make it suitable for the production of paper pulp. 4,036,440, Cl. 241-20.000.

Makino, Tadashi: *See—*

Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, 4,036,948, Cl. 424-32.000.

Malasek, Jaromir; Kuda, Vladimir; Dvoracek, Pavel; and Horn, Vladimir, to Vyzkumny a vyvojovy ustav Zavodu vseobecneho strojirenstvi. Device for supporting the slay drive of a loom. 4,036,265, Cl. 139-190.000.

Maldonado, Juan Ramon: *See—*

Coquin, Gerald Allan; Maldonado, Juan Ramon; Maydan, Dan; and Somekh, Sasson Roger, 4,037,111, Cl. 250-505.000.

Malmin, Oscar. Cartridge and sealing means therefor. 4,036,226, Cl. 128-218.00D.

Mandler, Walter: *See—*

Leitz, Ludwig, and Mandler, Walter, 4,037,238, Cl. 354-152.000.

Mandrin, Charles, to Sulzer Brothers Limited. Process and apparatus for evaporating and heating liquified natural gas. 4,036,028, Cl. 62-52.000.

Maniar, Gunvant N.: *See—*

Philip, Thoni V.; and Maniar, Gunvant N., 4,036,640, Cl. 75-126.00C.

Manne, Richard S.; Bethea, Sam R.; and Kelso, Edward A., to Exxon Research and Engineering Company. Process for manufacturing naphthenic solvents and low aromatics mineral spirits. 4,036,734, Cl. 208-57.000.

Mannesmann Aktiengesellschaft: *See—*

Wolters, Hans Richard, and Keltjens, Heinz, 4,036,258, Cl. 137-614.040.

Manning, Harold E., to Petro-Tex Chemical Corporation. Dehydrogenation catalyst. 4,036,781, Cl. 252-439.000.

Manthey, Willi, and Deiwick, Horst, to BWG Bergwerk-und Walzwerk Maschinenbau G.m.b.H. Apparatus for cooling hot slabs. 4,036,243, Cl. 134-76.000.

Manuccia, Thomas J.: *See—*

Clark, Marion D., and Manuccia, Thomas J., 4,036,720, Cl. 204-177.000.

Maples, Jack S.: *See—*

Roberson, Morris L.; Beck, John W.; Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.

Marais, Sarel Johannes. Plough share with reinforcement plate covering tongue holes therein. 4,036,307, Cl. 172-749.000.

Marangoni, Carlo. Machine for treating worn out pneumatic tires and for applying a pre-molded tread ring. 4,036,677, Cl. 156-394.000.

Margerum, John D.: *See—*

Brault, Robert G.; DeAnda, Cesar C.; Jenney, Joe A.; and Margerum, John D., 4,036,647, Cl. 96-76.00C.

Marinello, Rosolino. Apparatus for assisting the treatment of wounds or inflammations internal to the human body. 4,036,229, Cl. 128-268.000.

Marquardt, Warren B.: *See—*

Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000.

Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., to Texaco Development Corporation. Method of preparing polyaminopolyphenylmethanes. 4,036,880, Cl. 260-570.00D.

Marrotte, Gary J., and Mulder, H. Christopher. Cartridge belt guide for ammunition box. 4,036,102, Cl. 89-33.01B.

Martens, Theophile: *See—*

Bernet, Henri Georges, and Martens, Theophile, 4,036,603, Cl. 44-13.000.

Martin, Albert R., to Harris Corporation. Chirp communication system. 4,037,159, Cl. 325-30.000.

Martin, Fred David: *See—*

Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, 4,036,660, Cl. 106-90.000.

Martin, Lincoln A., to Geophysical Systems Corporation. Method of vibratory seismic prospecting for minimum correlation noise. 4,037,190, Cl. 340-15.5LA.

Martin Marietta Corporation: *See—*

Taylor, Glen J., 4,037,047, Cl. 174-68.500.

Martin, Marvin C. Disposable beverage container cover element carrying folded drinking straw. 4,036,392, Cl. 220-23.000.

Martin, Terence Geoffrey, to Coal Industry (Patents) Limited. Hydrogenation of coal. 4,036,731, Cl. 208-8.000.

Marvin Glass & Associates: *See—*

Breslow, Jeffrey D., 4,036,492, Cl. 273-1.00R.

Breslow, Jeffrey D., 4,036,493, Cl. 273-1.00M.

Marx, Michael: *See—*

Walker, Keith A. M., and Marx, Michael, 4,036,970, Cl. 424-273.000.

Walker, Keith A. M., and Marx, Michael, 4,036,973, Cl. 424-273.000.

Walker, Keith A. M., and Marx, Michael, 4,036,974, Cl. 424-273.000.

Marynissen, William E., to Bic Pen Corporation. Lighter. 4,036,579, Cl. 431-131.000.

Matzluft, William Frank: *See—*

Castellion, George Augustus, and Matzluft, William Frank, 4,036,870, Cl. 260-465.300.

Maschinenfabrik Schweiter AG: *See—*

Suter, Xaver, 4,036,353, Cl. 198-486.000.

Suter, Xaver, 4,036,444, Cl. 242-35.60R.

Maschinenfabrik Wifag: *See—*

Heimlicher, Paul, and Von Hein, Eduard, 4,036,487, Cl. 270-71.000.

Masciopinto, Anthony J.: *See—*

Kirkland, Kerry G.; Masciopinto, Anthony J.; and Owens, James H., 4,036,295, Cl. 166-.600.

Mashimo, Yukio: *See—*

Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, 4,037,233, Cl. 354-23.00D.

Maslanka, William Walter, to Hercules Incorporated. Electroconductive paper. 4,037,017, Cl. 428-413.000.

Masloboev Shvedov, Alexei Alexeevich: *See—*

Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masloboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.

Massachusetts General Hospital, The: *See—*

Haber, Edgar, 4,036,945, Cl. 424-1.000.

Massachusetts Institute of Technology: *See—*

Levine, David W.; Thilly, William G.; and Wang, Daniel I. C., 4,036,693, Cl. 195-1.800.

Massey, Janet E. Educational game. 4,035,932, Cl. 35-48.00D.

Mast, Aquila D.: *See—*

Crane, Jack W., and Mast, Aquila D., 4,035,999, Cl. 56-341.000.

Masuda, Toyotsugu: *See—*

Ichiryu, Ken; Masuda, Toyotsugu; Kinoshita, Haruo; Kajiwara, Toshiyuki; and Matsuoka, Shigemichi, 4,036,041, Cl. 72-8.000.

Masuhara, Kenichi: *See—*

Kobashi, Toshiyuki, and Masuhara, Kenichi, 4,036,803, Cl. 260-29.6AN.

Mata, Justo M.: *See—*

Staples, Edward O., and Mata, Justo M., 4,036,696, Cl. 195-80.00R.

Material Control, Inc.: *See—*

Reiter, Robert C., 4,036,351, Cl. 198-499.000.

Reiter, Robert C., 4,036,354, Cl. 198-499.000.

Mathauser, William R. Bicycle brake shoe with heat dissipating means. 4,036,335, Cl. 188-264.00A.

Mathe, Tibor: *See—*

Petro, Jozsef; Mathe, Tibor; and Tungler, Antal, 4,036,877, Cl. 260-515.00R.

Mathers, James E.: *See—*

Shaffer, Francis N., and Mathers, James E., 4,037,110, Cl. 250-483.000.

Mathias Bauerle GmbH: *See—*

Raible, Hermann, and Muller, Rolf, 4,036,138, Cl. 101-463.000.

Mathis, Paul-Henri: *See—*

Caspar, Raymond, and Mathis, Paul-Henri, 4,035,968, Cl. 52-63.000.

Matovich, Edwin, to Thagard Technology Company. High temperature fluid-wall reactors for transportation equipment. 4,036,181, Cl. 123-3.000.

- Matsuda, Hironobu, to Olympus Optical Co., Ltd. Automatic tape cassette-assembling system. 4,035,899, Cl. 29-773.000
- Matsuda, Kazuo, Ohmura, Hidemasa, and Sakai, Takeyo, to Kao Soap Co., Ltd. Aqueous amphoteric polyurethane having blocked NCO groups and process. 4,036,801, Cl. 260-29.2TN
- Matsui, Shigeaki: See—
  - Saito, Masumi, Tani, Sumio, Matsui, Shigeaki, and Kasaoka, Shigeaki, 4,036,785, Cl. 252-472.000
- Matsuka, Shigemichi: See—
  - Ichiryu, Ken; Masuda, Toyotsugu, Kinoshita, Haruo, Kajiwara, Toshiyuki; and Matsuka, Shigemichi, 4,036,041, Cl. 72-8.000
- Matsumoto, Kuniaki; Hatakeyama, Junichi, and Okamoto, Masaharu, to Hitachi, Ltd. Flood control system for a dam. 4,036,023, Cl. 61-25.000
- Matsumoto Seiyaku Kogyo Kabushiki Kaisha: See—
  - Sugiyama, Iwakichi; Takaoka, Yukihisa; and Endo, Kiyoshi, 4,036,796, Cl. 260-22.0CA.
- Matsuo, Kazumasa: See—
  - Yamashita, Nobuo, Hayamizu, Yoshisada; Nagai, Yoshitaka, Imai, Toshihiro, and Matsuo, Kazumasa, 4,036,218, Cl. 128-4.000
- Matsushima, Hisatomo: See—
  - Honda, Takeo, and Matsushima, Hisatomo, 4,036,549, Cl. 339-275.00R
- Matsushita Electric Industrial Co., Ltd.: See—
  - Nagaoka, Tadashi, 4,037,253, Cl. 358-128.000
  - Ono, Shusuke; Wasa, Kiyotaka, and Hayakawa, Shigeru, 4,037,176, Cl. 333-30.00R
- Matsushita, Katsuyuki, Murayama, Hideo, Yawata, Kazufumi and Kobayakawa, Masaki, to Nippon Electric Kagoshima, Ltd. Method for producing multi-figure luminescent display tubes. 4,035,885, Cl. 29-25.140
- Matsushita, Tomiharu: See—
  - Yamaguchi, Yoshihiro; Matsushita, Tomiharu, Noguchi, Masataka; Ide, Hideaki; and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000
- Matthey, Henri, and Delessert, Georges, to Telectronics SA. Device for the bidirectional movement of an information support. 4,036,458, Cl. 242-201.000
- Mattocks, George Roland: See—
  - Holmes, Charles Chamberlain; Skinner, Wallace, and Mattocks, George Roland, 4,036,675, Cl. 65-134.000
- Mauroy, Marcel: See—
  - Gillard, Claude, and Mauroy, Marcel, 4,036,222, Cl. 128-2.080
- Maury, Jean Robert. Bicompartmental syringe. 4,036,225, Cl. 128-15.00M
- Maxsted, Malcolm D.: See—
  - Dixon, Robert L., and Maxsted, Malcolm D., 4,036,313, Cl. 175-344.000
- May & Baker Limited: See—
  - Caton, Michael Peter Lear, Coffee, Edward Charles John, and Watkins, Gordon Leonard, 4,036,872, Cl. 260-468.00D
- Maydan, Dan: See—
  - Coquin, Gerald Allan, Maldonado, Juan Ramon, Maydan, Dan, and Somekh, Sasson Roger, 4,037,111, Cl. 250-505.000
- Mayhew, Raymond Leonard: See—
  - Tilson, Edward Arthur, and Mayhew, Raymond Leonard, 4,037,012, Cl. 428-304.000
- Maykut, Albert R.: See—
  - Betts, Robert E., Thorn, Lawrence B., and Maykut, Albert R., 4,036,013, Cl. 60-271.000
- McAvoy, Nelson: See—
  - Filipescu, Nicolae; McAvoy, Nelson, Kagan, Morton R., and Serafin, Francis A., 4,037,172, Cl. 331-94.50F
- McCarthy, James B.: See—
  - Gajonska, David A., McCarthy, James B., and Rutkiewicz, Joseph A., 4,036,160, Cl. 91-375.00A
- McCarthy, John P.: See—
  - Kaufman, Harold B., Jr.; Moyer, John H., and McCarthy, John P., 4,037,071, Cl. 219-10.55I
- McCarty, James C., and Mendola, Dominick, to Syntex (U.S.A.) Inc. System for culturing aquatic animals. 4,036,176, Cl. 119-3.000
- McClain, A. Ervin: See—
  - Bennett, Robert L., Parrott, Orville C., Getzin, Allan R., and McClain, A. Ervin, 4,036,611, Cl. 55-149.000
- McClintic, Wayne L., and Sheetz, Charles E., to FMC Corporation. Bin destacker and restacker. 4,036,375, Cl. 214-6.00F
- McCombs, Frank P.: See—
  - Foley, Kevin M.; Bell, Reuben H., and McCombs, Frank P., 4,036,806, Cl. 260-37.00N
- McCoy, Robert M.: See—
  - Brennan, Thomas E., Hartmann, Robert H., and McCoy, Robert M., 4,037,126, Cl. 310-260.000
- McCracken, Charles Kennedy, to Trane Company, The. Incineration system for the disposal of a waste gas and method of operation. 4,036,576, Cl. 431-5.000
- McCreery, James F., to Kennametal Inc. Cut off tool. 4,035,889, Cl. 29-96.000
- McDonald, Gregory. Microphone holder assembly. 4,037,063, Cl. 179-147.000
- McDonnell Douglas Corporation: See—
  - Anderson, John H., and Waters, Elmer D., 4,036,286, Cl. 165-45.000.
- McGahan, Everett G., and Melanko, Charles L. Video switcher. 4,037,250, Cl. 358-108.000
- McGill, Kenneth Harmon: See—
  - Eddy, Kenneth Harmon, and McGill, Kenneth Harmon, 4,036,508, Cl. 280-422.000
- McGilvray, Malcolm Canmore, Jr.: See—
  - Durland, Douglas Howard; and McGilvray, Malcolm Canmore, Jr., 4,036,428, Cl. 233-23.00R
- McGinniss, Vincent Daniel, to SCM Corporation. Cationic aqueous compositions of polymer having amine groups, acid neutralized, and abis-maleimide cross-linker, coatings and process. 4,037,018, Cl. 428-418.000.
- McIntosh, Lawrie Gandier: See—
  - Filko, Colin, Smith, Richard Stanley; McIntosh, Lawrie Gandier, and Bouman, Willem John, 4,036,415, Cl. 223-40.000
- McKeon, John F., and Lambert, Roy E., to FMC Corporation. Welded steel roller chain. 4,036,072, Cl. 74-245.00R
- McKinney, Joel D.: See—
  - Readal, Thomas C.; McKinney, Joel D., and Titmus, Robert A., 4,036,740, Cl. 208-120.000.
- McKnight, Oliver R., and Seaman, William M., Jr., to Hollis and Company. Sprocket and method for producing same. 4,036,071, Cl. 74-243.00R
- McLane, Martin M., and Newsom, Raymond A., to Monsanto Company. Recovery of iodine. 4,036,940, Cl. 423-503.000.
- McPhee, John, to Rusco Industries, Inc. Fail safe press brake guard. 4,036,343, Cl. 192-134.000
- McQuinn, Ted M., to General Motors Corporation. Feed and accumulator control of trimmer valve boost pressure. 4,036,083, Cl. 74-867.000
- McRae, Brian Joseph: See—
  - McRae, Lucy Theresa, and McRae, Brian Joseph, 4,035,865, Cl. 16-114.00R
- McRae, Lucy Theresa, and McRae, Brian Joseph. Implements usable by persons afflicted with arthritis. 4,035,865, Cl. 16-114.00R.
- Meader, Arthur L., Jr., to Chevron Research Company. Polyurethane precursors containing thixotropic agents. 4,036,797, Cl. 260-28.00R
- Meadowcraft, Ronald Ross, and Bain, Alastair Stewart, to Atomic Energy of Canada Limited. Nuclear fuel element. 4,036,691, Cl. 176-68.000
- Mearl Corporation, The: See—
  - Bucco, Mario P., and Van Valkenburg, Alvin, 4,036,656, Cl. 106-88.000
- Meckstroth, Alan F.: See—
  - Servais, Ronald A., Bauer, Paul T.; and Meckstroth, Alan F., 4,036,519, Cl. 296-1.00S
- Meek, James M., to United States of America, Army. Arming system. 4,036,144, Cl. 102-70.20R
- Mefina S.A.: See—
  - Fresard, Marcel; Baruffa, Olindo, and Gabriel, Jean-Pierre, 4,036,158, Cl. 112-258.000.
- Meguro, Shinichi, Imafuku, Shinsaku; Kawamura, Kazuo, Hashimoto, Shigeki, and Narita, Shigeyoshi, to Hokkaido Sugar Co., Ltd. Process for beet sugar production. 4,036,694, Cl. 195-11.000.
- Mehta, Povindar K., to Regents of the University of California. High iron oxide hydraulic cement. 4,036,657, Cl. 106-89.000.
- Meier, Otto: See—
  - Scheidweiler, Andreas, and Meier, Otto, 4,037,106, Cl. 250-381.000
- Meininger, Fritz: See—
  - Fuchs, Hermann, and Meininger, Fritz, 4,036,825, Cl. 260-196.000.
- Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, to Bayer Aktiengesellschaft. 1,2,4-Triazole antimycotic compositions and use thereof. 4,036,966, Cl. 424-269.000.
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  - Westphal, Kurt, Meiser, Werner, Eue, Ludwig, and Hack, Helmuth, 4,036,632, Cl. 71-93.000.
- Melanko, Charles L.: See—
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- Melcher, Charles H.: See—
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- Meloy Laboratories, Inc.: See—
  - Lucero, Daniel P., and Teets, Alan R., 4,036,915, Cl. 261-104.000
- Menard, Jacques Pierre Raymond Raphael: See—
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- Merck & Co., Inc.: See—
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  - Alexander, Merwin K., Meyer, Daniel J., and Cohen, Philip, 4,036,459, Cl. 248-11.000.
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  - Chretien, Gilbert, Ditacroute, Gerard, and Meyer, Jacques, 4,036,908, Cl. 260-863.000.
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- Mezei, John R. Trailer mounted automobile crusher. 4,036,125, Cl. 100-100.000
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- Micknel Manufacturing Inc.: See—
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- Mitsubishi Chemical Industries Ltd.: See—
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  - Schatz, Klaus W., and Snyder, Paul W., Jr., 4,036,779, Cl. 252-417.000
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  - Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl 427-145.000
- Nakaguti, Osamu See—
  - Kamiya, Takashi; Sato, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl 260-306.70C
- Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Sugiyama, Kiyoshi, to FMC Corporation. Method of increasing the rate of solubility of materials of low solubility 4,036,990, Cl 424-361.000
- Nakajima, Ichiro; Sanaka, Isao; Takeda, Tsuginori; Koarai, Hiroyuki; Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, to Fujitsu Ltd. Data processing system for converting from logical addresses to physical addresses 4,037,209, Cl 364-200.000
- Nakajima, Saburo See—
  - Okamoto, Yoshihiko; Abe, Toshio; Hirose, Kazuhiro; Nakajima, Saburo; and Sato, Hirosai, 4,036,008, Cl 58-85.500
- Nakajima, Shin'Ichiro See—
  - Nakai, Yoshinobu; Nakajima, Shin'Ichiro; and Sugiyama, Kiyoshi, 4,036,990, Cl 424-361.000
- Nakamoto, Soichi See—
  - Tunekawa, Tokuichi; Nakamoto, Soichi; and Taguchi, Tetsuya, 4,037,234, Cl 354-24.000
- Nakamura, Hideo See—
  - Sato, Teruo, and Nakamura, Hideo, 4,037,025, Cl 179-15.0BT
- Nakamura, Hitoshi See—
  - Kamiya, Takashi; Sato, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl 260-306.70C
- Nakamura, Takeshi, and Nishiyama, Hiroshi, to Murata Manufacturing Co., Ltd. Piezoelectrically driven tuning fork with harmonic suppression 4,037,121, Cl 310-8.200
- Nakamura, Toshikazu See—
  - Tamada, Minoru; Shikama, Takashi; and Nakamura, Toshikazu, 4,037,082, Cl 219-541.000
- Nakanishi, Yoshitaka. Sash lock 4,036,039, Cl 70-90.000.
- Nakano, Shiro; Kanbe, Norio; Nakagawa, Tsugumichi; Nishio, Akira; and Kitahara, Kengo, to Sekisui Kagaku Kogyo Kabushiki Kaisha and Tomoegawa Paper Co., Ltd. Method for producing thermoplastic resin films or sheets for chelate color printing 4,037,004, Cl 427-145.000
- Nakayama, Keiji, to Diesel Kiki Co. Engine fuel injection system 4,036,192, Cl 123-139.0AT
- Nakazato, Tetsuo; Kamon, Shingi; Tokuda, Koichi; and Homma, Kosuke, to Sumitomo Bakelite Company, Limited. Apparatus for sealing the heads of containers 4,035,987, Cl 53-133.000.
- Nanao, Teruaki See—
  - Yoshimori, Ikuo; Nanao, Teruaki; and Sagino, Toshio, 4,036,24[illegible], Cl 15[illegible]
- Narahara, Hisaaki See—
  - Tanaka, Yoshinori, and Narahara, Hisaaki, 4,037,247, Cl 358-4.0[illegible]
- Narita, Shigeyoshi See—
  - Meguro, Shinichi; Inafuku, Shinsaku; Kawamura, Kazuo; Hashimoto, Shigeki; and Narita, Shigeyoshi, 4,036,694, Cl 195-11.0[illegible]
- Naruke, Yoshikazu See—
  - Ikuta, Hiroaki; Naruke, Yoshikazu; Nagasawa, Yoshio; and Yakushi, Masanori, 4,037,211, Cl 364-200.000
- Nash Metalware Co. Inc. See—
  - Eisenberg, Stephanie 4,036,3[illegible], Cl 211-88.000
- National Controls, Inc. See—
  - Rock, Frank C., 4,036,3[illegible], Cl 177-[illegible]
- National Research Development Corporation See—
  - Brown, David Keith; Dabill, David William; Smith, Jack [illegible]; Jones, Alan; and Jones, Thomas Alwyn, 4,03[illegible], Cl [illegible]32.00F
- National Semiconductor Corporation See—
  - Allen, Robert M., and [illegible], M[illegible], 4,0[illegible], Cl [illegible]
- National Steel Corporation See—
  - Saunders, William T., 4,036,[illegible]56, Cl 72-329.0[illegible]
- National Upper Cervical Chiropractic Research Association, Inc. See—
  - Gregory, Ralph R., 4,036,213, Cl 128-2[illegible]
- Nauta, Robin Gustav, to Dorr-Oliver Incorporated. Fluid bed incinerator feed system 4,036,153, Cl 110-8.00F
- NCR Corporation See—
  - Betts, William L., and Greene, Robert T., 4,037,226, Cl 340-347.0DD
- Neal, Wayne Ray See—
  - Owens, Michael, and Neal, Wayne Ray, 4,037,148, Cl 323-17.000
- Neff, Gregor N. Collection and feeding of insects to animals 4,036,189, Cl 119-51.00R
- Neilsen, Hildaur L., to Rolodex Corporation. Rotary card holder 4,035,938, Cl 40-68.600
- Neiman, Michel, to Societe de Diffusion Neiman. Cap for a fuel tank 4,036,393, Cl 220-206.000.
- Nekrutman, Samuil Veniaminovich See—
  - Kirpichnikov, Vladlen Pavlovich; Leibin, Jury Veniaminovich; Nekrutman, Samuil Veniaminovich; and Vyshelessky, Alexandr Nikolaevich, 4,037,070, Cl 219-10.55A
- Nelson, Gerald H. See—
  - Mickey, Edgar G., and Nelson, Gerald H., 4,035,940, Cl 40-140.000
- Nemec, Allen R. See—
  - Chamran, Morteza M., and Nemec, Allen R., 4,037,154, Cl 324-123.00R.
- Nephew, O. Thomas See—
  - Rao, Kamlaker P.; Lowe, William L., and Nephew, O. Thomas, 4,036,372, Cl 212-144.000
- Nethercutt, Henry W., and Lambiotte, Edward J. Syringe destroyer with needle disposing cannister 4,035,911, Cl 30-131.000
- Neufang, Karlheinz, to Siemens Aktiengesellschaft. Circuit arrangement for monitoring PCM couplers 4,037,054, Cl 179-15.0BF
- Neumann, Peter, to Sandoz, Inc. Substituted imidazolinylaminoimidazoles 4,036,976, Cl 424-273.000
- Neuzil, Richard W. See—
  - Rosback, Donald H., and Neuzil, Richard W., 4,036,744, Cl 208-310.00Z
- Neveux, Rene, to Societe Anonyme Francaise du Ferodo. Radiator especially for the air-conditioning system of an automobile 4,036,288, Cl 165-63.000
- Newman, Albert L. See—
  - Bajorek, Jay E.; and Newman, Albert L., 4,035,978, Cl 52-727.000
- Newman, Gerald R. Random motion fish lure apparatus and methods 4,035,945, Cl 43-42.150
- Newman-Green, Inc. See—
  - Green, Elward Howard, 4,036,459, Cl 239-466.000
- Newnom, Richard S., to Amerace Corporation. Apparatus for making self-locking internally threaded fasteners with ring-like locking elements 4,035,859, Cl 10-72.00P
- Newsom, Raymond A. See—
  - McLane, Martin M., and Newsom, Raymond A., 4,036,930, Cl 423-503.000
- Newton, John Chase, to Westinghouse Brake & Signal Co. Ltd. Driving and locking mechanisms 4,035,956, Cl 49-280.000
- NFF International, Ltd. See—
  - DeMarco, Thomas M., 4,036,614, Cl 55-310.000
- NGK Insulators, Ltd. See—
  - Mamma, Tsuyoshi, and Hara, Kainosuke, 4,036,753, Cl 210-63.00R
- Nicholas, John F., to General Electric Company. [illegible] control circuit 4,037,163, Cl 328-175.000
- Nichols, Richard D. I. See—
  - [illegible], John F., and Nichols, Richard D. I., 4,035,902, Cl 70-446.000
- Nicholson, John S. See—
  - Armitage, Bernard J., and Nicholson, John S., 4,036,98[illegible], Cl 424-353.000
- Nicklas, Manfred E. Internal coating and sandblasting [illegible] for pipe 4,036,173, Cl 118-306.000
- Nico Pyrotechnik Hanns-Juergen Diederichs KG See—
  - [illegible], Willi, 4,036,145, Cl 102-73.00R
- [illegible], Frank G. See—
  - [illegible], Charles I., and [illegible], Frank G., 4,036,242, Cl [illegible]
- Nidola, Antonio; de Nora, Vittorio; and Spaziante, Placido M., to Diamond Shamrock Technologies S.A. Electric storage batteries with valve metal electrodes 4,037,[illegible]32, Cl 429-198.000
- Nielsen, Knud. Child's chair 4,036,523, Cl 297-130.000
- Nielson, Thomas Christian, and [illegible], James Louis, to International Business Machines Corporation. Apparatus for transferring sample holders relative to a movable magazine 4,036,381, Cl 214-[illegible]
- Nieman, John P., to Caterpillar Tractor Co. Method of treating [illegible] centrifugal castings 4,036,2[illegible], Cl 164-[illegible]
- Nihon Denshi Kabushiki Kaisha See—
  - Okamura, Kinuo; [illegible]; Tatsumori, Kaneko; [illegible]; and [illegible], 4,037,101, Cl 250-[illegible]
- [illegible], to Bunker Ramo Corporation. Electrical connector [illegible] rear slot [illegible] contact receiving channels via conductor receiving and holding [illegible] 4,036,[illegible], Cl [illegible]9.00R
- [illegible] See—
  - [illegible], Tsutomu; Shirogami, Tametsu; [illegible]; Hirokazu; and Aizawa, Kazuo, 4,037,03[illegible], Cl 429-206.000
- Nippon [illegible] Kabushiki Kaisha, to Japan Petro Co., Ltd. See—
  - [illegible], Ryoichi; Terasaki, [illegible]; and [illegible], Masaru, 4,037,060, Cl 176-100.43K
- Nippon Electric Company Limited See—
  - [illegible], Yuk[illegible]; and Ish[illegible], Tatsuo, 4,037,24[illegible], Cl 358-13.000

Katoh, Hidehiko Kajiwara, Yuji, and Takamizawa, Hideo, 4,037,168, Cl. 330-31.000

Mimitsuka, Takao, and Iwakawa, Tunekiyo, 4,037,130, Cl 313-220.000.

Nippon Electric Kagoshima, Ltd See—

Matsushita, Katsuyuki, Murayama, Hideo, Yawata, Kazufumi, and Kobayakawa, Masaki, 4,035,885, Cl. 29-25.140

Nippon Gakki Seizo Kabushiki Kaisha See—

Ogita, Minoru; and Hoshi, Juro, 4,037,057, Cl 179-15.0BT

Ogita, Minoru, 4,037,165, Cl 329-124.000

Tomisawa, Norio Uchiyama, Yasuji, Okumura, Takatoshi, and Takeda, Toshio, 4,036,096, Cl 84-1.010.

Yokoyama, Kenji, 4,037,166, Cl 330-13.000.

Nippon Kogaku K K . See—

Maida, Osamu, 4,036,555, Cl. 352-169.000

Nippon Mining Co., Ltd : See—

Ozaki, Hiromi Yamane, Mamoru, Yoshikai, Haruo, and Kodama, Hachio, 4,036,736, Cl 208-106.000.

Nippon Oil Co., Ltd See—

Tsuchiya, Shozo, 4,037,038, Cl 526-56.000

Nippon Paint Co. Ltd., See—

Hirai, Seizaburo, Mizoe, Yoji; and Koji, Itoh, 4,036,804, Cl 260-29.7SQ

Kato, Hisao, Yagi, Hideo, and Fukuta, Shunji, 4,036,721, Cl 204-181.000

Nippon Shokubai Kagaku Kogyo Co., Ltd See—

Suzuki, Hideo Sato, Takahisa, Kubota, Tatsuo; Osaka, Shigemi and Komatsu, Shigeru, 4,036,780, Cl 252-437.000.

Nippon Soken, Inc : See—

Hattori, Tadashi; Takada, Shigetaka, Hayashi, Kenji and Iwata, Toshiharu, 4,036,186, Cl 123-32.0EA

Igashira, Toshihiko, Yamaguchi, Shunzo, and Hujita, Masami, 4,036,183, Cl 123-8.130

Noguchi, Masaaki, Banda, Tsuchio, and Tanaka, Taro, 4,036,180, Cl 123-3.000.

Nippon Telegraph and Telephone Public Corporation See —

Fujimoto, Isao, Kasubuchi, Takeshi and Aiba, Masahiko, 4,037,230, Cl 346-75.000

Nippondenso Co., Ltd See—

Kobayashi, Hisanori, 4,036,194, Cl 123-139.DAW

Kondo Yoshihiko 4,037,146, Cl 318-444.000

Numata, Kenichi, and Muramatu, Yukihiko, 4,036,191, Cl 123-119.00A.

Nishi, Takayuki See —

Kubota, Hitoshi, Nishi, Takayuki, and Kobayashi, Takashi, 4,036,042, Cl 72-9.000

Nishio, Akira See —

Nakano, Shiro, Kanbe, Norio, Nakagawa, Tsugumichi, Nishio, Akira and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.

Nishio Takuji, to Tokyo Kosei Kaken Co Ltd Mobile floor cleaning and polishing device. 4,035,958, Cl 51-425.000.

Nishioka, Kunihiko See—

Yamaguchi, Yoshihiro; Matsushita, Tomiharu, Noguchi, Masataka, Ide, Hideaki, and Nishioka, Kunihiko, 4,036,043, Cl. 72-41.000

Nishioka, Masato, and Carter, Daniel Dulaney, to Procter & Gamble Company, The Venting closure assembly 4,036,386, Cl 215-260.000

Nishiyama, Hiroshi See—

Nakamura, Takeshi, and Nishiyama, Hiroshi, 4,037,121 Cl 310-8.200

Nishizawa, Chiharu See—

Togo, Shizuo, Ito, Muneo, Nishizawa, Chiharu, and Ohba, Michio, 4,036,861, Cl 260-369.000

Nissan Chemical Industries, Ltd . See—

Takahashi, Hiroki, Ozawa, Kiyomi, Iwasawa, Yoshihiro, Ogawa, Masayuki, Okamoto, Shigekatu; Ochiai, Yoshinori, and Katakura, Eizo, 4,036,984, Cl. 424-311.000

Nissan Motor Co., Ltd See—

Ariga, Hajime, 4,036,014, Cl. 60-274.000.

Hata, Yoshitaka, Shioyama, Giichi; and Minami, Hidehiro, 4,036,015, Cl. 60-282.000

Katoh, Sadao, 4,036,535, Cl 303-6.00C.

Nixon, Ralph Alan, to Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, The Underwater anchoring apparatus 4,036,161, Cl. 114-296.000.

Nizhensky, Anatoly Danilovich See—

Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich, Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich, Laschuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000

Noble, Roger K.: See—

Reed, Robert D.; Schwartz, Robert F : and Noble, Roger K., 4,036,580, Cl 431-202.000.

Noctua, Inc.: See—

Christensen, Craig M., 4,036,557, Cl. 356-28.000.

Noetzel, Siegfried; and Herwig, Walter, to Hoechst Aktiengesellschaft Flame retarding polyamide molding compositions 4,036,811, Cl. 260-45.75W.

Nogaj, Alfred: See—

Lohwasser, Hermann; Nogaj, Alfred; and Reinehr, Ulrich, 4,035,884, Cl. 28-281.000.

Noguchi, Masaaki; Bunda, Tsuchio; and Tanaka, Taro, to Nippon Soken, Inc. Fuel reforming system for an internal combustion engine 4,036,180, Cl 123-3.000.

Noguchi, Masataka See—

Yamaguchi, Yoshihiro, Matsushita, Tomiharu; Noguchi, Masataka, Ide, Hideaki and Nishioka, Kunihiko, 4,036,043, Cl 72-41.000

Noiles, Douglas G See—

Veth, George J ; and Noiles, Douglas G , 4,036,211, Cl. 128-2.00R

Nolan, John F See—

Clem, William E , and Nolan, John F , 4,035,986, Cl 53-61.000

Nolan, John M to General Electric Company Multiple-plate clutch. 4,036,344, Cl 192-48.300.

Noltemeyer, Friedrich. See—

Dahm, Wolfram, Lederhaas, Josef, Merkle, Roland; Lutz, Horst, Moser, Peter; Noltemeyer, Friedrich; and Roger, Heinz, 4,036,755, Cl 210-168.000

Nomiya, Kosei Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, to Hitachi, Ltd.' Information processing system. 4,037,212, Cl. 364-200.000

Nomura, Yazyuro See—

Hosokawa, Yoshinori; Wakiyama, Yoshihiro; and Nomura, Yazyuro, 4,037,109, Cl 250-444.000.

Nordgren, John Lennart, and Thordarson, Gunnar Gudmund, to U S Philips Corporation. Impact contact device for projectiles 4,036,143, Cl 102-70.20R

Nordstrom, Harold A : See -

Bahoshy, Bernard J , Klose, Robert E.; and Nordstrom, Harold A , 4,036,992, Cl 426-3.000

Norton Company See—

Pemrick, Raymond E., and Cocanour, Paul M., 4,035,961, Cl 51-295.000.

Novey, William E., to Eli Bridge Company. Solid state timer-stepper with soft switch-on and switch-off load control. 4,037,135, Cl 315-194.000.

Novinson, Thomas. See—

O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H , 4,036,840, Cl. 260-256.50R.

Nuclear Battery Corporation: See—

Barr, Harold N ; Lyon, Warren Charles; and Bustard, Thomas S 4,036,665, Cl 136-202.000

Nuclear Power Company Limited: See—

Rickard, Allan Robert, and George, Brian Victor, 4,036,687, Cl. 176-37.000.

Nucleonic Data Systems, Inc., See—

Allport, John J., 4,037,104, Cl. 250-359.000.

Nugent, John W.: See—

Ennis, George E.; Ennis, George Thomas; and Nugent, John W., 4,035,862, Cl. 15-53.0AB.

Numata, Kenichi, and Muramatu, Yukihiko, to Nippondenso Co., Ltd Exhaust gas recirculation system. 4,036,191, Cl. 123-119.00A.

Numata, Saburo; and Fujino, Shinichiro, to Fuji Photo Optical Co., Ltd Switching circuit for electric shutter 4,037,236, Cl. 354-51.000.

Nya Asfalt AB. See—

Puhringer, Josef Alfred; Lund, David Yngve Mikael; Froberg, Rolf Bo, and Ornelius, Erik Vilhelm Bernhard, 4,036,658, Cl. 106-90.000.

Nyholm, Jarl Shop scales with digital weight indication. 4,036,318, Cl. 177-211.000

Oakland, John Stephen. See—

Mercer, Alec Victor; and Oakland, John Stephen, 4,036,851, Cl 260-310.00D

Oberg, Gary R., to Berkley & Company, Inc. Water ski safety flag 4,035,856, Cl. 9-313.000.

Obert, Jean-Claude. Apparatus for generating aerosols of solid particles 4,036,223, Cl. 128-266.000.

O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H., to ICN Pharmaceuticals 2-Substituted-s-triazolo[1,5*a*]pyrimidines. 4,036,840, Cl. 260-256.50R

Occidental Oil Shale, Inc.: See—

Cha, Chang Yul, and Ridley, Richard D , 4,036,299, Cl 166-261.000.

French, Gordon B., 4,036,099, Cl 86-20.00C.

Occidental Petroleum Corporation: See—

Gundzik, Richard M.; and Logan, Forrest E., 4,036,608, Cl 55-89.000.

Ochiai, Yoshinori See—

Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.

Oda, Minoru; and Badono, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Fluorescent X-ray sulfur analyzer. 4,037,099, Cl. 250-272.000.

Odell, Jack L.: See—

Bell, Duncan; Odell, Jack L.; Olson, David E., and Peirce, Allen E , 4,037,189, Cl 340-6.00R.

Oden, Kenneth W , to Dixie-Narco, Inc. Tandem column vender anti theft device. 4,036,400, Cl 221-67.000.

O'Donnell, Phillip P.: See—

Gale, Stephen B.; O'Donnell, Phillip P.; and Bruckenstein, Stanley, 4,036,726, Cl. 204-231.000.

Offenhauer, Robert D.: See—

Espenscheid, Wilton F.; Offenhauer, Robert D., and Yan, Tsoung Y , 4,036,770, Cl. 252-51.50R

Offerdahl, Richard E.: See—

Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B , Offerdahl, Richard E., Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl 361-385.000.

Officine Galileo Meccanotessile S.p.A.: See—

Santi, Luciano, 4,036,267, Cl 139-336.000

Ogawa, Masayuki. See—

Takahashi, Hiroki, Ozawa, Kiyomi; Iwasawa, Yoshihiro, Ogawa, Masayuki, Okamoto, Shigekatu; Ochiai, Yoshinori, and Katakura, Eizo, 4,036,984, Cl 424-311.000

Ogikubo, Masaru. See—

Uchida, Ryuichi; Terasaki, Kaoru; and Ogikubo, Masaru, 4,037,060, Cl 179-100.41K

Ogita, Minoru, and Hoshi, Juro, to Nippon Gakki Seizo Kabushiki Kaisha Noise-cancelling apparatus for FM stereo receiver 4,037,057, Cl. 179-15.0BT.

Ogita, Minoru, to Nippon Gakki Seizo Kabushiki Kaisha Synchronous signal generating system with phase-locked loop circuit 4,037,165, Cl. 329-124.000

Ogoshi, Toshiaki; Miyawaki, Yozo; Kondo, Fusao; and Sakurai, Susumu, to Lion Fat & Oil Co., Ltd Apparatus for continuous sulfonation 4,036,596, Cl 23-283.000.

Ohba, Michio: See—

Togo, Shizuo; Ito, Muneo; Nishizawa, Chiharu, and Ohba, Michio, 4,036,861, Cl 260-369.000.

Ohi, Hideyuki See—

Okumura, Kimio; Soya, Tatsunori, Kauchi, Yosuke, and Ohi, Hideyuki, 4,037,101, Cl 250-310.000

Ohkubo, Kazuo: See—

Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji, Tamao, Yoshikuni, Ohkubo, Kazuo; Tezuka, Tohru, and Tonomura, Shinji, 4,036,955, Cl 424-177.000

Ohmae, Tsutomu; Yano, Hideo; and Suzuki, Toshio, to Agency of Industrial Science & Technology Control device for use in shunt motor. 4,037,144, Cl. 318-338.000.

Ohmura, Hidemasa. See—

Matsuda, Kazuo; Ohmura, Hidemasa; and Sakai, Takeyo, 4,036,801, Cl. 260-29.2TN.

Oil-Dri Corporation of America. See—

Valenta, Rudolph C , 4,036,928, Cl. 264-118.000.

Oishi, Minoru, Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada, and Koga, Syozi, to Kobe Steel Ltd Process for welding aluminum and aluminum alloys in horizontal welding position. 4,037,078, Cl 219-137.00R.

Okamoto, Masaharu: See—

Matsumoto, Kuniaki, Hatakeyama, Junichi, and Okamoto, Masaharu, 4,036,023, Cl 61-25.000

Okamoto, Shigekatu: See—

Takahashi, Hiroki; Ozawa, Kiyomi, Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl 424-311.000

Okamoto, Shosuke, Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, to Mitsubishi Chemical Industries Ltd.; and Okamoto, Shosuke N^2-naphthalenesulfonyl-L-argininamides and the pharmaceutically acceptable salts thereof. 4,036,955, Cl 424-177.000.

Okamoto, Yoshihiko; Abe, Toshio, Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, to Tokyo Shibaura Electric Co., Ltd Electronic timepiece 4,036,008, Cl. 58-85.500.

Okazaki, Kiyoshi: See—

Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu, Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,036,954, Cl. 424-176.000.

Okorodudu, Abraham O M , to Mobil Oil Corporation. Lubricant compositions containing carboxylic acid esters of hindered hydroquinones. 4,036,773, Cl. 252-56.00R.

Oku, Teruo: See—

Kamiya, Takashi; Saito, Yoshihisa; Teraji, Tsutomu; Nakaguti, Osamu, Oku, Teruo; Nakamura, Hitoshi; and Hashimoto, Masashi, 4,036,847, Cl. 260-306.70C.

Okubo, Ichiro: See—

Tsujimoto, Michihiro; and Okubo, Ichiro, 4,036,805, Cl. 260-37.00N.

Okuda, Naoki: See—

Oishi, Minoru; Okuda, Naoki; Tomita, Makoto, Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl 219-137.00R

Okumoto, Yutaka, to Japan Tobacco & Salt Public Corporation, The. Apparatus for controlling amount of tobacco filler in cigarette manufacturing machine. 4,036,238, Cl. 131-21.00B.

Okumura, Kimio; Soya, Tatsunori, Kauchi, Yosuke; and Ohi, Hideyuki, to Agency of Industrial Science & Technology; and Nihon Denshi Kabushiki Kaisha. Method and apparatus for analyzing fine grained substances. 4,037,101, Cl. 250-310.000.

Okumura, Takatoshi: See—

Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, 4,036,096, Cl. 84-1.010.

Oldershaw, Reginald W : See—

Busby, Edwin S., Jr., and Oldershaw, Reginald W., 4,037,260, Cl. 360-73.000.

Oldham, Edwin W.: See—

Barnes, J. Haywood, 4,036,442, Cl. 241-82.500.

Oldham, Frank Sand dispensing device for a motor vehicle 4,036,516, Cl. 291-38.000.

Oldham, Vern L.: See—

Barnes, J. Haywood, 4,036,442, Cl. 241-82.500.

Olin Corporation. See—

Watson, W. Gary; and Breedis, John F., 4,036,642, Cl. 75-164.000

Olson, David E.: See—

Bell, Duncan, Odell, Jack L.; Olson, David E.; and Peirce, Allen E., 4,037,189, Cl 340-6.00R.

Olson, Steven W Headset hanger 4,036,464, Cl. 248-309.00R

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Kabayashi, Minoru; and Miyazi, Kazumi, 4,037,262, Cl 360-96.000

Matsuda, Hironobu, 4,035,899, Cl. 29-773.000.

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O'Mahony, John P., See—

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Omnitech Inc.: See—

Laliberte, Albert J., and DeAngelis, Armand, 4,036,168, Cl 118-8.000

Ono, Shusuke, Wasa, Kiyotaka, and Hayakawa, Shigeru, to Matsushita Electric Industrial Co., Ltd Multi-layered substrate for a surface-acoustic-wave device 4,037,176, Cl. 333-30.00R.

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Alexander, Merwin K ; Meyer, Daniel J.; and Cohen, Philip, 4,036,459, Cl 248-11.000

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von Voros, Geza, 4,035,922, Cl 33-143.00I

Orgill, Rodney H See—

Bennett, Thomas H ; Carlow, Earl F., Kouvoussis, Anthony E , Orgill, Rodney H ; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000

Orita, Nobuhiro, Yabe, Koichi; and Kawanami, Akifumi, to Kurita Water Industries Ltd Method of treating water containing chromate 4,036,751, Cl 210-35.000

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Suzuki, Hideo; Sato, Takahisa, Kubota, Tatsuo; Osaka, Shigemi, and Komatsu, Shigeru, 4,036,780, Cl 252-437.000

Osborne, Thomas F , and Stockwell, Richard Kent, to Hewlett-Packard Company. Calculator having preprogrammed user-definable functions 4,037,092, Cl. 235-156.000

Osborne, William Steese See—

Birney, Richard Eugene; Osborne, William Steese, and Graybiel, Lynn Allan, 4,037,207, Cl 364-200.000

Birney, Richard Eugene; Davis, Michael Ian; Hood, Robert Allen; Graybiel, Lynn Allan, Kahn, Samuel, and Osborne, William Steese, 4,037,215, Cl. 364-200.000

Oshikiri, Tatsuo, to Kabushiki Kaisha Oshikiri Kikai Seisaku-Sho Full-automatic panning system for white bread production line 4,036,569, Cl. 425-140.000

Osterlund, Alfred G ; and Ruble, Frank D , to Xerox Corporation Hammer intensity selection apparatus for serial printer 4,037,208, Cl 364-900.000.

Otaco Limited See—

Faul, Thomas L , 4,036,527, Cl. 297-454.000

Ototani, Tohei; and Kataura, Yasuji, to Ototani, Tohei Composite calcium clad material for treating molten metals 4,035,892, Cl 428-576.000.

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Yamaguchi, Hideo; Kume, Hidetoshi; and Shibuta, Osamu, 4,036,936, Cl 423-407.000.

Outboard Marine Corporation: See—

Lassanske, George G , 4,036,075, Cl 74-409.000

Maier, Daniel F.; and Sheldon, John D., 4,036,162, Cl 115-17.000

Over, William Roderick, and Brehm, Ronald Carl, to AMP Incorporated. Apparatus for connecting conductors to contact terminals in an electrical connector. 4,035,897, Cl 29-56.600

Owan, Vernon L. Portable jack 4,036,474, Cl 254-124.000

Owen, Donald R. Protection and control of electric immersion-type heater. 4,037,080, Cl. 219-328.000

Owens-Corning Fiberglas Corporation: See—

Foley, Kevin M.; Bell, Reuben H , and McCombs, Frank P , 4,036,806, Cl. 260-37.00N.

Thomson, Francis D., 4,036,790, Cl 260-2.5AQ.

Owens-Illinois, Inc.: See—

Amberg, Stephen W.; and Landers, Frank S , 4,036,675, Cl 156-245.000.

Chang, Long Fei, 4,036,926, Cl. 264-94.000.

Owens, James H.: See—

Kirkland, Kerry G.; Masciopinto, Anthony J , and Owens, James H., 4,036,295, Cl. 166- 600.

Owens, Michael; and Neal, Wayne Ray, to General Electric Company Ballast control device. 4,037,148, Cl. 323-17.000.

Oxirane Corporation: See—

Kornfeld, Alan D., 4,036,905, Cl. 260-682.000.

Ozaki, Hiromi, Yamane, Mamoru; Yoshikai, Haruo; and Kodama,

Hachio, to Nippon Mining Co., Ltd. Process for producing synthetic coking coal and treating cracked oil. 4,036,736. Cl. 208-106.000
Ozawa, Kiyomi: *See*—
Takahashi, Hiroki; Ozawa, Kiyomi; Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu; Ochiai, Yoshinori; and Katakura, Eizo, 4,036,984, Cl. 424-311.000.
P. R. Mallory & Co., Inc.: *See*—
Dey, Arabinda N., 4,035,909, Cl. 29-623.200
Dey, Arabinda N.; and Schlaikjer, Carl R., 4,037,025, Cl. 429-29.000.
Frey, Robert L., and George, Lee R., 4,037,188, Cl. 338-174.000
Pacific Erectors Corporation: *See*—
Tuckey, James C., 4,036,395, Cl. 220-224.000
Packer, David H.: *See*—
Bertozzi, Eugene R., Barclay, Robert, Jr., Packer, David H.; and Smith, Daniel J., 4,036,882, Cl. 260-584.00B
Paffoni, Camillo: *See*—
Carlini, Filippo Maria; Pieri, Giampiero; Paffoni, Camillo; and Boffa, Gioacchino, 4,036,733, Cl. 208-12.000
Pagano, Victor H., and Moore, Freeman O., Jr., to United States of America, Army. Lightweight method of construction for ribbed applique armor. 4,036,104, Cl. 89-36.00H
Pages, Michel: *See*—
Bardonnet, Claude; Brun, Robert; and Pages, Michel, 4,036,760, Cl. 210-323.00R
Pagny, Georges Claude Andre: *See*—
Goujon, Roger Hubert; Menard, Jacques Pierre Raymond Raphael; and Pagny, Georges Claude Andre, 4,037,156, Cl. 324-158.00R
Pallos, Ferenc M.; and Baker, Don R., to Stauffer Chemical Company. Phosphorus containing herbicide antidotes. 4,036,628, Cl. 71-86.000
Palm Brothers, Incorporated: *See*—
Nachtigall, Walter E., Jr., 4,036,391, Cl. 221-150.00A
Palmer, James E.; Lavallee, Donald C.; and Huber, George, to Spectron Corporation. Connecting and switching system, and switching apparatus suitable for use therein. 4,037,186, Cl. 335-206.000.
Panafacom Limited: *See*—
Ikuta, Hiroaki; Naruke, Yoshikazu; Nagasawa, Yoshio; and Yakushi, Masanori, 4,037,211, Cl. 364-200.000
Panchishin, July Modestovich: *See*—
Taranov, Sergei Glebovich; Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich; Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich; Grinberg, Isaak Pavlovich; Lasciuk, Eugeny Eustafievich; Panchishin, July Modestovich; and Chigirin, Jury Trofimovich, 4,037,150, Cl. 324-45.000.
Papko, Tamara Stepanovna: *See*—
Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Leontiev, Alexandr Semenovich; Papko, Tamara Stepanovna; Masleboev-Shvedov, Alexei Alexeevich; and Kononov, Nikolai Fedorovich, 4,036,782, Cl. 252-455.00Z.
Papst, Hermann Ernst Robert. Assembly for the damping of flexural and torsional vibration in the shafts of machines. 4,036,030, Cl. 64-1.00V
Pare, Guy: *See*—
Denis, Jacques, and Pare, Guy, 4,036,771, Cl. 252-56.00R.
Pardee, Marilynn. Mattress cover. 4,035,854, Cl. 5-334.00C
Parlee-Anderson Corporation: *See*—
Anderson, Robert N., and Parlee, Norman A., 4,036,637, Cl. 75-84.000
Parlee, Norman A.: *See*—
Anderson, Robert N., and Parlee, Norman A., 4,036,637, Cl. 75-84.000.
Parrott, Orville C.: *See*—
Bennett, Robert L.; Parrott, Orville C.; Getrin, Allan R.; and McClain, A. Ervin, 4,036,611, Cl. 55-149.000.
Patchornik, Avraham; and Kraus, Menahem A., to Yeda Research & Development Co. Ltd. Novel method of organic synthesis to form a polymer-bound active species. 4,037,037, Cl. 526-46.000
Pate, Harold L.; and Borsh, Richard J., to Indian Head Inc. Retainer clip and synthetic resin box combination. 4,036,389, Cl. 220-3.800
Patel, Padma Ambalal; and Baker, Dennis Stanley, to Glacier Metal Company Limited, The. Bearing material. 4,036,822, Cl. 260-79.000
Patil, Arvind S., and Weissman, Eugene Y. Diaphragms from discrete thermoplastic fibers requiring no bonding or cementing. 4,036,729, Cl. 204-296.000.
Paton, Robert Michael: *See*—
Crosby, John; Rennie, Robert Allan Campbell; and Paton, Robert Michael, 4,036,869, Cl. 260-453.0AP.
Paules, Eugene H., to ExCel Engineering, Inc. Automatic vacuum packaging machine and method. 4,035,982, Cl. 53-22.00B.
Paulson, Roger A.: *See*—
Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard L.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000
Peace Medical: *See*—
Fegan, Frank Joseph, and Smith, William Harold, 4,036,253, Cl. 137-556.000.
Pearce, Jai K.; and Wells, William, to Pennsylvania Engineering Corporation. Steel converter vessel tuyere block construction. 4,036,481, Cl. 266-222.000.
Pearson, Walter B., to Hayes International Corporation. System for augmenting the visual and radar characteristics of an airborne target. 4,037,228, Cl. 343-18.00C
Peasley, Howard P. Sewage treatment apparatus. 4,036,754, Cl. 210-139.000.
Peasley, Howard P. Backflush filter system. 4,036,757, Cl. 210-196.00C
Pecaro, George J. Drip irrigation emitter. 4,036,435, Cl. 239-116.000.
Peddle, Charles: *See*—
Bennett, Thomas H.; Carlow, Earl E.; Kouvoussis, Anthony E.; Orgill, Rodney H.; Peddle, Charles; and Wiles, Michael F., 4,037,204, Cl. 364-200.000
Pedersen, Vernon G.: *See*—
Briley, Ronald D., and Pedersen, Vernon G., 4,035,857, Cl. 9-342.000
Peel, Aubrey A., Sr. Safety cage for tire inflation. 4,036,273, Cl. 157-1.000
Peer, Thomas Richard: *See*—
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.
Pehrsson, Anders Lennart, to Aktiebolaget Karlstads Mekaniska Werkstad. Apparatus for mounting and dismounting a submerged propeller unit for a floating body. 4,036,163, Cl. 115-34.00R
Peirce, Allen E.: *See*—
Bell, Duncan; Odell, Jack L.; Olson, David E., and Peirce, Allen E., 4,037,189, Cl. 340-6.00R.
Pellant, Michal; Pokorny, Oldrich; Reichel, Pavel; Zuna, Jaroslav; Kafunek, Pavel; and Kratina, Jindrich, to CKD Praha, oborovy podnik. High-power semiconductive devices. 4,037,246, Cl. 357-82.000
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Smith, Henry D., 4,037,265, Cl. 361-58.000.
Pemrick, Raymond E., and Cocanour, Paul M., to Norton Company. Coated abrasive backing of dimensionally stabilized heat stretched fabric. 4,035,961, Cl. 51-295.000.
Pennington, William. Heat sealing of plastic sheets. 4,036,676, Cl. 156-273.000
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Pearce, Jai K.; and Wells, William, 4,036,481, Cl. 266-222.000
Pennwalt Corporation: *See*—
Little, Thomas Hamilton, 4,036,426, Cl. 233-7.000.
Pentel Kabushiki Kaisha: *See*—
Abe, Kiyomi, and Tagata, Genichi, 4,035,933, Cl. 35-48.00R.
Penzias, Rolf, to Molins Limited. Rod-like articles. 4,036,118, Cl. 93-77.0FT
Perani, Giuseppe, to Fonderie F. lli Perani S.p.A. Radiator for heating plants with elements. 4,036,287, Cl. 165-55.000.
Perkin-Elmer Corporation, The: *See*—
Chamran, Morteza M., and Nemec, Allen R., 4,037,154, Cl. 324-123.00R
Maher, Francis William, Jr.; and Pire, Vladimir Valentine, 4,037,003, Cl. 427-2.000.
Pernegger, Wolfgang: *See*—
Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.
Perronnet, Jacques; and Girault, Pierre, to Roussel-UCLAF. Crotonamides. 4,036,633, Cl. 71-106.000.
Perry, Carlos V., Jr.: *See*—
Perry, Carlos V., Sr.; Perry, Carlos V., Jr.; and Perry, Christopher G., 4,036,249, Cl. 137-367.000.
Perry, Carlos V., Sr.; Perry, Carlos V., Jr.; and Perry, Christopher G. Diverter valve. 4,036,249, Cl. 137-367.000.
Perry, Christopher G.: *See*—
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Perry, Eric; Heath, Roy T.; Rost, Lee F.; and Cowan, Braughler, to C & P Industries, Inc. Bottle handling apparatus. 4,036,382, Cl. 214-313.000.
Persinski, Leonard J.; Martin, Fred David; and Adams, Sally Lee, to Calgon Corporation. Methods of using cementing compositions having improved flow properties, containing sulfonated copolymers of styrene-maleic anhydride. 4,036,660, Cl. 106-90.000.
Perticamps S A Embalagens: *See*—
Camps, Jean Bernard, 4,036,413, Cl. 222-500.000
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Cornett, Lee G., and Peterson, Wesley D., 4,037,178, Cl. 333-71.000.
Petit, Jean Francois: *See*—
Adam, Arlette; Berger, Frank M.; Chedid, Louis; Lederer, Edgar; and Petit, Jean Francois, 4,036,953, Cl. 424-92.000
Petito, Ferdinand C.: *See*—
Clark, Wellman L.; Cox, John T.; Klauber, Gerald; Petito, Ferdinand C.; Ramsey, John B., Jr.; and Waylonis, John E., 4,037,131, Cl. 313-388.000.
Petreev, Anatoly Mikhailovich; Lipin, Anatoly Alexeevich; Rabko, Vladimir Davidovich; Suxov, Gennady Erich; Kunegin, Vladimir Ivanovich; and Kurdjukov, Alexandr Safronovich. Double-piston rock drill. 4,036,309, Cl. 173-103.000
Petro, Jozsef; Mathe, Tibor; and Tungler, Antal, to Budapesti Muszaki Egyetem. Process for the production of aldehydes. 4,036,877, Cl. 260-515.00R
Petro-Tex Chemical Corporation: *See*—
Manning, Harold E., 4,036,781, Cl. 252-439.000
Petrocci, Alfonso N.: *See*—
Green, Harold A.; Merianos, John J.; and Petrocci, Alfonso N., 4,036,959, Cl. 424-248.560
Petzoldt, Karl; and Wiechert, Rudolf, to Schering Aktiengesellschaft. Process for the preparation of estrene-3,17-dione derivatives. 4,036,695, Cl. 195-51.00B
Pfaff Industriemaschinen GmbH: *See*—
Becker, Dietmar; Jehle, Fritz; Schonthaler, Ruhi; and Wellenbacher, Erich, 4,036,156, Cl. 112-121.260.

Pfeiler, Manfred: *See*—
Lutz, Herbert, and Pfeiler, Manfred, 4,037,107, Cl. 250-402.000
Pfizer Inc.: *See*—
Barth, Wayne E., 4,036,846, Cl. 260-306.70C
Hess, Hans-Jurgen E.; Johnson, Michael R.; Bindra, Jasjit S.; and Schaaf, Thomas K., 4,036,832, Cl. 260-240.00R
Sciavolino, Frank C., 4,036,853, Cl. 260-343.000
Philip Morris Incorporated: *See*—
Teng, Lina Chen, 4,036,237, Cl. 131-17.00R
Philip, Thomi V., and Maniar, Gunvant N., to Carpenter Technology Corporation. Alloy steel. 4,036,640, Cl. 75-126.00C
Phillips, Edwin R.; and Stankiewicz, Raymond J., to Sperry Rand Corporation. High speed development technique. 4,036,175, Cl. 118-651.000.
Phillips Petroleum Company: *See*—
Cruzan, Charles G., 4,036,062, Cl. 73-422.0GC
Farfaglia, Silvio T., 4,035,926, Cl. 34-34.000
Quigg, Donald J., 4,036,699, Cl. 195-142.000.
Roof, Lewis B., and Porter, Grady T., 4,036,063, Cl. 73-422.0GC
Strope, Daniel J., 4,036,904, Cl. 260-681.50R.
Phillips, Reginald Andrew, to Dobson Park Industries, Ltd. Pressure fluid operated percussion tools. 4,036,108, Cl. 91-165.000
Phillips, William, to RCA Corporation. Method of making optical waveguides and product by the process. 4,037,005, Cl. 427-162.000
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Bennett, Milton, 4,035,898, Cl. 29-788.000.
Photo-Lith International: *See*—
Tugwell, Dennis H., 4,037,008, Cl. 428-200.000
Pickard, John: *See*—
Kocsis, Alex; Kasner, Gerald; Fermi, Rudy; Bratton, David, and Pickard, John, 4,036,133, Cl. 101-415.100.
Pickles, Joseph, to Ferro Manufacturing Corporation. Seat recliner hinge assembly. 4,035,866, Cl. 16-146.000
Pickton, Shailer T.; and Dean, Gordon B., to Systron Donner Corporation. Exponential decay wave form generator and method. 4,037,164, Cl. 328-187.000.
Piekarski, Gottfried; Hundmeyer, Anton; Kippe, Dieter; and Maier, Siegmund, to Wacker-Chemie GmbH. Organo-aluminum-silicon reducing agents and process. 4,036,867, Cl. 260-448.00A
Pieri, Giampiero: *See*—
Carlini, Filippo Maria; Pieri, Giampiero; Paffoni, Camillo; and Boffa, Gioacchino, 4,036,733, Cl. 208-12.000.
Pierre, Kenneth Jonas; Tung, Ker-Kong; and Nadj, Henriette, to Beckman Instruments, Inc. Kinetic assay for alpha-amylase. 4,036,697, Cl. 195-99.000.
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Pinder, Russell Stuart, and Clark, Leslie, to International Research and Development Company Limited. Photodetectors and thin film photovoltaic arrays. 4,036,645, Cl. 136-89.00C.
Pinsonneault, Jacques Emile: *See*—
DeRees, Delbert D.; and Pinsonneault, Jacques Emile, 4,036,522, Cl. 296-154.000.
Pipkin, Denzil B. Hook and leader storage device. 4,036,451, Cl. 242-137.100.
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Pircon, Ladislav J. Endless belt impingement apparatus and method. 4,036,609, Cl. 55-91.000
Pittet, Alan O.: *See*—
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,036,886, Cl. 260-599.000.
Pittinger, Charles B., Jr. Filament wound perforate plate system. 4,035,915, Cl. 30-347.000.
Plank, Don A., to Exxon Research and Engineering Company. Photodegradable polyolefin composition containing a dinaphthylphthalate. 4,037,034, Cl. 526-5.000.
Plastomedical Sciences, Inc.: *See*—
Steckler, Robert, 4,036,788, Cl. 260-2.10E.
Platter, Fenton H. Mattress construction for use in hospitals and the like. 4,035,853, Cl. 5-91.000.
Plempel, Manfred: *See*—
Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,036,966, Cl. 424-269.000
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Plunguian, Mark; and Cornwell, Charles E. Shaped articles of hydraulic cement compositions having a reflective surface. 4,036,839, Cl. 264-256.000
Poiblaud, Gerard Joseph, to U.S. Philips Corporation. Method of preparing galliumphosphide. 4,036,932, Cl. 423-299.000.
Poirier, Robert Victor, to Du Pont de Nemours, E. I., and Company. Tetrafluoroethylene copolymer fine powder resin. 4,036,802, Cl. 260-296.00F.
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Polyakov, Viktor Ivanovich: *See*—
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Polymer Corporation Limited: *See*—
Smith, Brian Howard Alfred, 4,036,911, Cl. 260-880.00R
Ponci, Riccardo: *See*—
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Pongracz, Magdalena Julia Beatriz: *See*—
Amato, Jose; Propker, Marta; Pongracz, Magdalena Julia Beatriz, and Szabo, Jorge Luis Jose, 4,036,985, Cl. 424-320.000.
Poole, Ralph B., to Sprague Electric Company. Electrolytic capacitor package having a grommet with tapered lead holes. 4,037,142, Cl. 361-433.000
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Pornin, Rene: *See*—
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Potemkin, Jury Pavlovich: *See*—
Levin, Izrail Aronovich; Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich; Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich, 4,037,128, Cl. 313-188.000.
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Potyondy, Istvan. 360° Swing. 4,036,489, Cl. 272-49.000
Pouey, Michel, to Etablissement Public: Agence Nationale de Valorisation de Recherche (ANVAR). Focalization process of spherical concave diffraction gratings. 4,036,558, Cl. 356-79.000
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Hoffman, Charles R., and Powell, Michael W., 4,037,243, Cl. 357-23.000
Powers, Charles A.; Holman, George B.; and Smith, Robert C., to Standard Oil Company (Indiana). Process and composition for cementing casing in a well. 4,036,301, Cl. 166-293.000.
PPG Industries, Inc.: *See*—
Carroll, Thomas D., and Cross, Christopher G., 4,036,622, Cl. 65-3.00R
Rahn, Henry W., 4,036,727, Cl. 204-268.000
Ramler, Warren J.; and Lackore, James K., 4,037,112, Cl. 250-527.000
Sieger, John S.; and Gulotta, Joseph A., 4,036,626, Cl. 65-182.00R
Pratt, Albert R., to Raytheon Company. Brake lock knob assembly. 4,036,079, Cl. 74-531.000.
Press, Jack J. Atmospheric heat exchange method and apparatus. 4,036,209, Cl. 126-271.000
Presti, Fredrick Joseph. Seamless retread envelope. 4,036,271, Cl. 150-54.00B
Preston, Edward G.; Rakowicz, Jan A.; and Labbe, Francis A. M., to Molins Limited. Hopper for a cigarette making machine. 4,036,239, Cl. 131-109.00R
Price, Henry F.: *See*—
Jameson, John; Price, Henry F.; and Butts, William O., 4,037,239, Cl. 354-203.000
Priebe, William F., to Frito-Lay, Inc. Process for concentrating dilute aqueous starch mixtures. 4,036,664, Cl. 127-69.000
Prince, Douglas F., to Castone Development Corporation. Concrete product manufacturing system. 4,036,575, Cl. 425-443.000
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Ruskin, Henry, 4,036,088, Cl. 83-167.000
Roloff, Heinz-Rudolf. Entry or passage door, especially for shower stalls. 4,035,957, Cl. 49-388.000.
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Davies, Peter Gough, Jones, Keith Thomas; and Salmon, Brian, 4,036,046, Cl. 72-286.000.

Saltarelli, Martin O., to Beloit Corporation. Refiner head assembly and refining disk therefor. 4,036,443, Cl. 241-297.000.

Sami, Hiroshi; Taira, Kaoru, and Kumai, Teruo, to Toyota Jidosha Kogyo Kabushiki Kaisha. Carburetor equipped with a cooling system. 4,036,188, Cl. 123-41.310.

Sampson, Mark J. Horological instrument. 4,036,009, Cl. 58-127.00R.

Samuel Moore and Company: *See—*
Houk, Richard D., 4,036,066, Cl. 74-55.000.

Sanaka, Isao: *See—*
Nakajima, Ichiro, Sanaka, Isao, Takeda, Tsuginori, Koarai, Hiroyuki; Ando, Toru, Ifuku, Tetsuhiko, and Murano, Hatsuo, 4,037,209, Cl. 364-200.000.

Sandell, Richard P.: *See—*
Morgan, Barry S., and Sandell, Richard P., 4,036,918, Cl. 261-114.00R.

Sander, Nils Borje Lennart, to Svenska Aktiebolaget Bromsregulator. Slack adjuster built into a brake unit for a rail vehicle brake system. 4,036,332, Cl. 188-196.00D.

Sander, Nils Borje Lennart: *See—*
Dahlkvist, Nils Goran; Axelsson, Lars Bengt, and Sander, Nils Borje Lennart, 4,036,111, Cl. 92-29.000.

Sandoz, Inc.: *See—*
Houlihan, William J., 4,036,855, Cl. 260-343.30R.
Houlihan, William J., 4,036,978, Cl. 424-274.000.
Neumann, Peter, 4,036,976, Cl. 424-273.000.

Sandoz Ltd.: *See—*
Avar, Lajos; and Hofer, Kurt, 4,036,812, Cl. 260-45.75N.
Mercer, Alec Victor, and Oakland, John Stephen, 4,036,851, Cl. 260-310.00D.
Schaub, Fritz; and Schelling, Hanspeter, 4,036,980, Cl. 424-278.000.

Sandstede, Gerd: *See—*
Binder, Horst; Knodler, Reinhard; Kohling, Alfons; and Sandstede, Gerd, 4,036,724, Cl. 204-195.00R.

Sandvik Aktiebolag: *See—*
Eriksson, Stig-Lennart; and Gustafsson, Manfred Wallace, 4,035,890, Cl. 29-96.000.

Sankyo Company Limited: *See—*
Konotsune, Takuo; and Kawakubo, Katsuhiko, 4,036,631, Cl. 71-92.000.

Santi, Luciano, to Officine Galileo Meccanotessile S.p.A. Device to detect the belt tension of weft inserting members in shuttleless looms. 4,036,267, Cl. 139-336.000.

Sapozhnikov, Ivan Vasilievich: *See—*
Levin, Izrail Aronovich, Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich, Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich, 4,037,128, Cl. 313-188.000.

Sasaki, Toshimi: *See—*
Koike, Keiichi; and Sasaki, Toshimi, 4,037,015, Cl. 428-331.000.

Sasmor, Ernest J.: *See—*
Halpern, Alfred; and Sasmor, Ernest J., 4,036,951, Cl. 424-60.000.

Sato, Goro, to Hokuetsu Kogyo Co., Ltd. Globoid worm type rotary machine. 4,036,567, Cl. 418-105.000.

Sato, Takahisa: *See—*
Suzuki, Hideo; Sato, Takahisa, Kubota, Tatsuo; Osaka, Shigemi; and Komatsu, Shigeru, 4,036,780, Cl. 252-437.000.

Sato, Teruo; and Nakamura, Hideo, to Sony Corporation. Stereophonic demodulator apparatus. 4,037,055, Cl. 179-15.0BT.

Satoh, Shinobu. Apparatus for purification of exhaust gases. 4,036,593, Cl. 23-260.000.

Saunders, Leonard R., and Allard, G. D. Skip. Drill string system. 4,036,539, Cl. 308-4.00A.

Saunders, William T., to National Steel Corporation. Single-slide press for carrying out multiple functions with a single work-input stroke. 4,036,056, Cl. 72-329.000.

Saupe, Martin, to Kaltenbach & Voigt. Dental teaching device. 4,035,920, Cl. 32-71.000.

Savarese, Giuseppe, to Texas Instruments Incorporated. Read-only memory using complementary conductivity type insulated gate field effect transistors. 4,037,217, Cl. 340-173.0SP.

Savariste, Anthony: *See—*
Roberson, Morris L.; Beck, John W., Maples, Jack S.; Savariste, Anthony; Donaldson, Donald J.; Stein, David L.; and Kelly, Allan C., 4,036,931, Cl. 423-121.000.

Savinainen, Kyosti: *See—*
Makila, Eino; Virtanen, Unto; and Savinainen, Kyosti, 4,036,440, Cl. 241-20.000.

SBE Incorporated: *See—*
Hodama, Takuo, 4,037,116, Cl. 307-247.00A.

Schaaf, Thomas K.: *See—*
Hess, Hans-Jurgen E.; Johnson, Michael R., Bindra, Jasjit S.; and Schaaf, Thomas K., 4,036,832, Cl. 260-240.00R.

Schaar, Lothar, to Heye, Hermann. Shearing device for strands of plastic material. 4,036,094, Cl. 83-623.000.

Schaffhauser, Hans: *See—*
Miloradovic, Predrag, and Schaffhauser, Hans, 4,037,160, Cl. 325-42.000.

Schairer, George S., to Boeing Company, The. Retractable engine noise suppression system for over-the-wing jet aircraft. 4,036,452, Cl. 244-1.00N.

Schar, Hugo, to Rieter Machine Works, Ltd. Method and apparatus for braking a bobbin chuck and for releasing a bobbin tube thereon. 4,036,446, Cl. 242-39.000.

Scharbert, Juergen: *See—*
Groeger, Ingo; and Scharbert, Juergen, 4,037,218, Cl. 340-173.00R.

Schat, Hermannus, to ITT Industries, Inc. Charge transfer delay circuit for analog signals. 4,037,119, Cl. 307-293.000.

Schatz, Klaus W., and Snyder, Paul W., Jr., to Mobil Oil Corporation. Method of regenerating catalyst in a swirl type regenerator containing a dilute phase baffle. 4,036,779, Cl. 252-417.000.

Schaub, Fritz, and Schelling, Hanspeter, to Sandoz Ltd. Ether substituted benzodioxan derivatives. 4,036,980, Cl. 424-278.000.

Scheeter, John J.: *See—*
Waddell, Jerry D.; and Scheeter, John J., 4,036,532, Cl. 302-53.000.

Scheib, Rudi. Tiltable sled. 4,036,506, Cl. 280-21.00A.

Scheidweiler, Andreas, and Meier, Otto, to Cerberus AG. Ionization-type fire or smoke sensing system. 4,037,106, Cl. 250-381.000.

Schelling, Hanspeter: *See—*
Schaub, Fritz, and Schelling, Hanspeter, 4,036,980, Cl. 424-278.000.

Schenk, Norbert: *See—*
Vogel, Axel, Biedermann, Wolfgang; Halcour, Kurt, Schenk, Norbert, and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.

Schering Aktiengesellschaft: *See—*
Petzoldt, Karl, and Wiechert, Rudolf, 4,036,695, Cl. 195-51.00B.

Scherrer, Raymond E., to International Telephone and Telegraph Corporation. Method for providing electrical isolation between spaced portions of a layer of semiconductive material and the product produced thereby. 4,036,706, Cl. 204-15.000.

Schewe, Richard A.: *See—*
Darsie, Burns, and Schewe, Richard A., 4,036,262, Cl. 139-11.000.

Schiffer, Josef: *See—*
Blume, Friedrich, deceased; Blume, Monika Ingrid, heir; Blume, Friedrich, heir; Messinger, Werner; and Schiffer, Josef, 4,035,914, Cl. 30-346.510.

Schilken, Herbert: *See—*
Hartmann, Albert; Schilken, Herbert, and Romeiser, Bernhard, 4,036,865, Cl. 260-428.000.

Schimmer, Rigobert; Gesing, Horst, Beerwerth, Wolfgang, and Messerschmidt, Jurgen, to Licentia Patent-Verwaltungs-G.m.b.H. Jig. 4,036,485, Cl. 269-285.000.

Schindler, Harvey D.: *See—*
Riegel, Herbert D., Schindler, Harvey D.; and Strangio, Vincent A., 4,036,776, Cl. 252-187.00R.

Schippers, Heinz, to Barmag Barmer Maschinenfabrik Aktiengesellschaft. Apparatus for producing texturized yarns. 4,035,879, Cl. 28-246.000.

Schirmer, Marvin D. Apparatus for removing and replacing spiral springs in clock barrels. 4,036,084, Cl. 81-7.500.

Schissler, Lloyd R.: *See—*
Edelberg, Murray; and Schissler, Lloyd R., 4,037,205, Cl. 364-900.000.

Schlaikjer, Carl R.: *See—*
Dey, Arabinda N.; and Schlaikjer, Carl R., 4,037,025, Cl. 429-29.000.

Schmall, Karl-Heinz. Vehicle control apparatus. 4,036,323, Cl. 180-105.00R.

Schmauderer, Emil, Jr.: *See—*
Anderson, Roger E., and Schmauderer, Emil, Jr., 4,036,434, Cl. 239-8.000.

Schmedemann, Helmuth: *See—*
Volkner, Wolfgang, and Schmedemann, Helmuth, 4,036,457, Cl. 244-134.00D.

Schmerling, Louis, to Universal Oil Products Company. Production of chloro-substituted saturated compounds. 4,036,896, Cl. 260-648.00R.

Schmidt, Frederick C.: *See—*
Linn, Donald F.; Schmidt, Frederick C.; and Yanko, John P., 4,036,338, Cl. 192-13.00R.

Schmidt, Robert J., deceased, and Graf, Peter E., to Chevron Research Company. Asphalt mineral aggregate compositions containing silanes as adhesion promoters. 4,036,661, Cl. 106-273.00N.

Schmitt, Arnold J., and Linkletter, Merle G., to Beloit Corporation. High bulk tissue forming and drying apparatus. 4,036,684, Cl. 162-290.000.

Schneemann, Anthony K. Collet locking and operating mechanism therefor. 4,036,484, Cl. 269-57.000.

Schneider, Fritz: *See—*
Gawlick, Heinz; Rammensee, Horst; Mack, Karl; and Schneider, Fritz, 4,036,103, Cl. 89-35.00R.

Schnell, Georg: *See—*
Hammon, Fritz; Schnell, Georg; and Reimer, Karl-Juergen, 4,037,259, Cl. 360-66.000.

Schnell, Hans Gunther, to Van Kooten B.V. Lining for a pile driving head and method and tool for the removal of said lining. 4,036,310, Cl. 173-131.000.

Schober, Hans: *See—*
Madl, Josef; and Schober, Hans, 4,035,913, Cl. 30-287.000.

Scholl, Edward C.: *See—*
Murphy, Robert E. J.; Haemer, Laurence F.; and Scholl, Edward C., 4,036,673, Cl. 156-71.000.

Scholz, Manfred: *See—*
Dorner, Heinrich, Jungmann, Axel, and Scholz, Manfred, 4,036,700, Cl. 176-87.000.

Schonthaler, Rubi: *See—*
Becker, Dietmar, Jehle, Fritz; Schonthaler, Rubi; and Willenbacher, Erich, 4,036,156, Cl. 112-121.260.

Schrape, Peter: *See—*
Beeskow, Bruno; Worner, Gunter; and Schrape, Peter, 4,036,341, Cl. 192-106.200.

Schreiber, William Lewis, Mosciano, Gerard Joseph, Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, to International Flavors & Fragrances Inc. Processes for producing 4- and 5-phenyl pentenals. 4,036,886, Cl. 260-599.000.

Schreiber, Winfried, to Daimler-Benz Aktiengesellschaft. Belt roll-up mechanism for a safety belt in a vehicle. 4,036,449, Cl. 242-107.000.

Schroder, Klaus Dieter, to Firm Tente-Rollen Gesellschaft mit beschrankter Haftung Companie. Lockable caster, more particularly swivel caster. 4,035,864, Cl. 16-35.00R.

Schruff, Herbert. Fastening element. 4,036,098, Cl. 85-70.000.

Schubert, Bernhard, and Bildung, Otto, to Hauni-Werke Korber & Co., KG. Method and machine for the production of composite filter mouthpieces. 4,036,119, Cl. 93-77.0FT.

Schuster, Wilhelm. Machine for erecting, filling and closing flat-foldable cartons. 4,035,989, Cl. 53-186.000.

Schwalenstocker, Henry John, Jr., to Du Pont de Nemours, E. I., and Company. Silver halide emulsion sensitized with a fused diazepine. 4,036,649, Cl. 96-107.000.

Schwartz, Bradford Clyde; Silkensen, Ralph Donald, and Steving, Gerald, to International Business Machines Corporation. RF bias sputtering method for producing insulating films free of surface irregularities. 4,036,723, Cl. 204-192.0EC.

Schwartz, Newton: *See—*
Feit, Eugene David, and Schwartz, Newton, 4,036,708, Cl. 204-38.00A.

Schwartz, Robert E.: *See—*
Reed, Robert D., Schwartz, Robert E., and Noble, Roger K., 4,036,580, Cl. 431-202.000.

Schwarz, Gunter. Ski brake apparatus. 4,036,509, Cl. 280-605.000.

Schwerdtel, Wulf: *See—*
Vogel, Axel, Biedermann, Wolfgang, Halcour, Kurt, Schenk, Norbert, and Schwerdtel, Wulf, 4,036,895, Cl. 260-635.00R.

Sciara, Frank: *See—*
Zurit, David, and Sciara, Frank, 4,035,893, Cl. 29-157.00R.

Sciavolino, Frank C., to Pfizer Inc. Semi-synthetic oleandomycin derivatives-C, modifications. 4,036,853, Cl. 260-343.000.

SCM Corporation: *See—*
McGinniss, Vincent Daniel, 4,037,018, Cl. 428-418.000.

Scott Bonnar Limited: *See—*
Knight, Roy George, 4,036,070, Cl. 74-242.700.

Scott, Bruce Albert: *See—*
Engler, Edward Martin; Kaufman, Frank Benjamin, and Scott, Bruce Albert, 4,036,648, Cl. 96-90.00R.

Scott, Joseph D. Trigger release device for bow strings. 4,036,204, Cl. 124-35.00A.

Scott, Timothy F.: *See—*
Brushwyler, Gordon R.; and Scott, Timothy F., 4,036,722, Cl. 204-195.00B.

Seaman, William M., Jr.: *See—*
McKnight, Oliver R., and Seaman, William M., Jr., 4,036,071, Cl. 74-243.00R.

Searle, John L., to Fischer & Porter Co. Electromagnetic flowmeter usable in less-than-full fluid lines. 4,036,052, Cl. 73-194.0EM.

Secretary of State for Industry in Her Britannic Majesty's Government of the United Kingdom of Great Britain & Northern Ireland, The: *See—*
Nixon, Ralph Alan, 4,036,161, Cl. 114-296.000.

Seeger, Walter: *See—*
Effenberger, Hubert, and Seeger, Walter, 4,036,006, Cl. 58-23.00R.

Segall, Gordon Hart: *See—*
Holton, Harry Hutchinson, and Segall, Gordon Hart, 4,036,680, Cl. 162-65.000.

Segsworth, Robert Sidney, to Tibur Metals, Ltd. Extended arc furnace and process for melting particulate charge therein. 4,037,043, Cl. 13-9.00R.

Seiler, Hanspeter: *See—*
Seiler, Niklaus; and Seiler, Hanspeter, 4,036,124, Cl. 100-98.00R.

Seiler, Niklaus, and Seiler, Hanspeter. Sludge press. 4,036,124, Cl. 100-98.00R.

Seireg, Ali A.; and Baz, Amr M. S., to Wisconsin Alumni Research Foundation. Decompression plan calculator. 4,037,084, Cl. 235-69.000.

Seixo de Melo Paulino, Marceano: *See—*
Stewart, Roger Green; and Seixo de Melo Paulino, Marceano, 4,037,114, Cl. 307-205.000.

Sekino, Jun: *See—*
Murakami, Masuo, Kawahara, Shigemi, Kawata, Hiroitsu, Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,036,954, Cl. 424-176.000.

Sekisui Kagaku Kogyo Kabushiki Kaisha: *See—*
Murai, Sadao, Kita, Takeshi; and Mochizuki, Kiyoshi, 4,036,930, Cl. 264-167.000.
Nakano, Shiro, Kanbe, Norio, Nakagawa, Tsugumichi, Nishio, Akira, and Kitahara, Kengo, 4,037,004, Cl. 427-145.000.

Sekmakas, Kazys, and Shah, Raj, to DeSoto, Inc. Electrodeposition of aqueous dispersions of amine functional urethane copolymers. 4,036,800, Cl. 260-29.2TN.

Select Energy Systems, Inc.: *See—*
Fichtner, Robert L., 4,037,141, Cl. 361-182.000.

Selin, Clifford E., Proell, Wayne A., and Applegate, James M., to American Hydrocarbon Company. Preparation of nitric acid. 4,036,934, Cl. 423-394.000.

Sellstedt, John H., Guinosso, Charles J., and Begany, Albert J., to American Home Products Corporation. 2-Alkoxyoxamoyl-pyrazines. 4,036,837, Cl. 260-250.0BN.

Selway, Rupert Alec: *See—*
Howes, John Gordon Bernard, da Costa, Nicholas Mario, Selway, Rupert Alec, and Potter, William Duncan, 4,036,814, Cl. 260-47.0UA.

Sennik, John Joseph, to Electrohome Limited. Compensation of cathode ray tube for moire. 4,037,133, Cl. 315-31.0TV.

Senstek Ltd.: *See—*
Strehoff, William P., Elliott, William S.; and Johnson, Dale, 4,036,065, Cl. 73-432.00R.

Serafin, Francis A.: *See—*
Filipescu, Nicolae; McAvoy, Nelson, Kagan, Morton R.; and Serafin, Francis A., 4,037,172, Cl. 331-94.50E.

Sergeev, Vladimir Alexandrovich: *See—*
Korshak, Vasily Vladimirovich, Sergeev, Vladimir Alexandrovich; and Teplyakov, Mikhail Mikhailovich, 4,036,818, Cl. 260-63.00K.

Servais, Ronald A., Bauer, Paul T.; and Meckstroth, Alan F., to Aerospan Corporation. Streamlining apparatus for articulated road vehicle. 4,036,519, Cl. 296-1.00S.

Service Equipment Design Co., Inc.: *See—*
Hauk, Ernest D., Hauk, Thomas D.; and Carstensen, Kenneth J., 4,036,261, Cl. 138-96.00T.

Sessoms, J. C., Jr.: *See—*
Jordan, Bertram L.; Mitchell, John D., and Sessoms, J. C., Jr., 4,036,454, Cl. 294-5.500.

Seubert, Rolf: *See—*
Blechschmitt, Kurt, Reuter, Peter, Wirth, Friedrich, Buerger, Gert; and Seubert, Rolf, 4,036,783, Cl. 252-461.000.

Seufert, Wilhelm, to Werner & Pfleiderer. Screw extruder housing. 4,036,540, Cl. 308-239.000.

Severinsen, John, to Metex Corporation. Conductive elastomeric elements. 4,037,009, Cl. 428-241.000.

Seyffert, Michael: *See—*
Allen, Robert M., and Seyffert, Michael, 4,036,725, Cl. 204-206.000.

Shaffer, Francis N., and Mathers, James E., to GTE Sylvania Incorporated. Yttrium indium phosphate X-ray phosphors, method of preparation and X-ray intensifying screen containing same. 4,037,110, Cl. 250-483.000.

Shah, Raj: *See—*
Sekmakas, Kazys, and Shah, Raj, 4,036,800, Cl. 260-29.2TN.

Shakespeare Company: *See—*
Ruff, George Robert, and Derrick, Danny O'Brian, 4,036,325, Cl. 182-46.000.

Shanklin Corporation: *See—*
Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., 4,035,983, Cl. 53-28.000.
Shanklin, F. Garrett; Hunt, Edward F.; and King, Francis X., Jr., to Shanklin Corporation. Smooth product transfer highspeed L-sealer. 4,035,983, Cl. 53-28.000.
Sharland, David Cedric, to Beecham Group Limited. Pharmaceutical tablet. 4,036,968, Cl. 424-271.000.
Sharp Kabushiki Kaisha: *See—*
Fujimoto, Isao; Kasubuchi, Takeshi; and Aiba, Masahiko, 4,037,230, Cl. 346-75.000.
Shin, Yasuo, 4,036,151, Cl. 108-20.000.
Sharp, Richard Stanton, to Burroughs Corporation. Computer-peripheral interface. 4,037,210, Cl. 364-900.000.
Sharps Associates: *See—*
Razdan, Raj Kumar; and Dalzell, Haldean Cloyce, 4,036,857, Cl. 260-345.300.
Shaw, Richard A.: *See—*
Boyden, Willis G.; and Shaw, Richard A., 4,037,194, Cl. 340-63.000.
Sheetz, Charles E.: *See—*
McClintic, Wayne L.; and Sheetz, Charles E., 4,036,375, Cl. 214-6.00F.
Sheftel, Edward A. Musical instrument supporting apparatus. 4,036,462, Cl. 248-166.000.
Sheldon, John D.: *See—*
Maier, Daniel F.; and Sheldon, John D., 4,036,162, Cl. 115-17.000.
Sheldon, Roger A.; van der Meer, Johannes W.; Verbrugge, Pieter A.; and Mulder, Albertus J., to Shell Oil Company. Preparation of 3-bromobenzaldehyde. 4,036,887, Cl. 260-599.000.
Shell Oil Company: *See—*
Anderson, William S., 4,036,910, Cl. 260-879.000.
Blytas, George C., 4,036,944, Cl. 423-648.00R.
Sheldon, Roger A.; van der Meer, Johannes W.; Verbrugge, Pieter A.; and Mulder, Albertus J., 4,036,887, Cl. 260-599.000.
Shelledy, Frank Boyd: *See—*
Barkley, John Allen; Robinson, Neil Lloyd; and Shelledy, Frank Boyd, 4,037,264, Cl. 360-129.000.
Shelley, Edwin F. Light emitting diode watch with acceleration responsive switch. 4,036,007, Cl. 58-50.00R.
Shepard, Richard Wilton: *See—*
Ashmead, Albert Sidney; Ross, William Alden, and Shepard, Richard Wilton, 4,036,036, Cl. 66-123.000.
Sherritt Gordon Mines Limited: *See—*
Yurko, William J., 4,036,639, Cl. 75-101.0BE.
Sherwin, Donald D. Arrow broadhead. 4,036,499, Cl. 273-106.50B
Sherwin-Williams Company, The: *See—*
Saklikar, Arvind R.; and Van Eck, Jack M., 4,036,174, Cl. 118-623.000.
Sherwood Medical Industries Inc.: *See—*
Dodge, Larry H.; and Economidy, Byron G., 4,036,231, Cl. 128-276.000.
Shibuta, Osamu: *See—*
Yamaguchi, Hideo; Kume, Hidetoshi; and Shibuta, Osamu, 4,036,936, Cl. 423-407.000.
Shibuya, Masakuni: *See—*
Mukai, Osamu; Miyatani, Akira; Fukuzawa, Kokichi; Nagao, Yoshiro; Kubota, Kenichi; Shibuya, Masakuni; and Kobayashi, Shigelu, 4,036,326, Cl. 184-27.00R.
Shidara, Tokihiko: *See—*
Kawai, Shinichi; Maeyama, Shigeo; and Shidara, Tokihiko, 4,037,127, Cl. 313-60.000.
Shields, Michael A.: *See—*
Allen, Richard J.; and Shields, Michael A., 4,035,907, Cl. 29-590.000.
Shikama, Takashi: *See—*
Tamada, Minoru; Shikama, Takashi; and Nakamura, Toshikazu, 4,037,082, Cl. 219-541.000.
Shikano, Yoshiro: *See—*
Kobayashi, Gai; and Shikano, Yoshiro; 4,036,291, Cl. 165-105.000.
Shim, Kyung S., to Stauffer Chemical Company. Polyurethane foams prepared from mixed polyalkylene glycol polyphosphorous compounds. 4,036,789, Cl. 260-2.5AR.
Shimizu, Hidemi: *See—*
Murakami, Masuo; Kawahara, Shigemi; Kawata, Hiroitsu; Okazaki, Kiyoshi; Sekino, Jun; and Shimizu, Hidemi, 4,036,954, Cl. 424-176.000.
Shin, Masami; and Tamaki, Kanji. Tape recorder with head positioning mechanism. 4,037,261, Cl. 360-78.000.
Shin, Yasuo, to Sharp Kabushiki Kaisha. Microwave cooking apparatus with turntable. 4,036,151, Cl. 108-20.000.
Shindo, Tadashi: *See—*
Aisaka, Noboru; Shindo, Tadashi; and Kawakami, Tatsuya, 4,036,034, Cl. 66-50.00R.
Shinoda, Nobuhiko; Ito, Tadashi; Ito, Fumio; Mashimo, Yukio; and Sakurada, Nobuaki, to Canon Kabushiki Kaisha. Exposure control device for a camera. 4,037,233, Cl. 354-23.00D.
Shioyama, Giichi: *See—*
Hata, Yoshitaka; Shioyama, Giichi; and Minami, Hidehiro, 4,036,015, Cl. 60-282.000.
Shirogami, Tamotsu: *See—*
Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, 4,037,033, Cl. 429-206.000.
Shishoo, Roshan Lal; and Alfredsson, Sara Inga-Lill, to Svenska Textilforskningsinstitutet. Process and device for molding textile materials 4,036,924, Cl. 264-89.000.
Shoda, Hiroshi: *See—*
Ishizaka, Susumu; Kondo, Taizo; Shoda, Hiroshi; and Sugimoto, Masakatsu, 4,035,904, Cl. 29-563.000.
Short, Jeffrey R., III: *See—*
Woonton, Kent; Short, Jeffrey R., III; and Roach, Kenneth N., 4,036,277, Cl. 164-16.000.
Shults, Vyacheslav Mikhailovich: *See—*
Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl. 90-24.00F.
Shuster, Edward Joseph: *See—*
Schreiber, William Lewis; Mosciano, Gerard Joseph; Pittet, Alan O.; Vock, Manfred; and Shuster, Edward Joseph, 4,036,886, Cl. 260-599.000.
SI Handling Systems, Inc.: *See—*
Jones, Vercoe C.; and Hale, Robert A., 4,036,148, Cl. 104-166.000.
Sibeud, Jacques Pierre; and Ruff, Charles David, to Rhodia, Inc. Process for the removal of hydrogen sulfide and mercaptans from liquid and gaseous streams. 4,036,942, Cl. 423-573.000.
Sieborger, Gunter; Kilian, Ernst August; and Jonkuhn, Gerhard, to U.S. Philips Corporation. Circuit arrangement for electronically applying an alternating voltage. 4,037,118, Cl. 307-255.000.
Siegel, Israel. Low pressure engine. 4,036,017, Cl. 60-497.000.
Siegel, Israel. Solar differential temperature motor. 4,036,019, Cl. 60-531.000.
Sieger, John S.; and Gulotta, Joseph A., to PPG Industries, Inc. Metallic seal for preventing tin leaks in a float glass furnace. 4,036,626, Cl. 65-182.00R.
Siemens Aktiengesellschaft: *See—*
Betzmeir, Helmut; and Lettau, Hans, 4,036,685, Cl. 176-19.0LD.
Dorner, Heinrich; Jungmann, Axel; and Scholz, Manfred, 4,036,700, Cl. 176-87.000.
Groeger, Ingo; and Scharbert, Juergen, 4,037,218, Cl. 340-173.00R.
Helder, Johannes; De Steur, Hubert; De Vogelaere, Marc; and Pernegger, Wolfgang, 4,036,590, Cl. 23-230.00R.
Horninger, Karlheinrich, 4,037,089, Cl. 235-152.000.
Januschkowetz, Herbert; and Laub, Hans, 4,036,707, Cl. 204-20.000.
Kullmann, Dieter; Henninger, Peter; and Intichar, Lutz, 4,037,124, Cl. 310-52.000.
Lutz, Herbert; and Pfeiler, Manfred, 4,037,107, Cl. 250-402.000.
Moeckel, Peter, 4,037,263, Cl. 360-114.000.
Neufang, Karlheinz, 4,037,054, Cl. 179-15.0BF.
Rozehnal, Gunther; and Wedler, Hartmut, 4,037,199, Cl. 340-150.000.
Sieradzki, Benjamin; and Giese, John David, to Chemetron Corporation. Mixer. 4,036,477, Cl. 259-41.000.
Sietmann, Vernon H.; Smith, Raymond L.; and Keese, Larry S. Apparatus for drying grain. 4,035,928, Cl. 34-174.000.
Signetics Corporation: *See—*
Allen, Richard J.; and Shields, Michael A., 4,035,907, Cl. 29-590.000.
Silagy, Richard J.: *See—*
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Silkensen, Ralph Donald: *See—*
Schwartz, Bradford Clyde; Silkensen, Ralph Donald; and Steving, Gerald, 4,036,723, Cl. 204-192.0EC.
Siltec Corporation: *See—*
Lorenzini, Robert E.; Iwata, Akiyoshi; and Lorenz, Karl, 4,036,595, Cl. 23-273.0SP.
Simes, James G.: *See—*
Hillsman, Deane; Cook, Albert M.; and Simes, James G., 4,036,221, Cl. 128-145.600.
Simjian, Luther G. Exercise and massaging apparatus. 4,036,219, Cl. 128-48.000.
Simon, David L. Fuel. 4,036,604, Cl. 44-53.000.
Simon, Eli. Process for producing improved, protective conversion coatings on aluminum and its alloys, wherein aluminum is the principal constituent. 4,036,667, Cl. 148-6.200.
Singer Company, The: *See—*
Broyles, Douglas Wright; and Stark, Troy Cecil, 4,037,231, Cl. 346-108.000
Evans, John Lorenz; and Zoltan, Bart Joseph, 4,036,453, Cl. 244-3.160.
Kahan, William; Landau, John Vernon, Jr.; Rogers, Howard David; Rupinski, Fredrick Alexander; Peer, Thomas Richard; and Brennan, Martin David, 4,036,035, Cl. 66-75.200.
Singleton, O'Neal. Device for installing ceiling insulation. 4,036,475, Cl. 254-133.00R
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Sircar, Anup: *See—*
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Sirico, James Louis: *See—*
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Siskin, Michael: *See—*
Wristers, Jos; Siskin, Michael, and Porcelli, Joseph J., 4,036,737, Cl. 208-108.000
Sivers, Curt: *See—*
Jordan, Helmut; and Sivers, Curt, 4,037,108, Cl. 250-427.000.
Sjostrand, Fritiof Stig; Lundmark, Anders Gunnar Rudolf; and Ekstrom, Gosta Ivar, to Atlas Copco Aktiebolag. Handle structure for percussive tools. 4,036,085, Cl. 81-52.300.

Skinner, Everett B., and Lair, James O., to Talley Industries of Arizona, Inc. Rocket catapult with direct mechanically actuated ignition of rocket motor. 4,036,456, Cl. 244-122.0AD
Skinner, Wallace: *See—*
Holmes, Charles Chamberlain; Skinner, Wallace; and Mattocks, George Roland, 4,036,625, Cl. 65-134.000.
Skipka, Guido: *See—*
Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl. 260-251.00R.
Slivensky, Robert B.: *See—*
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Sloan, Kenneth B.: *See—*
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Slobodskoi, Igor Pavlovich: *See—*
Levin, Izrail Aronovich; Potemkin, Jury Pavlovich; Slobodskoi, Igor Pavlovich; Troitsky, Alexandr Mikhailovich; and Sapozhnikov, Ivan Vasilievich, 4,037,128, Cl. 313-188.000
Slobodyanik, Ivan Petrovich. Contact plate for columns for carrying out mass transfer processes between gas and liquid. 4,036,917, Cl. 261-114.0JP.
Slone, Thomas James, to Procter & Gamble Company, The. Dosing valve. 4,036,407, Cl. 222-188.000
Smith, Barry L., to UMC Industries, Inc. Coin totalizer for different denominations. 4,036,347, Cl. 194-48.000
Smith, Brian Howard Alfred, to Polymer Corporation Limited. Preparation of graft copolymers. 4,036,911, Cl. 260-880.00R.
Smith, Clyde M.: *See—*
Brown, William E.; and Smith, Clyde M., 4,036,613, Cl. 55-294.000.
Smith, Daniel J.: *See—*
Bertozzi, Eugene R.; Barclay, Robert, Jr.; Packer, David H.; and Smith, Daniel J., 4,036,882, Cl. 260-584.00B.
Smith, Harry: *See—*
Buckle, Derek Richard; Cantello, Barrie Christian Charles; and Smith, Harry, 4,036,964, Cl. 424-258.000
Smith, Henry D., to Pemco Corporation. Arc preventing power supply system. 4,037,265, Cl. 361-58.000.
Smith International, Inc.: *See—*
Dixon, Robert L.; and Maxsted, Malcolm D., 4,036,313, Cl. 175-344.000.
Dixon, Robert L.; and Allison, Robert E., 4,036,314, Cl. 175-364.000.
Smith, Jonathan; Larko, Robert C.; and Booth, Eugene E., to Sunbeam Equipment Corporation. Liquid quenching system. 4,036,478, Cl. 266-133.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Ganellin, Charon Robin; and Young, Rodney Christopher, 4,036,971, Cl. 424-273.000.
Smith, Raymond L.: *See—*
Sietmann, Vernon H.; Smith, Raymond L.; and Keese, Larry S., 4,035,928, Cl. 34-174.000.
Smith, Richard Stanley: *See—*
Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, 4,036,415, Cl. 223-40.000.
Smith, Robert C.: *See—*
Powers, Charles A.; Holman, George B.; and Smith, Robert C., 4,036,301, Cl. 166-293.000.
Smith, Robert Neal, to United States of America, Navy. Isolation amplifier for resistive and inductive loads. 4,037,147, Cl. 318-632.000.
Smith, William Harold: *See—*
Fegan, Frank Joseph; and Smith, William Harold, 4,036,253, Cl. 137-556.000.
Snam Progetti, S.p.A.: *See—*
Cesca, Sebastiano; Greco, Alberto; Bertolini, Guglielmo; and Bruzzone, Mario, 4,037,041, Cl. 526-97.000
Snyder, Paul W., Jr.: *See—*
Schatz, Klaus W.; and Snyder, Paul W., Jr., 4,036,779, Cl. 252-417.000.
So. Ci. Bre.: *See—*
Dulou, Raymond; Magnin, Pierre; and Bechtel, Pierre, 4,036,884, Cl. 260-586.00G
Soares, James R., to Biological Developments, Inc. Barbituric acid antigenic conjugates, their preparation, antibodies and use. 4,036,823, Cl. 260-112.00R
Societa' Farmaceutici Italia: *See—*
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Societe Anonyme Francaise du Ferodo: *See—*
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S.A. Sidmar: *See—*
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Societe Chimique des Charbonnages: *See—*
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Societe d'Assistance Technique pour Produits Nestle S.A.: *See—*
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Societe de Diffusion Neiman: *See—*
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Societe Francaise d'Etude d'Installations Siderurgiques Sofresid: *See—*
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Societe Franco-Americaine de Constructions Atomiques-Framatome: *See—*
Weilbacher, Jean-Claude; and Bodson, Guy, 4,036,686, Cl. 176-19.00R
Societe Nationale Elf Aquitaine (Production): *See—*
Blanc, Jean-Henri; Pornin, Rene; and Voirin, Robert, 4,037,035, Cl. 526-16.000.
Soderberg, Bo, to Asea Aktiebolag. Means in a motor-driven rail-vehicle. 4,037,143, Cl. 318-52.000.
Soderlind, Richard Leroy; and Lund, Glenn A. L., to Sperry Tech Corporation. Anti-injection paint spray nozzles. 4,036,438, Cl. 239-288.500
Sokolov, Vasily Ivanovich: *See—*
Ivin, Jury Filoretovich; Levischev, Arkady Nikolaevich; and Sokolov, Vasily Ivanovich, 4,036,429, Cl. 233-27.000.
Soldate, Albert M. Mechanical vibrator for use in material transport apparatus and the like. 4,036,598, Cl. 23-288.00B
Soligno, Vincenzo, to Breda Termomeccanica S.P.A. Supporting grid for pipes. 4,036,461, Cl. 248-68.00R
Solomon, Elias E., to Gulf & Western Manufacturing Company (Systems). Supervision of transducers. 4,037,222, Cl. 340-261.000
Solomovitz B., Yancu. Anti-vandalism protective attachment device for a pay telephone. 4,037,067, Cl. 179-184.000.
Soloviev, Igor Nikolaevich: *See—*
Sukhov, Ivan Alexeevich; Soloviev, Igor Nikolaevich; Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl. 90-24.00F
Somekh, Sasson Roger: *See—*
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Sony Corporation: *See—*
Amano, Yoshifumi, 4,037,224, Cl. 340-324.00M
Doi, Toshitada, 4,037,052, Cl. 179-1.0MF.
Ishii, Hirohisa; Hukui, Koichiro; and Inoue, Norikatsu, 4,035,908, Cl. 29-597.000
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Sato, Teruo; and Nakamura, Hideo, 4,037,055, Cl. 179-15.0BT
Suzuki, Tadao, 4,037,169, Cl. 330-35.000.
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SOS Consolidated, Inc.: *See—*
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South African Coal, Oil & Gas Corporation Limited: *See—*
Brink, Andries; Kleynjan, Cornelis; and Beukes, Quintin John, 4,036,730, Cl. 208-8.000
Southwestern Manufacturing Co.: *See—*
Athy, Lawrence F., Jr., 4,036,106, Cl. 91-5.000
Southwire Company: *See—*
Lowery, James O.; Blackmon, Jimmy D.; Jones, W. Carl; and Brewton, Lee K., 4,036,450, Cl. 242-129.000
Soya, Tatsunori: *See—*
Okumura, Kimio; Soya, Tatsunori; Kauchi, Yosuke; and Ohi, Hideyuki, 4,037,101, Cl. 250-310.000
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Jauch, Christian M. J., 4,036,005, Cl. 58-9.000
Spaziante, Placido M.: *See—*
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Spectron Corporation: *See—*
Palmer, James E.; Lavallee, Donald C.; and Huber, George, 4,037,186, Cl. 335-206.000.
Speicher, Edwin W., to M. E. Cunningham Company. Plate marking apparatus. 4,036,127, Cl. 101-5.000
Speidel, Blasius. Blood pressure indicator gauge. 4,036,061, Cl. 73-410.000.
Spencer, Dudley W. C. Horseshoe manufacture. 4,036,302, Cl. 168-4.000
Sperry Rand Corporation: *See—*
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Phillips, Edwin R.; and Stankiewicz, Raymond J., 4,036,175, Cl. 118-651.000
Sperry Tech Corporation: *See—*
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Spetzler, Edgar: *See—*
Klapdar, Wilhelm; Richter, Helmut; Spetzler, Edgar; and Wendorff, Jochen, 4,036,635, Cl. 75-49.000.
Spiegel, Jack. Portable clothes dryer. 4,035,927, Cl. 34-163.000.
Spiers, Ronald Geoffrey: *See—*
Hensel, Paul Christopher; and Spiers, Ronald Geoffrey, 4,036,419, Cl. 225-96.500
Spiral Step Tool Company: *See—*
Breitenstein, Charles T.; and Nicolaus, Frank G., 4,036,242, Cl. 133-4.00R
Spitzer, Robert, to Du Pont de Nemours, E. I., and Company. Electrolytic cells and processes. 4,036,714, Cl. 204-99.000
Sprague Electric Company: *See—*
Clement, Warren J., 4,035,905, Cl. 29-570.000.
Poole, Ralph B., 4,037,142, Cl. 361-433.000.
Sprague, George R., to Dayco Corporation. Carpet underlay comprising foamed scrap particles. 4,037,013, Cl. 428-310.000.

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  Engelbach, Heinz, and Sprague, Michael Jolyon. 4,036,860, Cl 260-369.000.

Springer, Robert H.: *See—*
  O'Brien, Darrell E.; Novinson, Thomas; and Springer, Robert H., 4,036,840, Cl. 260-256.50R

Spumalit-Anstalt: *See—*
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Square D Company *See—*
  Kennedy, Richard E., Quitschau, Alcird R.; and Kettelson, Ernest S., 4,036,396, Cl. 220-242.000.

Stahl, Horst. *See—*
  Treetscher, Otto, Wiedmann, Erwin, Stahl, Horst, and Forberich, Helmut, 4,036,762, Cl. 250-199.000.

Stahle, Helmut; Koppe, Herbert, Kummer, Werner; and Stockhaus, Klaus, to Boehringer Ingelheim GmbH 2-(N-thienylmethyl-phenylamino)-imidazolines-(2) and salts thereof 4,036,972, Cl 424-273.000

Stahlecker, Fritz, to Stahlecker, Fritz; and Stahlecker, Hans Opening and cleaning apparatus for an open end spinning unit 4,035,871, Cl 19-200.000

Stahlecker, Hans *See—*
  Stahlecker, Fritz, 4,035,871, Cl 19-200.000

Stahnecker, Erhard *See—*
  Keppler, Hans Georg, Stahnecker, Erhard; and Moeller, Rolf, 4,036,794, Cl 260-2.50B

Stalley, Anthony Donald, to Quantel Limited High speed digital information storage system. 4,037,203, Cl 364-900.000

Stambaugh, Sherwood C. and Hephner, Marie K. Rotatable shoe rack 4,036,367, Cl 211-37.000

Stamicarbon B.V.: *See—*
  Basten, Albert J., and Dreissen, Hubert H., 4,036,441, Cl 241-20.000
  Boesten, Wilhelmus H. J., 4,036,852, Cl 260-326.450.
  de Rooij, Abraham H., and Goettsch, Reijer, 4,036,830, Cl 260-239.30A

Stanadyne, Inc.. *See—*
  Clark, Calvin M; and D'Attilio, Americo P., 4,036,560, Cl 408-204.000

Standal, Norman S Self-propelled linear irrigation system 4,036,436, Cl 239-183.000

Standard Oil Company *See—*
  Greene, Janice L., 4,036,836, Cl 260-326.5FN

Standard Oil Company (Indiana) *See—*
  Powers, Charles A., Holman, George B., and Smith, Robert C., 4,036,301, Cl 166-293.000

Stanfill, Herman F., to Union Oil Company of California Method for placing a corrosion test specimen into an environment to be tested. 4,036,591, Cl 23-230.00C.

Stankiewicz, Raymond J.: *See—*
  Phillips, Edwin R. and Stankiewicz, Raymond J., 4,036,175, Cl. 118-651.000

Stannett, Vivian Thomas *See*
  Williams, Joel Lawson; and Stannett, Vivian Thomas, 4,036,588, Cl 8-130.100

Stapley, Edward O.; and Mata, Justo M., to Merck & Co., Inc Preparation of antibiotics by fermentation 4,036,696, Cl. 195-80.00R

Stark, Troy Cecil *See—*
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Stauffer Chemical Company *See—*
  Baker, Don R., 4,036,958, Cl 424-245.000.
  Grindstaff, Donald A., 4,036,999, Cl. 426-549.000.
  Pallos, Ferenc M., and Baker, Don R., 4,036,628, Cl. 71-86.000
  Shim, Kyung S., 4,036,789, Cl. 260-2.5AR

STEAG Aktiengesellschaft *See—*
  Zimmermann, Fritz, and Lenk, Arthur, 4,036,606, Cl 48-77.000.

Steckler, Robert, to Plastomedical Sciences, Inc Anionic hydrogels based on heterocyclic N-vinyl monomers 4,036,788, Cl 260-2.10E.

Steel Heddle Manufacturing Company *See—*
  Kaufmann, Frank H., 4,036,263, Cl. 139-91.000.
  Kaufmann, Frank H., 4,036,264, Cl 139-92.000.

Steger, John F., to Morton-Norwich Products, Inc Acidic hydrosols and process for coating therewith 4,037,019, Cl 428-469.000

Stem, David L. *See—*
  Roberson, Morris L., Beck, John W.; Maples, Jack S.; Savariste, Anthony, Donaldson, Donald J., Stem, David L.; and Kelly, Allan C., 4,036,931, Cl 423-121.000

Stendel, Wilhelm: *See—*
  Hoffmann, Hellmut; Homeyer, Bernhard, Hammann, Ingeborg; and Stendel, Wilhelm, 4,036,947, Cl 424-217.000

Stephenson, Peter Robert Norman, to Hawker Siddeley Dynamics Limited. Noise and drift correcting amplifier circuit for a live-scan imaging system. 4,036,763, Cl 250-214.00C

Sterling Glove Machinery Ltd *See—*
  Filko, Colin; Smith, Richard Stanley; McIntosh, Lawrie Gandier; and Bouman, Willem John, 4,036,415, Cl 223-40.000

Steroid Development Company Establishment *See—*
  Loken, Bjarte; MacDonald, Peter Lindsay, and Bigatti, Ettore, 4,036,831, Cl. 260-239.55D

Steving, Gerald *See—*
  Schwartz, Bradford Clyde; Silkensen, Ralph Donald, and Steving, Gerald, 4,036,723, Cl 204-192.0EC.

Stewart, Roger Green; and Seixo de Melo Paulino, Marceano, to RCA Corporation. Tri-state logic circuit 4,037,114, Cl. 307-205.000.

Stiefel Laboratories, Inc *See—*
  Stiefel, Werner K., 4,036,991, Cl 424-365.000

Stiefel, Werner K., to Stiefel Laboratories, Inc. Skin treatment with emollient cis-6-hexadecenoic acid or derivatives 4,036,991, Cl 424-365.000

Stillman, Allen M., and Stillman, Theodore Color changer for spotlights 4,037,097, Cl. 240-3.100

Stillman, Theodore: *See—*
  Stillman, Allen M., and Stillman, Theodore, 4,037,097, Cl 240-3.100.

Stilve, Victor Reingoldovich *See—*
  Sukhov, Ivan Alexeevich, Soloviev, Igor Nikolaevich, Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich; and Stilve, Victor Reingoldovich, 4,036,105, Cl 90-24.00F.

Stine, Robert David, to International Telephone and Telegraph Corporation Intercom system for a key telephone system 4,037,058, Cl 179-99.000

Stine, Robert David, to International Telephone and Telegraph Corporation Intercom system for a key telephone system 4,037,059, Cl 179-99.000.

Stirling, Irene, to Beecham Group Limited 2,12-Dioxo-7-hydroxymethyl-9-phenyl-1-aza-5,8,11-trioxotetracyclo[9.2.0.0^{6,13}0.^{6,9}]tridecane 4,036,969, Cl 424-272.000

Stitt, Thomas Detlor *See—*
  Bailey, Ronald Barry; and Stitt, Thomas Detlor, 4,037,145, Cl 318-341.000

Stockhaus, Klaus: *See—*
  Stahle, Helmut, Koppe, Herbert; Kummer, Werner; and Stockhaus, Klaus, 4,036,972, Cl 424-273.000

Stockwell, Richard Kent. *See—*
  Osborne, Thomas E.; and Stockwell, Richard Kent, 4,037,092, Cl. 235-156.000

Stolki, Thomas J., to Monsanto Company Preparation of molecularly oriented containers using reheat process. 4,036,927, Cl 264-97.000

Stoloff, Alfred: *See—*
  Larkin, William A.; and Stoloff, Alfred, 4,036,866, Cl 260-429.700.

Stolzer, Claus, Homeyer, Bernhard, Hammann, Ingeborg; and Unterstenhofer, Gunter, to Bayer Aktiengesellschaft O,S,N-tri-aliphatic hydrocarbon-thionothiolphosphoric acid ester amides and pesticidal composition and method. 4,036,956, Cl. 424-210.000.

Stone City Products, Inc.. *See—*
  Rankin, Armand F., 4,036,761, Cl. 210-474.000.

Storck, Friedrich, Kunesch, Rudolf; and Missbach, Gernot, to Hilti Aktiengesellschaft Device for dependently supporting an object. 4,036,460, Cl 248-59.000

Stotts, Lewis Everett: *See—*
  Atkins, James Damon; Murphy, Charles Allen, and Stotts, Lewis Everett, 4,037,213, Cl. 364-200.000.

Strangio, Vincent A., Riegel, Herbert, and Sze, Morgan C., to Lummus Company, The. Production of hexachlorocyclopentadiene 4,036,897, Cl 260-648.00C.

Strangio, Vincent A., to Lummus Company, The. Molten salt lift gas system for production of chlorinated hydrocarbons 4,036,900, Cl 260-659.00R

Strangio, Vincent A. *See—*
  Riegel, Herbert D., Schindler, Harvey D., and Strangio, Vincent A., 4,036,776, Cl. 252-187.00R

Straub, John Frederick, to Du Pont de Nemours, E. I., and Company Selective solar energy absorption. 4,036,206, Cl 126-270.000.

Streck, Roland *See—*
  Kupper, Friedrich-Wilhelm; and Streck, Roland, 4,036,858, Cl 260-348.50L.

Strehlow, Wolfgang H.: *See—*
  Lee, Pui Kum, and Strehlow, Wolfgang H., 4,036,552, Cl 350-97.000.

Strehoff, William P., Elliott, William S.; and Johnson, Dale, to Senstek Ltd. Grain loss monitor. 4,036,065, Cl. 73-432.00R

Stricharczuk, Paul Thomas, to B. F. Goodrich Company, The. Thermoplastic polymer blends of EP or EPDM polymer with crystalline polypropylene. 4,036,912, Cl 260-897.00A.

Strickland, Claudius R., Jr., to American Hoist & Derrick Company Baled wood chips. 4,036,359, Cl. 206-83.500.

Stromberg-Carlson Corporation *See—*
  Richards, Glenn L., 4,037,170, Cl 330-69.000

Strong, Jerry G., to Mobil Oil Corporation. 3-(3,4-Epoxy-4-methylcyclohexyl)butyl esters. 4,036,629, Cl 71-88.000.

Strope, Daniel J., to Phillips Petroleum Company. Isomerization of allenes in a hydrocarbon stream using magnesium oxide catalyst. 4,036,904, Cl 260-681.50R.

Strow, Lawrence Evans, and Bolth, Franklin Anderson, to Minerec Corporation Flotation with amine-stabilized dialkyl dithiophosphates. 4,036,746, Cl 209-166.000

Struthers Patent Corporation. *See—*
  Ganiaris, Neophytos, 4,036,619, Cl. 62-123.000.

Stryker Corporation: *See—*
  Rhodes, Earl H., Jr., 4,036,236, Cl. 128-317.000

Stuart, Alexander, to Burroughs Wellcome Co. Pharmaceutical compositions containing pteridines. 4,036,961, Cl. 424-251.000

Stude, Duane L., to Dow Chemical Company, The. Cement composition. 4,036,659, Cl. 106-90.000

Sturkey, William Cleere *See—*
  Aurich, Christoph W.; Sturkey, William Cleere, and Turner, James Keith, 4,036,038, Cl 68-5.00C

Sturm, Winfried *See—*
  Braun, Johannes, and Sturm, Winfried, 4,035,981, Cl 53-21.00R

Stute, Manfred *See—*
  Tank, Eggert and Stute, Manfred, 4,036,293, Cl. 165-134.000

Stutz, Hansruedi, and Spani, Hans, to Aktiengesellschaft Gebruder Loepfe Circuit arrangement for monitoring the operation of an electronic yarn clearer 4,036,445, Cl 242-37.00A.

Suarato, Antonino *See—*
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Sucro, Jost S. *See—*
  Benasutti, Louis D. and Sucro, Jost S., 4,036,620, Cl. 62-338.000.

Sugimoto, Masakatsu: *See—*
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Sugino, Toshio. *See—*
  Yoshimori, Ikuo, Nanao, Teruaki, and Sugino, Toshio, 4,036,248, Cl 137-271.000

Sugiyama, Iwakichi, Takaoka, Yukihisa, and Endo, Kiyoshi, to Matsumoto Seiyaku Kogyo Kabushiki Kaisha Process of drying and hardening film-forming material 4,036,796, Cl. 260-22.0CA

Sugiyama, Kiyoshi. *See—*
  Nakai, Yoshinobu, Nakajima, Shun'Ichiro, and Sugiyama, Kiyoshi, 4,036,990, Cl. 424-361.000

Sukhov, Ivan Alexeevich, Soloviev, Igor Nikolaevich, Shults, Vyacheslav Mikhailovich; Lipilov, Alexandr Sergeevich, and Stilve, Victor Reingoldovich Machine for edge forming of sheets for welding 4,036,105, Cl 90-24.00F.

Sulzer Brothers Limited *See—*
  Mandrin, Charles, 4,036,028, Cl 62-52.000.

Sumita, Tadayuki: *See—*
  Ito, Yasuro; Kaga, Hideharu; Yamamoto Yasuhiro; and Sumita, Tadayuki, 4,036,922, Cl 264-35.000.

Sumitomo Bakelite Company, Limited. *See—*
  Ishii, Ko, and Yoshida, Tadamasa, 4,037,020, Cl 428-518.000
  Nakazato, Tetsuo, Kanai, Shunji, Tokuda Koichi, and Hoami, Keisuke, 4,035,987, Cl. 53-133.000.

Sumitomo Chemical Company Limited. *See—*
  Yamada, Koichi, Hashimoto, Tadaaki, and Furumi, Yoshinori, 4,036,655, Cl. 106-77.000

Sun Chemical Corporation *See—*
  Adams, William R., 4,037,021, Cl 428-512.000.
  Rothmayer, Jules, 4,036,652 Cl 106-308.00N

Sunbeam Equipment Corporation *See—*
  Smith, Jonathan; Larko, Robert C., and Booth, Eugene E., 4,036,475, Cl 266-133.000

Sundermann, Rudolf *See—*
  Vogel, Axel; Durholz, Friedrich; Sundermann, Rudolf; and Skipka, Guido, 4,036,838, Cl. 260-251.00R.

Sundstrand Corporation *See—*
  Tennis, Francis Henry, 4,036,245, Cl 137-117.000

Sunnen Products Company: *See—*
  Vanderwal, Frank E., Jr., 4,035,959, Cl 51-34.00K.

Sutelan, Franklin S Bisectional architectural structure. 4,035,973 Cl 52-263.000

Suter, Xaver, to Maschinenfabrik Schweiter AG. Transfer apparatus for gripping and holding a spinning cop 4,036,353 Cl. 198-486.000

Suter, Xaver, to Maschinenfabrik Schweiter AG Apparatus for pneumatically separating a foot lap from a spinning cop 4,036,444, Cl 242-35.60E.

Sutter Hospitals Medical Research Foundation: *See—*
  Hillsman, Deane; Cook, Albert M.; and Simes, James G., 4,036,221, Cl. 128-145.600

Suxov, Gennady Ilich: *See—*
  Petreev, Anatoly Mikhailovich, Lipin, Anatoly Alexeevich, Rabko, Vladimir Davydovich; Suxov, Gennady Ilich, Kunegin, Vladimir Ivanovich and Kurdjukov, Alexandr Safronovich, 4,036,309, Cl. 173-103.000.

Suzuki, Haizo, Sato, Takahisa, Kubota, Tatsuo, Osaka, Shigemi, and Komatsu, Shigeru, to Nippon Shokubai Kagaku Kogyo Co., Ltd Catalyst for the preparation of maleic anhydride. 4,036,780, Cl 252-437.000.

Suzuki, Tadao, to Sony Corporation. Transistor amplifier. 4,037,169, Cl 330-35.000

Suzuki, Toshio. *See—*
  Ohmae, Tsutomu, Sano, Hideo, and Suzuki, Toshio, 4,037,144, Cl 318-338.000

Suzuki, Yukio *See—*
  Tanaka, Masanori; and Suzuki, Yukio, 4,037,056, Cl. 179-15.0BI

Svenska Aktiebolaget Bromsregulator: *See—*
  Dahlqvist, Nils Goran, Axelsson, Lars Bengt, and Sander, Nils Borje Lennart, 4,036,111, Cl 92-29.000
  Kraft, Uno Ingemar, 4,036,533, Cl 303-6.00A
  Sander, Nils Borje Lennart, 4,036,332, Cl 188-196.00D

Svenska Textilforskningsinstitutet *See—*
  Shishoo, Roshan Lal, and Alfredsson, Sara Inga-Lill, 4,036,924, Cl 264-89.000

SW (Delaware), Inc.. *See—*
  Cheatham, Joseph F., 4,035,878, Cl 26-87.000

Sweat, Tommy: *See—*
  Griner, Henry, Griner, Wade, Sweat, Tommy and Hyars, Claude, 4,035,998, Cl 56-27.500

Sweda International, Inc *See—*
  Feldman, Edward and Lupinacci, George, 4,036,549, Cl 197-151.000.

Swihart, Patrick S., Sr. Subsurface flow control apparatus and method 4,036,297, Cl 166-250.000

Swisstone Corporation *See—*
  Fishbein, Harry, 4,035,948, Cl 46-189.000

Sylvest, Aage C. *See—*
  Deane, Richard; and Sylvest, Aage C., 4,037,191, Cl 340-28.000.

Symons Corporation. *See*
  Van Meter, Richard A., 4,036,466, Cl. 249-18.000.

Synergistics, Inc *See—*
  Halpern, Alfred, and Sasmor, Ernest J., 4,036,951, Cl. 424-60.000.

Syntex (U.S.A.) Inc. *See—*
  Lanzilotta, Raymond P., 4,036,876, Cl 260-514.00D.
  McCarty, James C., and Mendola, Dominick, 4,036,176, Cl. 119-3.000
  Walker, Keith A. M., and Marx, Michael, 4,036,970, Cl 424-273.000
  Walker, Keith A. M., and Marx, Michael, 4,036,973, Cl 424-273.000
  Walker, Keith A. M., and Marx, Michael, 4,036,974, Cl 424-273.000.
  Walker, Keith A. M., and Unger, Stefan Howard, 4,036,975, Cl 424-273.000.

Systematics, Inc. *See—*
  Kuehn, Andrew, III, 4,036,200, Cl. 123-148.00E

Systron Donner Corporation *See—*
  Pickton, Shailer L., and Dean, Gordon B., 4,037,164, Cl 328-187.000.

Szabo, Jorge Luis Jose: *See—*
  Amato, Jose; Propker, Marta, Pongracz Magdalena Julia Beatriz, and Szabo, Jorge Luis Jose, 4,036,985, Cl 424-320.000.

Szabo, Lajos *See—*
  Szantay, Csaba, Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon, and Szporny, Laszlo, 4,036,841, Cl 260-293.530

Szantay, Csaba, Szabo, Lajos; Kalaus, Gyorgy; Karpati, Egon; and Szporny, Laszlo, to Richter Gedeon Vegyeszeti Gyar Rt. Indolo[2-3a]quinolizine derivatives 4,036,841, Cl. 260-293.530

Sze, Morgan C *See—*
  Strangio, Vincent A.; Riegel, Herbert, and Sze, Morgan C., 4,036,897, Cl 260-648.00C

Szporny, Laszlo *See—*
  Szantay, Csaba, Szabo, Lajos, Kalaus Gyorgy; Karpati, Egon, and Szporny, Laszlo, 4,036,841, Cl 260-293.530

Taenzi, Igarashi, and Toshio, Tsubota, to Mitsubishi Jukogyo Kabushiki Kaisha Automatic inspection apparatus 4,036,373 Cl 214-1.0BB

Tagata, Genichi *See*
  Abe, Kiyomi, and Tagata, Genichi, 4,035,933 Cl 35-48.00R

Taggart, Lewis W., to Kaiser Aluminum & Chemical Corporation Method of manufacturing a sacrificial anode rod assembly 4,035,903 Cl 29-458.000

Taguchi, Tetsuya *See—*
  Funekawa, Tokuichi, Nakamoto, Soichi and Taguchi, Tetsuya, 4,037,234, Cl 354-24.000

Taira, Kaoru. *See—*
  Sano, Hiroshi, Taira, Kaoru, and Kumai, Teruo, 4,036,198, Cl 123-41.310

Taisei Corporation. *See—*
  Ito, Yasuro, Kaga, Hideharu, Yamamoto, Yasuhiro, and Sumita Tadayuki, 4,036,922, Cl. 264-35.000

Takada, Juichiro, legal authorized heir *See—*
  Takada, Takezo, deceased and Takada, Juichiro, legal authorized heir, 4,036,322, Cl 180-82.000

Takada, Shigetaka *See—*
  Hattori, Tadashi, Takada, Shigetaka, Hayashi, Kenji, and Iwata, Toshiharu, 4,036,186, Cl. 123-32.0FA

Takada Takezo, deceased and by Takada, Juichiro, legal authorized heir Automatic locking safety belt retractor reel 4,036,322, Cl 180-82.000

Takagawa, Minoru: *See—*
  Furuyama, Susumu, Takagawa, Minoru, and Kajiyama, Shiro, 4,036,885, Cl 260-595.000

Takagi, Tohru, to Kansai Paint Co., Ltd Corona producing a planographic printing sheet 4,036,136, Cl. 101-467.000

Takahashi, Hiroki; Ozawa, Kiyomi, Iwasawa, Yoshihiro; Ogawa, Masayuki; Okamoto, Shigekatu, Ochiai, Yoshinori and Katakura, Eizo to Nissan Chemical Industries, Ltd Soil fungi inhibiting agent 4,036,984, Cl 424-311.000

Takaishi, Naotake: *See—*
  Inamoto, Yoshiaki, Fujikura, Yoshiaki; Ikeda, Hiroshi, and Takaishi, Naotake, 4,036,892, Cl 260-617.00F
  Inamoto, Yoshiaki; Fujikura, Yoshiaki; Tsuchihashi, Kiyoshi, and Takaishi, Naotake, 4,036,893, Cl 260-617.00F

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha Dual fastener slider 4,035,876, Cl 24-205.00R.

Takamatsu, Ikuo, to Yoshida Kogyo Kabushiki Kaisha Chair 4,036,524, Cl. 297-219.000.

Takamizawa, Hideo. *See—*
  Katoh, Hidehiko; Kajiwara, Yuji and Takamizawa, Hideo, 4,037,168, Cl. 330-31.000

Takamura, Tsutomu, Shiregami, Tamotsu, Niki, Hirokazu and Aizawa, Kazuo, to Tokyo Shibaura Electric Co. Ltd Rechargeable nickel-zinc battery 4,037,033 Cl 429-206.000

Takaoka Yukihisa *See—*
  Sugiyama, Iwakichi, Takaoka, Yukihisa and Endo, Kiyoshi, 4,036,796, Cl 260-22.0CA.

Takasaki, Takashi: *See—*
  Ikeda, Isao and Takasaki, Takashi 4,037,993 Cl 426-7.000

Takasawa, Yoshio *See*—
- Toyama, Teruhiko; and Takasawa, Yoshio, 4,036,630, Cl 71-88.000

Takata, Yoshinori, to Hitachi, Ltd Liquid chromatographical method 4,036,704, Cl 204-1.00T

Takeda Chemical Industries, Ltd.: *See*—
- Hori, Masatake, and Kikuchi, Shintaro, 4,036,747, Cl 210-22.00A
- Kitamori, Nobuyuki; Makino, Tadashi; and Hemmi, Keiji, 4,036,948, Cl 424-32.000

Takeda, Toshio: *See*—
- Tomisawa, Norio; Uchiyama, Yasuji Okumura, Takatoshi; and Takeda, Toshio, 4,036,096, Cl 84-1.010

Takeda, Tsuginori: *See*—
- Nakajima, Ichiro; Sanaka, Isao, Takeda, Tsuginori: Koarai, Hiroyuki, Ando, Toru; Ifuku, Tetsuhiko; and Murano, Hatsuo, 4,037,209, Cl 364-200.000

Taketomi, Bunsaku. Plug receptacle having a rotatable receptacle member 4,036,543, Cl. 339-2.00R

Takeuchi, Yasuhito, to Hewlett-Packard Company Apparatus for measuring the period and frequency of a signal 4,037,151, Cl 324-78.00R

Talley Industries of Arizona, Inc. *See*—
- Skinner, Everett B., and Lair, James O., 4,036,456, Cl 244-122.0AD

Talmadge, Samuel I Rotary door latch 4,036,517, Cl. 292-216.000

Tamada, Minoru, Shikama, Takashi, and Nakamura, Toshikazu, to Murata Manufacturing Co., Ltd. Positive temperature coefficient semiconductor heating device. 4,037,082, Cl. 219-541.000.

Tamai, Hideo; Morita, Takayuki, Kobayakawa, Masanao, and Komura, Ikuo, to Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Method and apparatus for doffing and donning bobbins in spinning machine 4,036,001, Cl. 57-52.000.

Tamaki, Kanji. *See*—
- Shin, Masami, and Tamaki, Kanji, 4,037,261, Cl. 360-78.000.

Tamao, Yoshikuni. *See*—
- Okamoto, Shosuke, Hijikata, Akiko, Kikumoto, Ryoji, Tamao, Yoshikuni, Ohkubo, Kazuo, Tezuka, Tohru, and Tonomura, Shinji, 4,036,955, Cl 424-177.000

Tamura, Tatsuo. *See*—
- Yamada, Yasuo, Saito, Junichi, Tamura, Tatsuo, and Kurahashi, Yoshio, 4,036,986, Cl 424-322.000

Tanaka, Taro: *See*—
- Noguchi, Masaaki, Bunda, Tsuchio, and Tanaka, Taro, 4,036,180, Cl. 123-3.000

Tanaka, Yoshinori, and Narahara, Hisaaki, to Sony Corporation. Still color television signal recording and reproducing apparatus. 4,037,247, Cl 358-4.000

Tani, Sumio *See*—
- Saito, Masumi, Tani, Sumio, Matsui, Shigeaki, and Kasaoka, Shigeaki, 4,036,785, Cl 252-472.000

Tank, Eggert, and Stute, Manfred, to Daimler-Benz Aktiengesellschaft. Heat exchanger for gases of greatly varying temperatures. 4,036,293, Cl 165-134.000

Taranov, Sergei Glebovich, Braiko, Voldmir Vasilievich; Nizhensky, Anatoly Danilovich, Belousov, Vladimir Petrovich; Kovalchuk, Dmitry Vasilievich, Grinberg, Isaak Pavlovich, Laschuk, Eugeny Eustafievich, Panchishin, July Modestovich, and Chigirin, Jury Trofimovich Method of and apparatus for eliminating the effect of non-equipotentiality voltage on the hall voltage. 4,037,150, Cl 324-45.000.

Tarnero, Maurice: *See*—
- Duhayon, Jacques, Jacques, Michel Jean, Michel, Pierre; Tarnero, Maurice; and Zellner, Edmond, 4,036,939, Cl 423-488.000

Tasch, Al F.; and Frye, Robert C., to Texas Instruments Incorporated Silicon gate CCD structure 4,035,906, Cl. 29-578.000.

Tate & Lyle Limited *See*—
- Burge, Malcolm Leonard Ernest, and Gill, Heather Ann, 4,037,000, Cl. 426-572.00J.

Taylor, Glen J., to Martin Marietta Corporation Multilayer circuit board with integral flexible appendages. 4,037,047, Cl. 174-68.500.

Taylor, Michael Gordon *See*—
- Lefkowitz, Michael, and Taylor, Michael Gordon, 4,037,050, Cl 178-69.00G.

Taylor, Otis Max, to TMC, Inc. Industrial fuel storage and self-blending tank and method 4,036,402, Cl 222-1.000.

Teets, Alan R.: *See*—
- Lucero, Daniel P.; and Teets, Alan R., 4,036,915, Cl 261-104.000.

Telectronics SA: *See*—
- Matthey, Henri; and Delessert, Georges, 4,036,458, Cl 242-201.000

Teledyne Industries, Inc.: *See*—
- Blackaby, Benjamin E., 4,037,076, Cl 219-121.00L.

Telljohann, Rudolf: *See*—
- Tetenborg, Konrad, and Telljohann, Rudolf, 4,036,116, Cl. 93-32.000.

Teng, Lina Chen, to Philip Morris Incorporated Smoking composition 4,036,237, Cl. 131-17.00R

Tennis, Francis Henry, to Sundstrand Corporation. Pressure compensated hydraulic control valve. 4,036,245, Cl. 137-117.000.

Tensei Suisan Company, Limited: *See*—
- Ikeda, Isumi; and Takasaki, Takashi, 4,036,993, Cl. 426-7.000.

Tension Structures Co.: *See*—
- Huddle, Carl F., 4,036,244, Cl 135-4.00R

Teplyakov, Mikhail Mikhailovich: *See*—
- Korshak, Vasily Vladimirovich; Sergeev, Vladimir Alexandrovich, and Teplyakov, Mikhail Mikhailovich, 4,036,818, Cl 260-63.00K.

Teraji, Tsutomu *See*—
- Kamiya, Takashi, Saito, Yoshihisa, Teraji, Tsutomu, Nakaguti, Osamu; Oku, Teruo; Nakamura, Hitoshi, and Hashimoto, Masashi, 4,036,847, Cl 260-306.70C

Terasaki, Kaoru *See*—
- Uchida, Ryuichi; Terasaki, Kaoru, and Ogikubo, Masaru, 4,037,060, Cl. 179-100.41K

Terayama, Toshio, to Kabushiki Kaisha Daini Seikosha. Mechanical filter device 4,037,179, Cl 333-71.000.

Terrell Machine Company, The: *See*—
- Ferguson, Richard, and Troutman, Kenneth W., 4,035,882, Cl 28-294.000

Terzian, John, to Raytheon Company. Microprogram controlled digital processor having addressable flip/flop section. 4,037,202, Cl 364-200.000

Tesco Engineering Company *See*—
- Ferguson, Paul M., 4,037,269, Cl 361-232.000.
- Webb, Anthony M., 4,036,468, Cl 251-84.000.

Tetenborg, Konrad, and Telljohann, Rudolf, to Windmoller & Holscher Method of stacking flat bags or sacks which are folded about at least two transverse fold lines 4,036,116, Cl. 93-32.000

Texaco Development Corporation: *See*—
- Brennan, Michael E.; and Yeakey, Ernest L., 4,036,881, Cl 260-583.00P
- Marquis, Edward T.; Gipson, Robert M.; and Watts, Lewis W., Jr., 4,036,880, Cl 260-570.00D

Texaco Inc *See*—
- Crawford, Wheeler C.; Yamamoto, Roy I.; and Cusano, Carmen M., 4,036,768, Cl 252-51.50A.
- Yamamoto, Roy I; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,766, Cl. 252-51.50A.
- Yamamoto, Roy I; Morduchowitz, Abraham; Crawford, Wheeler C.; and Cusano, Carmen M., 4,036,767, Cl. 252-51.50A.

Texas Instruments Incorporated: *See*—
- Dierschke, Eugene Gustav, 4,037,241, Cl. 357-17.000.
- Gosney, William Milton, 4,037,242, Cl 357-23.000.
- Raymond, Joseph H., Jr., 4,037,090, Cl. 235-152.000.
- Savarese, Giuseppe, 4,037,217, Cl. 340-173.0SP.
- Tasch, Al F., and Frye, Robert C., 4,035,906, Cl. 29-578.000.
- Vandierendonck, Jerry L., 4,037,094, Cl. 235-175.000.

Tezuka, Tohru *See*—
- Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji; Tamao, Yoshikuni; Ohkubo, Kazuo, Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl 424-177.000.

Thagard Technology Company: *See*—
- Matovich, Edwin, 4,036,181, Cl. 123-3.000.

Thany, Imre, to Raymond Lee Organization, Inc., The, a part interest. Handle device 4,036,424, Cl. 229-52.00A

Theeuwes, Felix, to Alza Corporation. Osmotic dispenser with gas generating means 4,036,228, Cl 128-260.000.

Theeuwes, Felix *See*—
- Zaffaroni, Alejandro; Michaels, Alan S., and Theeuwes, Felix, 4,036,227, Cl 128-260.000

Thilly, William G. *See*—
- Levine, David W.; Thilly, William G; and Wang, Daniel I C., 4,036,693, Cl. 195-1.800

Thiokol Corporation: *See*—
- Bertozzi, Eugene R; Barclay, Robert, Jr.; Packer, David H., and Smith, Daniel J., 4,036,882, Cl 260-584.00B.

Thomas, John G.: *See*—
- Walraven, Thomas A., Thomas, John G; and Hall, James B., 4,036,397, Cl 220-268.000.

Thomas, Wesley L. Grip assembly for attaching an electric cord to an electric appliance, and the like. 4,036,548, Cl. 339-103.00C.

Thompson, Albert W.: *See*—
- Berry, R Arlen; and Thompson, Albert W., 4,036,380, Cl. 214-305.000.

Thompson, John T.; and Cowan, Arnold A., to Cowan, Arnold A Adjustable shock absorber. 4,036,335, Cl. 188-319.000.

Thompson, John T.; and Gillemot, George W. Parts comprising a metal strap, U-shaped metal clip, and adjustable clamping means, for making an electrical terminal assembly 4,036,546, Cl. 339-95.00R.

Thompson, Malcolm J.; Feldmesser, Julius; and Robbins, William E., to United States of America, Agriculture, Control of nematodes and other helminths 4,036,987, Cl 424-325.000.

Thomson-Brandt: *See*—
- Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois, Lehureau, Jean Claude; and Puech, Claude, 4,037,251, Cl 358-128.000.

Thomson-CSF *See*—
- de Cremoux, Baudouin, 4,037,244, Cl. 357-30.000.

Thomson, Francis D., to Owens-Corning Fiberglas Corporation Polyurethane foam compositions 4,036,790, Cl. 260-2.5AQ.

Thordarson, Gunnar Gudmund: *See*—
- Nordgren, John Lennart, and Thordarson, Gunnar Gudmund, 4,036,143, Cl 102-70.20R.

Thorn, Lawrence B *See*—
- Betts, Robert E.; Thorn, Lawrence B; and Maykut, Albert R., 4,036,013, Cl. 60-271.000.

Thorne, David Edward; and Engel, Kurt, to Beecham Group Limited Aryloxypyridines. 4,036,844, Cl. 260-295.00R.

Thornton, Leonard: *See*—
- Davies, Robert W., Thornton, Leonard, Veness, Maxwell F., and Calver, Leonard H., 4,036,117, Cl. 93-51.00R.

Thorsell, Roland H., to Excor, Inc Saw for cutting truss members, rafters and the like with dimensional accuracy 4,036,093, Cl 83-471.300

Thumm, Helmut, Reusch, Lothar; and Wahl, Rainer Thread cutting apparatus and method of operating same. 4,036,086, Cl 82-24.00R

Thyssen Niederrhein AG Hutten- und Walzwerke *See*—
- Klapdar, Wilhelm, Richter, Helmut, Spetzler, Edgar, and Wendorff, Jochen, 4,036,635, Cl 75-49.000

Tibur Metals, Ltd: *See*—
- Segsworth, Robert Sidney, 4,037,043, Cl 13-9.00R

Tiedemann, William H., to Globe-Union Inc. Fluorinated carbon composition and resistor utilizing same 4,036,786, Cl 252-511.000

Tieden, Arthur E *See*—
- Luukonen, Leroy D., and Tieden, Arthur E., 4,036,378, Cl 214-92.000

Tilbrook, Roger W.: *See*—
- Golden, Martin P., Tilbrook, Roger W., and Heylmun, Neal F., 4,036,688, Cl 176-38.000

Tilson, Edward Arthur; and Mayhew, Raymond Leonard, to Caribonum Limited Transfer materials 4,037,012, Cl 428-304.000

Timmons, Jay Panel joining arrangements 4,035,972, Cl 52-241.000

Ting, Hui-tzeng Clean spark ignition internal combustion engine 4,036,187, Cl 123-32.0SP

Titmus, Robert A.: *See*—
- Readal, Thomas C.; McKinney, Joel D.; and Titmus, Robert A., 4,036,740, Cl 208-120.000

TMC, Inc.: *See*—
- Taylor, Otis Max, 4,036,402, Cl. 222-1.000

Togo, Shizuo; Ito, Muneo, Nishizawa, Chiharu, and Ohba, Michio, to Mitsubishi Gas Chemical Company, Inc. Process for producing a 2-tertiary-alkyl substituted anthraquinone 4,036,861, Cl. 260-369.000

Tokuda, Koichi: *See*—
- Nakazato, Tetsuo; Kamon, Shunji, Tokuda, Koichi, and Honma, Keisuke, 4,035,987, Cl. 53-133.000

Tokyo Kosei Kaken Co Ltd: *See*—
- Nishio Takuji, 4,035,958, Cl. 51-425.000.

Tokyo Shibaura Electric Co., Ltd.: *See*—
- Ito, Ayao; and Ishida, Akinori, 4,036,217, Cl. 128-2.080.
- Kawai, Shinichi; Maeyama, Shigeo, and Shidara, Tokihiko, 4,037,127, Cl. 313-60.000.
- Okamoto, Yoshihiko; Abe, Toshio, Hirose, Kazuhiro; Nakajima, Saburo; and Saito, Hiroshi, 4,036,008, Cl 58-85.500.
- Takamura, Tsutomu; Shirogami, Tamotsu; Niki, Hirokazu; and Aizawa, Kazuo, 4,037,033, Cl. 429-206.000.

Toman, Donald J., to Tull Aviation Corporation. Multiple carrier modulation synthesis. 4,037,173, Cl. 332-9.00R.

Tomcufcik, Andrew Stephen *See*—
- Curran, William Vincent; Tomcufcik, Andrew Stephen, and Ross, Adma Schneller, 4,036,849, Cl. 260-308.00D

Tominaga, Akira, to Kansai Paint Co., Ltd Aqueous cationic coating from amine-epoxy adduct, polyamide, and semiblocked polyisocyanate, acid salt. 4,036,795, Cl. 260-18.0PN

Tomisawa, Norio; Uchiyama, Yasuji; Okumura, Takatoshi; and Takeda, Toshio, to Nippon Gakki Seizo Kabushiki Kaisha. Musical tone waveshape generator 4,036,096, Cl. 84-1.010

Tomita, Makoto: *See*—
- Oishi, Minoru; Okuda, Naoki; Tomita, Makoto; Kashimura, Toshisada; and Koga, Syozi, 4,037,078, Cl 219-137.00R

Tomoegawa Paper Co., Ltd.: *See*—
- Nakano, Shiro; Kanbe, Norio, Nakagawa, Tsugumichi, Nishio, Akira; and Kitahara, Kengo, 4,037,004, Cl. 427-145.000

Tonomura, Shinji: *See*—
- Okamoto, Shosuke; Hijikata, Akiko; Kikumoto, Ryoji, Tamao, Yoshikuni; Ohkubo, Kazuo; Tezuka, Tohru; and Tonomura, Shinji, 4,036,955, Cl 424-177.000.

Tornkvist, Rolf E. A. Wave motor comprised of a submerged floating network of chambers formed by walls permitting variable geometry 4,036,563, Cl. 417-331.000

Torrington Company, The: *See*—
- Ashmead, Albert Sidney; Ross, William Alden, and Shepard, Richard Wilton, 4,036,036, Cl 66-123.000.

Toshio, Tsubota: *See*—
- Taenzi, Igarashi; and Toshio, Tsubota, 4,036,373, Cl 214-1.0BB

Touchette, Claude. Ring puzzle. 4,036,504, Cl 273-158.000.

Towgood, Dennis A: *See*—
- Friedericy, Johan A; and Towgood, Dennis A., 4,036,080, Cl 74-572.000.

Towmotor Corporation. *See*—
- Finn, David S., 4,036,342, Cl. 192-109.00F

Toyama, Teruhiko; and Takasawa, Yoshio, to Mitsui Toatsu Chemicals, Incorporated. Synergistic herbicidal composition for paddy fields 4,036,630, Cl 71-88.000.

Toyota Jidosha Kogyo Kabushiki Kaisha. *See*—
- Onuma, Kiyoshi; and Nagano, Syuji, 4,036,081, Cl 74-781.00R
- Onuma, Kiyoshi, 4,036,082, Cl 74-781.00R.
- Sami, Hiroshi; Taira, Kaoru; and Kumai, Teruo, 4,036,188, Cl 123-41.310
- Uemura, Hiroshi, 4,037,193, Cl. 340-59.000.

Trane Company, The: *See*—
- McCracken, Charles Kennedy, 4,036,576, Cl 431-5.000

Transcale AB *See*—
- Flinth, Rune; and Kjell, Nordstrom, 4,036,315, Cl. 177-1.000.

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Traphagan, Seeran M. Book cover and carrying device. 4,036,417, Cl 224-45.00N

Trautvetter, Jutta; Weingartz, Albert, and Werner, Lothar, to Henkel & Cie G m b.H. Process for the production of a marbled or mottled soap cake and the product of such process. 4,036,775, Cl 252-134.000

Triano, Howie *See*—
- Atack, James W; Triano, Howie; and Zoretich, Peter, 4,035,844, Cl 2-2.000

Troetscher, Otto, Wiedmann, Erwin, Stahl, Horst; and Forberich, Helmut, to Carl Zeiss-Stiftung Wireless remote-control system for a camera or the like. 4,036,762, Cl. 250-199.000.

Trofimov, Valery Alexandrovich *See*—
- Ilin, Mikhail Ivanovich; Polyakov, Viktor Ivanovich; Trofimov, Valery Alexandrovich, Drankovsky, Ivan Karpovich; and Boitsov, Alexandr Ivanovich, 4,036,425, Cl 233-2.000.

Troitsky, Alexandr Mikhailovich *See*—
- Levin, Izrail Aronovich, Potemkin, Jury Pavlovich, Slobodskoi, Igor Pavlovich, Troitsky, Alexandr Mikhailovich, and Sapozhnikov, Ivan Vasilievich, 4,037,128, Cl 313-188.000

Troutman, Kenneth W.: *See*—
- Ferguson, Richard, and Troutman, Kenneth W., 4,035,882, Cl 28-294.000

Tschopel, Gunter *See*—
- Harand, Elmar, Richter, Gerd, and Tschopel, Gunter, 4,036,561, Cl. 415-18.000

Tsuchihashi, Kiyoshi *See*—
- Inamoto, Yoshiaki; Fujikura, Yoshiaki, Tsuchihashi, Kiyoshi, and Takaishi, Naotake, 4,036,893, Cl 260-617.00F

Tsuchiya, Shozo, to Nippon Oil Co., Ltd Resins for use as coating material and process for preparing same 4,037,038, Cl 526-56.000

Tsuda, George I *See*—
- Burnett, Gary I; and Tsuda, George I., 4,037,182, Cl. 333-73.00R

Tsuiki, Takao *See*—
- Nomiya, Kosei; Tsuiki, Takao; Kobayashi, Takeshi; and Hotta, Shinkichi, 4,037,212, Cl. 364-200.000

Tsujimoto, Michihiro, and Okubo, Ichiro, to Mitsui Toatsu Chemicals, Incorporated. Coloring of the organic materials with naphthacenequinones 4,036,805, Cl 260-37.00N

Tucci Corporation *See*—
- Tucci, Domenick, and Cantalupi, Lewis, 4,037,223, Cl 340-280.000

Tucci, Domenick, and Cantalupi, Lewis, to Tucci Corporation Audible alarm system for an electrical outlet 4,037,223, Cl 340-280.000

Tuckey, James C., to Pacific Erectors Corporation. Secondary sealing device for storage vessel having a floating roof 4,036,395, Cl 220-224.000.

Tugwell, Dennis H., to Photo-Lith International Transfer printing process and article 4,037,008, Cl 428-200.000

Tull Aviation Corporation *See*—
- Toman, Donald J., 4,037,173, Cl 332-9.00R

Tunekawa, Tokuichi; Nakamoto, Soichi, and Taguchi, Tetsuya, to Canon Kabushiki Kaisha Exposure control system stabilized against temperature variation 4,037,234, Cl 354-24.000

Tung, Ker-Kong *See*—
- Pierre, Kenneth Jonas; Tung, Ker-Kong, and Nadj, Henriette, 4,036,697, Cl 195-99.000

Tungler, Antal *See*—
- Petro, Jozsef, Mathe, Tibor, and Tungler, Antal, 4,036,877, Cl 260-515.00R.

Turnbull, John William, to Du Pont de Nemours, E. I., and Company Poly(meta-phenylene isophthalamide) composition 4,036,907, Cl 260-857.00L.

Turner, James E., and Turner, Louise L Animal protector 4,036,179, Cl. 119-96.000

Turner, James Keith *See*—
- Aurich, Christoph W., Sturkey, William Cleere, and Turner, James Keith, 4,036,038, Cl 68-5.00C

Turner, Louise L.: *See*—
- Turner, James E., and Turner, Louise L., 4,036,179, Cl 119-96.000

Tyrey, Elasco A. Radio-frequency coupler 4,037,177, Cl 333-32.000

Tyus, Philranzo Passenger transportation system 4,036,146, Cl 104-1.00R.

Uchida, Ryuichi; Terasaki, Kaoru, and Ogikubo, Masaru, to Nippon Atsudenki Kabushiki Kaisha t/a Japan Piezo Co., Ltd Stereophonic pickup cartridge 4,037,060, Cl. 179-100.41K.

Uchiyama, Yasuji *See*—
- Tomisawa, Norio; Uchiyama, Yasuji, Okumura, Takatoshi, and Takeda, Toshio, 4,036,096, Cl. 84-1.010.

Ueda, Hiroshi, to Minolta Camera Kabushiki Kaisha Exposure indicating device for use in multiple exposure control cameras 4,037,235, Cl 354-38.000.

Uemura, Hiroshi, to Toyota Jidosha Kogyo Kabushiki Kaisha. Liquid level alarm apparatus for a tank of a vehicle 4,037,193, Cl. 340-59.000.

Ugine Carbone: *See*—
- Romagnolo, Gerard, 4,035,888, Cl. 29-95.00R.

Ullman, John E., to Huntingdon Industries Incorporated Package 4,036,362, Cl. 206-432.000.

Ulm, Reign C. *See*—
- Bodley, Robert W.; and Ulm, Reign C., 4,036,394, Cl 220-222.000

UMC Industries, Inc.: *See*—
- Smith, Barry L., 4,036,347, Cl. 194-48.000

Underbrink, Gary L.: *See*—
- Wilkes, Lambert H.; Underbrink, Gary L., and Jones, Joseph K., 4,035,869, Cl. 19-80.00R.

Underhill, Thomas Travis *See*—
- Knight, Arthur Holt; and Underhill, Thomas Travis, 4,036,556, Cl. 355-14.000

- Unger, Stefan Howard: *See—*
  - Walker, Keith A. M.; and Unger, Stefan Howard, 4,036,975, Cl 424-273.000
- Unie Van Kunstmestfabrieken, B.V.: *See—*
  - Kaasenbrood, Petrus J.C.; and Van Nassau, Petrus J.M., 4,036,878, Cl. 260-555.00A.
- Unifab Corporation: *See—*
  - DeSmit, Phillip A., 4,036,177, Cl 119-18.000.
- Union Carbide Corporation: *See—*
  - Kozak, Theodore Fredrick, 4,036,233, Cl. 128-287.000.
- Union Oik Company of California: *See—*
  - Stanfill, Herman F., 4,036,591, Cl 23-230.00C.
- Union Oil Company of America: *See—*
  - Ward, John W., 4,036,739, Cl. 208-120.000.
- Union Oil Company of California: *See—*
  - Fischer, Paul W.; and Pye, David S., 4,036,764, Cl. 252-8.50C.
  - Holm, LeRoy W.; and Ferr, Donald H., 4,036,300, Cl 166-273.000
- United Gas Industries Limited: *See—*
  - Cliff, Thomas Charles, 4,036,059, Cl. 73-368.000.
- United Kingdom Atomic Energy Authority: *See—*
  - Betts, Colin; Collinson, Alfred Edward; and Hart, David Frederick, 4,036,690, Cl. 176-40.000
- United States of America
  - Agriculture: *See—*
    - Brown, George E.; and Farkas, Daniel F., 4,035,925, Cl 34-8.000.
    - Thompson, Malcolm J.; Feldmesser, Julius, and Robbins, William E., 4,036,987, Cl. 424-325.000.
  - Air Force: *See—*
    - Dadian, Thomas F., 4,035,939, Cl 40-132.00D
    - Hochwalt, John R., 4,035,845, Cl. 2-6.000.
    - Kline, Charles R., 4,037,227, Cl 343-18.00E.
  - Army: *See—*
    - Betts, Robert E., Thorn, Lawrence B.; and Maykut, Albert R., 4,036,013, Cl 60-271.000.
    - Clark, Wellman L., Cox, John T.; Klauber, Gerald; Petito, Ferdinand C., Ramsey, John B., Jr., and Waylonis, John E., 4,037,131, Cl. 313-388.000.
    - Hanson, Richard Eric, 4,036,049, Cl. 73-116.000.
    - Korr, Abraham L.; Walker, Evan Harris, Dickey, Charles M.; and Bushey, Bransby W., 4,036,140, Cl. 102-38.000.
    - Meek, James M., 4,036,144, Cl 102-70.20R
    - Monsler, Michael J., 4,036,012, Cl. 60-203.000.
    - Pagano, Victor H., and Moore, Freeman O., Jr., 4,036,104, Cl 89-36.00H
    - Williams, David, 4,036,142, Cl. 102-70.20R
  - Energy Research and Development Administration: *See—*
    - Golden, Martin P., Tilbrook, Roger W., and Heylmun, Neal F., 4,036,688, Cl. 176-38.000
  - Government: *See—*
    - Goodheim, Harold, 4,036,170, Cl. 118-73.000
  - Interior: *See—*
    - Campbell, Eugene, 4,037,157, Cl 324-175.000.
  - Navy: *See—*
    - Bumgardner, Jon H., 4,037,162, Cl. 328-151.000.
    - Clark, Marion D., and Manuccia, Thomas J., 4,036,720, Cl 204-177.000.
    - Jencks, Craig S., 4,035,846, Cl. 2-413.000
    - Keyser, David R., and Zavod, Pierce H., 4,036,581, Cl. 431-267.000
    - Landau, Michael B., 4,037,024, Cl 429-17.000.
    - Nahay, Lawrence P., 4,037,065, Cl. 179-170.0NC.
    - Smith, Robert Neal, 4,037,147, Cl 318-632.000.
- U.S. Philips Corporation: *See—*
  - De Wild, Willem Reindert, 4,037,180, Cl. 333-72.000.
  - Janssen, Peter Johannes Michiel, 4,037,252, Cl 358-128.000
  - Nordgren, John Lennart, and Thordarson, Gunnar Gudmund, 4,036,143, Cl. 102-70.20R
  - Poiblaud, Gerard Joseph, 4,036,932, Cl 423-299.000
  - Sieborger, Gunter, Kilian, Ernst August; and Jonkuhn, Gerhard, 4,037,118, Cl. 307-255.000
- United States Surgical Corporation: *See—*
  - Veth, George J., and Noiles, Douglas G., 4,036,211, Cl. 128-2.00R.
- United Technology Laboratories, Inc.: *See—*
  - Griffith, Russell W., 4,037,152, Cl. 324-79.00R.
- Universal Oil Products Company: *See—*
  - Schmerling, Louis, 4,036,896, Cl. 260-648.00R
- University of Illinois Foundation: *See—*
  - Kansy, Robert; and Culton, Jon, 4,037,175, Cl 333-30.00R
- University of Virginia: *See—*
  - Hoyle, John A., Humphris, Robert R.; and Boring, John W., 4,037,102, Cl. 250-336.000.
- Unterstenhofer, Gunter: *See—*
  - Stolzer, Claus; Homeyer, Bernhard; Hammann, Ingeborg; and Unterstenhofer, Gunter, 4,036,956, Cl 424-210.000
- UOP Inc.: *See—*
  - Antos, George J., 4,036,742, Cl. 208-139.000.
  - Antos, George J., 4,036,743, Cl 208-139.000.
  - Antos, George J., 4,036,903, Cl. 260-673.500.
  - Bauer, Carl F., 4,036,208, Cl. 126-271.000.
  - Broughton, Donald B., 4,036,745, Cl. 208-310.00Z.
  - Gembicki, Stanley A., and Aeschbach, Stefan H., 4,036,784, Cl 252-465.000.
  - Levy, Joseph; and Christensen, Nils J., 4,036,899, Cl. 260-654.00R
  - Pollitzer, Ernest L.; and Hayes, John C., 4,036,741, Cl. 208-139.000.
  - Rosback, Donald H., and Neuzil, Richard W., 4,036,744, Cl. 208-310.00Z.
- Upjohn Company, The: *See—*
  - Lednicer, Daniel, 4,036,977, Cl 424-274.000
- USM Corporation: *See—*
  - Kelley, John Sherburne, 4,036,160, Cl. 113-121.00C.
- Usui Kokusai Sangyo Kabushiki Kaisha: *See—*
  - Kikuchi, Yasubee, 4,036,339, Cl. 192-58.00B.
- Vacca, Anthony A.: *See—*
  - Ahmann, Gerald L.; Carlson, Douglas M.; Marquardt, Warren B.; Offerdahl, Richard E.; Paulson, Roger A.; and Vacca, Anthony A., 4,037,270, Cl. 361-385.000
- Vachet, Francois: *See—*
  - Leroi, Jean-Claude; and Vachet, Francois, 4,036,703, Cl. 203-57.000.
- Valayil, Silvester P.: *See—*
  - Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,710, Cl. 204-52.00R.
  - Kardos, Otto; Arcilesi, Donald A.; and Valayil, Silvester P., 4,036,711, Cl. 204-52.00R
- Valdes, Rogelio Rodriguez: *See—*
  - Fernandez, Carlos M. Cruz, Valdes, Rogelio Rodriguez; and Alberto, Delfin Perez, 4,035,996, Cl. 56-13.900.
- Valenta, Rudolph C., to Oil-Dri Corporation of America. Process for pelletizing sorptive mineral fines. 4,036,928, Cl. 264-118.000.
- Valli, Roberto. Egg escalator. 4,036,355, Cl. 198-607.000.
- Van Kooten B.V.: *See—*
  - Schnell, Hans Gunther, 4,036,310, Cl 173-131.000.
- Van Byelvelt, Rudi: *See—*
  - Welcker, Willy H., 4,035,970, Cl. 52-187.000.
- Vande Castle, Jerome: *See—*
  - Gerlach, Carl J.; and Vande Castle, Jerome, 4,035,984, Cl. 53-28.000
- van der Lely, Ary, to C. van der Lely N. V. Soil cultivating machines. 4,036,303, Cl 172-49.000.
- van der Lely, Cornelis. Soil cultivating implements. 4,036,154, Cl. 111-10.000.
- van der Meer, Johannes W.: *See—*
  - Sheldon, Roger A.; van der Meer, Johannes W.; Verbrugge, Pieter A.; and Mulder, Albertus J., 4,036,887, Cl. 260-599.000.
- Vanderwal, Frank E., Jr., to Sunnen Products Company. Cam operated automatic control for a honing machine. 4,035,959, Cl. 51-34.00K.
- Vandierendonck, Jerry L., to Texas Instruments Incorporated. Multifunctional arithmetic and logical unit. 4,037,094, Cl. 235-175.000.
- Van Eck, Jack M.: *See—*
  - Saklikar, Arvind R.; and Van Eck, Jack M., 4,036,174, Cl. 118-623.000
- Van Meter, Richard A., to Symons Corporation. Flying deck-type concrete form installation. 4,036,466, Cl. 249-18.000.
- Van Nassau, Petrus J.M.: *See—*
  - Kaasenbrood, Petrus J.C.; and Van Nassau, Petrus J.M., 4,036,878, Cl. 260-555.00A.
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  - Oosterling, Pieter Adriaan; and van Staveren, Hendricus Cornelis, 4,035,991, Cl. 56-1.000
- Van Valkenburg, Alvin: *See—*
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- Vasiliu, Dan: *See—*
  - Duca, Mihail, Vasiliu, Dan; Demetrescu, Teodor; Cimpoias, Ion; Linca, Ion; Breazu, Stefan; Antonescu, Virgil; and Cojocaru, Iosif, 4,035,997, Cl 56-209.000.
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- Vaughan, Christopher D.: *See—*
  - Karg, Gerhart; and Vaughan, Christopher D., 4,036,241, Cl. 132-7.000.
- veba-Chemie AG: *See—*
  - Ester, Wilhelm, deceased; Ester, Margarete, heir; Louis nee Ester, Brigitte, heir; Ester, Wolfgang, heir; and Heitmann, Wilhelm, 4,036,890, Cl. 260-610.00B.
  - Ibing, Gunter; and Haferkorn, Herbert, 4,036,594, Cl. 23-264.000
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- Veitel, Myrtle M.: *See—*
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- Velsicol Chemical Corporation: *See—*
  - Krenzer, John, 4,036,848, Cl 260-306.80D
- Vending Components, Inc.: *See—*
  - Zurit, David; and Sciara, Frank, 4,035,893, Cl. 29-157.00R.
- Veness, Maxwell F.: *See—*
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- Verbrugge, Pieter A.: *See—*
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- VerBurg, David L. Method for freeze forming meat products 4,036,997, Cl 426-272.000
- Vetco Offshore Industries, Inc.: *See—*
  - Baugh, Benton F., 4,036,247, Cl 137-236.000.
- Veth, George J., and Noiles, Douglas G., to United States Surgical Corporation. Temperature, pulse and respiration detection apparatus 4,036,211, Cl 128-2.00R
- Victor Company of Japan, Limited: *See—*
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- Vierra, Joyce L.: *See—*
  - Vierra, Frank C., and Vierra, Joyce L., 4,036,491, Cl 272-119.000
- Viro, Felix, and Mourning, Michael C., to GAF Corporation. Diffusion transfer color process using lactone or sultone ring containing lipophilic non-diffusing color formers which yield diffusing dyes 4,036,643, Cl 96-29.00D
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  - Makila, Eino, Virtanen, Unto, and Savinainen, Kyosti, 4,036,440, Cl 241-20.000
- Visual Marketing Incorporated: *See—*
  - Deffner, John F., 4,035,941, Cl 40-219.000
- Vock, Manfred: *See—*
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- Voges, Dieter, Winderl, Siegfried, and Mueller, Herbert, to BASF Aktiengesellschaft. Manufacture of isomer-free 3-methylbutylamine 4,036,883, Cl 260-585.00B
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- Volkner, Wolfgang, and Schmiedemann, Helmuth, to Licentia Patent-Verwaltungs-G.m.b.H. Aircraft de-icing 4,036,457, Cl 244-134.00D
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- von Fischern, Bernhard: *See—*
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- Von Hein, Eduard: *See—*
  - Heimlicher, Paul, and Von Hein, Eduard, 4,036,487, Cl 270-71.000
- von Recklinghausen, Daniel R., to Electro Audio Dynamics, Inc. Planar pattern voice coil audio transducer 4,037,061, Cl 179-115.5PV
- von Voros, Geza, to Optograms, Inc. Digital electro-optical micrometer and gages 4,035,922, Cl 33-143.00L.
- Vyshelessky, Alexandr Nikolaevich: *See—*
  - Kirpichnikov, Vladimir Pavlovich, Leibin, Jury Veniaminovich Nekrutman, Samuil Veniaminovich; and Vyshelessky, Alexandr Nikolaevich, 4,037,070, Cl 219-10.55A
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- W. R. Grace & Co.: *See—*
  - Davidson, James John Alexander, 4,036,388, Cl 215-341.000
  - Guthrie, James Leverette, and Bach, Donald John, 4,036,791, Cl 260-2.5AG
  - Reppert, Merlyn R., 4,036,530, Cl 301-9.0DN
- Wacker-Chemie GmbH: *See—*
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- Waddell, Jerry D., and Scheeter, John J., to ACF Industries, Incorporated. Fluidizing outlet 4,036,532, Cl 302-53.000
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  - Fleagle, Joseph E., 4,036,537, Cl 303-106.000
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- Wagner, Heinz. Hip capitulum cap for a hip joint prosthesis 4,035,848, Cl 3-1.913
- Wagner, Joseph P., and Jackson, Byron L., to Robertshaw Controls Company. Thermally operated control device and method of making the same 4,036,433, Cl 236-100.000
- Wagner, Karl, and von Fischern, Bernhard, to AGFA-Gevaert, A.G. Visual exposure indicator in photographic apparatus. 4,037,232, Cl 354-23.00R
- Wahl, Rainer: *See—*
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- Wakiyama, Yoshihiro: *See—*
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- Walker, Alexander D. R., to N-Dimensions, Inc. Integral revolution clutch 4,036,067, Cl 74-112.000
- Walker, Evan Harris: *See—*
  - Korr, Abraham L., Walker, Evan Harris, Dickey, Charles M. and Bushey, Bransby W., 4,036,140, Cl 102-38.000
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- Walker, John F., to Calspan Corporation. Process for the interpretation of remotely sensed data 4,037,048, Cl 358-113.000
- Walker, Keith A. M., and Marx, Michael, to Syntex (U.S.A.) Inc. Imidazol-1-yl propane derivatives 4,036,970, Cl 424-273.000.
- Walker, Keith A. M., and Marx, Michael, to Syntex (U.S.A.) Inc. Imidazol-1-yl propane derivatives 4,036,973, Cl 424-273.000.
- Walker, Keith A. M., and Marx, Michael, to Syntex (U.S.A.) Inc. 1-{2-[R^1-Thio(oxy)]-3'-(R^2-thio(oxy)]propyl}imidazoles 4,036,974, Cl 424-273.000
- Walker, Keith A. M., and Unger, Stefan Howard, to Syntex (U.S.A.) Inc. 1-[2-(1-Adamantyl)-2-(R-thio)ethyl]imidazoles and 1-[2-(1-adamantyl)-2-(R-oxy)ethyl]imidazoles 4,036,975, Cl 424-273.000
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  - Boyko, Daniel, Wallach, David, and Gasul, Mordecai, 4,035,900, Cl 29-795.000
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- Walter Kidde & Company, Inc.: *See—*
  - Fleming, William J., 4,036,166, Cl 116-114.500
- Walton, Lewis Anthony, to Babcock & Wilcox Company, The. Nuclear fuel element nut retainer cup 4,036,692, Cl. 176-76.000
- Wang, Daniel I. C.: *See—*
  - Levine, David W., Thilly, William G., and Wang, Daniel I. C., 4,036,693, Cl 195-1.800
- Ward, Derek. Wire wrapping apparatus 4,036,268, Cl 140-124.000
- Ward, John W., to Union Oil Company of America. Catalytic cracking process using ammonia-stable zeolite catalyst 4,036,739, Cl 208-120.000
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B 176,995	3,915,773	Oct 28, 1975	B 289,471	3,917,184	Nov 4, 1975
B 178,475	3,944,602	Mar 16, 1976	B 289,523	3,921,166	Nov 18, 1975
B 189,772	3,925,367	Dec 9, 1975	B 289,883	3,925,063	Dec 9, 1975
B 189,773	3,925,405	Dec 9, 1975	B 290,328	3,924,838	Dec 9, 1975
B 190,679	3,925,346	Dec 9, 1975	B 291,104	3,925,007	Dec 9, 1975
B 198,810	3,916,043	Oct 28, 1975	B 291,694	3,925,339	Dec 9, 1975
B 204,161	3,924,605	Dec 9, 1975	B 292,054	3,915,877	Oct 28, 1975
B 207,272	3,914,123	Oct 21, 1975	B 292,126	3,914,465	Oct 21, 1975
B 211,786	3,914,300	Oct 21, 1975	B 292,140	3,914,340	Oct 21, 1975
B 213,211	3,925,269	Dec 9, 1975	B 292,300	3,927,167	Dec 16, 1975
B 220,683	3,914,471	Oct 21, 1975	B 292,563	3,923,653	Dec 2, 1975
B 222,188	3,914,739	Oct 21, 1975	B 293,378	3,923,725	Dec 2, 1975
B 223,621	3,925,526	Dec 9, 1975	B 293,437	3,913,414	Oct 21, 1975
B 224,323	3,925,476	Dec 9, 1975	B 294,103	3,924,396	Dec 9, 1975
B 233,383	3,925,424	Dec 9, 1975	B 294,579	3,916,737	Nov 4, 1975
B 233,741	3,925,326	Dec 9, 1975	B 294,673	3,916,023	Oct 28, 1975
B 235,011	3,925,086	Dec 9, 1975	B 295,481	3,921,593	Nov 25, 1975
B 235,925	3,924,949	Dec 9, 1975	B 295,674	3,916,107	Oct 28, 1975
B 236,609	3,925,187	Dec 9, 1975	B 295,860	3,923,880	Dec 2, 1975
B 237,953	3,924,051	Dec 2, 1975	B 299,267	3,917,106	Nov 4, 1975
B 239,289	3,922,711	Nov 25, 1975	B 300,353	3,921,734	Nov 25, 1975
B 241,433	3,923,711	Dec. 2, 1975	B 302,271	3,929,130	Dec 30, 1975
B 245,194	3,919,179	Nov 11, 1975	B 302,692	3,924,598	Dec 9, 1975
B 248,916	3,920,862	Nov 18, 1975	B 302,836	3,923,573	Dec 2, 1975
B 251,109	3,914,148	Oct 21, 1975	B 302,998	3,928,233	Dec 23, 1975
B 251,635	3,914,149	Oct 21, 1975	B 303,011	3,930,188	Dec 30, 1975
B 252,947	3,923,803	Dec 2, 1975	B 303,702	3,914,131	Oct 21, 1975
B 254,211	3,917,677	Nov 4, 1975	B 304,687	3,924,783	Dec 9, 1975
B 254,708	3,923,878	Dec 2, 1975	B 305,417	3,915,882	Oct 28, 1975
B 255,756	3,923,781	Dec 2, 1975	B 305,868	3,921,463	Nov 25, 1975
B 256,334	3,924,988	Dec 9, 1975	B 305,881	3,923,478	Dec 2, 1975
B 256,936	3,925,513	Dec 9, 1975	B 306,655	3,924,642	Dec 9,1975
B 258,687	3,914,221	Oct 21, 1975	B 306,829	3,925,411	Dec 9, 1975
B 259,236	3,924,874	Dec 9, 1975	B 306,938	3,916,050	Oct 28, 1975
B 259,274	3,928,688	Dec 23, 1975	B 307,677	3,915,276	Oct 28, 1975
B 260,455	3,925,634	Dec 9, 1975	B 308,661	3,924,349	Dec 9, 1975
B 260,945	3,925,250	Dec 9, 1975	B 308,892	3,919,624	Nov 11, 1975
B 261,378	3,913,468	Oct 21, 1975	B 309,207	3,914,743	Oct 21, 1975
B 261,828	3,925,551	Dec 9, 1975	B 309,499	3,922,002	Nov 25, 1975
B 262,241	3,925,528	Dec 9, 1975	B 309,681	3,927,374	Dec 16, 1975
B 262,287	3,921,209	Nov 18, 1975	B 309,755	3,919,468	Nov 11, 1975
B 262,378	3,914,410	Oct 21, 1975	B 309,756	3,914,136	Oct 21, 1975
B 262,599	3,925,323	Dec 9, 1975	B 309,860	3,922,485	Nov 25, 1975
B 264,257	3,928,665	Dec 23, 1975	B 310,149	3,924,705	Dec 9, 1975
B 264,833	3,923,566	Dec 2, 1975	B 310,271	3,923,689	Dec 2, 1975
B 265,369	3,925,245	Dec. 9, 1975	B 310,740	3,985,686	Oct 12, 1976
B 265,727	3,914,479	Oct 21, 1975	B 311,313	3,925,142	Dec 9, 1975
B 265,862	3,915,915	Oct 28, 1975	B 311,317	3,918,975	Nov 11, 1975
B 266,195	3,923,599	Dec 2, 1975	B 311,413	3,925,515	Dec 9, 1975
B 269,673	3,914,377	Oct 21, 1975	B 311,910	3,924,357	Dec 9, 1975
B 270,089	3,923,875	Dec 2, 1975	B 311,977	3,925,233	Dec 9,1975
B 271,104	3,925,400	Dec 9, 1975	B 312,139	3,925,530.	Dec 9, 1975
B 274,945	3,924,992	Dec 9, 1975	B 312,477	3,923,714	Dec 2, 1975
B 275,426	3,925,168	Dec 9, 1975	B 313,098	3,925,045	Dec 9, 1975
B 276,271	3,916,028	Oct 28, 1975	B 313,531	3,925,548	Dec 9, 1975
B 276,560	3,916,030	Oct 28, 1975	B 313,594	3,924,626	Dec 9, 1975
B 276,993	3,948,823	Apr 6, 1976	B 313,900	3,915,932	Oct 28, 1975
B 277,449	3,924,048	Dec 2, 1975	B 314,049	3,920,588	Nov 18, 1975
B 278,491	3,921,170	Nov 18, 1975	B 314,255	3,923,764	Dec 2, 1975
B 278,991	3,914,469	Oct 21, 1975	B 314,271	3,921,845	Nov 25, 1975
B 279,583	3,923,749	Dec 2, 1975	B 314,489	3,925,016	Dec 9, 1975
B 280,015	3,925,378	Dec 9, 1975	B 314,800	3,930,087	Dec 30, 1975
B 280,395	3,919,604	Nov 11, 1975	B 314,977	3,923,459	Dec 2, 1975
B 281,341	3,920,643	Nov 18, 1975	B 315,363	3,920,673	Nov 18, 1975
B 281,943	3,924,013	Dec 2, 1975	B 315,397	3,923,963	Dec 2, 1975
B 282,081	3,913,483	Oct 21, 1975	B 315,731	3,914,108	Oct 21, 1975
B 282,252	3,924,997	Dec 9, 1975	B 316,014	3,920,861	Nov 18, 1975
B 282,390	3,924,576	Dec 9,1975	B 316,239	3,913,546	Oct 21, 1975
B 282,819	3,982,932	Sep 28, 1976	B 316,422	4,016,206	Apr 19, 1977
B 283,124	3,923,512	Dec 2, 1975	B 316,917	3,925,494	Dec 9, 1975
B 283,300	3,925,011	Dec 9, 1975	B 317,080	3,925,324	Dec 9, 1975
B 284,297	3,913,722	Oct 21, 1975	B 317,347	3,923,552	Dec 2, 1975
B 284,427	3,952,812	Apr 27, 1976	B 317,624	3,925,167	Dec 9, 1975
B 285,200	3,923,680	Dec 2, 1975	B 318,122	4,026,905	May 31, 1977
B 285,796	3,914,303	Oct 21, 1975	B 318,195	3,915,699	Oct 28, 1975
B 286,499	3,914,129	Oct 21, 1975	B 318,618	3,915,365	Oct 28, 1975
B 286,614	3,924,696	Dec 9, 1975	B 318,640	3,925,186	Dec 9, 1975
B 286,913	3,928,696	Dec 23, 1975	B 318,745	3,916,571	Nov 4, 1975
B 287,164	3,914,139	Oct 21, 1975	B 319,226	3,925,082	Dec 9, 1975
B 287,270	3,924,825	Dec 9, 1975	B 319,339	3,916,056	Oct 28, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 319,402	3,919,568	Nov 11, 1975	B 345,390	3,940,343	Feb 24, 1976
B 319,414	3,928,666	Dec 23, 1975	B 345,422	3,914,392	Oct 21, 1975
B 320,261	3,924,033	Dec 2, 1975	B 345,527	3,927,365	Dec 16, 1975
B 320,452	3,925,083	Dec 9, 1975	B 345,567	3,913,985	Oct 21, 1975
B 320,603	3,915,571	Oct 28, 1975	B 346,044	3,988,405	Oct 26, 1976
B 321,018	3,921,623	Nov 25, 1975	B 346,145	3,913,293	Oct 21, 1975
B 321,101	3,917,163	Nov 4, 1975	B 346,210	3,916,142	Oct 28, 1975
B 321,938	3,923,889	Dec 2, 1975	B 346,350	3,915,824	Oct 28, 1975
B 322,182	3,925,390	Dec 9, 1975	B 346,487	3,927,406	Dec 16, 1975
B 322,239	3,920,973	Nov 18, 1975	B 346,585	3,913,820	Oct 21, 1975
B 322,564	3,914,373	Oct 21, 1975	B 346,613	3,923,545	Dec 2, 1975
B 322,621	3,920,863	Nov 18,1975	B 346,901	3,915,583	Oct. 28, 1975
B 322,777	3,924,382	Dec 9, 1975	B 348,083	3,923,774	Dec. 2, 1975
B 323,127	3,923,967	Dec 2, 1975	B 348,383	3,923,452	Dec. 2, 1975
B 323,191	3,914,566	Oct 21, 1975	B 348,495	3,914,654	Oct 21, 1975
B 323,203	3,916,165	Oct 28, 1975	B 348,558	3,914,109	Oct 21, 1975
B 323,568	3,920,536	Nov 18, 1975	B 349,141	3,915,363	Oct 28, 1975
B 323,666	3,924,568	Dec 9, 1975	B 349,177	3,914,033	Oct 21, 1975
B 324,495	3,928,664	Dec 23, 1975	B 349,231	3,915,831	Oct. 28, 1975
B 324,503	3,928,524	Dec 23, 1975	B 349,321	3,916,103	Oct 28, 1975
B 324,505	3,925,294	Dec 9, 1975	B 349,948	3,914,557	Oct. 21, 1975
B 324,739	3,924,990	Dec 9, 1975	B 350,025	3,927,415	Dec 16, 1975
B 324,879	3,923,538	Dec 2, 1975	B 350,143	3,924,419	Dec. 9, 1975
B 325,102	3,924,355	Dec 9, 1975	B 350,219	3,917,802	Nov. 4, 1975
B 325,261	3,921,304	Nov 25,1975	B 350,245	3,914,331	Oct. 21, 1975
B 326,514	3,925,080	Dec 9, 1975	B 350,523	3,924,726	Dec. 9, 1975
B 327,109	3,925,350	Dec 9, 1975	B 350,589	3,927,419	Dec 16, 1975
B 327,363	3,923,504	Dec 2, 1975	B 350,708	3,923,871	Dec. 2, 1975
B 327,612	3,925,620	Dec 9, 1975	B 350,843	3,915,461	Oct 28, 1975
B 327,674	3,918,540	Nov 11, 1975	B 351,055	3,914,074	Oct 21, 1975
B 327,899	3,925,674	Dec 9, 1975	B 351,218	3,914,186	Oct 21, 1975
B 328,164	3,914,703	Oct 21, 1975	B 351,222	3,921,179	Nov. 18, 1975
B 328,200	3,916,031	Oct 28, 1975	B 351,348	3,923,563	Dec. 2, 1975
B 328,205	3,914,106	Oct 21, 1975	B 351,421	3,914,733	Oct 21, 1975
B 328,210	3,914,275	Oct 21, 1975	B 351,493	3,914,758	Oct. 21, 1975
B 328,870	3,916,486	Nov 4, 1975	B 351,535	3,915,239	Oct 28, 1975
B 329,115	3,924,727	Dec 9, 1975	B 351,665	3,919,701	Nov 11, 1975
B 329,476	3,920,562	Nov 18, 1975	B 351,672	3,914,000	Oct 21, 1975
B 329,612	3,925,128	Dec 9, 1975	B 351,735	3,913,385	Oct 21, 1975
B 329,787	3,920,688	Nov 18, 1975	B 351,863	3,914,700	Oct 21, 1975
B 329,816	3,923,947	Dec 2, 1975	B 351,883	3,924,657	Dec. 9, 1975
B 330,536	3,925,452	Dec 9, 1975	B 351,926	3,914,133	Oct 21, 1975
B 330,828	3,913,589	Oct 21, 1975	B 351,939	3,913,480	Oct 21, 1975
B 331,417	3,914,157	Oct 21, 1975	B 352,445	3,928,746	Dec. 23, 1975
B 331,557	3,916,577	Nov 4, 1975	B 352,934	3,913,692	Oct 21, 1975
B 331,895	3,916,403	Oct 28, 1975	B 352,950	3,922,590	Nov 25, 1975
B 332,527	3,924,017	Dec 2, 1975	B 352,965	3,921,926	Nov 25, 1975
B 332,811	3,924,359	Dec 9, 1975	B 353,317	3,916,446	Nov. 4, 1975
B 333,876	3,921,208	Nov 18, 1975	B 353,387	3,924,404	Dec. 9, 1975
B 333,928	3,927,172	Dec 16, 1975	B 353,546	3,913,273	Oct 21, 1975
B 334,251	3,924,719	Dec 9, 1975	B 354,008	3,925,081	Dec. 9, 1975
B 334,868	3,919,469	Nov 11, 1975	B 354,098	3,925,547	Dec 9, 1975
B 334,985	3,923,912	Dec 2, 1975	B 354,145	3,927,279	Dec 16, 1975
B 335,670	3,928,686	Dec 23, 1975	B 354,296	3,914,580	Oct 21, 1975
B 335,741	3,925,615	Dec 9, 1975	B 354,510	3,928,658	Dec 23, 1975
B 335,773	3,920,953	Nov 18, 1975	B 354,889	3,913,204	Oct 21, 1975
B 336,129	3,923,606	Dec 2, 1975	B 354,979	3,914,251	Oct 21, 1975
B 336,243	3,925,422	Dec 9, 1975	B 355,095	3,925,656	Dec 9, 1975
B 336,345	3,925,179	Dec 9, 1975	B 355,269	3,914,561	Oct 21, 1975
B 336,652	3,914,211	Oct 21, 1975	B 355,510	3,913,704	Oct 21, 1975
B 336,902	3,918,897	Nov 11, 1975	B 355,595	3,925,649	Dec. 9, 1975
B 336,946	3,919,425	Nov 11, 1975	B 355,876	3,925,685	Dec 9, 1975
B 336,978	3,923,968	Dec 2, 1975	B 356,032	3,928,636	Dec 23, 1975
B 337,235	3,919,386	Nov 11, 1975	B 356,253	3,925,025	Dec 9, 1975
B 337,409	3,925,258	Dec 9, 1975	B 356,602	3,927,393	Dec 16, 1975
B 337,442	3,913,658	Oct 21, 1975	B 356,724	3,924,586	Dec 9, 1975
B 337,703	3,914,690	Oct 21, 1975	B 357,039	3,924,406	Dec 9, 1975
B 337,787	3,923,506	Dec. 2, 1975	B 357,057	3,913,738	Oct 21, 1975
B 339,059	3,924,822	Dec 9, 1975	B 357,131	3,924,453	Dec. 9, 1975
B 339,218	3,925,121	Dec 9, 1975	B 357,402	3,914,180	Oct 21, 1975
B 339,699	3,933,527	Jan 20, 1976	B 357,682	3,924,973	Dec 9, 1975
B 339,838	3,930,221	Dec 30, 1975	B 357,803	3,919,470	Nov 11, 1975
B 340,212	3,922,645	Nov 25, 1975	B 358,174	3,924,958	Dec 9, 1975
B 340,833	3,925,208	Dec 9, 1975	B 358,244	3,913,411	Oct 21, 1975
B 341,579	3,913,363	Oct 21, 1975	B 358,311	3,923,561	Dec 2, 1975
B 342,084	3,928,694	Dec 23, 1975	B 358,939	3,924,713	Dec 9, 1975
B 342,423	3,925,334	Dec 9, 1975	B 359,174	3,914,117	Oct 21, 1975
B 342,886	3,923,507	Dec 2, 1975	B 359,187	3,924,525	Dec 9, 1975
B 343,136	3,919,453	Nov 11, 1975	B 359,540	3,915,235	Oct 28, 1975
B 343,240	3,925,693	Dec 9, 1975	B 359,740	3,936,212	Feb 3, 1976
B 343,506	3,916,021	Oct 28, 1975	B 359,791	3,929,430	Dec 30, 1975
B 343,577	3,921,165	Nov 18, 1975	B 359,825	3,921,344	Nov 25, 1975
B 344,203	3,928,719	Dec 23, 1975	B 359,946	3,914,132	Oct 21, 1975
B 344,479	3,924,042	Dec 2, 1975	B 359,947	3,914,653	Oct 21, 1975
B 345,060	3,916,018	Oct 28, 1975	B 360,208	3,923,750	Dec 2, 1975
B 345,384	3,916,146	Oct 28, 1975	B 360,296	3,916,720	Nov 4, 1975

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DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 360,719	3,915,715	Oct 28, 1975	B 382,290	3,924,717	Dec 9, 1975
B 360,910	3,925,696	Dec 9, 1975	B 382,783	3,919,527	Nov 11, 1975
B 361,265	3,923,569	Dec 2, 1975	B 382,798	3,924,435	Dec 9, 1975
B 361,347	3,914,642	Oct 21, 1975	B 382,840	3,922,007	Nov 25, 1975
B 361,443	3,927,405	Dec 16, 1975	B 383,465	3,927,412	Dec 16, 1975
B 361,569	3,914,554	Oct 21, 1975	B 383,581	3,925,318	Dec 9, 1975
B 361,604	3,922,702	Nov 25, 1975	B 383,852	3,914,246	Oct 21, 1975
B 361,734	3,915,764	Oct 28, 1975	B 384,499	3,925,135	Dec 9, 1975
B 361,743	4,035,255	July 12, 1977	B 384,658	3,913,452	Oct 21, 1975
B 361,744	4,035,254	July 12, 1977	B 384,773	3,915,416	Oct 28, 1975
B 362,589	3,914,012	Oct 21, 1975	B 385,210	3,913,406	Oct 21, 1975
B 363,205	3,923,744	Dec 2, 1975	B 386,403	3,924,895	Dec 9, 1975
B 363,337	3,928,639	Dec 23, 1975	B 386,592	3,925,305	Dec 9, 1975
B 363,457	3,922,595	Nov 25, 1975	B 387,039	3,924,510	Dec 9, 1975
B 363,674	3,929,716	Dec 30, 1975	B 387,331	3,913,701	Oct 21, 1975
B 363,892	3,913,395	Oct 21, 1975	B 387,363	3,927,378	Dec 16, 1975
B 363,962	3,921,826	Nov 25, 1975	B 387,687	3,918,151	Nov 11, 1975
B 364,022	3,913,499	Oct 21, 1975	B 387,761	3,914,245	Oct 21, 1975
B 364,163	3,916,092	Oct 28, 1975	B 387,790	3,925,380	Dec 9, 1975
B 364,241	3,916,668	Nov 4, 1975	B 387,818	3,918,935	Nov 11, 1975
B 364,334	3,924,670	Dec 9, 1975	B 388,580	3,923,712	Dec 2, 1975
B 364,528	3,919,510	Nov 11, 1975	B 389,070	3,914,171	Oct 21, 1975
B 364,786	3,921,673	Nov 25, 1975	B 389,295	3,914,631	Oct 21, 1975
B 364,910	3,925,335	Dec 9, 1975	B 389,327	3,924,504	Dec 9, 1975
B 365,371	3,988,181	Oct 26, 1976	B 389,639	3,914,626	Oct 21, 1975
B 365,490	3,918,527	Nov 11, 1975	B 389,726	3,921,010	Nov 18, 1975
B 365,834	3,914,702	Oct 21, 1975	B 389,807	3,922,623	Nov 25, 1975
B 365,841	3,925,628	Dec 9, 1975	B 389,932	3,913,268	Oct 21, 1975
B 365,855	3,917,258	Nov 4, 1975	B 389,933	3,913,267	Oct 21, 1975
B 366,287	3,924,946	Dec 9, 1975	B 390,679	3,913,668	Oct 21, 1975
B 366,402	3,928,053	Dec 23, 1975	B 390,732	3,913,878	Oct 21, 1975
B 366,589	3,914,719	Oct 21, 1975	B 390,738	4,035,343	July 12, 1977
B 367,021	3,914,752	Oct 21, 1975	B 391,184	3,914,214	Oct 21, 1975
B 367,040	3,924,775	Dec 9, 1975	B 391,210	3,914,220	Oct 21, 1975
B 367,661	3,914,158	Oct 21, 1975	B 391,437	3,915,416	Oct 28, 1975
B 367,739	3,923,648	Dec 2, 1975	B 391,509	3,925,175	Dec 9, 1975
B 367,812	3,924,789	Dec 9, 1975	B 391,675	3,916,017	Oct 28, 1975
B 368,081	3,924,691	Dec 9, 1975	B 392,154	3,923,809	Dec 2, 1975
B 368,387	3,924,923	Dec 9, 1975	B 392,242	3,926,636	Dec 16, 1975
B 368,392	3,913,812	Oct 21, 1975	B 392,696	3,916,175	Oct 28, 1975
B 368,397	3,914,677	Oct 21, 1975	B 392,732	3,914,903	Oct 21, 1975
B 368,862	3,925,549	Dec 9, 1975	B 392,753	3,916,341	Oct 28, 1975
B 369,563	3,924,449	Dec 9, 1975	B 392,894	3,914,763	Oct 21, 1975
B 369,607	3,923,786	Dec 2, 1975	B 393,163	3,914,535	Oct 21, 1975
B 369,997	3,913,533	Oct 21, 1975	B 393,347	3,985,800	Oct 12, 1976
B 370,453	3,964,101	Jun 15, 1976	B 393,970	3,914,638	Oct 21, 1975
B 370,706	3,925,242	Dec 9, 1975	B 394,088	3,914,740	Oct 21, 1975
B 371,073	3,930,135	Dec 30, 1975	B 394,188	3,924,591	Dec 9, 1975
B 371,085	3,923,783	Dec 2, 1975	B 394,300	3,914,159	Oct 21, 1975
B 371,787	3,921,217	Nov 18, 1975	B 394,712	3,916,306	Oct 28, 1975
B 371,805	3,914,433	Oct 21, 1975	B 395,478	3,922,577	Nov 25, 1975
B 371,836	3,923,541	Dec 2, 1975	B 395,496	3,919,435	Nov 11, 1975
B 372,823	3,924,660	Dec 9, 1975	B 395,671	3,920,418	Nov 18, 1975
B 373,051	3,914,162	Oct 21, 1975	B 395,889	3,913,190	Oct 21, 1975
B 373,297	3,924,436	Dec 9, 1975	B 396,025	3,913,869	Oct 21, 1975
B 373,326	3,920,433	Nov 18, 1975	B 396,551	3,921,929	Nov 25, 1975
B 373,428	3,915,511	Oct 28, 1975	B 397,027	3,923,736	Dec 2, 1975
B 375,220	3,920,417	Nov 18, 1975	B 397,527	3,913,488	Oct 21, 1975
B 375,652	3,921,303	Nov 25, 1975	B 397,990	3,914,848	Oct 28, 1975
B 376,504	3,914,570	Oct 21, 1975	B 398,262	3,913,481	Oct 21, 1975
B 376,654	3,922,513	Nov 25, 1975	B 398,551	3,924,924	Dec 9, 1975
B 376,742	3,924,392	Dec 9, 1975	B 398,597	3,913,743	Oct 21, 1975
B 376,799	3,913,955	Oct 21, 1975	B 398,625	3,920,996	Nov 18, 1975
B 377,172	3,918,255	Nov 11, 1975	B 399,292	3,914,810	Oct 28, 1975
B 377,683	3,924,433	Dec 9, 1975	B 399,304	3,919,567	Nov 11, 1975
B 377,833	3,913,884	Oct 21, 1975	B 399,349	3,925,694	Dec 9, 1975
B 377,869	3,917,002	Nov 4, 1975	B 399,766	3,915,667	Oct 28, 1975
B 378,621	3,923,840	Dec 2, 1975	B 400,080	3,925,163	Dec 9, 1975
B 379,038	3,923,994	Dec 2, 1975	B 400,293	3,923,719	Dec 2, 1975
B 379,172	3,914,379	Oct 21, 1975	B 400,310	3,915,507	Oct 28, 1975
B 379,282	3,913,462	Oct 21, 1975	B 401,133	3,924,443	Dec 9, 1975
B 379,955	3,913,157	Oct 21, 1975	B 401,992	3,924,898	Dec 9, 1975
B 380,014	3,921,915	Nov 25, 1975	B 402,065	3,925,413	Dec 9, 1975
B 380,141	3,925,161	Dec 9, 1975	B 402,555	3,914,688	Oct 21, 1975
B 380,310	3,921,048	Nov 18, 1975	B 403,140	3,913,486	Oct 21, 1975
B 380,312	3,913,953	Oct 21, 1975	B 403,355	3,913,352	Oct 21, 1975
B 380,338	3,924,873	Dec 9, 1975	B 403,990	3,914,684	Oct 21, 1975
B 380,446	3,923,836	Dec 2, 1975	B 403,996	3,916,016	Oct 28, 1975
B 380,900	3,913,307	Oct 21, 1975	B 404,290	3,924,918	Dec 9, 1975
B 380,926	3,925,095	Dec 9, 1975	B 404,437	3,915,200	Oct 28, 1975
B 381,074	3,919,583	Nov 11, 1975	B 405,136	3,915,565	Oct 28, 1975
B 381,632	3,914,732	Oct 21, 1975	B 405,137	3,915,566	Oct 28, 1975
B 381,847	3,921,152	Nov 18, 1975	B 405,160	3,924,821	Dec 9, 1975
B 382,018	3,929,742	Dec 30, 1975	B 405,248	3,926,294	Dec 16, 1975
B 382,021	3,913,212	Oct 21, 1975	B 405,305	3,922,111	Nov 25, 1975
B 382,261	3,914,991	Oct 28, 1975	B 405,360	3,913,403	Oct 21, 1975

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER TRIAL VOLUNTARY PROTEST PROGRAM

JANUARY 28, 1975 NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	ISSUE DATE
B 405,495	3,924,577	Dec 9, 1975	B 424,415	3,919,458	Nov 11, 1975
B 405,938	3,920,109	Nov 18, 1975	B 424,462	3,920,522	Nov 18, 1975
B 406,065	3,914,199	Oct 21, 1975	B 424,572	3,924,979	Dec 9, 1975
B 406,357	3,924,529	Dec 9, 1975	B 424,748	3,924,395	Dec. 9, 1975
B 406,800	3,952,708	Apr 27, 1976	B 425,035	3,914,025	Oct 21, 1975
B 407,357	3,924,614	Dec 9, 1975	B 425,345	3,922,015	Nov 25, 1975
B 407,728	3,925,240	Dec 9, 1975	B 425,470	3,923,796	Dec 2, 1975
B 407,736	3,924,463	Dec 9, 1975	B 425,539	3,916,742	Nov 4, 1975
B 408,380	3,984,172	Oct 5, 1976	B 425,541	3,914,051	Oct 21, 1975
B 408,487	3,924,046	Dec 2, 1975	B 425,572	3,923,822	Dec 2, 1975
B 408,749	3,914,116	Oct 21, 1975	B 425,770	3,989,817	Nov 2, 1976
B 409,026	3,925,497	Dec 9, 1975	B 427,631	3,921,433	Nov 25, 1975
B 409,220	3,915,648	Oct 28, 1975	B 428,177	3,914,624	Oct 21, 1975
B 409,251	3,922,620	Nov 25, 1975	B 428,795	3,921,056	Nov 18, 1975
B 409,657	3,927,362	Dec 16, 1975	B 429,442	3,923,485	Dec 2, 1975
B 409,816	3,921,317	Nov 25, 1975	B 430,106	3,918,941	Nov 11, 1975
B 410,062	3,923,855	Dec 2, 1975	B 430,140	3,922,084	Nov 25, 1975
B 410,168	3,914,717	Oct 21, 1975	B 430,149	4,037,175	July 19, 1977
B 411,145	3,914,168	Oct 21, 1975	B 430,385	4,001,104	Jan 4, 1977
B 411,356	3,919,649	Nov 11, 1975	B 430,798	3,918,204	Nov 11, 1975
B 411,483	3,925,196	Dec 9, 1975	B 430,944	3,922,096	Nov 25, 1975
B 411,633	3,914,741	Oct 21, 1975	B 432,373	3,919,670	Nov 11, 1975
B 412,516	3,927,417	Dec 16, 1975	B 433,587	3,914,567	Oct 21, 1975
B 412,619	3,925,292	Dec 9, 1975	B 435,343	3,919,244	Nov 11, 1975
B 412,867	3,924,587	Dec 9, 1975	B 435,844	3,925,170	Dec 9, 1975
B 413,006	3,914,850	Oct 28, 1975	B 437,172	3,913,251	Oct 21, 1975
B 413,546	3,924,314	Dec 9, 1975	B 437,173	3,924,627	Dec 9, 1975
B 414,129	3,925,484	Dec 9, 1975	B 437,195	3,914,618	Oct 21, 1975
B 414,288	3,925,537	Dec 9, 1975	B 437,450	3,922,479	Nov 25, 1975
B 415,113	3,915,717	Oct 28, 1975	B 438,053	3,916,013	Oct 28, 1975
B 415,124	3,915,944	Oct 28, 1975	B 438,706	3,925,050	Dec 9, 1975
B 415,845	3,925,076	Dec 9, 1975	B 439,168	3,919,676	Nov 11, 1975
B 415,847	3,914,208	Oct 21, 1975	B 439,669	3,921,499	Nov 25, 1975
B 415,957	3,925,635	Dec 9, 1975	B 440,898	3,921,789	Nov 25, 1975
B 415,977	3,927,359	Dec 16, 1975	B 441,024	3,913,629	Oct 21, 1975
B 416,598	3,923,473	Dec 2, 1975	B 441,416	3,913,851	Oct 21, 1975
B 416,710	3,923,746	Dec 2, 1975	B 442,280	3,914,054	Oct. 21, 1975
B 416,832	3,924,975	Dec 9, 1975	B 442,859	3,918,570	Nov 11, 1975
B 416,933	3,924,968	Dec 9, 1975	B 442,919	3,925,483	Dec 9, 1975
B 417,299	3,918,235	Nov 11, 1975	B 444,614	3,927,996	Dec 23, 1975
B 418,121	3,925,023	Dec 9, 1975	B 445,471	3,914,711	Oct. 21, 1975
B 418,153	3,925,251	Dec 9, 1975	B 445,740	3,923,612	Dec 2, 1975
B 418,302	3,913,252	Oct 21, 1975	B 447,417	4,024,727	May 24, 1977
B 419,327	3,921,197	Nov 18, 1975	B 448,571	3,924,760	Dec 9, 1975
B 419,481	3,924,970	Dec 9, 1975	B 449,647	3,916,797	Nov 4, 1975
B 420,016	3,914,572	Oct 21, 1975	B 450,499	3,920,526	Nov 18, 1975
B 420,148	3,927,414	Dec 16, 1975	B 450,546	3,924,417	Dec 9, 1975
B 420,514	3,923,929	Dec 2, 1975	B 450,927	3,913,844	Oct 21, 1975
B 420,568	3,925,069	Dec 9, 1975	B 455,520	3,922,543	Nov 25, 1975
B 421,026	3,914,785	Oct 21, 1975	B 455,775	3,914,356	Oct 21, 1975
B 421,362	3,924,817	Dec 9, 1975	B 456,346	3,914,531	Oct 21, 1975
B 421,383	3,925,047	Dec 9, 1975	B 459,425	3,928,773	Dec 23, 1975
B 421,797	3,914,023	Oct 21, 1975	B 461,872	3,919,586	Nov 11, 1975
B 422,399	3,928,656	Dec 23, 1975	B 467,684	3,915,119	Oct 28, 1975
B 422,467	3,924,804	Dec 9, 1975	B 468,198	3,925,340	Dec 9, 1975
B 422,949	3,921,873	Nov 25, 1975			

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 48,560	4,002,772	Mar 30, 1976	Jan 11, 1977	B 371,912	3,995,738	Mar 2, 1976	Dec 7, 1976
B 54,859	4,000,101	Feb 17, 1976	Dec 28, 1976	B 372,016	3,989,685	Mar 9, 1976	Nov 2, 1976
B 59,512	3,999,216	Mar 16, 1976	Dec 21, 1976	B 372,232	4,000,967	Mar 16, 1976	Jan 4, 1977
B 66,272	4,014,978	Feb 24, 1976	Mar 29, 1977	B 372,722	3,998,925	Mar 9, 1976	Dec 21, 1976
B 71,613	4,008,393	Mar 16, 1976	Feb 15, 1977	B 373,354	3,989,870	Jan 27, 1976	Nov 2, 1976
B 73,017	4,001,879	Mar 9, 1976	Jan 4, 1977	B 374,553	4,008,394	Mar 30, 1976	Feb 15, 1977
B 78,315	3,982,192	Feb 10, 1976	Sep 21, 1976	B 374,588	3,985,899	Jan 27, 1976	Oct 12, 1976
B 79,099	3,982,177	Jan 13, 1976	Sep 21, 1976	B 376,749	4,014,856	Mar 30, 1976	Mar 29, 1977
B 97,259	3,999,614	Mar 9, 1976	Dec 28, 1976	B 378,513	3,981,780	Jan 27, 1976	Sep 21, 1976
B 105,006	4,007,074	Mar 23, 1976	Feb 8, 1977	B 378,760	4,001,477	Mar 9, 1976	Jan 4, 1977
B 111,130	4,001,386	Mar 16, 1976	Jan 4, 1977	B 379,177	3,981,976	Jan 27, 1976	Sep 21, 1976
B 141,968	4,013,442	Mar 30, 1976	Mar 22 1977	B 380,137	4,014,802	Mar 23, 1976	Mar 29 1977
B 150,142	3,981,767	Jan 27, 1976	Sep 21, 1976	B 381,006	4,009,447	Apr 6, 1976	Feb 22, 1977
B 159,570	4,036,870	Mar 23, 1976	July 19, 1977	B 381,709	3,984,587	Jan 13, 1976	Oct 5, 1976
B 160,045	3,983,446	Jan 13, 1976	Sep 28, 1976	B 381,985	3,990,775	Feb 3, 1976	Nov 9, 1976
B 160,099	3,987,221	Jan 13, 1976	Oct 19, 1976	B 382,120	4,013,639	Mar 23, 1976	Mar 22, 1977
B 163,463	3,981,659	Jan 27, 1976	Sep 21, 1976	B 383,697	4,008,211	Feb 17 1976	Feb 15 1977
B 167,470	4,001,101	Mar 2, 1976	Jan 4, 1977	B 384,225	3,998,523	Mar 16, 1976	Dec 21, 1976
B 181,208	4,001,391	Mar 9, 1976	Jan 4, 1977	B 384,330	3,985,613	Jan 27, 1976	Oct 12 1976
B 200,759	3,986,872	Feb 3, 1976	Oct 19, 1976	B 384,654	3,992,681	Feb 24, 1976	Nov 16, 1976
B 208,916	3,987,106	Jan 13, 1976	Oct 19, 1976	B 385,024	3,994,911	Feb 10, 1976	Nov 30, 1976
B 214,925	3,997,648	Mar 9, 1976	Dec 14, 1976	B 385,483	3,993,684	Feb 17 1976	Nov 23, 1976
B 231,416	4,000,054	Mar 30, 1976	Dec 28, 1976	B 385,631	3,982,923	Jan 27, 1976	Sep 28, 1976
B 236,266	4,013,624	Mar 23, 1976	Mar 22, 1977	B 386,257	3,981,915	Feb 3, 1976	Sep 21, 1976
B 236,342	4,001,182	Feb 10, 1976	Jan 4, 1977	B 386,673	3,993,717	Feb 3, 1976	Nov 23, 1976
B 248,240	3,983,556	Jan 13, 1976	Sep 28, 1976	B 386,828	3,992,440	Feb 3, 1976	Nov 16, 1976
B 257,143	4,000,111	Mar 16, 1976	Dec 28, 1976	B 387,337	D 243,157	Mar 16, 1976	Jan 25, 1977
B 270,274	3,982,223	Feb 17, 1976	Sep 21, 1976	B 388,675	4,012,459	Mar 30, 1976	Mar 15, 1977
B 270,351	3,997,893	Mar 30 1976	Dec 14, 1976	B 389,155	4,000,970	Mar 30, 1976	Jan 4 1977
B 271,743	4,001,195	Mar 16, 1976	Jan 4, 1977	B 389,304	3,986,829	Jan 27, 1976	Oct 19, 1976
B 276,026	3,992,405	Feb 3, 1976	Nov 16, 1976	B 390,031	3,985,799	Jan 13, 1976	Oct 12, 1976
B 279,415	4,000,697	Mar 16 1976	Jan 4, 1977	B 390,408	3,992,426	Feb 3, 1976	Nov 16, 1976
B 279,969	3,986,073	Jan 13, 1976	Oct 12, 1976	B 390,979	4,003,850	Mar 23 1976	Jan 18, 1977
B 281,162	4,009,481	Mar 23, 1976	Feb 22, 1977	B 391,473	3,988,370	Mar 2, 1976	Oct 26, 1976
B 283,941	3,995,313	Feb 3, 1976	Nov 30, 1976	B 391,797	3,988,046	Mar 9, 1976	Oct 26, 1976
B 288,757	4,001,072	Mar 30, 1976	Jan 4, 1977	B 391,828	4,014,933	Apr 6, 1976	Mar 29 1977
B 301,143	3,991,107	Jan 27, 1976	Nov 9, 1976	B 391,844	3,999,165	Mar 16 1976	Dec 21 1976
B 302,160	3,985,774	Feb 3, 1976	Oct 12, 1976	B 392,798	3,996,249	Mar 30, 1976	Dec 7, 1976
B 306,668	3,985,713	Feb 3, 1976	Oct 12, 1976	B 394,248	3,989,763	Jan 27, 1976	Nov 2 1976
B 307,698	3,993,763	Feb 3, 1976	Nov 23, 1976	B 394,350	3,982,200	Jan 13, 1976	Sep 21, 1976
B 308,659	3,981,947	Jan 27, 1976	Sep. 21, 1976	B 394,742	4,009,285	Apr 13 1976	Feb 22, 1977
B 311,450	3,988,976	Mar 9, 1976	Nov 2, 1976	B 395,554	3,998,156	Mar 9, 1976	Dec 21, 1976
B 311,779	4,013,481	Feb 10, 1976	Mar 22, 1977	B 395,978	4,001,085	Mar 2 1976	Jan 4, 1977
B 313,280	4,003,591	Apr 6, 1976	Jan 18, 1977	B 396,164	3,989,590	Feb 3, 1976	Nov 2, 1976
B 326,211	3,988,272	Mar 23, 1976	Oct 26, 1976	B 396,377	D 243,148	Apr 6, 1976	Jan 25, 1977
B 328,065	4,014,752	Mar 30, 1976	Mar 29, 1977	B 397,674	3,998,438	Mar 16, 1976	Dec 21, 1976
B 328,077	4,014,860	Apr 13, 1976	Mar 29, 1977	B 398,084	3,996,239	Feb 3, 1976	Dec 7, 1976
B 328,116	4,000,774	Mar 9, 1976	Jan 4, 1977	B 398,220	3,990,834	Feb 3, 1976	Nov 9, 1976
B 330,719	4,001,121	Mar 16, 1976	Jan 4, 1977	B 398,488	3,987,991	Feb 24, 1976	Oct 26 1976
B 330,736	3,996,299	Feb 3, 1976	Dec 7, 1976	B 399,098	3,997,665	Feb 24, 1976	Dec 14, 1976
B 332,442	4,001,231	Mar 30 1976	Jan 4, 1977	B 399,632	4,001,046	Mar 9, 1976	Jan 4, 1977
B 333,110	3,989,867	Mar 16, 1976	Nov 2, 1976	B 399,908	3,983,323	Jan 13, 1976	Sep 28, 1976
B 333,247	4,001,201	Mar 16, 1976	Jan 4, 1977	B 400,871	3,988,893	Feb 17, 1976	Nov 2, 1976
B 333,838	4,006,263	Mar 23, 1976	Feb 1, 1977	B 401,042	D 242,197	Mar 16, 1976	Nov 9, 1976
B 335,783	4,013,744	Mar 30, 1976	Mar 22, 1977	B 401,221	4,014,791	Apr 6, 1976	Mar 29, 1977
B 336,754	3,989,805	Mar 16, 1976	Nov 2, 1976	B 402,162	3,994,902	Mar 2 1976	Nov 30 1976
B 337,023	4,013,188	Mar 30, 1976	Mar 22, 1977	B 402,328	3,995,545	Apr 6 1976	Dec 7, 1976
B 337,823	4,002,746	Mar 23, 1976	Jan 11, 1977	B 402,553	3,983,219	Feb 17, 1976	Sep 28, 1976
B 339,194	3,982,215	Feb 3, 1976	Sep 21, 1976	B 402,657	4,013,665	Apr 6, 1976	Mar 22, 1977
B 339,446	4,001,067	Feb 24, 1976	Jan 4 1977	B 402,929	3,991,251	Feb 3, 1976	Nov 9 1976
B 340,170	4,000,444	Mar 30, 1976	Dec 28, 1976	B 403,076	4,014,917	Apr 20, 1976	Mar 29, 1977
B 344,669	4,013,655	Mar 16, 1976	Mar 22, 1977	B 403,243	3,996,232	Mar 30, 1976	Dec 7, 1976
B 347,661	3,999,218	Mar 16, 1976	Dec 21, 1976	B 403,326	4,001,212	Mar 23, 1976	Jan 4, 1977
B 348,433	3,984,405	Feb 3, 1976	Oct 5, 1976	B 403,477	3,995,315	Feb 3, 1976	Nov 30, 1976
B 349,370	3,989,684	Jan 27, 1976	Nov 2, 1976	B 403,507	3,982,095	Feb 10, 1976	Sep 21 1976
B 351,455	4,001,309	Feb 24, 1976	Jan 4, 1977	B 403,766	3,994,834	Feb 10, 1976	Nov 30, 1976
B 354,222	4,012,305	Mar 23, 1976	Mar 15, 1977	B 403,883	4,001,481	Mar 23, 1976	Jan 4, 1977
B 354,959	3,995,996	Feb 17, 1976	Dec 7, 1976	B 405,726	3,981,241	Jan 13, 1976	Sep 21, 1976
B 356,187	3,981,222	Jan 20, 1976	Sep 21, 1976	B 406,546	D 242,966	Mar 16, 1976	Jan 11, 1977
B 356,470	4,014,789	Mar 23 1976	Mar 29, 1977	B 407,205	4,000,966	Mar 16, 1976	Jan 4, 1977
B 357,526	4,001,319	Mar 23, 1976	Jan 4, 1977	B 407,737	3,992,546	Feb 3, 1976	Nov 16, 1976
B 358,260	3,989,661	Mar 30, 1976	Nov 2, 1976	B 407,812	4,010,086	Mar 23, 1976	Mar 1, 1977
B 358,427	3,989,896	Feb 3, 1976	Nov 2, 1976	B 408,123	4,014,887	Apr 13, 1976	Mar 29, 1977
B 359,768	4,013,684	Mar 30, 1976	Mar 22, 1977	B 409,848	3,983,270	Jan 27, 1976	Sep 28, 1976
B 359,901	3,981,729	Jan 13, 1976	Sep 21, 1976	B 410,074	4,001,303	Feb 24, 1976	Jan 4, 1977
B 361,954	4,014,753	Apr 6, 1976	Mar 29, 1977	B 410,694	3,995,530	Mar 23, 1976	Dec 7, 1976
B 363,565	4,004,821	Mar 30, 1976	Jan 25, 1977	B 411,471	3,982,933	Feb 17, 1976	Sep 28, 1976
B 364,797	3,996,131	Feb 17, 1976	Dec 7, 1976	B 411,624	4,001,205	Mar 16, 1976	Jan 4, 1977
B 367,092	4,014,920	Apr 13, 1976	Mar 29, 1977	B 411,765	3,993,428	Feb 24, 1976	Nov 23 1976
B 367,305	3,998,640	Mar 2, 1976	Dec 21, 1976	B 412,068	3,981,244	Jan 13 1976	Sep 21 1976
B 367,621	3,989,589	Feb 3, 1976	Nov 2, 1976	B 412,123	4,007,000	Mar 23, 1976	Feb 8, 1977
B 369,221	3,985,834	Feb 24, 1976	Oct 12, 1976	B 413,379	4,001,325	Mar 9 1976	Jan 4, 1977
B 369,373	4,013,683	Mar 23, 1976	Mar 22, 1977	B 414,028	3,993,738	Feb 17, 1976	Nov 23, 1976
B 369,379	4,013,754	Mar 30, 1976	Mar 22, 1977	B 414,266	3,993,614	Feb 10, 1976	Nov 23, 1976
B 370,309	3,989,640	Jan 20, 1976	Nov 2, 1976	B 414,481	3,982,979	Jan 20, 1976	Sep 28, 1976
B 371,095	4,005,074	Mar 23, 1976	Jan 25, 1977	B 414,971	D 242,208	Feb 10, 1976	Nov 9, 1976
B 371,635	4,010,290	Mar 23, 1976	Mar 1, 1977	B 415,021	3,994,173	Mar 2 1976	Nov 30, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 415,122	3,997,563	Feb 10, 1976	Dec 14, 1976	B 440,548	4,001,271	Mar 16, 1976	Jan 4, 1977
B 415,590	4,009,317	Mar 23, 1976	Feb 22, 1977	B 440,632	4,014,955	Apr 13, 1976	Mar 29, 1977
B 416,257	4,001,335	Mar 16, 1976	Jan 4, 1977	B 440,633	4,000,116	Feb 10, 1976	Dec 28, 1976
B 416,589	3,990,363	Jan 27, 1976	Nov 9, 1976	B 440,858	3,993,670	Feb 3, 1976	Nov 23, 1976
B 417,014	3,981,851	Jan 13, 1976	Sep 21, 1976	B 441,543	4,014,755	Mar 23, 1976	Mar 29, 1977
B 417,164	4,001,360	Mar 2, 1976	Jan 4, 1977	B 441,605	4,026,862	Feb 3, 1976	May 31, 1977
B 417,349	3,985,076	Mar 9, 1976	Oct 12, 1976	B 441,723	3,988,249	Mar 16, 1976	Oct 26, 1976
B 417,498	4,013,471	Mar 23, 1976	Mar 22, 1977	B 441,789	4,001,449	Mar 30, 1976	Jan 4, 1977
B 418,489	3,989,592	Jan 13, 1976	Nov 2, 1976	B 442,163	D 242,192	Mar 16, 1976	Nov 9, 1976
B 419,173	3,999,728	Mar 9, 1976	Dec 28, 1976	B 442,295	4,000,477	Mar 16, 1976	Dec. 28, 1976
B 419,582	3,989,681	Mar 2, 1976	Nov 2, 1976	B 442,431	4,011,260	Mar 23, 1976	Mar 8, 1977
B 420,176	4,001,017	Mar 16, 1976	Jan 4, 1977	B 442,810	3,997,533	Feb 24, 1976	Dec 14, 1976
B 420,321	3,990,645	Mar 30, 1976	Nov 9, 1976	B 442,866	3,982,351	Feb 24, 1976	Sep 28, 1976
B 420,472	3,993,934	Feb 24, 1976	Nov 23, 1976	B 442,953	4,002,657	Mar 23, 1976	Jan 11, 1977
B 421,373	4,001,326	Mar 23, 1976	Jan 4, 1977	B 442,970	3,989,890	Feb 3, 1976	Nov 2, 1976
B 421,608	4,013,806	Mar 23, 1976	Mar 22, 1977	B 443,163	3,981,242	Feb 3, 1976	Sep 21, 1976
B 421,975	3,994,693	Mar 2, 1976	Nov 30, 1976	B 443,446	D 242,494	Apr 6, 1976	Nov 23, 1976
B 422,063	3,994,835	Feb 3, 1976	Nov 30, 1976	B 443,563	3,996,204	Feb 24, 1976	Dec 7, 1976
B 422,156	4,010,401	Mar 23, 1976	Mar 1, 1977	B 443,647	3,990,737	Feb 17, 1976	Nov 9, 1976
B 423,365	3,996,186	Feb 17, 1976	Dec 7, 1976	B 443,712	3,982,233	Jan 27, 1976	Sep 21, 1976
B 423,404	3,990,958	Mar 2, 1976	Nov 9, 1976	B 444,078	4,014,854	Mar 23, 1976	Mar 29, 1977
B 423,441	3,997,137	Feb 17, 1976	Dec 14, 1976	B 444,294	4,013,634	Mar 30, 1976	Mar 22, 1977
B 423,867	3,990,844	Feb 3, 1976	Nov 9, 1976	B 444,437	3,995,171	Mar 9, 1976	Nov 30, 1976
B 423,883	3,986,871	Jan 27, 1976	Oct 19, 1976	B 445,166	4,001,252	Mar 2, 1976	Jan 4, 1977
B 424,354	D 242,416	Feb 10, 1976	Nov 23, 1976	B 445,459	3,988,889	Feb 3, 1976	Nov 2, 1976
B 424,410	4,021,196	Mar 30, 1976	May 3, 1977	B 445,493	3,994,903	Mar. 2, 1976	Nov 30, 1976
B 424,989	3,990,569	Feb 3, 1976	Nov 9, 1976	B 445,690	3,999,584	Feb 3, 1976	Dec. 28, 1976
B 425,193	4,002,107	Mar 23, 1976	Jan 11, 1977	B 446,107	4,001,276	Mar 9, 1976	Jan 4, 1977
B 425,285	4,014,676	Apr 13, 1976	Mar 29, 1977	B 446,956	4,014,765	Apr 13, 1976	Mar 29, 1977
B 425,462	3,998,396	Mar 9, 1976	Dec 21, 1976	B 447,000	3,984,419	Feb 3, 1976	Oct 5, 1976
B 425,588	3,985,111	Jan 13, 1976	Oct 12, 1976	B 447,440	3,991,724	Feb 17, 1976	Nov 16, 1976
B 426,157	4,013,714	Mar 23, 1976	Mar 22, 1977	B 449,892	3,997,919	Mar 23, 1976	Dec 14, 1976
B 426,227	3,999,028	Mar 2, 1976	Dec 21, 1976	B 449,988	4,014,794	Mar 30, 1976	Mar 29, 1977
B 426,266	3,998,839	Mar 2, 1976	Dec 21, 1976	B 450,196	3,997,701	Feb. 10, 1976	Dec 14, 1976
B 426,274	4,014,949	Jan 20, 1976	Mar 29, 1977	B 450,413	4,007,463	Mar 23, 1976	Feb 8, 1977
B 426,424	3,993,742	Feb 3, 1976	Nov 23, 1976	B 450,521	3,982,838	Feb 17, 1976	Sep 28, 1976
B 426,639	3,992,539	Feb 3, 1976	Nov 16, 1976	B 450,701	3,991,084	Mar 16, 1976	Nov 9, 1976
B 426,819	3,995,868	Feb 17, 1976	Dec 7, 1976	B 450,708	3,989,724	Mar 9, 1976	Nov 2, 1976
B 427,883	3,982,277	Jan 20, 1976	Sep 21, 1976	B 450,870	3,998,951	Mar 16, 1976	Dec 21, 1976
B 427,946	4,006,161	Mar 23, 1976	Feb 1, 1977	B 450,967	3,983,055	Jan 13, 1976	Sep 28, 1976
B 428,103	4,000,211	Feb 10, 1976	Dec 28, 1976	B 451,248	3,997,758	Mar 2, 1976	Dec. 14, 1976
B 428,271	3,987,415	Mar 23, 1976	Oct 19, 1976	B 451,308	3,991,037	Feb 17, 1976	Nov 9, 1976
B 428,408	3,995,252	Mar 2, 1976	Nov 30, 1976	B 451,396	4,000,450	Apr 13, 1976	Dec 28, 1976
B 428,877	3,984,649	Jan 27, 1976	Oct 5, 1976	B 451,438	Re 29,066	Mar 2, 1976	Dec 7, 1976
B 429,018	3,990,061	Feb 10, 1976	Nov 2, 1976	B 451,534	3,986,033	Jan. 13, 1976	Oct 12, 1976
B 429,027	4,001,260	Mar 23, 1976	Jan 4, 1977	B 452,034	4,002,367	Mar 23, 1976	Jan 11, 1977
B 429,157	3,990,628	Jan 27, 1976	Nov 9, 1976	B 452,138	4,004,278	Mar 23, 1976	Jan 18, 1977
B 429,434	3,989,223	Feb 17, 1976	Nov 2, 1976	B 452,293	4,014,726	Mar 30, 1976	Mar 29, 1977
B 430,157	3,992,465	Feb 17, 1976	Nov 16, 1976	B 452,501	4,001,111	Mar 16, 1976	Jan 4, 1977
B 430,172	3,982,563	Jan 13, 1976	Sep 28, 1976	B 452,672	3,981,602	Jan 13, 1976	Sep 21, 1976
B 430,213	4,013,514	Mar 30, 1976	Mar 22, 1977	B 452,879	4,001,089	Mar 16, 1976	Jan 4 1977
B 430,276	3,982,171	Jan 20, 1976	Sep 21, 1976	B 452,883	3,981,738	Jan 27, 1976	Sep 21, 1976
B 430,287	D 242,489	Feb 10, 1976	Nov 23, 1976	B 452,915	4,013,933	Mar 30, 1976	Mar 22, 1977
B 430,326	4,003,581	Mar 23, 1976	Jan 18, 1977	B 452,938	3,994,719	Feb 17, 1976	Nov 30, 1976
B 430,334	3,981,677	Jan 27, 1976	Sep 21, 1976	B 452,944	4,009,773	Mar 30, 1976	Mar 1, 1977
B 431,072	3,985,610	Jan 20, 1976	Oct 12, 1976	B 453,031	3,998,678	Mar 16, 1976	Dec 21, 1976
B 431,334	3,988,095	Mar 16, 1976	Oct 26, 1976	B 453,067	4,005,394	Mar 23, 1976	Jan 25, 1977
B 431,713	4,000,167	Feb 10, 1976	Dec 28, 1976	B 453,238	3,997,063	Mar 2, 1976	Dec 14, 1976
B 431,785	3,999,950	Feb 24, 1976	Dec 28, 1976	B 453,432	4,000,514	Mar 16, 1976	Dec 28, 1976
B 431,797	4,007,290	Mar 30, 1976	Feb 8, 1977	B 453,533	3,997,744	Feb 17, 1976	Dec. 14, 1976
B 432,049	3,995,123	Mar 23, 1976	Nov 30, 1976	B 453,616	3,987,376	Jan 27, 1976	Oct 19, 1976
B 432,140	3,999,163	Mar 23, 1976	Dec 21, 1976	B 453,759	3,989,790	Jan 27, 1976	Nov 2, 1976
B 432,265	4,013,480	Mar 23, 1976	Mar 22, 1977	B 453,960	4,014,701	Apr 13, 1976	Mar 29, 1977
B 432,593	4,003,404	Mar 30, 1976	Jan 18, 1977	B 454,283	3,995,153	Feb 3, 1976	Nov 30, 1976
B 432,969	3,997,017	Mar 2, 1976	Dec 14, 1976	B 454,833	4,008,733	Mar 30, 1976	Feb 22, 1977
B 432,991	3,991,669	Mar 2, 1976	Nov 16, 1976	B 455,425	3,990,060	Feb 3, 1976	Nov 2, 1976
B 433,094	3,987,768	Jan 27, 1976	Oct 26, 1976	B 455,481	3,991,092	Feb 24, 1976	Nov 9, 1976
B 433,707	4,013,594	Mar 23, 1976	Mar 22, 1977	B 455,486	4,001,353	Mar 16, 1976	Jan 4, 1977
B 433,892	4,016,061	Apr 6, 1976	Apr 5, 1977	B 455,686	4,001,156	Mar 2, 1976	Jan 4, 1977
B 433,930	4,012,324	Mar 23, 1976	Mar 15, 1977	B 455,759	3,984,242	Feb 24, 1976	Oct 5, 1976
B 434,206	3,994,610	Feb 3, 1976	Nov 30, 1976	B 455,806	3,998,919	Mar 23, 1976	Dec 21, 1976
B 434,441	D 242,849	Mar 16, 1976	Dec 28, 1976	B 456,069	3,998,991	Mar 9, 1976	Dec 21, 1976
B 435,481	4,000,892	Mar 9, 1976	Jan 4, 1977	B 456,148	3,984,269	Jan 13, 1976	Oct 5, 1976
B 435,570	4,000,908	Mar 16, 1976	Jan 4, 1977	B 456,153	3,997,992	Mar 9, 1976	Dec 21, 1976
B 435,617	4,001,234	Mar 16, 1976	Jan 4, 1977	B 456,384	4,014,859	Apr 6, 1976	Mar 29, 1977
B 436,724	3,991,856	Feb 24, 1976	Nov 16, 1976	B 456,579	3,993,715	Feb 10, 1976	Nov 23, 1976
B 437,209	4,001,193	Feb 3, 1976	Jan 4, 1977	B 456,869	4,001,277	Mar 9, 1976	Jan 4, 1977
B 437,559	3,993,287	Feb 3, 1976	Nov 23, 1976	B 456,900	3,996,262	Feb 3, 1976	Dec 7, 1976
B 437,596	3,985,638	Jan 27, 1976	Oct 12, 1976	B 456,905	4,013,431	Mar 23, 1976	Mar 22, 1977
B 437,894	4,001,015	Mar 2, 1976	Jan 4, 1977	B 457,547	3,996,397	Feb 17, 1976	Dec 7, 1976
B 437,986	4,011,399	Apr 20, 1976	Mar 8, 1977	B 457,850	3,993,586	Feb 10, 1976	Nov 23, 1976
B 438,048	4,001,394	Mar 23, 1976	Jan 4, 1977	B 457,862	3,987,195	Jan 27, 1976	Oct 19, 1976
B 438,484	3,992,451	Feb 17, 1976	Nov 16, 1976	B 457,886	3,988,498	Jan 13, 1976	Oct 26, 1976
B 438,882	3,983,719	Feb 24, 1976	Oct 5, 1976	B 457,931	4,001,229	Mar 16, 1976	Jan 4, 1977
B 438,916	3,983,050	Jan 13, 1976	Sep 28, 1976	B 458,500	3,997,805	Feb 24, 1976	Dec 14, 1976
B 439,542	3,982,199	Jan 27, 1976	Sep 21, 1976	B 458,617	3,984,422	Feb 3, 1976	Oct 5, 1976
B 439,778	4,001,455	Feb 3, 1976	Jan 4, 1977	B 458,964	3,996,615	Mar 2, 1976	Dec 7, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE	DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 459,190	4,010,786	Mar 30, 1976	Mar 8, 1977	B 475,236	3,989,990	Feb 3, 1976	Nov 2, 1976
B 459,381	4,000,017	Mar 9, 1976	Dec 28, 1976	B 475,385	4,001,071	Mar 9, 1976	Jan 4, 1977
B 459,408	4,018,890	Mar 23, 1976	Apr 19, 1977	B 475,681	3,983,332	Jan 20, 1976	Sep 28, 1976
B 459,597	3,996,711	Feb 17, 1976	Dec 14, 1976	B 476,267	4,005,068	Apr 6, 1976	Jan 25, 1977
B 459,811	3,982,173	Jan 20, 1976	Sep 21, 1976	B 476,372	3,985,771	Feb 24, 1976	Oct 12, 1976
B 459,821	4,005,954	Mar 30, 1976	Feb 1, 1977	B 476,542	4,013,549	Mar 30, 1976	Mar 22, 1977
B 460,388	3,989,448	Jan 27, 1976	Nov 2, 1976	B 476,568	3,999,456	Mar 16, 1976	Dec 28, 1976
B 460,441	3,981,828	Jan 13, 1976	Sep 21, 1976	B 476,577	3,982,070	Jan 20, 1976	Sep 21, 1976
B 460,846	3,985,817	Feb. 24, 1976	Oct 12, 1976	B 476,681	3,986,181	Jan 13, 1976	Oct 12, 1976
B 461,184	3,992,482	Feb. 17, 1976	Nov 16, 1976	B 476,776	3,998,715	Mar 23, 1976	Dec 21, 1976
B 461,250	4,000,768	Mar 16, 1976	Jan 4, 1977	B 476,967	3,995,206	Mar 9, 1976	Nov 30, 1976
B 461,336	3,982,231	Feb 3, 1976	Sep 21, 1976	B 477,252	3,985,759	Jan 13, 1976	Oct 12, 1976
B 461,352	3,981,681	Jan 13, 1976	Sep 21, 1976	B 477,481	3,991,076	Feb 3, 1976	Nov 9, 1976
B 461,685	4,013,661	Mar 30, 1976	Mar 22, 1977	B 477,584	D 242,855	Apr 6, 1976	Dec 28, 1976
B 461,752	4,016,541	Apr 20, 1976	Apr 5, 1977	B 477,597	3,993,912	Feb 17, 1976	Nov 23, 1976
B 461,874	3,982,276	Jan 27, 1976	Sep. 21, 1976	B 477,892	4,010,355	Mar 30, 1976	Mar 1, 1977
B 462,030	4,009,342	Mar. 23, 1976	Feb 22, 1977	B 478,234	4,010,421	Mar 30, 1976	Mar 1, 1977
B 462,386	3,988,188	Jan 13, 1976	Oct 26, 1976	B 478,739	3,992,253	Feb 17, 1976	Nov 16, 1976
B 462,424	3,989,602	Feb 24, 1976	Nov 2, 1976	B 479,175	3,985,700	Feb 17, 1976	Oct 12, 1976
B 462,828	3,998,395	Mar 9, 1976	Dec 21, 1976	B 479,242	3,983,074	Feb 17, 1976	Sep. 28, 1976
B 462,893	3,984,253	Feb 24, 1976	Oct. 5, 1976	B 479,502	3,999,030	Mar 16, 1976	Dec 21, 1976
B 463,322	3,989,982	Jan 20, 1976	Nov 2, 1976	B 479,681	D 242,672	Mar 16, 1976	Dec 14, 1976
B 463,388	3,992,605	Feb 10, 1976	Nov 16, 1976	B 479,969	4,001,132	Mar. 9, 1976	Jan. 4, 1977
B 463,473	4,002,068	Mar 23, 1976	Jan 11, 1977	B 480,114	4,001,327	Mar 2, 1976	Jan 4, 1977
B 463,591	4,015,051	Mar 30, 1976	Mar 29, 1977	B 480,251	4,008,700	Mar 23, 1976	Feb 22, 1977
B 463,671	3,985,385	Jan 13, 1976	Oct 12, 1976	B 480,287	4,006,029	Mar 30, 1976	Feb 1, 1977
B 464,027	3,999,390	Mar 16, 1976	Dec 28, 1976	B 480,292	3,994,011	Mar 16, 1976	Nov 23, 1976
B 464,290	3,990,307	Feb 3, 1976	Nov 9, 1976	B 480,350	3,994,164	Feb 10, 1976	Nov 30, 1976
B 464,491	4,015,612	Mar 30, 1976	Apr 5, 1977	B 480,384	3,999,737	Mar 23, 1976	Dec 28, 1976
B 464,587	3,991,091	Feb 3, 1976	Nov 9, 1976	B 480,452	3,994,923	Feb 10, 1976	Nov 30, 1976
B 464,593	3,997,659	Mar 9, 1976	Dec. 14, 1976	B 480,473	3,995,608	Mar 2, 1976	Dec 7, 1976
B 465,145	3,981,148	Jan 27, 1976	Sep 21, 1976	B 480,604	3,985,251	Jan 13, 1976	Oct 12, 1976
B 465,202	3,989,757	Feb 24, 1976	Nov 2, 1976	B 480,625	3,996,227	Feb 24, 1976	Dec 7, 1976
B 465,393	3,987,390	Jan. 27, 1976	Oct 19, 1976	B 480,662	3,988,382	Mar 2, 1976	Oct 26, 1976
B 465,688	3,989,770	Jan. 27, 1976	Nov. 2, 1976	B 480,740	3,996,431	Mar 2, 1976	Dec 7, 1976
B 465,955	3,997,502	Feb. 3, 1976	Dec 14, 1976	B 480,749	3,999,207	Mar 9, 1976	Dec 21, 1976
B 466,304	4,007,095	Mar 23, 1976	Feb 8, 1977	B 480,987	4,001,459	Mar 30, 1976	Jan 4, 1977
B 466,318	3,999,115	Mar. 9, 1976	Dec. 21, 1976	B 481,048	3,998,542	Mar 16, 1976	Dec 21, 1976
B 466,390	3,983,349	Feb 24, 1976	Sep 28, 1976	B 481,190	4,013,468	Mar. 30, 1976	Mar 22, 1977
B 466,419	4,011,087	Mar. 23, 1976	Mar. 8, 1977	B 481,600	3,981,235	Jan 27, 1976	Sep 21, 1976
B 466,444	3,986,039	Jan 20, 1976	Oct 12, 1976	B 481,737	3,982,057	Jan 13, 1976	Sep 21, 1976
B 466,906	3,993,037	Mar 16, 1976	Nov 23, 1976	B 481,778	4,001,385	Mar 30, 1976	Jan 4, 1977
B 466,929	3,991,195	Jan 27, 1976	Nov. 9, 1976	B 481,930	3,992,717	Feb 24, 1976	Nov 16, 1976
B 467,250	3,997,428	Feb 3, 1976	Dec. 14, 1976	B 481,989	4,008,337	Mar 23, 1976	Feb 15, 1977
B 467,328	3,997,599	Mar 9, 1976	Dec. 14, 1976	B 482,058	4,001,398	Mar. 2, 1976	Jan 4 1977
B 467,412	3,981,265	Jan 13, 1976	Sep 21, 1976	B 482,660	3,995,026	Feb 10, 1976	Nov 16, 1976
B 467,486	3,991,725	Mar 16, 1976	Nov 16, 1976	B 482,709	3,985,733	Feb 24, 1976	Oct 12, 1976
B 467,971	3,983,453	Jan. 13, 1976	Sep. 28, 1976	B 482,907	3,984,811	Jan. 20, 1976	Oct 5 1976
B 468,052	3,988,335	Feb. 10, 1976	Oct 26, 1976	B 483,247	4,001,889	Apr 13, 1976	Jan 4, [illegible]
B 468,100	3,995,107	Mar. 9, 1976	Nov. 30, 1976	B 483,256	3,981,723	Feb. 10, 1976	Sep 21, 1976
B 468,330	4,001,475	Mar. 16, 1976	Jan 4, 1977	B 483,268	3,995,215	Mar 9, 1976	Nov 30, 1976
B 468,350	3,981,922	Jan 13, 1976	Sep 21, 1976	B 483,606	3,986,990	Jan 27, 1976	Oct 19, 1976
B 468,421	4,014,739	Mar. 30, 1976	Mar. 29, 1977	B 483,615	3,988,637	Jan. 27, 1976	Oct 26, 1976
B 468,603	4,003,839	Mar. 23, 1976	Jan 18, 1977	B 483,746	4,014,923	Mar 23, 1976	Mar 29, 1977
B 469,036	4,005,926	Mar 16, 1976	Feb 1, 1977	B 483,762	3,993,608	Feb 10, 1976	Nov 23, 1976
B 469,468	4,000,220	Mar. 16, 1976	Dec 28, 1976	B 483,865	3,985,693	Jan 13, 1976	Oct 12, 1976
B 469,947	3,984,153	Jan. 20, 1976	Oct. 5, 1976	B 484,029	3,983,558	Feb 10, 1976	Sep 28, 1976
B 470,170	3,986,410	Jan. 13, 1976	Oct 19, 1976	B 484,067	3,992,374	Feb 17, 1976	Nov 16, 1976
B 470,305	4,014,043	Apr. 6, 1976	Mar 22, 1977	B 484,068	3,994,937	Mar 2, 1976	Nov 30, 1976
B 470,348	3,981,929	Jan. 13, 1976	Sep 21, 1976	B 484,121	3,997,770	Mar 16, 1976	Dec 14, 1976
B 470,576	3,997,507	Feb 24, 1976	Dec 14, 1976	B 484,269	4,000,159	Feb. 10, 1976	Dec 28, 1976
B 470,601	3,985,655	Mar 9, 1976	Oct 12, 1976	B 484,332	3,986,540	Mar 2, 1976	Oct 19, 1976
B 470,798	3,987,480	Jan 20, 1976	Oct 19, 1976	B 484,365	3,983,578	Jan. 27, 1976	Sep 28, 1976
B 470,853	4,002,101	Mar. 23, 1976	Jan 11, 1977	B 484,419	4,001,292	Mar 9, 1976	Jan 4, 1977
B 470,899	3,996,441	Mar 2, 1976	Dec 7, 1976	B 484,437	4,013,740	Mar 30, 1976	Mar 22, 1977
B 470,900	4,001,213	Mar 2, 1976	Jan. 4, 1977	B 484,482	3,994,017	Mar. 23, 1976	Nov 23, 1976
B 470,945	4,014,848	Apr. 13, 1976	Mar. 29, 1977	B 484,769	3,999,498	Mar 16, 1976	Dec 28, 1976
B 471,116	4,001,318	Feb. 17, 1976	Jan 4, 1977	B 485,051	3,992,418	Feb 17, 1976	Nov 16, 1976
B 471,221	3,981,974	Jan. 13, 1976	Sep. 21, 1976	B 485,060	3,983,067	Feb 17, 1976	Sep. 28, 1976
B 471,405	3,993,576	Feb. 10, 1976	Nov 23, 1976	B 485,169	3,989,791	Mar. 16, 1976	Nov. 2, 1976
B 471,494	3,993,660	Mar. 16, 1976	Nov 23, 1976	B 485,188	4,001,170	Mar 16, 1976	Jan 4, 1977
B 471,579	3,985,689	Jan 13, 1976	Oct 12, 1976	B 485,401	3,985,859	Jan 27, 1976	Oct 12, 1976
B 471,617	3,994,871	Feb 10, 1976	Nov 30, 1976	B 485,575	3,996,565	Feb. 24, 1976	Dec 7, 1976
B 471,681	4,012,844	Apr 13, 1976	Mar 22, 1977	B 485,926	4,006,357	Mar 23, 1976	Feb 1, 1977
B 471,735	3,989,408	Feb 3, 1976	Nov 2, 1976	B 485,972	4,017,472	Mar 23, 1976	Apr 12, 1977
B 471,836	4,000,150	Feb 24, 1976	Dec 28, 1976	B 486,280	3,983,130	Feb. 3, 1976	Sep 28, 1976
B 472,241	3,992,453	Feb 17, 1976	Nov 16, 1976	B 486,614	3,995,835	Feb. 17, 1976	Dec 7, 1976
B 472,256	3,985,789	Jan 13, 1976	Oct 12, 1976	B 486,678	4,001,273	Mar. 2, 1976	Jan 4, 1977
B 472,284	3,982,078	Jan 13, 1976	Sep 21, 1976	B 486,828	3,989,651	Mar 2, 1976	Nov 2, 1976
B 472,591	4,013,029	Apr. 6, 1976	Mar 22, 1977	B 487,062	D 241,256	Feb. 10, 1976	Nov 9, 1976
B 472,760	4,001,330	Apr 13, 1976	Jan 4, 1977	B 487,078	4,012,895	Mar. 30, 1976	Mar. 22, 1977
B 473,039	3,985,747	Feb 10, 1976	Oct. 12, 1976	B 487,133	3,989,826	Jan. 27, 1976	Nov 2, 1976
B 473,040	3,985,738	Feb. 10, 1976	Oct. 12, 1976	B 487,260	3,990,610	Jan. 27, 1976	Nov 9, 1976
B 473,813	3,989,071	Mar 9, 1976	Nov 2, 1976	B 487,411	3,983,579	Feb. 24, 1976	Sep 28, 1976
B 473,972	3,984,043	Jan 13, 1976	Oct. 5, 1976	B 487,423	3,998,810	Mar. 2, 1976	Dec 21, 1976
B 474,573	3,988,375	Jan. 20, 1976	Oct. 26, 1976	B 487,427	3,995,788	Mar 2, 1976	Dec. 7, 1976
B 474,747	3,997,704	Feb 24, 1976	Dec. 14, 1976	B 487,467	4,014,847	Apr 13, 1976	Mar 29, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 487,529	4,022,750	Mar 30, 1976	May 10, 1977
B 488,111	3,985,765	Jan 13, 1976	Oct 12, 1976
B 488,395	3,982,245	Jan 27, 1976	Sep 21, 1976
B 488,634	3,982,158	Jan 20, 1976	Sep 21, 1976
B 488,756	3,991,810	Mar 16, 1976	Nov 16, 1976
B 488,836	4,013,121	Mar 30, 1976	Mar 22, 1977
B 489,290	3,998,081	Feb 17, 1976	Dec 21, 1976
B 489,328	3,990,088	Jan 20, 1976	Nov 2, 1976
B 489,331	3,996,175	Feb 17, 1976	Dec 7, 1976
B 489,485	D 243,266	Apr 13, 1976	Feb 1, 1977
B 489,550	4,000,710	Mar 16, 1976	Jan 4, 1977
B 489,685	3,984,085	Feb 24, 1976	Oct 5, 1976
B 490,067	3,986,600	Jan 27, 1976	Oct 19, 1976
B 490,547	3,999,439	Feb 24, 1976	Dec 28, 1976
B 490,551	D 243,168	Apr 6, 1976	Jan 25, 1977
B 490,589	3,990,680	Feb 3, 1976	Nov 9, 1976
B 490,623	3,996,964	Mar 2, 1976	Dec 14, 1976
B 490,647	3,985,196	Feb 24, 1976	Oct 12, 1976
B 490,806	3,989,486	Feb 3, 1976	Nov 2, 1976
B 490,812	3,998,842	Mar 30, 1976	Dec 21, 1976
B 490,946	3,993,652	Feb 17, 1976	Nov 23, 1976
B 490,995	3,995,031	Feb 3, 1976	Nov 30, 1976
B 491,032	3,981,892	Feb 10, 1976	Sep 21, 1976
B 491,052	3,985,790	Mar 2, 1976	Oct 12, 1976
B 491,111	3,997,916	Feb 17, 1976	Dec 14, 1976
B 491,455	3,991,167	Feb 3, 1976	Nov 9, 1976
B 491,501	3,984,914	Jan 13, 1976	Oct 12, 1976
B 491,618	4,007,950	Mar 16, 1976	Feb 15, 1977
B 491,650	3,999,044	Mar 9, 1976	Dec 21, 1976
B 491,673	3,994,770	Feb 17, 1976	Nov 30, 1976
B 491,776	3,986,298	Mar 16, 1976	Oct 19, 1976
B 491,883	3,984,412	Feb 3, 1976	Oct 5, 1976
B 491,906	D 242,223	Feb 10, 1976	Nov 9, 1976
B 492,039	3,997,541	Feb 24, 1976	Dec 14, 1976
B 492,093	4,003,658	Mar 23, 1976	Jan 18, 1977
B 492,120	3,995,692	Feb 24, 1976	Dec 7, 1976
B 492,301	3,981,073	Jan 13, 1976	Sep 21, 1976
B 492,373	4,010,908	Mar 30, 1976	Mar 8, 1977
B 492,688	3,983,415	Jan 20, 1976	Sep 28, 1976
B 492,716	3,998,739	Mar 2, 1976	Dec 21, 1976
B 492,774	4,001,843	Mar 9, 1976	Jan 4, 1977
B 492,902	3,993,859	Feb 24, 1976	Nov 23, 1976
B 492,946	3,991,303	Jan 27, 1976	Nov 9, 1976
B 493,254	D 243,267	Apr 13, 1976	Feb 1, 1977
B 493,370	3,984,792	Mar 16, 1976	Oct 5, 1976
B 493,463	4,013,510	Mar 23, 1976	Mar 22, 1977
B 493,474	4,013,565	Mar 23, 1976	Mar 22, 1977
B 493,501	3,988,061	Feb 3, 1976	Oct 26, 1976
B 493,686	4,008,338	Mar 23, 1976	Feb 15, 1977
B 493,955	3,989,830	Mar 9, 1975	Nov 2, 1976
B 493,981	3,990,165	Mar 9, 1976	Nov 9, 1976
B 494,138	4,034,002	Mar 23, 1976	July 5, 1977
B 494,234	3,983,808	Feb 10, 1976	Oct 5, 1976
B 494,339	4,001,255	Mar 16, 1976	Jan 4, 1977
B 494,383	3,991,289	Feb 3, 1976	Nov 9, 1976
B 494,669	3,991,104	Feb 3, 1976	Nov 9, 1976
B 494,691	3,987,457	Mar 16, 1976	Oct 19, 1976
B 494,806	3,989,210	Feb 3, 1976	Nov 2, 1976
B 494,944	3,992,469	Feb 17, 1976	Nov 16, 1976
B 495,185	3,999,166	Mar 9, 1976	Dec 21, 1976
B 495,331	4,000,456	Mar 16, 1976	Dec 28, 1976
B 495,402	3,983,988	Feb 17, 1976	Oct 5, 1976
B 495,408	4,000,222	Feb 3, 1976	Dec 28, 1976
B 495,489	3,984,571	Feb 3, 1976	Oct 5, 1976
B 495,550	3,993,666	Feb 3, 1976	Nov 23, 1976
B 495,554	3,993,665	Feb 3, 1976	Nov 23, 1976
B 495,759	3,989,998	Feb 3, 1976	Nov 2, 1976
B 495,781	4,013,699	Mar 23, 1976	Mar 22, 1977
B 495,903	3,995,997	Feb 17, 1976	Dec 7, 1976
B 496,430	3,991,140	Feb 10, 1976	Nov 9, 1976
B 496,431	3,985,894	Jan 13, 1976	Oct 12, 1976
B 496,487	3,982,261	Jan 20, 1976	Sep 21, 1976
B 496,500	3,985,962	Feb 3, 1976	Oct 12, 1976
B 496,502	3,987,444	Jan 20, 1976	Oct 19, 1976
B 496,792	3,999,959	Feb 17, 1976	Dec 28, 1976
B 496,964	3,999,219	Apr 20, 1976	Dec 21, 1976
B 496,999	3,983,804	Jan 27, 1976	Oct 5, 1976
B 497,021	3,985,039	Jan 13, 1976	Oct 12, 1976
B 497,194	3,988,267	Feb 3, 1976	Oct 26, 1976
B 497,292	3,994,052	Feb 3, 1976	Nov 30, 1976
B 497,293	4,011,412	Mar 30, 1976	Mar 8, 1977
B 497,473	3,990,839	Feb 3, 1976	Nov 9, 1976
B 497,571	4,009,997	Mar 23, 1976	Mar 1, 1977
B 497,584	3,988,184	Feb. 24, 1976	Oct 26, 1976
B 497,702	3,996,589	Mar 2, 1976	Dec 7, 1976
B 497,780	3,997,500	Feb 24, 1976	Dec 14, 1976
B 497,853	3,987,934	Feb 17, 1976	Oct 26, 1976
B 497,890	D 243,091	Apr 6, 1976	Jan 18, 1977
B 497,960	3,991,325	Jan 20, 1976	Nov 9, 1976
B 498,208	4,001,480	Apr 13, 1976	Jan 4, 1977
B 498,288	4,013,657	Mar 23, 1976	Mar 22, 1977
B 498,775	3,993,868	Mar 2, 1976	Nov 23, 1976
B 498,205	3,989,611	Feb 10, 1976	Nov 2, 1976
B 498,500	3,982,241	Jan 20, 1976	Sep 21, 1976
B 498,775	3,993,868	Mar 2, 1976	Nov 23, 1976
B 498,820	3,996,670	Mar 9, 1976	Dec 14, 1976
B 498,951	3,996,907	Mar 2, 1976	Dec 14, 1976
B 499,171	3,985,192	Jan 27, 1976	Oct 12, 1976
B 499,209	3,995,907	Feb 24, 1976	Dec 7, 1976
B 499,227	3,981,344	Jan 27, 1976	Sep 21, 1976
B 499,324	4,001,375	Mar 16, 1976	Jan 4, 1977
B 499,352	3,981,391	Jan 27, 1976	Sep 21, 1976
B 499,370	4,013,544	Mar 30, 1976	Mar 22, 1977
B 499,718	3,990,058	Jan 27, 1976	Nov 2, 1976
B 499,786	4,000,663	Mar 16, 1976	Jan 4, 1977
B 500,171	3,997,262	Mar 30, 1976	Dec 14, 1976
B 500,176	3,995,316	Feb 3, 1976	Nov 30, 1976
B 500,408	D 242,721	Mar 16, 1976	Dec 14, 1976
B 500,945	3,996,817	Feb 24, 1976	Dec 14, 1976
B 500,959	4,014,853	Apr 13, 1976	Mar 29, 1977
B 500,981	3,984,681	Jan 27, 1976	Oct 5, 1976
B 501,122	3,981,385	Feb 17, 1976	Sep 21, 1976
B 501,181	3,984,761	Feb 10, 1976	Oct 5, 1976
B 501,253	3,994,015	Feb 3, 1976	Nov 23, 1976
B 501,317	3,985,643	Jan 13, 1976	Oct 12, 1976
B 501,379	4,013,696	Mar 30, 1976	Mar 22, 1977
B 501,415	3,982,051	Jan 13, 1976	Sep 21, 1976
B 501,482	4,012,650	Jan 13, 1976	Mar 15, 1977
B 501,503	4,001,640	Mar 2, 1976	Jan 4, 1977
B 501,540	3,985,694	Jan 13, 1976	Oct 12, 1976
B 501,975	3,998,466	Mar 2, 1976	Dec. 21, 1976
B 501,993	3,981,606	Jan 13, 1976	Sep 21, 1976
B 502,151	3,998,614	Mar 23, 1976	Dec. 21, 1976
B 502,161	4,000,500	Mar 2, 1976	Dec. 28, 1976
B 502,289	3,982,274	Jan 13, 1976	Sep 21, 1976
B 502,381	D 242,231	Mar 16, 1976	Nov 9, 1976
B 502,540	3,983,698	Jan 13, 1976	Oct 5, 1976
B 502,571	D 242,433	Apr 6, 1976	Nov 23, 1976
B 502,589	3,989,652	Jan 27, 1976	Nov 2, 1976
B 502,652	3,989,186	Feb 24, 1976	Nov 2, 1976
B 502,667	3,991,431	Feb 24, 1976	Nov. 16, 1976
B 502,973	3,982,161	Jan 27, 1976	Sep 21, 1976
B 502,993	3,992,489	Feb 17, 1976	Nov 16, 1976
B 503,029	3,986,879	Jan. 27, 1976	Oct 19, 1976
B 503,345	4,001,235	Feb 24, 1976	Jan 4, 1977
B 503,371	4,009,401	Mar 30, 1976	Feb 22, 1977
B 503,436	3,988,819	Feb 24, 1976	Nov 2, 1976
B 503,456	4,007,702	Mar 23, 1975	Feb 15, 1977
B 503,521	3,999,646	Mar 16, 1976	Dec 28, 1976
B 503,579	3,989,680	Feb 10, 1976	Nov 2, 1976
B 503,618	3,997,782	Mar 9, 1976	Dec 14, 1976
B 503,742	3,989,756	Feb 17, 1976	Nov. 2, 1976
B 503,776	4,016,000	Mar 23, 1976	Apr 5, 1977
B 503,780	3,990,055	Mar 16, 1976	Nov 2, 1976
B 503,817	3,988,307	Jan 13, 1976	Oct 26, 1976
B 504,056	3,993,923	Feb 24, 1976	Nov 23, 1976
B 504,061	3,987,534	Mar 16, 1976	Oct 26, 1976
B 504,156	3,999,048	Mar 23, 1976	Dec. 21, 1976
B 504,169	3,981,219	Jan 13, 1976	Sep 21, 1976
B 504,404	3,996,499	Feb 24, 1976	Dec 7, 1976
B 504,405	4,007,401	Apr 13, 1976	Feb 8, 1977
B 504,439	3,999,398	Mar 16, 1976	Dec 28, 1976
B 504,503	3,999,210	Mar 9, 1976	Dec 21, 1976
B 504,582	4,005,138	Mar 30, 1976	Jan 25, 1977
B 504,778	3,986,650	Feb 24, 1976	Oct 19, 1976
B 504,877	3,997,564	Feb 24, 1976	Dec 14, 1976
B 504,899	3,991,273	Mar 9, 1976	Nov 9, 1976
B 505,126	3,981,745	Feb 10, 1976	Sep 21, 1976
B 505,221	4,013,627	Mar 30, 1976	Mar 22, 1977
B 505,582	4,001,659	Mar 23, 1976	Jan 4, 1977
B 505,689	3,987,631	Mar 2, 1976	Oct 26, 1976
B 505,813	3,985,175	Jan 13, 1976	Oct 12, 1976
B 506,134	3,991,147	Feb 10, 1976	Nov 9, 1976
B 506,148	3,988,319	Feb 3, 1976	Oct 26, 1976
B 506,167	3,990,652	Feb 10, 1976	Nov 9, 1976
B 506,286	3,982,085	Jan 20, 1976	Sep 21, 1976
B 506,461	3,987,348	Jan 20, 1976	Oct 19, 1976
B 506,566	3,985,402	Jan 20, 1976	Oct 12, 1976
B 506,624	3,999,695	Mar 9, 1976	Dec 28, 1976
B 506,648	3,994,857	Feb 3, 1976	Nov 30, 1976
B 506,744	3,981,176	Jan 13, 1976	Sep 21, 1976
B 506,760	4,012,835	Apr 13, 1976	Mar 22, 1977
B 506,839	4,005,389	Mar 23, 1976	Jan 25, 1977
B 506,840	4,002,928	Mar 23, 1976	Jan 11, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 506,916	3,986,140	Feb 3, 1976	Oct 12, 1976
B 506,926	3,993,232	Feb 17, 1976	Nov 23, 1976
B 507,087	3,991,389	Feb 17, 1976	Nov 9, 1976
B 507,131	4,000,499	Mar 2, 1976	Dec 28, 1976
B 507,166	4,014,738	Apr 13, 1976	Mar 29, 1977
B 507,396	3,995,167	Feb 10, 1976	Nov 30, 1976
B 507,476	3,994,680	Feb 10, 1976	Nov 30, 1976
B 507,647	3,982,240	Jan 27, 1976	Sep 21, 1976
B 508,118	3,992,283	Feb 17, 1976	Nov 16, 1976
B 508,119	3,992,285	Feb 17, 1976	Nov 16, 1976
B 508,369	3,985,847	Jan 13, 1976	Oct 12, 1976
B 508,639	4,004,194	Mar 23, 1976	Jan 18, 1977
B 508,817	3,989,891	Feb 3, 1976	Nov 2, 1976
B 508,878	3,994,117	Feb 3, 1976	Nov 30, 1976
B 508,940	3,981,321	Feb 17, 1976	Sep 21, 1976
B 508,961	3,987,477	Feb 3, 1976	Oct 19, 1976
B 509,043	3,996,767	Feb 24, 1976	Dec 14, 1976
B 509,165	3,999,155	Mar 2, 1976	Dec 21, 1976
B 509,185	3,989,996	Feb 3, 1976	Nov. 2, 1976
B 509,238	3,982,399	Feb 24, 1976	Sep. 28, 1976
B 509,474	3,997,260	Feb 17, 1976	Dec 14, 1976
B 509,586	4,006,645	Feb 3, 1976	Feb 8, 1977
B 509,606	3,989,986	Feb 3, 1976	Nov 2, 1976
B 509,772	3,999,004	Mar 16, 1976	Dec 21, 1976
B 509,819	4,014,712	Apr 13, 1976	Mar 29, 1977
B 510,026	4,016,763	Apr 13, 1976	Apr 12, 1977
B 510,184	D 242,784	Apr 6, 1976	Dec 21, 1976
B 510,278	4,008,972	Mar 30, 1976	Feb 22, 1977
B 510,281	3,993,215	Mar 9, 1976	Nov 23, 1976
B 510,346	D 242,207	Feb 10, 1976	Nov 9, 1976
B 510,458	4,000,221	Feb 10, 1976	Dec 28, 1976
B 510,521	3,990,656	Mar 2, 1976	Nov 9, 1976
B 510,588	3,981,539	Jan 27, 1976	Sep 21, 1976
B 510,677	3,989,541	Feb 24, 1976	Nov 2, 1976
B 510,682	4,000,978	Mar 30, 1976	Jan 4, 1977
B 510,836	4,013,795	Mar 23, 1976	Mar 22, 1977
B 510,850	3,989,841	Feb 3, 1976	Nov 2, 1976
B 510,855	3,981,059	Jan 27, 1976	Sep 21, 1976
B 511,907	3,999,622	Mar 30, 1976	Dec 28, 1976
B 510,998	3,992,336	Feb 10, 1976	Nov 16, 1976
B 511,002	3,998,717	Mar 2, 1976	Dec 21, 1976
B 511,099	3,990,162	Feb 3, 1976	Nov 9, 1976
B 511,156	3,981,364	Jan 27, 1976	Sep 21, 1976
B 511,346	3,984,072	Jan 27, 1976	Oct 5, 1976
B 511,407	3,981,485	Feb 10, 1976	Sep 21, 1976
B 511,454	3,982,333	Feb 24, 1976	Sep 28, 1976
B 511,665	4,001,037	Mar 2, 1976	Jan 4, 1977
B 511,885	3,981,346	Jan 27, 1976	Sep 21, 1976
B 511,886	3,989,991	Feb 3, 1976	Nov 2, 1976
B 511,909	3,981,183	Feb 17, 1976	Sep 21, 1976
B 512,324	3,985,084	Feb 17, 1976	Oct 12, 1976
B 512,547	3,984,193	Jan 13, 1976	Oct 5, 1976
B 512,745	3,981,294	Jan 13, 1976	Sep. 21, 1976
B 512,779	4,014,897	Apr 13, 1976	Mar 29, 1977
B 512,818	3,997,363	Apr 6, 1976	Dec 14, 1976
B 512,849	3,982,141	Feb 3, 1976	Sep 21, 1976
B 512,964	3,995,279	Feb 10, 1976	Nov 30, 1976
B 513,014	3,991,113	Feb 10, 1976	Nov 9, 1976
B 513,027	3,995,143	Feb 17, 1976	Nov 30, 1976
B 513,134	4,006,764	Mar 23, 1976	Feb 8, 1977
B 513,280	3,988,211	Jan 20, 1976	Oct 26, 1976
B 513,368	3,982,138	Feb 3, 1976	Sep 21, 1976
B 513,706	3,986,064	Jan 13, 1976	Oct 12, 1976
B 513,756	3,993,869	Feb 3, 1976	Nov 23, 1976
B 513,781	4,001,324	Feb 24, 1976	Jan 4, 1977
B 513,789	3,981,599	Feb 3, 1976	Sep 21, 1976
B 513,791	4,008,608	Mar 30, 1976	Feb 22, 1977
B 514,259	4,013,649	Mar 23, 1976	Mar 22, 1977
B 514,687	3,986,522	Jan 27, 1976	Oct 19, 1976
B 514,839	4,033,816	Mar 2, 1976	July 5, 1977
B 515,135	3,990,085	Feb 17, 1976	Nov 2, 1976
B 515,303	3,987,939	Jan 20, 1976	Oct 26, 1976
B 515,368	4,014,733	Apr 6, 1976	Mar 29, 1977
B 515,452	3,995,243	Feb. 10, 1976	Nov 30, 1976
B 515,455	3,982,149	Jan 27, 1976	Sep 21, 1976
B 515,642	4,001,258	Feb 24, 1976	Jan 4, 1977
B 515,908	3,984,676	Jan 20, 1976	Oct 5, 1976
B 516,002	3,988,638	Jan 13, 1976	Oct 26, 1976
B 516,032	3,986,634	Jan 27, 1976	Oct 19, 1976
B 516,047	3,985,741	Feb 10, 1976	Oct 12, 1976
B 516,060	3,983,572	Feb 17, 1976	Sep 28, 1976
B 516,069	3,986,208	Mar 16, 1976	Oct 12, 1976
B 516,296	3,984,404	Feb 3, 1976	Oct 5, 1976
B 516,537	3,996,784	Feb 17, 1976	Dec 14, 1976
B 516,564	3,993,931	Feb 17, 1976	Nov 23, 1976
B 516,609	3,994,486	Feb 24, 1976	Nov 30, 1976
B 516,625	4,013,542	Mar 30, 1976	Mar 22, 1977
B 516,804	3,991,209	Mar 23, 1976	Nov 9, 1976
B 516,825	3,988,885	Feb 3, 1976	Nov 2, 1976
B 517,273	D 242,798	Mar 16, 1976	Dec 21, 1976
B 517,504	3,999,855	Mar 9, 1976	Dec 28, 1976
B 517,668	4,013,423	Apr 6, 1976	Mar 22, 1977
B 517,762	3,986,065	Mar 16, 1976	Oct 12, 1976
B 517,858	4,000,999	Feb 17, 1976	Jan 4, 1977
B 517,956	D 243,088	Apr 6, 1976	Jan 18, 1977
B 517,957	D 243,089	Apr 6, 1976	Jan 18, 1977
B 518,076	4,014,914	Mar 30, 1976	Mar 29, 1977
B 518,226	3,993,509	Feb 10, 1976	Nov 23, 1976
B 518,326	4,008,282	Mar 23, 1976	Feb 15, 1977
B 518,656	3,989,732	Feb 17, 1976	Nov 2, 1976
B 518,859	3,989,971	Feb 3, 1976	Nov 2, 1976
B 518,999	3,990,323	Feb 3, 1976	Nov 9, 1976
B 519,095	3,993,621	Feb 24, 1976	Nov 23, 1976
B 519,355	4,014,829	Apr 13, 1976	Mar 29, 1977
B 519,377	3,987,223	Jan 27, 1976	Oct 19, 1976
B 519,446	3,985,815	Feb 24, 1976	Oct 12, 1976
B 519,485	3,991,134	Feb 10, 1976	Nov 9, 1976
B 519,486	3,992,481	Feb 17, 1976	Nov 16, 1976
B 519,487	3,992,337	Feb 17, 1976	Nov 16, 1976
B 519,599	3,995,350	Feb 17, 1976	Dec 7, 1976
B 519,623	4,012,049	Apr 6, 1976	Mar 15, 1977
B 519,680	4,014,660	Mar 30, 1976	Mar 29, 1977
B 519,932	3,988,618	Feb 3, 1976	Oct 26, 1976
B 519,979	3,982,067	Feb 3, 1976	Sep 21, 1976
B 520,063	3,989,934	Mar 2, 1976	Nov 2, 1976
B 520,075	3,989,935	Feb 24, 1976	Nov 2, 1976
B 520,076	3,989,936	Mar 2, 1976	Nov 2, 1976
B 520,082	3,989,937	Mar 23, 1976	Nov 2, 1976
B 520,115	4,003,072	Mar 23, 1976	Jan 11, 1977
B 520,227	4,002,823	Mar 30, 1976	Jan 11, 1977
B 520,256	3,985,730	Jan 13, 1976	Oct 12, 1976
B 520,277	3,995,635	Feb 17, 1976	Dec 7, 1976
B 520,341	3,992,028	Mar 16, 1976	Nov 16, 1976
B 520,384	3,986,592	Jan 27, 1976	Oct 19, 1976
B 520,514	3,988,308	Mar 9, 1976	Oct 26, 1976
B 520,534	3,997,119	Feb 17, 1976	Dec 14, 1976
B 520,543	3,986,768	Jan 27, 1976	Oct 19, 1976
B 520,546	4,001,133	Mar 2, 1976	Jan 4, 1977
B 520,613	3,991,341	Mar 16, 1976	Nov 9, 1976
B 520,658	3,998,778	Mar 9, 1976	Dec 21, 1976
B 520,878	4,014,849	Apr 6, 1976	Mar 29, 1977
B 520,884	4,000,433	Mar 16, 1976	Dec 28, 1976
B 520,924	3,982,113	Jan 27, 1976	Sep 21, 1976
B 520,928	3,983,617	Jan 13, 1976	Oct 5, 1976
B 520,952	4,000,876	Mar 16, 1976	Jan 4, 1977
B 520,995	4,009,996	Mar 23, 1976	Mar 1, 1977
B 521,025	3,998,838	Mar 23, 1976	Dec 21, 1976
B 521,044	3,983,435	Feb 24, 1976	Sep 28, 1976
B 521,045	3,983,433	Feb 24, 1976	Sep 28, 1976
B 521,046	3,983,434	Feb 24, 1976	Sep 28, 1976
B 521,125	3,994,865	Feb 10, 1976	Nov 30, 1976
B 521,126	3,997,510	Feb 10, 1976	Dec 14, 1976
B 521,127	3,996,201	Feb 17, 1976	Dec 7, 1976
B 521,128	3,997,511	Feb 10, 1976	Dec 14, 1976
B 521,324	3,983,143	Jan 27, 1976	Sep 28, 1976
B 521,480	3,982,665	Jan 13, 1976	Sep 28, 1976
B 521,600	3,981,458	Jan 27, 1976	Sep. 21, 1976
B 521,612	4,000,251	Mar 9, 1976	Dec 28, 1976
B 521,620	3,983,749	Jan 27, 1976	Oct 5, 1976
B 521,643	3,997,567	Mar 2, 1976	Dec 14, 1976
B 521,711	3,989,835	Feb 10, 1976	Nov 2, 1976
B 521,793	3,996,981	Feb 24, 1976	Dec 14, 1976
B 521,984	3,983,220	Feb 17, 1976	Sep 28, 1976
B 521,985	4,012,404	Mar 23, 1976	Mar 15, 1977
B 521,986	3,981,607	Feb 3, 1976	Sep 21, 1976
B 522,009	3,995,444	Feb 17, 1976	Dec 7, 1976
B 522,038	3,993,119	Feb 3, 1976	Nov 23, 1976
B 522,227	3,992,904	Mar 30, 1976	Nov 23, 1976
B 522,309	3,991,603	Feb. 3, 1976	Nov 16, 1976
B 522,354	3,984,959	Jan 20, 1976	Oct 12, 1976
B 522,446	4,001,194	Mar 30, 1976	Jan 4, 1977
B 522,537	3,999,587	Mar 30, 1976	Dec 28, 1976
B 522,567	3,996,238	Feb 17, 1976	Dec 7, 1976
B 522,568	D 242,785	Apr 6, 1976	Dec 21, 1976
B 522,577	3,982,123	Jan 27, 1976	Sep 21, 1976
B 522,629	4,001,155	Mar 16, 1976	Jan 4, 1977
B 523,226	4,006,367	Mar 23, 1976	Feb 1, 1977
B 523,696	3,986,071	Jan. 13, 1976	Oct 12, 1976
B 523,885	3,981,040	Feb 17, 1976	Sep. 21, 1976
B 523,952	3,988,707	Mar 23, 1976	Oct 26, 1976
B 524,026	3,992,206	Feb 10, 1976	Nov 16, 1976
B 524,121	3,982,536	Feb 3, 1976	Sep 28, 1976
B 524,179	3,985,872	Jan 13, 1976	Oct 12, 1976
B 524,464	3,985,580	Feb 10, 1976	Oct 12, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 524,806	4,000,065	Mar 2, 1976	Dec 28, 1976
B 524,849	4,014,938	Mar 23, 1976	Mar 29, 1977
B 525,133	3,996,481	Mar 23, 1976	Dec. 7, 1976
B 525,204	4,001,109	Mar 16, 1976	Jan 4, 1977
B 525,809	3,985,040	Feb 24, 1976	Oct 12, 1976
B 525,961	3,985,557	Jan 13, 1976	Oct 12, 1976
B 526,106	3,990,073	Jan 27, 1976	Nov 2, 1976
B 526,190	3,982,129	Feb 17, 1976	Sep 21, 1976
B 526,279	4,013,138	Apr 13, 1976	Mar 22, 1977
B 526,289	3,992,641	Feb 24, 1976	Nov 16, 1976
B 526,388	3,992,017	Feb. 3, 1976	Nov 16, 1976
B 526,445	3,984,978	Jan 20, 1976	Oct 12, 1976
B 526,447	4,000,052	Feb 24, 1976	Dec. 28, 1976
B 526,510	3,989,708	Jan 20, 1976	Nov 2, 1976
B 526,654	4,011,534	Mar 23, 1976	Mar. 8, 1977
B 526,942	4,013,700	Mar 30, 1976	Mar 22, 1977
B 526,997	3,985,695	Jan 13, 1976	Oct 12, 1976
B 527,040	4,013,515	Mar 23, 1976	Mar 22, 1977
B 527,054	3,981,559	Feb 17, 1976	Sep 21, 1976
B 527,171	3,998,248	Mar 9, 1976	Dec 21, 1976
B 527,187	3,995,202	Feb 17, 1976	Nov. 30, 1976
B 527,333	3,999,732	Mar 23, 1976	Dec 28, 1976
B 527,669	3,982,206	Jan 13, 1976	Sep 21, 1976
B 527,693	3,995,233	Feb 3, 1976	Nov 30, 1976
B 527,788	D 242,337	Feb 10, 1976	Nov 16, 1976
B 527,972	4,000,016	Mar 9, 1976	Dec 28, 1976
B 527,999	3,981,682	Feb 3, 1976	Sep 21, 1976
B 528,297	4,001,138	Mar 16, 1976	Jan 4, 1977
B 528,303	3,991,023	Feb 10, 1976	Nov 9, 1976
B 528,401	3,991,619	Feb 3, 1976	Nov 16, 1976
B 528,756	3,990,476	Feb 3, 1976	Nov 9, 1976
B 528,761	3,982,221	Feb 10, 1976	Sep 21, 1976
B 528,962	3,989,666	Feb 24, 1976	Nov 2, 1976
B 528,966	3,989,667	Feb 24, 1976	Nov 2, 1976
B 529,156	3,989,158	Jan 13, 1976	Nov 2, 1976
B 529,194	4,000,776	Mar 23, 1976	Jan 4, 1977
B 529,214	4,013,004	Apr 20, 1976	Mar 22, 1977
B 529,659	3,996,875	Feb 24, 1976	Dec 14, 1976
B 529,836	3,994,345	Feb 3, 1976	Nov 30, 1976
B 529,925	4,014,003	Mar 30, 1976	Mar 22, 1977
B 529,974	3,987,098	Feb 17, 1976	Oct 19, 1976
B 530,174	3,993,635	Feb 24, 1976	Nov 23, 1976
B 530,255	3,996,103	Mar 2, 1976	Dec 7, 1976
B 530,263	4,009,736	Mar 30, 1976	Mar 1, 1977
B 530,285	4,013,903	Apr 6, 1976	Mar 22, 1977
B 530,303	4,006,029	Mar 23, 1976	Feb 1, 1977
B 530,318	3,985,752	Jan 13, 1976	Oct 12, 1976
B 530,437	4,014,857	Apr 13, 1976	Mar 29, 1977
B 530,569	3,999,865	Mar 16, 1976	Dec 28, 1976
B 530,580	4,001,151	Mar 2, 1976	Jan 4, 1977
B 530,605	3,989,064	Feb 3, 1976	Nov 2, 1976
B 530,709	4,012,944	Apr 6, 1976	Mar 22, 1977
B 530,813	3,986,131	Feb 17, 1976	Oct 12, 1976
B 530,873	4,001,016	Feb 17, 1976	Jan 4, 1977
B 530,925	3,983,161	Feb 24, 1976	Sep 28, 1976
B 531,096	3,984,415	Feb 10, 1976	Oct 5, 1976
B 531,267	3,997,040	Feb 24, 1976	Dec 14, 1976
B 531,425	3,992,595	Feb 3, 1976	Nov 16, 1976
B 531,566	3,997,820	Mar 16, 1976	Dec 14, 1976
B 531,686	3,990,017	Mar 23, 1976	Nov 2, 1976
B 531,753	3,988,843	Mar 2, 1976	Nov 2, 1976
B 531,929	3,986,067	Jan 20, 1976	Oct 12, 1976
B 532,005	3,992,397	Feb 24, 1976	Nov 16, 1976
B 532,140	4,001,299	Mar 2, 1976	Jan 4, 1977
B 532,319	3,990,292	Feb 3, 1976	Nov 9, 1976
B 532,326	3,993,959	Mar 23, 1976	Nov 23, 1976
B 532,424	D 242,292	Feb 10, 1976	Nov 9, 1976
B 532,476	3,992,756	Feb 3, 1976	Nov 23, 1976
B 532,477	4,014,895	Apr 13, 1976	Mar 29, 1977
B 532,679	4,010,706	Apr 6, 1976	Mar 8, 1977
B 532,901	3,984,318	Jan 13, 1976	Oct 5, 1976
B 532,969	3,981,706	Jan 13, 1976	Sep 21, 1976
B 532,976	4,000,837	Mar 23, 1976	Jan 4, 1977
B 533,056	3,983,969	Jan 13, 1976	Oct 5, 1976
B 533,259	3,999,556	Feb 24, 1976	Dec 28, 1976
B 533,454	3,996,566	Mar 2, 1976	Dec 7, 1976
B 533,580	3,982,255	Feb 3, 1976	Sep 21, 1976
B 533,652	4,000,196	Mar 23, 1976	Dec 28, 1976
B 533,734	3,984,799	Jan 27, 1976	Oct 5, 1976
B 533,968	3,986,576	Jan. 27, 1976	Oct 19, 1976
B 534,016	3,983,381	Feb 3, 1976	Sep 28, 1976
B 534,313	3,981,675	Jan 27, 1976	Sep 21, 1976
B 534,314	3,981,786	Feb 10, 1976	Sep 21, 1976
B 534,333	3,981,480	Feb 17, 1976	Sep 21, 1976
B 534,334	D 242,722	Mar 16, 1976	Dec 14, 1976
B 534,443	3,989,970	Jan 27, 1976	Nov 2, 1976
B 534,574	3,995,624	Feb 24, 1976	Dec 7, 1976
B 534,591	3,991,141	Feb. 17, 1976	Nov 9, 1976
B 534,680	4,014,904	Apr 20, 1976	Mar 29, 1977
B 534,767	3,982,180	Feb 3, 1976	Sep. 21, 1976
B 534,915	4,012,668	Mar 23, 1976	Mar 15, 1977
B 534,991	3,983,517	Jan. 27, 1976	Sep 28, 1976
B 535,076	3,981,718	Jan 20, 1976	Sep 21, 1976
B 535,209	4,001,873	Mar 16, 1976	Jan. 4, 1977
B 535,256	3,999,150	Mar. 23, 1976	Dec. 21, 1976
B 535,268	3,999,045	Mar 30, 1976	Dec 21, 1976
B 535,386	3,981,150	Jan 13, 1976	Sep 21, 1976
B 535,391	3,981,386	Jan 27, 1976	Sep. 21, 1976
B 535,411	3,990,543	Feb. 24, 1976	Nov. 9, 1976
B 535,437	3,997,555	Feb 24, 1976	Dec. 14, 1976
B 535,448	3,997,123	Mar 16, 1976	Dec. 14, 1976
B 535,466	3,981,309	Jan. 27, 1976	Sep. 21, 1976
B 535,813	3,981,819	Jan. 27, 1976	Sep. 21, 1976
B 535,928	3,981,466	Jan. 13, 1976	Sep. 21, 1976
B 536,009	3,982,112	Jan. 27, 1976	Sep 21, 1976
B 536,082	3,997,783	Mar. 16, 1976	Dec. 14, 1976
B 536,322	4,001,272	Mar. 23, 1976	Jan. 4, 1977
B 536,403	3,998,341	Mar. 23, 1976	Dec 21, 1976
B 536,511	3,995,989	Mar 9, 1976	Dec. 7, 1976
B 536,675	3,985,773	Jan 20, 1976	Oct 12, 1976
B 536,923	4,007,828	Mar 30, 1976	Feb. 15, 1977
B 536,935	3,985,729	Jan. 13, 1976	Oct. 12, 1976
B 537,058	4,000,969	Mar. 23, 1976	Jan 4, 1977
B 537,102	3,981,829	Jan 13, 1976	Sep. 21, 1976
B 537,709	3,981,368	Jan 13, 1976	Sep. 21, 1976
B 537,711	3,985,748	Jan 13, 1976	Oct 12, 1976
B 537,722	3,985,423	Feb 3, 1976	Oct 12, 1976
B 537,903	3,986,492	Jan 20, 1976	Oct. 19, 1976
B 538,472	3,992,884	Feb 3, 1976	Nov 23, 1976
B 538,491	3,982,928	Feb. 17, 1976	Sep. 28, 1976
B 538,686	3,982,199	Jan. 13, 1976	Sep. 21, 1976
B 538,753	3,993,642	Feb. 10, 1976	Nov. 23, 1976
B 539,374	3,996,229	Mar. 9, 1976	Dec. 7, 1976
B 539,746	3,983,423	Feb 17, 1976	Sep. 28, 1976
B 540,078	3,984,701	Jan. 13, 1976	Oct. 5, 1976
B 540,218	3,986,108	Feb. 10, 1976	Oct 12, 1976
B 540,632	3,981,600	Jan. 13, 1976	Sep 21, 1976
B 540,703	4,013,206	Apr. 13, 1976	Mar. 22, 1977
B 540,767	3,986,010	Mar. 16, 1976	Oct 12, 1976
B 540,872	3,982,135	Jan 20, 1976	Sep. 21, 1976
B 540,888	4,005,528	Mar 30, 1976	Feb 1, 1977
B 541,015	3,993,208	Jan 27, 1976	Nov 23, 1976
B 541,376	3,981,690	Feb 17, 1976	Sep. 21, 1976
B 541,415	3,982,080	Feb. 3, 1976	Sep. 21, 1976
B 541,464	3,995,424	Feb. 17, 1976	Dec 7, 1976
B 541,496	3,982,232	Jan. 27, 1976	Sep 21, 1976
B 541,501	4,005,826	Apr 13, 1976	Feb. 1, 1977
B 541,517	3,986,156	Jan. 13, 1976	Oct 12, 1976
B 541,710	3,994,472	Feb. 24, 1976	Nov 30, 1976
B 542,135	3,986,939	Feb 10, 1976	Oct 19, 1976
B 542,158	3,981,886	Jan 13, 1976	Sep 21, 1976
B 542,226	3,993,748	Feb. 24, 1976	Nov 23, 1976
B 542,258	4,013,536	Mar 23, 1976	Mar 22, 1977
B 543,078	3,995,687	Feb. 17, 1976	Dec 7, 1976
B 543,941	3,985,528	Jan 13, 1976	Oct 12, 1976
B 544,034	3,997,175	Feb 17, 1976	Dec. 14, 1976
B 544,476	3,993,585	Feb 24, 1976	Nov 23, 1976
B 544,899	3,994,962	Feb. 17, 1976	Nov 30, 1976
B 544,961	3,983,492	Jan. 13, 1976	Sep 28, 1976
B 545,050	3,982,073	Jan 20, 1976	Sep. 21, 1976
B 545,265	D 243,090	Apr 13, 1976	Jan 18, 1977
B 545,299	4,001,259	Feb. 24, 1976	Jan. 4, 1977
B 545,344	4,012,746	Mar 30, 1976	Mar 15, 1977
B 545,464	3,992,387	Feb. 10, 1976	Nov 16, 1976
B 545,630	3,981,337	Jan 27, 1976	Sep 21, 1976
B 545,777	4,004,906	Jan 27, 1976	Jan 25, 1977
B 545,856	4,006,939	Mar 30, 1976	Feb 8, 1977
B 545,935	3,990,337	Jan 27, 1976	Nov 9, 1976
B 545,945	3,995,260	Jan 27, 1976	Nov 30, 1976
B 546,097	3,999,309	Mar 23, 1976	Dec 28, 1976
B 546,295	3,987,070	Jan 20, 1976	Oct. 19, 1976
B 546,426	3,982,063	Jan 27, 1976	Sep. 21, 1976
B 546,631	3,983,729	Feb. 3, 1976	Oct. 5, 1976
B 546,665	3,990,062	Jan 20, 1976	Nov 2, 1976
B 546,677	4,015,654	Apr 6, 1976	Apr 5, 1977
B 546,911	3,981,058	Jan 13, 1976	Sep 21, 1976
B 546,922	3,987,742	Mar. 16, 1976	Oct 26, 1976
B 547,016	3,999,741	Mar 23, 1976	Dec. 28, 1976
B 547,208	4,001,218	Feb 24, 1976	Jan 4, 1977
B 547,547	3,997,670	Feb 24, 1976	Dec. 14, 1976
B 547,994	3,990,081	Jan 20, 1976	Nov 2, 1976
B 548,028	3,991,517	Feb 3, 1976	Nov 16, 1976
B 548,058	3,983,050	Feb 17, 1976	Sep 28, 1976
B 548,155	3,981,477	Jan 13, 1976	Sep 21, 1976

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 548,440	3,993,401	Feb 3, 1976	Nov 23, 1976
B 548,302	3,983,414	Feb 17, 1976	Sep 28, 1976
B 548,440	3,993,401	Feb 3, 1976	Nov 23, 1976
B 548,462	D 242,283	Feb 10, 1976	Nov 9, 1976
B 548,688	3,995,984	Mar 9, 1976	Dec 7, 1976
B 548,719	3,990,553	Feb 17, 1976	Nov 9, 1976
B 548,978	3,998,139	Mar 9, 1976	Dec 21, 1976
B 549,198	3,981,975	Jan 13, 1976	Sep 21, 1976
B 549,244	3,981,125	Jan 27, 1976	Sep 21, 1976
B 549,394	3,981,611	Jan 27, 1976	Sep 21, 1976
B 549,931	3,986,141	Jan 20, 1976	Oct 12, 1976
B 549,964	3,995,899	Feb 24, 1976	Dec 7, 1976
B 550,693	3,982,194	Jan 20, 1976	Sep 21, 1976
B 550,744	3,993,550	Feb 17, 1976	Nov 23, 1976
B 550,810	4,000,910	Mar 23, 1976	Jan 4, 1977
B 551,133	3,996,740	Mar 2, 1976	Dec 14, 1976
B 551,463	3,996,254	Feb 17, 1976	Dec 7, 1976
B 551,527	3,982,599	Jan 13, 1976	Sep 28, 1976
B 551,809	3,996,743	Feb 24, 1976	Dec 14, 1976
B 551,952	Re 29,059	Mar 2, 1976	Dec 7, 1976
B 552,006	3,992,129	Feb 3, 1976	Nov 16, 1976
B 552,489	3,994,864	Feb 10, 1976	Nov 30, 1976
B 552,498	3,983,139	Jan 13, 1976	Sep 28, 1976
B 552,508	4,001,250	Mar 16, 1976	Jan 4, 1977
B 552,629	3,994,773	Mar 23, 1976	Nov 30, 1976
B 552,709	4,001,467	Mar 23, 1976	Jan 4, 1977
B 552,932	3,989,292	Feb 3, 1976	Nov 2, 1976
B 553,421	4,001,146	Mar 23, 1976	Jan 4, 1977
B 553,460	3,990,019	Feb 3, 1976	Nov 2, 1976
B 553,584	3,992,456	Feb 17, 1976	Nov 16, 1976
B 553,629	3,999,242	Feb 24, 1976	Dec 28, 1976
B 554,039	3,999,944	Feb 24, 1976	Dec 28, 1976
B 554,164	4,001,465	Mar 9, 1976	Jan 4, 1977
B 554,283	3,981,152	Jan. 27, 1976	Sep. 21, 1976
B 554,291	4,001,209	Mar 9, 1976	Jan 4, 1977
B 554,380	4,001,147	Mar 9, 1976	Jan 4, 1977
B 554,594	3,985,960	Jan 20, 1976	Oct 12, 1976
B 554,655	4,015,048	Feb 24, 1976	Mar 29, 1977
B 554,848	4,001,265	Feb 24, 1976	Jan 4, 1977
B 554,939	3,994,013	Feb 10, 1976	Nov 23, 1976
B 555,146	4,007,636	Apr 20, 1976	Feb 15, 1977
B 555,437	3,991,152	Feb 3, 1976	Nov 9, 1976
B 555,456	3,993,423	Mar 30, 1976	Nov 23, 1976
B 555,772	3,982,641	Jan 13, 1976	Sep 28, 1976
B 556,057	3,985,349	Jan 13, 1976	Oct 12, 1976
B 556,496	3,990,244	Mar 16, 1976	Nov 9, 1976
B 556,897	3,992,972	Feb 3, 1976	Nov 23, 1976
B 557,153	3,991,603	Feb 3, 1976	Nov 16, 1976
B 557,274	4,016,375	Mar 23, 1976	Apr 5, 1977
B 557,299	3,990,357	Feb 3, 1976	Nov 9, 1976
B 557,621	3,990,800	Feb 3, 1976	Nov. 9, 1976
B 557,721	4,013,435	Mar 23, 1976	Mar 22, 1977
B 557,856	3,991,019	Feb 10, 1976	Nov 9, 1976
B 558,220	3,990,009	Jan 27, 1976	Nov 2, 1976
B 558,251	3,981,289	Jan 13, 1976	Sep 21, 1976
B 558,813	3,989,188	Feb 3, 1976	Nov 2, 1976
B 558,818	3,983,762	Jan 13, 1976	Oct 5, 1976
B 558,819	3,990,160	Feb 3, 1976	Nov 9, 1976
B 558,973	3,981,126	Feb 10, 1976	Sep 21, 1976
B 559,111	3,984,854	Feb 24, 1976	Oct 5, 1976
B 559,142	4,001,124	Mar 2, 1976	Jan 4, 1977
B 559,394	4,016,094	Apr 20, 1976	Apr 5, 1977
B 559,441	4,013,609	Mar 23, 1976	Mar 22, 1977
B 559,631	4,011,406	Mar 23, 1976	Mar 8, 1977
B 559,697	3,995,770	Mar 16, 1976	Dec 7, 1976
B 559,700	4,001,189	Mar 23, 1976	Jan 4, 1977
B 559,701	4,001,190	Mar 23, 1976	Jan 4, 1977
B 559,737	3,984,668	Jan 20, 1976	Oct 5, 1976
B 559,954	3,982,673	Feb 3, 1976	Sep 28, 1976
B 560,261	3,987,493	Mar. 16, 1976	Oct 19, 1976
B 560,488	3,989,940	Mar 16, 1976	Nov 2, 1976
B 560,717	3,982,034	Feb 10, 1976	Sep 21, 1976
B 560,765	3,983,389	Feb 3, 1976	Sep 28, 1976
B 561,062	D 242,248	Feb 10, 1976	Nov 9, 1976
B 561,165	4,013,002	Mar 30, 1976	Mar 22, 1977
B 561,166	4,011,809	Mar 30, 1976	Mar 15, 1977
B 561,365	4,005,078	Apr 13, 1976	Jan 25, 1977
B 561,387	3,985,706	Feb 10, 1976	Oct 12, 1976
B 561,405	4,003,770	Mar 30, 1976	Jan 18, 1977
B 561,712	3,992,126	Feb 17, 1976	Nov 16, 1976
B 561,732	3,991,460	Feb 3, 1976	Nov 16, 1976
B 561,764	3,984,634	Jan 27, 1976	Oct 5, 1976
B 561,770	4,000,366	Mar 16, 1976	Dec 28, 1976
B 561,784	3,984,710	Jan 27, 1976	Oct 5, 1976
B 562,413	4,000,930	Mar 16, 1976	Jan 4, 1977
B 562,462	3,985,836	Jan 13, 1976	Oct 12, 1976
B 562,519	4,013,125	Mar 30, 1976	Mar 22, 1977
B 562,601	3,998,360	Mar 16, 1976	Dec 21, 1976
B 562,698	3,983,972	Jan 13, 1976	Oct 5, 1976
B 562,813	3,985,491	Feb 3, 1976	Oct 12, 1976
B 563,070	3,996,230	Mar 9, 1976	Dec 7, 1976
B 563,165	4,000,977	Mar 9, 1976	Jan 4, 1977
B 563,244	3,983,562	Jan 27, 1976	Sep 28, 1976
B 563,301	3,995,589	Feb 17, 1976	Dec 7, 1976
B 563,412	3,992,127	Feb 24, 1976	Nov 16, 1976
B 563,419	3,999,051	Mar 23, 1976	Dec 21, 1976
B 563,722	3,990,925	Jan 13, 1976	Nov 9, 1976
B 563,780	3,987,769	Feb 3, 1976	Oct 26, 1976
B 563,932	4,000,638	Mar 23, 1976	Jan 4, 1977
B 564,252	4,001,293	Mar 2, 1976	Jan 4, 1977
B 564,255	4,015,996	Mar 30, 1976	Apr 5, 1977
B 564,314	3,984,996	Jan 20, 1976	Oct 12, 1976
B 564,902	4,001,351	Mar 23, 1976	Jan 4, 1977
B 565,180	3,981,685	Jan 27, 1976	Sep 21, 1976
B 565,275	3,990,299	Apr 6, 1976	Nov 9, 1976
B 565,717	3,999,138	Apr 13, 1976	Dec 21, 1976
B 565,754	4,011,626	Mar 30, 1976	Mar 15, 1977
B 566,464	3,996,367	Feb 3, 1976	Dec 7, 1976
B 566,556	3,998,511	Mar 23, 1976	Dec 21, 1976
B 566,572	3,988,590	Mar 16, 1976	Oct 26, 1976
B 566,585	4,001,083	Mar 2, 1976	Jan 4, 1977
B 567,058	3,985,188	Jan 13, 1976	Oct 12, 1976
B 567,076	4,011,187	Mar 23, 1976	Mar 8, 1977
B 567,158	3,988,073	Mar 23, 1976	Oct 26, 1976
B 567,207	3,991,689	Apr 13, 1976	Nov 16, 1976
B 567,435	3,995,724	Feb 3, 1976	Dec 7, 1976
B 567,854	3,985,038	Feb 3, 1976	Oct 12, 1976
B 567,892	4,000,855	Mar 16, 1976	Jan 4, 1977
B 568,226	3,992,698	Feb 24, 1976	Nov 16, 1976
B 568,770	3,982,213	Feb 10, 1976	Sep 21, 1976
B 569,125	3,986,980	Feb 24, 1976	Oct 19, 1976
B 569,293	4,004,149	Mar 30, 1976	Jan 18, 1977
B 569,501	3,999,250	Mar 9, 1976	Dec 28, 1976
B 569,519	3,993,133	Feb 3, 1976	Nov 23, 1976
B 569,646	3,985,222	Jan 13, 1976	Oct 12, 1976
B 569,859	3,994,160	Mar 9, 1976	Nov 30, 1976
B 570,172	3,987,763	Feb 3, 1976	Oct 26, 1976
B 570,615	3,998,570	Mar 23, 1976	Dec 21, 1976
B 570,862	3,991,639	Feb 24, 1976	Nov 16, 1976
B 571,219	3,991,388	Feb 24, 1976	Nov 9, 1976
B 571,638	4,001,244	Mar 9, 1976	Jan 4, 1977
B 571,659	3,995,186	Apr 13, 1976	Nov 30, 1976
B 572,642	3,990,715	Feb 10, 1976	Nov 9, 1976
B 572,726	4,015,020	Feb 24, 1976	Mar 29, 1977
B 573,033	3,995,224	Mar 23, 1976	Nov 30, 1976
B 573,114	4,014,843	Apr 6, 1976	Mar 29, 1977
B 573,991	4,013,704	Mar 30, 1976	Mar 22, 1977
B 573,994	4,000,641	Mar 23, 1976	Jan 4, 1977
B 574,128	3,982,961	Feb 17, 1976	Sep 28, 1976
B 574,616	4,000,424	Mar 2, 1976	Dec 28, 1976
B 574,996	3,989,718	Feb 17, 1976	Nov 2, 1976
B 575,583	4,000,928	Mar 16, 1976	Jan 4, 1977
B 575,757	3,981,170	Jan 27, 1976	Sep 21, 1976
B 575,761	4,013,123	Apr 13, 1976	Mar 22, 1977
B 575,776	4,013,124	Apr 20, 1976	Mar 22, 1977
B 575,851	3,985,826	Feb 10, 1976	Oct 12, 1976
B 576,385	4,009,498	Mar 30, 1976	Mar 1, 1977
B 576,859	3,991,526	Feb 24, 1976	Nov 16, 1976
B 576,903	3,995,032	Feb 3, 1976	Nov 30, 1976
B 578,447	3,982,658	Jan 20, 1976	Sep 28, 1976
B 579,104	3,982,081	Jan 27, 1976	Sep 21, 1976
B 579,116	3,986,227	Feb 3, 1976	Oct 19, 1976
B 579,153	4,013,745	Mar 30, 1976	Mar 22, 1977
B 579,806	3,995,318	Feb 3, 1976	Nov 30, 1976
B 580,379	4,000,796	Apr 6, 1976	Jan 4, 1977
B 580,826	3,988,391	Feb 17, 1976	Oct 26, 1976
B 580,921	3,984,054	Jan 13, 1976	Oct 5, 1976
B 581,564	4,036,653	Mar 23, 1976	July 19, 1977
B 581,843	4,000,562	Mar 16, 1976	Jan 4, 1977
B 583,051	3,990,714	Feb 3, 1976	Nov 9, 1976
B 583,089	3,982,174	Jan 27, 1976	Sep 21, 1976
B 583,712	3,995,064	Feb 10, 1976	Nov 30, 1976
B 584,520	3,981,149	Jan 27, 1976	Sep 21, 1976
B 584,997	4,000,030	Mar 9, 1976	Dec 28, 1976
B 585,247	3,989,914	Feb 3, 1976	Nov 2, 1976
B 585,731	3,993,603	Feb 3, 1976	Nov 23, 1976
B 586,215	3,985,302	Jan 20, 1976	Oct 12, 1976
B 586,380	3,983,885	Mar 2, 1976	Oct 5, 1976
B 586,387	3,981,311	Feb 3, 1976	Sep 21, 1976
B 586,663	3,992,080	Feb 3, 1976	Nov 16, 1976
B 587,118	Re 29,067	Mar 2, 1976	Dec 7, 1976
B 587,786	3,991,204	Feb 17, 1976	Nov 9, 1976
B 587,936	3,999,052	Mar 23, 1976	Dec 21, 1976
B 589,179	4,001,102	Mar 23, 1976	Jan 4, 1977

CROSS REFERENCE OF PUBLISHED PATENT APPLICATIONS PUBLISHED UNDER SECOND TRIAL VOLUNTARY PROTEST PROGRAM AND NOW ISSUED AS PATENTS—CONTINUED

DOCUMENT NUMBER	PATENT NUMBER	PUB. DATE	ISSUE DATE
B 589,687	3,995,349	Mar 23, 1976	Dec 7, 1976
B 589,966	3,985,828	Feb 17, 1976	Oct 12, 1976
B 590,158	3,985,163	Feb 10, 1976	Oct 12, 1976
B 590,159	3,985,164	Feb 3, 1976	Oct 12, 1976
B 590,502	4,001,171	Mar 23, 1976	Jan 4, 1977
B 591,141	4,013,631	Mar 23, 1976	Mar 22, 1977
B 592,143	3,984,713	Jan 27, 1976	Oct 5, 1976
B 592,146	4,001,084	Mar 2, 1976	Jan 4, 1977
B 592,658	4,001,164	Mar 23, 1976	Jan 4, 1977
B 593,781	4,015,953	Mar 16, 1976	Apr 5, 1977
B 594,871	3,999,245	Mar 16, 1976	Dec. 28, 1976
B 596,692	3,992,349	Feb 17, 1976	Nov. 16, 1976
B 597,410	4,000,925	Mar 30, 1976	Jan 4, 1977
B 657,438	3,985,701	Jan. 20, 1976	Oct 12, 1976
B 747,785	3,981,899	Feb. 10, 1976	Sep 21, 1976
B 750,679	4,007,049	Mar 23, 1976	Feb. 8, 1977
B 843,038	3,981,785	Feb. 3, 1976	Sep 21, 1976
B 845,044	4,001,338	Mar 30, 1976	Jan 4, 1977
B 848,336	3,993,752	Mar 30, 1976	Nov 23, 1976

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 19TH DAY OF JULY, 1977

NOTE —Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Abo, Hideo. *See—*
  Muta, Tohru, Abo, Hideo; and Noguchi, Sakae, Re 29,313, Cl 75-128.00A

Bargain, Michel; Combet, Andre, and Grosjean, Pierre, to Rhone-Poulenc S A Cross-linked resins. Re 29,316, Cl 260-30.200.

Bone, Arnold R , to Dennison Manufacturing Company. Apparatus for dispensing fasteners Re. 29,310, Cl 227-67.000

Carlson, Edgar, deceased; by Gulf Research & Development Company, Henke, Alfred M.; Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J., to Gulf Research & Development Company. Asphaltene hydrodesulfurization with small catalyst particles in a parallel reactor system. Re. 29,314, Cl 208-216.000.

Carlson, Edgar, deceased, by Gulf Science and Technology Company, Henke, Alfred M., Lehrian, William R., McKinney, Joel D , and Metzger, Kirk J., to Gulf Research & Development Company Asphatiene hydrodesulfurization with small catalyst particles utilizing a hydrogen quench for the reaction. Re. 29,315, Cl. 208-216.000.

Combet, Andre: *See—*
  Bargain, Michel, Combet, Andre; and Grosjean, Pierre, Re 29,316, Cl 260-30.200.

Compton, Leslie E.: *See—*
  Mallan, George M.; and Compton, Leslie E., Re 29,312, Cl 48-209.000.

Dagenais, Robert, to Dynaflair Corporation Ltd. Protective grille Re 29,308, Cl 160-183.000.

Dennison Manufacturing Company: *See—*
  Bone, Arnold R., Re. 29,310, Cl. 227-67.000

Dynaflair Corporation Ltd.: *See—*
  Dagenais, Robert, Re. 29,308, Cl 160-183.000.

Futs Metalliques Gallay S A.: *See—*
  Wessely, Eugene, Re. 29,307, Cl. 113-120.00R.

Grosjean, Pierre: *See—*
  Bargain, Michel; Combet, Andre; and Grosjean, Pierre, Re. 29,316, Cl. 260-30.200.

Gulf Research & Development Company: *See—*
  Carlson, Edgar, deceased; Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R ; McKinney, Joel D.; and Metzger, Kirk J , Re. 29,314, Cl. 208-216.000.
  Carlson, Edgar, deceased; Gulf Science and Technology Company, Henke, Alfred M., Lehrian, William R , McKinney, Joel D.; and Metzger, Kirk J , Re. 29,315, Cl. 208-216.000.

Gulf Science and Technology Company: *See—*
  Carlson, Edgar, deceased, Gulf Science and Technology Company, Henke, Alfred M ; Lehrian, William R., McKinney, Joel D ; and Metzger, Kirk J., Re. 29,315, Cl 208-216.000.

Henke, Alfred M *See—*
  Carlson, Edgar, deceased Gulf Research & Development Company; Henke, Alfred M ; Lehrina, William R , McKinney, Joel D , and Metzger, Kirk J , Re 29,314, Cl 208-216.000
  Carlson, Edgar, deceased, Gulf Science and Technology Company, Henke, Alfred M , Lehrian, William R ; McKinney, Joel D ; and Metzger, Kirk J , Re 29,315, Cl. 208-216.000.

Lehrian, William R : *See—*
  Carlson, Edgar, deceased; Gulf Science and Technology Company; Henke, Alfred M , Lehrian, William R.; McKinney, Joel D., and Metzger, Kirk J , Re 29,315, Cl 208-216.000.

Lehrina, William R *See—*
  Carlson, Edgar, deceased, Gulf Research & Development Company; Henke, Alfred M , Lehrina, William R.; McKinney, Joel D.; and Metzger, Kirk J , Re. 29,314, Cl. 208-216.000.

Mallan, George M ; and Compton, Leslie E., to Occidental Petroleum Corporation Gasification of carbonaceous solids Re. 29,312, Cl 48-209.000.

McKinney, Joel D : *See—*
  Carlson, Edgar, deceased; Gulf Research & Development Company; Henke, Alfred M.; Lehrina, William R., McKinney, Joel D , and Metzger, Kirk J., Re. 29,314, Cl 208-216.000.
  Carlson, Edgar, deceased; Gulf Science and Technology Company, Henke, Alfred M ; Lehrian, William R., McKinney, Joel D ; and Metzger, Kirk J., Re. 29,315, Cl 208-216.000.

Metzger, Kirk J.: *See—*
  Carlson, Edgar, deceased, Gulf Research & Devélopment Company; Henke, Alfred M.; Lehrina, William R., McKinney, Joel D.; and Metzger, Kirk J., Re. 29,314, Cl 208-216.000
  Carlson, Edgar, deceased; Gulf Science and Technology Company, Henke, Alfred M ; Lehrian, William R., McKinney, Joel D., and Metzger, Kirk J., Re. 29,315, Cl 208-216.000.

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  Mallan, George M., and Compton, Leslie E., Re 29,312, Cl 48-209.000

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Ritter, Erwin A. Painting apparatus. Re. 29,311, Cl 401-188.00R

Wessely, Eugene, to Futs Metalliques Gallay S.A. Manufacture of metallic containers. Re. 29,307, Cl 113-120.00R.

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Anderson, Frederic W , to Stribling's Nurseries, Inc. Dwarf nectarine tree 4,078, 7-19-77, Cl 41.000.

Anderson, Frederic W , to Reedley Nursery, Inc. Dwarf nectarine tree 4,079, 7-19-77, Cl 41.000

Anderson, Frederic W , to Stark Bro's Nurseries and Orchards Co Apricot tree 4,080, 7-19-77, Cl 39.000

Anderson, Frederic W., to Reedley Nursery, Inc. Nectarine tree. 4,081, 7-19-77, Cl 41.000.

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  - Katerndahl, Dean Richard, 245,120, Cl. D24-60.000.
- Austin, Charles K., to King Pretzel Corporation. Display cart for food, particularly soft pretzels, and the like. 245,075, 7-19-77, Cl. D12-22.000.
- Bardin, Robert S. Crepe pan. 245,059, 7-19-77, Cl. D7-95.000.
- Bell Telephone Laboratories, Incorporated: *See—*
  - Everhart, Joseph Robert; Genaro, Donald Michael; Liebe, John Hale; Sylvester, Gordon Elliot; Tilley, Alvin Richard; and Walker, James Thomas, 245,112, Cl. D14-60.000.
  - Genaro, Donald Michael; Sylvester, Gordon Elliot; and Tilley, Alvin Richard, 245,113, Cl. D14-60.000.
- Boyd, Donald A., to Production Experts, Inc. Housing for heat dispenser for a tubular fireplace heater. 245,097, 7-19-77, Cl. D23-127.000.
- Brown, Linda C. Book support stand or similar article. 245,055, 7-19-77, Cl D6-184.000.
- Bulletin Company: *See—*
  - Spillman, Robert A.; Klein, Charles H.; Savage, Frederick C.; and Simon, Edwin M., 245,101, Cl. D25-16.000.
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- Centers, Allen Dale, deceased; and by Centers, Alta A., administratrix. Protective mask for a horse. 245,115, 7-19-77, Cl. D30-37.000
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- Coldren, Chester P., to Eaton Corporation. Tamper resistant nut 245,067, 7-19-77, Cl. D8-397.000.
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  - Kay, Herbert M., 245,098, Cl D23-153.000
- Congleton, Wayne L., to Dolco Packaging Corporation. Packaging tray for meat or the like. 245,070, 7-19-77, Cl D9-219.000.
- Couturier, Adolphe, to Crown Crafts, Inc. Bedspread/blanket. 245,057, 7-19-77, Cl. D6-263.000.
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- Leib, Roger K. Desk or similar article. 245,054, 7-19-77, Cl. D6-161.000.
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- Taub, Ronald H. Display device for attachment to wire racks, or similar article. 245,066, 7-19-77, Cl. D8-361.000.
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- Trezise, Richard D., to Xerox Corporation. Ribbon cartridge. 245,116, 7-19-77, Cl. D64-11.00A.
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75 B	4,035,944

CLASS 43

42.15	4,035,945
131	4,035,946

CLASS 44

13	4,036,603
53	4,036,604
68	4,036,605

CLASS 46

25	4,035,947
189	4,035,948

CLASS 47

17	4,035,949
59	4,035,950
66	4,035,951

CLASS 48

77	4,036,606
209	Re.29,312

CLASS 49

74	4,035,952
192	4,035,953
203	4,035,954
280	4,035,955
	4,035,956
388	4,035,957

CLASS 51

34 K	4,035,959
163.1	4,035,960
165 R	4,036,607
295	4,035,961
308	4,035,962
324	4,035,963
425	4,035,958

CLASS 52

63	4,035,968
66	4,035,964
	4,035,965
73	4,035,966
111	4,035,969
126	4,035,967
187	4,035,970
236 6	4,035,971
241	4,035,972
249	4,035,974
263	4,035,973
284	4,035,975
577	4,035,976
586	4,035,977
727	4,035,978
737	4,035,979
745	4,035,980

CLASS 53

21 R	4,035,981
22 B	4,035,982
28	4,035,983
	4,035,984
30 R	4,035,985
61	4,035,986
133	4,035,987
183	4,035,988
186	4,035,989
222	4,035,990

CLASS 55

89	4,036,608
91	4,036,609
112	4,036,610
149	4,036,611
282	4,036,612
294	4,036,613
310	4,036,614
442	4,036,615
498	4,036,616

CLASS 56

1	4,035,991
	4,035,992
11.3	4,035,994
11 6	4,035,995
13.1	4,035,993
13.9	4,035,996
27.5	4,035,998
209	4,035,997
341	4,035,999

CLASS 57

1 R	4,036,000
52	4,036,001
58.89	4,036,002
140 R	4,036,003

CLASS 58

9	4,036,004
	4,036,005
23 R	4,036,006
50 R	4,036,007
85.5	4,036,008
127 R	4,036,009

CLASS 59

84	4,036,010

CLASS 60

39 18 B	4,036,011
203	4,036,012
271	4,036,013
274	4,036,014
282	4,036,015
325	4,036,016
497	4,036,017
520	4,036,018
531	4,036,019
644	4,036,020
692	4,036,021

CLASS 61

3	4,036,022
25	4,036,023
42	4,036,024
53.72	4,036,025
56 5	4,036,026

CLASS 62

6	4,036,027
52	4,036,028
55	4,036,617
	4,036,618
123	4,036,619
243	4,036,029
338	4,036,620
394	4,036,621

CLASS 64

1 V	4,036,030
7	4,036,031
21	4,036,032

CLASS 65

3 R	4,036,622
30 E	4,036,623
30 R	4,036,624
134	4,036,625
182 R	4,036,626

CLASS 66

14	4,036,033
50 R	4,036,034
75.2	4,036,035
123	4,036,036
170	4,036,037

CLASS 68

5 C	4,036,038

CLASS 70

90	4,036,039
431	4,036,040

CLASS 71

29	4,036,627
86	4,036,628
88	4,036,629
	4,036,630
92	4,036,631
93	4,036,632
106	4,036,633

CLASS 72

8	4,036,041
9	4,036,042
41	4,036,043
85	4,036,044
165	4,036,045
286	4,036,046
329	4,036,056
347	4,036,047

CLASS 73

81	4,036,048
88 R	4,036,057
116	4,036,049
119 A	4,036,050
193 R	4,036,051
194 EM	4,036,052
204	4,036,053
212	4,036,054
312	4,036,055
350	4,036,058
368	4,036,059
	4,036,060
410	4,036,061
422 GC	4,036,062
	4,036,063
425 6	4,036,064
432 R	4,036,065

CLASS 74

55	4,036,066
112	4,036,067
230.17 E	4,036,068
242.1 TA	4,036,069
242 7	4,036,070
243 R	4,036,071
245 R	4,036,072
393	4,036,073
409	4,036,074
	4,036,075
	4,036,076
526	4,036,077
529	4,036,078
531	4,036,079
572	4,036,080
781 R	4,036,081
	4,036,082
867	4,036,083

CLASS 75

.5 A	4,036,634
49	4,036,635
74	4,036,636
84	4,036,637
101 BE	4,036,639
123 B	4,036,638
126 C	4,036,640
128 A	Re.29,313
130 A	4,036,641
164	4,036,642

CLASS 81

7 5	4,036,084
52 3	4,036,085

CLASS 82

24 R	4,036,086

CLASS 83

79	4,036,087
167	4,036,088
198	4,036,089
282	4,036,090
319	4,036,091
471.2	4,036,092
471.3	4,036,093
623	4,036,094
674	4,036,095

CLASS 84

1.01	4,036,096

CLASS 85

5 CP	4,036,097
70	4,036,098

CLASS 86

20 C	4,036,099
	4,036,100

CLASS 87

8	4,036,101

CLASS 89

33 BB	4,036,102
35 R	4,036,103
36 H	4,036,104

CLASS 90

11 C	4,036,107
24 F	4,036,105

CLASS 91

5	4,036,106
165	4,036,108
216 A	4,036,109
375 A	4,036,110

CLASS 92

29	4,036,111
80	4,036,112
111	4,036,113

CLASS 93

1 C	4,036,114
8 R	4,036,115
32	4,036,116
51 R	4,036,117
77 FT	4,036,118
	4,036,119

CLASS 96

29 D	4,036,643
36	4,036,644
74	4,036,646
76 C	4,036,647
90 R	4,036,648
107	4,036,649
114.1	4,036,650

CLASS 98

43 R	4,036,120

CLASS 99

289 R	4,036,121
533	4,036,122
538	4,036,123

CLASS 100

98 R	4,036,124
100	4,036,125
210	4,036,126

CLASS 101

5	4,036,127
9	4,036,128
120	4,036,129
170	4,036,130
247	4,036,131
288	4,036,132
415.1	4,036,133
426	4,036,134
463	4,036,135
467	4,036,136

CLASS 102

23	4,036,137
24 R	4,036,138
28 R	4,036,139
38	4,036,140
	4,036,141
70.2 R	4,036,142
	4,036,143
	4,036,144
73 R	4,036,145

CLASS 104

1 R	4,036,146
23 R	4,036,147
166	4,036,148

CLASS 105

280	4,036,149

CLASS 106

1	4,036,651
47 R	4,036,653
52	4,036,654
77	4,036,655
88	4,036,656
89	4,036,657
90	4,036,658
	4,036,659
	4,036,660
273 N	4,036,661
300	4,036,662
308 B	4,036,663
308 N	4,036,652

CLASS 108

20	4,036,151
50	4,036,150

CLASS 110

8 E	4,036,152
8 F	4,036,153

CLASS 111

10	4,036,154

CLASS 112

121 15	4,036,155
121 26	4,036,156
163	4,036,157
258	4,036,158

CLASS 113

1 F	4,036,159
120 R	Re.29,307
121 C	4,036,160

CLASS 114

296	4,036,161

CLASS 115

17	4,036,162
34 R	4,036,163
37	4,036,164

CLASS 116

28 R	4,036,165
114 5	4,036,166

CLASS 118

7	4,036,167
8	4,036,168
49 1	4,036,171
66	4,036,169
73	4,036,170
262	4,036,172
306	4,036,173
623	4,036,174
651	4,036,175

CLASS 119

3	4,036,176
18	4,036,177
51 R	4,036,178
	4,036,189
96	4,036,179

CLASS 123

3	4,036,180
	4,036,181
	4,036,182
8.13	4,036,183
32 EA	4,036,186
32 SP	4,036,187
32 ST	4,036,202
41.31	4,036,188
75 B	4,036,184
90 25	4,036,185
117 D	4,036,190
119 A	4,036,191
139 AB	4,036,193
139 AK	4,036,195
139 AT	4,036,192
139 AW	4,036,194
140 R	4,036,196
146.5 A	4,036,197
	4,036,198
148 CC	4,036,201
148 E	4,036,199
	4,036,200

CLASS 124

21	4,036,203
35 A	4,036,204

CLASS 126

126	4,036,205
270	4,036,206
271	4,036,207
	4,036,208
	4,036,209

CLASS 127

69	4,036,664

CLASS 128

2 F	4,036,210
	4,036,214
2 R	4,036,211
	4,036,212
2 S	4,036,213
2.05 D	4,036,216
2.05 F	4,036,215
2.08	4,036,217
	4,036,222
4	4,036,218
48	4,036,219
82	4,036,220
145.6	4,036,221
212	4,036,224
218 D	4,036,226
218 M	4,036,225
260	4,036,227
	4,036,228
266	4,036,223
268	4,036,229
269	4,036,230
276	4,036,231
278	4,036,232
287	4,036,233
	4,036,234
292	4,036,235
317	4,036,236

CLASS 131

17 R	4,036,237
21 B	4,036,238
109 R	4,036,239
173	4,036,240

CLASS 132

7	4,036,241

CLASS 133

4 R	4,036,242

CLASS 134

76	4,036,243

CLASS 135

4 R	4,036,244

CLASS 136

89 C	4,036,645
202	4,036,665

CLASS 137

117	4,036,245
118	4,036,246
236	4,036,247
271	4,036,248
367	4,036,249
476	4,036,250
512.1	4,036,251
527.8	4,036,252
556	4,036,253
581	4,036,254
587	4,036,255
595	4,036,256
614.04	4,036,258
614.06	4,036,257
801	4,036,259

CLASS 138

94.3	4,036,260
96 T	4,036,261

CLASS 139

11	4,036,262
91	4,036,263
92	4,036,264
190	4,036,265
304	4,036,266
336	4,036,267

CLASS 140

124	4,036,268

CLASS 144

1 D	4,036,269
208 E	4,036,270

CLASS 148

1.5	4,036,666
6.2	4,036,667
6.35	4,036,668
11.5 C	4,036,669
12.1	4,036,670
24	4,036,671
175	4,036,672

CLASS 150

54 B	4,036,271

CLASS 152

210	4,036,272
225 R	4,036,273

CLASS 156

71	4,036,673
98	4,036,674
245	4,036,675
273	4,036,676
394	4,036,677
461	4,036,678

CLASS 157

1	4,036,274
13	4,036,275

CLASS 160

183	Re 29,308

CLASS 162

9	4,036,679
65	4,036,680
	4,036,681
167	4,036,682
274	4,036,683
290	4,036,684

CLASS 164

7	4,036,276
16	4,036,277
52	4,036,278
57	4,036,279
82	4,036,280
89	4,036,281
123	4,036,282
160	4,036,283
280	4,036,284

CLASS 165

45	4,036,285
	4,036,286
55	4,036,287
69	4,036,288
82	4,036,289
105	4,036,290
	4,036,291
122	4,036,292
134	4,036,293
154	4,036,294

CLASS 166

.6	4,036,295
250	4,036,297
251	4,036,298
261	4,036,299
273	4,036,300
293	4,036,301
322	4,036,296

CLASS 168

4	4,036,302

CLASS 172

49	4,036,303
260	4,036,304
283	4,036,305
287	4,036,306
749	4,036,307

CLASS 173

75	4,036,308
103	4,036,309
131	4,036,310
169	4,036,311

CLASS 174

15 R	4,037,045
18	4,037,046
68.5	4,037,047

CLASS 175

302	4,036,312
344	4,036,313
364	4,036,314

CLASS 176

19 LD	4,036,685
19 R	4,036,686
37	4,036,687
38	4,036,688
39	4,036,689
40	4,036,690
68	4,036,691
76	4,036,692
87	4,036,700

CLASS 177

1	4,036,315
	4,036,316
209	4,036,317
211	4,036,318

CLASS 178

67	4,037,049
69 G	4,037,050

CLASS 179

1 E	4,037,051
1 MF	4,037,052
6 R	4,037,053
15 BF	4,037,054
15 BT	4,037,055
	4,037,056
	4,037,057
99	4,037,058
	4,037,059
100.41 K	4,037,060
115 5 PV	4,037,061
133	4,037,062
147	4,037,063
156 R	4,037,064
170 G	4,037,066
170 NC	4,037,065
184	4,037,067

CLASS 180

5 R	4,036,320
6.48	4,036,321
82 C	4,036,322
105 R	4,036,323

CLASS 181

42	4,036,324

CLASS 182

46	4,036,325

CLASS 184

27 R	4,036,326
55 A	4,036,327

CLASS 188

26	4,036,328
72.7	4,036,329
72 8	4,036,330
187	4,036,331
196 D	4,036,332
264 A	4,036,333
	4,036,334
282	4,036,319
319	4,036,335

CLASS 190

18 A	4,036,336

CLASS 191

1 A	4,036,337

CLASS 192

13 R	4,036,338
48.3	4,036,344
58 B	4,036,339
084	4,036,340
106.2	4,036,341
109 F	4,036,342
134	4,036,343

CLASS 193

35 SS	4,036,345

CLASS 194

9 T	4,036,346
48	4,036,347

CLASS 195

1 8	4,036,693
11	4,036,694
51 B	4,036,695
80 R	4,036,696
99	4,036,697
103.5 M	4,036,698
142	4,036,699

CLASS 197

53	4,036,348
151	4,036,349

CLASS 198

420	4,036,350
486	4,036,353
499	4,036,351
	4,036,354
607	4,036,355
680	4,036,356
778	4,036,352

CLASS 200

5 F	4,037,068
61.27	4,036,817
86 R	4,037,069
209	4,036,827

CLASS 202

204	4,036,701
248	4,036,702

CLASS 203

57	4,036,703

CLASS 204

1 T	4,036,704
15	4,036,705
	4,036,706
20	4,036,707
38 A	4,036,708
43 T	4,036,709
52 R	4,036,710
	4,036,711
59 R	4,036,712
98	4,036,713
99	4,036,714
109	4,036,715
147	4,036,716
153	4,036,717
159.14	4,036,719
159.2	4,036,718
177	4,036,720
181	4,036,721
192 EC	4,036,723
195 B	4,036,722
195 R	4,036,724
206	4,036,725
231	4,036,726
268	4,036,727
283	4,036,728
296	4,036,729

CLASS 206

5 1	4,036,357
83 5	4,036,359
82	4,036,358
204	4,036,360
386	4,036,361
432	4,036,362
526	4,036,363
	4,036,364

CLASS 208

8	4,036,730
	4,036,731
11 LE	4,036,732
12	4,036,733
57	4,036,734
89	4,036,735
106	4,036,736
108	4,036,737
	4,036,738
120	4,036,739
	4,036,740
139	4,036,741
	4,036,742
	4,036,743
216	Re 29,314
	Re 29,315
310 Z	4,036,744
	4,036,745

CLASS 209

73	4,036,365
166	4,036,746

CLASS 210

22 A	4,036,747
23 H	4,036,748
	4,036,749
27	4,036,750
35	4,036,751
46	4,036,752
63 R	4,036,753
139	4,036,754
168	4,036,755
169	4,036,756
196	4,036,757
223	4,036,758
298	4,036,759
323 R	4,036,760
474	4,036,761

CLASS 211

4	4,036,366
37	4,036,367
60 R	4,036,368
88	4,036,369
162	4,036,370
182	4,036,371

CLASS 212

144	4,036,372

CLASS 214

1 BB	4,036,373
	4,036,374
6 F	4,036,375
14	4,036,376
17 DA	Re 29,309
92	4,036,378
152	4,036,379
305	4,036,380
310	4,036,381
313	4,036,382
	4,036,383
334	4,036,384
512	4,036,377

CLASS 215

209	4,036,385
260	4,036,386
309	4,036,387
341	4,036,388

CLASS 219

10.55 A	4,037,070
10.55 F	4,037,071
56	4,037,072
92	4,037,073
121 L	4,037,076
121 LM	4,037,075
121 P	4,037,074
123	4,037,077
137 R	4,037,078
219	4,037,079
328	4,037,080
387	4,037,081
541	4,037,082
552	4,037,083

CLASS 220

3.8	4,036,389
5 A	4,036,390
21	4,036,391
23	4,036,392
206	4,036,393
222	4,036,394
224	4,036,395
242	4,036,396
268	4,036,397
270	4,036,398
[illegible]03	4,036,399

CLASS 221

67	4,036,400
150 A	4,036,401

CLASS 222

1	4,036,402
23	4,036,403
39	4,036,404
63	4,036,405
181	4,036,406
188	4,036,407
193	4,036,408
249	4,036,409
255	4,036,410
413	4,036,411
490	4,036,412
500	4,036,413

CLASS 223

28	4,036,414
40	4,036,415

CLASS 224

45 N	4,036,417
45 R	4,036,416
48 F	4,036,418

CLASS 225

96.5	4,036,419

CLASS 226

87	4,036,420
185	4,036,421

CLASS 227

67	Re 29,310
110	4,036,422

CLASS 229

43	4,036,423
52 A	4,036,424

CLASS 233

2	4,036,425
7	4,036,426
10	4,036,427
23 R	4,036,428
27	4,036,429

CLASS 235

61.11 E	4,036,430
69	4,037,084
92 LG	4,037,085
92 PE	4,036,431
150.22	4,037,086
151.1	4,037,087
151.21	4,037,088
152	4,037,089
	4,037,090
153 AM	4,037,091
156	4,037,092
164	4,037,093
175	4,037,094
183	4,037,095

CLASS 236

35	4,036,432
100	4,036,433

CLASS 239

8	4,036,434
116	4,036,435
183	4,036,436
186	4,036,437
288.5	4,036,438
466	4,036,439

CLASS 240

1.4	4,037,096
3.1	4,037,097
78 R	4,037,098

CLASS 241

20	4,036,440
	4,036,441
82.5	4,036,442
297	4,036,443

CLASS 242

35 6 E	4,036,444
37 A	4,036,445
39	4,036,446
43.2	4,036,447
81	4,036,448
107	4,036,449
129	4,036,450
137.1	4,036,451
201	4,036,458

CLASS 244

1 N	4,036,452
3.16	4,036,453
118 R	4,036,455
122 AD	4,036,456
134 D	4,036,457

CLASS 248

11	4,036,459
59	4,036,460
68 R	4,036,461
166	4,036,462
210	4,036,463
309 R	4,036,464
463	4,036,465

CLASS 249

18	4,036,466

CLASS 250

199	4,036,762
214 C	4,036,763
272	4,037,099
281	4,037,100
299	4,036,777
310	4,037,101
336	4,037,102
341	4,037,103
359	4,037,104
367	4,037,105
381	4,037,106
402	4,037,107
427	4,037,108
444	4,037,109
483	4,037,110
505	4,037,111
527	4,037,112
554	4,037,113

CLASS 251

14	4,036,467
84	4,036,468
306	4,036,469
309	4,036,470

CLASS 252

8 5 C	4,036,764
21	4,036,765
48 6	4,036,769
51 5 A	4,036,766
	4,036,767
	4,036,768
51 5 R	4,036,770
56 R	4,036,771
	4,036,772
	4,036,773
132	4,036,774
134	4,036,775
187 R	4,036,776
301 21	4,036,778
417	4,036,779
437	4,036,780
439	4,036,781
455 Z	4,036,782
461	4,036,783
465	4,036,784
472	4,036,785
511	4,036,786

CLASS 254

10 5	4,036,473
28	4,036,471
93 HP	4,036,472
124	4,036,474
133 R	4,036,475
172	4,036,476

CLASS 259

41	4,036,477

CLASS 260

2 S	4,036,787
2.1 E	4,036,788
2.5 AG	4,036,791
2.5 AQ	4,036,790
2.5 AR	4,036,789
2 5 AW	4,036,792
2.5 B	4,036,794
2.5 F	4,036,793
18 PN	4,036,795
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REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

3,663,369, Re. S.N. 796,046, Filed May 17, 1977, Cl. 195/31, HYDROLYSIS OF STARCH, Alpha L. Morehouse, et al., Owner of Record: *Grain Processing Corporation, Muscatine, Iowa,* Attorney or Agent: Sidney Neuman, et al., Ex. Gp.: 172

3,844,361, Re. S.N. 803,601, Filed June 6, 1977, Cl. 175/66, CLOSED CIRCUIT METHOD OF CIRCULATING A SUBSTANTIALLY SOLID FREE DRILLING FLUID, Jack M. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Kenneth H. Johnson, Ex. Gp.: 354

3,852,201, Re. S.N. 803,604, Filed June 6, 1977, Cl. 252/8.5 A, CLAY FREE AQUEOUS DRILLING FLUID, Jack M. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Kenneth H. Johnson, Ex. Gp.: 223

3,889,067, Re. S.N. 802,735, Filed June 2, 1977, Cl. 179/18 J, DIGITAL TELEPHONE SWITCHING SYSTEM, Irving S. Reed, et al., Owner of Record: *Technology Service Corporation, Santa Monica, Calif.,* Attorney or Agent: Antonio M. Fernandez, et al., Ex. Gp.: 232

3,941,871, Re. S.N. 801,944, Filed May 31, 1977, Cl. 423/326, CRYSTALLINE SILICATES AND METHOD OF PREPARING THE SAME, Francis G. Dwyer, et al., Owner of Record: *Mobil Oil Corporation, New York, N.Y.,* Attorney or Agent: Charles A. Huggett, et al., Ex. Gp.: 113

3,953,335, Re. S.N. 803,602, Filed June 6, 1977, Cl. 252/8.5 A, MAGNESIA STABILIZED ADDITIVES FOR NON-CLAY WELLBORE FLUIDS, Jack M. Jackson, Owner of Record: *Inventor,* Attorney or Agent: Kenneth H. Johnson, Ex. Gp.: 223

3,961,446, Re. S.N. 801,811, Filed May 31, 1977, Cl. 47/38, BALANCED BOTANICAL GROWTH CONTAINER, Stanley I. Mason, Jr., et al., Owner of Record: *Simco, Inc., Weston, Conn.,* Attorney or Agent: Haynes N. Johnson, et al., Ex. Gp.: 337

3,994,825, Re. S.N. 801,628, Filed May 31, 1977, Cl. 252/309, PROCESS FOR MAKING COLLOIDAL SOLS OF ANTIMONY PENTOXIDE IN POLYHYDROXY ALCOHOLS, Charles Edward Crompton, et al., Owner of Record: *Chemetron Corporation, Chicago, Ill.,* Attorney or Agent: Nicholas M. Esser, et al., Ex. Gp.: 223

4,015,100, Re. S.N. 804,981, Filed June 9, 1977, Cl. 219/121, SURFACE MODIFICATION, Daniel S. Gnanamuthu, et al., Owner of Record: *Avco Everett Research Laboratory, Inc., Everett, Mass.,* Attorney or Agent: M. E. Frederick, et al., Ex. Gp.: 213

4,017,418, Re. S.N. 801,627, Filed May 31, 1977, Cl. 252/309, PROCESS FOR MAKING COLLOIDAL SOLS OF ANTIMONY PENTOXIDE IN POLAR ORGANIC SOLVENTS, Charles Edward Crompton, et al., Owner of Record: *Chemetron Corporation, Chicago, Ill.,* Attorney or Agent: Nicholas M. Esser, et al., Ex. Gp.: 223

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Disclaimers

3.009.525.—*Robert DeLiban,* Glenview, Ill. GUIDANCE SYSTEMS. Patent dated Nov. 21, 1961. Disclaimer filed May 12, 1977, by the assignee, *Barrett Electronics Corporation.*

Hereby enters this disclaimer to claims 17 and 21 of said patent.

3.297.172.—*Lester W. Haaker* and *Demetrius G. Jelatis,* Red Wing, and *Carelton E. Jennrich,* St. Paul, Minn. MASTER-SLAVE MANIPULATOR. Patent dated Jan. 10, 1967. Disclaimer filed Jan. 28, 1977, by the assignee, *Central Research Laboratories, Inc.*

Hereby enters this disclaimer to claims 20, 21, 22 and 24 of said patent.

3.625.793.—*David S. Sheridan,* Argyle, and *Isaac S. Jackson,* Greenwich, N.Y. BALLOON-TYPE CATHETERS AND METHOD OF MANUFACTURE. Patent dated Dec. 7, 1971. Disclaimer filed Apr. 14, 1977, by the assignee, *Mallinckrodt, Inc.*

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3.801.669.—*Harold F. Christmann,* Seabrook, Tex. PURIFICATION OF HYDROCARBONS. Patent dated Apr. 2, 1974. Disclaimer filed May 5, 1977, by the assignee, *Petro-Tex Chemical Corporation.*

Hereby enters this disclaimer to claims 1, 2, 3, 4, 5, 6, 7, 8, 9, 10, 11, 12, 13, 14, 15, 16 and 17 of said patent.

3,805,724.—*Frank W. Butler,* Westlake Village, Calif. SAILBOAT CANOPY APPARATUS. Patent dated Apr. 23, 1974. Disclaimer filed May 9, 1977, by the inventor.

Hereby enters this disclaimer to claims 1 and 2 of said patent.

3.855.562. *Hackchan Rhee,* Indianapolis, Ind. CIRCUIT BREAKER WITH AMBIENT TEMPERATURE COMPENSATION. Patent dated Dec. 17, 1974. Disclaimer filed May 26, 1977, by the assignee, *RCA Corporation.*

Hereby enters this disclaimer to claims 1, 2 and 3 of said patent.

3.911.892.—*Garrett H. Harris,* Jackson, Miss. STOVE CONSTRUCTION. Patent dated Oct. 14, 1975. Disclaimer filed May 12, 1977, by the assignee, *Newco Fireplace Equipment Limited, Inc.*

Hereby enters this disclaimer to claim 1 of said patent.

3.922.387.—*John Robert Larry,* Youngstown, N.Y. METALLIZATIONS COMPRISING NICKEL OXIDE. Patent dated Nov. 25, 1975. Disclaimer filed May 26, 1977, by the assignee, *E. I. du Pont de Nemours and Company.*

Hereby enters this disclaimer to all claims of said ptaent.

3.973.737.— *Kurt Eiglmeier,* Idstein, Taunus, Germany. PROCESS FOR THE MANUFACTURE OF AROMATIC 1,3-DIKETONES. Patent dated Feb. 10, 1976. Disclaimer filed May 23, 1977, by the assignee, *Hoechst Aktiengesellschaft.*

Hereby enters this disclaimer to claim 1 of said Patent.

3.952.574.—*John A. Speidel,* Maineville, Ohio. PROCESS AND APPARATUS FOR FORMING SHEET METAL STRUCTURES. Patent dated Apr. 27, 1976. Disclaimer filed May 11, 1977, by the inventor.

Hereby enters this disclaimer to claim 1 of said patent.

3.978.576.—*Jack Mustoe, Jr.,* Cumbernauld, Scotland. NAIL EXTRACTOR. Patent dated Sept. 7, 1976. Disclaimer filed May 24, 1977, by the assignee, *Glentore Timber Products Limited.*

Hereby enters this disclaimer to claims 12 and 17 of said patem.

3,985.876. –*John R. Hazlett* and *Elvin A. Holstius,* Greenville, N.C. CHEMOTHERAPEUTIC SOLUTIONS CONTAINING A SULPHUR AND A SALT OF A 2,4-DIAMINO-5-BENZYLPYRIMIDINE. Patent dated Oct. 12, 1976. Disclaimer filed May 10, 1977, by the assignee, *Burroughs Wellcome Co.*

Hereby enters this disclaimer to claims 1 to 14 of said patent.

4,030,082.—*Tsugio Goto,* Nobeoka, Japan. APPARATUS FOR THE TREATMENT OF YARN THICKNESS VARIATION SIGNALS. Patent dated June 14, 1977. Disclaimer filed Mar. 14, 1977, by the assignee, *Asahi Kasei Kogyo Kabushiki Kaisha.*

The term of this patent subsequent to May 20, 1992, has been disclaimed.

Disclaimer and Dedication

Design No. 234,792.—Maurice H. O'Link, St. Cloud, Minn. BUOYANT VEST. Patent dated Apr. 8, 1975. Disclaimer and dedication filed May 26, 1977, by the assignee, *Stearns Manufacturing Company.*

Hereby disclaims and dedicates to the Public the entire remaining term of said patent.

Service by Publication

Buck R. Young

In accordance with 37 CFR 1.47(b) (Rules of Practice in Patent Cases), notice is hereby given of the filing on December 29, 1971, of an application for patent entitled "Coating for Multi-Wall Bags," on behalf of Buck R. Young, whose last known address is The Helena Motel, Helena, Arkansas 72342. The application was made in compliance with 37 CFR 1.47(b) and 35 U.S.C. 118 by The Hudson Pulp & Paper Corporation without execution by the said Buck R. Young. Notice of the filing directed to the above noted address has been returned undelivered.

Any action to be taken by the said Buck R. Young in connection with the said application must be taken within thirty (30) days of the publication of this notice.

RENE D. TEGTMEYER,
Assistant Commissioner for Patents and Trademarks.

PATENT EXAMINING CORPS

RENE D. TEGTMEYER, Assistant Commissioner
WILLIAM FELDMAN, Deputy Assistant Commissioner

CONDITION OF PATENT APPLICATIONS AS OF JUNE 18, 1977

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL CHEMISTRY AND PETROLEUM CHEMISTRY, GROUP 110—S. N. ZAHARNA, Director Inorganic Compounds; Inorganic Compositions; Organo-Metal and Organo-Metalloid Chemistry; Metallurgy; Metal Stock; Electro Chemistry; Batteries; Hydrocarbons; Mineral Oil Technology; Lubricating Compositions; Gaseous Compositions; Fuel and Igniting Devices.	8-2-76
GENERAL ORGANIC CHEMISTRY, GROUP 120—A. L. LEAVITT, Director Heterocyclic, Amides; Alkaloids; Azo; Sulfur; Misc. Esters; Carbohydrates; Herbicides; Poisons; Medicines; Cosmetics; Steroids; Oxo and Oxy; Quinones; Acids; Carboxylic Acid Esters; Acid Anhydrides; Acid Halides.	8-11-76
HIGH POLYMER CHEMISTRY, PLASTICS AND MOLDING, GROUP 140—A. P. KENT, Director Synthetic Resins; Rubber; Proteins; Macromolecular Carbohydrates; Mixed Synthetic Resin Compositions; Synthetic Resins With Natural Polymers and Resins; Natural Resins; Reclaiming; Pore-Forming; Compositions (Part) e.g.: Coating; Molding; Ink; Adhesive and Abrading Compositions; Molding, Shaping, and Treating Processes.	6-1-76
COATING AND LAMINATING, BLEACHING, DYEING AND PHOTOGRAPHY, GROUP 160—R. FRIEDMAN, Director. Coating; Processes and Misc. Products; Laminating Methods and Apparatus; Stock Materials; Adhesive Bonding; Special Chemical Manufactures; Special Utility Compositions; Bleaching; Dyeing and Photography.	9-23-76
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP 170—H. S. VINCENT, Director Fertilizers; Foods; Fermentation; Analytical Chemistry; Reactors; Sugar and Starch; Paper Making; Glass Manufacture; Gas; Heating and Illuminating; Cleaning Processes; Liquid Purification; Distillation; Preserving; Liquid, Gas, and Solid Separation; Gas and Liquid Contact Apparatus; Refrigeration; Concentrative Evaporators; Mineral Oils Apparatus; Misc. Physical Processes.	8-2-76
ELECTRICAL EXAMINING GROUPS	
INDUSTRIAL ELECTRONICS, PHYSICS AND RELATED ELEMENTS, GROUP 210—W. L. CARLSON, Director Generation and Utilization; General Applications; Conversion and Distribution; Heating and Related Art Conductors; Switches; Photography; Motion Pictures; Illumination; Horology; Acoustics; Recorders; Weighing Scales.	3-1-76
SPECIAL LAWS ADMINISTRATION, GROUP 220—C. D. QUARFORTH, Director Ordnance, Firearms and Ammunition; Radar, Underwater Signalling, Directional Radio, Torpedoes, Seismic Exploring, Radio-Active Batteries; Nuclear Reactors, Powder Metallurgy, Rocket Fuels; Radio-Active Material.	4-28-76
INFORMATION TRANSMISSION, STORAGE AND RETRIEVAL, GROUP 230—J. F. COUCH, Director Communications; Multiplexing Techniques; Facsimile; Data Processing, Computation and Conversion; Storage Devices and Related Arts.	6-14-76
RECEPTACLES, SANITATION AND CLEANING, WINDING, AND MEASURING, GROUP 240—N. ANSHER, Director Receptacles; Joint Packing; Conduits; Plumbing Fixtures; Textile Spinning; Food; Agitating; Cleaning; Pressing; Geometrical Instruments; Sound Recording; Winding and Reeling; Measuring and Testing; Indicating.	12-29-76
ELECTRONIC COMPONENT SYSTEMS AND DEVICES, GROUP 250—L. FORMAN, Director Semi-Conductor and Space Discharge Systems and Devices; Electronic Component Circuits; Wave Transmission Lines and Networks; Optics; Radiant Energy; Measuring.	5-3-76
DESIGNS, GROUP 290—C. D. QUARFORTH, Director Industrial Arts; Household, Personal and Fine Arts.	11-17-75
MECHANICAL EXAMINING GROUPS	
HANDLING AND TRANSPORTING MEDIA, GROUP 310—D. J. STOCKING, Director Conveyors; Hoists; Elevators; Article Handling Implements; Store Service; Sheet and Web Feeding; Dispensing; Fluid Sprinkling; Fire Extinguishers; Coin Handling; Check Controlled Apparatus; Classifying and Assorting Solids; Boats; Ships; Aeronautics; Motor and Land Vehicles and Appurtenances; Brakes; Railways and Railway Equipment.	6-10-76
MATERIAL SHAPING, ARTICLE MANUFACTURING, TOOLS, GROUP 320—S. S. MATTHEWS, Director Manufacturing Processes, Assembling, Combined Machines, Special Article Making; Metal Deforming; Sheet Metal and Wire Working; Metal Fusion—Bonding, Metal Founding; Metallurgical Apparatus; Plastics Working Apparatus; Plastic Block and Earthenware Apparatus; Machine Tools for Shaping or Dividing; Work and Tool Holders, Woodworking; Tools; Cutlery; Jacks.	9-20-76
AMUSEMENT, HUSBANDRY, PERSONAL TREATMENT, INFORMATION, GROUP 330—G. M. FORLENZA, Director. Amusement and Exercising Devices; Projectors; Animal and Plant Husbandry; Butchering; Earth Working and Excavating; Fishing, etc.; Tobacco; Artificial Body Members; Dentistry; Jewelry; Surgery; Toiletry; Printing; Typewriters; Stationery; Information Dissemination.	7-6-76
HEAT, POWER, AND FLUID ENGINEERING, GROUP 340—B. R. GAY, Director Power Plants; Combustion Engines; Fluid Motors; Reaction Motors; Pumps; Rotary Engines and Pumps; Heat Generation and Exchange; Refrigeration; Ventilation; Drying; Temperature and Humidity Regulation; Machine Elements; Couplings; Gearing; Bearings; Clutches; Power Transmission; Fluid Handling and Control; Lubrication.	7-12-76
GENERAL CONSTRUCTIONS, TEXTILES AND MINING, GROUP 350—M. M. NEWMAN, Director Joints; Fasteners; Rod, Pipe and Electrical Connectors; Miscellaneous Hardware; Locks; Building Structures; Closure Operators; Bridges; Closures; Earth Engineering; Drilling; Mining; Furniture; Supports; Cabinet Structures; Centrifugal Separations; Coating; Textiles; Apparel and Shoes; Sewing Machines.	11-24-76

Expiration of patents: The patents within the range of numbers indicated below expire during June 1977, except those which may have expired earlier due to shortened terms under the provisions of Public Law 690, 79th Congress, approved August 8, 1946 (60 Stat. 940) and Public Law 619, 83rd Congress, approved August 23, 1954 (68 Stat. 764), or which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents .... Numbers 2,939,145 to 2,943,326, inclusive
Plant Patents .... Numbers 1,950 to 1,956, inclusive

REISSUES

JULY 26, 1977

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

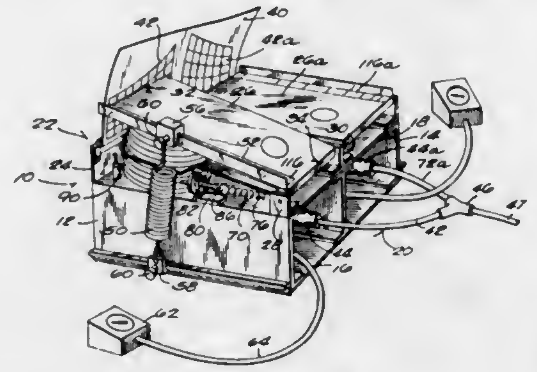
Re. 29,317
PNEUMATIC LUNG ANALOG

Kenneth C. Mosley, Grand Rapids, and Clare E. Barkalow, Comstock Park, both of Mich., assignors to Michigan Instruments, Inc., Grand Rapids, Mich.

Original No. 3,808,706, dated May 7, 1974, Ser. No. 327,503, Jan. 29, 1973. Application for reissue Sept. 17, 1976, Ser. No. 724,211

Int. Cl.^{2} G09B *23/28*

U.S. Cl. 35—17 **31 Claims**



1. A pneumatic lung analog comprising, in combination: a frame; a bellows in said frame, said bellows simulating a lung, said bellows having a stationary end plate secured to said frame and a movable end plate secured to said frame, said movable end plate being pivotal relative to said stationary plate; said bellows having air inlet and air outlet means for inflating and deflating said bellows, said movable end plate pivoting away from said stationary end plate when the flow of air is into said bellows and moving toward said stationary end plate when the flow of air is out of said bellows, said air inlet means defining a passageway having a preselected cross section flow area to simulate a preselected flow resistance through the respiratory track; means biasing said movable end plate toward said stationary end plate, said biasing means *including a spring connected at one end to said movable end plate and at the other end to said frame, said spring providing a force against said movable end plate urging it toward said stationary end plate when said bellows is expanded and* acting as a resistance to the expansion of said bellows, said biasing means simulating the respiratory compliance in a lung; *adjustment means for adjusting the force of said spring acting on said movable end plate, said adjustment means including attachment means anchoring the ends of said spring at various locations radially from the axis of pivot of said movable end plate so that the tension on said spring can be varied for a given angular movement of said movable end plate;* and indicating means associated with said movable end plate, said indicating means providing a performance readout of said lung analog in response to flow through said air inlet means.

Re. 29,318
DEVICE FOR THE DETECTION OF EXCESSIVE THREAD TENSION AND THREAD BREAKAGE

Jacques Palencher, Troyes, France, assignor to Lebocey Industrie, Troyes, France

Original No. 3,896,640, dated July 29, 1975, Ser. No. 349,014, Apr. 9, 1973. Application for reissue Nov. 26, 1976, Ser. No. 724,860

Claims priority, application France, Apr. 28, 1972, 72.15365

Int. Cl.^{2} D04B *35/12, 35/14*

U.S. Cl. 66—161 **2 Claims**

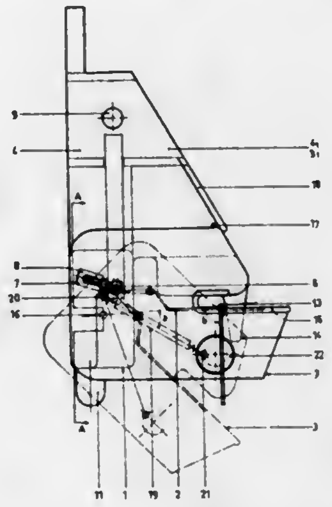
1. A device for detecting the breakage of, and excessive tension in, the thread operating in a knitting machine comprising:

a. a case;

b. a first detection lever pivotally mounted to said case, said first detection lever being arranged and configured to detect the breakage of said thread;

c. a second detection lever pivotally mounted to said case, said second detection lever being arranged and configured to slidably support said thread; and

d. a spring means having first and second ends, said first end thereof being connected to said case at a first point and said second end thereof being connected to said second detection lever at a second point thereon, the return force of said spring tending to maintain said second detection lever against an abutment, said first and second points being situated on opposite sides of an imaginary straight line joining the axis of rotation of said second detection lever and the point at which said thread engages said second detection lever, said first point being situated nearer to the axis of rotation of said second detection lever than to said point at which said thread engages said second detection lever, and said second point being situated nearer to said point at which said thread engages said second detection lever than to the axis of rotation of said second lever the length of said spring being approximately equal to the distance between the axis of rotation of said second detection lever and said point at which said thread engages said second detection lever,



whereby, said second detection lever is responsive to excessive tension in said thread by pivoting about its axis of rotation and against the return force of said spring until said thread escapes [thereform] *therefrom.*

Re. 29,319
DRAINAGE SYSTEM FOR INCISIONS OR WOUNDS IN THE BODY OF AN ANIMAL

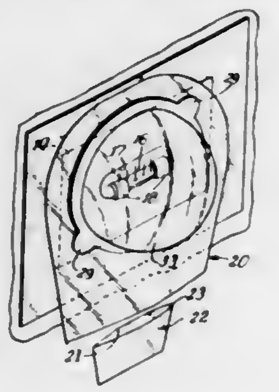
Harvey M. Nordby, Buffalo Grove; John L. Nolan, Glenview, and Bremen I. Johnson, Cary, all of Ill., assignors to Hollister Incorporated, Chicago, Ill.

Original No. 3,954,105, dated May 4, 1976, Ser. No. 565,614, Apr. 7, 1975. Continuation of Ser. No. 402,047, Oct. 1, 1973, abandoned. Application for reissue Oct. 29, 1976, Ser. No. 737,142

Int. Cl.^{2} A61F *5/44*

U.S. Cl. 128—275 **5 Claims**

4. A drainage system for draining fluids from an opening such as a wound or incision in the body of an animal, said system being usable in combination with a drain having a portion within the body and a portion extending outwardly of the body through said opening, said drainage system comprising a sheet of soft, pliable, plastic material, a blanket of gelatinous material adhered to one face of the sheet to be placed in contact with and thereby to sealingly engage the external area of the body surrounding the opening, said sheet and blanket being adapted to have an aperture formed therein exposing only said opening and the drain therein while covering and isolating the area of the body surrounding said opening and drain, a bag of thin plastic material having an inner wall and an outer wall, said walls being secured together at their peripheral edges to form a bag and said walls having opposed holes therein, a relatively stiff but deformable ring surrounding each of said holes and sealed to said walls, an adhesive-carrying face on the ring surrounding the hole in the inner wall for securing the bag to the opposite face of said sheet with the hole in the inner wall surrounding said aperture, a cap of thin plastic material secured to a third relatively stiff but deformable ring of approximately the same diameter as the ring in the outer wall, and means for removably securing said third ring to the ring in the outer wall to permit the cap to be removably secured to the outer wall of the bag.



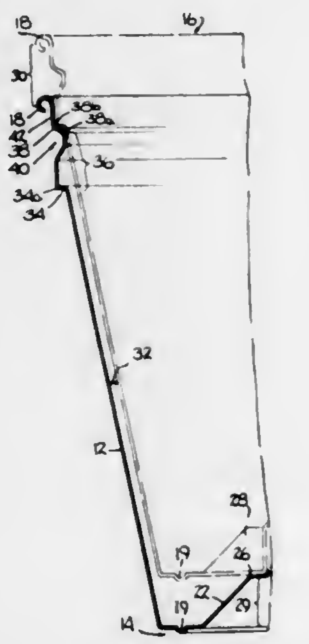
Re. 29,320
NESTABLE CONTAINERS

Daniel R. Kalata, Smithtown, N.Y., and Henry H. Huston, Burlington, Vt., assignors to Owens-Illinois, Inc., Toledo, Ohio

Original No. 3,347,411, dated Oct. 17, 1967, Ser. No. 442,398, Mar. 24, 1965. Continuation of Ser. No. 302,780, Nov. 1, 1972, abandoned, which is a continuation of Ser. No. 827,437, March 26, 1969. Application for reissue Feb. 6, 1974, Ser. No. 440,141

Int. Cl.² B65D *21/02*

U.S. Cl. 206—519 **10 Claims**



7. A nestable container comprising a bottom wall, a circumferential sidewall extending upwardly and generally inclined outwardly from said bottom wall and ending in a peripheral rim at its upper extent, and a combined stacking ridge and lid receiving area including said rim and the portion of said sidewall extending downwardly therefrom, said stacking ridge and lid receiving area comprising a shoulder adjacent the upper end of said container and extending generally horizontally outwardly from the inclined portion of said sidewall to form the lowermost extent of the stacking ridge portion of said area, a face section inclined and projecting inwardly and upwardly from said shoulder, and extending a shelf extending outwardly and upwardly from the upper extent of said face section and spaced downwardly from the top of said rim, the vertical distance between said shoulder and said shelf being defined as the top stacking height, the outer extent of said shoulder being greater than the inner extent of said shelf, the outer extent of substantially all portions of said sidewall which are intermediate said shoulder cnd a point spaced downwardly therefrom a distance equal to said top stacking height being less than the inner extent of said shelf, and the outer extent of all portions at and below said point being less than the inner extent of said shoulder, so that the shoulder of one such container can seat on the shelf of a next lower like container to provide a stacking means between two such containers when nested together, the distance between said shelf and the top of said rim being less than said top stacking height and the outer periphery of said shelf being joined to said rim with all portions of the inner surface of said sidewall between said shelf and the top of said rim being disposed at least as far outwardly as said outer periphery of the shelf, said shelf and at least the upper portion of said face section below said shelf forming a lid sealing means of said area.

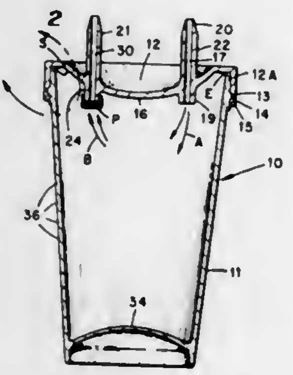
Re. 29,321
FLUID COLLECTION BOTTLE AND IMPROVEMENTS THEREIN

LeGrand K. Holbrook, Salt Lake City, Utah, assignor to Medical Development Corporation, Salt Lake City, Utah

Original No. 3,878,962, dated Apr. 22, 1975, Ser. No. 412,329, Nov. 2, 1973. Continuation of Ser. No. 857,161, Sept. 11, 1969, abandoned. Application for reissue Dec. 12, 1975, Ser. No. 640,059

Int. Cl.² B65D *47/12*

U.S. Cl. 215—309 **6 Claims**



1. A vacuum operated fluid collection bottle for recovering body fluids and comprising a container and a centrally concave cover *removably* secured thereto, said concave cover being essentially rigid and having an inwardly convex interior surface and an outwardly concave exterior surface, said concave cover being essentially rigidly constructed in such configuration, prior to vacuum application, whereby to insure against cover collapse when a vacuum is applied, said [bottle] *cover* being provided with a fluid admittance port and a vacuum port, both of said ports communicating with the interior of said bottle.

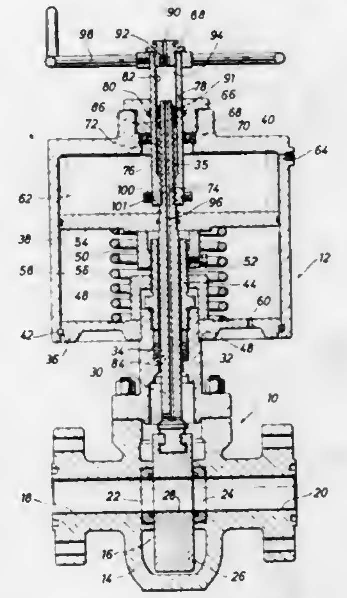
Re. 29,322
VALVE AND ACTUATOR ASSEMBLY

Norman A. Nelson, Houston, Tex., assignor to Teledyne Merla, div. of Teledyne, Inc., Garland, Tex.

Original No. 3,765,642, dated Oct. 16, 1973, Ser. No. 184,837, Sept. 29, 1971. Application for reissue Oct. 15, 1975, Ser. No. 622,601

Int. Cl.² F16K *3/02, 31/143*

U.S. Cl. 251—14 **37 Claims**



1. A valve and actuator assembly comprising:
valve body means defining a valve chamber and having flow passage means intercepting said valve chamber;
seat means disposed within said valve chamber about said flow passage means;
gate means being movably disposed within said valve chamber and having sealing engagement with said seat means, said gate having a flow port for registry with said flow passage means to conduct the flow of effluent through said valve and having an imperforate portion to block the flow of effluent;
bonnet means defining a closure for said valve chamber;
fluid motor means being carried by said bonnet means and having piston means movably disposed therein;
valve stem means having upper and lower extremities, the lower extremity being connected to said gate means and being connected to said piston means, said valve stem means cooperating with said valve body to define a first pressure responsive area of said stem means;
stem drive means engaging said stem means and being operative to impart reciprocal movement to said stem means;
balancing means carried by said stem means and cooperating with said stem drive means to define a second pressure responsive area of said stem means; and
means communicating effluent pressure from said valve chamber to each extremity of said valve stem and causing pressure induced forces acting on said first and second pressure responsive areas of said stem to be substantially balanced.

33. A valve and actuator assembly comprising:
valve body means defining a valve chamber and having flow passage means intercepting said valve chamber;
gate means being movably disposed within said valve chamber and having a flow port for registry with said flow passage means to conduct the flow of effluent through said valve and having a solid portion to block the flow of effluent;
bonnet means defining a closure for said valve chamber;
a fluid motor means attached to said bonnet means and having a housing defined by top and bottom walls and a generally cylindrical wall;
a piston being movably disposed within said housing and dividing said housing into first and second chambers;
means communicating pressurized actuating fluid into said first chamber to impart movement to said piston and said valve stem in one direction;
means venting said second chamber;
means imparting a force to said piston in a direction opposing said one direction;
valve stem means interconnecting said gate means and said piston;
stem drive means engaging said stem means and being operative to impart reciprocal movement to said stem means;
means defining an internal shoulder on said top wall of said housing;
thrust shoulder means being carried by said stem drive means within said housing and being engageable with said internal shoulder to limit axial movement of said stem drive means in one direction;
passageway means being defined in said piston to vent said actuating fluid from said first chamber into said second chamber; and
vent seal means being positionable in sealing relation between said stem drive means and said piston to block said passageway means and being positionable in non-sealing relation with said piston to open said passageway means.

Re. 29,323
ELECTROPHOTOGRAPHIC COPYING APPARATUS

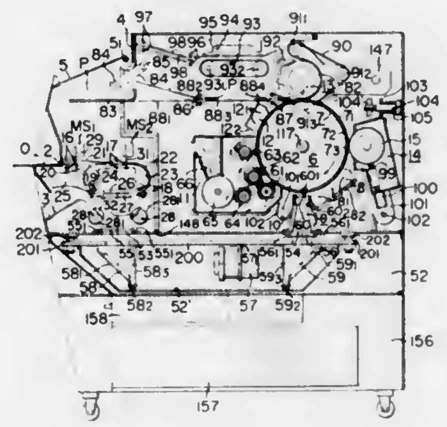
Kazuo Kawakubo, Kawasaki; Motobaru Fujii, Tokyo, and Masao Ariga, Kawasaki, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Original No. 3,770,345, dated Nov. 6, 1973, Ser. No. 20,210, Mar. 17, 1970. Application for reissue July 21, 1975, Ser. No. 597,906

Claims priority, application Japan, Apr. 16, 1969, 44-28971; Mar. 21, 1969, 44-21214

Int. Cl.² G03G *15/00*

U.S. Cl. 355—3 R **53 Claims**



1. An electrophotographic copying apparatus comprising in combination: a variable path for the transportation of an original to be reproduced; means for transporting an original over said path; control means for said path and means for detecting the passage of an original both arranged in said path, *said control means including a guide plate for guiding said original to be reproduced, guide plate positioning means adapted to shift said guide plate between first and second positions, cam means controlling operation of said guide plate positioning means and provided with a plurality of spaced pins, and cam driving means operable by signals from said detecting means to act upon said pins and shift said cam means, whereby* said control means [being] *is* adapted to establish a continuous recirculating path in response to a signal generated by said detecting means when the latter first detects an original inserted in said path through an inlet thereto, thereby circulating an original that has been inserted through said path so as to obtain more than one copy from an original that has been inserted, said control means being further adapted to alter said path in response to a signal generated by said detecting means when the latter detects the completion of a predetermined number of circulations of an original in said path, thereby discharging an original that has been circulated;

means for illuminating an original as it is being transported by said transporting means for deriving a projectable image therefrom; a photosensitive drum rotatably mounted upon a shaft; means for forming an electrophotographic image on said drum arranged around the periphery of said drum and including an optical system for projecting said projectable image upon said drum; means for feeding image transfer material; means for transferring an image from said drum to transfer material fed by said feeding means; and means for fixing an image on transfer material to which an image has been transferred.

Re. 29,324
N-SUBSTITUTED ASPARTYL PEPTIDE AMIDES

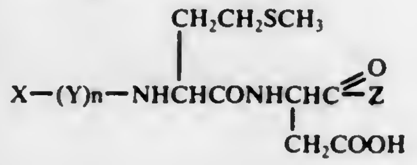
David A. Jones, Skokie, and Robert H. Mazur, Deerfield, both of Ill., assignors to G. D. Searle & Co., Chicago, Ill.

Original No. 3,875,137, dated Apr. 1, 1975, Ser. No. 352,865, Apr. 20, 1973. Application for reissue Feb. 5, 1976, Ser. No. 655,322

Int. Cl.^{2} C07C *103/52*

U.S. Cl. 260—112.5 R **13 Claims**

1. A compound of the formula



$$X-(Y)n-NH\underset{|}{\overset{\overset{\displaystyle CH_2CH_2SCH_3}{|}}{C}}HCONH\underset{\underset{\displaystyle CH_2COOH}{|}}{C}HC(=O)Z$$

wherein X is hydrogen or a tertiary-butoxycarbonyl radical, Y is a tryptophanyl radical, n is 0 or 1 and Z is an amine residue wherein the amine is an alkyl amine, cycloalkyl amine, or heterocyclic amine [or aralkyl amine].

Re. 29,325
HERMETIC POWER PACKAGE

Billy M. Hargis, Cleveland, Tenn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Original No. 3,681,513, dated Aug. 1, 1972, Ser. No. 109,888, Jan. 26, 1971. Application for reissue July 16, 1973, Ser. No. 379,364

Int. Cl.^{2} H01L *1/12, 1/14*

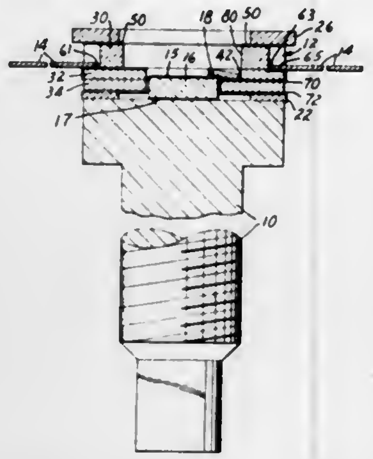
U.S. Cl. 174—52 S **4 Claims**

1. A package adapted for a power-consuming chip device comprising:

A. a metallic heat conductive base

B. a low expansion metallic shim brazed to said base and,

C. A *terminal-bearing and* lead-bearing alumina ceramic *ring or* collar *having a central opening and* having metallic surfaces at least partially covering the top and bottom surfaces[.] *and external terminals connected to internal terminals within the central opening by buried leads,* said *ring or* collar being sealed to said base by brazing to said shim and surrounding an area of said base adapted to receive said chip device.



Re. 29,326
INTEGRATED MAGNETIC HEAD HAVING ALTERNATE CONDUCTING AND INSULATING LAYERS WITHIN AN OPEN LOOP OF TWO MAGNETIC FILMS

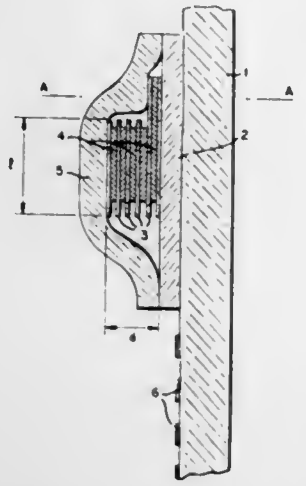
Jean Pierre Lazzari, Seyssinet; Igor Melnick, Grenoble, and Jean-Yves Valet, Seyssinet, all of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Original No. 3,723,665, dated Mar. 27, 1973, Ser. No. 81,881, Oct. 19, 1970. Application for reissue Apr. 15, 1976, Ser. No. 677,433

Claims priority, application France, Oct. 28, 1969, 69.36863

Int. Cl.^{2} G11B *5/20, 5/22, 5/42*

U.S. Cl. 360—123 **7 Claims**



1. An integrated magnetic head for reading and/or writing, a magnetic circuit for said head comprising an open loop of two magnetic films joined together at one end and disposed at the other end in proximity to the wiring and/or reading surface and substantially at right angles to said surface, and an electric winding for writing and/or reading within said loop comprising in an alternate arrangement a succession of electrically conducting and electrically insulating film layers at least partially superposed in a direction substantially at right angles to the plane of said magnetic films, wherein said loop has a convergent shape at the level of the opening of said open loop, wherein an electrically conducting layer having its two faces adjacent to two electrically insulating layers is level with the open end of said loop forming a gap, the other layers being set back towards the interior of said loop.

PLANT PATENTS

GRANTED JULY 26, 1977

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

4,082
ROSE PLANT-MELISSA VARIETY

Gayle Kent McDaniel, Carlton, Oreg., assignor to Carlton Rose Nurseries, Carlton, Oreg.

Filed May 24, 1976, Ser. No. 689,641

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—18 **1 Claim**

1. A new and distinct variety of rose plant of the Hybrid Tea Class obtained as a seedling from seed parent No. 1968-L and pollen parent No. 167-D characterized by its ability to yield medium-sized long lasting blooms on a continuous basis in a greenhouse substantially as shown as described.

4,083
ROSE PLANT—JOFITALI VARIETY

Willem De Witte, Aarbergerweg 15, Rijsenhout (Post Aalsmeer) Commune de Haarlemmeneer, Netherlands

Filed May 24, 1976, Ser. No. 689,503

Claims priority, application Netherlands, May 28, 1975, 752882; Morocco, Oct. 31, 1975, 17283

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—19 **1 Claim**

1. A new and distinct variety of Grandiflora rose-plant of vegetative reproduction, characterized by the fact that

from the physical point of view, the plant is erect; the flower is double, very luminous Rose Bengal on the inside and Spiraea Red on the outside; the flower initially has a high-centered form;

from the biological point of view, this rose-plant is of vigorous vegetation, has an excellent capacity for reblooming, great resistance to diseases, and its flowers last a long time whether on the plant or when cut;

substantially as shown and described.

4,084
NECTARINE TREE

Sam Parnagian, 410 E. Adams, Fowler, Calif. 93625

Filed Aug. 18, 1976, Ser. No. 715,339

Int. Cl.^{2} A01H *5/03*

U.S. Cl. Plt.—41 **1 Claim**

1. A new and distinct variety of nectarine tree, substantially as illustrated and described, characterized by its vigorous growth and large size; its bearing of early ripening, very highly colored, clingstone, yellow fleshed fruit which ripens from 10 to 14 days earlier than the fruit of the Armking nectarine tree (U.S. Plant Pat. No. 2,943) and which is smoother, glossier and more highly colored than the fruit of the Mayred nectarine tree (U.S. Plant Pat. No. 2,758); and which is further distinguished from the Armking nectarine tree by its even more vigorous growth and more nearly spherical fruit.

4,085
LILY PLANT NAMED STAR GAZER

Ted T. Kirsch, Sitkum Rte. Box 142, Myrtle Point, Oreg. 97458

Filed Sept. 24, 1976, Ser. No. 726,481

Int. Cl.^{2} A01H *5/00*

U.S. Cl. Plt.—68 **1 Claim**

1. A new and distinct variety of Oriental hybrid lily plant substantially as herein shown and described, characterized by its very large upwardly facing flowers borne on strong, stiff vertically projecting pedicels, by the substantially overall bright red coloring of the sepals and petals which are bordered by a marginal band of white, and by the long lasting quality of the blooms whether on the plant or as cut flowers.

PATENTS

GRANTED JULY 26, 1977

ERRATA

For CLASS	See PATENT NO.
210-077	4,037,338
084-474	4,037,518
296-061	4,037,564
123-003	4,037,568
211-106	4,037,737
237-008 R	4,037,779
285-005	4,037,859
432-112	4,038,021
428-596	4,038,040
428-576	4,038,041
428-625	4,038,042
261-089	4,038,353
427-248 E	4,038,430
023-230 B	4,038,485
361-230	4,038,583
361-104	4,038,584
361-334	4,038,585
361-435	4,038,586
361-321	4,038,587
364-200	4,038,640
364-900	4,038,641
364-90	4,038,642
364-200	4,038,643
364-900	4,038,644
364-200	4,038,645
235-151	4,038,668
358-127	4,038,679

PATENTS

GRANTED JULY 26, 1977

GENERAL AND MECHANICAL

4,037,272

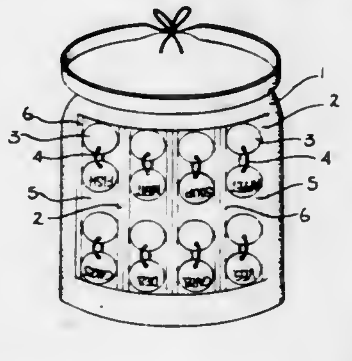
RECIPE APRON

Esther G. Shani, 1670 Huntington Drive, South Pasadena, Calif. 91030

Filed May 20, 1976, Ser. No. 688,419

Int. Cl.^{2} A41D *13/04*

U.S. Cl. 2—48 **6 Claims**



1. A recipe apron comprising:

an apron;

a plurality of rings coupled to said apron;

a plurality of recipe sheets coupled to said rings; and

a plurality of transparent cover sheets extending over said recipe sheets, each of said transparent cover sheets, being fixed along one edge thereof to said apron and being detachably coupled along the other edge thereof to said apron whereby said cover sheets may be detached along one edge to allow a user to flip through the recipe sheets and reattach to said apron thereby holding said recipe sheets in place and protecting said recipe sheets from stains.

4,037,273

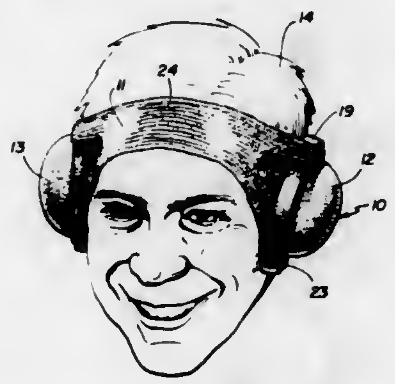
EAR PROTECTOR

Wallace F. Labaire, 9 Pleasant St., Worcester, Mass. 01608

Filed June 20, 1975, Ser. No. 588,596

Int. Cl.^{2} A41D *21/00*

U.S. Cl. 2—209 **1 Claim**



1. A method of forming an ear protector, comprising the steps of,

a. forming an inner container having an inner, upwardly-convex dome and having a peripheral, upwardly-concave trough, the trough having an uppermost and outermost peripheral sealing edge,

b. placing the inner container in a fist sealing mold, which mold has a sealing surface positioned adjacent and beneath the sealing edge of the inner container,

c. concentrically connecting an annular resilient ring to a rigid ring,

d. fixing a head strap to the rigid ring,

e. placing the rigid ring with the resilient ring downwardly and concentrically in the trough of the inner container,

f. placing a sound-damping material over the upwardly-facing surface of the dome of the inner container,

g. forming an outer container having a sealing edge corresponding to the sealing edge of the inner container,

h. placing the outer container in a second sealing mold which has a sealing surface positioned adjacent to and over the sealing edge of the outer container,

i. bringing the first and second sealing mold together, so that the sealing edges of each container are in contact, except that a portion of the head strap passes between the sealing edges at predetermined locations, and

j. causing the sealing surfaces to bring about a hermetic seal between the inner and outer containers at their sealing edges.

4,037,274

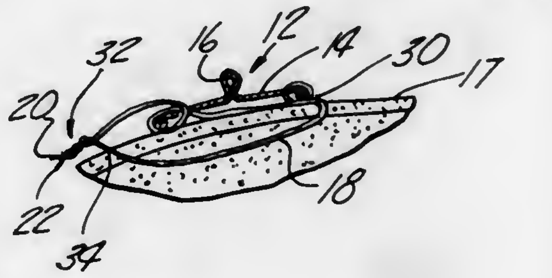
APPLIANCE AND METHOD FOR FACILITATING HAIRPIECE ATTACHMENT

Frank L. Agosta, 26061 Fernwood, Roseville, Mich. 48066

Filed Aug. 25, 1975, Ser. No. 607,345

Int. Cl.^{2} A61F *1/00;* **A61B** *17/00;* **A61L** *17/00*

U.S. Cl. 3—1 **5 Claims**



1. An appliance for facilitating the attachment of a hairpiece to the scalp of a person, comprising:

a. a snap member, the snap member comprising a base and an upstanding projection,

b. an elongated suture having a first end and a second end, the suture being connected to the snap member medially of the suture, and

c. a surgical needle connected to the suture at the first end thereof, the needle comprising a hook element and a connecting element integrally formed therewith, the connecting element being detachably connected to the first end of the suture, and

wherein the first end of the suture is adapted to be inserted into the scalp via the needle beneath the snap member and exited from the scalp proximate the second end of the suture such that the two ends of the suture are interconnectable to render the snap member detachably connected to the scalp.

5. A method for detachably connecting a hairpiece to the head of a person, comprising:

a. placing on the scalp at a predetermined position an appliance comprising:
  1. a snap member having a base and an upstanding projection,
  2. an elongated suture having a first end and a second end, the snap member being mounted to the suture medially thereof, and
  3. a surgical needle, the first end of the suture being detachably connected to the needle,

b. inserting the needle into the scalp at a first point,

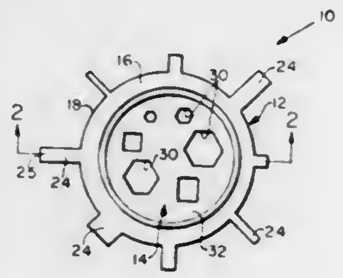
c. drawing the needle through the scalp beneath the snap member,

d. withdrawing the needle from the scalp at a second point thereof proximate the second end of the suture, such that

the first end of the suture is drawn through the scalp beneath the snap member and is withdrawn from the scalp proximate the second end of the suture,
e. detaching the needle from the first end of the suture,
f. joining together the first and second ends of the suture above the scalp,
g. securing to a hairpiece a snap member having a recess for receiving the projection, and
h. snapping the projection into the recess.

4,037,275
SPORTSMAN'S SCREWDRIVER AND WRENCH

Fred O. Schor, Rte. 4, Box 367, Harrison, Ark. 72601
Filed Aug. 24, 1976, Ser. No. 717,122
Int. Cl.^{2} B25F ***1/00***
U.S. Cl. 7—1 G **3 Claims**



3. A tool kit comprising,
a tool device including:
1. an outer tool member including a plurality of radially extending screw driver heads,
2. an inner tool member including a plurality of wrench apertures, adapted to be interchangeable with said outer tool member, and
3. coupling means for releasably securing said inner tool member to said outer tool member in a substantially horizontal plane such that either of said tool members may be utilized individually or in assembled relation with each other,

b. said outer tool member includes:
i. a body portion having an outer peripheral edge and an inner spaced apart edge defining an opening in said body portion,
ii. said screw driver heads extend outwardly from said outer peripheral edge and integrally formed therewith, and
iii. said plurality of screw driver heads each differ as to length or width thereof,

c. said inner tool member includes:
iv. a plate having an outer peripheral wall in matching conformity to said opening, and
v. said wrench apertures extend through said plate and vary in size,

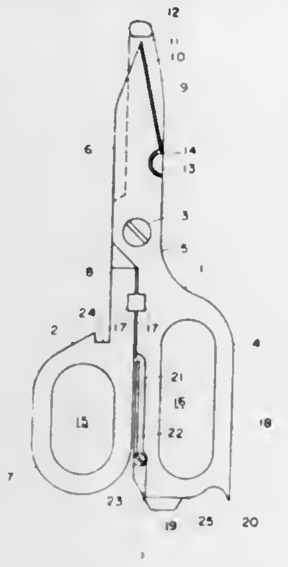
d. said coupling means includes:
vi. a peripherally extending gasket mounted in fixed relationship to said opening, and
vii. a peripherally extending groove in said gasket adapted to receive therein said outer peripheral wall of said inner tool member,

e. a file,
f. a container of oil, and
g. a cloth.

4,037,276
MULTIFUNCTIONAL TOOL FOR RESCUE WORK

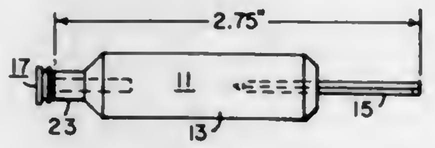
Reiner G. Brinker, 5424 Camille Drive, Mechanicsville, Va. 23111
Filed May 17, 1976, Ser. No. 687,253
Int. Cl.^{2} B26B ***11/00***
U.S. Cl. 7—6 **8 Claims**

8. In a pair of shears comprising two elongated integral substantially flat members, each comprising a handle portion, shank portion and substantially straight blade portion, said members being pivotably connected in coplanar opposed relationship by a threaded bolt in a manner such that said blade portions can be brought into sliding, overlapping contact, at least one of said blade portions being provided with a straight beveled cutting edge, and tapering to a pointed tip, the improvement comprising an arcuate beveledged recess located between said bolt and said pointed tip on said blade portion provided with a straight beveled cutting edge, the forward extreme of said recess meeting with said beveled cutting edge at a doubly beveled juncture having an angle of less than 100° and adapted to initiate a cutting action by a puncturing or gripping effect in a sheet structure acted upon by said shears, propagation of said cutting action being achieved by said straight beveled cutting edge, said shears being adapted to operation by a single hand of the user.



4,037,277
SURGICAL TOOL

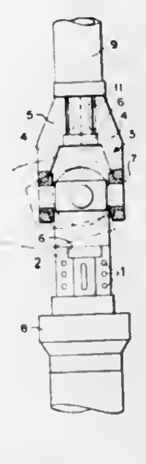
Frederick J. Shipko, Spring Church, Pa., assignor to Coratomic Inc., Indiana, Pa.
Filed Aug. 30, 1976, Ser. No. 718,794
Int. Cl.^{2} B25F ***1/00;*** **B23P** ***19/02;*** **B25B** ***13/48***
U.S. Cl. 7—1 G **5 Claims**



1. In combination a heart pacer having a socket for receiving a terminal for effecting an electrical connection to said heart, and also having an opening extending from said socket laterally of said socket and a thread in said opening for receiving a set screw to secure said terminal to said socket, and a surgical tool for use in the implanting said heart pacer in the heart of a host, the said tool comprising a handle, a wrench for screwing a set screw into said thread for securing said terminal in said socket, secured in one end of said handle, and a plug for sealing said opening, said plug having a stem and being removably held by said stem in the opposite end of said handle.

4,037,278
DEVICE FOR COUPLING A CARDAN HALF-JOINT WITH A FIXED STRUCTURE

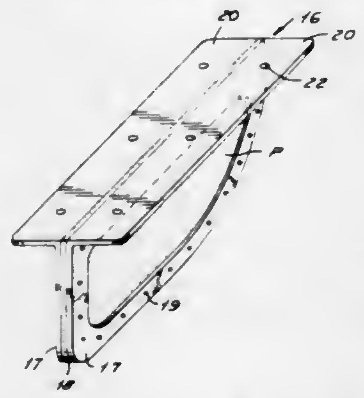
Giuseppe Dotti, Milan, Italy, assignor to Snam Progetti S.p.A., Milan, Italy
Filed Dec. 3, 1975, Ser. No. 637,125
Claims priority, application Italy, Dec. 3, 1974, 30122/74
Int. Cl.^{2} B63B ***21/52***
U.S. Cl. 9—8 R **1 Claim**



1. A device anchoring a structure below sea level, comprising:
a pair of opposing forks, each of which has a pair of opposing prongs, a shank connected to said prongs, and a seat in said shank adjacent to where said prongs diverge from one another,
a cross pin extending through said prongs which unite said opposing forks,
opposing shafts to which said forks are secured, wherein one of said shafts is anchored below sea level and the other one of which is connected to a movable body, and wherein each of said shafts includes a radial projection adapted to be received by a recess in each of said seats of each of said forks, and
a plurality of bolts which extend through each of said shanks of said forks in a direction perpendicular to the pull forces on said forks for securing said forks to said shafts without being subjected to pull forces on said shafts.

4,037,279
WATER SKI

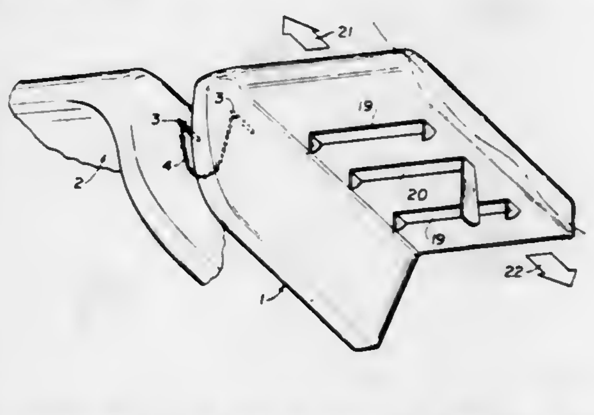
Herbert F. Ziebart, 6981 Deepwater Point Road, Rte. 2, Williamsburg, Mich. 49690
Filed Oct. 17, 1975, Ser. No. 623,430
Int. Cl.^{2} A63C ***15/00***
U.S. Cl. 9—310 A **4 Claims**



1. In a water ski, the combination comprising
a water ski body having a forward end, a rear end, a top side and a bottom side,
a fin extending downwardly from the bottom side,
said fin comprising two spaced frames and an elastic element interposed between said frames and defining an elastic portion of substantially uniform thickness movable laterally of the water ski body under the action of water,
said water ski body including a longitudinally extending slot,
said frames extending through said slot,
said frame elements having flanges integral therewith and engaging the top side of said water ski.

4,037,280
APPARATUS FOR WALKING ON WATER OR LAND

Christian Klepsch, Post Kirschberg, Haus, near 16, Doesingerried, Germany (8371)
Filed Sept. 5, 1975, Ser. No. 610,788
Claims priority, application Germany, Sept. 7, 1974, 2442948
Int. Cl.^{2} A63C ***15/04***
U.S. Cl. 9—310 D **13 Claims**



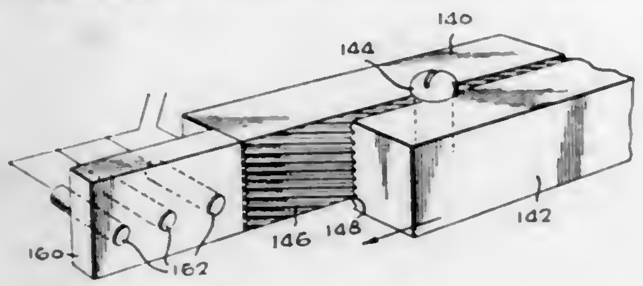
1. An apparatus or walking on water or land, comprising floatation means, each floatation means including a substantially vertically arranged floatation body forming a keel and a substantially horizontally arranged floatation body forming a stabilization member, means operatively interconnecting said floatation bodies to each other so that two floatation means forming a pair have a mirror symmetrical shape relative to each other whereby each of the respective vertically arranged floatation bodies has a vertical surface and the vertical surfaces of the pair face each other to extend substantially in parallel to each other when the pair is in use, said apparatus further comprising paddle means, and means operatively securing said paddle means to said floatation means whereby said paddle means normally extend downwardly but flap backwardly when the respective floatation means is pulled through the water, and wherein said paddle means comprise at least one paddle structure including a first portion and a second portion extending substantially at a right angle to said first portion, said first and second paddle portions being rigidly connected to each other to form said paddle structure, said securing means hinging said first portion to said substantially horizontal floatation body whereby said second paddle portion performs a stabilizing function.

4,037,281
FASTENER MANUFACTURING METHOD

Richard L. Reynolds, Palos Verdes, Calif., assignor to Litton Systems, Inc., Beverly Hills, Calif.
Division of Ser. No. 554,734, March 3, 1975, Pat. No. 3,972,084, which is a division of Ser. No. 479,650, June 17, 1974, Pat. No. 3,968,533, which is a continuation-in-part of Ser. No. 353,449, April 23, 1973, Pat. No. 3,894,570. This application May 14, 1976, Ser. No. 686,413
Int. Cl.^{2} B21H ***3/02;*** **B23G** ***9/00;*** **B23K** ***9/04***
U.S. Cl. 10—10 R **5 Claims**

1. A method of manufacturing an impregnated, threaded fastener comprising the steps:
a. forming a helical thread having thread crests on a shank portion of a fastener blank by cold-rolling said fastener shank portion between a pair of thread-forming dies by reciprocating at least one of the dies relative to the other of said dies to advance the fastener blank positioned therebetween by rolling;

b. mechanically feeding at least said thread crests of said fastener shank into rotational contact each 120° of the circumference on the outside diameter of the thread on said fastener shank with an electrode positioned adjacent to said dies and having an impregnatable substance by continuing the movement of said reciprocating thread-forming die;



c. rapidly, mechanically vibrating said electrode; and

d. applying to said electrode an electrical potential of less than 50 volts and 50 amperes so that at least a portion of said thread crests are impregnated with the impregnatable substance as said fastener shank thread crest portions are rotationally advanced into contact with said vibrating electrode.

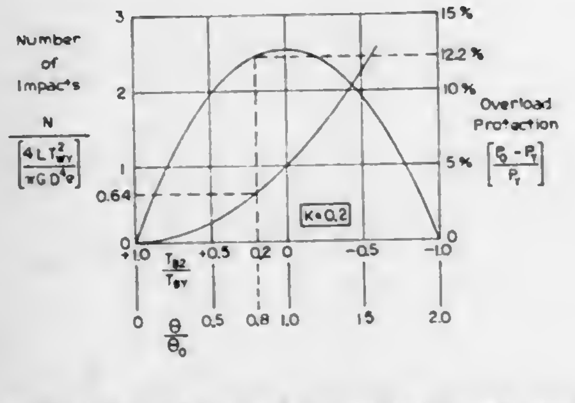
4,037,282
PROCESS FOR CREATING OVERLOAD PROTECTION AGAINST YIELDING IN BOLTS

Norman C. Dahl, 40 Fern St., Lexington, Mass. 02173

Continuation-in-part of Ser. No. 664,574, March 8, 1976. This application June 7, 1976, Ser. No. 693,546

Int. Cl.² F16B *31/02*

U.S. Cl. 10—27 R **7 Claims**



1. A method for creating built-in overload protection against further yielding in a threaded bolt which previously has been tightened to its yield point, said method comprising: reducing the torque acting in the shank of said bolt to fifty percent or less of the valve existing at the end of tightening, said reduction in torque being accomplished by rotating the bolt head or the nut in the direction opposite from tightening through an angle θ such that the reduction in twist of said shank causes said torque to reduce to fifty percent or less of the value existing at the end of tightening and where said angle of rotation θ is not large enough to cause decrease in the tension existing in said bolt at the end of tightening.

4,037,283
ELECTRIC STIPPLING DEVICE

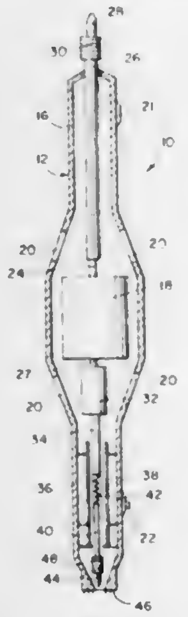
David Moisiuk, 103 Quincy Drive, Regina, Saskatchewan, Canada

Filed Aug. 3, 1976, Ser. No. 711,281

Int. Cl.² B43L *19/00*

U.S. Cl. 15—4 **3 Claims**

1. An electric stippling device comprising in combination:
an elongated housing;
an electric motor mounted within an intermediate section of said housing, a rotatable motor shaft extending from each of the opposed ends of said housing longitudinally of said housing;
an eraser member mounted adjacent one end of said housing and projecting therefrom, said eraser member being connected to the motor shaft extending from one end of said motor to be rotatable therewith;
a stippling shaft member mounted within said housing adjacent the other end of said housing having a stippling point affixed thereto;



means operably connecting said stippling shaft member with the motor shaft extending from the other end of said motor and adapted to convert the rotary movement of said motor shaft into reciprocatory movement of said stippling shaft member;
and means for selectively activating said motor and thereby rotating said eraser member and reciprocating said stippling shaft member.

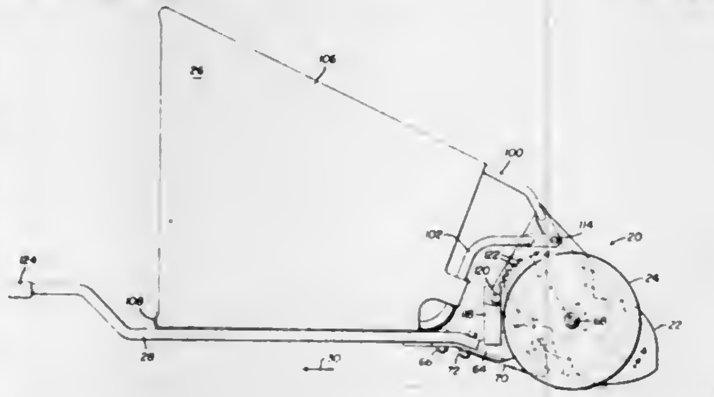
4,037,284
SWEEPER ASSEMBLY

Raymond F. McDonald, Winneconne, Wis., assignor to J. I. Case Company, Racine, Wis.

Filed June 10, 1976, Ser. No. 694,731

Int. Cl.² E01H *1/04*

U.S. Cl. 15—83 **6 Claims**



1. A rotary sweeper assembly, comprising a enclosed housing having a top and side walls and a lower inlet opening, ground tranversing wheels supporting said housing for movement along the ground, a rotary brush assembly within said housing enclosure lifting particulate material into said housing through said inlet opening and propelling the particulate material out of a forwardly opening outlet adjacent the tops of said housing enclosure and a hopper adjacent said outlet forward of said housing receiving particulate material, the improvement comprising a drag-guard plate extending from said hopper assembly at an acute angle to the ground surface toward said lower inlet opening, then said plate being turned upwardly adjacent said housing but spaced therefrom, said plate extending substantially across the entire forward end of said housing and the lower face defining an arcuate drag surface spaced below the lower forward end of said housing protecting said housing and lifting the sweeper assembly upon engaging an accumulation of particulate material.

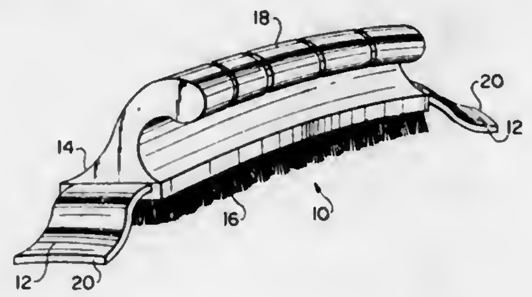
4,037,285
BRUSH FOR CLEANING WHITEWALL TIRES

Bela Bottos, 1308 H Stone Mill Court, Stone Mountain, Ga. 30083

Filed Feb. 24, 1976, Ser. No. 660,993

Int. Cl.² A46B *9/02*

U.S. Cl. 15—160 **4 Claims**



1. A brush for cleaning the whitewall portion of a whitewall tire, the tire being of the type wherein said whitewall portion is generally circular and is recessed to define a groove, said brush comprising a base having a top and bottom, a plurality of outwardly projecting bristles mounted on said base so as to define an arcuate scrubbing surface having a width and radius of curvature corresponding to the width and radius of curvature, respectively, of the whitewall groove, a handle connected to said base top, and a resilient guide flap projecting longitudinally outwardly from each end of said base; said guide flaps having a width corresponding to the width of the whitewall groove and being curved such that the lateral edges thereof define S-curves and the distal end portions ride in the whitewall groove in spring-biased engagement therewith when said brush is in operative contact with the tire.

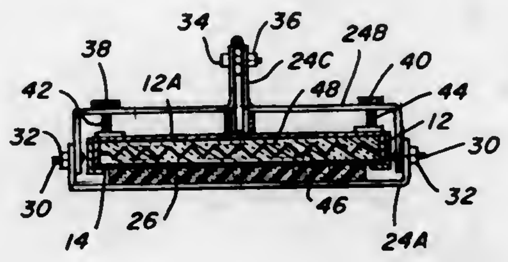
4,037,286
REARVIEW MIRROR FOR VEHICLES

G. P. Medearis, 1021 Faulkner Lane, Waco, Tex. 76704; Sam F. Williams, Jr., P.O. Box 35, Leroy, Tex. 76654, and Morris O. Medearis, 2526 N. Cheyem, P.O. Box 2332, Tulsa, Okla. 74101

Filed Jan. 14, 1976, Ser. No. 649,028

Int. Cl.² B60S *1/24, 1/44*

U.S. Cl. 15—250.05 **3 Claims**



1. An outside rearview mirror for a vehicle, comprising:
a rectangular vertical frame adaptable to be supported outside a vehicle;
a mirror supported by said frame in the front portion thereof, the mirror having a front surface and a rear surface;
a gear motor supported to said frame, the gear motor having a drive shaft extending therefrom;
a crank arm secured at the inner end to said drive shaft for rotation by said gear motor;
a wiper bracket slidably supported on said frame for vertical reciprocation;
a horizontal squeegee member secured to said wiper bracket engaging said mirror front surface;
a first and second vertical guide member each secured at the upper and lower ends thereof to the back surface of said frame, the guide members being spaced apart from and parallel to each other, the portion of said guide members intermediate the ends being spaced from said frame, said wiper bracket being slidably received between said frame and said guide members intermediate portion whereby said wiper bracket is reciprocally retained in position relative to said frame, a pair of vertically aligned spacers positioned opposite said first and second vertical guide members; and
a connecting rod extending from the outer end of said crank to said wiper bracket, said wiper bracket being vertically reciprocated by the rotation of said gear motor drive shaft to wipe said mirror, and
wherein said wiper bracket includes a rearward portion and a forward portion, the rearward portion extending adjacent the back surface of said frame and having one end of said connecting rod pivotally attached to the central portion of said rearward portion, the front portion extending adjacent said mirror front surface and having said squeegee member affixed thereto, said front portion being detachable from said rearward portion to facilitate the replacement of said squeegee member, said rearward portion being slidable between said vertical spacers and said vertical guide members.

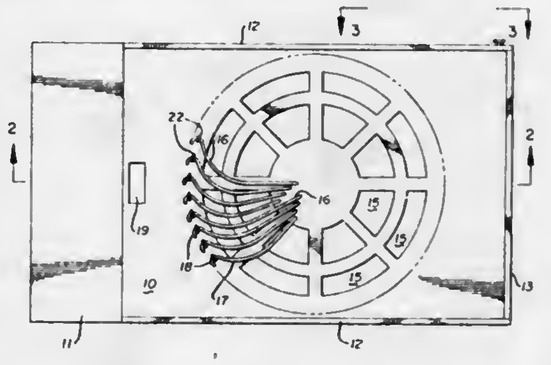
4,037,287
BUFFING MACHINE PAD CLEANING DEVICE

Richard E. Whittaker, 302 S. Croton Ave., New Castle, Pa. 16101

Filed Aug. 16, 1976, Ser. No. 714,991

Int. Cl.² A46B *17/00*

U.S. Cl. 15—257 R **5 Claims**



1. A buffing machine pad cleaning device comprising a raised, substantially flat platform having a plurality of relatively large openings therein, a plurality of bars positioned on and attached to said platform in a radial pattern overlying said openings, said bars defining an area substantially the same size as said buffing machine pad so that the same can be positioned thereon and rotated thereagainst by said buffing machine.

4,037,288
FILAMENT LIQUID QUENCHING APPARATUS

Richard D. Meyer, Greenville, S.C., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Division of Ser. No. 395,036, Sept. 7, 1973, Pat. No. 3,905,381. This application June 19, 1975, Ser. No. 588,559

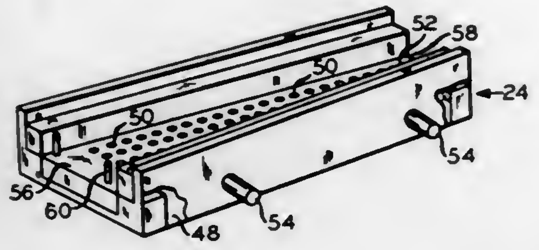
Int. Cl.² B08B *3/00;* A47L *5/34*

U.S. Cl. 15—302 **3 Claims**

1. Apparatus for removing liquid from filaments comprising:
a longitudinal chamber wherein a plurality of apertures are

located in a substantially flat surface of said chamber over which said filaments are passed parallel to the lengthwise dimension of said chamber and in contact therewith and a means in communication with said chamber for removing fluids therefrom:

a liquid quench tank positioned immediate the longitudinal chamber comprising a tank for storing a quench liquid;



at least one baffle in said quench tank to dampen the movement of quench liquid wherein said baffle contains an opening through which said filaments pass and a perforated area to permit circulation of said quench liquid but which reduces turbulence of said quench liquid;

means for guiding said filaments through said tank; and

a weir to control the level of quench liquid in said tank.

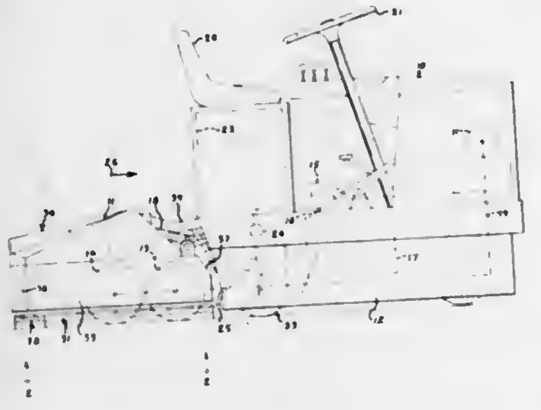
4,037,289
SCRUBBER SQUEEGEE APPARATUS

Harold D. Dojan, Cedar, Minn., assignor to Tennant Company, Minneapolis, Minn.

Filed Nov. 19, 1975, Ser. No. 633,265

Int. Cl.² A47L *7/00, 1/06*

U.S. Cl. 15—320 **21 Claims**



1. For a surface maintenance machine, a squeegee assembly comprising an elongated flexible squeegee, an elongated squeegee frame having a first terminal end portion, a second terminal end portion and an elongated arcuately curved backing surface intermediate portion between said end portions, and operable quick release means for clamping the squeegee against the backing surface and retaining the squeegee in a squeegee working position on the frame and alternately for releasing the squeegee, said quick release means including an over center locking device that is operable between a squeegee clamping position and a squeegee release position, an elongated band having a first end portion, an intermediate portion and a second end portion, said band first end portion and squeegee frame first end portion having cooperating means for transmitting a force from the band to the squeegee frame to move the band intermediate portion toward the backing surface intermediate portion when the locking device is operated from its release position toward its clamping position, means for connecting the device to the band second end portion, and means for connecting the locking device to the squeegee frame second end portion, the last mentioned means including an elongated second band having a first end portion connected to the locking device, and a second end portion, said second band second end portion and squeegee frame second end portion having cooperating means for transmitting a force from the second band to the squeegee frame when the locking device is operated from its release position toward its clamping position, the locking device comprising means for forcing the bands to exert a force on their second end portions to move them away from one another when the locking means is moved from its release position toward its clamping position, and the cooperating means including squeegee frame portions to limit the movement of the band second end portions away from one another.

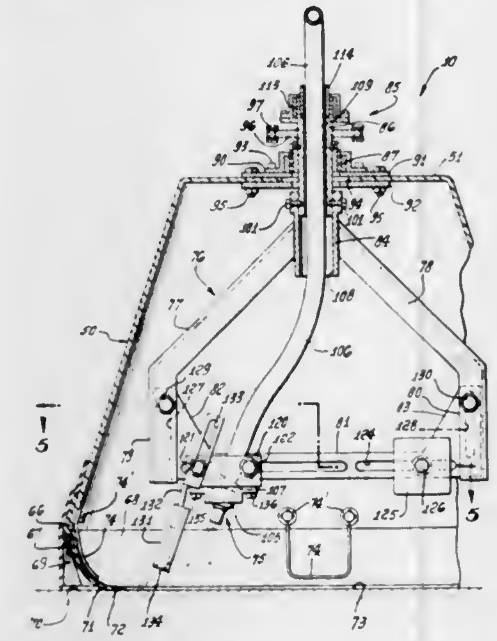
4,037,290
VACUUM CLEANING DEVICE

James J. Rose, Sylmar, and Edward L. Horton, San Gabriel, both of Calif., assignors to Enviro-Blast International, Los Angeles, Calif.

Division of Ser. No. 518,579, Oct. 29, 1974, Pat. No. 3,916,568, which is a continuation-in-part of Ser. No. 483,357, June 26, 1974, abandoned, which is a continuation of Ser. No. 360,192, May 14, 1973, abandoned. This application Aug. 27, 1975, Ser. No. 608,045

Int. Cl.² A47L *5/14*

U.S. Cl. 15—345 **19 Claims**



1. In a vacuum cleaning device to remove debris from a surface, the combination of:

a hood supported on and movable along the surface and having its open side confronting the surface to form therewith a traveling vacuum chamber;

a nozzle in the hood directed towards the surface and mounted for circular orbital movement therein;

means to supply to the nozzle compressed air substantially free of entrained particles to agitate the debris on the surface;

means to withdraw air from the hood to maintain a vacuum therein and to entrain and withdraw the agitated particles of debris from the body; and

means for selectively adjusting the radius of said circular orbit.

4,037,291
CASTER AND SWIVEL LOCK ASSEMBLY

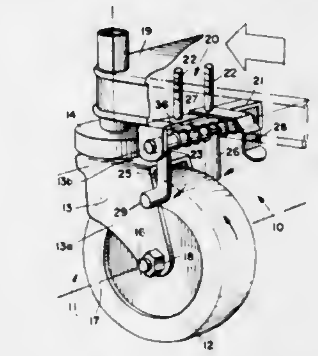
David F. Huempfner, Kewaunee, and Richard C. Tringali, Manitowoc, both of Wis., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Aug. 19, 1976, Ser. No. 715,979

Int. Cl.² B60B *33/00, 33/02*

U.S. Cl. 16—35 R **15 Claims**

1. A swivel caster assembly including a swivel mount, a leg connected to said swivel mount for swivel movement about a generally vertical swivel axis, and a wheel supported by said leg for rotational movement about a generally horizontal rotation axis, said rotation axis being spaced behind said swivel axis when said wheel is in a trailing position, the improvement wherein a locking and releasing member is pivotally mounted and positioned for automatically releasably locking said wheel in said trailing position, said member comprising a shaft and a finger projecting radially therefrom, means supporting said shaft for pivotal movement about a generally horizontal pivot axis between a locking position wherein said finger is lowered and a releasing position wherein said finger is raised above said wheel, said shaft having said pivot axis disposed behind said swivel axis, said finger being directly engageable with the periphery of said wheel when said finger is lowered and when said wheel is swiveled towards said trailing position in one direction to ride upon said wheel and thereby promote smooth movement of said member from a lowered to a partially raised position above said wheel, said member pivoting under the influence of gravity from said partially raised position into said locking position as said wheel fully reaches said trailing position, and said finger thereafter being directly engageable with the periphery of said wheel when said finger is lowered and when said wheel is swiveled towards a new trailing position in the other direction to ride upon said wheel and thereby promote smooth movement of said member from a lowered to a partially raised position above said wheel, said member pivoting under the influence of gravity from said releasing position into said lowered position as said wheel fully reaches said new trailing position.



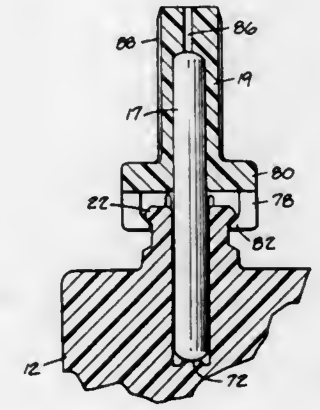
4,037,292
UNIVERSAL STEM FOR A CARPET CASTER

Sidney D. Lapham, 2324 Tice Creek Drive Manor No. 3, Walnut Creek, Calif. 94595

Division of Ser. No. 502,180, Aug. 30, 1974, Pat. No. 3,984,724. This application Oct. 20, 1975, Ser. No. 623,678

Int. Cl.² B60B *33/00*

U.S. Cl. 16—38 **4 Claims**



1. A universal stem for casters having a caster body including an annular collar formed thereon, and having a bearing surface formed therein, said stem being arranged to be mounted to a receiving socket in an object to be castered comprising:

a. a stem cap having a stem portion adapted to engage said socket, and a shroud portion adapted to loosely fit over said collar for rotation thereabout; and

b. a pin-type bearing member extending axially through said stem cap and into said caster body when said caster is assembled, said bearing member rotatably bearing at one of its ends against said bearing surface in a substantially point contact relationship to permit free rotation of said caster body with respect to said stem;

c. said shroud portion having resilient jaws equipped with flanges adapted to be snapped over said collar to prevent said stem cap and caster body from separating under the influence of gravity.

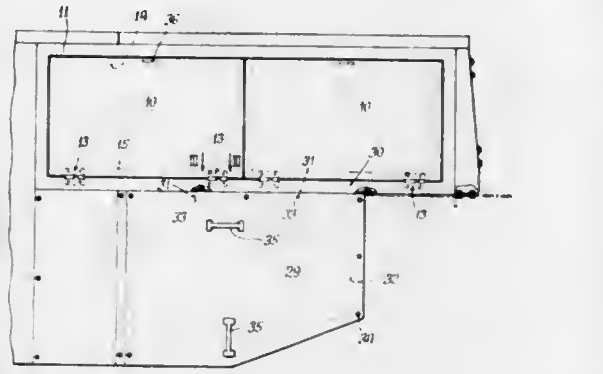
4,037,293
HINGE AND PANEL MOUNTING MEANS

Michael P. Morge, Oswego, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Apr. 8, 1976, Ser. No. 675,029

Int. Cl.² E05D *1/06*

U.S. Cl. 16—171 **5 Claims**



1. In a vehicle having a vertically extending housing portion provided with an opening, said housing portion defining a horizontally extending edge portion at a lower edge of said opening, and a closure panel for selectively closing said opening and having a lower edge portion, improved hinge means for hingedly mounting said closure panel lower edge portion to said housing edge portion, said hinge means comprising: a tubular female connector fixedly carried by said housing edge portion adjacent said opening thereof with the bore of the female connector extending axially horizontally, said female connector having an end portion defining a downwardly opening notch; and a male connector fixedly carried by said closure panel lower edge portion and having a cantilevered end defining a horizontal axis spaced outwardly from said closure panel to be passed transversely upwardly through said female connector notch into abutment with the female connector above the notch thereby to cause the male connector to be disposed in coaxial alignment with said tubular female connector bore to be moved axially horizontally thereinto to hingedly mount said closure panel to said housing.

4,037,294
METHODS AND APPARATUS FOR FILLETING FISH

William Pirie Cowie, Aberdeen; Fraser Donaldson, New Deer, and Geoffrey John Grantham, Aberdeen, all of Scotland, assignors to Lever Brothers Company, New York, N.Y.

Filed May 9, 1975, Ser. No. 575,868

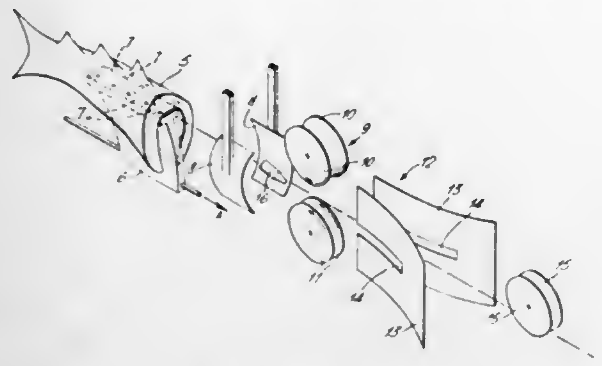
Claims priority, application United Kingdom, May 14, 1974, 21221/74

Int. Cl.² A22C *25/16*

U.S. Cl. 17—56 **10 Claims**

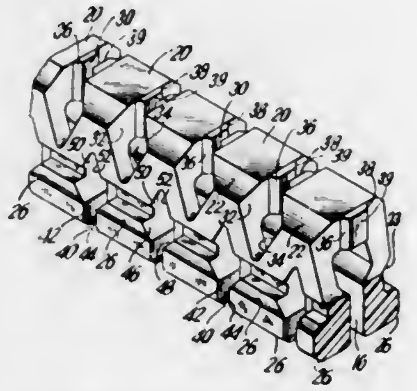
1. A method of filleting fish comprising the steps of making a pair of initial longitudinal cuts into the fish one on each side of, closely adjacent, and parallel to the vertebral column of the fish to be filleted, which cuts pass down through the skin towards but not into the parapophyses, accommodating

ploughs in each of said initial cuts, and by relative movement between the ploughs and the fish, drawing a side fillet clear of the rib and pin bones and main bone structure on each side of the fish.



4,037,295
SLIDE FASTENER STRINGER

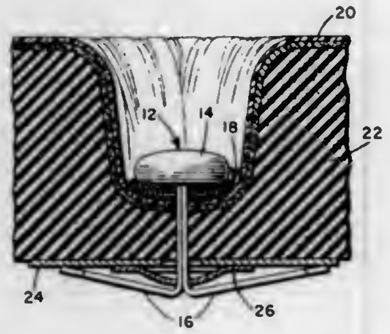
Fred H. Rojahn, 107 Jefferson Terrace, Springfield, N.J. 07081, and Jose Lichtenberg, Fuente De San Pedro No. 17, Mexico City, Mexico
Filed Feb. 9, 1976, Ser. No. 656,397
Int. Cl.^{2} A44B *19/14*
U.S. Cl. 24—205.13 D **4 Claims**



1. A stringer for a slide fastener comprising:
an elongated body having two leg portions connected by a bight portion to define a generally U-shaped configuration in transverse cross section, said U-shaped configuration being generally rigid to maintain said leg portions in a predetermined spaced apart position relative to each other;
a first plurality of transverse slots disposed between closed ends of said bight portion of said body to provide a plurality of longitudinally spaced apart head members;
a second plurality of transverse slots disposed between free open ends of said leg portions of the body to provide a plurality of longitudinally spaced apart legs on each side of said head members;
longitudinally extending groove means provided in an outside side surface of each of said legs for receiving stitches when the stringer is sewn to a fabric;
said first and said second plurality of slots being arranged in a longitudinally alternating pattern to provide a pair of legs facing each other between adjacent head members, each leg of said pair being connected to each of said adjacent head members;
said first plurality of slots being defined by pairs of inclined wall surfaces extending inwardly from an outside surface of said bight portion of said U-shaped body, each of said pairs of inclined wall surfaces defining a V-shaped configuration with an open end of said V-shaped wall surfaces being adjacent each other at said head members for longitudinal flexibility thereof to permit said adjacent head members to be spread apart when closing and opening the slide fastener;
said second plurality of slots being defined by sets of inclined walls extending inwardly from an outside surface of each of said leg portions of said U-shaped body, each of said sets of inclined walls defining a V-shaped configuration with an open end of said V-shaped walls being adjacent each other at said groove means for longitudinal flexibility thereof to permit relative movement between longitudinally adjacent legs when closing and opening the slide fastener;
said leg portions being relatively close together at said free open ends thereof to provide a longitudinally extending aperture for receiving the fabric therebetween, said leg portions being relatively widely spaced apart adjacent said closed ends of said bight portion for providing a longitudinally extending recess for receiving head members of an associated stringer, said aperture and said recess being in direct open communication with each other.

4,037,296
METHOD AND ARTICLE FOR TUFTING UPHOLSTERY AND THE LIKE, AND THE RESULTING ARTICLE OF MANUFACTURE

Douglas M. White, Stamps, and Alga L. White, Lewisville, both of Ark., assignors to The Alan White Company, Stamps, Ark.
Filed Dec. 15, 1975, Ser. No. 640,967
Int. Cl.^{2} A44B *1/18;* **A47C** *27/00*
U.S. Cl. 24—90 B **9 Claims**

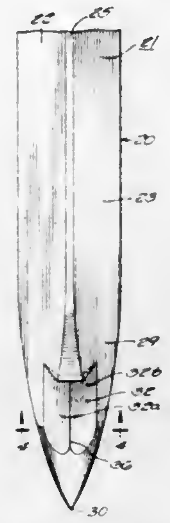


1. A pliable upholstery-reinforcing washer for use with a fastener to tuft a vinyl-type non-woven upholstery material, said fastener comprising a prong button adapted to extend through an aperture in said non-woven upholstery material and a foam upholstery material positioned therebeneath, through an aperture in a rigid fiber washer and through an aperture in a metal washer with the button head of said prong button adapted to be disposed atop said non-woven upholstery material and with the prongs of said prong button bent sideways on the backside of said metal washer so as to tuft said material, said pliable upholstery-reinforcing washer comprising a pliable base having an aperture therein so as to slidably receive therethrough one of said fasteners and an adhesive on the side of said base adjacent said non-woven upholstery material, said pliable upholstery-reinforcing washer being adapted to be fixedly positioned on said non-woven upholstery material beneath the button head and atop said non-woven upholstery material whereby said pliable washer reinforces the hole in said non-woven upholstery material and prevents the button head from stretching and tearing said non-woven upholstery material adjacent the aperture therein.

4,037,297
FELTING NEEDLE WITH BARBED TIP

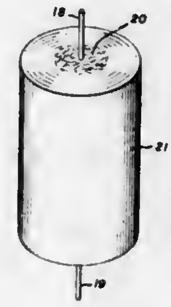
Edson Perkins Foster, Cato, Wis., assignor to Foster Needle Company, Inc., Manitowoc, Wis.
Filed June 15, 1976, Ser. No. 689,394
Int. Cl.^{2} D04H *18/00*
U.S. Cl. 28—115 **15 Claims**

1. A barbed felting needle having a non-circular blade portion with a plurality of faces and with a ridge between each pair of adjacent faces, a tapered point portion at the outermost end of the blade portion converging to a tip, at least one barb disposed in the tapered point between the tip and the blade portion.



4,037,298
METHOD OF MAKING A PARTIALLY IMPREGNATED CAPACITOR

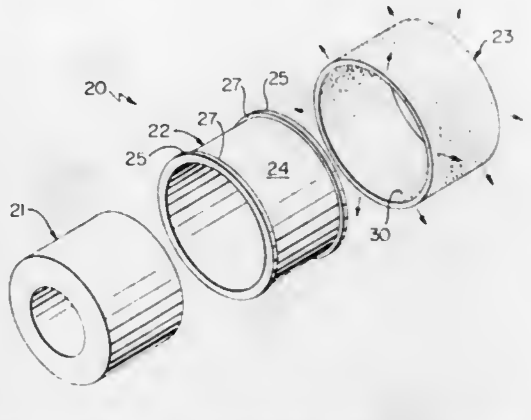
Robert J. Flanagan, Hudson Falls; Richard C. Conners, and Richard C. Merrill, both of Glens Falls, all of N.Y., assignors to General Electric Company, Hudson Falls, N.Y.
Division of Ser. No. 506,461, Sept. 16, 1974; Pat. No. 3,987,348. This application Sept. 15, 1975, Ser. No. 613,452
Int. Cl.^{2} H01G *4/22*
U.S. Cl. 29—25.42 **7 Claims**



1. A process of making a hard roll capacitor section comprising in combination
a. winding a capacitor roll on a hard core using only synthetic resin strips which are heat shrinkable and some of which are metallized,
b. maintaining a tension on said strips during said winding of above about 200 grams per inch of strip width per mil thickness,
c. subjecting said roll to an elevated temperature correlated to said winding tension and over a period of time to significantly heat shrink said synthetic resin strips on said hard core to rigidize said roll,
d. inserting said rigid roll in a casing and covering the ends of said roll with a dielectric liquid,
e. and sealing said casing,
f. whereby said roll section has a substantially dry central section which predominates the distance between the roll edges which is not penetrated by the dielectric liquid, and narrow margin sections at said edges which are wet by said dielectric liquid.

4,037,299
TEXTILE COT ASSEMBLY

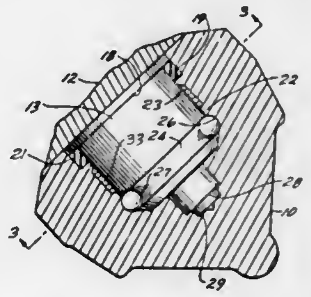
Kenneth C. Smith, Westhoughton, near Bolton, England, assignor to Dayco Corporation, Dayton, Ohio
Continuation-in-part of Ser. No. 581,321, May 27, 1975, abandoned. This application Aug. 5, 1976, Ser. No. 711,921
Int. Cl.^{2} B21B *31/08*
U.S. Cl. 29—130 **6 Claims**



1. A textile cot assembly comprising a rigid cylindrical core; a rigid tubular cylindrical supporting means fixed concentrically around said core and having a supporting surface adjoined at opposite edges thereof by a pair of annular shoulders of greater diameter than said surface; and an elastomeric sleeve having a tubular inside surface and a plurality of gripping projections extending radially inwardly from said inside surface with each projection having an inner portion engaging said supporting means, said sleeve being disposed in stretched condition with its diameter increased within the range of approximately 3 to 8 percent from its unstretched condition, the outer diameter of said sleeve, when stretched and seated, being greater than the outside diameter of said shoulders, said inner portions of said projections being partially deformed at their area of contact with said supporting means by radially inward pressure exerted by said stretched sleeve, said projections with their partially deformed inner portions preventing rotation of said sleeve relative to said supporting means.

4,037,300
DRILLING BIT BEARING STRUCTURE

Lloyd L. Garner, Los Alamitos, Calif., assignor to Smith International, Inc., Irvine, Calif.
Division of Ser. No. 546,936, Feb. 4, 1975, Pat. No. 4,021,084. This application Apr. 5, 1976, Ser. No. 673,391
Int. Cl.^{2} B21D *53/10*
U.S. Cl. 29—148.4 R **7 Claims**



1. A process for forming an improved bearing surface in a rock bit cutter cone of high strength alloy steel, the bearing surface having spaced portions of hard-facing alloy with increased resistance to formation of cracks and propagation of cracks into and through the cone, comprising steps of:
forming a cutter cone blank of high strength alloy steel;
forming a cylindrical blank bearing surface in a bore of the cutter cone blank;
forming a plurality of shallow pockets spaced apart from each other in the cylindrical blank bearing surface;

filling each of the pockets with a wear resistant hard-facing alloy having a hardness greater than the hardness of the alloy steel when carburized and hardened; and

grinding the hard-facing alloy and blank bearing surface to form a finished bearing surface;

the resulting composite bearing surface being characterized by a decreased tendency, as compared to a continuous ring of hard-facing alloy, to form large propagating cracks in the individual portions of hard-facing alloy.

4,037,301

METHOD OF MANUFACTURING DOORS AND ARRANGEMENT THEREFOR

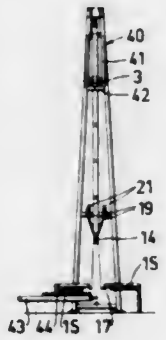
Anders Lövgren, Skelleftea, Sweden, assignor to UTEC AB, Skelleftea, Sweden

Filed June 13, 1975, Ser. No. 586,692

Claims priority, application Sweden, June 14, 1974, 7407872

Int. Cl.² B23P *21/00*

U.S. Cl. 29—429 **4 Claims**



1. A method for the manufacture of a door of the kind comprising two parallel spaced webs of flexible material connected to laterally spaced cross-members and comprising the steps of:

a. feeding in parallel fashion from each of two supply sources a continuous web of a flexible material which said webs are maintained under tension while supported on a frame, the feeding of said webs occurring a step at a time and by an amount substantially equalling a preselected spacing between supporting cross-members,
b. inserting in the space between said two webs at intervals corresponding to the preselected spacing an elongate cross-member extending in the direction transverse to the direction of feed of the webs,
c. securing the two webs on respectively opposite sides of each cross-member,
d. repeating steps (a) through (c) until the preselected door dimension is obtained,
e. severing the attached webs from their respective frames,
f. telescoping the door section by bringing into substantially abutting relationship the cross-members which have been attached to said webs,
g. removing the door section from the frame.

4,037,302

USED VEHICLE PARTS DISASSEMBLY SYSTEM AND METHOD

John M. Hollander, 205 County Road No. 6, Wayzata, Minn. 55391

Filed Feb. 23, 1976, Ser. No. 660,684

Int. Cl.² B23Q *17/00*

U.S. Cl. 29—403 **22 Claims**

1. A method for providing used vehicle parts obtained from used vehicles which comprises:

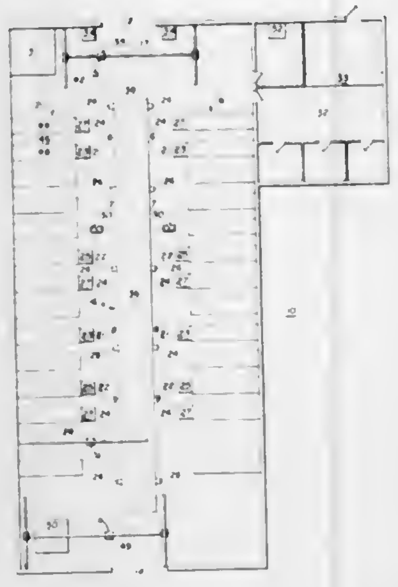
conveying a used vehicle along a fixed conveyor line;

sequentially disassembling at various locations along said conveyor line, while preserving in recyclable condition, substantially all recyclable used parts from the used vehicle;

identifying the sequentially disassembled used vehicle parts;

storing the sequentially disassembled used vehicle parts in a storage area; and

entering and maintaining inventory information on the used vehicle parts in a record-keeping system wherein said inventory information is based on inventory numbers which indicate the interchangeability of certain vehicle parts between various makes, models and years, whereby the availability of said used vehicle parts can be determined and a desired used vehicle part and its interchangeable equivalents can be located among the recyclable used vehicle parts stored and identified in the storage area of said integrated system.



4,037,303

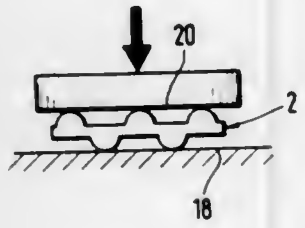
METHOD FOR THE BRIQUETTING OF METAL SWARF, PELLETS, AND POWDERS WITH ROLLER PRESSES

Hartmut Rieschel, Hattingen, Ruhr, Germany, assignor to Maschinenfabrik Koppern GmbH & Co., KG, Hattingen, Germany

Filed Mar. 25, 1975, Ser. No. 561,977

Int. Cl.² B22F *3/24*

U.S. Cl. 29—420.5 **8 Claims**



1. A method of briquetting metal swarf, pellets, powders and the like comprising the following steps:

A. directing said metal materials to a roller press comprising opposed briquetting rollers having mold depressions located in the surfaces thereof with the mold depressions in said rollers being arranged in staggered relation so that they do not overlap when disposed in opposite relation;
B. processing said metal materials between said rollers to form a metal extrusion comprising a generally flat web having a plurality of solid molded portions extending from opposite surfaces thereof, said molded portions all being of substantially the same size and shape and being arranged in closely adjacent, side-by-side relation to define aligned transverse and longitudinal rows extending across the web with each adjacent molded portion extending from opposite surfaces of the web, whereby each side of the web defines a checkered pattern;
C. positioning said extrusion between opposed continuous surfaces that extend from side to side of the extrusion; and
D. simultaneously applying pressure against opposite sides of the extrusion by said opposed surfaces, with said pressure being substantially normal to the plane of said extrusion so as to simultaneously engage the outermost surfaces only of the oppositely extending molded portions of at least one transverse row, thereby causing the extrusion to break along the web portions interconnecting adjacent molded portions so as to separate the latter to form individual briquettes.

4,037,304

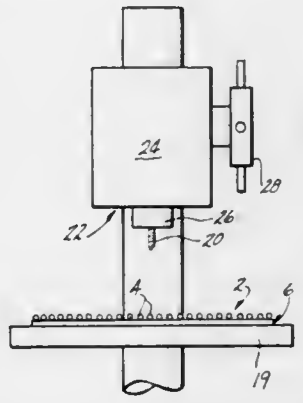
METHOD OF REMOVING RODS FROM METALLIC ANODES

Thomas L. Cummings, Ocoee, Tenn., assignor to Olin Corporation, New Haven, Conn.

Filed June 24, 1976, Ser. No. 699,552

Int. Cl.² B23P *19/00*

U.S. Cl. 29—427 **6 Claims**



1. A method of removing a portion of a rod from a metallic anode of the type used in chlor-alkali electrolytic cells without damaging adjacent rods, said anode having a foraminous surface comprised of a plurality of closely spaced, substantially parallel rods, said rods being welded at method comprising

a. mounting a drill bit in a chuck with a free end of the drill bit foreshortened to a length no more than twice the diameter of the drill bit so that the drill bit does not skip off the surface of the rod,

rotating the drill bit at a suitable speed for drilling said rod;

c. advancing the rotating drill bit through said rod to be removed at at least two separate locations, said rod being free of weldments between said locations, and
d. removing the portion of the rod between the two locations.

4,037,305

METHOD FOR HYDROSTATIC EXTRUSION

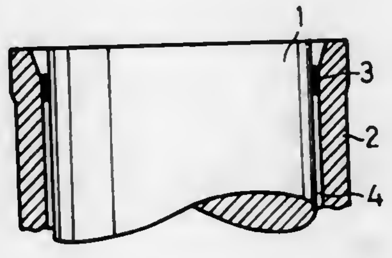
Hans Gunnar Larsson, Vasteras, Sweden, assignor to Allmanna Svenska Elektriska Aktiebolaget, Sweden

Filed June 29, 1976, Ser. No. 700,789

Claims priority, application Sweden, Sept. 24, 1975, 7510692

Int. Cl.² B23P *17/00*

U.S. Cl. 29—421 R **9 Claims**



1. Method for manufacturing rod-shaped compound products by hydrostatic extrusion of a compound billet containing a core of a first material and a casing, surrounding the core, of a second material, with a gap between the casing and the core, which comprises applying a sealing ring (3,13,23) with greater thickness than the gap (4) between the core and the casing around the rear end of the core (1), inserting the core (1) into the casing (2), then pressing the sealing ring (3,13,23) to stick in the gap (4) between the core (1) and the casing (2) so that the sealing ring (3, 13, 23) and/or the casing (2) are deformed, inserting the billet formed of the core (1) and the casing (2) into a hydrostatic extrusion press and forming the billet under the influence of a liquid into an elongated product by pressing it through a die opening.

4,037,306

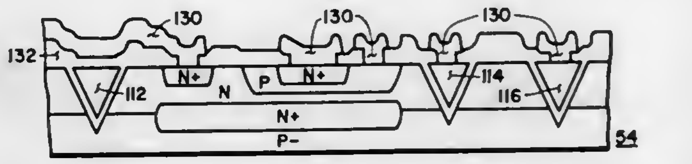
INTEGRATED CIRCUIT AND METHOD

Ronald J. Gutteridge, Scottsdale, and George A. Stickney, Mesa, both of Ariz., assignors to Motorola, Inc., Chicago, Ill.

Filed Oct. 2, 1975, Ser. No. 619,121

Int. Cl.² B01J *17/00*

U.S. Cl. 29—577 **5 Claims**



1. A method for manufacturing an integrated circuit comprising the steps of:

a. providing a semiconductor substrate having an upper layer;
b. forming device junctions in said upper layer;
c. forming an oxide layer over the surface of said upper layer;
d. forming a metal masking layer over the surface of said oxide layer;
e. forming a predetermined pattern of openings through said metal masking and oxide layers;
f. forming recessed regions in the surface of said semiconductor substrate using said predetermined pattern of openings as a mask, said recessed regions extending below the surface through said upper layer thereby isolating device regions containing said device junctions;
g. removing portions of said oxide layer overhanging the periphery of said recessed regions using said metal masking layer as a mask;
h. removing said metal masking layer without removing said oxide layer;
i. forming a thin insulating layer in said recessed regions;
j. forming metal regions in said recessed regions, the surface of said metal regions coinciding with said surface of said upper layer; and
k. electrically connecting said metal regions to a potential source to form an equipotential interconnecting network, said network selectively connectable to said device junctions and to other electrical components of said integrated circuit.

4,037,307

METHODS FOR MAKING TRANSISTOR STRUCTURES

George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Continuation-in-part of Ser. No. 560,590, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,962, July 5, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,532

Int. Cl.² B01J *17/00*

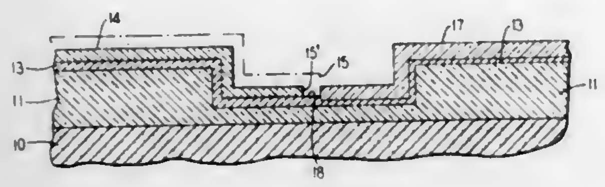
U.S. Cl. 29—571 **10 Claims**

1. A method for making transistors comprising the steps of:

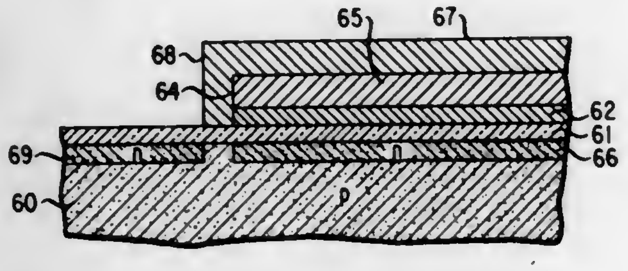
forming over a semiconductor substrate a first mask (e.g., **14**) having an exposed portion including a first vertical edge (e.g., 15) and then thereafter controllably removing a portion of the exposed surface of the first mask, including the portion of the first mask which defines the first vertical edge, to define a second vertical edge (e.g., 15') laterally removed a controlled distance from the location of the first edge;

forming over the semiconductor substrate a second mask having a first vertical edge at a location corresponding to the location of the first vertical edge of the first mask and having a second vertical edge at a location corresponding to the location of the second vertical edge of the first mask, said second mask being characterized in that it inhibits impurities from passing therethrough; and

forming in the semiconductor substrate first and second separate impurity regions, the first impurity region being formed at a location defined by the first edge of the second mask and the second impurity region being formed at a location defined by the second edge of the second mask.



4,037,308
METHODS FOR MAKING TRANSISTOR STRUCTURES
George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 560,590, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,962, July 5, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,533
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **3 Claims**



1. A method for making transistors comprising:

the steps of forming over a semiconductor substrate a first mask having an exposed portion which includes a first vertical edge;

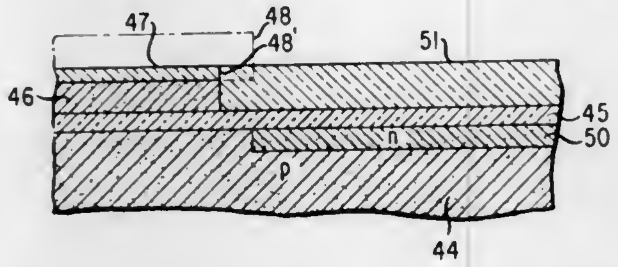
forming a first impurity region in the substrate at a location defined by the first vertical edge of the first mask;

forming a second mask which has a first vertical edge which abuts the first vertical edge of the first mask;

controllably increasing the lateral extent of the second mask to cause the first vertical edge thereof to be extended by a controllable amount to define a second vertical edge; and

forming a second impurity region in the substrate at a location defined by the second vertical edge of the second mask.

4,037,309
METHODS FOR MAKING TRANSISTOR STRUCTURES
George Elwood Smith, Murray Hill, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Division of Ser. No. 560,590, March 21, 1975, abandoned, which is a continuation-in-part of Ser. No. 485,962, July 5, 1974, abandoned. This application Nov. 3, 1976, Ser. No. 738,355
Int. Cl.² B01J *17/00*
U.S. Cl. 29—571 **4 Claims**



1. A method for making transistors comprising the steps of:

forming over a semiconductor substrate a first mask having an exposed portion which includes a first vertical edge;

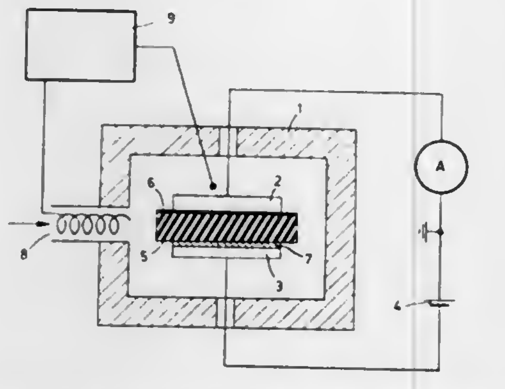
forming a first impurity region in the substrate at a location defined by the first vertical edge of the first mask;

controllably removing a portion of the first mask, including the portion of the first mask which defines the first vertical edge, to define a second vertical edge laterally removed a controlled distance from the location of the first edge;

forming over the semiconductor substrate a second mask having a first vertical edge at a location corresponding to the location of the second vertical edge of the first mask; and

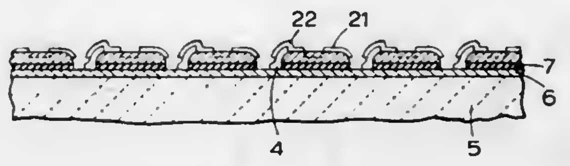
forming a second impurity region in the substrate at a location defined by the first edge of the second mask.

4,037,310
METHOD OF MANUFACTURING A HOMOPOLAR ELECTRET FROM A FOIL
Jan van Turnhout, Delft, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Mar. 17, 1975, Ser. No. 558,936
Claims priority, application Netherlands, Mar. 25, 1974, 7403965
Int. Cl.² B05D *5/12*
U.S. Cl. 29—592 **15 Claims**



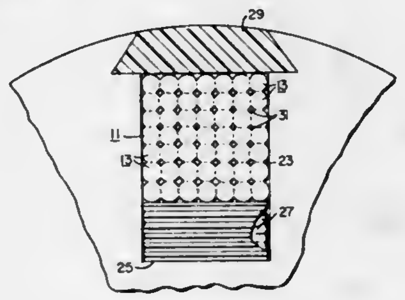
1. A method for producing a homopolar electret from a foil of a non-polar polymer which comprises, heating said foil to a temperature above the glass-rubber transition temperature but below the melting temperature of the polymer and applying an electrostatic field thereto of a magnitude such that a homopolar charge is injected into the foil which is greater than the desired charge value thereby to form an electret foil, cooling the foil to room temperature but removing the electrostatic field before said glass-rubber transition temperature is reached whereby the surplus charge is removed from the electret foil after removal of the field.

4,037,311
METHODS OF MANUFACTURING INFRA-RED DETECTOR ELEMENTS
Morris V. Blackman, and Michael D. Jenner, both of Southampton, England, assignors to U.S. Philips Corporation, New York, N.Y.
Filed July 14, 1976, Ser. No. 704,999
Int. Cl.² H01L *31/18*
U.S. Cl. 29—593 **15 Claims**



1. A method of manufacturing a plurality of infra-red detector elements each comprising a body of infra-red sensitive material having a substantially rectangular surface configuration with a pair of low resistance electrical contacts spaced apart on one surface of the body at opposite sides of a sensitive area of the element, comprising the steps of adhering a wafer of the infra-red sensitive material to a supporting body, forming a first plurality of substantially parallel extending channels extending in the wafer material to define on the supporting body a plurality of substantially parallel strip portions of the infrared sensitive material, reducing the thickness of the strip portions to obtain a curvature of the exposed longitudinal edges of the strip portions, forming a second plurality of substantially parallel extending channels in the wafer material of the strip portions in a direction substantially normal to the longitudinal direction of the strip portions to define on the supporting body an array of substantially rectangular elemental body portions of the infra-red sensitive material each having curved edges on two opposite sides, depositing electrically conductive material to form on the surface of each elemental body portion a pair of electrical contact layers which are spaced apart and adjoin the oppositely located curved edges, and removing the elemental body portions with applied contact layers from the supporting body.

4,037,312
METHOD OF FABRICATING A MECHANICALLY STABLE ELECTRICAL WINDING HAVING COOLING OPENINGS THEREIN
Daniel W. Deis, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation of Ser. No. 307,314, Nov. 16, 1972, now Defensive Publication No. T915,004. This application Dec. 12, 1974, Ser. No. 532,288
Int. Cl.² H02K *15/09*
U.S. Cl. 29—598 **8 Claims**



1. A method of fabricating a superconductive electrical winding in a structure having a chamber to receive the winding comprising:

forming a plurality of superconductive filaments into a single strand;

encasing the strand of superconductive filaments in a normally conductive material to form a wire;

insulating the wire;

covering the insulated wire with a thermally responsive bonding material;

forming a plurality of the insulated wires covered with the thermally responsive bonding material into a composite cable;

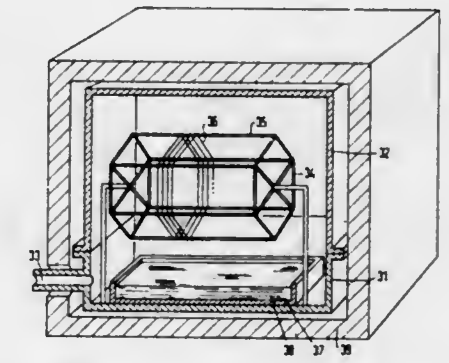
placing a desired number of winds of the cable in the chamber;

compressing the winds in the chamber by means of a fluid pressurizing material, the pressure of said compressing being sufficient to cause the bonding material of adjacent wires in the winding to merge without filling in the interstices among the wires;

hardening the pressurizing material to maintain the winds in the compressed state; and

heating the structure to cause the bonding material to bond the wires together and secure them in the positions they occupy in the compressed winds.

4,037,313
METHOD FOR THE MANUFACTURE OF A SUPERCONDUCTOR
Manfred Wilhelm, Nuremberg, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany
Continuation of Ser. No. 488,834, July 15, 1974, abandoned. This application Mar. 11, 1976, Ser. No. 665,820
Claims priority, application Germany, Aug. 1, 1973, 2339053
Int. Cl.² H01V *11/00*
U.S. Cl. 29—599 **18 Claims**



1. An improved method for manufacturing a superconductor in the form of a superconductive intermetallic compound of the type A_3B with an A-15 crystal structure including at least two elements the first of which is a ductile element having a higher melting point and the second an element having a lower melting point comprising the steps of:

a. providing a single melt consisting of the second element;
b. providing a starting structure consisting of the first element surrounded by and embedded in a ductile carrier metal;
c. placing said melt and said starting structure together in a chamber with said starting structure disposed above said melt;
d. providing an inert atmosphere in said chamber by one of evacuating said chamber to a maximum residual gas pressure of 10^{-2} torr and pressurizing said chamber with an inert gas to a maximum pressure of 500 torr; and
e. heating both said single melt and starting structure to the same temperature, said temperature being between 600° and 950° C, and maintaining said temperature such that said melt forms a vapor of said second element, said vapor reacting with said starting structure such that said superconductive intermetallic compound is formed through the reaction of said vapor of said second element, diffusing through said ductile carrier metal, with said first element.

4,037,314
METHOD OF PRODUCING AN ELECTRICAL HEATING ELEMENT AND FITTING ASSEMBLY

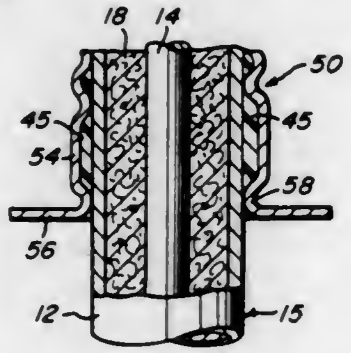
James F. Pease, 5805 Folkestone Drive, Dayton, Ohio 45459

Division of Ser. No. 454,291, March 25, 1974, Pat. No. 3,930,140, which is a continuation-in-part of Ser. No. 334,002, Feb. 20, 1973, Pat. No. 3,800,415, which is a division of Ser. No. 244,516, April 17, 1972, Pat. No. 3,732,398, which is a continuation-in-part of Ser. No. 194,742, Nov. 1, 1971, abandoned. This application Dec. 15, 1975, Ser. No. 640,737

The portion of the term of this patent subsequent to May 8, 1990, has been disclaimed.

Int. Cl.^{2} H05B *3/04*

U.S. Cl. 29—611 **6 Claims**



1. In a method of producing an electrical heating element assembly for mounting within spaced openings of a liquid heating vessel, and including the steps of forming an elongated tubular sheath having opposite end portions, positioning an elongated electrical resistance element within the sheath with a thermally conductive insulation material, and extending terminal members from the end portions of the resistance element through corresponding end portions of the sheath, the improvement comprising the steps of drawing a sheet of metal to form a pair of tubular fittings each having a flange portion and a tubular wall portion, deforming said tubular wall portion of each said fitting to produce a helical convoluted thread portion having a corrugated wall configuration in axial cross-section, deforming each said fitting to produce axially spaced first and second annular wall portions, positioning each said fitting on the corresponding said end portion of said tubular sheath with said first and second annular wall portions engaging said sheath at axially spaced locations on said sheath, and confining a fluid bonding and sealant material within the space defined between said tubular wall portion of each said fitting and said sheath and between said axially spaced first and second corresponding annular wall portions.

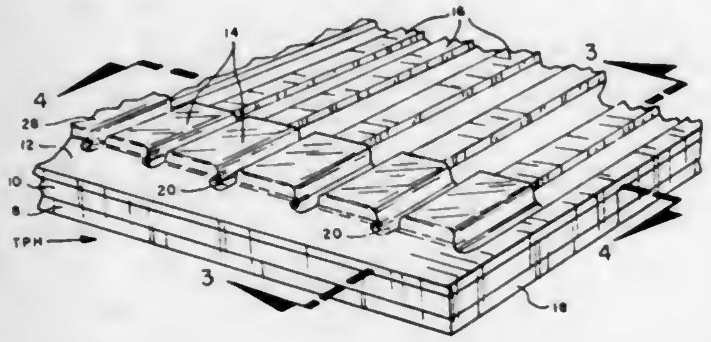
4,037,315
THERMAL PRINTING HEAD

Earl Wesley Stapleton; Patricia Ann McLaughlin, and Jerry Edwin Turnbaugh, all of Portland, Oreg., assignors to Tektronix, Inc., Beaverton, Oreg.

Continuation of Ser. No. 572,499, April 28, 1975, abandoned, which is a division of Ser. No. 383,955, July 30, 1973, Pat. No. 3,903,393. This application Sept. 13, 1976, Ser. No. 722,989

Int. Cl.^{2} H01C *7/02. 7/04*

U.S. Cl. 29—612 **4 Claims**



1. A method of making a thermal printing head comprising the steps of:

applying conductive paste onto a surface of an insulating substrate member defining a common conductive member and conductive means spaced from each other and having ends spaced from said common conductive member;

firing said conductive paste and substrate member thereby fixing said common conductive member and conductive means in position on said substrate;

applying a paste of resistive material onto said common conductive member and the ends of said conductive means and to said substrate surface in the space between said common conductive member and the ends of said conductive means defining a continuous bar of resistive material;

firing

cutting substrate member and resistine paste to fix said resistive bar in position on said common conductive member, ends of said conductive means and said substrate member; and cutting through said resitive bar to form discrete resistive members connected between said common conductive member and respective ones of said conductive means.

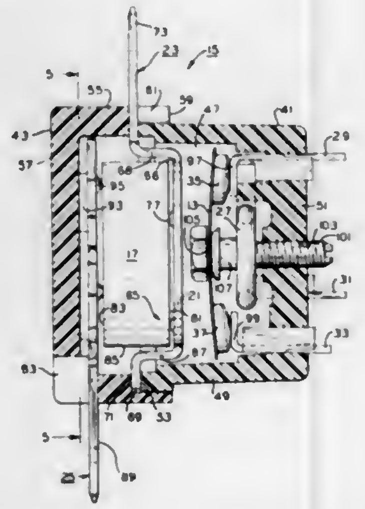
4,037,316
METHOD OF ASSEMBLING TEMPERATURE RESPONSIVE RESISTANCE MEMBER

Donald H. Stoll, Morrison, Ill., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 508,457, Sept. 23, 1974, abandoned. This application Mar. 30, 1976, Ser. No. 671,961

Int. Cl.^{2} H01H *11/00;* H01C *17/02*

U.S. Cl. 29—622 **23 Claims**



1. A method of assembling a temperature responsive resistance member so as to be enclosed within a chamber of a pair of separable housings with one of the housings having a pair of openings extending from the chamber exteriorly of the one housing generally in different directions, the method comprising the steps of:

a. mounting the temperature responsive resistance member in both supporting engagement and electrical contacting engagement between a seating portion of a pair of electrical terminals and positioning an electrical connection portion on the terminals within the openings in the one housing so as to extend exteriorly thereof generally in the different directions, respectively; and

b. joining the separable housings so that the temperature responsive resistance member is enclosed within the chamber and disposing the seating portions arranged in both the supporting engagement and the electrical contacting engagement with the temperature responsive resistance member within the chamber so that the temperature responsive resistance member is predeterminately spaced within the chamber from the housings only by the seating portions of the terminals.

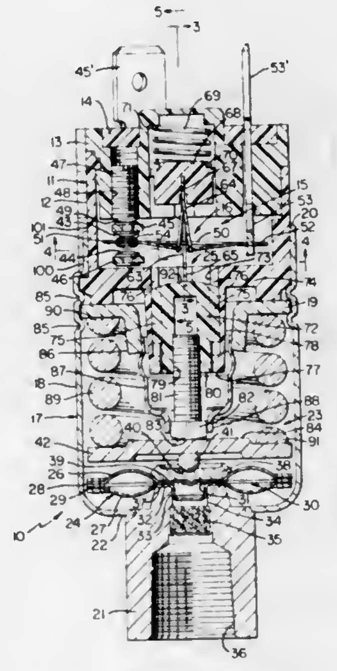
4,037,317
METHOD OF MAKING FLUID OPERATED ELECTRICAL SWITCH CONSTRUCTION

Werner R. Bauer, Radnor, Pa., and Roger P. Sepso, Stratford, Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 428,877, Dec. 27, 1973, Pat. No. 3,984,649. This application July 16, 1976, Ser. No. 706,069

Int. Cl.^{2} H01H *11/00*

U.S. Cl. 29—622 **11 Claims**



1. A method of making a fluid operated electrical switch construction comprising the steps of providing a first housing having an electrical switch therein, providing a second housing having an expandible and contractible element therein, providing a motion transmitting means that has a length adjustment means therein for adjusting the length of said motion transmitting means, assembling said housing together so that said motion transmitting means is disposed in said housings between said element and said switch to transmit movement of said element to said switch to operate the same, adjusting the length of said length adjustment means of said motion transmitting means solely by causing relative movement between said housings while said housings are assembled together but before the same are secured together, and, thereafter securing said housing together so that said length adjusting means will be at desired adjusted condition thereof.

4,037,318
METHOD OF MAKING FUSES

Harold W. Burkley, Indianapolis, and Wayne H. Geno, Noblesville, both of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Oct. 26, 1976, Ser. No. 735,303

Int. Cl.^{2} H01H *69/02*

U.S. Cl. 29—623 **6 Claims**

1. A method of making fuses for a record unit comprising,

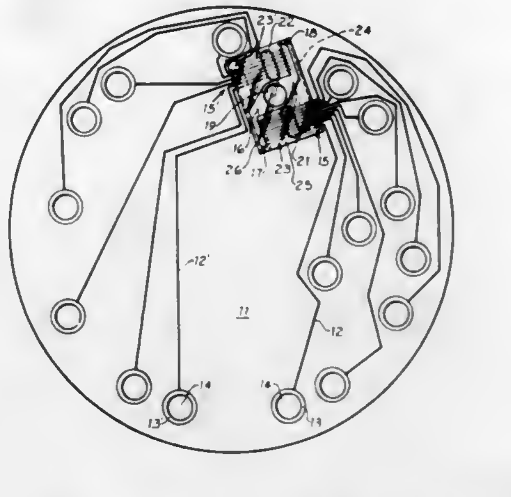
first providing on an insulated substrate an electrical circuit pattern with which a plurality of fuses are to be connected,

next providing a groove in said substarate in an area where said fuses are to be located,

next attaching each end of a plurality of fine wires to said electrical circuit pattern, said fine wires crossing said groove in said substrate,

next covering the attached ends of said fine wires with a first coating, next masking the uncovered portion of said fine wires with a flexible material, and

then encapsulating said fine wires and said first coating with a second coating whereby said flexible material prevents said second coating from individually encapsulating said fine wires and prevents said second coating from entering said groove.



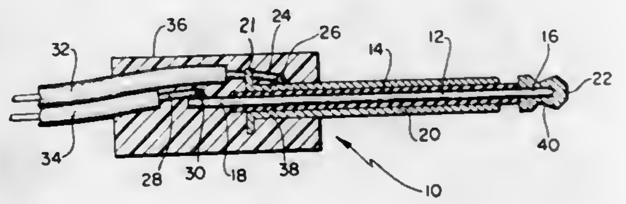
4,037,319
METHOD OF MANUFACTURE OF MALE ELECTRICAL PLUG ASSEMBLY

Robert E. Maloof, East Greenwich, R.I., assignor to Victor Electric Wire & Cable Corporation, West Warwick, R.I.

Division of Ser. No. 601,713, Aug. 4, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 748,112

Int. Cl.^{2} H02G *15/00*

U.S. Cl. 29—629 **6 Claims**



1. A method of manufacturing a male electrical plug assembly comprising the steps of feeding a continuous length of conductor having an insulation applied thereto through a sleeve of predetermined length until the leading end of the conductor extends outwardly from the outermost end of said sleeve, severing the conductor at an end thereof that is external of the sleeve but adjacent to the innermost end thereof while simultaneously stripping a portion of the insulation from said conductor at the ends thereof to form exposed conductor ends, the stripped end of the conductor at the outer end thereof being spaced from said sleeve by said insulation, mounting a head pin on the exposed outer end of said conductor, connecting conductor leads to said sleeve and conductor at the inner ends thereof, and molding a body around the inner ends of said sleeve and conductor as connected to said conductor leads to encapsulate the connected conductor leads and the inner portions of said conductor, insulation and sleeve.

4,037,320
APPARATUS FOR FORMING ARMATURE WINDINGS FOR COMMUTATOR TYPE DYNAMO/ELECTRIC MACHINES

Gerard Edward Wilding, 4 The Retreat, Englefield Green, Surrey, England

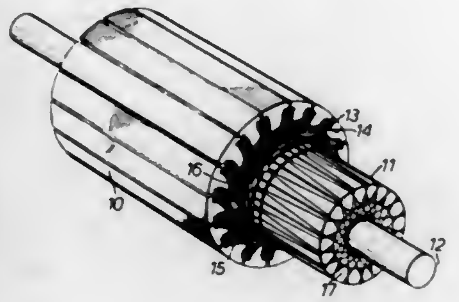
Division of Ser. No. 460,553, April 12, 1974, Pat. No. 3,942,246. This application Dec. 24, 1975, Ser. No. 644,049

Int. Cl.^{2} H02K *15/09*

U.S. Cl. 29—733 **28 Claims**

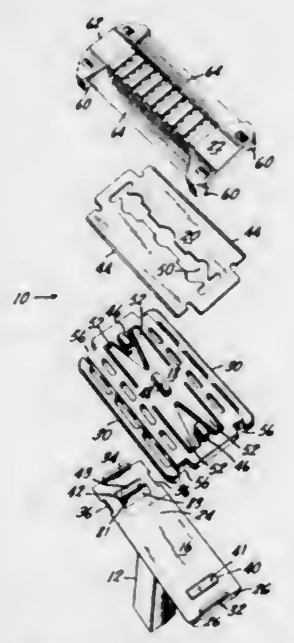
1. Wire looping means for laying a wire in the connection slots of a commutator carried by the armature shaft of a dynamo-electric machine, said wire looping means comprising:

- a drive shaft having a common axis for rotary and axial reciprocatory motion, and
- at least one wire-looping arm carried at one end of said drive shaft and extending in a direction parallel to but spaced from said common axis,
- said arm having a wire-transporting, radial projection extending axially along the surface thereof that is remote from said common axis,



- an open-ended, wire-transporting, radial slot being formed in said arm, said radial slot being disposed beside said projection and extending axially towards said drive shaft,
- and said arm and said radial slot being dimensioned so as when in operation to extend axially over said commutator and said connection slots when said drive shaft is axially aligned with and disposed adjacent said armature shaft.

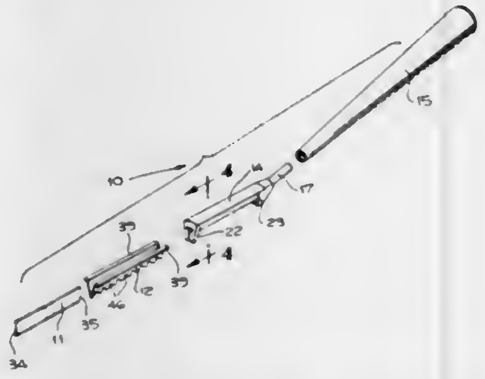
4,037,321
DOUBLE EDGE BLADE RAZOR
Clemens A. Iten, and Malcolm B. Sykes, both of Staunton, Va., assignors to Philip Morris Incorporated, New York, N.Y.
Filed Nov. 11, 1976, Ser. No. 740,783
Int. Cl.^{2} B26B *21/06*
U.S. Cl. 30—47 **18 Claims**



1. A razor including a handle and a shaving head assembly connected to said handle, said shaving head assembly comprising

- an elongated mounting plate fixed to said handle, said mounting plate having a top surface and being disposed symmetrically of said handle,
- an elongated bridge member received on the top surface of said mounting plate for sliding travel longitudinally of said mounting plate between first and second positions thereon, and vice versa, said bridge member in its first position being disposed symmetrically of said handle and in its second position having one end and a longitudinal portion thereof extending beyond one end of said mounting plate,
- a razor blade member received on top of said bridge member, and
- a cap member received on top of said blade member, there being cooperating means on said blade member and said bridge member and cooperating means on said cap member and said bridge member for unitarily moving said blade member and said cap member with bridge member when said bridge member is slid between its first and second positions, said cap member having downwardly depending structure girdingly engaging longitudinal marginal portions of said mounting plate when said bridge member is in said first position, the underside of said bridge member and the upper surface of said mounting plate having cooperating structure engageable when said bridge member is in said first position for urging said bridge member upwardly of said mounting plate thereby to clamp said blade member against said cap member, the cooperating structure at said bridge member underside and said mounting plate upper surface disengaging when said bridge member is slid to its second position, the downwardly depending structure on said cap member being released from engagement with the marginal portions of said mounting plate when said bridge member is moved to its second position whereby said cap member can be lifted upwardly free of said assembly to permit removal and replacement of said blade member.

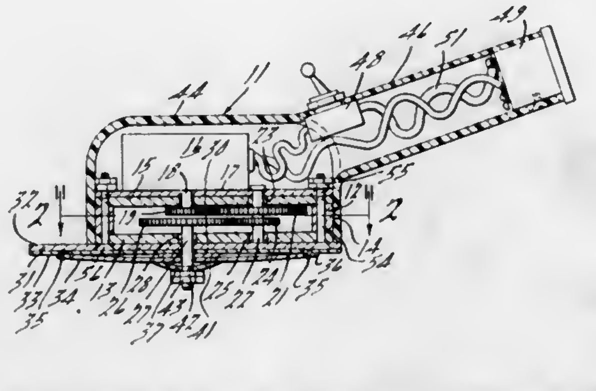
4,037,322
RAZOR ADAPTED FOR SURGICAL PREPARATION
Albert E. Bresler, 14314 Chase St., Panorama City, Calif. 91402
Filed Oct. 15, 1974, Ser. No. 514,489
Int. Cl.^{2} B26B *21/10, 21/12*
U.S. Cl. 30—53 **8 Claims**



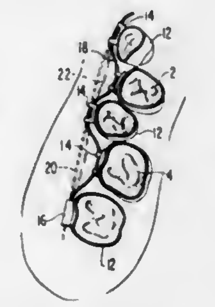
6. A razor comprising a blade head, a ridigly fixed handle extending from the blade head in the plane of the blade, the head handle making an acute angle with the blade edge, walls in the blade head defining a slot adapted to removably receive a blade, head means housing the ends of the blade; means for guarding the cutting edge of the blade including a blade carrier, parallel side walls on the carrier adapted to replace the blade, means for registry of the blade in the slot, a carrier fold surrounding the blade cutting edge, and arcuate walls defining perforations in the carrier fold such that the cutting edge of the blade is discontinuous; and a razor blade residing removably in the blade head slot.

4,037,323
GRASS TRIMMING DEVICE
Paul F. Seibold, 26665 York Road, Huntington Woods, Mich. 48070
Continuation of Ser. No. 331,491, Feb. 12, 1973, abandoned. This application May 3, 1976, Ser. No. 682,516
Int. Cl.^{2} B26B *19/14*
U.S. Cl. 30—206 **3 Claims**

1. In a hand trimmer for grass, a motor having a shaft, means driving said shaft by speed reducing means located directly adjacent to said motor, a thin, flat circular plate having an aperture through the center through which said driven shaft extends, teeth on the forward half edge portion of said plate, the rear half-edge portion of the plate having a free unbroken edge, a blade secured at its center to said driven shaft and having a length substantially equal to the diameter of said plate, notches cut in the forward half edge portion of the plate forming said teeth, one side edge of the notches being radially disposed to form cutting edges, the other side of the notches being tangent to a circle approximately half the radius of the plate for trapping the grass when the trimmer is advanced thereinto, said blade having its centerline aligned with the center of the driven shaft with the cutting edges disposed parallel to but offset in opposite directions therefrom each side of the driven shaft so as to produce a scissor-like cut with the radially disposed cutting edges, the single blade is driven by the motor at reduced speed so as to permit the grass to be moved into the notches between the passage of each half of the blade thereover, whereby each half of the blade cuts the grass as they advance seriatim over the notches so that only a single cut occurs to the grass within a notch at any one time thereby limiting the power requirement for the cutting operation to a minimum.

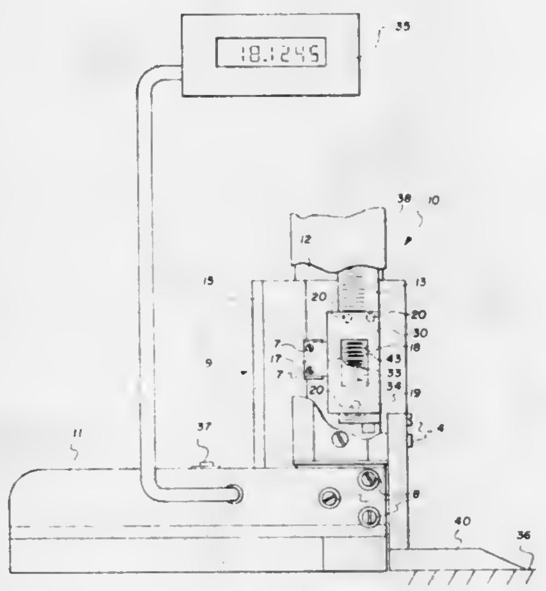


4,037,324
METHOD AND SYSTEM FOR ORTHODONTIC MOVING OF TEETH
George F. Andreasen, Iowa City, Iowa, assignor to The University of Iowa Research Foundation, Iowa City, Iowa
Continuation-in-part of Ser. No. 259,184, June 2, 1972, abandoned. This application May 21, 1973, Ser. No. 362,578
Int. Cl.^{2} A61G *7/00*
U.S. Cl. 32—14 A **19 Claims**



1. A method of moving teeth by attaching a plurality of brackets to a plurality of teeth, subjecting the brackets and the teeth connected thereto to forces which urge them toward desired positions, the latter step being performed by subjecting a wire of a near-stoichiometric alloy of nickel and titanium to torsional forces and flexural forces before attaching it to the brackets, and non-rotatably attaching the wire to the brackets so that torsional restorative forces and flexural restorative forces act upon the brackets and teeth.

4,037,325
LINEAR GLASS SCALE HEIGHT GAGE
Ernest G. Weber, Fairport; John W. Balliett, Penfield; John M. Lacagnina, Henrietta, and Bruce R. Robinson, Penfield, all of N.Y., assignors to Quality Measurement Systems, Inc., Penfield, N.Y.
Continuation-in-part of Ser. No. 540,523, Jan. 13, 1975, abandoned. This application Mar. 16, 1976, Ser. No. 667,385
Int. Cl.^{2} G01B *7/02, 5/02*
U.S. Cl. 33—125 C **4 Claims**



1. A measurement device using Moiré fringes produced between a measurement scale and a relatively movable reader scale, said scales having respective optical rulings of different numbers of lines per unit of distance, said respective rulings being disposed generally parallel with each other, and said measurement device comprising:

- a. a beam member;
- b. said measurement scale being secured to said beam member to extend in a direction parallel with a surface of said beam member;
- c. a carriage movable along said beam member and guided by said surface of said beam member;
- d. a reader head supporting said reader scale and mounted on said carriage for movement therewith along said measurement scale in a direction parallel with said measurement scale;
- e. a flexure hinge secured to said reader head and to said carriage and extending generally parallel to said measurement scale for fixing said reader head relative to said carriage againt any motion in a direction parallel with said measurement scale and for allowing limited motion of said reader head in directions transverse to said measurement scale;
- f. bearings on said reader head disposed for engaging said measurement scale and positioning said reader scale in parallel relation to said measurement scale; and
- g. flexure spring means mounted on said carriage and having a free end engaging said reader head for resiliently urging said reader head toward said measurement scale to press said bearings against said measurement scale and hold said reader scale in parallel relation with said measurement scale.

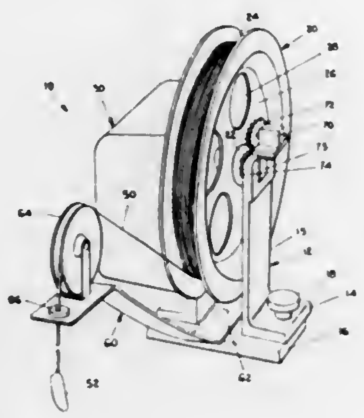
4,037,326
TROLLING APPARATUS

William M. Booth, Grand Haven, and James E. Rieth, Grand Rapids, both of Mich., assignors to James E. Rieth, Grand Rapids, Mich.

Division of Ser. No. 274,505, July 24, 1972, Pat. No. 3,916,555. This application July 9, 1975, Ser. No. 594,500

Int. Cl.^{2} G01B *3/00;* **A01K** *89/00*

U.S. Cl. 33—139 **1 Claim**



1. A trolling apparatus adapted for mounting to a boat to pay out and retrieve a line in the water comprising:
  - a reel frame;
  - a line reel rotatably mounted to said frame and having a peripheral channel for holding a line therein, said channel having a circumference corresponding to a predetermined unit length of line to be wound on said reel;
  - line guide means coupled at one end to said reel frame and extending therefrom;
  - a line anchored at one end to said reel and wound thereon in said channel, said line guidably supported by said guide means as it is extended and retracted to and from said reel;
  - a reversible drive motor;
  - means coupling said drive motor to said reel such that when said drive motor is not actuated, said reel is securely held in position to hold said line at a predetermined selected position wherein said means coupling said drive motor to said line reel comprises a plurality of gears, one of which integrally includes at least one cam detent formed on a side of said gear; and wherein said trolling apparatus includes a limit switch positioned to be actuated by said cam detent as said gear rotates and further includes remote electrically operated indication means for providing an indication of the length of line extended from said reel, said indicating means comprising an electrical counter selectively coupled to a source of actuating potential by said limit switch as said gear rotates to provide an indication of the length of line extended from said reel; and
  - means for actuating said drive means to extend and retract said line from said reel.

4,037,327
DOG HEIGHT MEASURING WICKET

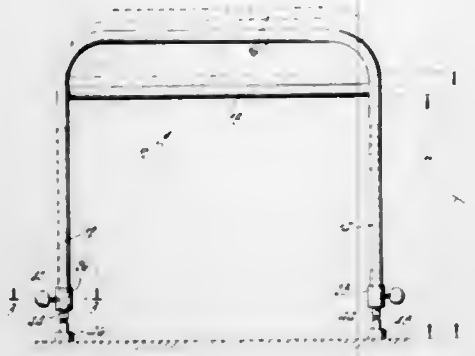
George Hildebrand, 843-a Heritage Village, Southbury, Conn. 06488

Continuation-in-part of Ser. No. 538,412, Jan. 3, 1975, Pat. No. 3,943,630. This application Mar. 16, 1976, Ser. No. 667,412

Int. Cl.^{2} G01B *5/00, 5/02*

U.S. Cl. 33—169 R **1 Claim**

1. A measuring wicket for dogs comprising a U-shaped member having a pair of spaced tubular legs and an interconnecting bar, a cross bar below said interconnecting bar and extending between said legs and secured thereto, leg extensions slidably telescopically received in said legs, enlarged cylindrical bosses at the bottom of said legs, indexing grooves in said extensions co-operable with said cylindrical bosses to indicate the effective height of said cross bar, locking means threadedly mounted in said legs for engagement with said extensions in said grooves selectively locking each of said leg extensions in an adjusted position, each said locking means including a spring pressed ball detent seatable in said grooves, and indicia on said extensions for indicating the height of the cross bar when said locking means is seated in one of said grooves, and enlarged feet on said leg extensions engageable with said bosses when said leg extensions are fully retracted into said legs.



4,037,328
SPATIAL ORIENTATION DEVICE

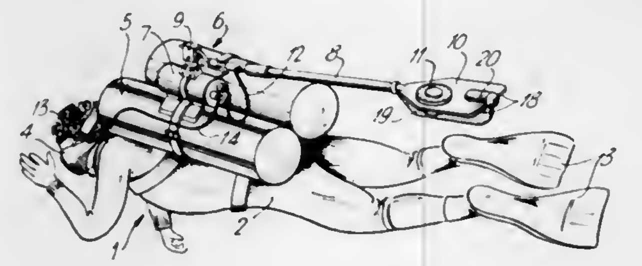
Lorne Kuehn, Downsview, and Harold O. Seigel, Don Mills, both of Canada, assignors to Her Majesty the Queen in Right of Canada, Canada

Filed Oct. 7, 1976, Ser. No. 730,639

Claims priority, application Canada, June 2, 1976, 253789

Int. Cl.^{2} G01C *17/30*

U.S. Cl. 33—349 **9 Claims**



1. A spatial orientation sytem for underwater navigation comprising:
  - boom means, for pivotal attachment to an underwater swimmer or diver;
  - compass means, mounted on said boom means adjacent an outboard end thereof, including means to develop an electrical voltage when deviation from a predetermined null axis occurs and which is proportional thereto;
  - adjustable means for setting said predetermined null axis so as to provide an initial heading;
  - an audible tone generating means receiving said proportional electrical voltage;
  - a pair of bone conduction transducers, adapted to be worn on opposite sides of the head by said swimmer or diver, receiving an output from said audible tone generating means;
  - gating means connected to said output of said audible tone generating means for directing the audible tone to a selected one of said transducers corresponding to deviation in one direction and to the other said transducer corresponding to deviation in the other direction, whereby said swimmer or diver receives an audible signal indicating the magnitude and direction of any deviation from the initial heading.

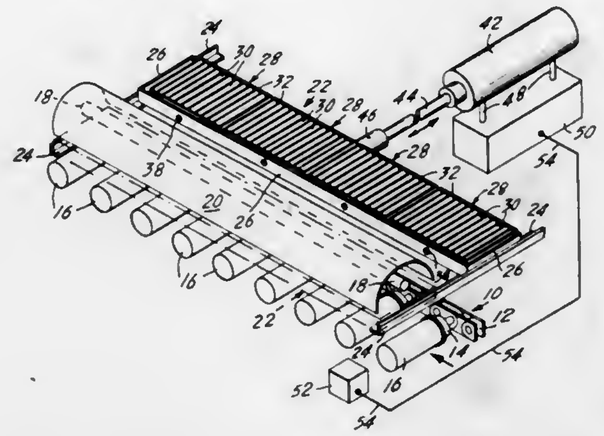
4,037,329
SHUTTER AND SYSTEM EMPLOYING SAME

Sydney Johnstone Wallace, Point Roberts, Wash., assignor to American Can Company, Greenwich, Conn.

Filed Feb. 13, 1976, Ser. No. 657,955

Int. Cl.^{2} F26B *3/28;* **F27D** *5/00*

U.S. Cl. 34—4 **15 Claims**



1. A shutter comprising: an elongated frame; and a plurality of individual baffle units, each of said units being comprised of a multiplicity of overlappingmutually spaced blade means disposed along the length of said unit and extending thereacross to provide a radiation barrier while permitting passage of air therebetween, headers supporting said blade means at their opposite ends, and means engaging said headers to mount said units adjacent one another along the length of said frame and accommodating thermal expansion thereof, confronting blade means of adjacent units overlapping one another to provide. a radiation barrier while permitting passage of air therebetween with said blade means extending transversely of said frame, the recited disposition and configuration of said baffle units being effective to prevent the passage of radiation through said shutter while permitting the flow of air therethrough, and the recited disposition of said blade means in combination with the recited expandable mounting of said baffle units in said frame minimizing the tendency of thermal expansion to distort said shutter.

4,037,330
METHOD AND MEANS FOR DRY COOLING BULK MATERIALS

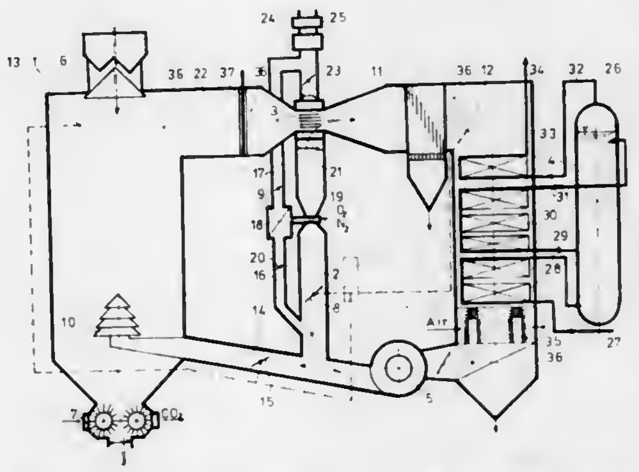
Roland Kemmetmüller, Vienna, Austria, assignor to Waagner-Biro Aktiengesellschaft, Austria

Filed May 17, 1976, Ser. No. 687,006

Claims priority, application Austria, June 13, 1975, 4530/75

Int. Cl.^{2} F26B *7/00, 21/06*

U.S. Cl. 34—20 **16 Claims**



1. A method for dry cooling hot bulk material within a closed system with a cooling gas, said method comprising:
  - a. directing a cooling gas through said bulk material to thereby cool said material and heat said cooling gas;
  - b. removing said heated cooling gas from said bulk material and mixing therewith a cold cooling gas;
  - c. cooling said mixture of heated and cold cooling gases to provided a cold stream of cooling gas; and
  - d.i selectively diverting a portion of said cold stream of cooling gas to the removed heating cooling gas for mixing therewith in step b; and
  - ii directing the undiverted portion of said cold stream of cooling gas to said bulk material for cooling same.

4,037,331
FREEZE-DRYING APPARATUS

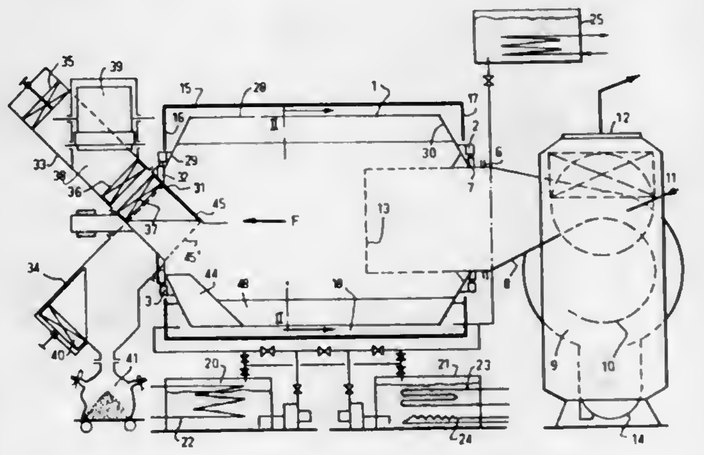
Jacques Brilloit, Grenoble, France, assignor to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude, Paris, France

Filed Jan. 19, 1976, Ser. No. 650,000

Claims priority, application France, Jan. 22, 1975, 75.01880

Int. Cl.^{2} F26B *13/30, 5/06, 5/12*

U.S. Cl. 34—92 **3 Claims**



1. Apparatus for the lyophilization of particles of material of the type comprising at least one sublimation enclosure rotating around a horizontal axis, said enclosure having an axial opening communicating with admission and discharge passage both downwardly inclined, said enclosure having a frusto-conical part around said opening and a cylindrical part, said frusto-conical part being fitted with substantially radial vanes extending from the immediate vicinity of said opening and having the form of a catchment through, while said cylindrical part has longitudinal vanes between which is located a series of guides, formed on one transverse side of deflecting walls substantially arranged along a helical line and on the other transverse side by radial blanking-off walls.

4,037,332
INFORMATION CONVERSION SYSTEM FOR ACCELERATED INSTRUCTION

Vyacheslav Vyacheslavovich Petrusinsky, ulitsa Malaya Jushunskaya, 8, korpus 2, kv. 51, Moscow, U.S.S.R.

Filed Aug. 4, 1975, Ser. No. 601,702

Int. Cl.^{2} G09B *19/06*

U.S. Cl. 35—35 C **4 Claims**

1. A method of forming and converting information for accelerated instruction with multichannel recording of said information on a carrier and simultaneous instruction of a reference student, including the steps of
  - a. forming, from educational aids, initial synchronized audiovisual signals of basic and auxiliary study information;
  - b. forming audiovisual signals of functional background to the rhythm of the student's bioprocesses;
  - c. forming service signals for controlling the process of reproduction of signals recorded on said signal carrier;
  - d. forming test signals and instruction signals;
  - e. working out a suggestive formula of suggestive and subsensor control;
  - f. forming, in accordance with said suggestive formula,

suggestive and subsensor control signals in the form of speech signals to the rhythm of the student's bioprocesses;

g. forming, in accordance with said suggestive and subsensor control signals, reflex reinforcement signals;

h. forming suggestive and subsensor stimulation signals;

i. registering responses and bioreactions of said reference student;

j. measuring, with reference to said test signals, the conscious perception threshold and the time of reaction of said reference student by recording his responses and bioreactions;

k. frequency-filtering said audio signals of said basic and auxiliary study information;

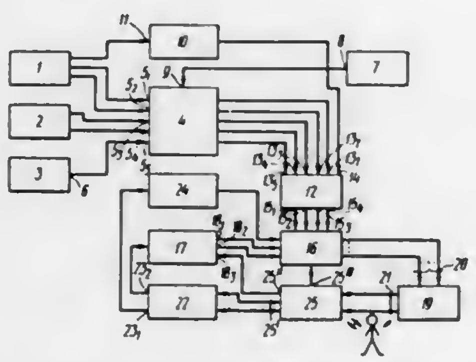
l. delaying in time, within the limits of a syntagma, said audio signals of basic and auxiliary study information;

m. changing the intensity of said delayed audio signals to the perception threshold level of said reference student, in accordance with the number of the latter's responses to said test signals;

n. linearly adding said delayed and weakened audio signals to said initial audiovisual signals of basic and auxiliary study information, said audiovisual signals of functional background, and said signals of suggestive and subsensor control and reflex reinforcement;

o. commutating said added signals in time and with respect to recording channels with said suggestive and subsensor stimulation signals, suggestive control signals, and test signals, with due regard for the time of reaction of said reference student;

p. forming signals for biostimulating electrically active points on said reference student's body;



q. synchronizing said audiovisual signals of said basic and auxiliary study information, said suggestive and subsensor control signals, and said audiovisual signals of functional background with the rhythm of physiological processes of said reference student;

r. forming - from said formed audiovisual signals of basic and auxiliary study information, said audiovisual signals of functional background, said suggestive and subsensor control signals, said reflex reinforcement signals, said test and instruction signals, said suggestive and subsensor stimulation signals, said signals delayed and weakened to the perception threshold level of said reference student, said signals synchronized with the rhythm of bioprocesses of said reference student, commutated in time and with respect to the recording channels - signals of sessions of passively assimilating information, signals of sessions of activization of passively assimilated material, signals of sessions of assimilating information and checking to the rhythm of the student's bioprocesses, signals of programmed relaxation sessions, signals of sessions of suggestively stimulating the state of said student, signals of sensomotor training sessions, signals of sessions of biostimulation of electrically active points on the body of said student, signals of suggestively controlled sleep sessions, and signals of programmed active rest sessions;

s. registering responses and bioreactions of said reference student to said formed signals of said sessions;

t. recording all said formed and converted signals on the carrier simultaneously with recording the responses and bioreactions of said reference student;

u. using said signals recorded on the carrier, as these signals are being reproduced, for accelerated instruction of students whose performance, as regards the number of responses and bioreactions to test signals, is similar to that of said reference student.

3. A system for effecting the proposed method of forming and converting information for accelerated instruction, comprising:

a. a study information unit means intended for forming synchronized audiovisual signals of basic and auxiliary study information; outputs of said study information unit means;

b. a unit means of control signals and accompaniment signals, intended for forming audiovisual signals of functional background and service signals for controlling reproduction of said audiovisual signals of said basic and auxiliary study information; outputs of said unit means of control signals and accompaniment signals;

c. a test and instruction unit means; an output of said test and instruction unit means;

d. an audiovisual unit means intended for presenting said audiovisual signals of basic and auxiliary study information, audiovisual signals of functional background, and test and instruction signals in a suggestive form; inputs and outputs of said audiovisual unit means, said inputs of said audiovisual unit means being connected to said outputs of said study information unit means, said control and accompaniment signal unit means, and said test and instruction unit means, respectively;

e. a unit means suggestive and subsensor control and reflex reinforcement of suggestive and subsensor signals, intended for forming audiovisual signals of subsensor and suggestive control from said formed suggestive formulas recorded in the form of speech signals, for forming said synchronized audiovisual signals of reflex reinforcement of said suggestive and subsensor formulas, forming said speech signals of suggestive and subsensor stimulation in the form of key speech signals; outputs of said unit means of suggestive and subsensor control and relex reinforcement of suggestive and subsensor signals; said output of said unit means of suggestive and subsensor control being connected to said input of the audiovisual unit means;

f. means for providing student responses, a delayed reinforcement unit means intended for delaying in time said speech signals of basic and auxiliary study information within the limits of a syntagma, frequency filtering these signals and weakening them to the perception threshold of said reference student, in accordance with the number of said student's responses to said test signals; an input and an output of said delayed reinforcement unit means being connected to said output of said study information unit means;

g. a signal converter means having channels, intended for linearly adding said delayed, weakened and filtered signals to said signals of said audiovisual unit means and said signals of said unit means of suggestive and subsensor control and reflex reinforcement of said suggestive formulas, commutating in time all said received signals and directing them to said channels with due regard for the number of responses and the time of reaction of said reference student to test signals; six inputs and four outputs of said signal converter means; five of said inputs of said signal converter means being connected to said respective outputs of the audiovisual unit means, the sixth of said inputs being connected to said output of said delayed reinforcement unit means;

h. a unit means for recording signals on a carrier, intended for recording on said carrier said converted signals synchronously with the rhythm of said reference student's physiological processes and his bioreactions in the course of check instruction; inputs and outputs of said unit means for recording signals on a carrier; some of said inputs of said unit means for recording signals on a carrier being connected to said respective outputs of said signal converter means;

i. a biostimulation unit means intended for stimulating electrically active points on said reference student's body; inputs and outputs of said biostimulation unit means; said outputs of said biostimulation unit means being connected to respective inputs of said unit means for recording signals on a carrier;

j. a check reproduction unit means intended for transmitting said signals to said reference student for check instruction and for instructing students whose performance, as regards the reactions to said test signals, is similar to that of said reference student; a multichannel input and an output of said reproduction unit means; said multichannel input of said reproduction unit means being connected to the multichannel output of said unit means for recording signals on a carrier, whereas output audiovisual signals are reproduced for said reference student;

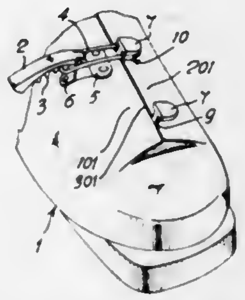
k. a response and biosignal unit means intended for registering the basic physiological processes of said reference student and his reactions to signals of said check reproduction unit means; inputs and outputs of said response and biosignal unit means; one of said outputs of said response and biosignal unit means being connected to said input of said biostimulation unit means;

l. a sensor unit means intended for picking up bioinformation from said reference student and transmitting stimulating signals to said reference student; inputs and outputs of said sensor unit means; some of said outputs being connected to said inputs of said response and biosignal unit means, one of the other outputs being connected to said input of said biostimulation unit means, a third output being connected to the input of said unit means for recording signals on a carrier, the inputs of said sensor unit means being connected to the outputs of said check reproduction unit means.

4,037,333
LACING DEVICE FOR SKI BOOTS

Icaro Olivieri, 10, Via Feltrina Nord, Montebelluna, Italy (31044)

Filed Aug. 24, 1976, Ser. No. 717,289
Claims priority, application Italy, Sept. 18, 1975, 12795/75
Int. Cl.² A43B *5/04, 11/00;* **A43C** *11/00*
U.S. Cl. 36—117 **8 Claims**



1. In a ski boot of the type comprising a ski boot upper provided with two flaps defining an opening, a lacing device including a hooked lever-like lacing member provided on one flap and intended to cooperate with a flexible elastic ring-like lacing member on the other flap, means for securing said flexible elastic ring-like lacing member in a removable manner onto its flap, said means comprising:

a. a shaped projection provided on the flap and presenting at least a side groove;

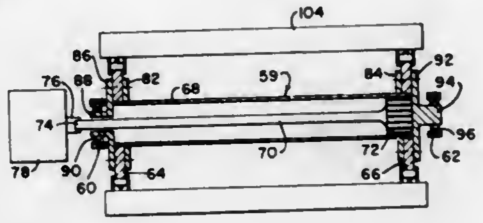
b. a locking element in the form of a small plate shaped so as to present at least a channel-like portion capable of slidably engaging the said groove provided on the shaped projection, so as to define, upon engagement with the said groove, a tubular channel for housing a portion of the said ring-like lacing member;

c. at least an anchoring member provided on said locking element, capable of engaging a portion of the flap in order to secure the locking element in the position in which its channel-like portion engages the groove provided on the shaped projection.

4,037,334
DRIVE MEANS FOR AN ELEVATING SCRAPER ELEVATOR

Robert Antone Plemitscher, Dubuque, Iowa, assignor to Deere & Company, Moline, Ill.

Filed May 21, 1976, Ser. No. 688,673
Int. Cl.² B60P *1/36*
U.S. Cl. 37—8 **3 Claims**

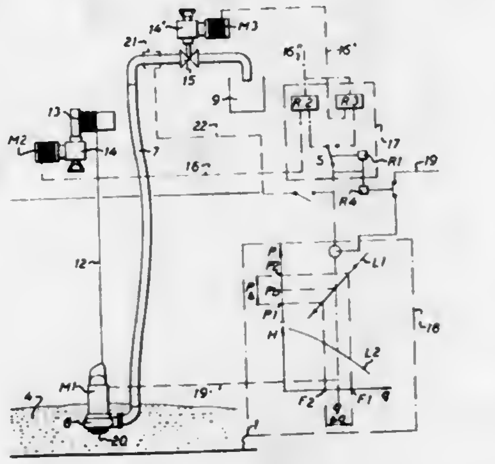


1. In an elevating scraper elevator of a type including a main frame rotatably supporting at least one pair each of drive and idler sprockets at longitudinally spaced locations thereof and an endless conveyor trained about the drive and driven sprockets, the improvement comprising: said pair of drive sprockets being fixed to opposite first and second end portions of a relatively torsionally stiff hollow drive shaft section; said hollow drive shaft section having its opposite ends rotatably mounted on the main frame; a relatively torsionally flexible second drive shaft section located centrally within the hollow drive shaft and having opposite first and second ends of which the first end is located adjacent to the first end portion of the hollow drive shaft and the second end **16** located adjacent to and is fixed to the second end portion of the hollow drive shaft and forms the sole connection between the first and second drive shaft sections; and drive input means mounted on the main frame and drivingly coupled to the first end of the second drive shaft section.

4,037,335
METHOD OF CONTROLLING A MOBILE SUCTION DEVICE FOR SUCKING SUSPENDIBLE MATERIAL FROM THE BOTTOM OF A LIQUID BODY, AND AN APPARATUS FOR CARRYING OUT THE METHOD

Nils Arne Sandberg, Hassleholm, Sweden, assignor to Ingenjorsfirman N.A. Sandbergs Industrikonstruktioner AB, Hassleholm, Sweden

Filed May 5, 1975, Ser. No. 574,280
Claims priority, application Sweden, Aug. 29, 1974, 7410937
Int. Cl.² E02F *3/88*
U.S. Cl. 37—58 **9 Claims**



1. A method of controlling a suction device used for sucking material suspendible in fluid, especially sedimented material, from the bottom of a liquid body, said device being movable along at least one axis including at least one suction nozzle, means for producing suction in the nozzle, and means for supporting and moving said nozzle in relation to said material for sucking material and fluid as a suspension, wherein variations under and above predetermined limits of at least one magnitude which is characteristic of the operation of the suction device and which varies in response to the rate of flow through the nozzle, are sensed and used as signals for controlling a movement of the nozzle along at least one horizontal axis.

4,037,336

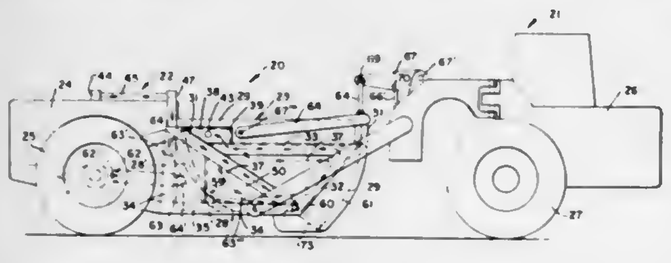
SCRAPER DEVICE HAVING RECEPTACLE WALLS HEATED BY ENGINE EXHAUST

Robert D. Benson, Arvilla, N. Dak. 58214

Filed Mar. 15, 1976, Ser. No. 666,608

Int. Cl.^{2} E02F ***3/06***

U.S. Cl. 37—124 **1 Claim**



1. A scraper device comprising a front and rear frame, an engine fixed on said rear frame, an elongated receptacle fixed on said rear frame in front of said engine, said engine having an exhaust outlet, said receptacle having side walls, a back wall, a cover plate to cover the front of said receptacle, and an unloading plate movably mounted within said receptacle for unloading earth from within said receptacle, said side walls each having a vertical inner panel having smooth inner surfaces, lateral rib members mounted to the outside of said inner panel to form outward extending ridges, outer panel means parallel to said inner panel means and spaced outwardly therefrom and connecting said ribs together at their outer edges to form substantially one air tight compartment on each side wall, said substantially one air tight compartment on each side wall covering a major portion of the area of each inner side wall, said substantially one air tight compartment having an inlet port, said ribs having ports to provide communication throughout the interior of each of said air tight compartments, each of said substantially one air tight compartments having an outlet port, pipe means connecting said exhaust outlet of said engine to said inlet ports of said air tight compartments, said unloading plate being movable to move from rear to front along said inner side wall panels for said unloading whereby heated exhaust from said engine piped from said engine exhaust outlet through said pipe means to each of said substantially one air tight compartments on each side wall will be caused to travel through said compartments to directly heat a major portion of the inner wall of each side wall by the heat of said exhaust before the heated exhaust will travel out of said air tight compartments through the outlet pipe to keep a major portion of the side walls sufficiently heated to prevent any moisture in the earth in the receptacle located between the unloading plate and the inner side walls from freezing and locking the unloading plate to the inner side wall panels during sub zero weather.

4,037,337

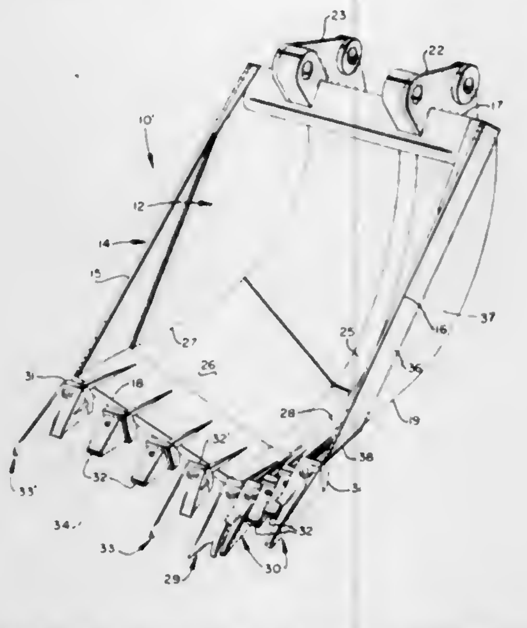
EXCAVATING BUCKET AND TEETH FOR A BACKHOE

Charles Wayne Hemphill, Duncanville, Tex., assignor to ADCO Buckets, Inc., Dallas, Tex.

Filed Aug. 18, 1976, Ser. No. 715,560

Int. Cl.^{2} E02F ***9/28***

U.S. Cl. 37—141 R **16 Claims**



1. An excavating bucket mount means by which said bucket can be attached to a backhoe, said bucket having a bottom member comprised of two opposed sloped members which slope downwardly towards one another; a rear wall; spaced sides joined to said bottom member and rear wall to form an outwardly opening enclosure;

said sloped members having a leading edge spaced from said rear wall;

a plurality of digging teeth, each tooth having a shank by which it is mounted to one of said opposed sloped members, the teeth mounted to one said sloped member being mirror images of the teeth mounted to the opposed said sloped member;

each tooth having a pilot member and an asymetrically arranged secondary digging member, said pilot member is projected forwardly of said asymetrically arranged secondary digging member, with the secondary digging member of the teeth on one said sloped member all being orientated in the same relative direction respective to the secondary digging member of the teeth located on the remaining sloped member;

said plurality of teeth being arranged in opposing pairs with an outer pair of teeth being located fowardly, laterally, and at a higher elevation respective to the next adjacent inner pair of teeth.

4,037,338

VACUUM BELT FILTERS

Sylvain Dominique Daniel Léonce Berline, 45 Rue du Belvedere, Mareil-Marly, Yvelines, France

Filed Dec. 22, 1975, Ser. No. 643,060

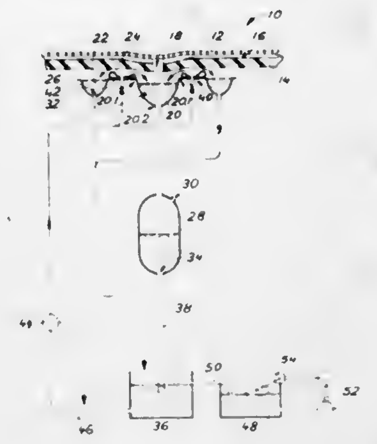
Claims priority, application France, Dec. 26, 1974, 74.42864; Apr. 30, 1975, 75.13626

Int. Cl.^{2} B01D ***33/00***

U.S. Cl. 210—77 **9 Claims**

1. A suction box for a vacuum belt filter having a belt whereon material is carried that is to be filtered by means of a suction force exerted via the suction box and which travels over the suction box, the suction box including a conduit fast with the suction box along each edge thereof parallel to the direction of travel of the belt, each conduit having an inner and an outer wall and an inlet opening through which a pressurized support fluid may be introduced into the conduit to provide a support cushion for the belt, and the inner wall of each conduit being of a resiliently deformable material and having a longitudinal cavity and an opening through which a pressurizing fluid may be forced into the cavity to pressurize it so that the conduits deform, in use, according to the shape of the belt.

7. A method of operating a vacuum belt filter having a belt whereon material is carried that is to be filtered by means of a suction force exerted via a suction box located below the belt



over which the belt travels, which includes supporting the belt on a cushion of the filtrate by forcing a part of the filtrate between support members, located along each edge of the support box, parallel to the direction of travel of the belt, and the belt; collecting the filtrate that flows out between the belt and the support members; and re-cycling the collected filtrate to form the support cushion.

4,037,339

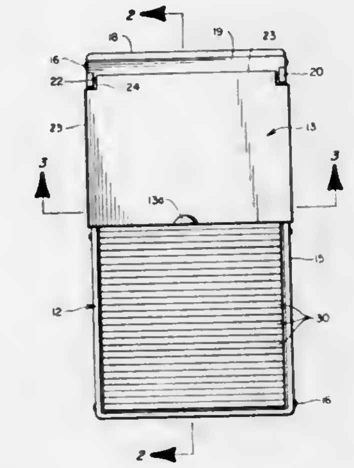
VISIBLE FILE-CARD SYSTEM

Jerome M. Romick, 2008 Zettler Road, Columbus, Ohio 43227

Filed Sept. 2, 1976, Ser. No. 719,938

Int. Cl.^{2} B42F ***15/00***

U.S. Cl. 40—104.12 **7 Claims**



1. A visible file-card assembly comprising a holder including a back panel with a longitudinally-extending recess formed therein to provide parallel spaced longitudinally-extending depending flanges of substantial depth and longitudinally-extending card-support surfaces at each side thereof, said flanges having pairs of aligned inwardly-opening pivot socket openings formed therein at longitudinally-spaced intervals; and cards adapted to be mounted on the holder, said cards being of flexible material, a tab projecting upwardly from the upper edge of each card and of slightly less lateral extent than the spacing of said recess flanges so that it can be inserted in the recess between the flanges and so located laterally on the card as to provide laterally-disposed card surfaces which will rest on the flat card support surfaces at each side of the recess, a resilient pivot strip secured to the tab at laterally spaced points so there is an unsecured portion therebetween to permit insertion of the finger between the strip and tab for flexing, said pivot strip having pivtos projecting from the opposed ends thereof beyond the respective end of the tab, flexing and bowing of the pivot strip by insertion of the finger between it and the tab contracting the strip to shorten the overall length of the strip with its pivots to permit insertion of the strip on the tab into the holder recess to align the pivots therof with a pair of said pivot socket openings and withdrawal of the finger permitting extension of the strip so that the pivots thereof will project into the opposed openings of the pair to pivot the card to the holder and permit it to rest on said card support surface at each side of the recess and removal of the card by inserting the finger to flex and bow the strip to withdraw the pivots from said socket openings.

4,037,340

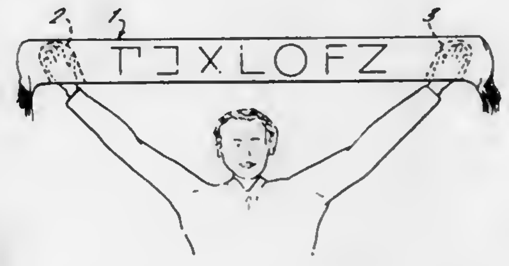
SCARF

Alan Sidney Lewis Owensmith, Epsom, England, assignor to Merchant Inventors International Limited, England

Filed Feb. 10, 1976, Ser. No. 657,382

Int. Cl.^{2} G09F ***7/00***

U.S. Cl. 40—129 A **6 Claims**



1. A scarf for wearing about the neck, said scarf being generally rectangular and having a length substantially greater than its width, each of the opposed end sections of the scarf having at least one hand-receiving pocket having an open end facing a longitudinal edge of the scarf and having an opposite closed end, said pockets together providing bearing places against which hand pressure can be exerted towards the scarf ends, the spacing of such bearing places along the scarf being such that a user can let his hands bear against such places while the scarf is being worn, draped around his neck, and can then by raising his arms and moving his hands away from each other, bring the scarf into a display position in which the part of the scarf between said places is stretched taut above the user's head with the opposed surfaces of the scarf facing to the front and rear of the user, and wherein that part of the scarf bears readable matter which is legibly displayed when the scarf is in such display position.

4,037,341

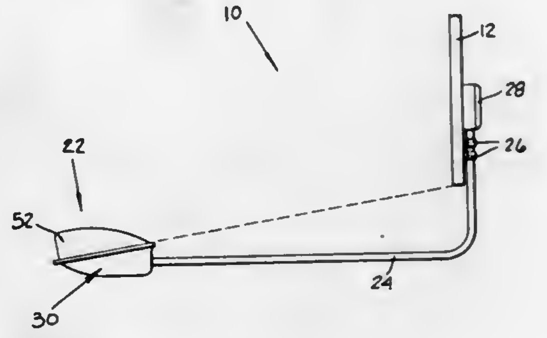
LUMINAIRE FOR LIGHTING A SIGN AND METHOD

Herbert Arnold Odle; Daryl Dean Sullivan, and Kurt Franck, all of Newark, Ohio, assignors to Johns-Manville Corporation, Denver, Colo.

Filed Aug. 13, 1973, Ser. No. 387,879

Int. Cl.^{2} G09F ***13/00***

U.S. Cl. 40—130 B **14 Claims**



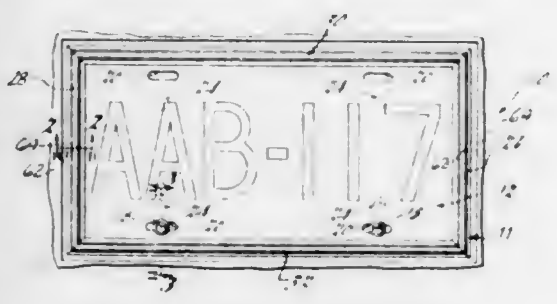
1. A lighting arrangement comprising:

a. a rectangular sign located in a fixed position and including

a top edge portion, a bottom edge portion and opposite side edge portions; and
b. a luminaire including
  i. a light opaque luminaire support comprising a front section having a flat top edge, and side sections located at opposite ends of said front section and extending rearwardly therefrom, each of said side sections including a flat top edge which extends from an associated end of said front section and wherein all of said flat top edges lie in a common plane, said front and side sections extending from said plane into a first area to one side of said plane.
  ii. a light source disposed between the said side sections and rearwardly of said front section and in said common plane,
  iii. a reflector having a reflective surface, said surface being positioned between said side sections and extending from above said source around the back side of said source and under and forward thereof, said surface including a top rear section located behind and above said source for directing light from said source towards a specific one of said edge portions and a bottom front section located in front of said source for directing light from said source towards a segment of said sign including an opposite edge portion thereof, said segment being to one side of said specific edge portion, and
  iv. means for supporting said light source and reflector with said support;
c. means for locating said luminaire in a predetermined position in front of said sign such that
  i. said specific one edge portion of said sign lies in said common plane with the remainder of said sign being located in a second area on the opposite side of said plane as said first area, and
  ii. said front and side sections of said opaque luminaire support prevent specific direct light from said source from escaping said luminaire, said specific light being direct light which would otherwise pass into said first area and beyond said one edge portion of said sign.

4,037,342
LICENSE PLATE HOLDER

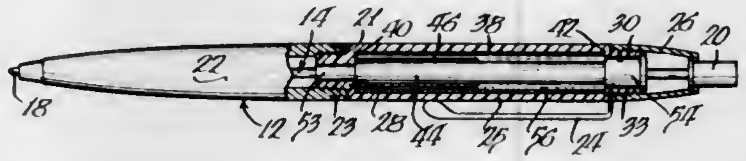
John A. Bott, 931 Lakeshore Drive, Grosse Pointe Shores, Mich. 48236
Filed Feb. 2, 1976, Ser. No. 654,464
Int. Cl.² G09F *7/00*
U.S. Cl. 40—209 **1 Claim**



1. A license plate frame assembly comprising,
a one-piece frame member fabricated of a molded polymeric material,
said frame member being of a generally rectangular configuration and having a frontal wall arranged parallel to the license plate to be assembled thereto,
said frame member also including inner and outer rearwardly projecting enclosure walls integrally connected to said frontal wall and defining therewith spaced apart rearwardly facing retaining clip receiving areas,
said areas comprising a pair of spaced parallel slots arranged at generally 90° to the plane of the license plate and located on opposite parallel edges of said frame member,
a pair of retaining clips associated one with each of said areas and each including a resilient arm section adapted for engagement with a rearward side of the license plate and a retaining leg section arranged at generally right angles to the associated resilient arm section and adapted to be nestingly received in one of the receiving areas,
said retaining leg sections each having an aperture therein,
means formed integrally of said retaining clips comprising folded corners of said resilient arm sections of said retaining clips which provide sharp projections extending from the plane of the associated clips and adpated to engage the license plate for resisting relative movement between the license plate and said frame assembly,
an inwardly extending blind bore formed in said frame member at each of said receiving areas and adpated to have the aperture of the associated retaining clip aligned therewith upon insertion of the retaining leg into said receiving area, and
a pair of threaded fastening elements cooperable with said bores and apertures for removably securing said retaining leg sections of said clips in said receiving areas.

4,037,343
NOVELTY WRITING INSTRUMENT HAVING AN APPEARING AND DISAPPEARING PERSONAL NAME

Victor Lonsmin, 1406 Ogden, LaGrange, Ill. 60525
Filed Feb. 19, 1976, Ser. No. 659,262
Int. Cl.² G09F *19/00*
U.S. Cl. 40—334 **19 Claims**

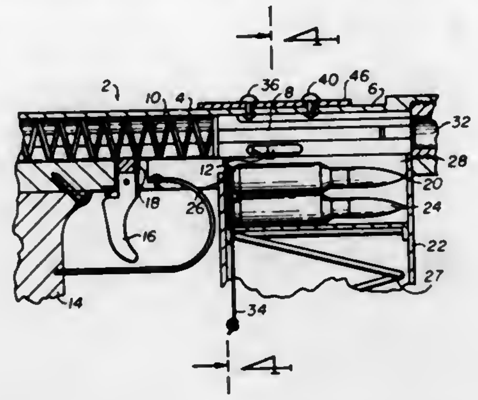


1. In a writing instrument having a writing mechanism and a body containing the writing mechanism, the improvement comprising means for causing an individual person's name to appear and disappear from the body of the writing instrument, and including film carrying name indicia juxtaposed said body and slide means movable within said body, at least a portion of said body being transparent, said portion of said film providing said name indicia being transparent, the other portion of said film being-opaque, said body having an interior the same color as said other portion of said film, said interior being viewable through said transparent portion of said film, said slide means being of a different color than said other portion of said film, said slide means being movable between said film and said interior between one position with said name indicia apparent on said body and a second position with said name indicia not apparent on said body.

4,037,344
MAGNETIC CARTRIDGE CHAMBERING AND BOLT HOLDING SYSTEM

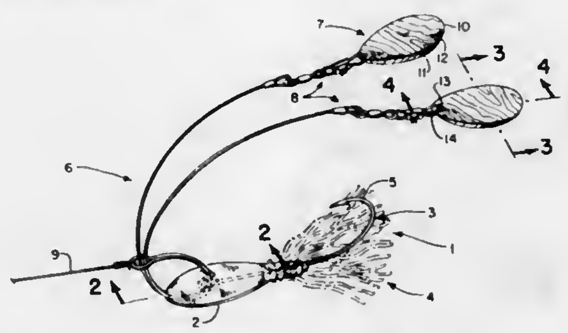
Frederick P. Reed, Davenport, Iowa, assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed Mar. 22, 1976, Ser. No. 669,061
Int. Cl.² F41C *13/00*
U.S. Cl. 42—16 **11 Claims**

1. In a firearm assembly having a receiver housing, a reciprocable bolt, a firing chamber in said receiver housing, and an ammunition cartridge feed inlet communicating with said receiver housing for positioning of each cartridge in a guide station in the receiver housing for subsequent linear movement of the cartridge by the bolt into the firing chamber, the improvement comprising:
magnetic means carried by said receiver for magnetically guiding movement of each cartridge through said inlet to said guide station and for holding each of said cartridges in said station for subsequent movement thereof by the bolt into the firing chamber.



4,037,345
FISHING LURE BLADE

Eugene Dubois, 1057 Sunshine, Baker, La. 70714
Continuation-in-part of Ser. No. 567,526, April 14, 1975. This application Feb. 9, 1976, Ser. No. 656,154
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.13 **1 Claim**

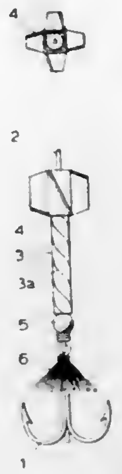


1. In a fishing lure used in water having a body means, a hook assembly attached to one end of said body means, a guard assembly attached to said body means' other end, the improvement to which comprises a blade attached to said guard assembly, said blade being constructed from material having a density sufficiently small to cause said blade's density to be less than said water's density, said blade being attached to said guard assembly by a swivel assembly, said blade comprises a body section having an oblong shape formed by a concave surface adjacent to a flat surface, said body section having one end narrower than the other, said swivel assembly connecting to said narrow end.

4,037,346
TUBE FLY, AND METHOD FOR ITS PRODUCTION

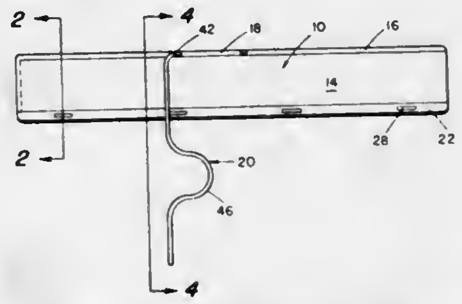
Johan Wilhelm Isaachsen Holst, Lybekkveien 39 A, Oslo 3, Norway
Filed Feb. 20, 1976, Ser. No. 659,851
Claims priority, application Norway, Feb. 20, 1975, 750583
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.14 **28 Claims**

1. A tube fly for use in fly fishing with a fly rod and a fly line having a hook and a bead bearing at the end thereof, said tube fly comprising:
a tube shaped body having an inner diameter dimensioned to form means for receiving therethrough a fly line such that said tube body freely rotates directly about such fly line in front of a hook and a bead bearing;
at least one set of thin-walled fins bonded to said tube body, the fins of said at least one fin set being inclined at an angle to the axis of said tube body, said at least one fin set comprising means to cause spinning of said tube body about the fly line without substantial twisting of the fly line when the assembled fly is pulled through the water; and
the weight of said tube fly not exceeding 1.5 g.



4,037,347
FISHING BAIT HOLDER

Kenneth L. Deal, R.R. No. 1, Palo, Iowa 52324
Filed Mar. 12, 1976, Ser. No. 666,435
Int. Cl.² A01K *97/00*
U.S. Cl. 43—4 **2 Claims**



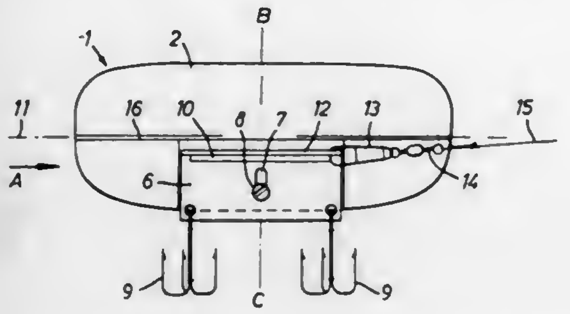
1. A fishing bait holder comprising a pair of confronting generally parallel grippers each having a longitudinally extending top edge and a longitudinally extending lower edge generally parallel to said top edge, the top edge and lower edge of each of said grippers being joined by an outwardly curved central portion, a plurality of links formed at spaced intervals along the lower edge portions of said grippers and a single hinge pin extending through said links along substantially the entire length of the holder to pivotally join said grippers, a generally upwardly extending lip along the top edge of each of said grippers which lips engage one another when said holder is closed, said central portions of said grippers forming a narrow longitudinally extending trough for the reception of bait, an end member at one end of each of said grippers which end members partially enclose said trough when said holder is closed with said lips engaged, and a downwardly extending handle connected at its upper end to said grippers near the top edges thereof, said handle being formed of resilient material so as to normally bias the holder to an open position with said lips separated.

4,037,348
FISH LURE

Joachim Kruger, Schillerstrasse 8, D-49 Herford, Germany
Filed Mar. 12, 1976, Ser. No. 666,436
Claims priority, application Germany, Mar. 15, 1975, 2511414
Int. Cl.² A01K *85/00*
U.S. Cl. 43—42.23 **4 Claims**

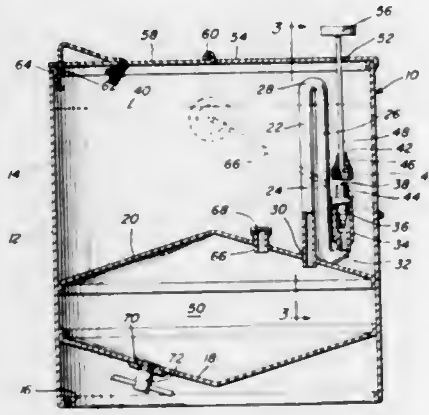
1. An imitation fish lure for use with a rod and line for catching predatory fish comprising a wing shaped swimming body curved symmetrically about a transverse median line to present an outwardly curved face to one side of said swimming body and for imitating a fish swimming transversely to said line

when pulled thereby, a bar parallel to a longitudinal axis of said swimming body, arranged, on said outwardly curved face of said swimming body and arranged below said longitudinal axis of said swimming body when said swimming body is pulled by said line, fastening means for slidable attachment of said line to said bar, adjusting means for adjusting said bar at right angles to said longitudinal axis of said swimming body and a stabilizing edge defined by said outwardly curved face of said swimming body covering said bar and extending to opposite extremities of said swimming body.



4,037,349
MINNOW BUCKET WITH WATER AERATING MEANS

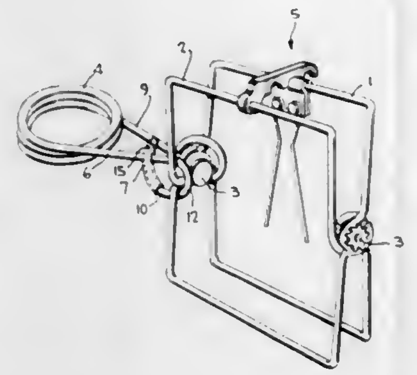
James A. Key, 812 Hanover, Weatherford, Tex. 76086
Continuation-in-part of Ser. No. 547,748, Feb. 6, 1975, Pat. No. 3,972,145. This application June 4, 1976, Ser. No. 693,118
The portion of the term of this patent subsequent to Aug. 3, 1993, has been disclaimed.
Int. Cl.^{2} A01K *97/04*
U.S. Cl. 43—57 **6 Claims**



1. A minnow bucket with water aerating means, said bucket including peripherally continuous upstanding side wall portions, rigid upper and lower vertically spaced closure walls extending and sealingly secured across the lower end portions of said side wall portions and defining an upwardly opening water receptacle above said upper closure wall and a closed airtight chamber between said closure walls, air passage means opening through said upper closure wall, including an inlet end open to said chamber and an upwardly opening outlet end above said upper closure wall, a tubular valve body supported within said outlet end, a valve element shiftably supported centrally within said valve body for movement between lower and upper open and closed limit positions, respectively, a support member threadedly engaged with the upper end of said body and including an abutment portion engageable with said valve element upon downward threading of said support member on said body to variably downwardly displace said element away from its closed limit position toward its open limit position for variably controlling the venting of air from said airtight chamber through said tubular valve body into said receptacle and aerating the water therein, means operative to introduce air under pressure into said chamber, a stationary partial top wall secured over one side portion of the upper end of said bucket in vertical registry with said valve body, said support member being carried by the lower end of a substantially vertical operating rod whose upper end is rotatably received through said partial top wall, and a further top wall portion hingedly supported from said partial top wall swingable into and out of position, in coaction with said partial top wall, to substantially fully close the upper end of said bucket, said upper and lower closure walls being of upright and inverted conical shape, respectively, said support member comprising a downwardly opening internally threaded cap closed at its upper end, the lower end of said operating rod being secured downwardly through the closed upper end of said cap and including a lower terminal end projecting down into the interior of said cap and comprising said abutment portion, said cap including a lateral vent opening formed in one side thereof above said tubular valve body and below the closed upper end of said cap.

4,037,350
SAFETY RELEASE FOR ANIMAL TRAP

Anthony J. Souza, Lititz, Pa., assignor to Woodstream Corporation, Lititz, Pa.
Filed Mar. 12, 1976, Ser. No. 666,505
Int. Cl.^{2} A01M *23/26*
U.S. Cl. 43—90 **5 Claims**

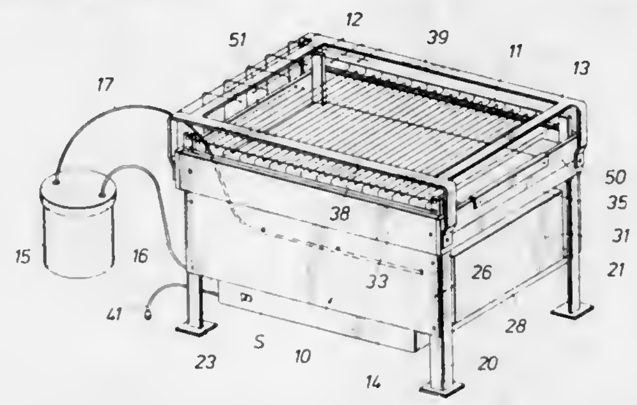


1. A trap comprising two similar frame-shaped jaws, each of said jaws having opposite frame ends, pivot means pivotally connecting said frame ends of one of said jaws to the respective frame ends of the other of said jaws intermediate said frame sides for pivoting said frame-shaped jaws about a common pivot axis between a sprung position in which the opposite frame sides of one jaw are in adjacent relation with the respective frame sides of said other jaw, and a set position in which the respective frame sides of the two jaws are in opposite adjacent relation, spring means comprising a coil spring member with two projecting arms each of which terminates in a ring member which slidably engages around a respective pair of pitvotally connected frame ends for biasing said frame-shaped jaws around said pivot means from said set position to said sprung condition; one of said ring members which terminates a projecting arm of the spring being a closed ring and the other of said ring members being an open ring with its opening being sufficient to permit passage of said frame side there through, the open end of said ring member engaging one end of an elongated tubular sleeve, the other end of which is slotted on opposing sides in a direction longitudinal to the axis of the tubular member to engage transversely the arm of the spring on which said open ring is disposed and locking means at the slotted end of said tubular sleeve to maintain said arm and sleeve in engagement, and a trigger means extending between said frame-shaped jaws for releasing said frames from the set to the sprung position when releasing pressure is applied to said trigger means.

4. Easily releasible safety keeper means for a trap of the rotating frame type having spring means comprising projecting arms, each arm having a terminal ring slidingly engaging the frames of the trap, one of said rings being partially open; said keeper means comprising an elongated tubular sleeve having a curvature approximately equal to that of said ring, one end of said sleeve being slotted on opposing sides in a direction longitudinal to the axis of the sleeve, the other end of said sleeve being engaged by the open end of said partially open ring, said slotted end of said sleeve engaging transversely the arm of said spring, and means to releaseably lock said keeper means to said arm.

4,037,351
APPARATUS FOR ATTRACTING AND ELECTROCUTING FLIES

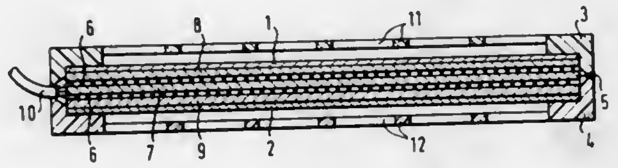
Charles H. Springer, Rte. 1, Box 327, Alta Loma, Tex. 77510
Filed Dec. 15, 1975, Ser. No. 640,476
Int. Cl.^{2} A01M *1/22*
U.S. Cl. 43—112 **11 Claims**



1. Apparatus adapted for use in attracting and electrocuting insects such as flies or the like, comprising: an open-topped but otherwise enclosed hollow structure; grid means mounted horizontally on said structure and having a plurality of pairs of closely spaced conductors; means for electrically charging said pairs of conductors to a potential difference sufficient to subject an insect passing therethrough to a destructive electrical current; and means for producing and then, by positive pumping pressure, releasing in a region below said grid means a dry odor that is effective to attract an insect to pass through said grid means.

4,037,352
ELECTRICAL DEVICE WHICH EMITS INSECTICIDAL VAPORS

Claude Hennart, Le Clos Baron a Seraincourt, and Rene Blanc, Poitiers, both of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Continuation of Ser. No. 634,580, Nov. 24, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 726,027
Claims priority, application Luxembourg, Sept. 5, 1975, 73337
Int. Cl.^{2} A01M *19/00*
U.S. Cl. 43—129 **17 Claims**



1. A device destined for the emission of vapours of an active substance, in particular an insecticidal substance, which comprises, in a rigid assembly,

a. a reservoir containing the active substance and having an evaporation surface for the emission of the active vapours, said reservoir comprising

i. a system of two plates of a porous fibrous material, one of the large faces of one of the plates facing one of the large faces of the other, and a frame for the plates, which separates the space between the two plates from the exterior whilst leaving entirely or partially free at least one of the two large external faces of the two plates, which can thus serve as an evaporation surface, and

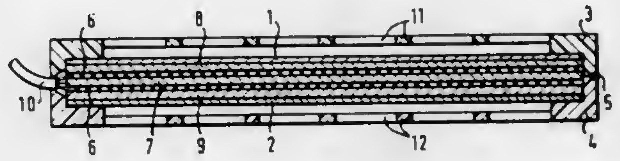
ii. an insecticidal pyrethrinoid substance having a vapour pressure, at 25° C, of between 1×10^{-6} and 2×10^{-4} mbar, said two plates being impregnated, with said substance or substances, the total evaporation surface of the two plates being at least 10 cm^2, the amount of active substance in said reservoir being sufficient to give effective evaporation, at 90° C for a period of at least 10 hours, and the thickness of the plates being sufficient to absorb the said amount of active substance,

b. an electrical resistance associated with the said reservoir in such a way as to heat at least the part of the said reservoir which comprises, or is close to, the said evaporation surface, said resistance being enclosed within the said system and being so constructed as to heat the large internal faces of the two plates to a temperature of up to 90° C, and

c. a system for connecting the resistance to a source of electric current.

4,037,353
DEVICE FOR EMITTING VAPORS OF ACTIVE SUBSTANCE

Claude Hennart, Le Clos Baron a Seraincourt; Marcel Dulat, and René Blanc, both of Poitiers, all of France, assignors to Airwick Industries, Inc., Carlstadt, N.J.
Continuation of Ser. No. 634,379, Nov. 24, 1975, abandoned. This application Sept. 23, 1976, Ser. No. 726,028
Claims priority, application Luxembourg, Nov. 27, 1974, 71378
Int. Cl.^{2} A01M *19/00*
U.S. Cl. 43—129 **17 Claims**



1. A device destined for the emission of active vapours of an active substance, in particular an insecticidal substance, which comprises, in a rigid assembly,

a. a reservoir containing the active substance and having an evaporation surface for the emission of the active vapours, said reservoir comprising

i. a system of two plates of a porous or fibrous material, one of the large faces of one of the plates facing one of the large faces of the other, and a frame for the plates, which separates the space between the two plates from the exterior whilst leaving entirely or partially free at least one of the two large external faces of the two plates, which can thus serve as an evaporation surface, and

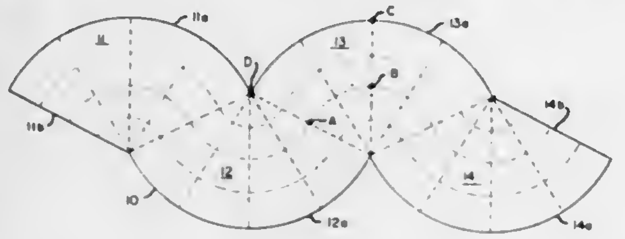
ii. an insecticidal organo-phosphorus substance having a vapour pressure, at 25° C, of between 5×10^{-5} and 5×10^{-3} mbar, with or without addition of a pyrethrinoid insecticidal compound having a vapour pressure, at 25° C, of between 1×10^{-6} and 2×10^{-4} mbar, said two plates being impregnated, with said substance or substances, the total evaporation surface of the two plates being at least 20 cm^2, the amount of active substance in said reservoir being sufficient to give effective evaporation, at 85° C for a period of at least 10 hours, and the thickness of the plates being sufficient to absorb the said amount of active substance,

b. an electrical resistance associated with the said reservoir in such a way as to heat at least the part of the said reservoir which comprises, or is close to, the said evaporation surface, said resistance being enclosed within the said system and being so constructed as to heat the large internal faces of the two plates to a temperature of up to 85° C, and

c. a system for connecting the resistance to a source of electric current.

4,037,354
EDUCATIONAL AND TOPOLOGICAL TOYS, PACKAGING, KEY, JEWEL, FLOATING GEAR, ARCHITECTURE AND GEODESICS, SPACE MECHANICS AND VISUAL EYE THERAPY DEVICES

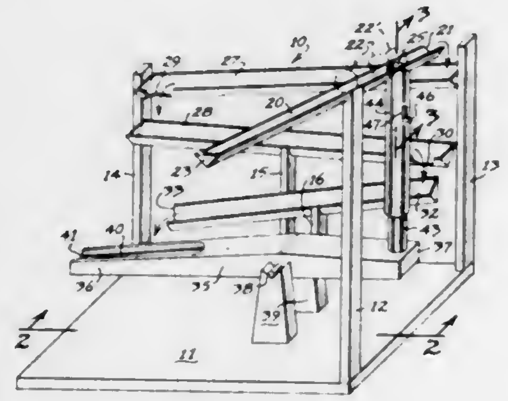
ChaBakKuk, New Brighton, Beaver County, Pa. 15066
Filed Feb. 24, 1975, Ser. No. 552,643
Int. Cl.^{2} A63H *33/06*
U.S. Cl. 46—1 L **6 Claims**



1. A toy, packaging, key, jewel, floating gear and architectural geodesic device having a constant center of gravity and at least one continuous substantially curvilinear surface comprising a three dimensional package whose outer surfaces are defined by wrapping a flat sheet cut selectively from an even number of connected arcuate segments of one kind formed into conical segments, mixed arcuate segments of two kinds formed into conical segments, arcuate segments of one kind formed into conical segments mixed with an even number of rectangular segments formed into cylindrical segments into a closed package with all edges in contact with another edge of the sheet.

4,037,355
MARBLE TRACK TOY

Bonnie A. Street, Rte. 2, Box 8, McEwen, Tenn. 37101
Filed Aug. 19, 1976, Ser. No. 715,872
Int. Cl.^{2} A63H *33/00*
U.S. Cl. 46—43 **7 Claims**



1. A marble track toy comprising:

a. a base,

b. a declining magazine trough mounted on said base for supporting a plurality of rolling objects.

c. a seat opening in said magazine trough for receiving by gravity one of said rolling objects in a stationary position,

d. declining track means on said base below said seat opening having a lower end, and along which said rolling objects are adapted to roll,

e. said track means being adapted to receive a rolling object released from said seat opening,

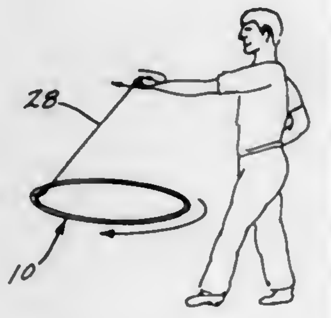
f. a teeter arm having first and second end portions,

g. fulcrum means mounting said teeter arm on said base to pivot about a horizontal transverse axis between said end portions, said first end portion being vertically below the lower end of said track means,

h. plunger means operatively associated with said second end portion and cooperative with said seat opening to release a rolling object from said seat opening to cause said object to roll toward and upon said track means when another rolling object drops from the lower end of said track means upon the first end portion of said teeter arm.

4,037,356
SPINNING HOOP

Gilbert S. Chantland, R.R. No. 1, Tama, Iowa 52339
Filed Sept. 15, 1975, Ser. No. 613,468
Int. Cl.^{2} A63H *1/32*
U.S. Cl. 46—47 **3 Claims**



1. A spinning hoop, comprising,

a circular hoop element,

a swivel means secured to said hoop element at a point along the circumference thereof, and

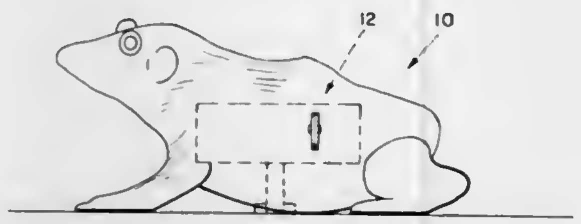
a supporting cord for hand manipulation secured to said swivel means so that said hoop may be spun and moved relative to said cord without imparting substantial twisting of said cord,

said hoop being a hollow tube,

and an elongated metal ballast element extending through a substantial portion of the length of the interior of said hollow tube.

4,037,357
JUMPING TOY

Henry T. Monroe, and William H. Peebles, Jr., both of 35 N. 63rd St., Philadelphia, Pa. 19139
Filed Apr. 9, 1976, Ser. No. 675,349
Int. Cl.^{2} A63H *11/06*
U.S. Cl. 46—129 **6 Claims**



1. A jumping toy comprising, in combination:

a base member having side walls and a bottom wall and a simulated animal or insect mounted thereon;

a first shaft mounted rotatably in said base member;

a coil spring mounted upon said first shaft and adapted to be wound thereon;

a gear train operatively connected to said coil spring and including a sector gear;

said bottom wall of said base member having an aperture therein;

a thrust spring-biased thrust rod mounted for vertical oscillation within said base member in vertical alignment with said aperture;

a movable shaft mounted within said base member for oscillation together with said thrust rod; first gear means carried by said movable shaft engageable with and drivable by said sector gear;

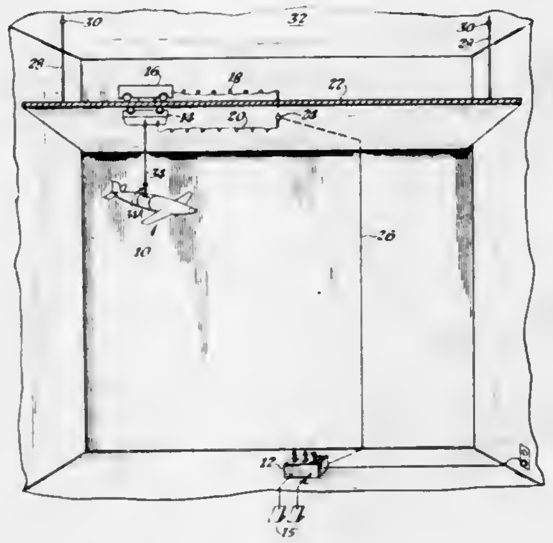
a gear rack mounted fixedly within said base member;

and second gear means carried by said movable shaft maintained in meshing engagement with said gear rack;

whereby upon winding of said coil spring and activation of same said sector gear drives said gear means and effects rotation of the movable shaft and the climbing of said gear rack by said second gear means against the spring bias, the cyclical engagement and disengagement of said sector gear and first gear means of said movable shaft causing cyclical oscillation of said thrust rod and the periodic development of a force against a supporting surface for said toy sufficient to propel the toy away from said supporting surface.

4,037,358
MODEL AIRPLANE DRIVE AND CONTROL SYSTEM

Phillip Rosenbaum, 113 Nurmi, Fort Lauderdale, Fla. 33301
Filed Oct. 31, 1975, Ser. No. 627,522
Int. Cl.^{2} A63H *30/02*
U.S. Cl. 46—253 **6 Claims**



1. A model aircraft control and propulsion system comprising:

a model aircraft;

means for providing a pathway for moving a vehicle, said means being attachable to a room ceiling;

a vehicle moveably coupled to said ceiling vehicle support means;

tethering means connected to said moveable vehicle and said aircraft;

means for controlling the movement of said vehicle;

power supply connected to said means for controlling movement of said vehicle;

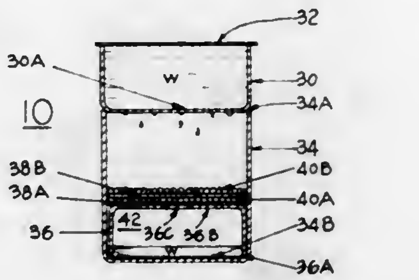
motor means for propelling said vehicle connected to said vehicle and said power means;

means connected to said moveable vehicle for positionably moving said tether vertically to a particular vertical position relative to said ceiling; and

means in said aircraft for changing the flight attitude of said aircraft relative to said tethering means.

4,037,359
BEAN SPROUT METHOD AND APPARATUS FOR GROWING SAME

Ting-fu Peng, and Eng-Chin Peng, both of Baltimore, Md., assignors to Terrell C. Birch, Falls Church, Va.
Continuation-in-part of Ser. No. 478,578, June 12, 1974. This application Aug. 20, 1975, Ser. No. 605,997
Int. Cl.^{2} A01C *1/00*
U.S. Cl. 47—14 **2 Claims**



1. Self watering kit means for growing edible sprouts from seeds comprising:

a growth chamber comprising a container constructed of water impervious material and open only at its top end, said container being devoid of any drain means below its top end;

an open top, inverted vessel of material porous to the passage of liquid only by capillary action mounted on the bottom of said growth chamber and having both a side wall and a bottom portion of said material, said bottom portion extending across substantially the entire transverse cross-section of said growth chamber and spaced from the bottom of the latter to thereby provide an elevated support surface;

a primary water reservoir comprising an open top container of material porous to the passage of liquid only by capillary action and acting in conjunction with the force of gravity and the head of water contained therein to supply water to said growth chamber, said primary water reservoir substantially closing and engaged with the top of said growth chamber, but permitting the flow of air therebetween into and out of said growth chamber;

a perforate lid covering the top of said primary reservoir; and

at least one absorbent membrane overlying and coextensively juxtaposed with said elevated support surface for receiving a layer of seeds for sprouting;

said growth chamber preventing any loss of water from said means for growing edible sprouts at any point except by the flow of air into and out of said growth chamber; and

said sidewall of said inverted vessel conducting water by capillary action from the bottom of said growth chamber up to the bottom portion of said inverted vessel.

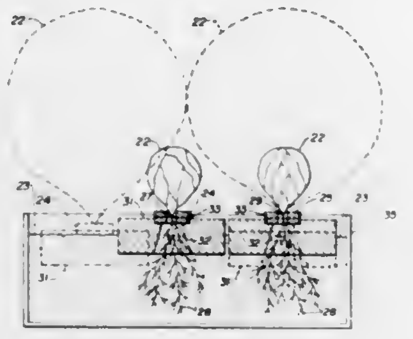
4,037,360
RAFT APPARATUS FOR GROWING PLANTS BY MEANS OF WATER CULTURE

Robert S. Farnsworth, 99 Somerset Road, Piedmont, Calif. 94611
Continuation-in-part of Ser. No. 537,198, Dec. 30, 1974, Pat. No. 3,927,491. This application Dec. 19, 1975, Ser. No. 642,554
Int. Cl.^{2} A01G *31/00*
U.S. Cl. 47—63 **7 Claims**

1. Raft means for the hydroponic growth of at least one plant thereon including a raft body formed to float on a nutrient solution in a stable position, said body being formed with a generally vertically oriented channel extending from a foliage supporting upwardly facing side of said body through said body to a nutrient solution contacting downwardly facing side of said body, said channel having a transverse dimension formed for receipt of the stem of a plant therein with the root system of said plant depending downwardly into said nutrient

solution, and said body having sufficient buoyancy to float said plant on said nutrient solution and said body extending laterally in all directions from said channel a distance sufficient to support the foliage of said plant above said nutrient solution during a substantial portion of the growth cycle of said plant, wherein the improvement in said raft means comprises:

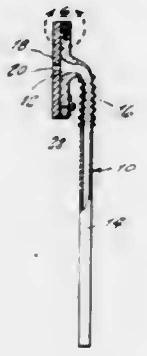
auxiliary buoyancy means engaging said body and formed to



assist in the buoyant support of said body on said nutrient solution by providing auxiliary stability and buoyancy for said body, said auxiliary buoyancy means being formed with a generally vertically oriented auxiliary channel in substantially aligned registration with said channel in said body, and said auxiliary channel being dimensioned for downward depending of the root system of said plant therethrough.

4,037,361
PLANT WATERING STICK

William R. Murphy, and Frances H. Murphy, both of 1210 W. Boynton Road, No. 114, Boynton Beach, Fla. 33435
Filed Sept. 8, 1976, Ser. No. 721,345
Int. Cl.² A01G *29/00*
U.S. Cl. 47—48.5 **8 Claims**



1. A plant watering device comprising:

an elongated tubular body having a funnel-shaped end portion;

a cap pivotably connected to said funnel-shaped end portion; and

bendable hinge means on said tubular body adjacent said funnel-shaped end portion for rotating said funnel-shaped end portion from a substantially horizontal to a substantially vertical plane.

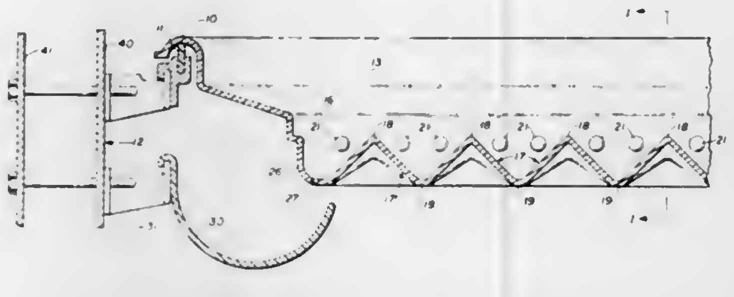
4,037,362
DEVICE FOR SOILLESS GROWTH OF PLANTS

Darrel S. Finck, 4180 E. Avenue, Hayward, Calif. 94544
Filed Aug. 27, 1976, Ser. No. 718,347
Int. Cl.² A01G *31/00, 25/00*
U.S. Cl. 47—59 **4 Claims**

1. A device useful in soilless growth of plant materials comprising a tray element including:

a. sidewalls wherein two opposing sidewalls have rail-engaging members, two opposing sidewalls have holding protrusions, and at least two sidewalls slope with respect to vertical to provide upwardly expanding area of said device,

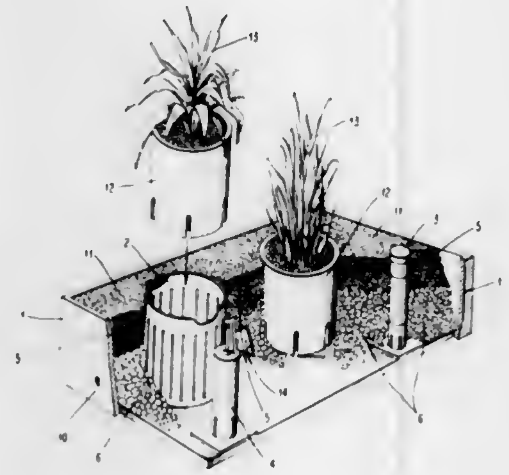
b. a bottom, including plural corrugations having upper crests and lower crests, wherein the plane including the tops of all upper crests is a surface draining toward said sidewalls and wherein said plane intersects said sidewalls immediately below said holding protrusions, and the bottoms of all corrugations are shaped to drain into a common liquid-collecting passageway, and



c. a membrane made of water-impervious, non-porous, stiff but bendable material extending across and in contact with the tops of all of said corrugations, substantially in contact with all of said sidewalls and beneath said holding protrusions whereby said membrane forms an upper surface from which liquid will flow from the center of said surface toward the sidewalls.

4,037,363
METHOD AND APPARATUS FOR INCREASING THE AVAILABLE VOLUME FOR A NUTRITIVE SOLUTION CONTAINED IN A HYDROPONIC RECEPTACLE

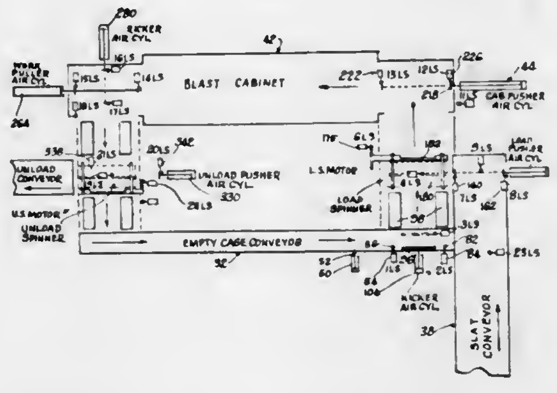
Gerhard Baumann, Bern, Switzerland, assignor to Interhydro A. G., Bern, Switzerland
Filed Mar. 26, 1975, Ser. No. 562,128
Claims priority, application Switzerland, Mar. 29, 1974, 4421/74
Int. Cl.² A01G *31/02*
U.S. Cl. 47—59 **6 Claims**



4. A system for increasing the available volume for a nutritive solution contained in a hydroponic receptacle into which at least one plant and a substratum have been placed, comprising a plurality of hollow shells placed on the bottom of the receptacle to a level just bove the maximum level of the nutritive solution, and a layer of material covering said hollow shells.

4,037,364
METHOD AND MEANS FOR CONTINUOUS SURFACE TREATMENT

Ardee H. Freeman, Granger; Harold F. Schulte, Mishawaka, and Hubert Davidson, South Bend, all of Ind., assignors to Wheelabrator-Frye, Inc., Mishawaka, Ind.
Continuation of Ser. No. 871,145, Oct. 13, 1969, abandoned, whicb is a division of Ser. No. 551,395, May 19, 1966, Pat. No. 3,517,465. This application June 9, 1975, Ser. No. 584,748
Int. Cl.² B24C *3/14, 3/30*
U.S. Cl. 51—41. **13 Claims**



1. A continuous cleaning apparatus comprising an elongated cage, said cage having an open feed end and an open discharge end to permit the axial movement of a part therethrough, feed means for delivering a part to said feed end one at a time, discharge means for receiving a part from said discharge end, cleaning means positioned along said cage and external thereto for cleaning a part carried therein, said cage being of skeletal form with open portions in its periphery to permit cleaning media from said cleaning means to enter and pass through said cage, means for advancing a part past said cleaning means, rotation means connected to continuously rotate said cage to cause a part therein to continuously rotate as it is cleaned and advanced past said cleaning means, and means at said feed end for removing a part from said feed means and disposing it in said cage.

5. In a machine for the surface treatment of articles of large dimension comprising a plurality of open cages having longitudinally spaced apart supporting ring members interconnected by longitudinal members arranged to define an open space in between for receiving the articles, means for loading the cages by displacement of the articles endwise into the cages, means for unloading the cages by displacement of the articles out of the cages, comprising a pair of spaced rollers mounted for rotational movement in one direction, means for displacement of a cage onto the rollers with the ring members riding on the rollers for rotational movement of the supported cage, an abutment means for stopping rotational movement of the cage when the latter becomes properly oriented for insertion of an article into or out of the cage, means for alignment of an article endwise of the cage at the loading station, ram means located adjacent one end of the article and power operated means for actuation of the ram in an endwise stroke between extended and retracted positions of adjustment to engage the article for displacement endwise into the aligned cage at the loading station and from the cage at the unloading station during the stroke of the ram.

4,037,365
APPARATUS FOR CUTTING ARCUATELY-SHAPED WORMS

Carroll Richard Cole, Decatur, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed June 25, 1976, Ser. No. 699,760
Int. Cl.² B24B *5/26*
U.S. Cl. 51—97 R **1 Claim**

1. An apparatus for cutting a worm blank to generate an arcuate worm, said apparatus comprising in combination:

a frame pivotally mounted for swinging movement about a fixed axis;

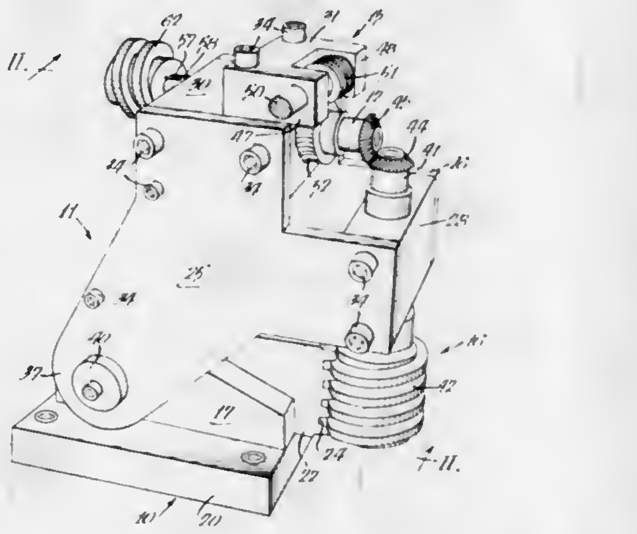
a support shaft journalled in said frame for axial rotation about an axis which is in a plane generally perpendicular to said fixed axis, said support being adapted to carry a worm blank with the worm axis on the support shaft axis;

a fixed gear segment the radius of curvature of which is centered on said fixed axis;

power means for rotating said support shaft including

  a power transmission shaft journalled in said frame and adapted to be connected to a source of power to receive rotational torque therefrom,

an input worm fixed to said power transmission shaft, and



a spur gear fixed to the support shaft and meshing with said input worm, whereby rotation of the power transmission shaft rotates the support shaft;

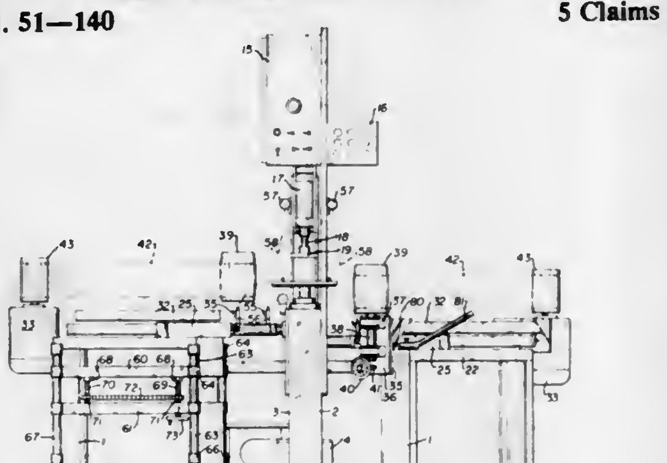
cutting means disposed adjacent to a worm blank on the support shaft for cutting a groove in the surface of said worm blank;

a gear journalled in the frame and engaged with said fixed gear segment; and

means for driving said gear in timed relationship with said shaft so that it traverses said fixed gear segment to swing the frame about said fixed axis whereby said worm blank is arcuately translated relative to said cutting means as said worm blank is rotated on the worm axis so that an arcuate worm is generated from said worm blank.

4,037,366
PROFILE SANDER

Earlyn Elridge Shuffler, Cowansville, Canada, assignor to Vilas Industries Limited, Cowansville, Canada
Filed Jan. 12, 1976, Ser. No. 648,107
Claims priority, application Canada, July 22, 1975, 232005
Int. Cl.² B24B *21/02, 21/14*
U.S. Cl. 51—140 **5 Claims**



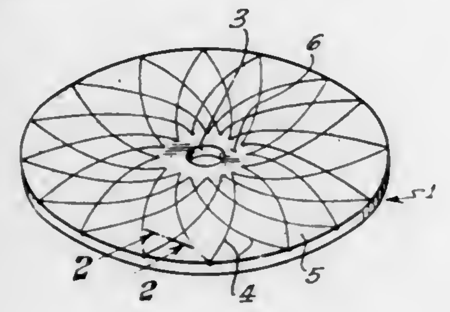
1. A profile sanding machine including a turntable on which a wooden work-piece is mounted; pneumatically operated

means for clamping said work-piece to said turntable; a pair of sanding units, at least one of which is adjustable in relation to said work-piece at least in a vertical plane; each of said sanding units including a roller at one end thereof, an inflatable air bag at the other, and a sanding belt disposed around said roller and bag, the vertical axis of each said air bag capable of movement toward and away from the vertical axis of said roller, and means for moving each said unit into and out of sanding contact with the profile of said work-piece and for maintaining said contact under constant pressure during a predetermined number of rotations of said turntable.

4,037,367
GRINDING TOOL

James A. Kruse, 22937 Ostronic Drive, Woodland Hills, Calif. 91364

Filed Dec. 22, 1975, Ser. No. 643,347
Int. Cl.^{2} B24D *7/02*
U.S. Cl. 51—209 S **15 Claims**



1. A rotary grinding disk adapted for grinding under a flowing liquid film having a flat top supporting surface to which particles of abrasive are rigidly bonded and a network of grooves of constant depth and width traversing said supporting surface to provide a continuum of centrifugal drainage channels in the radial direction and subdividing said supporting surface into working elements of quadrilateral shape at least 0.25 inch in length on each side, said sides being inclined to the radius at an acute angle of 0° to 75° measured in either sense, wherein a family of concentric circles each trace circular arcs partly across said working elements of arc length L_E, and partly across said grooves of arc length L_G and wherein the ratio of arc length L_E/L_G is at least 1.5, said grooves being substantially rectangular in cross-section, having a depth of 0.00004 inch (1 micron) to 0.1 inch (2540 microns), and a width of 0.0002 inch (5 microns) to 0.15 inch (3810 microns).

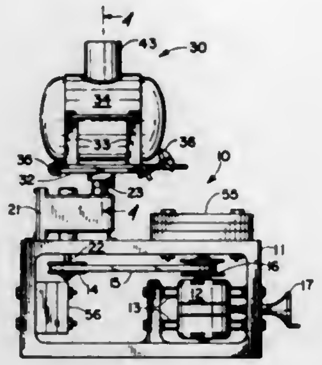
4,037,368
METHOD FOR DEFLASHING SMALL PARTS

William S. Kerwin, Minneapolis; John Rodney Nelson, Edina, and Hans Robert Toll, St. Anthony Village, all of Minn., assignors to Toll Cryogenics, Inc., Minneapolis, Minn.

Division of Ser. No. 367,863, June 7, 1973, Pat. No. 3,909,988. This application Apr. 11, 1975, Ser. No. 567,185
Int. Cl.^{2} B24B *1/00*
U.S. Cl. 51—314 **3 Claims**

1. The method of deflashing molded parts, comprising the steps of:

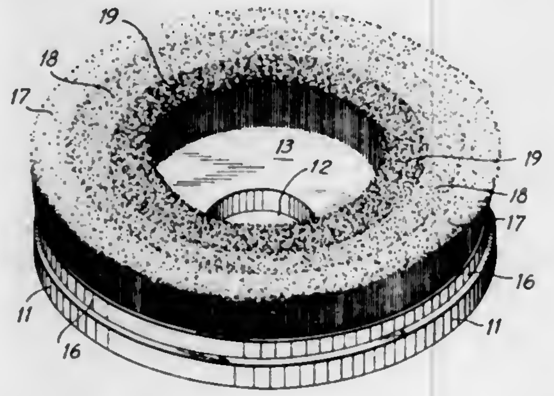
a. placing a plurality of the parts to be deflashed in a generally elongated container having generally rounded ends;
b. supporting the container with its longitudinal axis generally in a horizontal plane; and
c. rotationally oscillating the container about a generally vertical axis.



4,037,369
FLOOR MAINTENANCE BRUSH

Murray Robert Campbell, Unit W1, Windsor Towers, 9 Parker St., South Perth, Australia

Filed Oct. 1, 1975, Ser. No. 618,617
Claims priority, application Australia, Oct. 3, 1974, 9145/74
Int. Cl.^{2} B24D *13/14;* **A46B** *9/06*
U.S. Cl. 51—400 **10 Claims**



9. A brush or pad comprising a substantially circular backing plate and fibres of varying diameter and abrasive characteristics secured to and projecting from one face of said plate, the larger diameter fibres being more abrasive and impregnated with abrasive particles, the larger diameter fibres being positioned in the central region of the brush, said fibres decreasing in diameter and abrasive characteristics radially outwardly on said plate, the least abrasive fibres being unimpregnated and disposed in the outer peripheral area of the brush.

4,037,370
CARTON CLOSING AND SEALING APPARATUS

E. Alan Williams, Saratoga, Calif., assignor to Nolex Corporation, Los Angeles, Calif.

Filed Nov. 3, 1975, Ser. No. 628,443
Int. Cl.^{2} B65B *7/16*
U.S. Cl. 53—375 **37 Claims**

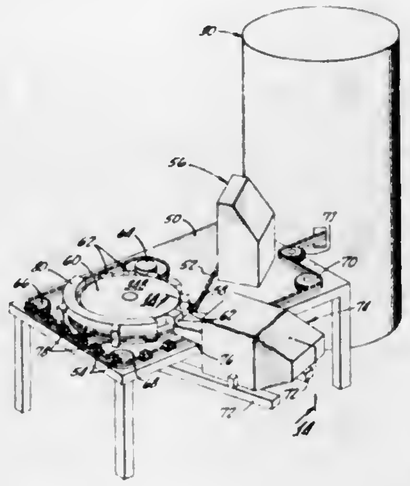
1. Apparatus for effecting liquidtight closure of an open end of a liquid-filled carton having at said open end a single closure panel integral with the body of the carton and adapted to be brought into a closure position relative to the body of the carton and also having at said open end a plurality of narrow sealing tabs integral with the body of the carton and directed inwardly thereof for surface contact with the inside surface of said closure panel, said apparatus comprising:

platform means for supporting said carton in an upright position;

means for preparatorily conditioning the inner surface of the closure panel and the outer surfaces of the sealing tabs for adhesive interengagement;

means engageable with the outer surface of the single carton closure panel for closing it into pressure contact with the narrow sealing tabs to effect liquidtight surface interengagement between the carton closure panel and the narrow sealing tabs; and

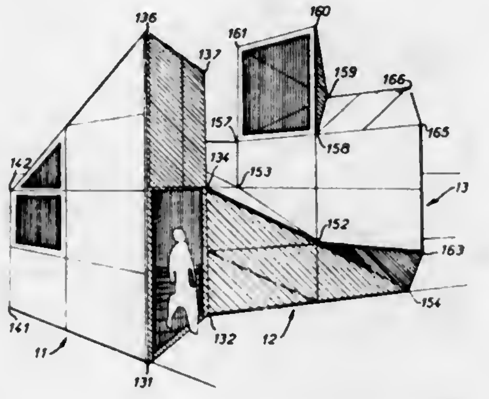
means having smooth flat carton-wall matching surfaces for completely engaging the carton walls and non-deformably clasping the carton in substantially complete contacting and gripping encompassment immediately below the top of the carton to reinforce and impart rigidity to the walls of the liquid-filled carton during the application of said pressure contact by the closure panel closing means and preclude crushing of the carton walls.



4,037,371
CONSTRUCTION OF BUILDINGS BY ASSEMBLING PREFABRICATED ELEMENTS

Yves Jean Olivier de la Lande de Calan, 25 Rue du Faubourg St.-Honore, Paris 8e, France

Filed Aug. 8, 1975, Ser. No. 603,091
Claims priority, application France, Aug. 12, 1974, 74.27862
Int. Cl.^{2} E04H *1/02*
U.S. Cl. 52—79.7 **6 Claims**

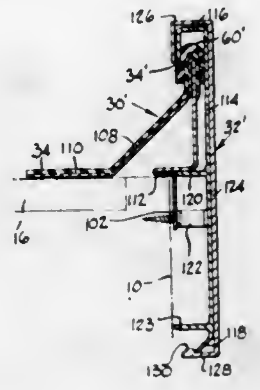


1. A system of building construction with prefabricated elements, comprising a plurality of juxtaposed elemental volumetric units joined to define a hollow functional building of non-rectangular configuration, said units including at least one irregular tetrahedron and at least one irregular pyramid with a rectangular base, said tetrahedron and said pyramid being mutually determined by a plane passing through one side of an equilateral triangular base of a right prism and the apex of the other base opposite said one side, the height of the right prism being U and the length of the sides of the equilateral triangular bases of the right prism being 2U.

4,037,372
ROOF FACIA ARRANGEMENT

Francis Joseph Patry, Lewiston, Maine, assignor to Johns-Manville Corporation, Denver, Colo.

Filed June 9, 1975, Ser. No. 584,809
Int. Cl.^{2} E04D *13/14, 5/14, 3/36*
U.S. Cl. 52—96 **16 Claims**



1. A roof facia arrangement comprising:

a. a longitudinally extending integral facia receiver adapted to fixely rest against adjoining top and side surfaces of a building, said receiver including
   i. a vertical receiver section adapted to rest against the side surface of said building,
   ii. a second receiver section located above and transverse to said first section extening beyond both sides of said first section, a portion of said second section being adapted to rest against the top surface of said building, and
   iii. a vertical third section having an uppermost edge and located above said fist and second sections, said third section being connected with said second section and spaced forwardly of said first section;
b. a longitudinally extending intermediate member substantially shorter longitudinally than said receiver and including
   i. a vertical main section substantially longer vertically than said receiver,
   ii. an inverted U-shaped section located above and extending rearwardly of said main section,
   iii. first interlocking means located below and extending rearwardly of said main section, and
   iv. second interlocking means connected with and extending rearwardly from said main section above said interlocking means and below said inverted U-shaped section;
c. said receiver and intermediate member being connected together such that
   i. said main section of said member is located in front of said receiver,
   ii. said inverted U-shaped section is positioned over the uppermost edge of the third section of said receiver, and
   iii. said section interlocking means engages in force-fitting relationship against a second portion of said second receiver section;
d. a longitudinally extending facia cover plate substantially longer longitudinally than said intermediate member, said cover plate including
   i. a vertical main section,
   ii. an inverted U-shaped section located above and extending rearwardly of said last-mentioned main section, and
   iii. interlocking means located below and extending rearwardly of said last-mentioned main section;
e. said cover plate, receiver and intermediate member being connected to together such that
   i. said main section of said cover plate is located in front of said receiver and intermediate member,
   ii. said inverted U-shaped section of said cover plate is positioned over said inverted U-shaped section of said

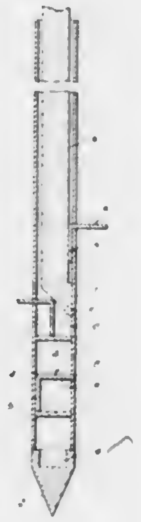
member, and over said uppermost edge of said third receiver section, and
  - iii. said interlocking means of said cover plate is interlocked with said first interlocking means of said intermediate member, and
  - iv. said cover plate is free to move longitudinally relative to said receiver and intermediate member but held substantially fixed relative to said receiver and member in all other directions;

f. a longitudinally extending moisture seal located between the uppermost edge of said third receiver section and said inverted U-shaped section, said seal being of sufficient resiliency so as not to prevent said free longitudinal movement of said cover plate; and

g. a flashing membrane adapted to extend over the top surface of said building and having a longitudinal portion located between the uppermost edge of said third receiver section and said moisture seal.

4,037,373
EARTH ANCHOR

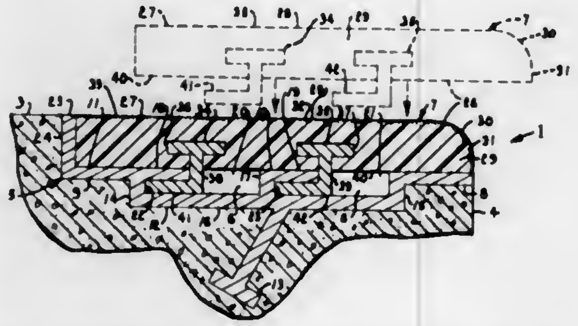
Sigmund Echtler, Sickinger Strasse 1, 8000 Munich 50, Germany
Filed Aug. 2, 1976, Ser. No. 711,077
Claims priority, application Germany, Aug. 6, 1975, 2535162
Int. Cl.^{2} E02D *5/80*
U.S. Cl. 52—127 **10 Claims**



1. An earth anchor comprising an elongated tube of polygonal section having a plurality of elongated longitudinally extending flat sides at least some of which are each formed with a throughgoing slot spaced longitudinally from the other slots and extending substantially perpendicular to the respective side, said tube having a pointed end and an open end; and a plurality of L-shaped anchor elements each having a flat anchor leg slidable substantially perpendicular to said tube in a respective slot and extending substantially perpendicularly to said tube and a flat guide leg extending substantially parallel to said tube substantially perpendicularly from the respective anchor leg toward said pointed end and slidable substantially perpendicularly in said tube on the anchor leg of the adjacent anchor element, each element being slidable in a direction substantially perpendicular to said tube between an inner position with its anchor leg substantially received within said tube and an outer position with its anchor leg projecting substantially perpendicularly from said tube through the respective slot and with its guide leg lying flatly against the inner surface of the respective side below the respective slot.

4,037,374
STAIR NOSING STRUCTURE

Claude P. Balzer; Almer A. Reiff, and Edward M. Corman, all of Wichita, Kans., assignors to Balco Inc., Wichita, Kans.
Filed May 17, 1976, Ser. No. 686,741
Int. Cl.^{2} E04F *11/16;* E04C *5/03*
U.S. Cl. 52—179 **5 Claims**



1. A stair nosing structure for a stair step having a tread surface, said stair nosing structure comprising:

a. an elongated relatively rigid base member for mounting on a stair step, said base member having a forward edge portion and a rear edge portion and upwardly facing portions, said base member having an anchor portion for securing said base member to the stair step, said base member having portions defining a channel extending along the length thereof and presenting opposite substantially parallel faces, said base member channel defining portions including wall members extending from said base member adjacent the rear edge portion thereof;

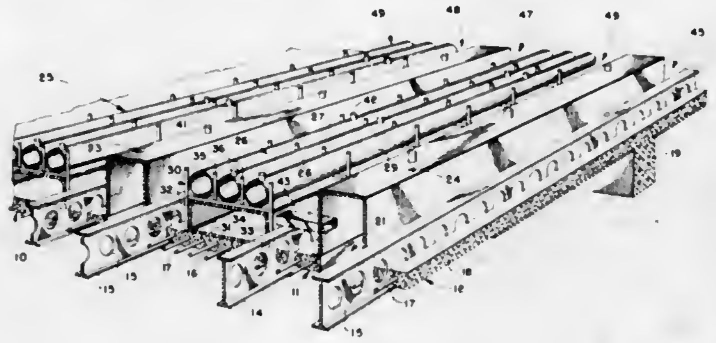
b. an elongated tread member having a forward edge portion and a rear edge portion and overlying said base member, said tread member having portions engaging said upwardly facing portions of said base member;

c. elongated means extending from said tread member and engaging said base member with an interference engagement with spaced portions of said base member including at least one of said opposed faces of said channel defining portions of said base member to secure said tread member to said base member, said elongated means extending from said tread member including:
  1. a first wall member at a rear edge portion of said tread member and having a face engageable with a face of one wall member of said base member channel defining portions; and
  2. a second wall member spaced forwardly from said first wall member and extending from said tread member and engageable with the opposed face of the other of said wall members of said base member channel defining portions, said second wall member of said tread member being resilient to urge said face of the tread member first wall member into clamping engagement with said face of the wall member of said base member channel defining portions.

4,037,375
MULTI-STORY FLOOR-CEILING SYSTEM AND METHOD

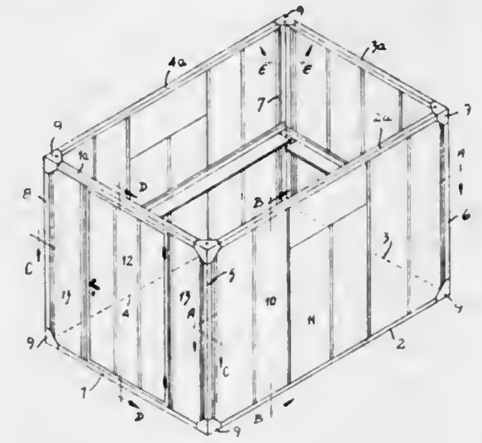
Theodore Maggos, 509 E. 72nd St., New York, N.Y. 10021; David H. Geiger, Kirby Lane, Rye, N.Y. 10580; Sheldon M. Steiner, 184-61 Tudor Road, Jamaica, N.Y. 11432, and Henry D. Gregorio, 12 Deepdale Court, Glencove, N.Y. 11542
Filed Aug. 18, 1975, Ser. No. 605,666
Int. Cl.^{2} E04B *5/48, 5/36, 1/16*
U.S. Cl. 52—220 **16 Claims**

1. A floor-ceiling construction for multi-story buildings, comprising: a bottom membrane having significant tensile strength, said membrane including laterally spaced strip elements, void-producing ductwork supported on said membrane and regularly arranged creating with said membrane a form, said ductwork including ducts open at the bottom ridging the lateral space between said strip elements, a poured-in-place plastic material encasing said form, said poured-in-place plastic material including a regular arrangement of structural elements alternating with said ductwork, and said bottom membrane including upwardly projecting elongated keying elements between said ductwork adapted to integrate said membrane with said poured-in-place material and increase the strength of said structural elements when said poured-in-place material cures.



4,037,376
BUILDING STRUCTURE

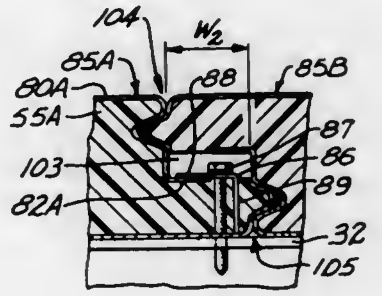
Baruch Baal-Taxa, 3 Mivzah Kadesh St., Tel Baruch, Israel
Filed June 23, 1975, Ser. No. 589,534
Int. Cl.^{2} E04H *7/00;* E04C *2/38*
U.S. Cl. 52—280 **14 Claims**



1. A structural assembly including at least one structural unit, comprising a plurality of panels each having edge portions; means forming a base frame for said unit, including a plurality of lower elements each having channels for receiving lower edge portions of a respective panel; means forming a top frame for said unit, including a plurality of upper elements each having channels for receiving upper edge portions of a respective panel, each channel of an upper element having a closed side, an open side opposite said closed side, and a pair of side walls extending intermediate said closed and open sides, one of said side walls converging towards the other of said side walls in direction towards said open side; means connecting said base frame to said lower frame, including a plurality of upright elements intermediate said lower and upper elements, each upright element having a channel receiving side edge portions of a respective panel; and wedging means securing a respective panel in said channels, including wedging members each having a movable portion in a respective channel of an upper element, each movable portion having a first part in sliding engagement with extending generally parallel to an inner surface of said one side wall, and a second part overlying an inner surface of said other side wall, each wedging member also having a handle portion located exteriorly of said respective channel and operative for moving an movable portion so that said first part slides along said one side wall between an inoperative retracted position and an operative panel-wedging position in which said second part frictionally engages a region of said other side wall and in which said first part frictionally engages said upper edge portions of said respective panel so as to wedge the latter against another region of said other side wall.

4,037,377
FOAMED-IN-PLACE DOUBLE-SKIN BUILDING PANEL

Norbert C. Howell, Connersville; Walter Tischuk, Richmond, and Thomas M. Welsh, Connersville, all of Ind., assignors to H. H. Robertson Company, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 732,689, May 28, 1968, abandoned. This application Nov. 3, 1970, Ser. No. 86,425
Int. Cl.^{2} E04C *1/10, 2/20*
U.S. Cl. 52—309.9 **33 Claims**



1. A building construction panel comprising an outer facing sheet, an inner facing sheet and a foamed-in-place core disposed between the said outer facing sheet and the said inner facing sheet;

each of said facing sheet having a central web and a first side edge and a second side edge,

a first side wall extending along the said first side edge,

a second side wall extending along the said second side edge,

a first flange re-entrant from the said first side wall generally parallel to the said central web, and

a second flange extending outwardly from the said second side wall generally parallel to the said central web;

said outer facing sheet and said inner facing sheet being arranged with said second flange of each facing sheet confronting the opposing central web of the other facing sheet, and with the second flange of each facing sheet laterally sapced-apart from the said first flange of the other facing sheet whereby the said outer facing sheet is entirely spaced-apart from the said inner facing sheet; and

complementary mating elements formed in said outer facing sheet, one disposed lengthwise of one said side wall and one disposed lengthwise of the other said side wall, said complementary mating elements being distinct and spaced from said first flange and said second flange of said outer facing sheet;

the said outer facing sheet including:

a channel-like configuration defined by the said first flange, the first side wall and an adjoining portion of the said central web;

said foamed-in-place core filling the channel-like configuration whereby a positive mechanical connection is provided between the said outer facing sheet and the said foamed-in-place core;

said panel adapted to be engaged side-by-side with others of said panel, with one of said mating elements of each panel engaged with the complementary mating element of an abutting panel whereby the outer facing sheets are mechanically engaged with one another.

4,037,378
WINDOW FRAME

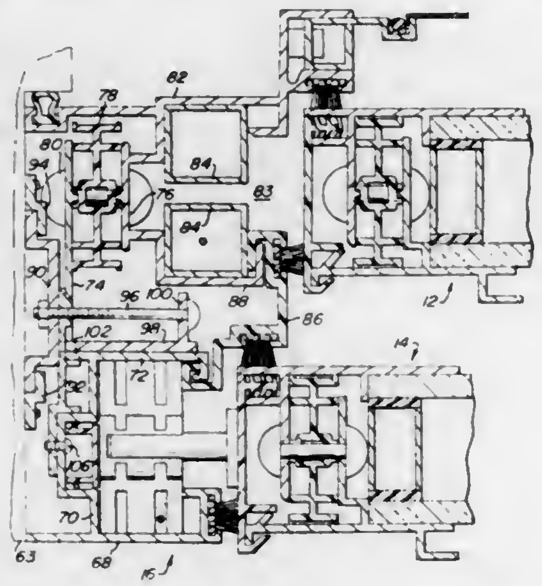
David R. Collins, Washington Crossing, Pa., and Sheldon N. Katz, Cherry Hill, N.J., assignors to Replacement Products Industries Corporation, Cornwells Heights, Pa.

Filed Feb. 24, 1976, Ser. No. 660,760

The portion of the term of this patent subsequent to May 24, 1994, has been disclaimed.

Int. Cl.^{2} E04B *1/62;* E06B *3/54;* E05C *3/02*

U.S. Cl. 52—397 **8 Claims**



1. A window frame adapted to receive at least one sash comprising a rectangular frame having an outdoor face and an indoor face, said frame having side members connected to a top member and a sill member, four corner members of non-metallic material whose width corresponds to the general width of said faces on said frame, each frame member being connected to an adjacent frame member by one of said corner members, each frame member having a metal component on the outdoor face thermally insulated from a metal component on the indoor face by a non-metallic thermal barrier strip, each barrier strip having spaced parallel zones of contact with juxtaposed walls of said metal components associated therewith, and non-metallic fasteners structurally connecting said juxtaposed walls and the thermal barrier strip associated therewith.

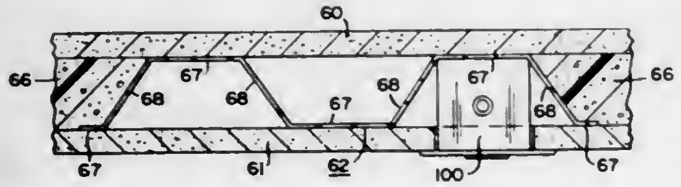
4,037,379
WALL PANEL

Leroy Ozanne, 15800 S. Woodland, Shaker Hts., Ohio 44120

Filed July 8, 1976, Ser. No. 703,640

Int. Cl.^{2} E04B *1/74;* E04C *1/16, 1/10*

U.S. Cl. 52—404 **15 Claims**



1. A generally rectangularly shaped building wall panel including in combination: first and second spaced and parallel side frame members each having first and second end portions, first and second spaced and parallel end frame members each having first and second end portions, said end frame members being identical in construction, each said end frame member comprising a channel shaped metal member having a bottom wall and first and second sidewalls, a generally rectangularly shaped side member positioning tab formed from said bottom wall of said channel shaped metal member at each of said first and second end portions of each of said end frame members, said side member positioning tabs extending normal to said bottom wall and normal to the longitudinal extent of said channel shaped metal member, said first side frame member comprising a channel shaped metal member having a bottom wall and first and second sidewalls, said first end portion of said first side frame member engaging said first end portion of said first end frame member with said bottom wall of said channel shaped metal member of said first side frame member engaging said side member positioning tab thereat and being fixedly secured thereto, said second end portion of said first side frame member engaging said first end portion of said second end frame member with said bottom wall of said channel shaped metal member of said first side frame member engaging said side member positioning tab thereat and being fixedly secured thereto, said second side frame member comprising a generally box shaped metal member having first and second end walls connected by first and second sidewalls, said first end portion of said second side frame member engaging said second end portion of said first end frame member with said first end wall of said box shaped metal member of said second side from member engaging said side member positioning tab thereat and being fixedly secured thereto, said second end portion of said second side frame member engaging said second end portion of said second end frame member with said first end wall of said box shaped metal member of said second side frame member engaging said side member positioning tab thereat and being fixedly secured thereto, a corrugated metal structural member having first and second end portions, said first end portion of said corrugated structural member engaging said first end frame member intermediate said first and second end portions thereof, said second end portion of said corrugated structural member engaging said second end frame member intermediate said first and second end portions thereof, additional tabs located at said intermediate portions of said first and second end frame members, said additional tabs being formed from said bottom wall of said channel shaped metal members and lying in a plane generally parallel to the longitudinal extent of said channel metal members, said additional tabs being fixedly secured to said first and second end portions of said corrugated metal structural member to secure the same to said first and second end frame members, said corrugated metal structural member having a width less than the distance between said first and second side frame members, a portion of said box shaped metal member of said second side frame member including said second end wall and portion of said first and second sidewalls overhanging said second end portions of said first and second end frame members in position to be received in the channel shaped metal member of the first side frame member of another building wall panel.

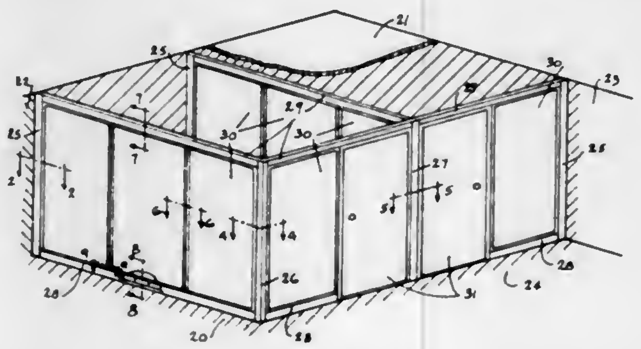
4,037,380
INTERIOR PARTITION STRUCTURE WITH RESILIENTLY-BIASED PANELS

Gordon J. Pollock, 2039 Wooster Rd. No. 45, Rocky River, Ohio 44116

Filed Jan. 29, 1976, Ser. No. 653,550

Int. Cl.^{2} E04B *2/82, 2/76*

U.S. Cl. 52—483 **15 Claims**



1. In a multi-panel partition structure for creating an enclosure in an interior chamber of a building, the combination of a plurality of vertical support posts extending upwardly from the floor of the chamber in predetermined horizontally spaced relationship to define the peripheral outline of the partition structure, a panel-support base extending between each adjacent pair of said support posts and engaging the floor of the chamber, a plurality of vertically extending partition panels resting on said base in yieldably compressed co-planar abuting relationship with each other between said support posts, but free from securement or attachment with each other or with said posts whereby each of said panels is movable into or out of said partition structure independently of any other panel and without dissassembly of any other element of said partition structure, said panels having parallel top and bottom edges, a head-piece extending horizontally between said support posts and secured relatively thereto at a predetermined height, and spring means carried by said head-piece and operatively engaging the top edges of said partition panels to bias said panels into yieldable compression abutment with said base.

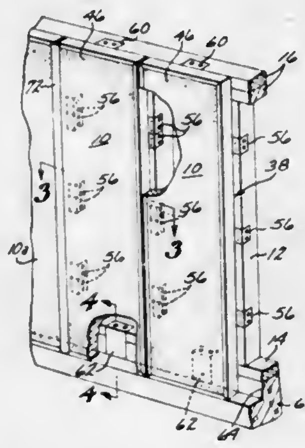
4,037,381
BUILDING PANEL

Fred J. Charles, 9112 Lubec St., Downey, Calif. 90240

Filed Mar. 17, 1976, Ser. No. 667,652

Int. Cl.^{2} E04C *2/28, 2/46*

U.S. Cl. 52—627 **4 Claims**



1. A building panel comprising:

a rectangular metal frame adapted to span adjacent studs of a building wall and including a pair of side members each adapted to overlie a portion of the width of one of the adjacent studs;

building material filling said frame and defining exterior and interior faces; and

a plurality of metal tabs spaced along and fastened to said side members and each including an attachment leg bent inwardly of and at a right angle relative to said interior face, said legs each having an upper edge and a lower edge, the upper edges of said legs on one of said side members being transversely aligned with the lower edges of said legs, respectively, on the other of said side members whereby said building panel is properly aligned with an adjacent, like building panel upon engagement between said upper edges of said building panel and said lower edges of the adjacent building panel, each of said legs being offset laterally, to one side of the associated one of said side members whereby each of said legs is adapted for orientation upon and securement to the side of a building stud.

4,037,382
SCAFFOLDING

Daniel Jacobs, Johannesburg, South Africa, assignor to Form-Scaff (Proprietary) Limited, Johannesburg, South Africa

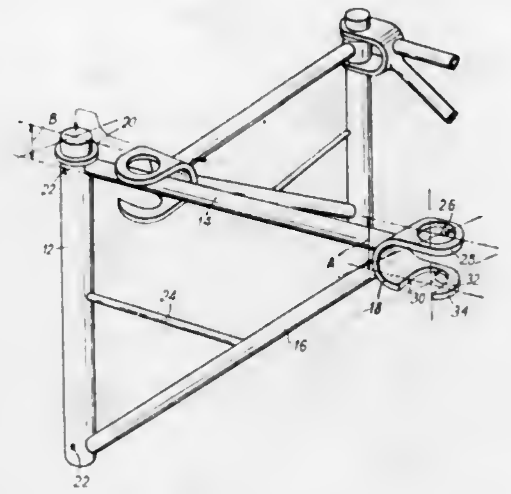
Filed Apr. 22, 1976, Ser. No. 679,248

Claims priority, application South Africa, Apr. 24, 1975, 75/2650

Int. Cl.^{2} E04H *12/10;* E04G *1/06*

U.S. Cl. 52—638 **9 Claims**

1. In a scaffolding element of the kind comprising a right angled triangular frame consisting of a vertical member, a horizontal member extending from near the upper end of the vertical member, an inclined member extending upwardly from near the lower end of the vertical member, an end element at the ends of horizontal and inclined members the improvement that the end element comprises a locating and locking yoke having an upper part and a lower part both fixed as to vertical movement relative to the horizontal member the upper part having an aperture of a diameter slightly greater than the diameter of the vertical member and the space between the upper and lower parts slightly greater than the distance between the end of the vertical member and the underside of the horizontal.



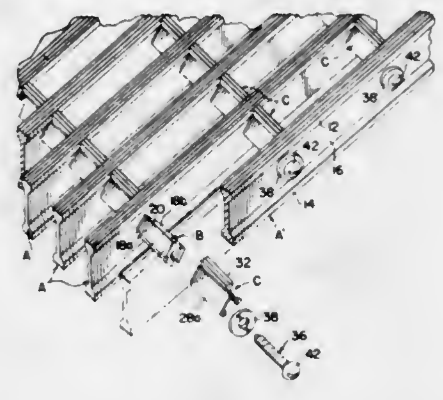
4,037,383
METAL GRATING

William H. Diebold, Hudson, and Adolph D. Russo, Beechwood, both of Ohio, assignors to Russo Architectural Metals, Inc., Twinsburg, Ohio

Filed Sept. 16, 1976, Ser. No. 723,731

Int. Cl.^{2} E04C *2/42*

U.S. Cl. 52—664 **11 Claims**



1. A metal grating comprising:

a plurality of spaced parallel extending bearing bars including a pair of outer bearing bars and a plurality of intermediate bearing bars therebetween, said bearing bars having a plurality of spaced transverse openings along their length with the openings of each bearing bar being aligned with openings of an adjacent bearing bar;

a plurality of transverse cross bars each passing through respective aligned openings in said bearing bars;

a plurality of spacer members each mounted on a cross bar in the space between adjacent pairs of said bearing bars, means holding said spacer members in position on said cross bars, and

fastening means acting in conjunction with said outer bearing bars and the ends of said cross bars placing said cross bars in tension and said bearing bars and said spacer members in compression.

4,037,384

ANCHORAGE ASSEMBLIES

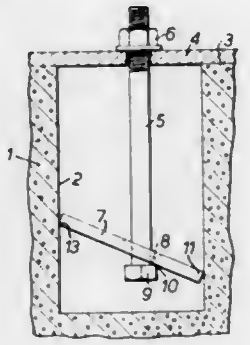
Godfrey Matthew Owen Molyneux, Burway, Rudford, Gloucestershire, England

Continuation of Ser. No. 441,321, Feb. 11, 1974, abandoned. This application Aug. 21, 1975, Ser. No. 606,457

Claims priority, application United Kingdom, Feb. 10, 1973, 6658/73; Feb. 17, 1973, 7925/73

Int. Cl.² E04B *1/41;* E01D *11/00*

U.S. Cl. 52—698 **11 Claims**



1. An assembly comprising a base having a blind hole therein, a structural member having an aperture registering with said hole, a bolt having enlargements adjacent opposite ends thereof, one of said enlargements being a nut screw-threadedly received on the bolt, the bolt extending through said aperture, one of said enlargements being in said blind hole and the other of said enlargements being on the side of said structural member opposite said hole, and a single washer element on the bolt within the hole and jammed without significant penetrations against the sides of the hole when the bolt and the nut are mutually tightened, said washer element having at least two peripheral points with an undistorted span greater than at least one transverse dimension of the hole, the bolt being held captive to the washer solely by said enlargement within the hole, and the washer providing an aperture enabling the bolt to tilt but not to move substantially laterally relative to the washer, thereby ensuring that said enlargement within the hole exerts a force eccentric with respect to said two points and enabling the bolt to be adjusted angularly within the hole to emerge from the hole at a selected position before the nut and bolt are mutually tightened.

4,037,385

PORTABLE ROOM CONSTRUCTION AND METHOD

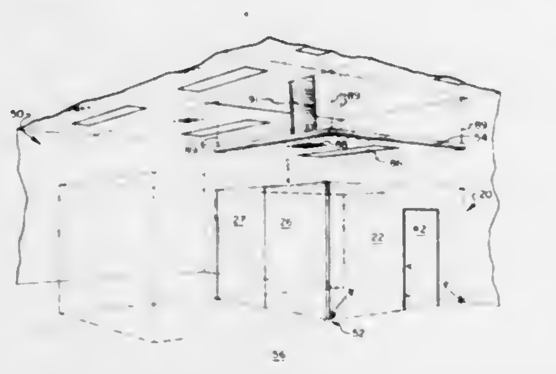
Carl D. Wahlquist, Woodland Hills, Calif., assignor to Building Components Research, Inc., Los Angeles, Calif.

Division of Ser. No. 522,664, Nov. 11, 1974, Pat. No. 3,984,949. This application Mar. 3, 1976, Ser. No. 663,315

The portion of the term of this patent subsequent to Mar. 11, 1992, has been disclaimed.

Int. Cl.² E04B *1/343*

U.S. Cl. 52—745 **6 Claims**



1. A method of assemblying an interior room within a space, the steps of:

providing an assembly of initially folded wall panels in a generally vertical orientation, the assembly together forming four walls of a room;

relocating the assembly by moving the entire assembly to a predetermined location within the space;

unfolding the wall panel assembly to form an enclosure;

lowering a ceiling unit until at least a portion of the weight of the ceiling unit rests upon the unfolded wall panel assembly; and

downwardly displacing the wall panel assembly under the weight of the ceiling unit until a seal is formed simultaneously at the top and bottom of the wall panel assembly.

4,037,386

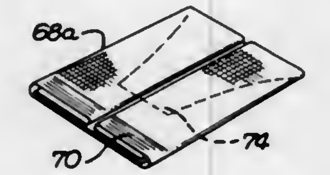
METHOD OF FOLDING AND ROLLING BRIEFS

Carl F. Sjoman, Los Angeles, Calif., assignor to Team Industries, Los Angeles, Calif.

Division of Ser. No. 501,693, Aug. 29, 1974, Pat. No. 3,965,647. This application Mar. 15, 1976, Ser. No. 666,866

Int. Cl.² B65B *63/04*

U.S. Cl. 53—21 FW **2 Claims**



1. A method of folding a man's brief, or the like, having a waistband, comprising the steps of:

a. making a transverse fold in the brief;

b. making spaced, parallel longitudinal folds in the transversely folded brief; and

c. then rolling the transversely and longitudinally folded brief into a substantially cylindrical configuration having an axis substantially parallel to the longitudinal folds and with the waistband at one end.

4,037,387

METHOD OF FILLING AND SEALING BAGS

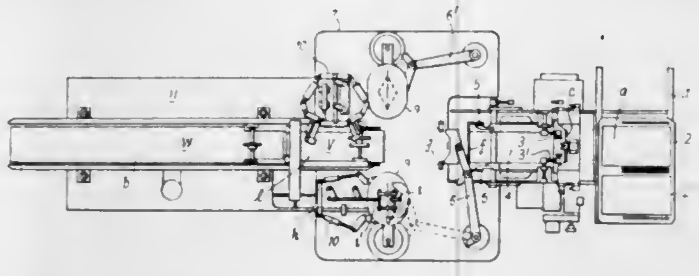
Yoshizumi Orikawa, Hiroshima, Japan, assignor to Showa Seitai Co. Ltd., Japan

Filed Aug. 13, 1975, Ser. No. 604,285

Claims priority, application Japan, Aug. 13, 1974, 49-92928

Int. Cl.² B65B *43/30*

U.S. Cl. 53—29 **3 Claims**



1. In a method of filling and sealing bags, in combination the steps of:

i. providing a supply of unsealed empty bags

ii. sequentially removing the individual bags from said supply and moving them to a bag-positioning station

iii. in alternated transfer steps transferring each bag by respective transfer means from the bag-positioning station to a respective one of two filling stations

iv. in alternated filling steps filling each bag in its respective filling station

v. in alternated steps inserting in each bag at its respective filling station a weighed quantity of material

vi. in alternated steps moving each filled bag by respective conveyance means to a bag-forwarding station

vii. in alternated steps forwarding each filled bag from the bag-forwarding station to a bag-sealing station

viii. in alternated steps sealing each bag in the bag-sealing station.

4,037,388

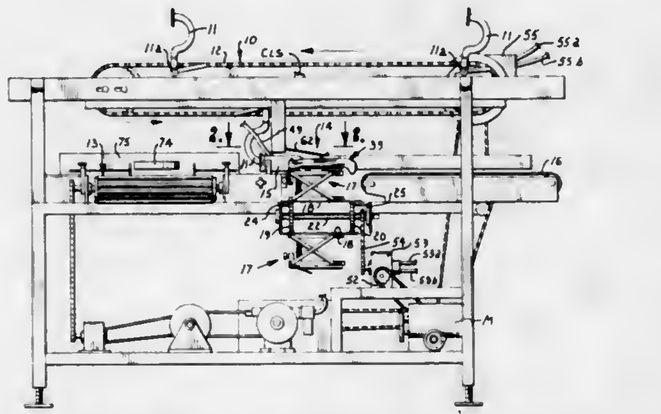
BAG SUPPLY SYSTEM FOR BAGGING MACHINE

Frank J. Bastasch, Palos Verdes Estates, Calif., assignor to United Bakery Equipment Company, Inc., Kansas City, Kans.

Filed June 1, 1976, Ser. No. 691,234

Int. Cl.² B65B *57/04, 43/32*

U.S. Cl. 53—64 **4 Claims**



1. In an article bagging machine having a pusher for moving articles linearly toward and through a bagging station where the articles are individually bagged, the combination therewith of

a bag supply conveyor extending transversely with respect to the bagging station and supporting a plurality of bag tables for movement of the tables transversely into and out of the bagging station, each bag table adapted to carry a stack of bags,

power means operable to drive said conveyor at intermittent intervals thus to move the bag tables successively into and out of the bagging station, and

control means operable to cause engagement of said power means when the last bag has been removed from the table in said bagging station and to disengage said power means when the next bag table has arrived at the bagging station,

said bag tables having top bag support surfaces which are movable vertically relative to the conveyor and are resiliently biased toward an upwardly extended position,

means for depressing said surfaces during movement of said tables from the position next to the bagging station into the bagging station and releasing same at the station so that the table surfaces with the bags thereon may rise, and

stop means engaging the topmost bag to limit the vertical movement to less than the extended position for said surfaces so that said surfaces continue to rise as bags are progressively removed from the stack.

4,037,389

BRAKE SAFETY SYSTEM FOR A POWER DRIVEN ROTARY MOWER

Joseph R. Harkness, Germantown, Wis., assignor to Briggs & Stratton Corporation, Wauwatosa, Wis.

Continuation-in-part of Ser. No. 485,946, July 5, 1974, abandoned. This application Mar. 17, 1976, Ser. No. 667,696

Int. Cl.² A01D *69/10*

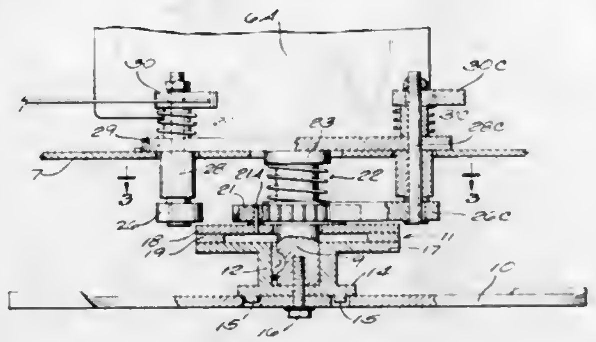
U.S. Cl. 56—11.3 **15 Claims**

5. In combination with a rotary mower having a wheel supported deck, an engine mounted on the deck with its drive shaft projecting through the deck into the space therebeneath, a cutting blade carried by the drive shaft, and means securing the cutting blade against rotation relative to the drive shaft, a selectively engageable brake mechanism operative to stop rotation of said engine drive shaft and the cutting blade and comprising:

A. a first member encircling and fixed to said shaft to rotate therewith;

B. a second member freely rotatably encircling said shaft and adjacent to said first member;

C. expansible means urging said second member axially into frictional driving engagement with said first member; and



D. manually movable stop means engageable with said second member to abruptly and positively stop rotation thereof and thus effect frictional stopping of said drive shaft and cutting blade.

4,037,390

DEVICE FOR SIDE DELIVERY OF CROP, GRASS OR GRAIN

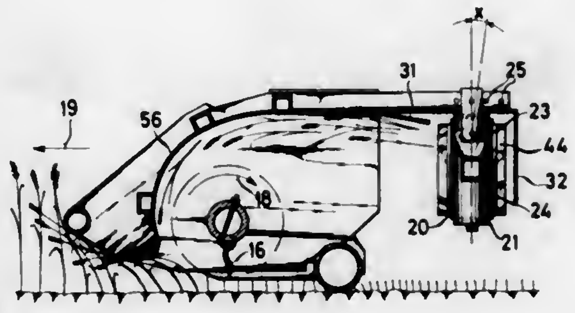
Alexander Jan Vogelenzang, Wageningsestraat 28, Andelst, Netherlands

Filed Mar. 10, 1976, Ser. No. 665,615

Claims priority, application Netherlands, Mar. 19, 1975, 7503295

Int. Cl.² A01D *57/20*

U.S. Cl. 56—14.5 **15 Claims**



1. A device for cutting and effecting side delivery of a crop, such as grass or grain, comprising:

a frame;

a cutting means on said frame for cutting said crop and for tossing the cut crop rearwardly of said means with a sufficient throw component whereby said cut crop moves in a path through the air for a predetermined distance;

a pair of end pulleys supported on said frame behind said implement and spaced apart a distance at least as great as the full width of said path;

at least one movable conveyor belt supported on said pulleys, said conveyor belt having a portion for receiving and effecting side delivery of said cut crop, said portion spaced rearwardly of said implement by at least said predetermined distance for directly receiving said cut crop and disposed transversely of and being within said path, said portion being disposed in a generally vertical plane;

and drive means on said frame and connected to at least one of said pulleys for driving said conveyor belt in at least one direction and at a speed sufficient to cause said cut crop tossed against said portion to be retained thereagainst until said cut crop is moved to an end of said conveyor belt and to cause said cut crop to be propelled through the air from said end of said conveyor belt.

4,037,391

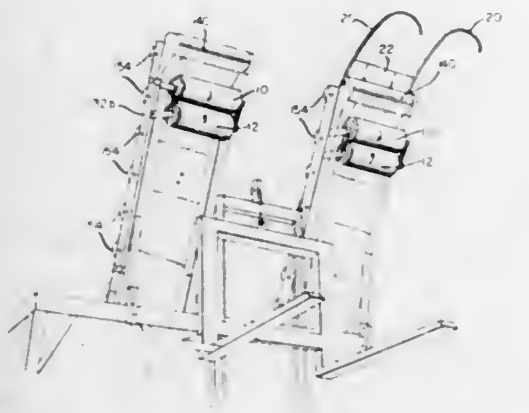
LEAF GUIDE MEANS FOR TOBACCO HARVESTER

John D. Mitchell, and Bertram L. Jordan, both of Lewiston, N.C., assignors to Harrington Manufacturing Company, Lewiston, N.C.

Filed Sept. 20, 1974, Ser. No. 507,901

Int. Cl.² A01D *45/16*

U.S. Cl. 56—27.5 **1 Claim**



1. An improved tobacco leaf conveyor arrangement for a mobile tobacco harvester which comprises in combination:

a. an endless conveyor surface that is disposed on a tobacco harvester, the ascending portion of said endless conveyor extending rearwardly and upwardly to a leaf discharge point, the descending portion of the endless conveyor extending from said discharge point downwardly and forwardly to a point where it can receive leaves for lifting;

b. a first roller means mounted so that its periphery will press against the descending portion of the conveyor at a point near the leaf discharge point of the conveyor,

c. a second roller means mounted adjacent to and above said first roller means and with its periphery pressed against the periphery of said first roller means in a driving relationship, said second roller means being located closer to said leaf discharge point of said conveyor surface than said first roller means, whereby said second roller means will rotate in a direction opposite to the direction of movement of the descending portion of the conveyor surface to thus assist in disengaging leaves from said conveyor surface adjacent said discharge point.

4,037,392

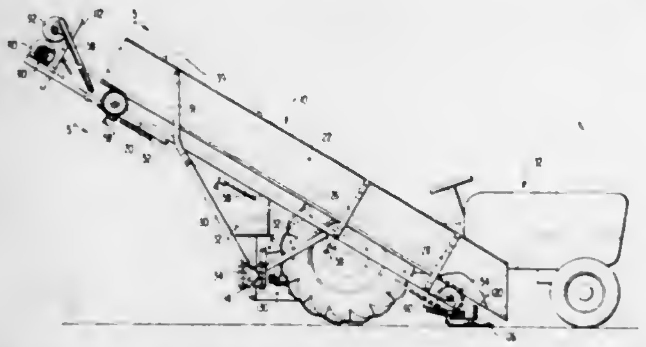
TOBACCO HARVESTER

Miller Taylor; Jimmy N. Taylor; Oren M. Taylor, and George R. Taylor, all of Highway 701 South, Elizabethtown, N.C. 28337

Filed Jan. 27, 1976, Ser. No. 652,676

Int. Cl.² A01D *45/16*

U.S. Cl. 56—27.5 **7 Claims**



1. A tobacco harvester adapted to be mounted on a tractor comprising a frame means, inclined chute means mounted on said frame means with the lower end of said chute means disposed close to the ground, cutting means mounted on said frame means adjacent the lower end of said chute means for serving the stalk of a tobacco plant, conveyor means on said frame means for moving the cut plant up said chute means, stripping means mounted on said frame adjacent the upper end of said chute means for removing the tobacco leaves from the stalk of the cut plant and feed means mounted on said frame for pulling the stalk through said stripping means.

4,037,393

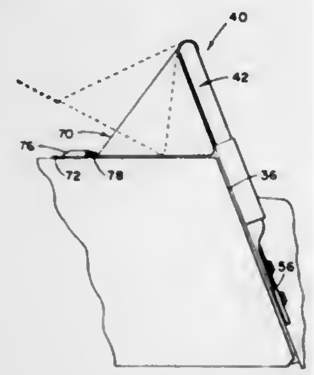
HARVESTER ATTACHMENT

Sidney Elmer Anderson, Geneseo, Ill., assignor to Deere & Company, Moline, Ill.

Filed May 5, 1975, Ser. No. 574,557

Int. Cl.² A01D *45/02*

U.S. Cl. 56—119 **9 Claims**



1. In a multi-row crop harvester having at least one forwardly extending gathering member adapted to move between a pair of adjacent rows of row planted crops as the harvester advances and including a hood-like downwardly and forwardly inclidned shield structure on top of the gathering member with opposite forwardly converging sides, the combination therewith of an improved shield extension mounted on the shield structure and comprising: an inverted generally U-shaped support having opposite generally upright legs and a transversely extending bight portion; a pair of laterally spaced attachment means on the shield structure respectively adapted to removably mount the lower ends of the support legs on the shield structure; a front panel member mounted on and extending downwardly and forwardly from the support and having a lower edge adjacent the top of the shield structure forwardly of the support; and latch means operative between the top of the shield structure and a lower, forward portion of the front panel for releasably locking the pabel to the shield structure.

4,037,394

GRASS EJECTION SYSTEM FOR MOTOR-DRIVEN LAWN MOWERS

Sture Lindhlad, Tranas, Sweden, assignor to Stiga AB, Tranas, Sweden

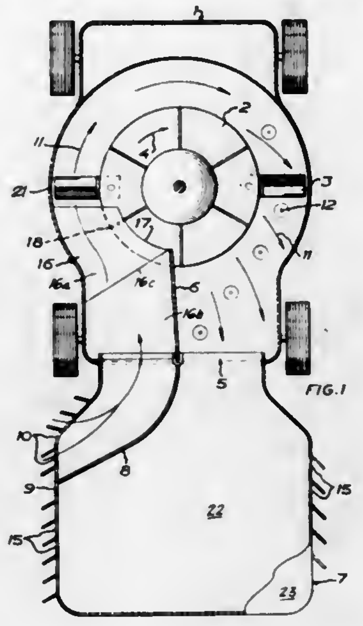
Filed June 25, 1975, Ser. No. 590,166

Claims priority, application Sweden, June 26, 1974, 7408456

Int. Cl.² A01D *35/22, 53/06*

U.S. Cl. 56—202 **6 Claims**

1. A grass transport and ejection system for a motor driven lawn mower including a wheeled casing having a top wall and downwardly depending side walls defining an open-bottomed housing for a rotary cutting means equipped with means for generating an air stream for carrying grass cuttings out of the mower casing, and an opening in one side wall of the mower casing, the improvement comprising a baffle mounted within said housing adjacent said opening and extending inwardly therefrom and dividing the interior portion of the casing adjacent said opening into a suction air channel defined by one side of said baffle, said top wall, and a portion of the side wall of the casing adjacent one side of the opening, and an ejection channel defined by the other side of the baffle, said top wall of the casing and a portion of the side wall of said casing adjacent the other side of the opening.



4,037,395

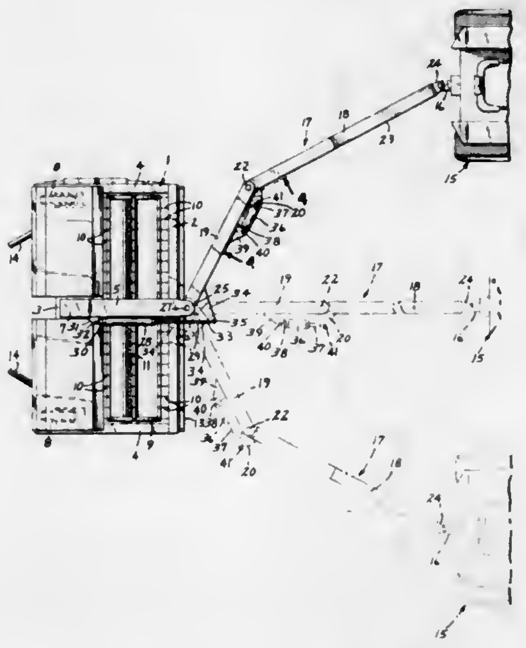
TRACTOR PULLED CROP HARVESTER

Larry L. Henkensiefken, Waseca; Glenn G. Kanengieter, Blooming Prairie; T. Herbert Morrell, and Thomas N. Storm, both of Owatonna, all of Minn., assignors to Owatonna Manufacturing Company, Inc., Owatonna, Minn.

Filed Mar. 24, 1976, Ser. No. 669,865

Int. Cl.² A01D *75/14*

U.S. Cl. 56—218 **5 Claims**



1. A tractor pulled crop harvester comprising:

a. a wheel supported frame having a generally centrally located transverse frame member extending in the direction of travel of the frame;

b. a harvesting mechanism mounted in said frame below said transverse frame member and rearwardly of the forward end of said transverse frame member;

c. a draft tongue which comprises front and rear tongue sections, each having front and rear ends, characterized by means pivotally securing the front end of said rear section to the rear end of said front section on a generally vertical axis, and means for imparting pivotal movement to one of said sections relative to the other thereof and for holding said sections in different positions of swinging movement relative to each other;

d. pivot means connecting said rear end of said rear tongue section of said draft tongue to said frame by pivotal attachment to the forward end of said transverse frame member for swinging movements of said draft tongue relative to said frame on an axis parallel to the axis of swinging movement of said front and rear tongue sections;

e. means on the front end of said front tongue section of said draft tongue for pivotal connection on a generally vertical axis to a tractor hitch; and

f. power operated means on said frame and draft tongue for imparting said swinging movements to said draft tongue and for holding said draft tongue in desired positions of swinging movement thereof.

4,037,396

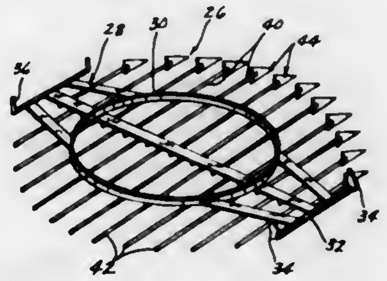
BLADE GUARD FOR ROTARY LAWN MOWERS

Wesley F. Buchele, and William I. Baldwin, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed May 27, 1975, Ser. No. 580,907

Int. Cl.² A01D *75/20*

U.S. Cl. 56—255 **7 Claims**



1. In a mower device,

a wheel-supported mower cowling having an open bottom,

a horizontal elongated cutting blade disposed within said cowling,

said blade having sharpened cutting ends and an unsharpened center portion,

means operatively secured to said cowling for supporting and rotating said blade,

guard means secured to and covering the open bottom of said cowling,

said guard means including a plurality of spaced-apart elongated members extending longitudinally in the intended direction of travel of said mower device, said elongated members having rearward and forward ends, said elongated members having pointed members at their forward ends which extend forwardly of the forward end of said cowling,

each of said pointed members comprising a flat, vertically disposed member having a horizontally disposed lower edge portion and a top portion extending upwardly and rearwardly from the forward end of said lower edge portion,

the forward end of said cowling having a plurality of spaced-apart openings extending upwardly from the lower edge thereof, the rearward end of said pointed members being positioned in said openings.

4,037,397

LAWN RAKES

Donald Fiorentino, 8 Skytop Road, Edison, N.J. 08817

Filed Sept. 8, 1976, Ser. No. 721,281

Int. Cl.² A01D *7/10*

U.S. Cl. 56—400.12 **3 Claims**

1. A combination rake and pickup device comprising:

a. a first rake head including a plurality of first tines,

b. said first tines include a plurality of first free ends extending outwardly from each of said first tines,

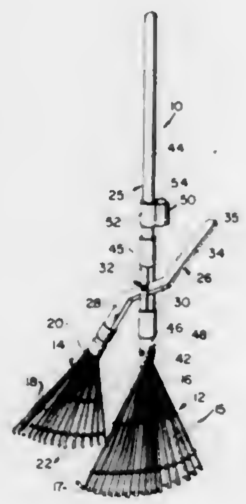
c. an elongated handle extending from said first rake head, said elongated handle being of sufficient length to permit normal use of said first rake head and having a cavity extending therethrough,

d. said handle includes:
  1. a bracket having said cavity therein,
  2. a lower handle portion connected to said first rake head at one end thereof and said bracket at the other end thereof, and
  3. an upper handle portion connected to said bracket at one end thereof with the opposite end thereof adapted to be gripped by the user of the device,

e. a second rake head oppositely disposed to said first rake head on one side thereof and including a plurality of second tines,

f. said second tines terminate above said first free ends and include a plurality of second free ends shorter than said first free ends and extending inwardly towards said first tines,

g. an elongated support member extending from said second rake head and having an intermediate section crossing said handle and an arm disposed on the opposite side of said handle and adapted to be gripped by the user of the device,



h. said support member includes:
  1. a base section connected at one end thereof to said second rake head,
  2. said intermediate section angularly disposed relative to said base section and connected at one end thereof to the other end of said base section, said intermediate section crossing said handle through said cavity and pivotably secured thereto by said pivot means, and
  3. said arm connected to said intermediate section at one end thereof and extending upwardly therefrom,

i. pivot means removably coupling said intermediate section below said arm to said handle such that manual positioning of said arm moves said second rake head between a closed position with said first and second tines extending in substantially parallel spaced apart relationship to each other to an open position with said first and second tines spaced from each other,

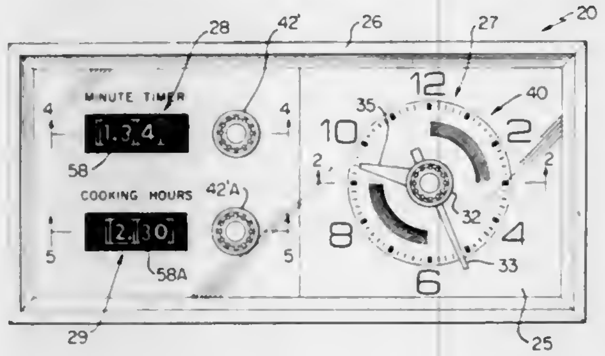
j. said pivot means includes a fastener extending transversely through said bracket and said intermediate section and adapted to be removed therefrom for independent use of either said first rake head or said second rake head, and

k. latching means coupled to said handle and adapted to releasably engage said arm so as to obtain retention of said arm relative to said handle in the closed position of the rake and permitting manual release therefrom for movement of said second tines relative to said first tines.

4,037,398
DIGITAL TIMER AND TIME INDICATOR DRUMS THEREFOR

Paul T. Flumm, Oakville, and Vernon B. Harris, Waterbury, both of Conn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 465,707, April 30, 1974, Pat. No. 3,899,872.
This application May 27, 1975, Ser. No. 580,598
Int. Cl.² G04F *3/02, 3/04;* **G04C** *23/12*
U.S. Cl. 58—22.9 **8 Claims**



1. In a digital timer having timer means carried by a frame means and setting means to set a selected period of time of said timer means operatively associated with means for interconnecting drive means and said timer means together to cause said drive means to drive said timer means for only said set period of time, said timer means comprising shaft means carried by said frame means and a pair of indicator drums rotatably mounted to said frame means by said shaft means, said drums having means cooperating together so that one of said drums will cause incremental movement of the other drum in a timed relation to incremental movement of said one drum, said cooperating means comprising a pinion-like gear means rotatably mounted to said frame means intermediate said drums, said one drum having drive means operatively associated with said gear means to drive the same as said one drum is rotated, said other drum having driven means operatively associated with said gear means to be driven thereby in a timed relation to the incremental movement of said one drum, the improvement wherein said driven means of said other drum comprises a plurality of pins extending in a circular array from said other drum substantially parallel to the axis of rotation of said other drum, said one drum having driven means to be driven by the first-mentioned drive means when interconnected thereto, said driven means of said one drum comprising a plurality of pins extending in a circular array from said one drum substantially parallel to the axis of rotation of said one drum, said first-mentioned drive means that drives said pins of said one drum comprising a gear rotatably mounted to said frame means to rotate about an axis substantially transverse to said axis of rotation of said one drum and meshing with certain of said pins.

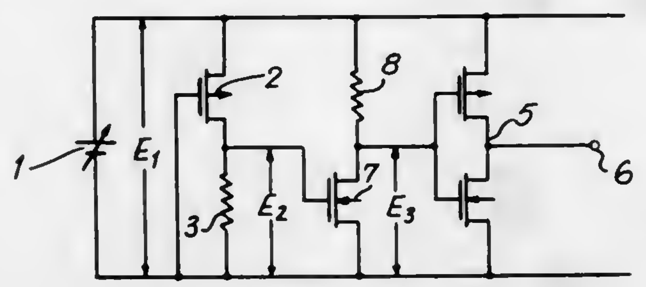
4,037,399
ELECTRONIC TIMEPIECE BATTERY POTENTIAL DETECTING CIRCUITRY

Hiroyuki Chihara, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed Sept. 24, 1975, Ser. No. 616,347
Claims priority, application Japan, Sept. 24, 1974, 49-109808
Int. Cl.² G04C *3/00;* **G08B** *21/00*
U.S. Cl. 58—23 BA **40 Claims**

1. In an electronic timepiece comprising oscillator means for producing a high frequency time standard signal, divider means for producing a low frequency timekeeping signal in response to said high frequency time standard signal, and display means for displaying time in response to the said timekeeping signal, the improvement comprising a DC power source for energizing said oscillator, divider and display means, said power source means being adapted to produce an

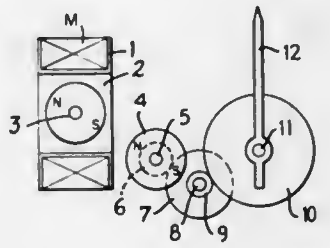
effective potential for such energizing, and electronic switching means for detecting the effective potential produced by said power source means, said electronic switching means including first stage switching means and second stage switching means, said first stage switching means including a first control electrode coupled to said power source for detecting the effective potential thereof, said first stage means further including two further electrodes adapted to define a closed current circuit having one of a first positive and negative current temperature coefficient in response to said control electrode being referenced above a predetermined potential, said two further electrodes defining one of an increased and decreased impedance in response to said control electrode detecting a drop in the effective potential of said power source, and said second stage switching means having a control electrode coupled to one of said first stage means further electrodes for detecting the potential thereof when same defines a closed current path, said second stage further including two further electrodes defining a closed circuit having one of a positive and negative second temperature coefficient opposite to said first current temperature coefficient in response to said control electrode being referenced below said predetermined potential, said two further electrodes of said second stage means defining a circuit for compensating for changes in one of said increased and decreased impedance of said two further electrodes of said first stage means due to changes in temperature when said second stage swithcing means control electrode detects a change in the effective potential of said first stage switching means further electrodes.



4,037,400
DRIVE DEVICE FOR ELECTRIC CLOCK

Kiyoshi Kitai, Tokyo; Masuo Ogihara, Chiba; Kozo Sato, Chiba; Nobuo Shinozaki, Chiba; Yoichi Seki, Shisui, and Yuzuru Takazawa, Togane, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan

Filed Apr. 6, 1976, Ser. No. 674,303
Claims priority, application Japan, Apr. 7, 1975, 50-41970
Int. Cl.² G04B *19/30*
U.S. Cl. 58—23 D **3 Claims**

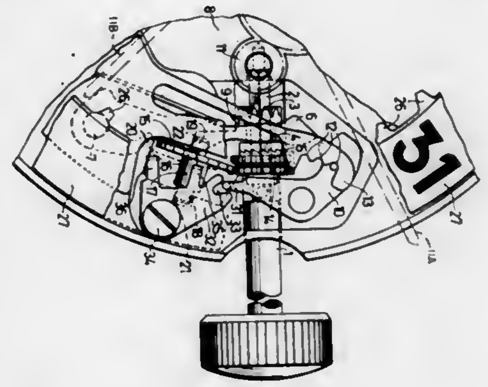


1. A drive device for driving a clock hand of an electric clock comprising: a polarized drive rotor having opposite polarity poles rotatably arranged in the magnetic field developed by a coreless field coil; a polarized auxiliary rotor having opposite polarity poles rotatably arranged and magnetically coupled to said polarized drive rotor so as to displace the polarized drive rotor through a suitable angle with respect to the central direction of the magnetic field developed by the coreless field coil whereby an output may be taken out of either one of said polarized drive rotor and polarized auxiliary rotor so as to drive the clock hand; and means for alternately applying an exciting current of opposite polarities to said coreless field coil to drive said polarized drive rotor and thereby drive said polarized auxiliary rotor due to the magnetic coupling between said two rotors to thereby move the clock hand at stepwise intervals.

4,037,401
APPARATUS FOR ADJUSTING A DATE RING OF A WATCH

Wolfgang Ganter, and Gunter Scholz, both of Schramberg, Germany, assignors to Firma Gebruder Junghans GmbH, Germany

Filed Jan. 15, 1976, Ser. No. 649,238
Claims priority, application Germany, Jan. 22, 1975, 2502380
Int. Cl.² G04B *19/24*
U.S. Cl. 58—58 **17 Claims**



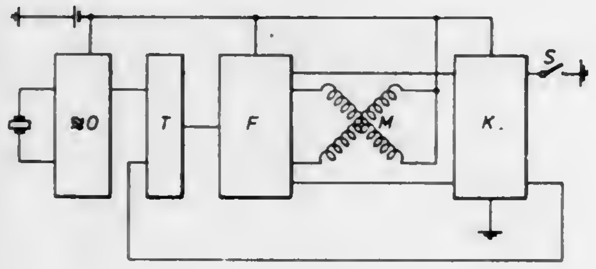
1. In a timepiece having a drive spring; indicator hands; a date ring; an operating shaft arranged for winding said spring, adjusting said hands, and adjusting said date ring; a date control gear on said shaft; a correcting gear having a correcting gear shaft and being in continuous engagement with said date control gear, said correcting gear being shiftable into driving connection with said date ring; and an adjusting lever for releasably retaining said operating shaft in control positions for winding said spring, adjusting said hands, and adjusting said date ring, the improvement wherein:
  said date control gear is slidable and non-rotatable relative to said operating shaft;
  said date control gear operates independently of winding of said spring and adjusting of said hands;
  said correcting gear being mounted for rolling movement along a stationary wall toward said date ring in response to being rotated in a selected direction by said control gear; and
  control lever means being operably connected to said operating shaft for being shifted relative to said correcting gear in response to movement of said shaft between said control positions;
    said control lever having a stop portion disposed in the path of travel of said correcting gear toward said date ring when said operating shaft is at least in a position for winding said spring, to prevent shifting of said correcting gear into driving relationship with said date ring;
    said stop portion being disposed out of the path of travel of said correcting gear toward said date ring when said operating shaft is in a date adjusting position to permit shifting of said correcting gear into driving relationship with said date ring.

4,037,402

CIRCUIT ARRANGEMENT FOR A QUARTZ CONTROLLED ELECTRICAL CLOCK

Paul Sieber, Heilbronn-Bockingen, Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Mar. 12, 1975, Ser. No. 557,879
Claims priority, application Germany, Mar. 29, 1974, 2415291
Int. Cl.^{2} G04B *27/00*
U.S. Cl. 58—85.5 **6 Claims**



1. In a circuit arrangement for a quartz-controlled electric clock composed of an oscillator stage producing a train of oscillations at a fixed frequency, frequency divider means having an input connected to receive a train of oscillations and at least one output providing pulses at a rate which is a fixed fraction of the frequency of the train of oscillations connected to its input, the frequency divider means containing switchable means which assume a different switching state in responce to each oscillation cycle applied to the divider means and which cause a pulse to be applied to each divider means output upon assuming a selected switching state, and a stepping switch motor having drive coils connected to the divider means output for receiving the pulses in order to effect driving of the motor, the improvement wherein said switchable means remain in their existing switching state upon termination of delivery of oscillations to said divider means input, and said arrangement comprises:

a gate circuit connected between said oscillator stage and said frequency divider means input and having a control input, said gate circuit passing the train of oscillations from said oscillator stage to said frequency divider means input when a first control signal is present at said control input and blocking passage of such oscillations when a second control signal is present at said control input;

control logic means having inputs connected to said frequency divider means to receive signals indicating the switching state of said switchable means, an output connected to said control input of said gate circuit to supply control signals to said control input, and an external control input, said control logic means being arranged to normally apply the first control signal to said control input and to monitor the switching state of said switchable means in a manner such that after application of an external control signal to said external control input, the second signal is produced at said logic means output only at the instant when said switchable means assumes that switching state which immediately precedes the selected switching state at which a pulse is applied to said divider means output, there being no current flow through said driving coils when said switchable means are in such immediately preceding state; and

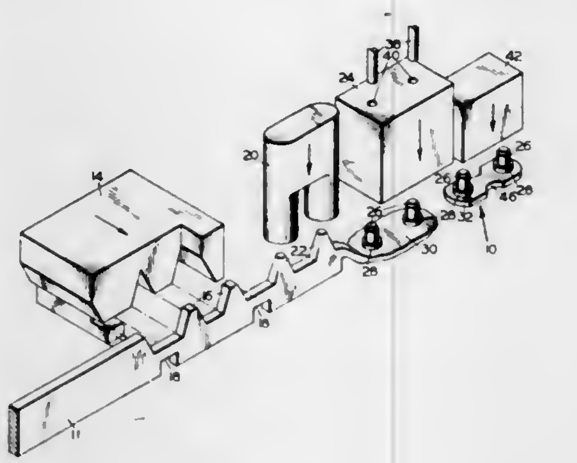
switch means connected to said logic means external control input and switchable into a condition for applying the external control signal thereto.

4,037,403

METHOD OF MAKING INTEGRATED TIE STRAP AND RIVET ASSEMBLIES FOR SAW CHAINS

Donald D. Lanz, and Ronald E. Hencye, both of Oregon City, Oreg., assignors to Omark Industries, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 613,168, Sept. 15, 1975. This application Oct. 18, 1976, Ser. No. 733,258
Int. Cl.^{2} B21L *9/02*
U.S. Cl. 59—8 **6 Claims**



1. The method of making integrated tie strap and rivet assemblies for saw chains comprising:

a. Providing a length of elongate bar,
b. Supporting the elongate bar in a longitudinal orientation,
c. Rough cutting the elongate bar to form trapezoidal blanks on its upper portion,
d. Coning the trapezoidal blanks to form partial frustroconic protrusions,
e. Coining the elongate bar to form rivets and concentric shoulders from the partial frustro-conic protrusions, and a flat base from the remainder of the elongate bar, and.
f. Trimming the flat base to form a tie strap.

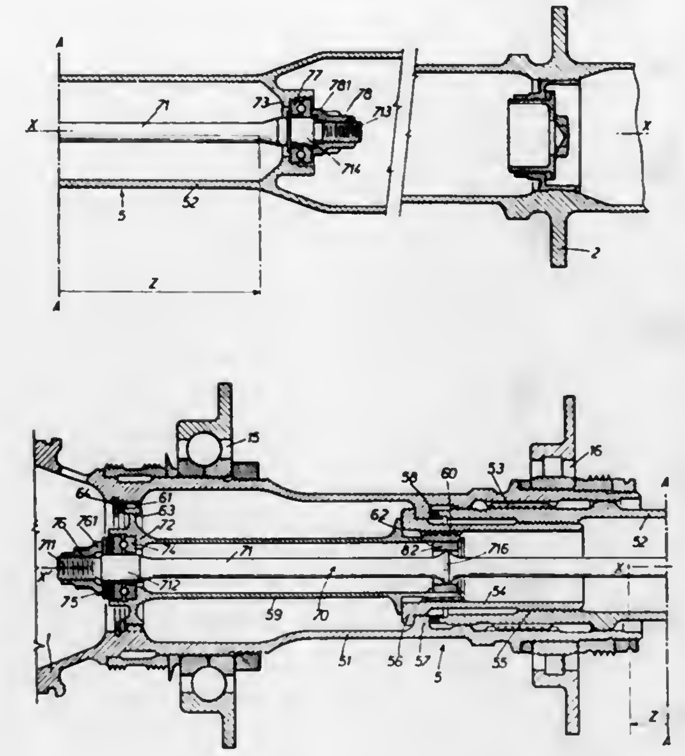
4,037,404

COUPLING DEVICE FOR GAS TURBINE ENGINE

Georges Bougain, Crisenoy, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Evry, France

Filed June 30, 1976, Ser. No. 701,418
Claims priority, application France, July 9, 1975, 75.21500
Int. Cl.^{2} F02K *3/00*
U.S. Cl. 60—223 **5 Claims**

1. A gas turbine engine comprising a compressor and an expansion turbine of which the respective rotors are axially spaced one with respect to the other along the longitudinal axis of the engine and which are rigidly connected both in rotation and in axial traction by a main coupling device and a safety coupling device interconnecting the said rotors solely in axial traction but permitting them to turn one with respect to the other in case of accidental rupture of the main coupling device, the said safety coupling device comprising an axial rod supported, adjacent its both extremities, against two abutments axially facing away from each other and being radially connected with the main coupling device by means of members having low coefficient of friction, which permit relative movement of rotation between the said abutments and the said rod.

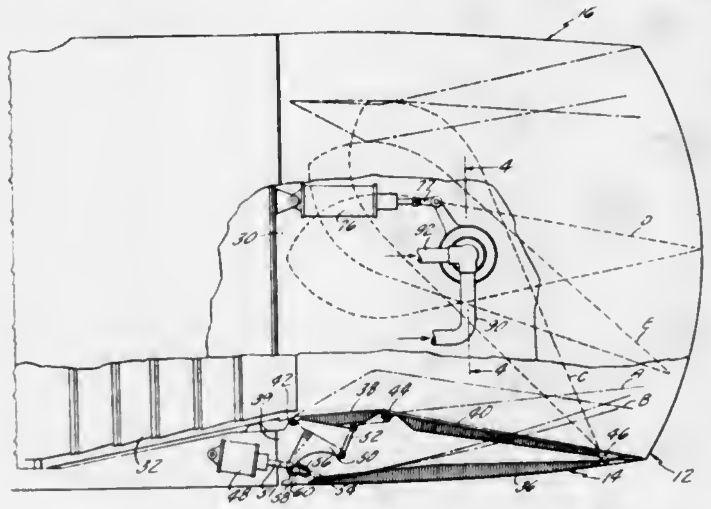


4,037,405

TWO DIMENSIONAL NOZZLE WITH ROTATING PLUG

Edward A. Huenniger, East Hartford, Conn., and Robert M. Spurrell, Auburn, Wash., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 30, 1975, Ser. No. 618,091
Int. Cl.^{2} F02K *1/12;* **F02C** *7/18*
U.S. Cl. 60—229 **14 Claims**



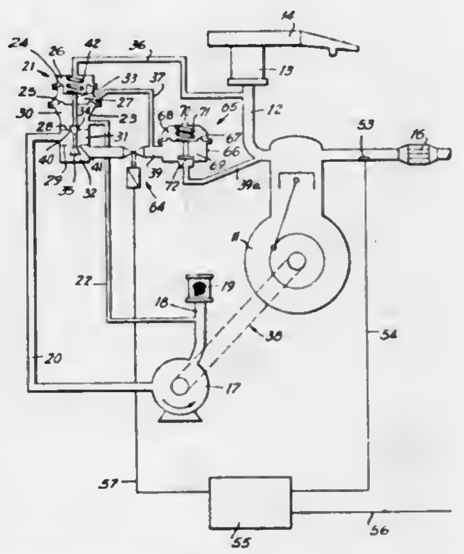
1. In combination with a turbine type power plant that generates hot gases for developing thrust, means including a two dimensional nozzle having opposing parallel side walls and opposing collapsible walls defining a box shaped exhaust gas passage for obtaining horizontal thrust, rotatable plug means extending between said parallel side walls in said nozzle, said collapsible wall includes at least three panels each of said panels extending across said parallel side walls, a pair of said panels extending into said nozzle and pivotally connected to each other to define the throat of said nozzle, and the other panel hingedly connected to the end of one of said pairs of panels, means for controlling said collapsible walls to form a variable throat and means for rotating said plug to form with said collapsible walls a blockage of said nozzle, and additional means for controlling said plug and said collapsible walls so that one of said collapsible walls cooperates with said plug to form a blockage and the other wall defines a thrust vectoring and exhaust gas metering nozzle.

4,037,406

APPARATUS FOR THE PREDETERMINED ADDITION OF SECONDARY AIR FOR THE OPTIMUM COMBUSTION OF EXHAUST GASES OF INTERNAL COMBUSTION ENGINES

Günter Härtel, Parkstrasse 16, 4041 Rosellen, Germany

Division of Ser. No. 356,193, May 1, 1973, Pat. No. 3,931,710. This application Oct. 22, 1975, Ser. No. 624,826
Claims priority, application Germany, Nov. 10, 1972, 2254961
Int. Cl.^{2} F02B *75/10*
U.S. Cl. 60—276 **6 Claims**



1. Apparatus for the proportionate addition of secondary air to the inlet of an internal combustion engine for effecting optimum combustion and after-burning of the exhaust gases from the internal combustion engine, said apparatus comprising an engine-driven air pump; control means for introducing predetermined quantities of secondary air to the engine; means including a sensor located externally of said control means and responsive to at least one of a plurality of engine operating conditions for regulating said control means; said control means including means for the withdrawal of a portion of the secondary air conveyed through said control means and conducting said withdrawn secondary air to the suction side of said air pump, said air pump returning said secondary air from the pressure side of said air pump to said control means; means for determining the rate of feed of the secondary air and the quantity of the air portion withdrawn from said control means to said air pump, and means including two spaced conical valve means controlling flow passages through said control means, said valve means being mounted on a common actuating control rod and being positioned so that, during an increase of the fed quantity of secondary air, the quantity of the withdrawn air portion is reduced, said actuating control rod for said conical valve means being rigidly connected to two spaced upper and lower membranes having unequal operative surfaces, said membranes defining therebetween a first control pressure chamber, and a second control pressure chamber located above the upper membrane communicating with the suction inlet of said engine and secondary air control valve means coupled to said control means for receiving pumped secondary air therefrom for supplying the secondary air to said engine inlet while maintaining constant pressure in said first control pressure chamber.

4,037,407

EXHAUST GAS PURIFICATION SYSTEM FOR INTERNAL COMBUSTION ENGINES

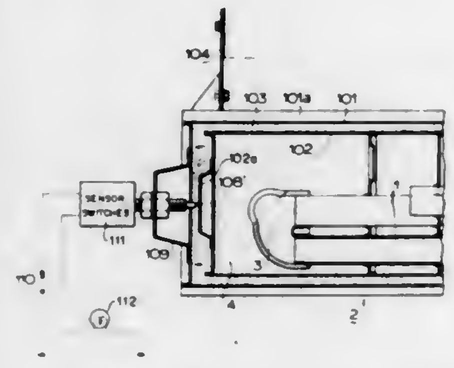
Yukio Mizuno, Tachikawa, and Midori Hiramoto, Tanashi, both of Japan, assignors to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 15, 1975, Ser. No. 605,157

Claims priority, application Japan, Nov. 28, 1974, 49-137321

Int. Cl.^{2} F01N *3/00, 7/00*

U.S. Cl. 60—277 **1 Claim**



1. An exhaust gas purification system for internal combustion engines having an engine cylinder and an intake system thereto, comprising

an exhaust valve having an opening area,

an exhaust gas passage communicating with said exhaust valve having no expanded portion in which the exhaust gas thereby passes without stagnating or mixing with subsequent.exhaust gas,

a reactor communicating with said exhaust gas passage,

a secondary air passage with a check valve means communicating with said exhaust gas passage, and

means for maintaining the temperature of exhaust gas over a trigger temperature of said reactor,

said exhaust gas passage having a volume at least equal to a displacement volume of the cylinder of the engine and less than four times the displacement volume and said exhaust gas passage having a cross-sectional area less than three times the opening area of said exhaust valve,

said reactor further forms an expanded chamber and includes a double shell structure having an outer shell, and an inner shell with an end plate,

a heat-insulation wall surrounding said expanded chamber between said inner shell and said outer shell, and

a sensor means having a push rod facing adjacent to said end plate of said inner shell, for being actuated by movement of said end plate to push said push rod when said reactor is substantially excited over the trigger temperature due to engine misfire, whereby sensor switches are activated to send a signal from a power source to a receiving device.

4,037,408

CYLINDER HEAD FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

Masahiro Ozawa, Fuchu, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

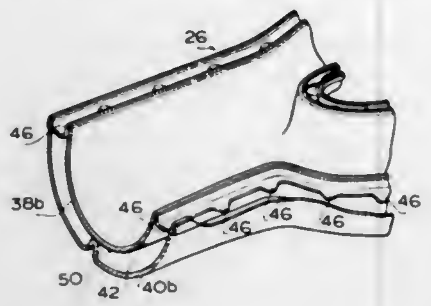
Filed Dec. 1, 1975, Ser. No. 636,558

Claims priority, application Japan, Dec. 26, 1974, 50-2486[U]

Int. Cl.^{2} F01N *7/10*

U.S. Cl. 60—282 **2 Claims**

1. A cylinder head for a multi-cylinder internal combustion engine comprising a block formed with a plurality of exhaust ports, with a common port adapted for connection to an exhaust system and with a plurality of passages communicating at one end with said common port, each of said passages communicating with one of said exhaust ports, a liner disposed in each of said passages, said liner comprising an inner shell and an outer shell, the inner shell being disposed in said outer shell and spaced from the same to form an air layer around said inner shell, said inner shell comprising a first half and a second half secured with each other and, in which said outer shell comprising a first half and a second half secured with each other, said first half of said inner shell has offset portions and said second half of said inner shell has edges thereof engaging the respective offset portions of said first half of said inner shell, in which said first half of said outer shell has offset portions and said second half of said outer shell has edges thereof engaging the respective offset portions of said first half of said outer shell, and in which said first half of said inner shell has outwardly projecting teeth abutting said outer shell and each of said first and second halves of said outer shell has inwardly projecting protuberances abutting said inner shell.



4,037,409

GAS TURBINE ENGINE FOR VEHICLES

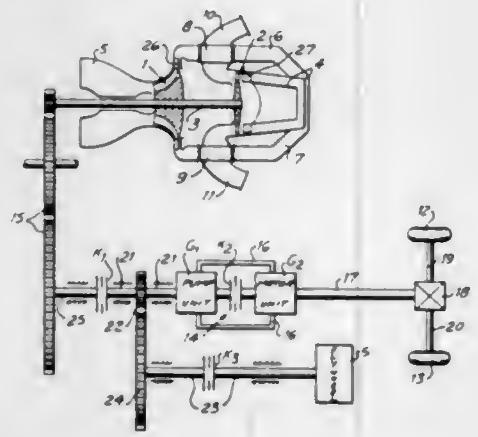
Heinrich Leibach, Grafrath-Wildenroth, Germany, assignor to Motoren- und Turbinen-Union Munchen GmbH, Munich, Germany

Filed Mar. 2, 1976, Ser. No. 663,072

Claims priority, application Germany, Mar. 6, 1975, 2509670

Int. Cl.^{2} F15B *1/02*

U.S. Cl. 60—413 **3 Claims**



1. Gas turbine engine for vehicles with at least one wheel drive shaft; an infinitely variable transmission for coupling said engine to said wheel drive shaft; a flywheel for storing and releasing braking energy; a disengageable coupling connecting said flywheel with said infinitely variable transmission to said wheel drive, said transmission comprising hydraulic transmission means having a pump unit and a motor unit operable hydraulically be said pump unit, said units being reversible for braking the vehicle, said motor unit being driven by the vehicle's wheels and operating as a pump, said pump unit operating as a motor and driving said flywheel when braking the vehicle, said flywheel being disengaged on the drive side, at the same time as the hydraulic transmission, from the gas-turbine engine by means of said clutch.

4,037,410

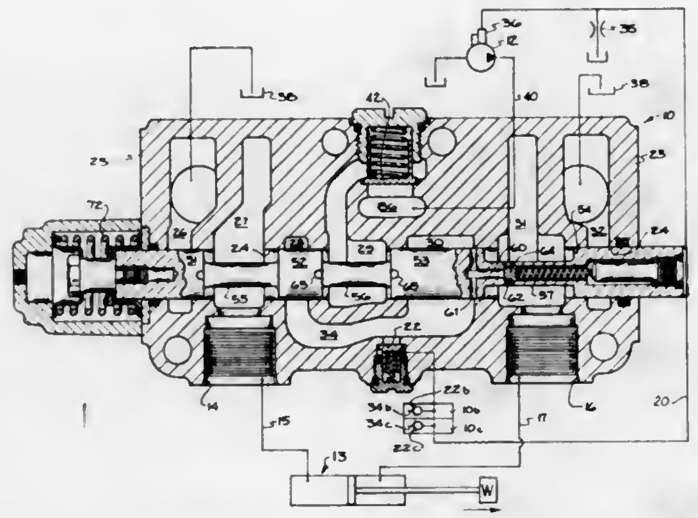
HYDRAULIC CONTROL VALVE

Alan D. Jackson, Hutchinson; Homer R. Graber, Pretty Prairie, and Robert D. Krehbiel, Hutchinson, all of Kans., assignors to The Cessna Aircraft Company, Wichita, Kans.

Filed May 26, 1976, Ser. No. 690,342

Int. Cl.^{2} F16H *39/46*

U.S. Cl. 60—445 **16 Claims**



1. A hydraulic valve in a closed-center load responsive system supplied by a pressure flow compensated variable displacement pump having a flow compensating means:

a valve body;

a bore in the body;

a pump pressure cavity intersecting the bore and connected to the pump discharge;

a motor port cavity intersecting the bore adjacent the pump pressure cavity;

a signal passage intersecting the valve bore intermediate the pump pressure cavity and the motor port cavity, the signal passage connecting with the flow compensating means of said pump;

a craning passage including a check valve therein connecting the motor port cavity to the signal passage allowing flow only from the signal passage to the motor port cavity;

a valve spool means positioned in said bore having a first neutral position blocking flow from the pump pressure cavity and flow from the motor port cavity;

a second position metering flow from the pump pressure cavity across the signal passage into the motor port cavity and an intermediate third position metering flow from the pump pressure cavity into the signal passage, whereby the flow compensating means of the pump maintains a pressure level at a preset level abpve the load pressure in the motor port cavity.

4,037,411

THERMAL ENERGY CONVERTING ASSEMBLY

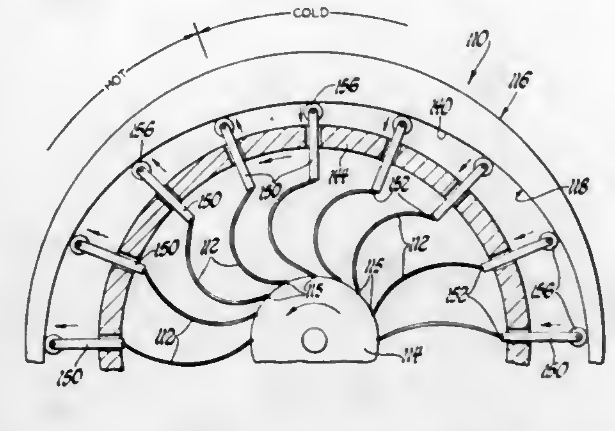
Peter A. Hochstein, 14020 15 Mile Road, Sterling Heights, Mich. 48077

Filed Feb. 2, 1976, Ser. No. 654,368

Int. Cl.^{2} F03G *7/06*

U.S. Cl. 60—527 **28 Claims**

1. A thermal energy converting assembly comprising: a plurality of temperature sensitive elements made of material which undergoes thermoelastic, martensitic phase transformation; reaction means for supporting said elements; cam means reacting with said elements for straining said elements during a first phase and allowing the unstraining of said elements during a second phase, and support means supporting said reaction means and said cam means for allowing relative movement between said elements and said cam means to extract energy as said elements react with said cam means during said unstraining of said elements.



4,037,412

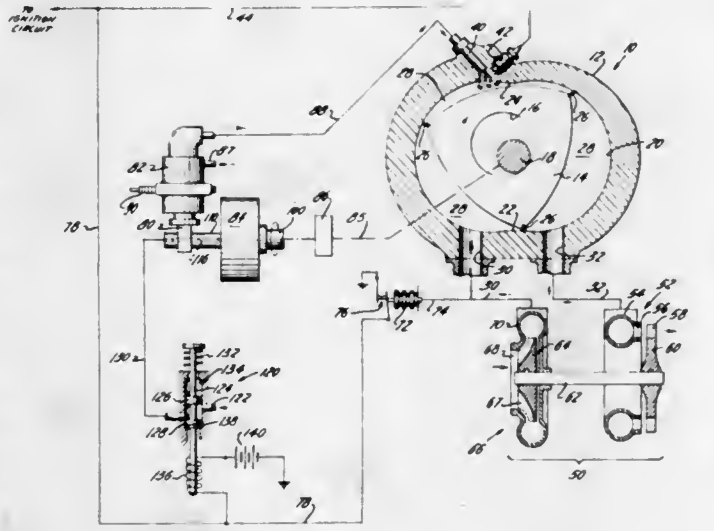
COMPOUND SPARK-IGNITION AND DIESEL ENGINE

Charles Jones, Hillsdale, N.J., assignor to Curtiss-Wright Corporation, Wood-Ridge, N.J.

Filed Oct. 9, 1975, Ser. No. 621,234

Int. Cl.^{2} F02B *33/44, 33/42, 69/00, 53/04*

U.S. Cl. 60—605 **10 Claims**



1. A compound rotary engine comprising:

a. an outer body having an internal cavity, the peripheral surface of which has a multi-lobe profile, said outer body also having an air intake passage and a combustion gas exhaust passage;

b. an inner body of generally polygonal profile mounted for relative rotation within said outer body, the apex portions of said inner body having sealing cooperation with said multi-lobe surface to define a plurality of working chambers which vary in volume in response to said relative rotation, the volumetric compression ratio of said working chambers being substantially less than that required for diesel-type operation;

c. a fuel nozzle mounted on said outer body for discharging fuel into each working chamber after the air charge therein has been substantially compressed;

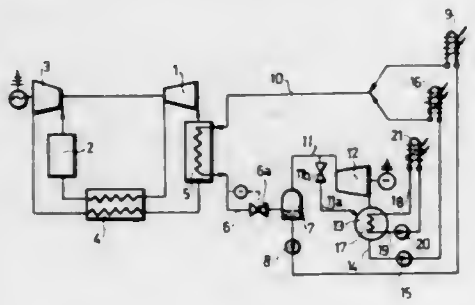
d. ignition means for igniting fuel discharged into each working chamber by said fuel nozzle such that the engine is capable of operating with diesel-type fuels as a spark-ignited engine; and

e. a supercharger driven by the engine exhaust gases discharging from said exhaust passage for supplying compressed air to said air intake passage, the supercharger output pressure being incapable below a predetermined engine power output, which is significantly above idling output, of raising the compression pressure in said working chamber to a value high enough for diesel-type operation but at higher engine power outputs being capable of raising the compression pressure in said working chambers to a value high enough for diesel-type operation.

4,037,413

POWER PLANT WITH A CLOSED CYCLE COMPRISING A GAS TURBINE AND A WORK GAS COOLING HEAT EXCHANGER

Laszlo Heller; Laszlo Forgo, and Zoltan Szabo, all of Budapest, Hungary, assignors to Energiagazdalkodasi Intezet, Hungary
Filed Nov. 26, 1975, Ser. No. 635,451
Claims priority, application Hungary, Dec. 9, 1974, HE 670
Int. Cl.² F01K *23/04*
U.S. Cl. 60—655 **6 Claims**

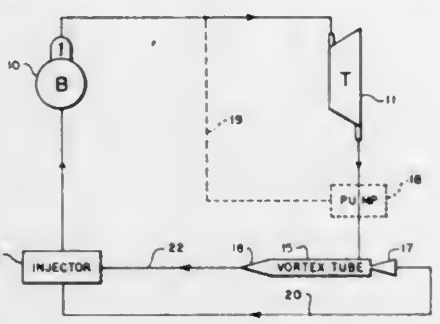


1. A closed cycle power plant, comprising a gas turbine having an intake and an exhaust, a work gas cooling heat exchanger having a heater side and a heat abduction side, said heater side of said heat exchanger being connected between said intake and said exhaust of said gas turbine, an air cooler, an evaporator having a liquid chamber and a vapour chamber, said liquid chamber of said evaporator being connected to said heat abduction side of said heat exchanger through said air cooler, said vapour chamber of said evaporator being also connected to said heat abduction side of said heat exchanger through a condensation vapour turbine.

4,037,414

LIQUID/VAPOR ENERGY CYCLE

Carl D. Nicodemus, 176 Meigs St., Rochester, N.Y. 14607
Filed July 23, 1976, Ser. No. 708,124
Int. Cl.² F01K *19/00*
U.S. Cl. 60—670 **10 Claims**



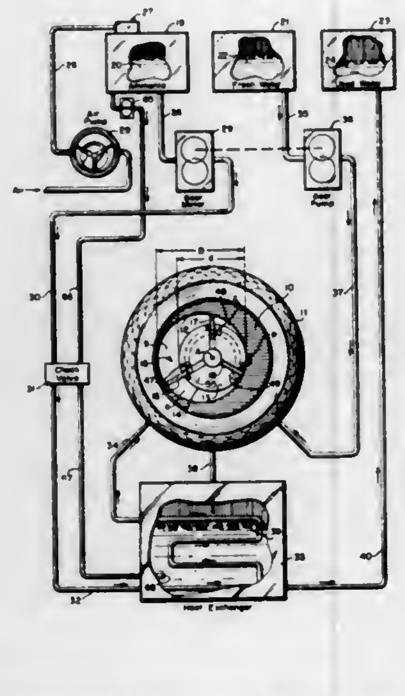
1. In a liquid/vapor energy cycle including means for heating a said liquid in a boiler to produce said vapor and a transducer driven by said vapor, the improvement comprising:

a. a vortex tube arranged for receiving the output from said transducer and dividing said transducer output into relatively hot and cold portions; and
b. an injector powered by said vapor and arranged for pumping said cold portion into said boiler.

4,037,415

IMPLOSION ROTARY ENGINE

Albert S. Christopher, 2269 Hyland, and Robert J. Tufts, P.O. Box 3088, both of Ventura, Calif. 93003
Continuation-in-part of Ser. No. 524,078, Nov. 15, 1974, Pat. No. 3,975,914. This application July 6, 1976, Ser. No. 702,748
Int. Cl.² F01K *25/06, 25/10*
U.S. Cl. 60—673 **8 Claims**



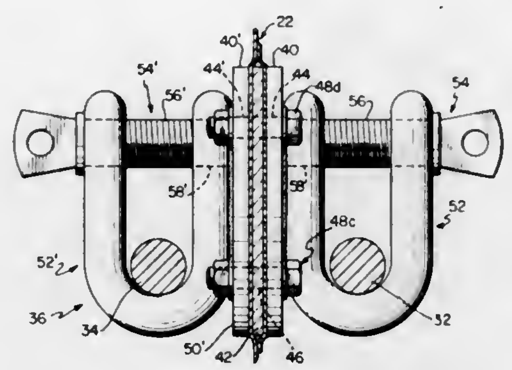
1. An implosion rotary engine including, in combination:

a. a first member having an inner annular wall of given diameter defining a circular cavity;
b. a second member having an outer annular wall of outside diameter smaller than said given diameter eccentrically positioned in said cavity with respect to the center of said cavity so as to be in tangential engagement with said inner wall at one point whereby a crescent shaped volume is defined between said inner annular wall and outer annular wall;
c. at least one movable vane in said second member radially extending from its outer annular wall to engage said inner annular wall and divide said crescent shaped volume into first and second volumes on opposite sides of said vane, said members being mounted for relative rotation about an axis passing through the center of said second member so that said vane reciprocates in and out as it passes said one point of tangency and said volumes sequentially increase and decrease in size;
d. a gas container holding a given gas under at least 2 atmospheres of pressure;
e. a liquid container holding a given liquid for which said gas has a chemical affinity;
f. a used liquid container;
g. gas inlet means connected between said gas container and the members for sequentially introducing said given gas into said first and second volumes only when they are increasing in size;
h. liquid inlet means connected between said liquid container and said members for sequentially introducing liquid into said first and second volumes only when they are decreasing in size;
i. outlet means connected between said used liquid container and said members for sequentially passing liquid which has absorbed said given gas from said volumes as said volumes reach minimum sizes; and
j. a heat exchanger housing for effecting heat exchange between used liquid passing from said outlet means to said used liquid container and incoming gas from said gas container, heat being generated by absorption of said gas in said liquid whereby gas introduced to the members expands the volume receiving the gas and water introduced into said volume when the members reach a relative rotative position such that the volume starts decreasing absorbs said gas to create a vacuum contracting said volume so that relative rotation of said members is sustained.

4,037,416

CABLE CONNECTOR ASSEMBLY FOR OIL BOOM

Paul Preus, Smith Road, Toms River, N.J. 08753
Filed May 17, 1976, Ser. No. 687,215
Int. Cl.² E02B *15/04*
U.S. Cl. 61—1 F **2 Claims**

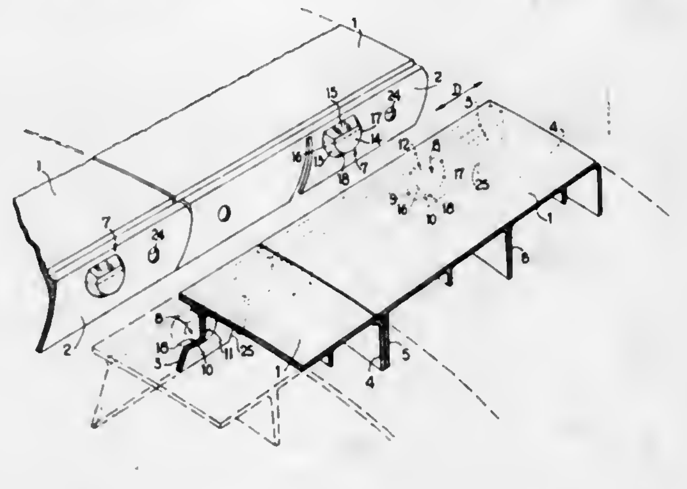


1. A barrier for water carried pollutants comprising a series of end to end connectable boom sections, each boom section comprising a flexible tubular sleeve containing a flotation means and a depending skirt, flexible draft members extending along each side of the skirt immediately below the tubular sleeve and means connecting the flexible draft member to the skirt at spaced intervals characterized in that the connecting means comprise a pair of rigid plates, one of said pair of plates being positioned on one face of said skirt and the other of said pair of plates being positioned on the opposite face of said skirt, means rigidly joining said pair of plates through the skirt, and an anchor shackle secured to the outer face of at least one of the pair of plates, said anchor shackle being of generally U-shaped configuration and secured to the outer face of said plate with the legs of the U-shaped shackle directed upwardly to thereby receive the flexible draft member between the legs, and a closure pin releasably closing the extended ends of the legs and securing the flexible draft member to the anchor shackle.

4,037,417

VOUSSOIR FOR A CASING

Jacques Oger, Pont-a-Mousson, France, assignor to Pont-A-Mousson S.A., Nancy, France
Filed Mar. 19, 1975, Ser. No. 560,013
Claims priority, application France, Mar. 22, 1974, 74.10002
Int. Cl.² E21D *11/22*
U.S. Cl. 61—45 R **8 Claims**

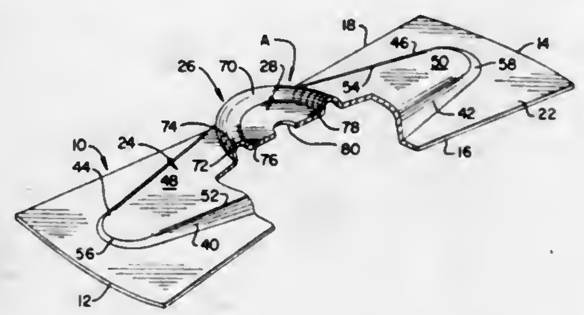


1. In a casing voussoir comprising a web in the general shape of a sector of a cylindrical ring and at least a first juxtaposition wall and a second juxtaposition wall which are substantially perpendicular to said web and substantially radial relative to the axis of the cylindrical ring, guide means for the juxaposition of said first and second walls between two neighbouring voussoirs of the casing; the improvement comprising the combination of the following features, said guide means are constituted by at least two elements of conjugate shape, one being a hollow in said first wall and the other being a projection on said second wall, said elements having a clearance therebetween when the two voussoirs are juxtaposed along said walls, at least one of said elements being tapered to facilitate the introduction of the projection in the hollow when assembling said neighbouring voussoirs, and said hollow element comprises an opening in the first wall surrounded by a portion which is integral with said first wall around the opening and projects inwardly of the voussoir.

4,037,418

LOAD SUPPORTING BEARING PLATE

John I. Hannan, Shadyside, Ohio, assignor to Phillips Stamping Co., Inc., Bellaire, Ohio
Filed May 12, 1976, Ser. No. 685,695
Int. Cl.² E21D *21/00;* F16B *29/00*
U.S. Cl. 61—45 B **32 Claims**

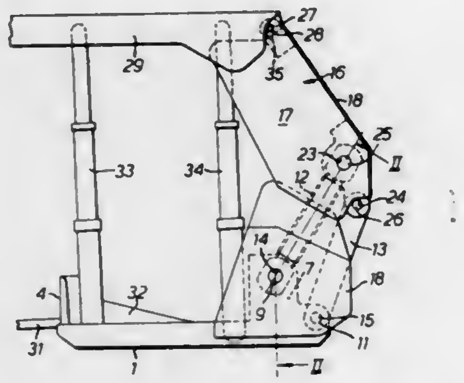


1. A low profile bearing plate of the type adapted to provide support for a generally planar surface, said plate comprising:

a generally flat body having a length greater than the width with a longitudinal axis extending between the body ends and a transverse axis extending between the body sides with said axes intersecting at substantially the midpoint of said body, one face of said flat body defining a generally planar plate bearing surface adapted to be closely received against a generally planar surface; an elongated major embossed area extending outwardly from the other face of said body and being located so as to extend along said longitudinal axis over a major portion of the body length; the height of said major embossed area being such that said plate defines a relatively low profile; a recessed area extending inwardly from the outer surface of said major embossed area back toward said plate bearing surface and being coaxially disposed relative to the intersection of said body axes, said recessed area having a bottom wall disposed generally parallel to and spaced from said plate bearing surface; and, an opening in said bottom wall coaxially disposed with the intersection of said body axes adapted to receive headed fastener means for affixing said support plate to a generally planar surface; the depth of said recessed area being such that when said fastener means is received in said opening, at least a portion of the head of said fastener means is concealed within said recessed area.

4,037,419
MINE ROOF SUPPORT

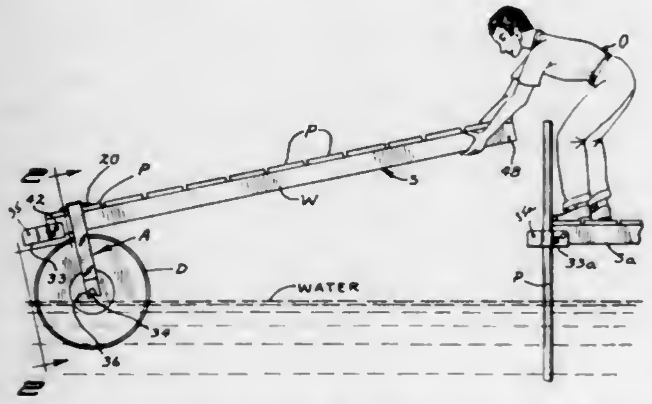
Nigel Hill, and James Anthony Sutton, both of Cheltenham, England, assignors to Dowty Mining Equipment Limited, Tewkesbury, England
Filed Dec. 18, 1975, Ser. No. 641,939
Claims priority, application United Kingdom, Dec. 18, 1974, 54780/74
Int. Cl.^{2} E21D *15/44*
U.S. Cl. 61—45 D **5 Claims**



1. A mine roof support having a floor-engaging part, a roof-engaging part, a shield of substantial width pivotally connected to the roof-engaging part to extend downwardly and rearwardly towards the goaf, a top link whose width is most of the width of the shield pivotally connected by coaxial pivots at its upper corners to the shield for movement about a first axis and pivotally connected by coaxial pivots at its lower corners to the floor-engaging part for movement about a second axis, a bottom link of a narrow width closer to the goaf than the top link, pivotally connected to the shield for movement about a third axis and pivotally connected to the floor-engaging part for movement about a fourth axis close to the floor-engaging surface, all pivot axes being substantially parallel to one another, and extendible strut means carried by the floor-engaging part to adjust the height of the roof-engaging part such that reduction in height of the roof-engaging part towards its lowest position causes the bottom link to extend from the fourth pivotal axis away from the floor-engaging part and close to the goaf side of the floor surface on which the support stands, the width and the connections of the top link locating the shield against any force applied to the shield in a transverse sense which will tend to apply torsion and shear forces to the top link and resisting any tendency for the roof-engaging part to move transversely relative to the floor-engaging part.

4,037,420
MECHANISM FOR INSTALLATION AND REMOVAL OF A DOCK IN THE WATER

Jack W. Wicks, 1407 Soo Line Bldg., Minneapolis, Minn. 55402
Filed Sept. 5, 1975, Ser. No. 610,529
Int. Cl.^{2} E02B *3/20*
U.S. Cl. 61—48 **7 Claims**

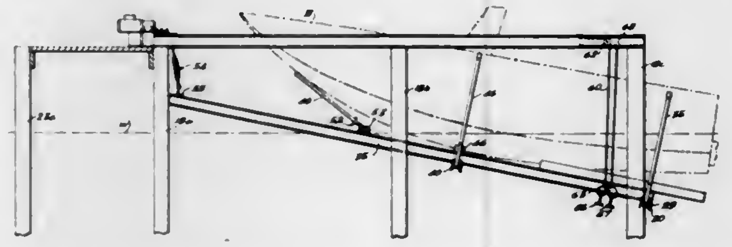


1. A mechanism for installation and removal of a dock section having permanent brackets secured thereto for engagement with dock posts including

a. a pair of temporary brackets,
b. means for releasably connecting said temporary brackets to a dock section adjacent one end thereof,
c. means for releasably engaging the free end of the temporary brackets to a float for supporting the dock section at one end upon the water,
d. means on the other end of the dock section for connection with a support,
e. means for connecting the permanent brackets secured to the dock section to dock posts for permanently supporting the dock section on the dock posts and support whereby the temporary brackets and float are released from the dock section.

4,037,421
FLOAT-ON BOAT DOCKING AND LIFTING ASSEMBLY

William P. Whitley, Jr., 3001 Industrial Ave. No. 3, Fort Pierce, Fla. 33450
Filed Dec. 22, 1976, Ser. No. 753,549
Int. Cl.^{2} B63C *3/06*
U.S. Cl. 61—65 **10 Claims**



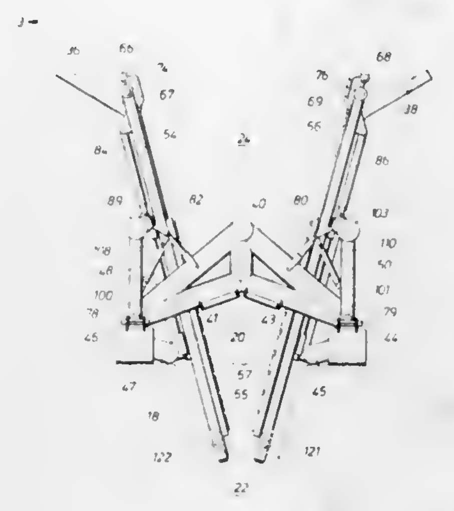
1. A float-on boat docking and lifting mechanism comprising, in combination, a cradle support framework having spaced, parallel, elongated members and being open at one end to permit entry of a water craft, means for supporting said framework members in a substantially common, horizntal plane and in vertical spaced relation above a body of water, an elongated float-on boat cradle between and below said framework members, means pivotally securing one end of said boat cradle at a central position between the other ends of said cradle support framework members at a location above the surface of the body of water, a reversible winch mechanism having a pair of axially aligned winding drums, means mounting said winch mechanism so that the axis of rotation of said winch drums is centrally located between said other ends of said framework members and extends longitudinally therebetween, a first cable means secured at one end to one of said winch drums, pulley sheave means directing said first cable for passage along one side of one of said framework members from said other end to said one end thereof, and means controlled by movement of said first cable means along said one of said framework members in one direction or the other, selectively, for raising or lowering the other end of said boat cradle.

4,037,422
ARTICULATED JET SLED

Nico deBoer, Kenner, and Robert L. Olsen, New Orleans, both of La., assignors to J. Ray McDermott & Co. Inc., New Orleans, La.
Filed Sept. 4, 1975, Ser. No. 610,105
Int. Cl.^{2} E02F *5/06*
U.S. Cl. 61—72.4 **24 Claims**

1. Apparatus for entrenching a submerged elongated structure such as a pipeline or cable in the subsoil beneath a body of water, comprising:

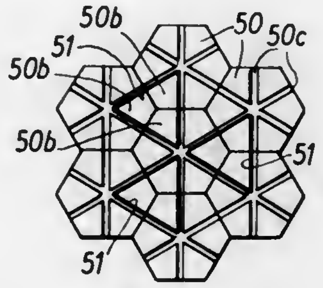
a frame for disposition above the elongate structure; first and second jet leg apparatus extending downwardly on opposite sides of said elongate structure;
said first and second jet leg apparatus each being mounted on the frame for pivotal movement about an axis parallel to the elongate structure, with the center of gravity of each apparatus being inboard of the pivot axis; and
positioning means for pivoting said first and second jet leg apparatus about said pivot axes to move said jet leg apparatus from a substantially vertical attitude to an attitude wherein the lower end of each jet leg is below and beneath the elongate structure to form a trench within the subsoil to accommodate the elongate structure;



said positioning means serving to apply a restraining force to said jet legs to maintain the lower ends thereof below and beneath the elongate structure, with the lower ends of said jet legs being free to swing outwardly upon the release of the restraining force.

4,037,423
PROCESS FOR PRODUCING A CONNECTING CONSTRUCTION UNIT, SUCH AS A QUAY, CONTAINER OR PLATFORM

Einar Knutsen, Astrupsvei 36, 5032 Minde, Norway
Filed Sept. 4, 1975, Ser. No. 610,431
Claims priority, application Norway, Sept. 26, 1974, 743469
Int. Cl.^{2} E02B *3/20;* **E02D** *5/20*
U.S. Cl. 61—87 **8 Claims**

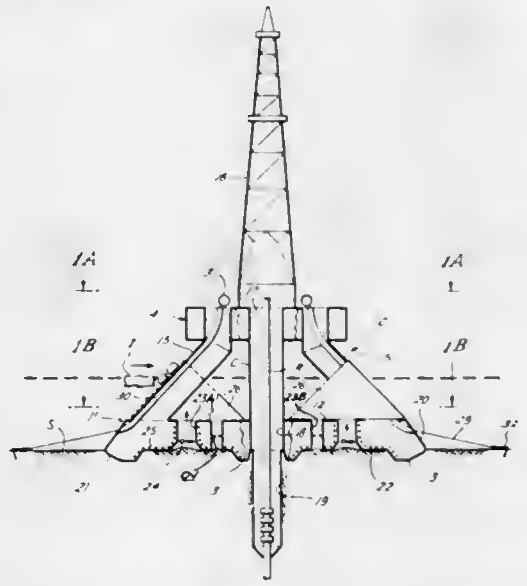


1. A process for making a connecting construction unit on a body of water without the use of docks and comprising the steps of

a. providing a plurality of floatable construction elements, each element having at least two intersecting slots therein,
said slots extending cross-wise of said element and intersecting opposite side surfaces of said element, said slots opening through the top surface of said element and extending vertically in a major part of the height extension of said element,
b. assembling the floatable construction elements in abutting relation with slots in adjacent elements in lateral communication to form a continuous network of intersecting slots and including positioning reinforcing means in said slots to form a reinforced semi-rigid raft construction,
c. filling said network of slots with water-proof molding material while said raft construction is floating on the water and imbedding said reinforcing means therein to form a substantially rigid raft construction having a network of reinforced skirt-formed walls,
d. and forming a connecting construction on the reinforced rigid raft construction.

4,037,424
OFFSHORE DRILLING STRUCTURE

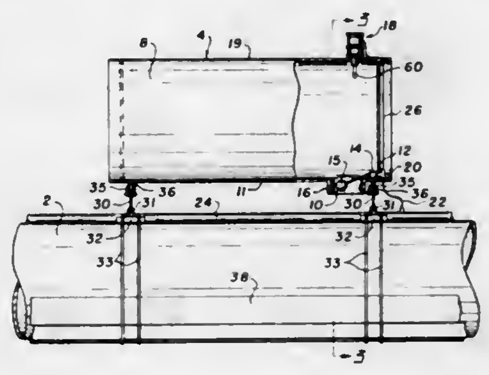
Edward O. Anders, Houston, Tex.
Continuation-in-part of Ser. No. 619,400, Oct. 3, 1975. This application June 23, 1976, Ser. No. 698,839
Int. Cl.^{2} B63B *35/44, 21/27*
U.S. Cl. 61—98 **26 Claims**



1. An offshore drilling structure, comprising a hull adapted to float on the water surface, during transit, and having ballast compartments which permit it to be raised and lowered within the water, when at a drilling site, a working platform supported above the hull, said platform and hull having openings therethrough to pass drilling equipment between the platform and the subsurface, the bottom of the hull having a recessed area about the opening in the hull, said hull having holes connecting said recessed area with its top, and a thruster mounted within each hole for reducing the pressure within the recessed area so that, when the hull is supported on the subsurface, soil from the subsurface may be drawn into the recessed area.

4,037,425
BUOYANCY APPARATUS

Harry Berg, Abbotsford, Canada, assignor to H. B. Contracting Ltd., Surrey, Canada
Filed June 9, 1975, Ser. No. 584,838
Int. Cl.^{2} F16L *1/04*
U.S. Cl. 61—112 **26 Claims**



1. Buoyancy apparatus comprising:

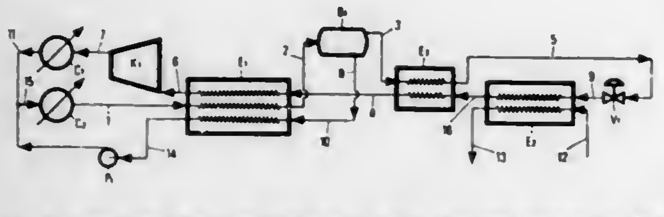
a tank floatable in a body of water and adapted to be connected to a pressure gas line, said tank having gas therein and consequently having a predetermined buoyancy in the water, an opening in the tank near the bottom thereof to maintain the interior of the tank in communication with said water,

a gas inlet in the tank spaced below the top of the tank and through which gas from said line can be directed into the tank,

normally-closed valve means controlling the gas inlet and normally preventing gas from entering the tank, and

control means connected to the valve means operable to open said valve means and located at said opening, said control means being operated by water flowing through the opening into the tank when the tank is moved downwardly in the water to open valve means and permit gas to enter the tank to expel the entering water, thereby maintaining the buoyancy of the tank.

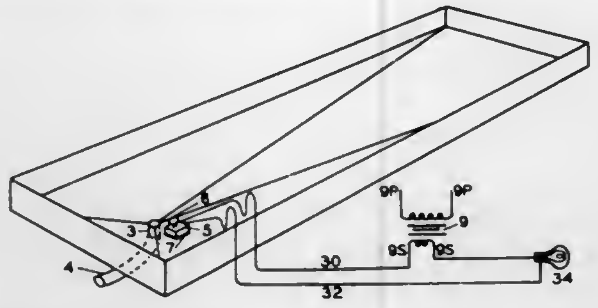
4,037,426
COLD PRODUCING PROCESS
Alexandre Rojey, Vanves, France, assignor to Institut Francais du Petrole, Rueil-Malmaison, France
Filed June 9, 1976, Ser. No. 694,448
Claims priority, application France, June 9, 1975, 75.18174
Int. Cl.² F25B *5/00, 7/00, 39/02*
U.S. Cl. 62—117 **14 Claims**



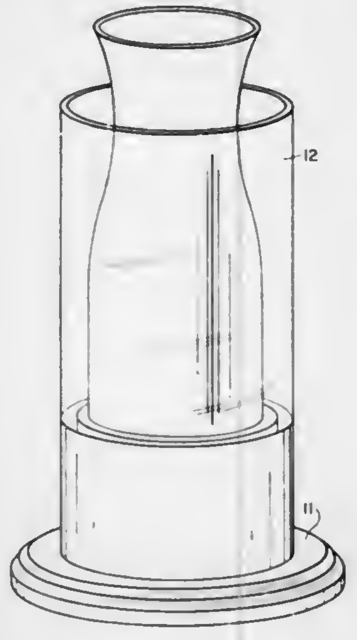
1. A process for producing cold by evaporation at low temperature of a refrigerating fluid passing from a gaseous state to a liquid state or vice-versa, comprising the steps of (a) compressing, in a compression zone, a gaseous phase of refrigerating fluid so as to obtain a compressed gaseous phase and dissolving it, at least partly, in a liquid solvent phase so as to obtain a solution, transferring at least a portion of the compression heat and of the dissolution heat to an external cooling fluid, (b) cooling the solution from step (a) as indicated in steps (d) and (f), so as to obtain two liquid phases by separation of the mixture constituents, (c) separating the light liquid phase from the heavy liquid phase, (d) placing the heavy liquid phase from step (c) in heat exchanger relationship with the solution to be cooled from step (b) and then sending said heavy liquid phase, as solvent phase, to step (a) for dissolving a further amount of compressed gaseous phase, (e) expanding the light liquid phase and vaporizing it so as to produce cold, (f) placing the vaporized light phase from step (e) in heat exchange relationship with the solution to be cooled from step (b) and feeding back said vaporized light fraction to the compression zone as gaseous phase of the refrigerating fluid.

4,037,427
REFRIGERATION EVAPORATORS WITH ICE DETECTORS
Doris S. Kramer, 2009 Woodland Drive, Yardley, Pa. 19067
Continuation-in-part of Ser. No. 142,694, May 21, 1971, abandoned, and Ser. No. 373,456, June 25, 1973, abandoned. This application Aug. 26, 1974, Ser. No. 500,309
Int. Cl.² F25D *21/04*
U.S. Cl. 62—128 **4 Claims**

1. Improved refrigeration evaporator means for use within a freezing environment comprising in combination an element for cooling air and condensing moisture from the air, drain pan means mounted under the element for receiving only said moisture said pan means having an outlet for discharging the moisture to a drain; wherein the improvement comprises: continuously self-heated resistor sensing means mounted within the drain pan means, said sensing means having a higher temperature in the presence of air and a lower temperature in the presence of ice; and indicating means mounted without the drain pan means for indicating a change from the higher to the lower temperature.



4,037,428
BEVERAGE COOLER ASSEMBLY
Albert J. Giannotti, 800 Live Oak Ave., Menlo Park, Calif. 94025
Filed Mar. 19, 1976, Ser. No. 668,452
Int. Cl.² F25D *3/08*
U.S. Cl. 62—371 **9 Claims**



1. A beverage cooler assembly comprising a hollow cylinder adapted to receive and surround a beverage container, a base supporting said cylinder in a vertical position, a removable refrigerant container filled with a refrigerant supported by the base within the cylinder, said refrigerant container having flat parallel upper and lower surfaces and side surfaces which have the same shapes as the hollow cylinder and sized to fit closely adjacent to the inner surface thereof, the upper surface of said container receiving and supporting the beverage container disposed in the hollow cylinder in heat transfer relationship therewith to cool the bottom of the beverage container by conductive cooling and the sides by convective cooling, said removable refrigerant container being removable from the cylinder for recooling and reusing.

4,037,429
ADAPTER UNIT FOR CONVERTING A TWO-WHEEL DRIVE VEHICLE TO A FOUR-WHEEL DRIVE VEHICLE
George Edward Britzius, 4669 Olympia Way, Longview, Wash. 98632
Filed Dec. 11, 1975, Ser. No. 639,883
Int. Cl.² F16C *35/00;* **B60K** *17/34*
U.S. Cl. 64—4 **4 Claims**

1. An adapter unit for economically converting a two-wheel drive vehicle having a transmission output shaft driving the rear wheels of the vehicle to a four-wheel drive vehicle having a power transfer unit enclosed in a housing having an access opening to a power input shaft thereof for driving the rear, forward or both forward and rear wheels of the vehicle, the adapter unit coupling the transmission output shaft to the power input shaft of the power transfer unit and comprising:

a housing having a hollow sleeve portion integral with and connected to a rigid plate extending normal thereto, the plate having a machined surface adapted to be connected to said power transfer unit over said access opening,

a drive shaft extending coaxially through said sleeve portion and including means on one end thereof adapted to drivingly engage said transfer unit input shaft and means on the other end thereof adapted to be in driven engagement with said transmission output shaft,

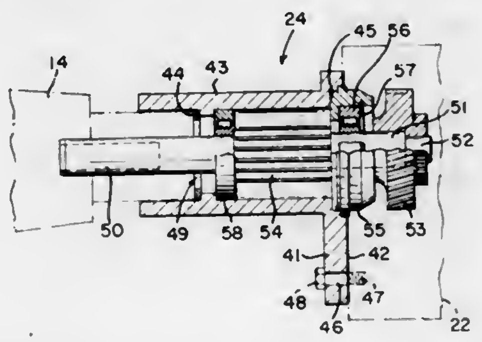
at least one bearing supporting said drive shaft for rotation in said sleeve portion,

a recess in said machined surface of the rigid plate coaxial with said sleeve portion,

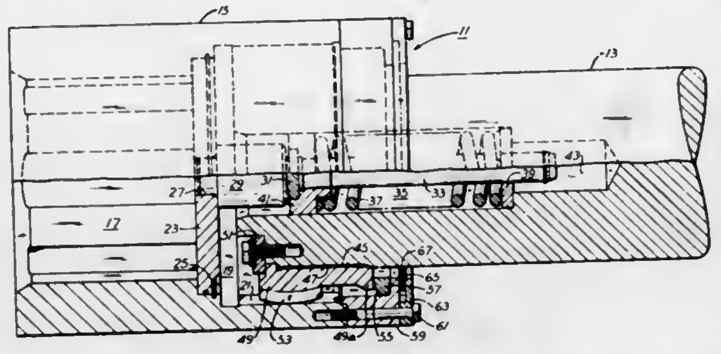
a bearing adapter mounted in the recess extending beyond the plane of the machined surface of the adapter plate to be received in the access opening of the power transfer unit,

a bearing supported by said bearing adapter supporting said drive shaft of the adapter unit for rotation, and

sealing means sealing the adapter unit against environmental damage.



4,037,430
ROLL-END SPINDLE COUPLING
John Wright, Baltimore, Md., assignor to Koppers Company, Inc., Pittsburgh, Pa.
Filed Nov. 17, 1975, Ser. No. 632,672
Int. Cl.² F16D *3/18*
U.S. Cl. 64—9 R **3 Claims**

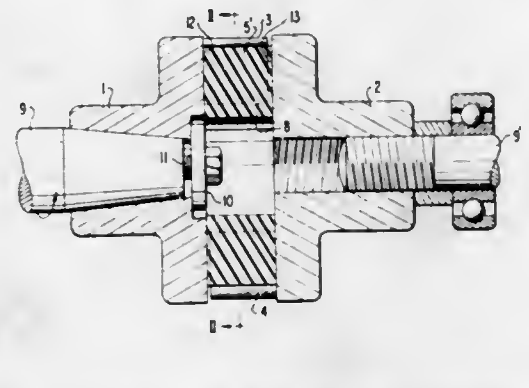


1. In a spindle coupling comprising a shaft and a roll end sleeve on one end of said shaft, and resiliant means mounted to said shaft that coacts with a plunger abutting a thrust plate in said sleeve, and a flex hub surrounding the end of said shaft, with carrying means drivingly connecting said sleeve to said shaft, the improvement therewith comprising:

a. first means disposed around said shaft, said first means coacting with and being in continous operable engagement with said flex hub; and

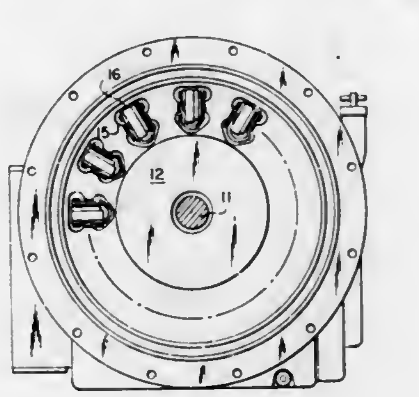
b. second means secured to said sleeve and coacting with and maintaining said first means in continuous operable engagement with said flex hub, said first means and second means cooperating to prevent an external axial force from being applied to the driving or driven machine bearings.

4,037,431
COUPLING DEVICE USED IN ONE-WAY ROTATING DRIVE
Takao Sugimoto, Akashi, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Kobe, Japan
Filed May 19, 1976, Ser. No. 687,813
Claims priority, application Japan, May 20, 1975, 50-67951[U]
Int. Cl.² F16D *3/64*
U.S. Cl. 64—14 **2 Claims**



1. In a coupling device for use in a one-way rotatingdrive arrangement, said coupling device being of the type which is composed of a pair of flanges connected to a drive shaft and to a driven shaft respectively, the improvement comprising; at least two pair of claw members, each pair consisting of one claw projecting along the drive shaft axis from one of the flanges and a second claw projecting along the drive shaft axis from the other of said flanges, each said claw member having generally an L-shape with the concave portion facing its paired claw member; and an elastic circular member, having first and second group of radial projections alternately provided on its periphery, mounted between said flanges, each of said first group of radial projections having two convex surfaces mating with the concave surfaces of said pair of claw members, each of said second group of radial projections being substantially smaller and lighter and having a different shape than those of said first group.

4,037,432
RESILIENT DRIVING CONNECTION
Karl Gustav Ahlen, Stockholm, Sweden, assignor to S.R.M. Hydromekanik Aktiebolag, Stockholm-Vallingby, Sweden
Filed Dec. 31, 1975, Ser. No. 645,661
Int. Cl.² F16D *3/14*
U.S. Cl. 64—27 L **14 Claims**



1. A resilient driving connection rotatably drivingly connecting a driving part and a driven part, comprising:

a plurality of drive units spaced about the axis of rotation of the parts, each unit comprising a drive member rigid with the driving part and a driven member rigid with the driven part, first opposed surfaces on the driving and driven members through which drive normally occurs, second opposed surfaces on the driving and driven members substantially free of driving forces during normal drive, but through which force is transmitted upon braking wherein the driven member drives the driving member, both pairs of opposed surfaces extending in planes which are radial or parallel to radial planes so that the driving and driven members can move radially relative to each other to correct for misalignment between the driving and driven parts,

first resilient means interposed between the first opposed surfaces, said first resilient means having means for absorbing energy and becoming stiffer as the driving load increases, such that the resonant frequency thereof increases sufficiently rapidly with increased load that it stays above the actual frequency of vibration of the resilient means during normal operation thereof, and second resilient means interposed between the second opposed surfaces, said second resilient means having a stiffness less than that of the first resilient means so as to permit relative movement of both pairs of opposed surfaces for correcting for misalignment, but sufficiently stiff to keep the second opposed surfaces apart without backlash during substantially all normal driving conditions,

said first resilient means comprising a metallic strip located between the first opposed surfaces and bent so as to normally resiliently engage both of said first opposed surfaces and to at least partially straighten out and become stiffer as the driving load increases, and said second resilient means comprising a metallic strip between the second opposed surfaces arranged to normally space the second opposed surfaces apart from each other while maintaining the first metallic strip in contact with the first opposed surfaces.

4,037,433

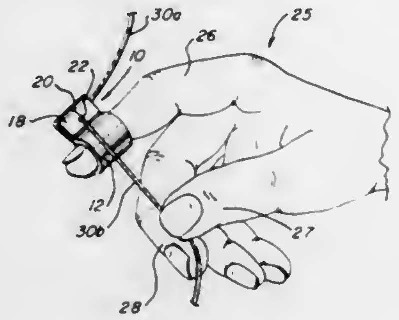
HAND KNITTING AID

Blanche V. Weber, 1350 Pontiac, Denver, Colo. 80220

Filed Aug. 28, 1975, Ser. No. 608,581

Int. Cl.² D04B *3/04;* **B65H** *59/14*

U.S. Cl. 66—1 A **2 Claims**



1. Yarn tensioning means for knitting and the like comprising:

a. ring-like support means for mounting adjacent a fingertip of a user;

b. leather flange means upstanding generally radially from said ring-like support means, extending a distance from said support means;

c. there being a bore through said leather means with a rough interior surface to induce friction on yarn passing therethrough; and

d. there being a slit extending into said flange means providing a yarn ingress to said bore.

4,037,434

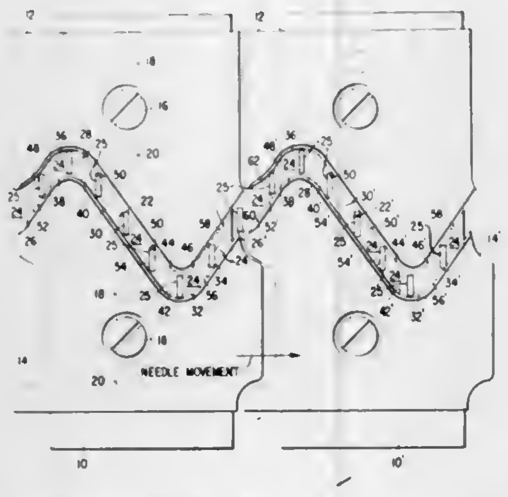
CLOSED CAM TRACK FOR A CIRCULAR KNITTING MACHINE

Gerard Durville, Geneva, Switzerland, and Charles Hamilton Wunner, Charlotte, N.C., assignors to The Singer Company, New York, N.Y.

Filed Mar. 26, 1976, Ser. No. 670,802

Int. Cl.² D04B *15/32*

U.S. Cl. 66—57 **7 Claims**



1. Needle actuating camming for a circular knitting machine defining a closed cam track with opposite sides to engage the butts of needles and alternately move the needles repeatedly between cast-off and latch clear positions, the cam track including straight needle raising portions, straight needle lowering portions, and curved bridging track portions between the raising and lowering portions of the track, the bridging portions each having one side defined by a single circular arc which is tangent to a corresponding one side of each of a raising and a lowering portion of the closed cam track, and having an opposite side which is defined by two circular arcs both with a radius equal to the first mentioned circular arc and with one of such two circular arcs tangent to the raising portion of the closed cam track on the side opposite the said one side thereof, the other being tangent to the lowering portion of the track on the side opposite its said one side.

4,037,435

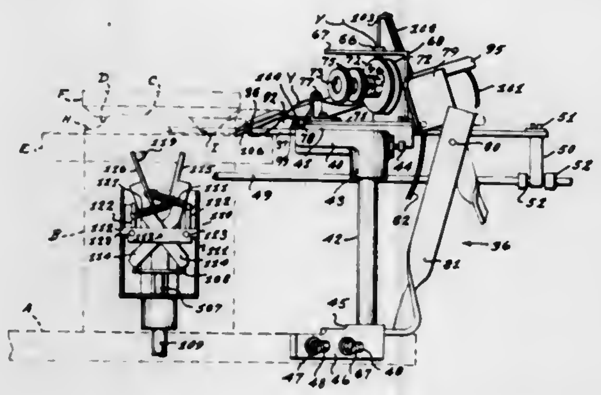
AUXILIARY FEED ATTACHMENT FOR A CIRCULAR KNITTING MACHINE

Everardo Tapia, Mexico City, Mexico, assignor to Speizman Industries, Inc., Charlotte, N.C.

Filed Apr. 17, 1968, Ser. No. 721,988

Int. Cl.² D04B *15/54, 23/22, 27/02*

U.S. Cl. 66—142 **3 Claims**



1. An auxiliary yarn feeding attachment for a circular knitting machine of the type that knits a welt-like fabric portion by supporting an initial portion of the fabric above the knitting level until the welt-like portion is completed by knitting the initially supported portion with a subsequent course of the fabric, said attachment comprising an auxiliary yarn feeding member movably mounted on said circular knitting machine adjacent the needle circle thereof, means for selectively positioning said auxiliary yarn feeding member sequentially in an inoperative withdrawn position at which it retains an auxiliary yarn in a non-feeding disposition, a feeding position at which the auxiliary yarn is fed temporarily to the needle circle for knitting in said welt-like fabric portion, and an intermediate position at which the auxiliary yarn is positioned out of knitting engagement with the needle circle and is drawn by the previously knit portion thereof in a constricting loop around the welt-like fabric portion prior to completion thereof, thereby substantially reducing the tubular size of said welt-like fabric portion at said constricting loop, and auxiliary yarn clamping and cutting means mounted on the circular knitting machine adjacent the needle circle and spaced from said auxiliary yarn feeding member in the direction of needle circle rotation, said clamping and cutting means being operable to hold the leading end of said auxiliary yarn during movement of said auxiliary yarn feeding member to said feeding position for extension of said auxiliary yarn from said clamping and cutting means into engagement with said needle circle to initiate knitting, to release said auxiliary yarn following said initiation of knitting and to cut the trailing end of the auxiliary yarn during movement of the auxiliary yarn feeding member to its inoperative withdrawn position.

4,037,436

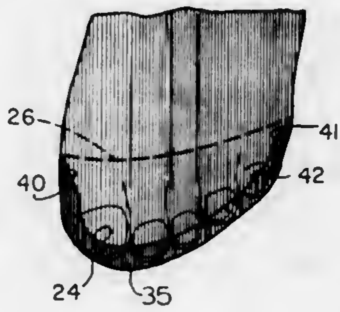
TOE CONSTRUCTION AND METHOD FOR SEAMLESS HOSIERY PRODUCTS

Nicholas Wehrmann, Wilkesboro, N.C., assignor to Ithaca Textiles, Inc., Wilkesboro, N.C.

Filed Sept. 2, 1975, Ser. No. 609,783

Int. Cl.² A41B *11/02;* **D04B** *9/46*

U.S. Cl. 66—186 **3 Claims**



1. In a seamless circular knit product such as hosiery, panty hose anklets, and the like, having a tubular seamless knit foot portion formed of courses knit of body yarn and terminating in an initially open-ended toe portion, said toe portion open end being closed by stitching along a trim line substantially arcuate in shape in the relaxed fabric to provide upper and lower sides thereof, the upper side when worn being adapted to rest above and the lower side to rest below the toes of the wearer, said upper side including courses and partial courses of reinforcing thread of selected length designed to provide a reinforced area having the outer edge thereof defined by said stitched trim line and having the inner edge thereof defined by a boundary line which in the state of the toe portion fabric being relaxed follows a series of connected substantially straight lines and in the worn stretched state assumes a substantially arcuate shape and with a major portion thereof being substantially parallel to said arcuate stitched trim line, said inner edge define by said lines following a semi-hexagonal shape in the relaxed fabric state and adapted to assume an arcuate shape in the stretched fabric shape, said reinforcing thread courses being formed such that said toe portion when worn provides a narrow curved band of reinforced fabric limited to the upper outer extremities of the toes of the wearer, a selected width band of reinforced fabric over the lower extremities of the toes of the wearer and outer edge reinforced portions adapted when worn to provide reinforcement over the ends of all the toes of the wearer.

4,037,437

MACHINE FOR THE PROCESSING OF HIDES AND SKINS

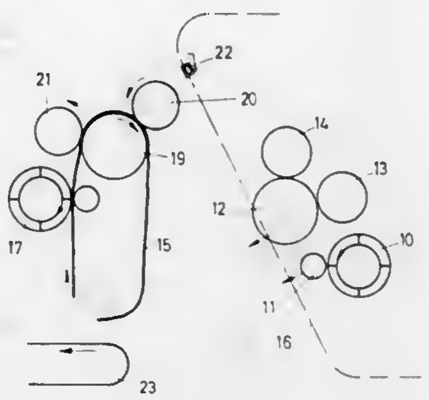
Gerhard Richter, and Peter Pöppel, both of Regensburg, Germany, assignors to USM Corporation, Boston, Mass.

Filed May 26, 1976, Ser. No. 690,053

Claims priority, application Germany, May 28, 1975, 2523555

Int. Cl.² C14B *1/06*

U.S. Cl. 69—42 **10 Claims**



1. A machine for processing hides and skins comprising a frame and first and second processing units mounted in the frame, the first processing unit comprising a first processing member mounted for rotation in the frame, first roller means arranged in the frame to grip the hide or skin inserted in the machine, and means for rotating rollers of the first roller means to draw the hide or skin past the first processing member to process a first portion of the hide, and the second processing unit comprising a second processing member mounted for rotation in the frame, second roller means arranged in the frame to grip the hide or skin inserted in the machine not later than commencement of processing of the first portion of the hide by the first processing unit, and means for rotating rollers of the second roller means while the hide is gripped by the second roller means to draw the hide or skin past the second processing member to process the remainder of the hide not processed by the first processing unit, said machine also comprising a conveyor device by which the hides or skins are inserted upwardly, from below the first processing unit, into the first processing unit between rollers of the first roller means and between rollers of the second roller means.

4,037,438

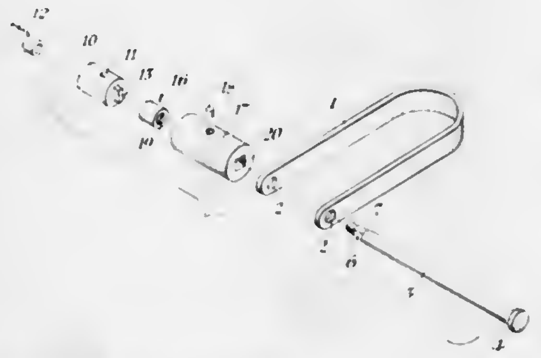
LOCKING DEVICE

Peter B. Miller, Fort Lauderdale, Fla., assignor to Milschar Manufacturing & Development, Fort Lauderdale, Fla.

Filed Sept. 8, 1975, Ser. No. 611,076

Int. Cl.² E05B *73/00*

U.S. Cl. 70—18 **1 Claim**



1. A locking device comprising:

a securing member and a latching means,

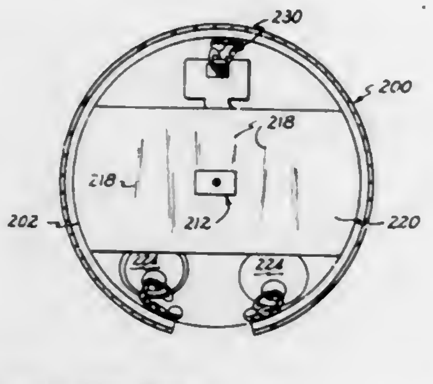
said securing member including an intermediate means, a first end means connected to one distal end of said intermediate means, and a connecting means connected to a

portion of said intermediate means for preventing separation from and relative rotational movement in relation to said latching means, and
said latching means including a housing, a rotatable member held in said housing, and a locking mechanism connected in said housing and to said rotatable member,
said housing and rotatable member including first and second mating means for mating with said connecting means to prevent relative separating movement and relative rotational movement,
said connecting means including a first threaded means to prevent relative separating movement and second means to prevent relative rotational movement,
said first mating means including a mating thread for mating with said first threaded means,
a locking mechanism opening means,
said second mating means includes a non-circular portion that is an opening in said housing, and
said second means includes a non-circular portion in mate with said second mating means.

4,037,439

KEY HOLDING APPARATUS

James D. Youd, 113 Metcalf Road, N. Attleboro, Mass. 02760
Continuation-in-part of Ser. No. 584,694, June 6, 1975. This application Mar. 1, 1976, Ser. No. 662,354
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 R **12 Claims**



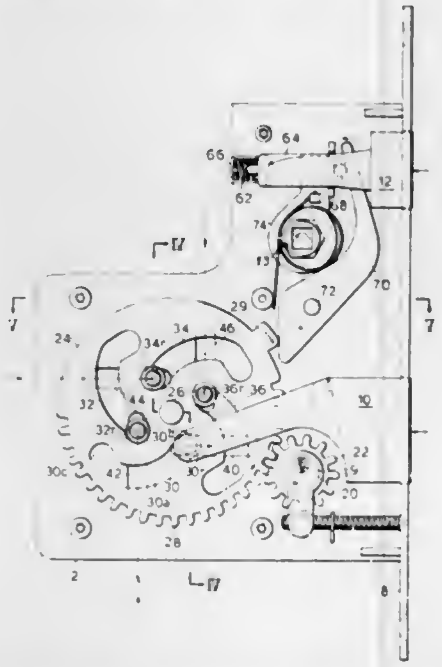
1. A key case comprising
a. a generally flat circular housing having a top, a bottom and a side wall extending therebetween,
b. a generally flat circular base member disposed within the housing, the base member formed with a plurality of key receiving pockets formed in the base member, and
c. means rotatably mounting the base member relative to the housing, whereby the base member may be grasped and rotated to bring a selected key receiving slot into alignement with the slot.

4,037,440

SECURITY LOCK FOR DOORS

Joseph Shabtai, 41 Geulim St., Holon, and Simon Assaraf, 91 Rothschild St., Rishon Lezion, both of Israel
Filed July 7, 1975, Ser. No. 593,554
Claims priority, application Israel, June 25, 1975, 47557
Int. Cl.² E05B *59/00*
U.S. Cl. 70—108 **3 Claims**

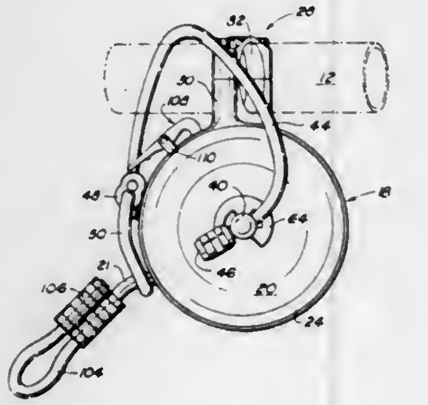
1. A rim locking device mountable within, and adjacent to, one side of, a door in a door frame, comprising: a casing including a pair of side plates; a cylinder rotatably disposed between the side plates and having a keyhole for receiving a key to rotate the cylinder; a gear carried by the outer surface of said rotatable cylinder; a toothed-wheel rotatably disposed between the side plates and meshing with said gear for rotation thereby upon rotation of the cylinder by the key; and a plurality of locking bars coupled to said toothed-wheel and projectable thereby into locking engagement with the door frame, one of said locking bars being a short locking bar projectable from and withdrawable into said one side of the door, the remaining locking bars being long locking bars projectable from and withdrawable into the remaining three sides of the door, said toothed-wheel being formed with a cam surface for each locking bar, each locking bar carrying at its inner end a cam follower movable along the respective cam surface of the toothed-wheel, at least one of the side plates being formed with a guiding slot for each locking bar guiding the movement thereof such that the rotation of the toothed-wheel in one direction projects the outer ends of the locking bars from the door into locking engagement with the door frame, and the rotation of the toothed-wheel in the opposite direction withdraws the locking bars into the door; said device further including a tongue projectable from said one side of the door into a recess in the door frame, a spring urging the tongue to its projecting position, a lever pivotable to withdraw the tongue from the door frame, and an abutment carried by said toothed-wheel for pivoting the lever to withdraw the tongue when the toothed-wheel has been rotated in the direction to withdraw the locking bars.



4,037,441

BICYCLE LOCK

Robert D. Ray, 1000 E. 9th, Edmond, Okla. 73034
Filed Mar. 1, 1976, Ser. No. 662,556
Int. Cl.² B62H *5/00*
U.S. Cl. 70—233 **15 Claims**



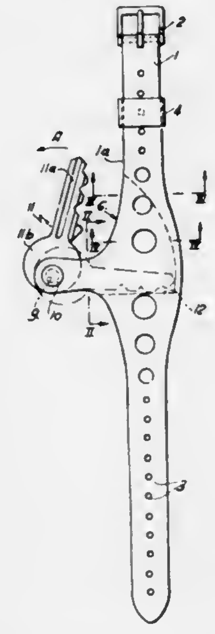
1. A bicycle lock comprising:
a reel housing having a cable opening therein;
a shaft projecting through said housing;
a cable reel mounted on said shaft for rotation in said housing;
spring means connected between said shaft and said cable reel for resiliently opposing rotation of said cable reel in one direction on said shaft;

a guide ring detachably secured to said housing opposite said opening;
a securing cable wound upon said cable reel and projecting through said cable opening and through said guide ring;
a safety cable having one end connected to said housing, a second end secured to said guide ring and connected by said guide ring to the securing cable extended therethrough, and a bight portion between said ends of said safety cable for looping over and engaging a part of the frame of the bicycle; and
a two-part bar clamp secured to the outer side of said housing and including:
  a base part having a semicircular opening therein;
  an upper cap part having a semicircular opening therein dimensioned to mate with the semicircular opening in said base part; and
means for detachably engaging said base part and said upper cap part with each other and about a portion of a bicycle frame.

4,037,442

CLOAKROOM BRACELET FOR BATHING ESTABLISHMENTS AND THE LIKE

Heinz Staude, and Fritz Goesswald, both of Peiting, Germany, assignors to Eulit Werk Staude & Co. KG, Peiting, Germany
Filed Apr. 29, 1976, Ser. No. 681,701
Claims priority, application Germany, Sept. 4, 1975, 7527905; Jan. 29, 1976, 2603264
Int. Cl.² A47G *29/10*
U.S. Cl. 70—456 R **4 Claims**

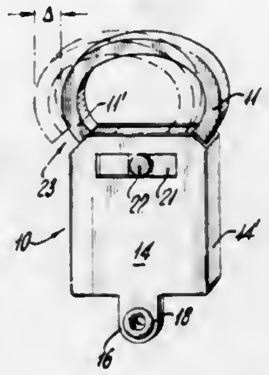


1. In a cloakroom bracelet for bathing establishments and the like, consisting of a flexible strap made of synthetic resin, which has at one end a buckle and in its middle part a recess for the accommodation of a flat key having a key handle joined on a pivot to the strap, the improvement comprising wherein said recess is designed as a pocket which opens toward one of the narrow faces of the strap, said key handle being pivotal into or out of said pocket about an axis extending at right angles to the plane of said strap and piercing said strap, said strap, on the side where the mouth of said pocket is, having two parallel lugs set at a distance apart and extending substantially at right angles to said narrow face and in the plane of said strap, each of said lugs having near its free end a hole for a pivot axis of said key located between said lugs, said key when in its swung-in position extending substantially at right angles to the lengthwise direction of said strap.

4,037,443

KEY RETAINING DEVICE

Alfred E. Motzer, Meriden, Conn., assignor to The W. E. Bassett Company, Derby, Conn.
Filed Oct. 5, 1976, Ser. No. 729,762
Int. Cl.² A47G *29/10*
U.S. Cl. 70—459 **8 Claims**

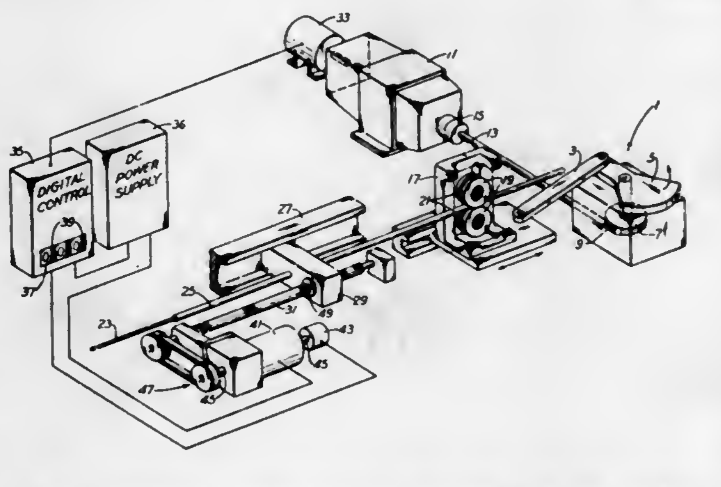


1. In a key retainer or the like, a case defined by and between spaced edge-connected front and back panel members, with an opening at one end, a slide member having a body movably carried by said case between said panel members, said slide member integrally including a key-receiving generally C-shaped bail including a first end integral with said slide, said first bail end extending in a first direction away from said body and through said opening and beyond said one end of said case, guide means coacting between said slide member and at least one of said panel members and determining a range of slide movement transverse to said first direction and within said case, the other end of said bail being otherwise spaced from said body such that (a) in one limiting position of slide guidance the said other end of said bail coacts with the adjacent region of said case to define an effectively closed key-retaining bail loop and (b) in a second position of slide guidance said other end of said bail is spaced from said case to an extent permitting selective key application to or removal from said bail, and spring means coacting between said slide and case and resiliently urging said slide in the direction of said one position, whereby any force tending to pull an assembled key in said first direction away from said case is totally sustained by said guide means, normally and substantially without risk of slide displacement from said one position.

4,037,444

SHELL FEED SYSTEM FOR A COLD PILGER MILL

Harry Calhoon Ledebur, Canfield, and Floyd William Diehl, Jr., Youngstown, both of Ohio, assignors to Wean United, Inc., Pittsburgh, Pa.
Filed Jan. 10, 1977, Ser. No. 758,384
Int. Cl.² B21B *37/00, 17/06*
U.S. Cl. 72—21 **7 Claims**



1. In combination with a cold pilger mill having repetitive

cyclic periods of operation, an improved feed system for feeding a shell into the mill to be reduced thereby, comprising:

feed carriage means,

rotatable feed screw means for advancing said carriage means with a shell,

a power means for rotating said feed screw means to both advance said carriage means from a starting position toward the mill and thereafter to return said carriage means after completing its forward travel.

means for producing a signal representative of the cyclic operational characteristics of the mill, and

control means for receiving said signal and employing it to control the operation of said power means so that said power means drives said screw means during the forward travel of said carriage means to feed the shell into said mill and for thereafter rapidly returning said carriage means to its starting feed position,

said control means includes means for causing said power means to operate to advance the shell at variable preselected lengths or rates of feed.

4,037,445

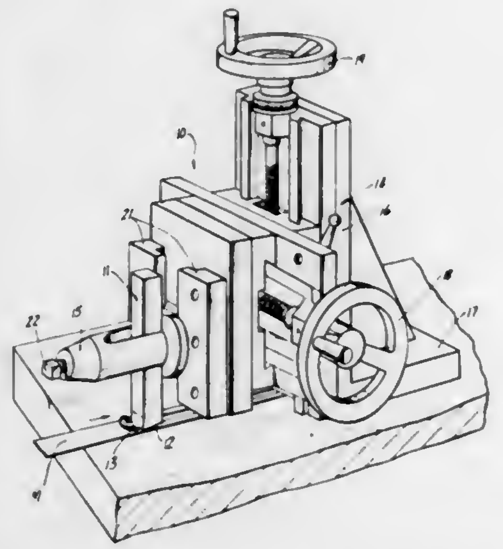
METHOD AND APPARATUS FOR PRODUCTION OF MULTIPLE GAUGE STRIP

Joseph Winter, New Haven; Eugene Shapiro, Hamden, and Warren F. Smith, Branford, all of Conn., assignors to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 642,594, Dec. 19, 1975, Pat. No. 3,992,977, and Ser. No. 645,749, Dec. 31, 1975, Pat. No. 4,015,459, which is a continuation-in-part of Ser. No. 462,755, April 22, 1974, abandoned, said Ser. No. 642,594, is a continuation-in-part of Ser. No. 462,851, April 22, 1974, abandoned. This application Aug. 30, 1976, Ser. No. 718,850

Int. Cl.^{2} B21C *3/10*

U.S. Cl. 72—60 **14 Claims**



1. A method for the production of a multiple gauge metal strip product of generally rectangular cross section possessing regions of two or more variable thicknesses providing a generally stepped surface configuration, said method comprising

shaving said strip by drawing said strip while under back tension through a shaving apparatus whereby surface reduction of the strip is confined to an area comprising from about 5 to about 50% of total surface area, and volume removal of strip material ranges from about 10 to about 60% as measured in relation to initial strip cross sectional area; and

drawing the shaved strip through a die defining said rectangular cross section wherein direct surface-to-surface contact between said strip and said die is prevented, the width dimension of said strip is unchanged and the ratio of strip surface to strip cross sectional area changes by at last 30%.

4,037,446

METHOD OF PRODUCING BRIGHT STEEL FROM ROLLED STEEL WIRE

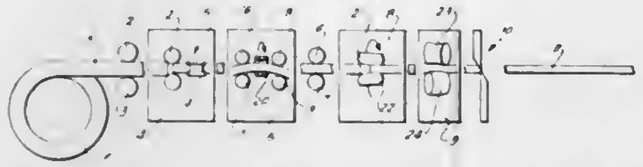
Ralf Fangmeier, Solingen, Germany, assignor to Th.Kieserlin & Albrecht, Solingen, Germany

Filed June 21, 1976, Ser. No. 698,256

Claims priority, application Germany, July 19, 1975, 2532366

Int. Cl.^{2} B21B *15/00*

U.S. Cl. 72—68 **6 Claims**



1. A method of converting rolled steel wire into straight bright steel wire, comprising, in combination, the steps of transporting steel wire along a predetermined path through a straightening means; removing peripheral surface portions from the steeel wire entering the straightening means by transporting the steel wire through a peeling means located upstream of the straightening means; reducing the diameter of the steel wire entering the peeling and straightening means by transporting the steel wire through a roller calibrating means located upstream of the peeling means, the roller calibrating means being operative for reducing the diameter of the wire and imparting thereto a round cross-sectional shape in a manner incidentally producing within the thusly calibrated wire persisting internal stresses which tend to result in a loss of roundness of the cross-sectional shape of the steel wire occurring as the latter emerges from the straightening means; and preventing such loss of roundness by plastically deforming the steeel wire to a point beyond its elastic limit using an orbital wire bender located upstream of the peeling means and downstream of the calibrating means.

4,037,447

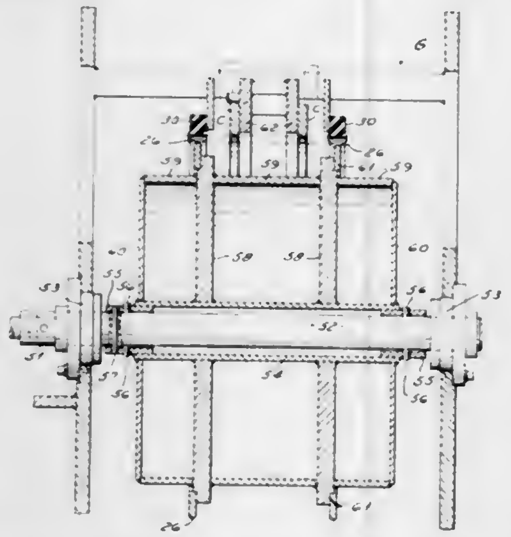
PLANETARY STRAIGHTENING MACHINE

Sheldon E. Sampson, Davisburg, and Don A. Cargill, Bloomfield Hills, both of Mich., assignors to Cargill Detroit Corporation, Clawson, Mich.

Filed Mar. 23, 1976, Ser. No. 669,478

Int. Cl.^{2} B21D *3/16, 13/00, 53/00*

U.S. Cl. 72—92 **12 Claims**



1. A planetary production workpiece processing machine comprising;

a stationary frame, a central rigid annular element rotatably mounted on a fixed axis relative to said frame having circumferentially extending workpiece engaging tooling thereon, cooperating non-rotatably fixed non-yieldably rigid reactive workpiece engaging displacement tooling mounted on said frame in non-concentric relation adjacent to the path of said circumferential tooling extending between workpiece entering and exiting positions, said respective rotating and reactive tooling being formed with varying relative spacing accommodating and producing a planetary rolling drive and reaction engagement of the workpiece with varying relative radial displacement to perform a processing operation by stressing said workpiece beyond its elastic limit.

4,037,448

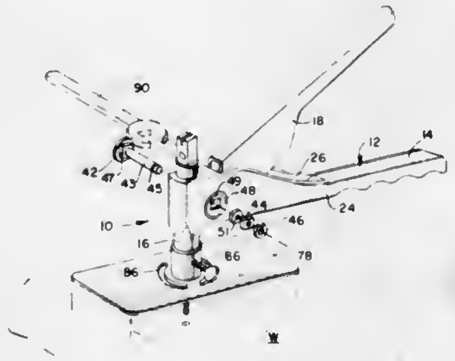
METAL LEVELER TOOL

Anthony E. Di Maio, Georgetown; Alfred E. Bresnahan, Wenham, and Joseph G. Todisco, Georgetown, all of Mass., assignors to Marson Corporation, Chelsea, Mass.

Filed Nov. 25, 1975, Ser. No. 635,065

Int. Cl.^{2} B21D *1/12*

U.S. Cl. 72—114 **10 Claims**



1. Apparatus for use in drawing sheet metal within a dented surface comprising a plate adapted to be received on said sheet metal to span at least a portion of the area of said dented surface, said plate having an opening therethrough, a sleeve mounted on one side of said plate to surround said opening; a metal leveler, said metal leveler including a body having a handle and a housing offset at one end, said housing providing a chamber of substantially cylindrical cross-section between an opening at each end, said housing received in said sleeve with one end opening in longitudinal alignment with said plate opening, a chuck removably received in said chamber and movable longitudinally between two spaced limit positions, a screw having an elongated threaded shank, means for fixedly mounting said screw on said chuck with the threaded shank portion extending longitudinally of said housing through said one end opening, a second handle, means for mounting said second handle on said body for pivotal movement relative to said body handle, means for coupling said second handle and chuck whereupon longitudinal advance of said chuck toward the limit position near said one end opening causes said second handle to pivot in one direction and whereupon pivotal movement of said second handle in the opposite direction causes said chuck to retract longitudinally toward the other limit position nearer the other end opening, and means carried by said chuck for advancing said chuck toward said open end opening so that said screw threadedly engages through said sheet metal in said dent; and means to removably secure said housing in said sleeve.

4,037,449

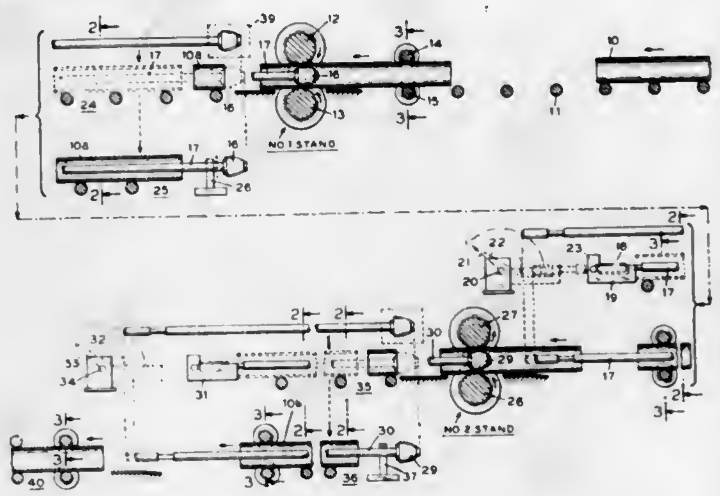
CONTINUOUS FLOW PLUG MILL SYSTEM

James W. Schuetz, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed July 30, 1976, Ser. No. 710,013

Int. Cl.^{2} B21B *17/10*

U.S. Cl. 72—209 **19 Claims**



10. The method of carrying out plug mill operations on a seamless tubular shell, which comprises

a. advancing the shell through a first rolling stage in which the shell is driven through a first mill stand and over a first mandrel supported plug,

b. during said first rolling stage, advancing the shell over a mandrel bar,

c. upon termination of the first rolling stage, transferring the shell and the mandrel bar contained within it laterally,

d. thereafter advancing the shell through a second rolling stage, in which the shell is driven through a second mill stand and over a second mandrel supported plug, and

e. stripping the shell from said mandrel bar during the second rolling stage.

4,037,450

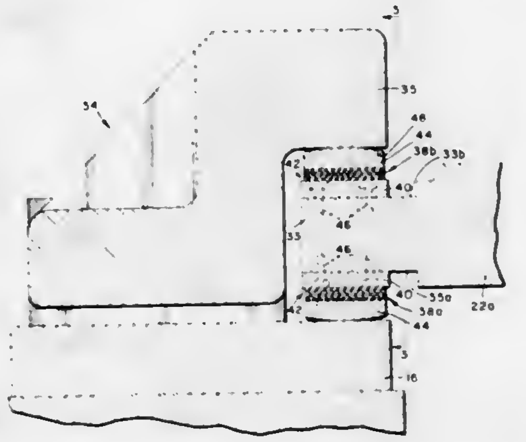
APPARATUS FOR SUPPORTING BEARING CHOCKS IN A ROLLING MILL

Martin Gilvar, Oakham, Mass., assignor to Morgan Construction Company, Worcester, Mass.

Continuation of Ser. No. 632,685, Nov. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 562,636, March 27, 1975, abandoned. This application Oct. 14, 1976, Ser. No. 732,392

Int. Cl.^{2} B21B *31/02, 31/24*

U.S. Cl. 72—237 **4 Claims**



1. In a rolling mill, the combination comprising: a housing; a work roll journalled for rotation between bearing chocks contained in said housing; first restraining means acting on said chocks to oppose forces exerted axially on said roll during mill operation; second restraining means acting on said chocks to oppose roll separating forces exerted transversally on said roll during mill operation, said housing and said first and second

restraining means being suitably dimensioned to accommodate movement of said chocks in the direction of rolling during mill operation; bearing pads positioned between opposed surfaces of said bearing chocks and said first restraining means, each of said bearing pads having integrally joined alternating layers of metal and an elastomer lying in planes perpendicular to the chock axes, the said layers being subjected both to compression between said opposed surfaces and to shear tending to distort said elastomer layers to accommodate chock movement in the direction of rolling as tension is developed in the product being rolled.

4,037,451

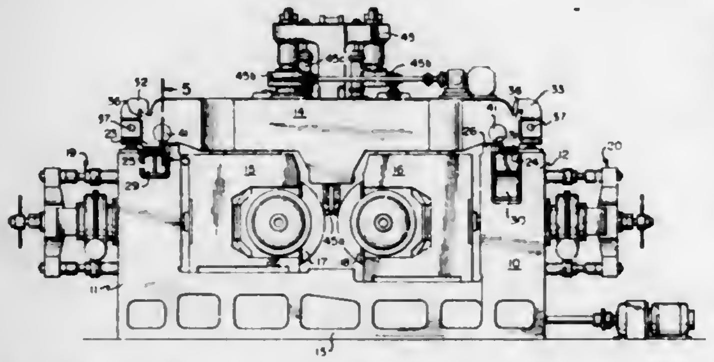
PIERCING AND REELING MILL CONSTRUCTION WITH REMOVABLE CAP

James W. Schuetz, Pittsburgh, Pa., assignor to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed May 4, 1976, Ser. No. 682,919

Int. Cl.^{2} B21B *31/08*

U.S. Cl. 72—238 **11 Claims**



1. A top opening mill for rolling tubular workpieces, which comprises

- a. a lower mill frame structure comprising a base and spaced sets of frame uprights on opposite sides of the mill pass line,
- b. a mill cap extending over the pass line and adapted to connect the top of said sets of frame uprights to form a closed mill frame structure for the containment of removable mill roll modules,
- c. a retractable mill shoe support carried by said cap,
- d. means for releasably clamping said mill cap to said mill frame uprights,
- e. generally horizontal guiding and support means for guiding and supporting said mill cap for longitudinal movement relative to the mill uprights in the direction of said pass line, and
- f. means for controllably moving the unclamped mill cap on said support means, whereby to provide overhead access to the mill rolls.

4,037,452

GROUP GEARING ARRANGEMENT IN A CONTINUOUS ROLLING MILL

Karl Grimpe, Mulheim, and Erich Reth, Duisburg, both of Germany, assignors to Demag Aktiengesellschaft, Duisburg, Germany

Filed May 11, 1976, Ser. No. 685,175

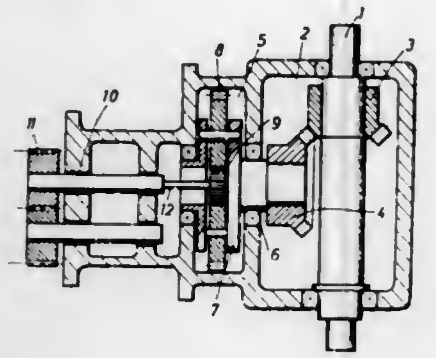
Claims priority, application Germany, May 14, 1975, 2521393

Int. Cl.^{2} B21B *35/02*

U.S. Cl. 72—249 **4 Claims**

1. A gear arrangement for driving the individual stands of a continuous rolling mill, particularly for a wire manufacturing block comprising

- a. a motor;
- b. a common main drive shaft driven by said motor;
- c. a secondary speed drive shaft for each stand;
- d. a bevel gear arrangement disposed between said main drive shaft and each said secondary speed drive shaft; characterized by
- e. a planetary gear connecting said bevel gear arrangement to each said secondary speed drive shaft, and



- f. the sun gear of said planetary gear is fixed on one end of said secondary speed drive shaft outside the bearings therefor.

4,037,453

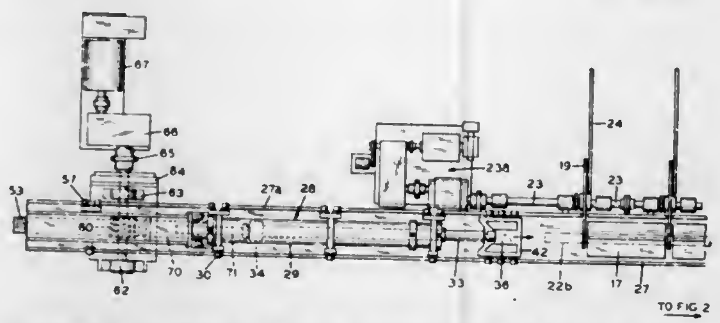
SHELL PUSHER FOR PLUG MILL OR THE LIKE

Robert A. Remner, Sewickley, and Leroy V. Rowland, Evans City, both of Pa., assignors to Aetna-Standard Engineering Company, Ellwood City, Pa.

Filed May 4, 1976, Ser. No. 682,917

Int. Cl.^{2} B21B *39/06*

U.S. Cl. 72—252 **16 Claims**



6. For use in combination with a plug mill or the like having working rolls for engaging and working a tubular shell and means for returning the shell through the mill after a working pass, a shell pushing system, which comprises

- a. a pusher cylinder and ram having a ram stroke of sufficient capacity to push an unworked shell from a predetermined load position into working engagement with the mill but of insufficient stroke capacity to push an unworked maximum length shell into working engagement with the mill from an initial ram position which is spaced far enough from the mill to accommodate the shell after elongation in the mill,
- b. means supporting said pusher cylinder for movement toward and away from the mill, and
- c. controllable drive means for advancing and retracting said pusher cylinder.

4,037,454

TUBE FORMING

Francis Joseph Fuchs, Jr., Princeton Junction, N.J., assignor to Western Electric Company, Inc., New York, N.Y.

Filed June 10, 1976, Ser. No. 694,499

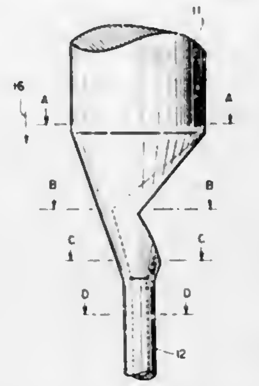
Int. Cl.^{2} B21C *25/02*

U.S. Cl. 72—264 **16 Claims**

1. A method of forming a metallic tube from an unpierced metallic billet, which method comprises the steps of:

- a. extruding the billet along a longitudinal direction through a first die aperture region so configured as to provide the billet with a generally C-shaped cross-section perpendicular to said longitudinal direction; then
- b. further extruding the billet through a second die aperture region so configured as to reduce the diameter of the generally C-shaped cross-section; while simultaneously

- c. guiding both ends of the generally C-shaped cross-section continuously toward and then into contact with one another within said second die aperture region so as to form a tubular shape; and then



- d. welding said contacting ends together so as to form said metallic tube.

4,037,455

PROCESS FOR PRODUCING METAL RINGS

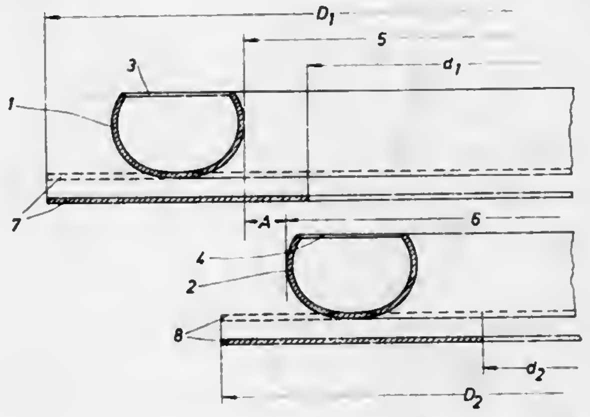
Max Ruf, Obereisesheim, Germany, assignor to Audi NSU Auto Union Aktiengesellschaft, Germany

Filed June 22, 1976, Ser. No. 698,744

Claims priority, application Germany, June 28, 1975, 2528905

Int. Cl.^{2} B21D *43/28*

U.S. Cl. 72—324 **1 Claim**



1. A process for production of two metal rings having a concave C-shaped cross-section, each open in axial direction, in particular for annular sealing members, the outside diameter of the one ring being slightly smaller than the inside diameter of the other ring, comprising the steps of providing an annular strip the outside diameter of which is larger than the outside diameter of a strip as required for the larger ring if produced singly and after the annular strip has subsequently been deep-drawn, will correspond to the outside diameter of a strip as required for the larger ring if produced singly and the inside diameter of which is equal to the inside diameter of a strip as required for the smaller ring if produced singly, preliminarily shaping the annular strip by deep-drawing the strip to initially form more or less parallel planar zones off-set step-wise in cross-section and connected by way of roundings by an intermediate web extending obliquely outward between the parallel zones, so that the web together with its adjacent zones already acquires the initial form of the neighboring branches of the C-shaped cross-sections of the rings, parting intermediate the roundings to form individual annular strip parts and finally shaping by deep-drawing the individual strip parts thus preformed into finished rings having their final C-shaped cross-section.

4,037,456

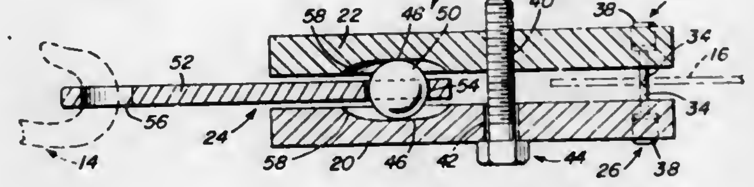
AUTO BODY CLAMP

Davis R. Jarman, Brunswick, Ga., assignor to Virgil Hinson, Brunswick, Ga., a part interest

Filed July 15, 1976, Ser. No. 705,564

Int. Cl.^{2} B21D *1/12*

U.S. Cl. 72—325 **3 Claims**



1. An automobile body clamp, comprising, in combination:

- a. first and second plates attachable to a pulling device, the plates being disposed in an adjacent relation;
- b. jaw means mounted on at least one of the plates for gripping sheet material arranged between the plates; and
- c. clamp means arranged engaging the first and second plates for selectively drawing the plates together at the jaw means, the clamp means including each of the plates being provided with a through hole mating with the hole provided in the other of the plates, and an adjustable fastener arranged in the holes for selectively drawing the plates toward one another, and the clamp means further including fulcrum and attachment means for permitting attachment of the plates to a pulling device while simultaneously forming a fulcrum about which the plates pivot under the influence of the adjustable fastener, with the attachment means including each of the plates being provided with a recess disposed opposite the recess provided in the other of the plates, the holes provided in the plates being arranged between the teeth and the recesses, a ball movably arranged in the recesses, and a tongue connectible to a pulling device and provided with a through opening, the ball being disposed in the opening and mounting the tongue for swivel movement, the recesses being provided with opposed inclines which function as cam surfaces causing the plates to widen at the associated end thereof when a pull on the tongue causes the ball to roll up the inclines.

4,037,457

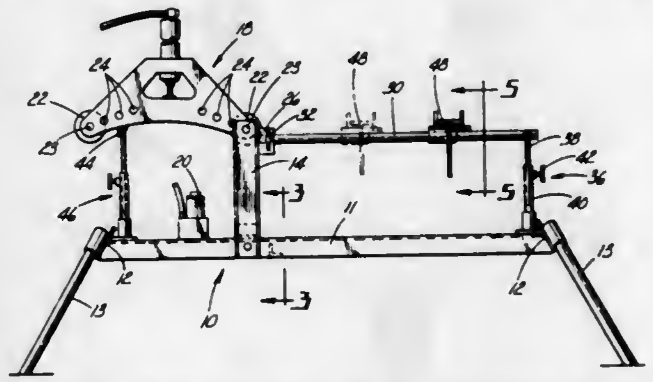
SUPPORT TABLE FOR PIPE BENDER

John E. Henderson, 8404 Locust Drive, Kirtland, Ohio 44094

Filed Sept. 17, 1975, Ser. No. 614,324

Int. Cl.^{2} B21D *7/04*

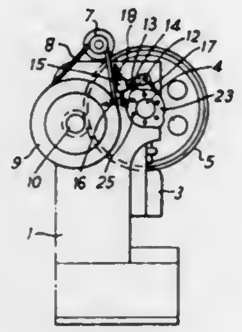
U.S. Cl. 72—389 **8 Claims**



1. A support table for a pipe bender comprising, a pair of upright support members, said upright support members including means to pivotally mount one end of a pipe bender therebetween, first and second support means on opposite sides of said pivotal mounting means, and means to vertically adjust both said first and second pipe support means to a plurality of horizontal positions; whereby various size pipes can be supported within the bender in a level configuration irrespective of the shoe size and position of the bender.

4,037,458
SILENCING METHOD AND SILENCER DEVICE IN CRANK PRESS MACHINE

Fumio Sato, 2855-1, Nishifuzi cho, Onomichi, Hiroshima, Japan
Filed Feb. 26, 1976, Ser. No. 661,683
Claims priority, application Japan, Mar. 4, 1975, 50-26886
Int. Cl.² B21J *9/20*
U.S. Cl. 72—429 **6 Claims**



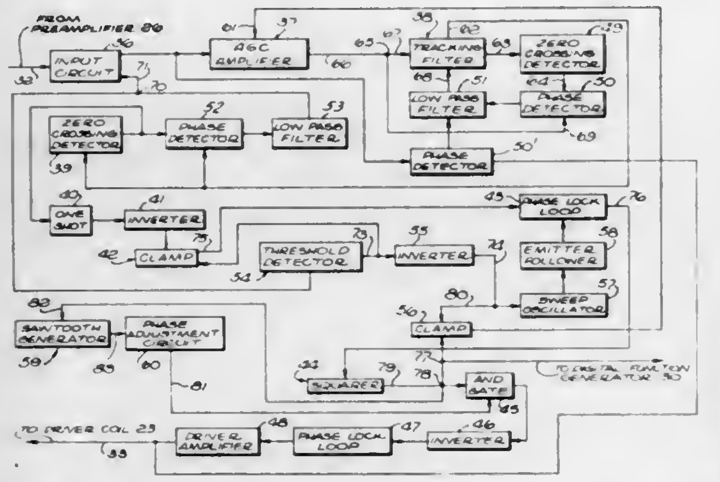
1. In a crank-driven press having a machine frame, a crankshaft rotatable in said frame, a press tool coupled to the crank of said crankshaft and driven thereby in a pressing stroke, the improvement which comprises:

- i. brake means on said machine frame to act on said crankshaft, and
- ii. cam means driven in synchronism with said crankshaft and coacting with said brake means so as to cause said brake means to brake said crankshaft during a period commencing shortly before and terminating shortly after said press tool terminates its pressing stroke,

thereby to reduce vibration and noise of operating said press.

4,037,459
DENSITOMETER

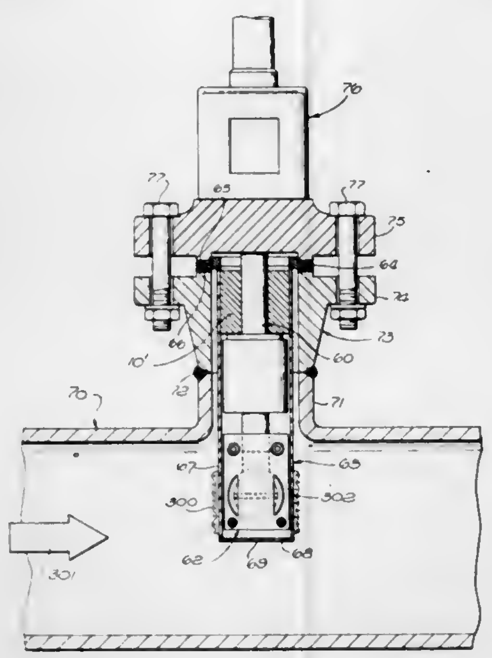
Gerald L. Schlatter, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed June 28, 1976, Ser. No. 700,401
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A **2 Claims**



1. A densitometer comprising: a probe having an input lead and an output lead; a loop circuit having an input lead connected from said probe output lead, a first output lead connected to said probe input lead, and a second output lead, said probe and said loop circuit forming an electromechanical oscillator, said probe including a vane, means connected from said probe input lead to vibrate said vane, a transducer, means connecting said transducer to said probe output lead to produce a first A.C. signal thereof of the same frequency as that at which said vane vibrates, said first A.C. signal having a frequency which is a known invariant function of the density of the fluid in which said vane is immersed, a second A.C. signal being impressed upon said loop circuit second output lead of the same frequency as that of said first A.C. signal; utilization means; output means connecting said loop circuit second output lead to said utilization means; a phase detector for adjusting the phase of said second signal so that it remains the same relative to said first signal independent of changes in said probe, said loop circuit or said fluid, said phase detector having first and second input leads and an output lead, said loop circuit including an input circuit having an input lead connected from said probe output lead, and an output lead connected to said phase detector first input lead, a tracking filter having first and second input leads and an output lead, means connecting said tracking filter output lead to said loop circuit first output lead, said loop circuit second output lead being connected to said phase detector second input lead, a low pass filter having an input lead and an output lead, means connecting said input circuit output lead to said first input lead of said tracking filter, said low pass filter output lead being connected to said second tracking filter input lead, said phase detector output lead being connected to said low pass filter input lead.

4,037,460
DENSITOMETER

Milton H. November, Hacienda Heights, and LaVerne D. Lyon, Claremont, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed July 29, 1976, Ser. No. 709,582
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A **8 Claims**

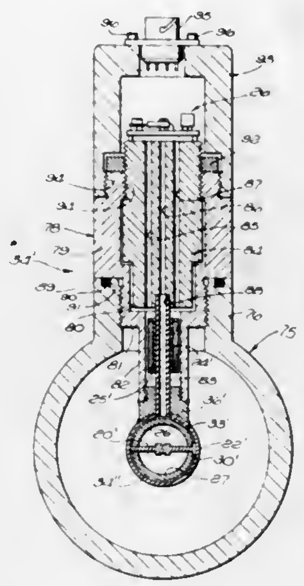


1. A vibration densitometer comprising: an electromechanical oscillator including a probe having input and output leads, a lower end, and a loop circuit having an input lead connected from said probe output lead, and an output lead connected from said probe input lead; a shield fixed to said probe lower end, said probe having a vane supported at said probe lower end; driver means to vibrate said vane, said driver means being located above said vane, an upper mounting; an extension fixed to said upper mounting and attached to said driver means, said shield defining an annular recess; and a perforate annular body positioned around said shield in said recess thereof.

4,037,461
PROBE AND METHOD OF MAKING THE SAME

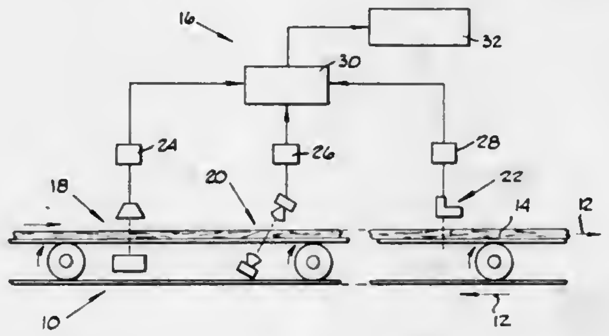
Charles Eveleigh Miller, Boulder, Colo., assignor to International Telephone and Telegraph Corporation, New York, N.Y.
Filed Aug. 5, 1976, Ser. No. 711,739
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 A **3 Claims**

1. A vibration densitometer probe, said probe comprising: a substantially fixed structure; a vane; and means to support said vane on said fixed structure, said vane having a symmetrical embossment on each side thereof, said fixed structure including a hollow cylinder having a symmetrical axis, said vane being generally rectangular in plan view defined between a pair of longitudinal edges fixed relative to and inside said cylinder, said vane having a symmetrical axis coincident with said cylinder axis, said embossments being symmetrically fixed relative to said vane on opposite sides of said vane and said coincident cylinder and vane axes.



4,037,462
METHOD OF AND ASSEMBLY FOR MONITORING THE DRY DENSITY OF A BOARD PRODUCT

Carl George Necker, Littleton, and Richard Rial Colwell, Englewood, both of Colo., assignors to Johns-Manville Corporation, Denver, Colo.
Filed Oct. 12, 1976, Ser. No. 731,381
Int. Cl.² G01N *9/00*
U.S. Cl. 73—32 R **6 Claims**

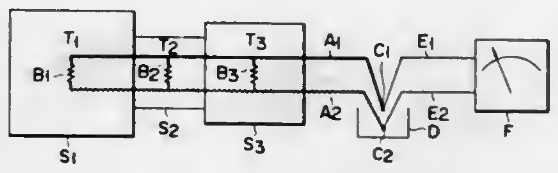


1. A method of monitoring the dry density of a board product made by a wet forming process, which process includes preparing an aqueous slurry of at least some of the compenents making up the product, depositing said slurry on a moving screen to form a moisture-laden sheet thereon, and removing said moisture from said sheet to form said product, said method comprising:

- a. simultaneously and automatically measuring the wet weight, moisture content and thickness of said water-laden sheet while said sheet is on said moving screen; and
- b. from these measurements automatically calculating the dry density of the board product to be produced from the measured sheet.

4,037,463
TEMPERATURE-DETECTING ELEMENT

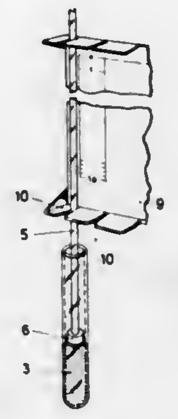
Yoshiaki Arakawa; Isamu Aoyanagi, and Saburo Matsumoto, all of Yokohama, Japan, assignors to Showa Denko Kabushiki Kaisha, Tokyo, Japan
Filed July 8, 1975, Ser. No. 594,070
Claims priority, application Japan, July 10, 1974, 49-78968; July 30, 1974, 49-87142
Int. Cl.² G01K *3/06, 7/04;* **G08B** *17/00*
U.S. Cl. 73—341 **20 Claims**



1. An element for detecting a weighted mean temperature of a given region comprising two metal wires constituting a thermocouple, and electric resistor means consisting of a plurality of heat-insensitive resistors each electrically connected between said two metal wires and each within a different defined section in said region, each resistor having a temperature coefficient of less than 300 ppm/° C absolute, wherein the resistance of said resistor means is at least 30 times the sum of resistance of said two metal wires, and the resistance ratio between any two resistors is the reciprocal of the ratio between the areas of the two sections within which the said two resistors are respectively disposed.

4,037,464
DEVICE FOR TRANSFERRING BLOOD OR A SIMILAR FLUID TO A PIPETTE

Björn Wenander, Saro, Sweden, assignor to Mediplast AB, Molndal, Sweden
Filed June 5, 1975, Ser. No. 584,163
Claims priority, application Sweden, June 24, 1974, 7408222
Int. Cl.² G01N *1/14, 33/16*
U.S. Cl. 73—61.4 **4 Claims**



1. An improved expendable assembly for transfer of blood, comprising a test tube and a pipette for determination of the sedimentation rate of a blood sample, said pipette including a compressible, transparent tube provided at one end with a cylindrical body having an axial through-channel communicating with the pipette, said cylindrical body forming a piston slidingly accommodated in the test tube so that blood is caused to rise in the to a predetermined level by displacing the piston downward into the test tube, and a stand provided with at least two upper and lower vertically spaced series of locking tongues arranged, after the pipette is filled, to secure the pipette in a vertical position by pinching said compressible pipette tube between two adjacent tongues in each one of said spaced-apart series of locking tongues, thereby pinching the pipette tube so as to give the pipette said sample of blood isolated from the interior of the test tube so that determination

of the sedimentation rate of the blood sample can be accomplished.

4,037,465

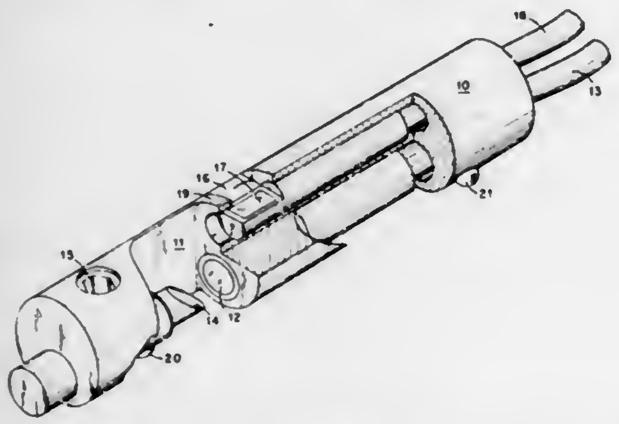
ULTRASONIC PROBE SYSTEM FOR THE BORE-SIDE INSPECTION OF TUBES AND WELDS THEREIN

K. Von Cook; Dan W. Koerner, both of Clinton; Robert A. Cunningham, Jr., Powell, and Horace T. Murrin, Jr., Alcoa, all of Tenn., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 19, 1976, Ser. No. 743,371

Int. Cl.^{2} G01N *29/04*

U.S. Cl. 73—67.8 S **8 Claims**



1. An ultrasonic probe system for the bore-side inpsection of small tubes and welds therein comprising a two-channel probe adapted to be rotated at a selected speed within a tube to be inspected and to be moved axially along said tube a selected amount for each revolution of said probe, said probe including a cylindrical body member, a first transmitter-receiver ultrasonic transducer mounted within said body member, a deep recess provided in the forward end of said body member, said first transducer facing axially and forwardly into said recess, a reflector mounted within said recess and aligned with said first transducer for receiving ultrasound therefrom and directing it into the wall of said tube at a desired angle, said reflector also receiving ultrasound reflected from said tube and directing it back to said first transducer, said body member further provided with a small notch oriented at 90° and rearward from with respect to said recess, a second ultrasnic receiver transducer mounted in said body memberwith the face thereof projecting into said notch for receiving ultrasonic signals from the inside wall of said tube, a ridge positioned between said recess and said notch which serves as a baffle between said respective transducers, said body member further provided with a separated pair of spring loaded biasing means for maintaining said ridge baffle against the inside wall of a tube being inspected, said system further including a first ultrasonic signal generator and receiver unit, an ultrasonic signal receiver unit, rotary joint means for coupling said respective units to said respective first and second transducers, recorder means, a longitudinal potentiometer actuated by axial movement of said probe, a rotation potentiometer actuated by rotary movement of said probe, said respective potentiometers providing respective X and Y inputs to said recorder means, and means for amplifying the received ultrasound outputs of said ultrasound units feeding them to said recorder means, whereby any flaws and/or defects on the outer and inner surfaces of said tube to be inspected are recorded by said recorder means.

4,037,466

METHOD OF REGENERATING A GLYCOL-ETHER TYPE INSPECTION PENETRANT REMOVER BY SOLVENT EXTRACTION

James R. Alburger, 5007 Hillard Ave., La Canada, Calif. 91011

Continuation-in-part of Ser. No. 606,285, Aug. 20, 1975, Pat. No. 3,988,924, which is a continuation-in-part of Ser. No. 577,323, May 14, 1975, Pat. No. 3,992,319, which is a continuation-in-part of Ser. No. 327,559, Jan. 29, 1973, abandoned. This application Oct. 26, 1976, Ser. No. 735,681

Int. Cl.^{2} G01N *19/02*

U.S. Cl. 73—104 **8 Claims**

1. In an inspection penetrant process which includes the steps of (1) applying a water-insoluble dyed liquid pentrant to test surfaces, (2) applying a solvent remover to said penetrant-treated test surfaces to dissolve and remove excess surface penetrant, leaving entrapments of penetrant in any surface cracks which may be present, and (3) inspecting said test surfaces for the presence of flaw-entrapment indications, the improvement which comprises the following step

- a. After using said solvent remover to dissolve dyed liquid penetrant from said test surfaces, withdraw the said used remover from a remover reservoir tank and circulate it through a column of halogenated hydrocarbon extraction solvent, returning said used remover to said remover reservoir tank, said solvent remover comprising a mixture in water of a glycol-ether solvent liquid which is substantially inert to extraction from water solution, said glycol-ether liquid being present in the water mixture at dilution ratios from about 2 – 1 up to about 300 – 1 by halogenated hydrocarbon extraction solvent.

4,037,467

FUEL INJECTOR TESTING APPARATUS

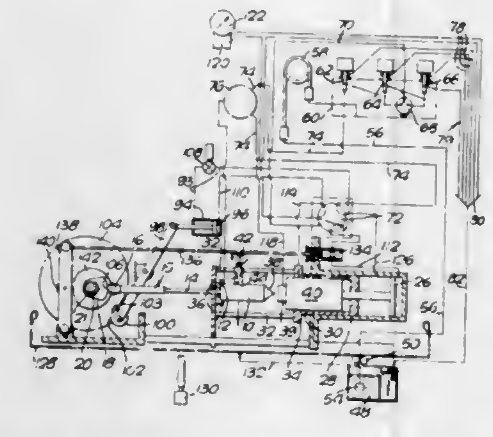
Reginald Stanley Emerson, Buckingham, England, assignor to Leslie Hartridge Limited, England

Filed Oct. 15, 1976, Ser. No. 732,707

Claims priority, application United Kingdom, Oct. 17, 1975, 42668/75

Int. Cl.^{2} G01M *15/00*

U.S. Cl. 73—119 A **12 Claims**



1. Apparatus for testing fuel injectors having their own in-built high pressure pump, the said apparatus comprising: removable motion-transmitting means adapted to engage and actuate the high pressure pump of an injector to be tested on the apparatus, driving means comprising a cam-shaft and a motor driving said cam-shaft for imparting motion to said motion-transmitting means, a fuel-collecting nose assembly to receive the nozzle end of an injector to be tested, and an hydraulic clamp for engaging and thus clamping the nozzle end of the injector into the said fuel-collecting nose assembly, the said motion-transmitting means serving also as a positioning means for positioning an injector when the latter is fitted on the apparatus for testing.

4,037,468

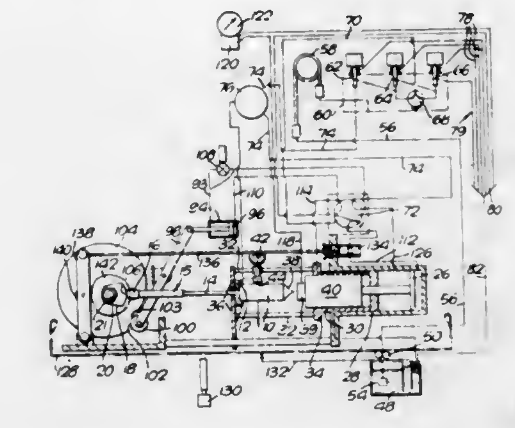
FUEL INJECTOR TESTING APPARATUS

Reginald Stanley Emerson, Buckingham, England, assignor to Leslie Hartridge Limited, England

Filed Oct. 15, 1976, Ser. No. 732,779

Int. Cl.^{2} G01M *15/00*

U.S. Cl. 73—119 A **7 Claims**



1. Apparatus for testing fuel injectors having their own in-built high pressure pump, the apparatus comprising means for axially locating and clamping an injector to be tested on the apparatus, a fuel arm assembly for supplying fuel to an inlet on the injector, and means for mounting the said fuel arm assembly for swinging movement into and out of a fuel-supplying position, the said fuel arm assembly including a valve adapted to make sealing contact with the injector outlet and a spring for urging the said valve into a closed position, the valve being pushed into its fuel-supplying position, against the action of the said spring, when the valve makes sealing contact with the injector inlet.

4,037,469

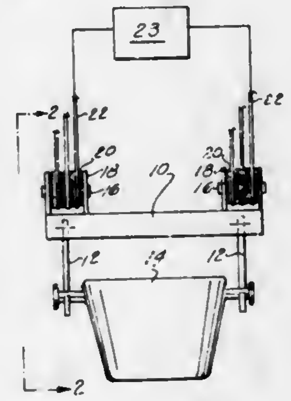
FORCE MEASURING APPARATUS

Kjell Helge Nordstrom, and Rune Nils Allan Flinth, both of Vasteras, Sweden, assignors to Transrail AB, Vasteras, Sweden

Filed Aug. 11, 1975, Ser. No. 603,595

Int. Cl.^{2} G01L *1/22*

U.S. Cl. 73—141 A **16 Claims**



13. In a material handling apparatus, an elongated force-transmitting member having a substantially horizontal axis, a pair of longitudinally extending elongated beam members having central portions engaging spaced portions of said elongated force transmitting member, said elongated beam members deflecting longitudinally in response to forces applied to the end portions of said beam members and to the portion of the force transmitting member engaging the central portions of said elongated beam members and directed in a force measuring direction normal to the longitudinal axes of the elongated beam members, said elongated beam members engaging said force transmitting member in a manner which permits movement of said beam members relative to said force transmitting member transverse to said force meassuring direction, and means for measuring the strain introduced into said beam members due to the application of said forces applied thereto.

4,037,470

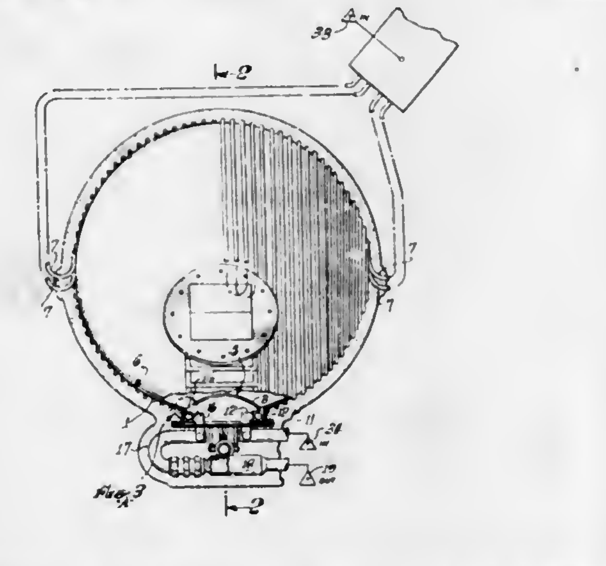
METHOD AND APPARATUS FOR MEASURING HIGH ENERGY LASER BEAM POWER

Kenneth John Mock, Inglewood, and Joseph Daniel Mozic, Playa Del Rey, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 19, 1976, Ser. No. 715,776

Int. Cl.^{2} G01K *17/00*

U.S. Cl. 73—190 EW **16 Claims**



1. A method of instantaneously determining the power of high energy laser beams comprising:

- directing the full laser beam intensity onto a thin-walled partially-reflective heat-conducting tubular substrate formed of a plurality of adjacently-disposed tube-like members,
- absorbing by heat-exchange a predetermined minor fraction of the full intensity in a coolant medium carried by (said tubular substrate) each of said tube-like members and reflecting the balance,
- said predetermined fraction being determined in accordance with the heat input needed to produce a temperature rise in said tubular coolant that is as instantaneous as possible within temperature limits consistent with maintaining the physical integrity of the substrate, and
- measuring said temperature rise for determining the full intensity laser beam power.

4,037,471

OIL LEVEL DETECTION DEVICE IN ENGINE OIL PAN

Yoshinori Okamoto, Kawagoe, and Toshio Tsuruoka, Kitaoizumi, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Japan

Filed May 28, 1976, Ser. No. 691,192

Claims priority, application Japan, June 6, 1975, 50-76452[U]

Int. Cl.^{2} G01F *23/02*

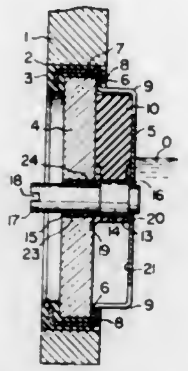
U.S. Cl. 73—324 **6 Claims**

1. An oil level detection device which comprises, in combination:

- a. a receptacle for accommodating therein engine lubricating oil;
- b. a window opening formed in one part of the side wall of said oil receptacle, a packing being fitted around the peripheral edge of said window opening to enable a window glass to be fitted therein to constitute an oil level detection window;
- c. a reflection plate provided within said oil containing vessel in confrontation to the inner surface of said oil level detection window glass, and securely fitted at the peripheral edge thereof to said packing;

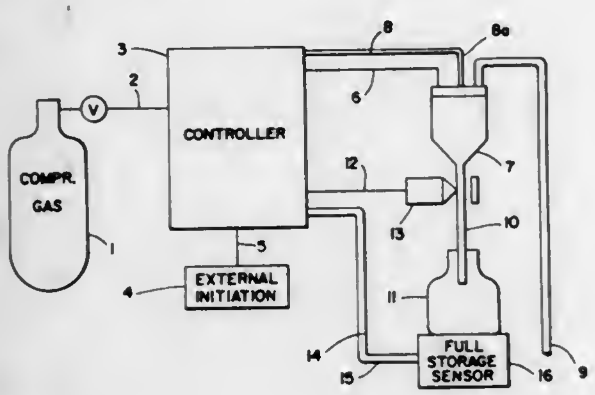
d. wiper means interposed between the inner surface of said window glass and said reflection plate; and

e. a rotational shaft for supporting a base portion of said wiper means, said shaft being supported on said oil level detection window and said reflection plate, and having an operating portion projecting outwardly of said detection window, through which the shaft operates said wiper means.



4,037,472
EXPLOSION-PROOF FLOW SAMPLING APPARATUS

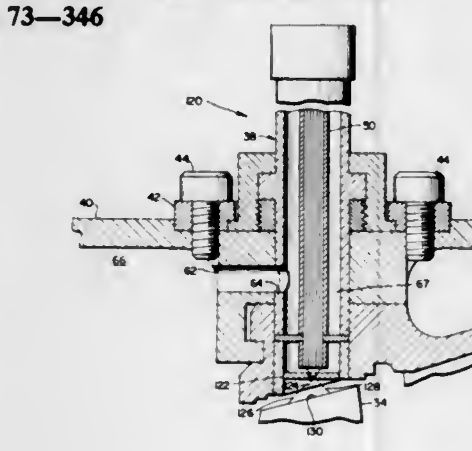
Wendall C. Gates, Santa Cruz, Calif., assignor to Advanced Instrumentation Inc., Santa Cruz, Calif.
Filed Sept. 16, 1976, Ser. No. 723,820
Int. Cl.² G01N *1/14*
U.S. Cl. 73—421 B **21 Claims**

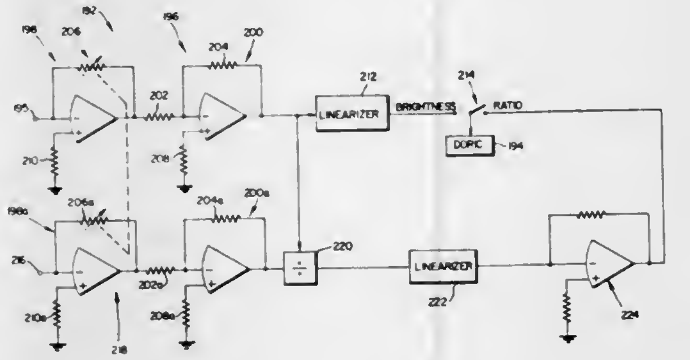


1. An explosion-proof flow sampling apparatus for taking samples from liquids which may contain solids, comprising:
- a sealed chamber;
- an intake conduit connecting the chamber with the flow to be sampled;
- a source of vacuum connected to the chamber;
- a drain conduit at the bottom of the chamber for draining a sample into a storage container below, said drain conduit including a shutoff valve;
- a tube leading downward from the top of the chamber to a level approximately representing a full chamber, said source of vacuum communicating with the chamber through the tube;
- means for sensing a predetermined pressure difference between the interior of the tube and the remainder of the chamber above the level of the liquid; and
- pneumatically-operated controller means operably connected to said sources of pressure and vacuum, to said drain conduit shutoff valve, and to said sensing means, including means for activating the source of vacuum to exert suction on the chamber while holding closed the shutoff valve to draw sample material into the chamber through the intake conduit until the sensing means senses said predetermined pressure difference; means for terminating the vacuum after the sensing of said pressure difference; and means for subsequently opening the shutoff valve to drain the sample through the drain conduit to the storage container.

4,037,473
RADIATION PYROMETERS WITH PURGING FLUID

William A. Compton; Thomas E. Duffy, and Manfred I. Seegall, all of San Diego, Calif., assignors to International Harvester Company, San Diego, Calif.
Continuation of Ser. No. 181,157, Sept. 16, 1971, abandoned. This application Aug. 30, 1974, Ser. No. 501,988
Int. Cl.² G01J *5/04*
U.S. Cl. 73—346 **28 Claims**



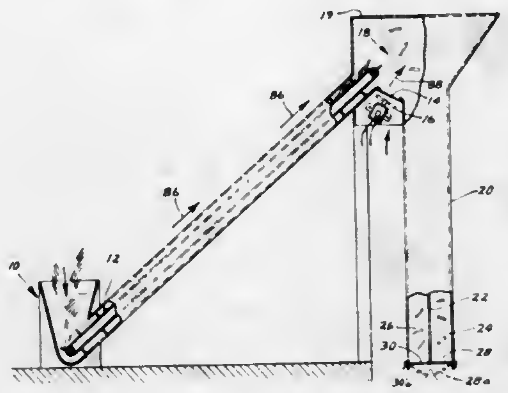


28. The combination of a turbine engine comprising an apertured housing and a wheel rotatably mounted in said housing with means for measuring the temperature of said wheel, said temperature measuring means comprising detector means for generating an electrical signal having a magnitude proportional to the intensity of radiant energy impinging thereon; a fiber optics device for conducting radiant energy to said detector means; a member having an aperture therethrough, said member being located adjacent one end of said fiber optics device with the aperture therethrough aligned with the aperture in said housing, said fiber optics device extending from said apertured member to said detector means, and said apertured member being separated from the end of the fiber optics device thereadjacent only by an airspace, whereby radiant energy emitted from said wheel can pass seriatim through the apertures in said housing and in said apertured member and be directed by said member onto the end of the fiber optics device and thence conducted to the detector means.

4,037,474
REPRESENTATIVE SAMPLING DEVICE

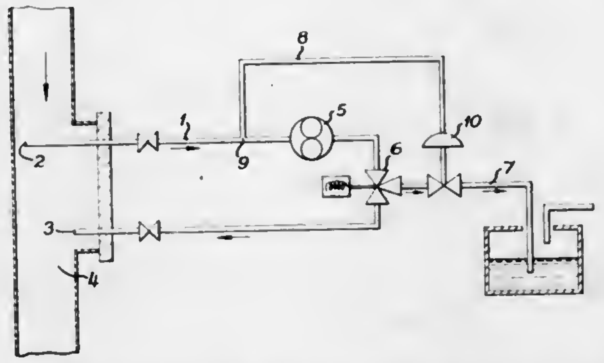
Walter Robert Kost, Minneapolis, Minn., assignor to General Mills, Inc., Minneapolis, Minn.
Filed Feb. 6, 1976, Ser. No. 655,924
Int. Cl.² G01N *1/02*
U.S. Cl. 73—421 R **10 Claims**

1. An apparatus for separating out a representative sample from a collection of various pieces of paper comprising a chamber having an upper and a lower portion, means for conveying the pieces of paper in an even flow into said chamber, means for generating a stream of air to blow through and gently toss the pieces of paper as they enter into said chamber, an elongated tube means adjacent the lower portion of said chamber through which the pieces of paper can free fall due to gravity after said pieces leave the said chamber, the sides of said tube being free of substantial inward convergence from its end adjacent the lower portion of said chamber to the lower portion of said tube to prevent the sliding of the pieces of paper down the sides of said tube which sliding would provide a separating out of such pieces different in make-up from that provided by the free fall of said pieces, and means associated with the lower portion of said elongated tube to divide the pieces of paper into desired proportions.



4,037,475
SAMPLING DEVICE

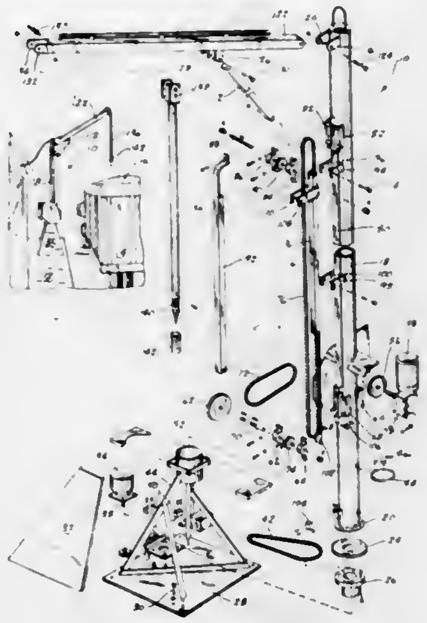
William Henry Topham, Rochester, England, assignor to The British Petroleum Company Limited, London, England
Filed Mar. 23, 1976, Ser. No. 669,637
Claims priority, application United Kingdom, Apr. 18, 1975, 16067/75
Int. Cl.² G01N *1/14*
U.S. Cl. 73—422 R **5 Claims**



1. A liquid sampling device comprising a liquid conduit loop including a pair of ends adapted to be in open communication with a liquid source, a pump connected in said loop intermediate said ends for circulating liquid at a substantially constant rate from one of said ends to the other thereof and a sample outlet valve connected in said loop downstream from said pump for removing a sample of liquid from said loop, said valve having an outlet through which said sample flows, and a back-pressure valve connected between said outlet and said loop upstream of said pump, said back-pressure valve being responsive to the liquid pressures at said outlet and in said loop upstream of said pump and maintaining any difference between the pressure at said outlet and the pressure at said loop upstream of said pump substantially constant.

4,037,476
GRAIN SAMPLING PROBE

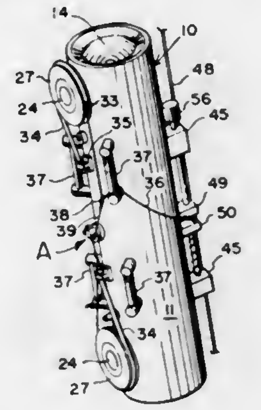
James McCrabb, R.R. 2, West Liberty, Muscatine County, Iowa 52776
Filed June 21, 1976, Ser. No. 697,737
Int. Cl.² G01N *1/08*
U.S. Cl. 73—423 R **22 Claims**



1. A grain sampling probe comprising,
- a base,
- an elongated support pole, mounted to said base,
- a support arm having inner and outer ends, said inner end being pivotally connected to said support pole,
- a vertically disposed elongated hollow probe pivotally connected to said outer end of said support arm,
- a first power output means, and
- mechanical drive means associated with said power output means, said support arm and said support pole to move said probe at a uniform rate of speed downwardly and upwardly.

4,037,477
WATER SAMPLER DEVICE

Shale J. Niskin, 2941 Lucaya, Coconut Grove, Fla. 33133
Filed June 1, 1976, Ser. No. 691,905
Int. Cl.² G01N *1/10*
U.S. Cl. 73—425.4 R **11 Claims**



1. A water sampler device for collecting a sample of water at a desired depth in a body of water comprising a substantially elongated tubular member, valve seat means mounted at each end of said tubular member, substantially spherical valve means mounted on each of said valve seat means in an initially closed position to prevent contaminated surface waters of said body of water from entering into said tubular members, valve rotating means connected to each of said valve means, valve operating means connected to said valve rotating means for consecutively rotating each of said valve means from said closed position to an open position to permit the flow of fluid

through said tubular member when said device has arrived at said depth in said body of water and then to a further closed position to contain water in said tubular member.

4,037,478

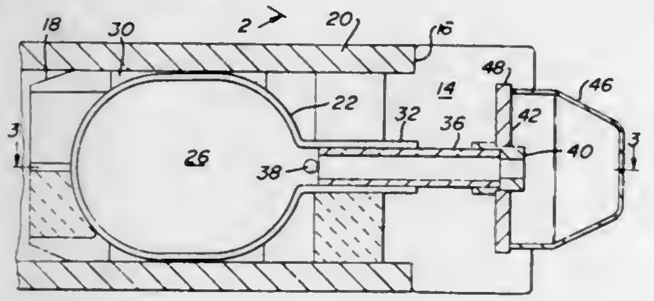
DEVICE FOR COLLECTING SAMPLES OF MOLTEN METAL

Omer P. Cure, Diepenbeek, Belgium, assignor to Electro-Nite Co., Philadelphia, Pa.

Filed Sept. 15. 1976, Ser. No. 723,360

Int. Cl.² G01N *1/12*

U.S. Cl. 73—425.4 R **12 Claims**



1. A device for collecting a sample of molten metal comprising a non-metallic body having a chamber therein, a vessel in said chamber, a filling conduit supported by said body, said conduit having one end communicating with said vessel, a tube of deoxidizing material supported by said body adjacent the other end of said conduit and communicating therewith, and a metal ring coupled to the outer diameter of said tube, said metal ring having a melting temperature greater than the melting temperature of said tube.

4,037,479

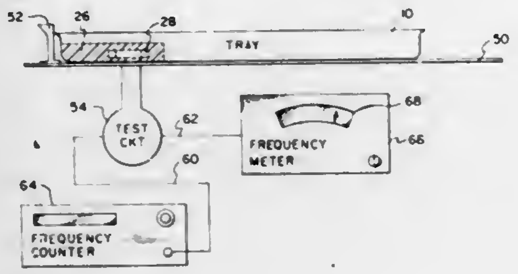
METHOD AND APPARATUS FOR SENSOR ASSEMBLY INSPECTION

William H. Kuntz, Louisville, Ky., and Donald G. Moore, Glencoe, Ill., assignors to Chemetron Corporation, Chicago, Ill.

Filed Dec. 1, 1975, Ser. No. 636,804

Int. Cl.² G01N *29/00*

U.S. Cl. 73—432 R **8 Claims**



1. Apparatus for testing a traysensor arrangement which is suitable for use in a microwave oven to determine whether a ferromagnetic sensor has been properly positioned and assembled on the tray, the testing apparatus comprising:

frequency determinative circuit means for generating an electrical signal,

means for positioning a tray in predetermined relation to said frequency determinative circuit means so that the frequency of said electrical signal is determined by the relative position of said ferromagnetic sensor on said tray, and

frequency comparison meas, coupled to said frequency determinative circuit means, distinguishing among properly and improperly assembled trays, and trays assembled for alternative applications based upon frequency.

4,037,480

MANUAL DEXTERITY APTITUDE TESTING

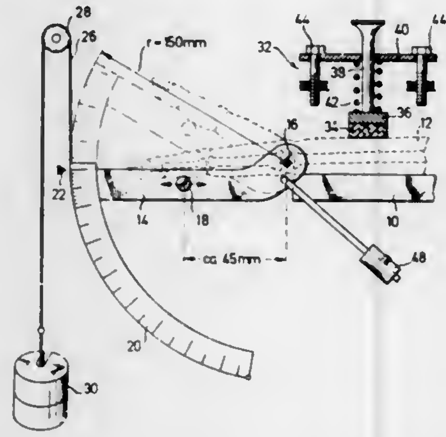
Christoph Wagner, Dortmund-Kirchhorde, Germany, assignor to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v., Gottingen, Germany

Continuation of Ser. No. 403,956, Oct. 5, 1973, abandoned. This application Aug. 21, 1975, Ser. No. 606,725

Claims priority, application Germany, Oct. 7, 1972, 2249208

Int. Cl.² A61B *5/00*

U.S. Cl. 73—432 R **17 Claims**



1. An apparatus for testing a joint system between two relatively movable parts of the arm system of a person in order to determine said person's aptitude for activity requiring manual dexterity, said apparatus comprising first means for supporting one of the two relatively movable parts, second means for supporting the other of the two parts, at least one of the first and second means being capable of rotation about an axis which substantially coincides with an axis of one degree of freedom of rotational movement of the joint system when the two connected parts are supported in the first and second means, each of the first and second means including means for preventing movement of the respective supported part relative to the first or second means in a direction of decreasing stress on the joint system, third means for applying a constant predetermined force to at least one of the first and second means for biassing the latter to rotate in a direction of increasing stress on the joint system, and fourth means for measuring the static deflection of the joint system resulting from the application of the constant force, the measurement being indicative of the person's aptitude for the given activity.

4,037,481

DEVICE FOR MEASURING THE DENSITY OF LIQUIDS

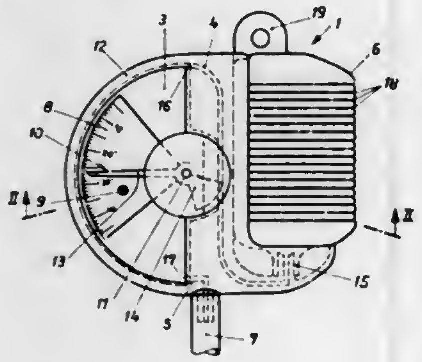
George Edgar Caliahan, Dusseldorf-Nord, Germany, assignor to Helmut Naumann, Dusseldorf, Germany

Filed May 12, 1975, Ser. No. 576,646

Claims priority, application Switzerland, May 21, 1974, 6972/74

Int. Cl.² G01N *9/16*

U.S. Cl. 73—454 **8 Claims**



1. A portable device for measuring the density of liquids, comprising a casing having a chamber formed therein, a floating element pivotally mounted in said chamber to turn about an axis which is arranged to be horizontal when said device is being used to measure the density of a liquid, said floating element being formed as a scale member, a reference element pivotally mounted about said axis and exterior to said chamber, said reference element adapted to remain stable in equilibrium about said axis during said use, said reference element being formed as an indicator arm which comprises a proper arm extending on one side of said axis and being movable over the scale member and a balancing portion extending to the opposite side of said axis, the relative position of said proper arm and said balancing portion is such that the center of gravity of the indicator arm lies vertically below said axis thereby maintaining said indicator arm in stable equilibrium about said axis during said use, a resilient compressible hollow element for filling said chamber with a liquid of which the density is measured, said hollow element being formed with a channel means connecting the interior of said hollow element at the outlet of said channel means to said chamber at the inlet of said channel means, and said casing being formed with a further channel through which said chamber can be filled with said liquid, said hollow element being of such size that said chamber can be filled through said further channel by compression and release of said hollow element.

4,037,482

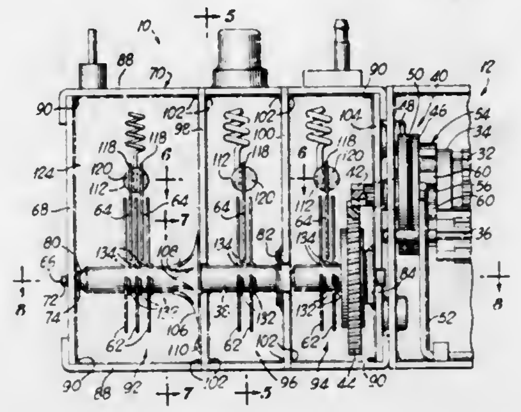
ACCURATE UHF TELEVISION TUNING SYSTEM AND METHOD OF FABRICATING SAME

Alarico A. Valdettaro, Bloomington, Ind., assignor to Sarkes Tarzian, Inc., Bloomington, Ind.

Filed May 13, 1975, Ser. No. 577,062

Int. Cl. F16h *35/18*

U.S. Cl. 74—10.41 **18 Claims**



1. The combination of, a UHF tuner having a plurality of groups of tuning elements connected to a common rotatable main tuning shaft, said rotatable main tuning shaft being rotatable over a range of approximately 270° to effect selective reception of all television stations in the UHF television band, a control shaft, gear means interconnecting said control shaft and said main tuning shaft, detent means for said control shaft to establish a stop position of said main tuning shaft for each of the seventy television stations in the UHF band, dial indicator means connected to said control shaft and arranged to provide an exact digital indication of the UHF channel number corresponding to one of said stop positions of said main tuning shaft, said tuning elements of said UHF tuner being aligned to receive the corresponding UHF station at each of said stop positions of said main tuning shaft with a maximum error of approximately one megacycle, whereby the channel indicated by said dial indicator means is nonambiguous, said maximum error of approximately one megacycle being maintained when said combination is fabricated on a production line.

4,037,483

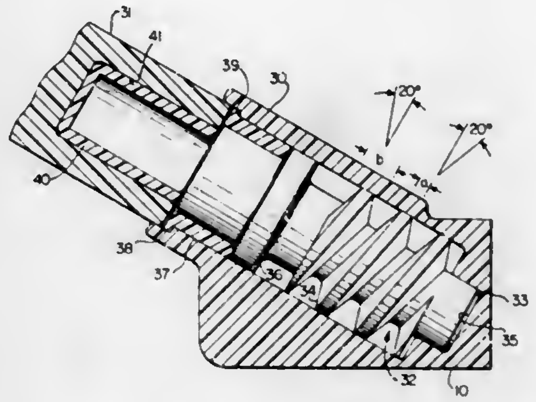
WINDOW OPERATOR MECHANISM

Nestor M. Nadal, Ci 37 Calle Pedro Goyco, Levittown Lakes, P.R. 00950

Filed Apr. 26, 1976, Ser. No. 680,145

Int. Cl.² F16H *19/08*

U.S. Cl. 74—32 **6 Claims**



1. An improved window operator in which each of the components is molded from a polymeric material, the operator being of the type having a housing having a central longitudinal plane, a worm gear rotatably mounted in said housing with the axis of rotation of said worm gear intersecting said plane at an acute angle, a crank handle coupled to said worm gear outside of said housing, a sector gear rotatably mounted in a plane parallel with said central plane with its teeth in engagement with said worm gear to be driven thereby, an arm formed on said sector gear and extending out of said housing, and a link pivotally attached to said arm, said link being connectable to a window closure to operate said closure upon rotation of said crank, the improvement wherein

said worm gear is formed with a single helical tooth in the major portion of which the ratio of the axial dimension of the top land to the axial dimension of the root is substantially 4:10.

4,037,484

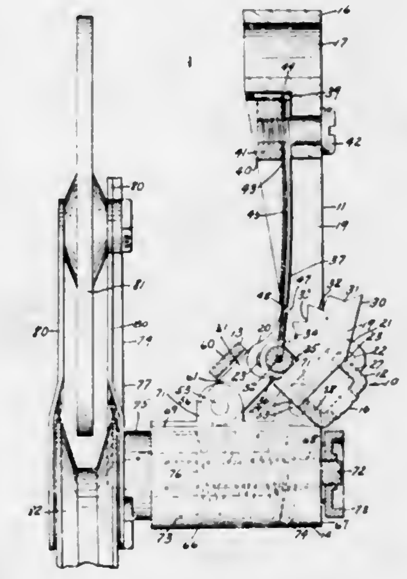
DERAILLEUR CONSTRUCTION HAVING FIXED INCREMENT MEANS

Milton Morse, 44 Honeck St., Englewood, N.J. 07631

Filed July 21, 1975, Ser. No. 597,436

Int. Cl.² F16H *7/22*

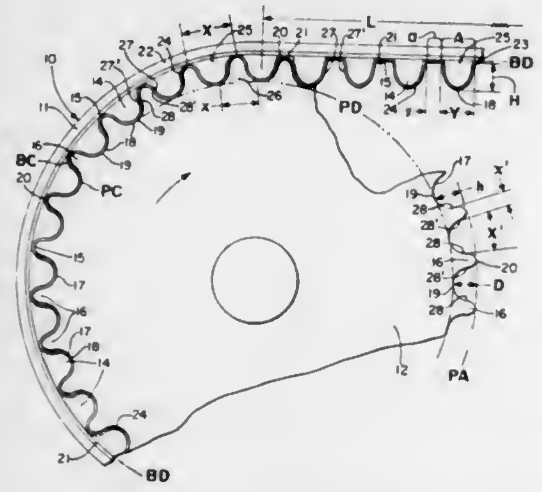
U.S. Cl. 74—217 B **4 Claims**



1. In a bicycle chain derailleur mechanism including a relatively fixed mounting member adapted to be secured to a

portion of a bicycle frame, a pivot block supporting chain-entraining means, and shiftable laterally of said mounting member to result in moving a continuous segment of a bicycle chain from one hub sprocket to another, first and second parallel trunnions interconnecting said fixed mounting means and said pivot block, the improvement comprising: a generally planar detenting plate supported on one of said trunnions for arcuate movement therewith, said plate having a plurality of detenting recesses arranged in spaced increments corresponding to arcuate displacement of said one of said trunnions in moving said pivot block to predetermined positions to locate said entraining means in co-planar relation relative to given hub sprockets; and a resilient movable detenting member carried by said fixed mounting member and adapted to selectively engage one of said detenting recesses upon movement of said trunnions; whereby said pivot block is resiliently locked into one of said predetermined positions.

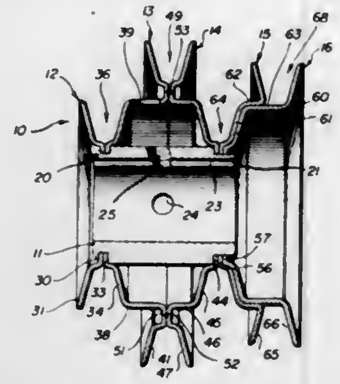
4,037,485
BELT DRIVE AND BELTS AND PULLEYS THEREFOR
Ronald D. Hoback, Lincoln, Nebr., assignor to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Dec. 18, 1975, Ser. No. 642,090
Int. Cl.^{2} F16G *1/28;* F16H *7/00*
U.S. Cl. 74—229 **36 Claims**



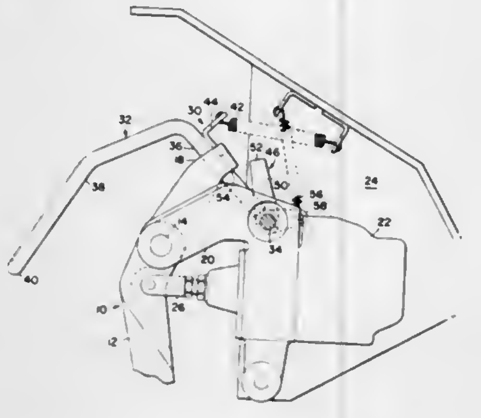
1. A belt drive comprising: a flexible power transmission belt having a plurality of alternating teeth and grooves extending generally transversely thereof and a pair of toothed pulleys having a plurality of alternating teeth and grooves extending generally axially thereof which engage with the belt teeth and grooves during the operation of the drive, the dimensional relationship of said belt teeth and grooves and said pulley teeth and grooves being such that in the longitudinal extent of the belt between the pulleys the height of the belt teeth is greater than the depth of the pulley grooves while as the belt travels around the pulleys the extreme outwardly facing portions of the belt teeth which confront the pulleys come into contact with the portions of the toothed pulley disposed between the pulley teeth which define the bottom of the pulley grooves and at the same time said belt teeth are compressed to reduce their height so that the extreme radially outwardly facing portions of the pulley teeth come into contact with the portions of the belt disposed between the belt teeth which define the bottoms of the belt grooves.

4,037,486
PULLEY
Edward H. Schultz, Jr., Glencoe, Ill., assignor to Nagel-Chase Manufacturing Company, Chicago, Ill.
Filed Jan. 12, 1976, Ser. No. 648,249
Int. Cl.^{2} F16H *55/54*
U.S. Cl. 74—230.8 **9 Claims**

1. A multi-groove pulley, comprising the combination of a cylindrical, axially elongated hub, a first non-folded sheet metal member having a base for attachment to the hub and a flange flaring simultaneously radially and axially diagonally outwardly away from the base, and second, third, fourth and fifth sheet non-folded metal members each having a base for attachment to the hub, an inner flange flaring simultaneously radially and axially diagonally outwardly from the base, a sleeve extending axially from the inner flange, and an outer flange flaring simultaneously radially and axially diagonally outwardly from the sleeve, all the sheet metal members being abuttively assembled on the hub for forming a plurality of belt-accommodating grooves wherein said sheet metal members are assembled on said hub in a mutually opposed and aligned array so that the first member flange and second member inner flange form a first belt-accommodating groove, the second and third member outer flanges form a second belt-accommodating groove, the third and fourth member inner flanges form a third belt-accommodating groove, the fourth and fifth member outer flanges form a fouth belt-accommodating groove.

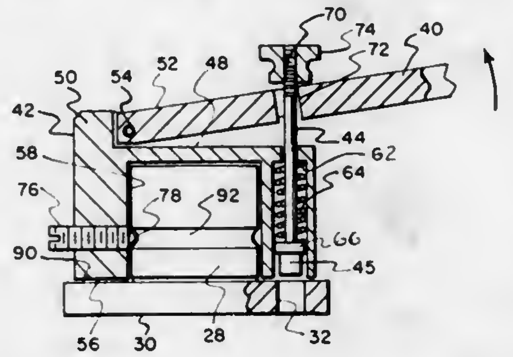


4,037,487
SERVICE BRAKE LOCK MECHANISM
Brian Alvin Ahlschwede, Malcolm, Nebr., and Edwin Lee Whisler, Peosta, Iowa, assignors to Deere & Company, Moline, Ill.
Filed July 14, 1975, Ser. No. 595,847
Int. Cl.^{2} G05G *5/06*
U.S. Cl. 74—529 **9 Claims**



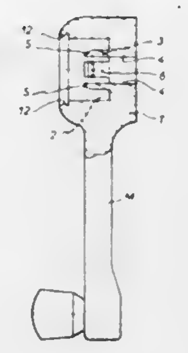
1. A control, comprising: a support structure; an elongate manually operable control arm pivotally mounted on the support structure for movement between first and second positions and including an abutment surface located so as to be a traiiing surface as the arm moves from its first to its second position; arm biasing means mounted between the support structure and the arm and urging the latter towards said first position; a locking pawl pivotally mounted on the support structure for movement between arm-release and arm-lock positions and including an abutment surface located so as to be in engagement with the abutment surface of the arm when the arm is in its second position and the pawl is in its arm-lock position and so to be free of the arm when the arm is in its first position and the pawl is in its arm-release position; an pawl biasing means connected between the support structure and the pawl and biasing the latter towards said arm-lock position; a manually operable control member pivotally mounted on the support structure for movement between pawl-retain and pawl-release positions; said pawl including a second abutment surface located so as to lead when the pawl is moving toward the arm-lock position; said control member including an abutment surface located so as to be in engagement with the second abutment surface of the pawl when the control member is in its pawl-retain position and when the pawl is in its arm-release position; a control member biasing means mounted between the support structure and control member and urging the control member torwards its pawl-retaining position; said control member biasing means urging the abutment surface of the control member against the second abutment surface of the pawl with a force greater than the force exerted on the abutment surface of the control member by the second abutment surface of the pawl as effected by the pawl biasing means; said abutment surface of the control member being located so as to move in a direction away from the second abutment surface of the pawl as the control member is moved from its pawl-retain to its pawl-release position; and said control member and arm having respective manually engageable portions arranged to trace closely adjacent paths with the portion of the control member trailing the portion of the arm respectively during movement of the control member from its pawl-retain to its pawl-release position and during movement of the arm from its first to its second position, whereby an operator may use a single appendage to simultaneously move the arm and the control member when it is desired to lock the arm in its second position.

4,037,488
HANDLE MECHANISM FOR MACHINE TOOLS
Thomas D. Laney, Sr., 6026 SE. Brooklyn St., Portland, Oreg. 97206
Filed Feb. 23, 1976, Ser. No. 660,272
Int. Cl.^{2} G05G *1/12;* F16D *11/00*
U.S. Cl. 74—548 **7 Claims**



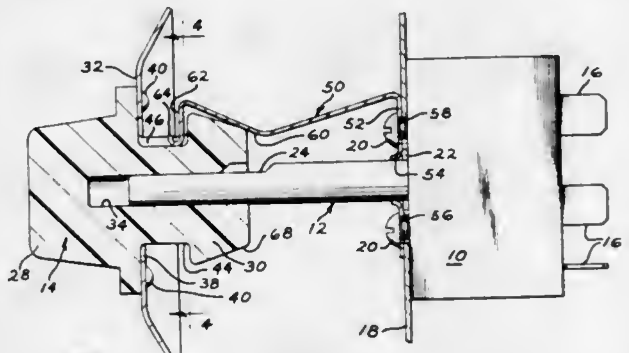
1. A handle mechanism for machine tools comprising:
- a. a body member having a front portion and a rear portion, said front portion defining a substantially planar face, and means defining a bore extending through said face and into said body member;
- b. an elongate handle member hingedly attached to said rear portion of said body member and extending laterally therefrom;
- c. an elongate index pin slideably mounted in said body member parallel to the direction of said bore so as to be forwardly extensible beyond said face and rearwardly retractable behind said face; and
- d. fastening means removably positioned proximate a side of said handle member oriented away from said body member and attached to said index pin for coupling said pin directly to said handle member such that movement of said handle member in one direction relative to said body member causes said index pin to retract behind said face and movement of said handle member in an opposite direction relative to said body member causes said index pin to extend beyond said face, said retraction and extension of said index pin being effected solely by movement of said handle member, and for permitting said retraction and extension of said index pin independent of said movement of said handle member, said index pin being completely removable from said body member solely upon detachment of said fastening means.

4,037,489
MECHANICAL DEVICES AND MEANS FOR ROTATING A SHAFT
Henri Morel, Maule, France, assignor to ITW de France, S.A., Beauchamp, France
Filed Aug. 20, 1976, Ser. No. 716,050
Claims priority, application France, Aug. 29, 1975, 75.26673
Int. Cl.^{2} G05G *1/00*
U.S. Cl. 74—548 **3 Claims**



1. Mechanical assembly for driving an axle in rotation comprising means for actuating said axle and means for fixing said actuating means together, wherein said axle comprises an end adapted to receive said actuating means, with, on said end, at least one flat and at least one groove extending over a circular arc situated at right angles with respect to said flat, said actuating means is constituted by a knob or crank-handle head including a central recess adapted to receive said axle end and at least two flexible parts mounted in said recess and arranged at right angles to one another, one of these parts being adapted to bear on said flat and the other provided with a pin adapted to be engaged in said groove and said fixing means is constituted by a ring adapted to encircle and grip said two parts of said actuating means respectively against and in said flat and said groove of said axle end, said ring comprising means adapted to make it itself fast to said actuating means.

4,037,490
TWO-STEP CONTROL KNOB OPERATION
Arthur C. Wilson, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Jan. 2, 1976, Ser. No. 646,415
Int. Cl.^{2} H01H *3/10*
U.S. Cl. 74—553 **7 Claims**

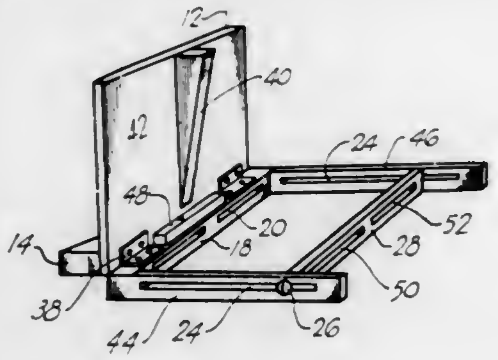


1. A control knob mounted on the shaft of a control device, said knob comprising:
- a. a handle portion; and

b. a hub portion to receive the shaft of the control device, the hub portion including an outer groove with a locking seat;
c. a locking spring means fixed with relation to the control device and cooperating with the groove of the hub portion for releasably holding the knob on the shaft as well as locking the knob from rotation when the locking spring engages the locking seat;
d. the knob being capable of limited longitudinal movement along the shaft;
e. the hub portion including release means for withdrawing the locking spring from the locking seat whereby the knob may be rotated to adjust the control device.

4,037,491
SEWING MACHINE FOOT SWITCH OPERATING DEVICE

Zebbie J. Newbold, 3512 NW. 14th Terrace, Miami, Fla. 33125
Filed May 20, 1976, Ser. No. 688,326
Int. Cl.^{2} G05G *1/14;* D05B *75/00;* H01H *3/14*
U.S. Cl. 74—561 **9 Claims**

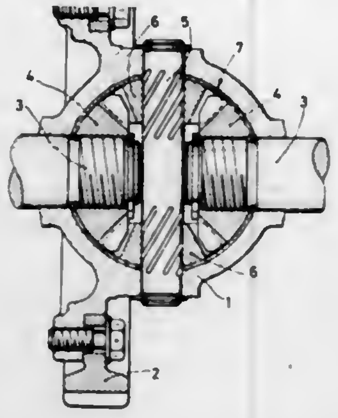


1. A sewing machine foot switch operating device comprising a foot operated treadle, an adjustable four sided rectangular frame, hinging means for hingeably affixing said treadle to said adjustable frame, adjustment means for adjusting the location of one of the sides of said four sided frame, locking means for selectively securing said one of said four sided frame to the two adjacent sides thereto of said four sided frame, an adjustable sized void for the location of a foot switch therewithin, said void contained within a portion of the length of said one side and another side parallel thereto of said four sided frame and a pair of adjustably located rods, said rods parallel to each other and parallel to said two adjacent sides, foot switch operating means for operating a foot switch when said treadle is depressed, heel rest means extending outwardly from said treadle for retention of the heel of the user.

4,037,492
BEARING ARRANGEMENT FOR AXLE OR SHAFTS PROVIDED WITH ROTATING GEARS IN A DIFFERENTIAL GEAR BOX

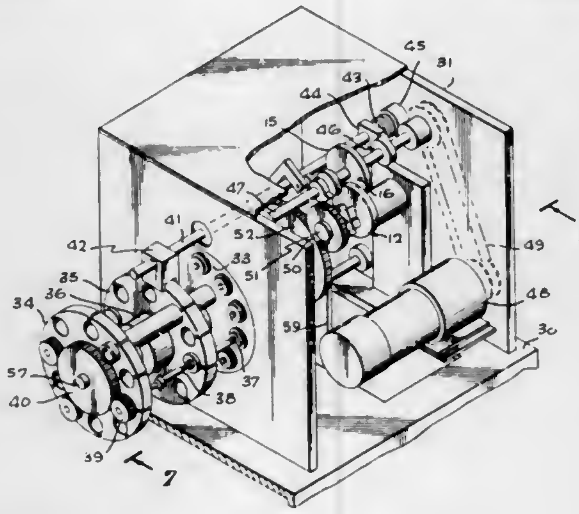
Karl Ashauer, Wolfsburg, and Hansjorg Mihatsch, Gifhorn, both of Germany, assignors to Volkswagenwerk Aktiengesellschaft, Germany
Filed Nov. 5, 1975, Ser. No. 629,030
Claims priority, application Germany, Nov. 14, 1974, 2454067
Int. Cl.^{2} F16H *1/38, 1/40*
U.S. Cl. 74—710 **6 Claims**

1. In a differential gear box containing rotatable gears mounted on shafts extending through the gear box and having bearing rings positioned between the gears and the gear box, each of the bearing rings encompassing a shaft of a respective gear, the improvement wherein each of the bearing rings is joined to at least one adjacent bearing ring by a web to form an unitary bearing ring structure which includes all the bearing rings, whereby entrainment of the bearing rings resulting from rotation of the gears on the shafts is prevented.



4,037,493
POSITIONING AND INDEXING APPARATUS

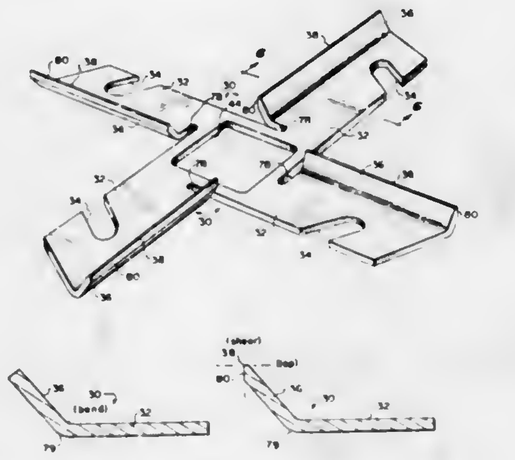
Edgar P. Freer, 7000 Scarborough Peak Drive, Canoga Park, Calif. 91307
Filed May 27, 1975, Ser. No. 580,601
Int. Cl.^{2} B23B *9/24*
U.S. Cl. 74—820 **8 Claims**



1. Positioning and indexing apparatus comprising:
a frame;
a platform movably carried on said frame;
an index means fixedly secured to said platform so as to move therewith;
driving means selectively engageable with said index means for imparting movement to said platform;
means interconnecting said driving means with said platform via said index means to a predetermined number of positions whereby each position is a precise dimension from adjacent positions;
stop mechanism carried on said frame and operable with respect to said index means for releasably retaining said platform in each of said predetermined positions;
said index means includes a plurality of equally spaced-apart slots formed in the periphery of said platform outwardly radiating from the center thereof;
said driving means includes a pin outwardly projecting from said driving means selectively engageable with said index slots in a serial sequence;
said driving means includes a drive wheel having its center of rotation beyond the periphery of said index means and carrying said pin on its side face offset from its center thereof.

4,037,494
METHOD OF PRODUCING A RADIAL ARM-TYPE MEAT GRINDER CUTTER BLADE

Charles W. Hess, Schiller Park, Ill., assignor to Speco, Inc., Schiller Park, Ill.
Division of Ser. No. 659,941, Feb. 20, 1976, Pat. No. 3,993,255. This application May 26, 1976, Ser. No. 690,199
Int. Cl.^{2} B21K *1/76*
U.S. Cl. 76—101 A **3 Claims**

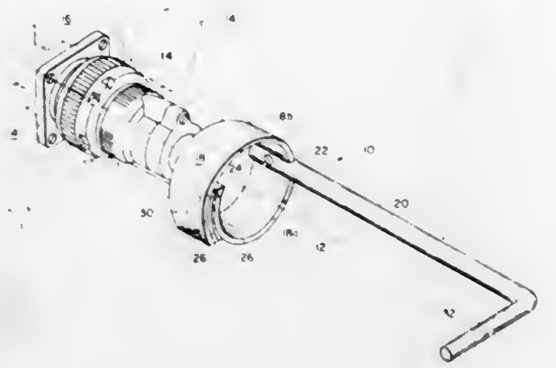


1. The method of producing a radial arm-type cutter blade for a rotary meat grinder, which comprises the steps of stamping a blank from a horizontally disposed sheet of flat metal of predetermined thickness so as to provide a plurality of flat radially and horizontally extending blank arms which are, in part, separated from the central hub part by narrow slits which intersect and extend rearwards from the base regions of the leading side edges of the arms and terminate short of the base regions of the trailing side edges of said arms, while at the same time providing a non-circular drive opening in the hub part, bending the leading side marginal portions of the arms upwardly along radial lines between the leading and trailing side edges of the arms and at right angles to the slits in order that they extend outwardly and upwardly at angles of the order of 45°, and then shearing the outer side edge regions of the outwardly and upwardly bent leading side marginal portions of the arms so as to form flat, inner, meat-pushing surfaces which extend vertically and at right angles to the plane of the unbent trailing side marginal portions of the arms, and flat, outer surfaces which are coplanar, extend horizontally and in parallel relation with said unbent trailing side marginal portions of the arms, are adapted to engage flatly the inner surface of the perforated grinder plate of the meat grinder in which the cutter blade is used, extend at right angles to the inner meat-pushing surfaces, and join the latter in right-angle shearing edges.

4,037,495
FLEXIBLE STRAP WRENCH

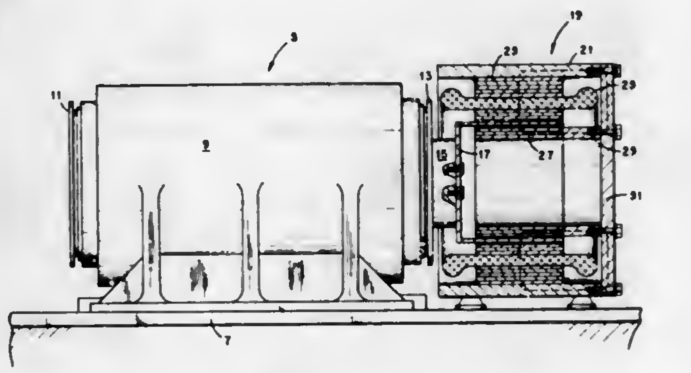
Donald M. Beckstead, 4944 No. 13 Navy Road, Millington, Tenn. 38053
Filed Aug. 27, 1976, Ser. No. 703,987
Int. Cl.^{2} B25B *13/52*
U.S. Cl. 81—64 **6 Claims**

1. A tool for rotating an object comprising:
a flexible strap having two free ends capable of being formed into a loop to receive the object to be rotated;
means for adjustably securing together the free ends of said strap;
a shaft secured to said strap intermediate the ends and extending in a direction normal to a peripheral plane containing said loop;
whereby objects can be rotated from an axially remote position.



4,037,496
COMBINATION SPINDLE-DRIVE SYSTEM FOR HIGH PRECISION MACHINING

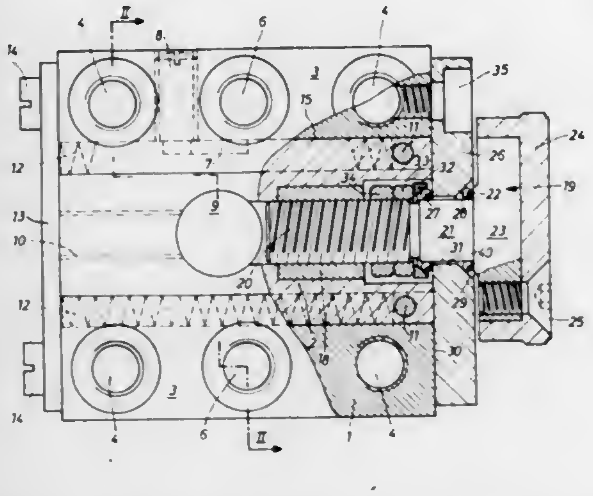
Howard L. Gerth, Knoxville, Tenn., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.
Filed Sept. 1, 1976, Ser. No. 719,637
Int. Cl.^{2} B23B *19/02*
U.S. Cl. 82—28 R **4 Claims**



1. A combination spindle-drive for a precision machining lathe comprising:
a spindle having a rotatably disposed shaft adapted to carry a workpiece at one end of said shaft;
a cup-shaped rotor supported in cantilever arrangement from the opposite end of said shaft by affixing the base of said cup-shaped rotor concentrically to the said opposite end of said shaft so that the walls of said cup-shaped rotor extend axially from said opposite end of said shaft, said rotor composed of an electrically conductive, non-magnetic material;
a stator disposed coaxially about the walls of said cup-shaped rotor in an adjacent spaced relationship from said rotor, to form air gaps along the outer and inner walls of the said cup-shaped rotor, said stator having an outer core member disposed adjacent the outer wall of said cup and provided with a poly-phase AC winding for applying a rotating magnetic field to said rotor and an inner core member disposed adjacent the inner wall of said cup-shaped rotor, said inner core member magnetically coupled to said outer core member so that the magnetic flux produced by said winding circulates through the walls of said cup-shaped rotor to produce torque on said rotor due to the reaction of eddy currents induced in said rotor by said rotating magnetic field.

4,037,497
TOOL HOLDER WITH FINE INFEED

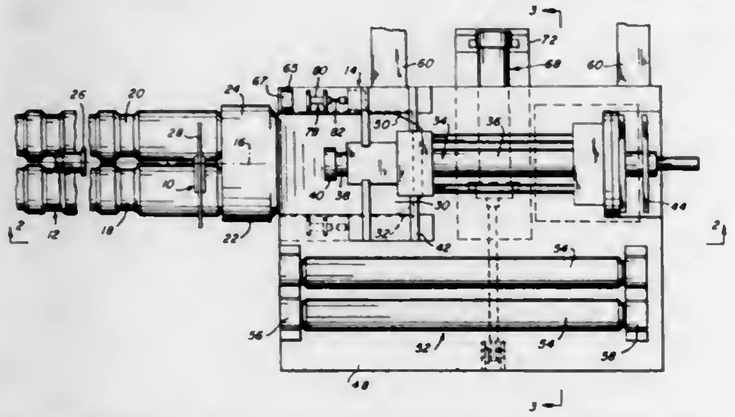
Fritz Angst, Breitenmatt 1362, Oberdurnten, Switzerland
Filed Aug. 31, 1976, Ser. No. 719,208
Claims priority, application Switzerland, Sept. 9, 1975, 11671/75
Int. Cl.² B23B *29/00*
U.S. Cl. 82—36 R **8 Claims**



1. A tool holder with fine infeed, comprising a base body, a slide, means for displaceably guiding the slide in said base body, said slide being adapted to receive a work tool, an in-feed-threaded spindle threadably retained in said slide, said threaded spindle having thread play, at least one spring for eliminating said thread play, means for providing three axial bearing locations and two radial bearing locations for mounting the spindle with respect to the slide and the base body, said bearing locations including an outermost bearing location situated facing away from the threads of the spindle and structured as an axial and radial pivot bearing, and means for interconnecting with one another free of play said pivot bearing and a neighboring bearing location of said bearing locations forming an axial bearing.

4,037,498
MOVABLE SIZING GAUGE

Evans D. Dorman, McCandless Township, Allegheny County, Pa., and William P. Getty, Odgen Dunes, Ind., assignors to United States Steel Corporation, Pittsburgh, Pa.
Filed Aug. 23, 1976, Ser. No. 716,912
Int. Cl.² B23B *5/14*
U.S. Cl. 82—86 **7 Claims**

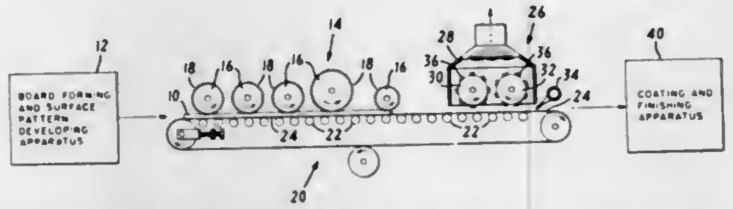


1. In apparatus for cutting segments from elongated stock including a conveyor for moving said stock along a pass line, cutting means adjacent the end of said conveyor, means beneath the end of said conveyor for the gravity discharge of segments and an adjustable sizing gauge including a stop head operatively positioned. in said pass line to be abutted by the end of said stock after said end has passed beyond said cutting means, the improvement comprising:

a. a movable carriage mounting said sizing gauge;
b. means for moving said carriage transversely of said pass line; and
c. means on said carriage forming a receptacle to receive stock from said conveyor when said conveyor is moved to position said sizing gauge out of alignment with said pass line.

4,037,499
METHOD AND APPARATUS FOR PERFORATING FIBROUS BOARD SURFACES IN NON-REPETITIVE PATTERNS

Theodore E. Hillman, Cloquet, Minn., assignor to Conwed Corporation, St. Paul, Minn.
Filed Jan. 26, 1974, Ser. No. 652,427
Int. Cl.² B26F *1/24*
U.S. Cl. 83—1 **7 Claims**


12
BOARD FORMING AND SURFACE PATTERN DEVELOPING APPARATUS
10
18
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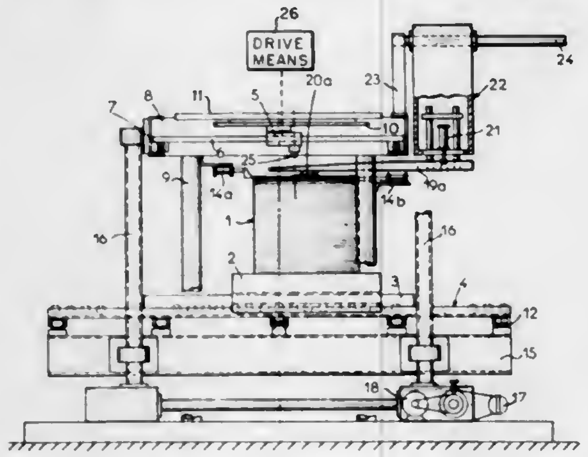
34
40
COATING AND FINISHING APPARATUS

1. Apparatus for fissuring a fibrous board product of predetermined thickness comprising:

a. a substantially flat surface;
b. a plurality of rolls positioned above said surface, each said roll have an outer periphery;
c. a plurality of perforating members randomly spaced on the outer periphery of each said roll;
d. the distance from the ends of the said perforating means to the said flat surface being less than the predetermined thickness of the board product;
e. means for passing said board product between the said flat surface and the said plurality of rolls; and
f. said perforating members being loosely secured in said rolls, whereby said perforating members are moveable with respect to their respective rolls.

4,037,500
PROCESS AND APPARATUS FOR CONTINUALLY CUTTING STACKED GLASS SHEETS

Raymond Vatin, Thourotte, France, assignor to Saint-Gobain Industries, Neuilly-sur-Seine, France
Filed Mar. 23, 1976, Ser. No. 669,595
Claims priority, application France, Mar. 27, 1975, 75.09733
Int. Cl.² B26D *3/08;* B65H *3/08*
U.S. Cl. 83—7 **14 Claims**

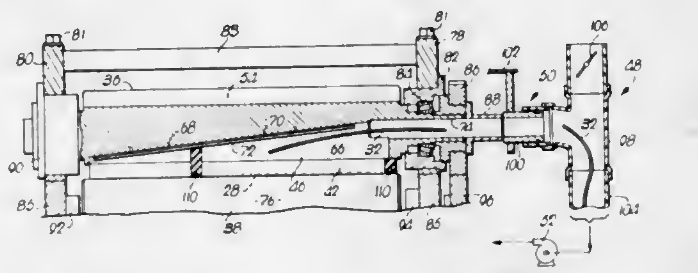


1. A process for continually cutting glass blanks comprising moving a stack of blanks into position beneath a cutting head carrying a scoring tool and having a reference templet associated therewith, bringing said scoring tool into contact with the uppermost blank of said stack and actuating the cutting head to produce a score line in the uppermost blank under guidance of said templet, withdrawing the cutting tool from the uppermost blank and removing the blank from the stack to expose the next uppermost blank, relatively moving the stack and cutting head closer together by a distance equal to the thickness of a blank, and repeating the actuation of the cutting head to produce a score line in the then uppermost blank of the stack under guidance of said templet.

4. Apparatus for continually cutting glass blanks comprising a cutting head and a templet for guiding the movement thereof, support means for supporting a stack of blanks beneath the cutting head, means for actuating said cutting head to score a line in the uppermost blank of said stack, pick-up means for removing the uppermost blank from the stack after the scoring thereof, and means for relatively moving the stack and cutting head closer together by a distance equal to the thickness of a blank to bring the succeeding blank into position for scoring by said cutting head.

4,037,501
THROUGH-THE-CYLINDER SLUG OUT DEVICE

Dean E. Gladow, Emporia, Kans., assignor to Didde-Glaser, Inc., Emporia, Kans.
Filed June 21, 1976, Ser. No. 698,115
Int. Cl.² B26F *1/38*
U.S. Cl. 83—100 **20 Claims**

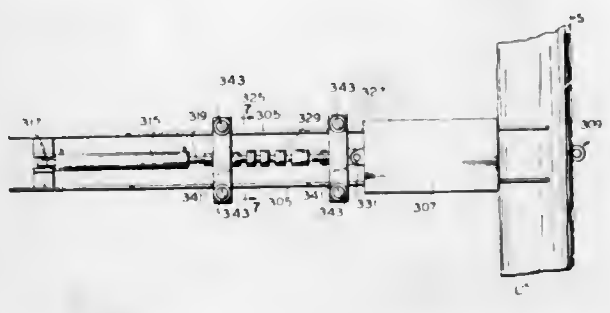


1. A web-cutting assembly equipped for through-the-cylinder slug removal, said assembly comprising:

an elongated, axially rotatable cutting cylinder;
an elongated, axially rotatable anvil cylinder adjacent said cutting cylinder,
said cutting and anvil cylinders cooperatively presenting a web-receiving and cutting nip area therebetween;
at least a pair of spaced cutting elements mounted on the periphery of said cutting roll and operable for successively cutting slugs from a web passing through said nip area as the cutting and anvil cylinders rotate,
at least one of said cylinders including structure defining an elongated, axially and inwardly extending slot therein which is adapted for slug-receiving alignment with said pair of elements during cutting of said slugs for receiving the latter,
said slot-defining structure including spaced, opposed sidewall portions and a bottom wall portion which is tapered inwardly from a point adjacent one end of the roll to the opposite end thereof;
slug-conveying structure including means located adjacent said opposite end of said one roll and proximal to the axis of the latter and in communication with said slot for conveying cut slugs from the slot; and
structure rotatably supporting said cutting and anvil cylinders in web-receiving and cutting disposition.

4,037,502
LOG POSITIONERS

Paul J. Westfall, 4444 W. Burnside, Portland, Oreg. 97210
Continuation-in-part of Ser. No. 425,288, Dec. 17, 1973, Pat. No. 3,906,829, which is a continuation-in-part of Ser. No. 264,739, June 21, 1972, abandoned. This application Sept. 8, 1975, Ser. No. 610,984
Int. Cl.² B27B *29/10*
U.S. Cl. 83—726 **5 Claims**



1. An actuating assembly for a head rig having a log carriage and knee means movable along the carriage to variously locate a log relative to a saw,

comprising setwork means on the carriage including a series of bottoming out cylinder drives having varying effective lengths,
the piston of each cylinder drive being connected to the cylinder of the adjacent cylinder drive whereby the movement of each piston is additive to the movement of each of the other pistons,
means for energizing the cylinder drives selectively to differently locate the knee means and thereby the log with relation to the saw,
said series of cylinders having a head end in driving relation to said knee means,
first stopping means associated with said knee means,
second stopping means associated with the rear end of said series of cylinder drives,
control means whereby the first stopping means may be activated after a selected position of said knee means has been achieved to fixedly hold said knee means in said position until such time as said first stopping means has been inactivated,
said control means inactivating said second stopping means while said first stopping means is activated to enable collapsing movement of said series of cylinders without distrubing the position of said knee means,
said means connected to the rear ends of said series of cylinders for collapsing the same to condition the same for full extension when the second stopping means is subsequently activated and said first stopping means is activated.

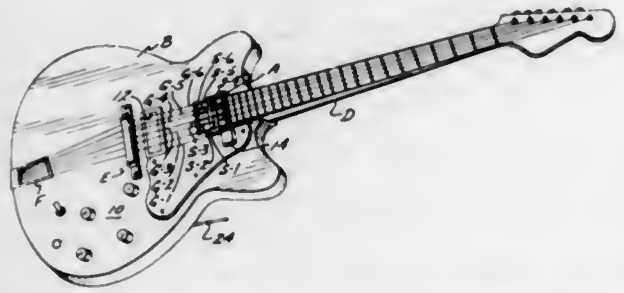
4,037,503
POWER OPERATED GUITAR DEVICE

Evan C. Jacobson, 6479 Rendina St., Long Beach, Calif. 90815, and Stephen R. Becker, 1525 Freeman Ave., Long Beach, Calif. 90804
Continuation-in-part of Ser. No. 500,028, Aug. 23, 1974, abandoned. This application Nov. 10, 1975, Ser. No. 630,304
Int. Cl.² G10F *1/20;* G10D *3/16*
U.S. Cl. 84—9 **18 Claims**

1. In combination with a musical stringed instrument that includes a rigid body bearing an elongate keyboard, a bridge secured to a first side of said body, and a plurality of laterally spaced tensioned strings that extend longitudinally the length of said keyboard and across said bridge, and means on said keyboard and body for engaging end portions of said strings to maintain the latter in a tensioned condition, power operated means for selectively vibrating each of said strings individually or in unison with other of said strings, said power operated means including:

a. a plurality of laterally spaced, elongate shafts that are

spaced from said strings and substantially parallel thereto, with each of said shafts including first and second ends;
b. a plurality of rotatable members mounted on said first ends of said shafts that cause said strings to vibrate and emit a musical tone when brought into rotatable pressure contact therewith;
c. power means for rotating said shafts; and
d. manually actuated means for selectively moving said shafts and rotatable members from first positions where said rotatable members are out of contact with said strings to second positions where said rotatable members are in rotatable pressure contact with said strings to cause the latter to vibrate and emit musical tones, said manually actuated means including a support means extending transversely across said strings and secured to said first side, said support means carrying receptacle means to slidably receive a plurality of pins; a plurality of pins slidably mounted in said receptacle means, said pins having first and second ends; a plurality of buttons mounted on said support means and bearing on the first ends of said pins; a plurality of bearings mounted on said second ends of said pins that rotatably support said shafts; and spring means that at all times tend to maintain said buttons, pins, shafts, rotatable members and gears in said first position, but each of said rotatable members being selectively movable to said second position by applying manual pressure to said button associated therewith.



4,037,504

DEVICE IN A PIANO MECHANISM

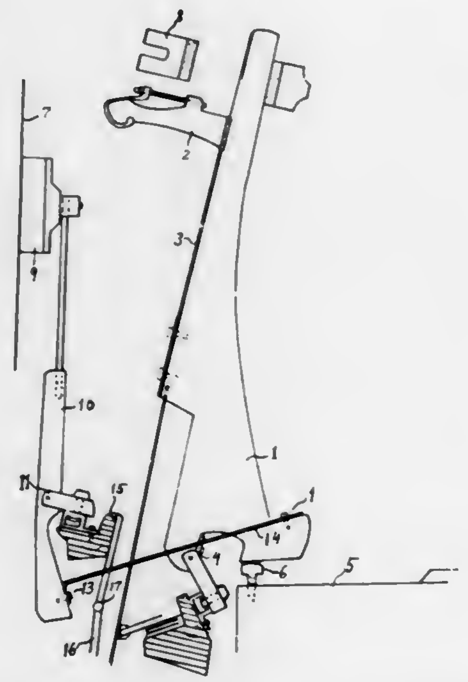
Gunnar Sjöstrand, Onhult Box 268 A, Atvidaberg, Sweden

Filed Oct. 1, 1975, Ser. No. 618,360

Claims priority, application Sweden, Oct. 14, 1974, 7412876

Int. Cl.² G10C *3/18, 3/00*

U.S. Cl. 84—255 **3 Claims**



1. In piano mechanism for controlling the movement of a damper in coordination with the movement of a hammer, said damper being mounted on an elongated damper arm which is journalled on an axis, the improvement which comprises an elongated hammer arm mounted for movement toward and away from a piano string, and an elongated damper lifter means firmly connected to the hammer arm close to the end remote from the hammer and to the damper arm on the opposite side of said axis with respect to the damper, said damper lifter means being longitudinally unyielding in both directions whereby said damper arm is positively moved away from and toward said string in response to movements of the hammer arm in the respective opposite directions.

4,037,505

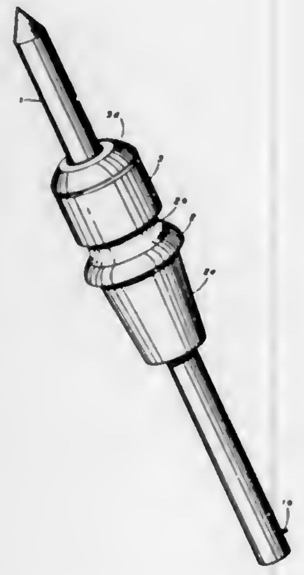
ADJUSTABLE END PIN FOR STRING BASS OR CELLO

Lea Maples, 84 Orchard Estates Drive, Walnut Creek, Calif. 94598

Filed Apr. 19, 1976, Ser. No. 678,152

Int. Cl.² G10D *1/02, 3/00*

U.S. Cl. 84—280 **3 Claims**



1. For use in combination with a string instrument, of the string bass or cello type, having a socket in the bottom end for receiving a height adjusting pin; the improvement in the assembly of such pin comprising a hub having a tapered end portion which snugly fits into said socket, a cylindrical collar surrounding the opposite end portion of said hub, an end pin freely extending through said hub and collar, a substantially annular jam plate extending angularly through an angular cavity in said collar and having a central hole surrounding said end pin, a helical spring surrounding said end pin and having one end seated in said hub and the other end in engagement with said jam plate so as to normally urge the jam plate in angular relationship with the longitudinal exis of said end pin so as to wedge against two diametrically opposite, longitudinally spaced portions of said end pin to prevent it from moving longitudinally relative to said hub, said collar having an internal shoulder portion which is engageable with a peripheral portion of said jam plate upon movement of said collar toward said tapered portion of the hub and against a fulcrum portion of the hub within said collar, whereby said jam plate will tip as a lever about said fulcrum point against the action of said spring to free said end pin and allow it to be pulled away from said tapered portion to permit selective withdrawal of said end pin away from said tapered portion to enable incremental adjustment of the height of the instrument from a floor.

4,037,506

STRINGS FOR MUSICAL INSTRUMENTS

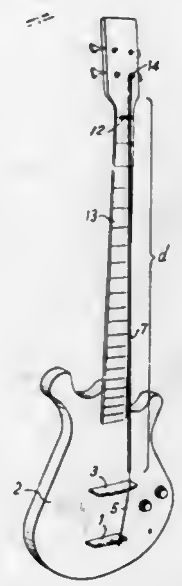
James Charles How, Bexleyheath, England, assignor to James How Industries Limited, Kent, England

Continuation of Ser. No. 470,286, May 15, 1974, abandoned. This application Aug. 28, 1975, Ser. No. 608,802

Claims priority, application United Kingdom, May 20, 1973, 13182/73

Int. Cl.² G10D *3/00*

U.S. Cl. 84—297 S **3 Claims**



1. A fingerboard type stringed musical instrument having a nut and a bridge, a first anchoring means beyond the nut, a second anchoring means beyond the bridge, and a metal string of which a first portion is loaded and of which a second contiguous portion is non-loaded, the string being disposed with the loaded portion extending from the first anchoring means over the nut and substantially as far as the bridge, and the non-loaded portion extending over the bridge to the second anchoring means.

4,037,507

CAPO TASTO

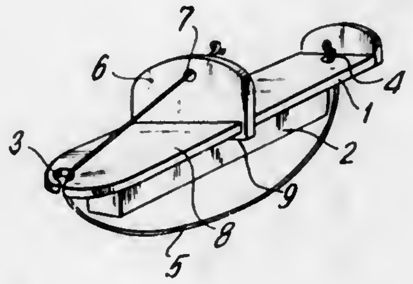
Masataka Shibata, 2-2-3, Kamiosaki, Shinagawa, Tokyo, Japan

Filed Mar. 11, 1976, Ser. No. 666,021

Claims priority, application Japan, Mar. 14, 1975, 50-65668[U]

Int. Cl.² G10D *3/04*

U.S. Cl. 84—318 **5 Claims**



1. A capo tasto comprising:
a first plate member, generally rectangular in configuration, said first plate member having a notch at one end thereof;
a second plate member, generally rectangular in configuration, said second plate member being smaller in area than said first plate member, said first plate member being secured to and superposed over said second plate member;
a tension control member having at one end thereof a centrally located generally T-shaped slot formed longitudinally therein and having substantially parallel side walls, said slot having upper and lower sections, the width of said upper section being greater than the width of said lower section, said first plate member being slidingly receivable in said upper slot section, and said second plate member being slidingly receivable in said lower slot section; and
a string element, one end thereof being secured to the end of said first plate member opposite that having the notch, the other end of said string element being slidingly received in the notch of said first plate member and secured to the tension control member, there being a space defined between said second plate member and said string element for receiving the neck of a guitar, said guitar neck being subject to compresion from both said second plate member and said string element whereby tension on the guitar strings may be continuously varied by sliding said tension control member along said first and second plate members.

4,037,508

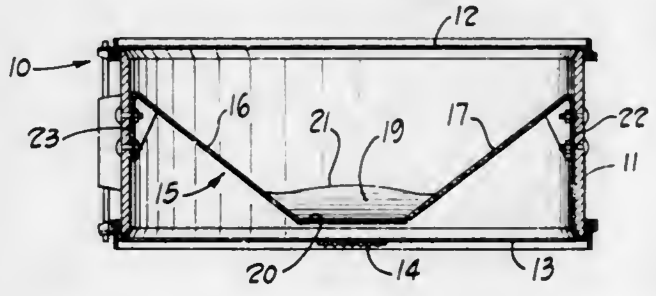
SNARE DRUM

John W. Wolford, P.O. Box 1024, Dundee, Fla. 33838

Filed July 1, 1976, Ser. No. 701,951

Int. Cl.² G10D *13/02*

U.S. Cl. 84—415 **2 Claims**



1. In combination with a snare drum, a ventrasonic acoustic-chamber adapted to interfit the interior of the snare drum between the batter and snare heads and clear of the drum shell, comprising;
a. a hollow circularly shaped body, open at the top and bottom, having angularly inclined side and end walls extending upwardly from a rectangularly shaped orifice at the lower edge thereof;
b. said bounding side and end walls being flat and outwardly inclined at an approximate 40° angle to the plane of the orifice;
c. the orifice being aligned with the snare and spaced upwardly of the snare head; and
d. the upper rim of the side and end walls being spaced from the batter head and clear of the drum shell.

4,037,509

PRACTICE CYMBAL COVER

Ralph Slomovits, 19200 Roseland Ave., Euclid, Ohio 44117

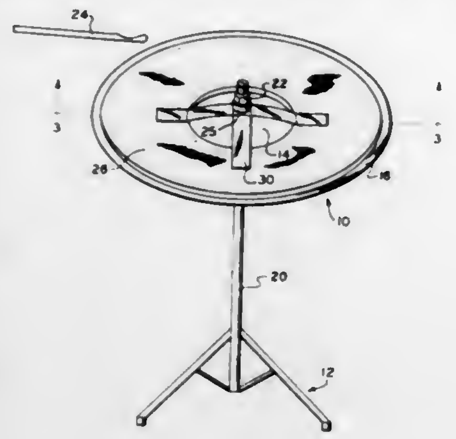
Filed Dec. 29, 1975, Ser. No. 644,523

Int. Cl.² G10G *7/00*

U.S. Cl. 84—422 R **6 Claims**

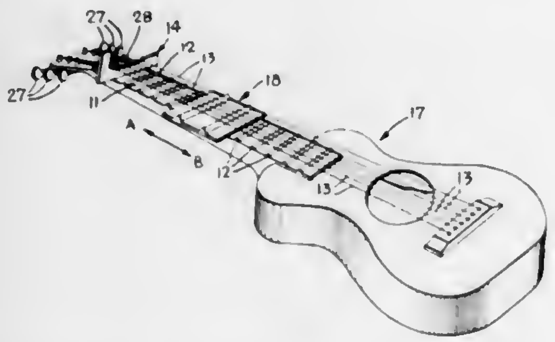
1. A practice cover for a cymbal for covering at least a major portion of the upper surface of the cymbal and providing a resilient surface which may be struck by a percussion stick, said practice cover comprising a substantially circular member of resilient material having a diameter approximately equal to the diameter of the cymbal to be covered, said resilient member including an annular opening disposed in the center thereof having a diameter substantially equal to the diameter of the bell portion of the cymbal to be covered, said annular opening allowing the substantially circular member of resilient material to overlie and be in substantially continuous contact with the upper surface of the cymbal to provide a surface to be struck by a percussion stick which simulates the action of the

cymbal on the percussin stick while muffling at least eighty percent of the noise normally associated with the cymbal and means disposed in the center of said member for securing said resilient member in a position overlying the upper surface of the cymbal.



4,037,510
FRET REFINISHING APPARATUS AND METHOD

Michael F. Ginex, 119-59 27th Ave., New York, N.Y. 11354, and Donald E. Thomas, 143-57 Rose Ave., New York, N.Y. 11355
Filed Mar. 17, 1976, Ser. No. 667,900
Int. Cl.² G10G *7/00;* G10D *3/06;* B24D *15/00*
U.S. Cl. 84—453 **12 Claims**

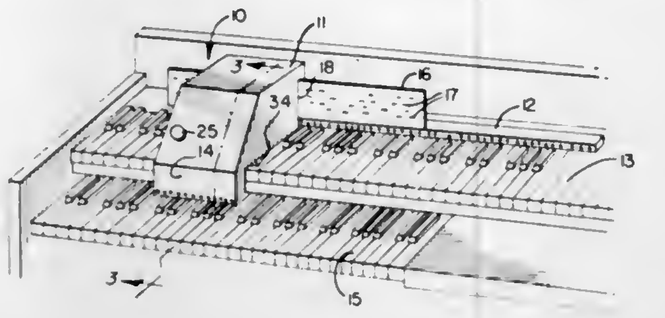


1. An apparatus for refinishing a fret on the fingerboard of a fretted stringed instrument,
comprising in combination
a flat tool having two substantially parallel sides, a first side supporting abrasive material disposed substantially in a first plane, and
a second side disposed substantially in a second plane with elongated portions raised above said second plane and supporting abrasive material on said raised elongated portions.

4,037,511
TEACHING DEVICE FOR ATTACHMENT TO AN ORGAN

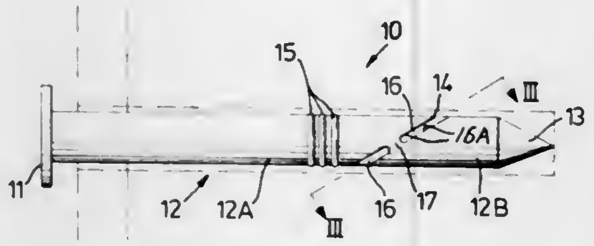
Juan M. Del Castillo, Risco 119, Mexico City, Mexico
Filed Dec. 30, 1975, Ser. No. 645,374
Int. Cl.² G09B *15/08*
U.S. Cl. 84—478 **17 Claims**

1. A teaching device for use with a musical instrument having an upper and a lower keyboard comprising
a main housing resting on the upper keyboard,
an elongated housing extending from said main housing and along the rear of the upper keyboard along a portion of the upper keyboard,
a record sheet having indications thereon in accordance with music to be played on the musical instrument, means to move said record sheet through at least said main housing, means mounted in said elongated housing and said main housing in a position to designate in accordance with said record sheet the keys on the upper and lower keyboards which are to be pressed.



4,037,512
WIRE NAIL

B. E. Ingvar Sundberg, Tyreso, Sweden, assignor to Nordisk Kartro Aktiebolag, Sweden
Filed Oct. 24, 1974, Ser. No. 517,621
Claims priority, application Sweden, Oct. 24, 1973, 7314419; Oct. 24, 1973, 7314420
Int. Cl.² F16B *13/04*
U.S. Cl. 85—79 **5 Claims**

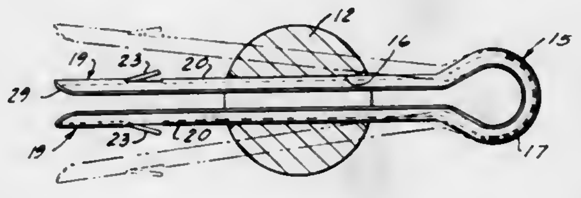


1. A wire nail comprising:
a. a metal shank having a solid front end adapted to be driven into a holding structure, and a solid rear end having a head;
b. said shank having at least four flat parallel wedge faces between said ends and defining at least two slots extending at an acute angle from the outside of said shank toward its axis; and
c. a web-like ligament of metal, said ligament having at least three radially outermost circumferentially spaced ends flush with the periphery of said shank, said ligament being yieldable in response to a compressive force applied to the nail ends and lying in a plane parallel to said acute angle and interconnecting said faces of said solid ends, said ligament having a continuous extent across said shank and in said plane greater than the transverse size of said shank taken perpendicularly to its length and having at least one web-like portion extending traversely to the direction of said continuous extent.

4,037,513
COTTER PIN

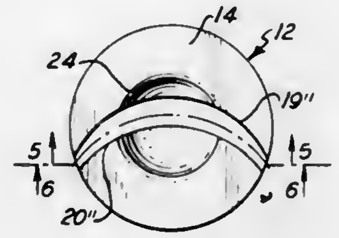
Stephan C. Hobson, Buffalo Grove, Ill., assignor to Portec, Inc., Oak Brook, Ill.
Filed Sept. 3, 1976, Ser. No. 720,401
Int. Cl.² F16B *21/14*
U.S. Cl. 85—8.3 **4 Claims**

1. In a cotter pin and in combination with a fastening member having a transversely extending apertured portion having a circumferential inner periphery with said cotter pin being positioned within said apertured portion, said cotter pin having a bight portion at one end and opposed legs extending from said bight portion and biased outwardly relative to each other to normally extend at predetermined equal angles with respect to the longitudinal center of the cotter pin, said legs of said cotter pin being spaced apart throughout their length in said apertured portion and being adapted to fit through apertured portions of various diameters by compressing said legs toward each other, said legs having outer ends projecting beyond said fastening member and a locking arm extending outwardly of each of said legs adjacent the outer ends of said legs and formed integrally therewith and having free ends facing the fastening member and retaining said cotter pin in position in said fastening member by the bias of said legs, without deforming the free ends of said legs the dimension between the free ends of said locking arms when said legs are compressed into diametrically opposed engagement with each other being greater than the maximum transverse dimension of said apertured portion whereby said locking arms prevent accidental removal of the cotter pin should said legs be inadvertently pressed into engagement with each other, said outer surfaces of said legs having a shape corresponding to the shape of the apertured portion, and the inner surfaces of said legs being concave throughout the length thereof including the outer ends, said locking arms being formed integrally of said legs and said locking arms being released to accommodate removal of the cotter pin from said apertured portion by pressing said legs together and then moving said legs laterally of each other in opposite directions and partially nesting the ends of said legs relative to each other to clear the ends of said locking arms from the apertured portion and thereby permit ready removal of the cotter pin.



4,037,514
HIGH TORQUE FASTENER HEAD

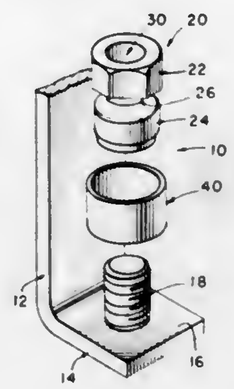
Juan Andres Lliteras, 6146 Beachway Drive, Falls Church, Va. 22041
Filed Feb. 23, 1976, Ser. No. 660,534
Int. Cl.² F16B *23/00*
U.S. Cl. 85—45 **5 Claims**



1. A fastener having a threaded shank portion and an integral head portion, said head portion having an arcuate slot formed therein, said arcuate slot intersecting the longitudinal axis of said shank portion, said slot consisting of a pair of arcuate side walls, each side wall being on the opposite sides, respectively, of said longitudinal axis and parallel thereto so that a line traversing the center of said slot and intersecting said longitudinal axis is arcuate, each said arcuate side wall being contained within a cylindrical surface of revolution, said surface of revolution converging towards one another at each end thereof whereby, for a given screw head size, said slot is longer and affords an extensive area of arcuate, surface to surface contact between a correspondingly arcuate driving implement to thereby distribute torque forces more evenly throughout the body of the fastener, and thereby allowing a greater torque force to be applied without the risk of injuring the slot or user by deformation or slippage of the implement in the slot.

4,037,515
TAMPER RESISTANT FASTENER

David A. Kesselman, 1183 Elm Ave., Sonoma, Calif. 95476
Filed Aug. 26, 1976, Ser. No. 717,763
Int. Cl.² F16B *31/02*
U.S. Cl. 85—61 **11 Claims**



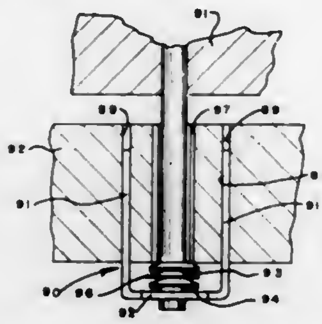
1. A tamper resistant fastener comprising:
a threaded stud;
a stud engaging means threadably engaged on said stud and being devoid of any disengaging tool accommodating means;
a gripping means engaging portion connected to said stud engaging means for transmitting torque to said stud engaging means from the gripping means;
a frangible neck connecting said gripping means engaging portion to said stud engaging means, said frangible neck being adapted to fracture when a predetermind torque is applied to said gripping means engaging portion to separate said gripping means engaging portion from said stud engaging means; and
a cylindrical slip ring for preventing a gripping instrument from applying a gripping force to said stud engaging means for turning said stud engaging means to remove the fastener, said slip ring surrounding said stud engaging means and slidably connected thereto to freely rotate about said stud engaging means when said gripping means engaging portion is separated from said stud engaging means and having locking means thereon engaging said stud engaging means for preventing said slip ring from moving axially of said stud, said slip ring being spaced closely adjacent said stud engaging means about the entire periphery of said stud engaging means, said close spacing defining means preventing insertion of a disengaging device between said stud engaging means and said slip ring.

4,037,516
SAFETY DEVICE AND METHOD

Mark M. Hart, 37 Huntleigh Woods, St. Louis, Mo. 63131
Filed Oct. 24, 1975, Ser. No. 625,584
Int. Cl.² F16B *31/02*
U.S. Cl. 85—62 **3 Claims**

1. A safety device for detecting and signaling relative movement of near and far parts of a structure both toward and away from one another, comprising a shank extending slidably through said near structure part and having one end anchored in said far structure part, and another, outer, end projecting beyond said near structure, said shank having a stop in the form of an annular collar on its said projecting part but spaced toward the near structure part from the outermost end of the said shank, a first annular wafer mounted on and around said shank between said collar and said near structure part, said first wafer being hollow, rupturable, and having a flowable material sealed within it, a leg secured only to said near structure part

and carrying a ring, slidably mounted around the said outer end of said shank and spaced from said collar, and a second annular wafer mounted on and around said shank between said ring and said shank collar, said second wafer being hollow, rupturable, and having a flowable material sealed within it,



whereby relative movement of said collar in a direction toward said near structure part will compress said first wafer between said collar and said structure, and relative movement of said collar in a direction away from said near structure part will compress said second wafer between said collar and said ring.

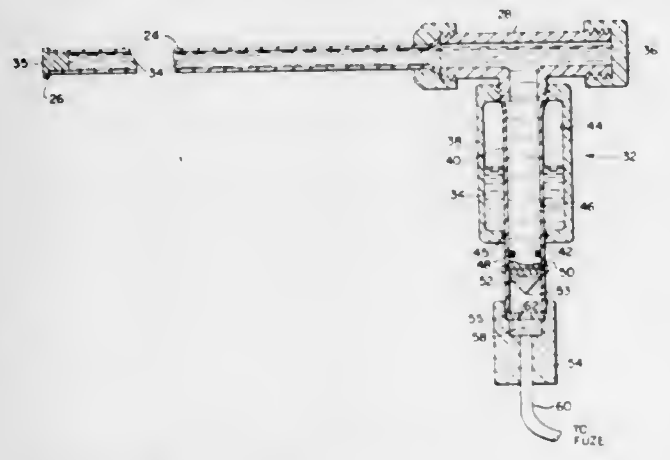
4,037,517
FUZE ACTIVATION DEVICE

George S. Briggs, Adelphi, and Hugh H. Snider, Jr., Silver Spring, both of Md., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Sept. 24, 1976, Ser. No. 726,385

Int. Cl.^{2} F42C *15/12, 15/40*

U.S. Cl. 89—1.5 D **32 Claims**



1. A sensor and energy source for detecting and registering bomb ejection and for generating an energy signal which comprises:
- a crushable container having a substantially incompressible working substance;
- a movable impact element positioned adjacent one end of said container, said element movable in response to displacement of said working substance; and
- means positioned adjacent to and responsive to said impact element for generating an energy output signal,
- whereupon bomb ejection, said container is crushed to displace the working substance, forcing said impact element against said energy generating means to produce an output control signal associated with bomb ejection.

4,037,518
MUSICAL CHORD AND NOTE CALCULATOR

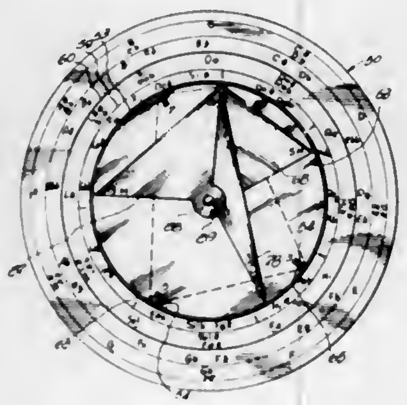
Felix Hector Garcia Lorenzen, Dolores 265, Villa Sarmiento, Ramos Mejia, Buenos Aires, Argentina

Filed Oct. 9, 1975, Ser. No. 621,205

Claims priority, application Argentina, Oct. 11, 1974, 25606610; Apr. 25, 1975, 258512

Int. Cl.^{2} G09B *15/02*

U.S. Cl. 84—474 **32 Claims**



1. A chord calculator comprising a main disk having a central upstanding spindle and spaced from and centered on said spindle a circularly annular array of twelve angularly equispaced indicia corresponding to the notes of the chromatic scale; a plurality of chord indicators each having a central hole adapted to fit over said spindle and each fitting within said array, each chord indicator having at least three and at most four formations one of which is alignable with a chord root note and the others of which are alignable with the other notes of a respective basic chord; and a plurality of interval indicators for adding additional notes to said basic chord, each of said interval indicators being of generally triangular shape and having one apex formed with a throughgoing hole adapted to fit over said spindle and two other apices alignable respectively with a chord root note and with another note spaced by a musical interval of a third from the next lower note.

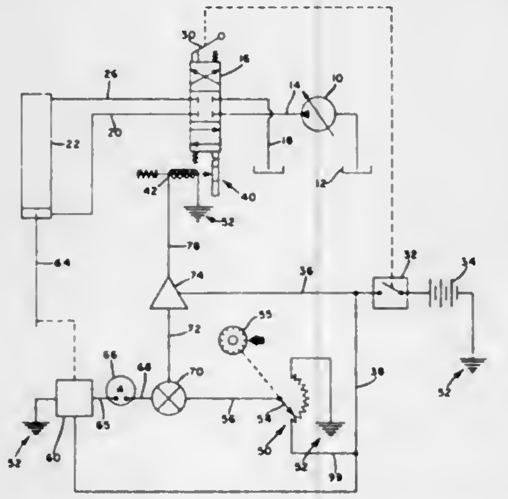
4,037,519
HYDRAULIC SYSTEM

Wayne Russell Miller; Jan Vilas Seipp, both of Dubuque, Iowa, and Garn Farley Penfold, East Moline, Ill., assignors to Deere & Company, Moline, Ill.

Filed Apr. 21, 1975, Ser. No. 570,230

Int. Cl.^{2} F01B *25/26, 31/12*

U.S. Cl. 91—1 **5 Claims**



1. An electro-hydraulic system comprising: a fluid reservoir; a fluid source of pressurized fluid; fluid function means providing a mechanical output and having at least one port; fluid passage means connected to the port; function control means operatively associated with the fluid source and the reservoir for controlling pressurized fluid in the fluid passage means and positionable to normally block or selectively connect the fluid source and the reservoir from and to the fluid passage means; manually operable input means operatively associated with the function control means providing an input for selectively positioning the function control means; releasable means intermeshable with the function control means and the input means for positively holding the function control means in a hold position connecting the fluid source to the fluid passage means and to cause the releasable means to withdraw from mesh with the function control means in response to a manual input positioning the function control means away from the hold position or to an electrical release current; an electrical current source, function sensor means operatively associated with the function means and providing an electrical output current proportional to the function means mechanical output; manually operable limiting means providing an electrical limiting current proportional to desired function means mechanical output; control means operatively associated with the function sensor means, the limiting means, and the releasable means for comparing the function sensor means output current and the limiting current and providing the electrical release current to the releasable means when the output current is equal or greater than the limiting current; and power switching means responsive to the input means positioning of the function control means in and away from the hold position to connect and disconnect, respectively, the electrical current source to and from the function sensor means, the limiting means, and the control means to provide electrical current thereto.

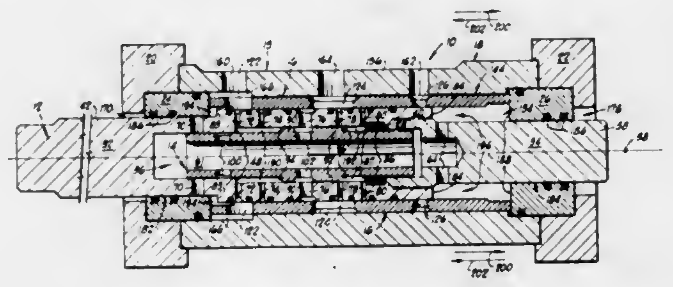
4,037,520
FLUID MOTOR APPARATUS

Herbert Edward Jakob, 8 Pritchard Lane, Taylors, S.C. 29687

Filed Aug. 29, 1975, Ser. No. 608,883

Int. Cl.^{2} F01L *15/12, 25/04, 21/02;* **F01B** *7/18*

U.S. Cl. 91—224 **8 Claims**



1. A pressure fluid operated motor comprising:
- a barrel assembly having a piston support bore, an inlet port means, and an outlet port means;
- a piston, having a piston bore disposed therein, supported by the barrel assembly in the piston support bore, the piston movable alternately in a first direction and in a second direction, and the piston having a first piston pressure face and a second piston pressure face larger than the first piston pressure face, the first piston pressure face forming with the barrel assembly a first piston actuating chamber having continuous fluid communication with the inlet port means, and the second piston pressure face forming with the barrel assembly a second piston actuating chamber; and,
- valve spool means supported by the piston for selectively communicating inlet pressure fluid from the inlet port means to the second piston actuating chamber, the valve spool means characterized as comprising a trapped fluid means for preventing mechanical impact between the valve spool means and the piston and the valve spool means further characterized as comprising a valve spool disposed in the piston bore for movement therein the valve spool having a first positional mode wherein the valve spool has moved maximally in the second direction in relation to the piston, and the valve spool having a second positional mode wherein the valve spool has moved maximally in the first direction in relation to the piston, and the trapped fluid means characterized as comprising:
- a first spool pressure face portion of the valve spool forming with the piston a first spool actuating chamber, the first spool actuating chamber forming a trapped fluid chamber when the valve spool is in the first positional mode;
- a second spool pressure face portion of the valve spool forming with the piston a second spool actuating chamber, the second spool actuating chamber forming a trapped fluid chamber when the valve spool is in the second positional mode;
- passage means for selectively providing fluid communication between the first spool actuating chamber and the inlet port means, and between the first spool actuating chamber and the outlet port means; and,
- passage means for selectively providing fluid communication between the second spool actuating chamber and the inlet port means, and between the second spool actuating chamber and the outlet port means.

4,037,521
NOISE REDUCTION

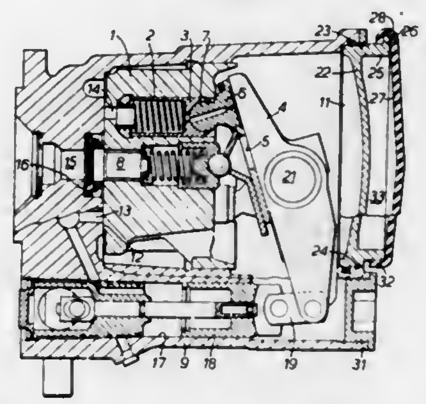
Donald Patterson McLeod, Cheltenham, England, assignor to Dowty Hydraulic Units Limited, Cheltenham, England

Filed Jan. 26, 1976, Ser. No. 652,314

Claims priority, application United Kingdom, Jan. 24, 1975, 3221/75

Int. Cl.^{2} F01B *3/02, 13/04*

U.S. Cl. 91—499 **6 Claims**



1. An axial piston machine, comprising a casing, a cylinder block within the casing, having a plurality of cylinders therein, parallel or nearly parallel to a central axis, a piston in each cylinder, a swash plate located at one end of the cylinder block and engaging the pistons projecting from the cylinders at that end of the block, mounting means for the swash plate in the casing for transmitting to the casing the piston thrusts that act on the swash plate, a valve plate secured within the casing, on which the cylinder block is mounted for rotation, a low and a high pressure main port in the valve plate, a cylinder port from each cylinder opening into the surface of the cylinder block which rotatably engages said valve plate, whereby during rotation, cylinders with outwardly moving pistons are connected to one main port and cylinders with inwardly moving pistons are connected to the other main port, a drive shaft passing through the valve plate to rotate the cylinder block, the casing having a closure member at an end which is opposite the valve plate, a cover of pliant material mounted on one of said closure member and said casing and externally of the casing adjacent to the swash plate and together with said closure member covering said end of the casing which is oppo-

site the valve plate, said cover covering said closure member, and a quantity of air or other gas trapped by the cover against the external surface of the closure member, the natural frequency of vibration of the cover being low compared to the natural frequency of the material used for the casing.

4,037,522

VEHICLE AIR CONDITIONING COMPRESSOR

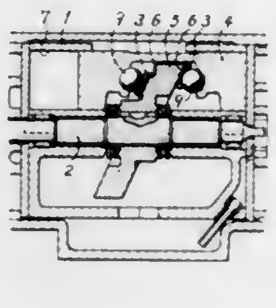
Teruaki Inoshita; Takashi Fukuda; Hitoshi Toga, all of Toyota, and Hikaru Takaoka, Kariya, all of Japan, assignors to Taihou Kogyo Kabushiki Kaisha and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho, both of, Japan

Filed Sept. 23, 1975, Ser. No. 615,888

Claims priority, application Japan, Sept. 24, 1974, 49-109856

Int. Cl.^{2} F01B *3/00;* **F04B** *1/12, 27/08*

U.S. Cl. 92—71 **3 Claims**



1. In a vehicle air conditioning compressor having a swash plate mounted on a rotatable shaft and a plurality of pistons, each of which is slidably engaged with the swash plate through intermediary of a set of a ball means and a shoe plate through the intermediary of a set of a ball means and a shoe means rotatably engaging with one another and slidably reciprocates inside a cylinder bore of a common cylinder block in accordance with rotation of the swash plate, an improvement wherein:

each said shoe comprises an imperforate ferrous backing plate as a major part thereof and a continuous, imperforate, sintered porous layer of a copper alloy, which is relatively thin with respect to said major part, formed integrally on said backing plate in slidable contact with said swash plate, said sintered layer having thickness in the range of from 0.3 mm to 0.5 mm and consisting essentially of tin in a range of from 2.5 to 12.1 percent by weight and lead in a range of from 7.0 to 25.0 percent by weight with the balance by weight being copper.

4,037,523

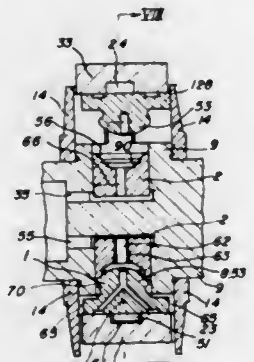
APPLICATION OF AN ENTERING OR DEEP-DIVING PISTON SHOE WITH A CENTRAL RADIAL SUPPORT MEMBER AND MEANS FOR SECURING THE SAME IN FLUID HANDLING RADIAL PISTON DEVICES

Karl Eickmann, 2420 Isshiki, Hayama, Kanagawa, Japan

Filed Nov. 29, 1974, Ser. No. 528,346

Int. Cl.^{2} F01B *1/00*

U.S. Cl. 92—72 **16 Claims**



1. A fluid machine comprising: a housing member; a rotor member rotatable in said housing member about a rotor axis and formed with a plurality of angularly spaced and radially outwardly opening recesses and with a radially outwardly opening cylinder at the base of each recess; said cylinders having wall portions extending with equal radii along said cylinders and said recesses, partially forming walls of said recesses; a piston radially displaceable in each of said cylinders and having a piston head with a bearing bed; a plurality of piston shoes radially displaceable independently of their respective pistons, each piston shoe having a radially inwardly projecting portion radially engageable with a respective bearing bed of the respective piston head of a respective piston, said inwardly projecting portion always engaged in the respective recess and partially moveably retained between respective portions of said wall portions and at radially outermost position between wall portions of the respective recess; a pair of end elements carried on one of said members and having radially extending innermost planar faces flaking said shoes axially; said bearing bed and said inwardly projecting portion having complementary face portions of equal radii; a cam in said housing engageable radially with said piston shoes and constructed to displace the same radially; and portions of said shoes being each received in a respective containment space delimited radially by said rotor member and said cam and delimited axially by said innermost faces of said end elements.

4,037,524

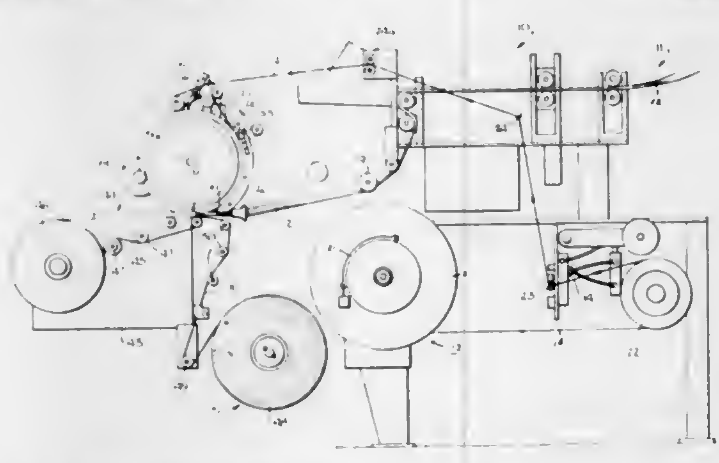
APPARATUS FOR COMBINING A TUBE WITH A CIGARETTE FILTER

Floyd Vanmeda Hall, Durham, N.C., assignor to Liggett Group Inc., Durham, N.C.

Filed Nov. 8, 1976, Ser. No. 740,030

Int. Cl.^{2} A24C *5/50*

U.S. Cl. 93—77 FT **17 Claims**



1. A filter making machine comprising

means for supplying a continuous supply of tow to an injection station;

means for supplying spaced apart tubes to said injection station;

means for positively moving each tube into said tow at said injection station; and

means for wrapping paper about said tow and injected tubes downstream of said injection station to form a continuous filter rod with longitudinally spaced apart tubes therein.

4,037,525

SIGNATURE STACKER EMPLOYING SWINGABLE INTERCEPT MEANS DRIVEN IN A NON-LINEAR FASHION

Christer A. Sjogren, Miami, Fla., and Ralph H. Backman, Taby, Sweden, assignors to EDS, Inc., Hialeah Gardens, Fla.

Filed July 30, 1975, Ser. No. 600,491

Int. Cl.^{2} B31B *1/98*

U.S. Cl. 93—93 C **26 Claims**

1. A stacker for forming bundles containing a preselected number of signatures from an incoming signature stream delivered to the stacker with the signatures arranged in overlapping fashion, said stacker comprising

infeed conveyor means for receiving said signature stream;

an outfeed location means;

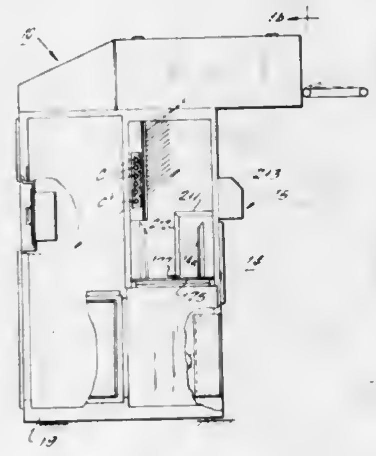
swingable blade means including a blade assembly having tips movable across the downstream end of said infeed conveyor means to intercept said stream;

reciprocating stop means for normally preventing said tips from moving in the path of the signature stream as the signatures leave the infeed conveyor means when said stop means is in an extended position;

preloading means for biasing said blade means in a first direction and against said stop means;

means positioned in said infeed conveyor means for counting said signatures to generate a trigger signal upon reaching a count representative of the desired bundle size;

reciprocating means positioned beneath said blade means for stacking signatures delivered from said conveyor means and blade means to form a bundle when in the collection position and dropping the formed bundle upon said outfeed location means positioned therebeneath when in the withdrawn position;



drive means responsive to said trigger signal to move said stop means to a withdrawn position displaced away from said blade tips into said stream for temporarily collecting a quantity of signatures on said blade means for a period sufficient to permit the said receiving means to complete its operation;

means for thereafter rapidly rotating said blade assembly from a rest condition through substantially one full revolution and back to said rest condition to deposit the signatures temporarily held thereon to said receiving means and return said blade tips to the position above said stop means and being urged against the stop means by said preloading means in readiness for the next intercept operation;

said rotating means including means for moving said assembly at a faster rate during the intermediate portion of each revolution to move the blades from beneath the signatures deposited thereon so that the signatures undergo free-fall to be deposited upon said reciprocating means.

4,037,526

TRAIN TUNNEL VENTILATION METHOD AND APPARATUS

William M. Jaekle, Moraga, Calif., assignor to Southern Pacific Transportation Company, San Francisco, Calif.

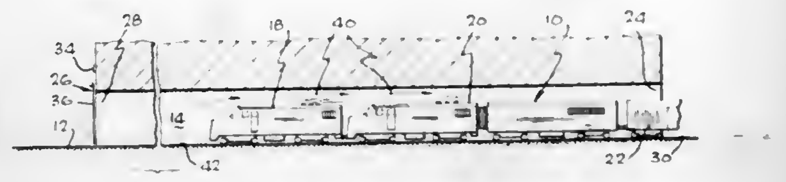
Filed Mar. 10, 1976, Ser. No. 665,425

Int. Cl.^{2} E01G *7/02*

U.S. Cl. 98—49 **7 Claims**

1. A method for ventilating a train tunnel that has entrance and exit ends, comprising:

closing said tunnel against the free flow of air from the exit end thereof and maintaining said tunnel closed, while driving said train through said tunnel toward the exit end thereof; and



opening the exit end of said tunnel before said train reaches the exit end of said tunnel.

4,037,527

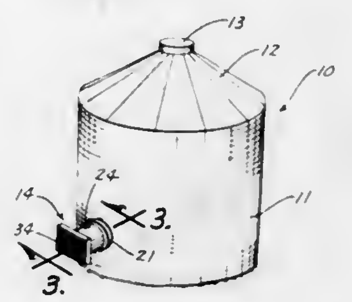
GRAIN DRYING APPARATUS

Vincent B. Steffen, 321 E. Hamilton, New Hampton, Iowa 50659

Filed Oct. 15, 1975, Ser. No. 622,638

Int. Cl.^{2} E04H *7/22*

U.S. Cl. 98—55 **5 Claims**



1. In a grain bin having sidewalls forming a chamber for receiving grain, a plenum chamber for receiving air from an air circulating means and a perforated floor dividing the plenum chamber from the grain receiving chamber for allowing air to flow from the plenum chamber to the grain receiving chamber, the improvement comprising:

an opening in a sidewall of said bin, part of said opening lying above said perforated floor and part of said opening lying below said perforated floor;

a perforated plate disposed between said opening and said grain receiving chamber for preventing grain from flowing out of said opening but allowing the flow of air from said opening directly into said grain receiving chamber; and

means for connecting said air circulating means to said opening for causing air to enter said plenum chamber and said grain receiving chamber through said opening.

4,037,528

DENSITY CONTROL MECHANISM FOR CROP BALER

Allen Andrew White, Peabody; George Yatcilla, and Harold Keith Garrison, both of Newton, all of Kans., assignors to Hesston Corporation, Hesston, Kans.

Filed Aug. 27, 1976, Ser. No. 718,390

Int. Cl.^{2} B30B *9/30*

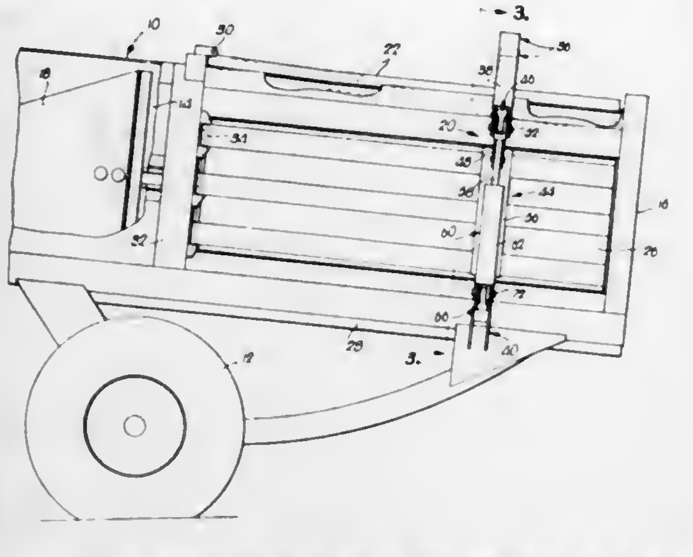
U.S. Cl. 100—191 **17 Claims**

1. In combination with a variable dimension bale chamber having a pair of mutually perpendicular, inwardly and outwardly shiftable walls that coverge toward one corner of the chamber, mechanism for controlling said shifting of the walls including:

a bell crank having a pair of diverging legs provided with outer ends;

structure swingably connecting said crank to one of said walls between said ends;

means for operably coupling the end of one leg with the other of said wall; and power means coupled with the other leg for rocking the crank and simultaneously displacing the same in a direction to inwardly shift said walls.



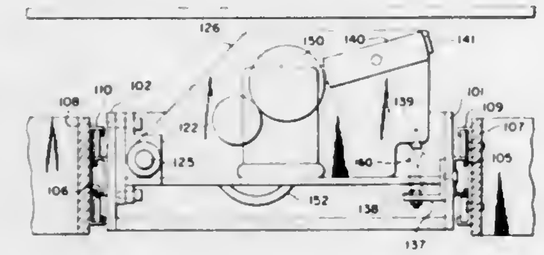
4,037,529
BOTTOM CODERS

Patrick Delligatti, c/o Dalemark Ind. 950 Airport Road, Industrial Park, Lakewood, N.J. 08702

Filed Oct. 21, 1975, Ser. No. 624,422

Int. Cl.² B41F *17/16*

U.S. Cl. 101—35 **3 Claims**



1. In a bottom coder including a cabinet having an upper horizontal product traversing surface, a pair of mutually opposed drive belts for conveying items to be marked across said product traversing surface, and printing means projecting upwardly through the product traversing surface and located in the path of movement of the products whereby the products are engaged by said belts and transported across said surface contact said printing means; the improvement comprising a drawer structure slideably mounted in said cabinet below said product traversing surface; said printing means being mounted within and supported by said drawer structure; means carried by said drawer structure for raising and lowering said printing means whereby said printing means may be moved to a position below the product traversing surface to enable said drawer to be slid open to a position wherein the printing means is completely external of the cabinet to permit complete access to said printing means, and thereafter said drawer may be closed and said printing means may be raised to a position above the product traversing surface whereby it may contact the products being conveyed thereacross; said means for raising and lowering comprising a frame of generally rectangular form; yoke means mounted on said frame for pivotal movement, said yoke means comprising one arm including means supporting the components of said printing means, said yoke means further comprising another arm in contact with an adjustment means whereby said yoke may be pivotally swung between said upper and lower positions and may be adjusted in its upper position to affect pressure of the printing means against the bottom of the items to be marked.

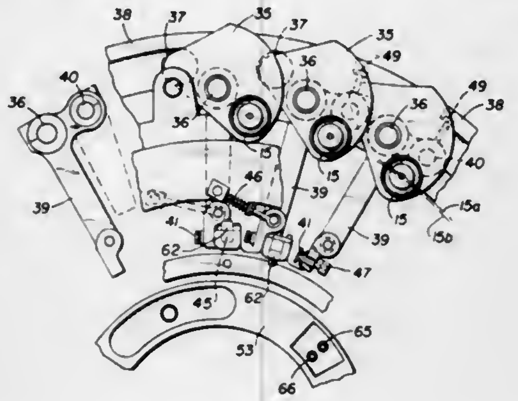
4,037,530
MANDREL TRIP MECHANISM FOR CAN PRINTERS

Enn Sirvet, Washington Township, Bergen County, N.J., assignor to Coors Container Company, Golden, Colo.

Filed Dec. 1, 1975, Ser. No. 636,402

Int. Cl.² B41F *17/22*

U.S. Cl. 101—40 **10 Claims**



1. In a continuous printing machine for cylindrical containers, a cam actuated pivoting mandrel mechanism comprising:

a. a mandrel arm,
b. a pivot arm pivotally mounted on said printing machine and having said mandrel arm pivotally mounted thereon,
c. a can support mandrel mounted on said mandrel arm at a point non-coaxial with the mounting of the mandrel arm on the pivot arm,
d. a slidable stop member mounted on the printing machine and supporting said pivot arm in a first position when a properly mounted can is on the mandrel, the stop being movable to a second position wherein the pivot arm is not supported in said first position,
e. means for detecting a missing or a partially loaded can on the mandrel, and
f. means for moving said slidable stop member to said second position in response to said detecting means when a missing or improperly loaded can is on the mandrel, the slidable stop member allowing the pivot arm to move from said first position and in turn move said mandrel arm and mandrel from printing position.

4,037,531
ROTARY PRINTING MACHINE

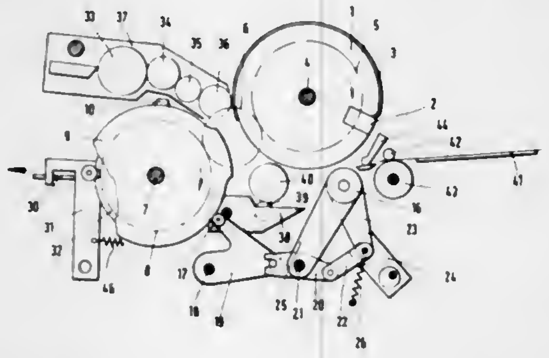
Gerhard Ritzerfeld, Schorlemer Allee 14, 1000 Berlin 33, Germany

Filed Aug. 4, 1975, Ser. No. 601,933

Claims priority, application Germany, Aug. 8, 1974, 2438420

Int. Cl.² B41L *47/46*

U.S. Cl. 101—91 **4 Claims**



1. A printing machine of the type comprised of a cyclically moving printing member having a printing surface comprised of a rotating printing drum carrying a printing and inking means for inking the printing surface, comprising, in combination, a counterpressure member mounted for movement into an operative position in which it presses towards the inked printing surface so as to press an item to be printed against the inked printing surface; feeding means for feeding an item to be printed into the space intermediate the printing surface and said counterpressure member; moving means operative when driven for moving said counterpressure member into said operative position; controllable coupling means; rotary synchronizing means coupleable with the cyclically moving printing member by said controllable coupling means so as to receive rotational drive force from the printing member and be rotated by the latter and operative when so coupled and rotated for effecting transfer to items to be printed of predetermined portions of the ink image on the printing surface by transmitting mechanical drive force from said printing member to said moving means; and control means operative for detecting feeding of an item to be printed and in response to such detection engaging said controllable coupling means and accordingly establishing a driving connection between the cyclically moving printing member and said synchronizing means.

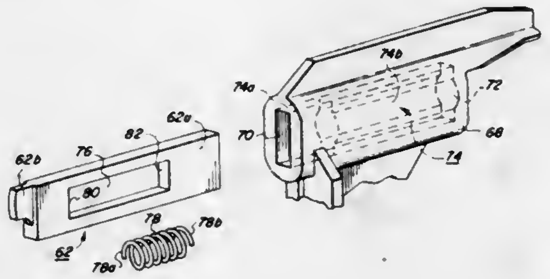
4,037,532
HAMMER ASSEMBLY

Mario G. Plaza, Fremont, and Michael C. Weisberg, San Carlos, both of Calif., assignors to Xerox Corporation, Stamford, Conn.

Filed Mar. 8, 1976, Ser. No. 664,797

Int. Cl.² B41J *9/02*

U.S. Cl. 101—93.48 **5 Claims**



1. A hammer assembly comprising:

a housing having opposing ends and an internal passage extending between said open ends, said passage including a forward portion adjacent the other end of said housing and a rearward portion adjacent the other end of said housing, said forward and rearward portions each being substantially uniform in cross-sectional area along the longitudinal axis of said housing, said cross-sectional area of the forward portion being less than said cross-sectional area of the rearward portion;

a hammer element positioned in said housing for reciprocal movement in said passage between forward and rearward positions, said hammer element having an opening formed therein;

a biasing member positioned in said opening and capable when enabled of biasing said hammer element in the direction of its rearward position, said biasing member comprising a helically wound spring compressed when not enabled between a pair of opposing walls of said hammer element defining the forward and rearward ends of said opening, said spring having a diameter greater than said cross-sectional area of the forward portion of said passage and less than said cross-sectional area of the rearward portion of said passage; and

means for enabling said spring when said hammer element is in at least its forward position, said means for enabling comprising wall means forming part of said housing and being located substantially at the boundary of the forward and rearward portions of said passage for engaging one end of said spring and preventing its movement toward the end of said housing adjacent the forward portion of said passage whereby continued forward movement of said hammer element causes said spring to be further compressed between said wall means at said one end of said spring and one of said pair of opposing walls at the other end of said spring thereby biasing said hammer element in a rearward direction.

4,037,533
COLOR LITHOGRAPHY USING A RANDOM PATTERN SCREEN

Sidney L. Rapoport, Lagrangeville, and Douglas F. Mitchell, Brooklyn, both of N.Y., assignors to Rapoport Printing Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 529,614, Dec. 5, 1974, abandoned. This application June 2, 1976, Ser. No. 692,206

Int. Cl.² B41M *1/14*

U.S. Cl. 101—211 **10 Claims**

1. In the method of reproducing multicolored visual subject matter having gradations of tonal density, including the steps of making a continuous tone color separation for at least each of the colors cyan, magenta and yellow, producing a halftone image from each of said color separations, converting each of said halftone images to a halftone printing plate, and printing a substrate with each of said halftone printing plates in registry, the improvement comprising the steps of making at least two secondary images, converting each of said secondary images into a secondary printing plate and printing said substrate with each of said secondary printing plates in registry with said halftone printing plates, each of said at least two secondary images being made by exposing a different one of said magenta, cyan and yellow color separations to a photographically sensitive surface through a random pattern screen.

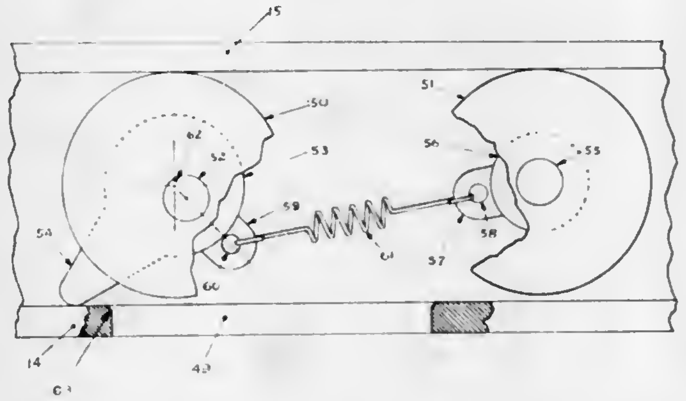
4,037,534
IMPRINTER

William P. Barbour, 791 E. Fairview Ave., Annapolis, Md. 21403

Filed Oct. 29, 1975, Ser. No. 626,999

Int. Cl.² B41F *3/04*

U.S. Cl. 101—269 **6 Claims**



1. An imprinter for printing data on a document, comprising a base having guidance means; a carriage assembly movable along said guidance means during an imprint stroke and a return stroke; and means cooperating with said carriage assembly and said guidance means for lowering said carriage assembly during the imprint stroke and raising said carriage assembly during the return stroke, wherein said lowering and raising means includes front wheel means engageable at said guidance means and rotatably mounted about a rotatable lifting cam, a front axle eccentrically mounted with respect to said lifting cam and operatively connected with said carriage assembly, a lifting cam lever rotatable in unison with said lifting cam, slot means axially spaced along said guidance means for cooperating with said lifting cam lever at the beginning of the imprint stroke to lower said carriage assembly and at the beginning of the return stroke to raise said carriage assembly, and biasing means for biasing said lifting cam lever into said slot means at the termination of the imprint stroke.

4,037,535

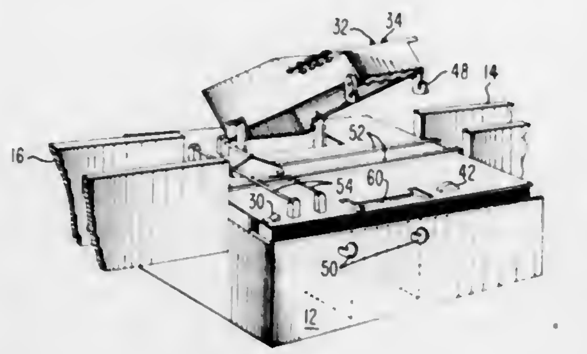
HIGH SPEED PRINTING APPARATUS

Jerry Hans Lehmann, Rochester; Richard L. Mills, Pittsford; William H. Mowry, Jr., Ionia; James D. Peglow, Canandaigua; Norman H. Preston, Rochester, and Aniel G. Sitole, Pittsford, all of N.Y., assignors to Burroughs Corporation, Detroit, Mich.

Continuation of Ser. No. 499,560, Aug. 22, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,194

Int. Cl.² B41F *1/28, 1/34*

U.S. Cl. 101—287 **5 Claims**



1. Printing apparatus for printing signatures and dates on items effective to commercially validate such items comprising:

a printing station having a printing platen and including demountable printing members capable upon introduction of an item in juxtaposition to said platen of producing an impression of a signature and a date thereon from said printing members,
input feed means for feeding items such as checks to said printing station,
output collecting means for collecting items after printing,
an item feed pathway including continuously movable means for moving items from said input feed means to said printing station and thence to said output collecting means,
means in said printing station for causing an impression to be produced on one of said items from said signature and date impression producing members,
linking means for inking said printing members including means for incrementally presenting a fresh inked area of said inking means to said signature and date impression producing members,
clutch means for advancing the item moving means to present one of said items to said printing station,
first photo optical sensing means producing an electrical signal for initiating and controlling the actuation of said clutch means,
item stop means in said item feed pathway for stopping the item adjacent to said printing members, and
second photo optical sensing means removably mounted on said item stop means,
including means demountably supporting the second photo optical sensing means permitting the latter to be removed or replaced as required.

4,037,536

ENCLOSURE FOR EXPLOSIVE MATERIAL

George L. Griffith, Coopersburg, Pa., assignor to IMC Chemical Group, Inc., Terre Haute, Ind.

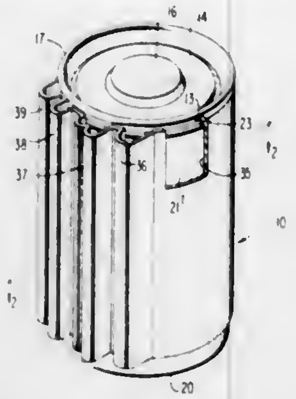
Filed Sept. 8, 1975, Ser. No. 611,593

Int. Cl.² F42B *3/00*

U.S. Cl. 102—20 **1 Claim**

1. An improved enclosure for explosive material of the type having a cylindrical container including an enclosed lower end, a sidewall sealingly secured to said lower end, a cover adapted to be sealingly secured to said sidewall with a seam to form an enclosed, sealed container, and a sleeve in encircling engagement with the container extending substantially the entire length of said sidewall, said sleeve and said sidewall including means cooperating to define at least one recess adapted to receive a detonator, and maintain said detonator in contact with said sidewall along substantially the entire length of said sidewall, wherein the improvement comprises:

a depression in the upper end of said sidewall below the seam of said sidewall with said cover, extending around the circumference of said sidewall, with said seam constituting the upper boundary of said depression; and a resilient protrusion of the inner surface of said sleeve at the upper end of said sleeve, having a shape corresponding to that of said sidewall depression, and extending at least partially around the circumference of the inner surface of said sleeve, said protrusion engaging said sidewall depression, thereby enabling said sleeve to be slid onto said sidewall without axial rotation and hindering said sleeve from slipping off said sidewall.



4,037,537

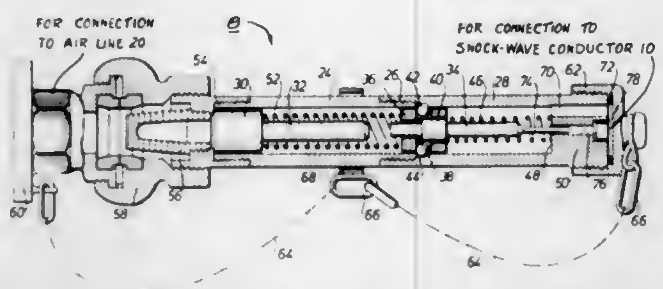
METHOD AND A DEVICE FOR BLASTING

Torgny Thorsell, and Torbjorn Svensson, both of Skelleftea, Sweden, assignors to Linden-Alimak AB, Skelleftea, Sweden

Filed Sept. 30, 1975, Ser. No. 618,279

Int. Cl.² F42D *3/10*

U.S. Cl. 102—22 R **6 Claims**


FOR CONNECTION TO AIR LINE 20
FOR CONNECTION TO SHOCK-WAVE CONDUCTOR 10
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1. A device for initiating the explosion of an explosive blasting charge by means of a shock wave transmitted to the charge by means of a shock wave conductor,

said device comprising a pressurized fluid operated initiator for detonating a blasting cap to produce the shock wave,
said device further comprising a pressurized fluid operated operating element movable from a rest position to an operating position in response to pressurized fluid,
a connection means for connecting said operating element through a pressurized fluid line to a remote source of pressurized fluid for operator initiator of the operation of said device,
said operating element being operable in said operating position for initiating movement of a striking element against the blasting cap for detonating the same,
and means for connecting said device to a shock wave conductor for conducting the shock wave from the blasting cap to a remotely positioned explosive blasting charge for detonation thereof.

4,037,538

DEVICE FOR FIRING AN ELECTRIC DETONATOR

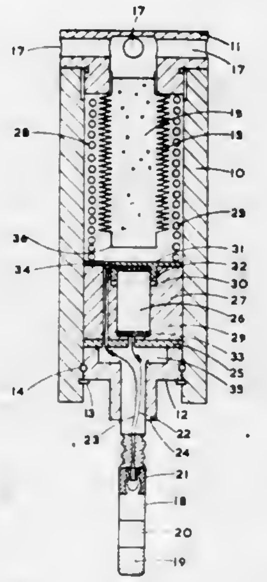
Jeremy Charles Andrews, Salcoats, and Gordon Brian Roger Shannon, Dundonald, both of Scotland, assignors to Imperial Chemical Industries Limited, London, England

Division of Ser. No. 515,017, Oct. 15, 1974, Pat. No. 3,987,729. This application Aug. 26, 1976, Ser. No. 718,203

Claims priority, application United Kingdom, Oct. 31, 1973, 50605/73

Int. Cl.² F42D *1/04*

U.S. Cl. 102—23 **4 Claims**



1. A method of blasting comprising providing a first explosive charge in a desired location, exploding a further explosive charge thereby generating a shock wave, exposing to the shock wave a piezo-electric transducer located in a housing having a wall portion formed by a bellows element which is deformable in response to external pressure on the housing, the bellows transmitting pressure to the transducer, said transducer being capable of generating an electrical voltage in response to the shock wave, and conducting said voltage to an electric detonator having a fusehead capable of being activated by the voltage so as to fire said detonator, said first explosive charge being associated with said detonator so as to be exploded by the exploding of said detonator.

4,037,539

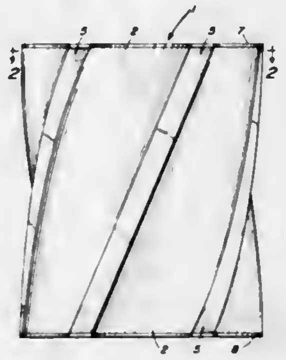
SPIRAL CHANNEL BLAST-FRAGMENT WARHEAD

Emory E. Hackman, Arlington, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 20, 1971, Ser. No. 168,509

Int. Cl.² F42B *13/48*

U.S. Cl. 102—67 **9 Claims**



1. A warhead comprising:

a solid, one-piece, substantially cylindrical casing;
coverplates on the ends of of said casing;
an explosive material substantially filling said casing and extending to the inner periphery of said casing;
plural detonators symmetrically disposed along the longitudinal axis of said casing within said explosive material; and
spiral channel means having a concave circular-arc-shaped cross-section formed in said casing for producing a particular fragmentation pattern.

4,037,540

DIRECTIONAL ANTENNA FOR A PROJECTILE OR ROCKET DETONATOR

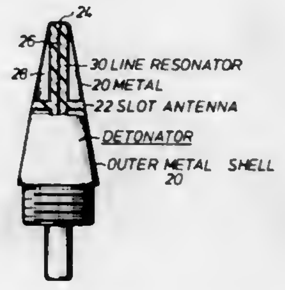
Wolfgang Keydel, Ulm (Danube), Germany, assignor to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Nov. 11, 1975, Ser. No. 630,893

Claims priority, application Germany, Nov. 16, 1975, 2454528

Int. Cl.² F42C *13/04, 13/00;* **H01Q** *13/10, 13/18*

U.S. Cl. 102—70.2 P **17 Claims**



1. In a projectile or rocket having a metal outer shell and including a proximity or influence detonator operating with electromagnetic waves, particularly according to the reflected beam principle, and a directional antenna having a rotationally symmetrical radiation diagram for said detonator, the improvement wherein said antenna is constituted by a circular slot which is formed in said outer shell and which is coaxial with the longitudinal axis of the said projectile or rocket; and further comprising resonator means disposed within said outer shell, and coupled between said antenna and said detonator for exciting said circular slot.

4,037,541

TRACK FOR A COMBINED MONORAIL AND OVERHEAD MONORAIL

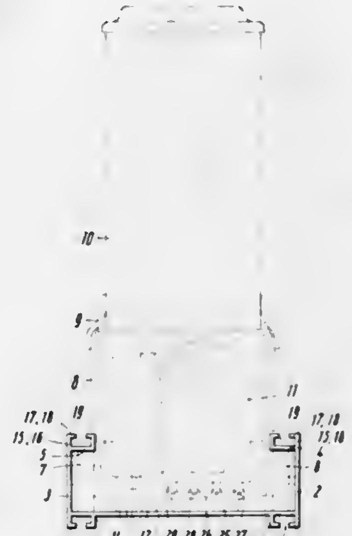
Horst Giessler, Salzboden Strasse 22, CH-4310 Rheinfelden, Switzerland, and Klaus Luckerath, 2 Prattelnerstr. 8, D-7889 Grenzach-Wyhlen 2, Germany

Filed Oct. 16, 1975, Ser. No. 623,202

Claims priority, application Germany, Oct. 17, 1974, 7434754[U]

Int. Cl.² E01B *25/08, 25/22*

U.S. Cl. 104—109 **6 Claims**

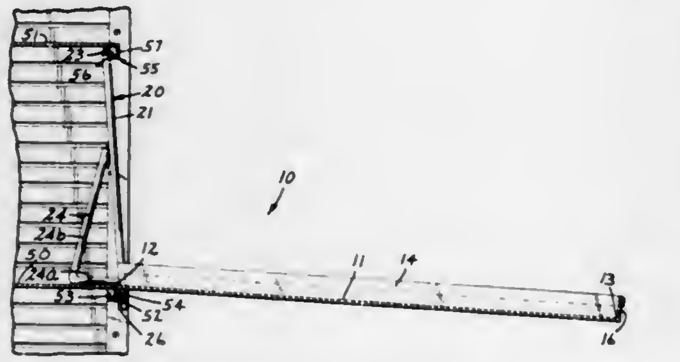


1. A track for a combined monorail and overhead monorail for slidably supporting an accessory device having a power supply control tracks and at least a pair of roller members comprising:

a U-shaped rail section including a base wall and two sidewalls secured to the ends of said base wall and extending upwardly therefrom, each of said sidewalls having a flange extending inwardly from its upper edge which cooperates with said base wall to slidably receive therebetween the roller members of the accessory device; and

at least one shoulder section extending along the length of said rail section formed on the lower surface of the bottom wall of said rail section as well as on the upper surface of one of the flanges of said sidewalls, said shoulder section having two arms extending generally outwardly therefrom, the ends of which extend toward one another, to define therebetween an outwardly opened, longitudinally disposed channel extending therethrough, for mounting the track on a suitable support or suspension system.

4,037,542
AUXILIARY SHELF APPARATUS
Thomas Kropiwka, 715 4th Ave., NW., New Brighton, Minn. 55112
Filed May 20, 1976, Ser. No. 688,362
Int. Cl.² A47B *41/04*
U.S. Cl. 108—32 **7 Claims**



1. Auxiliary shelf apparatus for use with shelving of the type having at least a pair of shelves vertically spaced apart from one another in rack-type arrangement, wherein the upper shelf of said pair has formed at its front edge a downwardly projecting lip, said apparatus comprising:

a. tray means having front and rear ends;

b. first support means secured at said rear end of said tray means for detachably engaging the lower shelf of said pair thereby supporting said tray means against vertical downward movement and horizontal movement toward said lower shelf when said first support means engages said shelf, said tray means being supported in substantially flush alignment with said lower shelf; and

c. second support means secured to said tray means for detachably engaging the downwardly projecting lip of the upper shelf, said second support means resisting pivotal downward movement about said rear end of said tray means when said second support means engages the downwardly projecting lip of the upper shelf, said second support means permitting the sliding movement of an item from said lower shelf onto said tray means,

said auxiliary shelf apparatus being readily attachable and detachable with respect to said pair of shelves.

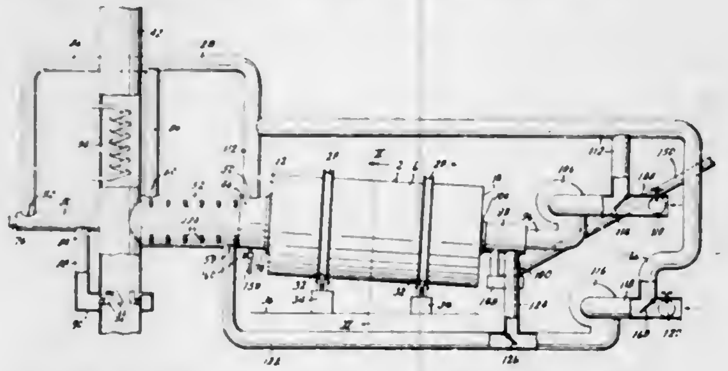
4,037,543
POLLUTION FREE COMBINATION CARBONIZATION APPARATUS AND FURNACE
James F. Angelo, P.O. Box 846, Jonesboro, Ark. 72401
Filed Feb. 27, 1976, Ser. No. 662,216
Int. Cl.² F23G *5/06;* C10B *1/10*
U.S. Cl. 110—14 **22 Claims**

1. A combination device for converting granular cellulosic material alternatively either to charcoal or to ash, said device comprising:

a. a retort including means by which said cellulosic material is continuously introduced thereto, and by which the charcoal or ash in continuously removed therefrom after conversion of said material,

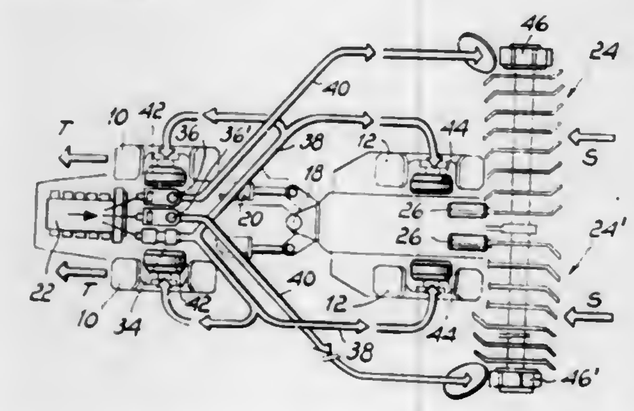
b. means operable initially to start the conversion reaction by heating at least a portion of the introduced material to carbonization temperature to initiate a spontaneous, self-sustaining carbonization reaction in which a combustible hydrocarbon gas is released from said material,

c. means operable to inject air into said retort, and



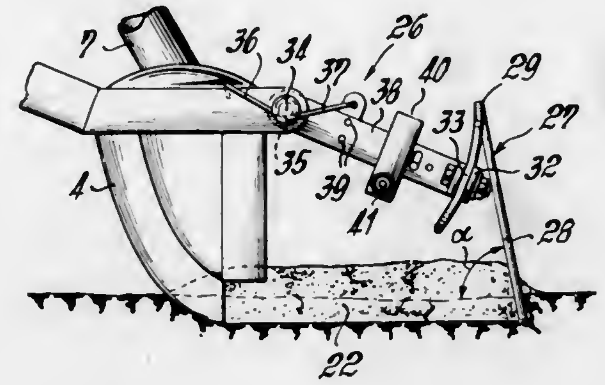
d. means operably to adjust the rate of injection of air into said retort, whereby said rate may alternatively either be set sufficiently low to add only enough oxygen to support combustion of only enough of said hydrocarbon gas, in spatially separated relation from said cellulosic material, to provide sufficient heat to dry and elevate the freshly added material to carbonization temperature, whereby a continuous carbonization reaction producing charcoal is established independently of said initial heating means, or sufficiently high to add sufficient oxygen to permit relatively complete combustion of said hydrocarbon gas and said material, whereby a continuous ash producing operation is established.

4,037,544
AGRICULTURAL MACHINE
Natale Cantone, Via M. Prestinari, 219, Vercelli, Italy
Filed Sept. 2, 1975, Ser. No. 609,483
Claims priority, application Italy, Apr. 9, 1974, 26927/74; May 30, 1975, 23887/75
Int. Cl.² A01C *23/00*
U.S. Cl. 111—6 **13 Claims**



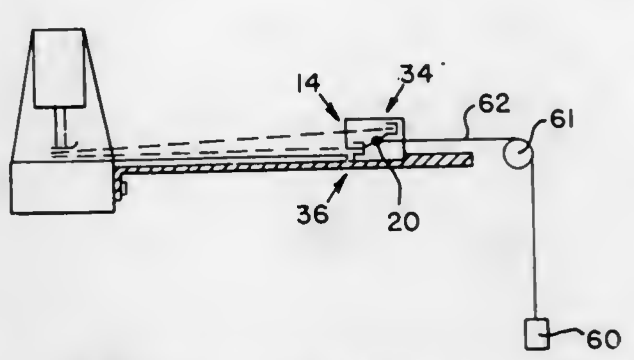
1. An agricultural self-propelled machine including a vehicle capable of autonomously advancing when driven and an assembly of implements actuated with a rotary motion and capable of processing the soil during advancement of the vehicle thereon comprising: a primary source of mechanical energy, at least two transducers having inputs connected to said primary source and individually capable of transforming the mechanical energy produced thereby into independent non-mechanical energy flows and having outputs connected to separate power flow channels, and at least two driving means fed through channels with the non-mechanical energy flows produced by said transducers, at least one of said driving means being operatively connected to means to advance said vehicle on the soil, and at least another of said driving means being operatively connected to said assembly of implements, and wherein at least one of the driving means is provided with means to vary the power supplied thereby, and the speed imparted thereby to the members to which it is operatively connected, and also with means to vary the former without proportionately varying, or without varying at all, the latter.

4,037,545
MACHINE FOR DISTRIBUTING MATERIAL
Heinz Dreyer, Hasbergen-Gaste, Germany, assignor to Amazonen-Werke H. Dreyer, Hasbergen-Gaste, Germany
Continuation of Ser. No. 422,040, Dec. 5, 1973, abandoned. This application Apr. 14, 1975, Ser. No. 567,972
Claims priority, application Germany, Dec. 16, 1972, 2261765
Int. Cl.² A01C *5/06*
U.S. Cl. 111—85 **6 Claims**



1. Machine for distributing granular or powdered material and suitable for being pulled by a tractor, comprising a frame, a hopper mounted on the frame, furrow openers mounted on the frame, material conveying tubes connected to the furrow openers and the hopper for the transport of material from the hopper to the furrow openers, the furrow openers having outlet orifices for delivery of said material to the soil, furrow closers connected to the furrow openers for pivoting in vertically extending planes with respect to and behind the furrow openers, each furrow closer comprising a support pivotally connected to the furrow opener and a hiller mounted on the support by a mounting device for projection of the hiller below the mounting device and into the soil for closing of a furrow, the hiller being secured to the mounting device by a releasable fastener so that the length of the projection of the hiller below the mounting device can be adjusted, the furrow openers being movable between a lower position and an upper position with resultant movement of the furrow closers to, respectively, penetrate the ground and raise from the ground, the pivot mounting of the furrow closers and the length of the supports, and the adjustability of the adjustable mounting of the hillers on the mounting devices being such that the hillers can be disposed on the supports so that in the raised position the hillers are disposed beneath the furrow openers so that when the furrow openers and furrow closers are lowered, the hillers contact the ground and support the furrow openers above the ground so that the outlet orifices do not become plugged with soil, and while in the working position the hillers are the only parts of the furrow doses which contact the ground the hiller being formed of a single piece of flexible spring steel strip and consisting essentially of two downwardly projecting fingers, a U-shaped section, and sections joining the free ends of the U-shaped section to the upper ends of the fingers, said U-shaped section being arched to provide the U-shaped section concave when viewed from the forward end of the machine, the hiller being clamped on the mounting device at the arched portion.

4,037,546
SEWING MACHINE APPARATUS FOR ALIGNING AND SEWING PIECES OF TEXTILE FABRIC OR THE LIKE
Johann Otto Kleinschmidt, Karlsruhe, Germany, assignor to Union Special G.m.b.H., Stuttgart, Germany
Filed July 27, 1976, Ser. No. 709,051
Int. Cl.² D05B *21/00*
U.S. Cl. 112—121.26 **19 Claims**



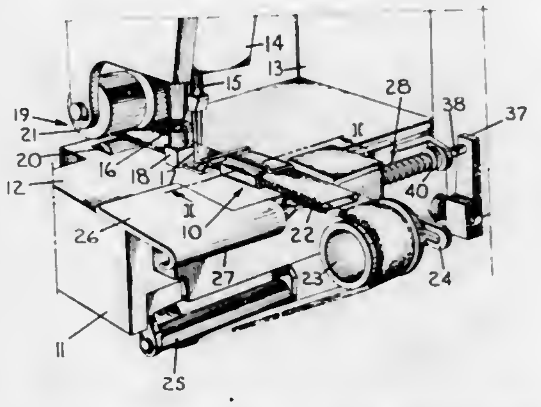
1. In combination, a sewing machine having differential feed means for engaging and feeding a overlying series of fabric panels and an apparatus for aligning a mismatched trailing end portion means of said fabric panels in a predetermined position comprising:

means for accepting and holding each of said end portion means of said fabric panels and movable therewith;

means for continuously sensing the position of each of said end portion means relative each other during the sewing operation; and

means connected to said sensing means for selectively advancing or retarding the relative rate of feed of said differential feed means thereby aligning each of said end portion means upon completion of the sewing operation.

4,037,547
CLAMSHELL GUIDE TO APPLY ANNULAR ELASTIC BANDS ON CLOTHES
Nerino Marforio, Milan, Italy, assignor to Rockwell-Rimoldi S.p.A., Milan, Italy
Filed Dec. 17, 1974, Ser. No. 533,501
Claims priority, application Italy, Dec. 27, 1973, 32289/73
Int. Cl.² D05B *23/00, 35/06*
U.S. Cl. 112—121.27 **1 Claim**



1. An openable guide for guiding circular elastic bands to the sewing instrumentalities of a sewing machine for attachment as waist bands onto garments, said guide comprising:

a. individual support members (58, 60) independently mounted for pivotal movement on the sewing machine;

b. a pair of opposed elements (29, 30) attached to said support members (58, 60) respectively having cooperating internal surfaces defining a shaped channel (31) through which the elastic bands are guided;

c. control means (28) operatively connected to a first one said support members (58) for selectively pivoting the latter between positions of close proximity with and a lower inclined location spaced from the others of said support members **(60)**; and

d. means **(62, 63, 64)** interconnecting said first one of said support members **(58)** with the other of said support members **(60)** for effecting simultaneous pivotal movement of the latter with and in a direction opposite to said first support member **(58)** during selective actuation of said control means **(28)**;

e. said means for effecting simultaneous pivotal movement of said support member **60** including:

  1. a bifurcated arm **(65)** extending from and forming an integral part of said support member **60**; and
  2. an arm **62** forming an integral part of said support member **(58)** having a laterally extending pin **(63)** disposed within the bifurcation of said arm **(65)**.

4,037,548

KNIFE OPERATING DEVICE FOR SEWING MACHINES

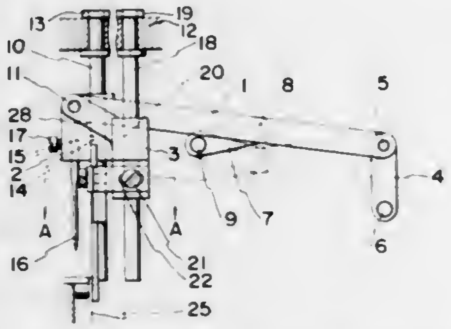
Tetsuro Hirayama, Chofu; Kousuke Yuyama, and Yoshihiko Matsuura, both ofTokyo, all of Japan, assignors to Juki Co., Ltd., Tokyo, Japan

Filed Oct. 30, 1974, Ser. No. 519,243

Claims priority, application Japan, Nov. 1, 1973, 48-123222; Nov. 8, 1973, 48-125748; Nov. 8, 1973, 48-125749

Int. Cl.^{2} D05B *37/00*

U.S. Cl. 112—123 R **14 Claims**



1. A knife operating device for a sewing machine, comprising:

a. a rocking arm having a front end and a rear end, and being pivotally mounted at its rear end to the sewing machine,

b. a needle stub guiding bar intersecting the rocking arm at the front end of the rocking arm, the bar being connected to the frame of the sewing machine,

c. a needle stub mounted on the needle stub guiding bar and being guided thereby,

d. a knife holder,

e. means connecting the knife holder to the rocking arm, and

f. means operatively connected to the rocking arm to simultaneously move both the needle stub and the knife holder in response to the movement of the rocking arm.

4,037,549

CASE FOR PORTABLE SEWING MACHINES

Susumu Hanyu, Hachioji, and Takashi Amano, Tokyo, both of Japan, assignors to Janome Sewing Machine Co., Tokyo, Japan

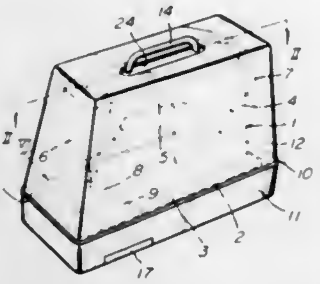
Filed Sept. 4, 1975, Ser. No. 610,403

Claims priority, application Japan, Sept. 10, 1974, 49-108150[U]

Int. Cl.^{2} D05B *73/10*

U.S. Cl. 112—258 **7 Claims**

1. A case for a portable sewing machine of the type having a work supporting rectangular bed, parts mounted on and extending above said bed and including a standard secured to the bed, a bracket secured to the standard and spaced apart from the bed and a flywheel mounted on said standard adjacent to said bracket, and a handle mounted on top of the bracket, said case comprising a hollow rectangular base having a bottom wall, four side walls extending upwardly from said bottom wall and an open top and being arranged to receive the bed of a sewing machine; means for securing said base to the bed therein; and a cover at least partially surrounding the parts of a machine whose bed is supported by said base, said cover being open from below and having a top wall and four side walls extending downwardly from said top wall, said cover having an elongated opening provided in said top wall through which the handle of the machine whose bed is supported by said base extends so that the case can be lifted through the medium of the machine therein by lifting the machine by way of the handle, one of said side walls of said cover having a substantially circular second opening for said flywheel.



4,037,550

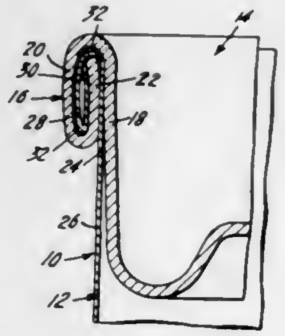
DOUBLE SEAMED CONTAINER AND METHOD

David Edward Zofko, Greenwich, Conn., assignor to American Can Company, Greenwich, Conn.

Division of Ser. No. 483,800, June 27, 1974, abandoned. This application May 18, 1976, Ser. No. 687,496

Int. Cl.^{2} B21D *51/32, 51/34*

U.S. Cl. 113—120 Y **7 Claims**



1. A method of hermetically double seaming a flanged metallic container end closure to an open-ended metallic cylindrical container body whose body wall metal is highly worked, has a substantially axial grain direction and is less than about **0.0057** inch thick at its marginal open end portion, to form a container capable of withstanding internal pressures of up to about **90** psi developed at elevated temperatures of up to about 140° F., which comprises:

forming an annular body curl of the less than about **0.0057** inch thick marginal open end portion of the container body wall, said curl having an edge which points toward the container body wall,

placing a flanged metallic end closure over the curled open end of the container body,

applying a sealant material to a surface of at least one of the end closure and body wall for bonding said closure and said wall together, and,

double seaming the end closure to the container body by bending the end closure flange downward and up under the body curl between it and the container body, in a first operation, to form an end closure skirt and cover hook, and by radially compressing the seam, in a second operation, to bend the body curl and conform it to substantially the shape of the end closure skirt and cover hook, so that the compressed closure skirt and cover hook are coextensive with said body curl and terminate in adjacent edge portions presented axially toward the open end portion of the container body wall, tightening and bonding the seam against the container body, hermetically to double seam the end closure to the container body.

4,037,551

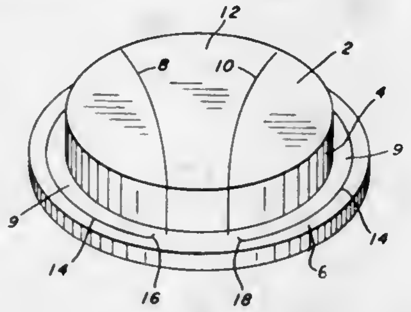
TEAR-OFF CLOSURE AND METHOD OF FORMING THE SAME

Paul R. Lewis, Richmond, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Feb. 25, 1976, Ser. No. 661,255

Int. Cl.^{2} B21D *51/44*

U.S. Cl. 113—121 C **4 Claims**



1. A method of forming a tear-off closure comprising the steps of:

drawing a metal disc into a closure shell having a top end wall, a closure skirt around the top end wall, an annular rim extending outwardly from the bottom of the closure skirt and a wall depending from the outer edge of the annular rim;

severing said rim at a location between said skirt and said depending wall part way around the closure to leave an outwardly projecting edge at the bottom of the closure skirt;

curling a bottom edge of said depending wall inwardly under said outwardly projecting edge on the closure skirt; and

curling the top edge of said depending wall inwardly over said outwardly projecting edge to form a beaded pull ring with an inwardly open slot therein in which at least a portion of said outwardly projecting edge of the closure skirt is entrapped.

4,037,552

PROCESS FOR REDUCING THE STRESSES CAUSED BY THE VERTICAL BENDING OF A BOAT ON INDEPENDENT TANKS INSTALLED THEREIN

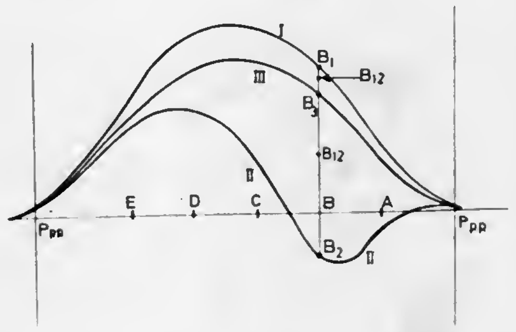
Jaime Torroja, Las Arenas, Spain, assignor to Sener, Tecnica Industrial Y Naval S.A., Las Arenas, Spain

Continuation of Ser. No. 527,591, Nov. 27, 1974, abandoned. This application May 24, 1976, Ser. No. 689,657

Claims priority, application Spain, Dec. 1, 1973, 421085

Int. Cl.^{2} B63B *25/08*

U.S. Cl. 114—74 R **5 Claims**



1. A process for reducing the stresses in a vessel comprising the steps of,

providing a hull having a plurality of zones in each of which an independent cargo tank for the storage of material, such as liquefied gas, is to be installed,

subjecting the hull in each of said zones along a central transverse section with respect to the tank to be installed therein to a predetermined vertical static bending moment in the absence of the tank by adjusting the ballasting of the hull while it is afloat,

and installing each of the tanks in said hull within its respective zone while maintaining said predetermined vertical static bending moment on said zone whereby the maximum stresses to which the tank will be subjected under different sailing conditions will be substantially reduced.

4,037,553

APPARATUS FOR CONNECTING A SAILING MAST TO A SAILING BOARD

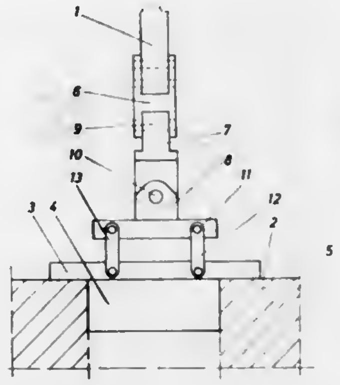
Hannes Marker, Hauptstrasse 51-53, 81 Garmisch-Partenkirchen, Germany

Filed Oct. 15, 1975, Ser. No. 622,512

Claims priority, application Germany, Oct. 18, 1974, 2449636

Int. Cl.^{2} B63B *15/00*

U.S. Cl. 114—91 **5 Claims**



1. Apparatus for connecting a sailing mast to a sailing board having a longitudinal dimension comprising a linking member, means for pivotably attaching said linking member to the foot of a mast, connecting means for connecting said linking member to a sailing board, said connecting means comprising means for moving said linking member in a plane along the longitudinal dimension of the sailing board so that the mast can be lifted, fixed and firmly maintained in at least two positions along the longitudinal dimension of the sailing board.

4,037,554

COMBINATION GAFF AND BOAT HOOK

Peter F. Foscolo, 4565 Middlesex Road, Wilmington, N.C. 28401

Filed Apr. 29, 1976, Ser. No. 681,387

Int. Cl.^{2} B63B *21/54*

U.S. Cl. 114—221 R **4 Claims**

1. A combination gaff and boat hook comprising:

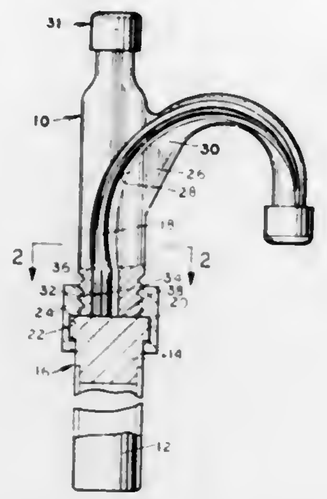
a rigid elongated rod-like element;

a gaff element secured fixedly to one end of said rod-like element;

a sheath for said gaff element adapted to be removably positioned thereover and to be connected adjacent one end thereof to said rod-like element to form an extension thereof, said sheath being shaped to present a boat hook at the other end thereof;

a slit formed in the side wall of said sheath element adapted to permit the passage of said gaff therethrough during sheathing and unsheathing therof, said sheath providing the housing for and defining therein an arcuate through bore dimensioned and configured to receive said gaff element therein;

and a lock nut for removably positioning said sheath over said gaff and for coupling said sheath to said rod-like element, an interior recess being formed in said nut configured and dimensioned to rotatably receive a peripherally extending enlarged head on one end of said rod-like element, the longitudinal axis of said lock nut being coaxial to the longitudinal axis of said rod-like element, and an interior portion of said lock nut remote from said one end of said rod-like element being adapted to threadedly cooperate with threads formed on the outer surface of said sheath on the end thereof adjacent to said one end of the rod-like element, the rotation of said lock nut being adapted to selectively couple said sheath and rod-like element with the sheath in position sheathing said gaff element.



4,037,555

BUOY RECOVERY TECHNIQUE

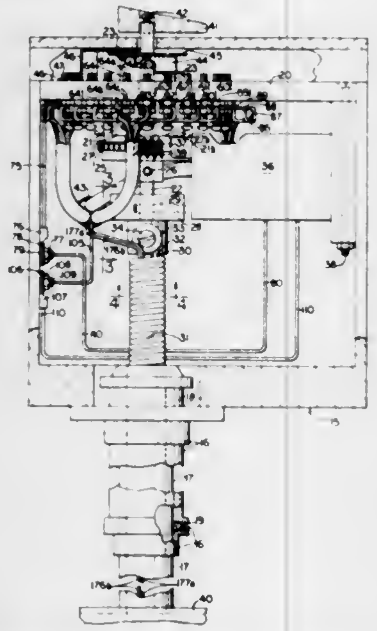
Myer Berman, 14527 Woodcrest Drive, Rockville, Md. 20853
Filed June 30, 1976, Ser. No. 701,487
Int. Cl.² B63B *21/56*
U.S. Cl. 114—245 **3 Claims**

1. Apparatus for recovery of moored buoys having a buoy mooring line in a fluid medium from a moving vehicle comprising:
a first float;
a depressor connected to said first float;
a second float;
a diverter connected to said second float;
a sweep wire connected between said depressor and said diverter to sweep through the fluid medium in a sweep area defined by said diverter;
a grapnel attached to said sweep wire for engaging a buoy mooring line to which the buoy to be recovered is attached; and
a grapnel receiving ring attached to said buoy mooring line between a pair of wedge stops for engaging said grapnel;
whereby when said apparatus is towed from said moving vehicle said grapnel engages said buoy mooring line enabling recovery of said buoy.

4,037,556

BOAT STEERING MECHANISM FOR OUTBOARD MOTOR

Garrett H. Harris, 157 S. Denver, Jackson, Miss. 39209, and Louis M. Harris, 2423 W. Mulberry, San Antonio, Tex. 78228
Filed Oct. 28, 1975, Ser. No. 626,305
Int. Cl.² B63H *25/42, 21/26*
U.S. Cl. 115—18 R **21 Claims**



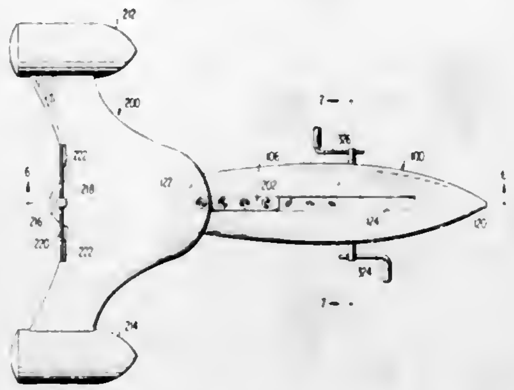
1. Steering mechanism for a boat motor having a shaft which turns to turn the boat motor which comprises a steering motor connected to turn the shaft, a plurality of first contacts spaced circumferentially around the shaft, a sweep contact mounted on the shaft and sequentially engageable with the first contacts as the shaft turns, a pedal, means for pivotally mounting the pedal, a contact plate means, means for causing the contact plate means to move with the pedal, a plurality of second contacts engageable with the contact plate means, means connecting each first contact with a respective one of the second contacts, and power means connected to drive the steering motor when steering motor operating power from the power means flows through the sweep contact while said sweep contact engages one of the first contacts which is connected to a second contact in engagement with the contact plate means, the flow of steering motor operating power through the sweep contact and the steering motor stopping when the sweep contact reaches a first contact connected with a second contact that is free of the contact plate means.

4,037,557

HAND-DRIVEN WATER CRAFT

Luis Jorge Velandia Arevalo, Torres Los Andes, Apt. No. 6, Merida, Venezuela
Continuation-in-part of Ser. No. 403,713, Oct. 4, 1973, Pat. No. 3,903,834. This application Sept. 8, 1975, Ser. No. 611,429
Int. Cl.² B63H *16/04*
U.S. Cl. 115—24 **6 Claims**

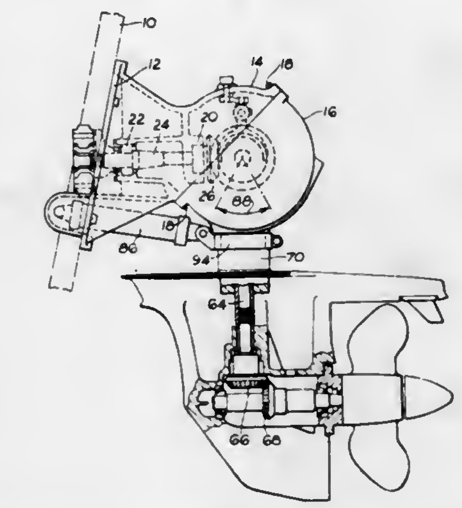
1. A water craft comprising:
a front hull including at least one flotation chamber;
a rear stabilization deck assembly joined to and extending as a cantilever rearwardly of said hull, said stabilization deck comprising a hollow substantially flat flotation chamber;
foot controlled rudder means pivotally mounted on said rear deck assembly; and
propulsion means on said hull and including a frame, a hand crank transversely mounted on said frame, a propeller assembly mounted on said frame, and means on said frame coupling rotary movement of said crank to said propeller assembly,
said hull, said rear deck assembly, and said propulsion means each comprising discrete disconnectable modules; said rear stabilization deck including an elongated tongue; and said front hull including an elongated channel, said tongue being received in said channel and being longitudinally adjustable to establish the overall length of the craft.



4,037,558

MARINE DRIVE UNITS

Clarence Frank Nossiter, Shorwell, England, assignor to Enfield Industrial Engines Limited, Cowes, England
Division of Ser. No. 270,512, July 10, 1972, Pat. No. 3,826,219. This application Mar. 26, 1974, Ser. No. 454,961
Claims priority, application United Kingdom, July 9, 1971, 32311/71; Nov. 6, 1971, 51646/71
The portion of the term of this patent subsequent to July 30, 1991, has been disclaimed.
Int. Cl.² B63H *5/12*
U.S. Cl. 115—41 HT **1 Claim**

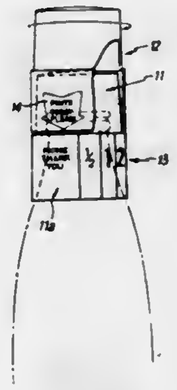


1. In a marine drive unit for transmitting drive between an inboard engine of a vessel and a propeller thereof, which comprises:-
a first casing adapted to be mounted on the transom of the vessel and rotatably mounting a horizontal lay shaft which extends transversely of the fore-and-aft axis of the vessel;
an input shaft adapted to be drivingly connected to the inboard engine and extending in the fore-and-aft direction;
a pair of first drive transmitting elements mounted rotatably, and in spaced relation, on said lay shaft and in constant mesh with a driving element carried by the input shaft so as to contra-rotate with respect to one another;
a second drive transmitting element fast with said lay shaft;
a power leg shaft extending orthogonally with respect to said input shaft and said lay shaft and having a drive element in constant mesh with said second drive transmitting element;
a second casing through which the power leg shaft extends, the second casing being pivotal with respect to said first casing about said lay shaft and rotatable about the axis of the power leg shaft;
a propeller drive shaft mounted in the second casing and drivingly connected to the power leg shaft;
clutch means selectively operable to drivingly connect one or the other of said first drive transmitting elements to the lay shaft to transmit rotational drive from the input shaft to the propeller shaft in a desired rotational sense, the improvement wherein;
the second casing extends through a slot in the first casing;
said slot extends arcuately about the axis of said lay shaft;
the second casing is formed with an extension having a part-spherical flange which is received within the first casing and is co-operable with a complementary spherical inner surface of the first casing; and
the center of curvature of said complementary inner surface being coincident with the point of intersection between the lay shaft and the power leg shaft whereby the second casing may pivot about the axis of the lay shaft and rotate about the axis of the power leg shaft.

4,037,559

MILK REQUIREMENT INDICATOR

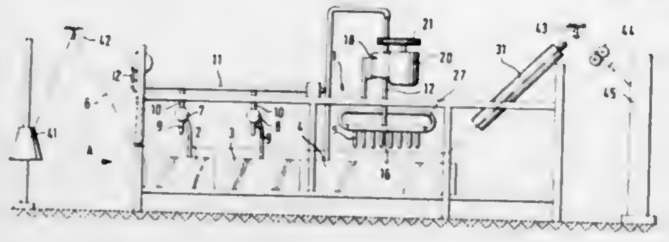
John Leslie Hopkins, 8 Carrwood Road, Bramhall, Stockport, and Arthur Holmes, Rombald, 25 Ryburn Ave., Blackburn, Lancashire, both of England
Filed Dec. 31, 1975, Ser. No. 645,669
Claims priority, application United Kingdom, Jan. 11, 1975, 1238/75
Int. Cl.² G09F *9/00*
U.S. Cl. 116—133 **10 Claims**



1. A tradesmans indicator comprising:
a pair of substantially identical, separable, hollow, cup members,
each cup member having a closure at one end, an opening at the other end, and a side wall with a truncated conical portion proximate said closure end and a skirt portion proximate said open end;
the truncated conical closed end portion of one said member nesting within the skirt portion at the open end of the other member;
said members being rotatable one within the other to selected angular positions when nested;
and the exposed outer surfaces of said members having cooperable indicia thereon for indicating a message to a tradesman as to reorders.

4,037,560
APPARATUS FOR DISCONTINUOUSLY APPLYING FLUID TO A STRAND-LIKE MATERIAL

Kurt Lutz, Strasse 35, Alte Schlierbacher, and Eugen Ulmer, D-7312, Kirchheim, Teck, both of Germany
Filed Mar. 16, 1976, Ser. No. 667,414
Claims priority, application Germany, Mar. 18, 1975, 2511728
Int. Cl.² B05B *7/00;* B05C *5/00;* D06B *1/02*
U.S. Cl. 118—314 **6 Claims**



1. An apparatus for discontinuously applying a liquid, such as a dye, onto a strand-like material such as yarn comprising a frame;

means on said frame for guiding a yarn strand along a predetermined path relative to said frame;

spray nozzle means for ejecting a spray of liquid;

means for supporting said spray nozzle means on said frame and for repetitively moving said nozzle means transversely with respect to said path so that the outlet end of said spray nozzle means is repetitively directed toward said path;

means for supplying a liquid to said spray nozzle means whereby during the passage of the strand-like material along the path, said material is sprayed with liquid at intermittent and irregular intervals;

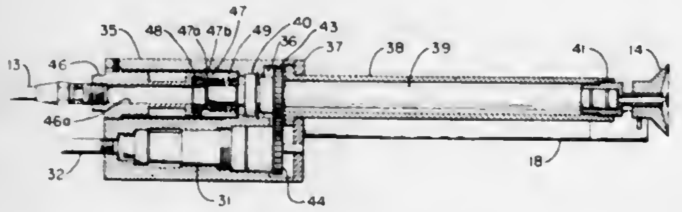
second spray nozzle means for ejecting a spray of liquid;

means for supporting said second spray nozzle means on said frame spaced from the first spray nozzle means in the direction of movement of the yarn strand and for rotating said second nozzle means about an axis generally perpendicular to said path so that the outlet end of said second nozzle means is repetitively directed toward said path; and

means for supplying a liquid to said second spray nozzle means.

4,037,561
ELECTROSTATIC COATING APPARATUS

Richard L. LaFave, and Richard O. Probst, both of Indianapolis, Ind., assignors to Ransburg Corporation, Indianapolis, Ind. Division of Ser. No. 778,362, Nov. 19, 1968, which is a continuation of Ser. No. 534,942, Feb. 17, 1966, abandoned, which is a continuation-in-part of Ser. No. 287,638, June 13, 1963, abandoned. This application Sept. 22, 1975, Ser. No. 615,575
Int. Cl.² B05B *5/04*
U.S. Cl. 118—629 **13 Claims**



1. An apparatus for coating an article with particles of powder comprising:

a souce of powder particles entrained in air;

means establishing an electrostatic field with respect to said article, charging particles therein and effecting deposition thereof on said article;

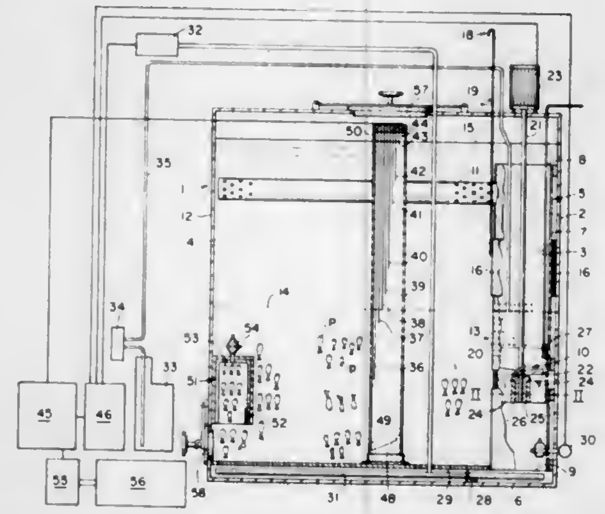
a distributor having a smooth, unobstructed rotating surface of nonconductive material to distribute said particles into the electrostatic field;

passage means connected to said source for delivering said entrained powder particles to the non-conductive surface, said pssage means having a non-rotating portion and a rotating portion; and

a nozzle connected with the rotating portion of the passage means to receive the entrained powder particles therefrom and having an aperture through which said mixture is discharged to impinge on and flow outwardly across said distributor surface.

4,037,562
INSTALLATION FOR CONVEYING LIVING FISH PARTICULARLY ANAESTHETIZED FISH, IN AQUEOUS MEDIUM

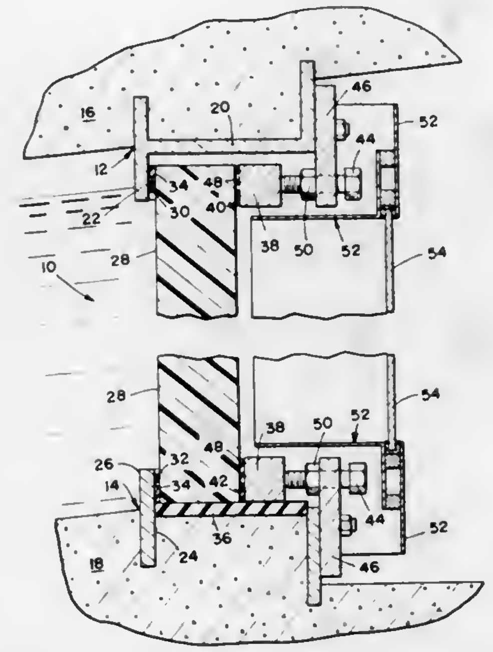
Jean-Marie Doutrelepont, Bellevaux-Ligneuville, Belgium
Filed Aug. 21, 1975, Ser. No. 606,732
Claims priority, application Belgium, Aug. 23, 1974, 819132
Int. Cl.² A01K *63/02*
U.S. Cl. 119—5 **34 Claims**



1. Installation for conveying in aqueous medium, living fish, particularly fish which have been anaesthetized, comprised of a tank and a device for supplying oxygen gas to the aqueous medium inside the tank, which comprises at least one circulation pump to cause an upward flow of the liquid in said medium, said circulation pump being arranged to suck the liquid from the tank top portion and to force said liquid back adjacent the tank bottom, said circulation pump comprising a duct connected to the tank and comprising the pump body, said duct being open at both ends thereof, the duct top end lying below the liquid level and the duct bottom end lying adjacent the tank bottom, as well as means dipping into the liquid and so arranged in the duct as to cause a liquid flow from the tank top portion, said means comprising a port substantially equally spaced from the liquid level inside the tank and the tank bottom, a screw mounted on a shaft co-axial with said duct and driven by a motor located outside said aqueous medium, said screw arranged between said port and said tank bottom, said device for supplying oxygen gas has the outlet thereof adjacent said screw at a level somewhat higher than said screw level, said motor is a varying-speed motor having at least one slow speed provided to drive said screw to prevent the suction of oxygen gas into the liquid inside said duct, and a high speed driving said screw to effect upward flow in said medium to the tank bottom portion.

4,037,563
AQUARIUM VIEWING WINDOW

John M. Pflueger, and William A. Hutcheson, both of San Francisco, Calif., assignors to John M. Pflueger, San Francisco, Calif.
Filed Mar. 29, 1976, Ser. No. 671,536
Int. Cl.² A01K *64/00*
U.S. Cl. 119—5 **9 Claims**



2. A Viewing window for an aquarium tank having at least one fenestration comprising:

a unitary water-pressure resistive transparent viewing panel having a viewing side and an opposing submersible side;

said panel being capable of bearing a substantial distributed pressure load on the surface of said submersible side and an equal opposing load along the periphery of said viewing side;

a lateral load bearing flange circumscribing the margin of said fenestration having one side confronting the periphery of said submersible side and an opposing side with a substantially uniformly smooth surface;

means interposed between said flange means and said submersible side periphery for sealing said fenestration to said viewing panel;

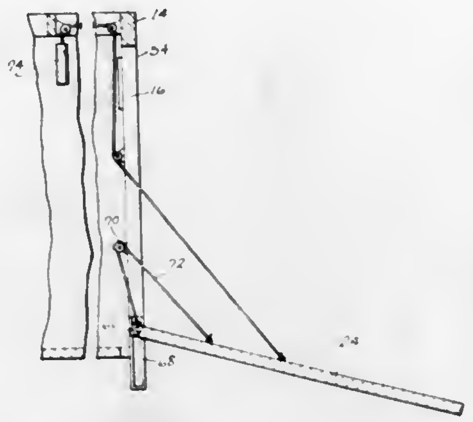
adjustable bracing means along said viewing side periphery for supporting said unitary viewing panel; and

means for urging said bracing means against said viewing side periphery thereby to maintain said sealing means in water-tight seal along said submersible side periphery.

4,037,564
COLLAPSIBLE LIVESTOCK RAMP

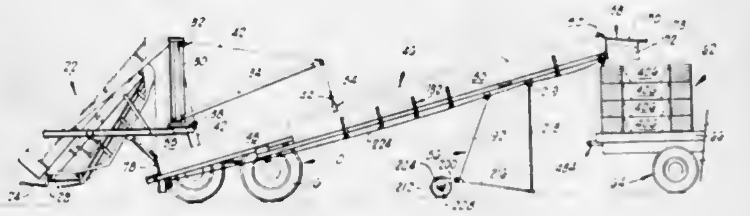
Andrew A. Schrock, Rte. 1, Box 204, Shipshewana, Ind. 46565
Filed Aug. 20, 1975, Ser. No. 606,286
Int. Cl.² B62D *25/00*
U.S. Cl. 296—61 **2 Claims**

1. In combination a vehicle and collapsible livestock ramp, said vehicle including a livestock compartment having an elevated floor and a rear wall having a door opening therein, said ramp including a platform, means pivotally connecting said platform at one end to said vehicle adjacent said floor at said door opening wherein said platform is pivotal between a generally upright position spanning said door opening and an inclined position whereby livestock may enter or leave said compartment, the improvement comprising said platform connecting means including guide parts carried by said compartment at the rear wall thereof on each side of said door opening, each guide part extending vertically from below to at least the level of said floor, a pulley carried by said rear wall at each side of said door opening above said guide parts, said platform one end carrying support means fitting shiftably within said guide parts for guiding the movement of said platform one end between elevated and lowered positions within the guide parts as the platform is shifted between its inclined and upright positions, a pair of cable means, one of said cable means passing about each pulley and having one end connected to said platform adjacent a said support means and its opposite end connected to said platform between said platform one end and the other end of the platform for supporting said platform one end in its elevated position within said guide parts when said platform is in its inclined position, and means extending between said compartment and platform for raising and lowering said platform between its upright and inclined positions.



4,037,565
SYSTEM FOR HARVESTING AND TRANSPORTING CHICKENS

Lloy W. Ledwell, Jr., Box 1106, Texarkana, Tex. 75501
Continuation-in-part of Ser. No. 492,348, July 26, 1974, Pat. No. 3,921,588. This application Nov. 24, 1975, Ser. No. 634,404
Int. Cl.² A01K *29/00*
U.S. Cl. 119—82 **17 Claims**



1. A system for harvesting and transporting chickens comprising:

a self-propelled vehicle having finger-carrying chicken harvesting means at one side thereof for picking up and elevating chickens as the vehicle advances;

a first conveyor carried on said self-propelled vehicle for receiving chickens from said chicken harvesting means and moving them to a second side of said vehicle;

an elongated telescoping conveyor having first and second ends, and having said first end pivotally connected to said vehicle and positioned under one end of said first conveyor at said second side of said vehicle for receiving chickens discharged from said first conveyor;

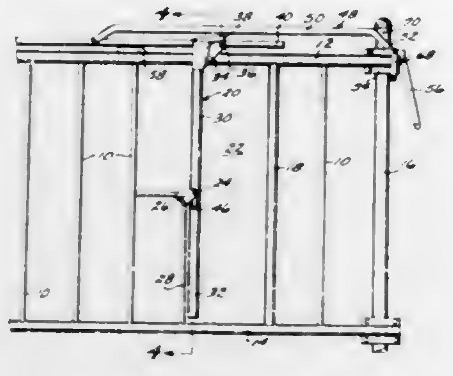
swingable boom means pivotally mounted on said vehicle for pivotation about a vertical axis and including a flexible suspension member connected to a medial portion of said elongated telescoping conveyor for swingably supporting said telescoping conveyor from said vehicle; and

a coop assembly detachably connected to the second end of said telescoping conveyor.

4,037,566

CATTLE LOCKING APPARATUS

Teunis Albers, 21205 Norwalk Blvd., Artesia, Calif. 90701
Filed May 24, 1976, Ser. No. 689,586
Int. Cl.² A01K *1/06*
U.S. Cl. 119—147 **11 Claims**



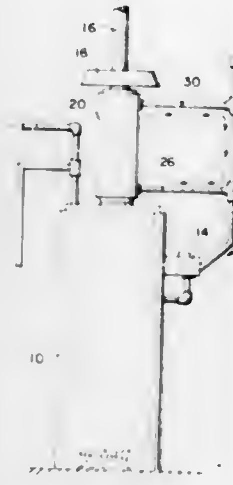
1. Cattle locking apparatus comprising:
a fixed stanchion;
a release stanchion located adjacent said fixed stanchion to define a head opening for an animal, said release stanchion having an upper portion and further having actuating means located below said upper portion, said upper portion including a coupling element;
mounting means mounting said release stanchion for pivotal movement between open and closed positions, said upper portion in said open position being pivoted away from said fixed stanchion to enlarge the upper part of said head opening and thereby enable an animal to place its head through said head opening, said actuating means in said open position being located in said head opening for engagement by the neck of an animal with its head in said upper part of said head opening, said upper portion in said closed position being pivoted toward said fixed stanchion to narrow the upper part of said head opening, said actuating means being operative to pivot said release stanchion to said closed position upon movement of the animal's neck against said actuating means and into the lower part of said head opening;
release means for detachably receiving said coupling element, said release means being movable into a release position to pivot said release stanchion into said open position, and movable into a locking position to pivot said release stanchion into said closed position; and
decoupling means engageable with said coupling element in said open position of said release stanchion to detach said coupling element from said release means whereby said release means is movable into said locking position independently of said release stanchion to leave said release stanchion in said open position, said release means being operative to detachably receive said coupling element of said release stanchion when said release means is in said locking position and said release stanchion is in said closed position.

4,037,567

WATER HEATING SYSTEM INCLUDING RECYCLE LOOP

Peter L. Torres, 76 Webster Ave., Jersey City, N.J. 07303
Filed Jan. 15, 1976, Ser. No. 649,538
Int. Cl.² F22B *33/00*
U.S. Cl. 122—20 B **4 Claims**

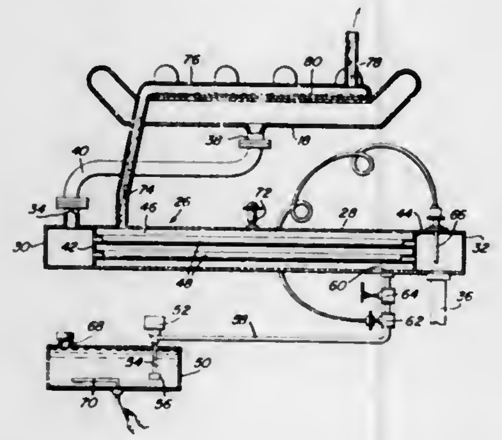
1. In a water heating system which includes a boiler, first conduit means connected between a water supply and said boiler, means for heating the water within and means for supplying water under pressure to said boiler, and an exhaust flue for discharging heated products of combustion from said boiler, the improvement comprising:
at least one coil of heat conductive material positioned within said exhaust flue;
second conduit means connected between said first conduit means and the lower end of said coil for withdrawing a minor portion of the water being conducted to said boiler for passage through said coil in heat exchange relation with the combustion gases discharged through said flue;
and third conduit means connected between the upper end of said coil and said first conduit means upstream of the point of connection between said first and second conduit means for the recycling of heated water to said first conduit means, whereby a recycle loop is provided for the heating of a portion of the water being conducted from said water supply to said boiler.



4,037,568

EXHAUST HEATED HYDROGEN AND OXYGEN PRODUCING CATALYTIC CONVERTER FOR COMBUSTION ENGINE

Edward T. Schreiber, 7400 Lyndale Ave. South, Minneapolis, Minn. 55423
Filed Apr. 11, 1975, Ser. No. 567,177
Int. Cl.² F02B *43/08;* **F02D** *19/00*
U.S. Cl. 123—3 **3 Claims**

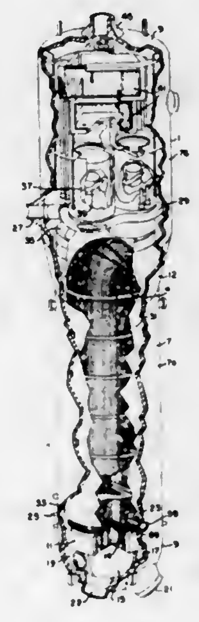


1. In combination with an internal combustion engine of the type having an air induction system including primary fuel inlet means and an exhaust system for combustion gases, supplemental fuel inlet means for said induction system including steam generator means having a steam outlet, a gas generator housing having a predetermined amount of iron filings disposed therein and fluid inlet and outlet means, means connecting said steam outlet with said fluid inlet means, and means communicating said fluid outlet means with said supplemental fuel inlet means, said exhaust system including portions which are heated to a high degree as a result of operation of said engine, said heated portions of said exhaust system being in good transfer relation with said gas generator housing for heating the internal surfaces thereof and said iron filings, the passage of steam through said housing and in intimate contact with the heated iron filings in said housing serving to further elevate the temperature of said steam and to produce hydrogen and oxygen gas for passage through said housing outlet and to said supplemental fuel inlet means, said exhaust system including an elongated exhaust manifold, said generator housing comprising an elongated tubular member through whose opposite end portions said fluid inlet and outlet means open, said tubular member being disposed in good heat transfer relation with the external surfaces of said exhaust manifold, said steam generator including a horizontally elongated housing provided with a pair of inner transverse partitions spaced from the opposite ends of said steam generator housing and dividing the latter into opposite end chambers and a central disposed between said partitions, a plurality of elongated horizontal heat transfer tubes extending through said central chamber and opening into said end chambers at their opposite ends, the opposite ends of said heat transfer tubes being sealed relative to said partitions, exhaust gas inlet means opening into one of said end chambers, exhaust outlet means opening outwardly of the other of said end chambers, means connecting said exhaust system to said exhaust gas inlet means, said central chamber including an upper outlet comprising said steam outlet and an inlet through which water to be heated into steam may be admitted into said central chamber, water supply means operatively associated with said central chamber inlet for supplying water thereto, said water supply means including heating means operative to heat the water supplied thereby, said water supply means including exhaust gas temperature sensing controlled valve means operative to admit additional quantities of heated water into said water and steam compartment means in response to the temperature of the exhaust gas at said outlet end of said exhaust conduit means being elevated to a predetermined level.

4,037,569

FLOW DISTRIBUTION ARRANGEMENT FOR A STEAM GENERATOR

Robert R. Bennett, Clearwater, and Wilbur M. Byerley, Riverview, both of Fla., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Jan. 30, 1976, Ser. No. 653,988
Int. Cl.² F22B *1/06, 37/48*
U.S. Cl. 122—32 **10 Claims**

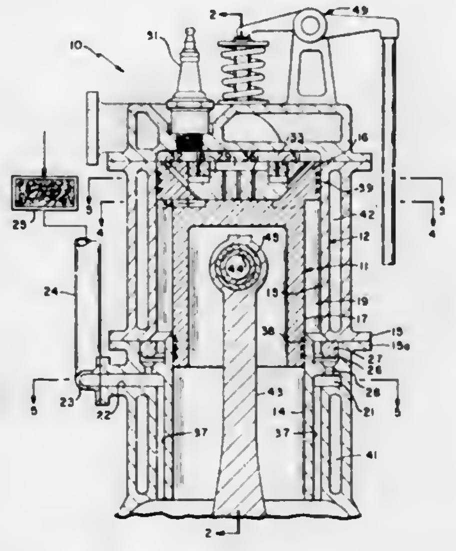


1. A vapor generator in which heat is transferred from a primary to a sencondary fluid to vaporize the latter, said vapor generator comprising:
a vertically oriented shell,
a plurality of U-shaped tubes disposed in said shell so as to form a tube bundle having an open lane adjacent the tubes having the shortest radius bends,
a head portion having a tubesheet with holes for receiving said tubes and a dividing plate which cooperates to form headers for each end of the U-shaped tubes,
a primary fluid inlet nozzle in fluid communication with one header,
a primary fluid outlet nozzle in fluid communication with the other header,
whereby the primary fluid flows through the tubes forming a hotleg and a coldleg portion of the tube bundle,
a wrapper disposed between the tube bundle and the shell to form an annular chamber adjacent the shell,
a secondary fluid inlet ring disposed to introduce influent secondary fluid to the upper portion of the annular chamber,
said secondary fluid inlet ring having ports so disposed therein that the majority of the secondary fluid is introduced into that portion of the annular chamber adjacent the hotleg portion of the tube bundle,
said secondary fluid ring having said ports so disposed that no secondary fluid is introduced to that portion of the annular chamber adjacent the said open lanes,
said annular chamber being generally free from obstructions, whereby the flow distribution of secondary fluid across the tubesheet is improved.

4,037,570

STRATIFIED CHARGE INTERNAL COMBUSTION ENGINE

Henry E. Bailey, P.O. Box 749, Orinda, Calif. 94563; Dennis H. Bailey, Rte. 1, Box 45, Clear Lake, Calif. 95457, and Richard E. Bailey, P.O. Box 6327, Clearlake Highlands, Calif. 95422
Filed Feb. 9, 1976, Ser. No. 656,306
Int. Cl.² F01L *11/00*
U.S. Cl. 123—47 A **4 Claims**



1. In a four-stroke cycle internal combustion engine, means forming at least one cylinder, said cylinder means including an upper cylinder wall having a given diameter and a lower cylinder wall having a diameter less than said given diameter, piston means mounted for reciprocating movement within the cylinder between successive intake, compression, expansion and exhaust strokes, said piston means having a piston head mounted for movement within the upper cylinder wall and defining therewith a combustion chamber together with a piston skirt mounted for movement within the lower cylinder wall, said piston skirt being radially spaced from the upper cylinder to define therewith a pumping chamber, cylinder valve means for directing air into the pumping chamber, intake valve means for directing a fuel-air mixture into the combustion chamber only during the intake stroke, exhaust valve means for directing exhaust gases out of the combustion chamber during the exhaust stroke, piston valve means in the piston

means for opening only during a terminal portion of both the intake and expansion stroke for injecting air from the pumping chamber directly into the combustion chamber to form a layer of fresh air below said fuel-air mixture during said intake and compression strokes and to form a layer of fresh air below said exhaust gases during a terminal portion of the expansion stroke and during the exhaust stroke, and means for igniting a compressed combustible mixture within the combustion chamber.

4,037,571
MULTI-CYLINDER INTERNAL COMBUSTION ENGINE

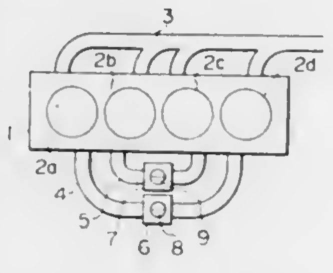
Yasuhiko Ishida, Susono, Japan, assignor to Toyota Jidosha Kogyo Kabushiki Kaisha, Toyota, Japan

Filed June 18, 1976, Ser. No. 697,478

Claims priority, application Japan, Mar. 9, 1976, 51-024571

Int. Cl.^{2} F02B *75/08;* F02M *13/04;* F02B *75/20*

U.S. Cl. 123—52 R **4 Claims**



1. A multi-cylinder internal combustion engine for use in a vehicle having an accelerator pedal, comprising:

at least a first cylinder group and a second cylinder group, each cylinder group comprising at least one cylinder;

a first and second intake manifolds connected to said first and second cylinder groups, respectively;

a first carburetor having a first throttle valve and mounted on said first intake manifold;

a second carburetor having a second throttle valve and mounted on said second intake manifold;

a throttle valve control means operable in response to an extent of the depression of the accelerator pedal for opening said first throttle valve to a greater extent than said second throttle valve when the engine is operating under a partial load and for opening said first and second throttle valves to a full extent when the engine is operating under a heavy load, opening degrees of said first and second valves being continuously changed.

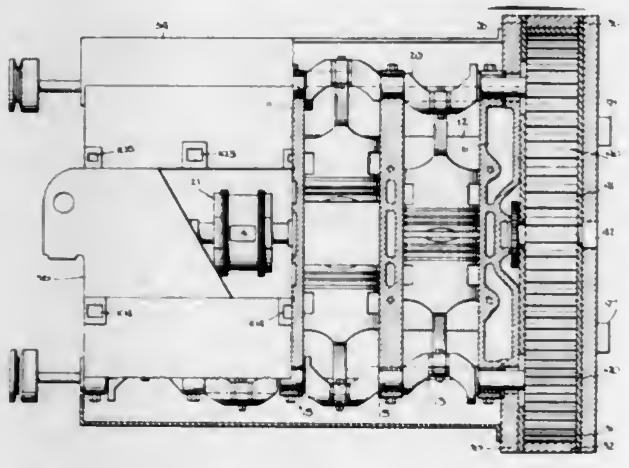
4,037,572
PAIRED PISTON ENGINE WITH ROTARY VALVES

Dennis LaVerne Franz, Rte. 1, Box 1198-B, Selah, Wash. 98942

Filed July 28, 1976, Ser. No. 709,495

Int. Cl.^{2} F02B *75/02*

U.S. Cl. 123—64 **16 Claims**



1. An internal combustion engine comprising

a block having a plurality of cylinders therein,

a pair of pistons having opposed piston heads in each of the cylinders;

a pair of crankshafts driven by the pistons,

intake means,

exhaust means,

a rotary valve adjacent the cylinders and the intake and exhaust means, comprising rotors having

intake passages which open the cylinders to the intake means during a portion of the rotation of the rotor corresponding to the intake cycle of the engine,

exhaust passages which open the cylinders to the exhaust means during a portion of the rotation of rotor corresponding to the exhaust cycle of the engine,

and second exhaust passages which open the cylinders during a portion of the rotation of the rotor corresponding to a second exhaust cycle of the engine.

13. An internal combustion engine comprising

a block having a plurality of cylinders therein;

a pair of pistons having opposed piston heads in each of the cylinders,

a pair of crankshafts driven by the pistons

intake means,

exhaust means,

a rotary valve adjacent the cylinders and the intake and exhaust means, comprising rotors having

intake passages which open the cylinders to the intake means during a portion of the rotation of the rotor corresponding to the intake cycle of the engine,

exhaust passages which open the cylinders to the exhaust means during a portion of the rotation of the rotor corresponding to the exhaust cycle of the engine,

and a second intake passage which opens the cylinder during a portion of the rotation of the rotor corresponding to a stratified charge intake cycle of the engine.

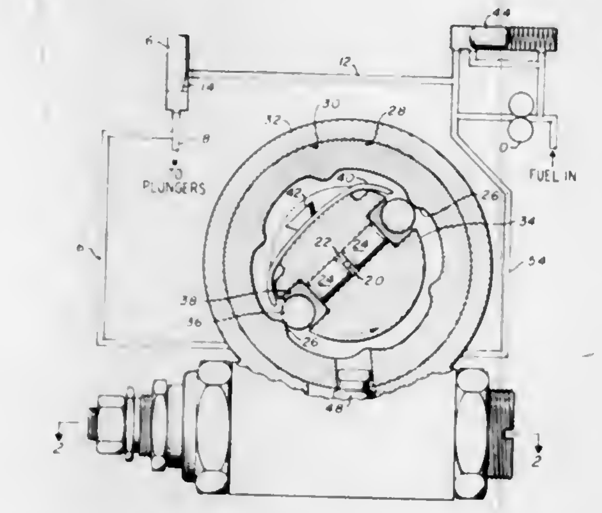
4,037,573
TIMING CONTROL FOR FUEL INJECTION PUMP

Joseph Edward Swift, South Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed May 21, 1976, Ser. No. 688,828

Int. Cl.^{2} F02M *59/20*

U.S. Cl. 123—139 AQ **8 Claims**



1. In a fuel injection pump for an internal combustion engine, pump plunger means providing sequential pumping strokes, means for changing the timing of the pumping strokes comprising a cylinder, an advance piston movable in said cylinder, means interconnecting said advance piston with said pump plunger means to advance and to retard the relative timing of the pumping strokes, a source of fluid having a pressure correlated with engine speed providing a speed related pressure, a hydraulic chamber at one end of said piston connected to said source of fluid under pressure to move the advance piston to advance the timing of the pumping strokes in response to increased engine speed, first means for controlling the delivery of fluid from said source to said hydraulic chamber, said first means including means for preventing the delivery of fluid from said source to said hydraulic chamber until a predetermined speed is reached, and second means for controlling the delivery of fluid from said source to said hydraulic chamber, said second means bypassing said first means to deliver fluid from said source to said hydraulic chamber during the starting of the engine thereby to advance the timing of the pumping strokes.

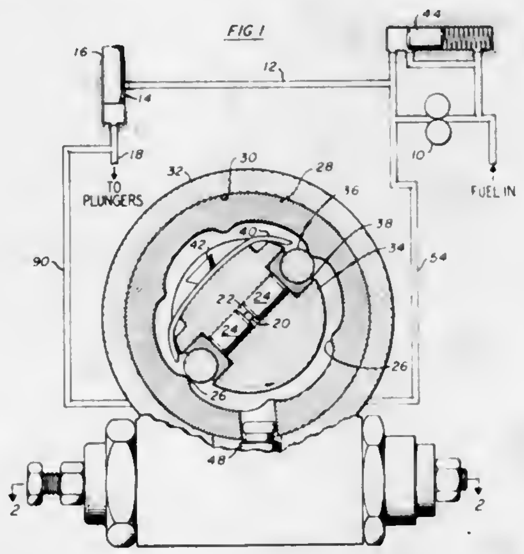
4,037,574
TIMING CONTROL FOR FUEL INJECTION PUMP

Joseph Edward Swift, South Windsor, Conn., assignor to Stanadyne, Inc., Windsor, Conn.

Filed May 21, 1976, Ser. No. 688,829

Int. Cl.^{2} F02M *59/20*

U.S. Cl. 123—139 AQ **6 Claims**



1. In a fuel injection pump for an internal combustion engine, pump plunger means providing sequential pumping strokes, means for changing the timing of the pumping strokes comprising a cylinder, an advance piston movable in said cylinder, means interconnecting said advance piston with said pump plunger means to advance and to retard the relative timing of the pumping strokes, a source of fluid having a pressure correlated with engine speed, a first hydraulic chamber at one end of said advance piston connected to said source of fluid to move the advance piston to advance the timing of the pumping strokes in response to increased engine speed, means for controlling the delivery of fluid from said source to said first hydraulic chamber, said means including means for preventing the delivery of fluid to said first hydraulic chamber until a predetermined speed is reached thereby to retard the timing of the pumping strokes during engine cranking, movable stop means engageable with said advance piston, a second hydraulic chamber for receiving fluid from said source to urge said movable stop toward said advance piston, and means providing continuous communication between said fluid source and said second hydraulic chamber whereby said movable stop limits the maximum retard position of said advance piston to a lesser amount as soon as the engine starts.

4,037,575
ALTITUDE COMPENSATED FUEL CONTROL SYSTEM

Mark F. Sommars, Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.

Filed Aug. 25, 1975, Ser. No. 607,322

Int. Cl.^{2} F02D *1/04*

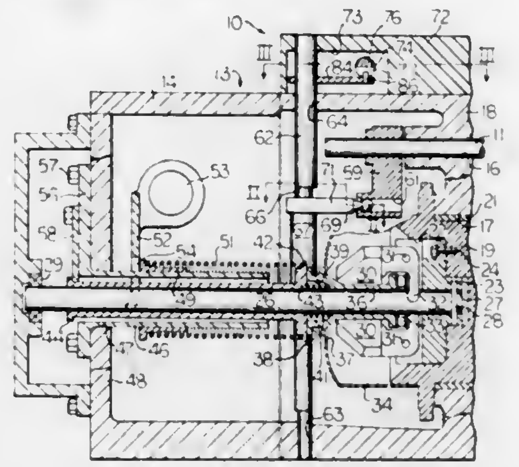
U.S. Cl. 123—140 MC **6 Claims**

1. An altitude compensated fuel control system for an internal combustion engine comprising;

a fuel control member for controlling flow of fuel to the engine;

first means for controlling the position of the fuel control member including a stop for limiting movement of the control member towards an increased fuel flow direction establishing a maximum fuel flow position of the fuel control member;

second means for adjusting the maximum fuel flow position of the fuel control member in direct response to changes in altitude and hence to changes in atmospheric pressure resulting from changes in altitude so that the maximum amount of fuel delivered to the engine decreases with an increase in altitude; and



wherein the fuel flow is controlled by rotary motion of the fuel control member, said first means includes a lever attached to the fuel control member and having a distal end, a pivot shaft having an eccentric intermediate portion formed thereon, a bell crank pivotally mounted on said eccentric portion and having a first arm and a second arm with said first arm pivotally associated with said distal end of said lever, and a speed responsive governor operatively connected to the second arm for pivoting the bell crank about the eccentric portion so that the first arm imparts rotary motion to the lever and the fuel control member.

4,037,576
IGNITION SYSTEM FOR INTERNAL-COMBUSTION ENGINES NEGATIVE BIAS TRIGGER

Alexandr Nikolaevich Alexeev, Saratovskaya ulitsa, 18/10, kv. 269, Moscow; Igor Ivanovich Zhmurin, shosse Entuziastov, 7a, kv. 6, Balashikha Moskovskoi oblasti; Alexandr Antonovich Moskovsky, Scherbakovskaya ulitsa, 58a, kv. 222, Moscow; Igor Minovich Oparin, ulitsa 9 Rota, 17, kv. 27, Moscow; Vyacheslav Ivanovich Cheplanov, 11 Parkovaya ulitsa, 48, korpus 2, kv. 46, Moscow; Leonid Shlemovich Sokolin, ulitsa Konstantinova, 32, korpus 2, kv. 3, Moscow, all of U.S.S.R.; Vladimir Semenovich Zolotarevsky, deceased, late of Moscow, U.S.S.R.; by Alla Meerovna Zolotarevskaya, and Maiya Vladimirovna Zolotarevskaya, administrators, both of Pulkovskaya ulitsa, 11, korpus 1, kv. 33, Moscow, U.S.S.R.

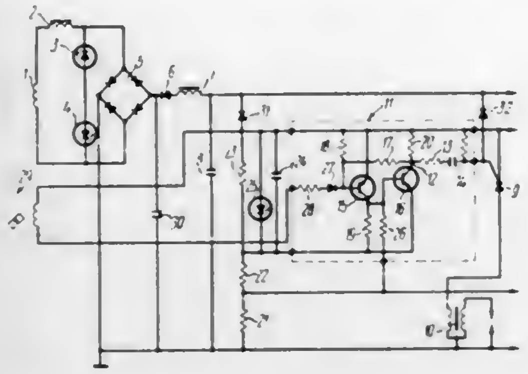
Filed Aug. 5, 1975, Ser. No. 602,025

Int. Cl.^{2} F02P *1/00*

U.S. Cl. 123—148 R **1 Claim**

1. An internal-combustion engine ignition system comprising: a power source with a voltage stabilizer; a capacitor connected through a rectifier to said power source; electric circuits connected in parallel with said capacitor, each circuit including an ignition coil in series with a thyristor, to the control gate of which is connected a pulse shaper circuit with a control pulse generator; an arrangement for applying a negative bias to the control gates of said thyristors, which arrangement comprises a diode whose anode is connected to the cath-

ode of each of said thyristors, whereas the cathode of said diode is connected to said capacitor and is also connected through isolation diodes to the control gate of each of said thyristors.



4,037,577

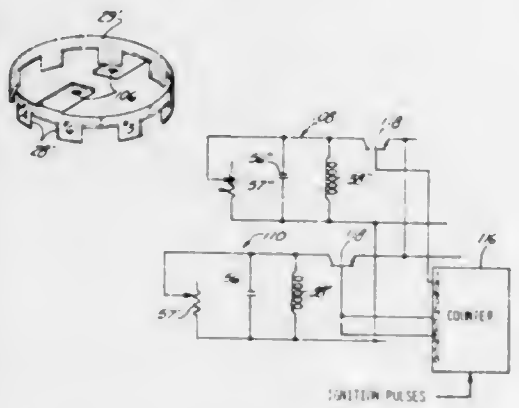
AUTO IGNITION SYSTEM

Michael R. Gallo, 3733 Quarton Road, Bloomfield Hills, Mich. 48033

Filed July 8, 1974, Ser. No. 486,635

Int. Cl.^{2} F02P *1/00, 5/04*

U.S. Cl. 123—148 E **4 Claims**



1. An automative ignition system for a multicylinder engine comprising a distributor element rotatable in proportion to engine speed, interrupter means mounted for rotation with said member, a tunable timing circuit, actuator means responsive to the proximity of said interrupter means and operatively associated with said timing circuit to produce an ignition timing signal quantity, addressable memory means operatively associated with said timing circuit and responsive to input addresses to tune said timing circuit so as to optimize said timing signal quantity produced thereby, and means for selectively progressively addressing said memory means for the ignition times of each cylinder of said engine.

4,037,578

IGNITION SAFETY CONTROL SYSTEM

James E. Dersch, Mound, and James L. Maciey, Rosemount, both of Minn., assignors to Nautec, Inc., Excelsior, Minn. Continuation of Ser. No. 504,155, Sept. 9, 1974, abandoned, which is a continuation of Ser. No. 339,856, March 9, 1973, abandoned. This application July 28, 1975, Ser. No. 599,468

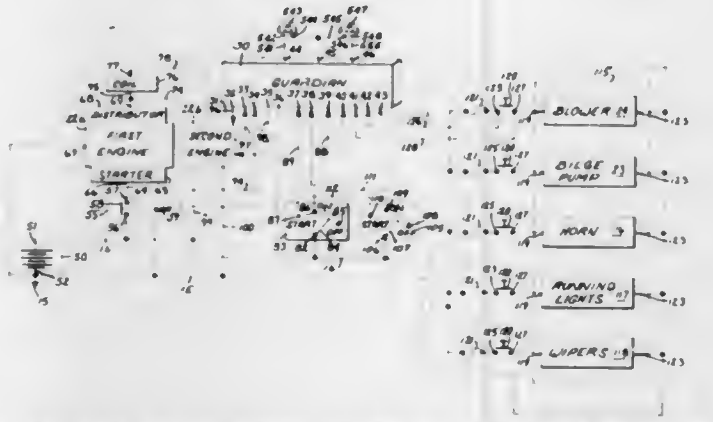
Int. Cl.^{2} F02N *17/00;* B63J *2/00*

U.S. Cl. 123—179 BG **12 Claims**

1. An electronic safety control apparatus for controlling the energization of an internal combustion engine of the type mounted in an enclosed engine compartment equipped with venting apparatus including an electrical blower operable when energized to ventilate the compartment, and in circuit with a battery, an electrical starter, an ignition coil and an ignition switch operable in conducting and non-conducting modes, the electronic safety control apparatus comprising:

a. first electronic switching means opeatively connected to the blower and to monitor the operative state of the ignition switch, responsive to a change in state of the ignition switch from its non-conducting mode to its conducting mode for continuously energizing the blower when the ignition switch is in its conducting mode and for automatically producing a continuous first enabling output signal delayed in time from the instant of said change in state of the ignition switch from its non-conducting mode to its conducting mode by a first predetermined time interval;

b. second electronic switching means operatively connected to the blower, to receive said first enabling signal and to monitor the operative state of the ignition switch, responsive to receipt of said first enabling signal and to change in state of the ignition swtich from its conducting mode to its non-conducting mode for producing a second continuous enabling signal over a second predetermined time interval and for continuously energizing the blower over a third predetermined time interval, said second and third predetermined time intervals beginning with said change in state of the ignition switch to its non-conducting mode;



c. blocking circuit means operatively connected in circuit with the starter and to receive said first and second enabling signals for electrically connecting and disconnecting the starter from energization, said blocking circuit means being normally operative in a first state to electrically disconnect the starter from energization and being operative in a second state when in receipt of said first or second enabling signals to electrically connect the starter for energization;

d. electronic engine sensing means operatively connected to the ignition coil for sensing electrical pulses passing through the ignition coil to energize the engine for providing a recylcing output signal after said sensed electrical pulses have continuously been applied to the engine for a fourth predetermined time interval, beginning with the first one of such sensed pulses; and

e. recycling circuit means operatively connected to said electronic engine sensing means, responsive to receipt of said recycling output signal for recycling said first electronic switching means to de-energize the blower until a subsequent change in state of the ignition switch from its non-conducting mode to its conducting mode.

4,037,579

ENERGY STORAGE-BOILER TANK USING SALT FUSION AND HEAT PIPING

Talbot A. Chubb, 5023 N. 38th St., Arlington, Va. 22207

Filed Jan. 26, 1976, Ser. No. 652,272

Int. Cl.^{2} F24H *7/04*

U.S. Cl. 126—400 **7 Claims**

1. An energy storage-boiler means, which comprises:

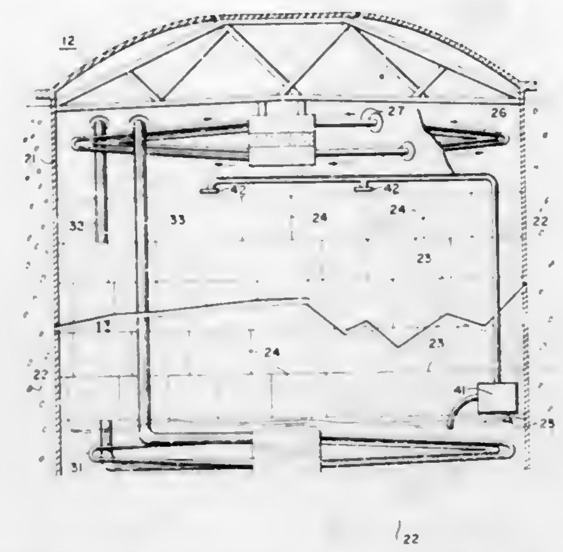
a housing having a closed top and bottom,

a vaporizable compound in the bottom area of said housing,

a plurality of layers of salt filled canisters substantially filling said housing above said vaporizable compound;

a plurality of boiler pipes in the closed top area of said housing above said salt filled canisters;

an input and output connected with said boiler pipes; and



a heat energy release means near the bottom of said housing for transferring heat energy to said vaporizable compound in the bottom area of said housing.

4,037,580

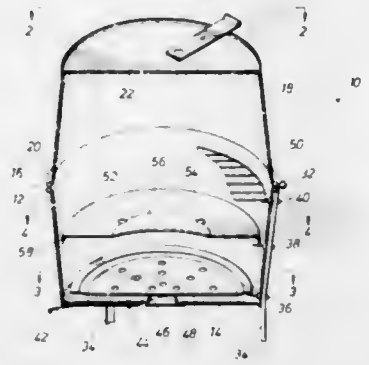
MEAT COOKING APPARATUS

Nicholas C. Angelo, 8702 Bob White, Houston, Tex. 77036

Filed June 2, 1975, Ser. No. 582,724

Int. Cl.^{2} A47J *37/07;* F24B *3/00*

U.S. Cl. 126—25 R **7 Claims**



1. For use in a cylindrical barbeque pit having a housing supported on a set of legs and which housing encloses a fire grate in the lower portions thereof and a meat receiving grill is located above the fire grate, the improvement comprising a baffle plate which has a shape closing off the housing between the fire grate and the meat receiving grill and which further defines an edge located gap about said baffle to enable heat and smoke to rise therepast to indirectly impinge on the meat and wherein said baffle is a solid member having grease and dripping collecting surface comprising,

a circular inner sloping surface connected to

an outer sloping surface, said connection forming a circular valley disposed near the center of said housing

the inner and outer sloping surface having sufficient slopes for grease and drippings to flow toward said valley,

said valley intersecting an opening means for dropping collected grease and drippings into the fire below for burning and which opening is sufficiently small to prevent upward flaring of flames to impinge on the meat receiving grill.

4,037,581

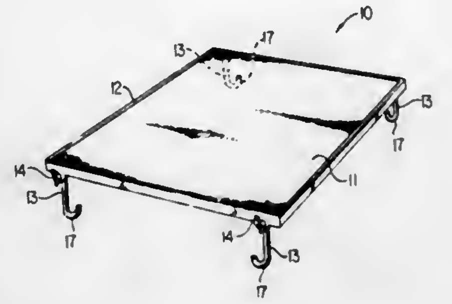
SCREEN DEVICE FOR STOVE OVENS

Thomas Trifiletti, Albany, N.Y., assignor to Lucia F. Friese; Mary A. Krauss and Lewis Trifiletti, all of Albany, N.Y., part interest to each

Filed May 25, 1976, Ser. No. 689,688

Int. Cl.^{2} A21B *1/42*

U.S. Cl. 126—39 M **3 Claims**



1. A screen device for use in preventing grease from splattering within a stove oven, comprising:

a screen member in sheet form, said screen member having pivotally attached thereto a plurality of leg members each of which is pivotable about its point of attachment to the screen member from a position in which each leg member is essentially perpendicular to said screen member to a position in which said leg member is essentially parallel to and in the same plane with said screen member, each of said leg members having a U-shaped portion at the outer end thereof, said U-shaped end portion providing for said end portion to rest upon a rack within said oven or to support the screen in an inverted position from the electric coils in the upper portion of an electric oven.

4,037,582

OIL STOVE

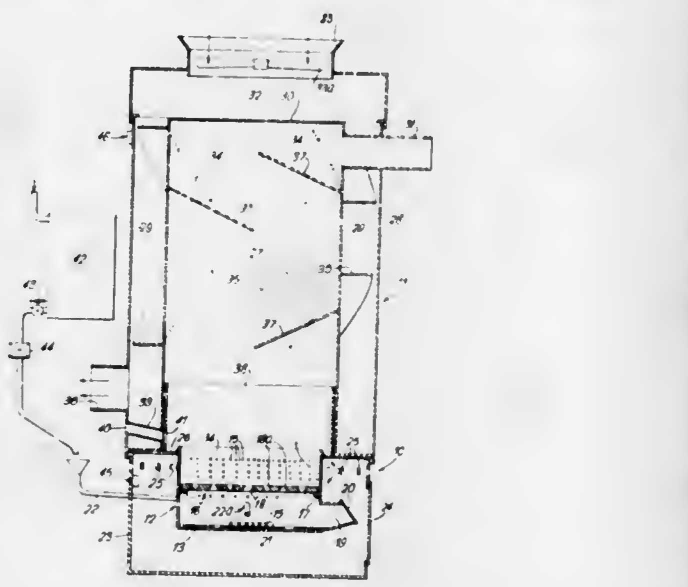
Isaac N. Moody, Glenrothes, Scotland, assignor to Industrial & Marine Services (Scotland) Limited, Kirkcaldy, Great Britain

Filed Nov. 26, 1975, Ser. No. 635,292

Claims priority, application United Kingdom, Nov. 27, 1974, 51310/74

Int. Cl.^{2} F24H *3/06*

U.S. Cl. 126—116 R **8 Claims**



1. A heating appliance incorporating combustion apparatus comprising an open pan having a floor portion and a cylindrical side-wall portion with perforations therein, the interior of said pan being divided by a fire plate in the form of a partition arranged generally parallel with and spaced from said floor portion, said partition having therein apertures which are arranged in concentric rings and are alternately convergent and divergent in the direction away from said floor portion of

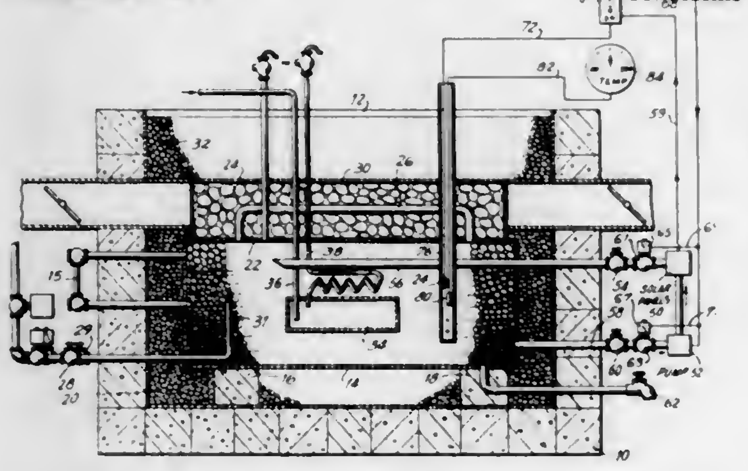
said pan, said perforations in said side-wall portion being disposed in circumferential rows both above and below said partition with the perforations in the uppermost row being smaller and more closely spaced than in the other rows, means for introducing oil into said pan at a point between said floor portion and said partition, heating means within said pan close to said floor portion, a flue duct extending from the open side of said pan, and heat exchange means surrounding said flue duct.

4,037,583
SOLAR HEATING SYSTEM AND PANELS

Paul Bakun, 14 Terrace Court, Old Westbury, N.Y. 11568, and Clifford Porter, 13 St. Eleanora's Lane, Crestwood, N.Y. 10707

Filed July 21, 1975, Ser. No. 597,541
Int. Cl.^{2} F24J *3/02*

U.S. Cl. 126—271 **11 Claims**



1. Solar heating apparatus comprising a source of a heatable fluid, solar heating means to receive heat from the sun and heat said fluid therewith, heat sink means to receive the fluid from said solar heating means and to store heat received with said fluid, and heat transfer means to transfer heat from said heat sink means to a heating system medium; said solar heating means comprising at least one solar heating panel; each said solar heating panel comprising an array of tubes of a heat conductive material which is substantially inert to said fluid, and a heatable mass to which said array is coupled and by which said array is heated to heat said fluid flowing through said tubes; said heatable mass including a dark colored concrete and sheets of screening embedded with said array of tubes in said mass, said sheets sandwiching said tubes therebetween, said sheets of screening being of a heat conductive material conducting heat from said concrete to said tubes and thus to said heatable fluid.

4,037,584
STOVE DAMPER ASSEMBLY

Baxter Fisher, Rte. 3, Box 285, Springfield, Oreg. 97477

Filed Nov. 18, 1976, Ser. No. 743,233
Int. Cl.^{2} F24C *15/20*

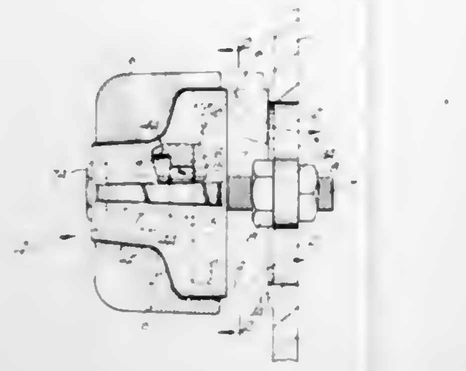
U.S. Cl. 126—290 **4 Claims**

1. A damper assembly for vented stoves and furnaces and comprising in combination,

a threaded shaft projecting outwardly from a vent defining upright member, means at the outer end of said shaft limiting outward damper movement,

locking means in place on said shaft lockably securing same to said upright member, and

a damper in supported engagement with said shaft and adapted to be positioned therealong to open and close said vent, said damper including front and rear internal wall surfaces defining front and rear damper recesses, an internal flange intermediate said recesses, traveler means disposed on said flange intermediate said front and rear recesses and in axially adjustable engagement with said shaft whereby surface contact and conductance of heat to the damper from said shaft is restricted to said traveler means to minimize damper heating.

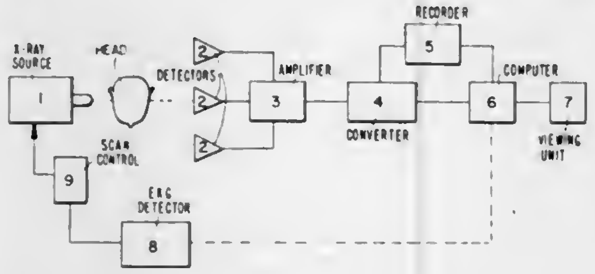


4,037,585
METHOD OF MEASURING BLOOD FLOW BY RADIATION

Philip L. Gildenberg, 6218 Claridge, Houston, Tex. 77035

Filed Oct. 10, 1975, Ser. No. 621,539
Int. Cl.^{2} A61B *6/02*

U.S. Cl. 128—2 A **30 Claims**



1. A method of measuring relative blood flow through at least a part of the body using penetrating radiation, comprising the steps of:

a. transmitting radiation from an external source through the body in a plurality of rays traversing a plurality of respective paths to establish a first set of rays in a planar slice of the body, the cross-sectional dimensions of each ray being small in relation to the dimensions of the body and each ray traversing the body for a period of time at least equal to a pulse interval;

b. transmitting radiation from said external source in further sets of rays similar to said first set of rays;

c. one of said sets being disposed in said planar slice at an initial angle or initial mean angle and the other of said sets of rays being disposed in said planar slice at angles or mean angles different from each other and from said initial angle or initial mean angle;

d. the sets of rays being such that every element of a two-dimensional matrix of elements of the body in said planar slice is intersected by a group of said rays, the group of rays being different for the different elements of the matrix, each element of said matrix having dimensions of the order to magnitude of the cross-sectional dimensions of said rays;

e. deriving from each ray emerging from the body over the period of time at least equal to a pulse interval a number of momentary output signals, each said signal representing the momentary sum of the transmissions or absorptions of the elements of the body intersected by the ray;

f. determining from said momentary signals a difference signal representing the maximum difference between said momentary signals for each ray over said period of time;

g. deriving sets of discrete difference signals corresponding to the sets of rays, said difference signals being indicative of the transmission or absorption of blood flowing through each element of said matrix, the number of difference signals being sufficient to determine substantial discrimination between the transmission or absorption coefficients due to blood flow through neighboring elements of the matrix;

h. deriving from said difference signals resultant signals representing the transmissions or absorptions due to blood flow in the elements of said matrix; and

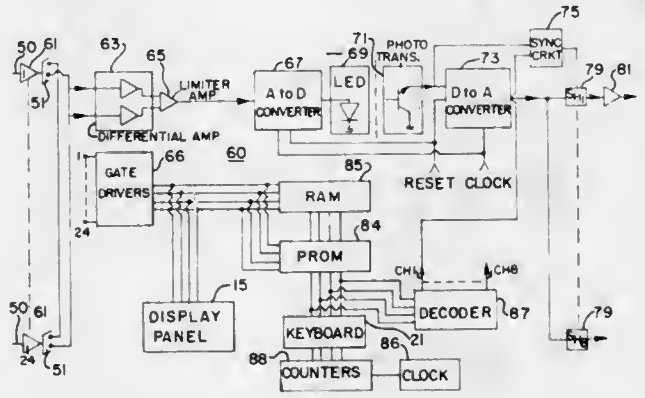
i. producing in response to said resultant signals a representation of the transmissions or absorptions due to blood flow in said elements of the slice of the body.

4,037,586
ELECTROENCEPHALOGRAPH DISPLAY

James A. Grichnik, 1107 S. Aldine, Park Ridge, Ill. 60068

Filed Apr. 14, 1976, Ser. No. 676,721
Int. Cl.^{2} A61B *5/04*

U.S. Cl. 128—2.1 B **6 Claims**



1. A digital electroencephalograph system including a plurality of electrically responsive terminals connectable to a patient's head for obtaining electrical signals, electronic circuit means for scanning said terminals for obtaining analog electrical signals from said terminals in selectable format, means for converting said analog signals to data in digital format, means for providing visual display of the selected format in which the terminals are scanned and thus of the actual format in which the data is obtained, and means for converting said data into an output analog signal.

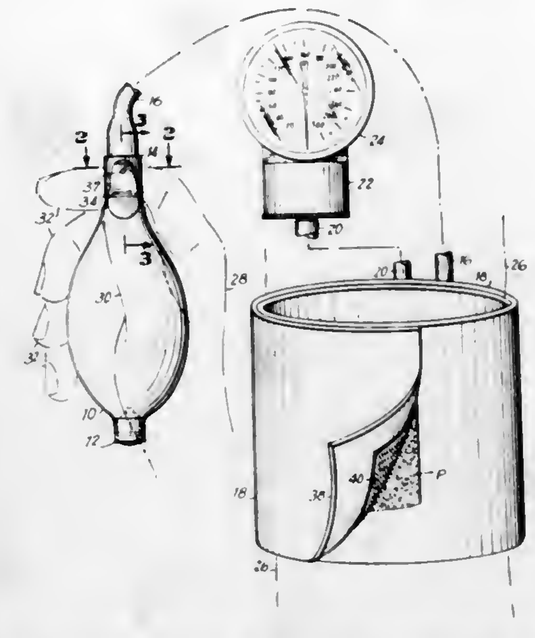
4,037,587
VALVE ASSEMBLY FOR A SPHYGMOMANOMETER

Nobuo Kaneda, Komae; Takenosuke Tokisono, Tokyo, and Teizo Uchida, Kawaguchi, all of Japan, assignors to Bristoline Inc., Island Park, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,703
Int. Cl.^{2} A61B *5/02*

U.S. Cl. 128—2.05 G **8 Claims**

8. A valve assembly for a sphygmomanometer comprising a body having an air passageway, a pumping bulb, coupling means at one end of said passageway to connect said body to the pumping bulb, a sphygmomanometer cuff, coupling means at the other end of said passageway to connect said body to said sphygmomanometer cuff, an egress check valve adjacent said bulb, an ingress check valve at an ingress opening to said bulb, a bleed valve adjacent said bulb and connected to said air passageway, said egress check valve being located between said bleed valve and an egress opening from said bulb, said bleed valve having a manually manipulatable control element positioned to be readily accessible to the finger tip of the hand of a user pumping the bulb, said control element being freely floating and pivotally mounted for movement from a valve closed position to a valve bleeding position, and resilient means to bias the control element to valve closed position, whereby said control element can be depressed against the bias so that finger pressure on said pivoted control element can accurately regulate the rate at which air is bled through said air passageway from said sphygmomanometer cuff.



4,037,588
LARYNGOSCOPES

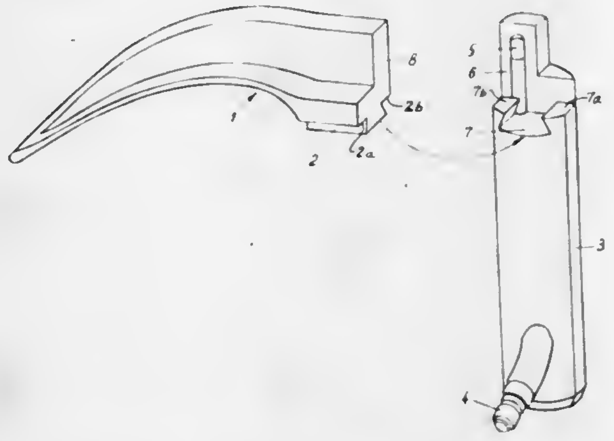
Helmut Heckele, Knittlingen, Germany, assignor to Richard Wolf GmbH, Knittlingen, Germany

Filed Mar. 15, 1976, Ser. No. 666,602

Claims priority, application Germany, Sept. 11, 1975, 7528678[U]

Int. Cl.^{2} A61B *1/06*

U.S. Cl. 128—11 **4 Claims**



1. A laryngnoscope comprising an elongated handle member, a spatula member made of a light-conducting material, said handle member when held in a vertical position presenting at its upper end a flat face in a vertical plane inwardly off-set from the longitudinal axis of the handle member, said handle member when so held also presenting both a dove-tailed mounting slot and flat upwardly facing horizontal shoulders on either side of the slot extending perpendicularly outward of the flat face, light emitting means mounted in the handle and having a light emitting element located in said flat face to illuminate the proximal end of the spatula member when mounted on the handle member, and said spatula member presenting at its proximal end a flat face complemented to the flat face of the handle member and having at its proximal end both a dove-tailed mounting projection and a pair of flat shoulders, both located beneath the flat face of the spatula, and complementaly slidable into and on to the mounting slot and flat shoulders of the handle member.

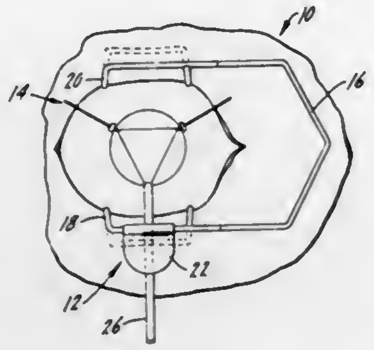
4,037,589
OCULAR SURGICAL SYSTEM

William U. McReynolds, Quincy, Ill., assignor to William U. McReynolds, Qunicy, Ill.

Filed Oct. 3, 1975, Ser. No. 619,189

Int. Cl.^{2} A61B *17/02*

U.S. Cl. 128—20 **15 Claims**



1. A system for retracting and retaining the iris of an eye in a dilated position, comprising

first means for retracting the iris, said first means including a shaft with a curved end for insertion within a first incision in the eye and engagement with the edge of the iris,

resilient means disposed about said shaft to grip the shaft and maintain the shaft in a fixed position,

means for maintaining said resilient means stationary in a position adjacent the eye,

at least one second means for retracting the iris, said second means including a length of wire with a shank having a hook formed at one end for insertion within a second incision in the eye, and

a flexible shield means disposed about the shank of said length of wire and movable thereon to adjoin the surface of the eye to prevent loss of aqueous fluid from the incision and to retain the length of wire in a particular position after insertion of the hook within the eye.

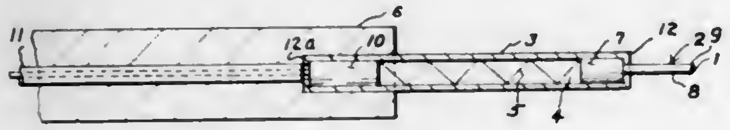
4,037,590
POINT PRESSURE THERAPY DEVICE

Albert A. Dohring, and Grace H. Dohring, both of 24028 Union, Dearborn, Mich. 48124

Filed Nov. 17, 1975, Ser. No. 632,366

Int. Cl.^{2} A61H *39/00*

U.S. Cl. 128—24.4 **6 Claims**



1. A therpeutic device to apply localized pressure, including,

a pressure member,

an elongated carrier for said pressure member,

a carrier holder elongated on longitudinal axis,

a hole formed in said holder elongated on and approximately concentric with said longitudinal axis,

said carrier including a piston, said piston being received in said hole to support said carrier for reciprocable sliding travel along said longitudinal axis, said piston having an inner end face,

means to resist escape of said piston from said hole,

said carrier further including a rod portion slidably protruding through said means to resist escape, said rod portion being a smaller diameter than said piston, said rod portion revolubly and terminally carrying said pressure member exteriorly of said holder for application to the skin of a patient,

means carried by said holder effective upon said piston to urge said carrier under variable pressure toward the skin of patient in the use of the device.

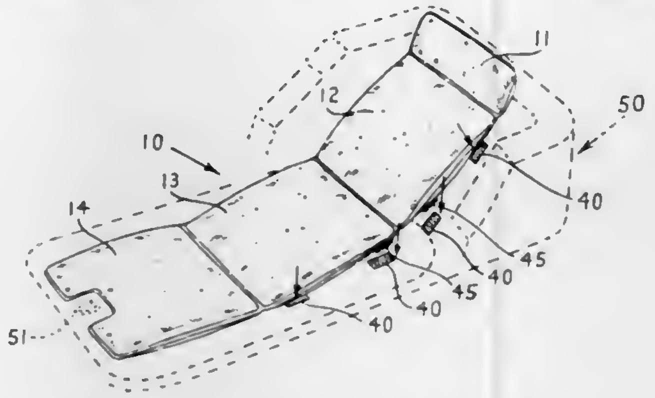
4,037,591
BATH TUB THERAPEUTIC PAD

Jay J. Sarno, 2880 Las Vegas Blvd. South, Las Vegas, Nev. 89109

Filed July 2, 1976, Ser. No. 702,288

Int. Cl.^{2} A61H *1/00*

U.S. Cl. 128—33 **9 Claims**



1. A therapeutic pad for use in a bath tub comprising: (1) a multiplicity of resilient and vibrant pad elements, one of said pad elements being of such configuration as to provide an opening therein to accommodate, and partially surround, the bath tub drain area; (2) a water-proof covering completely encasing said pad elements; (3) means joining said pad elements into an elongated series of pad elements; and (4) means to cause said pad elements to adhere to a bath tub surface when water is in said bath tub.

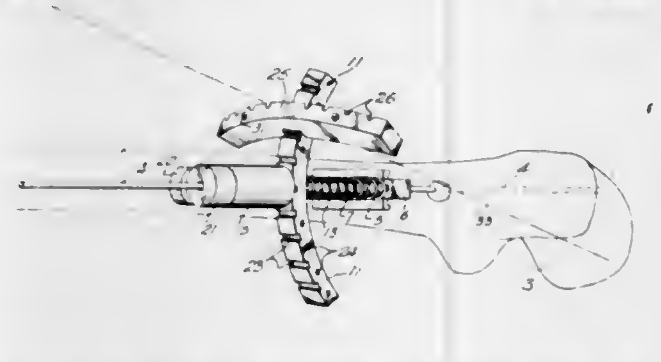
4,037,592
GUIDE PIN LOCATING TOOL AND METHOD

Richard F. Kronner, Rte. 2, Box 583, Roseburg, Oreg. 97470

Filed May 4, 1976, Ser. No. 682,833

Int. Cl.^{2} A61B *17/18;* A61F *5/04*

U.S. Cl. 128—92 EB **10 Claims**



1. A tool for use in the positioning of a surgical guide pin within the neck and head portions of a femur preparatory to hip nail installatin, said tool comprising,

a base adapted for surfacial abutment against the femur exterior offset from the guide pin axis and supported by a first surgical guide pin projecting outwardly from the femur, said base including an outwardly extending arm and arm extension,

a guide member rotatably mounted on said base and positionable about the axis of said first surgical guide pin preparatory to the taking of AP and lateral X-ray photographs of the femur with inserted surgical guide pin and attached tool,

retention means holding said guide member against undesired rotational movement in perpendicularly related position during the taking of the X-ray photographs, and

said guide member having indices thereon discernible on the AP and lateral X-ray photographs to enable the plotting of a corrected course for a second guide pin, said indices also facilitating the positioning and axial guidance of a second surgical guide pin for entry of same into the femur along said corrected course.

4,037,593
SURGICAL MASK WITH VAPOR BARRIER

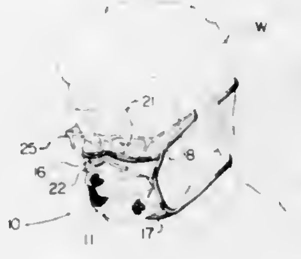
George W. Tate, Jr., Dallas, Tex., assignor to Giles C. Clegg, Jr. and John R. Lynn, both of Dallas, Tex.

Filed Nov. 28, 1975, Ser. No. 635,970

The portion of the term of this patent subsequent to Aug. 17, 1993, has been disclaimed.

Int. Cl.^{2} A62B *7/10*

U.S. Cl. 128—146.2 **4 Claims**



1. In an improved surgical mask of the type comprising a main body member including at least one layer of a filtering material, said main body having upper, lower and side edges, an upper region, a lower region and securing means extending laterally from the opposite edges for securing the mask over the face of a wearer to cover the nose and mouth, the improvement comprising;

an elongated strip of deformable, closed cell foam material having upper and lower edges and adaptable to the contours of the nose and cheek bones of the wearer attached to the inner surface of the upper region of the mask with the upper edge extending substantially across the entire upper edge of said main body, and being of sufficient width between the upper and lower edges to prevent flow of vapor through the upper region of the main body in the vicinity of optical aids used by the wearer of the mask, and

deformable means for assisting in maintaining a desired contour to said strip and holding said strip against the wearer's face in sealing relationship.

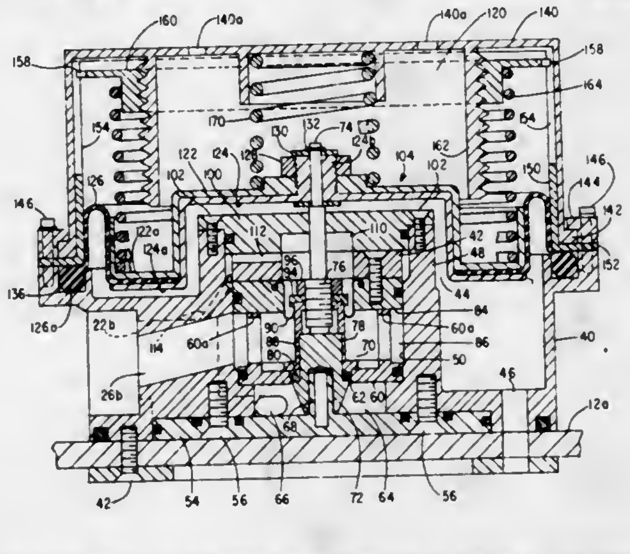
4,037,594
EXHAUST REGULATOR VALVE FOR PUSH-PULL DIVING SYSTEM

Peter S. Riegel, Columbus; Stephen E. Magill, Circleville, and Dwain R. Schroeder, Columbus, all of Ohio, assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Apr. 26, 1976, Ser. No. 680,320

Int. Cl.^{2} A62B *7/00*

U.S. Cl. 128—142.3 **3 Claims**



1. Push-pull diving apparatus including a helmet, pressure and suction lines for supplying breathing gas to said helmet from a source and returning exhaust gas to said source, and an exhaust regulator valve mounted on said helmet, said exhaust valve comprising:

a valve body in which are defined an inlet plenum, a balancing chamber, an outlet plenum disposed between said inlet plenum and said balancing chamber, and a valve seat surrounding a flow passage between said plenums, said inlet plenum being connected to receive exhaust gas from said helmet, said outlet plenum being connected to said suction line, and said balancing chamber being in communication with said inlet plenum;

said body further defining a helmet pressure sensing chamber, said helmet pressure sensing chamber being in communication with the interior of said helmet;

a piston having one side exposed to ambient pressure, the other side exposed to said helmet pressure sensing chamber, and movable in response to changes in differential between said helmet and ambient pressures;

a throttling valve member having a stem portion extending through said balancing chamber and connected to said piston for movement thereby in both closing and opening directions relative to said seat for increasing or decreasing throttling of exhaust gas flow from said inlet plenum to said outlet plenum;

said valve member having substantially equal areas exposed to said inlet plenum and to said balancing chamber, whereby forces acting on said valve member due to pressure differentials between said inlet and outlet plenums are substantially cancelled by forces acting on said valve member due to similar pressure differentials between said balancing chamber and said outlet plenum;

load means, acting on said piston, for effecting a predetermined force thereon in said valve member closing direction, whereby said regulating valve is operative to variably restrict exhaust gas flow from said inlet plenum to said outlet plenum so as to maintain pressure in said helmet at a predetermined differential relative to said ambient pressure irrespective of changes in said ambient pressure and in said pressure differential between said inlet and outlet plenums: a cup-shaped cover having a cylindrical outer wall and mounted on said body for rotation about its axis;

said cover comprising an externally threaded tubular boss in spaced concentric relation within said cylindrical outer wall;

an annular first spring seat threadedly engaged on said tubular boss and presenting a plurality of radially extending lugs;

a cylindrical guide member mounted on said body concentrically within said cover, and having axial slots engaged by said lugs so as to prevent rotation of said first spring seat about said axis;

said load means comprising concentric first and second compression springs, said first compression spring being disposed between said cylindrical outer wall and said tubular boss and compressed between said first spring seat and said piston, and said second compression spring being disposed within said tubular boss and compressed between said cover and said piston, whereby upon rotation of said cover in one direction or the other about said axis said first spring seat is moved axially along said tubular boss to vary the length of said first compression spring while maintaining the length of said second compression spring substantially constant.

4,037,595

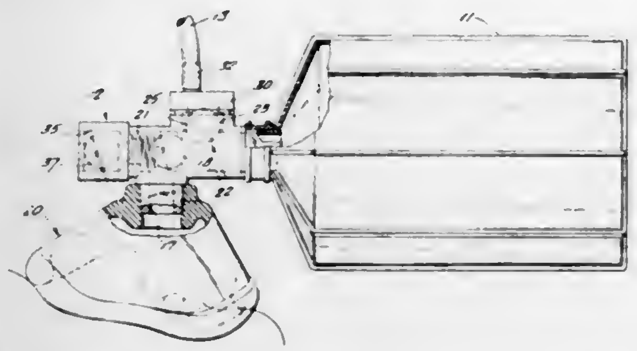
BREATHING EQUIPMENT SUCH AS RESUSCITATORS

James O. Elam, 950 E. 59th St., Chicago, Ill. 60637

Continuation-in-part of Ser. No. 460,139, April 11, 1974. This application Sept. 17, 1975, Ser. No. 614,030

Int. Cl.^{2} A61M *16/00*

U.S. Cl. 128—145.7 **1 Claim**



1. A resuscitator valve mechanism including a valve chamber having opposed inspiration and expiration ports in opposite ends thereof each having a valve seat surrounding the port, and the chamber having a port in a side wall of said chamber between the ends thereof for communication with the patient's lungs, a light weight ball valve in said chamber having clearance for gas flow around the valve adjacent the side walls of the chamber and being movable in opposite directions to engage either of the valve seats and close one or the other of the opposed ports, a compression spring between the ball valve and the wall of the valve chamber around the expiration port and urging the ball valve away from the expiration port seat, and the valve mechanism having means providing for connection of a source of pressurized inspiration gas and for directing such pressurized gas to the inspiration port, the ball valve being movable away from the inspiration valve seat under the influence of the pressurized gas, and said spring being deflectable sufficiently to provide for engagement of the ball valve with the expiration port seat and thus close the expiration port, the expiration port being centrally located at one end of said chamber and having a cross sectional area substantially smaller than the inspiration port thereby tending to retain the ball valve in a position spaced from the expiration port during selected flows of inspiration gas from a pressurized source thereof connected with the valve mechanism, and the spring being a helical coil spring having an inside diameter at least as large as the expiration port and having one end seated against the end of the valve chamber in an area surrounding the expiration port and the other end presented for engagement with the ball valve, and the motion of the light weight ball valve in said valve chamber being unguided except for the action of said spring and of the gas flow through the valve chamber.

4,037,596

PARENTERAL ADMINISTRATION SET WITH INTERNAL VALVE AND FLOW RESTRICTOR

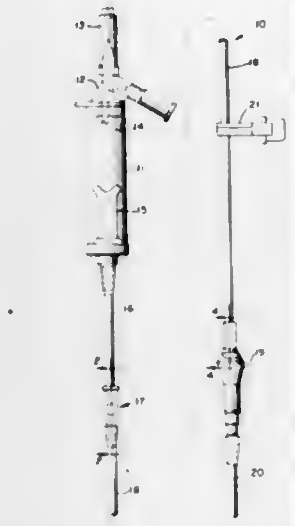
Robert J. LeFevre; George K. Burke, and Kenneth Raines, all of Bethlehem, Pa., assignors to Burron Medical Products, Inc., Bethlehem, Pa.

Filed Dec. 3, 1975, Ser. No. 637,209

Int. Cl.^{2} A61M *5/16*

U.S. Cl. 128—214 C **14 Claims**

1. A parenteral administration set comprising: a drip chamber having means thereon for connection with a source of fluid to be administered and having orifice means for forming drops of fluid flowng from the drip chamber; a length of flexible tubing connected with the drip chamber; valve means having movable means therein and in fluid communication with the interior of the length of tubing and operable between open and closed positions from exteriorly of the tubing to obtain a desired drip rate and thus control flow through the set; a needle adaptor connected with the tubing at its opposite end for receiving flow from the valve means; and fixed restrictor means in the tubing separate from the valve means and having an internal bore with a predetermined length and diameter sized to impart restriction to flow therethrough approximating the restriction to flow imposed by a needle of no larger than about 20 or 21 gauge, to insure that the rate of drop formation is such that only one drop will form and fall for each opening cycle of the valve means during normal operation, regardless of the size of needle connected to the needle adapter.



4,037,597

DRIP CHAMBER FOR INFUSION AND TRANSFUSION APPARATUS FORMED OF SEVERAL PARTS

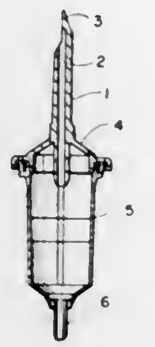
Hans-Jürgen Forberg, Lensahn, Holst, Germany, assignor to Firma Transcodan Sven Husted-Anderson, Germany

Filed July 3, 1975, Ser. No. 592,881

Claims priority, application Germany, July 3, 1974, 2331946; Mar. 5, 1975, 2509484

Int. Cl.^{2} A61M *5/16*

U.S. Cl. 128—214 C **13 Claims**



1. In a drip chamber for infusion and transfusion apparatus formed of separate parts joined together at junctions, with one end part having a liquid duct communicating therewith and terminating in a piercing needle and another end part having a hose communicating therewith, the improvement comprising, in combination, interengageable clampingly interlocking packing components, on the adjacent edges of the parts at said junctions, telescopingly interengageably by movement of the adjacent ends toward each other and forming, when interengaged, a labyrinth packing including a plurality of sealingly interengaged sealing surfaces, whereby liquid-tight seals are formed at said junctions; the two parts joined together at a junction being provided with interlocking components which are hooked over each other, the interlocking components having bevelled surfaces which interengage with each other during assembly of the two parts.

4,037,598

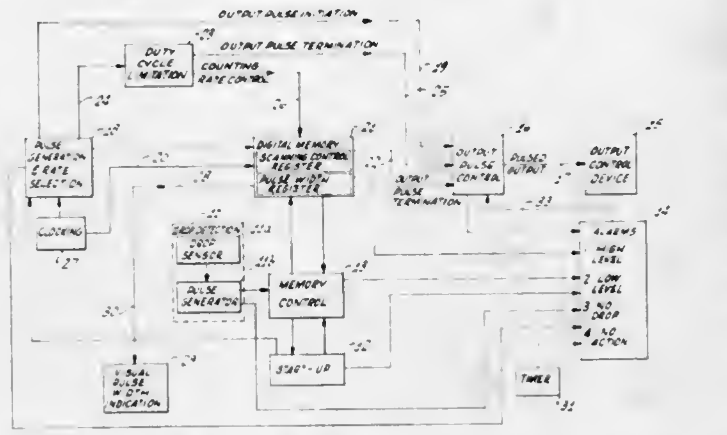
METHOD AND APPARATUS FOR FLUID FLOW CONTROL

Heinz W. Georgi, Del Mar, Calif., assignor to Ivac Corporation, San Diego, Calif.

Filed Aug. 12, 1974, Ser. No. 496,553

Int. Cl.^{2} A61M *5/14*

U.S. Cl. 128—214 E **102 Claims**



1. In a system for parenteral administration of liquids at desired drop flow rates through a feeding tube from a liquid source to a patient, the combination comprising:

electromechanical output control means for manipulating the feeding tube to vary the flow of liquid in the feeding tube;

electrical pulsing means for providing output pulses to operate said output control means, said output control means being active during the periods between said output pulses in a pulse train, said output pulses being at a substantially higher frequency than the desired drop flow rate frequency; and

digital memory and timing means for automatically predetermining and varying the pulse width of said output pulses operating said control means, to achieve the desired drop flow rate.

4,037,599

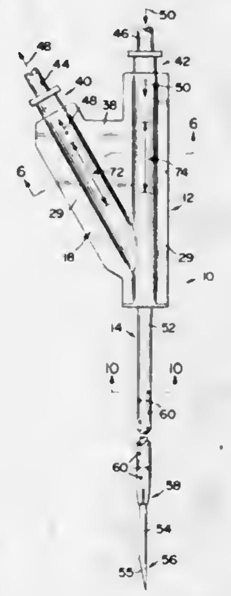
CONTINUOUS FLOW CATHETER DEVICE

James D. Raulerson, Rte. 2, Box 104, Alachua, Fla. 32615

Filed Jan. 26, 1976, Ser. No. 652,288

Int. Cl.^{2} A61M *5/00*

U.S. Cl. 128—214.4 **17 Claims**



1. A catheter device for the catherization of predetermined blood vessels required during hemodialysis, said catheter device comprising: a hub means including at least two fluid conduits disposed in spaced, separated relation to one another; tube means connected to said hub means and including at least an inner tube element and an outer tube element disposed in concentric relation to one another, each of said tube elements connected in fluid communicating relation to one of said two fluid conduits, said hub means comprising socket means formed in said hub means, mounting means formed on said tube means and comprising at least in part a substantially corresponding configuration as said socket means; said mounting means disposed in mounted engagement with said socket means on the interior of said hub means; a first path of fluid flow defined by the interconnected outer tube of one of said fluid conduits; a second fluid flow path defined by the interconnected inner tube element and the other of said fluid conduits, said first and second fluid flow paths disposed in segregated relation to one another; said first and second fluid flow paths interconnected to a continuous negative and positive source of fluid pressure, whereby a continuous flow of blood simultaneously travels from and to the predetermined blood vessel upon activation of the positive and negative source of fluid flow.

4,037,600

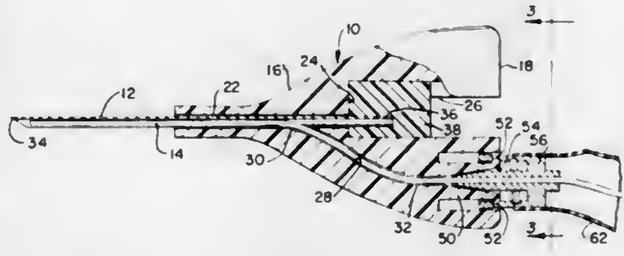
CATHETER PLACEMENT SYSTEM

Mark P. Poncy; George W. Poncy, and Richard P. Poncy, all of 3670 E. Indus. Way, Riviera Beach, Fla. 33404

Filed July 11, 1975, Ser. No. 595,014

Int. Cl.^{2} A61M *5/00, 25/00*

U.S. Cl. 128—214.4 **13 Claims**



1. Catheter placement apparatus comprising:

a body member with front and rear ends having a linear guiding passage extending longitudinally therein and a smoothly curved guiding passage merging with said linear guiding passage within said body member and opening through the rear end of said body member in essentially parallel relationship to said linear guiding passage;

a venipuncture needle slidable received in said linear guiding passage, said needle having a puncture point at one end projecting from said body member at the front end and a hub block fixed at the opposite end of said needle;

an insertion catheter positioned in said curved guiding passage and being normally slidable through said curved guiding passage and into said linear guiding passage.

4,037,601

PROCESS FOR PREPARING STERILIZED FEMININE HYGIENE ARTICLES OF NON-WOVEN AND WOVEN TEXTURES

Marian C. Denkinger, 88-35 Elmhurst Ave., Elmhurst, N.Y. 11373

Filed Apr. 30, 1976, Ser. No. 681,798

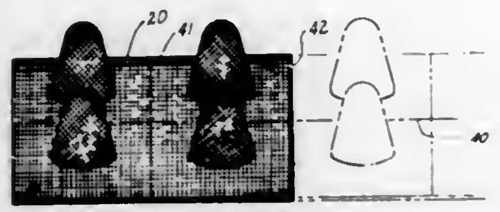
Int. Cl.^{2} A61F *13/00, 5/46*

U.S. Cl. 128—285 **4 Claims**

1. A feminine hygiene product for digital insertion into the vaginal canal having the following characteristics:

a fundamentally hollow form defined by an outer convex surface of fibrous absorbent textile material, an inner surface formed of a film of a material selected from the group consisting of hot melt adhesive, rubber latex, synthetic plastisol latex and starch,

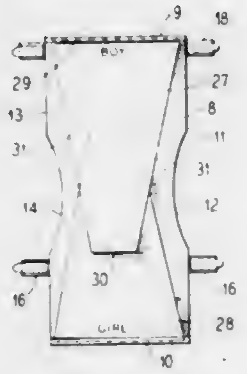
said film being adhered to and received in its outer convex surface, fibers of said textile material, thereby to give said product a unitary conical form defining



a flexible digital receiving liner and an exterior fibrous surface for vaginal conal contact.

4,037,602
ADAPTABLE DIAPER

Janet R. Hawthorne, 556 Riford Road, Neenah, Wis. 54956
Filed Feb. 26, 1976, Ser. No. 661,449
Int. Cl.^{2} A16F *13/16*
U.S. Cl. 128—287 **10 Claims**



1. A diaper assembly selectively adaptable for use with a boy or a girl, including

a planar diaper material having opposite sides and ends, an inside end and outside end,

a first tapered absorbent liner on the inside of the diaper material. said first tapered absorbent liner having a base, an oppositely smaller end and tapering sides connecting the base and smaller end, said liner base being attached by releasable attaching means to a diaper material end, and the smaller end extending beyond the mid-point between the opposite diaper material ends, and

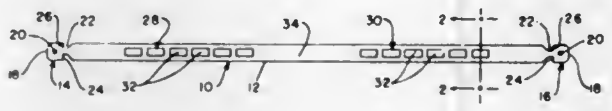
a second tapered absorbent liner having a base, an oppositely smaller end and tapering sides, the liner base of said second liner being attached at the other of the diaper material ends by a second releasable attaching means, said tapered end of the second tapered absorbent liner extending beyond the mid-point between the opposite diaper material ends and being in overlapping relationship with the smaller end of the first tapered absorbent liner,

whereby one of said liners may be removed at its base by releasing the attaching means so that the remaining liner may be selectively positioned relative to a boy or a girl, and the removed liner may be layered with the remaining liner to thicken the selected liner position.

4,037,603
METALLIC SURGICAL SUTURE

Erwin R. Wendorff, 1303 Garden Lane, Reading, Pa. 19602
Filed May 13, 1975, Ser. No. 576,960
Int. Cl.^{2} A61B *17/04*
U.S. Cl. 128—335.5 **5 Claims**

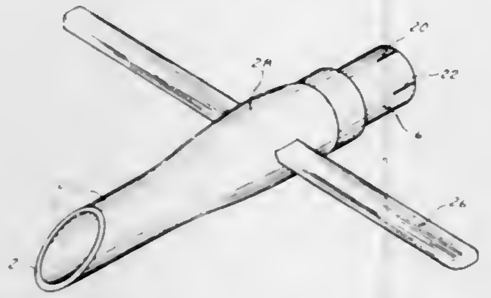
1. A surgical suture for employment in a looped condition with end portions of said suture in lapping relationship, said suture comprising a thin, narrow, flexible metallic strip of surgical steel, and there are means for interlocking each end of said suture to selected portions along said strip when said end portions are in lapping relationship, said means for interlocking being a series of apertures along a portion of said strip and a



shouldered tongue on the other portion of said strip adaptable to be inserted in the aperture and maintained in place.

4,037,604
ARTIFICAL BIOLOGICAL DRAINAGE DEVICE

John B. Newkirk, P.O. Box 1128, Englewood, Colo. 80110
Filed Jan. 5, 1976, Ser. No. 646,574
Int. Cl.^{2} A61M *27/00*
U.S. Cl. 128—350 V **10 Claims**



1. An artificial biological drainage device such as an eye shunt, comprising:

a. a plastic, body innocuous tubular body being sufficiently rigid to maintain its shape on being implanted in a human body and having two open ends;

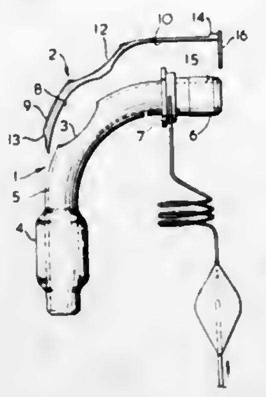
b. a soft, flexible tube contacting and peripherally secured to and telescoped over one end of said tubular body and having a soft, resilient closure forming a closed end for said tubular body, there being at least one slit in said closed end arranged to open outwardly providing a unidirectional valve for fluid above a predetermined pressure and arranged to close at a pressure slightly less than the opening pressure for maintaining fluid pressure in an eye at a generally predetermined level; and

c. a crossarm secured to said tubular body for securing the same in an implanted position all said parts being innocuous to the tissues and fluids in a body and being of a size to be accommodated in implant in a small organ.

4,037,605
TRACHEOTOMY TUBE

Bernard Charles Firth, 114 Grey Street, East Melbourne, Victoria 3002, Australia
Filed Apr. 13, 1976, Ser. No. 676,588
Claims priority, application United Kingdom, Aug. 14, 1975, 15148/75; June 19, 1975, 26058/75
Int. Cl.^{2} A61M *25/00*
U.S. Cl. 128—351 **9 Claims**

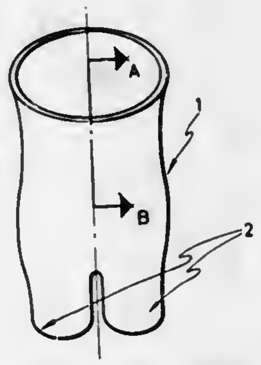
3. In combination, a tracheotomy tube and removable insert means, the tube having an inflatable cuffed end for insertion in a patient's trachea, an opposite end for releasable connection to a ventilator and an aperture in the wall of the tube intermediate its ends, the removable insert means cooperating with the tube to engage and seal the aperture in an airtight fit, said insert means being such as to provide a minimum change and obstruction in the bore of the tube whereby, in use, with the cuff inflated and said insert means in sealing engagement with the aperture a patient can be ventilated by the ventilator and upon



removal of the insert means the patient can breathe spontaneously through the nose and mouth.

4,037,606
WOMAN'S CORRECTING GARMENT

Jose Maria Masso Remiro, Barcelona, Spain, assignor to Turbo, S.A., Barcelona, Spain
Filed Nov. 20, 1975, Ser. No. 633,722
Claims priority, application Spain, Nov. 25, 1974, 207837
Int. Cl.^{2} A41C *1/00*
U.S. Cl. 128—547 **2 Claims**



1. A correcting garment, comprising a tubular body adapted to cover an anatomical region below the wearer's chest, said tubular body being consituted by superimposed inner and outer tubular sheets of fabric joined together by a layer of latex therebetween, said tubular sheets being elastic in the transverse direction, and each sheet having a tendency to undergo longitudinal rolling when it is subjected to transverse stretching, one sheet tending to roll towards the interior of the garment while the other sheet tends to roll towards the exterior thereof, whereby the tendency of said one sheet to roll neutralizes the tendency of said other sheet to roll and vice versa.

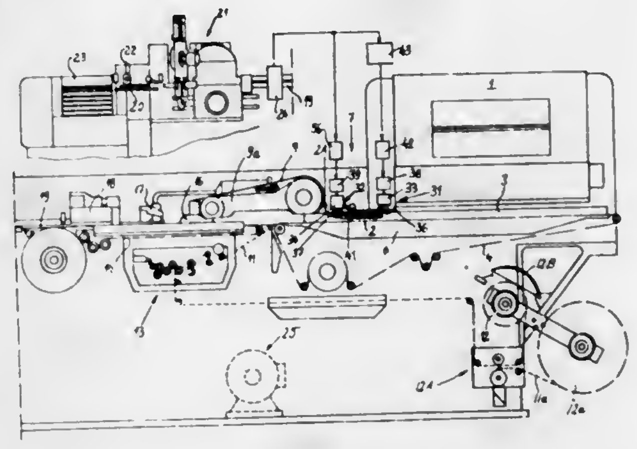
4,037,607
CIGARETTE AND FILTER FOR TOBACCO SMOKE

Harold Grossman, Upper Montclair, N.J., assignor to Montclair Research Corporation, Silver Spring, Md.
Continuation of Ser. No. 479,103, June 13, 1974, abandoned. This application July 20, 1976, Ser. No. 707,073
Int. Cl.^{2} A24D *1/06;* **A15B** *15/02*
U.S. Cl. 131—10 R **24 Claims**

1. In combination, a body of divided tobacco to be burned, a filter for the tobacco smoke resulting from the burning, the tobacco having a deposit thereon of particles of a water-insoluble, hydrophobic, moisture-laden, negative charge-imparting substance which releases moisture upon the burning of the tobacco, the filter comprising a porous substrate having a deposit thereon of particles of a positively charged, water-insoluble, hydrophobic, oleophilic, coalescing agent adapted to attract and neutralize the negatively charged particles dispersed in tobacco smoke.

4,037,608
METHOD AND APPARATUS FOR PRODUCING CIGARETTES WITH DENSE ENDS

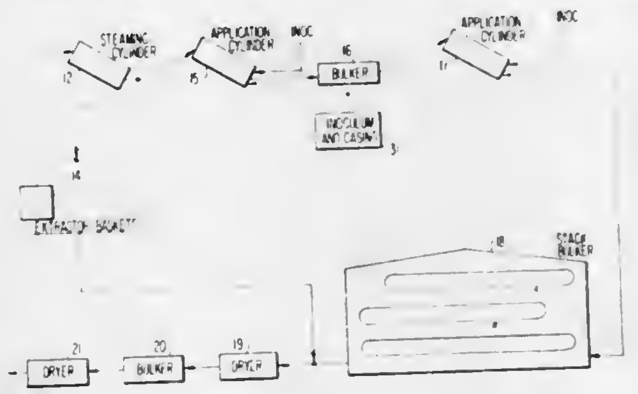
Günter Wahle, Reinbek, Germany, assignor to Hauni-Werke Körber & Co., KG, Hamburg, Germany
Filed Aug. 29, 1975, Ser. No. 609,151
Claims priority, application Germany, Sept. 11, 1974, 2443551
Int. Cl.^{2} A24B *7/14;* **A24C** *5/18*
U.S. Cl. 131—21 B **19 Claims**



1. A method of making cigarettes or analogous smokers' wherin an elongated rod-like filler of fibrous material is surrounded by a tubular wrapper and the filler has at least one dense end, comprising the steps of forming a continuous stream consisting of said fibrous material and containing material in excess of that which is required in the filler; removing material from said stream to convert the latter into a continuous rod-like filler wherein spaced-apart portions contain more material than the filler parts between such portions; monitoring the quantity of material in said spaced-apart portions; and varying the amounts of material which are removed from those portions of the stream which correspond to said spaced-apart portions independently of the quantity of material in said filler parts when the monitored quantities deviate from a predetermined quantity.

4,037,609
PROCESS FOR REDUCTION OF NICOTINE CONTENT OF TOBACCO BY MICROBIAL TREATMENT

Richard P. Newton, Louisville, Ky.; Vernon L. Geiss, Floyd Knobs, Ind.; John N. Jewell, and Lawrence E. Gravely, both of Louisville, Ky., assignors to Brown & Williamson Tobacco Corporation, Louisville, Ky.
Filed Nov. 17, 1975, Ser. No. 632,863
Int. Cl.^{2} A24B *15/02, 15/04, 3/12*
U.S. Cl. 131—141 **7 Claims**

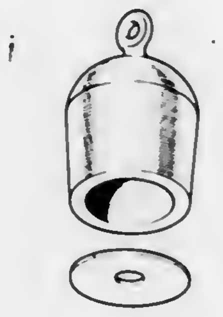


1. In a process for reducing the nicotine content of tobacco including the steps of:

a. contacting said tobacco with an aqueous medium containing at least 1 × 10^7 cells per gram based on the dry weight of said tobacco of a microorganism which degrades nicotine through a biochemical mechanism in which 3-succinoylpyridine is formed; and

b. maintaining said tobacco in contact with said microorganism for from about 1 to about 10 hours at a moisture level of at least 50% by weight based on the total weight of tobacco and water, a temperature of from about 20° C to about 45° C, and an initial pH of from about 5 to about 8; the improvement comprising subjecting said tobacco to steam for a sufficient period of time to bring the moisture level of the tobacco to at least 15% by weight prior to contacting said tobacco with said aqueous medium.

4,037,610
SMOKING SYSTEM
Philip F. George, 2 Dartmouth St., Worcester, Mass. 01604
Filed May 21, 1976, Ser. No. 688,622
Int. Cl.^{2} A24F *3/02, 9/02*
U.S. Cl. 131—184 A **7 Claims**

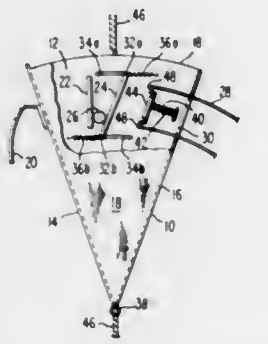


1. Smoking system, comprising

a. a pipe havng a bowl adapted to receive tobacco, the bowl having a substantially cylindrical inner surface, and

b. a tamper having a holding portion and having a tubular portion extending from the holding portion, the tubular portion having an outer surface adapted to fit snugly into the said inner surface of the bowl, the tubular portion having a relatively thin wall, so that the tamper acts to compress the tobacco only adjacent the said inner surface of the bowl.

4,037,611
AUTOMATIC CIGARETTE SNUFFER AND DISPOSAL DEVICE
Andrew P. Holland, 281 W. Mechanic St., New Hope, Pa. 18938
Filed May 10, 1976, Ser. No. 684,521
Int. Cl.^{2} A24F *13/18, 19/14*
U.S. Cl. 131—237 **15 Claims**



1. An automatic cigarette snuffer and disposal device comprising:

a. a moveable ashtray enclosure having an open upper area, said enclosure including a front wall, a rear wall and two side walls, said enclosure being selectively moveable between a closed and an opened position said side walls defining slot means therein;

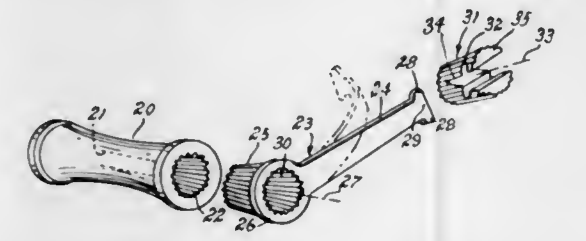
b. a stationary crusher plate fixedly mounted to said enclosure to be moveable therewith;

c. a moveable crusher plate being moveably mounted to said enclosure and positioned adjacent said stationary plate said moveable crusher plate including laterally disposed pins extending through said slot means to facilitate movement between said crusher plate and said enclosure;

d. cam means selectively engageable with said moveable plate responsive to said ash tray being moved toward a closed position to urge said moveable plate against said stationary plate and crush and snuff tobacco materials and the like located therebetween; and

e. disposal means operable responsive to movement of said enclosure to the opened position to urge said moveable crusher plate away from said stationary crusher plate to release crushed tobacco materials from between said plates for disposal therebelow.

4,037,612
WAVE ROD SYSTEM
Vernon Dale Ferrier, 5241 Pleasant Ave., Fairfield, Ohio 45014
Filed May 21, 1976, Ser. No. 688,682
Int. Cl.^{2} A45D *2/00*
U.S. Cl. 132—31 R **18 Claims**



1. An improved wave rod system, comprising in combination:

a. a spool;

b. a locking arm;

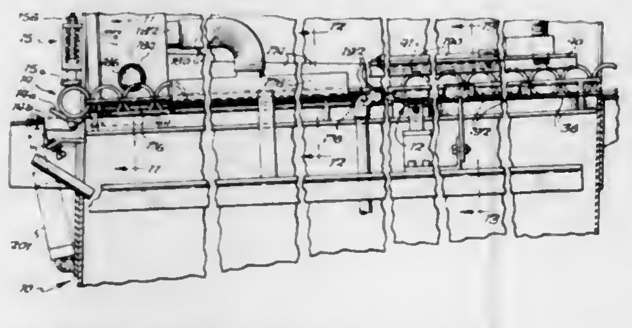
c. a bore in one of said spool and locking arm;

d. a stub affixed to the other of said spool and locking arm and adapted to be lockingly received in said bore;

e. means to couple said bore and said stub so as to prevent relative rotation between said spool and said arm; and

f. means to axially retain said stub in said bore.

4,037,613
WASHER FOR BEARING RACES
Jack P. Elliott, Amherst, N.Y., assignor to J. P. Elliott Associates, Inc., Buffalo, N.Y.
Filed Sept. 8, 1975, Ser. No. 610,934
Int. Cl.^{2} B08B *3/02, 9/00;* **B60S** *3/00*
U.S. Cl. 134—83 **9 Claims**



1. A bearing washing machine comprising:

a housing having track means for carrying bearing race means through a cleaning operation and said track means being substantially stationary during said cleaning operation wherein bearing race means roll along the longitudinal length of said track means, said track means comprising two spaced, substantially parallel support tracks providing a rolling support surface to each side of a bearing race means,

support track mounting means on which said support tracks are correspondingly mounted, at least one of said support track mounting means being selectively spaced from the other so as to vary the spacing of said support tracks in order to provide a rolling support surface to race means of different thicknesses,

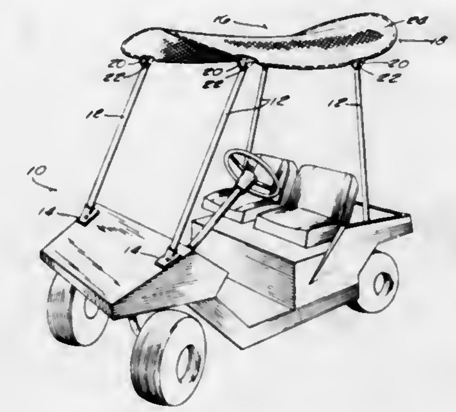
guide rail means disposed above said support tracks, said guide rail means being selectively spaced from said support tracks in order to retain race means of different diameters in rolling contact with said support tracks,

a plurality of threaded support track mounting means shafts on which said selectively spaced support track mounting means is respectively disposed and support track mounting means linkage for interconnecting and simultaneously adjusting said support track mounting means shafts so as to selectively vary the spacing between said support track mounting means,

guide rail means linkage for adjusting the spacing of said guide rail means from said support tracks to positions of substantially equal spacing from said support tracks along the longitudinal length of said guide rail means, and

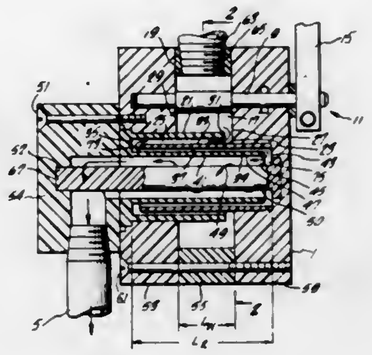
a plurality of cleaning nozzles being disposed adjacent to said track means, said cleaning nozzles being disposed for directing a corresponding plurality of selected fluid flows onto the bearing race means for the cleaning thereof in successive stages upon rolling of each bearing race means past said cleaning nozzles.

4,037,614
VEHICLE CANOPY
Charles E. Hines, and Dwight E. Williams, both of Lincoln, Nebr., assignors to Outboard Marine Corporation, Waukegan, Ill.
Filed Feb. 17, 1976, Ser. No. 658,593
Int. Cl.^{2} B62D *25/06;* **A47C** *29/00*
U.S. Cl. 135—5 A **9 Claims**



1. A canopy for a vehicle, which canopy is adapted for mounting on a plurality of upstanding support posts carried by the vehicle, said canopy comprising bracket means adapted for mounting said canopy on the support posts, a resilient perimeter frame supported by said bracket means and including opposed arcuate end sections which, in their free form, extend generally horizontally in outwardly bowed relation to each other, a flexible, water-repellent top, and means mounting said top on said perimeter frame so as to distort said end sections upwardly from their free form and cause said end sections, in attempting to return to their free form, to apply multi-directional tensions on said top such that said top assumes a generally upwardly convex shape in cross section.

4,037,615
FLUID CONTROL VALVE
Calvin A. Gongwer, Glendora, Calif., assignor to Innerspace Corporation, Glendora, Calif.
Continuation-in-part of Ser. No. 519,606, Oct. 31, 1974, abandoned. This application Oct. 16, 1975, Ser. No. 623,120
Int. Cl.^{2} F16K *47/08*
U.S. Cl. 137—1 **16 Claims**



1. A fluid control means comprising

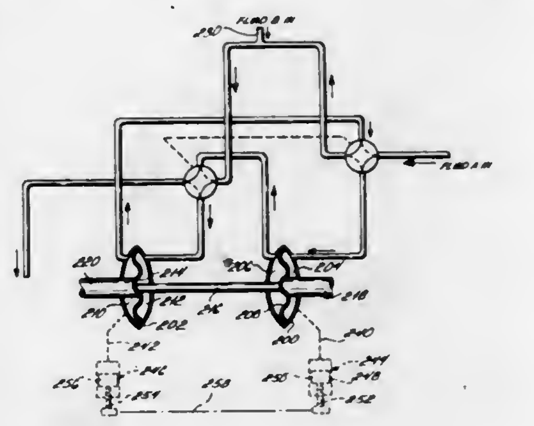
a housing means providing an axially extending outer wall and a plurality of inner walls, said outer and inner walls in inwardly spaced concentric annular relation, said annular walls having gradually decreasing diameters;

a housing inlet open to an outer annulus formed between said outer wall and the inner wall next adjacent said outer wall;

means for dissipating fluid flow energy having a valve nozzle means for introducing and tangentially accelerating varying amounts of fluid into said outer annulus and tangential to said outer wall and a means for directing and further tangentially accelerating said fluid having passed through said outer annulus through the series of annuli formed by said inwardly spaced concentric inner walls; and

an annular exit being formed by the innermost wall and the next adjacent inner wall.

4,037,616
PROPORTIONING FLUIDS
Harry Pinkerton, Bridle Path Lane, Mill Neck, N.Y. 11765
Continuation-in-part of Ser. No. 590,897, June 27, 1975, abandoned. This application May 12, 1976, Ser. No. 685,564
Int. Cl.^{2} G05D *11/03*
U.S. Cl. 137—99 **44 Claims**



1. Apparatus for proportioning and mixing two substantially incompressible fluids comprising an hydraulic circuits including a cylinder, a piston reciprocable in said cylinder and dividing the cylinder into two chambers, means reducing the effective volume swept by said piston in one chamber to be lesser than that swept by said piston in the other chamber, first conduit means constituting an inlet for a first fluid to said one chamber and connectable to a source of said first fluid, second conduit means connecting said one chamber to said other

chamber, third conduit means connected to said other chamber and constituting an outlet for mixed fluids, fourth conduit means constituting an inlet for a second fluid and connectable between a source of a second fluid and said second conduit means to cause said second fluid to be added to said first fluid in said second conduit means in an amount directly related to the differences in effective volumes swept by said piston, and interconnected valve means cooperating in said conduit means to permit controlled reciprocation of said piston in said cylinder, said source of said second fluid being different from said source of said first fluid and said valve means constituting means isolating said source of second fluid from both said chambers as said one chamber expands and connecting said source of said first fluid to said one chamber as said one chamber expands.

4,037,617

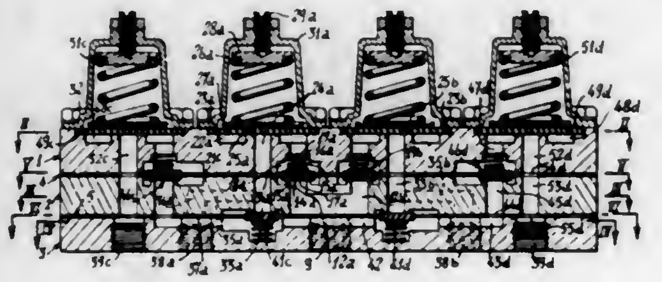
MULTIWAY PNEUMATIC VALVE AND ITS APPLICATION TO BRAKE

Fernando Perales, 15, rue Roger Salengro, 95230 Soisy-sous-Montmorency, France

Filed Dec. 4, 1975, Ser. No. 637,502

Int. Cl.² G05D *11/00*

U.S. Cl. 137—118 **5 Claims**



1. A fluid feeding system for feeding a fluid under different pressures to first and second outlets, said feeding system including a fluid supply inlet; first and second conduits communicating with the fluid supply inlet; first and second check valve means respectively mounted in the first and second conduits for controlling the flow of fluid therein; first and second diaphragms each having first and second faces, means cooperating with the first face of the respective diaphragms, said means forming a circular opening, an annular bearing surface surrounding said opening and an annular chamber surrounding said annular bearing surface; adjustable spring means respectively cooperating with the second faces of the respective diaphragms, the said annular chambers each having an annular open surface facing the diaphragm, the area of said open surface being substantially larger than the area of said annular bearing surface, the diaphragm being adapted to assume a rest position in which its first face closes the opening and the annular bearing surface and isolates each said annular chamber from its said surrounded circular opening, and a raised position in which the annular chamber and circular opening are opened and connected together, said first and second conduits communicating with the respective annular chambers which cooperate with the first and second diaphragms, respectively, third and fourth conduits respectively communicating with the circular openings downstream of the respective first and second diaphragms, each of said third and fourth conduits having an outlet to a closed tank, and a bypass bypassing said closed tanks comprising each of said third and fourth conduits forming a chamber having therein a seat and an annular bearing surface surrounding the conduit, third and fourth valve means each comprising a diaphragm made of resilient material, a flap valve cut from said diaphragm and engaging the bearing surface, and spring means supported on said seat and engaging the flap valve, said third and fourth conduits communicating through said third and fourth valve means with auxiliary tank means.

4,037,618

APPARATUS FOR MIXING FRICTION-REDUCING ADDITIVE TO WATER

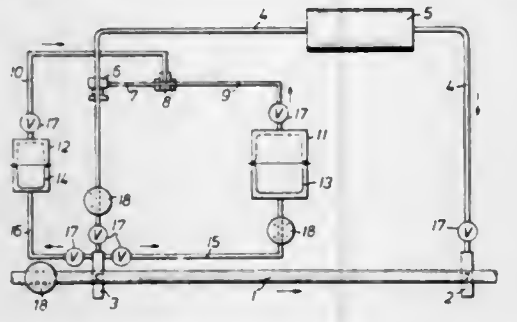
Anton Kresser, Wedel, Holstein, and Jens Bastein, Friedrichstadt, both of Germany, assignors to Licentia Patent-Verwaltungs-G.m.b.H., Frankfurt am Main, Germany

Filed Feb. 4, 1974, Ser. No. 439,299

Claims priority, application Germany, Feb. 3, 1973, 2305376

Int. Cl.² F16K *19/00*

U.S. Cl. 137—266 **12 Claims**



1. An apparatus for mixing a friction-reducing additive to water, comprising in combination:

a. a first supply line for defining a flow path for a water stream;
b. a mixing nozzle coupled to said first supply line and being disposed in said flow path;
c. a vessel for accommodating a friction-reducing additive;
d. a second supply line connecting said mixing nozzle to said vessel, said second supply line defining a flow path for the friction-reducing additive;
e. a third supply line connected to said second supply line between said vessel and said mixing nozzle, said third supply line defining a flow path for a buffer liquid;
f. routing means coupled to said second and third supply lines, said routing means having a first position in which communication is maintained between said vessel and said mixing nozzle for introducing, by means of said mixing nozzle, the friction-reducing additive to the water stream flowing in said first supply line, in said first position communication is blocked between said third supply line and said second supply line, said routing means having a second position in which communication is maintained between said second and third supply lines for introducing the buffer liquid into said second supply line, in said second position communication is blocked between said vessel and said mixing nozzle; and
g. means for switching said routing means from one of its said positions into the other.

4,037,619

THREE-POINT REGULATOR WITH FEEDBACK

Norbert Jeschke, Dietzenbach, Germany, assignor to Samson Apparatebau AG, Frankfurt am Main, Germany

Continuation of Ser. No. 410,390, Oct. 29, 1973, abandoned.

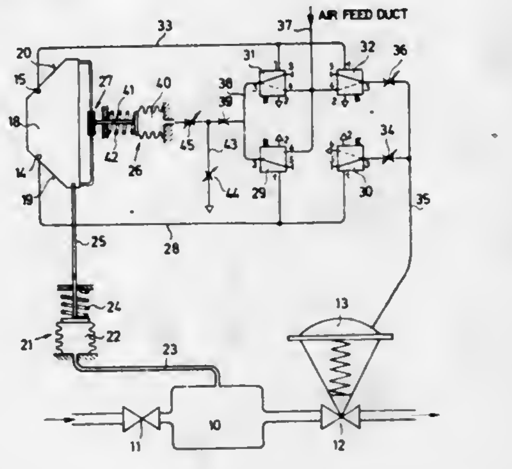
This application July 20, 1976, Ser. No. 707,771

Int. Cl.² F16K *31/12, 31/36;* F15B *13/16*

U.S. Cl. 137—492.5 **4 Claims**

1. A pneumatic regulator of the three-point type for regulating a flow of fluid, comprising:

adjustable valve means for controlling the flow of fluid;
means for controlling said adjustable valve means to maintain a predetermined fluid pressure in a pressure container connected in the fluid flow path, including first and second pneumatically-operated switches and a vane mounted therebetween to be movable from a neutral position, whereby movement of said vane in a first direction respectively opens and closes said first and second pneumatically-operated switches and movement in a second direction respectively closes and opens said first and second pneumatically-operated switches;
said adjustable valve means increasing the fluid flow in response to said first pneumatically-operated witch being opened and decreasing the fluid flow in response to said second pneumatically-operated switch being opened;
means for moving said vane in said first and second directions respectively in accordance with an increasing and decreasing pressure in said pressure container;
feedback means responsive to said first or said second pneumatically-operated switch for moving said vane in a direction to close either said first or said second pneumatically-operated switch, whereby the distance said vane moves in either said first or said second direction to open or close said first and second pneumatically-operated switches is increased;



said feedback means includes a stationary bellows and means for biasing and bellows in a neutral position, first and second microswitches respectively connected to said first and second pneumatically-operated switches and both said first and second microswitches being connected to said statinary bellows, and means for relieving the pressure within said stationary bellows;
feed duct means for supplying air to said first and second microswitches; and
said means for relieving includes a pre-choke valve connected to said first and second microswitches and to a first adjustable choke valve connected to said stationary bellows, and further including a second adjustable choke valve connected between said pre-choke valve and said first adjustable choke valve and open to the atmosphere.

4,037,620

CONTROLLER FOR FLUID PRESSURE OPERATED DEVICES

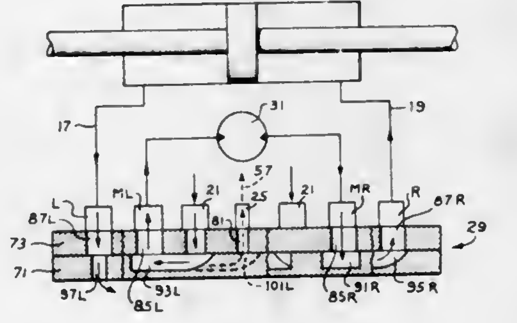
Oliver Wendell Johnson, Chaska, Minn., assignor to Eaton Corporation, Cleveland, Ohio

Continuation-in-part of Ser. No. 679,607, April 23, 1976, which is a continuation of Ser. No. 507,015, Sept. 18, 1974, abandoned.

This application June 23, 1976, Ser. No. 699,147

Int. Cl.² B62D *5/08*

U.S. Cl. 137—596 **19 Claims**



1. A controller for fluid pressure operated devices, said controller comprising:

a. a housing;
b. valve means disposed in said housing including a primary, rotatable valve member and a cooperating, relatively rotatable follow-up valve member, said valve members defining a neutral position relative to each other and having generally coincidental axes of rotation;
c. means coupling said follow-up valve member to said primary valve member for limited movement relative to said neutral position and for common rotary movement therewith;
d. a fluid meter including a metering member movable to measure the volume of fluid which passes therethrough;
e. means coupling said metering member to said follow-up valve member for imparting follow-up movement thereto responsive to movement of said metering member;
f. said controller including an inlet port, an outlet port, first and second control fluid ports for connection to a fluid pressure operated device, and a load sensing port for connection to a means operable to vary the fluid pressure at said inlet port;
g. said primary and follow-up valve members cooperating with said housing to define a first fluid passage connecting said inlet port in fluid communication with said first control fluid port when said valve members are relatively displaced in one direction from the neutral position, said first fluid passage including said fluid meter;
h. said primary and follow-up valve members cooperating with said housing to define a second fluid passage connecting said inlet port in fluid communication with said second control fluid port when said valve members are relatively displaced in the other direction from the neutral position, said second fluid passage including said fluid meter;
i. said first and second fluid passages being constructed and arranged to provide substantially the same restriction to fluid flow between said inlet port and said first and second control fluid ports, respectively, for the same relative displacement of said valve members from the neutral position in said one and the other directions, respectively; and
j. said follow-up valve member and said housing cooperating to define a load sensing passage in continuous fluid communication with said load sensing port and disposed to communicate with said first fluid passage when said valve members are relatively displaced in said one direction and with said second fluid passage when said valve members are relatively displaced in said other direction.

4,037,621

LOAD RESPONSIVE CONTROL VALVE WITH CONSTANT LEAKAGE DEVICE

Tadeusz Budzich, 80 Murwood Drive, Moreland Hills, Ohio 44022

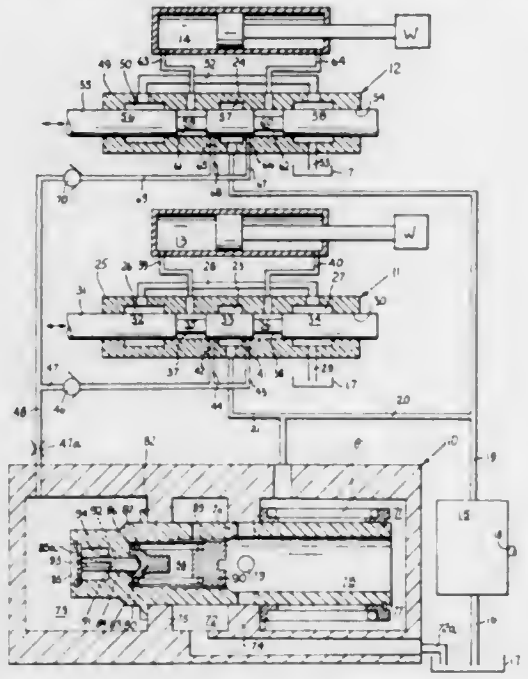
Filed Nov. 26, 1975, Ser. No. 635,416

Int. Cl.² F15B *13/042;* F16K *11/00*

U.S. Cl. 137—596.13 **5 Claims**

1. A valve assembly comprising a multiplicity of housings, each housing having an inlet chamber, a load chamber subjected to load pressure, an outlet chamber and exhaust means, valve bore means in each housing interconnecting said chambers and axially guiding a valve spool, load sensing port means at the region of each valve bore between said inlet chamber and said load chamber, check valve means operably connected with each of said load sensing port means to permit flow from said load sensing port means to a pressure chamber and to block reverse flow, bypass valve means interconnecting said inlet chambers and said exhaust means to maintain a constant pressure differential between said inlet chamber and said pressure chamber, said bypass valve means including a bypass spool, spring biasing means to bias said bypass spool in one direction to reduce said bypass flow, means responsive to pressure differential betwen pressure in said inlet chambers and pressure in said pressure chamber, said pressure in said pres-

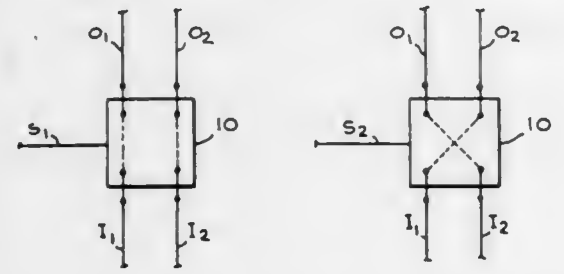
sure chamber being pressure of one of said load chambers subjected to highest load pressure, to bias said bypass spool in opposite direction to increase said bypass flow and pressure responsive variable leakage means continuously interconnecting said pressure chamber and said exhaust means to increase the response of said bypass valve means in a direction to increase said bypass flow, said pressure responsive variable leakage means having variable orifice means varied by pressure in said pressure chamber and subjected to pressure in said pressure chamber said variable leakage means includes spool means having guiding surface means guided in a bore interconnecting said pressure chamber and said exhaust means, varying flow area leakage passage means on said guiding surface means and connecting opposite ends of said spool means, spring biasing means biasing said spool means towards said pressure chamber and positioning said spool means in respect to said bore with change in pressure in said pressure chamber, said varying area leakage passage means cooperating with said interconnecting bore to produce a decrease in leakage flow in response to an increase in pressure in said pressure chamber.



4,037,622
DIAPHRAGM REVERSING VALVE

Gene W. Osheroff, Las Vegas, Nev., and Laurence McGann, Los Angeles, Calif., assignors to McQuay-Perfex Inc., Minneapolis, Minn.

Filed Dec. 7, 1971, Ser. No. 205,500
Int. Cl.^{2} F16K *11/10*
U.S. Cl. 137—597 **4 Claims**

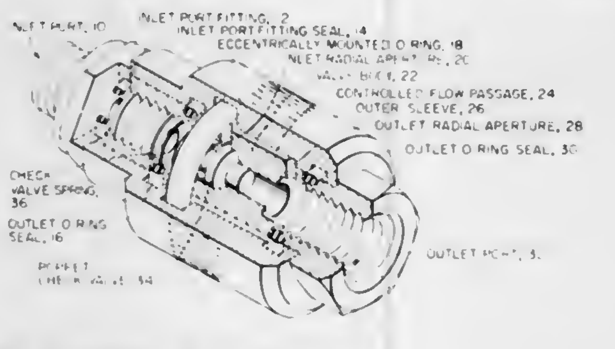


1. In a system wherein it is necessary to interconnect first and second inlet channels to first and second outlet channels in either one of two ways, namely, the first and second inlet channels to the first and second outlet channels, respectively, and the first and second inlet channels to the second and first outlet channels, respectively, connection-reversing apparatus mounted between said inlet and outlet channels and coupled to a gas-pressure source adapted to apply a pair of gas-pressure signals thereto, one signal being of higher pressure than the other, said reversing apparatus comprising: first, second, third and fourth valves respectively including first, second, third and fourth chambers and first, second, third and fourth free-floating diaphragms positioned between the rooves and floors of said chambers, the floors of said chambers each having a gas-pressure orifice therethrough and the rooves of said chambers each having first and second conduit orifices therethrough, each of said valves being open when the conduit orifices in the roof thereof are in communication with one another and closed when communications therebetween are interrupted, each of said diaphragms normally resting on the floor of its valve chamber and rising to the roof thereof to interrupt communications between the conduit orifices thereat in response to the application of the higher of the gas-pressure signals to its underside; first, second, third and fourth flow channels extending between said valves to form a closed-loop arrangement in which valves and flow channels are alternately connected in said loop, said first flow channel being connected between the first conduit orifices of said first and second valves, said third flow channel being connected between the first conduit orifices of said third and fourth valves, said second flow channel being connected between the second conduit orifices of said second and third valves, and said fourth flow channel being connected between the second conduit orifices of said first and fourth valves, the first and second outlet channels respectively being connected to said first and third flow channels and the first and second inlet channels respectively being connected to said second and fourth flow channels; and first and second pressure signal channels, said first signal channel being connected between the gas-pressure orifices of said first and third valves and said second signal channel being connected between the gas-pressure orifices of said second and fourth valves, the gas-pressure source being coupled to said first and second signal channels for applying the gas-pressure signals thereto.

4,037,623
VARIABLE O-RING CONTROL VALVE

Paul R. Beswick, 128 Topsfield Road, Ipswich, Mass. 01938

Filed Jan. 8, 1976, Ser. No. 647,364
Int. Cl.^{2} F16K *5/10*
U.S. Cl. 137—599 **17 Claims**


INLET PORT FITTING, 2
INLET PORT FITTING SEAL, 4
ECCENTRICALLY MOUNTED O RING, 18
CONTROLLED FLOW PASSAGE, 24
OUTER SLEEVE, 26
OUTLET RADIAL APERTURE, 28
OUTLET O RING SEAL, 30
CHECK VALVE SPRING, 36
OUTLET O RING SEAL, 16

1. A valve comprising in combination:

a valve body having a longitudinal bore extending at least partially therethrough having first one or more radial apertures therein;

one or more O-rings, the distance between a portion of said O-ring and said first one or more radial apertures being variable to vary the rate of fluid flow through said first one or more radial apertures;

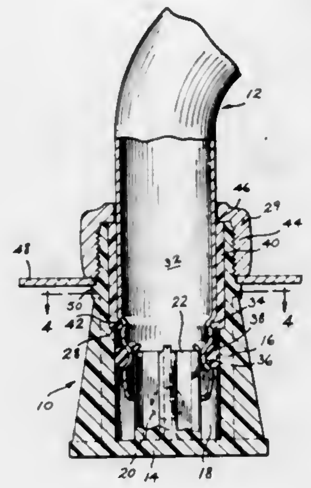
a cylindrical sleeve, said sleeve having a slot therein, and said O-ring being positioned in said slot; and

wherein said valve body is positioned within said sleeve and said slot and said O-ring extend radially around said valve body, the center of said O-ring being offset from the longitudinal axis of said valve body.

4,037,624
SPOUT ASSEMBLY

Larry G. Turner, Waterford, and Dennis W. Crawford, Pontiac, both of Mich., assignors to Bristol Products, Inc., Bristol, Ind.

Filed Mar. 1, 1976, Ser. No. 662,710
Int. Cl.^{2} E03C *1/04*
U.S. Cl. 137—615 **15 Claims**



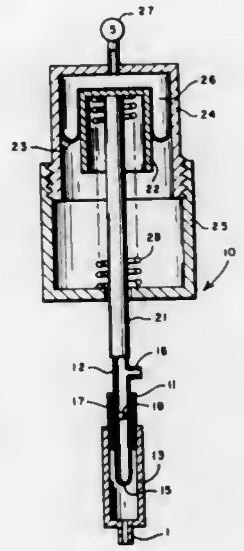
1. A spout assembly comprising a base having a bottom wall and a side wall, said bottom and side walls defining a cavity within said base having an open end, a fluid inlet port formed in said base and extending into said cavity, projection means carried by said base bottom wall and spaced from said base side wall, a spout having a bore therethrough with inlet and outlet end portions, said spout inlet portion fitting into said base cavity through the open end thereof and over said projection means, means securing said spout inlet portion within said base cavity for rotative movement of the spout relative to the base to position said spout outlet portion at selected angular locations, said projection means extending into said spout bore and contacting said spout inlet portion within said bore for guidably anchoring said inlet portion during said rotative movement of the spout, said projection means defining a fluid passage from said inlet port into said spout bore, said projection means including spaced ribs contacting said spout inlet portion within said spout bore, said ribs having an interstice therebetween defining said fluid passage.

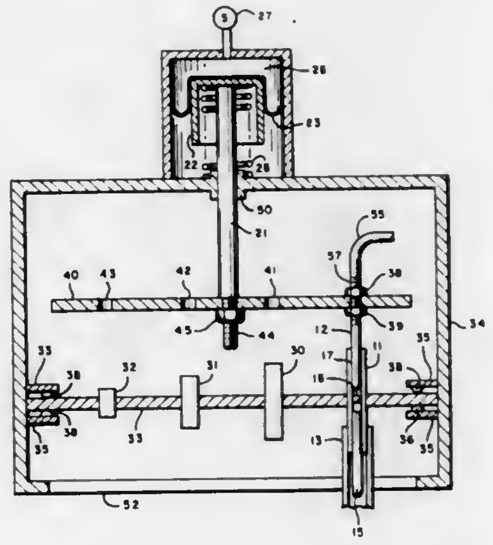
9. A spout assembly comprising a base having a bottom wall and a side wall, said bottom and side walls defining a cavity within said base having an open end, a fluid inlet port formed in said base and extending into said cavity, a spout having a bore therethrough with inlet and outlet end portions, said spout inlet portion fitting into said base cavity through the open end thereof, means securing said spout inlet portion within said base cavity for rotative movement of the spout relative to the base to position said spout outlet portion at selected angular locations, said spout inlet portion having a circumferential external groove, said base side wall having an internal shoulder formed within said cavity and spaced from said base end wall, said spout securing means including a sleeve and collar means, said sleeve fitted about said spout inlet portion and including lip means seated within said spout groove for securing said sleeve against longitudinal movement along said spout, said sleeve fitting within said cavity at its open end and seated upon said base shoulder, said collar means fitted about said spout and overlying said sleeve at said cavity opening for securing said sleeve within said cavity, and means for securing said collar means to said base.

4,037,625
SLIDING TUBE FLUIDIC CONTROLLER

Richard C. Mott, Harwood Heights, Ill., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 9, 1975, Ser. No. 621,183
Int. Cl.^{2} F15D *1/02*
U.S. Cl. 138—46 **6 Claims**





1. A fluidic controller having at least two selectable throttling ranges each having a corresponding calibration point, said controller comprising:

an outer tube having a first end connectable to a source of pressure and a second end connectable to a source of reference pressure;

inner tube means extending within said outer tube for forming a restrictive passage capable of establishing a substantially linear pressure gradient therealong between said outer tube and said inner tube means, said inner tube means having a first end and a second end, said second end having an output port, said inner tube means further having an orifice for communicating said restrictive passage to said output port;

sensing means for sensing a condition;

positioning means responsive to said sensing means for positioning said orifice along said passage; and,

throttling range changing means for changing the throttling range of said controller without affecting the calibration point.

4,037,626

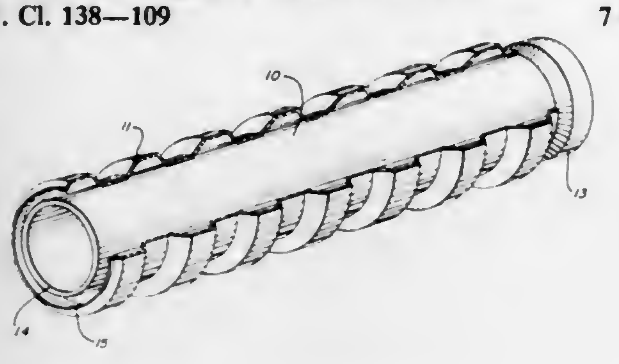
HIGH STRENGTH COMPOSITE PIPE STRUCTURE HAVING LEAKPROOF JOINTS

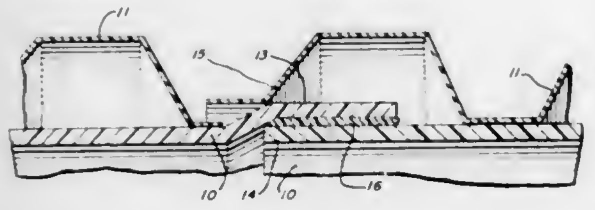
James E. Roberts, Jr., Canton, Ohio, assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Sept. 15, 1975, Ser. No. 613,051

Int. Cl.² F16L *9/06, 21/00*

U.S. Cl. 138—109 **7 Claims**





1. A leakproof, plastic composite pipe for conveying fluids comprising:

a. an outer corrugated pipe, the corrugations thereof defining an inner and an outer pipe diameter;

b. a smooth-walled liner fitted within and affixed to the outer corrugated pipe at the corrugations defining the inner diameter thereof; and

c. joining means for end-to-end joining of composite pipe sections comprising a bell at one end of the liner extending axially beyond the outer corrugated pipe, and a spigot at the other end of the liner coextensive with the outer corrugated pipe, the last corrugation coextensive with the spigot having a portion of the valley of the corrugation extending over the end of the spigot and adapted to slide over and cover the joint formed when the spigot of one composite pipe section is inserted into and engaged with the bell of an adjacent composite pipe section, said joining means being adapted to receive sealant means to provide a joint impervious to fluid leakage.

4,037,627

SEPARATOR FOR CONCRETE WRAPPING TO SUBMARINE PIPELINES

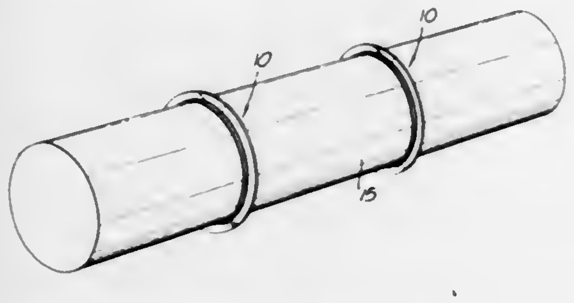
John Hurst, London, England, assignor to W. R. Grace Limited, London, England

Filed Apr. 7, 1976, Ser. No. 674,643

Claims priority, application United Kingdom, May 20, 1975, 21596/75

Int. Cl.² F16L *9/22, 9/08*

U.S. Cl. 138—175 **14 Claims**



14. A pipe having a concrete cladding sprayed thereon in discrete sections separated by spacers, each spacer comprising in combination a base flange having opposed sides, a web extending generally perpendicularly from the base flange from one said side, the cross-section of the spacer being generally T-shaped, the spacer being flexible, the web being compressible and the web being at least as resistant to bending adjacent the base flange as at positions remote from the base flange.

4,037,628

TRAVELLING-WAVE LOOM

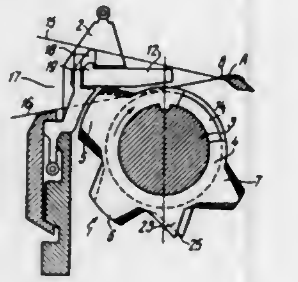
Jury Ivanovich Komarov, ulitsa Miklukho-Maklaya, 29, korpus 1, kv. 215; Dmitry Vladimirovich Titov, 13 Parkovaya ulitsa, 27, korpus 2, kv. 49; Gennady Ivanovich Kovalev, Kronshtadtsky bulvar, 27, kv. 85, and Alexei Pimenovich Mshvenieradze, Amurskaya ulitsa, 22, korpus 2, kv. 78, all of Moscow, U.S.S.R.

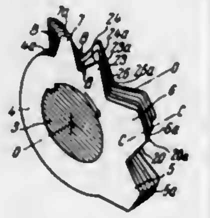
Filed May 13, 1976, Ser. No. 686,257

Claims priority, application U.S.S.R., May 15, 1975, 2134358

Int. Cl.² D03D *47/26*

U.S. Cl. 139—436 **6 Claims**





1. In a travelling-wave loom having a plurality of weft thread carriers, a rotary shaft; disks fixed to said shaft for rotation therewith; said disks forming groups each including at least two disks, said disks having teeth of different radial lengths arranged in increasing order of radial length in the direction of rotation, said disk teeth having front edges and said disks being angularly offset relative to one another with said teeth thereof forming parts of helicoids, one of said teeth of each disk engaging the weft thread as soon as the latter emerges from the weft thread carriers, at least one of the teeth of a disk of each group being located relative to the corresponding tooth of the other disk of each group in such a way that a helical line formed by front edges of these teeth has steps.

4,037,629

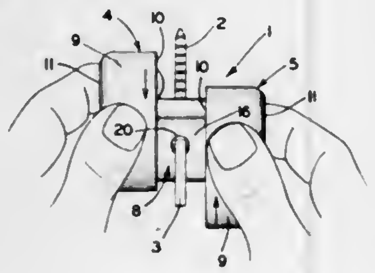
PORTABLE CRIMPING DEVICE

Vern J. Hively, 3640 Mountview Drive, Alliance, Ohio 44601

Filed Dec. 6, 1976, Ser. No. 747,690

Int. Cl.² B21D *13/04*

U.S. Cl. 140—106 **8 Claims**



1. A portable device for crimping a metal strip including:

a. a pair of spaced knob means;

b. gear means mounted on each knob means and extending outwardly therefrom, with said gear means being in meshing engagement with each other upon rotation of at least one of the knob means;

c. collar means located between the knob means and surrounding the meshing gear means;

d. opening means formed in the collar means for inserting and discharging a metal strip which is crimped by the meshing gear means when fed between said gear means upon rotation of said knob means.

4,037,630

MANUFACTURE OF BATTERY PLATES

Stanley Charles Foulkes, Bolton, England, assignor to Chloride Group Limited, London, England

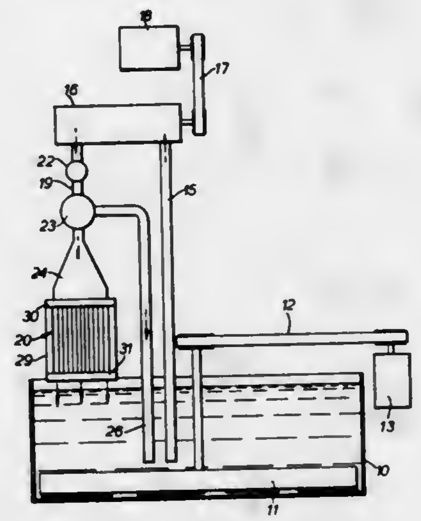
Filed Oct. 20, 1975, Ser. No. 623,897

Claims priority, application United Kingdom, Oct. 18, 1974, 45241/74; Dec. 23, 1974, 55500/74

The portion of the term of this patent subsequent to May 3, 1994, has been disclaimed.

Int. Cl.² H01M *4/82*

U.S. Cl. 141—1.1 **30 Claims**



1. A method for preparing enveloped plates for batteries by introducing an active material composition containing liquids into the porous envelope of the plate, when the envelope is assembled on the current conducting element of the plate, characterized in that the active material of the composition is introduced into the envelope as an aqueous slurry, comprising a lead acid active material composition, which has a rotating vane viscometer torque value of less than 0.006 lbs. ft. at 20° C, said aqueous slurry being introduced into the envelope at a pressure of less than 5 p.s.i. until the envelope is filled with the composition, liquid issuing through the walls of the envelope, the pressure then being allowed to rise to a value above 5 p.s.i. but not in excess of 100 p.s.i. whereafter the pressure is released.

4,037,631

METHOD OF CHARGING A CRYOGENIC PROBE

Robert R. Schulze, 4116 - 73rd Place, Des Moines, Iowa 50322, and Floyd R. Ladd, West Des Moines, Iowa, assignors to by said Floyd R. Ladd said Robert B. Schulze, Des Moines, Iowa 50265

Division of Ser. No. 570,723, April 23, 1975. This application Feb. 9, 1976, Ser. No. 656,350

Int. Cl.² B65B *3/10*

U.S. Cl. 141—2 **1 Claim**

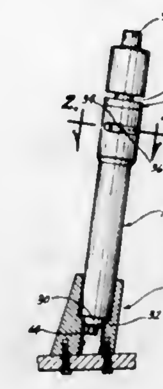
1. The method of charging a cryogenic probe having a movable valve means closing the lower end of an interior compartment, comprising

placing the cryogenic probe in a container having a cryogenic liquid therein,

removing the cryogenic probe from the container to permit the probe to warm slightly,

inserting the probe into the container so that the warmed probe causes the liquid to boil,

closing the container to the surrounding atmosphere when the probe is inserted therein,



opening the valve means so that the gas pressure above said liquid within said container created by the boiling liquid will cause the liquid to move upwardly into said interior compartment,

and closing said valve means.

4,037,632

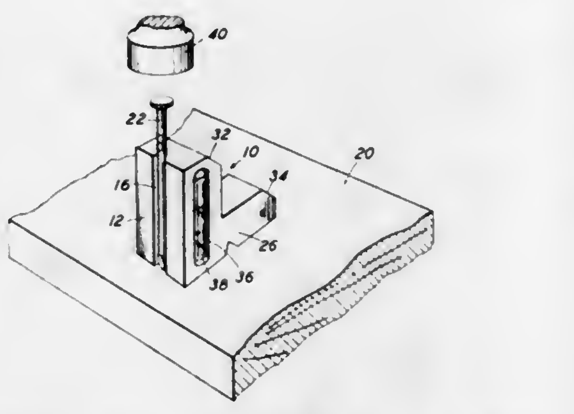
NAIL HOLDING DEVICE

Thomas Arena, 1905 Allison Drive, Bellmore, N.Y. 11710

Filed Aug. 3, 1976, Ser. No. 711,427

Int. Cl.² B25C *3/00*

U.S. Cl. 145—46 **9 Claims**



1. A nail holding device comprising a block of magnetic material formed with two sides meeting at a right angle whereby, when said block is positioned with one of said sides against a working surface, the other of said sides is arranged prependicularly with respect to said working surface; and a groove extending longitudinally the full length of said other side and so formed in said other side that, when the block is positioned as indicated, said groove extends perpendicularly with respect to said working surface whereby, when a nail made of a magnetizable material is placed in said groove, said nail is retained perpendicularly with repsect to said working surface, the length of said other side being less than the length of said nail but sufficiently long to adequately retain the nail so that initial driving of the nail straight into the working surface can be effected, said block further provided with a third side respectively meeting the outer ends of said two sides at an acute angle whereby, when said block is positioned with said third side against the working surface, initial driving of a nail retained in the groove in said other side can be effected at an angle.

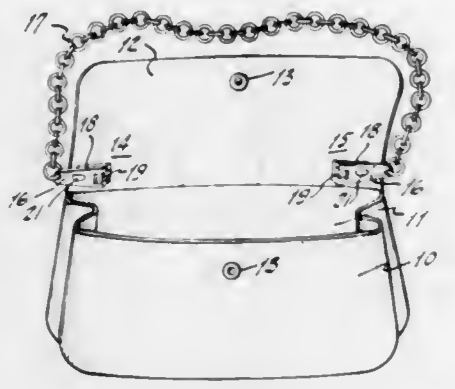
4,037,633
HINGED HANDBAG HANDLE APPARATUS

Michael Gordon, New York, N.Y., assignor to Koret, Inc., New York, N.Y.

Filed Nov. 26, 1976, Ser. No. 745,230

Int. Cl.^{2} A45C *13/26*

U.S. Cl. 150—33 **10 Claims**



1. A bag having an inner compartment formed between side walls, a back and a front wall and a bottom wall with an open top communicating with said compartment and a cover member for covering said open top, in combination therewith apparatus for enabling a user to carry said bag in a first and a second mode, comprising:

a. a first selectively pivotable hinge member coupled to said cover member on a right end of the inner surface and positioned to overlie said open top when said cover member is closed,

b. a second selectively pivotable hinge member coupled to said cover member on a left end of the inner surface and positioned to overlie said open top when said cover member is closed,

c. handle means coupled between said first and second hinge members and operative to enable said user to carry said bag during a first selectively pivotable position of said hinges where said handle means extend from and support said bag, said hinge members pivotable in a second position to enable said handle means to be positioned within said compartment to obscure the same in said second position to enable carrying said bag as a clutch apparatus in said second position, whereby when said cover member is closed, said hinge and handle means are obscured from view.

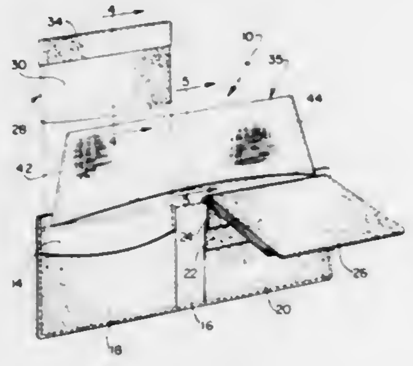
4,037,634
WALLET CONSTRUCTION

Franc M. Ricciardi, New York, N.Y., assignor to Richton International Corporation, New York, N.Y.

Filed June 16, 1976, Ser. No. 696,776

Int. Cl.^{2} A45C *1/06*

U.S. Cl. 150—36 **1 Claim**



1. A wallet construction, comprising a rear panel, an intermediate panel joined to said rear panel at the ends and along bottom edges thereof and defining a large pocket therewith that extends the length of said panel and that is of a dimension for receiving paper currency therein, an intermediate overlay strip overlapping said intermediate panel at a middle portion thereof for reinforcing said intermediate panel approximately along a fold line thereof, a plurality of secondary panels at least three marginal edges of which are joined to said intermediate panel to define a plurality of parallel extending, open-ended pockets, and an interior pocket located within said large pocket and having substantially the same longitudinal dimension thereof at least along an outer longitudinal edge threof, said interior pocket having a mouth that is normally located interiorly of said large pocket so that it is not normally visible when said large pocket is exposed, wherein articles of value or currency when located in said interior pocket are secreted from view when said large pocket is exposed upon the unfolding of said wallet construction for access to one or more of the pockets located therein, an interior pocket including a first interior panel that is joined to said rear panel at the outermost edge thereof for permanently attaching said interior pocket to said rear panel, and a second interior panel joined to said first interior panel along the sides thereof and along the edge normally located adjacent to a bottom edge of said rear panel, wherein the mouth of the interior pocket is exposed when the interior panels thereof are removed from said large pocket, and a removable insert normally located in one of said open-ended pockets and defining a separator therein, said removable insert having an open mouth for receiving an article of value therein and being normally disposed adjacent to the closed end of the open-ended pocket in which said removable insert is located and being located interiorly thereof.

4,037,635
PUNCTURE-PROOF TIRES

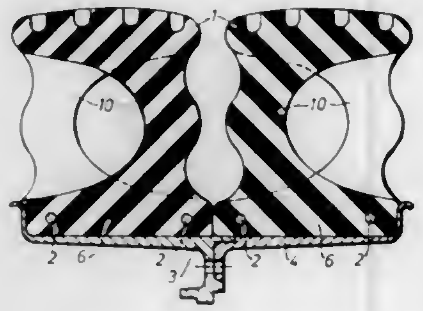
Jakob Ippen, Leverkusen-Steinbuechel, and Friedel Stüttgen, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 15, 1975, Ser. No. 640,788

Claims priority, application Germany, Dec. 19, 1974, 2460050

Int. Cl.^{2} B60C *7/08*

U.S. Cl. 152—301 **5 Claims**



1. A vehicle tire comprising two symmetrical halves adapted to lie alongside one another when the tire is mounted on a wheel felly, a continuous tire foot adapted to contact the felly, a resilient, reinforcing connecting portion, the connecting portion comprising a plurality of supporting members having been formed by axial cut-outs and the supporting members are segment-like and alternately arranged in opposite direction, thus being orientated alternately towards the felly edge and the felly centre.

4,037,636
SAFETY PNEUMATIC TIRE

Bodo Hagenbohmer, and Philipp Schaefer, both of Hannover, Germany, assignors to Michelin Recherche et Technique, Switzerland

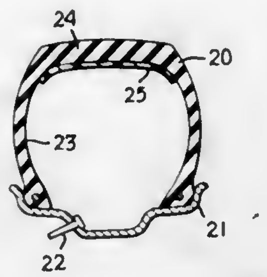
Filed Jan. 12, 1976, Ser. No. 648,014

Claims priority, application Germany, Jan. 14, 1975, 2501188; Nov. 4, 1975, 2549239

Int. Cl.^{2} B60C *21/08. 17/00*

U.S. Cl. 152—347 **28 Claims**

1. In a tire having an inner wall defining a tire cavity and containing a filling material for plugging punctures, the improvement which comprises said filling material being a suspension of hollow spheres, said suspension comprising a gaseous continuous phase containing freely movable suspended hollow spheres having thin shells consisting of synthetic material, said hollow spheres containing a gas in the centers thereof and having a diameter of from 0.01 to 0.4 millimeters and a density of from 0.005 to 0.25 g./cc., said suspension at least partially filling the tire cavity.



4,037,637
PNEUMATIC RADIAL TIRES

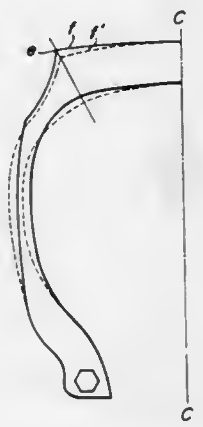
Iwao Arimura, Kodaira; Akio Sato, Higashi-Murayama; Hironori Hirano, Akigawa, and Shigeo Makino, Tokorozawa, all of Japan, assignors to Bridgestone Tire Company Limited, Tokyo, Japan

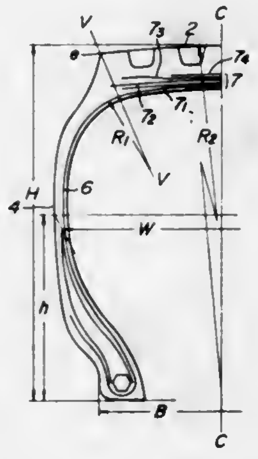
Filed Sept. 10, 1975, Ser. No. 612,167

Claims priority, application Japan, Sept. 18, 1974, 49-106648

Int. Cl.^{2} B60C *9/04, 9/18*

U.S. Cl. 152—352 R **13 Claims**





1. A pneumatic radial tire constructed to reduce breaker interlayer shearing strain, comprising: a pair of bead portions; a side portion arranged adjacent to each bead portion; an outwardly convex crown having shoulder portions connected to respective side portions, a carcass composed of at least one inextensible cord layer extending across said two bead portions and aligned in a substantially radial direction of the tire, and a breaker disposed outside said carcass in said crown and having a width substantially equal to a width of said crown, said breaker comprising at least two layers of cords having a modulus of at least 10×10^3kg/mm^2, said breaker cords being inclined a maximum of 25° with respect to the peripheral center line of the tire in different directions between said layers, said tire having an initial sectional shape which satisfies the following conditions when spaces between said bead portions are held in a normal distance before and after pressurizing said tire:

1. $R_1/R_1' \leqq 0.8$,
2. $R_2/W/R_2'/W' \geqq 1.5$,

where R_1 is a radius of curvature of the outer profile of the carcass in a vertical center section through the rotational axis of the tire on a normal line to the outer curved surface through a width-wise end of said crown before the inside of the tire is pressurized, R_1' is its corresponding radius of curvature after the inside of the tire has normally been pressurized, R_2 is a radius of curvature of the outer profile of the crown in the vertical center section through the rotational axis of the tire before the inside of the tire is pressurized, R_2' is its corresponding radius of curvature after the inside of the tire has normally been pressurized, W is the maximum width of the tire in the vertical center section through the rotational axis of the tire before the inside of the tire is pressurized, and W' is its corresponding maximum width of the tire after the inside of the tire has normally been pressurized.

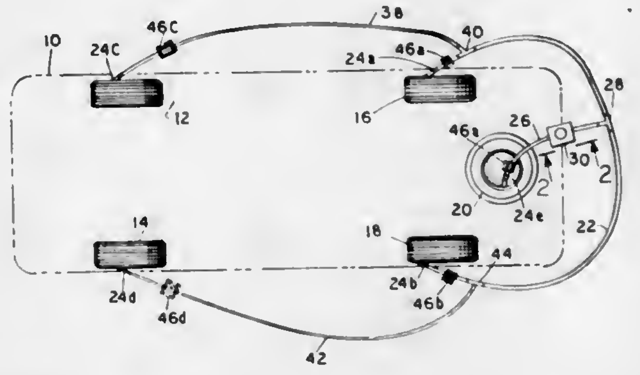
4,037,638
EMERGENCY KIT FOR VEHICLE TIRES

Rudolph Mosca, 225 Varick St., New York, N.Y. 10014

Filed Dec. 23, 1975, Ser. No. 643,633

Int. Cl.^{2} B60C *23/10*

U.S. Cl. 152—415 **3 Claims**



1. An emergency kit for simultaneously equlizing and increasing the inflation pressure in the four tires and in the spare tire of a motor vehicle comprising in combination:

a first length of flexible tubing having a coupling at each end thereof adapted to be sealingly connected with the inflation valves of the rear tires of a vehicle and to depress the valve stems thereof to open said inflation valves;

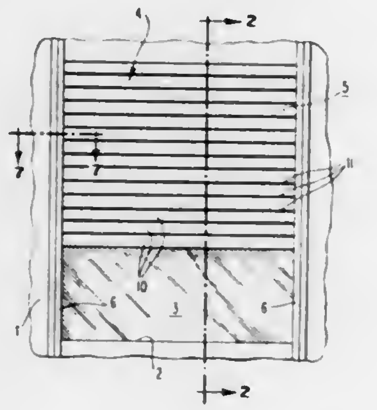
a second length of flexible tubing connected at one end thereof by means of a first tee coupling intermediate the ends of said first length of tubing and in open communication therewith, a coupling at the other end of said second length of tubing adaptedto be sealingly connected with the inflation valve of a spare tire and to depress the valve stem thereof to open said inflation valve;

a manually operable pump having an air inlet and an air discharge side operatively connected in said second length of flexible tubing having the discharge side thereof on the side of said tee coupling;

third and fourth lengths of flexible tubing each having a coupling at one end adapted to be sealingly connected with the inflation valves of the respective front tires of a vehicle and to depress the valve stems thereof to open said inflation valves and connected by means of second and third tee couplings to said first flexible tubing to be in open communication therewith, said second and third tee couplings being interposed in said first flexible tubing between said first tee coupling and the respective ends of said first flexible tubing;

and adjustable clamp means secured to each of said lengths of tubing for selectively permitting the flow of pressurized air therethrough to and from the front and rear tires of the vehicle, said clamp means being so positioned in said lengths of tubing as not to interfere with the open communication between same even when all of said clamp means are closed.

4,037,639
THERMAL BARRIER
J. Paul Jones, 644 Valley View Lane, Wayne, Pa. 19087
Filed Nov. 8, 1976, Ser. No. 739,528
Int. Cl.^{2} E06B *9/08*
U.S. Cl. 160—133 5 Claims



1. In combination with a structure having an aperture providing a means for transmission of thermal energy as between the inside and outside of the structure, thermal barrier for covering and uncovering the aperture comprising;

a pair of tracks,

means mounting the tracks adjacent opposite sides of the aperture;

a plurality of elongated, closed, hollow slats extending between the tracks, each slat providing a dead air space and having one side which is planar and the slats being arranged side-by-side and extending parallel with one another;

pivot means connecting adjacent slats and each pivot providing for the slats connected thereto to pivot relative to one another and for the slats to move in unison in translation in a direction generally normal to the axes of the slats;

on the opposite ends of each slat a pair of fingers, each finger extending generally parallel to the slat axis;

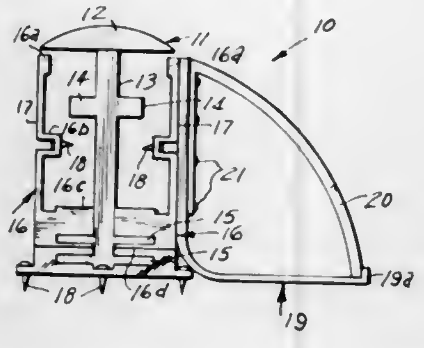
each said track including a first hollow compartment coextensive with the track and having an open side thru which the fingers extend into the compartment, means at the edges of the open side slideably engaging each of said fingers, a second hollow compartment co-extensive with the track and at least a portion of which extends over the ends of the slats and over portions

of the contiguous planar sides and means on the second compartment slidingly engaging the planar sides, said engagements providing for the slats to move in translation along the tracks and said engagements on the planar sides each constituting a seal minimizing passage of air therebetween;

said slats, pivots and tracks constituting thermal barrier means and movement of the slats in translation providing for the slats to be positioned to cover the aperture to reduce transmission of thermal energy thru the aperture and to be positioned to uncover the aperture to unimpede said transmission; and

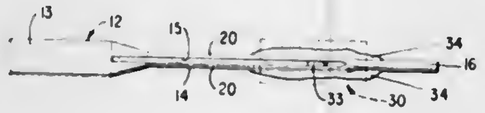
storage means for receiving said slats when the slats are positioned to uncover said aperture.

4,037,640
TAPESTRY HOLDER
Michael James Hubbard, 601 Hobson Ave., Hot Springs, Alaska 71901
Filed Dec. 26, 1974, Ser. No. 536,556
Int. Cl.^{2} A47H *13/00*
U.S. Cl. 160—398 7 Claims



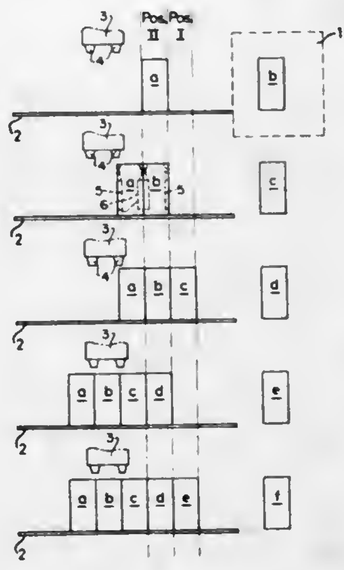
1. A tapestry holder assembly for mounting a tapestry on a supporting surface comprising at least one pressure plate means, slide bar means removably engaging said pressure plate means and having an elongated configuration extending the length of said pressure plate means, said slide bar means further comprising at least one first projection portion formed thereon and disposed in outward projection toward said pressure plate means, said pressure plate means further comprising at least one first protruding ridge portion formed thereon and disposed in outward projection toward said slide bar means, said first protruding ridge portion disposed in spaced apart and substantially adjacent over-hanging relationship to said first projection portion, whereby the tapestry is clamped between said pressure plate means and said slide bar means, retainer means slidingly and removably engaging said slide bar means and attached to the supporting surface, slide bar stabilizer means attached to said pressure plate means and disposed in resting support relation to the supporting surface.

4,037,641
METHOD OF FABRICATING SEWING MACHINE NEEDLES
Josef Zocher, Aachen, Haaren, Germany, assignor to The Singer Company, New York, N.Y.
Filed July 16, 1976, Ser. No. 705,860
Int. Cl.^{2} B21G *1/02*
U.S. Cl. 163—5 4 Claims



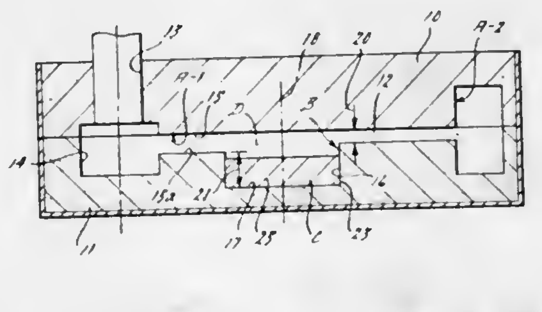
1. The method of forming a sewing machine needle having a cylindrical butt portion and a cylindrical blade portion of smaller diameter extending from said butt portion to a free extremity, comprising the steps of flow pressing a continuous groove in said blade portion extending from said butt portion to closely adjacent the free extremity thereof, shaping parallel side flanges at opposite sides of the groove in said blade portion in said flow pressing operation which parallel side flanges have a height dimension at least equal to the diameter of said cylindrical blade portion, die pressing an eye portion including an eye-accommodating web in said grooved blade portion closely adjacent to the free extremity thereof, modifying the shape of said parallel side flanges in said eye portion by said die pressing operation without reducing said height dimension, punching an eye in said eye-accommodating web, and forming a point at the free extremity of said blade portion.

4,037,642
METHOD IN THE OPERATION OF AN APPARATUS FOR PRODUCING CASTINGS
Marius Gunnergaard, Lyngby, Denmark, assignor to Dansk Industri Syndikat A/S, Herlev, Denmark
Filed Aug. 27, 1975, Ser. No. 608,337
Claims priority, application Denmark, Sept. 17, 1974, 4909/74
Int. Cl.^{2} B22D *33/00*
U.S. Cl. 164—18 4 Claims



1. A method in the operation of an apparatus for producing castings in casting moulds consisting of identical mould parts which are produced successively by the compression of sand or a similar material in a pressing chamber and are from this chamber fed to a pouring track or guideway on which the casting mould is formed by the mould parts being placed closely together and advanced stepwise through a pouring station, comprising the steps of delivering said mould parts one by one to said pouring track; moving a produced mould part along said pouring track to a preselected position; moving at least one additional mould part along said track to a position upstream of said preselected position where said at least one additional mould part is placed closely together with its immediately preceding mould part to form a casting mould; and repeating said first and second moving steps in sequence so as to move said formed casting mould stepwise through the pouring station with a length of step that is a multiple of the thickness of a mould part.

4,037,643
NODULARIZING TREATMENT EMPLOYING UNITIZED MODIFYING AGENT
Prem P. Mohla, Plymouth; Adolf Hetke, Livonia, and Robert J. Warrick, Ann Arbor, all of Mich., assignors to Ford Motor Company, Dearborn, Mich.
Filed Aug. 22, 1975, Ser. No. 606,909
Int. Cl.^{2} B22D *27/20*
U.S. Cl. 164—58 22 Claims



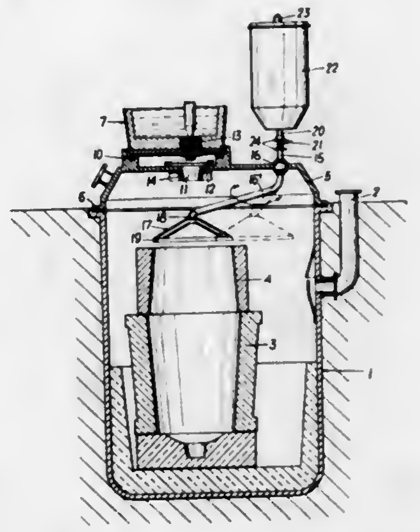
1. A method of conditioning a charge of molten cast iron which would normally solidify with a flake graphite structure immediately before casting to produce modified shape graphite cast iron castings, wherein the improvement consists of (a) recessing an impervious mass of nodularizing agent in and along a wall of gating runner system leading to a mold cavity so that the mass presents substantially a constant reaction interface surface throughout conditioning, and (b) introducing an effective amount of molten grey cast iron charge into said gating system allowing said molten charge to flow across said interface surface to progressively and uniformly dissolve said mass.

19. A molding apparatus for use in making nodular cast iron within a mold system, the apparatus comprising:

a. at least a two part refractory mold body, said body having first walls on one or both of said parts defining a molding cavity, said body having second walls on one or both of said parts defining a gating system in communication with said cavity, said body also having third walls defining one or more recesses in said second walls on or off the parting surface between said parts, said recesses having a bottom wall, side walls and an open top, said third walls providing a uniform cross-section taken in a direction normal to that portion of said second walls within which said recesses are deposed, and

b. an impervious solid mass of nodularizing agent disposed in and substantially occupying the interior of each of said recesses, said mass having an exterior surface mating with the bottom and side walls of the recess thereby presenting only an exposed top surface generally parallel to the orientation of said second wall within which said recess is disposed.

4,037,644
PROCESS FOR CASTING STEEL INGOTS UNDER A VACUUM
Rainer Tarmann, and Walter Hopf, both of Kapfenberg, Austria, assignors to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW), Vienna, Austria
Filed Sept. 16, 1975, Ser. No. 613,859
Claims priority, application Austria, Sept. 23, 1974, 7609/74
Int. Cl.^{2} B22D *27/16, 7/10*
U.S. Cl. 164—61 2 Claims



1. In a process of casting steel ingots which utilizes a ladle for carrying molten steel, a mould container having a lid, said lid being adapted to pass molten steel therethrough, said container capable of being evacuated, and a mold disposed within said container, said mould having a hood thereover, said process comprising the step of casting molten steel from said ladle into said mould under a vacuum, and thereafter applying an anti-piping powder onto the surface of molten steel, the improvement comprising the steps of:

maintaining said vacuum after said casting step is finished, and

introducing the anti-piping powder into said hood and applying it uniformly onto the surface of the molten steel while continuing to maintain said vacuum.

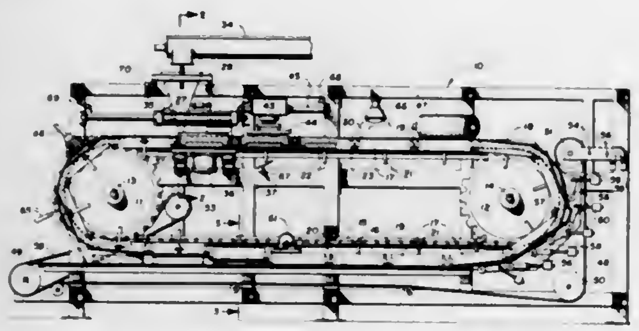
4,037,645

AUTOMATIC MOLD AND CORE FORMING MACHINE

William R. Kloster, Muscatine, Iowa, and Patrick H. Stewart, Danville, Ill., assignors to C L Industries, Inc., Danville, Ill. Continuation of Ser. No. 529,902, Dec. 5, 1974, abandoned, which is a continuation-in-part of Ser. No. 445,485, Feb. 25, 1974, abandoned. This application May 21, 1976, Ser. No. 688,698

Int. Cl.^{2} B22C *13/02. 15/02. 17/00*

U.S. Cl. 164—161 **11 Claims**



1. Apparatus for the automatic manufacture of sand molds, cores or the like for use in casting foundry pieces, comprising

a first continuous conveyor having a plurality of pattern pieces and flasks attached thereto, each of said flasks being movable with said conveyor from a vertically upright position through an inverted position and back to an upright position,

means connected to said flask and pattern pieces for mounting said flask and pattern pieces on said first conveyor for limited vertical movement with respect thereto, and guide means on said first conveyor for operating with said mounting means for guiding the limited vertical movement,

means adjacent said first conveyor for filling each of said flasks with sand-binder mixture when each flask is in an upright position at a filling location,

means adjacent said first conveyor for compacting said sand-binder mixture into a filled flask,

a second conveyor disposed below said first conveyor and operable to cooperate with said flasks of said first conveyor system when said flasks are in said inverted position, said flasks and said sand molds, cores or the like therein being brought into abutting engagement with said second conveyor when said flasks are moved into said inverted position after at least partial curing of the binder of said sand-binder mixture so that the sand-binder mixture in said flask will remain intact as a sand mold, core, or the like when inverted and separated from said flask, and

means adjacent said second conveyor for effecting release of said sand molds, cores, or the like from said flasks when said flasks are in an inverted position and displaced with respect to said first conveyor said means including means for moving said flasks away from said second conveyor and toward said first conveyor to separate said molds from said flasks completely, each of said flasks in turn being moved back into an upright position for receipt of further sand-binder mixture therein while said formed sand molds, cores, or the like are conveyed away by said second conveyor.

4,037,646

MOLDS FOR CONTINUOUSLY CASTING STEEL

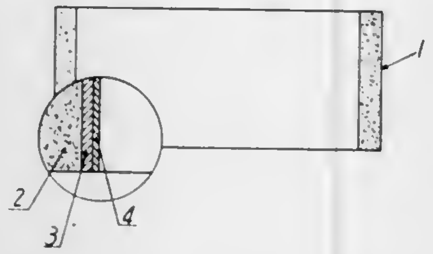
Senri Hara; Tomohiko Kimura, both of Ibaragi; Hiroshi Tomono, Wakayama, and Takayuki Sato, Osaka, all of Japan, assignors to Sumitomo Metal Industries, Ltd. and Satosen Company Limited, both of Osaka, Japan

Filed June 4, 1976, Ser. No. 692,909

Claims priority, application Japan, June 13, 1975, 50-72170; Oct. 27, 1975, 50-129556; Oct. 27, 1975, 50-129557

Int. Cl.^{2} B22C *9/06;* **B22D** *11/00*

U.S. Cl. 164—273 R **14 Claims**



1. A copper or copper alloy mold for continuously casting steel characterized in that the mold has a first layer formed on its interior surface and consisting essentially of at least one of nickel and cobalt and a second layer formed on the first layer and consisting essentially of at least one of nickel and cobalt as a main component and at least one of phosphorus and boron.

4,037,647

STRAND GUIDE FRAMEWORK FOR SUPPORTING A PARTIALLY SOLIDIFIED STRAND IN A CONTINUOUS CASTING INSTALLATION

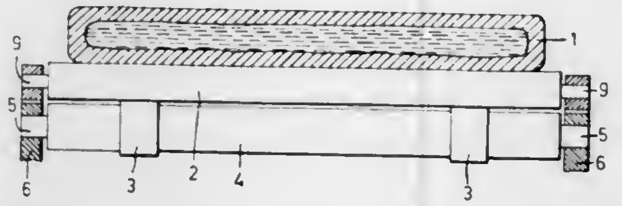
Hans Streubel, Dusseldorf, Germany, assignor to Schloemann-Siemag Aktiengesellschaft, Dusseldorf, Germany

Filed Dec. 9, 1974, Ser. No. 530,522

Claims priority, application Germany, Dec. 21, 1973, 2363841

Int. Cl.^{2} B22D *11/128. 11/124*

U.S. Cl. 164—282 **8 Claims**



1. A strand guide framework for supporting a partially solidified strand in a continuous casting installation comprising at least two guide roller pairs which successively follow one another in the direction of travel of the strand, support rollers supporting said guide rollers, the lengthwise axes of the support rollers being arranged with respect to the lengthwise axes of the guide rollers approximately in a plane located transverse to the direction of travel of the strand, said framework being equipped with secondary cooling means, each of the support rollers being provided with means cooperating with an associated guide roller and positioned at spaced predetermined points intermediate the ends of each support roller for providing restoring bending moments in said associated guide roller outwardly of each of said predetermined points, said cooperating means comprising only two support collars on each of said support rollers, the minimum spacing between the guide rollers is determined by the diameter of the support rollers and the space required for the secondary cooling means, and wherein the support collars are mounted such that the bending of the guide rollers is less than the bending of the support rollers.

4,037,648

METHOD OF COOLING RECOVERED SAND FOR CASTING PURPOSES AND APPARATUS THEREFOR

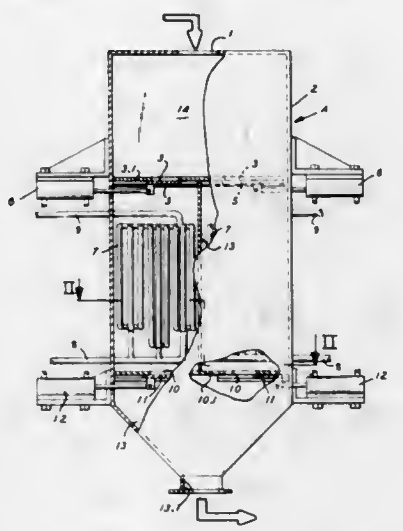
Sisir Kumar Maitra, Hamburg-Oststeinbek, Germany, assignor to Alfred Gutmann Gesellschaft fur Maschinenbau, Hamburg, Germany

Filed Apr. 3, 1975, Ser. No. 564,904

Claims priority, application Germany, Oct. 2, 1974, 2447008

Int. Cl.^{2} F28F *28/00*

U.S. Cl. 165—13 **5 Claims**



1. An apparatus for cooling recovered sand for casting purposes, said apparatus comprising a bunker defining an internal cavity having sand-receiving and discharging chambers respectively disposed at the top and bottom of the internal cavity, the bunker having a top feed opening communicating with the sand-receiving chamber and also having a bottom discharge means for said sand discharging chamber, the bunker also having upright partition walls in the internal cavity and dividing the cavity into a plurality of discrete adjacent cooling compartments located between said receiving and discharging chambers, the bunker also having spaced transverse walls joining the upright partitions and defining top and bottom walls of said cooling compartment, the top wall having a plurality of upper inlet openings each communicating with a respective cooling compartment and with said sand-receiving chamber, the bottom wall having a plurality of bottom discharge openings each communicating with a respective cooling compartment and with said discharging chamber, said bunker also having heat exchanger means disposed within each of said cooling compartments, and a plurality of individually controllable and operable gate means at each of said inlet openings and discharge openings in said top and bottom walls and having power operated means for opening and closing individual gate means individually controlling the flow of sand through said openings into and out of said cooling compartments.

4,037,649

HEATING AND REFRIGERATION SYSTEM

Dale R. Hartka, 18015 Parkside, Detroit, Mich. 48221

Filed Apr. 4, 1975, Ser. No. 565,236

Int. Cl.^{2} F25B *29/00*

U.S. Cl. 165—16 **5 Claims**

2. A combined air-heating and refrigeration system wherein the air temperature of a living space is maintained within a predetermined range, said air-heating portion of said system comprising:

a furnace having a heat exchanger for heating air flowing therby;

first duct means for selectively admitting air from inside said living space for circulation past said furnace for heating said air;

second duct means for selectively returning said air from said furnace to said living space;

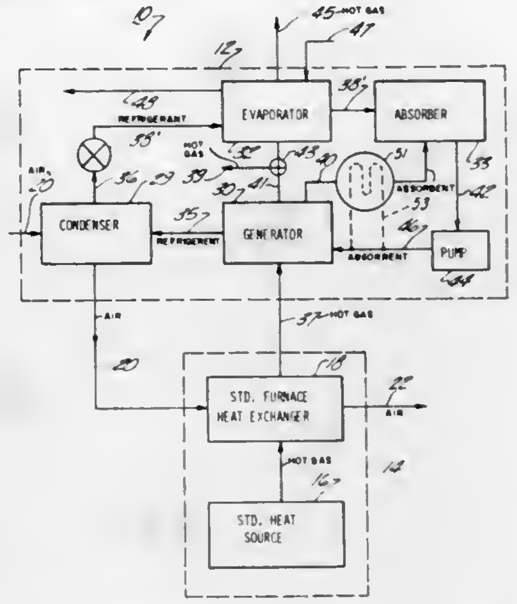
the refrigeration portion of said system comprising:

a refrigerant;

a condenser for condensing said refrigerator;

an evaporator for evaporating said refrigerant;

conduits interconnecting said elements to provide a circuit for said refrigerant;



first heat exchanger means associated with said condenser for preheating the air passing through said condenser for preheating the air passing through said first duct means; and

second heat exchanger means for transferring excess heat from said furnace to said evaporator to heat said refrigerant.

4,037,650

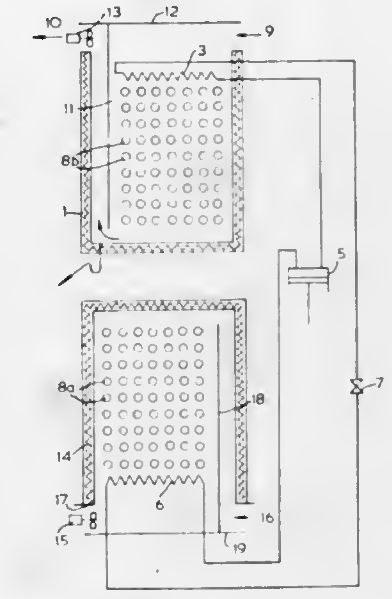
THERMAL STORAGE APPARATUS

John Edward Randall, Wirral, England, assignor to National Research Development Corporation, London, England

Filed May 23, 1975, Ser. No. 580,224

Int. Cl.^{2} F25B *27/02;* **G05D** *23/00;* **C09K** *3/18. 5/00*

U.S. Cl. 165—29 **13 Claims**



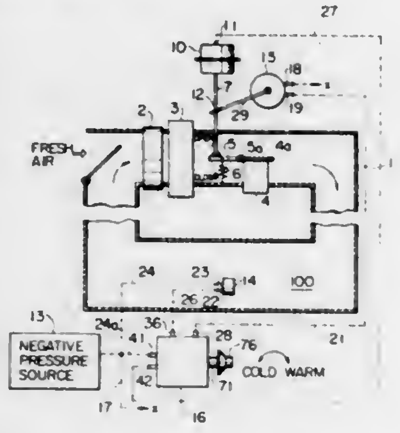
1. A thermal storage apparatus comprising a first thermal storage vessel containing a first thermal storage medium, which is capable of being maintained at a temperature below a pre-selected temperature, a second thermal storage vessel containing a second thermal storage medium, which is capable of being maintained at a temperature above said pre-selected temperature, and a refrigeration system for transferring heat from said first storage vessel to said second storage vessel, said second storage thermal medium in said second storage vessel comprises at least one crystallisable salt hydrate of the formula

$S. x H_2O$ having a crystallisation temperature in excess of said pre-selected temperature, said hydrate having the characteristic of at least partially dissociating at a temperature above its crystallisation temperature according to the equation $S. x H_2O \rightarrow S. y H_2O + (x-y) H_2O$, wherein y is not greater than x and may be zero, said compound $S.y H_2O$ being at least partially soluble in said $(x-y) H_2O$, said dissolution occurring with the absorbtion of heat, said $S. y H_2O$ and said $(x-y) H_2O$ recombining on cooling to said crystallisation temperature with the evolution of heat to reform said $S. x H_2O$.

4,037,651

TEMPERATURE CONTROL APPARATUS OF AIR CONDITIONER FOR AUTOMOBILES

Tosikatu Ito, Tohkai, and Reijiro Takahashi, Katsuta, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 5, 1976, Ser. No. 655,533
Claims priority, application Japan, Feb. 7, 1975, 50-15402
Int. Cl.^{2} F25B *29/00*
U.S. Cl. 165—30 **15 Claims**



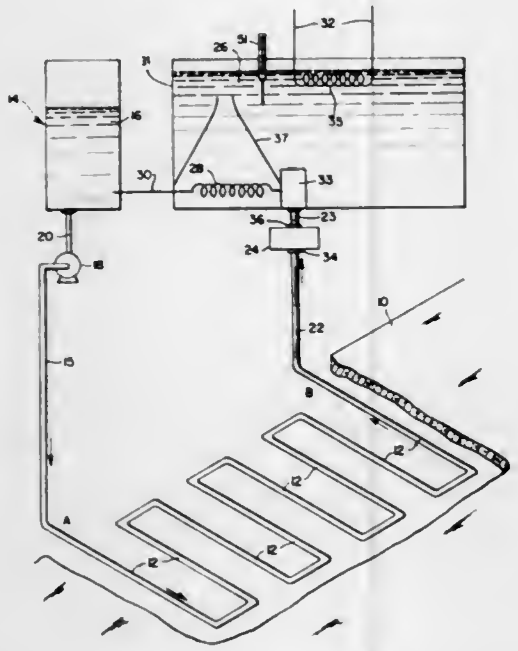
14. A temperature control apparatus of an air conditioner for motor vehicles having a negative pressure source, an engine, and a compartment to be air conditioned, comprising: an air duct connected to the compartment; blower means for circulating air through said duct and the compartment; cooler means disposed in said duct to cool the air flowing through said duct; heater means disposed in said duct for reheating air passing through the heater; door means for controlling the proportion of air flowing in said duct that passes through said heater means; actuator means for controlling the movement of said door means according to an applied negative control pressure; regulator means for producing a negative output pressure from the negative pressure source according to the movement of said door; temperature sensor means for producing a negative output pressure from the negative pressure source according to the temperature within the compartment; means for comparing the negative output pressures from said regulator means and said temperature sensing means, and producing a corresponding displacement correlated to the deviation between said two output negative pressures; and controller means having a moveable throttling valve fluid inserted between the negative pressure source and said actuator means and producing a variable throttling according to said displacement so as to produce a negative control pressure for said actuator to minimize the deviation between said two output signals.

4,037,652

SOLAR HEAT STORAGE SYSTEM

Hans Brugger, Gran View 9-W, Nyack, N.Y. 10960
Filed Jan. 30, 1976, Ser. No. 653,701
Int. Cl.^{2} F28D *21/00*
U.S. Cl. 165—45 **7 Claims**

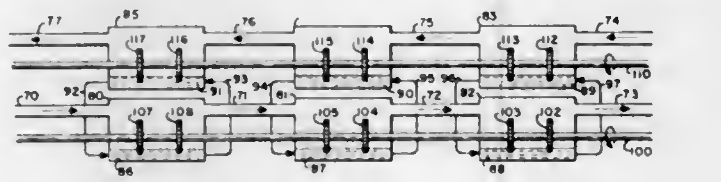
1. A solar heat storage system for a building including in combination a storage vessel containing a liquid medium for storing solar energy and solar heat collection means, said solar heat collection means comprising:
- an expansion tank located above street level for housing a predetermined heat transfer liquid adapted to absorb solar energy;
- a network of conductive conduits serially connected and arranged below street level in a serpentine fashion along a common plane disposed in an inclined position with respect to the street level such that each conductive conduit rises to a higher level relative to each preceding conductive conduit;
- means coupling said network of conduits to said expansion tank and to said vessel for forming a closed circulation loop for said predetermined heat transfer liquid;
- an overlayment of blacktop located above said network of conduits; and
- heat exchange means communicating between said network of conduits and said storage vessel for transferring heat from said predetermined liquid to said liquid medium.



4,037,653

HIGH-TEMPERATURE THERMAL EXCHANGE PROCESS

Herman P. Meissner, Windchester, Mass., and Frank C. Schora, Palatine, Ill., assignors to Institute of Gas Technology, Chicago, Ill.
Continuation of Ser. No. 414,202, Nov. 9, 1973, abandoned. This application Aug. 11, 1975, Ser. No. 603,624
Int. Cl.^{2} F28C *3/06*
U.S. Cl. 165—1 **8 Claims**

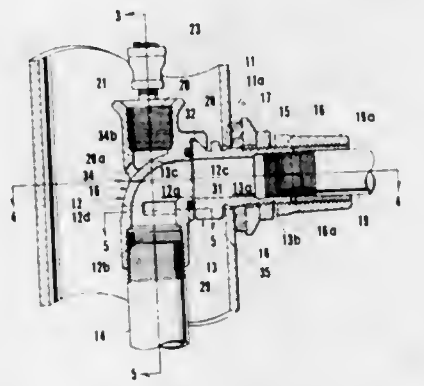


1. A process for providing heat transfer between a pair of gas streams which comprises:
- providing a plurality of first and second confined horizontal flow passageways, said first passageways joined in a first series and said second passageways joined in a second series;
- providing a plurality of first and second pools at the bottom of each of said first and second passageways, respectively, containing liquid having a low viscosity and a low vapor pressure over the temperature range used and selected from the group consisting of molten metal and molten inorganic salt;
- generating a plurality of liquid droplets in each said first flow passageways by throwing droplets from each of said first pools of liquid in the bottom of said first passageways;
- passing a gas stream, at a higher temperature than the droplets in said first passageways, through the plurality of said first flow passageways in heat exchange relationship with the droplets cooling the gas stream and heating said droplets;
- recovering the heated droplets in each of said first pools thereby heating the liquid in each of said first pools;
- transferring said heated liquid from one of said first pools to one of said second pools;
- generating a plurality of liquid droplets in each said second flow passageways by throwing droplets from each of said second pools of liquids in the bottom of said second passageways;
- passing a gas stream, at a lower temperature than the droplets in said second passageways, through the plurality of said second flow passageways in heat exchange relationship with the droplets heating the gas stream and cooling said droplets;
- recovering the cooled droplets in each of said second pools thereby cooling the liquid in each of said second pools; and
- recycling said cooled liquid from one of said second pools to one of said first pools.

4,037,654

PITLESS WELL ADAPTER APPARATUS

Neil C. Lien, Evansville, Wis., assignor to Baker Manufacturing Company, Evansville, Wis.
Filed Sept. 29, 1976, Ser. No. 727,712
Int. Cl.^{2} E21B *33/03;* F16L *55/00*
U.S. Cl. 166—88 **7 Claims**



1. A pitless adapter apparatus for connecting a well drop pipe to a delivery pipe through an opening in a well casing, comprising:

a. an adapter outlet member having an interior bore extending therethrough with an intake opening and a discharge opening for communication with a delivery pipe, a sealing face extending around the intake opening, an inverted U-shaped flange extending partially around the sealing face and having an arcuate upper portion and a pair of straight sides extending downwardly to a point below the lower margin of the intake opening, the peripheral surface of the flange being outwardly beveled at an angle of approximately 45° to the sealing face;

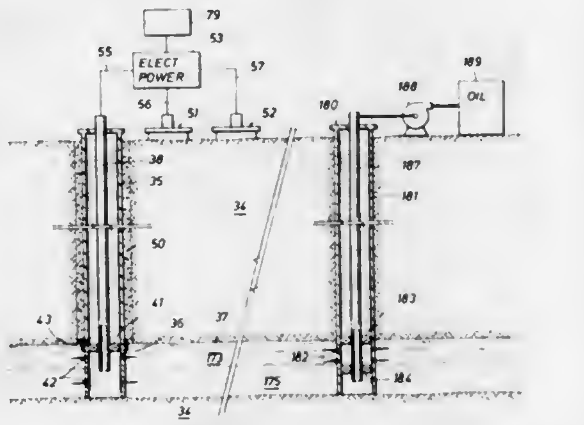
b. an adapter body member having a central bore extending therethrough with a bottom opening for communication with a well drop pipe and a side opening, a side face extending around the side opening, and an inverted U-shaped skirt extending outwardly from the adapter body member and having an arcuate upper portion extending above the side opening and a pair of straight sides extending downwardly from the upper arcuate portion on either side of the side opening to a point below the lower margin of the side opening, the skirt having a groove being inwardly beveled at an angle of approximately 45° to the side face and extending about the inner periphery of the skirt, the skirt being slideably engageable on the adapter outlet member flange whereby the body side opening and outlet member intake opening are substantially in registry and engagement of the beveled surfaces of the straight sides of the flange and skirt in mating relation prevents significant parting movement between the engaged members when the adapter apparatus is subjected to operating pressure moments, the engageable beveled surfaces of the flange and the skirt having a relative coefficient of friction no greater than one, the top of the adapter body member having an upwardly opening threaded bore with an outwardly flared portion around the threaded bore to locate and engage a threaded lift-out pipe within the threaded bore to facilitate engagement and removal of the adapter body member on the adapter outlet member within the well casing, the adapter body member further having an auxiliary opening in communication with the central interior bore and which opens upwardly to allow engagement of a connecting pipe for a pressure switch; and

c. sealing means engageable between the adapter outlet member sealing face and the adapter body member side face for providing a water-tight seal therebetween.

4,037,655

METHOD FOR SECONDARY RECOVERY OF OIL

Neil L. Carpenter, Kerrville, Tex., assignor to Electroflood Company, Houston, Tex.
Continuation of Ser. No. 462,326, April 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 228,846, Feb. 24, 1972, abandoned. This application Oct. 21, 1975, Ser. No. 624,391
Int. Cl.^{2} E21B *43/24*
U.S. Cl. 166—248 **10 Claims**



1. A method of increasing the internal pressure in a fluid-bearing earth formation, comprising the steps of
- establishing at least two spaced apart boreholes extending into a subsurface earth formation containing both oil and other aqueous liquids,
- disposing a separate electrical conductor in each of said boreholes and into electrical contact with said aqueous liquids in said formation,
- insulating both of said conductors from substantially all earth materials adjacent said boreholes and lying above said subsurface earth formation to establish an electrical path composed of said insulated conductors and said formation materials extending therebetween,
- establishing an AC flow of electric current in said electrical path composed of said insulated conductors and said formation materials lying therebetween,
- electrochemically generating free hydrogen gas in said subsurface earth formation between said boreholes as a function of current intensity in said formation, and
- trapping said free hydrogen gas in said formation to increase the pressure in said formation on said oil therein.

4,037,656

OIL RECOVERY METHOD EMPLOYING ACIDS EXTRACTED FROM CRUDES USING ANION-EXCHANGE PROCESS

James E. Cooper, Dallas, Tex., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,876

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 166—270 **8 Claims**

1. A method of producing oil from an oil-containing subterranean formation penetrated by an injection well and a production well, comprising the steps of:

a. contacting an oil containing carboxylic acids with an ion-exchange resin to selectively remove said carboxylic acids therefrom;

b. removing said carboxylic acids from said ion-exchange resin;

c. injecting said removed carboxylic acids via said injection well into said formation;

d. injecting an aqueous caustic solution via said injection well into said subterranean formation; and

e. producing oil via said production well from said subterranean formation.

4,037,657

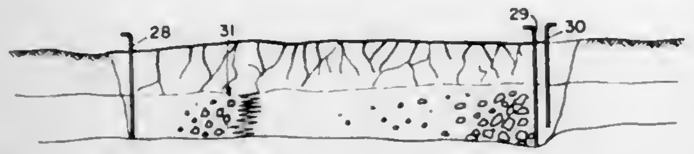
PROCESS FOR RECOVERY OF CARBONACEOUS MATERIALS FROM SUBTERRANEAN DEPOSITS BY IN SITU PROCESSING

Mitchell A. Lekas, 1015 Bermuda Drive, Concord, Calif. 94518

Filed Sept. 5, 1975, Ser. No. 610,694

Int. Cl.^{2} E21B *43/24. 43/26*

U.S. Cl. 166—271 **16 Claims**



1. A process for the in situ recovery of carbonaceous values from subterranean deposits comprising the steps;

breaking a portion of a subterranean carbonaceous deposit into rubble for thereby forming a zone of permeability;

raising the surface of the earth over said portion upward for accomodating the expansion of said portion of said deposit upward;

sealing at least the surface over said portion of said formation by placing sealing means in contact with said entire surface over said portion;

providing inlet means for communicating reacting fluid for initiating and controlling an extraction process within said zone of permeability;

forming an outlet communicating with said zone of permeability beneath said surface for withdrawing carbonaceous values from said deposit;

initiating an extraction process near said inlet for driving said carbonaceous values from said deposit by way of said outlet; and

continuing said extraction process while simultaneous therewith withdrawing said values from said deposit.

4,037,658

METHOD OF RECOVERING VISCOUS PETROLEUM FROM AN UNDERGROUND FORMATION

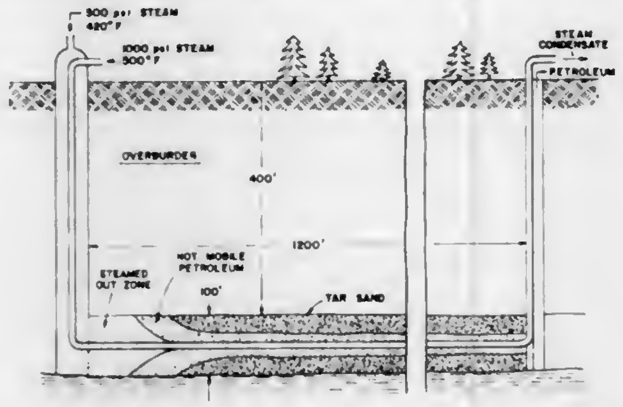
Donald J. Anderson, Newport Beach, Calif., assignor to Chevron Research Company, San Francisco, Calif.

Filed Oct. 30, 1975, Ser. No. 627,304

Int. Cl.^{2} E21B *43/24*

U.S. Cl. 166—272 **14 Claims**

1. A method of assisting the recovery of viscous petroleum from a petroleum-containing formation comprising forming a hole through a petroleum-containing formation; forming a flow path in said hole isolated from said formation for flow of fluid through said formation into and out of said hole; flowing a hot fluid through said flow path out of contact with said formation to heat viscous petroleum in said formation outside said flow path to reduce the viscosity of at least a portion of the petroleum adjacent the outside of said flow path to provide a potential passage for fluid flow through said formation adjacent the outside of said flow path and injecting a drive fluid into said formation through said passage adjacent the outside of said flow path to promote movement of the petroleum through said passage adjacent the outside of said flow path to a recovery position for recovery from said formation.



4,037,659

MICELLAR FLOODING PROCESS FOR RECOVERING OIL FROM PETROLEUM RESERVOIRS

LeRoy W. Holm, Fullerton, Calif., assignor to Union Oil Company of California, Brea, Calif.

Filed Aug. 2, 1976, Ser. No. 710,543

Int. Cl.^{2} E21B *43/22*

U.S. Cl. 166—273 **14 Claims**

1. In the method for recovering petroleum from a subterranean reservoir in which a micellar solution is injected into the reservoir through an injection well in communication therewith, and thereafter an aqueous flooding medium is injected to drive the micellar solution towards one or more spaced production wells from which fluids are recovered, the improvement which comprises:

injecting into said reservoir subsequent to the injection of said micellar solution and prior to the injection of said aqueous flooding medium an aqueous alkaline alkali metal silicate solution having a M_2O/SiO_2 molar ratio of between about 1 and about 4, wherein M is an alkali metal.

4,037,660

METHOD FOR STEAM CLEANING LINERS IN OIL WELL BORES

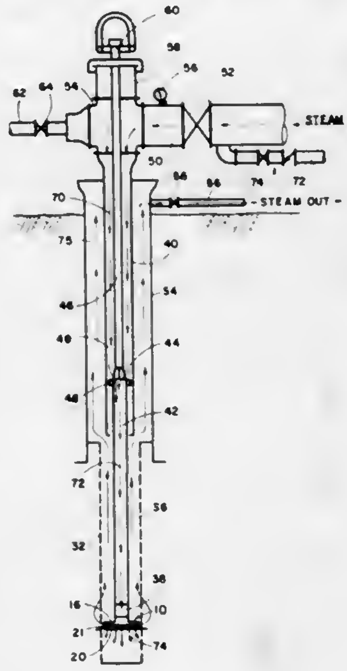
William D. Newsom, and James R. Carnahan, both of Bakersfield, Calif., assignors to K. R. Evans & Associates, Bakersfield, Calif., a part interest

Filed May 28, 1974, Ser. No. 473,697

Int. Cl.^{2} E21B *37/00*

U.S. Cl. 166—302 **6 Claims**

1. A method of steam cleaning a subsurface liner in a producing well bore having production equipment therein and comprising removing of the production equipment from the well bore, connecting a steam head to the lower end of a first tubing string, lowering the first tubing string and stream head into the well bore, landing the first tubing string with the lower end thereof spaced above the upper end of the liner, lowering connecting means through the first tubing string, connecting said connecting means with the steam head, disconnecting the steam head from the first tubing string, lowering the steam head into the interior of the liner, introducing steam at high pressure and high temperature into the interior of the first tubing string, diverting the steam into the interior of the steam head, directing the steam radially outwardly from the steam head during lowering thereof in said liner for impinging against the inner periphery of the liner, maintaining the steam at substantially constant volume during said radial directing thereof for maintaining high temperature and high pressure for discharge of the steam from the steam head at high temperature and high pressure, and directing the spent stream upwardly in the wall bore around the first tubing string for discharge from the well bore, elevating the steam head to the lower end of the first tubing string, connecting the steam head with the first tubing string, disconnecting the connecting means from the steam head, and raising the tubing string and steam head for removal thereof from the well bore.



4,037,661

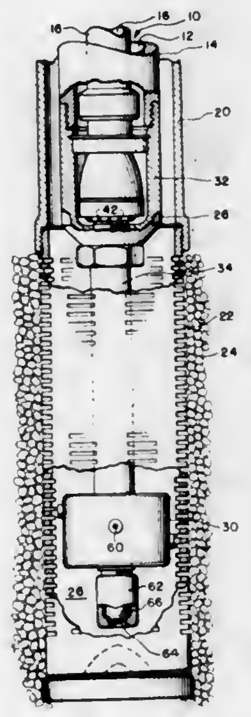
METHOD AND APPARATUS FOR CLEANING A SCREENED WELL

George Alan Ford, Houston, Tex., assignor to Walker-Neer Manufacturing Co., Inc., Wichita Falls, Tex.

Filed June 18, 1976, Ser. No. 697,404

Int. Cl.^{2} E21B *37/00. 43/25*

U.S. Cl. 166—311 **11 Claims**



1. A method for developing or cleaning a screened well employing a system of apparatus including a source of compressed air, a string of dual concentric drill pipe defining first and second fluid flow conduits, means for injecting air from said second conduit into said first conduit and a head adapted for fluid communication with said first conduit and including an entrance orifice for admitting formation liquid from said well and an exit orifice for directing compressed air toward said screen, said method comprising the steps of:

a. connecting said source to said first conduit;

b. directing compressed air through said first conduit, into said head and out said exit orifice to agitate said liquid and clear said screen;

c. disconnecting said source from said first conduit and connecting said source to said second conduit; and

d. injecting air from said second conduit into said first conduit at a point above said head, to draw said liquid into said head through said entrance orifice and to pump said liquid together with any solids present to the surface through said first conduit by air-lift.

11. A tool for developing or cleaning a screened well in conjunction with a string of dual drill pipe having concentrically disposed inner and outer pipes defining continuous annular and central flow passages, said tool comprising:

an inner tubular member adapted for fluid interconnection with the central flow passage of said string;

a head attached to said inner member and including means to direct fluid from said central passage toward the screen of said well;

an outer tubular member adapted for fluid interconnection with the annular flow passage of said string; and

means for diverting fluid flow from said annular flow passage into said central flow passage.

4,037,662

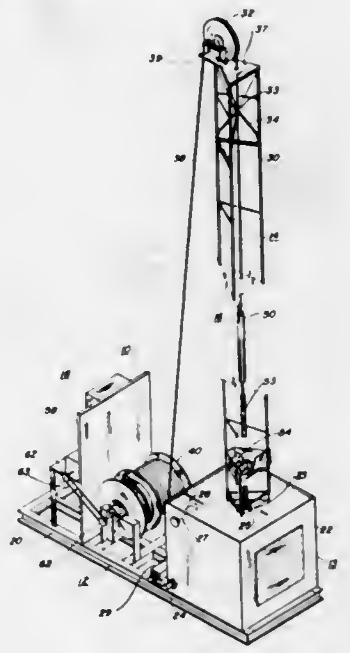
AUTOMATED BAILING APPARATUS IN FLEXIBLE COMBINATION FOR BAILING SHALLOW WELLS

Leslie Bowling, 1228 First National Bank of Commerce Bldg., New Orleans, La. 70112

Filed Aug. 30, 1976, Ser. No. 718,495

Int. Cl.^{2} E21B *37/00. 27/00*

U.S. Cl. 166—311 **9 Claims**



1. In an automated bailing apparatus, flexible in ranges of sizes of structure and material, and adjustable in operating parameters, for bailing shallow wells comprising in combination:

a. portable base means for installing over and around a shallow well production casing end extending above ground and said portable base means;

b. stationary tank assembly means, having sides, an enclosed top defining an opening, and a closed bottom defining a sleeved hole extending upwardly therein and in alignment with said top opening, mountable on said base means and adapted to receive in said sleeved hole said production casing end, fluid tight;

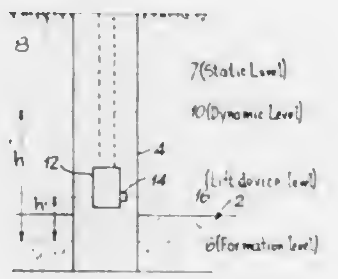
c. hoisting tackle means having in combination a hoisting tower with hoisting line mounted in and over said tank assembly means and in alignment with said top opening, and a drum or windlass mounted on said base means adjacent said tank assembly means, for raising and lowering a free end of said hoisting line through said aligned top opening and into said tank assembly means and shallow well production casing:

d. bailer means secured to the free end of said line of the hoisting tackle means for raising liquid from said shallow well and discharging it above and into said tank assembly means; and

e. control assembly means, having operating control means for actuating said hoisting tackle means and bailer means to travel full speed for a part of each trip from bottom of said shallow well to above said tank assembly means and return and half speed for a predetermined distance as the respective extremities of travel are approached, and adjustable to automatically bail any shallow well continuously for any period, depth, and desirable range of rates of bailing, and safety control means for cutting-off power in case of malfunction, separately or together, of any of the preceeding means.

4,037,663
METHOD FOR WELL EXPLOITATION

Smil Buchman, P.O. Box 9219, Tel Aviv, Israel
Filed Oct. 24, 1972, Ser. No. 299,674
Claims priority, application Israel, Dec. 17, 1971, 38393
Int. Cl.² E21B *43/00*
U.S. Cl. 166—314 **6 Claims**



1. A methd of pumping a liquid from a well bore communicating with an underground reservoir, the reservoir energy being used to transport the liquid from the reservoir to the well bore, characterized in introducing into the well bore a pump having a drive member, an external drive therefor, an inlet, and an outlet, the inlet being disposed at a level in the bore which is below the dynamic level of the liquid therein, the pump being such that the pressure of the liquid at the inlet applies equal and opposite forces to the pump drive member so that the latter is driven solely by the external drive and does not dissipate the liquid reservoir energy at the pump inlet level; and operating said pump to lift the liquid to the surface of the well bore solely by the external drive while conserving the reservoir energy at the pump inlet level in the well bore for increasing the rate and quantity of the liquid transported from the underground reservoir to the well bore by said reservoir energy.

4,037,664
FIRE FIGHTING-FOAM PRODUCING MODULE

John C. Gibson, Lawrence, Mass., assignor to Gibson Motor and Machine Service, Inc., Lawrence, Mass.
Filed Nov. 10, 1975, Ser. No. 630,326
Int. Cl.² A62C *5/02, 27/08*
U.S. Cl. 169—15 **6 Claims**

1. A fire-fighting, foam-producing, module usable as an independent unit connected to a hydrant water supply or as a portable, vehicle-mounted, unit connected to the water tank of a water tank truck, as a water supply said module comprising:

a sub-frame supporting a platform;

internal combustion engine driven, fluid pump means mounted on said platform;

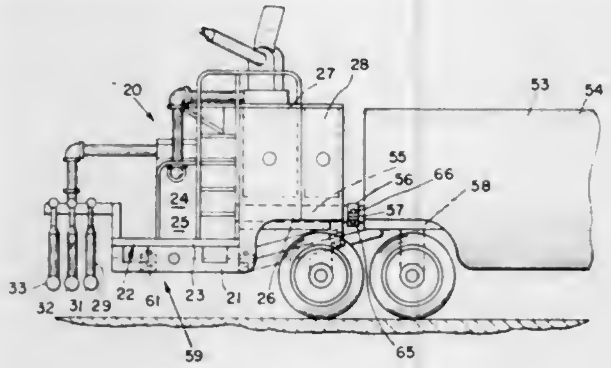
at least one foam spreader bar, mounted at the rear of said module and connected to the outlet of said pump, said spreader bar having a plurality of nozzles for dispersing pumped fluid on a fire;

an inflexible, water way conduit having one end connected to the inlet of said pump and having its other end detachably coupled to one of said water supplies,

a pair of tanks mounted on said platform, one tank containing aqueous film forming foam composition and the other tank containing protein composition,

mixing valve means, including conduits leading from each said tank into said pump means for selectively introducing one said composition, the other said composition or both, into the water pumped from said water supply,

and quick release means for detachably affixing said subframe on said tank truck.



4,037,665
FIRE EXTINGUISHER CONTAINING A HIGH INTERNAL PHASE RATIO EMULSION AS FIRE EXTINGUISHING AGENT

Larry R. Hopper, St. Louis, Mo., assignor to Petrolite Corporation, St. Louis, Mo.
Division of Ser. No. 446,646, Feb. 28, 1974, Pat. No. 3,984,334, which is a continuation-in-part of Ser. No. 108,215, Jan. 20, 1971, abandoned. This application June 22, 1976, Ser. No. 698,579
Int. Cl.² A62D *1/00*
U.S. Cl. 169—49 **6 Claims**

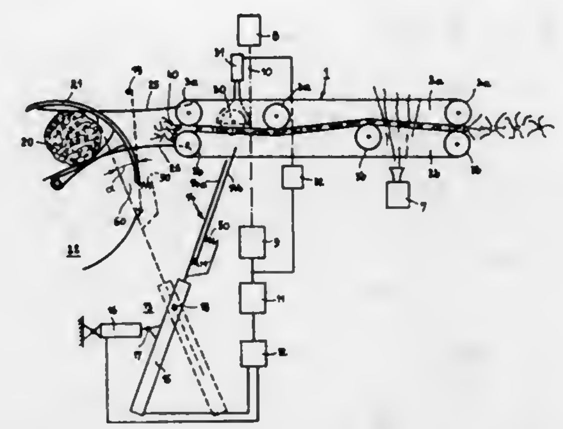
1. A fire extinguisher comprising a container containing (1) an essentially nonflammable thixotropic high internal phase ratio water-in-oil emulsion, said emulsion having the characteristics of an elastic solid when at rest, of an extremely viscous liquid at low shear conditions and of a low viscosity medium under moderate shear rates, said emulsion being highly resistant to destruction by radiant heat, said emulsion comprising water, an emulsifiable oil and a biodegradable oxyalkylated emulsifying agent not presistent and harmful to wild life, said water being present in said emulsion in an amount of at least 60% by volume of the emulsion and (2) means for expelling said thixotropic emulsion through an opening in the container onto or in the path of a fire.

4,037,666
APPARATUS FOR HARVESTING AND BUNDLING PLANTS

Karl Friedrich Rath, Farrach 8, Maria Rojach, Austria (A-9422)
Filed Dec. 17, 1975, Ser. No. 641,636
Claims priority, application Austria, Dec. 23, 1974, 10304/74
Int. Cl.² A01D *33/10*
U.S. Cl. 171—61 **15 Claims**

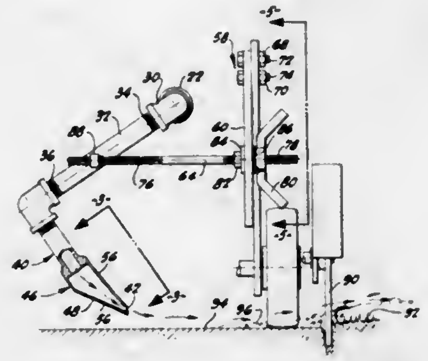
1. An apparatus for harvesting and bundling leafy or woody plants, which comprises a plant uprooting and removal device

for sequentially uprooting the plants from the soil and for removing the uprooted plants along a guided path, to an end of the path, and the improvement of a classifying and counting means arranged in the path for responding to plants meeting a minimum standard of plant size and counting the plants meeting said minimum standard, a plant packaging device spaced from the end of the path to define an accumulating space for the removed and counted plants, and a means for moving the accumulated plants to the packaging device, responsive to the counting device reaching a predetermined set limit number for accumulating said limit number of plants in said space.



4,037,667
BLOWER FOR EDGER

Michael Gonsalves, 2586 Nodal Ave., Castro Valley, Calif. 94546, and Constante C. Sarmiento, 33947-13th St., Union City, Calif. 94587
Filed Dec. 22, 1975, Ser. No. 643,400
Int. Cl.² A01D *35/00;* A01G *3/06*
U.S. Cl. 172—14 **7 Claims**



1. A blower apparatus for an exhaust gas producing plant cutter comprising:

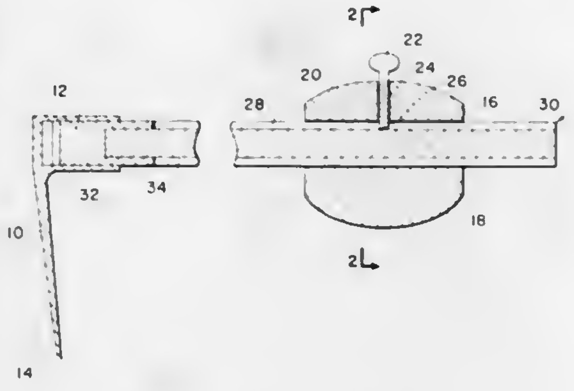
a. hollow member affixed to conduit exhaust gases from the plant cutter;

b. rotatable hollow member communicating with said hollow member said rotatable hollow member having an end portion culminating in a terminal opening behind the cutting mechanism of the plant cutter, the rotation of said rotatable hollow member adjusting the distance betwen said terminal opening and the cut vegetation resulting from the cutting mechanism of the plant cutter, such that exhaust gases from the cutter pass through said hollow member, rotatable hollow member, and terminal opening, said distance adjustment varying the ability of the exhaust gases to blow the plant cuttings;

c. adjustable support means for positioning said rotatable hollow member against the forces of gravity and reaction force exerted by the exhaust gases, said adjustable support means comprising a slotted bracket affixed to a portion of the plant cutter; an elongated member fitting within said slot and movable along the length of said slot; means for holding said elongated member to said rotatable member and means for fixing said elongated member to said slotted bracket.

4,037,668
GARDENING IMPLEMENT WITH OFFCENTER BALANCING WEIGHT

Terry M. Svejda, R.R. No. 2 Box 95, Mo. Valley, Iowa 51555
Filed Apr. 14, 1976, Ser. No. 676,852
Int. Cl.² A01B *1/08*
U.S. Cl. 172—371 **3 Claims**



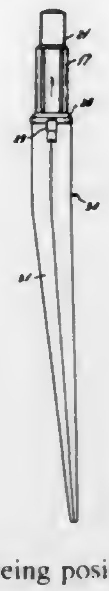
1. A gardening implement comprising a handle and a flat blade fixedly secured thereto whose lateral surfaces extend substantially perpendicular to the longitudinal axis of said handle, said longitudinal axis passing through said surfaces at a point adjacent a marginal edge of said plate, said plate having another marginal edge extending perpendicularly to said longitudinal axis, said another marginal edge for use on the earth in a gardening operation, a solid balancing weight, fastening means to selectively manually secure said balancing weight along the length of said handle, balancing means for balancing the weight of said plate by locating the centroid of gravity of said balancing weight at preferentially located surfaces of said handle, said fastening means including a threaded rod element threadingly engaged within said balancing weight, one end of said threaded rod element being disposed in clamping touching engagement with said handle, said balancing means including said balancing weight having a substantially geometrically off center hole passing through said balancing weight, said handle extending through said hole, said centroid of gravity of said balancing weight being located a distance substantially radially outwardly from the longitudinal axis of said hole.

4,037,669
TINE CULTIVATOR

Ary van der Lely, Maasland, and Cornelis Johannes Gerardus Bom, Rozenburg, both of Netherlands, assignors to C. van der Lely N. V., Maasland, Netherlands
Division of Ser. No. 450,671, March 13, 1974, Pat. No. 3,943,999. This application Nov. 19, 1975, Ser. No. 633,567
Claims priority, application Netherlands, Mar. 19, 1973, 7303763
Int. Cl.² A01B *33/00*
U.S. Cl. 172—59 **7 Claims**

1. A cultivator comprising a soil working member rotatably mounted on an upwardly extending shaft, said member including a support and at least one downwardly extending tine that is offset from said shaft, said tine being positioned to trace a circular path and work the ground during rotation, said tine including an upper fastening portion secured to the support and a soil working porton, the latter portion a first upper straight part that adjoins said fastening portion, the center lines of said fastening portion and said upper part coinciding with one another, a second and lower straight part of said soil working portion being inclined outwardly with respect to said first

part relative to said shaft, said second part having opposite sides which flatten and broaden towards a lowermost tip of the tine, said opposite sides being positioned substantially tangential to said circular path.



4,037,670

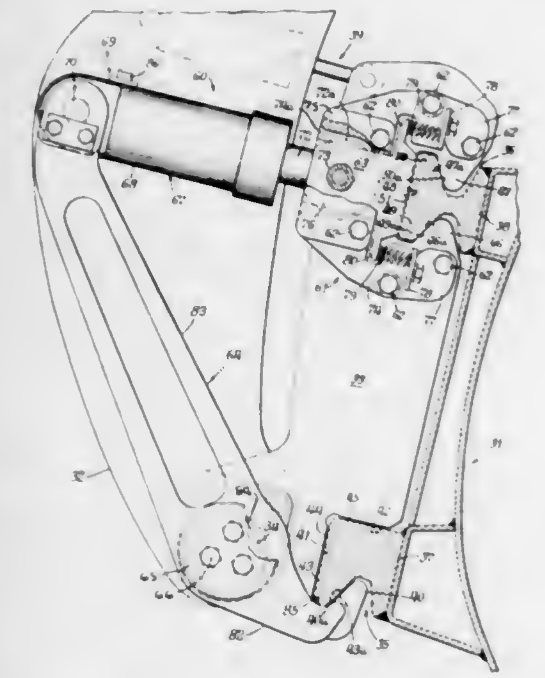
MOTOR GRADER WITH BLADE CLAMPING MECHANISM

Robert Allan Atherton, Chillicothe, and Carroll Richard Cole, Decatur, both of Ill., assignors to Caterpillar Tractor Co., Peoria, Ill.

Filed June 14, 1976, Ser. No. 696,160

Int. Cl.² E02F *3/76;* **A01B** *65/02*

U.S. Cl. 172—795 **14 Claims**



1. In a motor grader which has a circle with depending blade support arms, blade support means mounted on said arms on transverse pivots, a grader blade assembly which includes a lower support rail and an upper support rail carried in said blade support means for lateral sliding movement between confining surfaces which restrict vertical and fore-and-aft movement of the rails in the support means, and a hydraulic ram for shifting the blade assembly laterally in the support means, a blade clamping mechanism comprising, in combination:

a clamp shoe bracket on the blade support means behind the upper support rail;

a clamp shoe mounted on said bracket for movement between a release position spaced slightly from the upper support rail and a clamping position bearing against the rear of said upper support rail;

a clamp lever pivoted on the blade support means directly behind the lower support rail, said lever leaving having a long input arm with a free end directly behind the clamp shoe, and said lever having a short clamp arm in the vertical plane with the lower support rail;

a hydraulic ram which has a cylinder operatively connected to the input arm and a piston with a piston rod operatively connected to the clamp shoe;

and means for applying hydraulic pressure to the piston of said ram, movement of the pisiton in one direction acting to move the clamp shoe to clamping position and pivot the clamp lever to force the clamp arm against one of the vertical confining surfaces of the blade support means, and movement of the piston in the other direction acting to release the clamp shoe and the clamp arm from said rails.

4,037,671

DRILL BOOM WITH HYDRAULIC PARALLEL MOTION MEANS

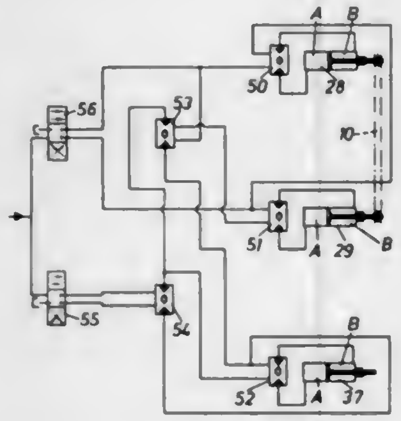
Erich Voldemar Kimber, Vendelso, and Per-Axel Carsten Ronne, Alta, both of Sweden, assignors to Atlas Copco Aktiebolag, Nacka, Sweden

Continuation of Ser. No. 480,518, June 18, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,249

Claims priority, application Sweden, July 3, 1973, 7309392

Int. Cl.² E21B *15/00;* **F15B** *11/22, 13/01*

U.S. Cl. 173—2 **6 Claims**



1. A drill boom arrangement with hydraulic parallel motion means for positioning an elongated rock drilling apparatus to different drilling pósitions with respect to a boom support, somprising in combination therewith:

a first cross shaft on said boom support,

a drill boom having forward and rear ends, said drill boom being pivoted at the rear end thereof on said first cross shaft,

a second cross shaft at the forward end of said drill boom for pivotally supporting said rock drilling apparatus,

an hydraulic elevating cylinder means pivotally connected at one end thereof to said drill boom and at the other end thereof to said boom support for selectively elevating and lowering the rock drilling apparatus to given elevation angles,

an hydraulic tilt cylinder means pivotally connected at one end thereof to said drill boom and at the other end thereof to said rock drilling apparatus for selectively tilting said rock drilling apparatus relative to said drill boom independently of said hydraulic elevating cylinder means, said hydraulic tilt cylinder means having a pair of hydraulic chambers,

an hydraulic pilot cylinder means having a pair of chambers and pivotally connected to said drill boom and to said boom support for sensing the elevation angle of said drill boom, and

an hydraulic circuit including fluid conduit means connecting one chamber of said hydraulic pilot cylinder means with one chamber of said hydraulic tilt cylinder means to selectively transfer hydraulic fluid therebetween to provide hydraulic slave coupling between said hydraulic pilot cylinder means and tilt cylinder means to concurrently operate same in order to tilt said rock drilling apparatus while maintaining parallel displacement of the rock drilling apparatus during operation of said hydraulic elevating cylinder means to change the drilling position; a common hydraulic control valve coupled to said hydraulic pilot, tilt and elevating cylinder means for alternately pressurizing the other chambers of said hydraulic pilot cylinder means and said hydraulic tilt cylinder means simultaneously with the chambers of said hydraulic elevating cylinder means during elevating and lowering of the rock drilling apparatus, respectively; a second control valve coupled to said hydraulic tilt cylinder means for actuation thereof independently of said hydraulic elevating and pilot cylinder means; first isolating valve means for isolating said hydraulic elevating and pilot cylinder means from said second control valve during actuation of said second control valve; and second isolating valve means for isolating said second control valve from said hydraulic tilt cylinder means during actuation of said common control valve, whereby said hydraulic pilot cylinder means assists the elevating movement of said drill boom and said hydraulic tilt cylinder means assists the lowering movement of said drill boom.

4,037,672

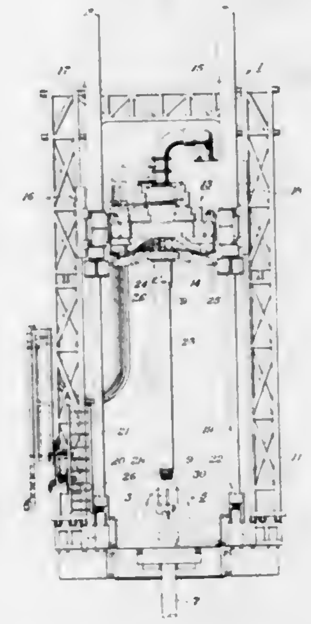
SHAFT DRILL BREAK-OUT SYSTEM

Lee Roy Hodge, Houston, Tex., assignor to Hughes Tool Company, Houston, Tex.

Continuation-in-part of Ser. No. 497,172, Aug. 12, 1974, Pat. No. 3,942,592. This application Feb. 4, 1975, Ser. No. 546,856

Int. Cl.² E21D *9/02;* **E02D** *7/28;* **E21B** *19/16*

U.S. Cl. 173—157 **4 Claims**



1. In an earth boring machine having a hydraulic and reversible swivel, powered for reciprocable movement with a cross member along a mast to move a drill stem and a drill through a work table and in a bore hole, the improvement comprising:

pump means having three output pressure limits selectively applied to the power swivel to produce a largest, an intermediate and a smallest output torque limit;

break-out means carried by the cross member and having arms to engage slots on the drill stem to enable break-out between the power swivel and the drill stem;

slip means carried by the work table to support the drill stem when disconnected from the power swivel and to selectively engage slots in the drill stem to permit make-up and break-out; and

control means connected with the pump means to establish the smallest torque limit for drilling, the intermediate torque limit for make-up, and the largest torque limit for break-out and for make-up of the power swivel with the drill stem when removing the drill stem from the hole.

4,037,673

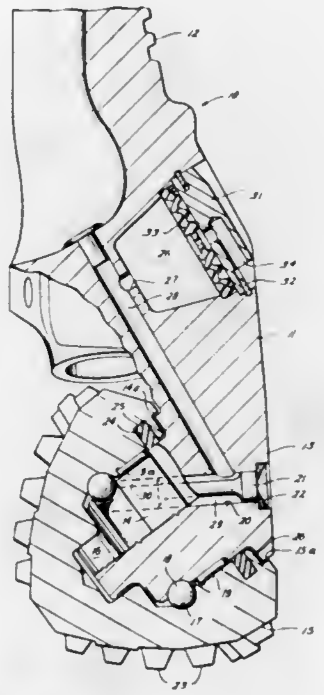
ROLLER CUTTER DRILL BIT

Daniel B. Justman, Houston, Tex., assignor to Reed Tool Company, Houston, Tex.

Filed May 7, 1976, Ser. No. 684,125

Int. Cl.² E21B *9/10*

U.S. Cl. 175—371 **3 Claims**



1. A drill bit comprising:

at least one head,

a cylindrical boss on said head having a flat end surface,

a bearing shaft arranged on said head and extending from the flat end surface of said boss,

a cutter rotatably mounted on said bearing shaft and having a counterbore fitting over said flat end surface and guided for rotary motion on said cylindrical boss,

said cutter having a smaller bore opening from said counterbore and fitting on said bearing shaft,

said cutter having a circumferential groove in said smaller bore and spaced from said flat end surface,

an elastomeric seal ring in said groove in sealing engagement with said shaft, and

said boss, said flat end surface and counterbore defining a tortuous passage preventing ingress of detritus to the area of the seal ring in said smaller bore.

4,037,674

BALANCE FOR DETERMINING THE WEIGHT PERCENTAGE OF AN EXTRACTED COMPONENT WITH RESPECT TO THE TOTAL WEIGHT OF A TEST MATERIAL

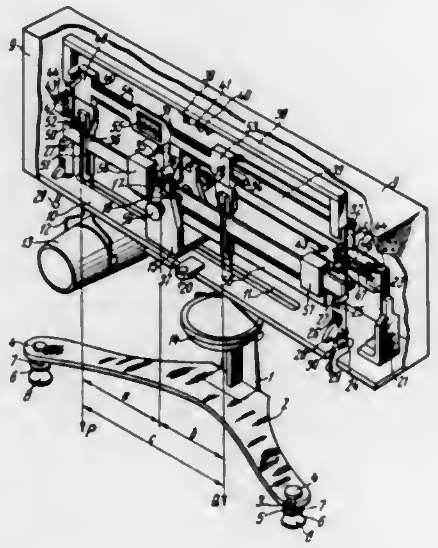
Valery Konstantinovich Kuzmich, ulitsa Komarova, 10, korpus 3, kv. 12, and Yakov Tevelevich Dashevsky, ulitsa Frantsa-Meringa 1, kv. 11, both of Odessa, U.S.S.R.

Filed Oct. 30, 1975, Ser. No. 627,039

Int. Cl.² G01G *19/00, 19/04, 1/18*

U.S. Cl. 177—200 **1 Claim**

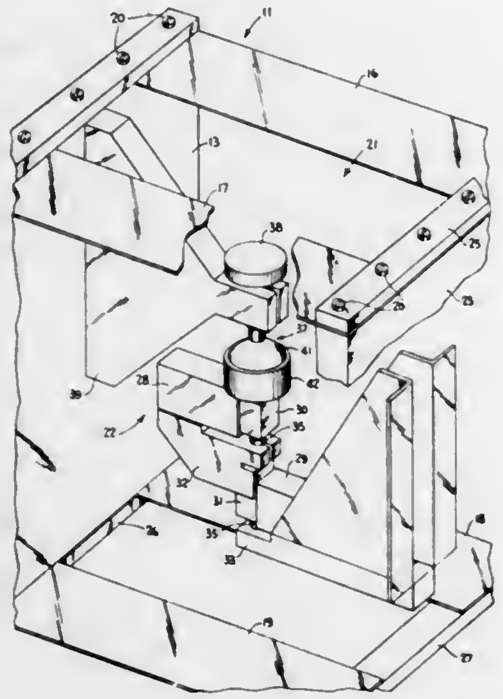
1. A balance for determining the weight percentage of an extracted component with respect to the total weight of a test material, the balance comprising a first moving load-receiving unit to accept the extracted component of a test material, the weight percentage of which is to be determined; a second moving load-receiving unit to accept the remaining mass of the material; a beam in the form of a rectangular frame of two horizontal plates connected by two vertical plates; a support for carrying said beam; a linear scale applied to one of said horizontal plates, to read off the weight percentage; said units being both located on one of said horizontal plates, namely one unit on each side of said support; a first rigid tie-rod rigidly connecting said units; a vernier on said first tie-rod; two movable balance weights on the other of said horizontal plates, namely one weight on each side of said support; a second rigid tie-rod rigidly connecting said weights; a drum; an axle for said drum, fixed in said beam; and flexible ties connecting said drum with said units and with said weights; said units and said weights moving simultaneously along said beam in opposite directions as said drum is turned, until said beam reaches its equilibrium, at which the position of said vernier is used to read off the weight percentage.



4,037,675

LEAF SPRING WEIGHING SCALE

Anthony Storace, Tarrytown, N.Y., and Paul R. Sette, Hamden, Conn., assignors to Pitney-Bowes, Inc., Stamford, Conn.
Filed Apr. 26, 1976, Ser. No. 680,155
Int. Cl.^{2} G01G *3/08*
U.S. Cl. 177—229 **10 Claims**



1. A leaf spring weighing scale, comprising:

a weighing pan for receiving a load and which is movable through a weighing range in response to said load;

a support means;

a movable load support structure supporting said weighing pan for movement, and disposed between the support means and said pan, said load support structure including a pair of upper and lower spaced-apart leaf spring strips so arranged so as to form a parallelogram for providing a substantially linear load support and pan movement;

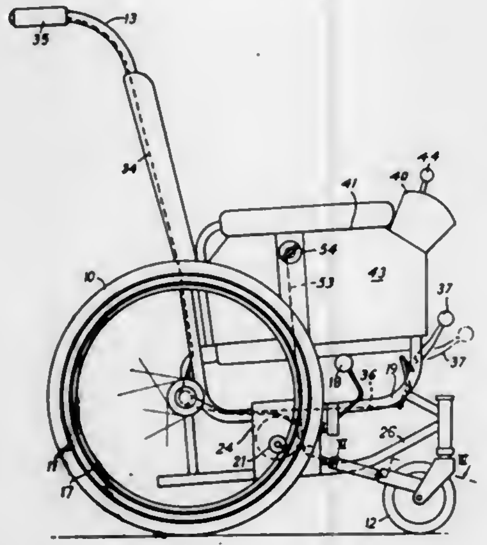
a first and a second deflection sensing load cell, said first and second load cells arranged in tandem, and operatively connected to said load support structure, said first first load cell being operative through a given portion of said weighing range, and said second load cell being operative through a remaining portion of said weighing range; and

interconnecting means operatively connecting said load support structure to said first and second load cells, said interconnecting means including a point contact connection disposed between said load support structure and said first and second load cells, said point contact connection having a ball in contact with a substantially flat surfaced anvil member, said point contact connection being operative to minimize load cell sensing errors introduced by any nonlinearities in the load support and pan movement.

4,037,676

POWERED INVALID-CHAIRS

Edward Thipthorp Ruse, 304 Bournemouth Park Road, Southend-on-Sea, England
Filed July 24, 1975, Ser. No. 598,640
Claims priority, application United Kingdom, July 24, 1974, 32776/74; Oct. 16, 1974, 44903/74
Int. Cl.^{2} B62D *11/04*
U.S. Cl. 180—6.5 **9 Claims**

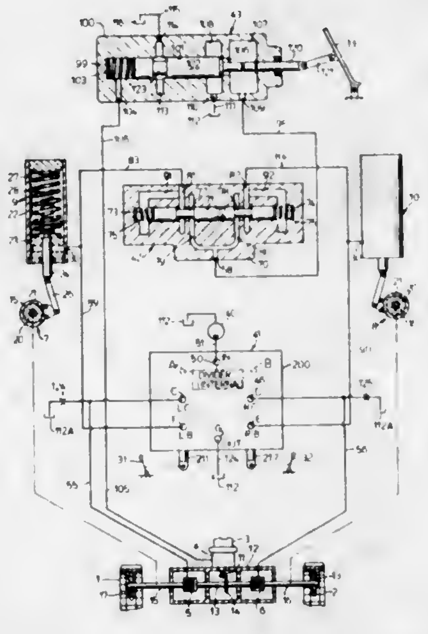


1. An invalid wheelchair comprising a frame, two relatively large ground wheels mounted on the frame and having a common axis of rotation, and at least one further ground wheel mounted on the frame, an electric motor mounted adjacent to each of said relatively large ground wheels, and a drive arrangement between each of said electric motors and its adjacent ground wheel, each drive arrangement comprising a pulley which is driven by the motor to rotate on an axis parallel to the axis of rotation of said relatively large ground wheel and which has a driving surface, the pulley being adapted to swing into and out of engagement with said inner driven surface with the driving surface of the pulley following an arc which cuts the driven surface of the wheel at an acute angle so that the driving pulley swings towards the wheel in the direction opposed to the direction of movement of the driven surface and drives itself into engagement with the driven surface, control means for said drive arrangement, in which said control means include first manually-operable means to swing said pulleys into and out of engagement with the driven surfaces of the wheels, first electric switch means to close when said pulleys are in engagement with the driven surfaces and to open when said pulleys are out of engagement with the driven surfaces, second manually-operable means which are operated by an attendant to swing said pulleys into and out of engagement with the driven surfaces, and second switch means connected in series with said first switch means and operated by the invalid to energise the two electric motors when said pulleys are in engagement with the driven surfaces, said second switch means being held closed when said second means are to be operated by the attendant.

4,037,677

COMBINED STEERING AND BRAKING MEANS FOR CRAWLER TRACTOR

George Paul Koch, Springfield, Ill., assignor to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.
Filed Dec. 15, 1975, Ser. No. 640,767
Int. Cl.^{2} B62D *11/08*
U.S. Cl. 180—6.7 **4 Claims**



1. In a vehicle having a pair of ground engaging drive means and which is steered by selectively driving and braking said drive means:

an engine-driven fluid power shifted transmission;

a pair of spring applied fluid released steering clutches for transmitting motive power from said transmission to said ground engaging drive means;

a pair of spring applied fluid released brakes for said ground engaging drive means;

a pair of hydraulic actuators for operating said brakes;

a source of pressurized fluid;

combined steering and braking valve means connected to said source, to said clutches, and to said brake actuators and being selectively actuatable for controlling fluid flow from said source to said steering clutches to operate said clutches and to said brake actuators to operate said brakes;

a pair of movable control members operatively connected for selectively actuating said combined steering and braking valve means;

said combined steering and braking valve means being responsive to operation of said levers to effect automatic application of both brakes if both steering levers are simultaneously operated to disengage both clutches and to effect application of one brake for one track if one steering lever is operated to disengage one clutch for said one track;

supplemental brake control valve means;

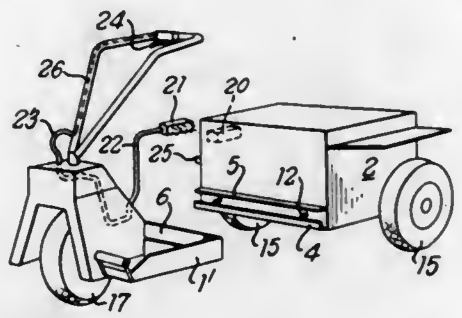
a single movable brake member for selectively operating said supplemental brake control valve means; and

shuttle valve means operatively connected to said combined steering and braking valve means, to said brake actuators and to said supplemental brake control valve means and responsive to said supplemental brake control valve means for controlling fluid flow from said source to said brake actuators to provide for supplemental control of said brakes.

4,037,678

VEHICLE CHASSIS STRUCTURE

Rudi Helmut Braune, Griffin Hill, Thrupp, Stroud, Gloucestershire, England
Filed July 9, 1975, Ser. No. 594,293
Claims priority, application United Kingdom, July 12, 1974, 30936/74
Int. Cl.^{2} B62K *5/06, 11/02*
U.S. Cl. 180—11 **3 Claims**

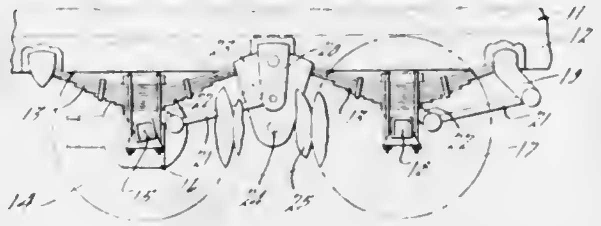


1. In a vehicle having first and second chassis units supported on respective independent rolling means, one of said chassis units being provided with steering means for the rolling means of said unit, and means releasably coupling sad first and second chassis units to each other, wherein the improvement comprises one of said chassis units having a horizontally disposed planar base member, and a planar end wall mounted in perpendicular abutment therewith and provided with a plurality of vertically elongated apertures, said planar base member and said end wall being arranged to define therebetween at least one elongated horizontal aperture, and wherein the other of said chassis units has a vertical end wall, at least one support flange mounted on said vertical end wall and arranged to pass through said at least one elongated horizontal aperture and to support said planar end wall of said one unit, and horizontaly disposed threaded clamping means mounted on said vertical end wall, said clamping means extending through said vertically elongated apertures of said planar end wall of said one unit, cooperatively threaded means being provided to rigidly clamp said planar end wall of said one chassis unit and said vertical end wall of said other chassis unit in complete surface abutment with each other, and at least one further flange mounted on said vertical end wall of said other unit to extend horizontally therefrom to be supported on top of said planar end wall of said one chassis unit, whereby a secure contact between chassis units over a large surface area is obtained.

4,037,679

SELECTIVE DRIVE FOR TRUCK DEAD AXLE

Herbert C. Ovshinsky, 15200 Leslie, Oak Park, Mich. 48237
Continuation-in-part of Ser. No. 574,501, May 5, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,735
Int. Cl.^{2} B62D *61/10*
U.S. Cl. 180—24.12 **13 Claims**

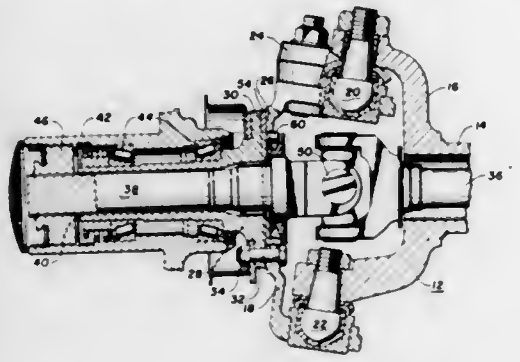


1. In a drive for the tires of wheels on a dead axle of a vehicle disposed behind or in front of a differentially driven axle, a through rotatable shaft fixedly supported substantially midway between the centers of the driven and dead axles approximately in alignment therewith, an expandable tire fixedly mounted on each end of said rotatable through shaft so as to be located between said wheel tires, expanding means on said vehicle, and means expanding said expanding means to provide a drive when expanded between the tires on the wheels of the differential axle and the tires on the wheels on the dead axle.

4,037,680
APPARATUS FOR ADJUSTING CAMBER

Clinton E. Grove, 23-1st St. SE., Box 2013, Elbow Lake, Minn. 56531

Filed Apr. 23, 1975, Ser. No. 570,657
Int. Cl.² B60K *17/30*
U.S. Cl. 180—43 R **3 Claims**



1. In an axle assembly for supporting a driven, steerable wheel of a vehicle, the axle assembly comprising:
- a rigid, hollow axle housing;
- a yoke rigidly secured to one end of the said axle housing;
- a steering knuckle pivotally mounted to said yoke to provide for steering of the wheel when said steering knuckle is pivoted, wherein said steering knuckle includes a first mounting pad;
- a spindle for supporting the wheel for rotation, wherein said spindle includes a second mounting pad;
- means for securing said spindle to said steering knuckle with said first and second mounting pads in facing relationship; and
- means for transmitting power to said spindle including:
  - a. an axle rod extending interiorly of said axle housing, said axle rod having an interior end for attachment to a source of driving power to rotate said axle rod and an exterior end proximate to said one end of said axle housing,
  - b. a stub shaft encircled by said first and second mounting pads for cooperating with said spindle to provide powered rotation of the wheel, and
  - c. means cooperating with said exterior end of said axle rod and with said stub shaft for transmitting driving power to said stub shaft from said axle rod during pivoting of said steering knuckle;

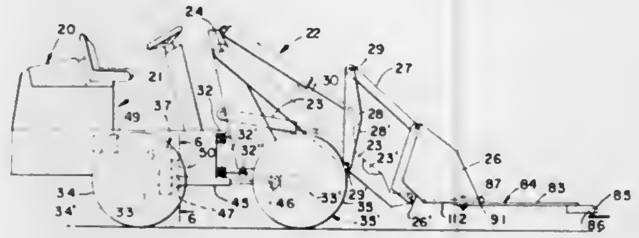
the improvement comprising:
- shim means interposed between said first and second mounting pads for controlling the camber of the wheel.

4,037,681
TOWABLE FRONT END LOADER

Oliver L. Gorby, Fargo, N. Dak., assignor to Dynamic Industries, Inc., Barnesville, Minn.

Continuation of Ser. No. 402,771, Oct. 2, 1973, abandoned. This application Sept. 8, 1975, Ser. No. 611,024
Int. Cl.² B60K *17/34*
U.S. Cl. 180—44 R **3 Claims**

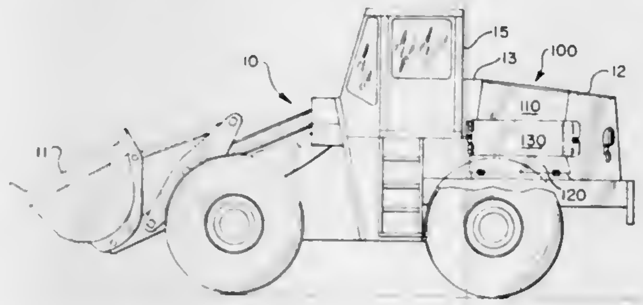
1. A front end loader device for towing comprising a front and rear frame, a pivotal activated connection between the front and rear frame, front and rear axles mounted to the front and rear frames, a pair of drive wheels mounted to said front and rear axles, a gear box having a plurality of reduction gears thereon engaged in a train to provide a gear reduction, said plurality of reduction gearing comprising a first input gear, intermediate reduction gears, and an output gear, said gear box being mounted to the front of said rear axle of said rear frame, a drive shaft connecting said output gear of said gear train to said rear axle, a drive shaft connecting said output gear to said front axle through universal joints, motor means connected to and powering said input gear whereby said intermediate reduction gears provides a reduced rotational speed to said output gear and to said drive shaft to drive said front and rear wheels of said loader to power the movement of said loader at very low speed, means to disengage at least one of said intermediate gears from said output gear to provide free wheeling of the wheels of the loader at relatively high speeds with said at least one of the intermediate and the input gear disengaged from the output gear during free wheeling to prevent their rotating with the output gear during free wheeling, said front frame having lifting arms mounted thereto with hydraulic cylinder means to raise and lower said lifting arms, a bucket mounted to said lifting arms at the outer ends, means to maintain said lifting arms with said bucket spaced above the ground, a tow arm having its one end attached to said bucket and its other end adapted to be attached to a towing vehicle for towing the loader in free wheeling by pulling the loader through the tow arm attachment to the bucket.



4,037,682
ENGINE COMPARTMENT ENCLOSURE

Don G. Sandrock, McHenry, and Peter J. Hoag, Arlington Heights, both of Ill., assignors to Fiat-Allis Construction Machinery, Inc., Deerfield, Ill.

Filed Feb. 20, 1976, Ser. No. 659,678
Int. Cl.² B62D *25/10*
U.S. Cl. 180—69 R **10 Claims**

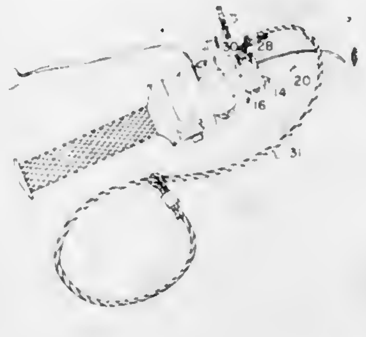


1. In an engine enclosure having a top, side shields and opposite ends operatively enclosing an engine, the improvement comprising
- a first panel hingedly supported from the enclosure top and extending downwardly therefrom to form a portion of the enclosure side,
- a first hinge means joining said first panel to the enclosure top for pivotal movement relative thereto,
- a second hingedly supported panel, forming another portion of the enclosure side, extending upwardly toward said first panel with an edge of said second panel spaced from the lowermost edge of said first panel,
- a second hinge means joining said second panel to the enclosure side for pivotal movement relative thereto,
- a third hingedly supported panel covering a portion of said first and second panels to close the space therebetween to form the enclosure side,
- a third hinge means supporting said third panel for pivotal movement from a position out from contact with said first and second panels into a position in overlying contact with at least a portion of said first and second panels, and
- means for preventing pivotal movement of said third panel when said third panel is in overlying contact with said portions of said first and second panels thereby preventing pivotal movement of said first and second panels.

4,037,683
MOTORVEHICLE SAFETY CUT-OUT SWITCH

Gene LeBell, 1260 Hayworth Ave., No. 10, Los Angeles, Calif. 90046

Filed Oct. 20, 1975, Ser. No. 623,595
Int. Cl.² B60K *28/00*
U.S. Cl. 180—99 **1 Claim**

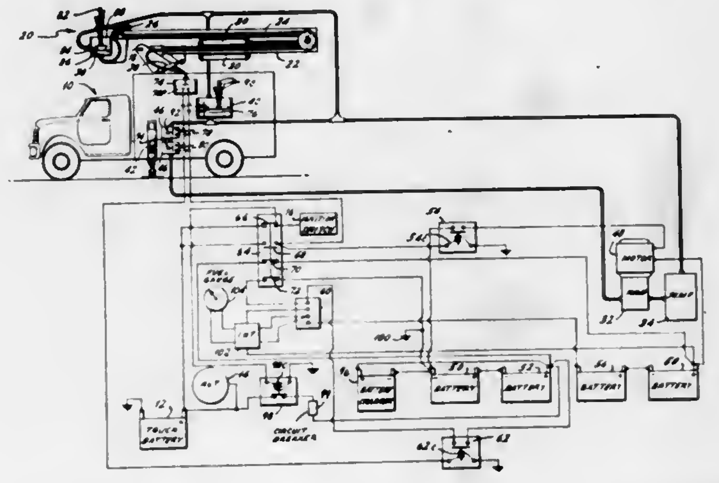


1. A safety cut-out switch for a motorvehicle ignition system comprising: a switch spring biased in a closed position; Means for connecting said switch to said ignition system to cut out said ignition system when said switch is closed; a spherical body; a housing for said switch rigidly secured to said motorvehicle, said housing including retaining means having a flaired and resilient opening for receiving and releasably holding said spherical body, and having means for opening said switch in response to the presence of said spherical body within said housing; and a lanyard having one end thereof connected to said spherical body and the other end adapted to be secured to a vehicle rider whereby said lanyard may pull said spherical body out of said housing by tension in a wide range of directions approximately hemispheric in angularity .

4,037,684
MOBILE LIFT APPARATUS WITH ELECTRIC POWER SYSTEM

Richard A. Moyer, Lansdale, and Joseph D. Patton, Chalfont, both of Pa., assignors to Asplundh Tree Expert Company, Willow Grove, Pa.

Filed Nov. 25, 1975, Ser. No. 635,222
Int. Cl.² B66F *11/04*
U.S. Cl. 182—2 **9 Claims**

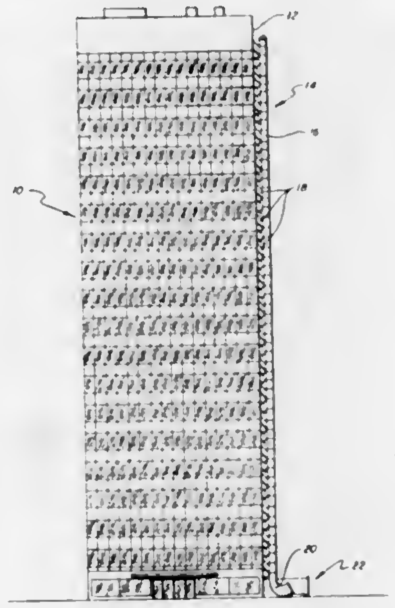


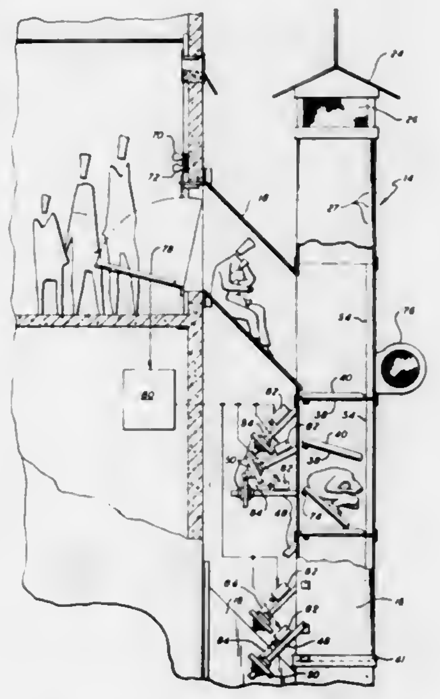
1. In combination a vehicle including an engine and a lift apparatus, said lift apparatus being operatively associated with a hydraulic control system inluding valve actuator means for controlling the operation of said hydraulic control system, said lift apparatus further including an electric motor operatively connected with pump means in said hydraulic control system and an electric power system for energizing said electric motor, said electric power system including battery means in series with said electric motor and switch means between said battery means and said electric motor, said switch means being operatively associated with said valve actuator means, said switch means being open when said valve actuator means is in an inoperative position and being movable to a closed position when said valve actuator means is operative, said electric power system further including master switch means for preventing the simultaneous operation of said vehicle engine and said electric motor.

4,037,685
BUILDING EVACUATION SYSTEM

Anthony Talucci, 2045 Valley Drive, Syracuse, N.Y. 13207

Continuation-in-part of Ser. No. 613,338, Sept. 15, 1975, abandoned. This application Dec. 19, 1975, Ser. No. 642,454
Int. Cl.² A62B *1/20*
U.S. Cl. 182—18 **13 Claims**





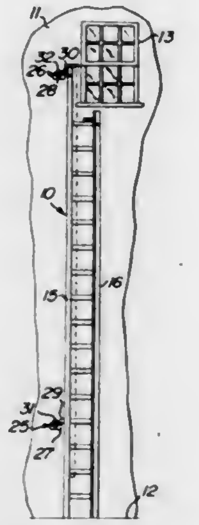
1. Apparatus for emergency evacuation of occupants from a multi-story building through openings in a side wall thereof, said apparatus comprising, in combination:
- a. a substantially vertical, hollow tube extending in fixed, parallel relation to the building side wall;
- b. means through which the interior of said tube communicates with the interior of the building at each floor thereof;
- c. A plurality of platform means mounted at predetermined intervals along the length of said tube for movement

between blocking and unblocking positions wth respect to the interior thereof;

d. biasing means associated with each of said platform means urging the latter toward said blocking position and providing a biasing force opposing movement of said platform means away from said blocking position; and

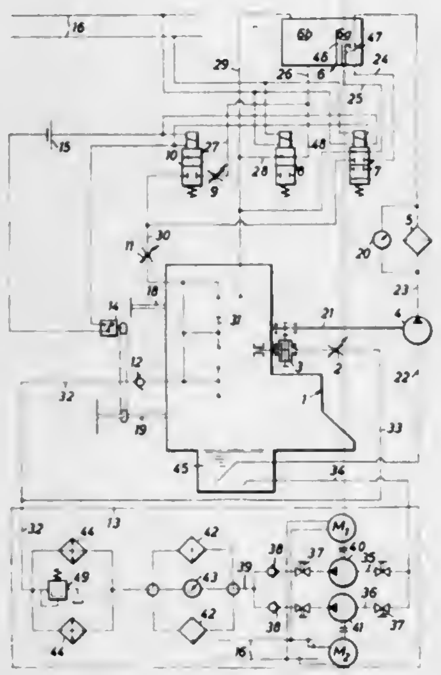
e. means for automatically adjusting the biasing force on said platforms in response to the weight of an individual to provide a substantially constant rate of movement of said platforms to said unblocking position irrespective of the weight of the individual.

4,037,686
ESCAPE LADDER
Harold H. Shull, 6745 Florida Drive, Lantana, Fla. 33462
Filed Feb. 6, 1976, Ser. No. 691,992
Int. Cl.^{2} E06C *1/383, 9/08*
U.S. Cl. 182—96 **6 Claims**



1. An excape ladder comprising a channel-shaped first side piece adapted to upstand along a building wall, mounting means on the exterior of said first side piece for mounting the latter to the building wall, a plurality of cross-pieces each having one end pivotally connected to the interior of said first side piece and extending in parallelism with each other from said first side piece, a channel-shaped second side piece in paralled facing relation with said first side piece, the other ends of said cross-pieces being pivotally connected to the interior of said second side piece to connect said first and second pieces together for parallel movement between a closed position in facing engagement with said cross-pieces enclosed within said side pieces and an open position with said side pieces spaced and said cross-pieces extending laterally between said side pieces, said mounting means comprising upper and lower arms extending laterally from the exterior of said first side piece for pivotal connection to the building wall, for swinging said ladder about a generally vertical axis toward and away from the wall, and detachable connection means connecting each of said arms to said first side piece for removably mounting the ladder to the wall, said detachable connection means each comprising a lateral end enlargement on the respective arm, said arms each having a reduced neck just inward of the end enlargement, and said first side piece having a relatively large through opening for receiving each of said enlargements, and a reduced upwardly extending opening for receiving the adjacent neck.

4,037,687
LUBRICATING MEANS FOR THE TRANSMISSION GEAR OF A SHIP
Wolfgang Krutz, Monchengladbach, and Hans Steinberg, Witten, both of Germany, assignors to Lohmann & Stolterfoht A.G., Witten, Germany
Filed May 11, 1976, Ser. No. 685,236
Claims priority, application Germany, June 10, 1975, 2526139
Int. Cl.^{2} F01M *1/18*
U.S. Cl. 184—6.4 **6 Claims**



1. Lubricating means for the transmission gear **(1)** of a ship having a lubricating oil sump **(45)**, and a driven shaft **(19)**, at least one lubricating oil pump **(40)** having an intake **(34)** connected to said sump and a supply pipe **(32)** connected to said gear, an electric motor **(M1)** driving said pump, and a ship electrical supply system **(16)** connected to said motor; the improvement comprising:

an additional lubricating oil pump **(4)** having a drive shaft, a suction pipe **(22)** connected to said sump and a delivery pipe **(23)**; a clutch **(3)** between said additional pump drive shaft **(2)** and the transmission driven shaft **(19)**; a branch pipe **(33)** between said supply pipe **(32)** and said clutch **(3)** and transmission gear **(1)**; with normal pressure in pipe **(33)** maintaining said clutch disengaged; a fall in pressure in the main lubricating oil supply pipe **(32)** permitting engagement of said clutch kinematically connecting said driven shaft **(19)** to said drive shaft **(21)** to drive said additional pump **(4)**; a tank supported above said transmission gear; said additional pump delivery pipe **(23)** outletting into said tank; a series of gravity feed lubricating pipes **(24,25,26)** between said tank and said transmission gear; and a vlave **(7,8,10)** connected to each pipe and to said electric supply **(16)**, said valves respectively opened and closed with the failure of the ship's electric supply system for maintaining lubrication to said transmission gear.

4,037,688
ELEVATOR SYSTEM
Charles L. Winkler, Worthington, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Continuation-in-part of Ser. No. 503,201, Sept. 4, 1974, abandoned. This application May 5, 1975, Ser. No. 574,829
Int. Cl.^{2} B66B *1/18*
U.S. Cl. 187—29 R **78 Claims**

1. An elevator system for a building having a plurality of landings, comprising:

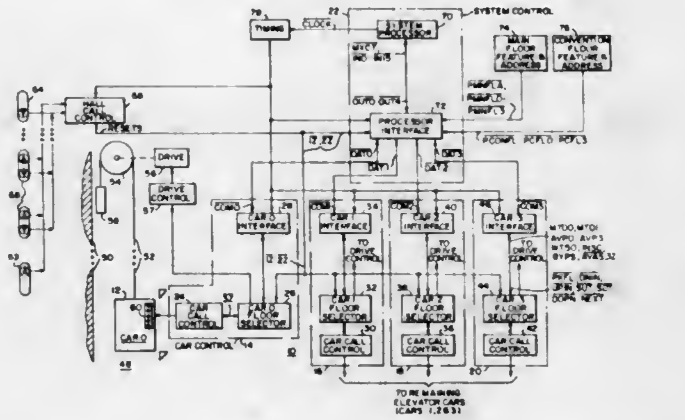
a plurality of elevator cars,

means mounting said plurality of elevator cars for movement relative to the landings,

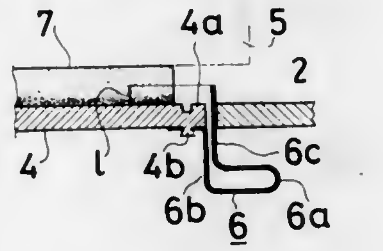
up and down hall call registering means for registering calls for elevator service in the up and down directions, respectively, from at least certain of the landings,

car control means for each of said plurality of elevator cars, each of said car control means providing enable signals indicative of the landings, and service directions therefrom, the associated elevator car is capable of serving,

and supervisory control means responsive to said up and down hall call registering means and to the enable signals provided by each of said car control means, said supervisory control means including storage means for storing said enable signals to obtain the building configuration existing at any instant, said supervisory control means effectively assigning calls for elevator service registered on said up and down hall call registering means to predetermined cars, using the building configuration stored in said storage means to determine which landings and service directions therefrom are currently in the building configuration, and which landings and service directions therefrom, each of the cars is capable of serving.

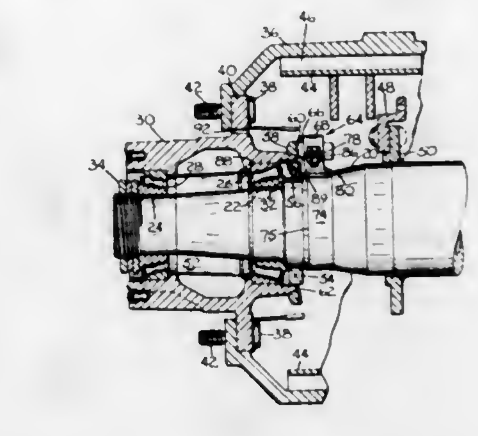


4,037,689
AUDIBLE ALARM SOUNDING TYPE PAD CLIP DEVICE FOR DISC BRAKE
Toshifumi Maehara, Iwatsuki, Japan, assignor to Akebono Brake Industry Company, Ltd., Tokyo, Japan
Filed Jan. 23, 1976, Ser. No. 651,629
Claims priority, application Japan, July 5, 1975, 50-94106[U]
Int. Cl.^{2} F16D *66/02*
U.S. Cl. 188—1 A **5 Claims**



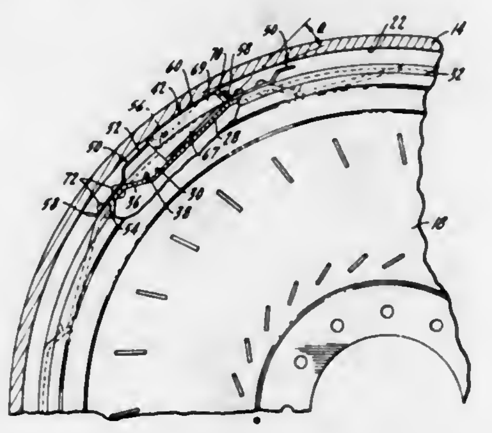
1. An audible alarm sounding pad clip device for disc brakes consisting of a side portion comprising an elongated U-shaped resilient member is adapted to be attached to the backing metal plate of a friction pad and includes a loop formed in the base portion of said resilient member and another side portion of the U-shaped member arranged to be resiliently in contact with the friction pad guiding face of a support with the end of the same side portion extending to a point coinciding with an allowable limit of wear of the lining of said friction pad.

4,037,690
SENSOR MODULE BRACKET
Frank H. Fisher, Kenton, Ohio, and Raymond John Jovick, Troy, Mich., assignors to Rockwell International Corporation, Pittsburgh, Pa.
Filed Oct. 9, 1975, Ser. No. 621,216
Int. Cl.^{2} B60T *8/12*
U.S. Cl. 188—181 R **10 Claims**



1. A bracket for mounting a sensor module to a veicle axle comprising an elongated body, a center portion of said body having a mounting surface adapted for contact with a surface of said axle and locating means projecting away from said surface, each end of said body being spaced radially outward from said center portion and adapted to mount one end of a sensor module, intermediate portions of said body connecting each of said body ends to said center portion and means for securing said center portion to said axle.

4,037,691
CENTRIFUGAL LOCK UP CLUTCH FOR FLUID COUPLINGS
John Saxon Ivey, Bloomfield Hills, Mich., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Jan. 2, 1976, Ser. No. 646,301
Int. Cl.^{2} F16H *41/18;* **F16D** *43/14*
U.S. Cl. 192—3.31 **7 Claims**

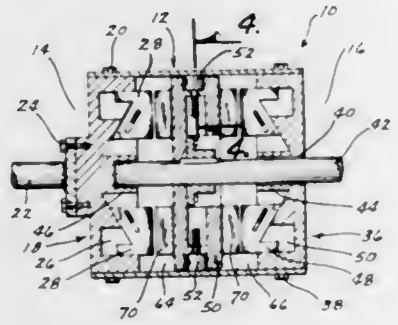


1. An engaging mechanism having first and second relatively rotating members, said first member comprising an annular shell, a series of ramps formed on said annular shell, a plurality of friction devices mounted between said ramps and said second member, cam means on said ramps in engagement with said devices, said devices having a frictional surface thereon, centrifugal force acting to urge said devices to move into engagement with said second member at a given speed of rotation to lock said members for rotation together, said cam means acting after initial engagement to wedge said devices between said ramps and said second member to increase the torque capacity of said engaging mechanism, said series of ramps being defined by forming said shell to provide a ramp

area extending axially from said annular shell and forming said ramps inwardly in said ramp area.

4,037,692
SPEED RESPONSIVE FLUID COUPLING AND CLUTCH

Douglas F. McFarland, Davis City, Iowa 50065
Filed Feb. 12, 1976, Ser. No. 657,453
Int. Cl.² F16H *41/18;* **F16D** *43/14*
U.S. Cl. 192—3.31 **7 Claims**



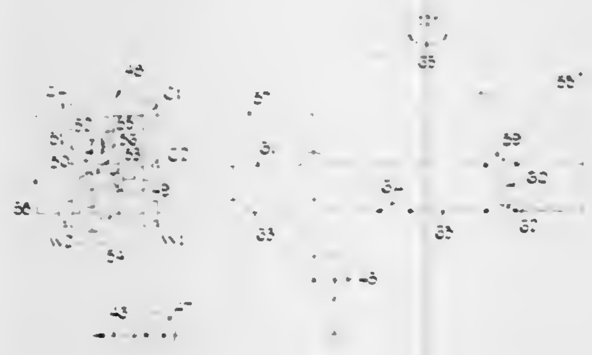
7. In a fluid coupling comprising,
a housing means having first and second ends,
a vane support means secured to said first end of said housing means for rotating said housing means and having inner and outer ends,
a power input shaft secured to said vane support means,
an output shaft rotatably extending into said housing means through one end thereof,
a clutch support means rotatably mounted on said output shaft in said housing means for rotation with said output shaft,
said housing having a fluid compartment between the inner end of said vane support means and said clutch support means,
movable vanes mounted on said inner end of said vane support means,
said movable vanes normally in an inoperative position but being movable into said fluid compartment at a predetermined time to cause the fluid therein to be revolved whereupon said clutch support means will be rotated,
and a movable clutch means on said clutch support means, said clutch means normally being in a disengaged position but being movable into engagement with said housing means at a predetermined time whereby said housing means and said clutch support means will be rotated at the same speed.

4,037,693
MOTOR VEHICLE DRIVE SYSTEM

Roger John Arthur Hewitt, Abingdon, and Nigel Terence Cross, Sheffield, both of England, assignors to GKN Transmissions Limited, Birmingham, England
Continuation of Ser. No. 419,982, Nov. 29, 1973, abandoned. This application July 14, 1975, Ser. No. 595,991
Claims priority, application United Kingdom, Nov. 29, 1972, 55199/72
Int. Cl.² B60K *41/22;* **F16H** *37/00*
U.S. Cl. 192—3.56 **7 Claims**

1. The combination in a motor vehicle of a prime mover, a multi-speed main gearing provided with a manual ratio selector means movable from a neutral position to any one of a number of operative positions equal to the number of ratios available in said main gearing but having no other operative positions, a disengageable main clutch between the prime mover and the input to the main gearing, a driver operated main clutch control having a first position in which the main clutch is engaged to transmit drive from the prime mover to the main gearing and a second position in which the main clutch is disengaged and which is normally assumed during ratio changes of the main gearing by said selector means, an auxiliary two ratio gearing in series with the main gearing, and ratio control means for the auxiliary gearing operable in dependence solely on the positions of the main clutch control and the manual ratio selector means so that, whenever the main gearing is in its highest ratio, the only action required to change the operative ratio of the auxiliary gearing is the movement of the main clutch control to its second position, each said movement of the main clutch control to its second position actuating the ratio control means to change the operative ratio of the auxiliary gearing while simultaneously disengaging the main clutch.

3. The combination in a motor vehicle of a prime mover; a multi-speed main gearing provided with a manual ratio selector means movable from a neutral position to any one of a number of operative positions equal to the number of ratios available in said main gearing but having no other operative positions; a disengageable main clutch between the prime mover and the input to the main gearing; a driver operated main clutch control having a first position in which the main clutch is engaged to transmit drive from the prime mover to the main gearing and a second position in which the main clutch is disengaged and which is normally assumed during ratio changes of the main gearing by said selector means; an auxiliary two ratio gearing in series with the main gearing, said auxiliary gearing being of the epicyclic type which provides a direct drive ratio and a planetary ratio; and ratio control means for the auxiliary gearing and operable in dependence solely on the positions of the main clutch control and the manual ratio selector means said ratio control means including (1) a hydraulic circuit having an outlet which is controlled by an electrically operated valve, said outlet being arranged when closed to pressurize said circuit thereby engaging the planetary ratio of the auxiliary gearing and (2) a relay arranged to control operation of the electrically operated valve, said relay being arranged to be activated, and hence the electrically operated valve closed, on the first movement of the main clutch control to its second position after the higest ratio of the main gearing has been engaged, the relay being deactivated, and hence the electrically operated valve opened, on subsequent movement of the main clutch to its second position, so that whenever the main gearing is in its highest ratio, the only action required to change the operative ratio of the auxiliary gearing is the movement of the main clutch control to its second position, each said movement of the main clutch control to its second position actuating the ratio control means to change the operative ratio of the auxiliary gearing while similtaneously disengaging the main clutch.

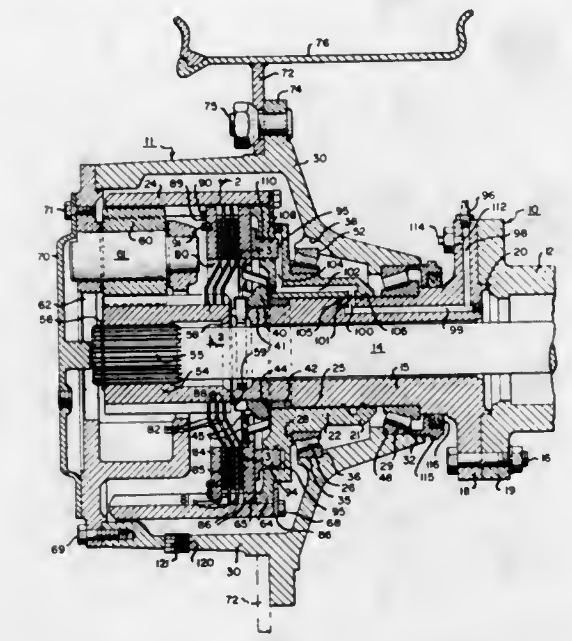


4,037,694
DRIVE AXLE OUTER END WITH BRAKE AND GEARING

Beverly W. Keese, Neenah, Wis., assignor to Rockwell International Corporation, Pittsburgh, Pa.
Filed July 21, 1975, Ser. No. 597,643
Int. Cl.² B60K *29/02*
U.S. Cl. 192—4 A **4 Claims**

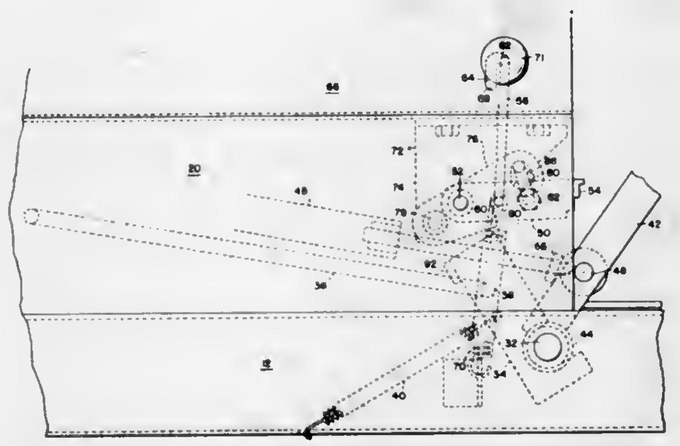
1. An axle outer end assembly comprising:
a hollow spindle,
an axle shaft projecting from said spindle,

an output member rotatably mounted on said spindle,
a planetary drive operably connecting said axle shaft and said output member, said planetary drive including a ring gear having a set of teeth, said gear being fixed to said spindle and a plurality of pinion gears engaging the teeth at one end of said ring gear,
a disc brake comprising a plurality of axially movable discs having projections extending radially outward into engagement with the teeth at the other end of said ring gear and second axially movable disc means comprising at least one disc intermediate adjacent ones of said first plurality of discs, said second disc means being non-rotatably secured to an element of said planetary drive,
abutment means preventing axial movement of said discs and disc means beyond a predetermined point, and
brake actuating means operative to move said discs and disc means axially toward said abutment means and into frictional contact with one another whereby said element and said output member are restrained against rotation.



4,037,695
INTERLOCK FOR A VEHICLE BRAKE AND CLUTCH CONTROL

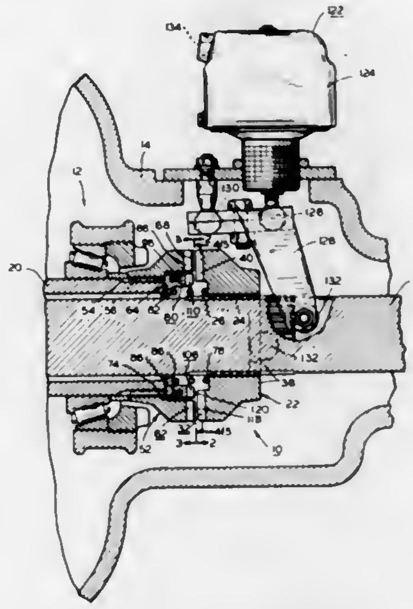
Arnold Emil Welck, Horicon, Wis., assignor to Deere & Company, Moline, Ill.
Filed Aug. 13, 1975, Ser. No. 604,166
Int. Cl.² F16D *67/02*
U.S. Cl. 192—13 R **8 Claims**



1. In a vehicle traction drive clutch and brake control of the type including clutch and brake control linkages exclusive of each other respectively including pivotally mounted clutch and brake pedals with the clutch pedal being pivotable between a normal drive establishing position and an actuated drive disestablishing position and with the brake pedal being pivotable between a normal brake-release position and an actuated brake-engage position, and a parking lock control linkage mounted for selective movement into engagement with the brake control linkage for locking the brake pedal in its actuated position, the improvement comprising: actuating means operatively interconnected between the parking lock control linkage and the clutch control linkage for locking the clutch pedal in its actuated position in response to the parking lock control being moved to lock the brake pedal in its actuated position; said parking lock control linkage including a first pivotally mounted locking pawl movable between a lock position, wherein it engages the brake control linkage and holds the brake pedal in its brake-engage position, and an unlock position wherein it is disposed free of the brake control linkage; and said actuating means includes an interlock member connected to said first locking pawl for movement therewith.

4,037,696
DYNAMIC TOOTH CLUTCH

Noah Alvin Shealy, Niles, Mich., assignor to Clark Equipment Company, Buchanan, Mich.
Filed May 7, 1976, Ser. No. 684,326
Int. Cl.² F16D *11/00*
U.S. Cl. 192—48.5 **21 Claims**



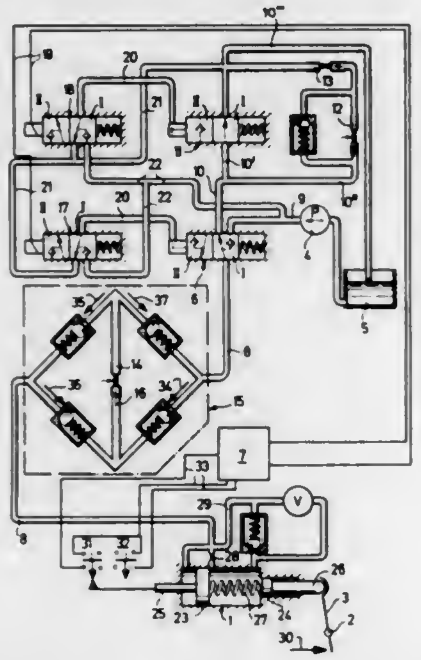
1. An improved dynamic tooth clutch comprising:
a. a pair of opposed annular members each of which has a series of equally angularly spaced axially extending teeth thereon, the teeth of said members being adapted to intermesh with clearance, so that when said teeth are in mesh, limited relative rotation can take place between said members, with the radial extent of the teeth of one of said members being greater than that of the teeth of the other of said members;
b. a cam ring concentric with said other member;
c. complementary retaining and control means on said cam ring and said other member such that said cam ring can rotate relative to said other member by a predetermined angular amount in either direction from a position in which it is centered relative to said other member, said control means also including yieldable means for biasing said cam ring toward its centered position;
d. a series of axially extending teeth on said cam ring adapted to intermesh with clearance with said teeth of said one member, so that when said teeth of said one member are in mesh with said teeth of said cam ring, limited relative rotation can take place between said one member and said cam ring, with the axial clearance between the outer axial end faces of the teeth of said annular members being less than the axial clearance between the outer axial end faces of the teeth of said one member and the outer axial end faces of the teeth of said cam ring, so that the tooth axial end faces of said annular members can axially abut whilst there is still axial clearance between the tooth axial end

faces of said one member and the tooth axial end faces of said cam ring; and

e. means for effecting relative axial displacement between said one member on the one hand and said other member and said cam ring on the other hand to effect meshing engagement between the teeth of said annular members and between the teeth of said one member and the teeth of said cam ring.

4,037,697
HYDRAULIC CLUTCH ACTUATING SYSTEM

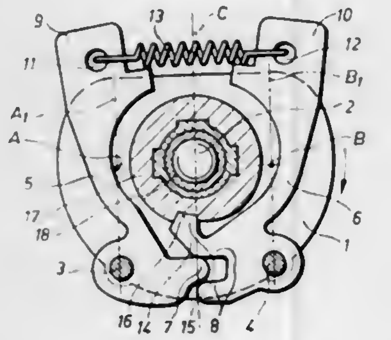
Karl Prenzel, Neu-Katzwang, Germany, assignor to Ardie-Werk, GmbH, Nurnberg, Germany
Filed Aug. 21, 1974, Ser. No. 499,539
Claims priority, application Germany, Aug. 21, 1973, 2342234
Int. Cl.² A16D *25/00*
U.S. Cl. 192—91 R 6 Claims



1. Means for electrohydraulically actuating a clutch comprising:
- a fluid reservoir;
- a source of pressurized fluid;
- hydraulic actuating motor means for actuating said clutch;
- fluid carrying means connected to said hydraulic actuating motor, said fluid reservoir and said source of pressurized fluid to provide pressure fluid to actuate said hydraulic motor means;
  - said fluid carrying means connected to said hydraulic actuating motor means comprise first and second discharge lines disposed in parallel relation communicating with said reservoir and said hydraulic actuating motor means;
- fluid actuated control valve means connected with said fluid carrying means to control a flow of pressure fluid with respect to said hydraulic actuating motor means;
- said fluid actuated control valve means comprise:
  - a fluid actuated shut-off valve in said second discharge line; and
  - first viscosity-independent flow regulator means in said first discharge line;
- first electrically actuated control valve means connected with said fluid carrying means and said fluid actuated control valve means to control said fluid actuated control valve means;
- viscosity-independent flow regulator means operatively connected in said control valve means to regulate fluid flow with respect to said hydraulic motor means;
- electrical means to control said electrically actuated control valves means; and
- means connecting said first electrically actuated valve means to said electrical means to actuate said first electrically actuated valve means.

4,037,698
CENTRIFUGAL COUPLING

Albert Rix; Hans Fuchs, and Jens Onuscheit, all of Wilhelmshaven, Germany, assignors to Olympia Werke AG, Wilhelmshaven, Germany
Filed Oct. 3, 1974, Ser. No. 511,914
Claims priority, application Germany, Nov. 10, 1973, 2356247
Int. Cl.² F16D *23/10*
U.S. Cl. 192—105 CE 8 Claims



1. A centrifugal coupling, comprising a first element rotatable about an axis of rotation; a second element having a first coupling portion; and means for entraining said second element for joint rotation with said first element, including a pair of flyweights mounted on said first element for pivoting about respective pivot axes parallel to and equidistant from said axis of rotation, means for connecting said flyweights for simultaneous pivoting away from and toward one another between respective rest and coupling positions thereof, and at least one second coupling portion on one of said flyweights which engages said first coupling portion in said coupling position, each of said flyweights having a center of gravity and a plane defined by the latter and the respective pivot axis, and being acted upon, during the operation of the coupling, by mass-related forces reducible into said center of gravity and resolvable into first components located in said plane, and second components normal to said plane, said entraining means being so constructed that said planes of said flyweights extend parallel to one another in said coupling position and said second components of non-centrigual forces having the same magnitudes act on both of said flyweights in the same direction and result in equal but opposite forces at said connecting means which counteract each other so that said first and second components of said non-centrifugal forces cannot pivot said flyweights from said coupling toward said rest positions thereof.

4,037,699
SAFETY APPARATUS FOR A PUNCH PRESS

Peter J. Cronen, Jr., 2910 Fairchild Ave., Wayzata, Minn. 55391
Filed July 28, 1975, Ser. No. 599,334
Int. Cl.² F16D *7/00*
U.S. Cl. 192—134 10 Claims

1. Safety apparatus attachable to a punch press which includes a flywheel, an electric drive motor which drives the flywheel, and a triggering device for initiating the pressing cycle, the flywheel being engageable with a crankshaft by means of a selectively engageable clutch for driving a ram, said safety apparatus comprising:

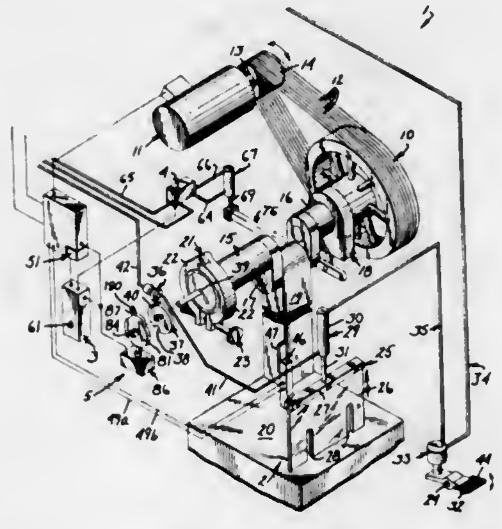
a. a drive and braking motor, said motor driving in one direction when power is supplied to the motor and imparting a braking force in a direction counter to the driving direction when the power supply to the motor is shut off;

b. means operably connected said drive-brake motor to the flywheel on the punch press for driving and braking the motion of the flywheel;

c. starting swtich means movable between an open and a closed position for intermittently transmitting power from a power source therethrough;

d. starting switch actuation means responsive to activation of the triggering device operable connected with the triggering device and with said starting switch means for moving said starting switch means between an open and a closed position when the triggering device is activated;

e. an energizable timing switch operably connected with said starting switch means so as to become energized when the starting switch means are actuated, said timing switch having a time delay which is initiated when said timing switch is energized, said timing switch being automatically movable between an opened and a closed position at the end of the time delay;



f. circuit means operably connecting the drive-brake motor with the starting switch means and a power source, for starting the motor when the starting switch means are actuated;

g. engagement means operably connected to said timing switch for positively engaging the clutch which interconnects the flywheel with the crankshaft, said engagement means movable from a disengaged to an engage position in response to said timing switch at the end of the time delay to thereby allow the flywheel to move the crankshaft through a pressing cycle; and

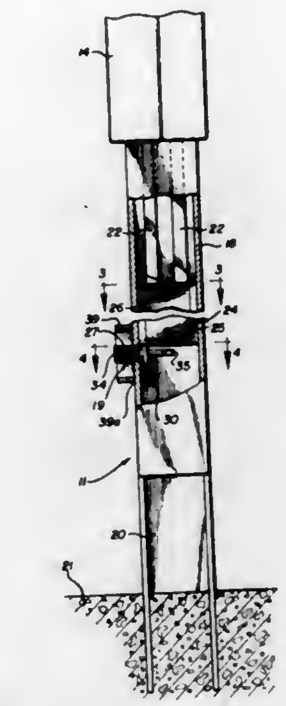
h. shut-off switching means operably attached to the crankshaft and said circuit means for shutting off power to said drive-brake motor after one pressing stroke of the ram has been completed, thereby causing said drive-brake motor to brake the motion of the flywheel to which it is connected.

4,037,700
COIN VAULT

Patrick T. Heraty, 3785 Columbus, Chicago, Ill. 60652
Filed June 1, 1976, Ser. No. 691,598
Int. Cl.² G07F *9/06*
U.S. Cl. 194—1 B 15 Claims

1. A coin vault assembly for coin operated devices, including
- an upstanding hollow post anchored to a support, a coin receiving mechanism mounted to the top of the post and electrical conductor means for connecting a device to said coin mechanism for programmed operation,
- a port at the bottom of the post, a removable coin box within the post, said coin box having continuous sidewalls, a top and a bottom, an opening in the top of said coin box,
- a coin chute extending from said coin mechanism and communicating with the opening in said top of the coin box,
- a support means associated with the bottom of the coin box,
- a locking member for said support member, and means in a sidewall of the post to hold the support member when the locking member is locked and to release the support member when the locking member is unlocked,

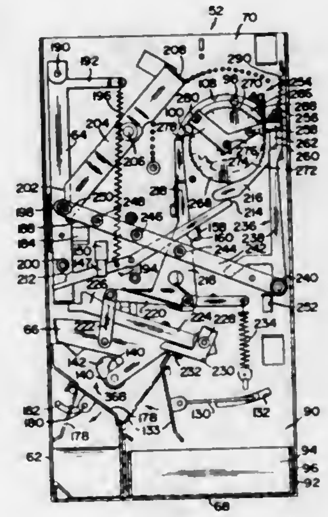
whereby said support member holds the coin box above the port thereby requiring the user to unlock the locking member by manual manipulation through the port so that



the said support member may be withdrawn from said holding means and the coin box may be dropped for removal from the post through said port.

4,037,701
PRICE SETTER FOR TOTALIZER COIN MECHANISM

Karl Knickerbocker, 400 Baycrest Drive, Venice, Fla. 33595
Continuation-in-part of Ser. No. 616,944, Sept. 26, 1975, abandoned. This application June 14, 1976, Ser. No. 696,129
Int. Cl.² G07F *5/08*
U.S. Cl. 194—1 L 6 Claims



1. A coin controlled mechanism for use with a dispensing machine wherein the dispensing machine includes an access door to permit removal of articles from the dispensing machine and latch means attached to the access door to normally lock the access door in a closed position, said controlled mechanism comprising a housing attached to the dispensing machine, coin chute means arranged within said housing to receive coins inserted into said housing, an actuator means movably attached to said housing and disposed to lockingly engage the latch means when in a non-dispensing position and disengage the latch means when in a dispensing position, a totalizer means movable between a dispensing and non-dispensing position disposed in coin interrupted disposition relative to said coin chute means to advance from said non-dispensing to said dispensing position in response to coins fed through said coin chute means, said actuator means movable from said non-dispensing to said dispensing position to operatively engage said

totalizer means and disengage the latch means to unlock the access door when said totalizer means is in said dispensing position relative to said actuator means and an adjustable price setter means comprising a limit stop movable between an upper and lower limit disposed to engage said totalizer means to control the movement thereof and variable adjustment means mounted on said housing, said variable adjustment means including an upper and lower limit means movably mounted on said housing independent of each other to selectively vary the relative distance therebetween, said limit stop coupled to a price control means movable between a first and second position by a quick change adjustment means movable between a first and second position to move said limit stop between said upper and lower linits, said upper and lower limit means disposed to engage said limit stop to control said upper and lower limits.

4,037,702

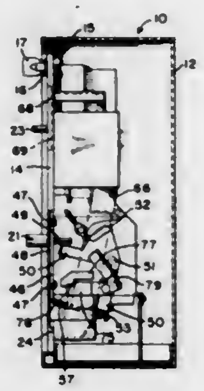
COIN OPERATED DISPENSING MACHINE

Jack Albert, Dayton, Ohio, assignor to American Lottery Equipment, Inc., Dayton, Ohio

Filed Mar. 15, 1976, Ser. No. 667,189

Int. Cl.^{2} G07F *5/04*

U.S. Cl. 194—93 **2 Claims**



1. An interlock for a coin operated dispenser for preventing operation thereof until a predetermined number of coins of predetermined size are received therein, for enabling a single operation thereof when such coins are received, for collecting the predetermined number of coins, and for holding additional received coins and accepting them in the same number for each operation of the dispeners, comprising:

a. an inclined holding chute for receiving and containing the coins therein, said holding chute being open at both ends thereof,
b. a first blocking member for blocking the lower end of said chute to contain the coins therein, said first blocking member being movable to release the coins for collection from said chute when the dispenser is operated,
c. means forming a slot across said holding chute at a distance from said first blocking member equal to approximately the sum of the diameters of the predetermined number of coins to be received therein,
d. a second blocking member movable into said slot in said chute when the dispenser is operated to separate the coins beneath from those above said slot and to prevent those above from moving downwardly through said chute as said first blocking member unblocks the lower end thereof during operation of the dispener,
e. means biasing said second blocking member toward movement into said slot through the position occupied by the uppermost of the predetermined number of coins when they are stacked in said chute on said first blocking member,
f. stop means for engaging and stopping movement of said second blocking member when it begins to move through said uppermost coin position, and
g. means causing second blocking member to engage the upper edge of the uppermost coin, when present, to cause said uppermost coin to cam said second blocking member up and over said stop means to permit said second blocking member to enter fully into said slot when the predetermined number of said coins of predetermined size is present therebeneath in said chute.

4,037,703

BLOCKING DEVICE FOR CARD OR VOUCHER READERS DESIGNED FOR PUBLIC USE

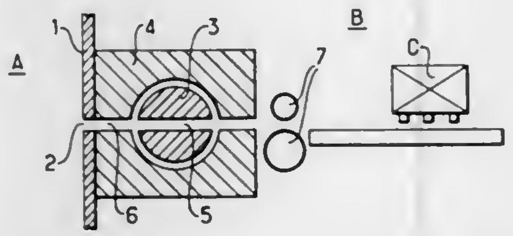
Andre Michaud, Chatenay Malabry, and Bernard Chalus, Arpajon, both of France, assignors to Transac - Compagnie Pour le Develcppment des Transactions Automatiques, Paris, France

Filed Dec. 12, 1975, Ser. No. 640,298

Claims priority, application France, Dec. 20, 1974, 74.42225

Int. Cl.^{2} G07F *7/00*

U.S. Cl. 194—97 R **3 Claims**



1. In a device for blocking a slot formed in a wall separating two mediums and for permitting the free passage, in an open position, from one medium to the other, of a flat object, said device comprising a cylindrical element, means for supporting said element for rotating about its axis in front of said slot, an elongated radial opening extending through said element, means for rotating said element about its axis and means for stopping rotation of said element in predetermined angularly spaced positions, the improvement comprising a guide block including a cylindrical opening receiving said cylindrical element and supporting said cylindrical element for rotation about its axis, said block including a passage extending therethrough from said wall and intersecting said element for alignment with the radial opening of said element, and wherein said means for rotating said cylindrical element comprises means for rotating said element in a single direction from position to position and through 360°; whereby, a cord attached to the card for effecting fraudulent passage of the flat object first in one direction through said passage from one side of the block to the other and through said aligned radial opening of said element wherein said opening of said element is aligned with said passage of said block and for subsequent passage in the opposite direction, wraps itself about the cylinder and blocks the passage to prevent the card from being recovered in an unauthorized fashion.

4,037,704

ACTUATOR FOR A WIRE MATRIX PRINTER AND METHOD OF MAKING

Gary L. Golobay, Valley Center, and Robert L. Schrag, Wichita, both of Kans., assignors to NCR Corporation, Dayton, Ohio

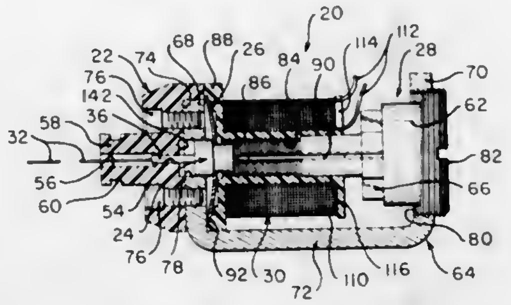
Filed July 3, 1975, Ser. No. 593,082

Int. Cl.^{2} B41J *3/04*

U.S. Cl. 197—1 R **6 Claims**

1. An actuator for a wire matrix printer comprising:
a frame means;
a plunger means having opposed abutment areas thereon and being mounted in said frame means for reciprocal movement between first and second position therein, and a print wire fixed to said plunger means to travel therewith;
a spring means having opposed fingers operatively connected to said opposed abutment areas on said plunger means to bias said spring means when said plunger means is moved to said first position;
magnet means producing a magnetic effect for attracting said plunger means toward said first position and for

holding it in said first position against the bias of said spring means, and also having abutment areas thereon;
means for producing a neutralizing flux which neutralizes said magnetic effect of said magnet means enabling said spring means to accelerate said plunger means towards said second position; and



said spring means being operatively disconnected from said plunger means after accelerating said plunger means towards said second position by having said spring means engage said abutment areas on said magnet means to thereby enable said plunger means to travel ballistically at least part way towards said second position.

4,037,705

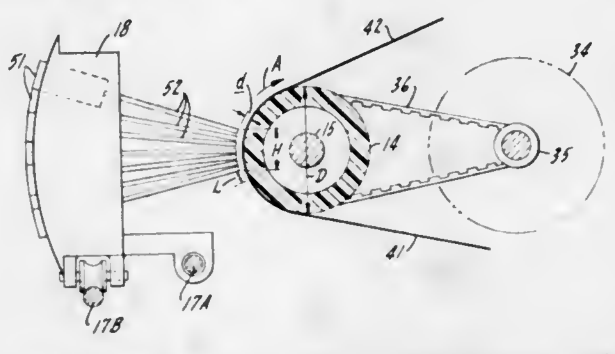
DESCENDER PRINTING SYSTEM FOR DOT MATRIX PRINTER

Donald P. Martin, Buffalo Grove, and Richard G. Ryan, Elmhurst, both of Ill., assignors to Extel Corporation, Northbrook, Ill.

Continuation-in-part of Ser. No. 624,054, Oct. 20, 1975, Pat. No. 3,990,559. This application Apr. 9, 1976, Ser. No. 675,566

Int. Cl.^{2} B41J *19/92, 3/04*

U.S. Cl. 197—1 R **7 Claims**



1. In a dot matrix printer of the kind comprising a print head, including a plurality of print elements disposed in a vertical array, for printing characters on a record sheet supported upon a platen in a format $m \times n$ of m horizontal column increments and n vertical row increments, a carriage for moving the print head across the record sheet in a horizontal printing direction with the lowermost printing element normally aligned with a horizontal base print line on the record sheet, and control means, including a FIFO input store, for actuating the print elements and the carriage in response to a received signal including a series of code words representative of characters to be printed and of other functions of the printer, the improvement comprising:
descender decoder means for decoding code words representative of descender characters that include descender components to be located below the base print line, prior to printing;
descender shift means, coupled to the descender decoder means, for shifting the record sheet upwardly through a distance L equal to p row increments, from a normal print position to a descender print position, thereby aligning p print elements below the base print line for printing each descender character, where $p < n$;
and shift reset means, included in the descender shift means, for shifting the record sheet downwardly through distance L from the descender print position to the normal print position, after completion of printing of a descender character, to permit printing a subsequent character entirely above the base line.

4,037,706

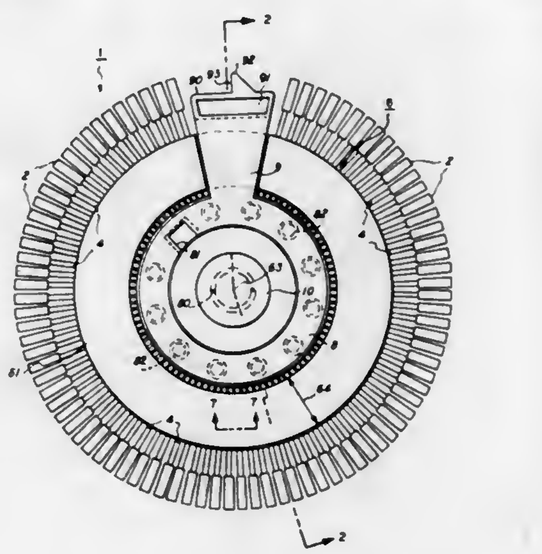
COMPOSITE PRINT WHEEL

Gordon Sohl, Richardson; David L. Bogert, Lewisville; Richard G. Crystal, Dallas, all of Tex., and Michael C. Weisberg, San Carlos, Calif., assignors to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 509,193, Sept. 25, 1974, abandoned. This application May 6, 1976, Ser. No. 683,977

Int. Cl.^{2} B41J *1/30*

U.S. Cl. 197—54 **29 Claims**



1. A print element for an impact printer comprising:
a metal alloy insert member having a plurality of beams extending radially outward from a center section, said center section having an opening in the center thereof and a plurality of apertures spaced around the center opening and positioned between the center opening and the beams,
character slugs molded to the ends of the beams, said character slugs having an impact surface engageable by hammer means for deflecting the character slug toward a record medium enabling a print surface on the slug to cooperate in a process for marking the record medium,
each of said character slugs including a print section and a capture section for coupling to the end of a beam whereby the energy imparted to the character slug by the hammer means is substantially reflected in stresses in the print section of a character slug rather than the capture section, and
plastic hub means having a plurality of projections, each of whieh extends through a respective one of the apertures in the insert member and coacts with the insert member to fixedly couple the hub means to the insert member,
said print element having an inertia of from about 6.4×10^{-4} in-oz-sec^2 to about 8.0×10^{-4} in-oz-sec^2.

4,037,707

CUP SHAPED PRINTER

Ta Cheng Ku, and Donald Joseph Stiles, both of Endwell, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

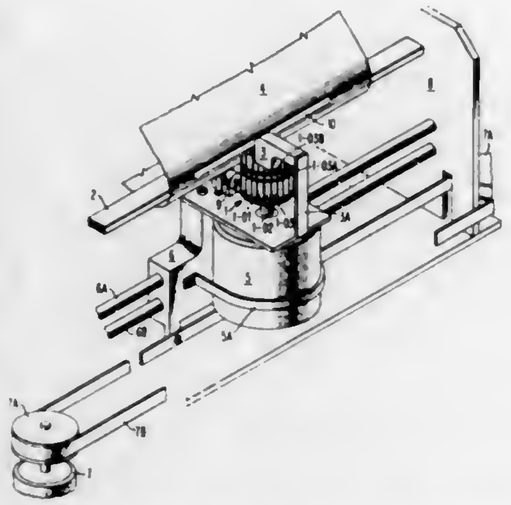
Filed Mar. 8, 1976, Ser. No. 665,030

Int. Cl.^{2} B41J *1/34*

U.S. Cl. 197—53 **3 Claims**

1. A print element for a serial printer which comprises:
a plurality of independent fingers, each of which has an axis and a first and a second end, a plurality of characters on said first end of each finger,
a central mounting element,
two semi-flexible non-stretchable parallel arms extending

from said central mounting element to the second end of each finger,



means to independently raise or lower each finger without substantially tilting the axis of said finger.

4,037,708

MULTICOLOR INK RIBBON CONTROL FOR A TYPEWRITER

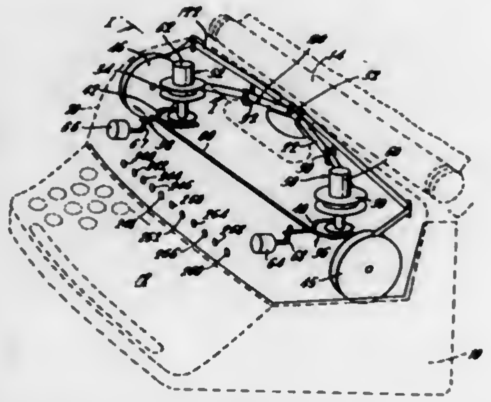
David A. Walker-Arnott, Bletchley, England, assignor to Xerox Corporation, Stamford, Conn.

Filed Jan. 26, 1976, Ser. No. 652,449

Claims priority, application United Kingdom, Feb. 5, 1975, 4950/75

Int. Cl.² B41J *33/20, 31/00*

U.S. Cl. 197—151 **10 Claims**



1. A typewriter ribbon system to enable selection of any specific longitudinal portion of a ribbon to be present in the operative impact area of the typewriter, comprising:

a ribbon including more than two longitudinal portions of different characteristics, each portion being separated from the other by a barrier portion, said ribbon extending from a first spool means on one side of said operative area to a second spool means on the opposite side of said operative area,

a ribbon drive means arranged adjacent each spool means and connectable thereto to drive a respective spool means, each said ribbon drive means being alternately operable to move said ribbon through said operative area, said ribbon drive means includes a motor and a clutch held between first and second resilient means, said motor and clutch being movable to move said clutch into and out of engagement with said spool means, and

a control means to operate said drive means to position a selected portion of said ribbon in said operative impact area.

4,037,709

RIBBON SPOOL WITH BUILT-IN BIFACIAL RE-INKER

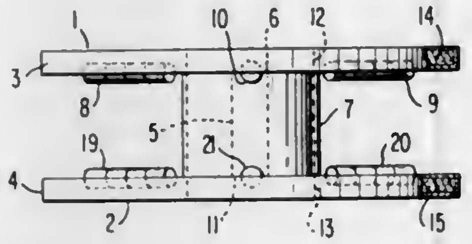
Eulogio Camacho Tibay, 1486 Castillo Park Subdivision, Almanza, Las Pinas, Rizal, Philippines

Filed Sept. 4, 1975, Ser. No. 610,350

Claims priority, application Philippines, Sept. 4, 1974, 16242

Int. Cl.² B41J *31/14*

U.S. Cl. 197—171 **1 Claim**



1. In a ribbon spool having a ribbon holder for holding ribbon wound thereon; a pair of fenders secured at the ends of said ribbon holder, said fenders each having faces disposed inwardly towards a ribbon wound on said holder, the improvement comprising: re-inker means provided on each of said fenders, said re-inker means having rollers rotatably mounted in each fender and slightly protruding at the inner faces thereof, an inking felt pad sealingly mounted in each of said fenders and said rollers comprising a series of segmented rollers rotatably supported in said fenders in communication with said felt pads, said rollers being positioned trisectionally on said fenders whereby ink from said inking pads is transferred to the edges of a ribbon wound on said ribbon holder in contact with said rollers during rotation of said spool which effectuates the winding and unwinding thereof to uniformly transfer ink to said ribbon by capillary action.

4,037,710

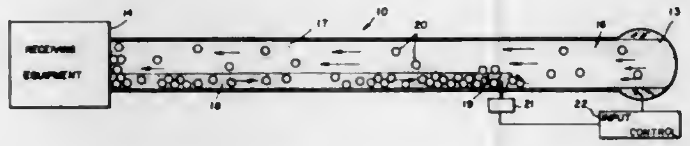
ACCUMULATOR FOR OBJECT FEEDER

Donald W. Brutcher, Mattydale, N.Y., assignor to Lipe-Rollway Corporation, Syracuse, N.Y.

Continuation-in-part of Ser. No. 487,385, July 11, 1974, abandoned. This application July 28, 1975, Ser. No. 599,663

Int. Cl.² B65G *27/00*

U.S. Cl. 198—443 **5 Claims**



1. An object accumulator for a feeder having a vibrated pile material oriented to direct the flow of objects, a feed portions of said pile material being oriented to form a substantially direct object feed route from an input region to an output region, an accumulator portion of said pile material being arranged adjacent and alongside said feed portion at said output region and at the same level as said feed portion, and said accumulator comprising:

a. a removal portion of said vibrated pile material directly adjacent said feed portion at said output region and oriented relative to the vibration direction of said accumulator to move said objects generally rearwardly relative to the direction of motion of said objects in said feed portion of said output region so that objects crowded out of said feed portion in said output region are pushed onto said removal portion without resistance from the orientation of any of said pile material to prevent jamming if said objects in output region, and said crowded-out objects are moved generally rearwardly of said feed direction;

b. a re-entry portion of said vibrated pile material directly adjacent said feed portion upstream of and adjacent to said

removal portion and oriented in a direction extending toward said feed portion for receiving said crowded-out objects from said removal portion and moving said crowded-out objects back toward said feed portion;

c. said removal portion and said re-entry portion being oriented and dimensioned relative to the size of said objects and said vibration direction of said accumulator to cooperate in moving said crowded-out objects in a generally arcuate swirl held outside said feed portion by crowding contact with said objects in said feed portion of said output region, said swirl variably accumulating from one to many of said objects, the distance across said swirl varying with the number of said objects crowded into said swirl, and said objects in said swirl being in crowded-together contact with each other and with said objects in said feed portion;

d. the radially inner portion of said swirl forming a relatively short path of substantially minimum length for a relatively rapid re-entry to said feed portion for said crowded-out objects pushed just outside of said feed portion;

e. portions of said swirl radially outward from said inner portion forming relatively longer paths up to many times the length of said short path for relatively slower re-entry to said feed portion for said crowded-out objects pushed relatively far away from said feed portion; and

f. said swirl returning said crowded-out objects to said feed portion as soon as space in said feed portion is available.

4,037,711

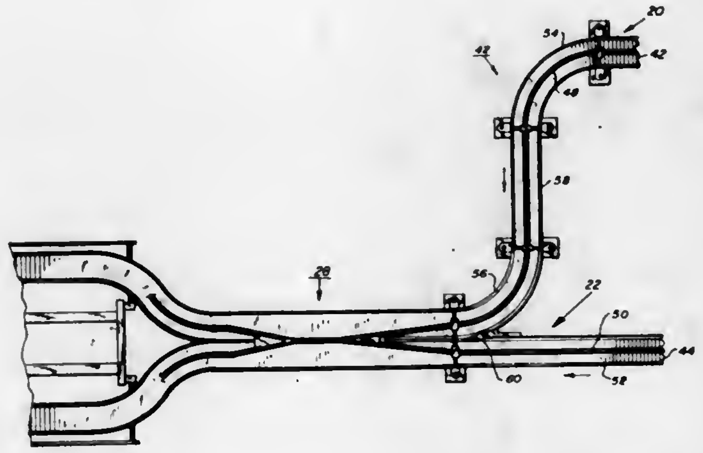
ANTI-JAM CONVERGING APPARATUS FOR BAILED CONTAINERS FROM PLURAL CONVEYORS

Raymond A. Heisler, 657 Dakota Trail, Franklin Lakes, N.J. 07417

Filed Oct. 23, 1975, Ser. No. 624,852

Int. Cl.² B65G *47/26*

U.S. Cl. 198—452 **9 Claims**



1. An anti-jam converging and metering apparatus in which containers carried on at least two conveyors are advanced in random order to a converging apparatus which receives these containers and by and with the forward propulsive motion of these containers actuates this apparatus so as to feed these containers one-at-a-time to a single line conveyor by which they are advanced to subsequent operations, said converging apparatus including: (a) at least two conveyors having length portions on which are provided side guide members and on these conveyors the containers are transported in an upright manner with at least one of the conveyors having its delivery end arranged to bring this conveyor toward and to the other conveyor to provide a Y-type converging portion; (b) a pivoted finger carried by a support means and in a manner so that the finger is easily moved in a plane substantially parallel to the plane of the conveyors, this pivot so positioned that the swinging end of the finger is normally directed toward the single conveyor, the swinging end of the finger being selectively movable to two extremes of movement and also in way of either of the paths of the containers carried on these converging conveyors, this finger so contoured and movably mounted that in each of the two extremes of movement the end is displaced so as to intrude into the path of a container on that conveyor over which the end of the finger is positioned while at this same time the pathway along the other conveyor is open to the flow of containers and when the finger is moved to the other extreme of movement the conveyor which was open to the flow of containers is closed while that conveyor previously blocked by the finger is now open for forward passage of containers; (c) an edge cam member provided on the outer side of a first conveyor and so formed and positioned as to tangentially engage a side portion of an advancing container on this conveyor and to move and guide this container in a path whereby at this same time the outer side of the displaced container engages a side of the finger to move the end of the finger around the pivot so that the moved end of the finger at this extreme of movement obstructs the pathway of a container along the second conveyor and with the finger in this first extreme of position the finger permits the container on the first conveyor to advance to the single line conveyor; (d) a lift plate provided on the outer side of the second conveyor this outer side being opposite the side adjacent the pivoted finger, said lift plate engaging a lower rim of an advancing container to slow the rate of advance of a container on this second conveyor when this container is displaced sidewardly by the finger when it is in way of the normal path of this container on the second conveyor, the finger so positioned and maintained in this position as a result of the prior presence and passage of a container on the first conveyor, and when the finger is in impeding condition on the second conveyor the side of the advancing container engages the side of the finger and when and while the finger is held by a container on the first conveyor this container on the second conveyor is displaced so that the rim is locally carried by the lift plate and with the passing of the container on the first conveyor the outer side guide and the forward urging of the conveyor causes the advancing second container to move the finger from this progress impeding position as soon as the container on the first conveyor has passed from finger engaging position, and (e) a contoured end on the swinging end of the finger, this contour so formed that in the extreme of movement of the pivoted finger the contour of the end in association with a guide side of the associated conveyor provides one side of a guided pathway which enables uninhibited passage of containers on a first conveyor and through the apparatus which containers on the second conveyor have not arrived at the pivoted finger and in the other extreme of movement of the contoured end of the swinging finger the opposite face of the finger provides a guided pathway along the second conveyor and uninhibited passage on this second conveyor through the apparatus when containers on the first conveyor have not arrived at the pivoted finger, the actuation of the finger being accomplished in response to the presence of and the forward propulsion of a container along one of the conveyors.

4,037,712

METHOD AND APPARATUS FOR SUPPLYING TOBACCO TO TOBACCO CUTTING MACHINES

Waldemar Wochnowski, Hamburg, Germany, assignor to Hauni-Werke Korber & Co., KG, Hamburg, Germany

Filed Jan. 30, 1976, Ser. No. 653,737

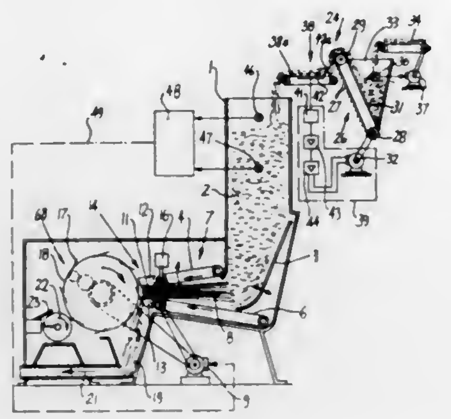
Claims priority, application Germany, Feb. 6, 1975, 2504902

Int. Cl.² B65G *43/08*

U.S. Cl. 198—524 **15 Claims**

6. Apparatus for supplying tobacco to at least one tobacco cutting machine having variable-speed prime mover means whose speed determines the output of said machine, comprising a container arranged to store a supply of tobacco; a metering unit having means for feeding to said container a continuous stream of tobacco at a substantially constant rate; means for transferring tobacco from said container to said machine; regulating means operable to vary the speed of said prime mover means so that the speed of said prime mover means

respectively increases and decreases when the volume of tobacco in said container respectively increases and decreases for reasons other than fluctuations in the rate of feed by said feeding means, particularly as a result of variations in temperature, moisture content and/or size of tobacco forming said stream; and means for operating said regulating means, including means for monitoring the volume of tobacco in said container.



4,037,713

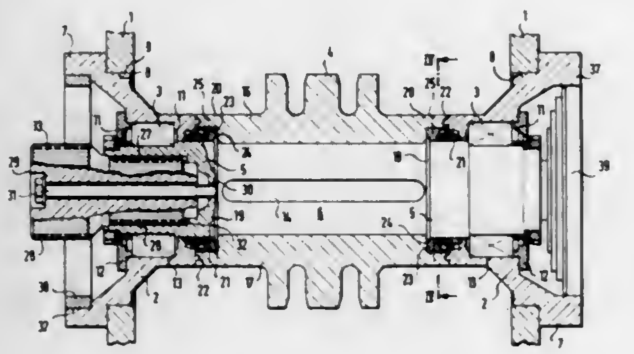
SCRAPER-CHAIN CONVEYORS

Mustafa Soliman, Lunen-Sud; Wulff Rösler, Altlunen; Jacob Spies, Dudweiler, and Klaus Herberg, Altlunen, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Westfaliar, Germany

Filed Mar. 22, 1974, Ser. No. 453,920

Int. Cl.² B60D *1/36;* F16H *1/00*

U.S. Cl. 198—725 **31 Claims**



1. A frame assembly for use with a scraper-chain conveyor; said assembly comprising:

a. a solid, continuous shaft with hollow end portions,
b. said shaft extending over substantially the entire width of the assembly,
c. a chain wheel carried by the shaft for rotation therewith,
d. two substantially identical bearing units having inwardly projecting parts with a frusto-conical region including a shoulder extending towards the center of the shaft into which the end portions of the shaft are received and are supported for rotation,
e. the bearing units being arranged symmetrically of the assembly,
f. means for supporting the bearing units with said shoulder of the bearing unit being engaged with the supporting means, and
g. spline or key means within the hollow end portions of the shaft and journal coupling means having external locating means engageable with said spline or key means enabling the shaft to be selectively coupled to drive means whereby the shaft can be driven from either end.

4,037,714

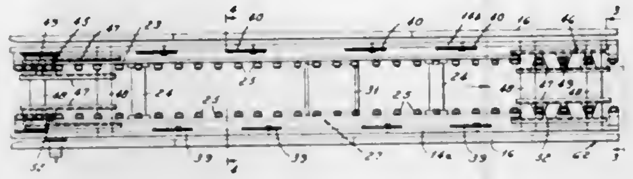
RECIPROCATING CONVEYOR

Frederick W. Koepke, Livonia, Mich., assignor to Centri-Spray Corporation, Livonia, Mich.

Filed July 21, 1976, Ser. No. 707,427

Int. Cl.² B65G *35/00*

U.S. Cl. 198—750 **10 Claims**



1. In a conveyor having a frame, a transfer bar carried by the frame, the transfer bar having article supporting means thereon, and driving means for reciprocating the transfer bar on forward and return movements.

the improvement comprising:

an expandable and contractable section carried by the frame adjacent at least one end of the transfer bar, said section including a plurality of article supports relatively movable in the directions of forward and return movements of the transfer bar, said article supports forming a continuation of the article supporting means of the transfer bar; and,

means for relatively moving said article supports to vary the spacing therebetween in response to forward and return movements of the transfer bar.

4,037,715

CHAIN CONVEYER SYSTEM

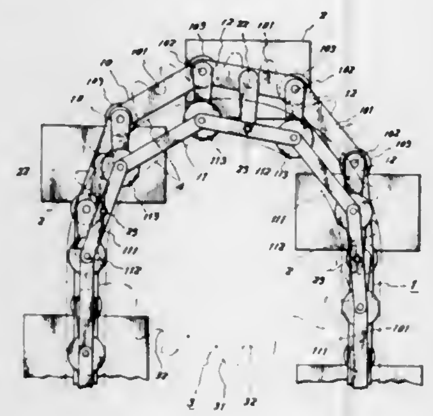
Katsuya Onishi, and Katsuyoshi Yoshida, both of Akashi, Japan, assignors to Yamato Scale Company, Japan

Filed Mar. 4, 1976, Ser. No. 663,668

Claims priority, application Japan, Apr. 18, 1975, 50-48052

Int. Cl.² B65G *17/12*

U.S. Cl. 198—800 **1 Claim**



1. A chain conveyor system, comprising a main roller chain stretched and driven along a predetermined transportation path, an auxiliary roller chain having the same pitch and same total length as said main roller chain and arranged in side by side relationship with said main roller chain and in a plane which is parallel to the plane in which said main roller chain is arranged, chain coupling links of equal effective length respectively coupling the roller shafts of said main roller chain to the roller shafts of said auxiliary roller chain, carriage supporting shafts respectively penetrating the links of said main roller chain rotatably at their midway points in the direction of said roller shafts and supporting carriages fixed thereto on the side opposite to the side of said auxiliary roller chain, coupling arms having the same effective length as said chain coupling links, one end of each of said coupling arms being fixed to said carriage supporting shafts respectively on the side of said auxiliary roller chain and the other end being pivoted at a midway point of a link of said auxiliary roller chain, whereby said chain coupling links and coupling arms maintain a parallel orientation throughout the system, and inner and outer chain guides in contact with rollers of said auxiliary roller chain to control the path of said auxiliary roller chain and to maintain said chain coupling links at a predetermined angle with respect to the horizontal plane.

4,037,716

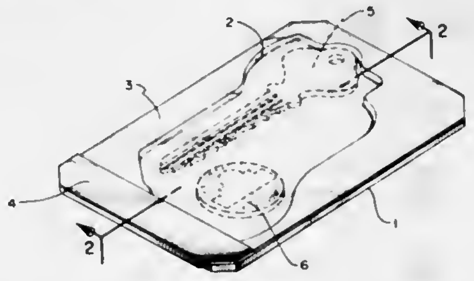
CARD KEY AND/OR COIN HOLDER

John D. Marks, 5077 Moordale Circle, Salt Lake City, Utah 84117

Filed June 21, 1976, Ser. No. 698,175

Int. Cl.² B65D *75/32;* A45C *11/00*

U.S. Cl. 206—38 **7 Claims**



1. A transferable and portable card holder for keys, coins and/or similar items comprising a rigid card having a depressed region therein for receiving and securely and durably containing one or more items and a pressure resealable, at least partially adhesively-coated lid which covers the depressed region and which adheres to the non-depressed surface of the card, whereby the lid can be repeatedly opened and closed to expose the contained items by stripping the lid from the surface of the card.

4,037,717

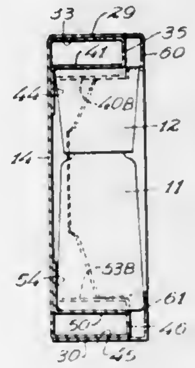
DISPLAY CARTON

Harry I. Roccaforte, Western Springs, Ill., assignor to Hoerner Waldorf Division - Champion Int. Corporation, St. Paul, Minn.

Filed July 23, 1975, Ser. No. 598,541

Int. Cl.² B65D *5/50*

U.S. Cl. 206—45.14 **2 Claims**



1. A blank made of paperboard and adapted to be folded into a display carton of generally rectangular and tubular shape, comprising:

a substantially rectangular sheet of said paperboard, said sheet having opposed vertical lateral edges and opposed horizontal top and bottom edges;

four vertically spaced parallel hinge lines intermediate the lateral edges thereof defining a pair of side walls, a front panel, a back panel, and a manufacturer's glue flap positioned at one lateral edge thereof;

said side walls and said front panel having end closure flaps hingedly attached to the top and bottom edges thereof along said top and bottom horizontal edges;

said front panel having means for displaying the contents of the carton;

said back panel having a first rectangular flap hingedly attached along the bottom edge thereof;

said first flap having a bottom cushioning structure hingedly attached thereto along a horizontal fold line;

said bottom cushioning structure having a pair of elongated apertures formed therein aligned substantially perpendicular to said bottom edge of said back panel, each of said apertures having spaced apart inner and outer lateral edges;

said structure including a second flap hingedly connected along a horizontal fold line to said first flap and defined on the opposite side by a first intermediate fold line extending between the ends of said elongated apertures as well as a first pair of colinear fold lines spaced between the lateral edges of said structures and said outer lateral edges of said apertures;

said inner lateral edges of said apertures and said first intermediate fold line together with a second intermediate fold line spaced from said first intermediate fold line defining a center support panel;

said outer lateral edges of said apertures and said first pair of colinear fold lines together with a second pair of colinear fold lines parallel to said first pair defining a pair of restraining panels on either lateral side of said bottom cushioning structure; and

a glue flap connected to said center section along said second intermediate fold line and to said restraining panels along said second pair of colinear fold lines.

4,037,718

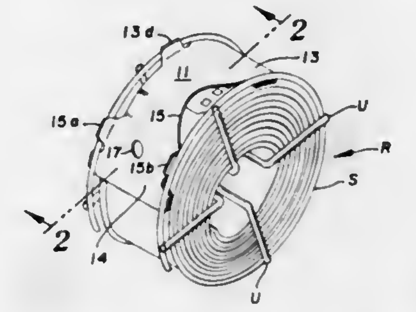
FILM RETENTION DEVICE

Paul Franklin Stiller, 23675 Smithtown Road, Excelsior, Minn. 55331

Filed Mar. 17, 1976, Ser. No. 667,495

Int. Cl.² B65D *85/672*

U.S. Cl. 206—53 **15 Claims**



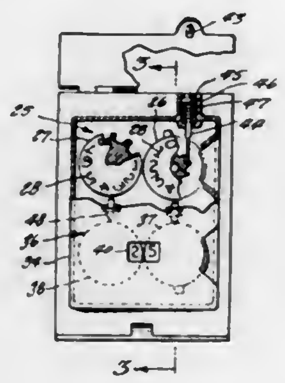
1. In combination, a film mounting reel and a film retention device therefore, said combination including:

a. a film mounting reel having a longitudinally extending core portion and a pair of longitudinally spaced film spacing elements arranged on said core portion, said film spacing elements including a sprially formed support member extending laterally from said core, the longitudinal spacing of said support members provided to receive the image area of the film therebetween;
b. the film retention device including a longitudinally extending, planar, body portion of a generally resilient material to allow forming thereof for placement thereof into said reel between said spiral supports thereof; and,
c. said body having at least one pair of oppositely directed, transversely extending tab elements, the transverse dimension of said tabs permitting the same to extend transversely into the spiral film supports of said reel for locking between adjacent of such spiral supports to retain the film against one of said spiral supports.

4,037,719

CIGARETTE COUNTING CASE

Alan Perlmutter, 120 Pitt Road, Springfield, N.J. 07081
Filed June 1, 1976, Ser. No. 691,559
Int. Cl.² B65D *85/10*
U.S. Cl. 206—266 **1 Claim**

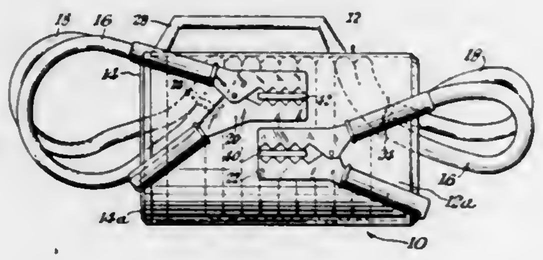


1. In a cigarette counting case, the combination of a first housing for containing a pack of cigarettes, a compartment in said first housing having a top opening and a bottom opening, said top opening being normally retained closed by an upwardly pivotable, spring-loaded top door, and said bottom opening being normally retained closed by a downwardly pivotable, spring-loaded bottom door, and said top door having a downwardly protruding post on its underside activating a counting mechanism contained in a second housing integrally formed on a front side of said first housing; said top opening including a pair of inwardly projecting tabs along a center of opposite longitudinal side edges thereof to prevent passage of a cigarette pack through said top opening into or out of said first housing thereby requiring usage of only said bottom opening for entering and removing a cigarette pack into said first housing, said second housing containing also a second counting mechanism that is manually operated; said mechanims each including a pair of intermeshing, numerically calibrated wheels behind a window opening on said second housing exposing aligned numerical calibrations of said pair of wheels, one said wheel having a knurled edge extending in a notch on an outer side of said second housing for manual resetting of said pair of wheels; said first mechanism being indicated with a text "cigarettes that I smoked today" and said second mechanism being indicated with a text "cigarettes that I smoked yesterday;" and said first mechanism, activated by said post, including a spring-loaded plunger pin which at its lower end bears against ratchet teeth of said knurl-edged wheel, said pin being slidable in a hole which opens on a top edge of said first housing, said pin at rest having an upper end that is flush with said first housing top edge.

4,037,720

BATTERY JUMPER CABLE CARRIER

Joseph McGurk, 121 NE 31st St., Pompano Beach, Fla. 33064
Filed July 26, 1976, Ser. No. 708,561
Int. Cl.² B65D *85/04;* H01B *7/06*
U.S. Cl. 206—328 **5 Claims**



1. In combination, a pair of battery jumper cables and a portable storage receptacle for the cables comprising:

a cable housing, said housing having an open end and a closed end surface, said closed end surface including an aperture receiving a cable;

a housing closure removeably mounted on the open end of said housing, said closure having at least one aperture for receiving a cable disposed therethrough;

a pair of electrical cables disposable within said housing, one end of said cables disposed through said housing closed end surface aperture and the opposite end through said closure aperture;

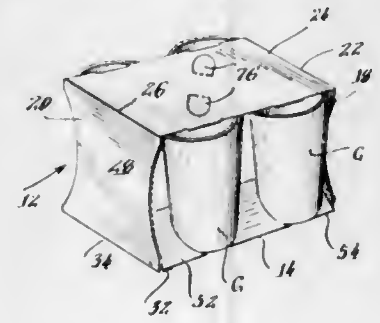
a battery terminal clamp coupled to each end of said electrical cables; and

cable slide preventing means coupled to said cable ends for retaining said closure adjacent one end of said cables and said housing closed end adjacent the opposite end of said cables to prevent relative movement of said closure and said housing relative to an intermediate portion of said cables.

4,037,721

GLASSWARE CARRIER

Joseph F. Schillinger, Palos Hills, Ill., assignor to Champion International Corporation, Stamford, Conn.
Filed Sept. 30, 1976, Ser. No. 728,263
Int. Cl.² B65D *65/10*
U.S. Cl. 206—434 **14 Claims**



1. A receptacle for displaying and carrying glassware comprising:

a substantially rectangular parallelopiped sleeve having a top wall, a bottom wall, a pair of side walls, and an open front and rear surface, collapsible to a substantially flat configuration about hinge lines connecting said walls at their lateral edges,

a substantially upright divider wall secured to the interior of each of said top and bottom walls and extending between said pair of side walls,

a support panel secured between said bottom wall and the divider wall on each side of said divider wall and said top wall and the divider wall on each side of said divider wall, each of said support panels being disposed at an acute angle with respect to the top and bottom wall to which it is secured and having at least one opening for receiving an item of glassware disposed between the openings adjacent said top and bottom walls on the same side of each of said divider walls,

means for pivoting each of said divider walls to a substantially flat condition on an adjacent top or bottom wall, and means for locking said divider wall in a substantially upright position relative to an adjacent top or bottom wall.

4,037,722

PROTECTIVE PACKAGING FOR BOTTLES

Donald Bremer, 6303 Mojave Drive, San Jose, Calif. 95120
Filed Mar. 29, 1976, Ser. No. 671,590
Int. Cl.² B65D *81/04, 81/16*
U.S. Cl. 206—523 **5 Claims**

1. A protective packaging for bottles having different neck lengths, comprising:

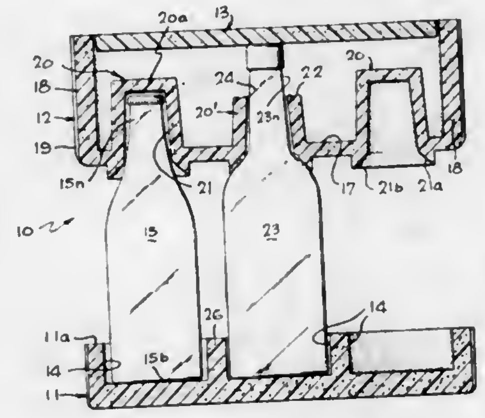
a bottle support block having a plurality of bottle-base-receiving recesses therein, and

a generally box-shaped unitary bottle neck retainer having;

a. a generally planar web section forming the bottom of said retainer, the length and width of said retainer corresponding to the like dimensions of said support block,

b. sidewalls projecting upwardly from the periphery of said web section, and

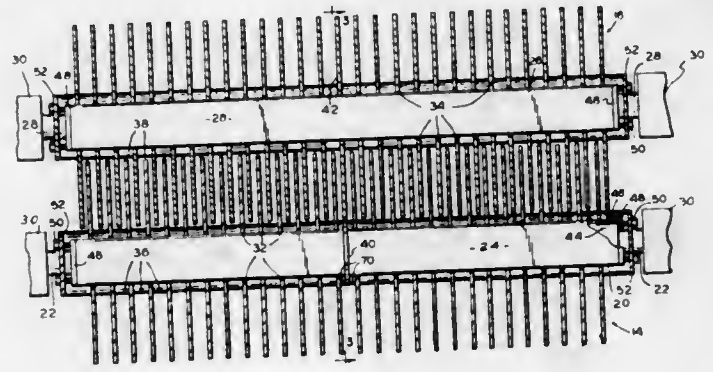
c. a like plurality of bottle-neck-receiving inverted cups integrally attached to said web section in geometric conformity with the arrangement of said recesses in said support block, said neck-receiving cups also projecting upwardly from said web section, the height of said sidewalls being greater than the height above said web section of said cups, said retainer being adapted to slip over the necks of bottles supported in said block, the upper portion of each cup extending above said web section and being individually flangible so as to accommodate a bottle having a neck of length greater than that received completely within one of said unbroken cups, said neck of greater length projecting through the opening in said cup exposed by breaking off the upper portion thereof.



4,037,723

DISK SEPARATOR

Harold F. Wahl, Portland, and James L. Keating, Boring, both of Oreg., assignors to Rader Companies, Inc., Portland, Oreg.
Filed May 2, 1975, Ser. No. 573,892
Int. Cl.² B07B *13/04*
U.S. Cl. 209—104 **6 Claims**



1. In an improved separator,

a first shaft,

a second shaft,

means journalling the shafts in parallel positions,

a plurality of first spacers slidable on the first shaft,

a plurality of first feed discs splined to the first shaft and positioned between the first spacers,

a plurality of second spacers slidable on the second shaft,

a plurality of second feed discs splined to the second shaft and positioned between the second spacers,

locating means for positioning said feed discs comprising, first locating means fixed to the first shaft at a predetermined point along the length thereof,

second locating means fixed to the second shaft at a point therealong such that the second locating means is laterally aligned with the first locating means,

said first locating means being parallel to said first feed discs and extending radially around said shaft beyond the internal periphery of said spacers to form a stop abutment,

said second locating means being parallel to said second feed discs and extending radially around said shaft beyond the internal periphery of said spacers to form a stop abutment,

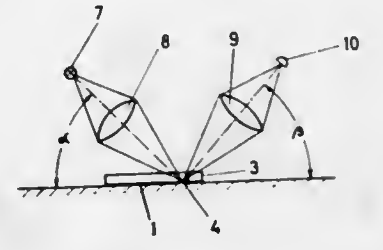
first retaining means pressing the first spacersand first feed discs snugly together and snugly against opposite sides of the first locating means,

and second retaining means pressing the second spacers and the second feed discs snugly together and snugly against the opposite sides of the second locating means.

4,037,724

METHOD OF AND APPARATUS FOR MEASURING DEFECTS IN SEALINGS

Peter Schultz, and Hinrich Martinen, both of, Quickborn, Germany, assignors to Firma Up Geratebau-und Vertriebs GmbH, Malente, Germany
Filed May 20, 1975, Ser. No. 579,208
Int. Cl.² B07C *5/342*
U.S. Cl. 209—111.7 R **5 Claims**



1. A method for measuring sealing material defects in a circular, ring-shaped sealing area of a container closure, said sealing area being located on the bottom, interior surface of an axially symmetrical closure, and said sealing area being coated with a sealing material, said sealing material having a different coefficient of reflectivity of light than said bottom interior surface at a predetermined wavelength, comprising the steps of:

a. selecting a wavelength such that there is a maximum difference between the reflectivity coefficients of said sealing material and said bottom interior surface of said closure,

b. positioning said closure in a predetermined control area;

c. illuminating a predetermined scan area of said sealing area of said closure with substantially monochromatic light pulses of said predetermined wavelength, the width of said predetermined scan area corresponding to the annular width of said sealing area;

d. maintaining said light pulses at a constant amplitude and correlating the pulse rate of said pulsed light to the rotational speed of said closure whereby an unbroken scanning of said sealing area is carried out,

e. detecting the level of the light of said predetermined wavelength reflected from said predetermined scan area;

f. rotating said closure by at least 360° about the axis of said ring-shaped sealing area so that the light reflected from said sealing area is progressively scanned over said entire sealing area;

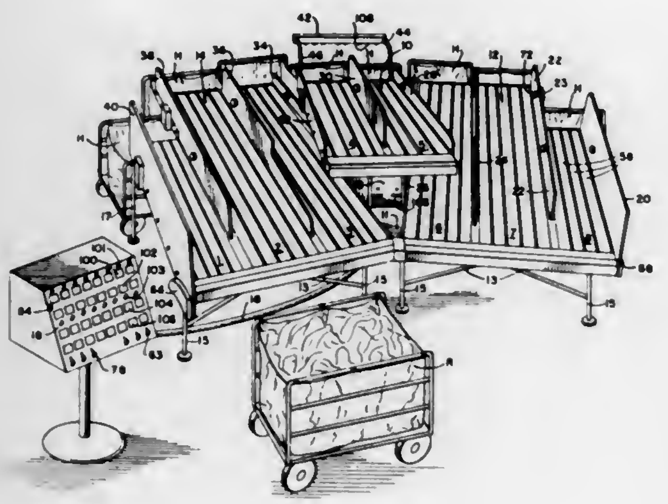
g. comparing said detected light level with a predetermined value representing the reflected light level of an inadequately coated portion of said sealing area; and

h. ejecting said closure from said predetermined control area when said detected light level corresponds to said predetermined value, whereby closures having a defect in said sealing material coating over a portion of said sealing area are rejected prior to being applied to a container.

4,037,725

LAUNDRY SORTING MACHINE

Harold G. Roberts, 5905 Jimson Lane, and Robert J. Brooks, 3001 N. Deer Track Road, both of Tucson, Ariz. 85702
Filed Jan. 19, 1976, Ser. No. 649,932
Int. Cl.² B07C *7/00*
U.S. Cl. 209—122 **12 Claims**



1. Apparatus for delivering segregated items of laundry from a sorting area into a corresponding one of a plurality of hampers within a discharge area, said apparatus comprising in combination:

a. a plurality of first conveyor means for conveying the items of laundry, said plurality of first conveyor means defining a fan like pattern from the sorting area to the discharge area, each of said first conveyor means including an input end disposed in proximity to the sorting area for receiving sorted items of laundry and located at a first level and including an output end disposed in proximity to the discharge area at a common discharge level for discharging the items of laundry into the hampers located therebelow, the input ends being close together and some of the output ends being separated to provide a space between the separated output ends of the first conveyor means in the fan like pattern;

b. a plurality of second conveyor means for conveying further items of laundry, said plurality of second conveyor means extending from the sorting area to the discharge area, each of said second conveyor means including an input end disposed in proximity to the sorting area for receiving sorted further items of laundry and located at a second level upwardly displaced from the first level and partially overlapping said closely spaced input ends of the first conveyor means and further including an output end disposed in a space between separated output ends of the first conveyor means at said common discharge level, the output ends of the second conveyor means in general horizontal alignment with the output ends of said plurality of first conveyor means for discharging the further items of laundry into the hampers; and

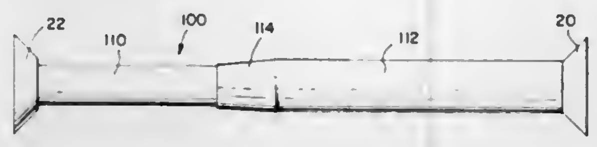
c. drive means for driving said plurality of first and second conveyor means;

d. whereby an operator within the sorting area has ready access to the input ends of said plurality of first and second conveyor means and the output ends thereof are sufficiently laterally displaced to accomodate placement of hampers in proximity thereto.

4,037,726

MULTIPLE SECTION CURTAIN ROD

William Edwin Schweers, Maple Ridge, Canada, assignor to Lawrence Peska Associates, Inc., New York, N.Y., a part interest
Filed Nov. 30, 1976, Ser. No. 746,069
Int. Cl.² A47H *1/022*
U.S. Cl. 211—105.5 **3 Claims**

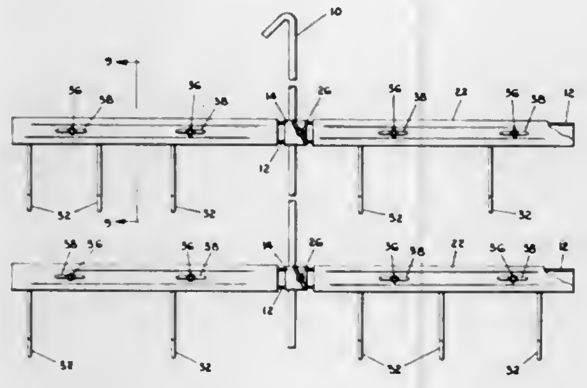


1. A resiliently biased telescoping curtain rod comprising center rod means, first tubular means telescopingly engaging one end of said rod means, second tubular means telescopingly engaging the opposite end of said rod means, resilient means operatively engaging said telescoping means for biasing said telescoping means away from each other and in an abutting relation with wall members to be spanned by said curtain rod, said resilient means comprising means for biasing both said first tubular means and said second tubular means away from each other, wall engaging means on the ends of said telescoping means for holding said curtain rod on wall members to be spanned by said curtain rod, collapsible and expandable curtain rod cover means surrounding said curtain rod and extending from one end of said first tubular means beyond said rod means and to the end of said second tubular means, said rod cover being adapted to receive curtain hook means, said rod cover comprising third tubular means surrounding and extending inwardly from the end of said first tubular means, a fourth tubular means telescopingly sliding over and receiving said third tubular means, the inwardly extending end of said fourth tubular means being gradually tapered towards the center of said third tubular means for slidingly moving curtain hook members over said rod cover.

4,037,727

ADJUSTABLE PAINTING OR PLATING RACK

Kenneth W. Kunkle, Grand Rapids, Mich., assignor to Pierce America, Inc., Grand Rapids, Mich.
Filed Jan. 2, 1976, Ser. No. 645,951
Int. Cl.² A47F *5/08;* **C25D** *17/04*
U.S. Cl. 211—117 **9 Claims**



1. An adjustable rack to hold objects that are to be plated or painted, said rack comprising:

a vertical support shaft;

a suspending means attached to the vertical shaft to support the rack from above;

at least one horizontal arm removably and adjustably attached to the vertical shaft;

fastening means removably connecting the horizontal arm to the vertical shaft to secure the horizontal arm in a fixed position with respect to the vertical shaft including a C-shaped clamp member, said C-shaped clamp member having an aperture disposed horizontally off-center with respect to the clamp member, said C-shaped clamp member receiving within the concave shape thereof, the vertical shaft, and a removable fastener extending through a hole in the horizontal arm and the aperture in the C-shaped clamp member to clamp the horizontal arm to the vertical shaft;

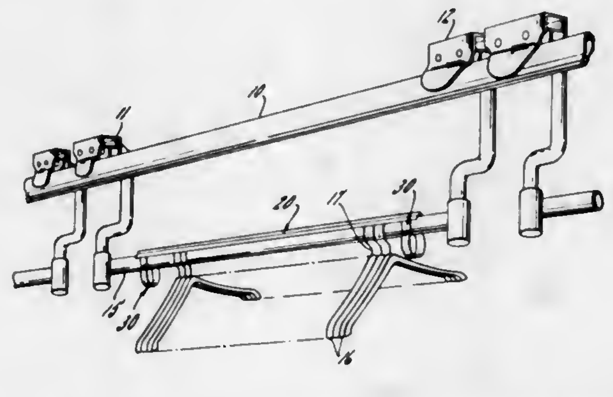
a plurality of hooks intervally spaced along the horizontal length of the horizontal arm, and

a fastening means for removably and adjustably attaching the hooks vertically in a fixed position to the horizontal arm.

4,037,728

CLAMP FOR GARMENT RACKS

Anson W. Cameron, 945 Manor Drive, Wilmette, Ill. 60091
Filed Sept. 7, 1976, Ser. No. 721,036
Int. Cl.² A47F *5/00*
U.S. Cl. 211—124 **3 Claims**



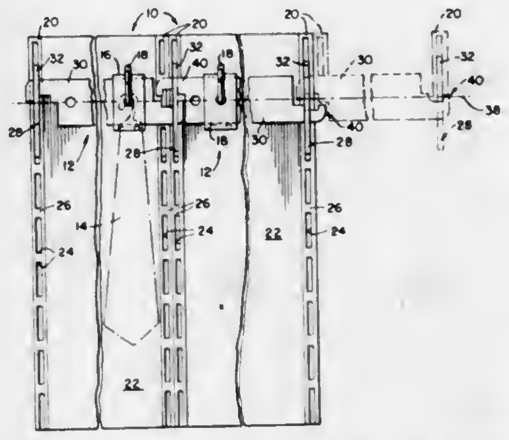
1. In a clamping assembly for clamping garment hangers to a tubular horizontal hanger bar for transport, the combination comprising a longitudinally extending clamping bar extending along and parallel to the hanger bar, a clip adjacent each end of the clamping bar for holding the clamping bar captive on the hanger bar, each clip being formed of a spring band of resilient metal closed in a continuous loop and bent into an open figure eight configuration forming upper and lower lobes, the clamping bar being secured to the clips at the upper lobes thereof, each of the lobes being somewhat larger than the diameter of the hanger bar and with the spring band being deformed inwardly between the lobes to provide a central obstruction in the form of a gap of a width substantially less than the diameter of the hanger bar so that the movement of the hanger is detented as such bar is relatively moved between one of the lobes and the other, and a strip of resilient rubber-like material extending longitudinally along the underside of the clamping bar and secured to the latter to bear against the hooks of the garment hangers on the hanger bar when the hanger bar occupies the upper lobe of the clips during transport in loaded condition, the resilient strip being relatively soft and of sufficient thickness as to bias the hanger bar against the central obstruction when the hanger bar occupies the upper lobe of the clips during transport empty on the return trip thereby to insure a snug fit and to prevent rattling of the clamping assembly on the hanger bar.

4,037,729

DISPLAY APPARATUS

Frank Alfred DeSisto, Yonkers, N.Y., assignor to J. C. Penney Company, New York, N.Y.
Filed May 4, 1976, Ser. No. 683,187
Int. Cl.² A47B *9/00;* **A47F** *5/10*
U.S. Cl. 211—208 **5 Claims**

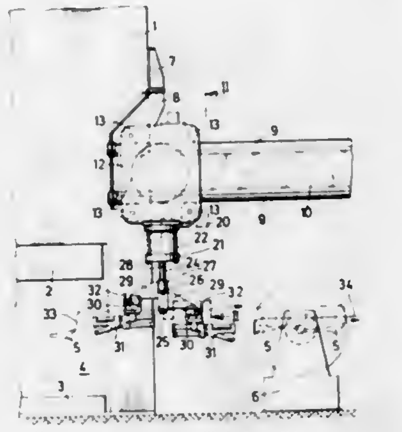
1. Display apparatus for supporting merchandise items which is detachably connected to at least a pair of vertically oriented and spaced apart shelf supporting members having a plurality of discrete slots formed therein, including a pair of end bracket means, each one having at least one projecting lug for detachable connection with the slots and having a pair of spaced apart openings; and first supporting bar connected to and between the bracket means includes latching means projecting from opposite end surfaces of the bar, each latching means is formed generally on the opposite side of a longitudinal axis of the bar from the other latching means and has notch means and forms a forward tongue portion which is adapted to removably and transversely extend through respective ones of the openings, the notch means are sized to enable vertical, longitudinal and tilting displacement of the bar relative to the bracket means for permitting the assembling and disassembling of the bar to the bracket means, the longitudinal displacement defined by the notch means is dimensioned to enable it to not only accommodate various spacings which may exist between the bracket means mounted on the shelf supporting members, but also to limit undesired displacement of the bar by virtue of the notch means being selectively engageable with opposite sides of mounted bracket means, the latch means is at least of such a length which enables a second supporting bar having latching means to be inserted in or removed from the other of the openings in the bracket means and be in an overlapping position with respect to the first supporting bar without being obstructed by the latter.



4,037,730

PRESS LINE WITH WORKPIECE FEEDING DEVICE

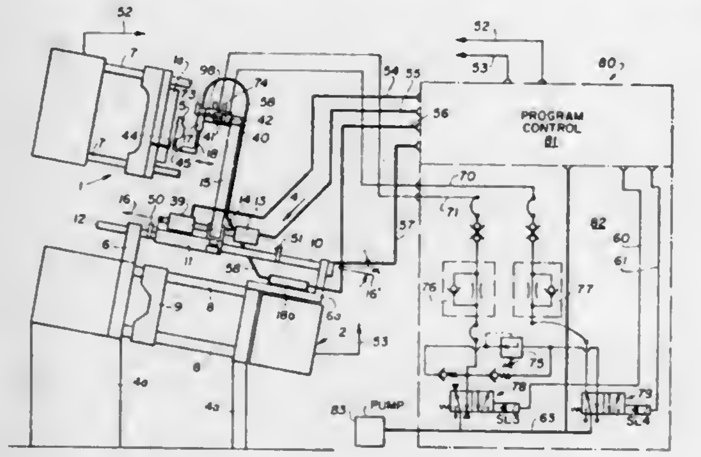
Helmut Fetzer; Franz Schneider, and Helmut Braitinger, all of Goppingen, Germany, assignors to L. Schuler GmbH, Germany
Filed Apr. 9, 1975, Ser. No. 566,194
Claims priority, application Germany, Apr. 9, 1974, 2417131
Int. Cl.² B65G *47/90*
U.S. Cl. 214—1 BB **14 Claims**



1. In combination with a press line having at least two presses, a transfer system transferring workpieces from a processing station of one press to a processing station of a subsequent press, the transfer system comprising track means extending over the entire interspace between two successive presses, a single transfer slide means arranged for horizontal movement along said track means, at least one pair of gripper

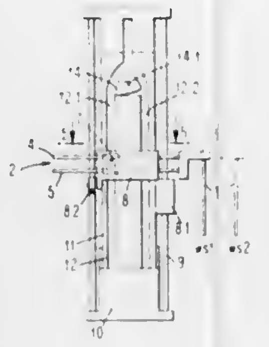
members pointing opposite directions and mounted on said transfer slide means for at least lifting and lowering movements and operating movements to grip and release the workpieces, a single storage station for the workpieces being disposed between the two successive presses, transfer drive means for controlling the movement of said transfer slide means in accordance with the travel path of said transfer slide means, and a reciprocating drive means for lifting and lowering said gripper members along the travel path of said transfer slide means, said transfer drive means and said reciprocating drive means being separate and independent of one another and being independently controllable of one another, said transfer drive means for controlling the movement of said transfer slide means being independent of the drives of the presses, and further comprising program control means for providing a variable program for effecting coordinated control of said transfer drive means, said reciprocating drive means and the operating movements of said gripper members at each of the presses and during transfers therebetween.

4,037,731
WORKPIECE TRANSPORT APPARATUS
Walter Reis, Obernburg, and Dietmar Boll, Elsenfeld, both of Germany, assignors to Walter Reis, Obernburg, Germany
Continuation-in-part of Ser. No. 474,333, May 29, 1974, Pat. No. 3,924,754. This application Oct. 3, 1975, Ser. No. 619,468
Claims priority, application Germany, May 27, 1975, 2523442; May 27, 1975, 7516833[U]
Int. Cl.² B65G *47/90*
U.S. Cl. 214—1 BB **10 Claims**



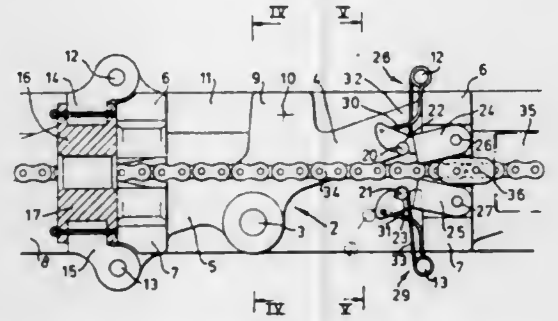
1. Apparatus for transporting a workpiece from one work station to another work station in response to the operation of at least one of said work stations, comprising transport means including a tranport arm, means tiltably supporting said transport arm at one end thereof for pivotal movement about a first axis, said transport arm having a free end opposite said supported end thereof, workpiece gripping means, connecting means supporting said workpiece gripping means on said free end of said transport arm for pivotal movement about a second axis parallel to and displaced from said first axis, said connecting means comprising piston cylinder means secured between said free end of the transport arm and to said gripping means for relatively displacing said workpiece gripping means with respect to said transport arm linearly along said second axis, and control means operatively connected to said piston cylinder means.

4,037,732
POSITIONING APPARATUS
Anthony William Orlando, Highland, and Frederick Arthur Schultz, Poughkeepsie, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Jan. 2, 1976, Ser. No. 646,312
Int. Cl.² B65G *47/90*
U.S. Cl. 214—1 BB **5 Claims**



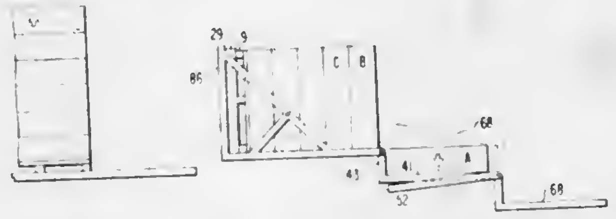
4. Apparatus for positioning a work object precisely relative to plural work stations for execution of work operations at said stations comprising:
- a stationary guide assembly having first and second cam tracks associated with respective first and second said work stations;
- a movable carrier assembly mounted for movement relative to said tracks and having a cam follower engageable with said tracks; said carrier assembly serving to hold said work object;
- a variably displaceable, multifaceted cam rotatably mounted about an axis located within the facets of the said cam and situated at a junction between said tracks; said cam facets being contacted by and displaced by said cam follower in the course of movemet of said carrier assembly for transporting said object from one to the other of said respective work stations; said cam further being effective when displaced to operate to guide said follower from following engagement with a respective one of said tracks to the other of said tracks, thereby positioning said object at the respective other station.

4,037,733
BAR HOLDER ARRANGEMENT FOR BAR STOCK MATERIAL TO BE FED TO A MACHINE TOOL
Ewart H. Doe, Houghton, near Stockbridge, and William J. Linforth, Chandlers Ford, both of England, assignors to Hagenuk Vormals Neufeldt and Kuhnke G.m.b.H., Kiel, Germany
Filed July 29, 1975, Ser. No. 600,116
Int. Cl.² B23Q *5/22*
U.S. Cl. 214—1.5 **8 Claims**



1. A bar holder arrangement for holding bar stock material to be fed to a machine tool, said arrangement comprising:
- a. a frame,
- b. a plurality of levers each pivotably mounted on an elongated member on said frame,
- c. each of said levers having at one of its ends an upstanding member so formed as to present a semicircular recess and at the other of its ends a further upstanding member so formed as to present a semicircular recess,
- d. a plurality of guide members each being so formed as to present a semicircular recess,
- e. each of said guide members being pivotably mounted on a respective one of said upstanding members and said further upstanding members,
- f. said guide members co-operating each with another of said guide members in pairs to define a plurality of circular receiving means for bar stock material and
- g. the pivotal mounting of each of said guide members on its respective upstanding member being about a respective axis perpendicular to the longitudinal extent of the bar holder arrangement such that it is pivotable outwardly to permit passage, between the co-operating pairs of guide members, of a bar feed member having a diameter greater than the diameter defined by the circular receiving means of said pairs of guide members,
- h. said levers being so disposed along said elongated member that the guide member on said upstanding member of one lever co-operates with the guide member on said further upstanding member of the next adjacent lever to define one of said circular receiving means for bar stock material, and
- i. means for pivoting said levers to separate the upstanding member of each lever from the further upstanding member of an adjacent one of said levers to open the bar holder arrangement and enable a length of bar stock material to be moved, in a direction perpendicular to the longitudinal extent of the length of bar stock material, to a position in which it is received by said circular receiving means when said levers are moved to respective positions in which the guide member on the upstanding member of each of said levers abuts the guide member on the further upstanding member of an adjacent one of said levers to form said circular receiving means.

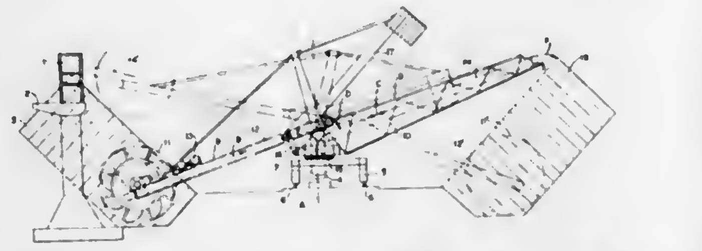
4,037,734
METHOD AND APPARATUS FOR DEPALLETIZING
Frank H. Erdman, Holmes Beach, Fla., assignor to Tropicana Products, Inc., Bradenton, Fla.
Filed Mar. 5, 1976, Ser. No. 664,366
Int. Cl.² B65G *59/06*
U.S. Cl. 214—8.5 A **26 Claims**



1. Depalletizing apparatus for unloading a pallet stacked with a plurality of layers of parallelepiped-shaped objects comprising:
- a. a stationary main support frame;
- b. a pivotable support frame mounted on said stationary main support frame for rotation about a horizontal axis;
- c. means for placing a stacked pallet on said pivotable support frame;
- d. means on said stationary main support frame for rotating the pivotable support frame together with the stacked pallet, 90° about its horizontal axis;
- e. first holding means pivotably connected to said pivotable support frame adjacent the first, top layer of the stack, opposite the pallet, for rotation about a horizontal axis; means for rotating said first holding means together with said first layer 90° to a reclining position from an initial upright position; and

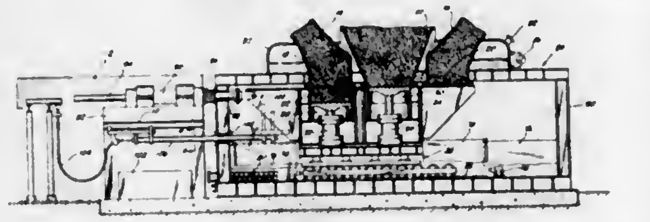
means for transferring said first layer of objects from said first holding means and for rotating said first layer of objects 180° about a horizontal axis so that said objects of said first layer assume the same orientation as when placed onto said pivotable support frame.

4,037,735
RECLAIMING AND STACKING SYSTEM
Heinz Althoff, White Plains, N.Y., assignor to Fried, Krupp Gesellschaft mit beschrankter Haftung, Essen, Germany
Filed Jan. 13, 1976, Ser. No. 648,823
Int. Cl.² B65G *65/28*
U.S. Cl. 214—10 **6 Claims**



1. A reclaiming and stacking system for conveying bulk material, comprising in combination:
- a. an elongated yard conveyor for moving the bulk material in the longitudinal direction of the yard conveyor;
- b. a rail-mounted undercarriage straddling transversely said yard conveyor;
- c. first and second booms each having an inner end and an outer end;
- d. means for supporting said first and second booms on said undercarriage at said inner ends;
- e. first and second boom conveyors supported on and extending along said first and second booms, respectively, each boom conveyor having inner and outer ends;
- f. a bucket wheel supported at said outer end of said first boom for removing bulk material from a pile spaced from and along said yard conveyor and discharging it onto said first boom conveyor at the outer end thereof;
- g. a central chute supported in the zone of said undercarriage and having a discharge end oriented towards said yard conveyor;
- h. the adjacent inner ends of the first and second boom conveyors being located so as to define a direct, unobstructed first path for the bulk material from the inner end of said first boom conveyor to the inner end of said second boom conveyor for providing a transfer of the bulk material by gravity directly from the first boom conveyor to the second boom conveyor; and
- i. transfer means operable to define a second path for transferring bulk material from the inner end of said first boom conveyor into said chute for deposition onto said yard conveyor.

4,037,736
DUAL CYLINDER RECIPROCATING SOLIDS FEEDER
John R. Pownall, Long Beach, and Harold E. Carver, Los Angeles, both of Calif., assignors to Union Oil Company of California, Brea, Calif.
Filed June 1, 1976, Ser. No. 691,633
Int. Cl.² F23K *3/00*
U.S. Cl. 214—23 **16 Claims**

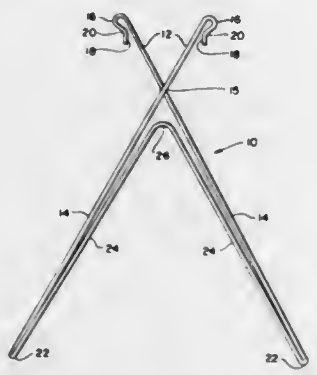


1. A solids feeder for introducing particulated solids into a

solids upflow vessel having a bottom solids inlet opening, which comprises:
- a horizontally movable carriage positioned below said solids upflow vessel;
- carriage actuator means for reciprocating said carriage between first and second stationary positions;
- first and second solids feed chutes communicating with an elevated solids feed reservoir for transporting particulated solids from said solids feed reservoir by gravity flow, each of said solids feed chutes terminating in a bottom outlet opening located at opposite sides of and in the same horizontal plane as the bottom solids inlet opening of said solids upflow vessel, and the bottom outlet openings of said first and second solids feed chutes and the bottom solids inlet opening of said solids upflow vessel being aligned in uniformly spaced relationship along an axis parallel with the direction of movement of said carriage;
- first and second vertical solids feed cylinders mounted on said carriage in spaced relationship along an axis parallel with the direction of movement of said carriage, said first solids feed cylinder being axially aligned with and immediately below the bottom outlet opening of said first solids feed chute and said second solids feed cylinder being axially aligned with and immediately below the bottom solids inlet opening of said solids upflow vessel when said carriage is in said first stationary position, and said first solids feed cylinder being axially aligned with and immediately below the bottom solids inlet opening of said solids upflow vessel and said second cylinder being axially aligned with and immediately below the bottom outlet opening of said second solids feed chute when said carriage is in second stationary position;
- a first solids feed piston movably mounted in said first solids feed cylinder;
- a second solids feed piston movably mounted in said second solids feed cylinder;
- solids feed piston actuator means for reciprocating said first and second solids feed pistons;
- solids sealing means for sealing said bottom outlet openings of said first and said second solids feed chutes and the solids inlet opening of said solids inlet vessel when said first and second solids feed cylinders are not axially aligned therewith; and
- control means for synchronizing the movement of said carriage and said first and said second solids feed pistons.

4,037,737
RACK STRUCTURE FOR SUPPORTING ARTICLES

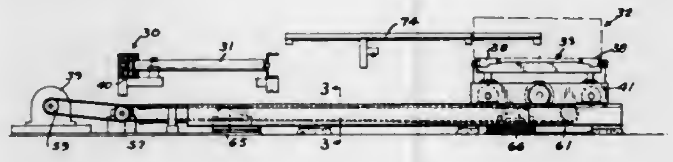
James E. Stevens, 2495 Temple Hills Drive, Laguna Beach, Calif. 92651, and Randel C. Martin, 34106 Street of the Amber Lantern, Apt. C, Dana Point, Calif. 92629
Filed Jan. 30, 1976, Ser. No. 654,140
Int. Cl.^{2} A47F *7/00;* **A47K** *1/08*
U.S. Cl. 211—106 **2 Claims**



1. A receptacle for generally flat articles comprising:
- a length of wire rod conformed generally to the configuration of an equilateral quadrilateral with the free ends of the rod crossed to define one apex of said quadrilateral and provided with an article receiving pocket formed by revertively bending said rod generally at the side apices of said quadrilateral to bring into proximity to the rod-crossing apex of said quadrilateral the opposite apex thereof and having the free ends of the rod extend beyond the crossing equal distances and each end bent into the configuration of a hook for suspending the receptacle, the bending of the hook being in a direction transverse to the direction of the bends forming the article receiving pocket thereby to accommodate suspending one receptacle from another by engaging a hook of said one receptacle with a pocket forming bend of said other receptacle.

4,037,738
TRANSFER APPARATUS

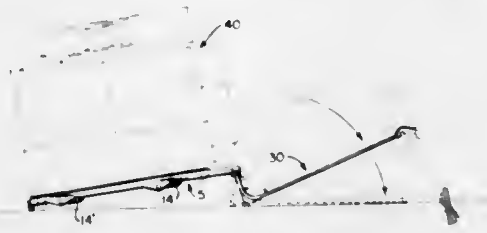
Richard B. Johnson, Mount Airy, Md., assignor to American Chain & Cable Company, Inc., Bridgeport, Conn.
Filed Oct. 9, 1975, Ser. No. 621,135
Int. Cl.^{2} B65G *47/04*
U.S. Cl. 214—38 CC **11 Claims**



1. In an apparatus for transferring loads between a conveyor and a station, the combination comprising
- a conveyor,
- a transfer car,
- means for supporting said car for movement between said conveyor and said station,
- said car having interdigitating means thereon adapted to interdigitate with said conveyor when the transfer car is at a position adjacent said conveyor,
- means for supporting and operating said interdigitating means for vertical movement such that said means may be moved upwardly to lift a load from said conveyor or said station and downwardly to lower said load on said conveyor or said station,
- a power source positioned in fixed position relative to said conveyor and said station,
- means extending between said power source and said transfer car for moving said transfer car between said conveyor and said transfer station,
- said means for lifting and lowering said interdigitating means comprising a cam,
- a cam follower on said interdigitating means such that upon rotation of said cam, said interdigitating means is lowered and lifted,
- said means for driving said transfer car comprising a chain driven from a position adjacent said conveyor,
- a first sprocket and a second sprocket,
- said chain having one end thereof connected to one sprocket,
- the other end of said chain being connected to another sprocket,
- a shaft rotatably mounted on said transfer car,
- said sprockets being mounted and fixed on said shaft,
- means interconnecting said shaft and said first-mentioned cam,
- a pair of cams on said shaft,
- and latch means positioned along the path of the transfer car for selectively engaging one or the other of said pair of cams to hold the transfer car in position adjacent said conveyor and said transfer position, respectively, so that upon movement of said chain, one of said sprockets or the other of said sprockets is rotated to actuate the drive to said cams of said lifting and lowering means for lifting and lowering said interdigitating means.

4,037,739
MOVING SYSTEM WITH INTEGRAL CASTERS

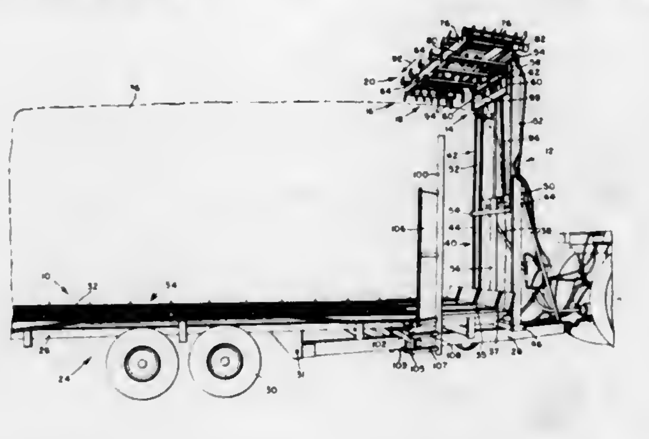
William S. Lee, New Orleans, La., assignor to Lee Inventions, Inc., New Orleans, La.
Division of Ser. No. 467,781, May 7, 1974, Pat. No. 3,918,597, which is a continuation-in-part of Ser. No. 189,337, Oct. 14, 1971, Pat. No. 3,809,261, which is a division of Ser. No. 9,223, Feb. 6, 1970, Pat. No. 3,633,774. This application Sept. 18, 1975, Ser. No. 614,546
Int. Cl.^{2} B65G *67/02*
U.S. Cl. 214—38 CC **8 Claims**



1. A moving apparatus for moving a heavy load having a portion of its bottom area offset from the surface on which it rests comprising;
- a sled for positioning beneath the offset bottom area of the heavy load in juxtaposition thereto, said sled having first and second integral sets of heavy duty carriage members movably mounted thereon, said carriage members being drop-leaf casters which are rotatably mounted on said sled and have a raised, inoperative position and a lowered, operative position at a 90° angle with respect to each other, said casters being movable from one position to another by being rotated the 90°;
- L-shaped leverage means for raising both ends of said sled so as to permit said first and second sets of carriage members to be moved into a lowered operative position under the heavy load, thereby enabling said heavy load to roll freely on the lowered carriage members, said leverage means provided with transportation means on said leverage means for transporting said sled on said leverage means; and
- spring biased locking means on said drop leaf casters for locking said drop leaf casters in their respective operative and inoperative positions.

4,037,740
STACK FEEDING APPARATUS

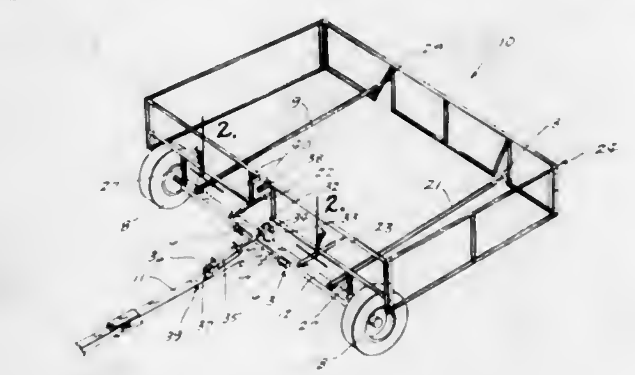
William Robert Wood; Edward Clyde Ryan, and Marvin Lee Bigbee, all of Ankeny, Iowa, assignors to Deere & Company, Moline, Ill.
Filed Aug. 28, 1975, Ser. No. 608,580
Int. Cl.^{2} B60P *1/00;* **A01F** *29/00*
U.S. Cl. 214—83.14 **19 Claims**



1. An apparatus for unloading a harvested crop stack comprising: a mobile elongated stack carrier having front and rear portions; a mast at one end of the carrier; structure carried by the mast, movable between the ends of said mast, and extending therefrom to overlie said carrier; means for advancing the stack along the carrier to position a portion of said stack in underlying relation to said structure; a continuous powered conveyor carried by said structure and movable therewith, having upper and lower runs traversing paths transverse to the direction of stack advancement; and raking means including knife means carried by said conveyor for serving the underlying stack portion from the stack, and for progressively dislodging said portion during downward movement of the structure, and for transferring said disloged portion away from said stack.

4,037,741
BALE TRANSPORTING AND FEEDING APPARATUS

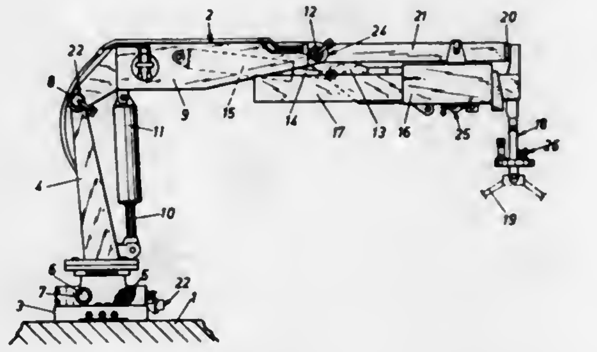
Donald E. Smith, R.R. 3, Russell, Iowa 50238
Filed Feb. 4, 1976, Ser. No. 655,268
Int. Cl.^{2} B66C *23/00*
U.S. Cl. 214—130 C **18 Claims**



1. Hay handling apparatus comprising:
- a frame adapted to be connected to prime mover;
- wheel means rotatably attached to said frame along a substantially horizontal axis for allowing said apparatus to be towed from place to place;
- an elongated member pivotally attached to the frame along a substantially horizontal axis;
- a first shaft means rigidly attached to said elongated member;
- a second shaft means rigidly attached to said elongated member, said first and second shaft means being substantially perpendicular with respect to the pivotal axis of the elongated member but non-parallel with respect to each other; and
- means for pivoting said elongated member and thereby said first and second shaft means with respect to said frame.

4,037,742
PROGRAMME CONTROLLED HYDRAULIC LOADING CRANE

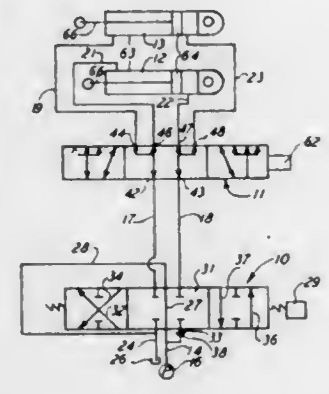
Hans Eric Karl Gustafsson, Saltsjoduvnas, Sweden, assignor to Hiab-Foco Aktiebolag, Hudiksvall, Sweden
Filed Oct. 7, 1975, Ser. No. 620,267
Claims priority, application Sweden, Oct. 8, 1974, 7412624
Int. Cl.^{2} E02F *3/32*
U.S. Cl. 214—138 R **4 Claims**



1. An improved hydraulic loading crane comprising crane parts including a hydraulically rotatable crane post, an inner

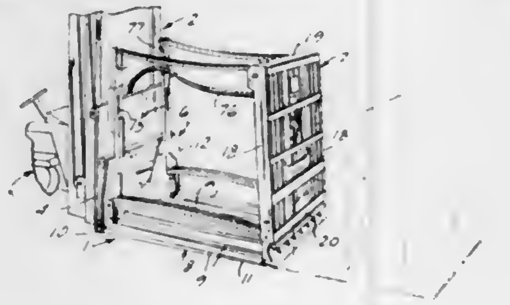
crane boom mounted at the upper end of said post for hydraulically operated pivotal movement in a vertical plane, a jib mounted at the outer end of said inner boom for hydraulically operated pivotal movement in a vertical plane, said jib provided with means for lifting a load, and an electroncially programmed control system comprising a memory, and a plurality of electrical encoders mounted on said crane and arranged, upon movement of said crane parts from a starting position to an end position and back, to register and store in said memory the change of positions between said crane parts which are movable relative to one another, a servo valve, and a comprising unit inserted between said memory and said servo valve and arranged, upon reading of said memory during the operation of said crane to compare signals stored in said memory with signals which are continuously emitted by said encoders to open said servo valve to values corresponding to the difference between said continuously incoming signals and the signals emitted from said memory for the purpose of feeding a corresponding required quantity of pressurized medium to the various hydraulic means for the purpose of obtaining the preprogrammed movements of said crane parts, said electrical encoders being arranged to register the change of angular positions between any one of said crane parts and said loading crane being further provided with means for turning said crane post comprising a first hydraulically operated rack arranged for reciprocal movement, a cog wheel disposed at the lower end of said post, said first rack cooperating with said cog wheel, said first rack provided with a second rack extending in the longitudinal direction of said first rack, a shaft arranged to drive one of said encoders, and a cog wheel mounted at one end of said shaft, said second rack engaging the teeth of said cog wheel.

4,037,743
MATERIAL HANDLING BUCKET DUAL CYLINDER SYSTEM
Carl Oluf Pedersen, Burlington, Iowa, assignor to J. I. Case Company, Racine, Wis.
Filed Jan. 14, 1976, Ser. No. 648,881
Int. Cl.^{2} E02F *3/70*
U.S. Cl. 214—140 **4 Claims**



1. A material handling bucket dual cylinder system comprising two fluid cylinders connectable to a bucket for loading and dumping actuations of the bucket, fluid actuated apparatus connected to said cylinders for powering said cylinders in the loading and dumping actuations, said apparatus including a first fluid valve and a second fluid valve with said valves being fluid-flow connected together in series, said first fluid valve having fluid passageways selectively interconnectable with said second fluid valve for passing fluid to said second fluid valve in two directions of fluid flow, said second fluid valve and said two cylinders having four fluid-flow separated fluid-flow lines connected therebetween for directing the flow of fluid to and from said cylinders for extension and contraction of said cylinders for use in the loading and the dumping of the bucket, said two cylinders having head and rod ends and said four fluid-flow lines being respectively and separately and exclusively directly connected to said cylinder ends, and said second fluid valve having three combinations of four fluid passageways in each of said three combinations and being arranged to selectively and separately fluid-flow connect each of said three combinations with said four fluid-flow lines for both simultaneous and individual selective fluid pressurizing of said two cylinder ends.

4,037,744
LIFT TRUCK PUSHER DEVICE
Tony Nagin, Jr., and Tony Nagin, Sr., both of 2023 Lioncrest Drive, Richton Park, Ill. 60473
Filed May 10, 1976, Ser. No. 684,889
Int. Cl.^{2} B60P *1/02*
U.S. Cl. 214—514 **15 Claims**



1. In a pusher device for lift trucks and the like, particularly for sheet-supported loads, the combination of a relatively fixed, generally vertically extending base structure provided with means for mounting the same on a lift truck, a platen structure rigidly carried by and extending generally horizontally outward from said base structure at the side thereof remote from the mounted side thereof, a pusher structure supported by said platen structure and movable thereon toward and away from said base structure, a plurality of pusher chains extending between said base and pusher structures with the adjacent ends of the chains secured to said base structure, which chains are each constructed to be rigid, when extended in substantially a straight line, to compression forces acting thereon along such line but capable of being flexed in a direction traverse to such line, a sprocket for each chain, rotatably supported by said pusher structure, by means of which said chains may be extended from or retracted to the latter, means carried by said pusher structure for guiding the free ends of the chains during retracting movement thereof whereby such free ends may be stored, in substantially a common plane, on said pusher structure, a power source carried by said pusher structure, and means operatively connecting said power source and said sprockets for rotating the latter in directions to simultaneously extend said chains or retract the same with respect to said pusher structure, and thereby correspondingly move the pusher structure toward or away from the base structure.

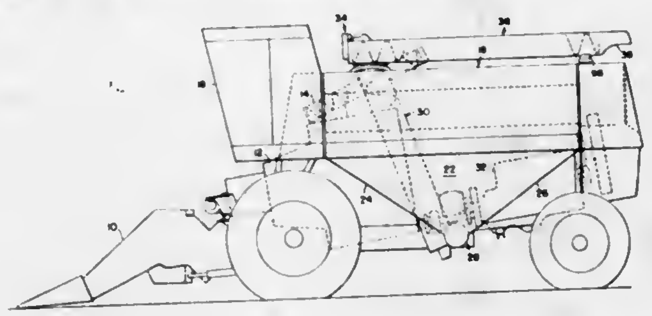
4,037,745
COMBINE GRAIN TANK UNLOADING MECHANISM
Edward John Hengen, Bettendorf, Iowa, and Eugene Byron Hutchinson, East Moline, Ill., assignors to Deere & Company, Moline, Ill.
Filed Feb. 9, 1976, Ser. No. 656,321
Int. Cl.^{2} B60P *1/40*
U.S. Cl. 214—521 **17 Claims**

1. In a combine harvester having a grain tank for temporarily holding processed grain and an unloading system for unloading grain from the harvester, the improvement in the unloading system comprising:

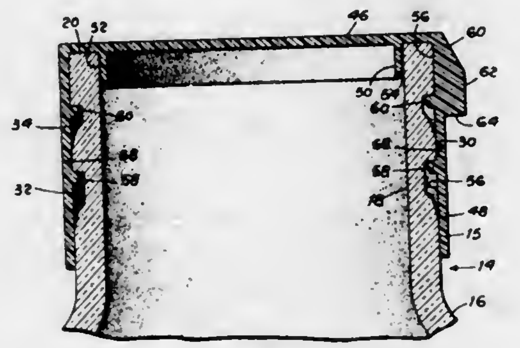
a generally upright auger conveyor operable to convey grain from the tank upwards and having an axis of rotation and an upper end;

an unloading auger conveyor having inner and outer ends and an axis of rotation and operable to receive grain from the upright conveyor at its inner end and discharge it from its outer end; and

mounting means carrying the unloading conveyor at the upper end of the upright conveyor, the mounting means including swivel means whereby the unloading conveyor may be positioned in a transport position and in a range of unloading positions, called an unloading zone, the swivel means having an axis of rotation, said axis being inclined to the axis of rotation of the upright conveyor so that the angle of the axis of rotation of the unloading conveyor relative to that of the upright conveyor changes between the transport position and positions in the unloading zone, said mounting means further including a housing, connected to the inner end of the unloading auger conveyor in communication therewith, and an annular bearing means around the upper end of the upright auger conveyor pivotally mounting the housing on the upper end of the upright auger conveyor in communication therewith.



4,037,746
PLASTIC CAP AND BOTTLE NECK
Richard P. Ver Hage, North Haledon, N.J., assignor to GSF Corporation, Hawthorne, N.J.
Filed June 11, 1976, Ser. No. 695,266
Int. Cl.^{2} B65D *41/46*
U.S. Cl. 215—31 **3 Claims**



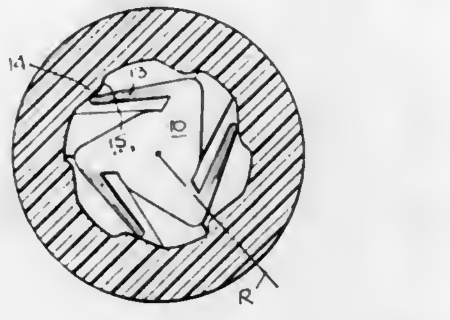
3. A container, comprising:

a body portion;

a substantially cylindrical neck extending upwardly from the body to an upper edge said neck having a substantially cylindrical outer surface;

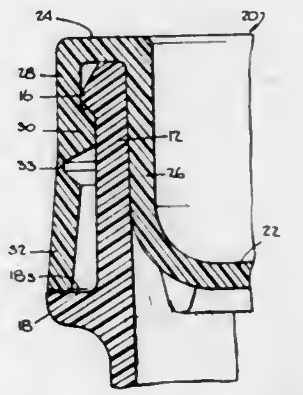
a pair of spaced circumferential grooves formed in said outer surface of the neck, the upper one of said grooves being spaced from the upper edge of the neck and the lower one of said grooves being spaced from the body portion so that the neck is divided into three separate cylindrical outer surface portions having increasing diameters from the upper most surface portion to the lower most surface portion, each of said grooves being partially defined by an annular surface intersecting the cylindrical outer surface portion farthest from the body portion at a right angle and a frustoconical surface intersecting the cylindrical outer surface portion closest to the body portion.

4,037,747
SAFETY CLOSURE CAP WITH TORQUE CONTROL
Daniel D. Acton, and John W. Boerstler, both of Lancaster, Ohio, assignors to Anchor Hocking Corporation, Lancaster, Ohio
Filed May 21, 1976, Ser. No. 688,594
Int. Cl.^{2} B65D *55/02*
U.S. Cl. 215—219 **4 Claims**



1. In a container sealing safety closure having an outer shell and an inner shell both with tops and depending skirts and having means for rotatively coupling said shells together in nesting relationships and with container engaging means on said inner shell and a plurality of elongated pawls extending outwardly from a central support on the top of one of said shells for operatively engaging ratchet teeth on the other of said shells when said closure is turned on to the container the improvement comprising said pawls and said ratchet teeth having their contacting surfaces shaped for sliding friction engagement to slide over each other at a predetermined closure torque application value.

4,037,748
CONTAINER AND CLOSURE
Edgar S. Stubbs, Jr., Guaynabo, P.R., assignor to Rigid-Pak Corporation, Bayamon, P.R.
Filed Feb. 5, 1976, Ser. No. 655,481
Int. Cl.^{2} B65D *41/32*
U.S. Cl. 215—256 **9 Claims**



1. A container and closure therefor comprising:

a container having a base, a sidewall and open top, said sidewall having inner and outer surfaces,

a snap-on closure to cover said top and be retained on the container,

said closure having an inverted circumferential U-shaped rim adapted to fit over the rim of said sidewall, said rim of said closure having a circumferential inner leg and a circumferential outer leg spaced from said inner leg by approximately the thickness of said sidewall of said container,

said inner leg of said closure having an first interference fit relationship with said inner surface of said sidewall of said container,

an outwardly projecting circumferential first ridge on the outer surface of said sidewall of said container and adjacent said open top of said sidewall,

said outer leg of said closure having a second interference fit relationship with said first ridge of said sidewall,

an inwardly projecting circumferential second ridge on the inner surface of said outer leg of said closure, said outer surface of said sidewall of said container having a third interference fit relationship with said second ridge,

said second ridge snapping over said first ridge as said closure is assembled on said container, said second ridge underlying and spaced below said first ridge in the closed state.

4,037,749

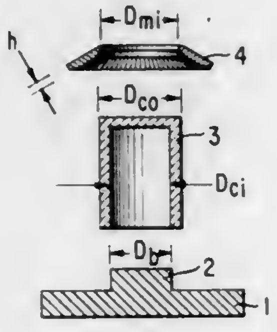
HERMETICALLY SEALED ENVELOPE AND METHOD OF MAKING THE SAME

Kurt Reznicek, Allentown, Pa., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 15, 1976, Ser. No. 666,878

Int. Cl.² H01L ***23/10;*** **H01J** ***19/58***

U.S. Cl. 220—2.3 R **6 Claims**



1. A hermetically sealed envelope comprising:

a base having an elevated portion on the surface thereof;

a tubelike cover having one end portion fitted in the proximity of said elevated portion; and

a separate sealing member positioned around said end portion and cold welded to said cover through permanent deformation thereby achieving a vacuum-tight seal between said base and said cover.

4,037,750

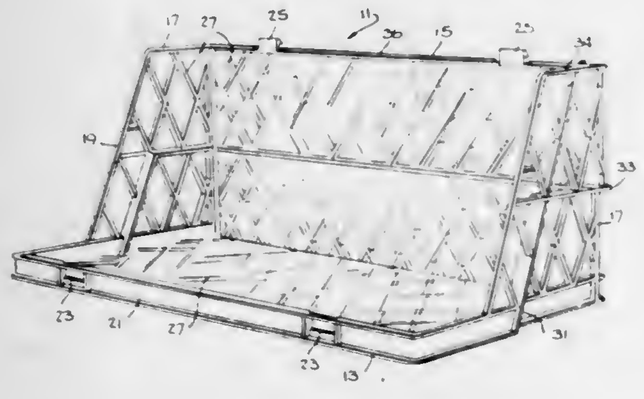
TRANSPORT-DISPLAY CASE

Theodor M. Box, 1108 Eileen Road, Brielle, N.J. 08730

Filed Apr. 10, 1975, Ser. No. 566,819

Int. Cl.² B65D ***21/02. 11/10***

U.S. Cl. 220—4 E **3 Claims**



1. An integrally molded plastic transport-display crate adapted to hold a plurality of one dozen egg cartons for transport comprised of a pair of complementary separable similarly shaped upper and lower interlocking members ech having a generally rectangular base, an upstanding wall along a first edge thereof, a pair of opposed angular sidewalls adjoining said upstanding wall along respective second and third edges adjacent said first edge the enclosure defined by said sidewalls and said upstanding wall having an overhanging brow portion spaced from said base and defining a stacking ledge extending around the three walls of said enclosure parallel to said base, the outer extremity of said enclosure constituting a stacking rim parallel to said base complementary to said ledge and complementary releasable locking means on said member to hold them together in opposed juxtaposition to define a transport crate, said upper member removable to render said lower member a display rack for said egg cartons, either said member being nestable within the other said member when disengaged therefrom with its said stacking ledge resting on the stacking rim of said other member, a plurality of bayonet receptacles on said ledge and a corresponding plurality of bayonet elements on said rim adapted to engage said receptacles in an adjacent member when in stacked relationship to maintain said members in such conditions, said ledge, rim, bayonet receptacles and bayonet elements constituting the sole stacking support for said members, a plurality of said members having their vertical axes aligned, when nested relative to one another, with a vertical axis perpendicular to the bases thereof

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4,037,751

INSULATION SYSTEM

Robert C. Miller, Encino, Calif., and Harold E. Lemont, Arlington, Tex., assignors to Summa Corporation, Las Vegas, Nev.

Continuation-in-part of Ser. No. 352,218, April 18, 1973, abandoned, which is a continuation-in-part of Ser. No. 272,468, July 17, 1972. This application Mar. 27, 1975, Ser. No. 562,765

Int. Cl.² E04B ***1/62. 2/30. 2/34***

U.S. Cl. 220—9 R **35 Claims**

1. An all-metal, low-conductivity, high-performance and relatively low-weight composite structure for use as a thermal insulation, said structure comprising:

metallic member means forming one skin surface for exposure to a zone of one temperature;

means forming a second skin surface for exposure to a zone of another temperature which is different from said one temperature;

said metallic member means being spaced from said means forming a second skin surface so as to form a fluid space therebetween;

metallic means disposed in said fluid space to define a spacer with opposite surface portions of said spacer in adjacent facing relationship with said metallic member means and said means;

said spacer being formed of a metal mesh having deformations therein to increase the spacing between said metallic member means and said means forming a second skin surface;

fixing means maintaining said metallic member means, said means and said metallic spacer in fixed relationship to each other;

the wire mesh of said spacer defining relatively long paths for the conduction of heat between said metallic member means and said means forming a second skin surface;

said metallic spacer forming multiple void spaces between said metallic member means and said means forming a second skin surface and said void spaces being sufficiently small in size to limit the circulation of gas between said metallic member means and said means forming a second skin surface, and

said composite structure being essentially free of non-metallic components.

4,037,752

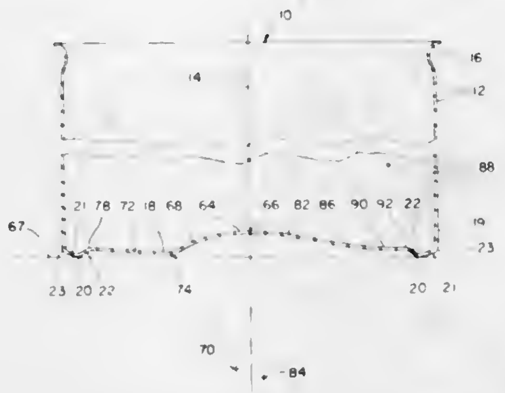
CONTAINER WITH OUTWARDLY FLEXIBLE BOTTOM END WALL HAVING INTEGRAL SUPPORT MEANS AND METHOD AND APPARATUS FOR MANUFACTURING THEREOF

Joseph Francis Dulmaine, Wheatridge, and Michael Edward Bagrosky, Arvada, both of Colo., assignors to Coors Container Company, Golden, Colo.

Filed Nov. 13, 1975, Ser. No. 631,539

Int. Cl.² B65D ***7/42***

U.S. Cl. 220—70 **12 Claims**



1. A generally cylindrical metal container having a product therein under pressure, said container including a generally cylindrical body having integral side and bottom walls, said bottom wall comprising a central inwardly extending area of depression, and a plurality of linearly extending surfaces located radially outwardly of and adjacent said area of depression, at least said linearly extending surfaces having been outwardly distended by pressure of said product to change the shape and configuration of the bottom wall such that said linearly extending surfaces become the outermost extent of the bottom wall and alone providing a stable base upon which the container rests in an upright position.

4,037,753

CONTAINER CLOSURE, ESPECIALLY FOR MIXING CONTAINERS

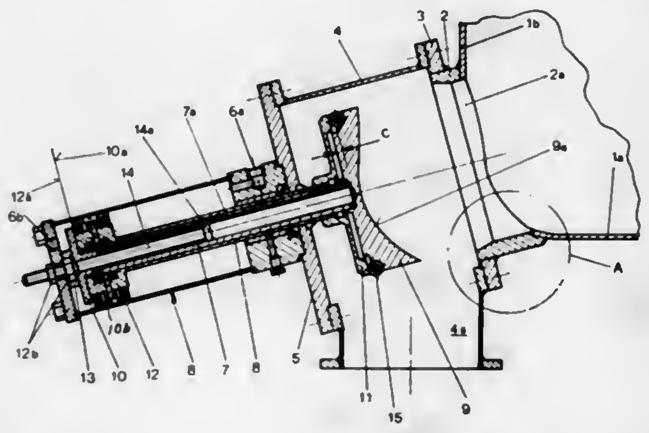
Justus Brandau, Körle-E., Germany, assignor to Thyssen Industrie Aktiengesellschaft, Essen, Germany

Filed Aug. 26, 1976, Ser. No. 717,902

Claims priority, application Germany, Sept. 1, 1975, 2538768

Int. Cl.² B65D ***43/20. 55/00;*** **F16K** ***51/00***

U.S. Cl. 220—211 **4 Claims**



1. A closure for closing a container, which includes: a pressure medium operable cylinder piston system, comprising coaxially arranged first and second piston rod means, a substantially round closure dish connected to said first piston rod means and movable from an open position to a closing position for closing an opening of a container to be closed, a pressure dish having an annular end face and being connected to and movable by said second piston rod means toward and away from said closure dish, said closure dish having a peripheral step opposite said annular end face of said pressure dish, and an elastic sealing element arranged in said peripheral step for sealing engagement with the wall of an opening of a container to be closed when said closure dish is in its closing position, said annular end face of said pressure dish and said peripheral step of said closure dish when the said closure dish is in its closing position together defining a groove locating said sealing element.

4,037,754

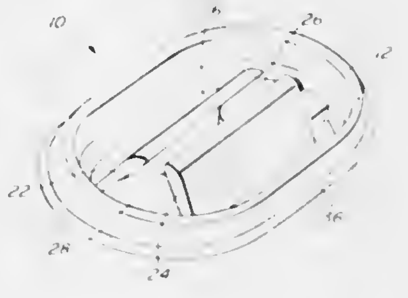
CLOSURE PLUG

Julius B. Wilhelmi, Hull, Mass., and Roger E. Somers, Hudson, N.H., assignors to TRW Inc., Cleveland, Ohio

Filed Dec. 6, 1976, Ser. No. 747,847

Int. Cl.² B65D ***51/18. 51/00. 51/16***

U.S. Cl. 220—254 **11 Claims**



1. A closure plug for an opening in a closure that permits passage of a conduit therethrough for introducing a substance into the closure and that seals the opening against the escape of the substance upon withdrawal of the conduit, comprising:

an integral, resilient body member including

A. a peripheral portion for sealingly engaging the closure around the periphery of the opening;

B. a central portion extending inwardly from said peripheral portion and defining outer and inner major faces and an aperture communicating with the opening;

C. first and second flap portions extending above the outer face of said central portion from opposed sides of the aperture; and

D. first and second tab portions extending from said central portion between said flap portions toward the center of the aperture;

E. whereby said flap portions may be deformed past said tab portions through the aperture to allow the passage of the conduit therethrough and whereby, upon withdrawal of the conduit, said flap portions resiliently assume a relatively flat, overlapped position in contact with said tab portions to seal the aperture against escape of the substance therethrough.

4,037,755

PNEUMATIC SEED DISPENSING APPARATUS

Floyd W. Reuter, Dearborn Heights, Mich., assignor to Massey-Ferguson Inc., Detroit, Mich.

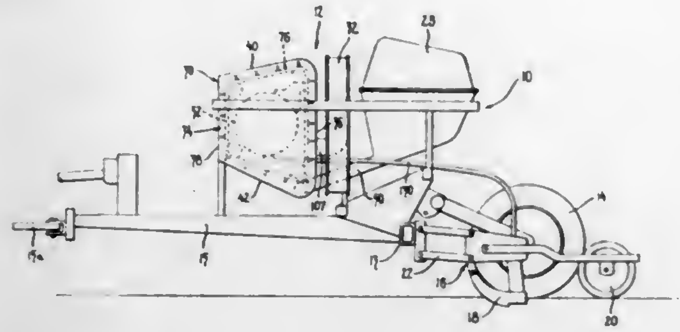
Filed Jan. 29, 1976, Ser. No. 653,675

Int. Cl.² B65H ***3/00;*** **A01C** ***7/08***

U.S. Cl. 221—211 **12 Claims**

1. A seed dispensing apparatus comprising: a housing, a drum supported in said housing for rotation about a horizontal axis, said drum and said housing forming a chamber therebetween, means to maintain said chamber at a higher pressure than the pressure in said drum, said drum having uniformly spaced openings disposed in the periphery of said drum and in a common plane disposed transversely to the axis of said drum, said openings communicating said chamber with the interior of said drum, means to convey seed to said chamber and to an upper circumferential surface exterior of said drum for depositing a seed in each of said openings, said seed being maintained in said openings by differential pressure in said chamber and in said drum, a rack assembly positioned in close proximity to the

exterior of said rotating drum at said circumferential surface, said rack assembly being operative to receive seed conveyed by said means conveying seed for distribution in said openings,



and discharge means positioned in said drum to close said openings when said openings reach a predetermined position to eliminate said pressure differential and permit said seeds to be separated from said drum.

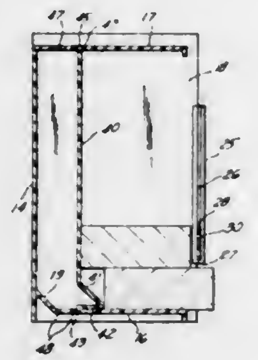
4,037,756
DISPLAY-DISPENSER RACK

John Jaquish, New York, N.Y., assignor to Trans World Display Corporation, New York, N.Y.

Filed June 21, 1976, Ser. No. 697,884

Int. Cl.^{2} A47F *1/00*

U.S. Cl. 221—242 9 Claims



1. A display-dispenser rack for maintaining in exposed view for selective dispensing, a variety of differently sized articles, said rack comprising:

a compartment having a vertical rear wall, spaced vertical side walls, and a bottom wall;

a flange on at least one of the vertical side walls of said compartment extending in a vertical plane partially over the front of said compartment, leaving an opening at the front of said compartment exposing the contents of said compartment to view, said flange spaced from the bottom wall of said compartment a distance at least equal to the height of a single one of the largest articles to be held in and dispensed from said compartment; and

a vertically extending rear spacer member selectively positionable in said compartment at a spaced distance from the rear wall of said compartment to constrain the articles in said compartment toward said flange,

said rear spacer member comprising a vertically extending plate member; a spring leg resiliently joined to a lower end of said spacer and angled to extend down toward the front of said compartment to displace the lowermost article in the compartment to a dispensing position; and a toe joined to said leg, said toe engaging in an opening in the bottom wall of said compartment.

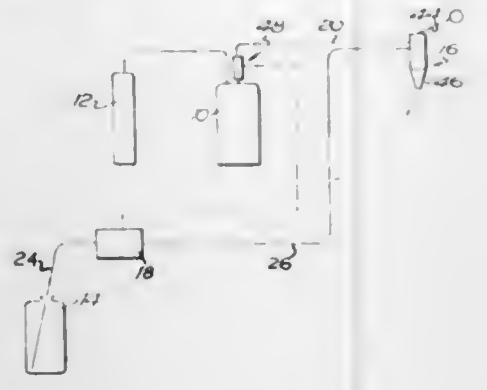
4,037,757
PREPARATION OF BEVERAGES

David William Green, Eastbourne, England, assignor to British Syphon Industries Limited, Sheffield, England

Filed Mar. 29, 1976, Ser. No. 671,287

Int. Cl.^{2} B67D *5/56*

U.S. Cl. 222—129.2 4 Claims



1. Apparatus for preparing a beverage, comprising a container for a quantity of a diluent; means for pressurizing said container by a top pressure of gas; dispense apparatus; means for connecting said container to said dispense apparatus; a container for a concentrate of the beverage; a pump for feeding a measured quantity of said concentrate to the dispense apparatus; said pump having a reciprocable member disposed in a pumping chamber and carrying a non-return valve, a spring biasing said reciprocable member, said reciprocable member being displaced, under the influence of a coil carrying a one-half wave rectified alternating current, against the force of said spring, and non-return valves disposed on opposite sides of the pump for the respective supply of said concentrate from said container therefor and delivery of said concentrate to said dispense apparatus and means for opening said dispense apparatus to flow of diluent from the diluent container and for simultaneously driving the pump whereby the diluent and a measure of said concentrate are mixed together,

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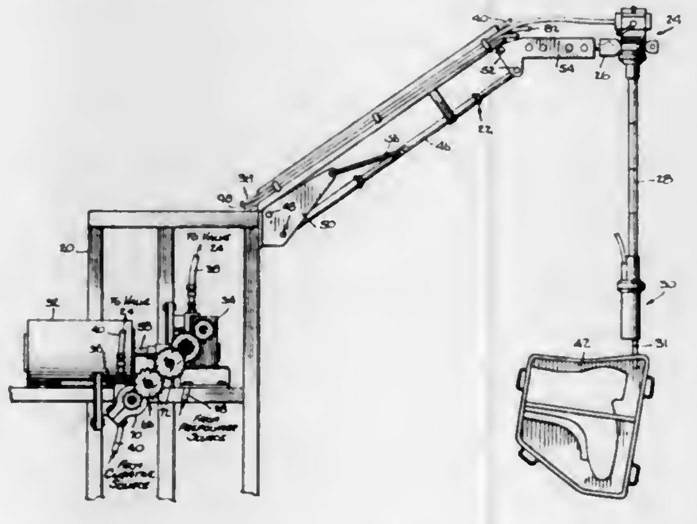
4,037,758
MOLD FILLING SYSTEM

Rene Bourque, Laval, Canada, assignor to Garcia Corporation, Teaneck, N.J.

Filed June 4, 1975, Ser. No. 583,568

Int. Cl.^{2} B67D *5/56*

U.S. Cl. 222—134 25 Claims



1. Apparatus for filling molds with a reaction mixture, said apparatus comprising a supporting framework, an arm extending out from the supporting framework, a mixing device pivotally suspended from the outer end of said arm, reaction component conduits and bypass conduits extending from reaction component sources to said mixing device, said mixing device including mixing valve means having a reaction mixture outlet, a dispensing valve connected to said reaction mixture outlet, and a dispensing nozzle extending from said dispensing valve, said mixing valve means comprising a plurality of input ports connected to said reaction component conduits for receiving various reaction mixture components, a corresponding plurality of bypass ports connected to said bypass conduits for discharging individual reaction mixture components, said valve means being operable to switch reaction mixture flow from said conduits alternately through said reaction mixture outlet or to said separate bypass conduits; and means synchronizing said mixing valve means with said dispensing valve whereby when said dispensing valve is closed said mixing valve directs components to said bypass conduits and when said dispensing valve is open said mixing valve directs components to said reaction mixture outlet, said valve synchronizing means comprising a common pilot system constructed and arranged to operate said dispensing valve and valve assembly by applying pilot fluid pressure thereto.

4,037,759
SEED PLANTING MACHINE

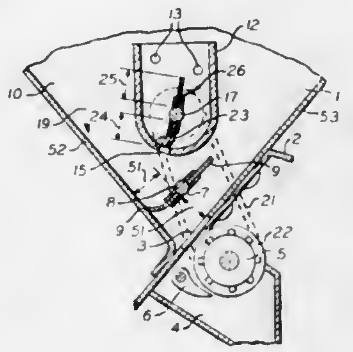
Franz Grosse-Scharmann; Bernd Gattermann, and Bernhard Steenken, all of Oldenburg, Germany, assignors to Amazonen-Werke H. Dreyer, Hasbergen-Gaste, Germany

Filed Dec. 22, 1975, Ser. No. 643,049

Claims priority, application Germany, Dec. 21, 1974, 2460869

Int. Cl.^{2} B67D *5/56*

U.S. Cl. 222—142 24 Claims



1. Planting machine having a seed planting mechanism and a seed hopper, and serving for the disinfecting of the seed, which is provided in its lower region with outlet openings for the disinfected seed and with a driven agitator mechanism disposed above said outlet openings, which comprises an agitator shaft with agitator means, the planting mechanism as well as also the agitator mechanism being drivable, characterized in that in the hopper for the seed above the agitator mechanism, a disinfectant distributor is arranged which comprises a magazine for receiving a supply of disinfectant, having at least one outlet opening, and of feeding means movable during operation relatively to the magazine to supply the disinfectant to the outlet opening(s) of said magazine and that the disinfectant distributor extends substantially over the entire area of the outlet openings of the seed hopper (1).

4,037,760
PROPORTIONAL DILUTER

Tomas Hirschfeld, Framingham, Mass., assignor to Block Engineering, Inc., Cambridge, Mass.

Filed Apr. 23, 1976, Ser. No. 679,564

Int. Cl.^{2} B67D *5/60;* G01F *11/26*

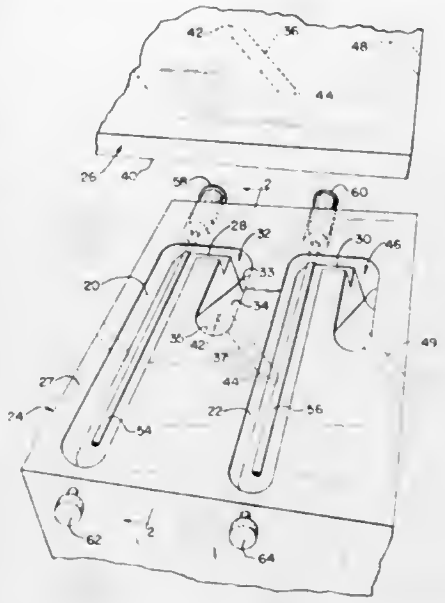
U.S. Cl. 222—145 14 Claims

1. A device for proportional liquid dilution, said device comprising in combination:

a structure including at least two storage chambers and at least one sampling chamber having a fixed volume smaller than either of said storage chambers and communicating between said storage chambers to provide a permanently open path for liquid flow therebetween; and

means for cyclically operating said device;

said chambers being so fixedly disposed with respect to one another that during each cycle, liquid in a first of said



storage chambers is transferred to fill said sampling chamber and then substantially all liquid in said sampling chamber is transferred to the other of said storage chambers, said transfer between said chambers occurring only in a direction from said first to said other storage chamber.

4,037,761
INDICATION OF LEVELS IN RECEPTACLES

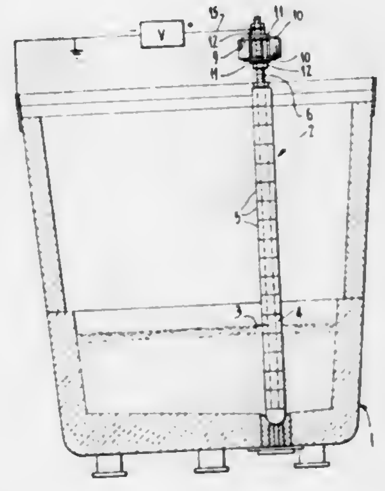
Kenneth Garry Kemlo, Lambton, and Clive Allen Gregory, Armidale, both of Australia, assignors to The Broken Hill Proprietary Company Limited, Australia

Filed May 13, 1975, Ser. No. 577,011

Claims priority, application Australia, May 13, 1974, 7532/74

Int. Cl.^{2} B22D *37/00*

U.S. Cl. 222—590 11 Claims



11. A method of locating the interface between molten metal having a first electrical property and a slag layer having a second electrical property which are separate phases of a melt held in a ladle said method being employed when the melt is being emptied from the ladle and comprising the steps of positioning a single electrode at a predetermined level within the ladle and in contact with the material in the ladle at that predetermined level, by employing the molten metal being teemed detecting the first electrical property associated with said molten metal through said electrode positioned at the predetermined level while said electrode is in contact with the molten metal phase of the melt, monitoring the detected first electrical

property while teeming and thereafter by employing the molten metal being dispensed determining when the slag phase is at the predetermined level by detecting the second electrical property associated with said slag through said electrode positioned at the predetermined level when the slag phase of the melt contacts said electrode.

4,037,762
PROTECTIVE NOZZLE FOR THE OUTLET OF A CASTING LADLE

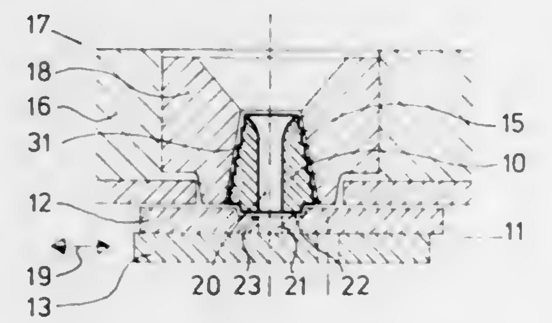
Franz Ruckstuhl, Schwerzenbach, Switzerland, assignor to Metacon AG, Zurich, Switzerland

Filed Jan. 13, 1976, Ser. No. 648,740

Claims priority, application Switzerland, Jan. 23, 1975, 818/75

Int. Cl.² B22D *41/08*

U.S. Cl. 222—591 **8 Claims**



1. A protective insert for the outlet passage of a container for molten material, said outlet passage being in the form of a conical bore, said protective insert comprising a body having an axial passage and a truncated cone-shaped exterior surface having a cone axis, said conical bore of said outlet passage having an interior surface which, when said insert is disposed in said outlet passage, defines with said exterior surface of said protective insert an annular gap, said exterior surface having a plurality of elevations projecting therefrom with said elevations lying substantially along a virtual conical boundary surface coaxial with said cone axis of said exterior surface and extending in a direction inclined with respect to a plane containing said cone axis, said elevations substantially bridging said annular gap and terminating close to said interior surface of said outlet passage so that the volumetric displacement occupied by said elevations comprises a substantial portion of the volume of said annular gap.

4,037,763
INSTRUMENT SUPPORT

Dick Turchen, Pearl River, N.Y., assignor to Video Components, Inc., New York, N.Y.

Filed Apr. 3, 1975, Ser. No. 564,748

Int. Cl.² G03B *17/00;* **A45F** *3/08*

U.S. Cl. 224—5 V **11 Claims**

1. A portable support frame for holding a camera and equipment accessory thereto, comprising:

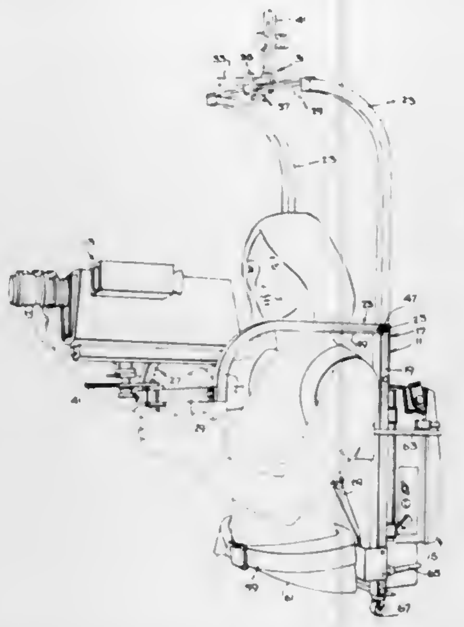
a frame having a first portion adapted to be positioned adjacent the back of a user, said first portion having a vertical length extending from the hip region of the user up to a level above the shoulders of the user, and a second portion having a pair of arms adaptable to extend forwardly from the upper end of said first frame portion at opposite sides, respectively, of the user's head above the level of the user's shoulders,

a cross-bar connecting the pair of arms;

means for hingedly connecting the rear portions of said arms to the upper end of said first frame portion for pivotal movement of said arms in only a vertical plane between a first position in which said arms are generally horizontal and a second position in which said arms are generally vertical;

pod means attached to the cross-bar in the region in front of the user for supporting a camera, where said camera is cantilevered from said first frame portion;

a belt adapted to wrap around the hip region of the user for supportion substantially all of the weight of the camera and its accessory equipment on the hip of the user; and



means on said first frame portion for attachment thereto of the accessory equipment in a position adjacent the back of the user.

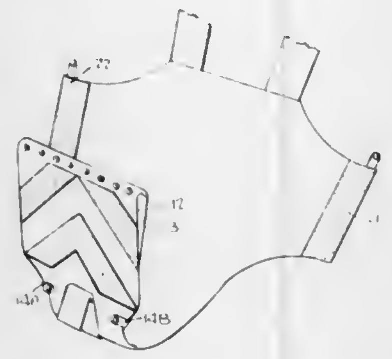
4,037,764
CHILD CARRIER

Emanuel Almosnino, and Susan Draisin Almosnino, both of 186 Ives St., Providence, R.I. 02906

Filed Aug. 28, 1975, Ser. No. 608,691

Int. Cl.² A63G *9/00;* **A47D** *13/02*

U.S. Cl. 224—6 **7 Claims**



1. A child carrier which may be mounted on the back or front of a bearer, said carrier comprising a flat piece of flexible material contoured to define a back section having a pair of outstretched wings and joined by a Venturi-shaped crotch section to a flap section, the width of the back section with outstretched wings exceeding that of the flap section, the carrier being assembled by placing a child therein with its back resting on the back section, after which the flap is folded over the child's abdomen with the child's legs extending through openings formed by the crotch section, to create a diaper-like pouch, the pouch being completed by overlapping and fastening the wings on the folded-over flap section, said wings being detachably connected to the exposed surface of said folded-over flap section by fabric fasteners formed by male elements secured to the margins of the wings and female elements secured to and extending across the exposed surface of the flap section whereby the size of the pouch may be conformed to the body of the child, a pair of straps attached to the back section and loopable over the shoulders of the bearer, and snap fastener means to latch said wings onto said flap section, said snap fastener means being constituted by female snap elements mounted on the free ends of tabs attached to the corners of said wings and complementary male snap elements mounted in a row across the flap section, whereby said wings may be latched at any selected position across said flap section to prevent the male elements of the fabric fasteners from peeling off.

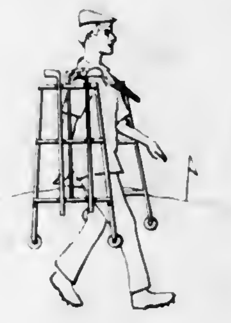
4,037,765
GOLF CLUB CARRIER

Mitchell Slayman, 30701 Fairgreens West, Laguna Niguel, Calif. 92677

Filed Aug. 25, 1976, Ser. No. 717,582

Int. Cl.² A45F *5/00*

U.S. Cl. 224—25 R **3 Claims**



1. A golf club support system adaptable for resting upon the shoulders of a golfer, wherein the weight of the golf clubs is distributed throughout said system, and said system is pivotable freely relative to the golfer, comprising:

a plurality of semi-circular platform supports, which rest on the shoulders of the golfer,

a plurality of swivels, each of which is pivotally attached to each said semi-circular support, whereby each said support will pivot freely in a vertical and horizontal direction,

a plurality of horizontal members substantially parallel to the golfer's shoulders, each said horizontal member secured to each said swivel,

a plurality of lateral members substantially perpendicular to the width of the shoulders and angled outward from the golfer's chest, each said lateral member substantially perpendicular to each said horizontal member,

a plurality of vertical members projecting outward from the chest that terminate in a substantially v-shaped collar to enable the golfer to balance said support system, each said vertical member substantially perpendicular to each said lateral member,

a plurality of legs parallel on either side of the golfer's body, and substantially parallel to each other, each said leg perpendicular to each said horizontal member, and

a golf club carrying means releasably secured to each said leg whereby golf clubs can be transported by said system when said means is secured to each said leg and said platform supports rest on the shoulders of the golfer.

4,037,766
MULTIPLE BOTTLE CARRIER

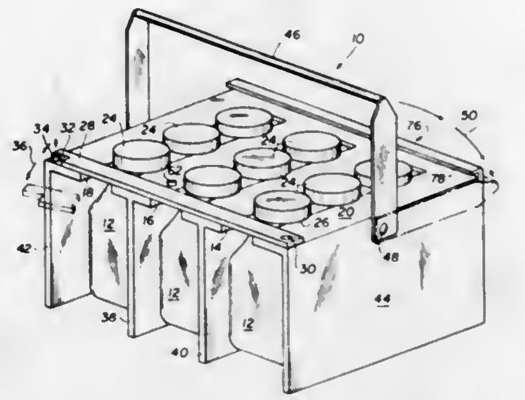
John Q. Iacono, 1638 Jasmine Ave., New Hyde Park, N.Y. 11040

Filed Mar. 3, 1976, Ser. No. 663,301

Int. Cl.² B65D *71/00*

U.S. Cl. 224—45 AA **6 Claims**

1. A multiple bottle carrier comprising a top bottleneck-gripping member of generally rectangular shape having plural slots of a selected width therein each open at one end and oriented transversely of said member in spaced apart relation to accommodate bottles each having an operative position in said carrier in which the neck of a bottle is projected upwardly through one said slot and a larger diameter cap is engaged to the bottleneck to obviate reverse direction movement through said slot, a closure element for said slots oriented transversely of said top member adjacent said slot end openings and arranged for opening and closing movements relative to said slot end openings, an upstanding grip along said top member remote from said slot end openings in overhanging relation to said top member, a slot size-adjusting member having an operative superposed relationship with said top member with an edge thereof engaged beneath said upstanding grip, said slot size-adjusting member having slots therein each open at the same one end thereof as said slots of said top member to receive bottles through said open ends and adapted to assume a selected degree of misalignment relative to said slots of said top member so as to diminish the effective width of said slots of said top member to the extent of said degree of misalignment, whereby said slots of said carrier are adapted to be used for a range of sizes of bottles, and means depending from said top member to support bottles held in the carrier free of contact with a support surface.



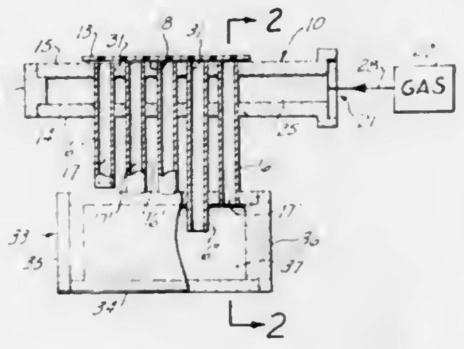
4,037,767
TAPE TRANSPORTING APPARATUS

Herbert Karsh, Laguna Beach, and Edgar S. Gilchrist, Newport Beach, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Nov. 17, 1975, Ser. No. 632,322

Int. Cl.² B65H *17/32*

U.S. Cl. 226—7 **29 Claims**



1. In apparatus for transporting a tape, an improvement for suppressing a predetermined flutter component, comprising in combination:

first means for defining a surface for guiding said tape;

second means extending to said tape guiding surface and defining a gas column having a resonance frequency corresponding to the frequency of said flutter component; and

third means operatively associated with said first means for coupling said gas column to said tape, including means for establishing and maintaining at said gas column a gas film of a controlled thickness between said guiding surface and said tape;

said third means including at least one first aperture in said guiding surface and means connected to said first aperture for issuing pressurized gas at a controlled rate through said first aperture and toward said tape to provide said controlled thickness gas film;

said first means having a second aperture in said guiding surface, said second aperture being distinct from said first aperture; and

said second means extending through said distinct second aperture to said guiding surface, including a tube communicating through said distinct second aperture with said gas film and forming said gas column including means defining a resonance chamber connected to said tube.

4,037,768

APPARATUS FOR BRAKING WEBS OF PHOTOGRAPHIC MATERIAL OR THE LIKE

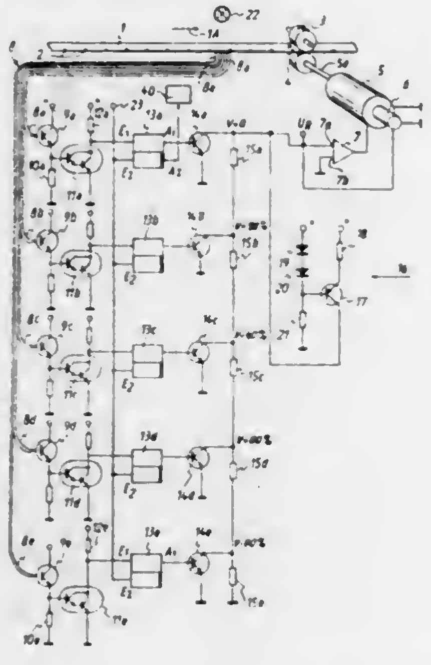
Eberhard Escales, Munich, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed May 20, 1976, Ser. No. 688,190

Claims priority, application Germany, May 30, 1975, 2524101

Int. Cl.² B65H *25/10*

U.S. Cl. 226—43 **13 Claims**



1. Apparatus for repeated rapid acceleration and controlled braking of a web which is provided with a series of markers, such as notches, or perforations, comprising means for moving the web lengthwise along a predetermined path, including a variable-speed motor; a light source adjacent to said path; a succession of photosensitive transducers positioned to receive light seriatim from said source in response to movement of a marker past said source and to effect transmission of different first signals which are indicative of decreasing permissible speeds of said motor while such marker occupies those portions of said path in which it brings about illumination of successive transducers, said transducers including a first transducer and a last transducer; means for changing the speed of said motor in response to said first signals, including means for furnishing a second signal which is indicative of the actual speed of said motor and means for comparing said second signal with first signals whose transmission is effected by successive transducers and for changing the speed of said motor in response to transmission of successive first signals thereto so that the speed of said motor decreases from the speed indicated by said second signal to the speed indicated by a first signal not later than when the nextfollowing transducer of said succession effects the transmission of a first signal, the first signal whose transmission is effected by said last transducer being indicative of zero speed; and a chain of series-connected resistors in circuit with said transducers, one for each of said transducers said chain having a terminal for transmission of first signals to said signal comparing means.

4,037,769

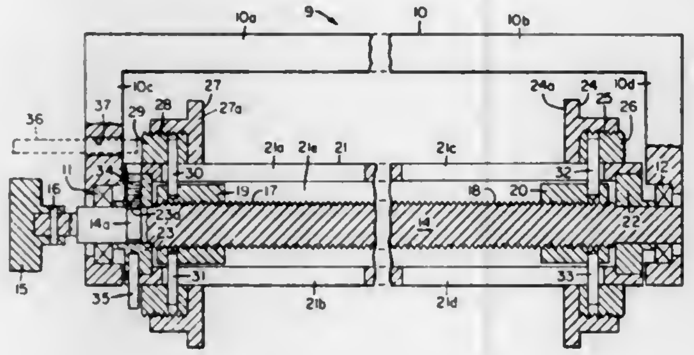
GUIDE ROLLER ASSEMBLY

Wheeler W. Meyers, Savona, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed Oct. 8, 1976, Ser. No. 730,990

Int. Cl.² B65H *23/02*

U.S. Cl. 226—190 **2 Claims**



1. A guide roller assemmbly adjustable to guide, at different times, lengths of tape, ribbon or similar material of different widths so that the centerline of the width of each of said lengths may be made to coincide with a centerline extending about the periphery of the roller of said assembly midway between the ends thereof and during longitudinal movement of each said length over said periphery of the roller, such guide roller assembly comprising;

A. a longitudinal hollow roller embodying slots extending from near each end of the roller to near the center thereof and having extending through the length of said hollow a shaft for rotationally supporting said roller, the ends of said shaft extending into rotational bearings disposed in a support member therefor and such shaft having threads of opposite hands extending from near first and second ones of said ends of the shaft to near the center thereof;

B. first and second internally threaded sleeve member screwed corresponding distances onto said threads on said first and second ends, respectively, of said shaft, such sleeve members being longitudinally movable within the hollow of said roller;

C. first and second flanged wheels correspondingly snugly disposed on the outer periphery of said roller between the center and first and second ones of said ends, respectively, of the roller and slidably movable along the length thereof;

D. means extending snugly through said slots in said roller and slidably movable along the length of such slots, such means also extending snugly into associated ones of said wheels and said sleeves for rotation thereof correspondingly with said roller;

E. manually releasable keying means for normally keying said shaft with said roller for rotation thereof in unison; and

F. means for imparting rotation only to such shaft when said keying means are manually released and said wheels and roller are held against rotation thereof.

4,037,770

TOOL USING CASELESS AMMUNITION

Roger Dorgnon, St. Peray; Marc Combette, Valence; Jean Luthringer, Paris, and Jean Ollivier, Valence, all of France, assignors to Olin Corporation, New Haven, Conn.

Filed June 11, 1976, Ser. No. 695,287

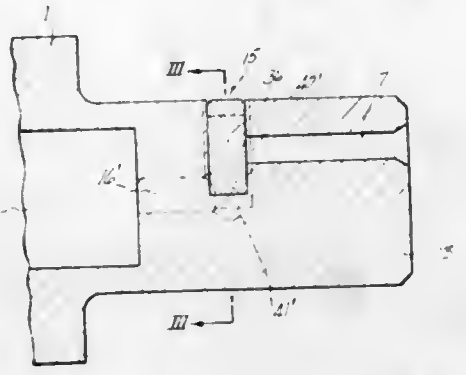
Claims priority, application France, June 27, 1975, 75.20311

Int. Cl.² B25C *1/14*

U.S. Cl. 227—9 **3 Claims**

1. A power-actuated tool of the type utilizing caseless ammunition pellets contained in a recess in a cylindrical breech, said recess for the ammunition comprising two blind bores each of whose diameter is greater than the thickness of the ammunition pellet and whose depth is similar to or greater than the diameter of the ammunition pellet, said blind bores being

connected by a slot having a depth which is at least equal to the diameter of the ammunition pellet and further comprising at least one combustion gas duct opening into the bottom of at least one of the blind bores.



4,037,771

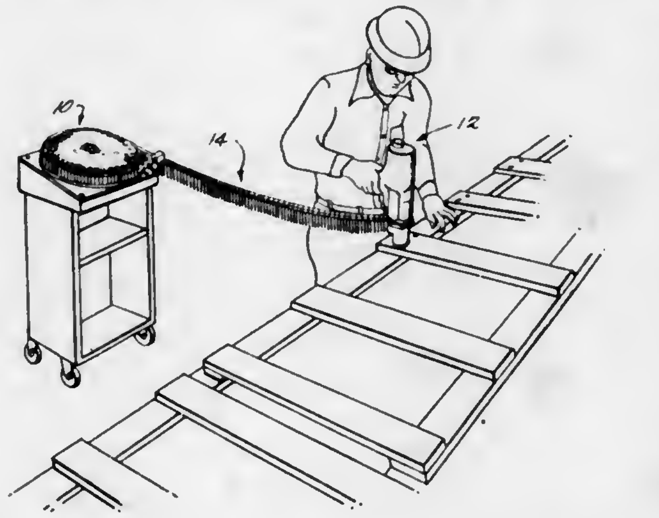
FASTENER DRIVING APPARATUS UTILIZING HIGH CAPACITY FASTENER PACKAGE

William J. Peterson, Coventry, R.I., assignor to Textron, Inc., Providence, R.I.

Filed Mar. 1, 1976, Ser. No. 662,954

Int. Cl.² B25C *1/04*

U.S. Cl. 227—130 **31 Claims**



1. Apparatus for driving successive fasteners from a package of generally parallel fasteners flexibly serially interconnected in general row formation having a total virgin package weight greatly in excess of that which could be practically manually handled, said apparatus comprising:

a portable power operated fastener driving device comprising a housing including a handle operable to be grasped by an operator to enable the operator to manually handle the device within a workpiece containing limited space, means carried by said housing defining a fastener drive track, means carried by said housing for engaging a leading portion of a fastener package and feeding successive leading fasteners laterally into said drive track, and power operated means carried by said housing for driving successive leading fasteners fed to said drive track longitudinally outwardly thereof into a workpiece contained in said limited space,

means for supporting a package of fasteners as aforesaid at a location spaced horizontally from the limited space within which the device is to be manually handled,

movable elongated bridge means of a horizontal extent sufficient to extend from the location of said package supporting means to the limited space within which the device is to be manually handled,

said movable bridge means having fastener package engaging means for receiving at one end of said bridge means a leading length of serially interconnected fasteners in row formation from the package supported by said package supporting means and for supporting the same for movement in the direction of extent of the row formation along the longitudinal extent of said elongated bridge means from said one end thereof outwardly of the other end thereof,

means connecting the other end of said movable bridge means in supported relation with respect to said device housing for movement thereof in response to the manual handling movement of the device within said limited space with the fastener package engaging means of said bridge means disposed to guide the leading portion of the leading length of the fastening package outwardly of said other end and into cooperating relation with the fastener feeding means of said device, and

means for supporting said one end of said movable bridge means for movement in a horizontal direction while maintaining the same in cooperating relation with said package supporting means with the one end of said package engaging means disposed to receive the leading length of the fastener package supported by said package supporting means in such a way as to accommodate any movements imparted to the other end of said movable bridge means by the manual handling movements of said device whereby such manual handling movements can be accomplished by the operator while supporting only a proportionate share of the weight of the bridge means and leading length of the fastener package supported thereon.

4,037,772

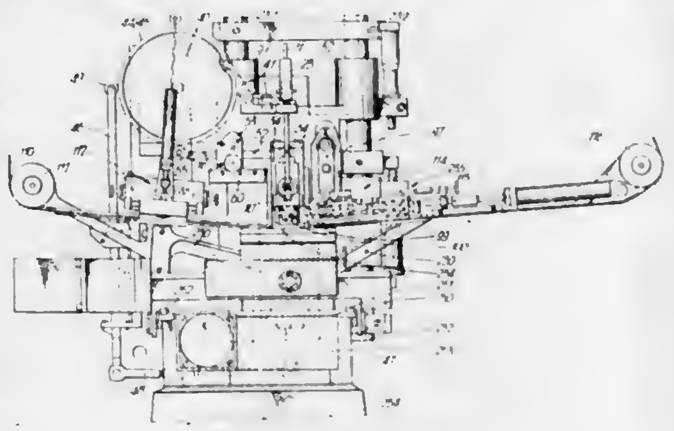
APPARATUS FOR BONDING WIRE LEADS

Jean Marcel Dupuis, Ottawa, Canada, assignor to Northern Telecom Limited, Montreal, Canada

Filed Oct. 4, 1976, Ser. No. 729,197

Int. Cl.² B23K *21/02;* **H01L** *21/601*

U.S. Cl. 228—1 R **26 Claims**



1. Apparatus for bonding wire leads to contacts on a device, comprising:

a bonding tool, said tool including an arcuate bonding surface for contact with said leads at a bonding position;

a support member having a forward end and a rearward end, said bonding tool attached at said forward end;

means supporting said support member, at said rear end, on a main support structure, said means comprising at two axis pivotal structure;

said two axis pivotal structure including a pivot for reciprocal rotation of said support member about a first axis extending from said main support structure and tangential to said arcuate bonding surface, said pivot mounted on a pivot support member mounted for reciprocal movement about a second axis normal to said first axis and tangential to said arcuate bonding surface, said first and second axes intersecting on said arcuate bonding surface at a bonding portion thereon;

means for reciprocating said pivot and said pivot support member about said first and second axes respectively, in a predetermined cycle whereby said bonding position moves over said arcuate bonding surface on a predetermined path.

4,037,773
BONDING OF METALS TO SOLID ELECTROLYTES

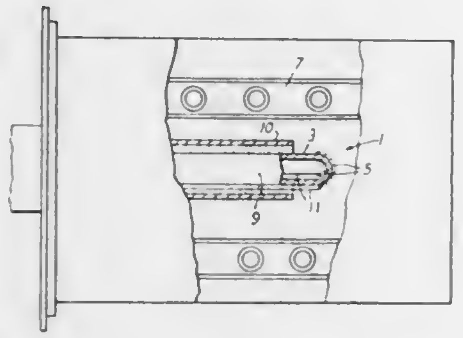
Robert George Hamilton Record, Luton, England, assignor to George Kent Limited, Luton, England

Filed Dec. 5, 1975, Ser. No. 638,090

Claims priority, application United Kingdom, Dec. 9, 1974, 53229/74

Int. Cl.^{2} B44D *1/50*

U.S. Cl. 228—122 **12 Claims**



1. A method of bonding a metal to a solid electrolyte material, suitably for making an electrolytic cell for measuring the oxygen content of gases, comprising:

applying a layer of the metal to a surface of the material; and then

heating the material in an atmosphere consisting or consisting substantially of hydrogen at a temperature and for a time sufficient to effect bonding of the metal to the material.

4,037,774
PROCESS FOR THE SOLDERING OF THE COOLER ASSEMBLY TO AUTOMOBILE RADIATORS

Dan Alexandru Barozzi; Valentin Calin, both of Brasov, and Zsigmond Peter, Prejmer, all of Romania, assignors to Intreprinderea De Radiatoare Si Cabluri, Brasov, Romania

Filed Sept. 12, 1975, Ser. No. 612,804

Int. Cl.^{2} B23K *1/02*

U.S. Cl. 228—183 **2 Claims**

1. In a process for soldering aluminum fins to cooling pipes made of aluminum, brass, steel, or copper to produce a cooling assembly for car radiators wherein the aluminum fins are etched and provided with a protective coating, wherein the cooling pipes are coated with solder, and where the aluminum fins are then mounted upon and soldered to the cooling pipes in a thermal bath, the improvement wherein:

a. the aluminum fins are etched for a period of 15 to 30 seconds at a temperature of 32° to 60° C in a solution which consists essentially of 10 to 14% sodium hydroxide, 4 to 7% zinc cyanide, 20 to 30% technical urea with the balance water; to prevent subsequent electrocorosion thereon;

b. the aluminum fins are then rinsed with running water for one minute;

c. the protective coating has a thickness of 2 to 4 microns and is applied by immersing the fins after etching in a bath which consists essentially of 10 to 30% technical stearine with 80 to 90% ethylene trichloride for 30 to 60 seconds at a temperature of 30° to 40° C; and

d. the thermal bath used during soldering consists essentially of 98% mineral oil having the following physical constants: minimum flash point 315° C and viscosity at 100° C of 45 to 65 c St and 2% technical stearine.

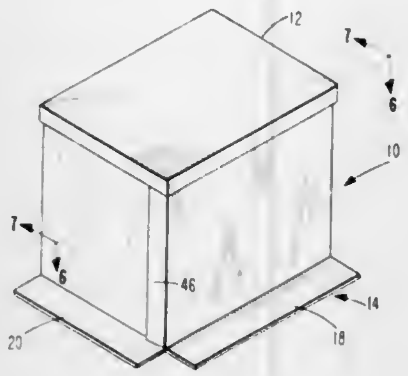
4,037,775
BULK REINFORCED LAMINATED CONTAINER

Robert A. Bamburg; Farris N. Duncan, both of West Monroe, and Roger M. Floyd, Monroe, all of La., assignors to Olinkraft, Inc., West Monroe, La.

Filed Feb. 18, 1976, Ser. No. 658,967

Int. Cl.^{2} B65D *5/72, 5/48, 13/00*

U.S. Cl. 229—15 **6 Claims**



1. A bulk reinforced laminated container body comprising

an outer shell having four serially joined shell wall panels and a joint flap hinged on one end of the shell wall panels and secured to the shell wall panel at the other end of the shell wall panels,

a center reinforcing partition having two center partition panels joined face-to-face and having two pairs of partition wall panels which are hinged on the side edges of the respective center partition panels,

said pairs of partition wall panels extending in opposite directions from the center panels and bonded to inside surfaces of respective side wall panels of the outer shell wall panels and

a pair of liners each having three serially joined liner wall panels wherein the intermediate liner wall panels are bonded to the inside surfaces of respective end wall panels of the outer shell wall panels and the end liner wall panels are bonded to the inside surfaces of the respective outer shell side wall panels in abutment with the ends of respective partition wall panels.

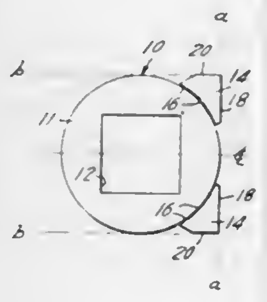
4,037,776
CIRCULAR LID

George Leroy Meyers, Menasha, and Thomas Dominic Pawlowski, Neenah, both of Wis., assignors to American Can Company, Greenwich, Conn.

Filed Apr. 26, 1976, Ser. No. 680,463

Int. Cl.^{2} B65D *5/64, 43/00*

U.S. Cl. 229—43 **10 Claims**



1. A unit blank for producing a single circular lid, comprising a circular main portion, and tab means projecting from the circumference thereof, said circular portion and said tab means being integrally formed from a piece of lid stock and having weak interconnecting means therebetween for facile detachment of said tab means, said tab means being configured to provide at least two rectilinear trailing edge portions on said blank outwardly of said circular portion, said edge portions

being aligned on a common axis extending perpendicularly to a medial axis, which medial axis is aligned with a diameter of said circular portion of said blank, whereby engagement members of a machine may contact said blank on said trailing edge portions of said tab means, to push said blank through the machine with a constant angular orientation.

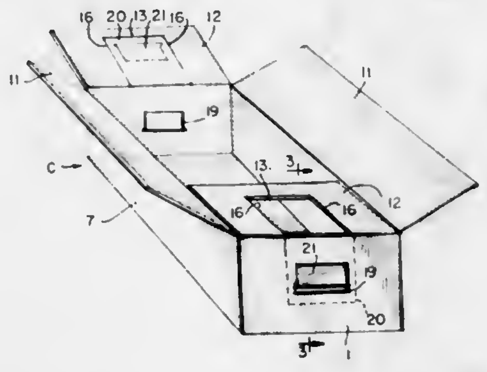
4,037,777
HANDHOLE CLOSURE FOR CONTAINERS

William G. Maughan, Clifton Forge, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed June 15, 1976, Ser. No. 696,381

Int. Cl.^{2} B65D *5/46, 25/22*

U.S. Cl. 229—52 B **1 Claim**



1. In a container having a pair of end walls and a pair of side walls, bottom closure flaps foldably connected to the lower edges of said walls and top closure flaps comprising a pair of major flaps foldably connected to the upper edges of said side walls and a pair of minor flaps foldably connected to the upper edges of said end walls, the improvement comprising handhole cutouts in each of said end walls with integral means for reinforcing said handhole cutouts and for shielding the entry of light and contamination into said container through said handhole cutouts, said integral means comprising a pair of reinforcing panels formed in said minor top closure flaps each of said reinforcing panels having an outer edge and two side edges wholly cut from a minor top closure flap and a foldable connection along an end wall that is common to the foldable connection between said end wall and minor top closure flap and a pair of handhole shielding flaps formed in each of said reinforcing panels, said shielding flaps each having an outer edge and two side edges wholly cut from a reinforcing panel and a foldable connection with said reinforcing panel that is parallel to and offset from the foldable connection between each reinforcing panel and end wall, wherein said reinforcing panels are adapted to be folded inside said container to lie adjacent the respective end walls and said handhole shielding panels are adapted to be engaged within the handhole cutouts in the perspective end walls.

4,037,778
UNIVERSAL BAG SUPPORT

Kenneth E. Boyle, 9126 Hayes, Overland Park, Kans. 66212

Continuation of Ser. No. 553,250, Feb. 26, 1975, abandoned. This application Sept. 7, 1976, Ser. No. 720,579

Int. Cl.^{2} B65D *33/02;* **B65B** *67/12*

U.S. Cl. 229—55 **1 Claim**

1. A free-standing refuse receptacle comprising:

a normally upright, flexible bag having a closed bottom adapted for resting on a supporting surface, an open top, and a continuous, annular sidewall extending between said top and bottom to define an interior refuse-receiving space,

said sidewall being flaccid throughout its expanse so as to render the bag incapable of supporting itself on said surface in an open and upright condition; and

an erect, substantially tubular and horizontally polygonal device within said bag holding the latter in said normally open and upright condition,

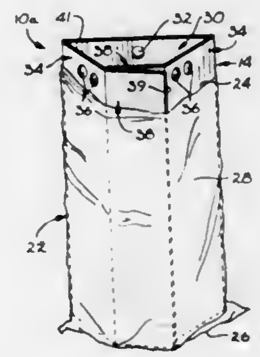
said device comprising a sheet of material having a pair of opposite, normally vertical end edges, a pair of opposite, normally horizontal upper and lower edges extending continuously between said end edges, and a pair of oppositely facing, normally inner and outer surfaces bounded by said edges,

said sheet being received within said space with said lower edge engaging the bottom of the bag and being substantially devoid of inherent resiliency but sufficiently rigid to avoid buckling,

said sheet having four vertically extending hinge lines formed therein, each extending continuously from the upper edge of the sheet to the lower edge thereof,

a central paid of said hinge lines defining a central upright panel of said sheet therebetween that has a width defined by the distance separating said central pair of lines,

an outer pair of said hinge lines being located on opposite sides of said central pair so that a pair of outer upright panels are presented on each side of said central panel,



one panel of each outer pair having its width defined by the distance separating the two hinge lines between which the panel is disposed, and the other panel of each outer pair having its width defined by the distance separating a corresponding said outer edge of the sheet and the next adjacent hinge line,

the combined widths of each pair of outer panels being substantially the same as said width of the central panel,

said outer surface of the sheet frictionally supporting the sidewall of the bag and said end edges of the sheet being mutually detached,

all of said hinge lines being operable to permit their respective panels to swing inwardly in such a direction as to move the portion of the sheet's inner surface presented by the moving panel toward that of the enext adjacent panel,

said hinge lines being further operable to permit the panels to be swung inwardly to such an extent as to render the device folded into a compact condition in which the two pairs of outer panels are alternately superimposed on said central panel and in which the final dimensions of the compacted device are substantially defined by said width of the central panel and the distance between said upper and lower edges of the sheet.

4,037,779
HEATING SYSTEM HAVING HIGH-LOW TEMPERATURE LIMIT CONTROLLED AUXILIARY BOILER

Joseph Jean Roy, 9811 Rosaryville Road, Upper Marlboro, Md. 20870, and Lorenzo Roy, 81 Hawley St., Lawrence, Mass. 01843

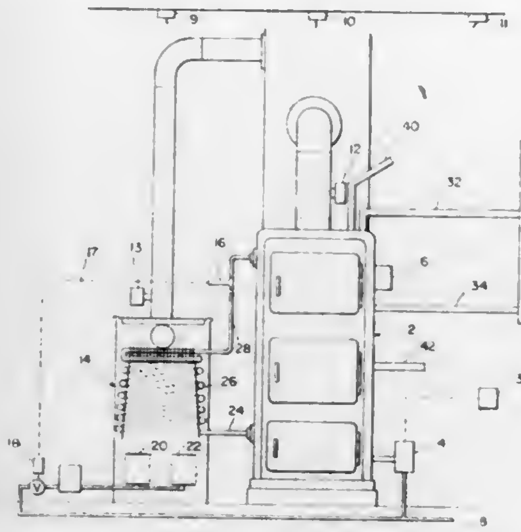
Filed Jan. 30, 1976, Ser. No. 653,780

Int. Cl.^{2} F24D *3/02*

U.S. Cl. 237—8 R **6 Claims**

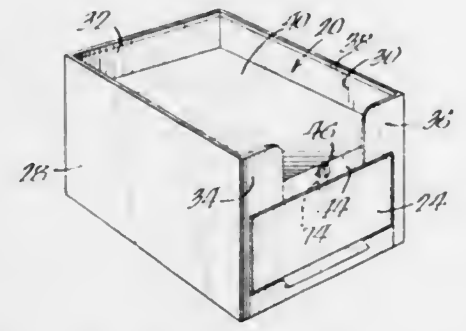
1. In a hot fluid conductor heating system having main boiler means with a given fluid capacity, main heating means having a given thermal capacity for heating the main boiler and thermostat means for actuating the main heating means, the im-

provement comprising: auxiliary boiler means having a fluid capacity less than said given capacity, said auxiliary boiler means connected to said main boiler means, auxiliary heating means having a thermal capacity substantially less than said given thermal capacity for heating the auxiliary boiler means and high-low temperature control means connected to said auxiliary heating means and maintaining a given temperature range of fluid conductor in said auxiliary and main boiler means.



4,037,780
LOCKING LETTER TRAY

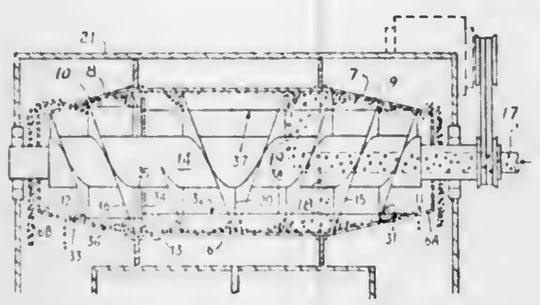
Sherwood S. Brownlee, Waynesboro; Fred H. Grubb, Stuarts Draft, and Richard C. Smith, Charlottesville, all of Va., assignors to Acme Visible Records, Inc., Crozet, Va.
Filed Apr. 5, 1976, Ser. No. 673,638
Int. Cl.² E05B *65/46;* **B65D** *55/14*
U.S. Cl. 232—31 **7 Claims**



1. In a desk top type locking letter tray for containing correspondence and the like, a housing having a base wall, a top wall spaced therefrom and parallel thereto, and side walls extending between the edges of said base and top walls forming a closure therewith, one of said side walls having an elongated slot formed therethrough toward said top wall for movement therethrough of correspondence into said closure, and another of said side walls having an enlarged opening therethrough and a lockable door associated therewith, said side walls extending beyond said top walls and defining therebetween and with said top wall an open tray for containing correspondence, said door when locked blocking entry to said closure through said opening and when unlocked being movable to clear said opening for removal of correspondence from said closure through said opening.

4,037,781
DECANTER CENTRIFUGE APPARATUS

Robert Edward High, St. Ives, Australia, assignor to Pennwalt Corporation, Philadelphia, Pa.
Filed Apr. 1, 1976, Ser. No. 672,698
Claims priority, application Australia, Apr. 1, 1975, 1058/75; Nov. 24, 1975, 4062/75
Int. Cl.² B04B *1/20*
U.S. Cl. 233—7 **5 Claims**



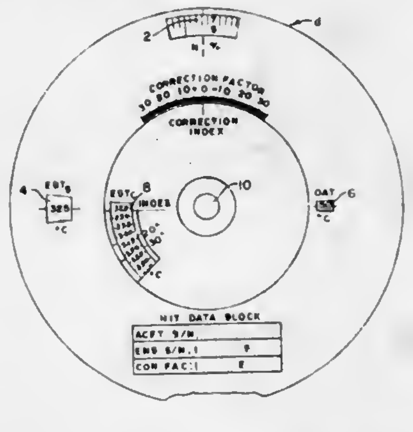
1. A solid bowl decanter centrifuge comprising a rotatable cylindrical bowl with conically tapering first and second opposite end portions each forming an internal inclined annular surface, a screw conveyor rotatable within and on the axis of the bowl and having first and second end parts of opposite pitch within the respective first and second end portions of the bowl, means for rotating said bowl and screw conveyor at different speeds, means for depositing a sludge within the bowl for separation of its different phases, means for discharging heavy and light solids phases of said sludge at the respective first and second end portions of the bowl, means for draining a liquid phase from the bowl between said end portions, said first and second opposite end portions of said bowl having respective first and second weirs to retain in the bowl during operation an annular pool of sludge, a heavy solids phase of the sludge being lifted from said pool and discharged over the first weir at said first end portion by the first end part of said screw conveyor, said means for draining the liquid phase of said sludge being a tube fixed to and passing through said bowl and having an inner orifice as an entry for said liquid phase, said orifice being spaced radially from the rotational axis of said bowl a greater distance than said first weir, a light solids phase of the sludge being discharged over the second weir at said second end portion, the second weir having a radial spacing from the rotational axis of said bowl which is intermediate that of said first weir and that of said liquid phase orifice, a primary radial baffle having its outer periphery spaced from the inner wall of said bowl to provide a passage, said primary baffle being secured to the screw conveyor at a position between said second weir and said liquid phase tube, said second weir having a radial spacing from the rotational axis of said bowl which is greater than that of said liquid phase orifice, whereby the light solids phase is discharged over the second weir by combined action of said screw flights and the hydraulic pressure of said liquid phase communicated via said passage, and an auxiliary radial baffle secured to said screw conveyor which is located between said liquid phase tube and the first weir, whereby in operation a light liquid phase of the sludge is confined between the primary and auxiliary baffles and is discharged via the liquid phase tube while a heavy liquid phase is discharged via said passage and over the second weir.

4,037,782
ENGINE CONDITION CALCULATING DEVICE

William Nelson Jackson, St. Louis, Mo., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.
Filed July 12, 1976, Ser. No. 704,712
Int. Cl.² G06G *1/02;* **G06C** *3/00*
U.S. Cl. 235—84 **7 Claims**

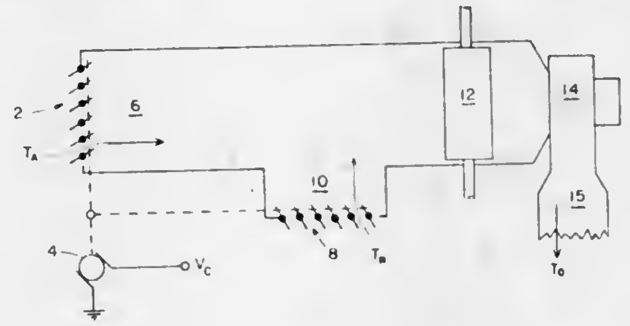
1. A calculating device for monitoring a turbine engine's condition on a daily basis from engine performance parameters N_1, EGT and OAT,

wherein N_1 measures the revolutions per minute of the gas producer section of the engine and is expressed in percent rpm,
wherein EGT is engine gas temperature,
and wherein OAT is outside air temperature, the calculating device comprising
a base having
an OAT scale increasing linearly in a predetermined direction and calibrated in degrees Celsius,
an N_1 scale increasing linearly in the same predetermined direction and also calibrated in degrees Celsius, first and second EGT scales in parallel disposition in increasing units, the OAT, N_1 and EGT values being oriented with respect to each other so that for each value of OAT corresponding values of N_1 and EGT are equally spaced on said base plate,
a first overlay plate adapted to overlie the base plate the first overlay having windows over the OAT, N_1 and the first EGT scales, oriented to expose an EGT value on the EGT scale and corresponding values of N_1 and OAT on the other two scales when the plate is moved from one value to another, and having a correction factor scale of numerals imprinted thereon,
and a second overlay plate adapted to overlie the first overlay plate
the second overlay having a window which exposes EGT values on the second EGT scale,
and an indexing line adapted to lie opposite numerals on the correction factor scale to linearly offset the window to a different EGT value on the second EGT scale based on the correction factor.



4,037,783
REDUCED OUTSIDE AIR CAPABILITY FOR UNIT VENTILATORS

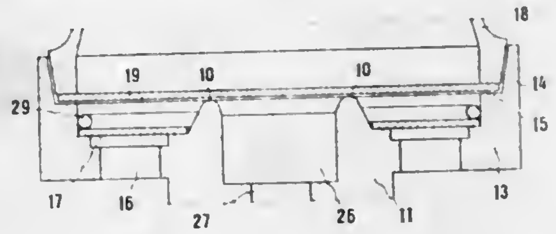
George J. Bradford, York, Pa., assignor to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Feb. 19, 1976, Ser. No. 659,400
Int. Cl.² F24F *7/00*
U.S. Cl. 236—49 **20 Claims**



1. A ventilation apparatus, comprising:
means for delivering tempered outdoor air to a room; and means for controlling the volume of outdoor air that is tempered in corresponding relation to outdoor air temperature so that the volume of tempered outdoor air delivered to the room remains substantially constant over variations in outdoor temperature.

4,037,784
STEAM TRAP

Louis J. Sabarly, Paris, France, assignor to Societe Industrielle des Charmilles, Paris, France
Filed Apr. 1, 1976, Ser. No. 672,670
Claims priority, application France, Apr. 10, 1975, 75.11236
Int. Cl.² F16T *1/10*
U.S. Cl. 236—56 **7 Claims**



1. A steam trap construction for allowing the escape of condensate of and from a working fluid under pressure and adapted for mounting in a body having a working fluid chamber communicating with a working fluid inlet and selectively communicating with or closed off from a condensate outlet, said trap construction comprising an enclosure carried by said body, a deformable metal diaphragm carried by said enclosure and dividing the latter into a first chamber and a second chamber, control fluid means in said first chamber under pressure, an annular valve seat extending into said second chamber and communicating via passage means with said outlet, one face of said diaphragm confronting and being capable of seating on said valve seat and its opposite face being exposed to said control fluid, and fluid passage means establishing communication between said working fluid chamber and said second chamber of said enclosure radially outwardly of said valve seat, said diaphragm being deformable to a position off said valve seat when the pressure of said working fluid acting on said one face of said diaphragm exceeds the pressure of said control fluid acting on the opposite face of said diaphragm, whereby fluid may pass from said second chamber into said outlet via said passage means, the area of said one face of said diaphragm exposed to said working fluid being less then the area of the opposite face of said diaphragm exposed to said control fluid when said diaphragm is seated on said valve seat.

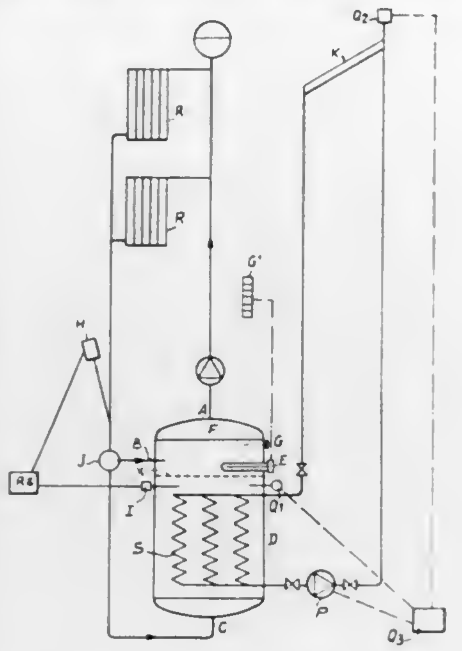
4,037,785
COMBINATION SOLAR AND ELECTRIC HEATER

Jean-Pierre Madern, Route de Perpignan, 66330 Cabestany, France
Filed Aug. 18, 1975, Ser. No. 605,291
Claims priority, application France, Aug. 20, 1974, 74.28915; Feb. 3, 1975, 75.03789
Int. Cl.² F24J *3/02*
U.S. Cl. 237—1 A **5 Claims**

1. In the combination of a solar heater, a storage container connected to receive heated liquid from and supply cooler liquid to said solar heater, and heat utilizing means connected to receive heated liquid from said storage container and return a cooler liquid to said container, the improvement which comprises:
at least one perforated partition dividing said container into upper and lower chambers,
an inlet for heated liquid from said solar heater,
an outlet for said heated liquid supplying said heat utilizing means, and an inlet for cooler liquid from said heat utilizing means, both said inlets and said outlets being located in said upper chamber, with the inlet for cooler liquid from said heat utilizing means below said outlets.

an outlet supplying cooler liquid to said solar heater positioned near the bottom of said upper chamber,

additional heating means in said upper chamber, and



heat responsive means for activating said additional heatng means.

4,037,786

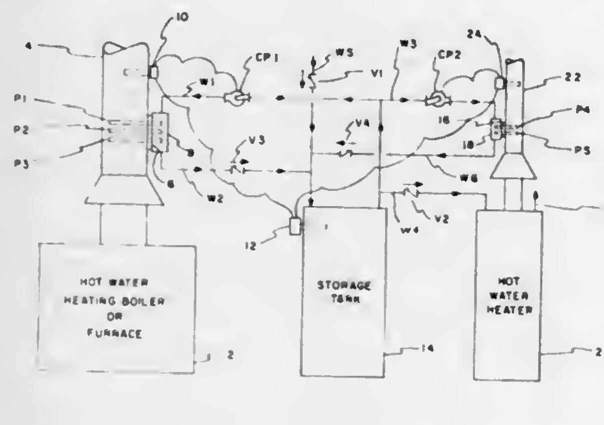
ENERGY RECOVERY AND STORAGE SYSTEM

Patrick Oliver Munroe, Tulsa, Okla., assignor to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Aug. 15, 1975, Ser. No. 605,051

Int. Cl.^{2} F24D *3/08;* **F24H** *1/22*

U.S. Cl. 237—19 **9 Claims**



5. An energy conservation and storage system comprising heat transfer means capable of receiving energy in the form of heat and transferring the heat to a fluid for storage in storage means, means for positioning said heat transfer means to enable a first portion to extend into a flue-stack for contact with flue gases and a second portion to extend outside the flue-stack for contact with fluid in a fluid holding jacket, circulating means for circulating fluid through said fluid holding jacket to remove heat supplied by the heat transfer means and to transfer the fluid to the storage means, a first temperature sensitive control means positioned in said flue-stack and responsive to a first control signal and to a range of temperatures in said flue-stack to control said circulating means and thereby control circulation of fluid through said fluid holding jacket and second temperature sensitive control means coupled to said storage means and responsive to the temperature of the fluid therein to provide said first control signal when the temperature of the fluid in said storage means is less than a predetermined value, thereby to activate said circulating means.

4,037,787

METHOD OF SUPPLEMENTAL IRRIGATION FOR FARMING

Harry A. King, 19361 Trino Circle, Yorba Linda, Calif. 92686

Filed Apr. 19, 1976, Ser. No. 678,249

Int. Cl.^{2} E01H *13/00;* **A01G** *13/06*

U.S. Cl. 239—2 R **4 Claims**

1. The method of supplying water to plants and conserving water already in the plant and in the soil comprising: placing in the atmosphere around the plant a fog of water droplets, the majority of which droplets having a diameter between about 10 and about 200 microns, substantially all of which droplets have a diameter no greater than 300 microns, the mass median diameter of all droplets being about 50 microns, whereby the droplets evaporate at a moderate rate and drift substantial distances with slow air movement before reaching the ground, whereby to cover a substantial area of ground with water.

4,037,788

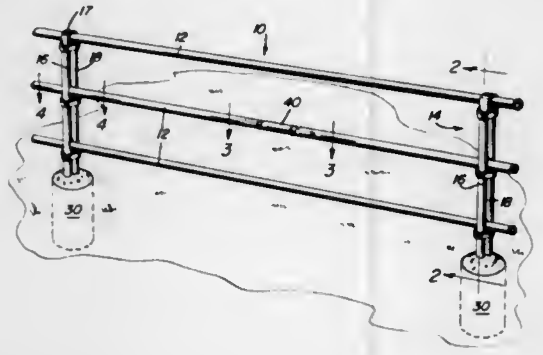
FENCE CONSTRUCTION

Harry D. Riley, 1302 W. Camelback, Phoenix, Ariz. 85013

Filed Dec. 3, 1975, Ser. No. 637,155

Int. Cl.^{2} A01G *25/00;* **E04H** *17/14*

U.S. Cl. 239—207 **7 Claims**



1. A fence constructed of rust-resistant metal tubing for the purpose of maintaining stock in a confined area, comprising; fence post means which can be fabricated for supporting fence rails without nuts, bolts, or welding; fence rail means supported by said fence post means, and means for locking said fence rail means to said fence post means in a secure manner, the fence post means includes metal tubing flattened and deformed at the center thereof and bent around the fence rail means for the uppermost rail with the two legs formed after the bending extending downwardly for mounting in the ground, and the fence post means has at least one semi-circular deformed portion in each of the vertical extending leg members for holding round fence rail means secured therewithin and supported between the two leg members, the round fence rail means including tubing of indeterminative length supported by the semi-circular deformed portions in said vertical fence post legs, internally mounted swage-type connectors for connecting the ends of horizontal rails together to form continuous fence rails of any desired length, and locking bands tightly fitting around the two leg members of the fence posts and just below each rail member for securely holding said rail members within and to said fence posts.

4,037,789

AEROSOL-PARTICLE DISPENSER

Shunji Nishimura, Rua Dr. Luiz Miranda No. 5, Pompeia, Estado de Sao Paulo, Brazil

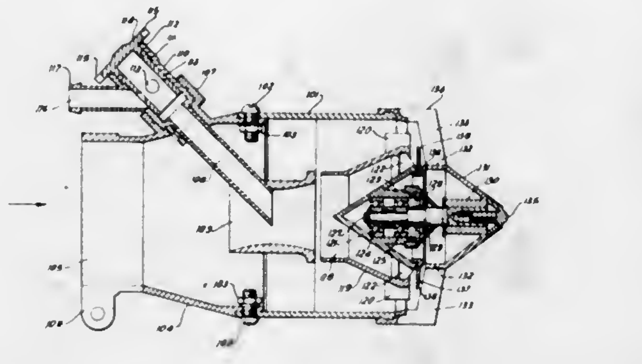
Division of Ser. No. 549,390, Feb. 12, 1975. This application Jan. 5, 1976, Ser. No. 646,667

Claims priority, application Brazil, Dec. 27, 1973, 010222; May 13, 1974, 03896

Int. Cl.^{2} B05B *7/30*

U.S. Cl. 239—214.17 **12 Claims**

1. A turbine for dispensing aerosol-particles, comprising a tubular body forming a passage which has an inlet end for a stream of gas, and an outlet end; a venturi mounted in said passage and having an extension which diverges in direction towards said outlet end; an outer hub mounted on said tubular body; a shaft mounted in said outer hub; an inner hub mounted for rotation on said shaft within said extension, defining with an inner circumferential wall surface thereof an annular clearance and carrying a plurality of angularly spaced blades which are located in said clearance; a tubular injector unit extending into said tubular body and having an open end positioned to discharge into said venturi, said unit having an outer turnable end portion exteriorly of said tubular body and provided with angularly spaced openings of different cross-sectional areas; a housing surrounding said outer end portion; a nipple communicating with said housing and adapted for connection to a source of substance to be dispensed; and an annular member mounted on said inner hub and having a central opening through which said shaft extends, said annular member having a serrated annular marginal portion axially spaced from and located opposite to said annular clearance.



4,037,790

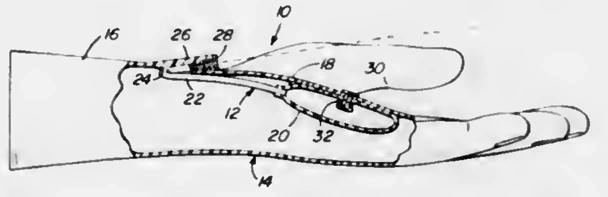
WATER GLOVE

Roger W. Reiser, 3697 Hillcrest Road, and Gary K. Summers, 2440 Pearl St., both of Dubuque, Iowa 52001

Filed Apr. 1, 1976, Ser. No. 672,626

Int. Cl.^{2} B05B *9/08*

U.S. Cl. 239—529 **7 Claims**



1. A novelty device, comprising, in combination:

a. spray means for containing an amount of medium to be sprayed and discharging the medium in response to an application of pressure thereon; and

b. carrying means connected to the spray means for supporting the spray means on a user's hand and causing the spray means to be subjected to an application of pressure whenever the user's hand has a force applied thereto, the carrying means being a glove arranged to be worn on a user's hand and being provided with an aperture for permitting discharge of the medium from the spray means, the spray means including:

  1. a compressible bulb arranged for containing an amount of medium to be sprayed and for being subjected to a force applied to the glove; and
  2. a nozzle member connected to the bulb and arranged in the aperture provided in the glove for directing the medium from the compressible bulb and out of the glove, the glove including a gauntlet and a palm portion, and wherein the aperture is disposed in the gauntlet and the nozzle member is directed in the general direction of the palm portion from the gauntlet.

4,037,791

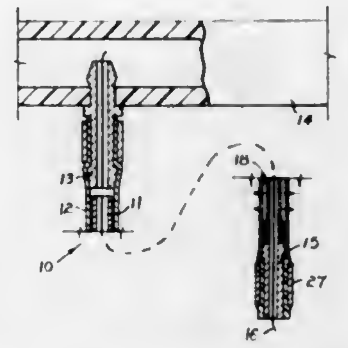
FLOW-CONTROL DEVICE

Leslie Fred Mullett, 29 Grantley Avenue, Victor Harbour, Australia (5211), and Alan James Brock, 26 Strangeways Terrace, North Adelaide, Australia (5006)

Filed Oct. 17, 1975, Ser. No. 623,229

Int. Cl.^{2} B05B *1/30*

U.S. Cl. 239—542 **13 Claims**



1. A pressure compensated emitter device for controlling rate of liquid discharging from a plenum which contains liquid at superatomspheric pressure, comprising

a discharge tube of comparatively smaller diameter and large length contained within said plenum, the discharge tube having an inlet end within the plenum and a discharge end downstream of the inlet end whereby a pressure gradient occurs between said ends of the discharge tube and a pressure differential exists between the plenum and the space within the discharge tube which increases towards said discharge end, the walls of said discharge tube being sufficiently resilient that the pressure differential reduces the cross-sectional area of at least a portion of said tube and;

a core extending through the tube from one said end to the other, the core having substantially a smooth surface and substantially a constant diameter throughout its length.

4,037,792

CONTINUOUSLY REFINING RAW FIBROUS MATERIAL TO PRODUCE MECHANICAL REFINER PULP

Viking Per Peterson, Sundsvall, Sweden, assignor to SCA Development Aktiebolag, Sundsvall, Sweden

Continuation of Ser. No. 401,598, Oct. 1, 1973, abandoned. This application Sept. 2, 1975, Ser. No. 609,226

Claims priority, application Sweden, Oct. 23, 1972, 13653/72; Apr. 3, 1973, 7304665

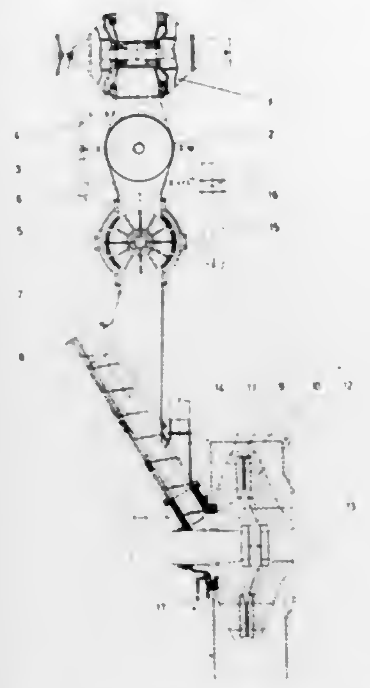
The portion of the term of this patent subsequent to Nov. 25, 1992, has been disclaimed.

Int. Cl.^{2} B02C *23/26;* **D21B** *1/14*

U.S. Cl. 241—18 **8 Claims**

1. A continuous method of producing a mechanical refiner pulp from raw fibrous material comprising the steps of preheating said fibrous material in a preheater in the presence of steam under a pressure which exceeds atmospheric pressure to a temperature exceeding 110° C., so as to soften said fibrous material, continuously introducing said softened fibrous material through a conduit to a disc refiner to refine said softened fibrous material between refining surfaces of said disc refiner, without prior defibration, whereby steam is generated in said disc refiner during refining of said softened fibrous material, continuously conducting at least a portion of said steam generated in said disc refiner away from said disc refiner as subsequent fibrous material is continuously being introduced between the refining surfaces of said disc refiner in order to obtain a desired pressure between said refining surfaces of said disc refiner and to prevent the entire amount of said steam generated in said disc refiner from passing between the discs thereof said desired pressure being greater than atmospheric pressure, but less than the pressure in said preheater, and main-

taining the gap between said refining surfaces such that the preheated fibrous material is refined to produce a mechanical refiner pulp of a sufficiently high quality that can be used for making cardboard or paper.



4,037,793

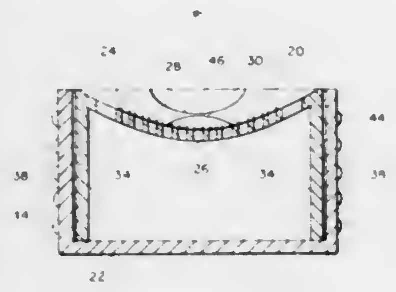
CITRUS GRATER

Lois J. Puustinen, 3560 Hayden Bridge Road, Springfield, Oreg. 97477

Filed Feb. 27, 1976, Ser. No. 662,151

Int. Cl.² A47J *43/25*

U.S. Cl. 241—30 **8 Claims**



1. A device for gratingly removing the extreme outer oil-bearing portion of the rind from citrus fruits, said device comprising a grating element having a flexible grating surface preformed in a concave, curved shape and flexibly conformable in shape to both spherical and nonspherical convex surfaces when any of said convex surfaces is pressed thereagainst, said grating element having a plurality of apertures formed therethrough, and grating means protruding from said grating surface proximate each of said apertures for penetrating substantially only the extreme outer oil-bearing portion of the rind of a citrus fruit as said fruit is pressed against said grating surface, said grating means protruding from said grating surface a distance sufficient to penetrate said oil-bearing portion of said rind without also substantially penetrating the white inner skin material lying thereunder, whereby, when said citrus fruit is pressed against said grating surface and moved relative thereto, the oil-bearing portion of said rind penetrated by said grating means is gratingly removed from said fruit and forced through said apertures.

4,037,794

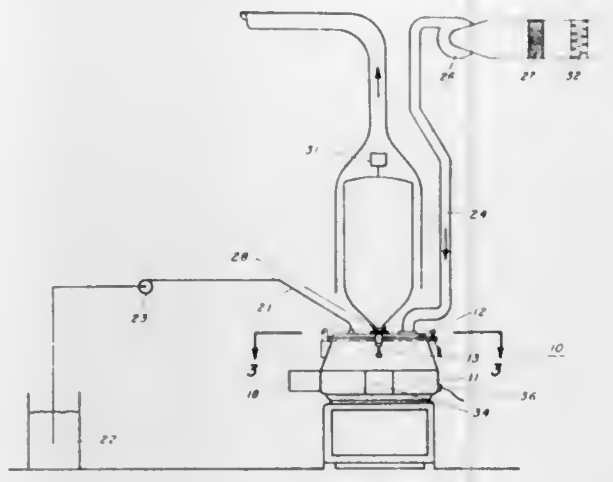
GRANULATION APPARATUS

Guido W. Melliger, Dover, N.J., assignor to Dierks & Sohne, Osnabrueck, Germany

Filed Sept. 23, 1974, Ser. No. 508,422

Int. Cl.² B02C *23/12*

U.S. Cl. 241—46.17 **11 Claims**



1. In an apparatus for the preparation of dry medicament granulations, an enclosed circular mixing chamber which is axially symmetrical about a vertical axis, sealable first means in communication with the chamber for introducing ungranulated medicament directly into the chamber, second means in communication with the chamber and disposed in spaced relation to the first sealable means for introducing granulating liquids into the chamber, rotatable mixing means supported within the chamber, third means in communication with the chamber for introducing drying air into the chamber, and forth means in communication with the chamber for withdrawing air from the chamber.

4,037,795

WASTE DISPOSAL SYSTEMS

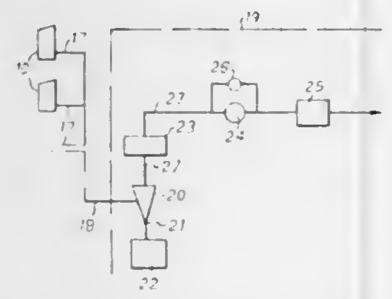
Donald R. Fyfe, 60 Raisins Hill, Pinner, Middlesex, England

Filed Jan. 6, 1976, Ser. No. 646,919

Claims priority, application United Kingdom, Jan. 8, 1975, 853/75; May 17, 1975, 21056/75

Int. Cl.² B02C *23/30*

U.S. Cl. 241—58 **8 Claims**



1. A waste disposal system comprising a disposal plant, at least one comminuting machine for separately receiving and comminuting waste, said comminuting machine being disposed remote from said disposal plant and having a loading port for waste, a discharge for communited waste, a duct extending between said discharge and said disposal plant and placing said discharge in constant communication with said disposal plant, suction means for drawing comminuted waste through said duct into said disposal plant, and said suction means being in constant communication with said loading port for maintaining a subatmospheric pressure at said loading port at all times, said comminuting machine also including rotaty cutters and grill means, and means mounting said grill means for selective movement between a first position in which said grill means are operatively interposed between said cutters and said discharge and a second position in which said grill means are inoperative by not being so interposed.

4,037,796

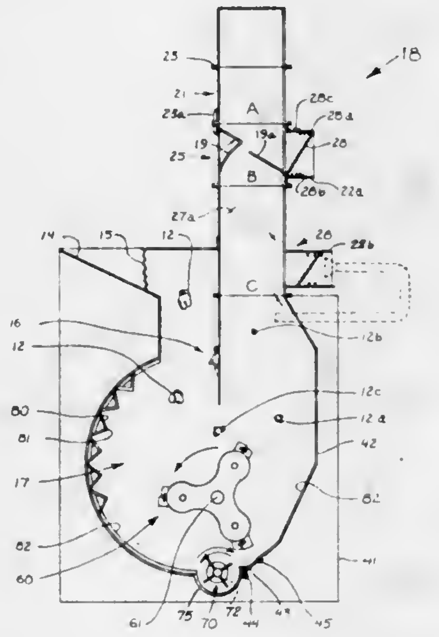
ROTARY MILL UTILIZING AN IMPACT REDUCTION CHAMBER AND A VERTICAL AIR FLOW CLASSIFICATION CHAMBER

Peter M. Francis, Las Vegas, Nev., assignor to Industrial Mining Machinery Company, Las Vegas, Nev.

Filed Apr. 13, 1976, Ser. No. 676,477

Int. Cl.² B02C *23/12*

U.S. Cl. 241—59 **6 Claims**



1. The improvement in a mill for the crushing and classification of materials comprising: the combination with a housing and drive motor of the following: an intake chute interconnecting with an impact reduction chamber within said housing; an impact rotor connected to said motor and mounted within said impact reduction chamber such that upon rotation of said impact rotor a verticle airflow is produced within said impact reduction chamber; a plurality of impact hammers mounted upon said impact rotor, extending outward from the periphery of said impact rotor; a motor driven reversible fluidizing rotor being located in said reduction chamber directly beneath said impact rotor to prevent materials from accumulating under said impact rotor; at least one classification chamber positioned directly above said impact reduction chamber with open interior communication between said impact reduction chamber and said classification chamber; means within the classification chamber to control the velocity of said vertical air flow caused by the rotation of said rotor; means within the classification chamber to gather materials of a predetermined size which are lifted by said vertical airflow; means cooperative with and connected to the classification chamber for the purpose of exiting the materials from the classification chamber; and means within the classification chamber to direct the movement of vertical airflow within the mill.

4,037,797

GRINDING MILL

Harold E. Stevens, deceased, late of Brigham City, Utah (by Joan Stevens, heiress), assignor to Mill & Mix Company, Inc., Brigham City, Utah

Filed Apr. 29, 1974, Ser. No. 464,794

Int. Cl.² B02C *7/14, 7/18*

U.S. Cl. 241—100 **4 Claims**

1. A grinding mill comprising

a housing;

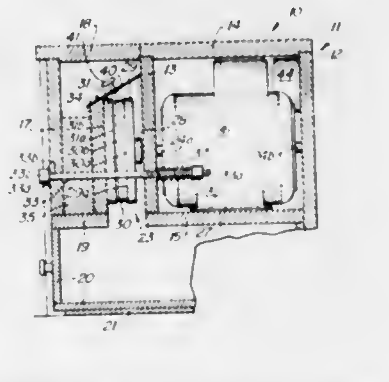
first and second partitions in the housing dividing the housing into compartments;

a motor in a first one of said compartments, said motor having an output shaft extending through said first partition into an adjacent second one of said compartments;

a grinding stone in said second compartment and fixed to and rotatable with said output shaft and a second grinding stone in said second compartment, said second stone being fixed to said second partition and held against rotation relative to said first stone and in face-to-face grinding relationship therewith and said second grinding stone having a hole through the center thereof through which grain to be ground is fed between the stones;

a removable lid extending from the first partition generally downwardly over the second partition within the housing and into a third compartment of the housing whereby grain placed therein is directed into the third compartment;

a floor panel beneath the first and third compartments;



a drawer opening in the housing below the floor panel and the second compartment;

a drawer havng an open top slidable into said drawer housing, whereby said open top is beneath the second compartment to receive material ground between the grinding stones in said compartment;

a hole through the second partition, said hold interconnecting the third compartment and the hole through the second grinding stone;

an access panel in the housing above the second and third compartments, through which grain to be ground can be fed; and

guide means above the drawer in the third compartment for directing grain placed therein through the hole through the second partition and the hole through the second grinding stone to be grounded between said stones before falling from the second compartment to the drawer.

4,037,798

CEREAL MILL

Johann Georg Schnitzer, Feldbergstrasse 26, 7742 St. Georgen, Germany

Filed Sept. 16, 1975, Ser. No. 613,866

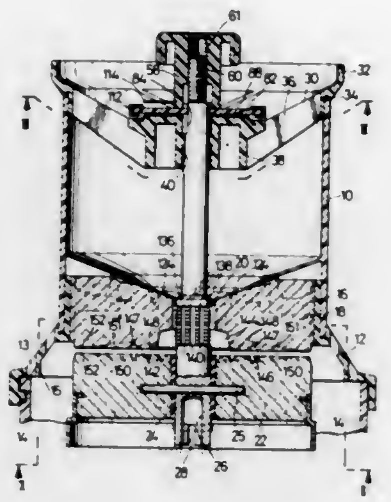
Claims priority, application Germany, Sept. 16, 1974, 2444151; Sept. 16, 1974, 2444150; Oct. 4, 1974, 2447380

Int. Cl.² B02C *7/14*

U.S. Cl. 241—101.2 **26 Claims**

1. A cereal mill comprising a cylindrical cereal supply container adapted to be placed on a kitchen appliance having a driven shaft, said supply container having a funnel-shaped portion to supply grain to be ground and a cover; an upper millstone fixedly mounted on said supply container below said funnel-shaped portion, said supply container and upper millstone being substantially stationary during the milling operation; a vertical driveshaft extending through said upper millstone and said funnel-shaped portion and being provided at the lower end thereof with coupling means for being coupled to the driven shaft of the kitchen appliance; a lower millstone disposed below said upper millstone and mounted on said driveshaft for common rotation therewith, said upper millstone having a central supply channel dimensioned to feed grain to be ground from said funnel-shaped portion to a milling space

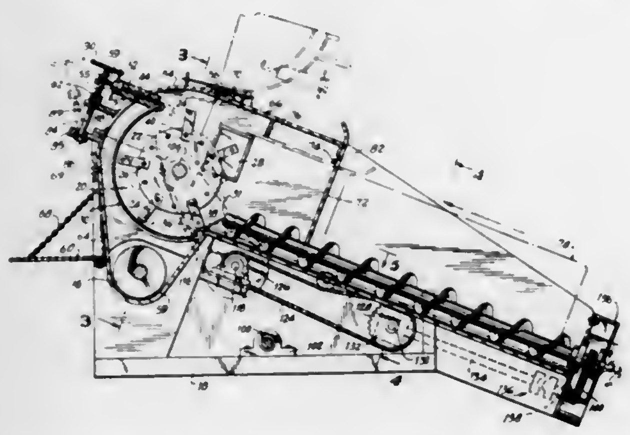
between said millstones; and adjusting means provided at the upper end of said driveshaft and said container for selectively moving said driveshaft along the axial direction thereof relative to said stationary container to adjust the milling space between said millstones, said adjusting means being disposed on the opposite end from said coupling means with respect to said millstones and being accessible for adjustments when said mill is supported on the kitchen appliance, whereby said millstones may be adjustably spaced from one another to change the milling space prior to or durig the milling operation.



4,037,799
PORTABLE HAMMERMILL AND ATTACHED INCLINED AUGERED FEED TABLE

Guy K. Urban, deceased, late of Lancaster, Pa. (by Mary Urban, administratrix/executrix), assignor to Feedmobile, Inc., Lititz, Pa.

Filed Apr. 30, 1975, Ser. No. 573,026
Int. Cl.² B02C *13/286*
U.S. Cl. 241—186 A **10 Claims**

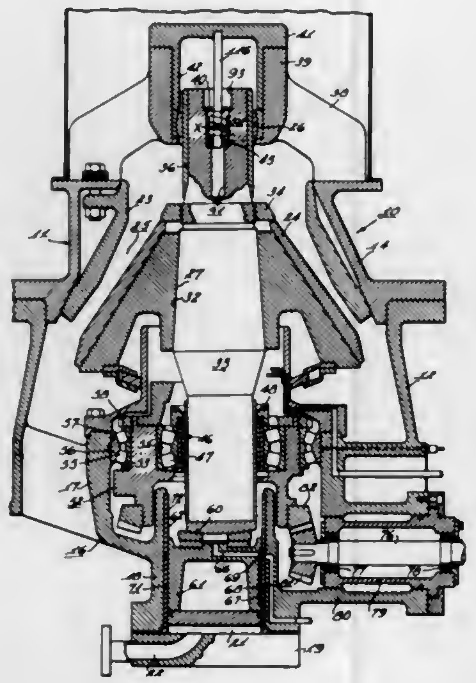


1. A hammermill comprising a housing defining a grinding chamber having a rotor with a plurality of swinging hammers and a removable screen; an open material-receiving trough forming a feed table on one side of the housing; at least one pair of counter-rotating augers rotatively supported within said trough and flighting disposed about said augers for feeding material to be processed directly upwardly at an angle into the rotor and grinding chamber of said hammermill; said feed table rigidly affixed to said rotor housing and residing in a plane passing through the plane of said rotor, and means for rotating said rotor and said augers.

4,037,800
GYRATORY CRUSHER HAVING ANTISPIN DEVICE FOR HEAD

Major Coxhill, Appleton, Wis., assignor to Allis-Chalmers Corporation, Milwaukee, Wis.

Filed June 8, 1976, Ser. No. 693,785
Int. Cl.² B02C *2/04*
U.S. Cl. 241—213 **3 Claims**

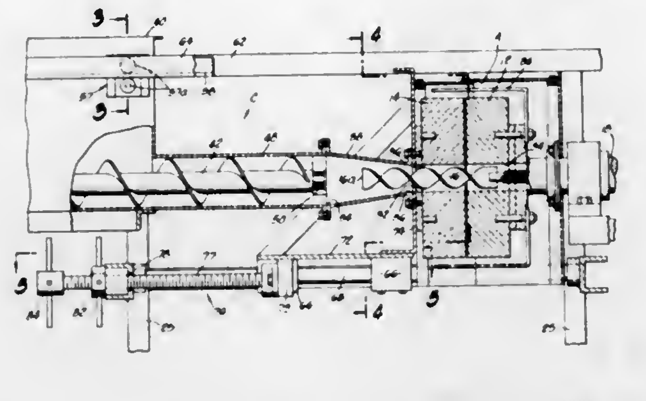


1. In a gyratory crusher having a frame including a spider, a crusher head carried by a shaft which is supported by the frame for rotation about its own axis and for gyratory movement about the axis of the frame and a drive eccentric operable to effect the gyratory movement of the shaft and crusher head:
- an axial bore in the shaft, said axial bore having a counterbore;
- a first ratchet plate having an axial opening the diameter of which is substantially equal to the diameter of said bore in the shaft, said first ratchet being disposed at the bottom of the counterbore and secured therein to rotate with the shaft;
- a second ratchet plate disposed in the counterbore in operating engagement with said first ratchet plate;
- means in said second ratchet plate defining a non-circular opening therethrough;
- a torsion rod of noncircular configuration of cross-section secured to the spider and depending downwardly therefrom into said axial bore formed in the shaft, said torsion rod extending through the openings in said first and second ratchet plates, said opening in said second ratchet plate being sized to give clearance to said torsion rod in all vertical positions of the shaft but sufficiently small enough wherein upon limited rotation of said second ratchet plate the sides of the opening engage with said torsion rod to stop further rotation of said second ratchet whereupon said first and second ratchet plates in cooperation with said torsion rod operate to prevent the further rotation of the shaft in the direction in which the drive eccentric is rotating; and,
- a spring confined within the counterbore and acting against said second ratchet plate to bias said second ratchet plate into operating engagement with said first ratchet plate, said spring yielding when the crusher is under load to permit the shaft to rotate in a direction opposite to the direction in which the drive eccentric is rotating.

4,037,801
GRINDING APPARATUS

James A. Jimenez, Temple City, Calif., assignor to Electra Food Machinery, Inc., El Monte, Calif.

Filed Mar. 1, 1976, Ser. No. 662,457
Int. Cl.² B02C *7/14, 7/16*
U.S. Cl. 241—247 **4 Claims**



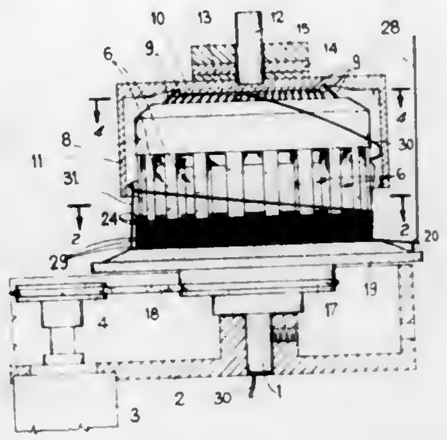
1. A material grinding apparatus for continuously grinding corn and the like in a manner to provide an output of ground material at a uniform controllable rate, comprising:
- a. a material grinding chamber having an opening for receiving material to be ground;
- b. first and second cooperating material grinding members in said chamber, said first grinding memeber being rotatable and said second grinding member being nonrotatable;
- c. a first feed worm disposed in axial alignment with the opening in said grinding chamber for feeding the material to be ground to said grinding members;
- d. a force feed means cooperatively associated with said first feed worm for controllably feeding the material to be ground to said first feed worm at a predetermined rate, said force feed means comprising:
  - 1. a material dispensing hopper;
  - 2. a second feed worm disposed in axial alignment with said first feed worm and cooperatively associated therewith for receiving the material from said hopper and feeding it to said first feed worm; and
  - 3. a frustoconically shaped nozzle disposed intermediate said second feed worm and said material grinding chamber, said nozzle having a rearward opening and a smaller diameter forward opening adapted to telescopically receive at least a portion of said first feed worm; and
- e. a carriage means reciprocably movable toward and away from said first grinding member for carrying said second nonrotatable material grinding member and said force feed means whereby said second grinding member can be moved into and out of material grinding engagement with said first grinding member.

4,037,802
APPARATUS FOR STORING AND FEEDING YARN TO YARN USING MACHINES

Sergio Calamani, Via Settima, 27, Segrate San Felice, Milan; Eugenio Turri, Via Benedetto Marcello, 1, and Ermanno Savio, Via Garofalo 22, both of Milan, all of Italy

Filed Apr. 7, 1975, Ser. No. 565,608
Claims priority, application Italy, Apr. 10, 1974, 21212/74; Aug. 7, 1974, 26113/74; Oct. 21, 1974, 28631/74
Int. Cl.² B65H *51/20*
U.S. Cl. 242—47.05 **12 Claims**

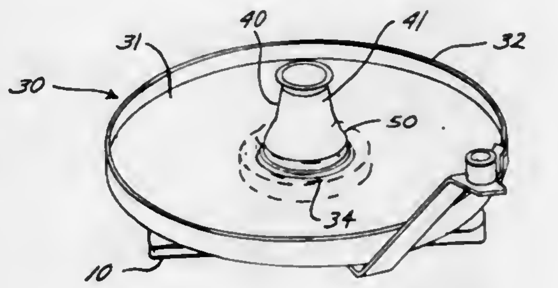
1. An apparatus for storing and feeding yarn to a yarn using machine comprising; a substantially upright hollow shaft containing a bore, a substantially cylindrical drum containing an outer surface with upper and lower portions thereof, distributing means for distributing yarn as windings on the said outer surface of said drum and then through said bore of said hollow shaft, driving means for producing relative rotational movement between said distributing means and said drum, translating means for causing said yarn windings to be translated from the lower to the upper portion of said outer surface of said drum while separating said windings from one another, and variable tension controlling means for braking and providing a variable range of tension to the yarn which is leaving said apparatus and being fed to said yarn using machine, said variable tension controlling means comprising; a bell member containing a base wall and a peripheral wall, said bell member being positioned above said drum such that the base wall is spaced apart from the drum top and the peripheral wall is spaced apart from the outer surface of said drum, an annular member coaxial with said shaft and coupled to said drum, and a plurality of inwardly projecting flexible elongated fingers secured to one of said members and having free ends contacting the other member for support of the bell member on the annular member, said fingers being inclined in the direction of the yarn movement during the run off from



4,037,803
CENTER FEED UNWINDER

Paul E. Becking, San Mateo, Calif., assignor to Data-Link Corporation, San Mateo, Calif.

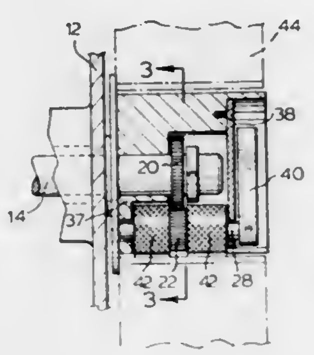
Continuation of Ser. No. 300,875, Oct. 25, 1972, abandoned, which is a continuation of Ser. No. 873,812, Nov. 4, 1969, abandoned. This application Nov. 1, 1973, Ser. No. 411,738
Int. Cl.² G11B *23/00;* **B65H** *25/22*
U.S. Cl. 242—55.18 **20 Claims**



1. Center feed tape unwinder comprising:
- a rotatable tape storage bowl; and
- a cone member extending outwardly at the center of said bowl, about which tape may spiral; said cone member including at least an upper and a lower inwardly and upwardly tapering conical portion with said upper conical portion having a surface with a substantially greater coefficient of friction with tape than the surface of said lower conical portion;
- said cone member further including a primary cone;
- said upper portion being a conical boot surrounding the upper part of said primary cone; and
- said lower portion being a secondary cone surrounding the lower part of said primary cone.

4,037,804
LOCKING MECHANISM

Slavco A. Kopachkov, Toronto, Canada, assignor to Rothmans of Pall Mall Canada Limited, Toronto, Canada
Filed June 23, 1976, Ser. No. 698,950
Int. Cl.² B65H *17/02*
U.S. Cl. 242—68.3 **6 Claims**



1. A locking mechanism comprising:

a hollow cylindrical housing having a circular base plate, wall means upstanding from and integral with said base plate and a circular cover plate closing an open end of said housing,

an axle extending through said base plate axially of and into said housing in non-rotatable relationship therewith,

sun gear wheel means mounted on said axle within said housing for rotation therewith,

three planetary gear wheel means located within said housing, said planetary gear wheel means being arranged in planetary fashion about and enmeshed with said sun gear wheel means, said planetary gear wheel means being substantially equally orbitally spaced one from another,

elongate axles mounted within the housing in rotatable relationship therewith and extending between said base plate and said cover plate in parallel relationship to each other and the axis of said housing,

each of said axles having one of said planetary gear wheel means mounted thereon in non-rotatable relationship therewith,

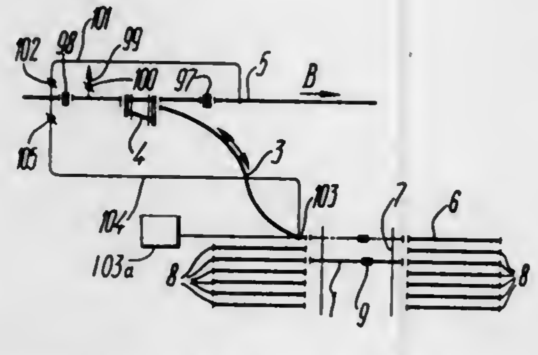
three circumferentially spaced axial slots formed in said wall means and arranged in radial alignment with said elongate axles,

at least one cylindrical gripping member eccentrically mounted on each of said elongate axles for rotation therewith between a first position in which each of said gripping members is simultaneously positioned wholly within the periphery of said wall means and a second position in which a portion of each of said gripping members simultaneously projects through the adjacent one of said slots and outside said periphery of said wall means, and

actuation means associated with one of said elongate axles for rotation of the same to cause simultaneous rotation of all said elongate axles and simultaneous movement of said gripping members between said first and second positions thereof.

4,037,805
ASSEMBLING AND REPAIR STATION OF A PLANT FOR PNEUMATIC TRANSPORTATION OF GOODS IN CONTAINERS THROUGH A PIPELINE

Adolf Moritsovich Alexandrov, Federativny prospekt, 6, korpus 3, kv. 8; Vladimir Efimovich Aglitsky, Zatsepsky val, 6/13, kv. 61; Ilya Solomonovich Kantor, Malo-Moskovskaya ulitsa, 31, kv. 45; Jury Abramovich Tsimbler, Sojuzny prospekt, 10, kv. 261; Jury Arnoldovich Topolyansky, Matveevskaya ulitsa, 10, korpus 4, kv. 442; Sergei Mikhailovich Susekov, shosse Entuziastov, 208, korpus 4, kv. 442, all of Moscow; Dmitry Rudolfovich Gun, Komsomolskaya ulitsa, 7, kv. 29, Ljubertsy Moskovskoi oblasti; Igor Igorievich Volyansky, proezd Stratonavtov, 12, korpus 1, kv. 12, Moscow; Gennady Alexeevich Pertsev, ulitsa Svoboda, 17, kv. 148, Moscow; Zoya Timofeevna Devyatkina, Teply Stan, 1 mikroraion, korpus 1, kv. 48, Moscow, and Mark Abramovich Feldman, Yasny proezd, 14, kv. 100, Moscow, all of U.S.S.R.
Continuation of Ser. No. 612,920, Sept. 12, 1975, abandoned. This application Nov. 17, 1976, Ser. No. 742,609
Int. Cl.² B65G *51/04*
U.S. Cl. 243—38 **7 Claims**

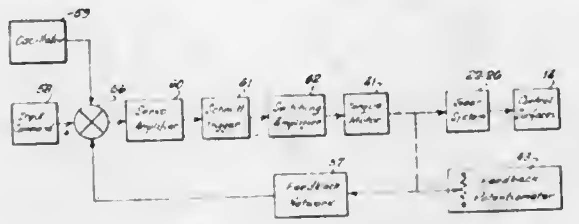


1. An assembling and repair station of a plant for pneumatic transportation of goods in containers through a pipeline, comprising: a switch means having one end thereof connected with said pipeline; a container-receiving trough connectable for receiving the containers with the other end of said switch means; a device for arresting the containers, connectable for receiving the containers with the opposite end of said container-receiving trough; a device for advancing the containers along said container-receiving trough, mounted on said trough movably therealong; means for driving said container-advancing device longitudinally of said trough; guideways extending substantially perpendicularly to the center line of said container-receiving trough; said container-receiving trough being mounted on said guideways for reciprocation therealong; means for driving said trough along said guideways; a plurality of troughs adapted to accommodate therein the containers for their maintenance and repair, arranged at both sides of said guideways parallel with one another, so that the respective center lines thereof are parallel with the center line of said container-receiving trough and coaxially aligned therewith, as said container-receiving trough is brought into opposition to either one of said plurality of said container-accommodating troughs.

4,037,806
CONTROL SYSTEM FOR ROLLING MISSILE WITH TARGET SEEKER HEAD

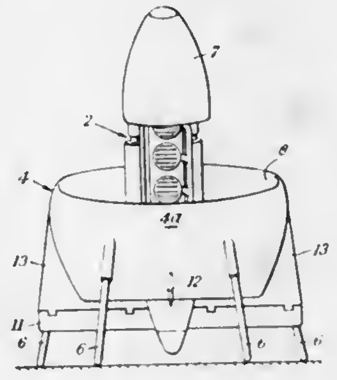
Joseph G. Hirsch, Diamond Bar; Jack L. Hoffa, Brea; Garry T. Lacy, Claremont, and Jerry M. Mowell, Covina, all of Calif., assignors to General Dynamics Corporation, Pomona, Calif.
Filed Sept. 16, 1964, Ser. No. 397,674
Int. Cl.² F42B *13/30*
U.S. Cl. 244—3.16 **19 Claims**

1. A control system adapted to effect flight control of a rolling missile, said control system comprising a target seeker head mounted to the body of said missile and having means for generating electrical signals in accordance with the relative positions of the missile and an associated target, a plurality of fixed area lift producing variable incidence control surfaces extendable upon launch from within the missile body into the missile's airstream and adapted to dither in the extended position for eliminating the inertial force caused by initial movement thereof, actuator means for extending said control surfaces from within said missile body and locking same in the extended position, means engaged with said control surfaces and operable to vary the incidence of said control surfaces when actuated by electrical control signals, said actuator means including electrical means for continuously dithering said control surfaces, electronic means connected to said seeker head and said actuator means to receive the electrical signals from said seeker head and transform them into actuator control signals, said electronic means being operably connected with said dithering means, whereby the incidence angle of the control surfaces is selectively varied during that portion of the missile's roll necessary to keep the missile on a target intercept course while continuously dithering said control surfaces.



4,037,807
FLIGHT VEHICLE

Thomas Johnston, Belfast 5, and Frederick Peter Youens, Holywood, County Down, both of Northern Ireland, assignors to Short Brothers and Harland Limited, Belfast, Northern Ireland
Continuation of Ser. No. 393,231, Aug. 30, 1973, abandoned. This application June 20, 1975, Ser. No. 588,882
Claims priority, application United Kingdom, Sept. 1, 1972, 40721/72
Int. Cl.² B64C *29/02*
U.S. Cl. 244—7 B **20 Claims**



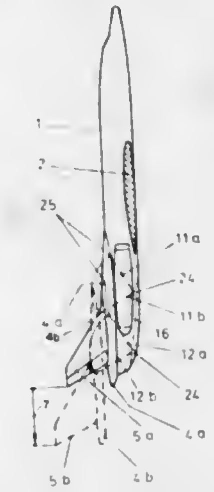
1. A flight vehicle comprising a duct of aerofoil cross-section which provides lift with the vehicle in a forward flight mode;

flow induction means for inducing a flow of ambient air through the duct to provide a thrust greater than the weight of the vehicle, which thrust acts along the axis of the duct to enable the vehicle to take-off with the axis of the duct vertical; and

means for controlling the attitude of said vehicle, said control means including adjustable control surfaces located in the flow of ambient air induced by the flow induction means to counteract moments produced on the vehicle by forward flight without substantial re-direction of the thrust by the control surfaces, and wings mounted on opposite sides of the outer surface of the duct and having trailing ends extending beyond the outlet end of the duct, the wings extending into the air stream around the outer surface of the duct in at least one plane generally parallel to the duct axis to modify the air flow around the outer surface of the duct to reduce pitching moments on the vehicle at high angles of incidence of the vehicle whereby the counteracting moments required from the control surfaces to overcome said pitching moments is reduced and the vehicle remains stable at such high angles of incidence, said wings also providing lift at low angles of incidence.

4,037,808
TRAVELLING TAIL-UNIT WITH CIRCULAR ARC MOTION

Herbert Kaniut, Orrerweg 33/35, 5000 Cologne 71, Germany
Continuation-in-part of Ser. No. 508,319, Dec. 4, 1974, abandoned. This application Feb. 18, 1976, Ser. No. 659,140
Claims priority, application Germany, Aug. 16, 1974, 2439479
Int. Cl.² B64D *33/02;* B64C *5/10*
U.S. Cl. 244—53 B **17 Claims**



1. An aircraft having a travelling tail unit which is movable in longitudinal direction of aircraft by means of circular arc motions comprising:

- a fuselage (**1**),
- a pair of fixed wings (**2**) with ailerons, landing flaps, slats,
- jet engines (**3; 23; 33**) mounted on said aircraft,
- a startbooster jet engine (**13**) accommodated inside of the aft end of said fuselage,
- a tail unit being composed of a tail unit-chassis (**4a; 4b**) having a longitudinal and airflow suitable shape and at least two tail surfaces, the parts of said tail unit forming a common monocoque construction,.
  - a. the said tail unit being substantially moved along the path of a circular arc upwards and rearwards into the rearward position increasing the effective tail unit lever for low-speed flight and particularly for takeoff and landing operations,
  - b. the said tail unit being substantially moved along the path of a circular arc forwards and downwards into the forward position for high-speed flight,
  - c. the said tail unit in its forward high-speed flight position being placed in a horizontal distance behind the trailing edges of said wings, from which forward position the said tail unit is moved rearwards into the position for low-speed flight and vice versa (FIG. **1**; FIG. **2**; FIG. **4** and FIG. **5**),
  - d. the said tail unit-chassis being connected with the aft end of said fuselage by means of two front swivel arms (**11** with positions **11***a* and **11***b*) and two hind swivel arms (**12** with positions **12***a* and **12***b*),
  - e. the said two front swivel arms (**11**) being with each other connected by means of crossbeams (**26**) into a front swivel arm-frame (FIG. **12**), and the said two hind swivel arms (**12**) being with each other connected by

means of crossbeams (**26**) into a hind swivel arm-frame (analogous to FIG. **12**), both said frames having rigid frame corners,

f. the said swivel arm-frames lying with their frame planes substantially transversally to the direction of flight,

g. the said swivel arm-frames having hinges on their corners, particularly each said swivel arm-frame having two lower hinges (**24**) on its two lower corners connecting said swivel arm-frame with the aft end of said fuselage and two upper hinges (**25**) on its two upper corners connecting said swivel arm-frame with said tail unit-chassis (FIG. **2**; FIG. **5** and FIG. **9** to FIG. **12**),

h. the said tail unit-chassis in its forward high-speed flight position (**4a**) being joined in an airflow suitable manner to said aft end of said fuselage,

i. the said tail unit-chassis in its forward high-speed flight position (**4***a*) being used as an airflow suitable fairing for said startbooster jet engine (**13**) when it is stopped during high-speed flight (FIG. **2**; FIG. **3** and FIG. **5** to FIG. **9**), whereas said tail unit-chasses moved into its rearward low-speed flight position (**4***b*) uncovers the air intake (**14**) and propelling nozzle of said startbooster jet engine, which put into operation (**15**) increases the takeoff thrust or the zoom away thrust of the air-craft (FIG. **10**),

increases the propulsion redundancy, makes the design of the main jet engines simpler, especially for supersonic aircraft, and being specially adpated to zero altitude conditions, reduces the fuel consumption, and makes the exhaust emissions on airfields cleaner,

j. the said tail unit being moved rearwards and forwards by means of actuators (**21** and **22**) coupled with at least one of said swivel arm-frames (FIG. **10** and FIG. **11**),

k. the said tail unit having control linkages continuously connecting the flight control means with the contol surfaces of said tail unit (FIG. **11** and FIG. **12**), and each said control linkage is transmitting a separate control command to a separate control surface,

l. the said startbooster jet engine (**13**) having its air intake through the inner opening of said front swivel arm-frame, and its propelling nozzle positioned inside of the inner opening of said hind swivel arm-frame (FIG. **9** and FIG. **10**),

m. the said tail unit arrangement having a crossbond (**20**) consisting of two rods in X-shape and being horizontally inserted into the front end of the upper cutout of the rear fuselage, diagonally connecting the left front end of the fuselage cutout with the right and rear fuselage side wall, and the right front end of the fuselage cutout with the left and rear fuselage side wall, penetrating the inner opening of said front swivel arm-frame (FIG. **1**; FIG. **4**; FIG. **10** and FIG. **12**), whilst said cross-bond is increasing the torsional stiffness of said fuselage aft end,

n. the said fuselage (**1**) having a channel (**16**) in its rear bottom side.

4,037,809

DEVICE FOR MOUNTING A TURBOREACTOR ON AN AEROPLANE

Paul Joseph Legrand, Vaux le Penil, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed Nov. 12, 1975, Ser. No. 631,196

Claims priority, application France, Nov. 13, 1974, 74.37468

Int. Cl.^{2} B64D *27/16, 29/08*

U.S. Cl. 244—54 **9 Claims**

1. A composite nacelle for housing on an airframe a turbojet engine developing forces, comprising:

a front nacelle section forming an air intake,

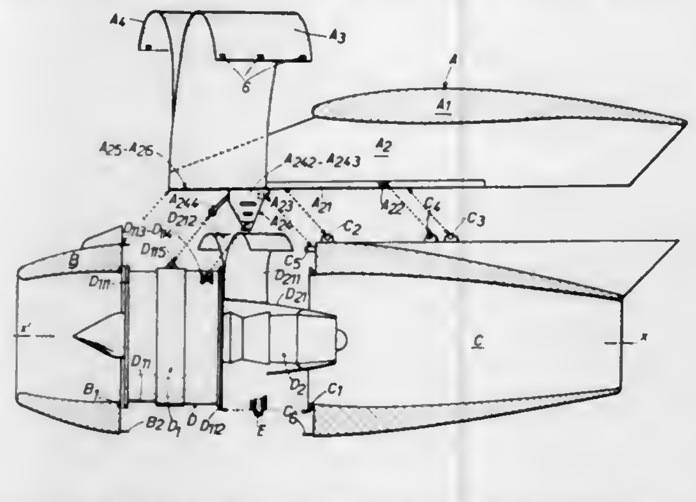
a compressor casing having an upstream end connected to said air intake and a downstream end axially spaced from said upstream end, said compressor casing being integral with said turbojet engine,

a mast member integral with said airframe,

unitary linking means between said mast member and said compressor casing for both supporting said turbojet engine and for transmitting said forces therefrom to said airframe,

a rear nacelle section having an upstream end connected with the downstream end of the compressor casing and a downstream end forming a gas exhaust,

an intermediate nacelle section between said front and rear nacelle sections, comprising a side gate member selectively movable to a closing position wherein said side gate member covers said unitary linking means and said compressor casing and to an opening position wherein said side gate member provides access thereto,



quick release locking means for connecting said rear nacelle section to said downstream end of the compressor casing,

sliding guide means between said rear nacelle section and said mast member for permitting longitudinal relative displacement of said rear nacelle section, and

means for releasably connecting said rear nacelle section to said mast member to permit said longitudinal relative displacement of said rear nacelle section, whereby practical maintenance of said turbojet engine is made possible.

4,037,810

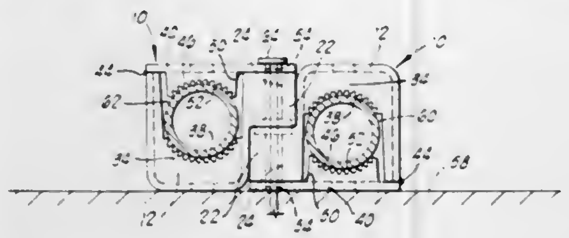
PIPE BRACKET AND CLAMP

Harold T. Pate, Solon, Ohio, assignor to Indian Head Inc., New York, N.Y.

Filed Jan. 12, 1976, Ser. No. 648,468

Int. Cl.^{2} F16L *3/22*

U.S. Cl. 248—68 CB **18 Claims**



1. A pipe clamp comprising:

a body portion having a pipe-receiving recess therein and first aperture means therethrough;

flexible hinge means on said body portion;

a clamping portion connected to said hinge means and having second aperture means formed therein, said clamping portion being adapted to fold about said hinge means relative to said body portion to bring said first aperture means and second aperture means into mutual alignment for receiving a fastener member therethrough;

cover means having one end flexibly connected to said clamping portion for extending across and blocking said first aperture means when said clamping portion is folded about said hinge means relative to said body portion;

closure means on said cover means insertible in and registerable with a portion of said first aperture means; and

a festening member extending through said second aperture means and into a portion of said first aperture means and protectively covered and blocked by said closure means to prevent exposure of the fastening member to unauthorized removal and to corrosive elements.

4,037,811

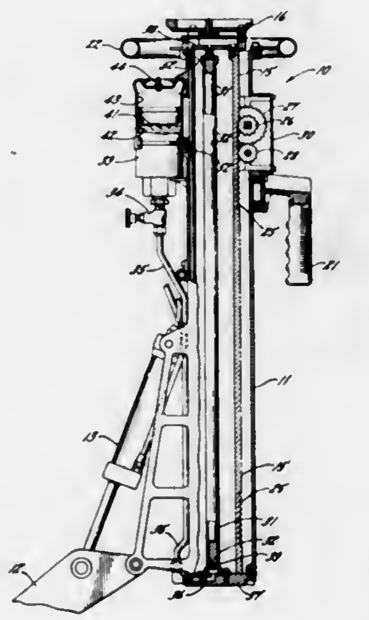
VERTICAL CONTROL FOR INSTRUMENT SUPPORT STRUCTURE

Chadwell O'Connor, 2024 Galaxy Drive, Newport Beach, Calif. 92660

Filed Dec. 24, 1975, Ser. No. 644,141

Int. Cl.^{2} F16M *11/00*

U.S. Cl. 248—162 **5 Claims**



1. In an instrument support structure having a column intended to be vertically disposed and a post slidably fitted for telescoping movement in the column, the combination comprising, a cylinder mounted in the lower end of said column and extending up into said post, a rod fixed to the upper end of said post and being slidably fitted in said cylinder, a hydraulic reservoir fitted on said column and being in fluid communication with the lower end of said cylinder, means for establishing and maintaining a variable pressure on said fluid so as to exert a force on said rod counterbalancing the weight of and on said post, said cylinder and rod being interfitted through a length at least as long as the full range of movement of said post in said column, and a crank mounted on said column and geared to said post for vertically moving the counterbalanced post in the column.

4,037,812

ADAPTABLE ENCLOSURE MOUNTING SYSTEM

John William Pausche, Norridge, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Sept. 2, 1975, Ser. No. 609,263

Int. Cl.^{2} F16M *13/02*

U.S. Cl. 248—218.4 **6 Claims**

1. An adjustable mounting assembly for attaching a lockable equipment enclosure or the like to a hollow pole, the pole having at least one aperture in a wall, the assembly comprising:

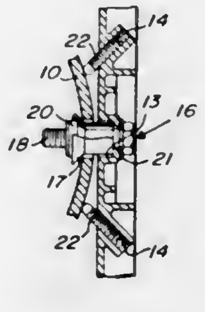
a bracket means having at least one cylindrical cavity formed in the back surface thereof, each cavity having in the bottom thereof an aperture smaller in diameter than the cavity, the bracket means having at least one mounting aperture and the bracket means having at least one threaded bore on each side of the vertical center line thereof, the longitudinal axis of each bore being angled from front to rear toward said vertical center line a the cylindrical cavity aperture, the mounting apertures, and the front openings of the threaded bores being positioned for being covered by a portion of the attached enclosure;

screw means for mating with each angled bore and adapted to being advanced within the bore into contact with the exterior of the hollow pole;

at least one subassembly for attaching the bracket to the pole, each subassembly comprising:

a tubular member having an outside diameter less than the inside diameter of the cylindrical cavity of the bracket means, having a length substantially greater than the depth of the cylindrical cavity and having a plurality of slots formed therein extending from one end of the member and along a substantial portion of the longitudinal dimension of the member;

a threaded bolt insertable in the tubular member, having a body diameter smaller than the aperture in the bottom of the cylindrical cavities, and having the longitudinal dimension of the body portion longer than the length of the tubular member;



a threaded member adapted to mate with the bolt and having a first portion of an outside diameter less than the inside diameter of the tubular element, having a second portion of a diameter substantially larger than the first portion, and having a third, tapered portion, joined to and connecting the first and second portions; and

wherein the apertures in the pole are dimensioned to provide a close fit for the second portion of the threaded member, whereby subsequent to installation of the subassemblies in the cylindrical cavities of the bracket means and insertion through the apertures in the hollow pole, rotation of the bolts will cause the bolts to advance within the threaded member, causing the slotted ends of the tubular members to expand, locking the bracket to the hollow pole.

4,037,813

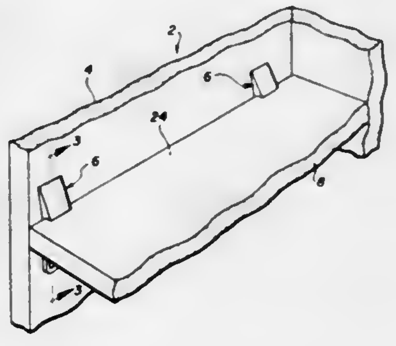
SHELF SUPPORT

Phillip J. Loui, Chicago, and James A. Schmidt, Jr., Berwyn, both of Ill., assignors to Handy Button Machine Company, Chicago, Ill.

Filed June 7, 1976, Ser. No. 693,355

Int. Cl.^{2} A47B *57/04*

U.S. Cl. 248—250 **6 Claims**

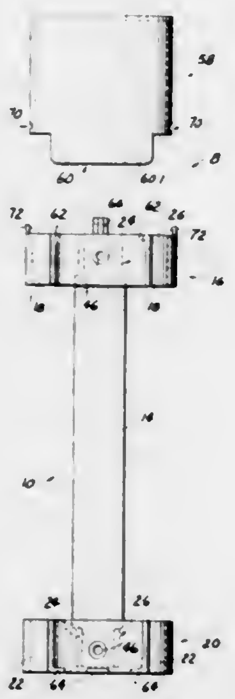


1. A one-piece plastic member for supporting an edge portion of a shelf on an upright and wherein the upright has at least one opening therein, comprising a back portion having a

first section, a second section and a third section, said sections being contiguous and in end-to-end relationship, at least one of said first and second sections having a region for engagement with said upright, a flange projecting from one side of said back portion to provide a support for the edge portion of the shelf, said flange being substantially at the junction of said first and second sections, a stem projecting from the opposite side of said first section for engagement in said opening, said second and third sections being resilient and forming an obtuse angle, a shoulder substantially at the vertex of said obtuse angle and being presented toward said flange and being spaced therefrom to cooperate with said flange for retaining the said shelf edge portion therebetween, said second and third section tending to flatten within elastic limits and increase said angle as the shelf edge portion is moved over said third portion and past said shoulder, whereupon the second and third sections snap back to cause the shoulder to retain said shelf edge portion, a portion of the third section remote from said shoulder having a region for engagement with said upright such that two regions are respectively above and below the shelf when the latter is on said flange.

4,037,814
CONTAINER SUPPORT AND HOLDER

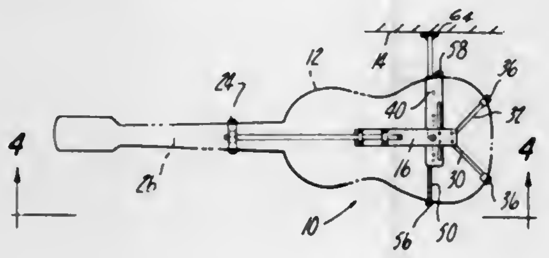
Anthony Robin Clausen, 7 Klip Street, Observatory, Johannesburg, Transvaal Province, South Africa
Filed Oct. 7, 1974, Ser. No. 512,572
Claims priority, application South Africa, Oct. 18, 1973, 73/8107
Int. Cl.^{2} A47F *1/00;* **A62C** *31/78*
U.S. Cl. 248—311.1 **10 Claims**



1. A container support for supporting a tubular container having an outlet at its one end, and comprising a holder having a pair of resiliently expandable arms to embrace such a container, a protective cap adapted to be removably located on the arms to protect the outlet of such a container held by the arms, the protective cap having an end wall and a skirt portion extending from the end wall, complementary engagement formations on the skirt portion and the arms which are adapted to be engaged to locate the cap on the arms to combat relative displacement in the direction of the polar axis of the skirt portion, locating means to locate the cap on the arms to combat relative displacement in a direction transversely to the polar axis of the skirt portion, and a bias zone on the cap to be engaged by a supported container to bias the cap away from the arms against the action of the engaged complementary engagement formations during withdrawal of such a container from the arms in a direction transversely to the polar axis of the container, the complementary engagement formations being adapted to become disengaged when the arms have been expanded by such a container during withdrawal thereof, to allow the biassing action so generated to cause the cap to flip off upon disengagement of the engagement formations.

4,037,815
MUSICAL INSTRUMENT SUPPORT

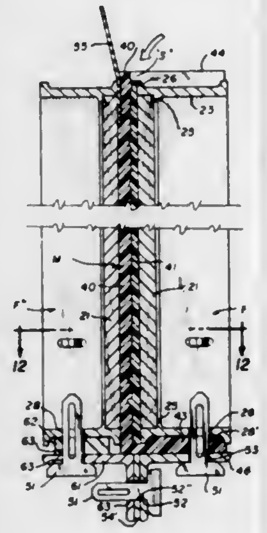
Arthur D. DeLano, Battle Creek, Mich., assignor to D & J Products, Battle Creek, Mich.
Filed July 19, 1976, Ser. No. 706,699
Int. Cl.^{2} A47F *5/00*
U.S. Cl. 248—285 **11 Claims**



1. An adjustable support device for holding stringed instruments comprising; a base member, a neck bracket supported on said base member for movement to selected positions longitudinally thereof and from one end of said base member to support the finger board of an instrument, support means connected to the other end of said base member for engagement with the body member of the stringed instrument, a pair of arms extending transversely to opposite sides of said base member for adjustment to selected positions, said free ends of said arms being provided with instrument engaging portions, and bracket means connected to one of said arms and being adapted for detachable connection to a wall or the like to maintain said device in elevated position.

4,037,816
APPARATUS FOR FORMING A LINER ON A PLANAR FORM MEANS

Samuel C. Scott, 2519 Walnut St., Denver, Colo. 80205
Filed Apr. 23, 1976, Ser. No. 679,674
Int. Cl.^{2} B29C *1/02*
U.S. Cl. 249—83 **10 Claims**



1. Apparatus for producing a flexible resilient polymeric liner and for bonding said liner to modular components of planar concrete forms for producing large planar, decorative concrete walls and the like comprising:

a. master mold means formed of flexible, resilient polymeric material including a planar section and integral flanges depending normally from the plane of said section around the edges of three adjacent sides and jointed together at the corners, there being a shallow, internal groove in said flanges adjacent said planar section, with rigid backing means attached to and supporting the resilient polymeric material of said planar section and said flanges,

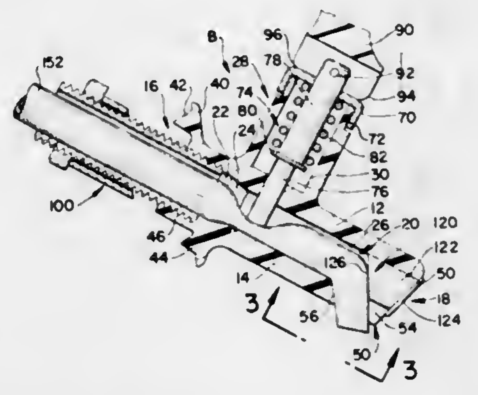
b. modular planar form means sized to seat in and be scaled by said flanges around three edges thereof with each one of said edges in sealing communication with said groove,

c. removable means inclusive of wedging pins securing said master mold means with said modular planar form means with the planar section of said master mold means in generally parallel position with said modular planar form means, and

d. supportive means on which said master mold means and said modular planar form means are non-permanently mounted for support in an upright position with said flanges along the sides and bottom of the assembly.

4,037,817
PINCH TUBE VALVE

John A. Chernak, BedfordHeights, Ohio, assignor to Tomlinson Industries, Inc., Cleveland, Ohio
Filed Oct. 28, 1975, Ser. No. 626,493
Int. Cl.^{2} F16K *7/06*
U.S. Cl. 251—7 **13 Claims**



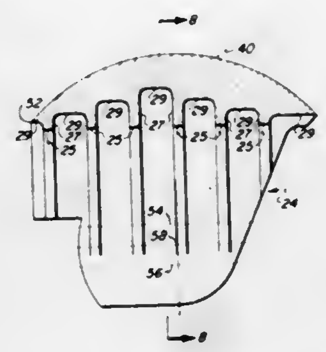
1. A pinch tube type valve for use in selectively controlling liquid flow through a flexible tube wherein the valve includes a valve body having an inlet end, an outlet end, a passageway connecting said inlet and outlet ends, an upper surface and a lower surface with said flexible tube adapted to be passed through said passageway with the outermost end thereof disposed adjacent said valve body outlet end, said pinch tube valve further including separate means communicating with said passageway for selectively closing said flexible tube to control liquid flow therethrough, the improvement comprising:

tube receiving means comprising an apertured area in the lower surface of said valve body adjacent said outlet end extending generally longitudinally along a portion of said lower surface from said outlet end toward said inlet end for receiving the outermost end of said tube in a particular desired position angularly disposed of said passageway for dispensing liquid therefrom; and,

a stop member selectively receivable in said passageway from said outlet end, said stop member including a shank portion adapted to extend inwardly through a portion of said passageway from said outlet end to retain said outermost end of said flexible tube in said angularly disposed position, said stop member shank portion being dimensioned to extend into said passageway a distance less than the longitudinal extension of said aperture along said lower surface from said outlet end.

4,037,818
CONTROL VALVE

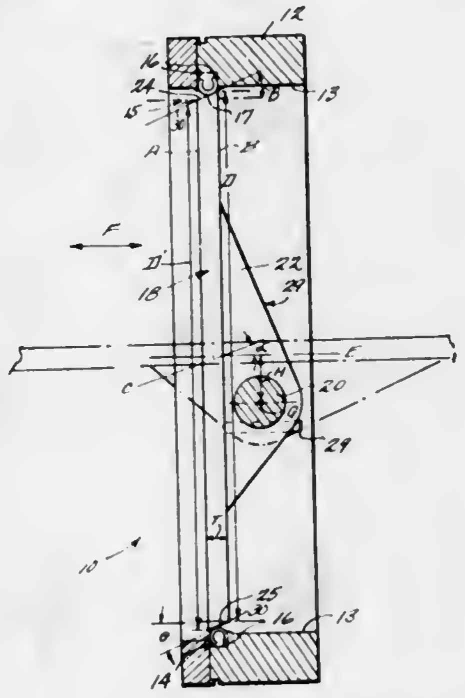
Roy E. Soderberg, and Albert J. Hanssen, both of North Kingstown, R.I., assignors to International Telephone and Telegraph Corporation, Nutley, N.J.
Filed Aug. 26, 1975, Ser. No. 607,749
Int. Cl.^{2} F16K *5/10, 47/04*
U.S. Cl. 251—121 **20 Claims**



1. A control valve of the type having inlet and outlet apertures and a rotatable valve plug with a surface defining a flow passage for communicating with said inlet and outlet apertures, wherein the improvement comprises a plurality of baffle elements each formed on said surface and having first and second surfaces and extending transversely into said flow passage, the surfaces of adjacent baffle elements being spaced apart for controlling fluid flow characteristics through said valve.

4,037,819
BUTTERFLY VALVE HAVING METAL-TO-METAL SEALING WITH CONICAL ANGLE-TRANSPORTED VANE

Peter G. Kindersley, Glens Falls, N.Y., assignor to Kamyr Valves Inc., Glens Falls, N.Y.
Filed Mar. 3, 1976, Ser. No. 663,614
Int. Cl.^{2} F16K *1/226*
U.S. Cl. 251—306 **5 Claims**



1. A butterfly valve comprising:

a body member having a substantially circular bore therethrough, fluid adapted to flow through said bore in a given direction,

a metal annular valve seat member,

means for mounting said annular valve seat member in said bore so that said annular member has a mating surface thereof disposed in said substantially circular bore and so that said annular valve seat member is radially movable with respect to said circular bore both toward and away an axis of said bore, said mounting means including a valve seat opening formed in said body member in communication with said substantially circular bore and having border surfaces, said valve seat having surfaces thereof engaging said border surfaces of said valve seat opening and preventing flow of fluid in said circular bore except interiorly of said mating surface,

means for cooperating with said metal valve seat member to form circular line contact with said mating surface of said valve seat, said means including a metal vane comprising a conical angle-transported disc, said conical angle-transported disc vane having a circular upper face of diameter D′ and a circular lower face of diameter D slightly greater than D′, with every section through said disc parallel to the upper and lower faces thereof being a circle of diameter between D and D′, D′ being approximately 99/100th of D, and a center line through said circular upper and lower faces making an angle α between 20° and 40° with a line perpendicular to said vane disc upper and lower faces,

said annular valve seat member having an inner diameter approximately midway between D and D′, and

shaft means for mounting said vane for rotation about an axis substantially perpendicular to the direction of fluid flow through said bore for movement from a first position wherein fluid may flow past said vane through said circular bore, to a second position wherein said vane is in circular line contact with said valve seat member and no fluid may flow there-past, said shaft means being attached to one face of said vane spaced a small distance therefrom.

4,037,820

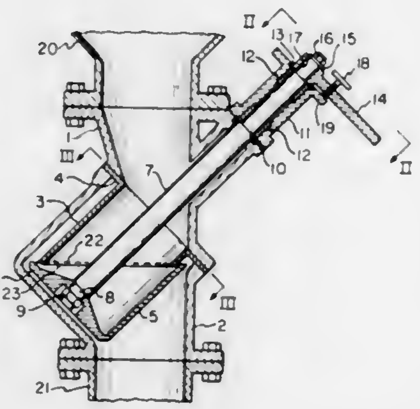
SEATLESS VALVE

Richard L. Lowe, 1906 Shaler Drive, Glenshaw, Pa. 15116

Filed Aug. 12, 1976, Ser. No. 713,715

Int. Cl.^{2} F16K *5/04*

U.S. Cl. 251—310 **11 Claims**



1. A seatless valve for metering or interrupting the flow of particulate materials comprising,

a housing arranged with an inlet at the top and an outlet at the bottom thereof,

a shaft journaled in the housing and extending thereinto at an acute angle to the direction of flow of the particulate materials,

a spout fixed with the housing and spaced therefrom generally comprising a circular cylindrical wall coaxial with said shaft, said spout opening at the upper end thereby in communication with the inlet to the housing and said spout opening at the lower end,

a rotor gate fixed to turn with said shaft, said gate comprising a radially extending base and a cylindrical wall coaxial with said shaft and spout, the cylindrical wall of said gate having an inner diameter greater than the outer diameter of the cylindrical wall of the spout, the base and cylindrical wall of said gate having minimal spacing from said spout at all angular positions of said shaft and gate, said cylindrical wall of said gate being cut away such that at one angular position of the shaft and gate, flow through the valve is unobstructed and in another angular position of the shaft and gate, the gate without touching the spout causes the area of repose of the material falling from the spout to be occupied thus stopping flow and in intermediate angular positions of the shaft and gate, particle flow is metered.

4,037,821

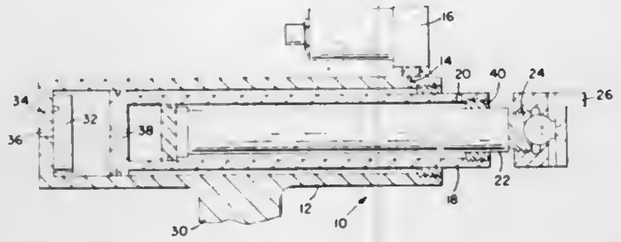
TELESCOPING RETRACTOR

Frank E. Greene, Rolling Hills Estates, Calif., assignor to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 10, 1976, Ser. No. 713,151

Int. Cl.^{2} B66F *3/24*

U.S. Cl. 254—93 R **1 Claim**



1. A telescoping retraction device for rapidly withdrawing an umbilical connector from a missile comprising:

a. an outer cylinder having a first inlet port therein;

b. an inner cylinder slidably carried in said outer cylinder, said inner cylinder having a second inlet port therein;

c. a piston slidably carried in said inner cylinder, and a piston rod having a first-end secured to said piston and a second end secured to said umbilical connector;

d. a power cartridge for generating a source of gas and for directing gas in said first inlet port to retract said inner cylinder for alignment of said second inlet port with said first inlet port whereby gas is directed against said piston for movement of said first object from said second object; and, shock absorbing means carried in the base of said outer cylinder.

4,037,822

SCISSORS JACK

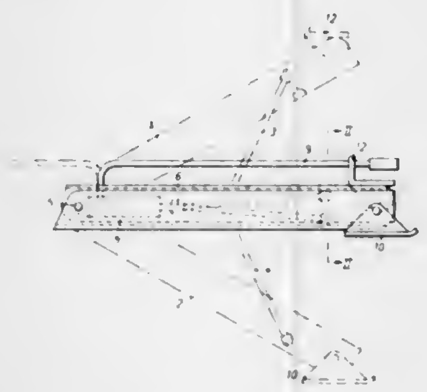
Giovanni Barcella, Zurich, Switzerland, assignor to AB Nike Hydraulik, Eskilstuna, Sweden

Filed Apr. 28, 1975, Ser. No. 572,498

Claims priority, application Sweden, May 6, 1974, 7406043

Int. Cl.^{2} B66F *3/24*

U.S. Cl. 254—124 **3 Claims**



1. A scissors jack for lifting motor vehicles and the like, comprising a pair of first elongated substantially coextensive links disposed in a common plane, corresponding first ends of said pair of first links being pivotally connected to one another at a first pivot point whereby the other ends of said first links

may be disposed closely adjacent to one another and may be selectively displaced relative to one another in said plane about said first pivot point, first engaging means adjacent the other end of one of said first links adapted to engage a ground surface, second engaging means adjacent the other end of the other of said first links adapted to engage a vehicle to be lifted, each of said first links being channel-shaped in cross section with said channel shapes being disposed in opposing relation to one another whereby, when said other ends of said first links are disposed closely adjacent to one another, said channel-shaped first links define an elongated cavity therebetween extending from said first pivot point to said other ends of said first links, a pair of elongated second links diposed in said common plane between said first links, one end of each of said second links being pivotally and inseparably connected to said first links respectively at predetermined fixed locations adjacent said other ends of said first links, the other ends of said second links being pivotally connected to one another at a second pivot point located in said common plane, said second links being shorter in length than said first links and extending from said other ends of said first links toward said first pivot point whereby said second pivot point is located in said elongated cavity at a position between said first pivot point and the pivotally interconnected ends of said first and second links, a hydraulic cylinder located entirely within said elongated cavity between said first and second pivot points, said channel-shaped first links having differing widths whereby one of said channel-shaped first links nests within the other of said channel-shaped first links when said other ends of said first links are in close proximity to one another to completely enclose and protect said second links and said hydraulic cylinder, and control means for applying fluid pressure to said cylinder to urge said second pivot point away from said first pivot point thereby to cause said second links to move the other ends of said first links and the engaging means thereon away from one another, said control means including means for selectively relieving said applied fluid pressure to cause said other ends of said first links to move toward and into close proximity to one another in response to enternal forces applied between said first and second engaging means, and said control means further including an elongated, manually operable lever disposed closely adjacent to and substantially coextensive with one of said elongated first links.

4,037,823

STEAM-DRIVEN TOW LINE WINCH

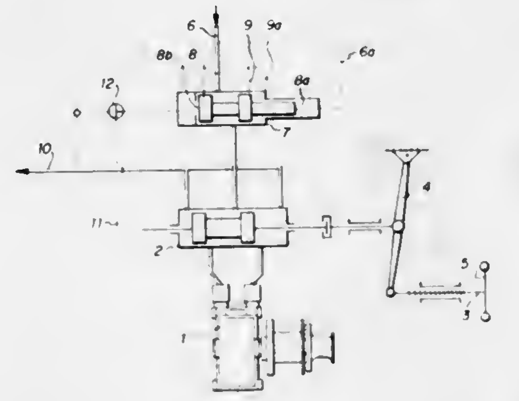
Hans Thaeter, Depkenstr. No. 2, 28 Bremen, and Anton Broehl, Postfach 84, 5474 Brohl-Lutzing No. 1, both of Germany

Filed Feb. 10, 1975, Ser. No. 548,742

Claims priority, application Germany, Feb. 13, 1974, 2406718

Int. Cl.^{2} B66D *1/10;* F15B *11/10*

U.S. Cl. 254—172 **6 Claims**



1. In a winch system of the type including a tow line winch actuated by a steam-driven motor, a live steam line for supplying steam for operating the motor, an exhaust line, and a hunting valve for controlling the direction of steam flow from the live steam line through the motor to the exhaust line and thereby controlling the direction of operation of the winch, the improvement comprising:

a pilot operated pressure control valve having a pilot port and connected between the live steam line and the inlet port of the hunting valve;

a pilot line connecting the working pressure of the steam-driven motor to the pilot port of the pressure control valve and thereby actuating the pressure control valve toward a first position;

a three-way cock in said pilot line having one position for connecting the working pressure of the motor to the pilot port and another position for connecting the working pressure of the motor to said exhaust line whereby the pressure control valve is put out of operation; and

means for applying a predetermined bias to the pressure control valve and thereby actuating the pressure control valve toward a second position;

so that the flow of steam from the live steam line through the pressure control valve to the hunting valve depends upon the ratio between the working pressure of the steam-driven tow line winch and the predetermined bias.

4,037,824

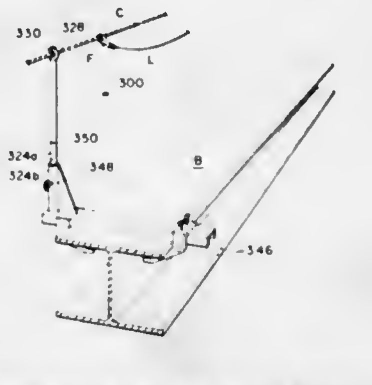
SAFETY POST

Gerald T. Whitmer, Rte. 1, Box 33, Shenandoah Junction, W. Va. 25442

Filed Apr. 15, 1976, Ser. No. 677,140

Int. Cl.^{2} B21F *27/00*

U.S. Cl. 256—53 **10 Claims**



1. A post for detachable affixation on flanged beams and the like to support a workers' safety-line-securing cable, comprising: a horizontal leg, a vertical leg, means for joining all said legs, means for clamping the horizontal leg to a said flanged beam, and the vertical leg having fixed thereto means including inwardly-turned overlapping horn structure having spacing for detachably engaging an intermediate portion of a said cable upon rotation thereof relative to a said cable, said spacing being proportioned for permitting a said workers' safety line on a said cable to be rotated in said spacing and passed along a said cable for passing a said post.

4,037,825

LOOP REACTOR FOR CHEMICAL PROCESSES

Herwig Burgert, 2, Helgenstock, Giessen, Germany (6300)

Filed Apr. 12, 1976, Ser. No. 676,322

Claims priority, application Germany, Apr. 14, 1975, 2516284

Int. Cl.^{2} B01F *13/02*

U.S. Cl. 259—4 R **3 Claims**

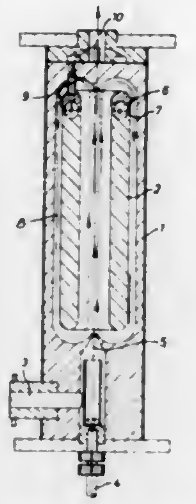
1. A loop reactor for chemical processes, comprising a reactor housing including inlet means at one end and outlet means at the opposite end of said housing;

pipes connected to said inlet means for supplying the reactants to be processed to the reactor;

a guide tube in said reactor housing defining a mixing chamber between said guide tube and the inner wall of said reactor housing;

means for inducing a circulation of said reactants through and around said guide tube;

annular means connected to said guide tube end adjacent said outlet means defining an annular space at one end of said guide tube, said annular space being connected to said mixing chamber by openings through which said reactants enter into said annular space; and
- escape pipes connected to said annular space for conducting said reactants to said reactor outlet.



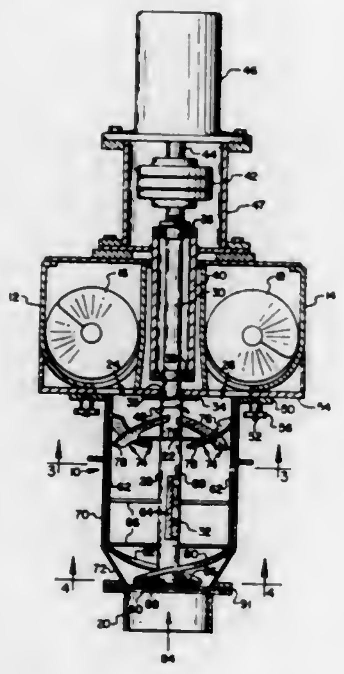
4,037,826
MIXING APPARATUS HAVING PLURALITY OF DIFFERENT BLADES WITH MULTIPLE FUNCTIONS

Gary L. Hulslander; Gary E. Mills, both of Portland, and David L. Harris, Oregon City, all of Oreg., assignors to Dependable-Fordath, Inc., Sherwood, Oreg.

Filed Apr. 26, 1976, Ser. No. 679,915

Int. Cl.^{2} B01F *7/16*

U.S. Cl. 259—8 **16 Claims**



1. Mixer apparatus comprising:
- mixing chamber means having a discharge opening at its lower end;
- feeder means for introducing the materials to be mixed into the upper end of said chamber;
- a rotatable shaft extending centrally through said chamber;
- means for rotating said shaft; and
- a plurality of blades fixed to said shaft within said chamber including convoluted mixing and impelling blades which spiral downward and inward to cause the spacing between said mixing blades and said shaft to decrease with distance along said shaft so that said mixing blades mix said materials and impel the mixed materials downward through said discharge opening when said shaft is rotated, and including longitudinal mixer blades fixed to said shaft above said convoluted mixing blades.

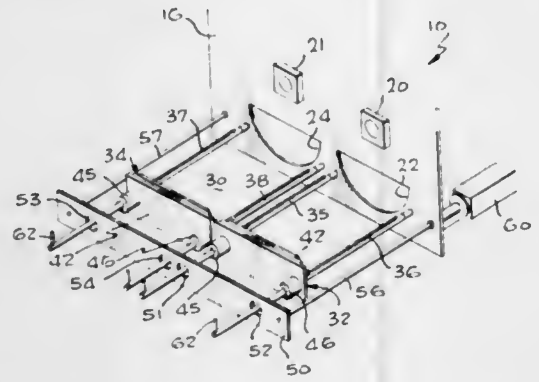
4,037,827
FOOD PRODUCT MIXER WITH AN IMPROVED DOOR MECHANISM

Alan L. Davison, La Mirada, Calif., assignor to F.P.E.C. Corporation, Maywood, Calif.

Filed Dec. 15, 1975, Ser. No. 640,729

Int. Cl.^{2} B01F *5/00, 7/00, 15/02;* B65D *5/72*

U.S. Cl. 259—37 **13 Claims**



1. For use with a food product mixer of the type defining a mixer enclosure with mixing means therein for mixing the food product in said enclosure, the enclosure having a substantially vertical front panel with *n* door openings defined therein through which food product is dischargeable, *n* being an integer, a door mechanism comprising:
- a separate slideable door associated with each opening;
- separate slide means associated with each door and extending in a direction perpendicular to said front panel for supporting the door thereon, with said door being slideable on said slide means toward and away from said front panel;
- actuatable door pushing means for urging each door to slide on said slide means toward said front panel until said door is in a closed position in which the door enclosed its associated opening; and
- separate operable locking means associated with each door for selectively locking each door when the latter is in the closed position and for unlocking said door, said door when unlocked being moveable from the closed position to an open position by sliding on said slide means away from said panel and the opening defined therein, wherein said slide means and said operable locking means comprise a pair of parallel, spaced apart rods, associated with each door, and disposed in a plane perpendicular to said front panel, with the door being slideable on said pair of rods toward said front panel when pushed by said door pushing means, with the pair of rods being rotatable to a locking position to physically clamp said door against said front panel when the door is in the closed position and thereby locks it to prevent it from sliding back on said rods away from said front panel, said rods being rotatable to an unlocked position in which said door is free to slide on said rods away from said front panel and the opening defined therein, thereby moving the door from its closed position to an open position.

4,037,828
AUTOMATIC TAPPING MACHINE

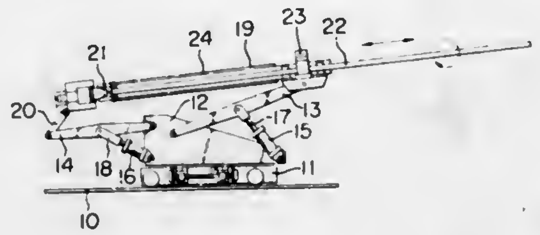
Takashi Terada, Kurobe; Isamu Amemiya, Uozu; Shinsaku Kubota, Uozu, and Koji Asada, Uozu, all of Japan, assignors to Nippon Carbide Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed July 1, 1976, Ser. No. 701,876

Claims priority, application Japan, Oct. 4, 1975, 50-119368; Oct. 9, 1975, 50-122106; May 19, 1976, 51-56641

Int. Cl.^{2} C21B *7/12*

U.S. Cl. 266—271 **13 Claims**



1. An automatic tapping machine for a tapping operation comprising a movable truck, a lower frame rotatably mounted on said truck, an upper frame arranged always in parallel with said lower frame, pressure actuatable means for moving said upper frame towards and away from said lower frame, a jig supporting mechanism adapted to hold a jig for use in the tapping operation, and a means for supporting said jig supporting mechanism above said frame and for actuating said jig supporting mechanism as required in the tapping operation, said jig holdable in said jig supporting mechanism having a diameter ranging from 40 to 100 mm.

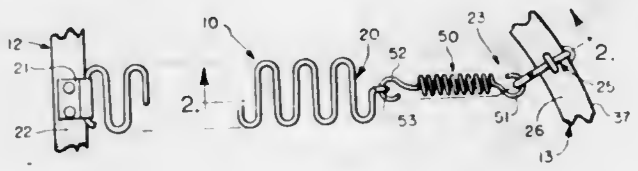
4,037,829
SPRING CONSTRUCTION

Lawton H. Crosby, and John L. Crosby, both of 403 Center, Lake Bluff, Ill. 60044

Continuation-in-part of Ser. No. 466,383, May 2, 1974. This application Mar. 5, 1976, Ser. No. 664,384

Int. Cl.^{2} F16F *3/00*

U.S. Cl. 267—110 **8 Claims**



1. A rail attachment assembly comprising:
- a. a curved frame rail having a back surface, a top surface, and a front surface, and
- b. an anchor pin including an anchor leg seated against said back surface of said rail, a horizontal attachment extending from said anchor leg across the width of said rail, and an attachment hook extending inwardly from said front surface of said rail and connected to a normally arced sinuous spring band,
- c. the longitudinal axis of said attachment leg extending perpendicular to a tangent to the curvature of the rail and the longitudinal axis of the band extending at an angle to said attachment leg axis.

4,037,830
WAFER HANDLER

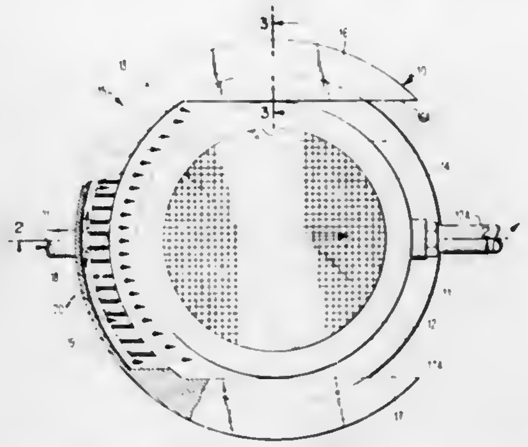
Henry Benjamin Poluzzi, Poughkeepsie, N.Y.; Anthony M. Roberti, Austin, Tex., and Wilfried Robert Romich, Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 7, 1976, Ser. No. 720,541

Int. Cl.^{2} B25B *11/00*

U.S. Cl. 269—21 **9 Claims**

1. A semiconductor wafer chuck for carrying thin, substantially planar semiconductor workpieces comprising: a substantially planar surface having a workpiece receiving area thereon comprising a vacuum platen for attachment of a workpiece thereto; means defining a plurality of channels adjacent one edge of said planar surface and superimposed thereof; a conduit in fluid communication with said channels, and a foraminous diffuser element in said conduit to equalize the pressure of fluid entering said channels; a source of at least Class 100 gaseous media connected to said conduit for supplying said channels with said gaseous media, whereby gaseous media emanating from said channels flows across the work area to create a laminar flow and a surface attachment effect of the gaseous media over said work area.



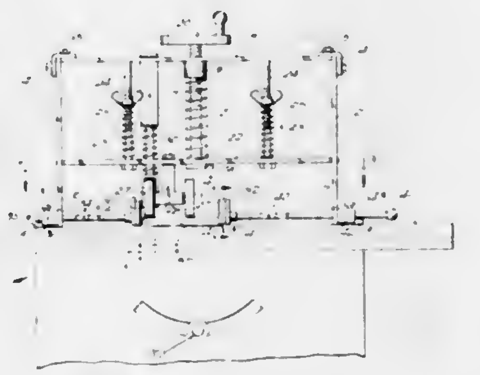
4,037,831
CUTTER HOLD DOWN APPARATUS

Harold O. Johnson, 1163 D St., Springfield, Oreg. 97477

Filed July 19, 1976, Ser. No. 706,538

Int. Cl.^{2} B23Q *3/18*

U.S. Cl. 269—306 **6 Claims**



1. An apparatus for attachment to the table of a bench saw or the like for confining workpieces of different thicknesses for travel past a rotatable cutter, said apparatus comprising,
- a framework for attachment to the saw table and including table mounted members and an arch extending therebetween,
- opposed fences inwardly of said table mounted members and laterally spaced from the cutter,
- means adjustably coupling said fences to the table mounted members, and
- a hold down assembly including hold down means for contact with the upper surface of the workpiece, a movable crossmember extending intermediate upright members of the framework arch and carrying said hold down means, crossmember supports on said arch, one of said crossmember supports adjustably mounted on said arch whereby the hold down means may be positioned to accomodate workpieces of different thicknesses, spring members carried by at least some of said crossmember supports and acting on the crossmember to downwardly

bias the hold down means carried thereby into workpiece contact to restrain same against upward displacement, adjustable means on some of said crossmember supports and positionable therealong to vary the rate of said spring members and hence the biasing force exerted thereby on said crossmember and on said hold down means.

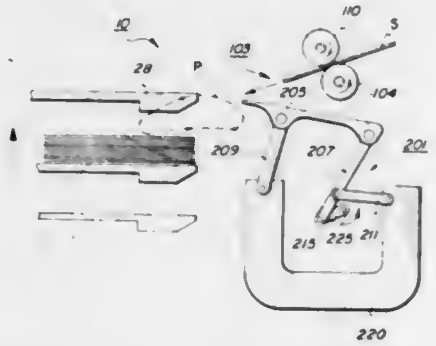
4,037,832
SORTER APPARATUS

John Howard Looney, Fairport, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed July 19, 1976, Ser. No. 706,727

Int. Cl.^{2} B65H *31/26*

U.S. Cl. 271—173 **1 Claim**



1. An improved sorting apparatus comprising:

a frame;

a vertical array of close-spaced horizontally extending parallel bin members movably supported on said frame and adapted to move past said loading station for receiving a sheet,

means for moving said bin members relative to said loading station;

conveyor means at a loading station for directing sheets into a selected bin member as the bin members are moved relative thereto; and

trail edge hold down means at said loading station adapted when actuated to the moved from a first position outside the bin path to a second position inside the bin path in contact with a stack of previously received sheets of the bin coincident with said bin receiving the next incoming sheet to facilitate entry thereof;

wherein said trail edge hold apparatus include a plurality of finger members actuated by a drive linkage to move in crank fashion;

wherein the continued movement of said fingers returning towards their starting position lifts them away from said stack.

4,037,833
RIDING TOY FOR CHILDREN

Paul R. Anderson, 23701 Surf Cove, Laguna Niquel, Calif. 92677

Filed May 5, 1976, Ser. No. 683,408

Int. Cl.^{2} A63G *19/02*

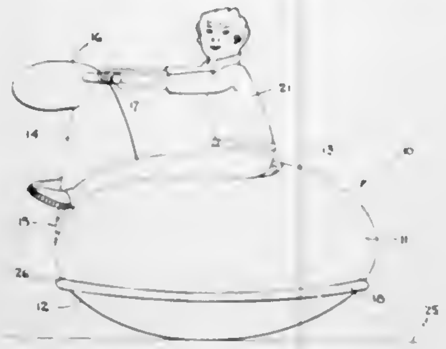
U.S. Cl. 272—52 **7 Claims**

1. A riding type toy for children, which comprises:

a rocking structure simulating an animal form having a generally ellipsoidal shaped body portion including a bottom surface adapted to engage a ground surface, a top surface and a neck portion extending upwardly adjacent the peripheral edge of the body portion having a head portion at the distal end thereof,

a pair of handhold bars having one of each extending outwardly of opposite sides of the head for a child to grip while seated on the top surface so as to provide the means for rocking and rotating said body slidably on the ground surface,

bumper means extending around the body portion and spaced from the ground surface adapted to engage rocking contact with said ground surface when so rocked and prevent said body from overturning beyond a safe angle from the verticle, the bumper means being adapted to exert a reactive force to return said body to an upright position,



a seat rest for the child to sit upon comprising a shallow dish-like basin disposed proximate the center of said top surface, and

a leg rest comprising a pair of arcuate channels in said top surface extending from the seat rest downwardly on opposite sides of the neck portion for supporting the legs of said child.

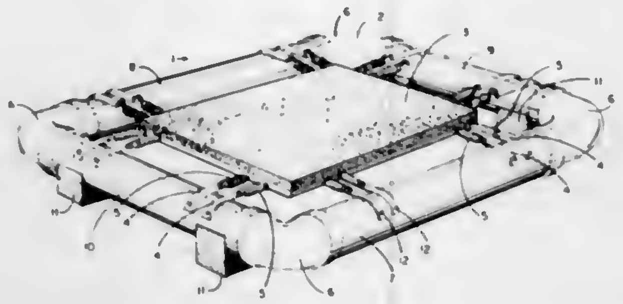
4,037,834
JOGGING DEVICE

Arthur Q. Oaks, 432 Spring St., Cambridge Springs, Pa. 16403

Filed Aug. 20, 1975, Ser. No. 605,998

Int. Cl.^{2} A63B *5/00*

U.S. Cl. 272—65 **6 Claims**



1. A jogging device comprising a frame having an arcuate upper surface, a horizontal completely rigid jogging platform freely suspended within and by same frame, means for yieldingly mounting the platform within the frame comprising a plurality of spring means, each of said spring means comprising in series combination a cantilever spring and a coil spring, said cantilever spring being attached to the arcuate upper surface of the frame and extending inwardly toward the platform, and said coil spring having one end thereof attached to the inward portion of the cantilever spring and the other end thereof attached to the platform.

4,037,835
STABILIZING MEANS FOR TRAMPOLINE

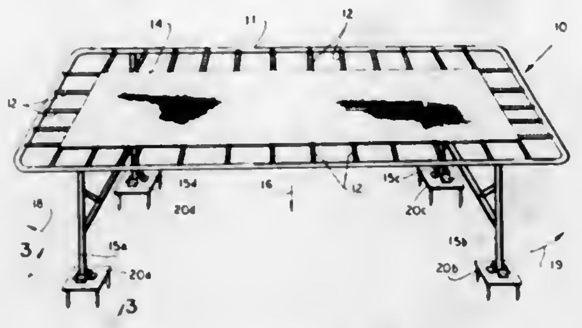
Roland W. Forsyth, Box 717, Decatur, Ga. 30032

Filed July 18, 1975, Ser. No. 597,015

Int. Cl.^{2} A63B *5/18*

U.S. Cl. 272—65 **2 Claims**

1. A trampoline comprising a frame, a plurality of legs supporting said frame, a mat carried within said frame, and stablizing means comprising a plurality of stabilizing shoes, each including a supporting plate, retaining means fixed to said supporting plate for slidably receiving one of said plurality of legs and for preventing lateral motion of said leg in any direction with respect to said supporting plate, and anchoring means fixed to said supporting plate and slidably insertable into a supporting surface for preventing lateral motion of said supporting plate with respect to any of a plurality of locations wherein said stabilizing shoe may be inserted, each of said plurality of legs having a foot at the lower end thereof, said retaining means comprising a first pair of substantially parallel stops engaging opposite sides of said foot and a second pair of substantially parallel stops arranged substantially perpendicular to said first pair of stops, and second pair of stops engaging opposite sides of said foot.



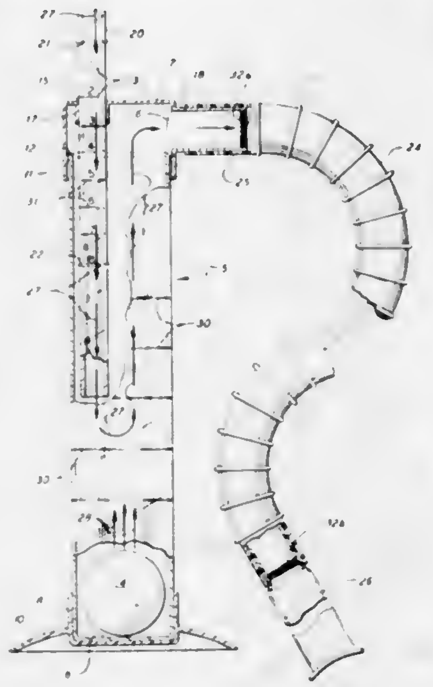
4,037,836
RESPIRATORY EXERCISER

George Puderbaugh, Manlius, and Stanley Erman, East Syracuse, both of N.Y., assignors to Diemolding Corporation, Canastota, N.Y.

Filed Mar. 12, 1976, Ser. No. 666,221

Int. Cl.^{2} A63B *23/00*

U.S. Cl. 272—99 **4 Claims**



1. A respiratory exerciser comprising an upright tube closed at its lower end, a closure member for the upper end of the tube, a lightweight ball positioned in the tube, the closure member having a pair of apertures therethrough, an elongated open-ended tube slidably mounted in one of the apertures and projecting down into the upright tube, the axis of said open-ended tube being parallel to but offset from the vertical axis of said upright tube, and an inhalation tube one end of which is in communication with the other aperture whereby a user of the exerciser by inhaling air through the inhalation tube can cause the ball to rise in the upright tube, the degree of difficulty in raising the ball being controlled by moving the open-ended tube up or down in its aperture.

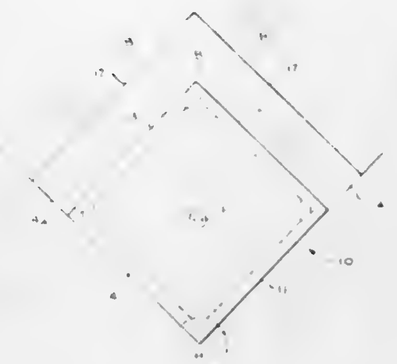
4,037,837
METHOD OF PLAYING BASEBALL

William Bauer, 212 Forester, El Campo, Tex. 77437

Filed Oct. 28, 1975, Ser. No. 626,256

Int. Cl.^{2} A63B *71/00*

U.S. Cl. 273—25 **6 Claims**



1. In a method of playing baseball comprising two opposing teams, having a plurality of players wherein one team is at bat and one team is on the field, said field having an infield, an outfield, foul lines, base lines, a home plate, a first base, a second base, a third base, and pitcher's mound wherein the improvement comprises having a plurality of members on each of said opposing teams, each of said teams having two forms, each of said forms having one or more members, assigning members of one form on both teams to a first designated area of said field, said first designated area being generally coextensive with said infield, designating a second area comprising less than 50% of the said field, said second designated area having at least a major part thereof disposedin said outfield, assigning a first form to use said first area of said field when the team to which that form belongs is on said field, and designating a second form of said team to said second area of said field, said second form being assigned to said second area of the field being restricted to said second area of the field for the purposes of playing the game of baseball, and said members of the first form not being restricted, but being able to play on the entire field.

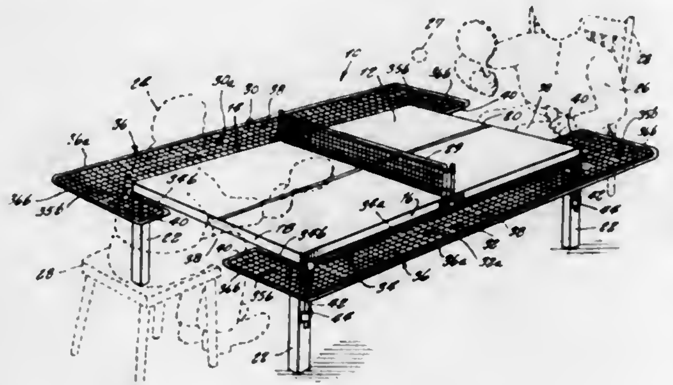
4,037,838
MINI TENNIS TABLE

Walter W. McCune, 200 W. 97th St., Apt. 214, Bloomington, Minn. 55420

Filed Mar. 26, 1976, Ser. No. 670,995

Int. Cl.^{2} A63B *67/04*

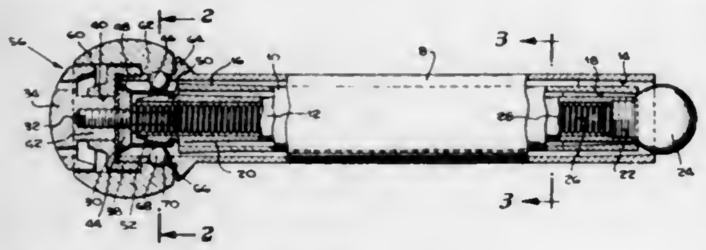
U.S. Cl. 273—30 **3 Claims**



1. In a tennis table having an elevated, generally rectangular horizontal playing surface defined by opposed relatively long side margins and opposed relatively short end margins, the improvement comprising: an elongated generally horizontal net means extending from said table including first portions directed along said side margins for catching a playing ball and preventing said ball from dropping to the ground; and second

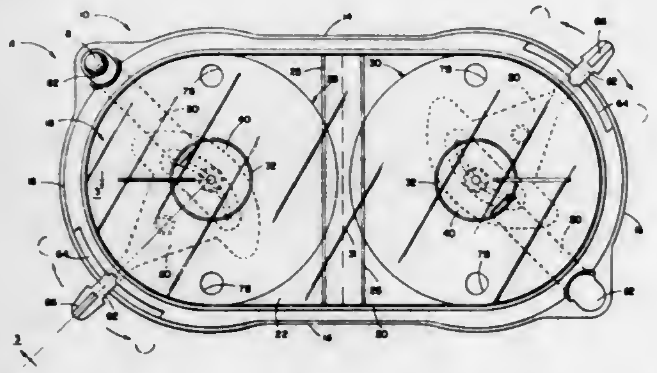
elongated portions of said net means directed along said end margins, said second portions defining gaps generally at the center of said end margins for enabling players to be positioned adjacent said end margins.

4,037,839
COLLAPSIBLE BATON
Norman C. Nelson, P.O. Box K, Barstow, Calif. 93211
Filed Dec. 31, 1975, Ser. No. 645,667
Int. Cl.² F41B *15/02*
U.S. Cl. 273—84 **13 Claims**



1. A police baton comprising,
at least a pair of telescoping tubes movable to extend and collapsed positions,
cooperating separably engageable stop portions adjacent the inner end of one tube and the outer end of the other tube to limit the extended movement of the tubes,
one of the tubes having a handle end,
spring means interposed between one of said handle end and its tube and the other tube and biasing said other tube to an extended position,
a catch device carried by said one of said handle and one of said tubes and releasably engaging said other tube for extension by said spring means,
and a safety lock associated with said catch device to releasably secure the catch device against release from said other tube.

4,037,840
TOY GAME DEVICE AND METHOD
Adolph E. Goldfarb, Tarzana; Erwin Benkoe, Encino; Delmar K. Everitt, Woodland Hills; Ronald F. Chesley, La Crescenta, and Richard D. Friedrich, Canoga Park, all of Calif., assignors to Adolph E. Goldfarb and Erwin Benkoe, both of Northridge, Calif.
Filed Feb. 12, 1976, Ser. No. 657,379
Int. Cl.² A63F *7/06*
U.S. Cl. 273—85 A **22 Claims**



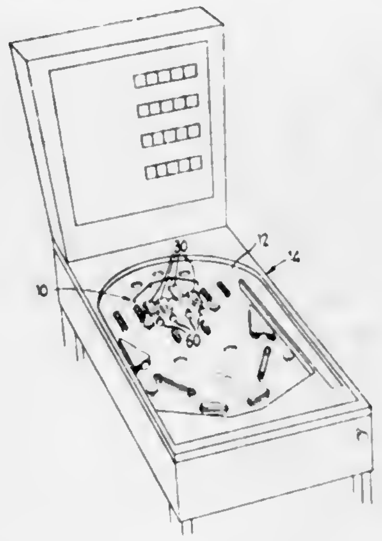
1. A toy game apparatus for engaging and propelling a playing piece into a goal area of an opponent player, said game apparatus comprising:
a. a game playing board,
b. a retaining wall extending around said playing board for retaining a playing piece therein,
c. a pair of opposed recessed goal areas in said playing board, said game board being of complex curvature such that the goal areas are located at low points in said game board and that the portions of the game board surrounding said goal areas converge downwardly and inwardly toward said goal areas in such manner that the playing piece can move toward the goal areas through arcuate paths surrounding the goal areas and into the goal areas at any point on the entire periphery of the goal areas and from any direction around the goal areas,
d. and striker means operatively associated with each of said goal areas to engage and propel said playing piece, and which playing piece will enter a goal area it is approaching if said striker means does not engage and propel said playing piece away from said goal area, each of said goal areas comprising an individual cup-like member and each said striker member being located at each said cup-like member for a rotational movement thereabout.

20. A method of playing a toy playing game in which a playing piece is moved between a pair of opposed goal areas on a game board, said method comprising:
a. introducing a playing piece onto a game board,
b. permitting said playing piece to move toward one or another of a pair of opposed goal areas on said game board by force of gravity,
c. causing rotation of a striker member at either of said goal areas by manual actuation of an actuating member to engage and propel said playing piece,
d. said playing piece automatically entering said goal areas from any point around the entire periphery of each of the goal areas and from any direction to achieve a score if said striker member associated with each goal area does not engage and propel the playing piece away from said goal area, said game board comprising a conically-shaped wall surrounding each said goal area and merging into said goal area so that said playing piece automatically enters the goal area if the striker member associated therewith is not actuated.

4,037,841
LACROSSE STICK HAVING TUBULAR METALLIC HANDLE
Fielding H. Lewis, Jr., Towson, Md., assignor to W. T. Burnett & Co., Baltimore, Md.
Filed Nov. 11, 1974, Ser. No. 522,578
Int. Cl.² A63B *59/02*
U.S. Cl. 273—96 D **12 Claims**

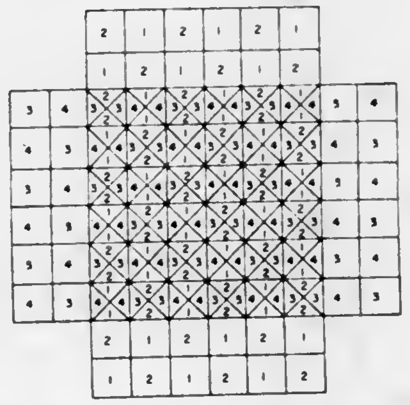
1. A lacrosse stick comprising a head; and a tubular metallic handle of elliptical cross-section, the major axis of said cross-section being normal to the general plane of said head, and the ratio of the length of the minor axis to the length of the major axis of said elliptical cross-section is within the range 0.8 to 0.93.

4,037,842
TARGET DEVICE FOR PINBALL GAMES
Jeffrey D. Breslow, Highland Park, Ill., assignor to Marvin Glass & Associates, Chicago, Ill.
Filed May 8, 1975, Ser. No. 575,975
Int. Cl.² A63B *71/00*
U.S. Cl. 273—127 R **16 Claims**



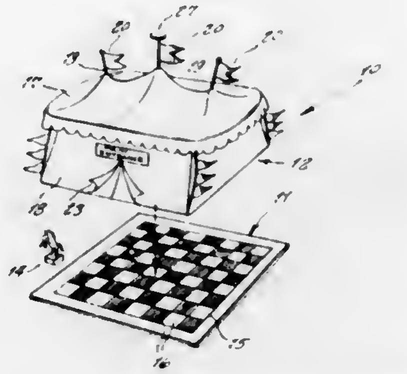
1. A target device for a pinball game, comprising:
a frame having means defining a playing surface over which pinballs are rollingly supportable;
an indicator member pivotally mounted on the frame for pivotal movement over the playing surface about an axis generally parallel and adjacent to the playing surface between first and second limit positions; and
actuating means operatively associated with said movable indicator and actuatable in response to engagement thereof by a pinball rolling on said playing surface for moving the indicator from either of said limit positions to the opposite limit position.

4,037,843
BOARD GAME APPARATUS
Alfred J. Hoffman, 1411 N. Kenmore Road, Indianapolis, Ind. 46219
Filed Sept. 25, 1975, Ser. No. 611,483
Int. Cl.² A63F *3/02*
U.S. Cl. 273—131 AB **1 Claim**



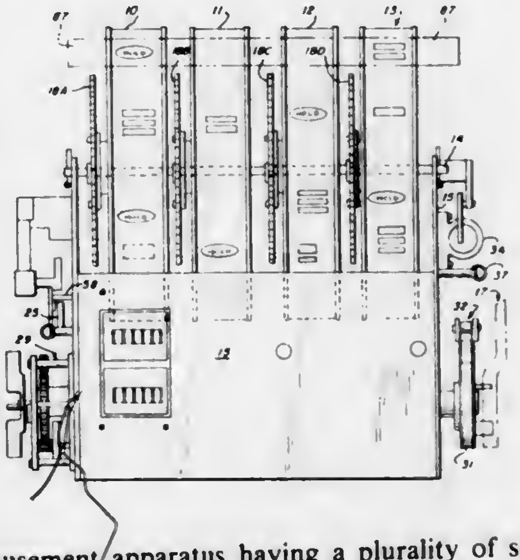
1. Board game apparatus comprising a game board having the configuration shown in FIG. 1 of the drawing and having on its surface the game pattern shown in said FIG. 1, the numerals in said figure representing four different colors on equivalent indicia, and four sets of game pieces, each set being of a different one of said colors or equivalent indicia.

4,037,844
CHILD'S TOY TENT CHESS BOARD
Jeanette LaMonica, and Diana LaMonica, both of 14710 Blyth St., Apt. 31, Panorama City, Calif. 91402
Filed Mar. 29, 1976, Ser. No. 671,387
Int. Cl.² A63F *3/02*
U.S. Cl. 273—136 K **4 Claims**



1. A child's toy tent chess board, comprising in combination, a chess board and a removable cover above said chess board, said cover being in the shape and ornamental appearance of a circus tent, said chess board and cover together forming a case enclosing playing pieces for said chess board, wherein said cover includes a circular disc upon an upper end of a center, upwardly extending pole for forming a handle for carrying said case in a hand.

4,037,845
AMUSEMENT APPARATUS
Donald E. Hooker, Wilmette, Ill., assignor to Bally Manufacturing Corporation, Chicago, Ill.
Continuation-in-part of Ser. No. 558,340, March 14, 1975, abandoned. This application Jan. 9, 1976, Ser. No. 647,905
Int. Cl.² A63F *5/04*
U.S. Cl. 273—138 A **6 Claims**

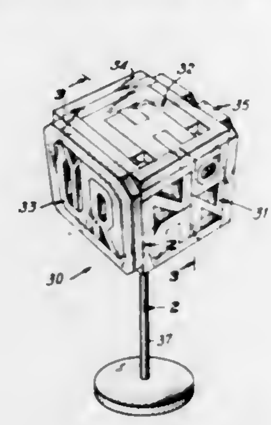


1. An amusement apparatus having a plurality of symbol display elements each having a plurality of symbols of a first type which designate "Win" symbols and a plurality of symbols of a second type which designate "Hold" symbols, said apparatus normally operative in a play cycle for displaying one symbol from each display element sequentially in a viewing area, said display elements adapted to be indexed at the end of a play cycle to display in said viewing area one symbol from each said display element to form a combination of said symbols which can have a predetermined score value, and control means associated with said display elements for automatically holding in said viewing area during the next succeeding play cycle a said "Win" symbol when at least one of the symbols simultaneously indexed with said "Win" symbol in said viewing area at the end of the first mentioned play cycle is a "Hold"

symbol; whereby a combination having increased score value can be built up stepwise in successive play cycles.

4,037,846
ALPHABET CUBE PUZZLE

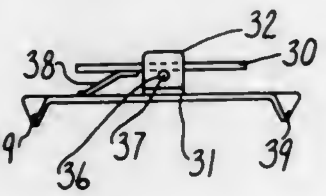
Joan Javits Zeeman, R.F.D. Box 126, Waitsfield, Vt. 05673
Filed Jan. 27, 1976, Ser. No. 652,932
Int. Cl.² A63F *9/12;* **G09B** *1/08, 1/10*
U.S. Cl. 273—157 R **71 Claims**



67. An alphabet puzzle comprising a reference member having a surface, a plurality of puzzle pieces shaped for mounting on said surface and means for releasably securing said puzzle pieces on said surface, said puzzle pieces being shaped substantially as shown in FIGS. 6, 7, 8, 9 and 10.

4,037,847
GOLF SWING TRAINING APPARATUS

Walter R. Lorang, 2239 W. Maple Road, Walled Lake, Mich. 48088
Filed Feb. 6, 1976, Ser. No. 655,684
Int. Cl.² A63B *69/36*
U.S. Cl. 273—187 B **10 Claims**



6. Golf swing training apparatus for teaching a player how to control the position of his body during the swing of the club at the ball comprising:

a platform for supporting a player's foot; said platform having a heel, a toe end, opposite sides, and a central axis extending between said heel and toe ends; and

rocker means on said platform bi-directionally rockably supporting said platform on a base; said rocker means being aligned on said central axis of said platform and positioned to engage a base at a point substantially directly below said axis and to permit said platform to rock from side-to-side and engage a base laterally of said point;

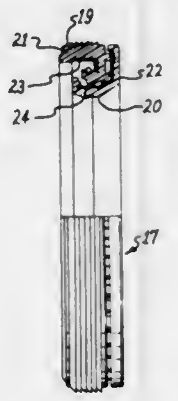
said platform being bi-directionally rockable between a position inclined toward the target and a position inclined away from the target;

a player with his off-target foot on said platform with said platform inclined toward the target being advised of proper body positioning during his backswing by said platform not rocking and remaining inclined toward the target, and being advised of improper body positioning during his backswing by said platform rocking from an inclination toward the target to an inclination away from the target to indicate a body shift away from the target;

a player with his target foot on said platform with said platform inclined away from the target being advised of proper body positioning during his downswing by said platform rocking from an inclination away from the target to an inclination toward the target thereby indicating a shift of his body toward the target, and being advised of improper body positioning during his downswing by said platform not rocking from an inclination away from the target to an inclination toward the target thereby indicating that he did not shift his body toward the target.

4,037,848
LUBRICANT SEAL

David B. Prescott, Littleton; Herbert H. Thumm, Denver, and Raymond L. Horner, Englewood, all of Colo., assignors to The Mechanex Corporation, Englewood, Colo.
Filed Feb. 11, 1976, Ser. No. 657,094
Int. Cl.² F16J *15/32*
U.S. Cl. 277—37 **13 Claims**



1. A seal for sealing between a bore and a shaft, said shaft being radially inwardly spaced from and coaxial with said bore and said bore and said shaft being subject to rotation relative to each other, said seal comprising;

a first substantially annular means having a first resilient elastomeric member adapted for sealingly engaging a continuous annular portion of said bore for preventing fluid flow between said bore and said resilient elastomeric member, said resilient elastomeric member being adapted for being installed into sealing engagement with said continuous annular portion of said bore by manual effort for enabling said seal to be sealingly engaged with said bore without installation tools;

a second substantially annular means having a second resilient elastomeric member adapted for sealingly engaging a continuous annular portion of said shaft for preventing fluid flow between said second resilient elastomeric member and said shaft, said resilient elastomeric member being adapted for being installed into sealing engagement with said continuous annular portion of said shaft by manual effort for enabling said seal to be sealingly engaged with said shaft without installation tools;

one of said first and second annular means further having a first rigid member, said first rigid member having a cylindrical band portion sealingly engaged with said one of said first and second annular means and a rigid wear surface radially facing toward said other of said first and second annular means, said cylindrical band portion of said first rigid member having a first side and a second side, said first rigid member further having a rigid side member affixed to said first end of said cylindrical band portion of said first rigid member and extending radially toward said other of said first and said second annular means, said rigid side member extending radially beyond a continuous annular portion of an axial side of said other of said first and said second annular means for limiting axial movement of said first and said second annular means relative to each other in a first axial direction;

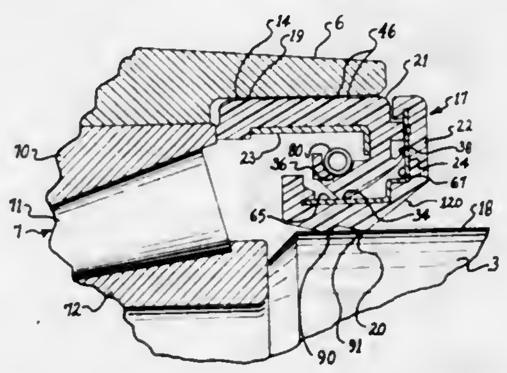
the other of said first and said second means further having a second rigid member for supporting said resilient elastomeric member of said other of said first and second annular means;

said one of said first and said second annular means further having an assembly maintenance rim disposed adjacent said second side of said cylindrical band portion of said first rigid member, said assembly maintenance rim radially extending beyond said wear surface of said cylindrical band portion of said first rigid member toward said other of said first and said second annular means, said assembly maintenance rim having a terminal radially facing portion having a spaced relationship relative to said second rigid member of said other of said first and said second annular means to provide a continuous substantially annular space between said second rigid member and said terminal radially facing portion of said assembly maintenance rim for enabling said second rigid member to move axially past said assembly maintenance rim when said first and said second annular means are coaxially aligned and forced axially toward each other; and

the other of said first and said second annular means further having resilient seal means sealingly engaged with said other of said annular means and adapted for being sealingly engaged with a continuous annular portion of said wear surface for permitting relative rotational movement between said seal means and said wear surface and for preventing fluid flow between said seal means and said wear surface under static and dynamic conditions, said resilient seal means being adapted for resiliently deforming as it is forced axially into engagement with said assembly maintenance rim as said first and said second annular means are coaxially aligned with said seal means adjacent said assembly maintenance rim and forced axially toward each other whereby said seal means resiliently deforms to slide over said terminal radially facing portion of said assembly maintenance rim and upon being forced axially past said assembly maintenance rim said seal means resiliently returns toward its original shape for sealingly engaging said wear surface and for limiting axial movement of said first and said second annular means in a second axial direction, said second axial direction being opposite to said first axial direction, for maintaining said seal as a preassembled unit.

4,037,849
LUBRICANT SEAL

Herbert H. Thumm, Denver, Colo., assignor to The Mechanex Corporation, Englewood, Colo.
Filed Feb. 11, 1976, Ser. No. 657,095
Int. Cl.² F16J *15/34*
U.S. Cl. 277—37 **3 Claims**



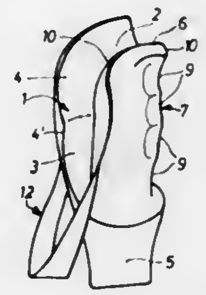
1. In a fluid seal for sealing between a bore and a shaft, said seal having a first resilient member for engaging said bore, a second resilient member for engaging said shaft and a rigid wear and support member interposed between and sealingly engaged with at least a continuous annular portion of each of said resilient members, said rigid member having a cylindrical portion affixed to one of said first and second resilient members and a radially extending portion, said radially extending portion having a substantially annular portion of an axial side surface disposed for engaging an axial side of said other of said resilient members for assuring proper alignment of said one of said resilient members and said rigid member relative to said other of said resilient members upon installation of said seal, the improvement comprising:

a continuous substantially annular stiffening groove comprising a continuous annular surface deformation formed in said substantially annular portion of said axial side surface of said radially extending portion of said rigid member disposed for engaging an axial side of said other of said resilient members, said stiffening groove being coaxial with and radially spaced from said cylindrical portion of said rigid member of aiding in preventing deformation of said radially extending portion of said rigid member due to axial force imposed upon said radially extending portion by said other of said resilient members; and

spacer means integral with said axial side of said other of said resilient members, said spacer means being interposed between said axial side of said other of said resilient members and said stiffening groove, said spacer means having a flat end portion aligned for engaging said continuous annular surface deformation forming said stiffening groove for reducing surface contact between said flat end of said spacer means and said rigid member.

4,037,850
SKI POLE HANDLE OR THE LIKE

Paul Haberlin, Bleicherweg 52, Zurich, Switzerland (8002)
Filed Oct. 20, 1975, Ser. No. 624,001
Claims priority, application Germany, Oct. 29, 1874, 2451381
Int. Cl.² A63C *11/22*
U.S. Cl. 280—11.37 H **8 Claims**



1. A handle for a pole, especially a ski pole, comprising an elongated body member having upper and lower ends and two substantially upright hand-engaging surfaces extending between said ends and formed on generally opposed sides of said body member, said upright surfaces extending approximately in the lengthwise direction of said body member and substantially parallel to the longitudinal axis thereof, one of said upright surfaces being configured to accomodate the distal end portions of the fingers of the user and the other upright surface being configured to accomodate the palm and the bases of the fingers of the user, said body member also defining a thumb resting surface formed on said upper end of the body member and on the same side of the body member as said other upright surface and merging with said other upright surface for accomodating the thumb of the user, and an upright wall formed on the same side of said body portion as said one upright surface and extending above said thumb resting surface to prevent the thumb from moving from said thumb resting surface towards said one upright surface.

4,037,851
STORE MERCHANDISING APPARATUS

Victor R. Romero, Sheridan Township, Calhoun County, Mich., assignor to Eagle Picher Industries, Inc., Cincinnati, Ohio
Filed Nov. 3, 1975, Ser. No. 628,198
Int. Cl.² B62B *3/02*
U.S. Cl. 280—79.3 **9 Claims**

1. A mobile merchanising cart, comprising:

base means;

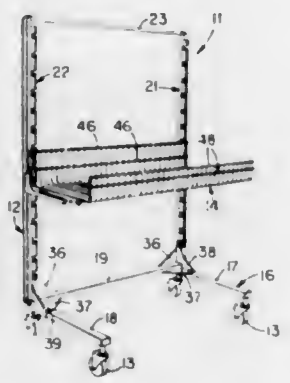
wheel means mounted on said base means for rollingly supporting said base means on a support surface, such as a floor;

a pair of upright posts fixed to said base means and projecting vertically upwardly therefrom, said posts being substantially parallel and spaced a preselected distance apart;

each post having an elongated vertical mounting member extending longitudinally thereof and projecting frontwardly therefrom toward the front of said cart, said mounting member having a plurality of notches which are uniformly vertically spaced apart and are arranged in a vertical row which extends longitudinally of the post over a substantial portion of the length thereof, each notch being comprised of an upright slot having a closed bottom and a transversely extending slot at the upper end of said upright slot and extending frontwardly therefrom through the frontward edge of said mounting member, the notches in the mounting member of one of said posts each being horizontally aligned with a corresponding slot in the mounting member of the other of said posts;

at least one horizontally elongated shelf extending horizontally between and being removably supported in cantilevered fashion on said pair of posts, said shelf including a substantially vertically extending rear wall and a substantially horizontally extending bottom wall fixedly connected to said rear wall and projecting frontwardly therefrom;

a pair of parallel horizontally extending rods mounted on the rearward side of said rear wall and received within a pair of said notches in each post of said pair of posts, and each rod being sized to be movable through one of said transverse slots and into the corresponding said upright slot of the mounting member of its associated post, said pair of rods projecting rearwardly from the rearward side of said rear wall and being vertically spaced apart a preselected distance substantially corresponding to the vertical spacing between the bottoms of a pair of said upright slots and being received within a pair of said upright slots in the associated mounting member so that said shelf is removably supported on said posts in a cantilevered manner with the frontward edges of said mounting members projecting frontwardly of said rods.



4,037,852

SKATEBOARD BRAKING METHOD AND APPARATUS

Arthur J. Bayer, 412 N. Curry, and Henry Schwarzer, 2815 Baker Drive, both of Carson City, Nev. 89701

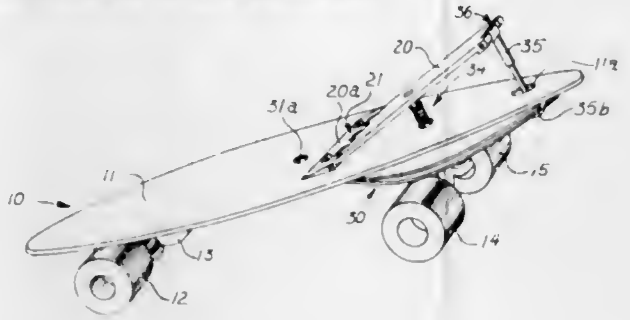
Filed Mar. 17, 1976, Ser. No. 667,558

Int. Cl.^{2} A63C *17/14*

U.S. Cl. 280—87.04 A **1 Claim**

1. The combination, with a skateboard comprising a platform with at least two pairs of wheels connected thereto on one side thereof, of:

1. Friction means pivotally supported by resilient members on the underside of said platform above one pair of wheels;
2. An activation lever attached to said friction means in such manner that said friction means is caused to come in contact with said wheels upon depression of said lever, and to be removed from contact upon elevation of said lever;
3. Hinge means pivotally attaching an end of said lever to said platform of said skateboard;



4. Spring means holding said lever normally at an angular relation to said platform, with the end of said lever not attached to the platform at a distance from the platform; and
5. Elongated rod means causing attachment of the lever means to the friction means.

4,037,853

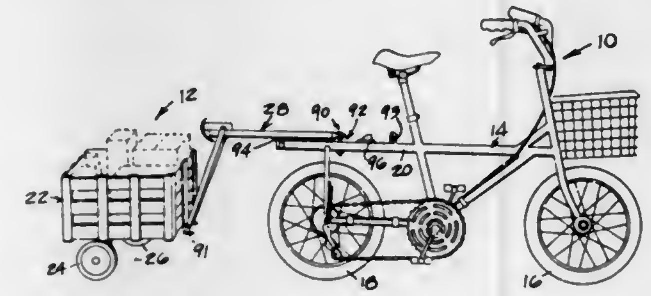
DELIVERY BICYCLE-TRAILER

Carl K. Sparks, 227 Richardson Drive, Mill Valley, Calif. 94941

Filed June 4, 1976, Ser. No. 692,666

Int. Cl.^{2} B62K *27/00*

U.S. Cl. 280—204 **12 Claims**



1. A trailer adapted for alternative use either to be towed behind a bicycle or the like or to be used as a hand truck, the trailer also being collapsible for storage upon the bicycle or the like, the trailer comprising a collapsible trailer body and a draw bar unit arranged at the forward end of the trailer body, the draw bar unit including a first elongated portion pivotably interconnected with the trailer body, a second draw bar portion pivotably interconnected with the first draw bar portion and means for locking the draw bar portions in a plurality of angled positions relative to each other and to the trailer body, the second draw bar portion including hitch means at its unpivoted end arranged for interconnection with hitch receiving means mounted upon the bicycle or the like.

8. A collapsible trailer body adapted either to be towed behind a bicycle or the like or to be carried upon a portion of the bicycle or the like, the trailer comprising a central longitudinally extending bridge portion for spanning a supporting portion of the bicycle or the like, side portions pivotably connected with opposite sides of the bridge portion, each trailer side portion including a wheel bracket for supporting a rotatable wheel, a parallelogram linkage effectively interconnecting the bridge portion with each of the wheel brackets in order to maintain the wheels in vertical alignment both when the trailer is expanded for towing behind the bicycle or collapsed for mounting upon a supporting portion of the bicycle, and a trailer draw bar including a first elongated draw bar portion and a second elongated draw bar portion pivotably interconnected with the first draw bar portion, the second draw bar portion including hitch means at its pivoted end.

4,037,854

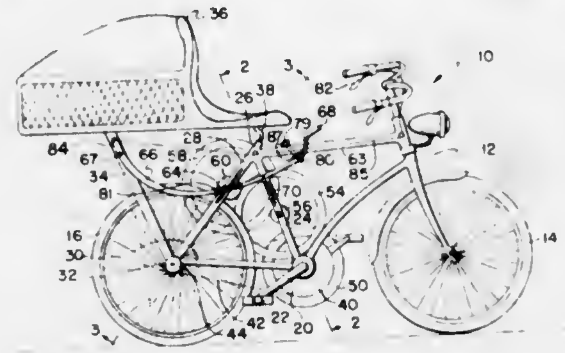
FLYWHEEL AIDED BICYCLE

Eugene Large, 25-64 83rd St., Jackson Heights, N.Y. 11370

Filed Oct. 15, 1975, Ser. No. 622,425

Int. Cl.^{2} B62M *1/10*

U.S. Cl. 280—217 **1 Claim**



1. A pedal propelled vehicle comprising a frame in which are journalled a tractive wheel and a pedal carrying shaft, first transmission means drivingly coupling said pedal carrying shaft to said tractive wheel, flywheel means mounted coaxial and rotatable with respect to said shaft, second transmission means carried by said frame for drivingly interconnecting said tractive wheel to said flywheel, said second transmission means including a slip clutch means, an elongated slot means in said frame directed radially from said tractive wheel, said slip clutch means comprising a clutch wheel forming a part of said second transmission means which is carried rotatably on an axle passing through said slot means, said clutch wheel being dimensioned to engage the circumference of said tractive wheel when said axle is positioned at a particular location along said slot means, an elongated lever pivotaly mounted at one end to said frame; said lever being rotatably secured to said axle at an intermediate position along the length of said lever for selectively positioning said axle along said slot means, spring means acting between said lever and said frame for urging said clutch wheel out of engagement with said tractive wheel; and a handgrip on the other end of said lever.

4,037,855

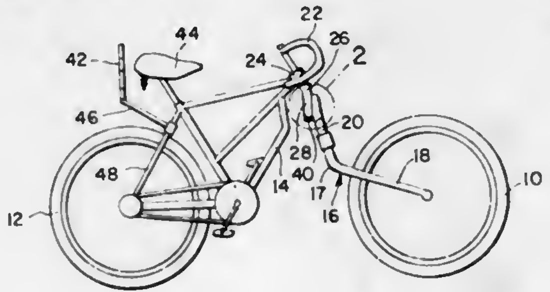
BICYCLE WITH SHOCK ABSORBING FRONT END

Melvin Smith, 1040 Oak, Apt. No. 4, San Francisco, Calif. 94117

Filed Aug. 20, 1975, Ser. No. 606,199

Int. Cl.^{2} B62K *21/20*

U.S. Cl. 280—276 **3 Claims**



1. A bicycle of the type comprising a frame and front and rear wheels rotatably mounted in said frame, said frame including handle bars and a fork assembly connected to said handle bars, said front wheel being rotatably mounted at an end of said fork assembly remote from said handle bars, said handle bars and fork assembly being pivotably mounted in said frame such that rotation of said handle bars with respect to the rest of said frame will rotate said fork assembly and front wheel with respect to said frame,

characterized in that said handle bars are connected to a front steering post having a substantially vertically-oriented cylinder at the lower end of said steering post, said cylinder forming a continuous downwardly extending portion of said front steering post,

said steering post and said cylinder being pivotable with said handle bars, said cylinder having a piston member slidably mounted in said cylinder and a pair of coil springs of substantially equal strength positioned in said cylinder above and below said piston member, respectively,

said cylinder having upper and lower end members to confine said springs in said cylinder and adjacent the upper and lower surfaces of said piston member, respectively,

said cylinder having a single vertically-oriented slot in a front side thereof, said piston member having a neck extension thereon extending from a front side of said piston and through said slot in said cylinder, an end of said neck extension remote from said piston being joined to an upper portion of said front fork assembly said neck extension and said slot being dimensioned to provide contact surfaces for the transmission of rotational forces imparted on said steering post and being transmitted by said slot to said neck extension for controlling the steering of said front fork assembly,

such that vertical shocks communicated to said front wheel and fork assembly due to road irregularities encountered by said bicycle will be springly cushioned by said pair of springs, yet said front wheel will be pivoted in response to rotation of said handle bars due to rotational force transmitted by said cylinder and the sides of said slot thereof against said piston extension.

4,037,856

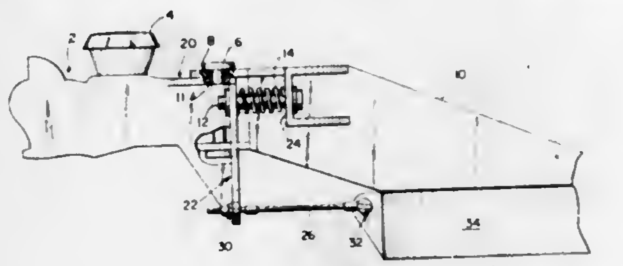
LATERAL FORCE LIMITING COUPLER ASSEMBLY

Eric G. Medlin; Stephen A. Blair, and Richard H. Dennis, all of Tempe, Ariz., assignors to U-Haul International, Inc., Phoenix, Ariz.

Filed May 26, 1976, Ser. No. 690,140

Int. Cl.^{2} B60D *7/00*

U.S. Cl. 280—446 B **14 Claims**



1. A lateral force limiting coupler assembly for a towed vehicle, operable for self-contained actuation of a surge-brake mechanism on said towed vehicle, comprising in combination:

- A. a coupler member adapted for engagement with a mating hitch assembly on a towing vehicle; and,
- B. a yoke member comprising a movable actuator portion of said surge-brake mechanism, and a tongue member comprising a portion of the frame of said towed vehicle; and,
- C. connecting means between said coupler member and said yoke member for allowing relative rotation in a lateral plane between said coupler member and said yoke member; and
- D. dampening means between said coupler member and said yoke member for resisting said relative rotation; and
- E. actuator means between said coupler member and said tongue member operable to actuate the wheel brakes of said towed vehicle in response to said relative rotation.

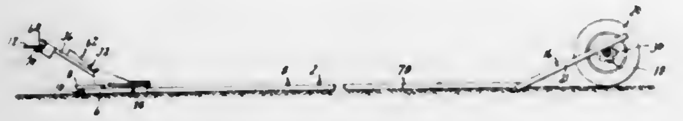
4,037,857
ELEVATOR TONGUE FOR FARM IMPLEMENTS

James C. Donahue, Durham, Kans., assignor to Donahue Corporation, Durham, Kans.

Filed Nov. 11, 1976, Ser. No. 740,823

Int. Cl.^{2} B60D *1/00*

U.S. Cl. 280—478 B **8 Claims**



1. In combination with a vehicle bed having ground-engaging wheels adjacent its rearward end supporting said bed in spaced relation above the ground, and being connectable at its forward end to a towing vehicle at generally the same elevation above the ground, an elevator tongue for connecting said vehicle bed to said towing vehicle, said tongue comprising:

a. a horizontal, upwardly facing track affixed to said bed adjacent its forward end and extending parallel to the line of travel of said bed,

b. a beam normally parallel, generally coextensive with, and above said track, and having means at its rearward end supported on said track for movement therealong,

c. a ramp affixed to said beam thereabove and sloping downwardly and rearwardly,

d. supporting means rigidly associated with said track and movably engaging said ramp forwardly of the rearward end of said beam,

e. releasable beam locking means securing said beam against forward movement relative to said track, and

f. means for connecting the forward end of said beam to said towing vehicle for vertical pivotal movement relative thereto, whereby when said locking means is released and said towing vehicle is driven forwardly, said beam is moved forwardly relative to said track, and said supporting means, acting in cooperation with said track and said ramp, lower the forward end of said bed to rest on the ground.

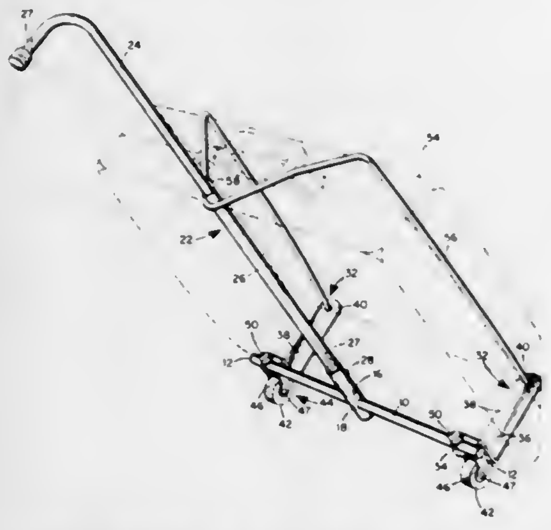
4,037,858
PORTABLE LUGGAGE CARRIER

John F. Adams, 55 Lee Road, Chestnut Hill, Mass. 02167

Filed Oct. 20, 1975, Ser. No. 623,600

Int. Cl.^{2} B62B *3/02*

U.S. Cl. 280—652 **8 Claims**



1. A portable luggage carrier comprising:

a. a horizontal beam having a vertical aperture formed therein adjacent to each end thereof;

b. a vertical socket affixed to said horizontal beam at the approximate mid-point thereof, said socket having an upwardly-extending opening;

c. two individual horizontal support fingers each having a vertical aperture formed therein adjacent to one end thereof;

d. two individual wheel housings each having a wheel mounted for rotation therein, each said housing having a vertical shaft extending upwardly through one of said support finger apertures and through one of said horizontal beam apertures, said support fingers pivoting about said vertical shafts independently of the wheel housings and between an unfolded operative position and a folded storage position;

e. means for engaging the tops of said shafts to prevent downward movement of said wheel housings relative to said horizontal beam;

f. an extendible vertical handle having at least two telescoping tubular sections, said handle being detachably mounted in said socket; and

g. a flexible length of elastic cord for securing luggage placed on said carrier, said cord running between the other ends of said support fingers and extending upwardly over the luggage and then around said handle.

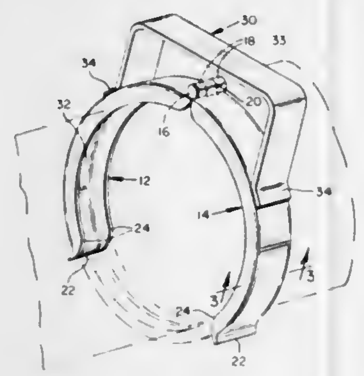
4,037,859
IRRIGATION PIPE JOINT LOCK

Lloyd W. Clements, 49 W. Lincoln Ave., C., Woodland, Calif. 95695

Filed July 19, 1976, Ser. No. 706,887

Int. Cl.^{2} F16L *23/00, 37/12*

U.S. Cl. 285—5 **7 Claims**



1. In an irrigation pipe joint clamp,

a pair or arcuate chennel-like arms having camming end portions,

securing means pivotally securing second hinging ends together,

and a generally U-shaped spring handle secured to the arms and biasing them inwardly,

the handle having a base portion spaced from the arms and the securing means sufficiently for the fingers of a user to be inserted therebetween.

4,037,860
SUSPENSION ARRANGEMENT

Horst Thiele, Friedhofstrasse 12, Neuenstadt a.K., Germany (7106)

Filed Sept. 11, 1975, Ser. No. 612,492

Int. Cl.^{2} B60G *11/26*

U.S. Cl. 280—709 **5 Claims**

1. A suspension arrangement for a vehicle having a plurality of axles and a frame supported by said axles comprising:

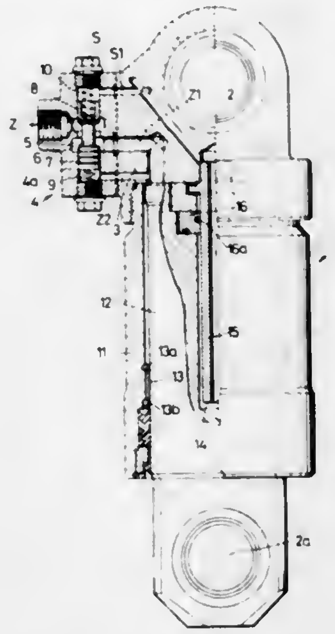
a. a plurality of suspension units respectively associated with said axles, each unit including

1. a cylinder member defining a first cavity,
2. a plunger member movable inward and outward of said cavity,
3. fastening means for fastening said members to said frame and to the associated axle respectively,
4. a cylinder element defining a second cavity and secured to one of said members for joint movement therewith, and
5. a plunger element moveable inward and outward of said second cavity and secured to the other one of said members for joint movement with the other member;

b. a pressure conduit;

c. a valve interposed between said conduit and said first cavity of each suspension unit;

d. a control conduit communicating with said second cavity of each suspension unit;



e. means for sealing said conduits from each other in all operative positions of said members, said elements, and said valves; and

f. a plurality of valve actuating means respectively associated with said units and responsive to a predetermined difference between respective fluid pressures in said control conduit and in the associated first cavity for closing the valve interposed between said associated first cavity and said pressure conduit.

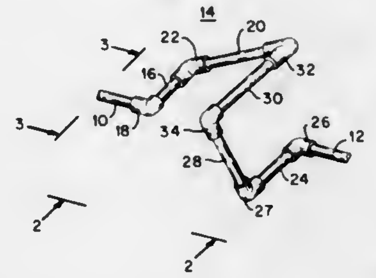
4,037,861
EXPANSION JOINT

Jonas Medney, 3504 Woodward St., Oceanside, N.Y. 11572

Filed Mar. 1, 1976, Ser. No. 662,595

Int. Cl.^{2} F16L *27/00, 43/00*

U.S. Cl. 285—168 **1 Claim**



1. An expansion assembly for coupling first and second lengths of pipe, said expansion joint comprising:

a. a rotatable right angle joint coupling a first pipe section at right angles to said first length of pipe;

b. a second pipe section coupled at right angles by a rotatable right angle joint to said first pipe section and rotatable about the longitudinal axis of the first pipe section;

c. a rotatable right angle joint coupling a third pipe section at right angles to the second length of pipe;

d. a rotatable right angle joint coupling a fourth pipe section at right angles to said third pipe section and rotatable around the longitudinal axis of said third pipe section; and

e. a fifth pipe section intercoupling said second pipe section and said fourth pipe section by a rotatable right angle joint at each end of the fifth pipe section, such that the second and fourth pipe sections are rotatable around the longitudinal axis of the fifth pipe section; and wherein said joints includes a circumferential groove on the internal surface therein and grooves spaced circumferentially on the outer surface thereof positioned adjacent said internal groove, and wherein the pipe section being joined to said joint includes a cooresponding groove on the outer surface thereof confronting the internal groove of the joint, and further including a key member insertable through the outer groove of the joint into the channel formed by the confronting grooves of the joint and pipe section.

4,037,862
FLEXIBLE DUCTING JOINTS

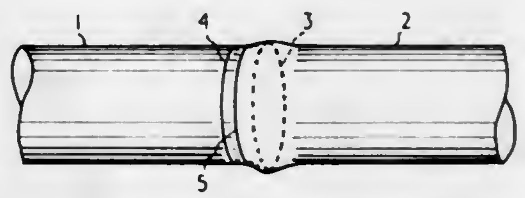
Peter Thorp, Hampton, and George William Bycroft, Doncaster, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Oct. 10, 1975, Ser. No. 621,373

Claims priority, application United Kingdom, Nov. 7, 1974, 48212/74

Int. Cl.^{2} F16L *31/00*

U.S. Cl. 285—260 **5 Claims**



1. A joint between two lengths of a flexible ducting in which an end of a first one of the said lengths is provided with a single ring secured to its extreme end, and the end of a second one of the said lengths is provided with a pair of parallel rings one of which is secured to an extreme end of the length and the other of which is spaced from said one ring by a predetermined distance, one of the rings secured to the extreme ends of the lengths being elastically deformable and having a diameter greater than the diameter of the ducting and the other rings having diameters equivalent to the diameter of the ducting, the elastically deformable ring being inserted into the adjacent length of ducting to a position where the said single ring lies between the said pair of parallel rings, the elastically deformable ring thereby extending material of the adjacent length of ducting in the area of the elastically deformable ring to a greater size than the remainder of the ducting.

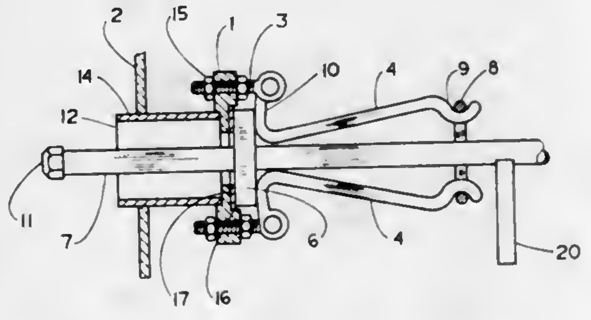
4,037,863
QUICK COUPLING DEVICE

Othello Kunzle, Gossau, Switzerland, assignor to Elex A.G., Zurich, Switzerland

Filed May 10, 1976, Ser. No. 684,754

Int. Cl.^{2} F16L *39/00*

U.S. Cl. 285—320 **6 Claims**



1. A quick coupling device for connecting a feed member to a housing member comprising: clamping means including a pair of opposed spring clips with a groove at the outer extremity thereof movably connected to one of said members and flange means fixedly connected to the other of said members to be engaged by said clamping means, said clamping means including a ring member engageable with said groove in nesting relation therein to hold said clamping means in clamped position against said flange means whereby said members are clamped against relative movement when said feed member and housing member are in assembled relationship, said other member including said flange means having stop means thereon, said ring member disposed between said stop means and said flange means, said stop means and said flange means being sized to retain said ring member therebetween.

4,037,864

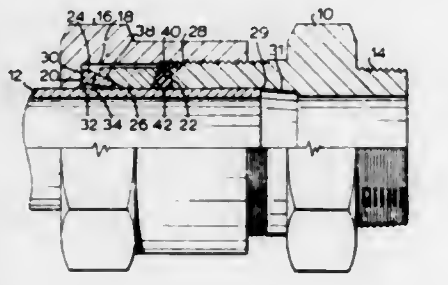
PIPE COUPLING

Leslie T. Anderson; Arthur D. Thompson, and Iamo Kairbara, all of London, Canada, assignors to Emco Ltd., London, Canada

Continuation-in-part of Ser. No. 567,648, April 14, 1975, abandoned. This application Sept. 13, 1976, Ser. No. 722,357

Int. Cl.^{2} F16L *17/02*

U.S. Cl. 285—342 **3 Claims**



1. A compression joint for connection with a compressible pipe having an outside wall comprising;

a. a sleeve formed with external threads and having an end wall and having a bore with a central axis extending therethrough to receive the end of said compressible pipe;

b. a nut having a threaded interior axially extending side wall and a radial end wall extending normal to said axis and having an opening to admit the end of said compressible pipe in use;

c. said side wall of said nut, said radial end wall of said nut and said end wall of said sleeve combining with the outside wall of a said compressible pipe when inserted in said bore in use to define a compression chamber;

d. a split compression ring of non-deformable cross-section in said chamber and having a radial back wall extending normal to said axis and abutting said radial end wall of said nut when said nut is threadedly tightened on said sleeve, the ring having an outer wall tapering inwardly toward the pipe away from the ring's radial wall, the ring having an inner pipe-wall compressing wall tapering inwardly toward the pipe away from the ring's radial wall, the ring having a front wall between said outer wall and said inner pipe-wall compressing wall, and the pipe compressing wall terminating at its inner extent in a sharp edge at said front wall to form an inwardly directed protuberance adapted to lead into the wall of a compressible pipe as the pipe-wall compressing wall compresses the wall of a pipe when the nut is threadedly tightened on the sleeve in use, said pipe-wall compressing wall having an axial extent that is longer than its radial extent;

e. a compressible gasket in said compression chamber disposed against said end wall of the sleeve and having at least one axially inclined wedge wall; and

f. a spacer tube in said chamber surrounding said pipe and disposed between said compression ring and said gasket, the tube having an inclined wall contacting and complimentary with the tapered outer wall of the split ring and the tube having a wedge wall contacting said gasket, whereby to cause said gasket and said split compression ring to move radially inwardly to grip said compressible pipe in use due to wedging action as the distance between said end wall of said sleeve and said end wall of said nut is reduced by threadedly tightening said nut on said sleeve.

4,037,865

DOOR FURNITURE MOUNTING

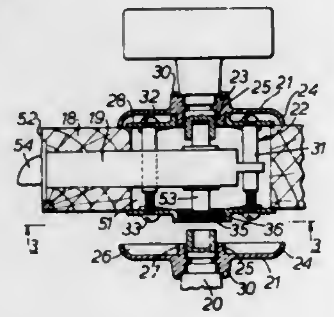
John Laurence Hook, Doncaster, Australia, assignor to Gainsborough Hardware Industries, Pty., Ltd., Australia

Filed Aug. 12, 1976, Ser. No. 713,720

Claims priority, application Australia, Aug. 14, 1975, 2798/75

Int. Cl.^{2} E05C *1/06*

U.S. Cl. 292—357 **12 Claims**



1. A door furniture mounting device comprising a pair of flat annular mounting discs and clamp means to draw the discs toward one another in parallel aligned array, wherein each disc is formed with a plurality of circumferentially spaced tongues which extend generally circumferentially of the disc but project to one side of the disc and which are spaced radially inwardly from the perimeter of the disc whereby in use of the mounting device the tongues may project laterally inwardly of said pair of mounting discs when the discs are held in said aligned array and can serve to locate the discs concentrically of an appropriately sized circular hole through the door by engaging the wall of the hole whereas in the event that the tongues cannot enter a hole in the door but engage the side faces of the door they can be deformed by their engagement with the door under the action of the clamp means to allow the discs to come flat against the door faces.

4,037,866

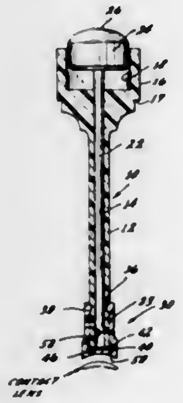
CONTACT LENS APPLICATOR

Edward E. Price, 421-B S. Marguerita, Alhambra, Calif. 91803

Filed July 26, 1976, Ser. No. 708,862

Int. Cl.^{2} A61F *9/00*

U.S. Cl. 294—1 CA **6 Claims**



1. An applicator instrument for use with a contact lens comprising a flexible member having a portion configurated to be in contact with the convex surface of a contact lens for holding it by surface tension, means carrying the said member adpated to be positioned wwhereby a contact lens can be applied to a position against an eyeball, and means for deforming the flexible member whereby to release the contact lens leaving it against the eyeball.

4,037,867

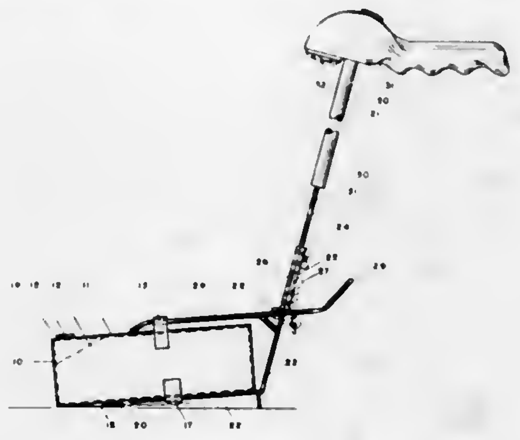
SANITARY WASTE COLLECTOR

Joseph D. Fano, 85-17 150th St., Jamaica, N.Y. 11435, and Fu Hwa, 82-78 167th St., Jamaica, N.Y. 11432

Filed Dec. 10, 1975, Ser. No. 639,389

Int. Cl.^{2} A01K *29/00*

U.S. Cl. 294—19 R **10 Claims**



1. In a sanitary waste collector comprising in combination a disposable container, a support for said container, and cooperating means on said container and said support for opening and closing said container and detachably connected said container with said support, the improvement comprising:

said disposable container including a bottom portion, a top closure portion swingably connected with said bottom portion;

said bottom portion including a base portion,

an upstanding rear portion fixed to said base portion, said swingable front portion including a front part complementary to said upstanding rear portion and a flap, said front part being swingably connected along an edge portion with said base portion for movement between a closed position and an open position positioned beneath said base portion;

said flap and said base portion including cooperating adhesive portions to hold said front part beneath said base portion in the open position of said container;

individual means connected with said base portion and said top closure portion detachably connecting said container with said support;

said support comprising a lower frame member and a vertical frame member fixed to each other and a moveable top cover frame member pivotally connected with said vertical frame member, said base portion being held to said lower frame member by said detachable connecting means, said top closure portions being held to said top cover frame by said detachable connecting means for movement between said open and said closed positions;

spring biasing means interconnecting said moveable top closure frame member and said vertical frame member urging said moveable frame member and said top closure portion into said closed position;

foot operated means connected with said moveable top closure frame member operable to overcome the force of said spring biasing means to move said moveable top closure frame and said top closure portions to said open position; and

said front part and said base portion in said open position providing a free edge adapted to contact a ground surface, and said front part after removal from said support structure being swingable about said free edge to form a front upstanding wall with said base portion, and said top closure portion being adapted to enclose said front upstanding wall when said top closure portion is closed onto said bottom portion.

4,037,868

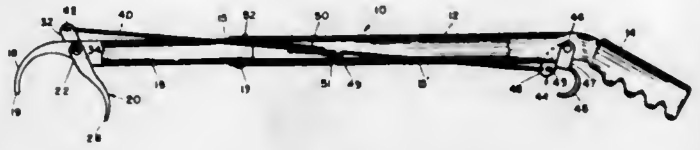
PICK UP APPARATUS

Robert M. Baker, R.F.D. No. 1, Morley, Mich. 49336

Filed Jan. 26, 1976, Ser. No. 652,297

Int. Cl.^{2} B25J *1/00*

U.S. Cl. 294—19 R **6 Claims**



1. A pickup apparatus comprising:

an elongated tubular shank flattened and curved at one end to define a curved first jaw member extending orthogonally to the axis of said shank and terminating at a linearly extending, continuous tip edge;

a second jaw member having a width substantially greater than said first jaw member, said second jaw member including an article engaging surface concavely curved about two, mutually perpendicular axes and terminating at a linearly extending, continuous tip edge;

means for mounting said second jaw member to said shank for relative motion with respect to said first jaw member with said concavely curved surface of said second jaw member facing said first jaw member such that the tip edges of said first and second jaw members align when closed; and

means coupled to said second jaw member for actuating said second jaw member for opening and closing said jaw members.

4,037,869

CLAMPING DEVICE FOR USE IN LIFTING SHIP'S HULL BLOCKS OR THE LIKE

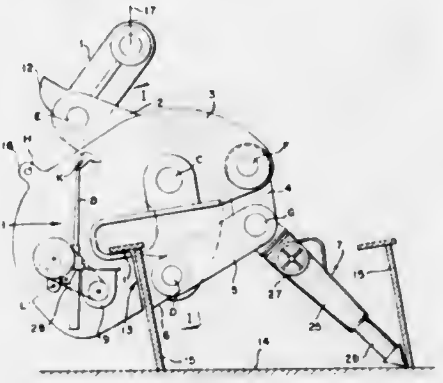
Yoshimi Terada, Himeji, and Akira Fujii, Aioi, both of Japan, assignors to Ishikawajima-Harima Jukogyo Kubushiki Kaisha, Ote, Japan

Filed Jan. 27, 1976, Ser. No. 652,739

Claims priority, application Japan, June 24, 1975, 50-87956[U]

Int. Cl.^{2} B66C *1/10*

U.S. Cl. 294—104 **1 Claim**



1. A clamping device for use in lifting ship's hull blocks of the type having spaced-apart longitudinal members comprising a frame, a clamping lever pivotally mounted on the frame, a movable jaw pivoted to one end of said lever, said frame being provided with a fixed jaw arranged in opposed relationship to said movable jaw, said lever being pivotally movable to clamp a longitudinal member between the movable and fixed jaws, a first link having one and pivoted to said one end of the lever, a second link having one end pivoted to said frame, a pivotal connection between the other ends of the first and second links, an elongated support having one end pivotally connected with said other ends of the first and second links at the last named pivotal connection, and means for extending said sup-

port to bring the other end thereof in firm engagement with an adjacent longitudinal member whereby the movable and fixed jaws firmly clamp the longitudinal member therebetween under the load force exerted to the clamping lever when a hull block is lifted and by the reaction force exerted to the movable jaw through said support.

4,037,870

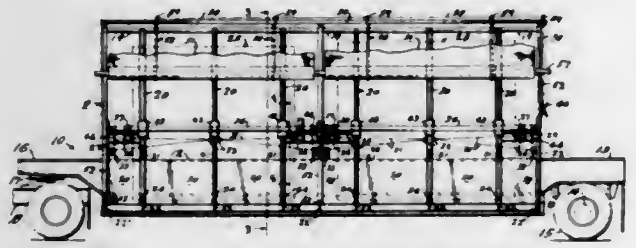
APPARATUS FOR TRANSPORTING GLASS PANES

John L. O'Neal, 24982 Thompson Road, Perrysburg, Ohio 43551

Filed Jan. 23, 1976, Ser. No. 651,848

Int. Cl.^{2} B60P *3/00*

U.S. Cl. 296—3 **3 Claims**



2. An improved structure for supporting stacks of one or more pieces of flat rigid sheet material on a semitrailer having a rigid main frame extending lengthwise of the semitrailer, said structure comprising a generally A-shaped frame having a plurality of pairs of opposed sloping side members extending downwardly to terminate below the level of said trailer main frame and a plurality of rigid internal webs joining said side members in each pair together at an intermediate position, said webs resting upon said main frame to support the entire structure on said semitrailer, means connecting said side members together at their top edges, said side members defining a sloped wall on each side of said structure, a plurality of load supporting girders, one girder extending outwardly from the lower end of each side member to provide a load supporting floor on each side of said structure, said structure supporting stacks of the flat material with edges of the material resting upon said floors and sides of the material resting against said sloped walls, and means for releasably clamping each stack for preventing movement of the material away from the sloped wall and for preventing edgewise movement of the material, said clamping means including a plurality of clamping bars, one clamping bar for each stack of the material and each clamping bar having a length greater than the maximum width of material stacks to be clamped by such bar, means for releasably attaching said clamping bars to said structure with at least a portion of a clamping bar spanning each stack of the material, said releasable attaching means including means for moving each clamping bar toward the adjacent sloped wall into contact with the outer surface of the stack of material spanned by such clamping bar, and releasable restraining means for preventing movement of said clamping bar away from such adjacent sloped wall.

4,037,871

MULTIPLE PURPOSE AMBULANCE COT WITH REMOVABLE STRETCHER TOP

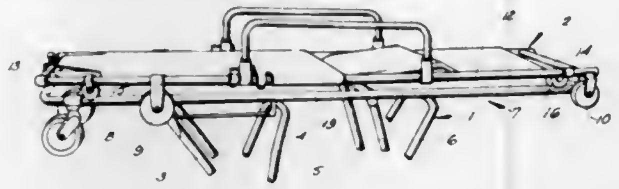
Elroy E. Bourgraf, Cincinnati, and Kenneth R. Self, Washington Court House, both of Ohio, assignors to Ferno-Washington, Inc., Wilmington, Ohio

Filed Apr. 23, 1976, Ser. No. 679,761

Int. Cl.^{2} A61G *1/02*

U.S. Cl. 296—20 **7 Claims**

1. A multiple purpose portable ambulance cot comprising a carrier base and a detachable stretcher top, said carrier base having a supporting frame including a pair of side rails, said stretcher top having a stretcher frame including a pair of side rails, sets of rollers mounted on one of said frames for engagement with the side rails of the other frame, and releasable locking means for detachably securing said stretcher top to the supporting frame of said carrier base with said rollers in engagement with said rails, whereby said stretcher top forms the patient receiving portion of the cot when attached to the carrier base, the stretcher top being removable for separate use.



4,037,872

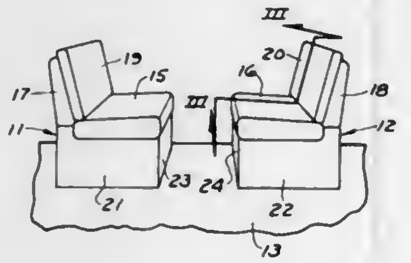
CONVERTIBLE SEAT-BED

Howard M. Quakenbush, Apple River, Ill., assignor to Flexsteel Industries, Inc., Dubuque, Iowa

Continuation-in-part of Ser. No. 602,203, Aug. 6, 1975, Pat. No. 3,913,152, which is a continuation-in-part of Ser. No. 402,860, Oct. 2, 1973. This application Dec. 22, 1975, Ser. No. 642,735

Int. Cl.^{2} A47C *17/14*

U.S. Cl. 297—65 **9 Claims**



1. In a convertible seat-bed assembly, a base structure, a seat support structive for a generally rectangular seat, a back support structure for a generally rectangular back, means providing a first pivotal connection between a rearward portion of said seat support structure and a lower portion of said back support structure for relative pivotal movement of said structure about a first horizontal axis, a first arm means, means providing a second pivotal connection between an upper end of said first arm means and said seat and back support structures on a second horizontal axis with there being not more than a short distance between said first and second horizontal axes, means providing a pivotal connection between a lower end portion of said first arm means and said base structure for pivotal movement of said first arm means about a third horizontal axis, second arm means, means providing a connection between an upper portion of said second arm means and said back support structure to provide relative pivotal movement about a fourth horizontal axis, means providing a pivotal connection between a lower portion of said second arm means and said base structure on a fifth horizontal axis, all of said axes being parallel to each other, said first arm means pivotal between a first position in which said first and second horizontal axes are spaced a substantial distance behind a vertical plane through said third axis and a second postion in which said first and second horizontal axes are spaced a substantial horizontal distance forwardly from a vertical plane through said third horizontal axis, said second arm means being pivotal between a first position in which said fourth axis is behind and above said first and second axes and a second position in which said fourth axis is being in and below said first and second axes, said assembly being in a seating condition when said first and second arm means are in said first and second positions thereof and being in a bed condition when said first and second arm means are in said second positions thereof, said seat support structure being moved forwardly and said back support structure being pivotal about said first axis downwardly and backwardly relative to said seat support structure during operation of said assembly from said seating condition to said bed condition.

4,037,873

CAR SEAT WITH SLACK ROLL-UP MECHANISM

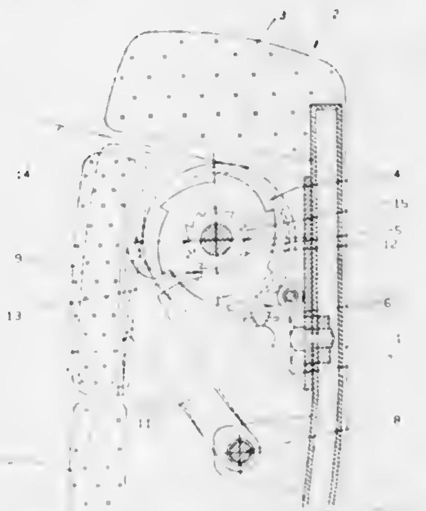
Per Olof Weman, Norderstedt, Germany, assignor to N.V. Klippan S.A., Haasrode, Belgium

Filed Mar. 9, 1976, Ser. No. 665,350

Claims priority, application Germany, Mar. 11, 1975, 2510726

Int. Cl.^{2} A62B *35/00*

U.S. Cl. 297—388 **5 Claims**



1. A car seat having a tension-free, roll-up belt collecting apparatus adapted to be actuated through a device arranged in the seat, so that further belt strap cannot be rolled up, said apparatus comprising a mechanically released locking means (**12, 13; 17, 18**) adapted to be actuated in response to the swiveling movement of the back rest (**2, 9**), said locking means being disposed in a back rest (**2, 9**) which is moving at least partly.

4,037,874

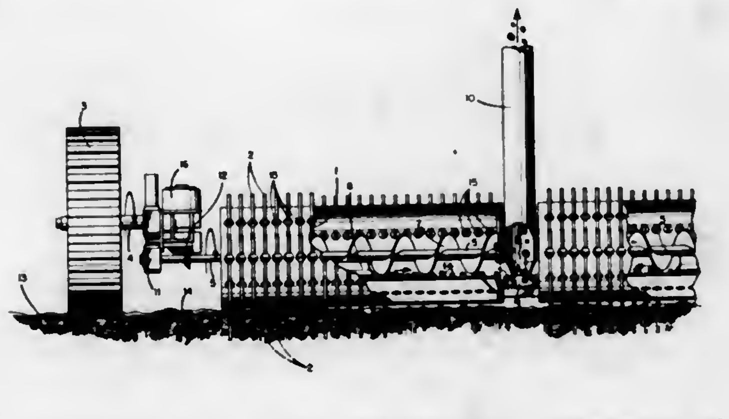
APPARATUS FOR UNDERWATER RETRIEVAL, SELECTION AND CONCENTRATION OF MATERIAL FOR OCEAN MINING

Jan-Olaf Willums, Sandvika, Norway, assignor to Nor-Am Resources Technology Incorporated, Boston, Mass.

Filed Oct. 28, 1975, Ser. No. 626,307

Int. Cl.^{2} E02F *7/00*

U.S. Cl. 299—8 **4 Claims**



1. Apparatus for retrieval, selection and concentration of materials for mining from the ocean bottom and the like having, in combination, longitudinally rotatable drum means provided with digger means and corresponding adjacent opening means for receiving materials loosened by the digger means during rotation of the drum means over the ocean bottom, said digger means comprising a plurality of substantially longitudinally extending rows of forks spaced transversely along the drum means and said opening means comprising a corresponding plurality of adjacent rows of openings, the spacing between said forks determining the minimum size of material to be mined and the size of said openings determining the maximum size of the material to be mined; material-retrieving trough means extending longitudinally along the interior of the drum means and communicating with said opening means; drive means disposed within the trough means and rotatable with said drum means to concentrate and move the materials received in the trough means longitudinally inwardly to a pick-up region; and hydraulic conduit means disposed at said pick-up region for transporting said concentrated material upward from the bottom.

4,037,875

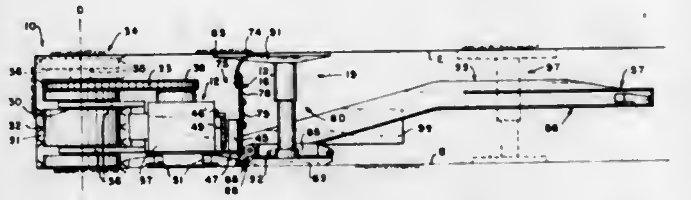
FULL FACE MINER

James Conley Justice, Beckley, W. Va., assignor to Coaltex, Inc., Beckley, W. Va.

Filed June 21, 1976, Ser. No. 698,123

Int. Cl.^{2} E21C *27/24*

U.S. Cl. 299—31 **16 Claims**



1. A full face miner for mining coal in a seam, comprising:

a. a pair of cutting heads each rotatable about a vertical axis, the vertical axes being parallel to each other and longitudinally spaced from each other along the face of coal to be mined;

b. means for rotating each of said cutting heads about its vertical axis for effecting cutting, each head rotating toward the other head;

c. means mounting said cutting heads for reciprocal longitudinal movement toward and away from each other, to effect shearing, along the coal face;

d. means for moving said cutting heads on said mounting means in reciprocal longitudinal movement to effect shearing;

e. means for supporting the roof of the cut seam and for anchoring said mounting means in stationary position within the seam during reciprocal movement of said cutting heads with respect to said mounting means;

f. a pair of paddle-type conveyors associated with said mounting means, one for each cutting head, for conveying coal cut from said coal face by said cutting heads away from said coal face; and

g. means for sumping said cutting heads.

4,037,876

TIGHTENING ARRANGEMENT FOR LONGWALL MINING MACHINE CABLE AND CONVEYOR

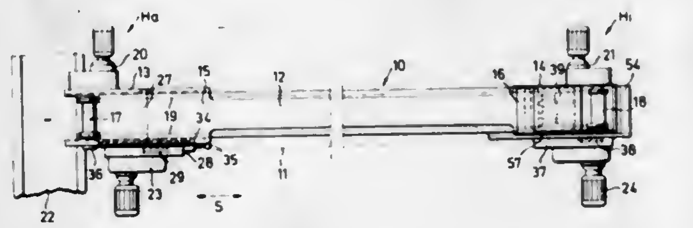
Werner Georg; Walter Heberling, both of Lunen, and Werner Langenberg, Werne, all of Germany, assignors to Gewerkschaft Eisenhutte Westfalia, Wethmar near Lunen, Germany

Filed Dec. 1, 1975, Ser. No. 636,419

Claims priority, application Germany, Dec. 6, 1974, 2457790

Int. Cl.^{2} E21C *29/16, 35/20*

U.S. Cl. 299—43 **22 Claims**



1. A mineral mining installation which comprises:

a scraper-chain conveyor with channel sections arranged end-to-end and a scraper-chain assembly movable along said channel sections;

drive stations at the ends of the conveyor for driving the scraper-chain assembly to effect transference of material along the channel sections of the conveyor and for driving a chain used to move a mining machine along the conveyor;

each drive station having a frame, drive means for driving the scraper-chain assembly and drive means for driving the chain;

each drive means for the chain comprising a drive motor and gearing unit supported by a housing in which is disposed a sprocket wheel drivably engaging with the chain and driven by said unit;

an intermediate connecting structure disposed between each frame and the adjacent endmost channel section of the conveyor and connected to the latter;

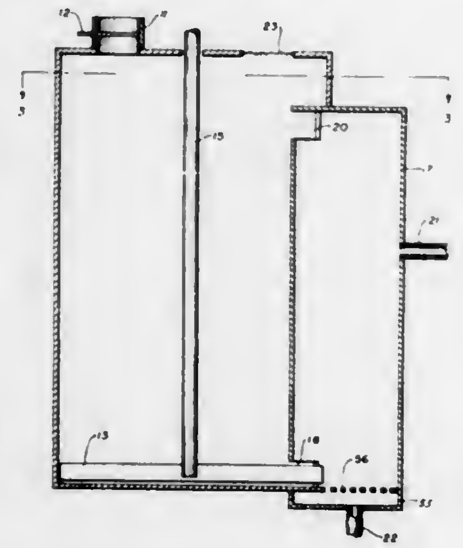
guide means to permit the housing at one of the drive stations to be slidably displaced in relation to the frame thereof and in relation to the associated connecting structure;

means for adjusting the tension in the drive chain;

said adjusting means comprising at least one hydraulic piston and cylinder unit operable to slide the housing at said one drive station along the frame and the connecting structure to thereby move the sprocket wheel engaging the chain and means at the other drive station for independently adjusting the tension in the scraper-chain assembly by displacing the frame and the scraper-chain assembly drive means of said other drive station.

4,037,877
DOWN-LOADING DEVICE

Allen Foster, c/o Clark Associates, Bldg. 10, S. Tenth & Wright Ave., Richmond, Calif. 94804
Division of Ser. No. 550,443, Feb. 18, 1975, Pat. No. 3,942,840. This application Feb. 23, 1976, Ser. No. 660,635
Int. Cl.² B65G *53/36*
U.S. Cl. 302—53 **1 Claim**



1. A device for producing air-fluffed down comprising a first vessel and a second vessel with,

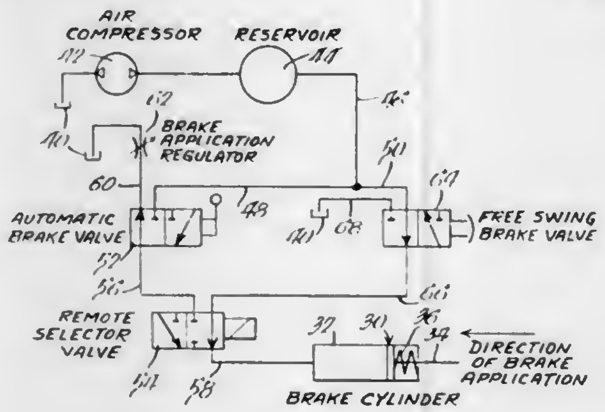
A. said first vessel having an upper opening to admit down, an upper filter to separate entrained down from air, an upper passageway into said second vessel, a lower passageway into said second vessel, and means to force down through said lower passageway and into said second vessel,

B. said second vessel having a lower air inlet, a lower opening connected to the lower passageway of said first vessel, an intermediate down-air outlet, an upper air outlet connected to the upper passageway in said first vessel, whereby said first vessel may contain a capacity of compact down and said second vessel may contain a predetermined amount of air-fluffed down,

C. said second vessel being cylindrical and of smaller diameter than said first vessel, and with said first and second vessels positioned so that the circular wall of said second vessel is partly within said first vessel.

4,037,878
VEHICLE WITH DUAL BRAKING SYSTEMS

Ronald L. Zyduck, Mosinee, Wis., assignor to J. I. Case Company, Racine, Wis.
Filed May 28, 1976, Ser. No. 690,888
Int. Cl.² B60T *7/12*
U.S. Cl. 303—13 **6 Claims**



1. In a vehicle having a turntable rotated about a fixed axis on a frame by drive means with normally actuated fluid released brake means between said frame and said turntable, a fluid circuit for supplying fluid under pressure to said brake means comprising a reservoir, a pressurized fluid source connected to said reservoir, first conduit means connecting said source to said brake means, said first conduit means having first valve means actuated in response to actuation of said drive means, said first valve means having a first position connecting said source to said brake means and a second position connecting said brake means to said reservoir, restrictor means between said first valve means and reservoir restricting fluid flow from said brake means to said reservoir, second conduit means connecting said source to said brake means, said second conduit means having second manually actuated valve means therein, and selector valve means in said first and second conduit means for selectively blocking flow in one conduit means while accommodating flow in the other conduit means so that said brake means may be released either manually or in response to actuation of said drive means.

4,037,879
EMPTY AND LOAD SENSING VALVE

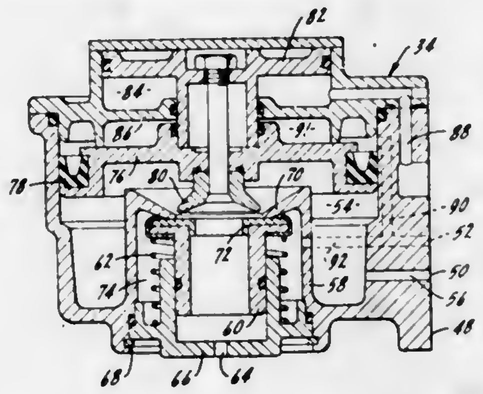
Charles Horowitz, Niles, Ill., assignor to Sloan Valve Company, Franklin Park, Ill.
Filed June 14, 1976, Ser. No. 696,059
Int. Cl.² B60T *8/18*
U.S. Cl. 303—23 R **11 Claims**

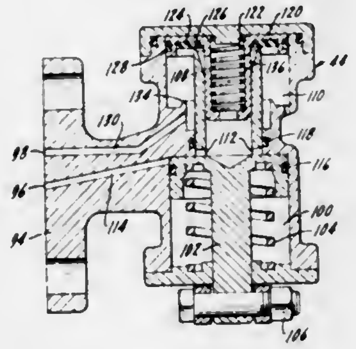
1. Empty-load valve means for a railroad air brake system including a load sensing valve for sensing the loaded condition of a railroad vehicle and a pressure control valve, two way air conduit means connecting said pressure control valve and load sensing valve,

said pressure control valve including a housing having an inlet connected to the vehicle air supply, an outlet connected to the brake applying means and an exhaust port, a first chamber in said housing, a piston movable in said first chamber, said inlet and outlet being connected to said first chamber on opposite sides of said piston, means carried by said piston for controlling communication between said inlet and outlet,

a second chamber in said housing connected to said load sensing valve through said two-way air conduit means, a portion of said piston being positioned to receive an air pressure created force from said second chamber whereby the position of said means for controlling communciation between said inlet and outlet is controlled by the pressure in said second chamber derived from said load sensing valve,

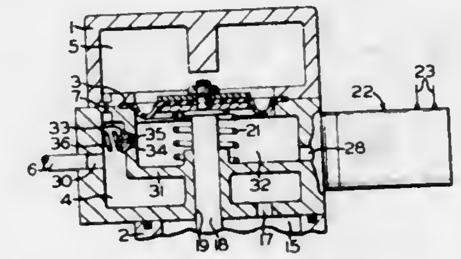
said load sensing valve including a housing having an inlet and an outlet connected to said two-way air conduit means, separate independently movable telescopically mounted pistons in said housing, one of said independently movable pistons adapted to be placed in load sensing relation with a portion of a railroad vehicle, spaced coaxial springs urging said pistons in opposte directions, said pistons cooperating to control communication between said housing inlet and outlet.





4,037,880
EMERGENCY BRAKE VALVE DEVICE FOR PROPOGATING AN EMERGENCY BRAKE APPLICATION

Robert J. Bridigum, Plum Borough, Pa., assignor to Westinghouse Air Brake Company, Wilmerding, Pa.
Filed June 28, 1976, Ser. No. 700,399
Int. Cl.² B60T *17/04*
U.S. Cl. 303—82 **5 Claims**



1. An emergency vent valve device for a railway vehicle in a train having a brake pipe normally charged with fluid at a certain pressure and effective upon reduction of fluid pressure therein for initiating a brake application on the train, said emergency brake valve device comprising:

a. a casing having formed therein a first chamber connected to brake pipe pressure via a first choke, a second chamber connected to said brake pipe pressure via a second choke, and a third chamber open directly to the brake pipe and communicating with said first and second chambers via said first and second chokes, respectively, said brake pipe being communicable to atmosphere via said third chamber;

b. vent valve means operably interposed between said third chamber and atmosphere, said vent valve means being effective in a normally closed position for cutting off said third chamber and the brake pipe from atmosphere and being operable to an open position for opening said third chamber and, therefore, the brake pipe to atmosphere;

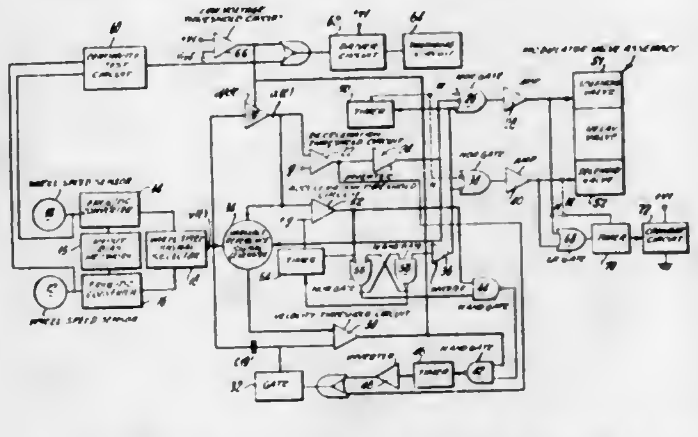
c. piston means operably disposed between and separating said first and second chambers and subjectable on opposite sides thereof to fluid pressure prevailing in said first and second chambers, respectively;

d. said piston means normally occupying a retracted position out of contact with said vent valve means in which said vent valve means assumes said closed position, and being operable, in response to a pressure differential established thereacross by a pressure reduction in said second chamber or said third chamber at a rate in excess of said preselected flow rate, to an extended position for operating said vent valve means to said open position; and

e. a one-way check valve interposed between said second chamber and said third chamber, the direction of flow being from said second chamber to said third chamber upon reduction of pressure in said third chamber to a degree less than that prevailing in said second chamber.

4,037,881
WHEEL SLIP CONTROL SYSTEM FOR AUTOMOTIVE VEHICLES AND THE LIKE

Joseph E. Fleagle, Overland, Mo., assignor to Wagner Electric Corporation, Parsippany, N.J.
Continuation of Ser. No. 546,270, Feb. 3, 1975, Pat. No. 3,951,467, which is a division of Ser. No. 607,701, Aug. 25, 1975, Pat. No. 3,988,599. This application Apr. 15, 1976, Ser. No. 677,079
The portion of the term of this patent subsequent to Apr. 20, 1993, has been disclaimed.
Int. Cl.² B60T *8/02, 8/08*
U.S. Cl. 303—106 **5 Claims**



1. A wheel slip control system for a vehicle having at least one wheel with associated braking means, comprising:

a. first means operative to generate a variable-width deceleration pulse when the rate of change of rotational velocity of a selected wheel exceeds a deceleration threshold, said first means being further operative to generate a variable-width slip pulse when the change in rotational velocity of the selected wheel, measured from the value of said rotational velocity at the time said deceleration pulse is initiated, exceeds a reference increment of wheel speed which is variable in relation to both the velocity and the deceleration of the selected wheel during deceleration of the selected wheel and in relation to acceleration during acceleration of the selected wheel;

b. second means operative to receive said deceleration pulse and said slip pulse, and further operative at least in response to said slip pulse to alter the braking force applied to at least said selected wheel; and

c. said variable reference increment of wheel speed comprising a fixed increment of wheel speed plus a variable increment of wheel speed.

4,037,882

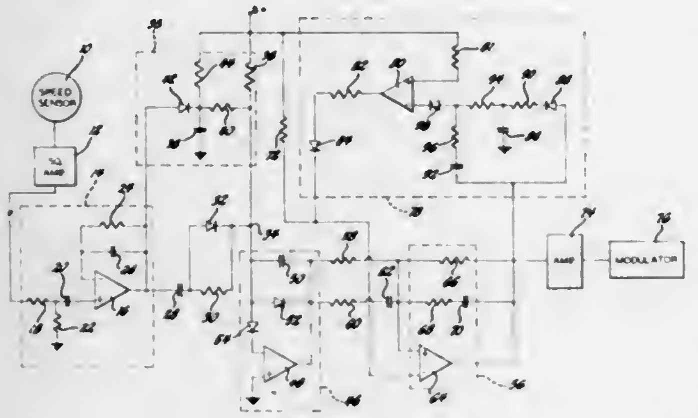
ANTI-LOCK BRAKE CONTROL CIRCUIT

David W. Taylor, Davison, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 20, 1975, Ser. No. 633,674

Int. Cl.² B60T *8/10*

U.S. Cl. 303—107 **3 Claims**



1. An anti-lock system controller for a vehicle with braked wheels, comprising:

a wheel speed signal generator effective to supply a voltage signal representing wheel speed;

a summing junction;

a differentiator coupled between the wheel speed signal generator and the summing junction and effective to differentiate the voltage signal and supply an acceleration signal to the summing junction representing wheel acceleration and deceleration;

a deceleration reference generator effective to supply a deceleration reference signal to the summing junction which represents a reference deceleration, the deceleration reference generator including a direct voltage source, an impedance coupled between the direct voltage source and the summing junction to supply a constant signal representing a constant portion of the deceleration reference signal, and a first order lag circuit coupled between the wheel speed signal generator and the summing junction and effective to supply a variable portion of the deceleration reference signal, the first order lag circuit comprising a storage capacitor, a unidirectional conducting element coupled between the storage capacitor and the wheel speed signal generator and effective to charge the capacitor to a voltage equal to the voltage signal when the voltage charge on the capacitor is less than the voltage signal, and an impedance coupled between the capacitor and the summing junction and effective to discharge the capacitor into the summing junction at a controlled rate, the current through the impedance comprising the variable portion of the deceleration reference signal; and

means effective in response to the acceleration signal and the deceleration reference signal by cyclically relieve and apply brake pressure when the acceleration signal and the deceleation reference signal attain predetermined relationships, whereby the variable portion of the deceleration reference signal provides adaptive control for road surfaces of varying coefficients of friction.

4,037,883

ANTI-LOCKING BRAKE SYSTEM

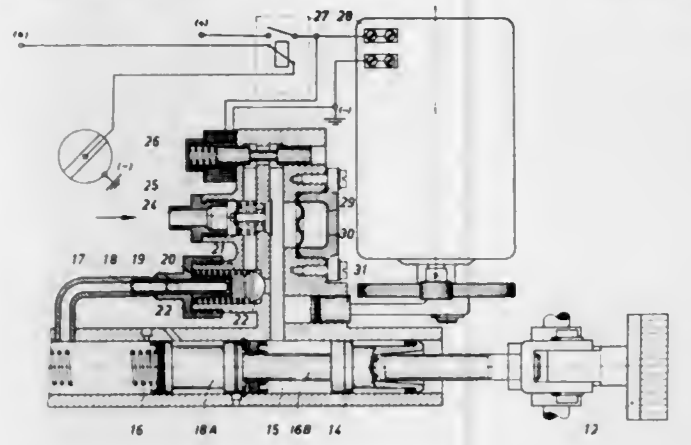
Werner Karl Heinz Fuchs, Sedlmayrstr. 14, 8 Munich 19, Germany

Continuation-in-part of Ser. No. 405,412, Oct. 11, 1973, abandoned, which is a continuation of Ser. No. 185,130, Sept. 30, 1971, abandoned. This application Sept. 17, 1975, Ser. No. 614,198

Claims priority, application Germany, Oct. 5, 1970, 2048802

Int. Cl.² B60T *8/06*

U.S. Cl. 303—116 **10 Claims**



1. An antilocking brake system for a vehicle with wheels having a sensing means in connection with at least one of the brakable vehicle wheels for monitoring wheel rotary deceleration, said brake system comprising: wheel brake cylinders, a master cylinder communicating with the wheel brake cylinders including a master cylinder piston therein, actuating means connected to the master cylinder piston for the actuation thereof, a chamber interposed between said master cylinder and said actuating means including an opposite piston in communication with the actuating means for reducing the braking force in the master cylinder when pressure within said chamber acts upon the opposite piston, pulsating means in communication with said chamber for producing pressure pulsations within the chamber, a solenoid valve connected to said sensing means for actuating the pulsating means, and further comprising:

a pressure regulating valve in communication with said chamber, an outlet and the master cylinder including a cylinder in communication with the master cylinder, a slidable regulating piston reciprocating in the cylinder, a check valve between the chamber and the outlet in order to pass fluid from said chamber to said outlet of the regulating valve, and a spring means mounted between said check valve and the regulating piston.

4,037,884

TOGGLE OR THE LIKE

Peter Bachinger, Bronnamberg, Germany, assignor to International Standard Electric Corporation, New York, N.Y.

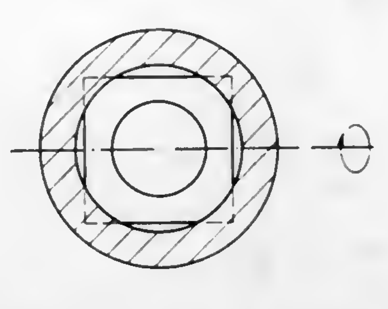
Filed Oct. 30, 1975, Ser. No. 627,199

Claims priority, application Germany, Oct. 30, 1974, 2451658

Int. Cl.² F16C *7/00*

U.S. Cl. 308—2 R **3 Claims**

1. Apparatus including a toggle or the like, said apparatus comprising: a hollow cylinder; an approximately spherical body supported inside said cylinder in a manner to rotate about an axis normal to that of said cylinder, the internal surface of said cylinder having at least one annular groove, and said body having an annular disc fitting in said groove; and a stub shaft fixed to said body and thereby movable therewith.



4,037,885

WITHDRAWAL GUIDE FOR DRAWERS OR THE LIKE

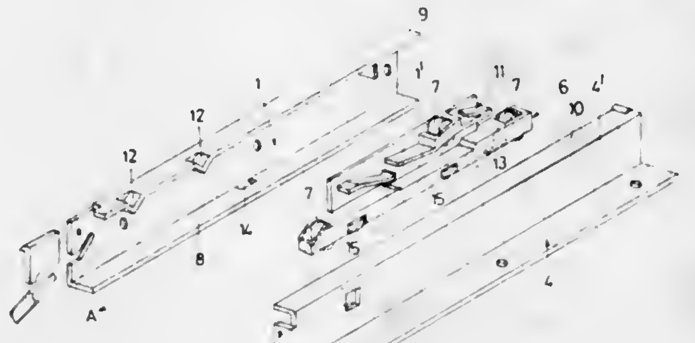
Erich Rock, Kuferstrasse 1085, A-6973 Hochst, and Bernhard Mages, Harte 10, A-6850 Dornbirn, both of Austria

Filed Feb. 23, 1976, Ser. No. 660,317

Claims priority, application Austria, Feb. 25, 1975, 1447/75; May 30, 1975, 4105/75; July 24, 1975, 5750/75

Int. Cl.² F16C *29/04*

U.S. Cl. 308—3.8 **10 Claims**



1. A withdrawal guide for a drawer and the like comprising: fixed support base means; one support rail on said fixed base means for each side of the drawer, one guide rail on the drawer, rollers for transmitting vertical forces occurring between said guide rail and said support rail, a roller carrier for supporting said rollers and comprising a mobile unit, at least one compensating roller in the mobile unit, said compensating roller having an axis of rotation normal to the axis of rotation of said rollers, a vertical track on said support rail said compensating roller running on said vertical track of the support rail and said guide rail respectively, said compensating roller being held only on its peripheral area without an axle being free to move in radial direction to a predetermined degree, peg means to secure the compensating roller to the roller carrier when the drawer guide rail is pulled out of the support rail, said peg means extending only ina lateral recess in said compensating roller, said compensating roller being snapable in and out of its position in the roller carrier.

4,037,886

BEARINGS

Karl Boden, Juelich, and Werner Geweke, Reutlingen, both of Germany, assignors to Padana AG, Zug, Switzerland

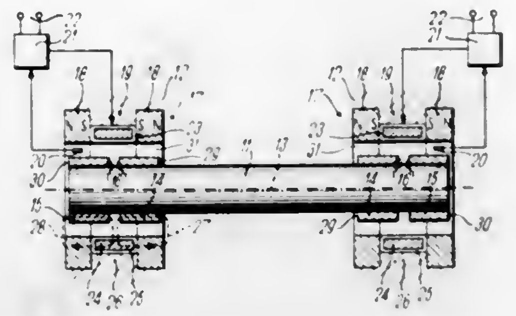
Filed Apr. 29, 1975, Ser. No. 572,668

Claims priority, application Germany, Apr. 30, 1974, 2420814

Int. Cl.² F16C *39/00*

U.S. Cl. 308—10 **21 Claims**

1. In a magnetic bearing for supporting two members against movement in a direction; two ferromagnetic parts on one of said members, said ferromagnetic parts respectively defining two mutually facing shoulders, said shoulders being spaced by a non-ferromagnetic gap in said direction, and magnet means arranged on the other of said members, said magnet means and said ferromagnetic parts defining two flux paths which respectively pass through said two ferromagnetic parts at said shoulders in opposite directions to exert a stabilizing effect upon said bearing in said direction, which direction is substantially parallel to said opposite flux path directions in said ferromagnetic parts, said magnetic field being substantially constant and exerting a destabilizing effect on said bearing in a direction transverse to said direction.



4,037,887

UNIVERSAL-JOINT ASSEMBLIES AND SELF-ALIGNING THRUST BEARINGS, ESPECIALLY FOR THE SHAFTS OF ROTATING MACHINES

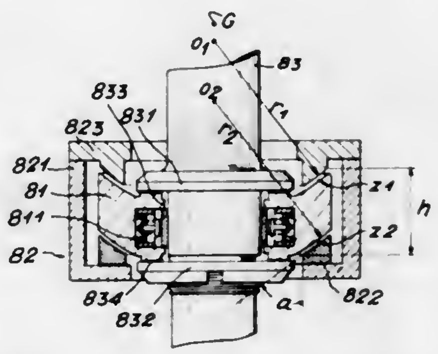
Roger Louis Elysee Germain, Maisons-Lafitte, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation, Paris, France

Filed May 10, 1976, Ser. No. 685,128

Claims priority, application France, May 14, 1975, 75.15575

Int. Cl.² F16C *23/00*

U.S. Cl. 308—72 **5 Claims**



1. A guiding unit for preventing axial translational motion of a rotor shaft of a rotating machine with respect to a stator by permitting limited angular displacement of said shaft in any axial plane comprising a housing, a bearing support articulated within said housing, said housing being within said stator, two partial spherical sliding zones on said support having different centers, a ring, a complementary surface on said ring cooperating with one of said zones and said ring being free in a transverse direction with respect to the axis of rotation of said rotor within said housing.

4,037,888

CONSTRUCTION OF SEPARATING SURFACES OF A SPLIT BEARING

Milorad Mirjanić, Fellbach, Germany, assignor to Daimler-Benz Aktiengesellschaft, Germany

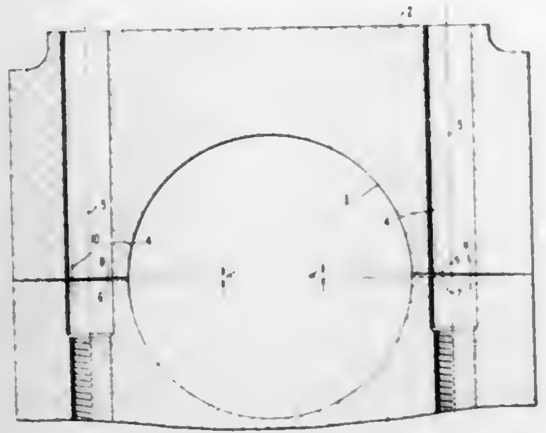
Filed Jan. 8, 1975, Ser. No. 539,427

Int. Cl.² F16C *19/04*

U.S. Cl. 308—74 **17 Claims**

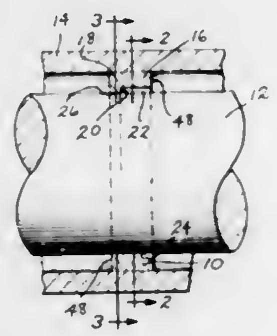
1. A construction of the separating surfaces of a split bearing provided with bores for receiving tightening bolts and with center longitudinal axes of the bores of the bolts intersecting the separating surfaces laterally of the center of the separating

surfaces, as viewed in cross section, characterized in that two adjacent separating surfaces of different bearing parts are inclined to one another with non-tightened bolts in such a manner that they subtend, as viewed in cross-section, an angle



of the magnitude of less than 1°, and in that said angle opens in the direction toward that side of the center of the separating surfaces, on which are located the center longitudinal axes of the bores of the bolts.

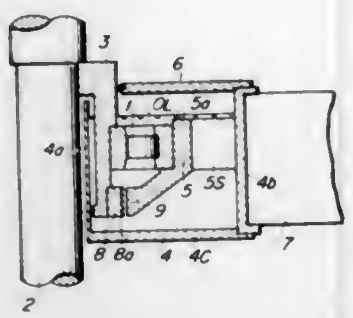
4,037,889
JOURNAL BEARING
James A. Piatt, 1337 Woodfield Ave., South Bend, Ind. 46615
Filed June 14, 1976, Ser. No. 696,038
Int. Cl.² F16C *1/24*
U.S. Cl. 308—121 **9 Claims**



1. A bearing comprising a support member having a bore therethrough to receive a rotatable shaft, said bore having a side wall formed by a shaft load carrying part and a shaft control part offset radially and longitudinally from said load carrying part by a shoulder, said load carrying part including segment means for bearing the load of said shaft, said control part including segment means separated from said load carrying part by said shoulder and located generally oppositely of the segment means of the load carrying part for restricting lateral movement of said shaft within said bore.

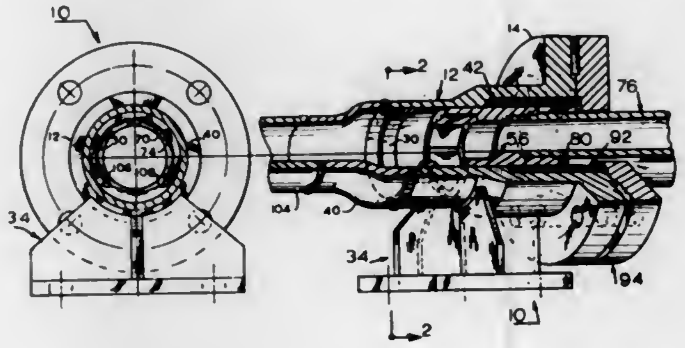
4,037,890
VERTICAL TYPE ANTIFRICTION BEARING DEVICE
Seiichi Kurita, Takahagi; Toru Nakayama, Hitachi; Kinpei Okano, Hitachi, and Seishi Watahiki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Japan
Filed Apr. 15, 1975, Ser. No. 568,198
Claims priority, application Japan, Apr. 26, 1974, 49-46539
Int. Cl.² B61F *17/22;* F16C *1/24*
U.S. Cl. 308—187 **16 Claims**

1. A vertical type antifrication bearing device comprising:
an antifriction bearing positioned between a vertical rotary member a stationary member;
an oil tub which houses said antifriction bearing and having lubricating oil filled therein;
pumping means for maintaining the level of said lubricating oil below said antifriction bearing during operation;
an oil feeding passage for feeding a desired amount of lubricating oil to said antifriction bearing from above, when the level of the lubricating oil is lowered below said antifriction bearing; and



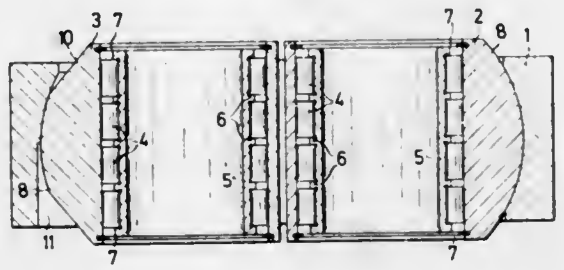
an oil return passage for returning the level of the lubricating oil to its initial position which permits the immersion of said antifriction bearing in said lubricating oil, during the stoppage of operation.

4,037,891
GLAND SEAL COMPRESSION
Tom Walters, 2102 Mason Blvd., Point Pleasant, W. Va. 25550
Filed July 1, 1976, Ser. No. 701,545
Int. Cl.² F16C *33/72*
U.S. Cl. 308—187.1 **22 Claims**



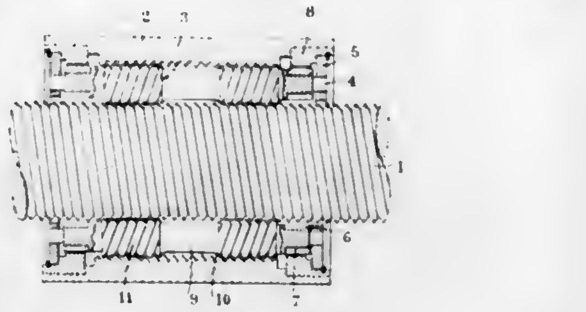
1. A calcuably controlled opposed conical wedging seal compression and anchorable gland seal complex for conveying pressurized liquid and gases consisting of substantially overlapping tubular members with an inner male fourth member axially slidable along and swivelable within other gland members about an axis common to other members in a sealed manner where an outer female first member has an upstream attachment end to subsequently retain the various members compressed, an inner axis based conical directional seal positioning bevelled section leading outward from an inner downstream male fourth member receiving chamber to an inner upstream second, third and fifth member receiving chamber where the second member is an annular seal ring element with opposed axis based conical bevels, complimentary with said directional seal positioning bevelled section of said female first member, leading inward in a manner to form opposed side shoulders at its inner cylindrical male fourth member receiving surface providing said seal element with a cross sectional shape of a substantially shouldered conical frustrum symmetric about a radial plane, where the third member is an annular travel gland which has a leading downstream axis based conical directional seal positioning bevelled end where said bevel is complimentary to the bevel on the seal element second member and leading from said third member's outer cylindrical surface inwardly upstream to its inner cylindical fourth member receiving chamber whereupon when the male fourth member after being received within the female first member's downstream receiving chamber, receives the seal element second member, receives the travel gland third member, followed by a fifth member which is a guidedly positioned compression spring where the second, third and fifth members are slidably received within the upstream receiving chamber of the female first member and compressingly retained therein by a retaining sixth member being firmly secured to the female first member's upstream attachment end in a manner where the configurations of the first and sixth members have lineal movement limiting abutments to contact abutment shoulders on the male fourth member to maintain said fourth member's seal receiving surface in contact with the seal element second member during subsequent fourth member lineal movements wherein said compressed retainment of the seal element second member where the first and thrid member's conical directional seal positioning bevels abut complimentary bevelled surfaces on the seal element second member compressingly deforming said seal element in a manner to effectively be sealed within said conical directional bevelled sections of the first and third members and for said seal element to be effectively sealed around the male fourth member permitting said fourth member to have lineal, rotary and torsional movements while effectively sealed to prevent the escapement of pressurized materials being conveyed within the gland complex where the continual seal confinement and deformation is accomplished by the constant rate compressive reacting force of the selected compressed spring fifth member applied in a non-crippling that assures a longer life expectancy and reliability of the seal element material and other gland members.

4,037,892
RADIAL ROLLER BEARING FOR TWO PARALLEL SHAFTS
Rudolf Jahn, and Arpad Toth, both of Herzogenaurach, Germany, assignors to Industriewerk Schaeffler OHG, Herzogenaurach, Germany
Filed Nov. 28, 1975, Ser. No. 635,794
Claims priority, application Germany, Jan. 24, 1975, 2502860
Int. Cl.² F16C *23/06, 35/04*
U.S. Cl. 308—194 **3 Claims**



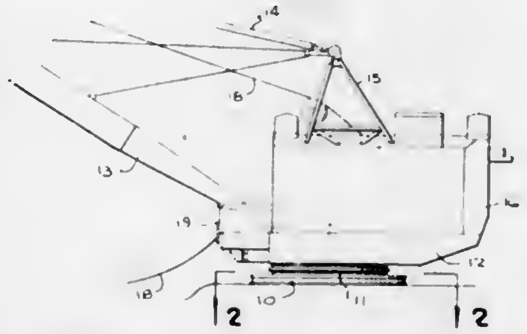
1. A radial bearing for two parallel shafts whose direction of radial load is inclined 60° to 75° to the outside toward a line intersecting the two shaft axes comprising a pair of races with a spherical outer contour adjustably mounted in a common bearing housing, the said races being flattened at their facing points with a gap between the races whereby the axes of the races are so close together that their distance is less than the diameter of a race, the recess of the housing receiving the races having an inside width of at least the axial length of the races, one of said races being provided at the side opposite the flattened portion with two plane or slightly curved surfaces inclined to each other and running from the end faces of the race and protruding into the area of its crowned surface and the said housing being a unitary element provided in the area of one recess at one end face with an inlet groove corresponding to the cross-sectional profile of said race.

4,037,893
ROLLING-CONTACT BEARINGS WITH THREADED OR GROOVED PLANET ROLLERS
Herve Perrin, Chambery, France, assignor to La Technique Integrale, Chambery, France
Filed Jan. 19, 1976, Ser. No. 650,141
Claims priority, application France, Jan. 21, 1975, 75.01813
Int. Cl.² F16C *13/00*
U.S. Cl. 308—205 **2 Claims**



1. A rolling-contact bearing comprising
an inner central screw having an axis and an outer thread extending along its entire length, said thread formed with a predetermined pitch with respect to said axis;
an outer annular nut having internal threads extending along its inner annular surface;
a plurality of axially extending rollers spaced about the periphery of said inner screw and each providing a threaded interconnection between said inner screw and said outer nut;
each said roller having end sections threaded to mesh with said inner screw with the threads having a predetermined root diameter and the threads in each section formed with the same pitch that is oppositely directed with respect to said predetermined pitch;
said end sections of each said roller being connected together by a central unthreaded portion, the diameter of each said central portion being substantially equal to said root diameter and extending axially a distance equal to approximately the central third of each said roller; and
each said central portion connected to its respective said end sections by rounded fillets.

4,037,894
FRAME CONSTRUCTION FOR POWER SHOVELS AND THE LIKE
Edwin W. Sankey, Marion, Ohio, assignor to Marion Power Shovel Company, Inc., Marion, Ohio
Filed Feb. 26, 1976, Ser. No. 661,818
Int. Cl.² F16C *19/04*
U.S. Cl. 308—227 **10 Claims**



1. In a machine having an upper moveable frame, a support frame for supporting said upper moveable frame comprising a rigid grid structure, an upper plate disposed on and rigidly secured to said grid structure and a pad for supporting said upper moveable frame, said support pad being disposed unattached on said grid structure and rigidly attached to said upper plate.

4,037,895

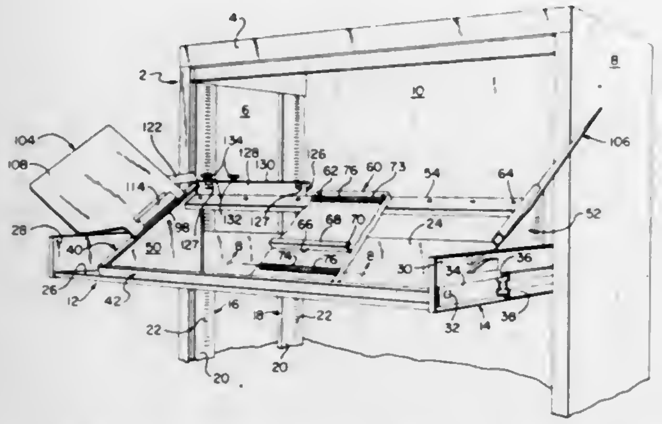
DOCUMENT STORAGE SYSTEM

Norman Hedstrom, Worcester; David Wright, and Jerome O'-Toole, both of Shrewsbury, all of Mass., assignors to Wright Line Inc., Worcester, Mass.

Filed Mar. 23, 1976, Ser. No. 669,672

Int. Cl.^{2} A47B *41/06, 63/00*

U.S. Cl. 312—233 8 Claims



1. A filing cabinet containing at least one pull-out storage unit having opposite sides, means on said storage unit for supporting a plurality of books each including a binding portion, said books being supported in a reading position on said storage unit with said binding portions substantially aligned and facing downward, means coupled to said filing cabinet for selectively moving said storage unit between a retracted location within said cabinet and an accessible location outside thereof, said accessible location permitting said books to be opened and read in situ, said books retaining said reading position in both of said locations, and book-closing means interactive with said filing cabinet for causing any portions of said books projecting beyond either one of said opposite sides to be displaced inwardly of said storage unit when said storage unit is moved from said accessible location to said retracted location in said cabinet.

4,037,896

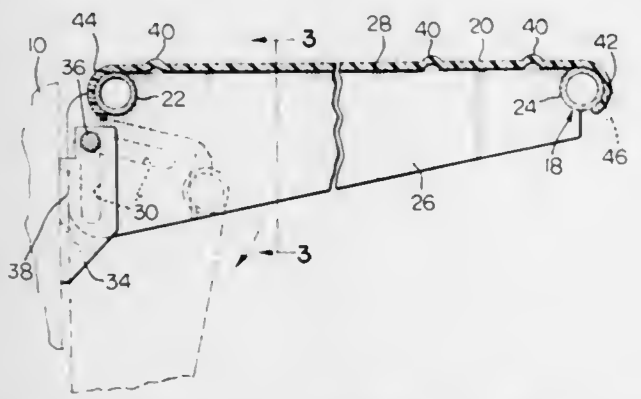
TRAY SLIDE AND SUPPORT THEREFOR

Robert J. Kennedy, Jr., and Kendall S. Smith, II, both of West Lafayette, Ind., assignors to Lincoln Manufacturing Company, Inc., Fort Wayne, Ind.

Filed Oct. 30, 1975, Ser. No. 627,145

Int. Cl.^{2} A47B *96/18, 5/00*

U.S. Cl. 312—281 4 Claims



1. A tray slide device, especially for a serving counter, comprising, a frame having front and back elongate rail members, and an elongate resilient tray support member having a tray support surface and dependent front and back edge portions adapted resiliently to engage said rail members of the frame for releasably holding said support member on the frame, said rail members of said frame being in the form of a pair of parallel tubular elements spaced in a substantially horizontal plane, and each edge portion of said support member is curved in cross section to embrace a portion of the periphery of the respective rail member, longitudinally spaced bracket means for perpendicularly and horizontally spacing said tubular elements and fixed thereto.

4,037,897

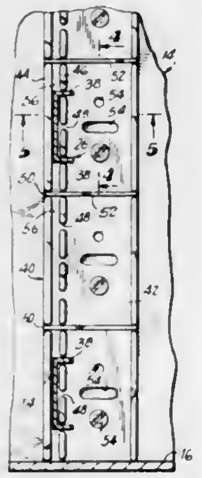
VERTICALLY INDEXED DRAWER GUIDE SUPPORT STRIP

Edward P. Siggia, Armonk, N.Y., assignor to Edward P. Siggia Inc., Mamaroneck, N.Y.

Filed Feb. 10, 1975, Ser. No. 548,234

Int. Cl.^{2} A47B *88/04;* **A47F** *5/00*

U.S. Cl. 312—343 14 Claims



1. In a drawer support construction in which a U-shaped cross-section drawer guide is adapted to provide for sliding movement of a drawer in a cabinet, the drawer guide being at least partially supported by a support member fastened to the rear wall of such cabinet, the improvement comprising

a improved support member in the form of a support strip including a web; and

a pair of spaced parallel vertical flanges perpendicular to said web, said flanges defining a channel for receiving the end of the central body portion of the U-shaped cross-section drawer guide, one of said flanges including a series of horizontally extending slots spaced along the length of said one flange for receiving and accommodating the two legs of the U-shape at the end of said drawer guide for support of said end of said drawer guide.

4,037,898

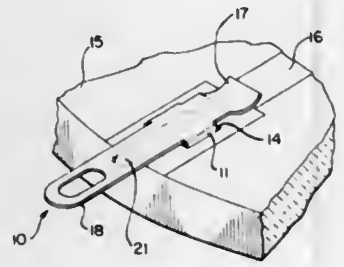
SNAP-IN ELECTRICAL TERMINALS

Edward L. Guyette, Costa Mesa, Calif., assignor to Beckman Instruments, Inc., Fullerton, Calif.

Filed Aug. 28, 1972, Ser. No. 283,985

Int. Cl.^{2} H05K *1/02*

U.S. Cl. 339—17 C 5 Claims



1. A terminal for providing electrical connection between an external conductor and a conductive film deposited on a non-conductive substrate, the terminal being fabricated from a single, flat sheet of resilient, conductive material and comprising:

a center portion having a forward extension to which the external conductor may be attached and a rearward extension curved downwardly into electrical contact with the film on the substrate; said center portion being formed with a recess having an underside which is in contact with the film when the terminal is installed on a substrate; and

a plurality of legs extending from the center portion and bent downward substantial 90° from the center portion, each leg having at its terminus a tab, with the legs inserted into a corresponding slot in the substrate, so that the tabs guide the legs into the slot and then snap out and lock in place as they emerge from the slot at the bottom of the substrate, thereby securing the terminal to the substrate, wherein said plurality of legs comprises two legs extending from opposite sides of the center portion, one of the legs having a recess extending from its lower edge along its longitudinal axis.

4,037,899

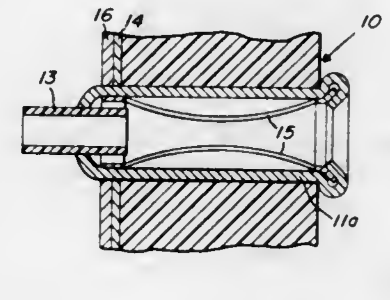
MINIATURE SOCKET ASSEMBLY

Kenneth E. Crowell, Fort Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 563,746, March 31, 1975, abandoned. This application Dec. 29, 1975, Ser. No. 644,666

Int. Cl.^{2} H05K *1/10*

U.S. Cl. 339—17 C 5 Claims



1. An improved socket assembly for receiving component guide pins, including in combination:

a base formed of insulating material and having plated conductor means on at least one side thereof;

a socket means mounted on said base and extending therethrough a predetermined distance, said socket means including a throughbore along the longitudinal axis with openings at respective ends thereof,

said base and socket means mounted thereon being adapted for flow wave soldering treatment to permanently interconnect said socket means to said plated conductor means;

resilient conductive means positioned in the socket means for applying additional pressure on an inserted guide pin, and

a resilient plastic tubing insert extending through the opening of said socket means from the side of said base having said plated conductor means thereon and into a portion of the interior of the resilient conductive means, said insert being positioned in the socket means during the manufacture of said socket means, maintained therein during the soldering operation and removable by the insertion of said guide pins.

4,037,900

BASEBOARD FOR ELECTRICAL INSTALLATIONS

Fritz Schmidger, Loomatt Atrium 4, Stallikon,Zurich, Switzerland

Filed Apr. 4, 1974, Ser. No. 457,696

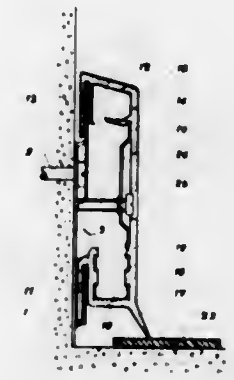
Claims priority, application Switzerland, Apr. 13, 1973, 5316/73

Int. Cl.^{2} H01R *7/28*

U.S. Cl. 339—23 4 Claims

1. Baseboard for electrical installation comprising:

an elongated hollow cover board made of a plastic material and having a front side and a rear side, said rear side including a longitudinally extending insulating material portion, said cover board including: (1) a longitudinally extending flat section on the front side of said cover board for mounting electrical distributing apparatus so that the latter are accessible from the outside of the cover board; (2) longitudinally running bare wires partly embedded in the insulating material portion on the rear and normally concealed side of the cover board, outside the region of said flat mounting section; and (3) holding means on the rear side of the cover board, in the region of said bare wires for the removable application of adapters connected to said electrical distributing apparatus and provided with bare contacts for connecting said apparatus to the bare wires; and



fastening means for securing said cover board to a wall, said fastening means consisting of fastening screws and a plurality of metallic supports, each of which is provided with upwardly directed tabs for suspending the cover board, and furthermore with lateral stops limiting an area having a rough surface against which, in the completely installed condition, the free end of the fastening screw borne by the cover board rests.

4,037,901

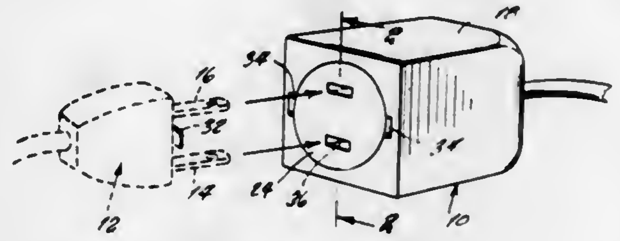
ELECTRICAL SAFETY SOCKET

Edward H. Kaszuba, 300 Winston Drive, Cliffside Park, N.J. 07010

Filed Apr. 28, 1976, Ser. No. 681,331

Int. Cl.^{2} H01R *13/44*

U.S. Cl. 339—41 9 Claims



1. An electrical safety socket comprising:

a housing,

a rotatable socket element within said housing adapted to axially receive the contact prongs of an electrical plug,

a pair of electrical contact elements fixed to said rotatable socket element,

a pair of stationary electrical contact elements in said housing adapted to be connected to a source of electrical power, and

rotation means in said housing operatively axially movable relative to said socket in response to the axial insertion of the prongs of said electrical plug into said socket element and into electrical contact with said contact elements fixed to said socket element for engaging with and rotating said socket element to a position electrically connecting said socket contact elements with said stationary contact elements.

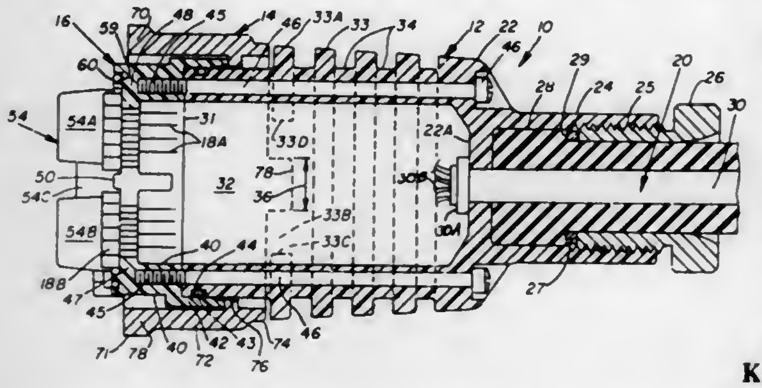
4,037,902
HERMAPHRODITIC MULTIPLE CONNECTOR PLUG

Sheldon M. Miller, Tulsa, Okla., assignor to Tesco Engineering Company, Tulsa, Okla.

Filed Mar. 16, 1976, Ser. No. 667,406

Int. Cl.² H01R *25/10*

U.S. Cl. 339—49 R **10 Claims**



1. In a high density hermaphroditic electrical connector plug adapted to couple and mesh with an identical meshing plug comprising;

- a. said electrical connector plug having a cable end and a meshing end, the cable end connected to a multi-conductor cable;
- b. said electrical connector plug comprising;
  - 1. a cylindrical body;
  - 2. a unitary cylindrical sealed contact assembly means attached and sealed to said body to support a plurality of electrical contacts inside said contact assembly means;
  - 3. said contact assembly means of said electrical connector plug having two circumferentially spaced projections in the meshing end, which mesh in only one angular colinear position with the projections of an identical contact assembly means on said identical meshing plug, and wherein when said contact assembly means projections of said electrical connector plug and said meshing plug are meshed, the electrical contacts of said electrical connector plug and said meshing plug are also meshed;

the improvement in means to lock and unlock said electrical connector plug and said identical meshing plug, comprising;

- c. a cylindrical locking ring on said electrical connector plug surrounding said body and contact assembly thereof and adapted to mate with a similar locking ring on said identical meshing plug;
- d. means to permit rotation of said locking ring on said body of said electrical connector plug through a selected angle;
- e. means to substantially prevent relative longitudinal motion of said locking ring and said body on which it is mounted;
- f. first and second circumferentially spaced projection on the meshing end of said locking ring;
- g. a single sloped groove in the inside surface of said first projection forming a first ridge on the inside end of said first projection, and on the outside surface of said second projection, forming a second ridge on the outside end of said second projection, said first ridge on said first projection of said locking ring of said electrical connector plug adapted to fit into a groove of a second projection, of said locking ring on said identical meshing plug, and vice versa;

whereby as said locking ring on said electrical connector plug is rotated clockwise with respect to said locking ring on said meshing plug, said ridges will slide in the corresponding grooves, and because of the slopes of the grooves, the two locking rings will be pulled together, and with them said electrical connector plug and said meshing plug; and wherein said electrical connector plug includes the further improvement comprising;

- h. a first longitudinal edge of said projections on said locking rings of said electrical connector plug and said meshing plug being the leading edge where said ridges and said grooves first mesh;
- i. the ends of said projections cut perpendicular to the axis of said locking rings, at said leading edges;
- j. the ends of said projections cut at a selected small slope angle to said perpendicular to the axis of said locking rings at the trailing edges of said projectons;
- k. whereby, after rotating said locking rings of said electrical connector and meshing plugs in a clockwise direction and said two plugs are pulled together, as said locking rings are rotated counter clockwise with respect to each other, said sloping ends of said projectons will slide, one on the other, and will pull apart said locking rings and with them said electrical connector plug and said meshing plug.

4,037,903
CASING

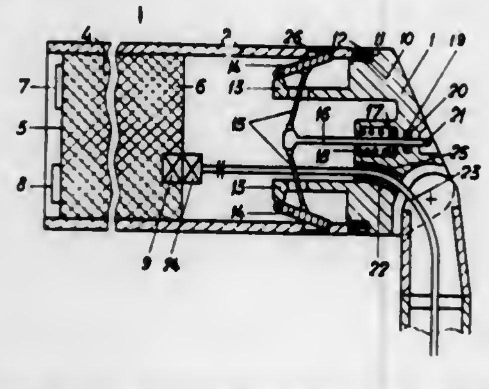
Kaspar Saner, Dubendorf, Switzerland, assignor to Wirth, Gallo and Company, Switzerland

Filed Aug. 27, 1976, Ser. No. 718,416

Claims priority, application Switzerland, Oct. 23, 1975, 13850/75

Int. Cl.² H01R *13/52, 13/54, 13/58*

U.S. Cl. 339—75 R **6 Claims**



1. A casing for an electrical apparatus having a front wall and a back wall, an electrical plug on said back wall, said casing having a base, a jacket in which said apparatus is mounted, stop spring means between said base and said jacket, said means comprising a rod slidably mounted in said base, a spring loading said rods and fingers rotatably mounted in said base and operatively connected with said rod, said rod having an end protruding outside said base, said jacket being thereby detachably fixed to said base, a passage in said base, a set of cables through said passage, a plug socket fixed to said cables, said back wall, said jacket and said base forming a water sealed room, said plug and said plug socket being within said room when said jacket is fixed to said base.

4,037,904
ELECTRICAL CONNECTOR

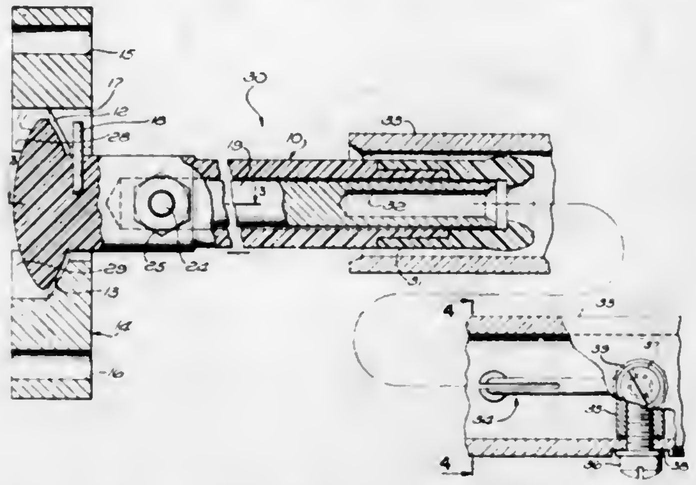
Bruce K. Arnold, El Toro, and Stephen K. Yamamoto, Los Angeles, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,347

Int. Cl.² H01R *13/62*

U.S. Cl. 339—64 R **9 Claims**

1. A fail-safe electrical connector for mounting between a fixed structure and a door structure, said connector comprising: a plate for mounting on one of the structures, the plate having a hole therethrough, said hole having a center axis; a hollow tubular insulator assembly connected with said plate and having its longitudinal axis generally coaxial with said center axis but being movable to a position somewhat misaligned therewith; a hollow tubular member having a rearward end fixed to the other structure and a forward end movable toward and said plate; a pin contact having a forward end portion enlarged in at least one dimension transverse to the length of said pin coaxially mounted within said member; said insulator assembly having a forward end and a rear end, said insulator assembly forward end being loosely slidable inside said member forward end, a bore extending through said insulator assembly forward end providing an opening at said insulator assembly forward end; means providing a generally free-floating connection between said rear end of said insulator assembly and said plate, said free-floating connection means allowing variation in the position of said insulator assembly sufficient to accommodate axial and angular misalignment between said center axis and said longitudinal axis; and a socket contact mounted in said bore mating with said pin contact when either one of the structures is moved toward the other.



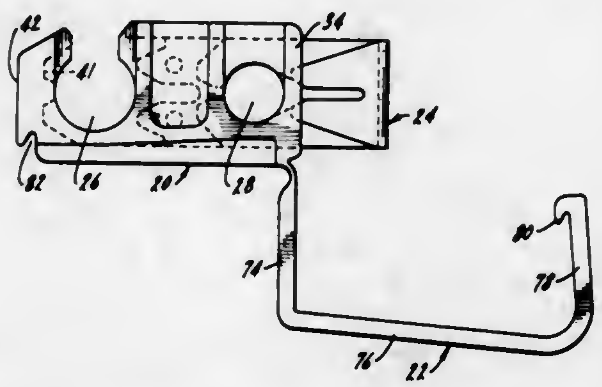
4,037,905
NO-STRIP ELECTRICAL CONNECTOR

James F. Lucas, Sycamore, Ill., assignor to Ideal Industries, Inc., Sycamore, Ill.

Continuation of Ser. No. 435,107, Jan. 21, 1974, abandoned. This application Dec. 12, 1975, Ser. No. 640,252

Int. Cl.² H01R *13/38*

U.S. Cl. 339—98 **14 Claims**



1. A no-strip electrical connector comprising a connector body of insulating material with two longitudinal wire-receiving channels, at least one of which extends throughout the entire length of the body and opens along a top longitudinal surface of the body to accept a through wire, the other channel being for a tap wire and being also bordered by the top surface of the body and containing a generally transverse stop surface, the connector body having side openings disposed intermediate the length of the tap wire channel through a longitudinal side of the body normal to the top surface and adjacent the tap wire channel and through the connector body between the channel, and a generally bent-over, two-legged conductive insert for inserting into the opening in the side of the connector body, both ends of the insert being slotted to form U-shaped contact members on the ends thereof which, when simultaneously forced into the insulated wires lying in the channels, penetrate the insulation of the wires and make an electrical contact between them, one leg of the insert being longer than the other and being adapted to engage the through wire lying in the through wire channel, the shorter leg being adapted to engage the tap wire lying in the tap wire channel when the insert is forced into the connector body, said connector body having as an integral part thereof a hinged cover flap with means for locking it in a closed position over the top and side of the body so as to cover the channels and side opening.

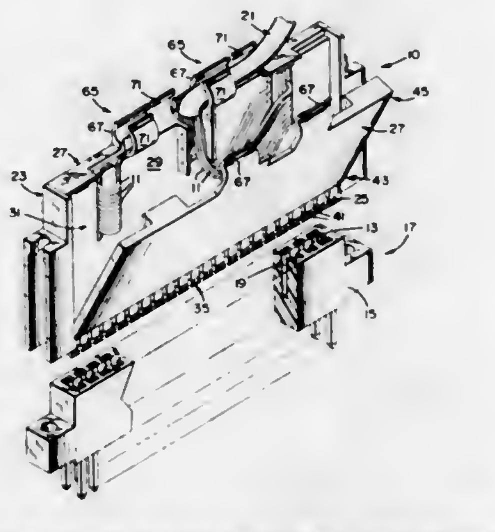
4,037,906
ELECTRICAL CONNECTOR AND CONTACT

Max Leroy Jayne, North Warren, Pa., assignor to GTE Sylvania Incorporated, Stamford, Conn.

Filed Mar. 22, 1976, Ser. No. 669,193

Int. Cl.² H01R *13/58*

U.S. Cl. 339—107 **13 Claims**



1. An electrical connector for electrically interconnecting at least one electrical wire and at least one electrical contacting member positioned within an insulative member, said connector comprising:

an electrically insulative housing comprising a body portion including at least one recessed area therein adapted for having said wire located therein and at least one contact receiving portion positioned relative to said recessed area, and an extending portion extending from said body portion;

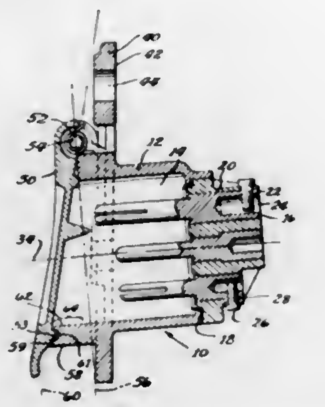
at least one electrical contact comprising a contacting portion positioned within said contact receiving portion of said housing for electrically contacting said wire when said wire is positioned therein, a retention portion adjacent said contacting portion for retaining said contacting portion of said contact within said contact receiving portion of said housing, and a tail portion adjacent said retention portion and adapted for electrically contacting said contacting member within said insulative member, said tail portion extending from said body portion of said housing in an engaged relationship to said extending portion of said housing; and

at least one cover means comprising first and second opposing end portions, said first end portion pivotedly mounted on said housing in the region substantially adjacent said contact receiving portion, said second end portion adapted for covering said recessed area of said housing, said second end portion including latching means for positively engaging said body portion of said insulative housing to latch said second end portion to said housing;

characterized in that said cover means includes first strain relief means for relieving tensile strain on said electrical wire when said wire is positioned within said contacting portion of said electrical contact.

4,037,907
TRACTOR-TRAILER ELECTRICAL RECEPTACLE

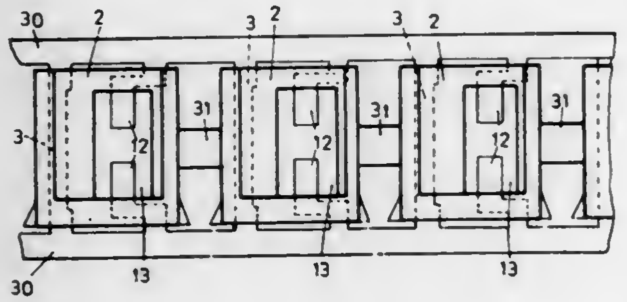
Boleslaw M. Klimek, Des Plaines, and Victor Mastis, Hinsdale, both of Ill., assignors to The Echlin Manufacturing Company, Branford, Conn.
Filed Feb. 23, 1976, Ser. No. 660,491
Int. Cl.² H01R *13/52, 13/60*
U.S. Cl. 339—126 R **10 Claims**



1. An electrical receptacle comprising a housing including a cavity therein having a principal axis, contact means mounted at least partially within said cavity, said housing having a first end and said cavity being open at said first end, said first end of said housing having a substantially planar end surface at an angle significantly other than 90° to said principal axis of said cavity.

4,037,908
STRIP OF LIGHT-SIGNAL UNIT SHELLS

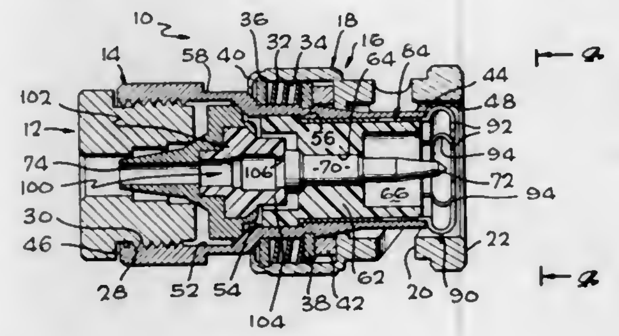
Cesare Gallone, 27, Milano Street, Cornaredo, Italy
Division of Ser. No. 310,097, Nov. 28, 1972, abandoned, which is a division of Ser. No. 206,610, Dec. 10, 1971, abandoned. This application Nov. 25, 1975, Ser. No. 635,387
Claims priority, application Italy, Dec. 12, 1970, 32927/70
Int. Cl.² H01J *7/44, 61/64;* **H01K** *1/62;* **H01R** *3/02*
U.S. Cl. 339—147 R **4 Claims**



1. A strip of light-signal unit shells which can be formed into single light-signal units by installing a gas discharge bulb and a removable resistance element and separating the light-signal unit shells from the strip thereby providing single light-signal units which may be inserted into a signalling device, said strip comprising a flat sheet of conductive material having openings which form continuous longitudinal conductors along two opposite edges of said sheet, continuous transverse conductors extending from one longitudinal conductor to the other and a pair of discontinuous conductors extending from opposite continuous longitudinal conductors adjacent each of the continuous transverse conductors and terminating in free ends, insulating shells provided with a recess, each insulating shell encapsulating a portion of one continuous transverse conductor and portions of an adjacent pair of discontinuous conductors, the free ends of each pair of discontinuous conductors extending into the recess of the shell associated therewith whereby the continuous longitudinal conductors may be severed adjacent each continuous traverse conductor and each discontinuous conductor to form terminals for installation of a gas discharge bulb and whereby the ends of the discontinuous conductors extending into the respective recesses may be bent at various angles in the respective recesses to receive and provide electrical contact with a removable resistance element.

4,037,909
COAXIAL CABLE CONNECTOR WITH ENERGY LOSS PREVENTION

Emanuel Trompeter, Tarzana; Tracy A. Hunter, Canoga Park, and Claud Azelton, Simi Valley, all of Calif., assignors to Trompeter Electronics, Inc., Chatsworth, Calif.
Filed June 9, 1976, Ser. No. 694,211
Int. Cl.² H01R *17/06*
U.S. Cl. 339—177 R **9 Claims**



1. An electrical cable connector, comprising:

a conductive hollow shell having axially opposite open forward and rearward ends, the rearward end being equipped for receiving the end of the cable to be attached to said connector;

first electrical contact means in said shell adapted to effect an electrical connection between said shell and the electrically conductive means of the cable;

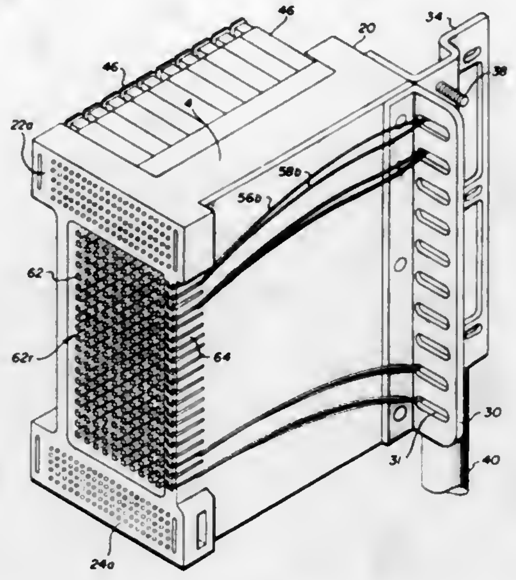
inner and outer second electrical contact means at the forward end of said shell adapted to effect an electrical connection between said shell and the counterpart shell of a mating connector, and

shielding means unitary with said inner and outer second electrical contact means in coaxial relationship therewith for preventing electrical interference and loss of energy through the inner one of said second electrical contact means in couple condition of said connector, said shielding means being defined by a forward annular portion of said shell and having an inner cylindrical surface and an outer periphery of frusto-conical configuration, said inner surface abuttingly engaging the inner one of said second electrical contact means and extending substantially the entire length thereof, and said outer periphery being adapted to frictionally engage and urge the mating surface of the counterpart shell into tight mechanical and electrical contact with the outer one of said second electrical contact means in the coupled electrically conductive condition of the shells.

4,037,910
TELEPHONE DISTRIBUTION FRAME CONNECTOR ASSEMBLY

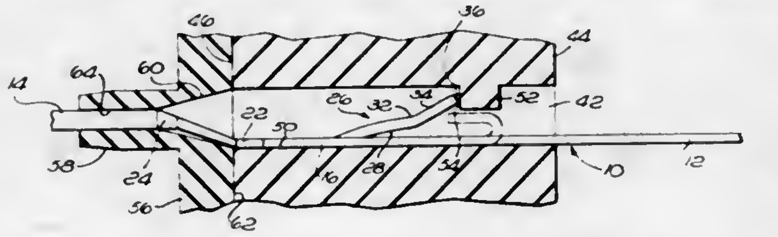
Edward S. Paluch, Elmwood Park, Ill., assignor to Reliable Electric Company, Franklin Park, Ill.
Filed Sept. 13, 1976, Ser. No. 722,426
Int. Cl.² H01R *9/00*
U.S. Cl. 339—198 R **6 Claims**

1. A telephone distribution frame connector assembly comprising an insulating connector block having a front face, a rear face, and opposed side faces, means for mounting said block on a distribution frame such that said rear face is adjacent to said frame and said front face is remote from said frame, one of said side faces having groups of socket-type electrical terminals for receiving a plurality of plug-in overload protector modules, the opposite side face having terminals for wired connection to central office equipment, a cable stub adjacent to said rear face, means for securing said cable stub to said block, said cable stub having wires in electrical connection with said socket type terminals for completing subscriber circuits from the wires of the cable stub to said opposite face terminals, a test field at said front face and accessible without interference from members of said frame or adjacent blocks or modules thereon, and wires electrically connecting said test field to some of said socket-type terminals so as to provide a means for testing the subscriber circuits.



4,037,911
ELECTRICAL CONNECTOR

John W. Anhalt, Orange, and James H. Curley, Costa Mesa, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed June 9, 1976, Ser. No. 694,306
Int. Cl.² H01R *9/16*
U.S. Cl. 339—217 S **13 Claims**



1. An electrical contact adapted to be mounted in a contact cavity in an insulator of an electrical connector comprising:

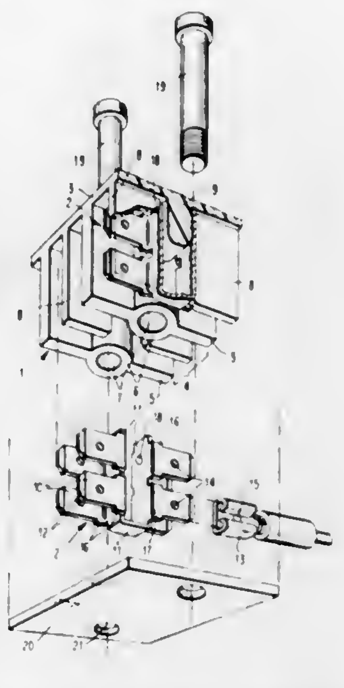
an electrically conductive body having a forward contacting section and a retention section behind said contacting section;

a spring retention tine on said retention section extending forwardly and outwardly therefrom so that the end thereof may engage a rearwardly facing shoulder in said cavity; and

said tine embodying a relatively deformable area spaced from said end and the point of emergence of said tine from said body whereby, upon the application of a predetermined rearwardly directed force to said end of said tine, said tine will fold back on itself at said deformable area.

4,037,912
TERMINAL ASSEMBLY

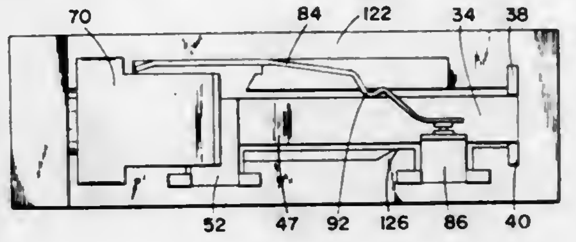
Helmut Siegfried Besser, Williston, Vt.; Gunter Kieven, Bodenheim, and Jurgen Wettlauffer, Mainz, both of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.
Filed May 21, 1976, Ser. No. 688,654
Claims priority, application Germany, May 24, 1975, 2523164
Int. Cl.² H01R *9/18*
U.S. Cl. 339—198 R **7 Claims**



1. A terminal assembly comprising a housing composed of a rigid insulating material, said housing including spaced apart wall members projecting from a base plate and defining a chamber therebetween; an elongated protuberance on each of said wall members in coextension with the extension thereof and projecting inwardly into said chamber; a U-shaped connector member for insertion into said chamber, said connector member formed from a strip of conductive material and having upstanding, spaced apart leg portions joined by a bottom portion; oppositely directed terminals formed from U-shaped segments of said leg portions in projection therefrom, with said terminals having common directional projections on each common leg portion, and with the terminals on one leg portion having an oppositely directed projection relative to that of the terminals on the other of said leg members, and means on said conductive strip for providing locking engagement with said abutments when said connector member is inserted into said chamber whereby said connector member is fixedly secured in said chamber.

4,037,913
PRINTED CIRCUIT JACK

James C. Deitch, Bloomington, and Lawrence F. Leistiko, Minneapolis, both of Minn., assignors to Magnetic Controls Company, Minneapolis, Minn.
Continuation-in-part of Ser. No. 549,731, Feb. 13, 1975, abandoned. This application June 1, 1976, Ser. No. 691,891
Int. Cl.² H01R *13/50;* **H05K** *1/04*
U.S. Cl. 339—221 M **9 Claims**



1. A molded jack especially suitable for direct connection on

its bottom side to a printed circuit board comprising an elongated molded nonconducting housing having an elongate axis and first and second generally parallel end surfaces generally perpendicular to the elongate axis at opposite ends of the housing, said surfaces connected together by elongated first and second generally parallel side walls extending therebetween, parallel to the elongate axis, said end surfaces also connected together by a third elongated side wall intermediate said first and second side walls, and said housing having an entrance hole in said first end surface to accept a plug along the elongate axis therethrough into the space between the side walls, and the end surfaces, with a plurality of spring metal contacts mounted in said housing by means of a plurality of vertical slots, said slots formed in the first and second side walls generally orthogonal to the elongate axis of said housing, said slots open at their ends remote from said third side wall so as to accept the spring contacts therein, said contacts having lugs extending therefrom which extend through the bottom of the housing to make contact with the circuit board, and said spring contacts including at least one pair of balanced spring contacts comprising a first spring contact extending from said first side wall to said second side wall proximate the first end surface and mounted in a vertical slot in the first side wall and a vertical slot in the second side wall so as to press against a plug inserted into the housing, and a second spring contact extending along the third side wall parallel to the elongate axis and mounted proximate the second end surface in vertical slots in the first and second side walls so as to press against the other side of the plug inserted into the housing to balance the force of said first spring contact and including a third spring contact mounted along said first side wall and in vertical slots in said first side wall so as to press against the side of a plug inserted into the housing.

4,037,914
ELECTRICAL CONNECTOR AND CONNECTOR CABLE

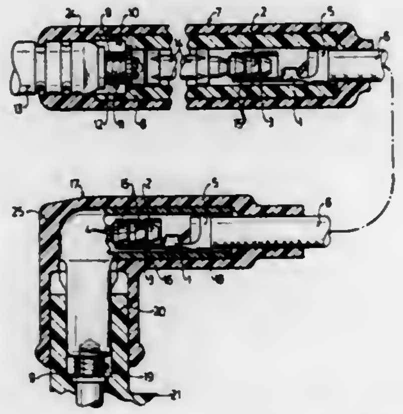
Martin Fetzer, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany

Filed Oct. 30, 1975, Ser. No. 627,051

Claims priority, application Germany, Nov. 14, 1974, 37955

Int. Cl.² H01R *13/54*

U.S. Cl. 339—253 R **2 Claims**



1. An electrical connector cable comprising an insulated conductor connected at each end to an electrical connector comprising a connector socket and a connector plug, each connector socket being permanently electrically connected to said conductor by an extension of the socket and having inwardly projecting catch ridges on a substantially cylindrical metallic socket portion, the two connector sockets being identical in configuration, each connector plug having an engagement surface substantially in the shape of a surface of revolution about its longitudinal axis providing substantially circumferential grooves and inter-groove ridges, the plugs being engaged in each case in one of said sockets and the ridges of said plugs being engaged with the catch ridges of that one of said sockets and at least one of said plugs having forward and rear slope inclinations differing from each other, the former being the greater, whereby the force required for disengagement of said socket and plug is substantially raised relative to the force required for their engagement, the engagement surfaces of one of the plugs being different from those of the other so that different amounts of force are required for their respective disengagement from the corresponding socket.

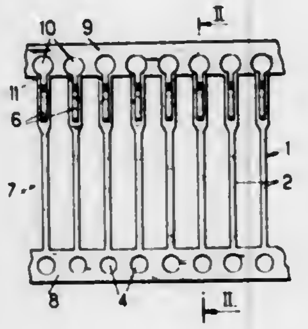
4,037,915
ELECTRICAL CONNECTOR STRIPS

Aime Cabaud, Versailles, France, assignor to COMATEL - Comptoir Europeen de Materiel Electronique, Issy les Moulineaux, France

Filed Apr. 29, 1976, Ser. No. 681,488

Int. Cl.² H01R *13/12;* H05K *1/07*

U.S. Cl. 339—258 P **3 Claims**



1. A connector strip for a circuit board comprising
a plurality of spaced solderable connectors;
each of said connectors having first and second end portions and a flat central portion extending along a longitudinal axis between said end portions;
a first common connecting element connecting together said first end portions;
each of said second end portions having a fork configuration formed by spaced leg portions;
a second common connecting element connecting together said second end portions;
said second common connecting element having a plurality of openings formed therein, each individual opening being aligned with the axis of respective connectors; and
each said opening formed with a keyhole configuration having its round hole opening located within said second common connecting element and its longitudinally extending opening forming the spacing between said leg portions whereby a weakened portion is formed in said second common connecting element at the junction of said round hole opening and said longitudinally extending opening to facilitate removal of said second common connecting element from said connectors.

4,037,916
HIGH CURRENT DENSITY ELECTRICAL CONTACT

Lloyd E. Thompson, Jr., 158 Clark Road, Rye, N.H. 03870

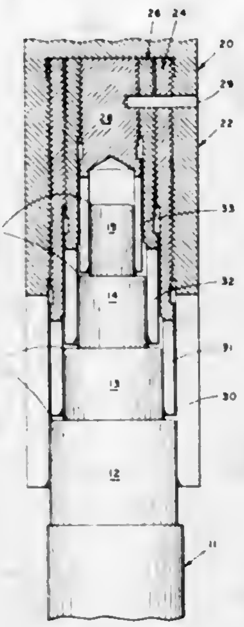
Filed Apr. 12, 1976, Ser. No. 676,446

Int. Cl.² H01R *13/12*

U.S. Cl. 339—258 R **12 Claims**

7. An electrical contact comprising:
a contact pin having a plurality of contacting surfaces of decreasing size; and
a receptacle having a like plurality of sections disposed one within another each of which is provided with contacting surfaces which mate with respective pin surfaces during the full extent of insertion of said pin into receptacle as defined by the axial length of the shortest of said pin contacting surfaces,

said receptacle sections joined together remote from their contacting surfaces to form a unitary member.



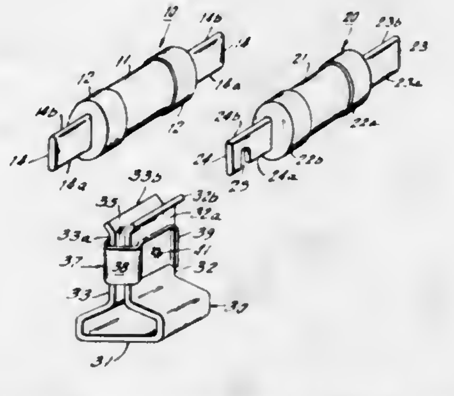
4,037,917
FIELD INSTALLED FUSE REJECTION MEANS WITH SPRING BETWEEN CLIP JAWS

Ralph C. Clement, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Jan. 20, 1976, Ser. No. 650,691

Int. Cl.² H01H *85/24*

U.S. Cl. 339—259 F **8 Claims**



1. A fuse terminal clip for forming an electrical connection to fuse means including a flat terminal blade having a notch formed partially therethrough, said fuse terminal clip comprising;
spaced arm means for electrically contacting opposed flat surfaces of said terminal blade, said spaced arm means adapted to resiliently capture said terminal blade in a gap therebetween;
biasing means for urging said spaced arm means together to increase the electrical conductivity between said spaced arm means and said terminal blade captured therebetween;
a rejector member extending between said spaced arm means and cooperating with said notch for rejecting a terminal blade lacking said notch and for facilitating insertion and capture between said spaced arm means only of a terminal blade provided with said notch;
collapsible retainer means carried on said rejector member for permitting placement of said rejector member between said spaced arm means and expanding upon being so emplaced to substantially prevent removal of said rejector member from said spaced arm means;
said spaced arm means including a pair of spaced parallel clip arms each having an aperture formed therethrough and the axes of both said apertures being in alignment;
said biasing means comprising a spring member having a pair of spaced arms each bearing resiliently against an associated one of said pair of clip arms and having an aperture formed therethrough in axial alignment with the aperture formed in said associated clip arms; and
said rejector member extending through the aligned pair of apertures, across the gap formed between said pair of clip arms and also extending through each of the apertures in said spring arms.

4,037,918
FOURIER-TRANSFORM HOLOGRAPHY BY PSEUDO-RANDOM PHASE SHIFTING

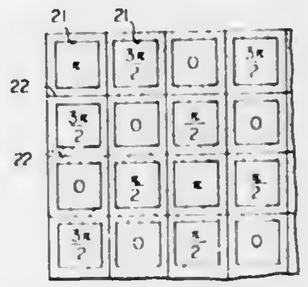
Makoto Kato, Osaka, Japan, assignor to Matsushita Electric Industrial Co., Ltd., Japan

Filed July 31, 1975, Ser. No. 600,589

Claims priority, application Japan, Aug. 3, 1974, 49-89248; Apr. 23, 1975, 50-49930; Apr. 23, 1975, -49931

Int. Cl.² G03H *1/16, 1/32*

U.S. Cl. 350—3.5 **23 Claims**



1. Apparatus for forming a hologram of an array of beams of electromagnetic radiation on a Fourier transform plane, comprising:
a pseudo-random phase mask receptive in use of a beam of electromagnetic radiation and comprised of phase shifting areas arranged in a pattern of rows and columns, there being an approximately equal number of phase shifting areas for each of the different phase shifts, wherein the number of different phase shifts is N which is at least three and each of the different phase shifts is one of the multiples of $m360°/N$, where m ranges from 1 to N, and the phase difference between orthogonally adjacent phase shifting areas is 360°/N, whereby the power spectrum of said phase-shifted beam on the Fourier transform plane distributes in two orthogonal directions from the center maximum of the power spectrum; and
means for recording a hologram of the Fourier transform of said beam at said center maximum.

4,037,919
HOLOGRAPHIC DEVICE WITH DIVIDED OBJECT BEAMS, A MULTICOLOR LIGHT SOURCE AND DIRECTION-SELECTIVE SCREEN

Yasutsugu Takeda, Kokubunji, and Yoshito Tsunoda, Hachioji, both of Japan, assignors to Hitachi, Ltd., Japan

Continuation of Ser. No. 398,550, Sept. 18, 1973, abandoned. This application May 12, 1975, Ser. No. 576,460

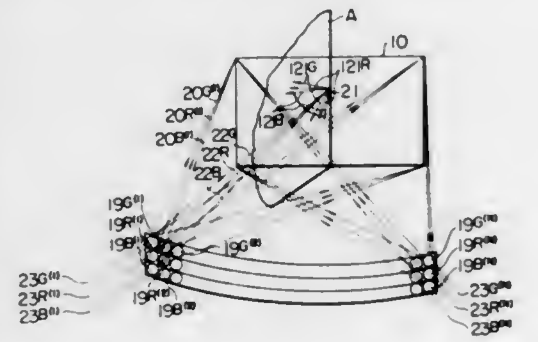
Claims priority, application Japan, Sept. 19, 1972, 47-94032; Feb. 19, 1973, 48-19879

Int. Cl.² G03H *1/16, 1/30*

U.S. Cl. 350—3.5 **2 Claims**

1. A holography apparatus comprising:
a first recording medium on which are arranged a plurality of two-dimensional multi-color photographic recordings of a three-dimensional object taken from a plurality of different photographic directions;

first means for providing a plurality of collimated coherent light beams of respectively different monochromaticities;
second means, disposed in the path of each of said coherent light beams, for separating said beams into respective collimated object beams and reference beams;
a hologram recording medium;
third means comprising a lens for focussing each of said collimated object beams, selectively, through each respective two-dimensional multi-color photographic recording on said hologram recording medium, said object beams thereby converging upon adjacent respective holographic recording areas of said hologram recording medium;
fourth means, disposed in the paths of said respective converging object beams for each respective photographic recording, for dividing each of said converging object beams into a plurality of separated smaller converging beams traveling along the direction of convergence of each respective object beam onto respective adjacent recording areas of said hologram recording medium; and
fifth means for directing said respective reference beams onto the adjacent respective holographic recording areas of said hologram recording medium simultaneously with the respective pluralities of separated smaller converging object beams which have been selectively focussed through a respective two-dimensional multi-color photographic recording on said first recording medium, to thereby from respective adjacent holograms of different monochromaticities of the multi-color information carried in a respective two-dimensional multi-color photograph of said three-dimensional object corresponding to a respective one of said different photographic positions on adjacent respective prescribed portions of said hologram recording medium; and



further comprising means for reproducing said holograms, said reproducing means including
a multi-color light source for illuminating said holograms with multi-color light beams; and
a direction-selective screen disposed at an image surface on which multi-color light beams from said multi-color light source having passed through said holograms form reproduced images of the respective holograms.

4,037,920

RADIATION SCANNING SYSTEM WITH TWO RELATIVELY MOVABLE REFLECTORS

Herbert Morrison Runciman, and Peter John Berry, both of Glasgow, Scotland, assignors to Barr and Stroud Limited, Glasgow, Great Britain

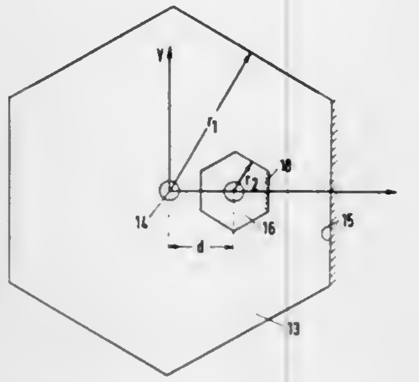
Filed July 29, 1975, Ser. No. 600,199

Claims priority, application United Kingdom, Oct. 26, 1974, 46424/74

Int. Cl.^{2} G02B *27/17;* **H01J** *3/16*

U.S. Cl. 350—7 **5 Claims**

1. Apparatus for use in a radiation scanning system comprising an objective device forming convergent radiation from a field of view, a radiation detector, and an optional scan means which is arranged to scan convergent radiation from said field of view across said detector, said scan means comprising a first drum which is rotatable about a first axis, a first set of optical members mounted on said first drum and defining a set of first planar reflective surfaces each of which extends perpendicular to a radius of said first drum, a second drum which is rotatable about a second axis extending parallel to and spaced from said first axis, a second set of optical members mounted on said second drum and defining a set of second planar reflective surfaces each of which extends perpendicular to a radius of said second drum, drive means rotating said first drum sequentially to move each of said first reflective surfaces through a first reflector station, and rotating said second drum sequentially to move each of said second reflective surfaces through a second reflector station, said scan means being arranged with the respective reflective surfaces when in said first and second reflector stations oppositely facing and the first and second reflector stations axially spaced, whereby convergent radiation from said field of view enters said detector after sequential reflection at said first and second reflector stations, said drums each having the same number of planar reflective surfaces and said drive means providing synchronous rotation of said drums, and the distance between said reflector stations in a plane perpendicular to said first and second axes being equal to the spacing between said axes in the same plane.



4,037,921

NIGHT VISION APPARATUS

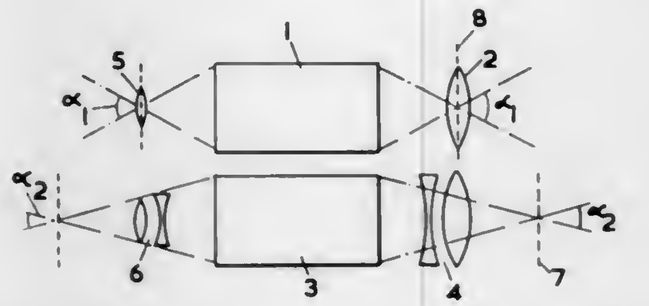
Alan Frederick John Cox, Christchurch, England, assignor to The Secretary of State for Defence in Her Britannic Majesty's Government of the United Kingdom of Great Britain and Northern Ireland, London, England

Filed June 14, 1976, Ser. No. 695,628

Claims priority, application United Kingdom, June 17, 1975, 25831/75

Int. Cl.^{2} G02B *23/12*

U.S. Cl. 350—36 **6 Claims**



1. Night vision apparatus comprising means for providing two intensified images of a scene, one of said images providing a comparatively wide-angle view of said scene, and the other of said images providing a comparatively narrow-angle view of said scene, but with better resolution, and observation means for enabling both of said intensified images to be observed simultaneously in superposed relationship with the same overall magnification.

4,037,922

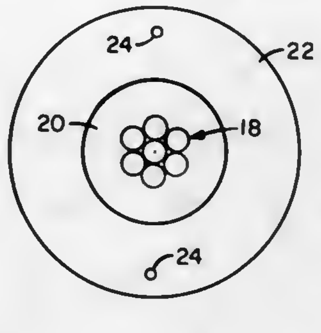
OPTICAL WAVEGUIDE CABLE

Stewart A. Claypoole, Painted Post, N.Y., assignor to Corning Glass Works, Corning, N.Y.

Filed July 7, 1975, Ser. No. 593,285

Int. Cl.^{2} G02B *5/16*

U.S. Cl. 350—96 B **18 Claims**



1. A substantially circular optical waveguide cable comprising:
a plurality of optical waveguide fibers disposed in a substantially contiguous relationship to form a single concentrically arranged fiber bundle,
an encapsulating coating of at least one layer surrounding said single bundle of fibers, and
at least two strength members embedded in said encapsulating coating and disposed parallel to said single bundle in a plane substantially along a diameter of said single bundle through the longitudinal axis of said bundle, at least one of said strength members being disposed in said plane on one side of said single bundle, the remainder of said strength members being disposed in said plane on the other side of said single bundle, each strength member on said one side of said single bundle being disposed at a distance from said longitudinal axis of said single bundle substantially equal to the distance therefrom of the corresponding strength member on said other side of said single bundle, said strength members on said one side of said single bundle being disposed adjacent each other and said strength members disposed on said other side of said single bundle being disposed adjacent each other when a plurality of strength members are disposed on either or both of said sides.

4,037,923

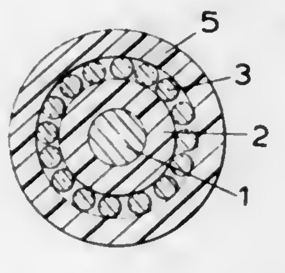
OPTICAL GUIDES WITH COMPRESSIBLE CELLULAR MATERIAL

Richard Ernest Beal, Wigan, England, assignor to BICC Limited, London, England

Filed June 25, 1974, Ser. No. 482,993

Int. Cl.^{2} G02B *5/14*

U.S. Cl. 350—96 B **4 Claims**



1. An optical guide consisting of an optical cable comprising at least two optical bundles, each comprising a group of fibres including a plurality of optical fibres assembled about and in contact with a longitudinally extending central elongate member of which at least an outer peripheral layer is of compressible cellular material and, surrounding the bundles and the central member, an outer protective sheath, the arrangement being such that when the cable is stressed in such a way as to subject optical fibres of at least one of the optical bundles to a tensile force, the optical bundle can move transversely inwardly to compress the compressible cellular material of the central member and thereby reduce the strain that would otherwise be imparted to said optical fibres, and a covering layer of compressible cellular material between the optical bundles and the surrounding protective sheath.

4,037,924

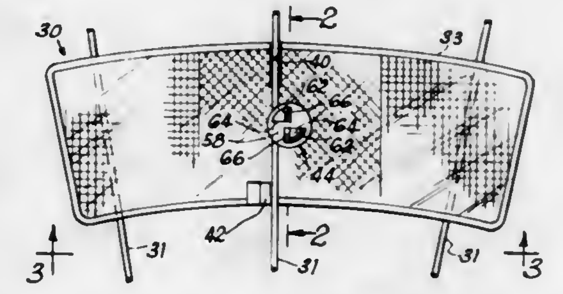
RETROREFLECTIVE MARKER DEVICES FOR ATTACHMENT TO SPOKES OF BICYCLE WHEELS OR THE LIKE

Louis May, Skokie, Ill., assignor to Sate-lite Mfg. Co., Harwood Heights, Ill.

Filed June 20, 1975, Ser. No. 588,731

Int. Cl.^{2} G02B *5/12*

U.S. Cl. 350—97 **12 Claims**



1. A retroreflective marker device for attachment to a wheel having a plurality of wire spokes spaced apart at predetermined intervals,
said device comprising a retroreflective marker member having a boss projecting therefrom,
said marker member having an opening extending into said boss with internally screw-threaded means in said opening,
and a clamping screw movably received in said opening and engaged with said internally screw-threaded means,
said boss having a locating groove therein disposed off center relative to said opening for receiving and retaining one wire spoke of said wheel,
said clamping screw having a clamping head disposed opposite said groove for directly engaging said spoke and clamping said spoke into said groove to retain said marker member on said spoke.

4,037,925

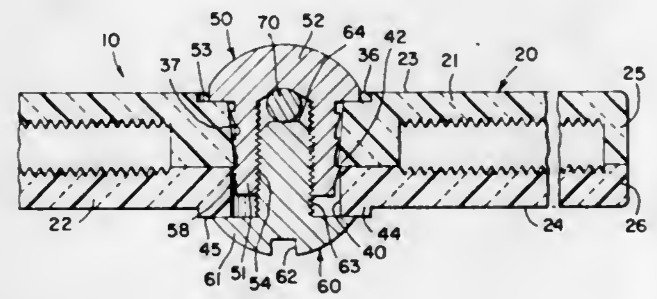
REFLECTOR ASSEMBLY

Robert S. Fleming, Pompton Plains, N.J., assignor to Amerace Corporation, New York, N.Y.

Filed Nov. 21, 1977, Ser. No. 634,305

Int. Cl.^{2} G02B *5/12*

U.S. Cl. 350—97 **12 Claims**



1. Apparatus comprising:
a. a member adapted to be mounted to the spoke of a wheel, said member having a portion defining an outer surface, an

opening in said member extending through said member and said outer surface;

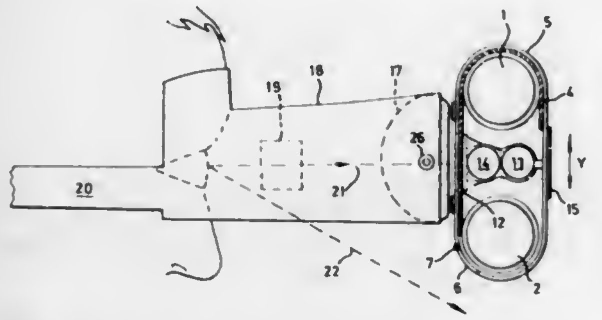
b. a fastener element having a head and a shank;

c. said shank being bifurcated and extending axially from said head, said shank being adapted to be disposed in said opening in said member with said head of said element engaging said member;

d. said bifurcated shank defining an axially extending transverse opening in said element adapted to receive said spoke of said wheel; and

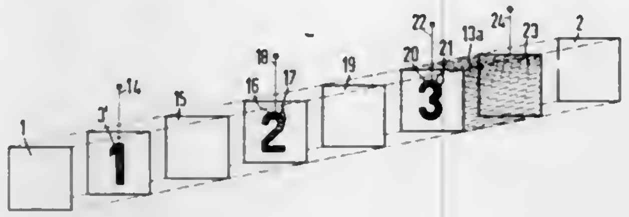
e. means for locking said spoke, said element and said member together when said spoke is received within said opening positioned between said head and said outer surface is said member, wherein said member further comprises a groove in said outer surface intercepting said opening, said groove being adapted to receive said spoke and retain said member relative to said spoke, wherein said member comprises a reflector member, said reflector member having a pair of opposed light-receiving sides, one of said sides including said outer surface, and said groove is disposed in said one of said sides and extends transversely of said reflector member for receiving said spoke.

4,037,926
PHOTOGRAPHIC FILM READING INSTRUMENT
Harry Arthur Hele Spence-Bate, Lot 115, Cheam Place, Morley, Western Australia, 6062, Australia
Filed Oct. 31, 1974, Ser. No. 519,674
Claims priority, application Australia, Nov. 5, 1973, 5534/73
Int. Cl.² G02B *27/02, 27/22*
U.S. Cl. 350—135 **8 Claims**



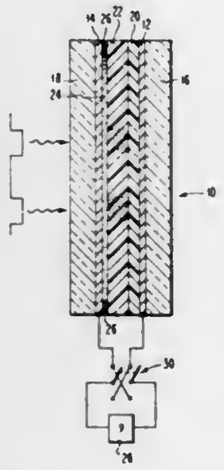
1. A photographic film reader comprising:
- a casing, means in said casing for holding a micro image bearing microfiche lamina;
- means connected to said holding means for moving said lamina in both an X-axis and a Y-axis direction; said means comprising a pair of equal sized rollers mechanically coupled for synchronous rotation in the same direction and further arranged for axial movement, the rollers being constructed so as to grip the lamina and to provide a passage for said lamina between the roller surfaces and the inner casing wall, the rotational movement of said rollers providing Y-axis shift and axial movement providing X-axis shift,
- means in said casing for illuminating at least one micro image on said lamina,
- means in said reader for magnifying said micro image,
- means connected to said casing for attaching said reader to a viewer's head,
- a first optical path in said reader between the viewer and said micro image through said magnifying means, and
- a second optical path in said reader between the viewer and a point outside said reader such that the viewer may select without moving said casing or reader either said first or said second optical path by shifting his vision.

4,037,927
LIQUID CRYSTAL DISPLAY SCREEN WITH MULTIPLE ELECTRODE ARRANGEMENT
Hans Krueger, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Jan. 21, 1975, Ser. No. 542,804
Claims priority, application Germany, Jan. 21, 1974, 2402749
Int. Cl.² G02F *1/16;* **G09F** *9/32*
U.S. Cl. 350—160 LC **6 Claims**



1. In a liquid crystal display screen which may be operated to separately display in time sequence at least two digits, said screen comprising a liquid crystal cell having two transparent carrier plates with a liquid crystal layer disposed therebetween, the improvement comprising a continuous, transparent electrical conductive layer disposed adjacent one of the two carrier plates and having a shape of a first digit and being provided with an electrical lead; at least one additional digit panel positioned between the layer forming the first digit and the liquid crystal layer, each of said additional digit panels having an interrupted electrical conducting layer in the form of a plurality of parallel strips delimiting an additional digit with said strips being interconnected to a single electrical lead and the strips of each additional digit panel extending in different directions, an insulating layer disposed between adjacent conductive layers, and electrical conducting electrode layer adjoining the other of said two carrier plates with the liquid crystal layer between the electrode layer and the digit panels so that a selected application of a potential on the electrode layer and a conductive layer of the digit creates an indication of the selected digit in the liquid crystal layer.

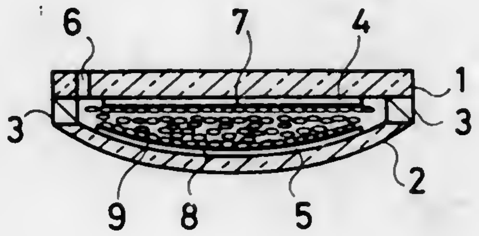
4,037,928
VISUAL IMAGE DISPLAY DEVICE
Robert Bruce Champ, and Meredith David Shattuck, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed June 4, 1976, Ser. No. 693,073
Int. Cl.² G02F *1/16*
U.S. Cl. 350—160 R **12 Claims**



1. A visual image display device comprising:
- a first and a second conductive electrode in spaced relationship;
- a first barrier layer positioned between said electrodes adjacent to said first electrode,

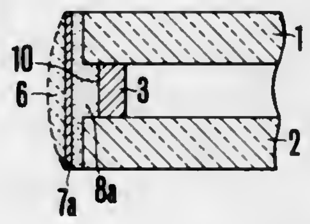
- a film of solvent positioned between said electrodes and adjacent
- a second barrier layer positioned between said first barrier layer and said solvent film, said second layer being a normally light transmitting recording medium and having the properties of being both photoionizable and capable of electrochemically producing a colored specie, and
- a voltage source and means for selectively applying this voltage between the electrodes to produce an electric field.

4,037,929
OPTICAL PROJECTION DEVICE AND AN OPTICAL READER INCORPORATING THIS DEVICE
Claude Bricot; Michel Hareng, and Erich Spitz, all of Paris, France, assignors to Thomson-Brandt, Paris, France
Filed Aug. 30, 1976, Ser. No. 718,475
Claims priority, application France, Sept. 3, 1975, 75.27008
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **6 Claims**



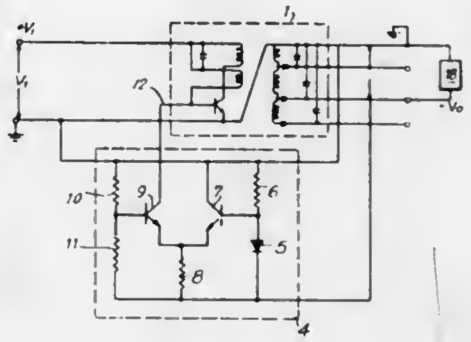
1. An optical projection device for focussing an optical beam having an optical axis and polarized rectilinearly in a direction Δ perpendicular to said optical axis, comprising a hollow glass lens arranged on the path of said beam, said hollow glass lens having inner walls and comprising two transparent electrodes arranged on said inner walls, supply means for applying to said two electrodes a variable electrical field, said lens containing a liquid nematic crystal having molecules capable of oscillating under the action of said electric field, the index thus presented by said liquid crystal to said beam varying between the ordinary index n_o and the extraordinary index n_E of said liquid crystal.

4,037,930
LIQUID CRYSTAL DISPLAY CELLS
Shigeru Matsuyama; Masabaru Koyama, both of Mobara; Masayoshi Kasai, Chiba; Mamoru Tsuzurahara, and Kazuo Sunahara, both of Mobara, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Apr. 5, 1976, Ser. No. 674,041
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **5 Claims**



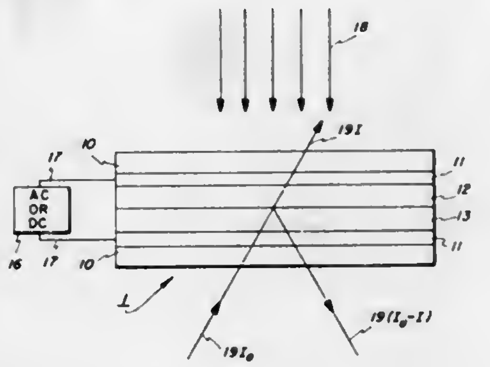
1. In a liquid crystal display cell of the type wherein a pair of insulating plates are hermetically sealed to a peripheral sealing member extending substantially entirely along the peripheries of said plates and therebetween and including at least one inlet port therein for filling a liquid crystal into the cell, the peripheries of the insulating plates slightly projecting beyond the periphery of the peripheral sealing member thus defining a shallow groove, the improvement which comprises a filler filling said groove about said inlet port, a metal layer which is applied to cover said filler and the side surfaces of said insulating plates, and an inlet port sealing member applied to said metal layer for sealing said inlet port.

4,037,931
LIQUID CRYSTAL DISPLAY CELL DRIVING CIRCUIT
Kazuo Ido, Suwa, and Shizuo Saito, Okaya, both of Japan, assignors to Kabushiki Kaisha Suwa Seikosha and Shinshu Seiki Kabushiki Kaisha, both of Tokyo, Japan
Filed May 2, 1975, Ser. No. 574,179
Claims priority, application Japan, May 2, 1974, 49-49561
Int. Cl.² G02F *1/18*
U.S. Cl. 350—160 LC **5 Claims**



1. A drive circuit for applying drive signals to a temperature dependent liquid crystal display cell comprising in combination power source means including a DC converter coupled to said liquid crystal display cell, said DC converter including an input terminal means and an output terminal means, said output terminal means being coupled to said liquid crystal display cell for applying a DC drive voltage thereto, and feedback control means coupled to said input terminal means and said output terminal means for stabilizing the DC drive signal applied to said display cell, said feedback control means including a temperature dependent diode, said diode having a temperature dependency characteristic corresponding to said liquid crystal display cell to effect an adjustment of the DC drive voltage to compensate for the temperature dependency characteristic of the liquid crystal display cell.

4,037,932
ELECTROOPTIC-PHOTOCONDUCTOR SANDWICH USING ACTINIC READOUT LIGHT
Werner E. L. Haas, Webster, and Gary A. Dir, Fairport, both of N.Y., assignors to Xerox Corporation, Stamford, Conn.
Filed May 3, 1976, Ser. No. 682,880
Int. Cl.² G02F *1/13*
U.S. Cl. 350—160 LC **25 Claims**



1. An imaging method comprising:

a. providing, without an optical blocking layer therebetween, a photoconductive layer and an electro-optic medium in between two electrodes;

b. applying a voltage between said two electrodes;

c. striking said photoconductive layer from one side with actinic radiation in imagewise configuration; and

d. uniformly striking said photoconductive layer from its other side with actinic radiation which is absorbed by said photoconductive layer in an amount effective to limit the intensity of uniform actinic radiation transmitted through said photoconductive layer no greater than about one-third of the intensity of said imagewise configured actinic radiation striking said one side of said photoconductive layer; wherein the amount of uniform actinic radiation absorbed by said photoconductive layer is sufficient to create a space charge limited current within said photoconductive layer.

4,037,933
LIGHT DEFLECTOR OF ACOUSTO-OPTIC INTERACTION TYPE

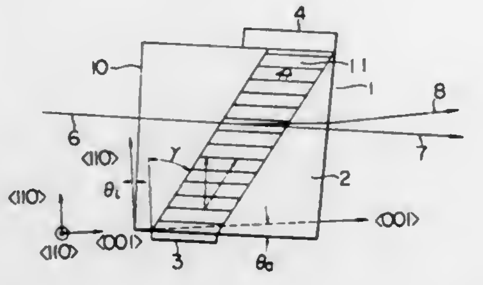
Tsutomu Yano; Koetsu Saito; Fukuya Kunlaki Fukaya, all of Kawasaki, and Akinori Watanabe, Komae, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Dec. 4, 1975, Ser. No. 637,702

Claims priority, application Japan, Dec. 9, 1974, 49-141793

Int. Cl.² G02F *1/16*

U.S. Cl. 350—161 W **4 Claims**



1. A light deflector for deflecting an incident beam of light through a predetermined angle comprising:

an acousto-optic medium formed of an anisotropic crystal having light incidence and exit surfaces and an acoustic wave incidence surface, said light incidence surface being inclined with respect to the (001) plane of said crystal at an angle which is less than 10°, and said acoustic wave incidence surface being inclined with respect to the (110) plane of said crystal, and

an ultrasonic wave source affixed to said acoustic wave incidence surface for propagating an ultrasonic energy wavefront in said crystal, the direction of the normal to said wavefront being different from the direction of ultrasonic energy propagation in said crystal.

4,037,934
MICROSCOPE OBJECTIVE

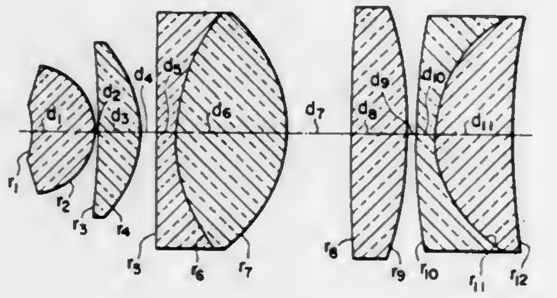
Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Nov. 11, 1975, Ser. No. 630,899

Claims priority, application Japan, Nov. 15, 1974, 49-131140

Int. Cl.² G02B *21/02*

U.S. Cl. 350—175 ML **6 Claims**



1. A microscope objective comprising a front lens group and a rear lens group, said front lens group comprising a first positive lens component having a concave surface positioned toward the object side and made of material having a high refractive index and low dispersion, a second positive meniscus lens component made of low dispersion material and a third cemented lens component having positive power and a cemented surface convex toward the object side and comprising a lens made of low dispersion material, said rear lens group comprising a fourth positive lens component made of low dispersion material and a fifth positive cemented lens component having a rear surface convex toward the object side, said microscope objective satisfying the following conditions:

$$n_I > 1.77,\ \nu_I > 49 \qquad (1)$$
$$r_a > 0 \qquad (2)$$
$$3f < (r_b/n_b - 1) \qquad (3)$$
$$5.9 < f_{II}/f_I < 20 \qquad (4)$$

wherein reference symbol n_I represents refractive index of the first lens component, reference symbol ν_I denotes Abbe's number of the first lens component, reference symbol r_a designates radius of curvature of one cemented surface of the third lens component, reference symbol r_b represents radius of curvature of the image side surface of the fifth lens component, reference symbol n_b denotes refractive index of the image side lens element of the fifth lens component, and reference symbols f, f_I and f_{II} designate the total focal lengths of the entire lens system, the front lens groups and the rear lens group respectively.

4,037,935
HIGH-SPEED ADJUSTABLE FOCUS TELEPHOTO OBJECTIVE LENS

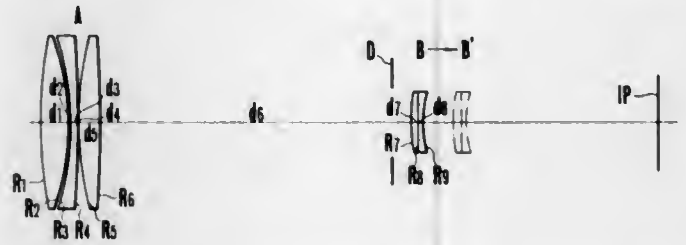
Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 4, 1975, Ser. No. 610,338

Claims priority, application Japan, Sept. 11, 1974, 49-104736

Int. Cl.² G02B *13/02*

U.S. Cl. 350—176 **11 Claims**



1. A high-speed focus adjustable telephoto objective lens, comprising:

a fixed lens group which has a positive refracting power and has at least one negative lens, said fixed lens group further being fixed at a position separated from the image surface by a prescribed length,

a movable lens group, which has a negative refracting power and has at least one positive element lens and at least one negative element lens, wherein the front surfaces contacting air of these element lenses have their convex planes facing toward an object and the rear faces thereof contacting air have their concave planes facing toward an image, said movable lens group being located at an object side on an axis being separated from said fixed lens group, and the diameters of the element lenses within the movable lens group being smaller than the diameters of the lenses within the fixed lens group,

whereby said movable lens group is shifted toward an object as said telephoto lens is refocused from an object at far distance to an object at close distance.

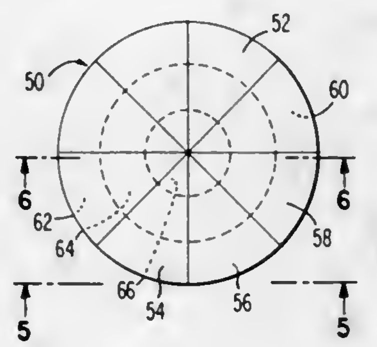
4,037,936
CORRECTING LENS HAVING TWO EFFECTIVE SURFACES

Albert Maxwell Morrell, Lancaster, Pa., and Dennis Henry Irlbeck, Cranford, N.J., assignors to RCA Corporation, New York, N.Y.

Continuation of Ser. No. 298,637, Oct. 18, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,356

Int. Cl.² G02B *3/02;* G03B *41/00*

U.S. Cl. 350—189 **3 Claims**



1. A correcting lens for use in the formation of a color picture tube screen comprising,

two effective surfaces on opposite sides of said lens, each surface comprising a plurality of elements separated by boundaries of discontinuity, one of said surfaces having radially extending boundaries of discontinuity and elements on opposite sides of said lens contoured to cooperatively reduce misregister in said tube.

4,037,937
VARIABLE MAGNIFICATION LENS SYSTEM USING SYMMETRIC LENS OF VARIABLE FOCAL LENGTH

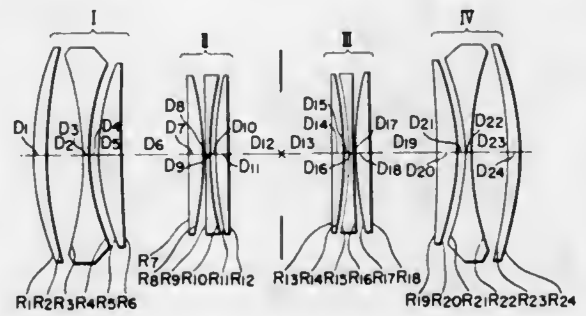
Kazuo Minoura, Shirane, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 299,307, Oct. 20, 1972, abandoned. This application May 3, 1974, Ser. No. 466,601

Claims priority, application Japan, Oct. 22, 1971, 46-83374; Apr. 17, 1972, 47-37668

Int. Cl.² G02B *15/16*

U.S. Cl. 350—184 **10 Claims**



1. In a variable magnification optical system having a central plane of symmetry and adapted to be interposed between a stationary object plane and a stationary image plane axially spaced from the object plane, wherein the system includes first and second pairs of lens groups each symmetrically disposed with respect to the central plane with the second pair being interior of the first pair, the improvement being that the lens groups of the first pair are stationary and the lens group of the second pair are respectively movable axially in symmetrical relation with respect to the central plane, and wherein the lens groups of the first pair are of negative power and the lens groups of the second pair are of opposite power and said two pairs of lens groups including all the lenses betwen the object and image planes and wherein the system is movable as a unit between the object and the image planes.

4,037,938
RETROFOCUS-TYPE OBJECTIVE FOR ENDOSCOPES

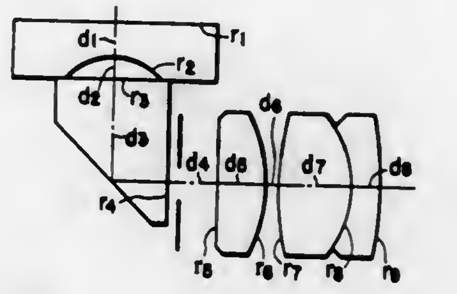
Nobuo Yamashita, Tama, and Toshihiro Imai, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan

Filed Nov. 26, 1975, Ser. No. 635,424

Claims priority, application Japan, Nov. 27, 1974, 49-136922

Int. Cl.² G02B *13/04*

U.S. Cl. 350—202 **13 Claims**



1. A retrofocus-type objective for endoscopes comprising a front diverging lens group comprising a lens having negative refractive power and a rear converging lens group comprising a positive lens and a positive cemented doublet lens whose cemented surface has negative refractive power, and said objective satisfying the following conditions:

$$|r_0| > |r_0'| \qquad (1)$$

$$0.8 \leqq m \leqq 2.5 \qquad (2)$$

$$0.5 \leqq |f\{1/f + (n_o - 1)/r_o\}| \leqq 1.0 \qquad (3)$$

$$0.5 \leqq f/|r_a| \leqq 1.2 \qquad (4)$$

wherein the reference symbol m represents the ratio of the total focal length of the rear converging lens group relative to the total focal length of the entire objective system as a whole, the reference symbol f_1 denotes the focal length of the front converging lens group, the reference symbol f designates the total focal length of the objective system as a whole, the reference symbol n_0 represents refractive index of the positive lens located on the object side of the rear converging lens group, the reference symbols r_0 and r_0' denote radii of curvature of the front and rear surfaces respectively of the positive lens located on the object side of the rear converging lens group and the reference symbol r_a designates radius of curvature on the cemented surface of the cemented lens of the rear converging lens group.

4,037,939
VARIABLE FIELD OF VIEW, VARIABLE MAGNIFICATION LENS ASSEMBLY FOR MINIATURE IMAGE VIEWER

William R. Latady, 220 Prospect St., Hingham, Mass. 02043

Continuation-in-part of Ser. No. 559,163, March 17, 1975, and a continuation-in-part of Ser. No. 577,983, May 16, 1975. This application May 19, 1975, Ser. No. 578,411

Int. Cl.² G02B *27/02*

U.S. Cl. 350—241 **2 Claims**

1. A miniature image viewer employing a scannable magnifying lens adapted for viewing images having information of a size not normally discernable to the human eye, said viewer comprising in combination:

a. a housing;

b. means for mounting a planar image within said housing;

c. means for illuminating said image;

c striking said photoconductive layer from one side with actinic radiation in imagewise configuration; and
d uniformly striking said photoconductive layer from its other side with actinic radiation which is absorbed by said photoconductive layer in an amount effective to limit the intensity of uniform actinic radiation transmitted through said photoconductive layer no greater than about one-third of the intensity of said imagewise configured actinic radiation striking said one side of said photoconductive layer, wherein the amount of uniform actinic radiation absorbed by said photoconductive layer is sufficient to create a space charge limited current within said photoconductive layer

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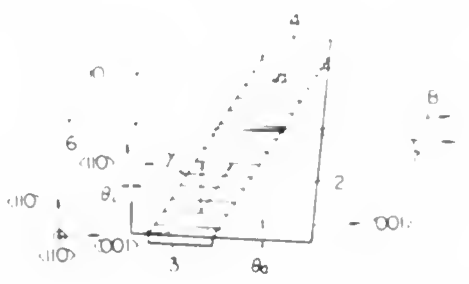
4,037,933

LIGHT DEFLECTOR OF ACOUSTO-OPTIC INTERACTION TYPE

Tsutomu Yano; Koetsu Saito; Kuniaki Fukaya, all of Kawasaki, and Akinori Watanabe, Komae, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan
Filed Dec. 4, 1975, Ser. No. 637,702
Claims priority, application Japan, Dec. 9, 1974, 49-141793
Int. Cl.² G02F *1/16*
U.S. Cl. 350—161 W **4 Claims**

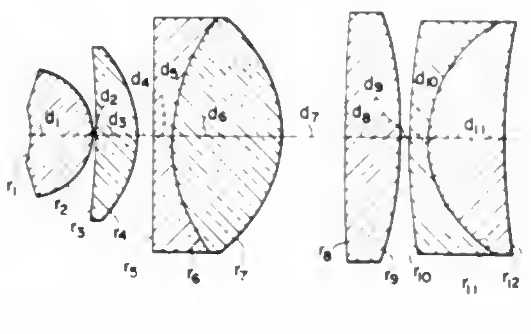


1. A light deflector for deflecting an incident beam of light through a predetermined angle comprising.
- an acousto-optic medium formed of an anisotropic crystal having light incidence and exit surfaces and an acoustic wave incidence surface, said light incidence surface being inclined with respect to the (001) plane of said crystal at an angle which is less than 10°, and said acoustic wave incidence surface being inclined with respect to the (110) plane of said crystal, and
- an ultrasonic wave source affixed to said acoustic wave incidence surface for propagating an ultrasonic energy wavefront in said crystal, the direction of the normal to said wavefront being different from the direction of ultrasonic energy propagation in said crystal.

4,037,934

MICROSCOPE OBJECTIVE

Masaki Matsubara, Hachiouji, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan
Filed Nov. 11, 1975, Ser. No. 630,899
Claims priority, application Japan, Nov. 15, 1974, 49-131140
Int. Cl.² G02B *21/02*
U.S. Cl. 350—175 ML **6 Claims**



1. A microscope objective comprising a front lens group and a rear lens group, said front lens group comprising a first positive lens component having a concave surface positioned toward the object side and made of material having a high refractive index and low dispersion, a second positive meniscus lens component made of low dispersion material and a third cemented lens component having positive power and a cemented surface convex toward the object side and comprising a lens made of low dispersion material, said rear lens group comprising a fourth positive lens component made of low dispersion material and a fifth positive cemented lens component having a rear surface convex toward the object side, said microscope objective satisfying the following conditions:

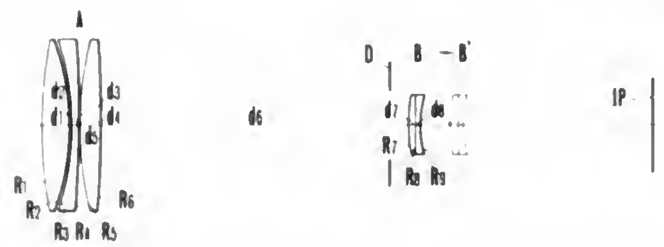
$$n_I > 1.77,\ \nu_I > 49 \quad (1)$$
$$r_a > 0 \quad (2)$$
$$3f < (r_b/n_b - 1) \quad (3)$$
$$5.9 < f_{II}/f_I < 20 \quad (4)$$

wherein reference symbol n_I represents refractive index of the first lens component, reference symbol ν_I denotes Abbe's number of the first lens component, reference symbol r_a designates radius of curvature of one cemented surface of the third lens component, reference symbol r_b represents radius of curvature of the image side surface of the fifth lens component, reference symbol n_b denotes refractive index of the image side lens element of the fifth lens component, and reference symbols f, f_I and f_{II} designate the total focal lengths of the entire lens system, the front lens groups and the rear lens group respectively.

4,037,935

HIGH-SPEED ADJUSTABLE FOCUS TELEPHOTO OBJECTIVE LENS

Kikuo Momiyama, Yokohama, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Sept. 4, 1975, Ser. No. 610,338
Claims priority, application Japan, Sept. 11, 1974, 49-104736
Int. Cl.² G02B *13/02*
U.S. Cl. 350—176 **11 Claims**



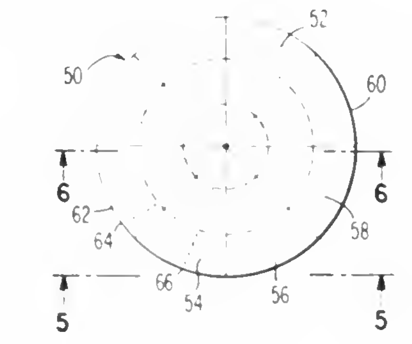
1. A high-speed focus adjustable telephoto objective lens, comprising:
- a fixed lens group which has a positive refracting power and has at least one negative lens, said fixed lens group further being fixed at a position separated from the image surface by a prescribed length,
- a movable lens group, which has a negative refracting power and has at least one positive element lens and at least one negative element lens, wherein the front surfaces contacting air of these element lenses have their convex planes facing toward an object and the rear faces thereof contacting air have their concave planes facing toward an image, said movable lens group being located at an object side on an axis being separated from said fixed lens group, and the diameters of the element lenses within the movable lens group being smaller than the diameters of the lenses within the fixed lens group,

whereby said movable lens group is shifted toward an object as said telephoto lens is refocused from an object at far distance to an object at close distance.

4,037,936

CORRECTING LENS HAVING TWO EFFECTIVE SURFACES

Albert Maxwell Morrell, Lancaster, Pa., and Dennis Henry Irlbeck, Cranford, N.J., assignors to RCA Corporation, New York, N.Y.
Continuation of Ser. No. 298,637, Oct. 18, 1972, abandoned. This application Apr. 5, 1974, Ser. No. 458,356
Int. Cl.² G02B *3/02*; G03B *41/00*
U.S. Cl. 350—189 **3 Claims**

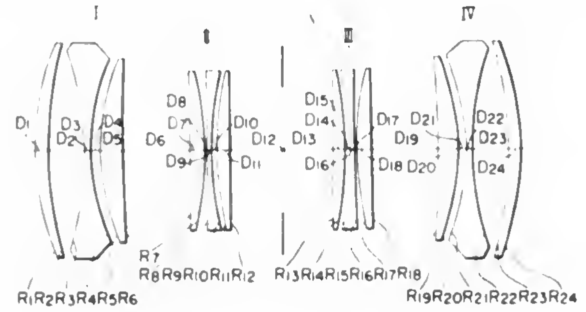


1. A correcting lens for use in the formation of a color picture tube screen comprising,
- two effective surfaces on opposite sides of said lens, each surface comprising a plurality of elements separated by boundaries of discontinuity, one of said surfaces having radially extending boundaries of discontinuity and elements on opposite sides of said lens contoured to cooperatively reduce misregister in said tube.

4,037,937

VARIABLE MAGNIFICATION LENS SYSTEM USING SYMMETRIC LENS OF VARIABLE FOCAL LENGTH

Kazuo Minoura, Shirane, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Continuation of Ser. No. 299,307, Oct. 20, 1972, abandoned. This application May 3, 1974, Ser. No. 466,601
Claims priority, application Japan, Oct. 22, 1971, 46-83374; Apr. 17, 1972, 47-37668
Int. Cl.² G02B *15/16*
U.S. Cl. 350—184 **10 Claims**

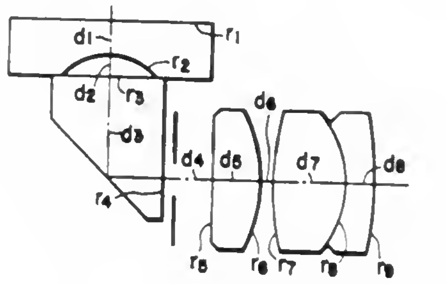


1. In a variable magnification optical system having a central plane of symmetry and adapted to be interposed between a stationary object plane and a stationary image plane axially spaced from the object plane, wherein the system includes first and second pairs of lens groups each symmetrically disposed with respect to the central plane with the second pair being interior of the first pair, the improvement being that the lens groups of the first pair are stationary and the lens group of the second pair are respectively movable axially in symmetrical relation with respect to the central plane, and wherein the lens groups of the first pair are of negative power and the lens groups of the second pair are of opposite power and said two pairs of lens groups including all the lenses betwen the object and image planes and wherein the system is movable as a unit between the object and the image planes.

4,037,938

RETROFOCUS-TYPE OBJECTIVE FOR ENDOSCOPES

Nobuo Yamashita, Tama, and Toshihiro Imai, Hachiouji, both of Japan, assignors to Olympus Optical Co., Ltd., Japan
Filed Nov. 26, 1975, Ser. No. 635,424
Claims priority, application Japan, Nov. 27, 1974, 49-136922
Int. Cl.² G02B *13/04*
U.S. Cl. 350—202 **13 Claims**



1. A retrofocus-type objective for endoscopes comprising a front diverging lens group comprising a lens having negative refractive power and a rear converging lens group comprising a positive lens and a positive cemented doublet lens whose cemented surface has negative refractive power, and said objective satisfying the following conditions:

$$|r_0| > |r_0'| \quad (1)$$
$$0.8 < m < 2.5 \quad (2)$$
$$0.5 < |f\{1/f_1 + (n_0 - 1)/r_0\}| < 1.0 \quad (3)$$
$$0.5 < f/|r_a| < 1.2 \quad (4)$$

wherein the reference symbol m represents the ratio of the total focal length of the rear converging lens group relative to the total focal length of the entire objective system as a whole, the reference symbol f_1 denotes the focal length of the front converging lens group, the reference symbol f designates the total focal length of the objective system as a whole, the reference symbol n_0 represents refractive index of the positive lens located on the object side of the rear converging lens group, the reference symbols r_0 and r_0' denote radii of curvature of the front and rear surfaces respectively of the positive lens located on the object side of the rear converging lens group and the reference symbol r_a designates radius of curvature on the cemented surface of the cemented lens of the rear converging lens group.

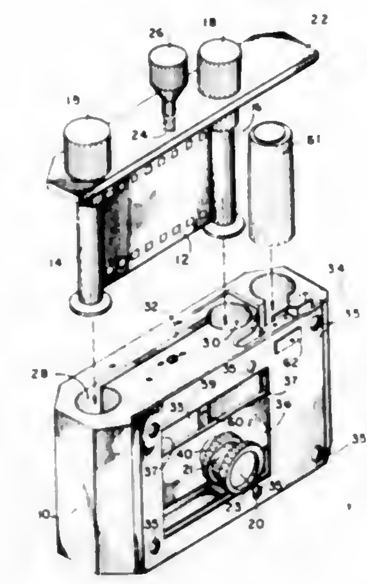
4,037,939

VARIABLE FIELD OF VIEW, VARIABLE MAGNIFICATION LENS ASSEMBLY FOR MINIATURE IMAGE VIEWER

William R. Latady, 220 Prospect St., Hingham, Mass. 02043
Continuation-in-part of Ser. No. 559,163, March 17, 1975, and a continuation-in-part of Ser. No. 577,983, May 16, 1975. This application May 19, 1975, Ser. No. 578,411
Int. Cl.² G02B *27/02*
U.S. Cl. 350—241 **2 Claims**

1. A miniature image viewer employing a scannable magnifying lens adapted for viewing images having information of a size not normally discernable to the human eye, said viewer comprising in combination:
a. a housing;
b. means for mounting a planar image within said housing;
c. means for illuminating said image;

d. a variable field of view, variable magnification lens assembly mounted within said housing, said assembly having a variable focal length for viewing at least a portion of said image at a first magnification and for viewing a lesser portion of said image at a second higher magnification, said assembly comprising a variable magnification zoom lens system; and



e. lens scanning means arranged to move said lens assembly in a plane to scan the surface of said image.

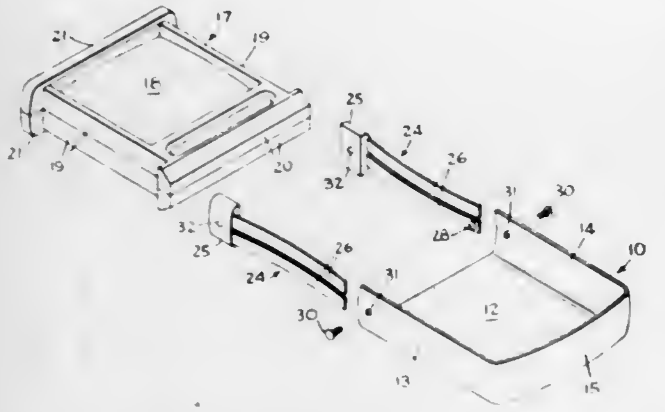
4,037,940
MAGNIFYING LENS DEVICE

Howard D. Yates, Bradford; James A. Smyth, Wilcox, and Paul A. Hajdu, Bradford, all of Pa., assignors to Zippo Manufacturing Company, Bradford, Pa.

Filed Sept. 15, 1975, Ser. No. 613,211

Int. Cl.² G02B *7/02*

U.S. Cl. 350—242 **4 Claims**



1. In a magnifying lens assembly, an open ended generally rectangular casing, a pair of lens members movable into and out of said casing, and spring means at opposite sides of the interior of said casing for cooperation with said lens members, each of said spring means comprising an integral member including an abutment portion within and adjacent to the open end of said casing and fixed thereto and a pair of spring leaves integral with said abutment portion and extending rearwardly therefrom and bowed laterally toward said lens members, each of said lens members having lateral extensions at its rear end for engagement with said abutment portions to limit outward movement of said lens members and for engaging laterally against said spring leaves to guide and center said lens members into alignment with said casing, said abutment portions being proportioned to provide guideways and centering means for said lens members at the open end of said casing.

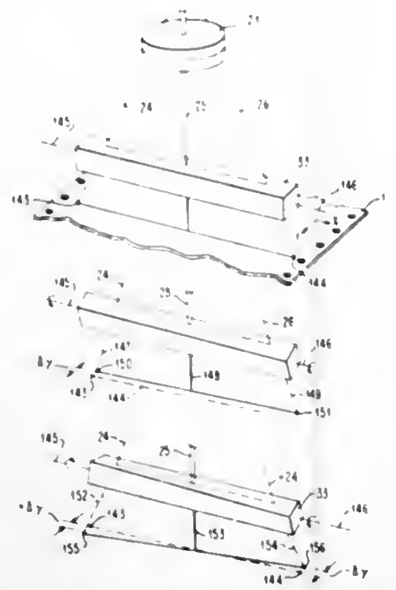
4,037,941
INSPECTION TOOL

James Garman Belleson, Hillsborough, Calif., and Kendall Clark, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 592,154, June 30, 1975. This application Mar. 25, 1976, Ser. No. 670,329

Int. Cl.² G02B *27/17*

U.S. Cl. 350—285 **11 Claims**



1. An inspection tool comprising: means to feed a workpiece to be inspected into a work zone, said workpiece having a pattern to be inspected; a source of coherent light and means to effect a sweep of said coherent light across said work zone; first light detector means positioned adjacent said work zone to receive light reflected from a workpiece in said zone from said sweep of coherent light; an elongated flexible prism mounted for rotation adjacent said work zone and in the path of said sweep of coherent light, intermediate said work zone and said source of coherent light; first and second actuator means connected respectively to opposite ends of said flexible prism; means to energize at least one of said first and second actuator means to effect rotation of at least said one end of said flexible prism upon said first light detector means detecting misalignment of said workpiece.

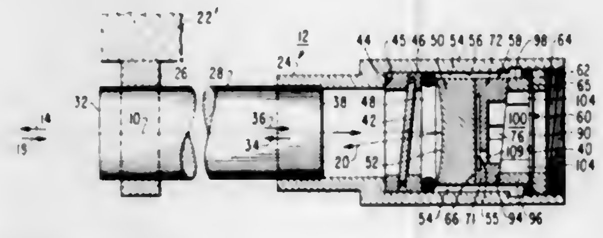
4,037,942
OPTICAL ADJUSTMENT DEVICE

Robert Charles Guyer, Beverly, Mass., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 19, 1976, Ser. No. 668,413

Int. Cl.² G02B *5/08*

U.S. Cl. 350—285 **6 Claims**



1. In combination:

an optical element having an optical axis,

means for mounting the element arranged so that the element can tilt about an axis substantially transverse said optical axis and is restrained from rotating substantially about said optical axis,

first and second wedge members each having a first planar surface tapering toward a second planar surface thereof, said second surfaces having a given spaced relationship when said first surfaces are contiguous, and

means rotatably mounting said members for wedging said first member between said second member and said element with said first surfaces contiguous, said wedging means and said members being arranged so that each member can rotate with respect to the other member, the rotation of each of said member pivoting the optical axis of said element without rotating the element about the optical axis of said wedge members each including means by which each wedge member can be rotated with respect to the other wedge member.

4,037,943
REFLECTION TYPE IMAGE FORMING OPTICAL SYSTEM HAVING A LARGE ANGLE OF VIEW

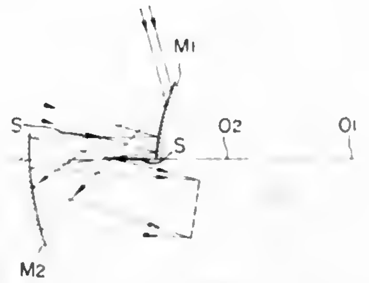
Satoru Anzai, Inagi, Japan, assignor to Nippon Kogaku K.K., Tokyo, Japan

Filed Mar. 10, 1975, Ser. No. 557,185

Claims priority, application Japan, Mar. 19, 1974, 49-30547

Int. Cl.² G02B *17/06*

U.S. Cl. 350—294 **3 Claims**



1. A reflection type image forming optical system having a large angle of view comprising:

a convex spherical reflecting mirror for reflecting incident light;

a concave spherical reflecting mirror disposed with the reflecting surface thereof facing the reflecting surface of the convex mirror, the concave mirror being arranged so that the distance between the center of curvature of the convex mirror and the center of curvature of the concave mirror is greater than half the radius of curvature of the concave mirror; and

a stop disposed between said reflecting surfaces of the convex and concave mirrors, the stop being arranged to select only light that enters the concave mirror at the large angle with respect to the normal thereof, when reflected by the convex mirror at a large angle, and that enters the concave mirror at a small angle with respect to the normal thereof, when reflected by the convex mirror at a small angle.

4,037,944
LOW STRESS OPTICAL MOUNTING STRUCTURE AND METHOD

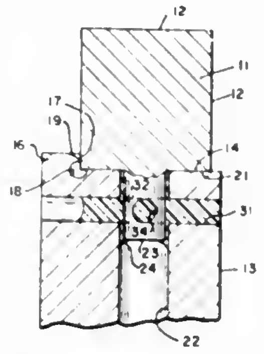
Richard A. Hanson, Concord, Calif., assignor to Systron Donner Corporation, Concord, Calif.

Filed Jan. 23, 1976, Ser. No. 651,721

Int. Cl.² G02B *5/08*

U.S. Cl. 350—310 **14 Claims**

1. A low stress optical system mounted relative to a mounting surface, comprising an optical element, an optical surface and an element support surface on said optical element, a mounting pedestal adapted to be attached to the mounting surface having a mounting bore therein, a pedestal support surface on said pedestal contacting said element support surface, a mounting post extending from said optical element and passing through said element and pedestal support surface and being loosely received in said mounting bore, said mounting post having a longitudinal axis extending substantially parallel to the axis of said mounting bore, means for registering said optical element relative to said mounting pedestal about said longitudinal axis, and a filler disposed between said mounting bore and said loosely received mounting post, whereby said optical element is positively and rigidly located relative to the mounting surface by said pedestal support surface and means for registering, and is substantially free of internally generated and externally induced stress.



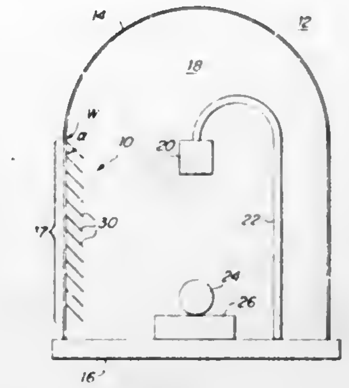
4,037,945
INDIRECT REFLECTIVE WINDOW

John S. Wollam, 53 Alcott St., Acton, Mass. 01720

Filed Apr. 1, 1975, Ser. No. 564,157

Int. Cl.² G02B *5/00*

U.S. Cl. 350—319 **6 Claims**



1. An indirect reflective viewing window for use in a metal-film deposition chamber for providing an unobstructed, indirect, clear and undistorted wide area view of the interior of the chamber and for preventing metal-film deposits from interfering with the reflective viewing of the chamber interior, comprising:

mounting means for attaching to the inside transparent portion of the chamber wall; and

an array carried by said mounting means on the inside of the chamber and including more than two planar reflective elements, each being disposed at an acute first angle to the plane of the window and parallel to each other; each of said reflective elements extending downwardly toward the base of the chamber in overlapping relationship to prevent deposits from forming on the area of the inside surface of the chamber where they are mounted, each of said reflective elements having first and second reflective surfaces for receiving radiation on its first said reflective surface and reflecting it to the second surface of one adjacent said reflective element and for receiving on and reflecting from its said second surface radiation from the first reflective surface of another adjacent reflective element, so that said radiation may then exit the chamber on a path parallel to the incident radiation.

4,037,946
FLEXIBLE BAR FOR SPECTACLE-FRAMES

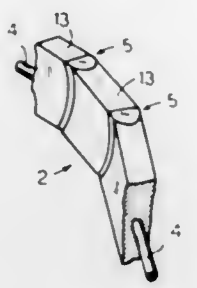
Oreste Blumenthal, Turin, Italy, assignor to S.p.A. Giuseppe Ratti Industria Ottica, Turin, Italy

Filed Jan. 22, 1975, Ser. No. 542,957

Claims priority, application Italy, May 28, 1974, 68658/74

Int. Cl.² G02C *5/16, 5/18*

U.S. Cl. 351—114 **8 Claims**



1. A flexible element for temples of spectacle-frames, comprising a bar formed of a chain of articulated elements traversed by a deformable longitudinal core arranged to hold them together, in which adjacent articulated elements have similar curved bearing surfaces confronting each other and nesting together for relative movement as the bar is flexed, said articulated elements also having side and end faces defining the girthal periphery of the bar, at least one such articulated element having a shape formed substantially by a portion of a body of revolution defined by surfaces which are obtained by an envelope from a generating plane figure which is made to rotate through an arc about an axis parallel to and spaced from the figure itself, the side and end faces of the articulated elements being unobstructed to permit free movement therebetween during flexing of the bar, said core being deformable to at least flex about axes lying parallel to said axis.

4,037,947
FILM-TRANSPORT CONTROL FOR SOUND-FILM CAMERA

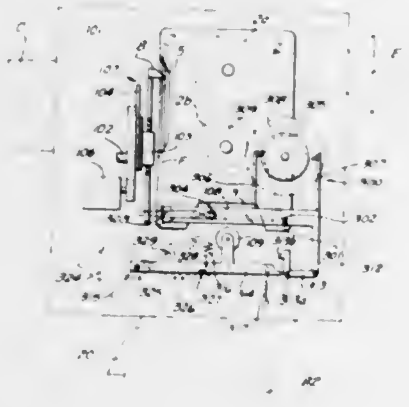
Otto Freudenschuss; Otto Kantner, and Peter Revy von Belvard, all of Vienna, Austria, assignors to Karl Vockenhuber and Raimund Hauser, both of Vienna, Austria

Continuation-in-part of Ser. No. 460,136, April 11, 1974, abandoned. This application Mar. 22, 1976, Ser. No. 669,084

Claims priority, application Austria, May 21, 1975, 3906/75; May 24, 1973, 4565/73

Int. Cl.² G03B *31/02*

U.S. Cl. 352—27 **14 Claims**



1. In a cine camera, in combination:

a casing adapted to accommodate a perforated motion-picture film having a sound track, said casing being provided with an exposure gate and sound-recording means;

electrically powered drive means in said casing for transporting said film past said exposure gate and said sound-recording means, said drive means including a reciprocable traction claw engageable with the film perforations in the vicinity of said exposure gate and further including a continuously rotatable capstan and a pinch roller adapted to clamp said film therebetween in the vicinity of said sound-recording means;

relatively displaceable support means for said pinch roller and said capstan, said support means including a movable member determining the relative spacing of said pinch roller and said capstan;

biasing means engaging said movable member for urging same from an inactive position into an active position in which the film is clamped between said capstan and said pinch roller;

latch means engageable with said movable member for releasably retaining same in said inactive position;

actuating means for energizing said drive means, said latch means being operatively linked with said actuating means for releasing said movable member at the start of a picture-taking operation; and

restoring means coupled with said drive means for re-engaging said movable member with said latch means by residual kinetic energy upon a de-energization of said drive means by said actuating means.

4,037,948
PHOTOGRAPHIC CAMERA WHICH CAN USE A FILM CARTRIDGE HOUSING A FILM CONTAINING SOUND RECORDING BELT

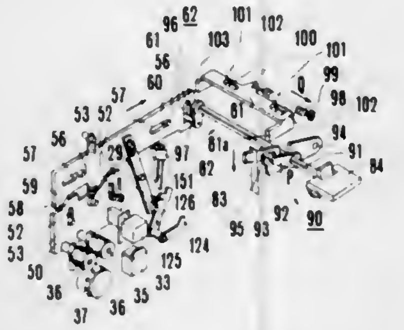
Keiichi Sakaguchi, Yokohama; Yoshio Komine, Tokyo; Toshikazu Ichiyanagi, Tokyo; Mamoru Shimazaki, Tokyo, and Kazuya Hosoe, Machida, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 16, 1974, Ser. No. 461,425

Claims priority, application Japan, Apr. 20, 1973, 48-45553; May 7, 1973, 48-50905

Int. Cl.² G03B *31/02*

U.S. Cl. 352—29 **24 Claims**



1. A motion picture camera adapted to utilize a film catridge housing a sound signal recording photographic film, comprising:

a cartridge housing chamber to house said cartridge;

a covering for said housing chamber, said cover being movable against said housing chamber to close and open the chamber;

sound signal recording means for recording sound signals on said film, said recording means being adapted to be changed over between a first state to functionally couple with said film for sound recording and a second state to release said coupling with the film for prohibiting sound recording on the film;

change over means to change over said recording means between said first and second states, said change over means being operatively connected with the recording means and operable manually from outside of the camera;

blocking means operatively engaging with said change over means to prohibit operation of said change over means to change over the recording means from the second state to the first state, said blocking means being movable between a first position to prohibit said operation of the change over means and to a second position to enable said operation of the change over means, said blocking means being shifted by said cover from its first position to its second position when said cover closes said housing chamber;

locking means for locking the cover at a state wherein the housing chamber is closed, said locking means being operatively connected to the change over means to lock the cover in association with operation of the change over means to change over the recording means from its second state to its first state, and to release the locking of the cover in association with operation of the change over means to change cover the recording means from its first state to its second state;

with both the setting of the sound recording and the locking of the cover being effected simultaneously by one operation of the change over means only when the cover is in a state closing the cartridge housing chamber.

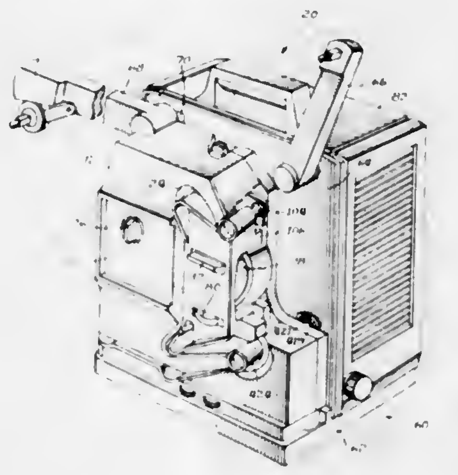
4,037,949
SLOT LOAD PROJECTOR

Vincent S. Pasturczak, Chicago, and Melvin T. Kerstein, Lincolnwood, both of Ill., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 17, 1975, Ser. No. 641,495

Int. Cl.² G03B *1/58*

U.S. Cl. 352—158 **27 Claims**



1. In a motion picture projector having a frame, a slot for edgewise loading of the film, a feed sprocket, a takeup sprocket, a film gate and a drive means for driving the film through the projector, a multiple position guide means for engaging the film and defining the path of travel thereof, said multiple position guide means comprising:

a manually operable actuator mounted on the frame for moving said guide means between an open position wherein a film strip can be loaded into the projector and a closed position where the film strip is engaged by said film gate and said sprockets;

a pair of loop forming rollers, one on either side of the film gate, said rollers being movable, in response to operation of said actuator, between an open position for engaging the film and forming a loop on either side of said gate and a retracted closed position out of engagement with the film strip;

cam means on the frame for defining the path of travel of the respective rollers; and

means mounting the feed roller and the takeup roller for movement in an arcuate path of travel, first away from said film strip, then toward said film strip, when moving from said closed to said open positions in response to operation of the actuator, said mounting means including a first mounting plate for each roller, a cam slot in each of said first mounting plates for engagement with said cam means, and a second mounting plate pivotally mounted on the frame, said first mounting plate being pivotally mounted on said second mounting plate for translatory and rotational movement, said second mounting plates being drivingly connected to said actuator whereby the feed roller and takeup roller move in a path defined by said cam means in response to operation of the actuator.

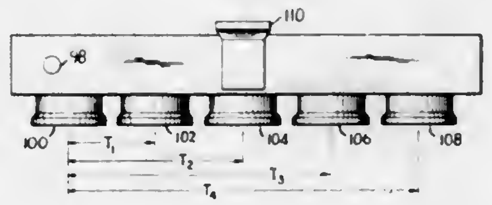
4,037,950
CAMERA FOR TAKING STEREOSCOPIC PICTURES

Allen Kwok Wah Lo, Atlanta, and Jerry Curtis Nims, Dunwoody, both of Ga., assignors to Dimensional Development Corporation, Atlanta, Ga.

Division of Ser. No. 508,810, Sept. 24, 1974, Pat. No. 3,960,563, which is a continuation-in-part of Ser. No. 398,990, Sept. 20, 1973, abandoned, which is a continuation-in-part of Ser. No. 292,796, Sept. 27, 1972, abandoned. This application Mar. 15, 1976, Ser. No. 666,865

Int. Cl.² G03B *35/00*

U.S. Cl. 352—58 **6 Claims**



1. In a camera for taking a plurality N of two-dimensional views of an object field for use in composing a stereoscopic picture of the type incorporating a viewing lenticular screen of lenticule width W, the camera including corresponding pluralities N of lenses and associated film frames, the lenses being aligned in a row with their optical axes substantially equidistantly spaced apart and susbstantially in parallel, the improvement comprising:

the distance T between the optical axes of the endmost lenses being related to predetermined values of $X_{r'}$, R, f, a and b generally in accordance with:

$$T = \frac{X_{r'}\, ab}{Rf(b - a)}$$

where

$X_{r'}$ is the total of (1) the parallax value between the image of the nearest foreground element in the object field and the image of the farthest background element in the object field, as formed on the stereoscopic picture from the film frame associated with one endmost lens, and (2) the parallax value between said nearest foreground element image and said farthest background image, as formed on the stereoscopic picture from the film frame associated with the other endmost lens;

a is the distance from the row of lenses to the nearest foreground element in the object field;

b is the distance from the row of lenses to the farthest background element in the object field;

R is the enlargement ratio between the film frames and the stereoscopic picture; and

f is the effective focal length of the camera lenses.

4,037,951

AUDIO-VISUAL CARTRIDGE AND PLAYER

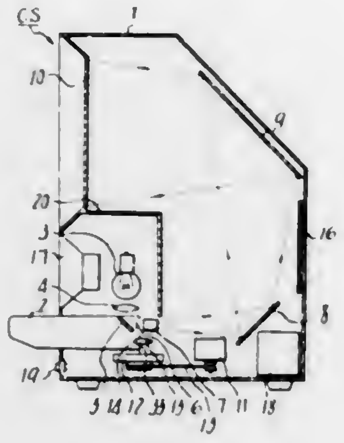
Teiji Aoki, 23-10, Daida-2, Setagaya, Tokyo, Japan

Continuation of Ser. No. 419,871, Nov. 28, 1973, abandoned, which is a division of Ser. No. 342,194, March 16, 1973, Pat. No. 3,844,643. This application July 30, 1975, Ser. No. 600,513

Claims priority, application Japan, Mar. 21, 1972, 47-27466; Apr. 15, 1972, 47-37974; May 20, 1972, 47-59299; June 6, 1972, 47-55671

Int. Cl.^{2} G03B *31/06, 23/02*

U.S. Cl. 353—19 4 Claims



1. The combination of a cartridge player and a film cartridge, said film cartridge having two portions separated by a partition wall for accommodating therein an endless film and an endless magnetic tape mounted on a reel, respectively, a driving means, a plurality of windows formed in said film cartridge for exposing said endless film and said magnetic tape therethrough, a reflector in said cartridge for projecting light passing through said endless film, a pivoted arm, a pinch roller located in said cartridge, mounted on said pivoted arm and engageable with said driving means to drive said magnetic tape and said film, and locking means engageable with said film and tape and comprising a projection engageable with the film and comprising a pivoted arm mounted in the cartridge and engaged with said magnetic tape reel when the cartridge is not in said cartridge player and said arm engaged with said cartridge player to move it out of engagement with said reel when the cartridge is in said cartridge player for automatically locking said endless film and magnetic tape so as to maintain synchronization therebetween when the cartridge is removed from the cartridge player and said locking means being released when said cartridge is mounted into said cartridge player, said cartridge player comprising a housing, a screen provided on said housing of said cartridge player and having a longer horizontal dimension than the vertical dimension, an opening formed through said housing in such a manner that when said film cartridge is loaded through said opening into said cartridge player the partition wall of the cartridge is located parallel to the longer dimension of the screen, a light source mounted in said housing for projecting light onto said reflector provided in said film cartridge, optical means mounted in said housing for projecting light from said reflector to said screen to produce an image of said film on said screen, means for guiding said film cartridge into said cartridge player to a driving position, means for releasing said locking means of said film cartridge when said cartridge is mounted into said cartridge player by said guiding means, and film driving means which is held at a predetermined position with respect to said film when said cartridge is not driven, said film driving means and said film pinch roller gripping said film therebetween and driving the film when said film driving means is energized and further including means for locking said cartridge in said machine when said driving means is energized so that the cartridge cannot be removed.

4,037,952

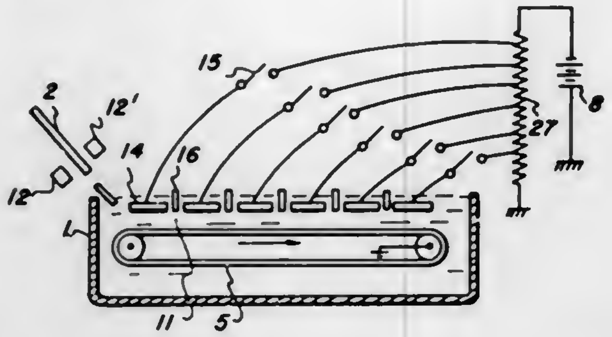
APPARATUS FOR LIQUID DEVELOPMENT OF CUT SHEET ELECTROSTATOGRAPHIC COPIES

Seiji Matsumoto, Tokyo, Japan, assignor to Rank Xerox Ltd., London, England

Division of Ser. No. 393,095, Aug. 30, 1973, Pat. No. 3,951,653. This application Oct. 20, 1975, Ser. No. 623,702

Int. Cl.^{2} G03G *15/00, 15/10*

U.S. Cl. 355—3 P 3 Claims



1. An apparatus useful in electrophoretic development of electrostatically imaged discontinuous insulating sheets comprising:

a. a development zone defined by a backing electrode and a development electrode, said development electrode comprising a plurality of individually biased electrodes, each individually biased electrode being separated from the adjacent individually biased electrode by an insulating spacer and said backing electrode being capable of transporting an electrostatically imaged discontinuous insulating sheet into and through said development zone;

b. a source of electrical energy for providing a biasing potential across said development zone between the backing and development electrode;

c. developer means for contacting a latent electrostatic image on an insulating member with developer materials in said development zone; and

d. sensing means for providing information to the individually biased segments of the development electrode concerning the position of the leading edge and the trailing edge of a discontinuous sheet relative to the development zone to sequentially activate said individually biased segments of the development electrode in synchronization with the passage of the leading edge of an insulating sheet through said zone and to sequentially inactivate said individually biased segments of the development electrode in synchronization with the passage of the trailing edge of an insulating sheet through said zone.

4,037,953

CASSETTE LOADING APPARATUS

Yoshiaki Sone, Tokyo, and Masanari Shirai, Chigasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

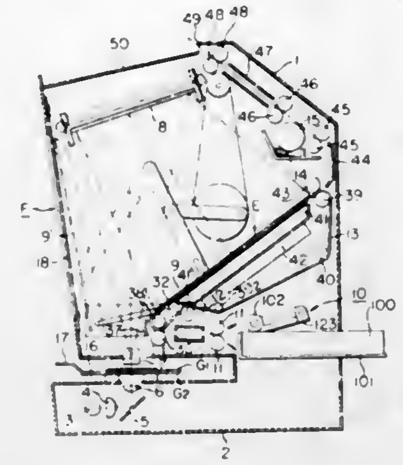
Filed Apr. 6, 1976, Ser. No. 674,302

Claims priority, application Japan, Apr. 10, 1975, 50-48733[U]

Int. Cl.^{2} G03B *13/28*

U.S. Cl. 355—45 7 Claims

7. A device for observing a micro-image and for reproducing the same, including lens means to enlarge and project the micro-image, a screen to receive the projected micro-image, and means including a copy material advancing device comprising: a cassette for storing a stack of sheets of copy material; means fixed to said apparatus for holding said cassette in a supply position; roller means for feeding said sheet material from said cassette to a copying position; and lifting means disposed on said cassette holding means for lifting said roller means while the cassette is moved toward said supply position, until the center of rotation of said roller means is disposed above the topmost sheet of material in said cassette, wherein said roller means then rotates in contact with the sheet material and moves into engagement with the topmost sheet in the cassette as the cassette is moved further along said path toward its said supply position.



4,037,954

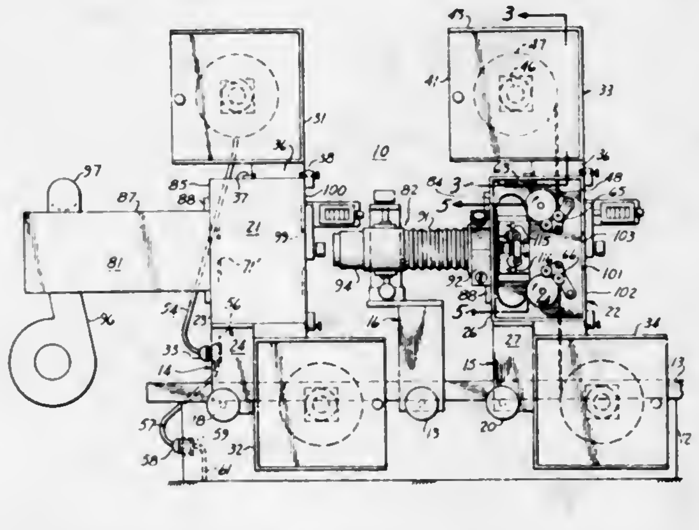
FILM REGISTERING ADVANCING MECHANISM

Harold A. Scheib, Encino, Calif., assignor to Bell & Howell Company, Chicago, Ill.

Filed Feb. 13, 1976, Ser. No. 657,343

Int. Cl.^{2} G03B *27/48, 1/22*

U.S. Cl. 355—50 11 Claims



1. In photographic film handling apparatus, the improvement comprising in combination:

means for providing a film aperture located in a plane; and means for transporting photographic film relative to said film aperture, including a film advancing mechanism mounted at said film aperture and including a first element for intermittently advancing said photographic film past said film aperture and a second element for registering said film relative to said film aperture between successive intermittent advancements, a first movable device for mounting said first element, a second movable device for mounting said second element, and means for moving said first and second mounting devices for said intermittent advancement of said photographic film and said registration of said film, respectively, all portions of said first and second elements, of said first and second movable devices and of said means for moving said first and second mounting devices being located outside and to one side of said aperture as seen in a direction extending perpendicularly to said plane.

4,037,955

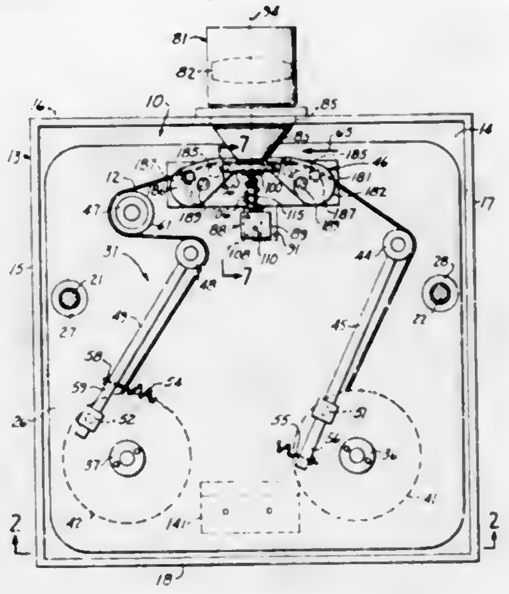
MICROFILM CAMERA AND PHOTOGRAPHIC FILM HANDLING APPARATUS

John Jamieson, Los Gatos, and Henry F. Price, Laguna Niguel, both of Calif., assignors to Bell & Howell Company, Chicago, Ill.

Filed Dec. 26, 1974, Ser. No. 536,702

Int. Cl.^{2} G03B *27/32*

U.S. Cl. 355—54 6 Claims



1. In apparatus for handling photographic film having a first format and alternatively photographic film having a second format different from said first format, the improvement comprising in combination:

photographic imaging equipment comprising a first unit including a first photographic lens system and first means operatively associated with said first lens system for defining a first image aperture, and a second unit including a second photographic lens system and second means operatively associated with said second lens system for defining a second image aperture;

means for releasably mounting said first unit and alternatively said second unit;

a film pressure plate operatively associated with said imaging equipment and common to said first aperture defining means and said second aperture defining means for clamping photographic film having said first format and photographic film having said second format alternatively against said first aperture defining means and against said second aperture defining means;

means coupled to said film pressure plate for actuating said film pressure plate relative to said first aperture defining means and alternatively relative to said second aperture defining means;

means connected to said actuating means for mounting said actuating means in a stationary relationship relative to said means for releasably mounting said first unit and alternatively said second unit;

means for advancing photographic film having said first format and alternatively photographic film having said second format past said film pressure plate;

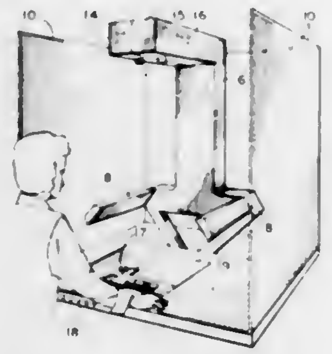
a carriage for mounting said advancing means for movement relative to said film pressure plate and said means for releasably mounting said first unit and alternatively said second unit;

means coupled to said carriage for moving said carriage relative to said film pressure plate and said means for releasably mounting said first unit and alternatively said second unit; and

means for alternatively guiding said advancing film having said first format and said advancing film having said second format in between said film pressure plate and said first aperture defining means and alternatively said second aperture defining means, said guiding means including a film guide base on said carriage in the vicinity of said film pressure plate and two exchangeable film guide units for guiding, respectively, film having said first format and film having said second format, one of said film guide units comprising first film guide members for guiding film having said first format and means for releasably attaching said first film guide members to said film guide base, and the other of said film guide units comprising second film guide members for guiding film having said second format and means for releasably attaching said second film guide members to said film guide base.

4,037,956
VERIFIED MAIL SYSTEM

Earl S. McKeen, Jr., 61 Jacobsen Drive, Norwood, Mass. 02062
Filed Dec. 19, 1975, Ser. No. 642,299
Int. Cl.^{2} G03B *27/32, 27/62;* **G01D** *9/42*
U.S. Cl. 355—77 **5 Claims**

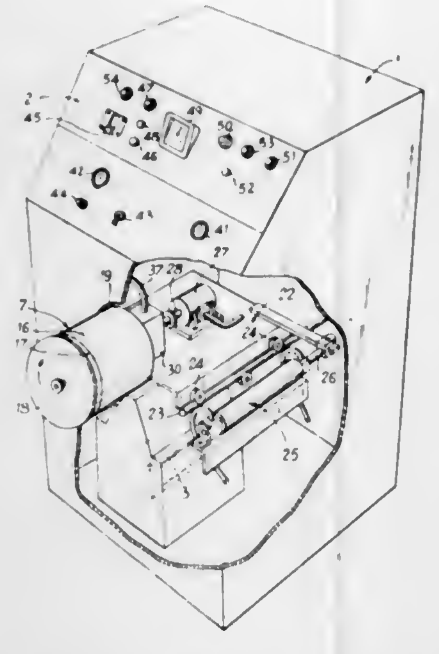


1. A method for the verification of mail contents comprising:
- receiving of mail contents by a postal employee from a postal customer;
- filling out a multipart receipt for said mail contents by said postal employee;
- retaining of one part of said multipart receipt by said postal customer for his records;
- retaining by said postal employee of the remaining parts of said multipart receipt for Post Office use;
- placing one part of said multipart receipt into a tab indicia plate which is placed at the corner of said mail contents to be copied;
- copying said mail contents with said tab indicia plate containing said multipart receipt at its corner;
- sending said copies of said mail contents to a Central Depository for storage;
- retrieving said stored copies at the request of said postal customer;
- reproducing copies of said mail contents;
- verifying that said copies are true copies of the mail contents originally received by the Post Office from said postal customer; and
- mailing said verified copies to said postal customer.

4,037,957
METHOD AND MACHINE FOR THE PRODUCTION OF A SERIGRAPHIC SCREEN BY THE PHOTOCHEMICAL METHOD

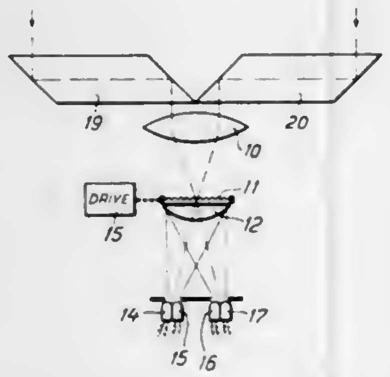
Bernard Lallement, Troyes, France, assignor to Vitos Etablissements Vitoux, Aube, France
Filed Mar. 25, 1975, Ser. No. 561,889
Claims priority, application France, Apr. 4, 1974, 74.11960; Mar. 14, 1975, 75.08019
Int. Cl.^{2} G03B *27/20*
U.S. Cl. 355—91 **23 Claims**

1. Machine for the production of a serigraphic screen from a blank tubular shaped woven fabric screen and a tubular masking film having transparent zones and opaque zones and bearing in the opaque zones the design to be printed in ink from the serigraphic screen, wherein the improvement comprises first means for supporting the tubular screen and the tubular masking film in a cylindrical form with the tubular masking film in surface contact with the tubular screen, said first means including a cylindrically shaped first support surface and a cylindrically shaped second support surface located radially outwardly from said first support surface and providing a space therebetween for the tubular screen and the masking film, second means connected to said first means and operable in the space between said first and second support surfaces for axially and radially stretching the tubular screen and masking film under the conditions of tension to be applied to the finished screen when it is used for printing, and means for directing actinic radiation through the masking film to the tubular screen so that the radiation only affects the portion of the tubular screen corresponding to the transparent zones in the masking film.



4,037,958
APPARATUS FOR DETERMINING PHOTOELECTRICALLY THE POSITION OF AT LEAST ONE FOCUSING PLANE OF AN IMAGE

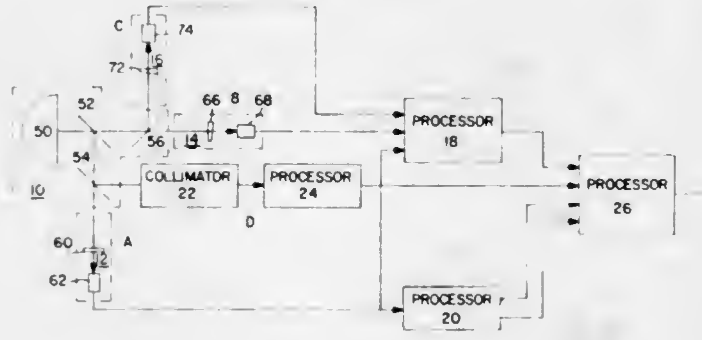
Horst Schmidt, Nauborn; Knut Heitmann; Eckart Schneider, both of Wetzlar, all of Germany, and Walter Mandler, Midland, Canada, assignors to Ernst Leitz Wetzlar GmbH, Wetzlar, Germany
Filed Oct. 15, 1975, Ser. No. 622,452
Claims priority, application Germany, Dec. 21, 1974, 2460805
Int. Cl.^{2} G01C *3/08;* **G01J** *1/20*
U.S. Cl. 356—4 **21 Claims**



1. In an apparatus for determining the position of a focusing plane of an image within an optical device comprising: along an optical axis, an optical correlator incorporating imaging optics for imaging an object into an image plane, at least one structure or grating acting as spatial frequency filter and mounted in or in the vicinity of said image plane of said imaging optics;
- further incorporating means for photoelectrically detecting associated with said spatial frequency filter;
- means for defining the entrance pupil of said imaging optics into a plurality of different regions being traversed by light fluxes emitted from said object as a set of light fluxes to be measured and to be imaged on said spatial frequency filter for being jointly modulated;
- means for splitting said set of light fluxes corresponding to the respective pupil regions into a pair of sets of partial light fluxes;
- means for causing a relative movement between said structure or grating and said image of said object;
- said means within said optical correlator for photoelectrically detecting further generating electrical output signals in response to respective ones of said partial light fluxes; and
- means for processing said signals to drive further electrical signals being indicative of the position of the focusing plane of the image;
- the improvement comprising:
- said means for defining the entrance pupil of said imaging system into a plurality of different regions comprising two rhombic prisms **(19,20)** in front of said optical imaging system, each of said prisms being laterally and symmetrically arranged with respect to said optical axis of said optical imaging system for enlarging the distance between the gravity centers of said entrance pupil of said optical imaging system.

4,037,959
MEANS FOR REAL-TIME LASER SOURCE CHARACTERIZATION

Jon H. Bumgardner, Ridgecrest, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.
Filed Dec. 15, 1975, Ser. No. 640,523
Int. Cl.^{2} G01J *1/00*
U.S. Cl. 356—73 **5 Claims**



1. A system for analysing beams or rays of monochromatic radiation comprising:
- an image collector for incident radiation anywhere from a large area;
- beam splitters arranged behind the collector to create at least three optical paths for said radiation;
- a plurality of attenuators which are located one in each of the optical paths with one optical path attenuated by a uniform optical filter to provide a reference beam and two other optical paths attenuated by optical filters with linear response which are mounted orthogonally to one another;
- a plurality of electro-optical detectors which are placed so that one is at the end of each optical path to intercept the radiation at that point to produce an electrical analog thereof; and
- a plurality of processing circuits attached to each output of said detectors for converting the electrical outputs therefrom to a value which is a reasonable display of a selected property of said beam, whereby the point of origin of said radiation is determined, the optical frequency is determined, the pulse width is determined, the power level is determined, and the pulse repetition frequency (PRF) is determined.

4,037,960
DIGITALLY SETTABLE SELECTIVE CONTROL FOR SPEED OF WAVELENGTH SCAN OR FOR TIME BASE SCAN

James H. Macemon, Glen Burnie, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.
Filed May 4, 1976, Ser. No. 683,188
Int. Cl.^{2} G01N *21/00;* **G01J** *3/42*
U.S. Cl. 356—73 **7 Claims**

1. In a spectrophotometer adapted to operate over a band of wavelengths:
- a recorder having a plotter-scriber for drawing a graph in two coordinates;
- means responsive to an optical meausrement made by said spectrophotometer for controlling the position of the plotter-scriber along one coordinate;
- said recorder having means for controlling the position of the plotter-scriber along another coordinate in accordance with the value of a signal;
- mode selector means for controlling the spectrophotometer to operate in a selected one of different modes;
- a common digitally settable means for selecting a desired scan rate;
- means, under the control of said mode selector means in a first of said different modes, for generating a time base having a rate of rise determined by said common digitally settable means and for supplying said time base to said recorder as said signal;
- means, under the control of said mode selector means in a second or said different modes, for scanning the wavelengths to which said spectrophotometer is set at a rate determined by said common digitally settable means, and for producing a voltage, indicative of the wavelength to which the spectrophotometer is set, and for supplying said voltage to said recorder as said signal.

4,037,961

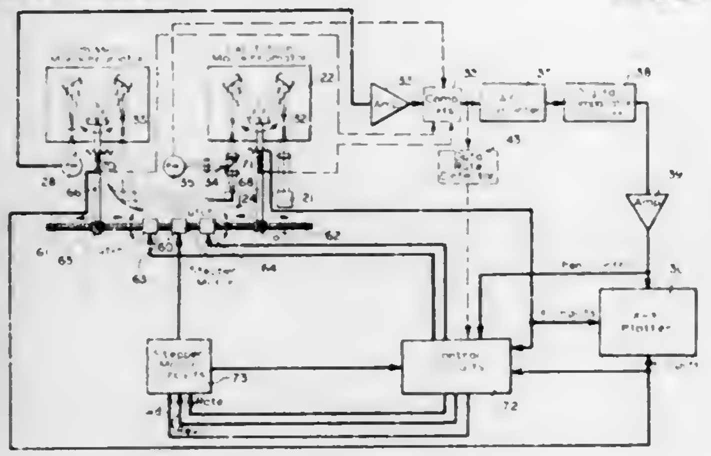
SYSTEM AND APPARATUS FOR CONTOUR PLOTTING THE TOTAL LUMINESCENCE SPECTRUM OF A SAMPLE

James H. Macemon, Glen Burnie, Md., assignor to Baxter Travenol Laboratories, Inc., Deerfield, Ill.

Filed July 6, 1976, Ser. No. 702,495

Int. Cl.² G01N *21/52*

U.S. Cl. 356—85 **4 Claims**



1. A system for producing a two-dimensional contour plot of the total luminescence spectrum of a sample comprising, in combination:

- excitation means including a monochromator having a variable operating wavelength dependent on applied pulses for generating a source of monochromatic light for application to said sample;
- emission detection means including a monochromator having a variable operating wavelength dependent on applied pulses for generating an output signal dependent on the amplitude of flourescent light emitted from said sample;
- an X-Y plotter including a marking pen responsive to an applied control effect and X and Y axis positioning means;
- synchronization means coupled between said monochromators and said position means for synchronizing the position of said pen on said plotter with the operating wavelength of said monochromators;
- pen control means responsive to the presence of a predetermined level at the output of said emission means for actuating said pen; and
- scanning means for progressively scanning one of said monochromators through a predetermined range of wavelengths, and for incrementally advancing the other of said monochromators upon the completion of each such scan, to form said desired contour plot.

4,037,962

APPARATUS FOR THE SPECTRAL ANALYSIS OF MATERIALS

Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhutte, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 10, 1976, Ser. No. 665,771

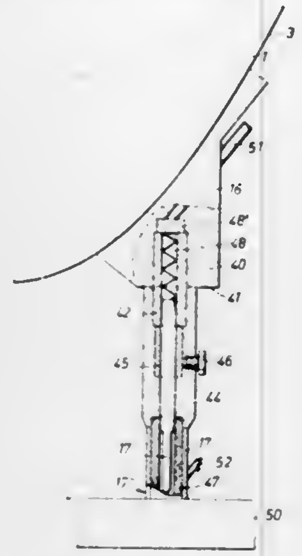
Claims priority, application Germany, Mar. 26, 1975, 2513345

Int. Cl.² G01J *3/30*

U.S. Cl. 356—86 **10 Claims**

1. An apparatus for spectroscopically analyzing the composition of a workpiece, said apparatus comprising:

- a support;
- a sleeve mounted on said support and having an open end engageable with a surface of the workpiece and formed with a laterally open cutout;
- an electrode on said support and having an electrode tip limitedly displaceable in said sleeve adjacent said open end thereof;
- means between said support and said electrode for fixing said electrode in said sleeve with said tip spaced inwardly of said open end thereof;
- means connected to said electrode for sparking between said surface and said tip when same are spaced apart and said open end abuts said surface;
- optical means on said support directed through said cutout at the space between said tip and said surface and including a primary slit for transmitting into said support the light of a spark in said space between said tip and said surface; and
- means in said support including a Rowland grating and a plurality of secondary slits for breaking the light received from said optical means down into an analyzable spectrum.



4,037,963

SPARK-DISCHARGE APPARATUS WITH GROUND DETECTION SAFETY CIRCUIT

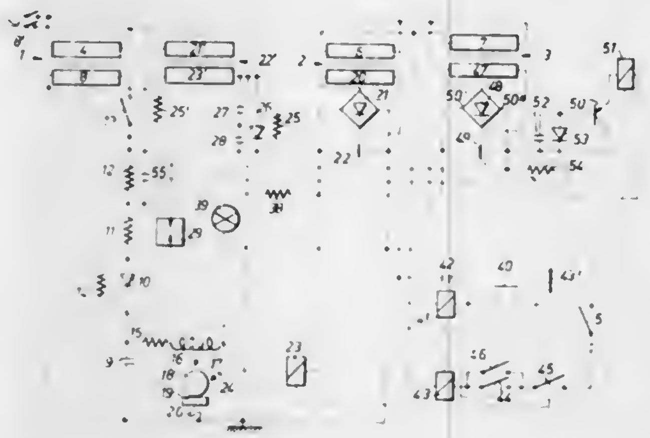
Ulrich Grisar, and Wilhelm Berstermann, both of Georgsmarienhuette, Germany, assignors to Klockner-Werke AG, Duisburg, Germany

Filed Mar. 10, 1976, Ser. No. 665,772

Claims priority, application Germany, Mar. 26, 1975, 2513379

Int. Cl.² G03B *27/04*

U.S. Cl. 356—86 **10 Claims**



1. A spark discharge apparatus for testing the composition of a conductive workpiece, said apparatus comprising a holder electrode conductively engageable with said workpiece; a counter electrode adapted to be spaced by a gap from said workpiece while same is in contact with said holder electrode; sparking means including a closable switch and connected across said electrodes for passing a unipolar electrical pulse across said gap only when said switch is closed; and circuit means including a terminal connectable to said workpiece and an electrical connection to said holder electrode, said circuit means being connected to said switch for closing same only on detection of a closed circuit between said terminal and said holder electrode, whereby said sparking means can only pass said pulse when said terminal is in electrical contact with said workpiece and said workpiece is in electrical contact with said holder electrode and by this the operator and the workpiece are on the same potential.

4,037,964

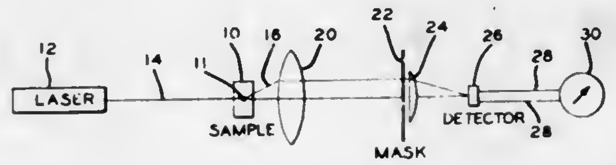
METHOD AND APPARATUS FOR MEASURING THE SUM OF THE RADII OF PARTICLES IN A COLLECTION

Alan Lee Wertheimer, North Wales, and Frederick Lee Williams, Lansdale, both of Pa., assignors to Leeds & Northrup Company, North Wales, Pa.

Filed Jan. 15, 1976, Ser. No. 649,754

Int. Cl.² G01N *15/02*

U.S. Cl. 356—102 **3 Claims**



2. Apparatus for measuring the sum of the radii of the individual particles of a collection of particles comprising:

- means for directing a light beam at said collection of particles,
- a filter for filtering the light diffracted from said beam by the particles of said collection, said filter having a filter function which varies between approximately 1.3 and 1.6 as the distance from the axis of said beam increases so that the magnitude of the total light flux transmitted is proportional to said sum, and
- means for detecting the magnitude of the total light flux transmitted by said filter as a measure of said sum.

4,037,965

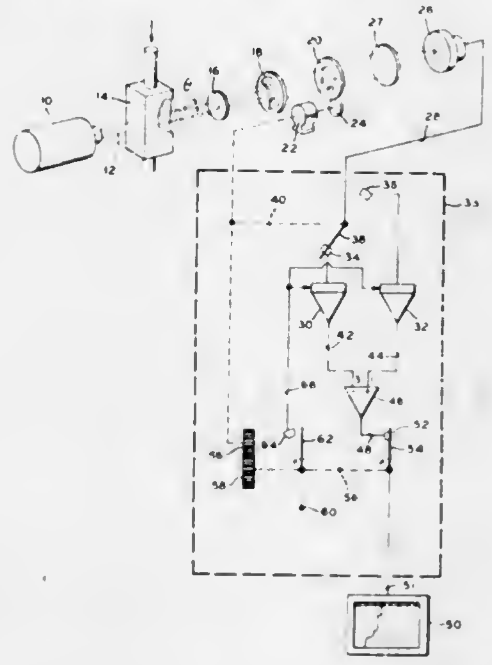
METHOD AND OPTICAL MEANS FOR DETERMINING DIMENSIONAL CHARACTERISTICS OF THE PARTICLE DISTRIBUTION IN A COLLECTION OF PARTICLES

Edward Leonhardt Weiss, Quakertown, Pa., assignor to Leeds & Northrup Company, North Wales, Pa.

Filed Mar. 23, 1976, Ser. No. 669,788

Int. Cl.² G01N *15/02*

U.S. Cl. 356—102 **12 Claims**



7. Apparatus for improving the measurement in a collection of particles of the moments of the particle distribution by number comprising,

- means for passing a light beam through said collection,
- means operable to measure the total of the low-angle, forward-scattered light flux from the particles,
- means for modulating the response of said measurement as a function of the angle of diffraction of the flux being measured so that the response to the flux diffracted by each particle in said light beam is such that the total flux measured is proportional to the desired moment, said modulating function having a range of values such that through the span of diffraction angles over which said response is modulated the function has a positive value for a part of the span including the smallest angle and a negative value for a part of the span adjacent the part of the span including the smallest angle.

4,037,966

METHOD AND DEVICE FOR EXAMINING PULP FOR THE PRESENCE OF SHIVES

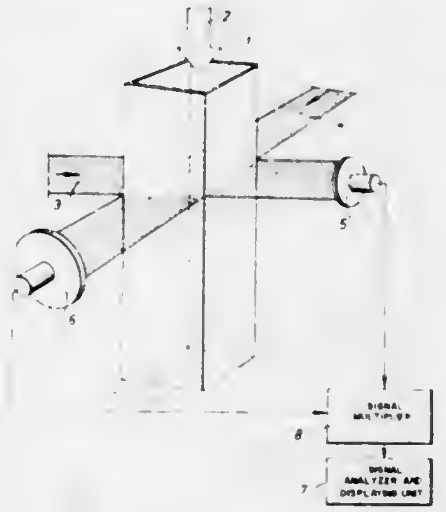
Jan Hill, Taby, Sweden, assignor to AB Tellusond, Stockholm, Sweden

Filed May 12, 1976, Ser. No. 685,924

Claims priority, application Sweden, May 14, 1975, 7505539

Int. Cl.² G01N *21/26*

U.S. Cl. 356—102 **12 Claims**



1. A method of examining pulp for the presence of shives therein, comprising the steps of passing a suspension of the pulp through a measuring duct with transparent walls, directing two mutually perpendicular beams of light through the measuring duct in a common plane perpendicular to the direction of the flow in the measuring duct, measuring the intensities of said two light beams after their passage through the measuring duct by means of two photo detectors, multiplying the output signals of said two photo detectors so as to provide a combined signal representing the product of the output signals of the photo detectors, and analyzing this combined signal with respect to amplitude variations ocurring therein.

4,037,967

APPARATUS FOR MEASURING THE DENSITY OF A LIQUID, UTILIZING THE LAW OF REFRACTION

Walter Schweizer, Berlin, and Martin-Ulrich Reissland, Gummersbach, both of Germany, assignors to VDO Adolf Schindling AG, Frankfurt am Main, Germany

Filed Apr. 29, 1974, Ser. No. 465,241

Claims priority, application Germany, May 14, 1973, 2324259

Int. Cl.² G01N *21/46*

U.S. Cl. 356—135 **13 Claims**

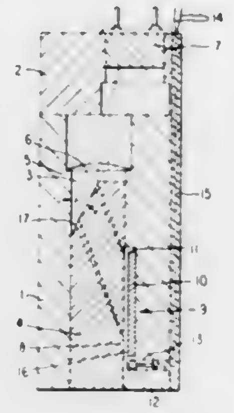
1. Apparatus for continuously measuring the density of a liquid within predetermined limits by use of the law of refraction, said apparatus being particularly useful for measuring the density of the electrolytic acid in a motor vehicle storage battery in order to determine its state of charge, comprising:

- A. a light-transmissive body having a measuring surface thereon,
- B. a plate of frosted light-transmissive material comprising at

least one frosted surface and at least one edge, the frosted surface being mounted in a position facing the measuring surface and spaced therefrom,

C. a lamp for directing light into the edge of said plate to cause the frosted surface to function as an illuminating surface of a light source with non-directional light transmissive characteristics,

D. the illuminating surface and the measuring surface defining walls of an open chamber which is filled with the liquid, and



E. a photosensitive element placed to receive light deflected by the measuring surface,

F. said measuring surface being enclosed by an opaque layer, and the light-transmissive body being arranged relative to the direction of rays emanating from said light source, so that only the light rays refracted in the area of the end of the opaque layer into the light-transmissive body strike the photosensitive element.

4,037,968

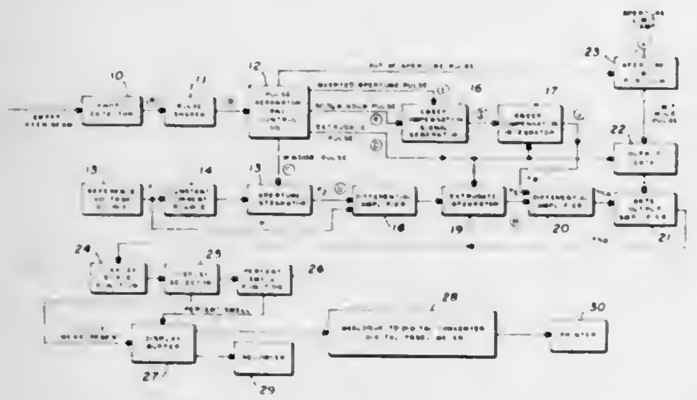
METHOD AND APPARATUS FOR MEASURING A DIMENSION OF AN OBJECT IN A DEFINED SPACE BY SCANNING WITH A LIGHT BEAM

David P. King, Akron, and Robert I. Barker, Cuyahoga Falls, both of Ohio, assignors to Monsanto Company, St. Louis, Mo.

Filed Dec. 22, 1975, Ser. No. 642,705

Int. Cl.² G01B *11/04, 11/10*

U.S. Cl. 356—160 **11 Claims**



1. A method of measuring the width of a continuous object between two of its edges which comprises:

a. placing the object between the edges of a measuring space,

b. scanning the measuring space and object between the edges thereof by means of a narrow beam of light through a rotating prism so that a beam of parallel light crosses one of the edges of the measuring space in the nonilluminated to illuminated direction and one of the edges of object in the illuminated to nonilluminated direction and crosses the other edge of the object in the nonilluminated to illuminated direction and the other edge of the measuring space in the illuminated to nonilluminated direction,

c. detecting the narrow beam of light passing through the measuring space,

d. generating an electrical analogue signal proportional to the time of scanning of measuring space

e. generating an electrical analogue signal proportional to the time the object interrupts the narrow beam of light

f. integrating a constant signal for said time of scanning the measuring space to obtain a signal proportional to the average speed of rotating the prism,

g. integrating said signal proportional to the average speed of rotating the prism for the time the object interrupts the narrow beam of light to obtain signal proportional to the uncorrected width of the object,

h. generating an electrical analogue correction signal in synchronization with the analogue signal of (d) representative of the rate of change of velocity of the beam of light across the measuring space,

i. integrating the correction signal for the time the object interrupts the narrow beam of light to obtain an integrated correction signal,

j. summing the value of the integrated correction signal and the signal proportional to the uncorrected width of the object to provide a composite signal representative of the width of the object independent of its position in the measuring space.

4,037,969

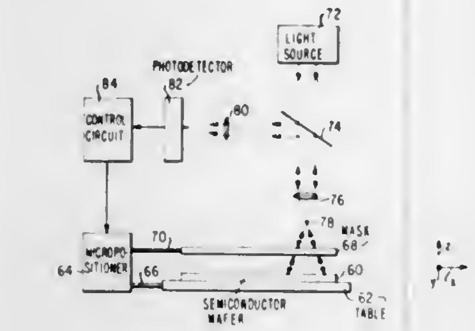
ZONE PLATE ALIGNMENT MARKS

Martin Feldman, Murray Hill, and Alan David White, Berkeley Heights, both of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 2, 1976, Ser. No. 673,126

Int. Cl.² G01B *11/26*

U.S. Cl. 356—172 **12 Claims**



1. A mask member for use in fabricating microminiature devices, said member comprising a relatively transparent substrate having a selectively patterned relatively opaque layer disposed on said substrate, said selectively patterned layer having formed therein at least one alignment mark pattern, said alignment mark pattern, when illuminated by incident radiation, forming a focused image in a reference plane that is spaced apart a predetermined distance from said forming means.

4,037,970

OPTICAL ANALYZER FOR AGRICULTURAL PRODUCTS

Donald R. Webster, Laurel, Md., and Eugene R. Ganssle, Skillman, N.J., assignors to Neotec Corporation, Silver Spring, Md.

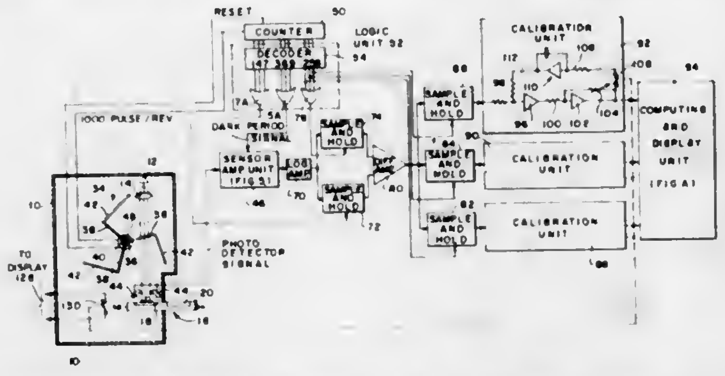
Division of Ser. No. 283,270, Aug. 24, 1972, abandoned, and Ser. No. 497,727, Aug. 15, 1974, and Ser. No. 420,863, Dec. 3, 1973, Pat. No. 3,861,788. This application Jan. 30, 1976, Ser. No. 653,848

Int. Cl.² G01J *3/48*

U.S. Cl. 356—188 **16 Claims**

1. Optical apparatus, comprising a source of wide band light for illuminating an object, a multiple filter assembly having a

rotatable axle and a plurality of narrow bandwidth optical interference filters fixed to said axle and radiating therefrom at the same axial location in respective planes forming therewith a paddlewheel configuration, said filter assembly being positioned relative to the light path defined between said light source and the object such that said filters are swept through said light path individually during rotation of said axle, said wide band light impinging on each successive one of said filters as the orientation thereof relative to said light path is changing,



whereby light passing through each one of said filters is restricted to continuously shifting bandwidths as a function of the instantaneous angle between said light path and a given filter during rotation, photosensitive means positioned to receive light from said source of light after passing through one of said filters and coming into optical contact with said object and to produce a signal representative of the level of light received, and means responsive to said signal to provide an indication of a characteristic of said object.

4,037,971

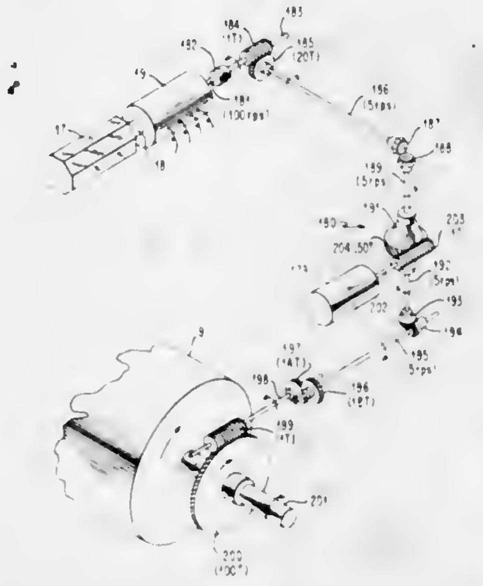
INSPECTION TOOL

James Garman Belleson, Hillsborough, Calif., and Kendall Clark, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 592,154, June 30, 1975. This application Mar. 25, 1976, Ser. No. 670,320

Int. Cl.² G02B *27/17*

U.S. Cl. 356—199 **14 Claims**



1. An inspection tool comprising: first means to feed a workpiece to be inspected into a work zone, said workpiece having a pattern thereon to be inspected; a source of coherent light and second means to effect a sweep of said coherent light across said work zone; first drive means connected to said second means to effect said sweep; a gear train connected to said first drive means and said first means to effect synchronous operation of said first and second means; a differential gear system in said gear train intermediate said first and second means; and a second drive means connected to said differential gear system whereby upon actuation of said second drive means variations in the speed of said first means may be obtained.

4,037,972

MEASURING APPARATUS

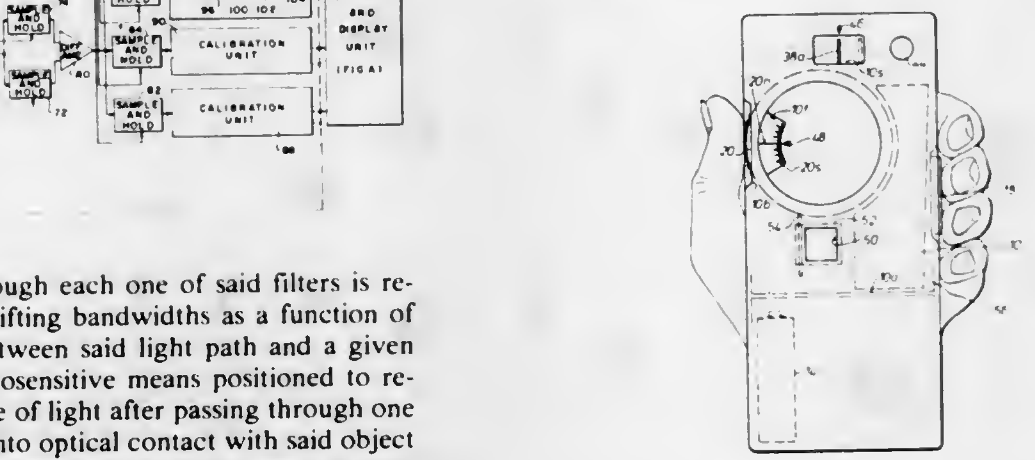
Wilhelm Pross, Munich, Germany, assignor to Compur-Werk Gesellschaft mit beschrankter Haftung & Co., Munich, Germany

Filed Oct. 6, 1975, Ser. No. 619,915

Claims priority, application Germany, Oct. 9, 1974, 2448206

Int. Cl.² G01N *21/22*

U.S. Cl. 356—206 **8 Claims**



1. An apparatus for measuring the light permeability of a measuring liquid for the purpose of testing a substance contained therein, comprising a first photoelectric element arranged in a measuring beam emitted by a light source and a second photoelectric element disposed in the path of a comparison beam from the same light source, a differential amplifier having two input terminals with said first photoelectric element being connected to one of said input terminals and said second photoelectric element being connected to the other of said input terminals, an indicator instrument connected to an output terminal of said differential amplifier, and a switch operated electronic regulating system connected to one of said input terminals of said differential amplifier and coming into operation on actuation of said switch for adjusting (1) the voltages set up at the two input terminals of said differential amplifier to the same potential and (2) the voltage applied to said output terminal connected to said indicator instrument to zero.

4,037,973

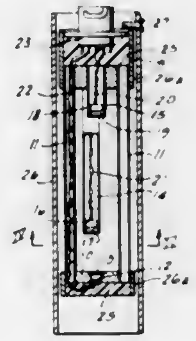
LIGHT SENSITIVE DEVICE FOR MEASURING PARTICLES IN A LIQUID

Larry R. Carr, West Chicago, Ill., assignor to Optronix Inc., West Chicago, Ill.

Filed Nov. 26, 1975, Ser. No. 635,279

Int. Cl.² G01N *21/26*

U.S. Cl. 356—206 **15 Claims**



1. A sensing unit for suspended solids measurements and the

like, comprising a single light source, a pair of photo detectors disposed on substantially a common light path of said source at different distances with respect thereto, with the liquid to be measured adapted to be disposed therebetween, means for supporting said source and detectors in fixed relation and in sealed relation with respect to the liquid to be measured, conductor means operatively connected to said source and detectors for connecting the same in an operative measuring circuit, and tubular opaque shield means cooperable with said supporting means to define a fluid chamber containing said source and detectors, said fluid chamber being provided at opposite ends of said tubular shield means with passageways for the ingress and egress of liquid relative to said fluid chamber.

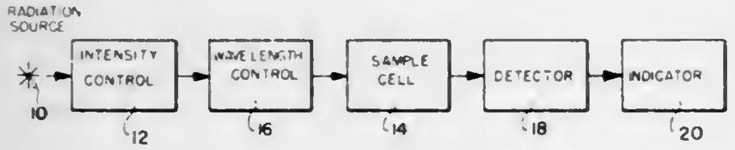
4,037,974
SAMPLE CELL FOR SPECTROPHOTOMETERS

Taylor C. Fletcher, 2650-1/2 Cherry Ave., Long Beach, Calif. 90806, and Bruce L. Wilkinson, 5518 Norton St., Torrance, Calif. 90503

Continuation-in-part of Ser. No. 515,500, Oct. 17, 1974, abandoned. This application Jan. 12, 1976, Ser. No. 648,177

Int. Cl.^{2} G01N *1/10*

U.S. Cl. 356—246 **6 Claims**



PRIOR ART

1. A sample cell constructed of a single homogeneous material for use in spectrophotometers having an entrance end and an exit end through which a beam of radiation enters and leaves the cell and passes through a sample contained in the cell, the cell having a transparent side wall, a first window at the entrance end integral with said side wall and of the same material as said side wall, a second window at the exit end integral with said side wall and of the same material as said side wall , and said side wall including means for minimizing the passage of the radiation through said side wall from the entrance end to the exit end of the cell so as to obviate the formation of a light pipe by said side wall.

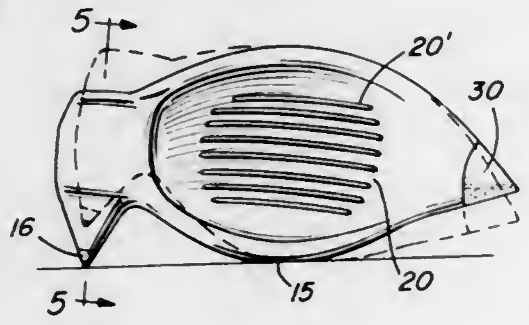
4,037,975
WRITING INSTRUMENT

Fred A. Huffman, P.O. Box 1319, Rawlins, Wyo. 82301

Filed May 4, 1976, Ser. No. 683,198

Int. Cl.^{2} B43K *7/00*

U.S. Cl. 401—6 **11 Claims**



10. A writing instrument in the shape of a bird comprising; body means so shaped as to form a pleasant hand engaging structure for convenient use by a writer, a writing implement at the beak position of the head of the bird-like instrument, a lower body portion means shaped so as to form a pivot point for rotating the bird-like body thereabout for convenient and pleasant use of said instrument, and further means of permitting a magnified pressure on the writing implement when the body means is rotated about said pivot point.

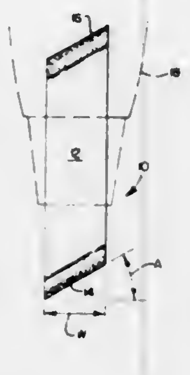
4,037,976
WRITING NIB STRUCTURE AND METHOD OF MANUFACTURE

John E. McDaniel, Douglasville, and Harold B. Morris, Newman, both of Ga., assignors to Glasrock Products, Inc., Fairburn, Ga.

Division of Ser. No. 586,593, June 13, 1975, abandoned. This application Mar. 2, 1976, Ser. No. 663,220

Int. Cl.^{2} B43K *1/00*

U.S. Cl. 401—198 **11 Claims**



1. The method of forming writing nibs comprising the steps of:

forming layers of relatively rigid material on opposite surfaces of a strip of wicking material thereby to provide a laminated strip in which said wicking material extends between and is exposed on opposite edges of said laminated strip;

shaping at least one edge of said laminated strip so that said wicking material projects beyond said layers of relatively rigid material at said edge; and

severing said laminated strip transversely at longitudinal increments to provide writing nibs of a length corresponding to the transverse dimension of said laminated strip.

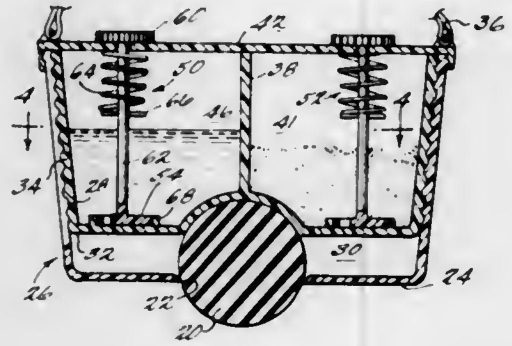
4,037,977
MASSAGE AND DISPENSING APPARATUS

Anne A. Ronai, c/o Thomas Ronai, Hideca, Apartado, 68658 Caracas, Venezuela

Continuation-in-part of Ser. No. 539,712, Jan. 9, 1975, abandoned. This application Jan. 27, 1976, Ser. No. 652,857

Int. Cl.^{2} A45D *33/12*

U.S. Cl. 401—209 **11 Claims**



1. A massager and dispenser apparatus comprising:

a housing having an open top and a bottom surface with an aperture extending therethrough,

an applicator ball extending partially through said aperture,

an insert member disposed in said housing for holding said applicator ball in a dispensing position, forming a dispensing chamber between said housing bottom and said insert and forming first and second storage chambers above said dispensing chamber, said insert having at least first and second apertures therein connecting first and second chambers respectively to said dispensing chamber,

a lid member closing the top of said housing and said first and second chambers,

first valve means having a vaive portion engaging said insert adjacent said first aperture so as to prevent, in a first position, movement of material into said dispensing chamber from said first chamber and to permit, in a second position, movement of material into said dispensing chamber and a knob portion extending through said lid for manually shifting said valve portion between said positions, and

second valve means having a portion engaging said insert adjacent to said second aperture so as to prevent, in a first position, movement of material into said dispensing chamber from said second chamber and in a second position movement of material into said dispensing chamber and a portion extending through said lid for manually shifting said valve portion of said second valve means between said positions.

4,037,978
RESILIENT SWIVEL CONNECTOR

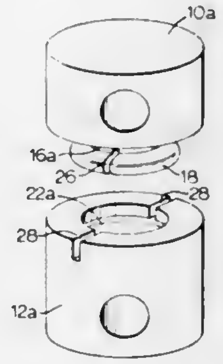
Brian W. Connelly, Toronto, Canada, assignor to B.C. Investments Ltd., St. Helier, Guernsey (Channel Is.)

Filed Aug. 14, 1975, Ser. No. 604,715

Claims priority, application United Kingdom, Aug. 23, 1974, 37200/74; Dec. 16, 1974, 54283/74

Int. Cl.^{2} F16D *1/12*

U.S. Cl. 403—164 **3 Claims**



1. A swivel coupling comprising:

a first resilient portion and a second resilient portion, the first portion being solid except for a first bore provided therethrough for grippingly receiving a cylindrical elongated member,

the second portion being solid except for a second bore provided therethrough for grippingly receiving an elongated member,

each portion defining a slot having a width less than the diameter of its respective bore, the slot being aligned with and extending radially from its respective bore and extending to the outer surface of the respective portion,

and interlocking engagement means for pivotally connecting the first portion to the second portion such that each portion is rotatable with respect to the other about an axis which is substantially perpendicular to elongated members when received in the respective bores.

4,037,979
ANCHORING ARRANGEMENT, ESPECIALLY FOR PRE-STRESSED CONCRETE CONSTRUCTIONS

Werner Fastenau, Esslingen-Rudern, Germany, assignor to Ed. Züblin Aktiengesellschaft, Stuttgart, Germany

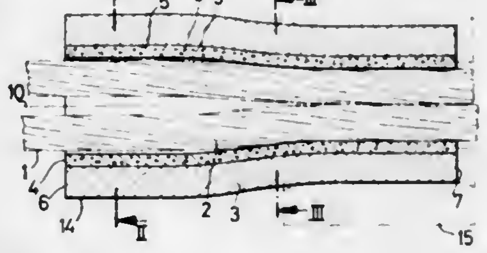
Filed Apr. 24, 1975, Ser. No. 571,207

Claims priority, application Germany, Apr. 24, 1974, 2419628

Int. Cl.^{2} B25G *3/28*

U.S. Cl. 403—284 **5 Claims**

1. An anchoring arrangement, especially for pre-stressed concrete constructions, for the anchoring of reinforcing means in the form of ropes, cables, wires and rods, which includes in combination: an outer sleeve of cold-compressible deformable soft steel, a prefabricated intermediate layer, arranged within and in contact with said outer sleeve, said prefabricated intermediate layer consisting of hard steel granular material with the granules of hard steel thereof densely arranged therewith and also consisting of a binding substance for said hard steel granules embedded therein, said prefabricated intermediate layer defining a hollow central space extending in the axial direction of said outer sleeve, and reinforcing means arranged within and substantially filling said hollow space while being in tight radially compressed engagement with said prefabricated intermediate layer, the granules of said prefabricated intermediate layer being harder than said reinforcing means and said sleeve and originally having at least substantially the form of the central hollow space between said outer sleeve and said reinforcing means, said hard steel granules during deformation of said outer sleeve pressing into said reinforcing means and said sleeve, said granules substantially filling the space between said reinforcing means and sleeve and in contact with each other through said space with the binding substance in the interstices between the particies, whereby the granules transfer the force directly from the reinforcing means to the sleeve.



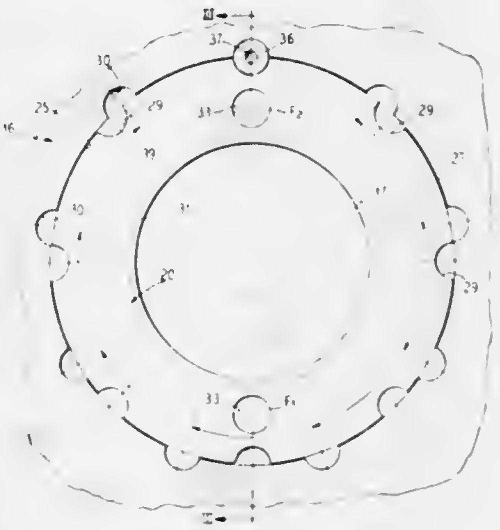
4,037,980
PUMP COUPLING

Walter D. Haentjens, Box 121, R.D. No. 1, Sugarloaf, Pa. 18249

Filed Dec. 24, 1975, Ser. No. 644,300

Int. Cl.^{2} F16B *1/00*

U.S. Cl. 403—336 **6 Claims**



1. A coupling assembly comprising:

a power input shaft and a coaxial power output shaft with opposed respective ends,

one of said shafts having a circumferential terminal threaded end,

first coupling means positionable on the end of said one shaft,

a nut-receiving recess defined in the forward face of said first coupling means, said recess having said wall portions located generally in radially equally spaced relationship to the axis of said shafts, in the region of said terminal threaded end, a cylindrical coupling nut having an axial bore provided with complimentary threads, said coupling nut engaging said terminal threaded end and being receivable within said recess with the outside radius of said coupling nut approaching the radius of said recess,

said recess additionally having a first plurality of half holes defined at circumferentially equally spaced intervals in said side wall portions, the axis of each such half hold being generally parallel to the axes of the other thereof, and also being equally radially spaced from said shaft axis,

said coupling nut additionally having a second plualtiy of half holes defined at circumferentially equally spaced intervals in the cylindrical outer wall thereof, the axis of each such half hole being generally parallel to the axes of the others thereof and also being equally radially spaced from said shaft axis,

the radius of each half hole in said first plurality of half holes being generally equal to the radius of each half hole in said second plurlity of half holes,

one of said pluralities of half holes comprising an even number of half holes, the other of said pluralities of half holes comprising an odd number of half holes whereby a minimum amount of turning of said coupling nut relative to said one shaft when one end face of said coupling nut is engaged with bottom facial portion of said recess is required to align one half hole of said first plurality of half holes with one half hole of said second plurality of half holes thereby to define a cylindrical channel, comprised of two registering half holes,

locking pin means slidably mounting in said channel,

second coupling means engaged with the other of said shafts at such opposed end thereof, including shaft engaging means therefor, said second coupling means having a forward face in abutting and mating relationship with said forward face of said first coupling means, and overlying said locking pin means, and

retaining means holding said first coupling means in rigid engagement with said second coupling means.

4,037,981
MACHINE FOR CUTTING AWAY OR PEELING OFF ROAD SURFACES

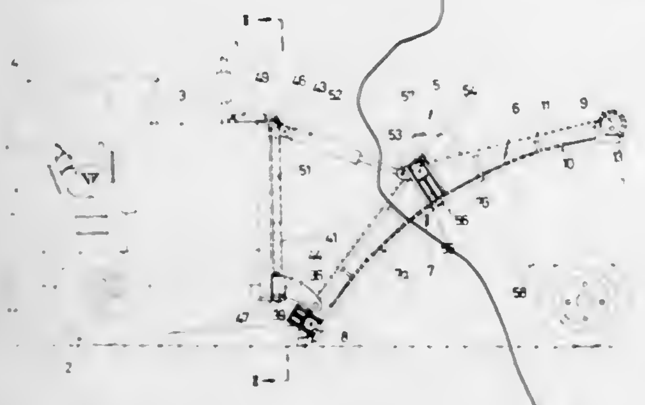
Reinhard Wirtgen, Hohner Strasse, 5461 Windhagen, Linz, Germany

Filed Jan. 9, 1976, Ser. No. 647,914

Claims priority, application Germany, Jan. 10, 1975, 2500861

Int. Cl.^{2} E01C *23/08*

U.S. Cl. 404—91 **16 Claims**



1. A machine for cutting away or peeling off road surfaces comprising a preferably self-propelled chassis on wheels which includes a cutting or peeling device and a conveyor machinery for transporting the cut away or peeled off material from the road level to a level suitable for the transfer into a collecting container, a truck, a trailer, or the like, said conveyor machinery being tilingly hinged, at one of its ends, to said chassis around a substantially perpendicular axis and lockably as well as vertically adjustably pivoted both in an operating position, in which the other of its ends extends backward beyond a plane defined by said chassis and said wheels, and in a rest position, in which said conveyor machinery resides substantially within a space defined by said chassis, said wheels, and other structural parts, wherein said conveyor machinery is secured at one of its ends to a support having bushes at its two ends which are vertically adjustably arranged on two guide spars and said two guide spars together with two crossbars secured to the ends thereof constituting a frame which is hinged for swivelling around the axis of one of said guide spars on said chassis and which is releasably connected with said chassis within the range of the other of said guide spars.

4,037,982
MACHINE TOOLS

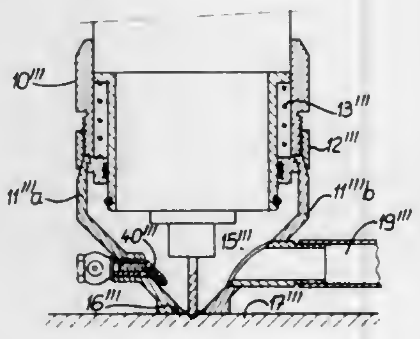
Gilbert-Louis Clement, Semeac, France, assignor to Infranor S.A., Switzerland

Continuation-in-part of Ser. No. 504,991, Sept. 11, 1974, abandoned. This application Oct. 8, 1975, Ser. No. 620,793

Claims priority, application Switzerland, Sept. 9, 1975, 11686/75; Sept. 9, 1975, 11686/75

Int. Cl.^{2} B23B *51/06, 47/34*

U.S. Cl. 408—61 **16 Claims**



1. A machine tool comprising, a hollow cylindrical body, a rotary driven tool mounted within said body for axial movement in use towards and away from a work surface, a suction chamber disposed about said tool and having means defining a central aperture for passage of the tool and a forward abutment surface for abutment against the work surface, means mounting said chamber for axial movement relative to said body and said tool, means resiliently biasing said chamber in a direction corresponding to a direction towards the work surface, stop means defining a forwardmost position of said chamber relative to said tool, said suction chamber comprising a plurality of complementary chamber sections each extending about a given portion of the circumferential extent of said chamber, means removably securing said chamber sections together and to said mounting means to allow removal of said chamber sections from said mounting means by a generally radial outward movement of said sections relative to said tool, said mounting means including an annular member mounted for axial movement relative to said body and said tool and subjected to the action of said biasing means, said annular member having an externally screw-threaded outer face and a lower edge with an outwardly-facing circular groove, said chamber sections when assembled having a circular upper edge with an inwardly-directed circular flange which rests in said groove of the annular member, and a screw ring threadably engaged on said outer face of the annular member, said screw ringn having a non-threaded clamping portion engageable about said upper edge of said chamber sections.

4,037,983
WIND MOTOR

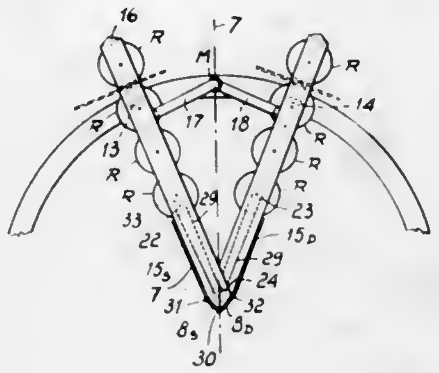
Rolando Poeta, Viale Certosa, 45, Milan, Italy

Filed Mar. 30, 1976, Ser. No. 671,864

Claims priority, application Italy, Apr. 7, 1975, 22027/75

Int. Cl.^{2} F03D *3/04, 7/06*

U.S. Cl. 415—2 **1 Claim**



1. A wind motor comprising a pair of horizontally disposed rotor support arms each having one end thereof pivotally mounted about a common vertical axis, two batteries of rotors each battery being respectively supported by one of said rotor support arms, each rotor battery including a plurality of rotors and each rotor comprising a series of elongated vertically extending blades arranged about a vertical rotor axis, the plurality of rotors in each battery being arranged in tandem fashion along their respective rotor support arm, and a pair of vertically extending deflector plates respectively mounted on said pair of rotor support arms and extending between said batteries of rotors and said common vertical axis, said rotor arms being positionable to arrange said batteries of rotors in a "V" formation which may be pointed into the wind to extract useful power therefrom.

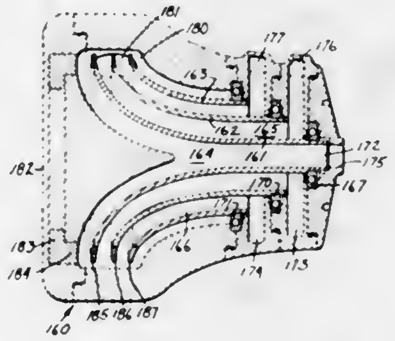
4,037,984
PUMPING APPARATUS AND PROCESS CHARACTERIZED BY GENTLE OPERATION

Edson Howard Rafferty, Excelsior, and Harold D. Kletschka, Minneapolis, both of Minn., assignors to Bio-Medicus, Inc., Minnetonka, Minn.

Division of Ser. No. 546,770, Feb. 3, 1975, Pat. No. 3,957,389, which is a continuation-in-part of Ser. No. 414,225, Nov. 9, 1974, Pat. No. 3,864,055, which is a continuation-in-part of Ser. No. 204,980, Dec. 6, 1971, abandoned, which is a continuation-in-part of Ser. No. 886,137, Dec. 18, 1969, Pat. No. 3,647,324, which is a continuation-in-part of Ser. No. 678,265, Oct. 26, 1967, Pat. No. 3,487,784. This application Mar. 15, 1976, Ser. No. 666,745

Int. Cl.^{2} F01B *1/36, 13/00*

U.S. Cl. 415—60 **11 Claims**



1. Apparatus for pumping biological fluids without causing significant damage thereto, comprising, in combination:

1. means dividing the fluid to be pumped into a plurality of independent streams;
2. means for accelerating the several streams by superficial contact with smooth accelerator members, including
   - a. a plurality of nested, coaxial rotators arranged to define walls of a plurality of pumping passages extending along the common axis and increasing in mean diameter with distance along the axis,
   - b. means separately mounting said rotators for rotation about said axis,
   - c. means supplying said streams to said passages at the smaller diameter ends thereof,
   - d. means driving said rotators independently at predetermined angular velocities which may be the same; and
3. meams combining the outputs of the several passages to comprise the principal output of the apparatus.

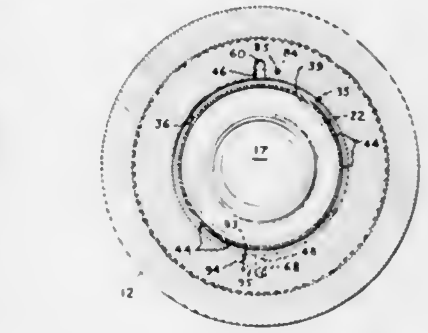
4,037,985
FLUSHING LIQUID SYSTEM FOR THE WEARING RING IN CENTRIFUGAL PUMPS AND THE WEARING RING ASSEMBLY AND WEARING RING FOR USE THEREIN

Igor J. Karassik, Maplewood, and Charles H. Thaw, Morristown, both of N.J., assignors to Worthington Pump, Inc., Moutainside, N.J.

Filed May 20, 1976, Ser. No. 688,156

Int. Cl.^{2} F01D *11/00;* **F04D** *29/08;* **F01D** *11/08*

U.S. Cl. 415—175 **11 Claims**



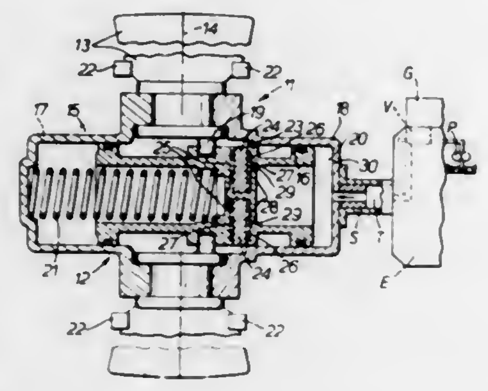
1. In a centrifugal pump forming a pumping chamber therein having a suction inlet and a discharge outlet, a support member in said centrifugal pump disposed between said suction inlet and discharge outlet and having a central opening therethrough, impeller means having at least one front shroud means rotatably mounted in said pumping chamber so that the front shroud means extends into said central opening in the support member, and wearing ring assembly means fixedly mounted in fluid tight engagement in said central opening in said support means and disposed about the front shroud means of said impeller means to form a leakage joint therewith, the combination therewith of a flushing liquid system wherein:

- a. said wearing ring assembly means has flushing liquid inlet means and flushing liquid outlet means disposed thereon in spaced relation,
- b. flushing liquid supply means operably connected to said centrifugal pump to supply flushing liquid to said flushing liquid inlet means in the wearing ring assembly means,
- c. flushing liquid return means operatively connected to said centrifugal pump to drain flushing liquid from said flushing liquid outlet means in said wearing ring assembly means,
- d. a first control means to control the pressure at which said flushing liquid is supplied by said flushing liquid supply means to said flushing liquid inlet means in said wearing ring assembly means,
- e. a second control means to control the pressure at which said flushing liquid is drained from said flushing liquid outlet means in the wearing ring assembly means, and
- f. said first control means and said second control means operative and responsive to at least one operating condition of said pump whereby some portion of the flushing liquid supplied to said wearing ring assembly means through said flushing liquid inlet means will be drained

through said flushing liquid outlet means to minimize the flushing liquid requirements of said pump and to reduce dilution by the flushing liquid of the process fluid or other mixture being pumped by the centrifugal pump.

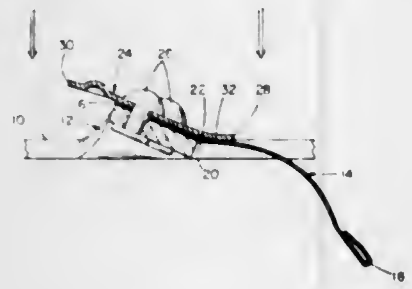
2. In the combination as claimed in claim 1 wherein said wearing ring assembly means includes,
a. a wearing ring,
b. said wearing ring having a first annular groove on the outer annulus thereof to define at least in part said flushing liquid inlet means,
c. means in said wearing ring for connecting said first annular groove with said leakage joint,
d. said wearing ring having a second annular groove on the outer annulus thereof spaced axially from said first annular groove and defining at least in part said flushing liquid outlet chamber, and
e. second means in said wearing ring connecting said annular groove with said leakage joint.

4,037,986
BLADED ROTORS HAVING CONTROL MEANS FOR EFFECTING BLADE PITCH ADJUSTMENT
John Alfred Chilman, Stroud, England, assignor to Dowty Rotol Limited, Gloucester, England
Filed Sept. 4, 1975, Ser. No. 610,376
Int. Cl.^{2} B64C *11/40*
U.S. Cl. 416—46 10 Claims



1. A bladed rotor including a hub and adjustable blades carried by the hub, said hub having control means, for effecting pitch-adjustment of said blades, which comprises an actuator and connecting means for operably connecting the actuator to the blades, said actuator comprising two co-operable and relatively-movable components, biassing means urging one of said components in one direction toward one end-of-stroke-defining position for adjusting pitch in one sense, fluid pressure means for moving said one component in the opposite direction toward the other end-of-stroke-defining position, against the action of said biassing means, for adjusting pitch in the other sense, stop means which are carried by and movable with said one component and which are movable, under centrifugal force, relative to said one component between an inoperative position and an operative position, spring means biassing the stop means toward their inoperative position in which position they are retracted in said one component, means for applying said fluid pressure to said stop means to urge the stop means to their inoperative position, said stop means being maintained in said inoperative position by the fluid pressure of said fluid pressure means when said fluid pressure is above a predetermined value, but when, with said rotor rotating above a predetermined rotational speed, said fluid pressure falls below said predetermined value, the stop means are displaced, solely under centrifugal force and against the bias of said spring means, to their operative position, in which position they project outwardly from said one component, and abutment means, forming part of the other of said components, which is disposed at a predetermined position intermediate said end-of-stroke-defining positions, which lies in the path of said stop means when said stop means are projecting from said one component, and which serves, upon said stop means coming into engagement therewith, to cause arrest of said one component only when that component is moving in said one direction and has not yet reached said one end-of-stroke-defining position.

4,037,987
FLEXIBLE BLADED FAN WITH INCREASED NATURAL FREQUENCY
Herbert N. Charles, and George K. Lie, both of Chatham, Canada, assignors to Fram Corporation, East Providence, R.I.
Filed June 30, 1975, Ser. No. 591,511
Int. Cl.^{2} F04D *29/36*
U.S. Cl. 416—132 A 5 Claims



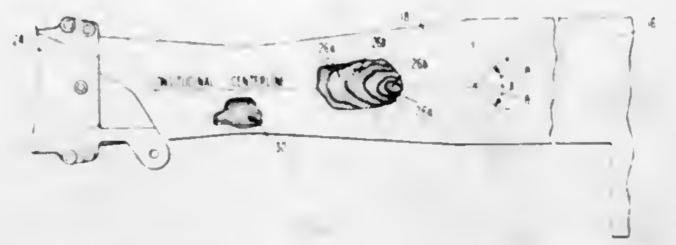
1. In a fan comprising a hub and a plurality of fan blade assemblies each comprising: an arm extending radially outwardly from said hub; a flexible, resilient blade having a radially extending leading portion, defined by the direction of fan rotation, connected to said arm, said blade extending transversely from said leading portion to a trailing edge behind said arm, said blade curved from said leading portion to said trailing edge in a downstream direction relative to airflow direction; and a reinforcing member extending radially along said blade leading portion on the upstream side thereof and extending transversely to a trailing edge between said leading portion and said blade trailing edge; said blade leading portion and said reinforcing member in contact along the radial extent of said reinforcing member and spaced apart at a gap behind said leading portion; the improvement in which:

said blade and said reinforcing member, with said fan stationary, contact along the radial extent of said reinforcing member at a second position behind said leading portion and said gap, said reinforcing member being curved in an upstream direction behind said blade leading portion at said gap and said blade being bent upstream between said blade leading portion and said reinforcing member trailing edge and contacting said reinforcing member at said second position between said bend and said trailing edge and therebehind said blade being curved in said downstream direction, said reinforcing member at said second position biasing and pre-stressing said blade in a downstream direction; whereby the natural frequency of said blade is raised by the prestressing contact of said blade and said reinforcing member.

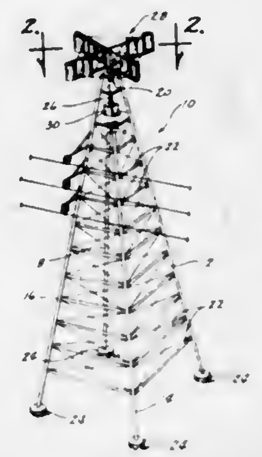
4,037,988
FLEXURE HAVING PITCH FLAP COUPLING
George William Laird, Greenville, Del., assignor to The Boeing Company, Seattle, Wash.
Continuation-in-part of Ser. No. 526,994, Nov. 25, 1974, abandoned. This application May 10, 1976, Ser. No. 684,935
Int. Cl.^{2} B64C *27/44*
U.S. Cl. 416—141 4 Claims

1. A composite structure flexure having a longitudinal centerline for connecting a rotor blade having a chord line to a rotor hub in a bearingless rotor assembly, wherein the composite structure comprises fibers held together by a bonding agent, wherein reference Cartesian coordinates for said flexure are chosen such that an X axis is parallel to the longitudinal centerline of the flexure, a Y axis is parallel to the chord line of the

blade, and a Z axis is perpendicular to the X and Y axes, wherein a plurality of said fibers are bonded in parallel coplaner relation in the XY plane to form a sheet, a plurality of said sheets comprising first, second, and third sets being bonded together in layers to form said flexure, the fibers of said first set oriented to form a positive angle with the X axis, the fibers of said second set oriented to form a negative angle with the X axis, the fibers of the third set being parallel to the X axis, whereby the resultant flexure allows limited three degrees of freedom of motiong of the blade to permit flap, pitch, and leadlag motion of the blade while inherently inducing a change in pitch angle of the blade in response to a change in flap angle of the blade.

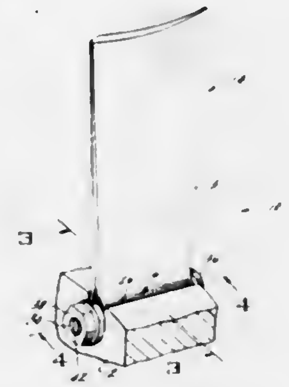


4,037,989
VERTICAL AXIS WIND TURBINE ROTOR
Jerome W. Huther, R.R. No. 2, P.O. Box 36, Elkhart, Iowa 50073
Filed May 12, 1975, Ser. No. 576,338
Int. Cl.^{2} F03D *3/06*
U.S. Cl. 416—197 A 3 Claims



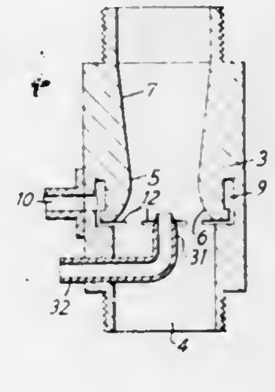
1. A vertical axis wind turbine comprising in combination,
a stationary frame member,
a rotatable shaft vertically journaled in said stationary frame member,
circumposed on said rotatable shaft a wind rotor comprised of a rotatable frame, the longitudinal axis of said rotatable frame being generally transverse to the longitudinal axis of said rotatable shaft, so that said rotatable frame may rotate about the longitudinal axis of said rotatable shaft,
said rotatable frame having at least two arms oppositely disposed with respect to each other radiating outwardly from said rotatable shaft, one of said arms having mounted thereon at least two concave surfaced semi-cylindrical shaped wind catching members, said wind catching members being spaced apart to define a wind break gap therebetween, and
the other of said arms having mounted thereon at least two convex surfaced semi-cylindrical shaped wind deflecting members, said wind deflecting members being spaced apart to define a wind break gap therebetween,
said wind break gaps, cooperatively acting with said semi-cylindrical shaped wind catching members and said semi-cylindrical shaped defelecting members during periods of strong wind to prevent destruction of said wind turbine caused by the stresses of excessively high rotational speeds induced by strong winds.

4,037,990
COMPOSITE TURBOMACHINERY ROTOR
David J. Harris, Fairfield, Ohio, assignor to General Electric Company, Cincinnati, Ohio
Filed June 1, 1976, Ser. No. 691,390
Int. Cl.^{2} F01D *5/32*
U.S. Cl. 416—220 R 10 Claims



1. A turbomachinery blade comprising an airfoil section fabricated of a plurality of bonded filament laminates and a pair of hollow inserts, each insert having a generally semicylindrical outer arcuate surface, and wherein said laminates extend from the airfoil section, pass between said inserts and then are divided into two portions, each portion being wrapped essentially 180° around the outer arcuate surface of one of said inserts before being led back into the airfoil section, thereby forming a generally cylindrical, rotatable root for the blade.

4,037,991
FLUID-FLOW ASSISTING DEVICES
Peter John Taylor, Fareham, England, assignor to The Plessey Company Limited, Ilford, Essex, England
Continuation of Ser. No. 382,689, July 26, 1973, abandoned, which is a continuation of Ser. No. 223,648, Feb. 4, 1972, abandoned. This application Sept. 15, 1975, Ser. No. 613,415
Int. Cl.^{2} F04B *23/14;* F04F *5/46*
U.S. Cl. 417—80 3 Claims



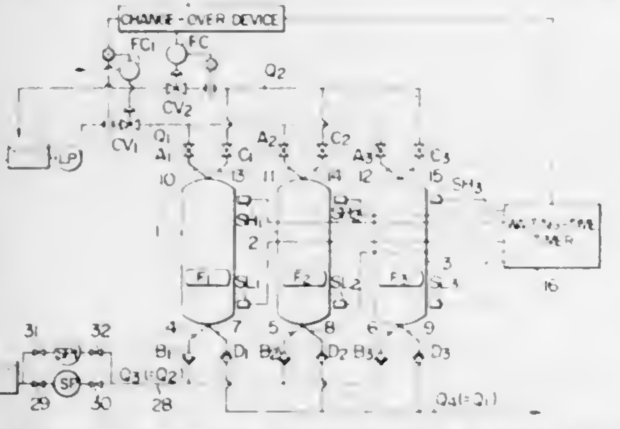
1. In a system for supplying liquid fuel to an engine via a positive-displacement fuel pump, the system including a dynamic pump having an outlet leading to said positive-displacement pump and an inlet and producing an increase of pressure at said outlet over the pressure at said inlet, and an inlet line having a low-pressure inlet and having an increased-pressure outlet connected to the inlet of said dynamic pump, said inlet line comprising in combination:
a. an inlet-line member having solid walls forming a through passage and having means for attachment of said member to said dynamic pump with one end of the through passage connected to said inlet of the latter pump, said passage having a Venturi throat interposed between a first

passage portion that extends from the throat to said one end of the passage, and a second passage portion that extends to the throat from the other end of the passage and includes a Venturi inlet and a convergent inlet portion leading from said Venturi inlet to the Venturi throat, said first passage portion including an outlet adjacent to said one end of the passage and a divergent diffusor portion leading from the throat to said outlet to form, jointly with said throat and said converging inlet portion, a Venturi-nozzle passage, said inlet portion, throat, and diffusor portion being all defined by said solid walls of said inlet-line member, and

b. a jet-forming nozzle arranged in said through passage coaxially with said Venturi-nozzle passage to form and direct a high-speed jet of liquid coaxially into the convergent inlet portion of the Venturi nozzle passage towards the throat and divergent outlet portions thereof to become mixed with liquid aspired, by jet-pump action, through the Venturi inlet, thus forming a stream of the resulting mixed liquid flowing through said diffusor portion to said outlet and said inlet-line member being additionally formed with an annular array of ports constituting a Coanda-slot system encircling said convergent inlet portion and opening into the same through the passage wall defining said convergent inlet portion, said Coanda slot system defining an annular zone encircling the passage and substantially separating said wall into an upstream portion and a downstream portion, the mutually facing edges of said upstream and downstream portions being respectively formed as an upstream lip and a downstream lip, and with an injection-liquid passage leading from a point outside and said inlet-line member to said annular Coanda-slot system to discharge through said injection-liquid passage into said convergent inlet portion of the through passage, the wall defining said inlet portion including, extending from said downstream lip towards the Venturi throat, an annular zone whose surface forms a continuous extension of the surface of the downstream lip and recedes from the direction of discharge of said high-speed flow of liquid in the Coanda-slot system at a sufficiently gradual progression to ensure that the liquid thus discharged through the Coanda-slot system tends to follow, through said throat and said divergent outlet portion, due to the Coanda effect, the surface of the solid wall in said through passage and form there a layer of longitudinally moving liquid which, due to the Coanda effect, adheres to the said solid wall and thus separates the stationary surface of said wall from the said stream of mixed liquid.

4,037,992
SLURRY CONTINUOUS PRESSURE-FEEDING APPARATUS

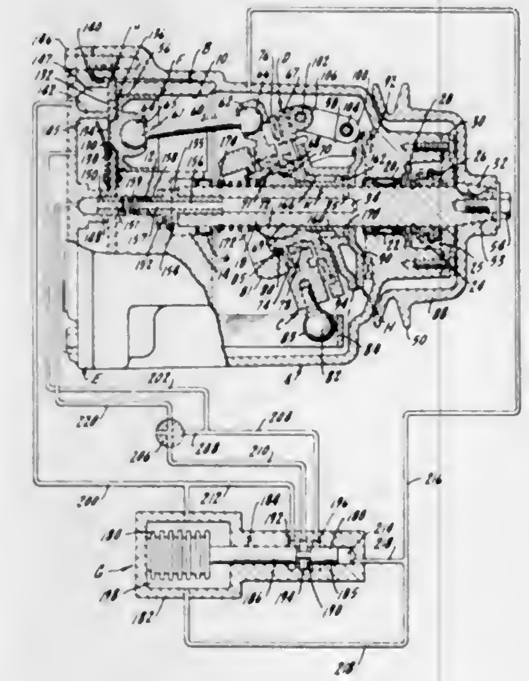
Kenji Uchida, Kashiwa, and Kenichi Fujita, Tokyo, both of Japan, assignors to Hitachi, Ltd., Japan
Filed Aug. 29, 1975, Ser. No. 609,051
Claims priority, application Japan, Nov. 25, 1974, 49-134279
Int. Cl.² F04F *11/00*
U.S. Cl. 417—102 **9 Claims**



1. In a slurry continuous pressure-feeding apparatus comprising three feed chambers arranged in parallel with one another and each having a float disposed in the interior thereof, a high-pressure pump adapted to deliver driving liquid to each of said feed chambers, a main slurry pump adapted to feed a slurry to each of said feed chambers, check-valves mounted in slurry inflow pipes and slurry outflow pipes and change-over valves mounted in driving liquid inflow pipes and driving liquid outflow pipes, detectors adapted to detect the upper and lower limits of said floats and open and close said change-over valves, a waiting timer adapted to detect a minimum opening and closing time for the two change-over valves provided to each of said feed chambers, and a change-over device for adjusting the inflow amount and the outflow amount of the driving liquid, the improvement comprising an auxiliary slurry pump connected removably in parallel with said main slurry pump through the agency of opening-and-closing valves said main slurry pump and said auxiliary slurry pump being rendered operative conjointly when two of the three feed chambers are used to continuously pressure-feed the slurry whereby the same amount of slurry that can be fed when all the three feed chambers are used can be fed by using two feed chambers.

4,037,993
CONTROL SYSTEM FOR VARIABLE DISPLACEMENT COMPRESSOR

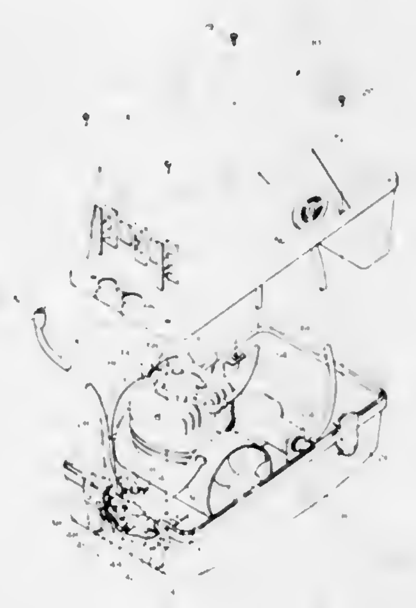
Richard W. Roberts, Lombard, Ill., assignor to Borg-Warner Corporation, Chicago, Ill.
Filed Apr. 23, 1976, Ser. No. 679,547
Int. Cl.² F04B *1/26*
U.S. Cl. 417—222 **5 Claims**



1. A variable displacement compressor comprising a plurality of cylinders and pistons cooperating to provide gas working spaces, each said cylinder having a suction and discharge port cooperating therewith; a wobble plate connected to said pistons and imparting the reciprocating force to actuate said pistons; a drive shaft; a cam mechanism driven by said drive shaft and cooperating with said wobble plate, said wobble plate and cam mechanism being pivoted at a point spaced from the drive shaft axis and movable from a position wherein said wobble plate is positioned along a plane substantially normal to said drive shaft axis to a position angularly displaced from said normal plane; a mounting element supporting said cam mechanism, and mounting element having an outer spherical surface engaging said cam mechanism and a central bore through which said drive shaft extends, said mounting element being slidable to and fro on said drive shaft as the wobble plate angle is changed; and a fluid actuator comprising a piston and cylinder arrangement in which increased pressure in said actuator cylinder causes the actuator piston to move said wobble plate in a direction toward said normal plane, reducing the stroke length of said pistons; and means for supplying high pressure gas from said gas working spaces to said actuator cylinder, said last-named means including a control valve responsive to a variable indicative of capacity requirements.

4,037,994
PRESSURE UNLOADING VALVE DEVICE FOR COMPRESSOR

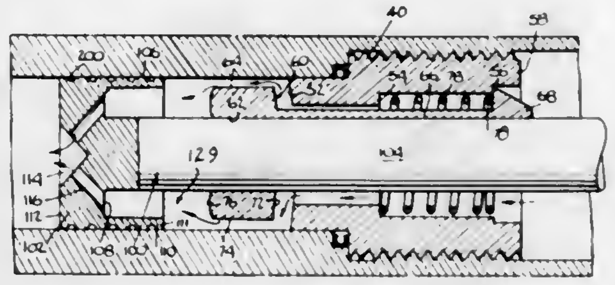
Forrest M. Bird, 212 NW. Cerritors, Palm Springs, Calif. 92262
Filed Mar. 31, 1975, Ser. No. 563,692
Int. Cl.² F04B *49/02*
U.S. Cl. 417—316 **4 Claims**



1. A device for use with a gas compressor having an outlet passage for directing gas to end use apparatus, including the combination of a valve body having at least one relief port and an inlet port in connection with the outlet passage of said compressor, means forming a chamber in the valve body for establishing fluid communication with said inlet and relief ports, a compressible elastomeric member mounted within said chamber, said member being sized to define in its substantially uncompressed state a clearance with the wall of the chamber, said clearance establishing a gas relief flow path through the chamber between said inlet and relief ports, said member in its compressed state contacting said chamber wall to occlude said relief flow path, and actuator means operable in one mode for causing said member to assume its compressed state and occlude the flow path while energizing said compressor, said actuator means further being operable in another mode for causing said member to assume its uncompressed state while said compressor is deenergized whereby gas pressure is relieved from the compressor outlet through said relief flow path and through the relief port of the valve body, said actuator means including a plunger slidably mounted for movement within the chamber, cam means operable for movement between a compressor-on and a compressor-off position, said cam means in the compressor-on position moving the plunger in a first direction for exerting a thrust force against the elastomeric member to cause the same to assume its compressed state, the cam means in said compressor-off position permitting movement of the plunger in a second direction away from the elastomeric member to cause the same to assume its uncompressed state, electrical contact means operable between first and second positions in which said gas compressor is operatively disconnected and connected, respectively, with a source of electrical power, and a second plunger disposed in operating engagement with said contact means, said second plunger being positioned in juxtaposed relationship with said elastomeric member whereby the latter undergoes respective elastic bulging and contraction between said compressed and uncompressed states for moving the second plunger to operate said contact means between respective second and first positions.

4,037,995
LIQUID PROPELLANT GUN (DAMPER)

Alfred Rapp Graham, Burnt Hills, N.Y., assignor to General Electric Company, Burlington, Vt.
Filed June 10, 1976, Ser. No. 694,868
Int. Cl.² F04B *17/00*
U.S. Cl. 417—349 **5 Claims**



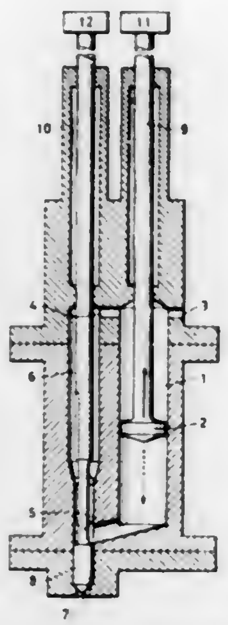
2. A pump comprising:
- a cylinder having a bore on a longitudinal axis with an inlet end and an outlet end;
- a piston having a head journaled for reciprocation in said cylinder bore along said longitudinal axis,
  said head having
    - a first face which is proximate to said bore outlet end and has a first effective transverse area,
    - a second face which is proximate to said bore inlet end and has a second effective transverse area which is less than said first area,
    - a cylindrical surface about said longitudinal axis and extending to and between said first and second faces and riding against the interior wall of said cylinder bore,
    - at least one bore of a first diameter passing through said head to and between said first and second faces,
    - at least one groove in said head cylindrical surface extending to and between said first and second transverse faces at an angle to said longitudinal axis, of a second diameter,
- first means disposed in said bore inlet end for initially inletting a quantity of liquid into said bore through said inlet end and for subsequently closing said inlet end, having a first face proximate to said piston head second face,
- second means for traversing said head towards said first means,
- said piston head second face and said first means first face, at a first longitudinal spacing between said piston head and said first means, mutually defining a first closed cavity having a first outlet through said piston head bore and a second outlet through said piston head groove, and at a second longitudinal spacing between said piston head and said first means, which second spacing is less than said first spacing, mutually defining a second closed cavity having an outlet through said piston head bore and a third closed cavity having an outlet through said piston head groove.

4,037,996
VOLUMETRIC PUMP

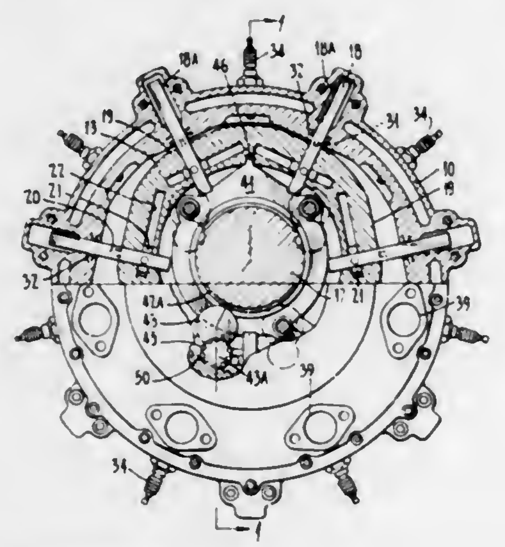
Willi Löliger, Konolfingen, Switzerland, assignor to Alpura Koreco A.G., Konolfingen, Switzerland
Filed Nov. 17, 1975, Ser. No. 632,770
Claims priority, application Switzerland, Nov. 22, 1974, 15538/74
Int. Cl.² F04B *7/00*
U.S. Cl. 417—518 **5 Claims**

1. Volumetric pump comprising
a cylinder chamber,
a piston reciprocably driven in said cylinder chamber,
an inlet at one end of said cylinder chamber,

ports at each end of said cylinder chamber,
a passage connected to and between said ports,
a valve movably mounted in said passage for controlling the flow in said passage, means outside said cylinder chamber for driving said valve in said passage, and
a closable outlet connected with the cylinder port at the cylinder end opposite the inlet end.

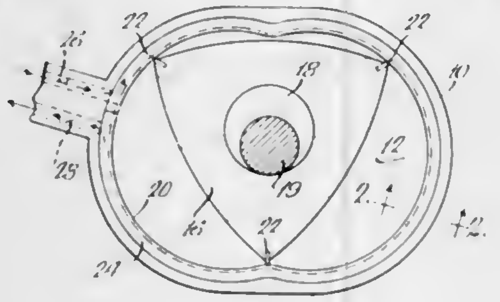


4,037,997
ORBITAL ENGINE WITH STABILIZING PLATE
Tony Ralph Sarich, 9 Halse Place, Karrinyup, Australia
Filed Feb. 3, 1976, Ser. No. 654,934
Claims priority, application Australia, Feb. 3, 1975, 0454/75
Int. Cl.² F01C *1/02*
U.S. Cl. 418—61 R **9 Claims**



1. A motor comprising:
a housing member having a cavity defined by an internal peripheral wall and opposed end walls,
a shaft supported for rotation relative to said housing member and having an axis of rotation,
a piston member mounted on said shaft eccentrically with respect to said axis of rotation to orbit within said cavity upon rotation of said shaft, said piston having a piston axis,
a plurality of vanes spaced circumferentially from one another to divide said housing into a plurality of chambers,
vane support means carried by at least one said piston member or said housing member and supporting said vanes in engagement with said housing walls and with said piston member as said piston orbits, whereby said vanes, said walls, and said piston member define a plurality of said chambers that vary in volume in sequence as said piston member orbits,
a control member journalled on said shaft coaxial with said piston axis,
piston member connecting means carried by said piston member and said control member for preventing angular movement of said control member with respect to said piston member, and
control member connecting means operatively connecting said control member to said housing member so that said control member moves in an orbital path corresponding to the orbital path of said piston member.

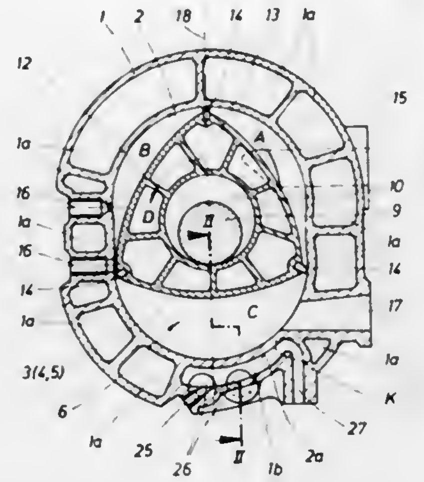
4,037,998
ROTARY ENGINE COOLING
Alexander Goloff, East Peoria, Ill., assignor to Caterpillar Tractor Co., Peoria, Ill.
Filed Nov. 3, 1975, Ser. No. 628,020
Int. Cl.² F01C *21/06;* F01P *3/02;* F02F *1/14*
U.S. Cl. 418—83 **9 Claims**



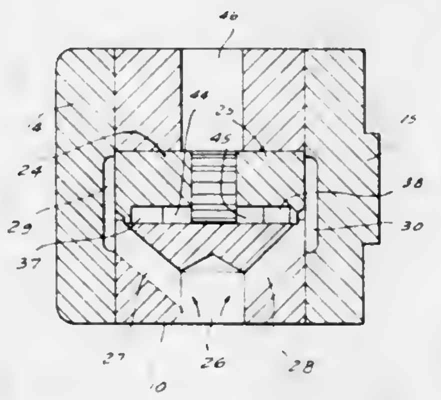
1. A rotary engine comprising:
a. a housing having interior walls defining an operating chamber;
b. a rotor mounted for movement in said chamber;
c. a thin layer of wear resistant metal within said chamber and located to be sealingly engaged by said rotor as said rotor moves within said chamber; and
d. a backing for said thin layer interposed in sandwiched relation between said thin layer and said housing for transmitting pressure applied to said thin layer to said housing, said backing being formed of a metal having high thermal conductivity and being provided with a plurality of relatively closely spaced, elongated, coolant passages, said backing including a plurality of protrusions extending into said passages to introduce turbulence in a coolant passing through said passages, said passages having a substantially uniform cross sectional area along their length.

4,037,999
LIQUID-COOLED ROTARY PISTON INTERNAL COMBUSTION ENGINE WITH HOUSING
Bauder Armin; Lechler Rolf, both of Neckarsulm; Steinwart Johannes, Obersulm-Willsbach, and Wilmers Gottlieb, Neuenstadt, all of Germany, assignors to Audi NSU Auto Union Aktiengesellschaft, Neckarslum,Wurrt, Germany
Filed Mar. 12, 1976, Ser. No. 666,404
Claims priority, application Germany, Mar. 15, 1975, 2511451
Int. Cl.² F01C *21/06*
U.S. Cl. 418—84 **5 Claims**

1. Liquid-cooled rotary piston internal combustion engine with a housing consisting of at least one annular shell with interior guideway and two parallel end walls and bounding an interior space, the shell containing first and second cavities for circulation of two separate cooling circuits with said first cavity being arranged in the region of the housing where the expansion and exhaust strokes take place in the interior space, and a liquid-cooled piston revolving in the interior space and having cavities traversed by cooling liquid, the piston cavities and said first cavity being connected in series.

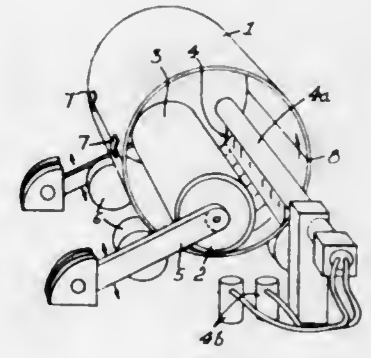


4,038,000
GEAR MACHINE WITH BEARING COOLING AND LUBRICATION
Wilhelm Dworak, Stuttgart, Germany, assignor to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Apr. 10, 1975, Ser. No. 567,113
Claims priority, application Germany, May 4, 1974, 2421599
Int. Cl.² F01C *21/04;* F03C *3/00;* F01C *1/18*
U.S. Cl. 418—102 **6 Claims**



1. In a gear machine, such as a gear pump or motor, a combination comprising a housing having an inner circumferential wall bounding a chamber; inlet and outlet ports in communication with said chamber for respectively admitting and discharging fluid relative thereto; gearing means mounted in said chamber and including a pair of meshing gears each having respective shafts at opposite axial sides of said gearing means; bearing sleeves journalling said shafts for rotation; wall means bounding said chamber at opposite ends thereof, said wall means being a pair of side walls each formed with a recess which overlies the respective shafts at each axial side of said gearing means; a pair of bores formed in said housing and extending from one of said ports to a respective one of said recesses at each axial side of said gearing means, said bores constituting the only source of communication with said one port and having a combined cross-sectional configuration such that all of the fluid at said one port communicates with said recesses; means for simultaneously cooling and lubricating all of the interior sleeve regions which surround said shafts, including interior passage portions formed in the internal surfaces of said sleeves, said interior passage portions communicating with said recesses and being operative for conveying all of the fluid from said one port along a part of the lengths of the respective shafts so as to cool and lubricate the latter; means for simultaneously cooling and lubricating all of the exterior sleeve regions which face said circumferential wall, including exterior passage portions formed in the external surfaces of said sleeves, said exterior passage portions communicating with said interior passage portions and being operative for conveying all of the fluid from the latter along a part of the lengths of the respective sleeves so as to cool and lubricate the latter; and passage means communicating said exterior passage portions with said chamber, whereby all of the fluid passing through the machine is employed in cooling and lubricating all of the sleeves and all of the shafts in a simultaneous and uniform manner.

4,038,001
CENTRIFUGAL MOULDING
Wolf Walter Stinnes, 31 Johan Rissik Ave., Waterkloff Ridge, Pretoria, South Africa (0002)
Filed May 6, 1975, Ser. No. 575,085
Claims priority, application South Africa, May 8, 1974, 74/2928
Int. Cl.² B29C *27/16*
U.S. Cl. 425—110 **5 Claims**

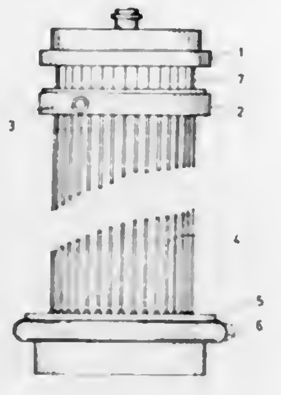


1. Apparatus suitable for moulding reinforcing fibres and a settable liquid bonding agent comprising:
a rotatable hollow mould form having at least one axial opening:
means for rotating the mould form about its longitudinal axis in actuating relationship with the mould form;
a rotatable mandrel located within the mould form parallel to the longitudinal axis thereof for rotatably mounting a multilayered roll of reinforcing fibres in the mould form;
rolling means adjacent the mould form for rotatably holding the mandrel within the mould form, the holding means being adapted to move the roll from a position wherein it is spaced from the mould form inner surface to a position wherein it is in contact therewith;
rotating means, on the holding means, for rotating the mandrel about its axis; and
means for injecting a settable liquid bonding agent into the mould form located within the annular space of the mould form.

4,038,002
PELLETIZER
Yoshio Inaba, and Takashi Hisagi, both of Tsuruga, Japan, assignors to Toyobo Co., Ltd., Japan
Filed Dec. 24, 1974, Ser. No. 536,183
Claims priority, application Japan, Dec. 24, 1973, 48-3575
Int. Cl.² B29F *3/06*
U.S. Cl. 425—136 **7 Claims**

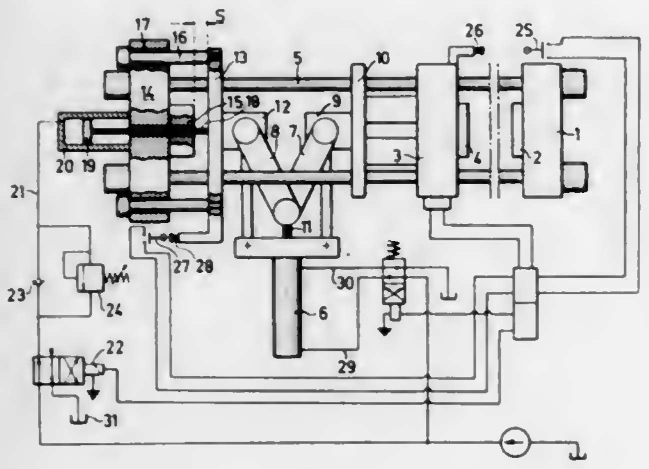
1. A substantially vertically disposed pelletizer apparatus utilizing a hydraulic suction force for the pelletization of a thermoplastic polymer which comprises a plurality of nozzle means for extruding a thermoplastic polylmer in a melt state into strands, a plurality of injector means disposed below corresponding nozzle means, said injector means receiving the strands from the nozzle means, and provided with means for introducing water and air together with said strands, a plurality of guide tubes disposed below corresponding injector

means, said guide tubes defining a space therein for receiving said strands and water-air mixture, said water cooling and solidifying the strands during their travel through said guide tubes, a cutter means disposed below the guide tubes for cutting the cooled and solidified strands, and an automatic control system for controlling the amount of thermoplastic polymer extruded through the nozzle means, said automatic control system including means for sensing the air pressure of the space in the upper portion of the guide tubes and control means connected to said sensing means for controlling the extrusion of the thermoplastic polymer through the nozzle, said control means being responsive to the operation of the sensing means.



4,038,003
INJECTION MOLDING MACHINE

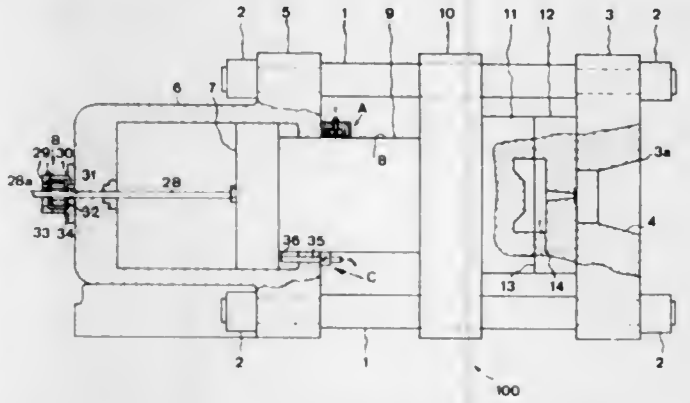
Jan Erik Enefrid Hansson, Viken, Sweden, assignor to Sund-Akesson Aktiebolag, Helsingborg, Sweden
Continuation of Ser. No. 574,850, May 6, 1975, abandoned. This application Oct. 1, 1976, Ser. No. 728,784
Claims priority, application Sweden, May 14, 1974, 7406408
Int. Cl.^{2} B29C *1/00*
U.S. Cl. 425—137 **1 Claim**



1. An injection molding machine comprising: first and second mold halves mounted for relative movement along a longitudinal axis, a stop and a link plate each mounted along said longitudinal axis so that said link plate is movable towards said stop against a pressure device, drive means for driving said mold halves towards each other along said longitudinal axis and for driving said link plate towards said stop along said longitudinal axis, first control means for maintaining a high pressure in said pressure device for preventing contact between said link plate and said stop during the starting phase of the mold closing, second control means actuated in response to said mold halves moving together and arriving at a fixed distance relative to each other or the relative movement of said mold halves during closing decreasing in speed to a predetermined value for switching said pressure device from a high pressure to a low pressure so that said drive means drives said link plate and said stop into contact with each other, a first device operable to indicate to a third control means the contact of said mold halves during proper operation, a second device operable to indicate to said third control means the contact of said link plate and said stop, said third control means being operative to retract said drive means to move said mold halves away from each other when said third control means receives a signal from said second indicating device before it receives a signal from said first indicating device, thereby indicating that an object is stuck between said mold halves.

4,038,004
MEASUREMENT APPARATUS FOR DETERMINING THE DEGREE OF FILLING OF A CASTING MOLD

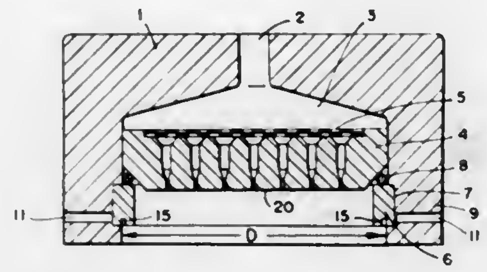
Eduard Hartmann, Urdorf, Switzerland, assignor to Bucher-Guyer AG Maschinenfabrik, Niederweningen, Switzerland
Filed July 28, 1975, Ser. No. 599,880
Claims priority, application Switzerland, Aug. 7, 1974, 10806/74
Int. Cl.^{2} B29F *1/06*
U.S. Cl. 425—150 **11 Claims**



1. A measurement apparatus for a molding machine for controlling the degree of filling of a molding mass filled under pressure into a molding compartment thereof, comprisingan electrical measurement value transmitter including sensing means responsive to changes in distance for determining the degree of filling of a mold having a molding compartment, said mold comprising two mold parts movable between a mold closure positin and a mold open position, at least one fluid-operated displacement means moving the mold parts against one another into the mold closure position, said fluid-operated displacement means comprising a closure cylinder and a closure piston cooperating with said mold, said measurement value transmitter comprising a first transmitter component and a second transmitter component, the first transmitter component being secured to the closure cylinder and the second transmitter component being coupled to allow relative movement with the closure piston, means providing a drag connection between the second transmitter component and the closure piston throughout a given range of movement of said closure piston, and during movement of said closure piston within said given range of movement said drag connection having means effective to allow relative movement between said first transmitter component and said second transmitter component and no relative movement between said second transmitter component and said closure piston, and when said closure piston has moved outside of said given range of movement said transmitter components being arranged so that said drag connection is rendered ineffective, said closure piston and said second transmitter component being coupled to allow relative movement and said first transmitter component and said second transmitter component having no relative movement therebetween.

4,038,005
NOZZLE PLATE HOLDER

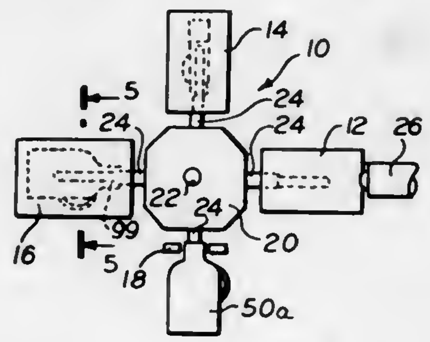
Erich Lenk, Remscheid-Lennep, Germany, assignor to Barmag Barmer Maschinenfabrik, Wuppertal, Germany
Filed June 9, 1975, Ser. No. 584,925
Claims priority, application Germany, June 20, 1974, 2429654
Int. Cl.^{2} B29F *3/00*
U.S. Cl. 425—190 **9 Claims**



1. In combination with an apparatus for the extrusion of a molten thermoplastic polymer including a nozzle plate arranged perpendicularly to the axial direction of flow of the polymer melt therethrough, an improved holding means for said nozzle plate comprising:
- a housing having side walls enclosing an axially extending cavity, said housing having a feed opening into said cavity at its inlet end to receive said polymer melt for extrusion and a discharge opening at its opposite end, the discharge opening of said housing being open to axially insert said nozzle plate along the inner wall surface formed by the sides of the housing;
- a peripheral groove extending around the inner wall surface of said housing at an axially spaced interval from the discharge end thereof;
- a plurality of supporting ledge elements removably inserted into said peripheral groove in end-to-end proximity and extending completely around the inner periphery of said side walls, the radially innermost ends of said ledge elements projecting out of the groove and into the discharge opening of said housing as a bearing surface to support said nozzle plate when fully inserted in said housing; and
- a sealing ring removably inserted between the nozzle plate and said bearing surface of the ledge elements to support and to seal the nozzle plate against the pressure exerted axially by the melt on the nozzle plate in the discharge direction.

4,038,006
APPARATUS FOR MAKING A BLOW MOLDED CONTAINER WITH HOLLOW HANDLE AND METHOD OF MAKING

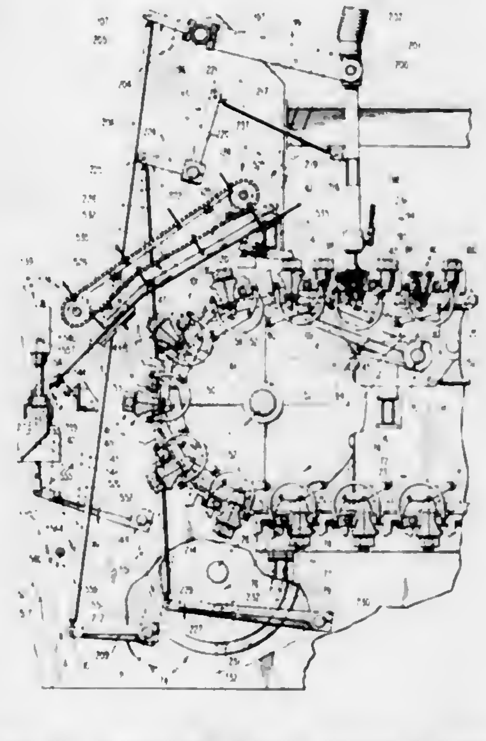
John J. Farrell, Green Brook, N.J., assignor to Farrell Patent Company, Greenbrook, N.J.
Division of Ser. No. 479,547, June 4, 1974, Pat. No. 3,928,522. This application Dec. 17, 1975, Ser. No. 641,482
Int. Cl.^{2} B29C *17/07*
U.S. Cl. 425—525 **9 Claims**



1. Apparatus for making an injection blow molded plastic container having a hollow handle projecting from a side of the container and of one-piece construction therewith, including in combination, an injection mold in which a parison is applied to a core rod, said injection mold being formed with a cavity so that the parison is thicker at that portion at which the handle is to be formed, a first blow station to which the core rod and parison are transferred, a first blow mold at the first blow station, having a cavity therein with a handle forming portion of the cavity for receiving the said thicker parison portion, means for applying fluid pressure to the inside of the parison to expand the said thicker parison portion into the handle portion of the cavity and to partially expand the remainder of the parison to a partially formed container, a part of the walls of the handle portion of the cavity of the first blow mold comprising mens to shear from the handle portion of the parison a part of the plastic thereof so as to form a hollow handle, a second blow mold, and means for transferring the partially blow container to the second blow mold, said second blow mold having a cavity with a handle portion shaped to the final contour for the container, and into which the hollow handle formed in the first blow mold is received, and means for supplying blowing fluid to expand the partially blown container in the second blow mold.

4,038,007
APPARATUS FOR MAKING HOLLOW MOLDED PRODUCTS

Arthur J. Griner, Wyckoff, and Daniel Anthony Koppa, Bloomfield, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.
Division of Ser. No. 103,707, Jan. 4, 1971, Pat. No. 3,958,912. This application May 1, 1973, Ser. No. 356,189
Int. Cl.^{2} B29C *5/00*
U.S. Cl. 425—259 **13 Claims**



1. Apparatus for producing hollow products comprising a conveyor carrying a row of a plurality of longitudinally spaced molds alternately through an oven to bake a moldable material within the molds and through a zone outwardly thereof, means at said zone for lifting the baked products upwardly out of successive molds, said product lifting means comprising suction means for supporting the product, pump means for charging successive molds with said material, and means for moving said pump means longitudinally from a terminal position substantially in synchronism with each mold while the latter is being thus charged by the pump means.

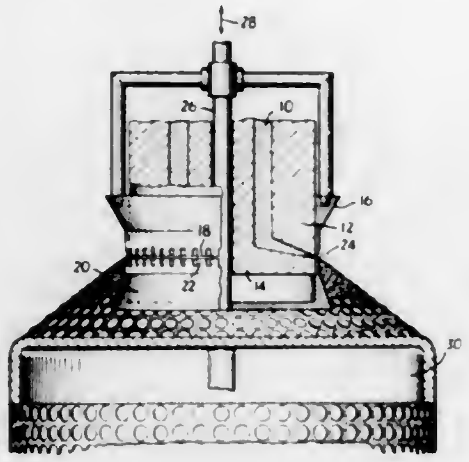
4,038,008
PRODUCTION OF NET OR NET-LIKE PRODUCTS

Ronald Leslie Larsen, Minneapolis, Minn., assignor to Conwed Corporation, St. Paul, Minn.

Continuation of Ser. No. 440,963, Feb. 11, 1974, abandoned. This application July 14, 1975, Ser. No. 595,721

Int. Cl.^{2} B29F *3/04*

U.S. Cl. 425—290 **3 Claims**



1. Apparatus for the production of thermoplastic structures comprising:

- a. an annular extrusion die of a stated diameter and including a pair of spaced die members, said die members defining a single, continuous annular extrusion orifice on the periphery of the extrusion die through which a unitary tube of molten polymer can be extruded substantially radially outward from the extrusion die;
- b. a pair of annular perforating members having a plurality of spaced teeth rigidly affixed to each other with one disposed below the extrusion orifice and the other disposed above the extrusion orifice with the teeth in each perforating member being axially positioned adjacent the extrusion orifice and operative upon reciprocating motion to alternately completely block off selected areas of the said continuous extrusion orifice corresponding to said teeth thereby interrupting the flow of polymer at said selected areas;
- c. said perforating members being substantially in axial sliding contact with said die members at the extrusion orifice; and
- d. an annular mandrel disposed below said extrusion die said mandrel having a diameter greater than the said stated diameter whereby the extruded molten polymer tube will be at least partially oriented when it is drawn over said mandrel.

4,038,009
APPARATUS FOR THE MANUFACTURE OF DISC RECORDS

William Herbert Toull, West Drayton, England, assignor to E M I Limited, Hayes, England

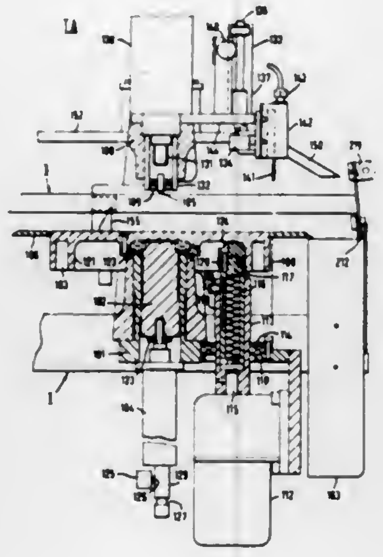
Filed Sept. 16, 1975, Ser. No. 613,873

Claims priority, application United Kingdom, Oct. 3, 1974, 42897/74

Int. Cl.^{2} B29D *17/00*

U.S. Cl. 425—308 **10 Claims**

1. Apparatus for the manufacture of a disc record including a source of material mouldable for processing to a disc record operable to supply said material to a first work station at which to form a shot of said material, a second work station at which to press from said shot a disc with surplus material attached as flash, a third work station at which to trim said flash material from said disc, a receiver for trimmed disc records and a reciprocal transfer assembly having first second and third transfer elements simultaneously operable forwardly to pick-up material in process from a respective work station and transfer it to a set-down position and return empty to the pick-up work station, the transfer assembly also having a flash clearing element simultaneously operable with said transfer elements to sweep trimmed flash from the third work station to a discharge point.



4,038,010
APPARATUS FOR PRODUCTION OF GRANULATED AND PULVERIZED PARTICLES FROM PASTY OR SIMILAR MATERIAL

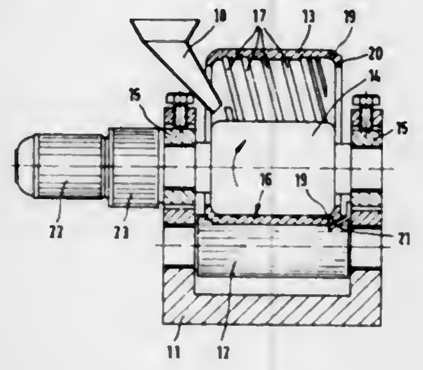
Horst Bremer, Lage, Germany, assignor to Gunther Papenmeier KG Maschinen-und Apparatebau, Detmold, Germany

Filed Oct. 7, 1974, Ser. No. 512,871

Claims priority, application Germany, Oct. 10, 1973, 2350746

Int. Cl.^{2} B29B *1/03*

U.S. Cl. 425—314 **24 Claims**



1. Apparatus for producing granulates from pulverulent, granular, doughy or similar material, such as plastics, comprising: rotatably mounted means having two closely adjacent but spaced apart rotatable curved surfaces, providing an elongate zone nip where the rotatable surfaces are approaching each other and each surface being rotatable about an axis; means on at least one of said rotatably mounted means providing at least one circumferential row of apertures through at least one of said rotatable surfaces adjacent said nip and spaced axially from said portion of said nip where material is fed, said rotatable surfaces being imperforate over a continuous extent of at least approximately one-half of their axial length extending from adjacent said row of apertures; drive means connected to said means with rotatable surfaces for imparting rotational drive thereto; means located adjacent said zone nip for continuously feeding material into one portion of the zone nip between the rotatable surfaces where said surfaces are imperforate; said surfaces at said zone providing periodic and repeated kneading action on the material causing it to be formed as a skin and conveyed in the axial direction and along the length of the adjacent imperforate portions of the rotating surfaces toward said at least one row of apertures; said surfaces, when rotating, providing a force on and causing kneaded material, when it has progressed to said row to pass through said apertures; and means located at the exit side of said apertures enabling granulating of the material extruding from said apertures.

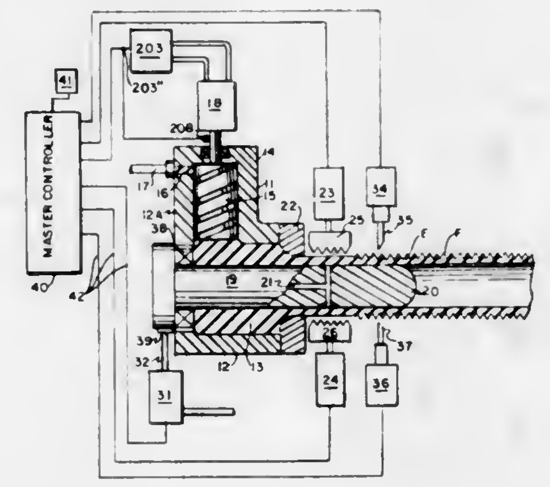
4,038,011
APPARATUS FOR FORMING RIBBED TUBING

Jerome H. Lemelson, 85 Rector St., Metuchen, N.J. 08840

Continuation-in-part of Ser. No. 319,194, Dec. 29, 1972, and a continuation-in-part of Ser. No. 68,724, Sept. 1, 1970, Pat. No. 3,708,253. This application Jan. 28, 1975, Ser. No. 544,833

Int. Cl.^{2} B29D *23/04*

U.S. Cl. 425—325 **3 Claims**



1. An apparatus for forming a tubular extrusion having a smooth inside wall surface and an irregular external wall surface comprising:

first means for extruding a plastic material in the shape of a tube, said first means including an extrusion die and a stationary mandrel extending through said die for forming the inside surface of a tubular extrusion formed in said die,

said mandrel having an end portion protruding a distance outwardly from said die,

second means including tooling located externally of said die, said tooling including a pair of forming dies each having at least one semi-circular rib-like formation, said forming dies being operable to engage the tubular extrusion formed in said die against the end portion of said mandrel immediately after said extrusion has exited from said die,

third means connected to said tooling for powering operating said tooling in synchronization with the movement of the extrusion from said die to cause said tooling to intermittently engage and disengage said tubing against said mandrel and to (predeterminately) deform a portion of the outer stratum of the extrusion as the extrusion passes over said mandrel so as to mold a plurality of circumferentially extending circular rib-like formations around said wall of said extrusion for varying the physical characteristics of said tubular extrusions.

4,038,012
MULTIPLE-ROLL CALENDARS FOR PRODUCING THERMOPLASTICS FILM

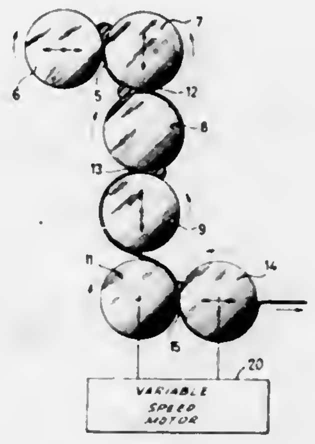
Gottfried Sander, Richterich, Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hannover-Kleefeld, Germany

Filed July 21, 1975, Ser. No. 597,531

Claims priority, application Germany, Aug. 14, 1974, 2438983

Int. Cl.^{2} B29C *15/00*

U.S. Cl. 425—363 **4 Claims**



1. A calender for producing thermoplastics films and comprising a plurality of calender rolls wherein viewed in the direction of working, a penultimate roll of said rolls is spaced from a roll of said rolls which immediately precedes said penultimate roll so that in operation of the calender a portion of the material being calendered, for a period as it travels from said preceding roll to said penultimate roll, is not in contact with any of said rolls, and said penultimate roll and a final one of said rolls which together define a final working gap, are provided with drive means whereby they can be driven at varying speeds independently of the others of said rolls.

4,038,013
SPINNERET APPARATUS WITH PARTICULATE MATERIAL CONVEYING MEANS

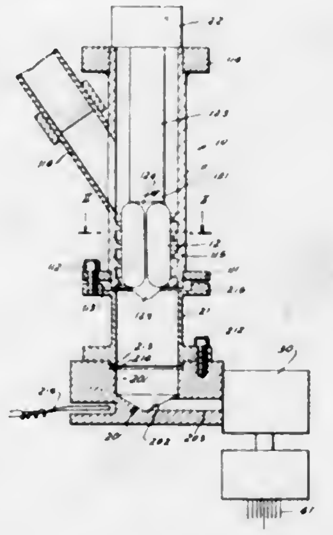
Ian Tomlinson, Rossendale, England, assignor to Ernest Scragg & Sons Limited, Macclesfield, England

Filed Mar. 31, 1976, Ser. No. 672,432

Claims priority, application United Kingdom, Apr. 29, 1975, 17818/75

Int. Cl.^{2} D01D *5/02*

U.S. Cl. 425—378 S **11 Claims**



1. An apparatus for conveying particulate material, comprising a cylindrical barrel having an internal wall provided with a screw thread; means for feeding said material into said barrel; a member mounted in said barrel and extending along at least part of the axial length of said screw thread, said member being of a polygonal cross-section having a transverse dimension

closely approximate to the inner diameter of the screw flights of said screw thread so as to allow movement of said material in a direction of said axis but to substantially prevent rotation of said material about said axis relative to said member; and means for causing relative rotation of said member and said barrel whereby to cause relative rotation of said material and said barrel to advance the material along said barrel.

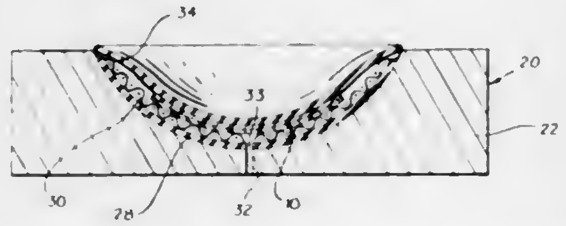
4,038,014
LENS MOLD

Robert J. Dusza, and Joseph W. Kantorski, both of Southbridge, Mass., assignors to American Optical Corporation, Southbridge, Mass.

Filed Sept. 24, 1976, Ser. No. 726,708

Int. Cl.^{2} B29C *17/04;* **B29D** *11/00;* **B29C** *1/02*

U.S. Cl. 425—388 **10 Claims**



1. A lens shaping mold of rigid base material having a lens blank receiving cavity of concave surface curvature substantially corresponding to a shape desired to be imparted to at least one surface of a lens placed in said cavity and urged against said cavity surface wherein the improvement comprises;

a cushion of uniform thickness extended over at least the major portion of said concave surface of said cavity, said cushion being adhered to said cavity surface; and

a covering of synthetic open texture fabric extended over and adhered to said cushion.

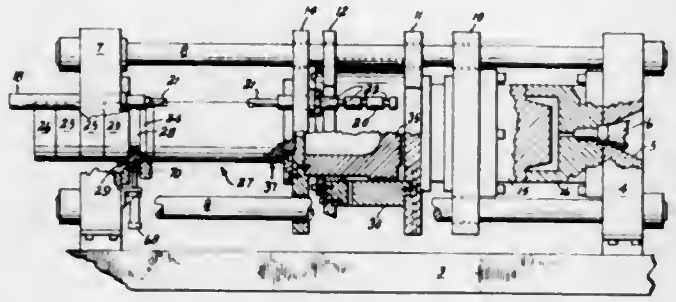
4,038,015
HYDRAULIC INJECTION MOLDING MACHINE WITH COMPRESSION RAM

James Earl Dawson, Lebanon, Ohio, assignor to Cincinnati Milacron, Inc., Cincinnati, Ohio

Filed Jan. 9, 1976, Ser. No. 647,741

Int. Cl.^{2} B29F *1/00*

U.S. Cl. 425—451.7 **15 Claims**



1. In a lock and block clamping force applying means for holding in a fully advanced position the movable platen of a hydraulic injection molding machine by engaging with a laterally moving lock to lock recess in the tail section of the blocking ram that moves longitudinally through the stroke of the machine and holds said platen, said lock fitting said lock recess to thereby block said ram and platen from any substantial movement away from said fully advanced position, an improved blocking ram construction that comprises:

a. said tail section having a cylindrical rear segment;

b. a plurality of annular spacer rings mounted on said rear segment;

c. a front section of said ram having a preselected diameter and which is secured to said moving platen and extends longitudinally a portion of the distance to said ram tail section;

d. said rear segment having a cylindrical sleeve portion of a diameter less than said ram front section diameter;

e. each ring of said plurality of annular spacer rings having an outer diameter substantially that of said ram front section, a predetermined longitudinal length, front and rear faces that are substantially parallel, and an inner diameter approximately but slightly larger than that of said sleeve portion, at least one of said rings being movable longitudinally on said cylindrical sleeve portion, the longitudinal dimensions of the respective rings providing means for mold height adjustment;

f. said lock recess being provided by the longitudinal dimension between the opposing faces on any two selected rings and longitudinally of a size to receive said lock and located to the rear of the rear face of one of said rings;

g. whereby said machine can be adjusted so its blocking ram moves to a preselected one of a number of predetermined advance positions which is coincident with the location of said recess whence said platen can be moved to said fully advanced position and, if molds be present, to hold the same closed while said lock and block construction resists opening of the mold during a molding procedure.

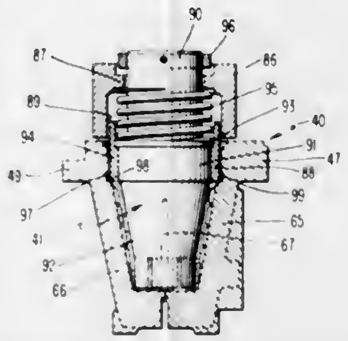
4,038,016
APPARATUS FOR MAKING HOLLOW MOLDED PRODUCTS

Arthur J. Griner, Wyckoff, and Daniel Anthony Koppa, Bloomfield, both of N.J., assignors to Nabisco, Inc., East Hanover, N.J.

Division of Ser. No. 103,707, Jan. 4, 1971, Pat. No. 3,958,912. This application May 1, 1973, Ser. No. 356,204

Int. Cl.^{2} A21C *11/00*

U.S. Cl. 425—451.9 **1 Claim**



1. In apparatus for making a hollow molded product, a mold having an open end cavity, a core bar, a core supported on the core bar and adapted to be inserted in the mold cavity through said open end, the core bar overlying the mold when the core is disposed within the mold, the core bar and the core being removable from the mold, the core comprising a main central member having a flange intermediate the ends thereof and a sleeve surrounding and secured to said flange and being mounted on the core bar for limited reciprocation in a direction into and out of the mold, interengaging external and internal shoulders on the core and mold, respectively, within the mold cavity to determine the fully inserted position of the core and thereby form a closed molding space inwardly of said shoulders around the core, interengaging surfaces on said core and mold within the cavity and outwardly of said interengaging shoulders for piloting and centering the core in the cavity, a groove in the wall of said cavity between said internal shoulder and said piloting surface in the mold cavity forming a space between the core and mold within the latter to receive excess moldable material from said molding space upon insertion of the core, resilient means acting between the core bar and the core for thrusting the core into the mold, said resilient means being a coil spring surrounding the core outwardly of said flange and extending into the outer end of said sleeve, and releasable latching means acting between the core bar and the mold to lock them together.

4,038,017
EXTRUSION HEAD

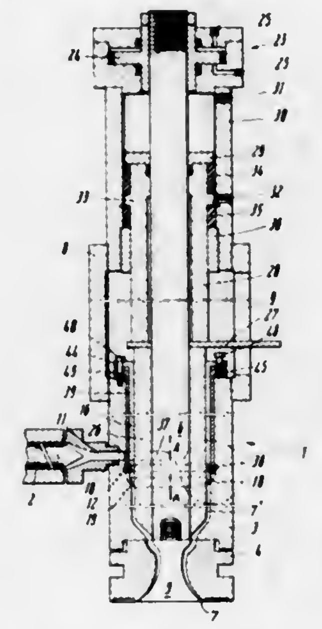
Erhard Langecker, Meinerzhagen, Germany, assignor to Battenfeld Maschinenfabriken GmbH, Meinerzhagen, Germany

Filed Mar. 4, 1976, Ser. No. 663,729

Claims priority, application Germany, Mar. 6, 1975, 2510127

Int. Cl.^{2} B29F *3/04*

U.S. Cl. 425—466 **12 Claims**



1. An extrusion head for the manufacture of a hollow string of thermoplastic material consisting of two concentric layers, the weld seams of which are circumferentially staggered in relation to one another, said extrusion head comprising:

at least one inlet passage arranged transversely in said extrusion head;

a ram chamber extending axially with respect to said extrusion head and having an annular volume to accommodate an axially displaceable annular piston;

means operatively associated with said ram chamber for deflecting and distributing said thermoplastic material into said ram chamber;

a die core downstream of said ram chamber;

a sleeve disposed concentrically with respect to said die core in said extrusion head, said sleeve having a tapered end which is disposed toward an exit slot in said extrusion head;

means operatively associated with said annular piston for axially displacing said annular piston;

means operatively associated with said die core; for axially displacing said die core;

said means for deflecting and distributing said thermoplastic material comprising:

a first annular groove surrounding said sleeve, an internal wall of said groove being formed by said sleeve; p1 a second annular groove corresponding to said first annular groove and located along with said first annular groove in a horizontal central plane;

a longitudinally displaceable separator sleeve which passes through said first and second annular grooves, said separator sleeve having an opening;

two inlet passages located above said first and second annular grooves, said inlet passages being staggered peripherally in relation to one another with one of said inlet passages opening into said first annular groove and the other of said inlet passages opening into said second annular groove via said opening in said separator sleeve;

two guide slots of selected widths which merge into said restrictor slot, said guide slots being formed by one end of said separator sleeve passing through said first and second annular grooves; and

a restrictive slot formed by said tapered end of said sleeve, said restrictive slot providing a passageway through which said thermoplastic material can enter said ram chamber,

said restrictive slot having a width which corresponds to the sum of the widths of said guide slots.

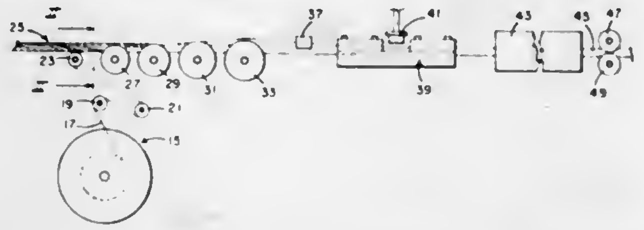
4,038,018
APPARATUS FOR MOLDING OF FILAMENT-REINFORCED PLASTIC RODS

Carl R. Pepmeier, Fredericksburg, Va., assignor to FMC Corporation, Philadelphia, Pa.

Filed June 21, 1976, Ser. No. 697,883

Int. Cl.^{2} B29C *27/14*

U.S. Cl. 425—505 **8 Claims**



1. In an apparatus for molding of reinforced plastic rods, said apparatus including means for continuously advancing a continuous, generally flat web which is in contact with a mass comprised of a bundle of filaments embedded within an unset plastic material, means for progressively deflecting successive longitudinal edge portions of the continuous web transversely and about the mass concomitantly with the continuous advancement of the web and mass to thereby a tube encasing such mass and means for setting the plastic material of the encased mass, the improvement comprising a shaping device having an elongated passage through which the encased mass is adapted to travel during the advancement thereof towards said setting means, said elongated passage being defined by generally like annular surfaces which are dimensioned to radially squeeze the encased mass to thereby express contained air therefrom while concomitantly imparting a precise circular cross-sectional shape thereto, at least portions of said annular surfaces being spaced longitudinally from adjacent of said annular surfaces to thereby minimize frictional retardation of the encased mass during its travel through said shaping device.

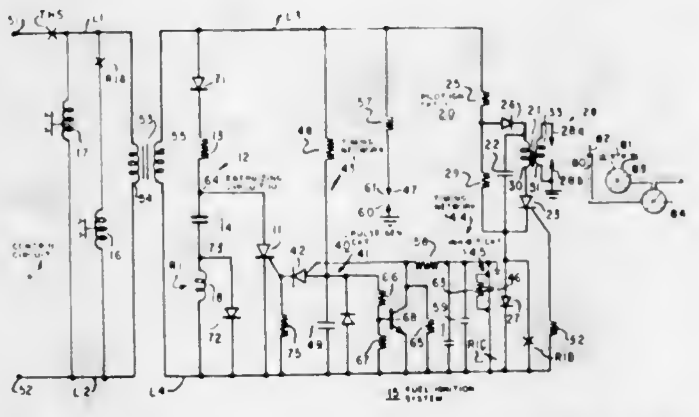
4,038,019
FAIL-SAFE ENERGIZING CIRCUIT FOR A FUNCTIONAL DEVICE

Russell Byron Matthews, Goshen, Ind., assignor to Johnson Controls, Inc., Milwaukee, Wis.

Filed Sept. 10, 1975, Ser. No. 611,961

Int. Cl.^{2} F23Q *9/14*

U.S. Cl. 431—51 **20 Claims**



9. In a fuel ignition system including pilot source means operable when enabled to provide a pilot flame, and main valve means operable when energized to supply fuel to a burner apparatus for ignition by said pilot flame, a control arrangement comprising switching means operable when enabled to effect operation of said valve means, capacitance means, means connecting said capacitance means to a source of a cyclical AC signal to enable said capacitance means to charge during a portion of alternate cycles of the AC signal, a normally disabled controlled switching device operable when enabled to connect said capacitance means in a circuit path with said switching means to permit said capacitance means to discharge over said switching means, said conrol arrangement further including flame sensing means for controlling the enabling of said controlled switching device, said flame sensing means being responsive to a pilot flame to be operable in a first mode to maintain said controlled switching device disabled for a plurality of cycles of said AC signal to permit said capacitance means to charge to a predetermined value, and to then enable said controlled switching device during the next one of said alternate half cycles of the AC signal to permit said capacitance means to discharge over said switching means to operate said switching means, and to thereafter enable said controlled switching device during each alternate half cycle of the AC signal while the pilot flame remains established to permit said capacitance means to discharge over said switching means during said alternate half cycles of the AC signal to maintain said switching means operated.

4,038,020

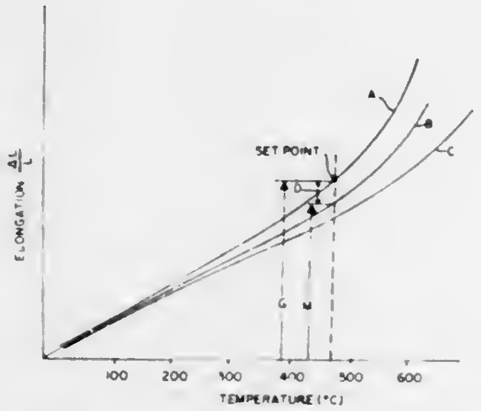
PHOTOFLASH LAMP

Emery G. Audesse, and Donald E. Armstrong, both of Williamsport, Pa., assignors to GTE Sylvania Incorporated, Montoursville, Pa.

Filed Oct. 10, 1975, Ser. No. 622,275

Int. Cl.^{2} F21K *5/02*

U.S. Cl. 431—93 **8 Claims**



1. A photoflash lamp comprising:
an hermetically sealed, light-transmitting envelope;
a quantity of combustible material located in said envelope;
a combustion-supporting gas in said envelope; and
ignition means attached to said envelope and disposed in operative relationship to said combustible material;
said ignition means including at least one metallic member passing through and sealed in one end of said envelope; and
said envelope comprising a borosilicate glass having a mean coefficient of thermal expansion in the range of about 52 to 55 × 10^{-7} in./in./° C between 0° C and 300° C and a coefficient of thermal expansion at the set point thereof which is higher than the coefficient of thermal expansion of said metallic member at the setpoint of said glass, whereby the glass about the seal to said metallic member is in a state of radial compression.

4,038,021

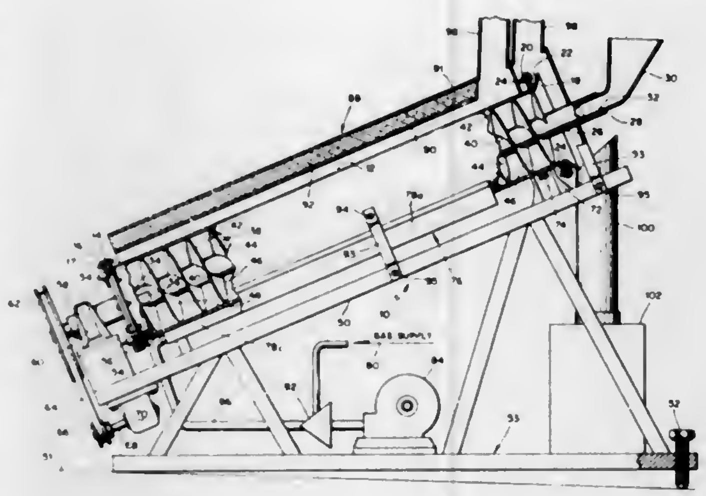
CONTINUOUS GRAIN DRIER AND METHOD

John O. Benson, Rte. No. 1, Box 28, Mayer, Minn. 55360

Filed Apr. 5, 1976, Ser. No. 673,934

Int. Cl.^{2} F27B *7/08*

U.S. Cl. 432—112 **15 Claims**



1. A continuous drier including a tubular casing mounted at an inclined axis for containing both a granular product to be dried and a heat transfer media in the form of heat conductive particles, a feed tube having the major longitudinal portion thereof concentrically disposed within said casing for feeding said product through the upper end of said casing into the casing adjacent the lower end thereof, a helical auger rotatable about said inclined axis having its outer edge engaging the interior of said casing and its inner edge engaging said feed tube, at least a portion of said auger having perforations therein of a size generally smaller than the grains constituting said product and generally larger than said particles constituting said heat transfer media so that said heat transfer media can sift downwardly as said product is advanced upwardly, and means for directing heat against the outside of said casing so that at least some of the heat transmitted through said casing is conducted to said product via said heat transfer media.

4,038,022

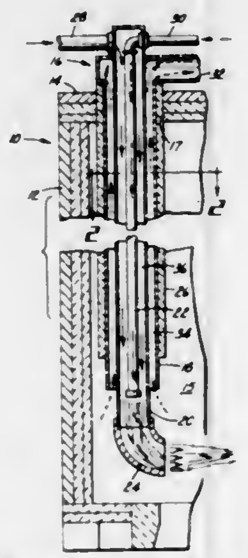
IN-FURNACE RECUPERATOR

Calvin C. Blackman, 5419 Park Drive, Vermilion, Ohio 44089

Filed June 9, 1975, Ser. No. 585,218

Int. Cl.^{2} F23D *11/44*

U.S. Cl. 431—166 **10 Claims**



1. In a furnace having a heating chamber defined by insulated walls and heated by the combustion of a fuel mixed with air delivered from the exterior of the furnace and wherein the air and fuel are supplied to a burner for combustion and the

combustion products are exhausted from the furnace, the improvement which comprises,
a heat recuperator extending beyond the insulated walls disposed within the confines of the furnace heating chamber,
said recuperator including collecting means to collect the products of combustion and cause them to flow from the furnace,
and air conducting means having an inlet positioned to draw air externally from the furnace and an outlet to supply air to the burner,
said air conducting means including heat conducting conduit means disposed in heat exchange relationship with said collecting means,
and insulating means surrounding the exterior of said recuperator within the chamber,
whereby the heat from the combustion products is utilized to preheat the air before the combustion products are exhausted from the furnace.

4,038,023

Patent Not Issued For This Number

4,038,024

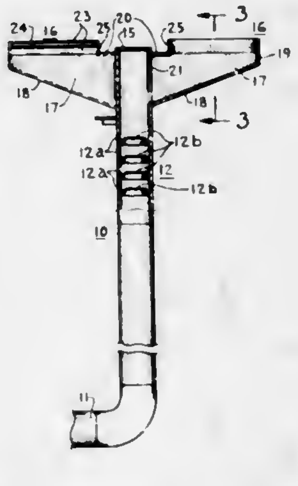
FLARE STACK GAS BURNER

John F. Straitz, III, Meadowbrook, Pa., assignor to Combustion Unlimited Incorporated, Elkins Park, Pa.

Filed Dec. 3, 1975, Ser. No. 637,385

Int. Cl.^{2} F23C *11/00*

U.S. Cl. 431—202 **3 Claims**



1. A flare stack gas burner for waste combustible gas comprising
a vertical stack pipe closed at the top and with an outwardly extending wall to which combustible gas is supplied for combustion,
a plurality of hollow fixed vanes extending outwardly from said outwardly extending wall and said stack pipe and to the interiors of which the gas from said stack is delivered,
each of said vanes having spaced parallel vertical side walls connected at the bottom by an upwardly and outwardly inclined bottom wall, and
said vanes being of a length of a plurality of times the diameter of the stack pipe, and
means for inducing the air required for the combustion of said gas comprising
a plurality of elongated flat inclined nozzles extending from said vanes for gas to be burned with at least one nozzle for each vane and to which said gas is delivered,
said nozzles extending substantially the lengths of the vanes, and
said nozzles having interior walls extending from the vertical side walls and converging to provide nozzle discharge openings and inducing combustion supporting air between said vanes and on each side of the gas streams discharged from said nozzles.

4,038,025

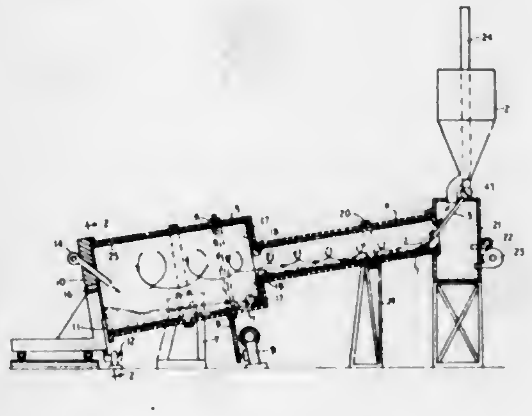
KILNS

Miroslav Kratochvil, Bondi Junction, Australia, assignor to R.M.C. Transport (New South Wales) Pty. Limited, Sydney, Australia

Division of Ser. No. 561,678, March 25, 1975, Pat. No. 3,955,917, which is a continuation-in-part of Ser. No. 431,879, Jan. 9, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,522

Int. Cl.^{2} F27B *7/02*

U.S. Cl. 432—13 **10 Claims**



1. A process for producing a light-weight aggregate from lumps of a material such as shale, clay or mud, said process comprising:
introducing said material into an upper end of a rotating substantially cylindrical first chamber having a lower end and an axis which is downwardly inclined;
moving said material through said first chamber into a rotating substantially cylindrical second chamber;
said second chamber having a downwardly inclined axis which is co-linear with the axis of said first chamber;
said second chamber having a diameter which is greater than the diameter of said first chamber and said second chamber having an upper end which is connected to said lower end of said first chamber;
heating said second chamber;
forming a sealing skin about the lumps of said material on entry of said material into said second chamber from said first chamber;
maintaining said second chamber at a substantially higher temperature than said first chamber by reflecting radiant energy exiting from the upper end of said second chamber directly back into the second chamber to maintain the temperature of said second chamber at a temperature which is sufficiently higher than the temperature of said first chamber to form said sealing skin about the lumps of material on their entry into the second chamber;
permitting hot gases from said second chamber to exit from the upper end of said second chamber into said first chamber to heat said first chamber, and
bloating said material within said second chamber after formation of said sealing skin about the lumps of material to provide an aggregate having improved properties of greater resistance to water absorption and higher strength.

4,038,026

ELECTROPHOTOGRAPHIC FUSING APPARATUS

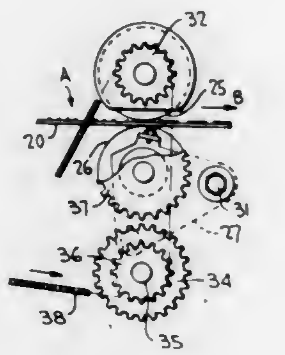
Kenichi Wada, Sakai; Yuji Enoguchi, Higashiosaka; Masaya Ogawa, Sakai; Hidetoshi Kawabata, Tondabayashi; Takaji Kurita, Kawachinagano; Susumu Tanaka, Sakai; Takao Fujiwara, Sakai, and Hiroshi Murasaki, Sakai, all of Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 585,709, June 10, 1975, Pat. No. 3,998,584. This application May 25, 1976, Ser. No. 689,845

Claims priority, application Japan, June 17, 1974, 49-69522; June 15, 1974, 49-68285

Int. Cl.^{2} H05B *3/10;* **G03G** *5/00*

U.S. Cl. 432—60 **4 Claims**



1. A heat roll assembly for an electrophotographic copying machine, comprising: frame means;

a pair of rolls comprising a heat roll and a support roll between which a support sheet bearing a toner powder image may pass;

one of said rolls being rotatably mounted on said frame means;

a roller assembly including levers pivotally mounted on said frame means, the other of said rolls being rotatably mounted on said levers for pivotal movement therewith, said roller assembly being pivotally mounted on said frame means for movement between a first position of rotative contact between said rolls and a second position wherein said rolls are spaced apart;

drive means for driving both of said rolls;

shift means including a shaft rotatably mounted on said frame means, said shaft having a cam element thereon in sliding contact with a cam follower mounted on said levers, a sprocket wheel rotatably mounted on said shaft and being in engagement with said drive means, and clutch means on said shaft for coupling the rotation of said sprocket wheel to said shaft for rotation thereof so as to effect movement of said roller assembly between said first and second positions;

means detecting arrival and departure of the support sheet from said rolls;

said shift means being actuated by said detecting means upon the arrival of the support sheet for shifting said other roll from said second to said first positions for rotation by said first roll, and for shifting said other roll to said second position from said first position upon the departure of the support sheet; and

said drive means being operatively connected to both said rolls for rotating said other roll only while in said second position.

CHEMICAL

4,038,027

CELLULOSIC TEXTILE MATERIALS HAVING IMPROVED SOIL RELEASE AND STAIN RESISTANCE PROPERTIES

John A. Kearney, Macon, Ga., assignor to The Bibb Company, Macon, Ga.

Continuation-in-part of Ser. No. 318,858, Dec. 27, 1972, Pat. No. 3,897,206. This application July 28, 1975, Ser. No. 599,350

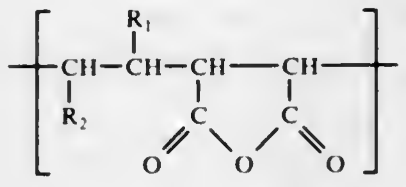
The portion of the term of this patent subsequent to July 29, 1992, has been disclaimed.

Int. Cl.^{2} D06M *13/20*

U.S. Cl. 8—120 **15 Claims**

1. A process for imparting improved soil release and stain resistance properties to cellulosic textile materials which comprises:

a. impregnating a cellulose-containing textile material with a solution of a water-soluble synthetic polymer acid or anhydride and an esterification catalyst said polymer having the recurring unit:



wherein

R$_1$ is hydrogen or methoxy;

R$_2$ is hydrogen or an alkyl of 1 to 4 carbons; and provided R$_1$ and R$_2$ are not simultaneously hydrogen and when R$_1$ is methoxy, R$_2$ is hydrogen;

b. drying the impregnated material at from room temperature to about 300° F;

c. curing the dryed impregnated material at a temperature of from about 250° F to about 410° F for a period of at least 15 seconds and sufficient to react said polymer with said cellulose-containing textile material; and

d. washing the cured material to remove excess unreacted polymer.

4,038,028

SEWAGE SLUDGE-IRRADIATION DEVICE

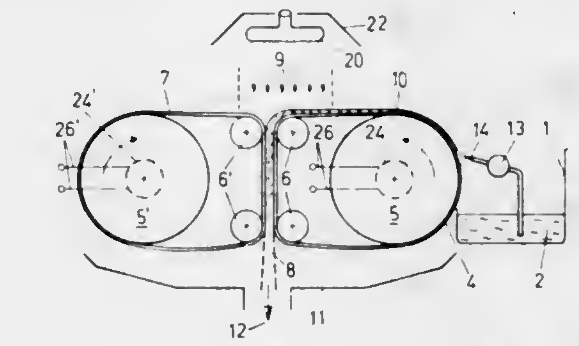
Ulrich La Roche, Zurich, Switzerland, assignor to BBC Brown Boveri & Company Limited, Baden, Switzerland

Filed Nov. 14, 1975, Ser. No. 632,103

Claims priority, application Switzerland, Nov. 20, 1974, 15418/74

Int. Cl.^{2} A61L *3/00*

U.S. Cl. 21—102 R **16 Claims**



1. An apparatus for irradiating sewage sludge with radiation having a sterilizing effect, comprising:

a conveyor system incorporating means for providing at least two cooperating conveyor devices,

means for supplying and depositing sewage sludge onto at least one of said conveyor devices,

said means for supplying and depositing sewage sludge onto at least one of said conveyor devices comprises a sewage sludge container for supplying the sewage sludge, said at least one conveyor device being structured to cooperate with said sludge container so as to withdraw the sewage sludge therefrom, and spreader means for spreading the withdrawn sludge deposited onto said at least one conveyor device over at least part of a surface thereof, said spreader means forming a substantially coherent thin layer of sewage sludge upon the surface of said at least one conveyor device, said spreader means comprising a material spreading element,

said conveyor devices being positioned relative to one another so as to form therebetween a passageway for the throughflow of the deposited sewage sludge, said passageway defining a mixing gap for the intermixing of the sewage sludge contained therein,

means for establishing a relative movement between said two conveyor devices,

said means for establishing a relative movement between said two conveyor devices comprises at least one drive means for driving at least one of said conveyor devices,

radiation means positioned relative to said conveyor system for irradiating the sewage sludge at a location immediately prior to intermixing thereof in the mixing gap.

4,038,029

LIMULUS LYSATE TURBIDITY TEST FOR PYROGENS

Joseph D. Teller, Freehold, and Kristine M. Kelly, Manasquan, both of N.J., assignors to Worthington Biochemical Corporation, Freehold, N.J.

Filed Jan. 20, 1976, Ser. No. 650,607

Int. Cl.^{2} G01N *21/00, 33/16;* **C12K** *1/00*

U.S. Cl. 23—230 B **19 Claims**

1. In a method for determining the endotoxin content of an aqueous liquid wherein the protein content of an aqueous lysate of washed amebocyte cells from the blood of the horseshoe crab is coagulated responsive to endotoxin contained in a sample of the liquid, the improvement which comprises admixing a sample of the liquid with lysate which is the product of water lysing washed amebocyte cells, said lysate being buffered at a pH between about 6.5 and about 6.8 and being at a concentration such that 1 ml thereof is reactive with 0.1 ml of an endotoxin solution containing 1 ng per ml of endotoxin to develop upon incubation for 60 minutes at 37° C turbidity that imparts an absorbancy between about 0.07 and about 0.2 at 360 nm, incubating said admixture under temperature and time conditions conducive to an increase in absorbancy resulting from reaction of said lysate with any endotoxin contained in the sample, and determining the absorbancy of the incubated admixture.

4,038,030

PROFILE ANALYSIS PACK AND METHOD

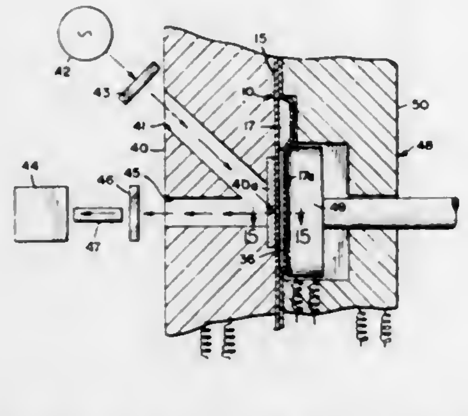
Bill E. Albright, Diamond Bar, Calif.; Michael D'Aquino, and Zindel H. Heller, both of Miami, Fla., assignors to American Hospital Supply Corporation, Evanston, Ill.

Filed Apr. 10, 1975, Ser. No. 566,921

Int. Cl.^{2} G01N *33/16, 21/24*

U.S. Cl. 23—230 B **20 Claims**

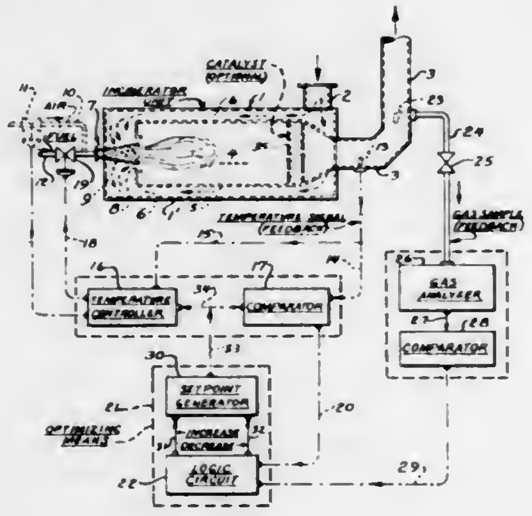
15. A method for reacting a diluted sample of body fluid with a test reagent capable of reacting with said fluid to produce a fluorescent reaction product, comprising the steps of partially filling a vertically-elongated chamber containing a test reagent with a diluted sample of body fluid, said chamber having one planar and transparent side wall and having a semi-rigid, opaque, and normally generally semi-cylindrical opposing side wall, bracing said planar side wall against a heated first platen and then advancing a second platen into engagement with a lower portion of said semi-rigid side wall to stress the same and reduce the volume of the chamber's lower portion, said semi-rigid side wall being capable of returning by reason of said stress to its original semi-cylindrical condition when said second platen is withdrawn, then withdrawing said second platen so that the lower portion of said semi-rigid wall returns to its normal semi-cylindrical configuration to relieve said stress, and repeating said advancing and withdrawing steps to mix thoroughly the contents of said chamber while maintaining the same at a preselected reaction temperature, and thereafter directing a beam of ultraviolet light obliquely through said planar transparent wall and measuring the intensity of the fluorescence emitted by the reaction product back through said planar transparent wall.



4,038,031
TEST COMPOSITION, DEVICE AND METHOD FOR DETECTING BILIRUBIN
Charles T. W. Lam, Elkhart, Ind., assignor to Miles Laboratories, Inc., Elkhart, Ind.
Filed Oct. 2, 1975, Ser. No. 618,802
Int. Cl.² G01N *21/06, 33/16*
U.S. Cl. 23—230 B **33 Claims**

1. A test composition for detecting bilirubin in a urine sample, which composition comprises a diazonium compound which reacts with urinary bilirubin to produce a color change; a constituent capable of producing an acidic pH in said urine sample; and an organic sulfonic acid or an organic sulfonic acid salt adduct of urea or of a derivative of urea, which adduct has a potentiating effect on reaction of said diazonium compound with urinary bilirubin in an acidic environment.

4,038,032
METHOD AND MEANS FOR CONTROLLING THE INCINERATION OF WASTE
Gerald L. Brewer, Rowayton, Conn., and Steven D. Olsen, New Rochelle, N.Y., assignors to UOP Inc., Des Plaines, Ill.
Filed Dec. 15, 1975, Ser. No. 641,126
Int. Cl.² F23G *7/06*
U.S. Cl. 23—230 A **5 Claims**



1. In a process for effecting the incineration of undesired waste gaseous materials, the improved method for automatically adjusting and conserving fuel input to the burner for the incineration zone responsive to changes in the quantity of pollutants content of the waste gas stream being introduced to the incineration zone which comprises:

a. a fuel flow control means operating responsive to process feedback and set point signals,

b. measuring a change in the combustion zone stream leaving the incineration zone,

c. sending an output signal to a set point optimizing means indicative of a change in the combustion gas stream,

d. comparing a feed back signal with at least one predetermined set point level in said optimizing means and generating a signal for a set point change responsive to a differential from the predetermined set point level to make an incremental change in such level and regulate said fuel flow control means to change fuel flow to the burner, whereby fuel input can be decreased for an above normal temperature level and, conversely, increased for conditions of excessive pollutants in the waste gas stream and for a low temperature unstable reaction in the incineration zone, said feed back signal being indicative of a change in the temperature of the combustion gas stream and providing a change in a temperature set point level responsive to a temperature deviation.

4,038,033
SELENIUM LABELLED COMPOUNDS IN THE SATURATION ANALYSIS OF CYCLIC NUCLEOTIDE
Reginald Monks, and Idris Lewis Thomas, both of Amersham, England, assignors to The Radiochemical Centre, Limited, England
Filed Mar. 29, 1976, Ser. No. 671,697
Claims priority, application United Kingdom, Apr. 8, 1975, 14462/75
Int. Cl.² C07H *19/10, 19/20;* **G01N** *33/16*
U.S. Cl. 23—230.3 **1 Claim**

1. In a method of performing a saturation analysis of a cyclic nucleotide by providing a reaction mixture of the cyclic nucleotide to be analysed, a radioactively labelled cyclic nucleotide and a specific reagent for the said cyclic nucleotide, which specific reagent is present in an amount insufficient to combine with all of said cyclic nucleotide and said labelled cyclic nucleotide,

effecting reaction of the reaction mixture, whereby part of the cyclic nucleotide becomes bound to the specific reagent and the remainder of the cyclic nucleotide does not become so bound,

separating the cyclic nucleotide which is bound to said specific reagent from the cyclic nucleotide that is not so bound, and measuring the radioactive concentration of one or both of the bound and the unbound cyclic nucleotide,

the improvement which consists in using as the radioactively labelled cyclic nucleotide, a cyclic nucleotide labelled with selenium-75.

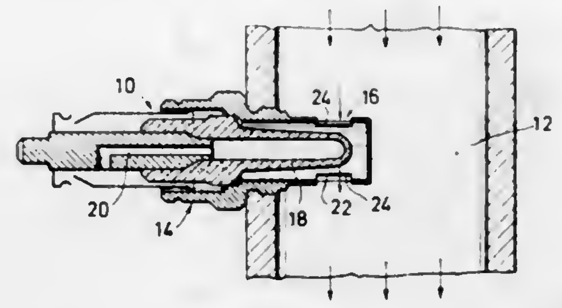
4,038,034
AIR-FUEL RATIO SENSING DEVICE FOR INTERNAL COMBUSTION ENGINE
Yasuo Nakajima, Yokosuka, and Kenji Yoneda, Yokohama, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan
Filed Apr. 7, 1976, Ser. No. 674,673
Claims priority, application Japan, Apr. 8, 1975, 50-42627
Int. Cl.² F16K *17/38;* **G01N** *27/00;* **G05D** *23/02*
U.S. Cl. 23—255 E **4 Claims**

1. An air-fuel ratio sensing device for an air-fuel ratio control system of an internal combustion engine, comprising:

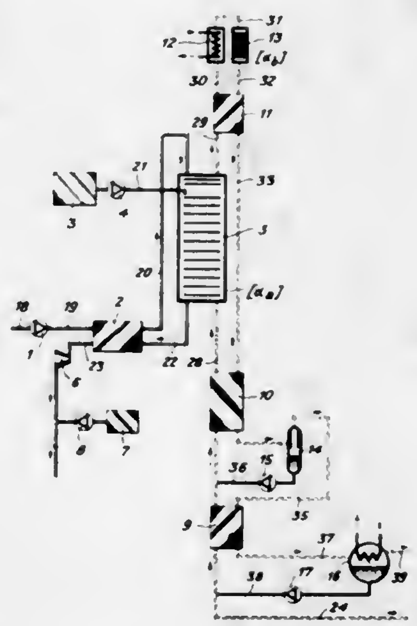
a sensing element extending into an exhaust gas passageway so as to be exposed to exhaust gases flowing therein;

a housing disposed about the sensing element and arranged to project into the exhaust gas passageway, said housing having a plurality of openings formed at circumferentially spaced positions; and

a plurality of bimetallic valves arranged to flex toward said plurality of openings as the temperature thereof rises, and to close said plurality of openings when said exhaust gases exceed a predetermined temperature.



4,038,035
APPARATUS FOR ENRICHING HYDROGEN WITH DEUTERIUM
Mehmet Sahabettin Ergenc, Zollikerberg, and Charles Mandrin, Winterthur, both of Switzerland, assignors to Sulzer Brothers Limited, Winterthur, Switzerland
Filed May 21, 1974, Ser. No. 472,053
Claims priority, application Switzerland, May 24, 1973, 7403/73
Int. Cl.² B01J *8/02, 8/08;* **C01B** *4/00, 5/02*
U.S. Cl. 23—260 **3 Claims**



1. An apparatus for enriching hydrogen with deuterium comprising

at least one isotope exchange column;

means for passing a first flow of fresh water of natural deuterium concentration into and through said column in a first direction;

means for passing a second flow of hydrogen into and through said column in an opposite direction to said first flow;

means for introducing a catalyst into said column to effect an isotope exchange between said flows to enrich the hydrogen with deuterium while introducing steam into said second flow;

at least one heating means downstream of said column relative to said second flow for heating the deuterium enriched hydrogen and superheating the steam;

a reactor means for receiving the enriched hydrogen and superheated steam;

a first conduit connecting an inlet of said reactor means to an outlet of said heating means to receive a flow of the enriched hydrogen and steam from said heating means;

a catalyst in said reactor means for effecting an isotope exchange between the heated hydrogen and superheated steam to further enrich the hydrogen with deuterium;

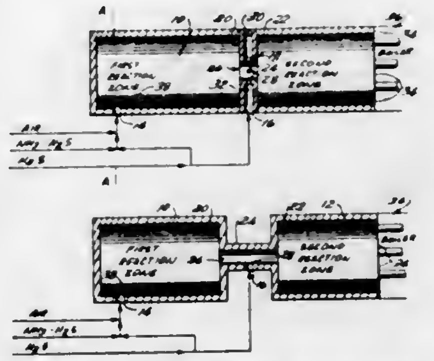
a second conduit connecting an outlet of said reactor means to an inlet of said heating means to deliver the hydrogen-steam mixture from said reactor means to said heating means;

a condensor downstream of said reactor relative to the flow of the further enriched hydrogen and superheated steam for condensing water from the superheated steam;

means for delivering condensed water from said condensor into said second flow to wet the hydrogen; and

a further heating means for heating the water in said second flow to steam prior to passage into said column.

4,038,036
APPARATUS FOR THE PRODUCTION OF SULFUR FROM MIXTURES OF HYDROGEN SULFIDE AND FIXED NITROGEN COMPOUNDS
David K. Beavon, Pasadena, Calif., assignor to The Ralph M. Parsons Company, Pasadena, Calif.
Division of Ser. No. 506,305, Sept. 16, 1974, Pat. No. 3,970,743. This application May 13, 1976, Ser. No. 685,981
Int. Cl.² B01J *1/00;* **C01B** *17/04, 17/06*
U.S. Cl. 23—262 **9 Claims**



1. In a thermal reactor for use in sulfur production consisting of a thermal reactor containing two thermal reaction zones in series, wherein the first thermal reaction zone has an inlet for feeding a first hydrogen sulfide feed and a source of oxygen thereto and wherein at least part of the hydrogen sulfide is converted to sulfur dioxide and wherein the second reaction zone has means associated therewith for feeding a second hydrogen sulfide feed thereto and wherein a portion of the formed sulfur dioxide reacts with hydrogen sulfide in the second thermal reaction zone to form sulfur, the improvement which comprises separating the first and second thermal reaction zones by a partition formed of a first transversely positioned planar apertured wall spaced from a second transversely positioned planar apertured wall, said planar walls being joined at their periphery to the external walls of said thermal reactor and extending radially inwardly therefrom, the first planar apertured wall serving a radiating surface to maintain a higher temperature in the first thermal reaction zone than the second thermal reaction zone, the respective apertures of said planar walls being interconnected by a gas flow conduit of a cross-sectional area which provides turbulent gas flow between said first and second thermal reaction zones, said partition being provided with means to introduce the second hydrogen sulfide feed into the gas flow conduit in the thermal reactor for turbulent mixing with the gas stream flowing from the first thermal reaction zone to the second reaction zone.

7. A thermal reactor for use in sulfur production which comprises:

a. a first refractory lined thermal reaction zone for reaction of a first feed of hydrogen sulfide and a source of oxygen to form sulfur dioxide, said first thermal reaction zone having feed inlet at one end thereof for a premixed feed of the first hydrogen sulfide feed and the source of oxygen to the first thermal reaction zone, and at the opposed end thereof, a first transversely-positioned planar apertured refractory wall providing a radiating surface for maximation of temperature in said first thermal reactor zone and providing an outlet for the reaction products formed in the first thermal reaction zone;

b. a second thermal reaction zone having an inlet formed of a second planar transversely-positioned apertured refractory wall spaced from the first planar apertured refractory wall to define a second thermal zone for operation at a lower temperature than the first thermal reaction zone and means for communication with a waste heat boiler;

c. a gas flow conduit connecting the apertures of said first and second planar refractory walls forming a turbulent gas flow path between said first and second thermal reaction zones, said gas flow conduit having a plurality of openings around the periphery thereof and a manifold connection to a second hydrogen sulfide feed surrounding said openings for feed of a second hydrogen sulfide feed through the plurality of openings to the gas flowing from said first thermal reaction zone to said second thermal reaction zone.

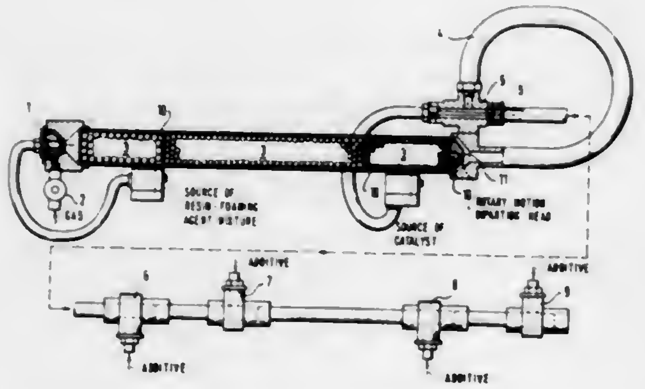
4,038,037
APPARATUS FOR THE MANUFACTURE OF HOMOGENEOUS, FINE-PORED SYNTHETIC RESIN FOAMS

Hans Wilmsen, deceased, late of Essen, Germany (by Joerg Wilmsen, heir)

Filed Sept. 10, 1974, Ser. No. 504,742

Int. Cl.² B01J *8/00*

U.S. Cl. 23—288 R **10 Claims**


1
10
2
3
5
9
7
GAS
SOURCE OF RESIN FOAMING AGENT MIXTURE
SOURCE OF CATALYST
ROTARY MOTION IMPARTING HEAD
11
6
ADDITIVE
ADDITIVE
8
ADDITIVE
ADDITIVE

1. Apparatus for the continuous preparation of a homogeneous, fine-pored, cured, synthetic resin foam with additives therein, said apparatus comprising, in combination, a foaming chamber having an inlet and an oulet spaced from said inlet, at least one nozzle at said inlet for directing materials into said foaming chamber, means containing the synthetic resin and a foaming agent connected to said nozzle and supplying said resin and said agent to said chamber, means for supplying gas under pressure to said inlet, said foaming agent, said gas and said resin foaming a foam-resin mixture without a curing agent for said resin in said foaming chamber, a first mixing chamber with a tubular wall and having a nozzle for directing materials into said mixing chamber, a foam-resin mixture inlet and an outlet spaced from said last-mentioned inlet, a circulation hose connected at one end to said outlet of said foaming chamber for receiving said foam-resin mixture from said chamber and connected to said inlet of said mixing chamber for supplying said foam-resin mixture thereto, means connected to said nozzle of said first mixing chamber for supplying a first additive to said nozzle of said first mixing chamber, a second mixing chamber with a tubular wall and having a nozzle for directing materials into said second mixing chamber, an inlet and an outlet spaced from said last-mentioned inlet, interconnecting means interconnecting said outlet of said first mixing chamber to said inlet of said second mixing chamber for supplying said foam-resin mixture with said additive to said second mixing chamber, and means connected to said nozzle of said second mixing chamber for supplying a second additive to said nozzle of said second mixing chamber, each of said first and second chambers being fee interiorly thereof of baffle plates, screws and stiffers and one of said means for supplying an additive comprising means containing a curing agent for said resin and supplying said curing agent to the mixing chamber to which it is connected.

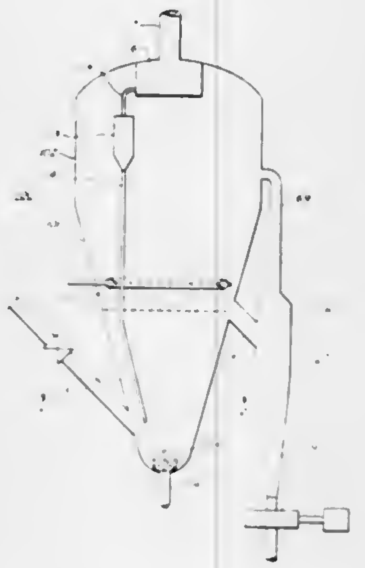
4,038,038
FLUIDIZED CRACKING CATALYST REGENERATION APPARATUS

Dorrance P. Bunn, Jr.; John C. Strickland, both of Houston; John P. MacLean, Stafford, and Douglas H. May, Jr., Houston, all of Tex., assignors to Texaco Inc., New York, N.Y.

Filed May 7, 1976, Ser. No. 684,504

Int. Cl.² B01J *8/24;* **B01D** *15/06*

U.S. Cl. 23—288 B **4 Claims**



1. Fluidized catalyst regeneration apparatus, which comprises in cooperation:

a. a vertical regenerator vessel **100** comprising a frusto-conic lower regenerator section **101** having a closed bottom and open top, in communication with a cylindrical upper regenerator section **102** having a closed top and an open bottom;

b. spent catalyst conduit means **103** for transferring spent catalyst from a reaction zone to the bottom portion of said lower regenerator section **101**;

c. primary regeneration gas distribution means for radially distributing an oxygen containing primary regeneration gas into the bottom portion of said lower regenerator section **101**;

d. a regeneration gas conduit **104** in communication with said primary regeneration gas distribution means;

e. secondary regeneration gas distribution means **112** in the upper portion of said lower regeneration section **101** for radially distributing oxygen containing gas into said lower regenerator section **101**;

f. a regenerated catalyst standpipe **107** exterior to said reactor vessel **100**, comprising an upper cylindrical standpipe section **108** having an opening in the side thereof, having a top with an opening therein, and having an open bottom, and a lower conical standpipe section **109** having an open top in communication with the open bottom of said upper cylindrical standpipe section **108** and an open bottom;

g. a regenerated catalyst ductway **106**, having open ends, directed downwardly at an angle of about 45° to 60° from the vertical, wherein the upper end of said regenerated catalyst ductway **106** is in communication with the interior of said lower regenerator section **101** and wherein the lower end of said regenerated catalyst ductway **106** is in communication with regenerated catalyst standpipe **107** via the opening in the side of upper cylindrical section **108**;

h. a deaeration gas line **69** for providing communication from the top of said upper cylindrical standpipe section **108** to upper regenerator section **102**;

i. catalyst-gas separation means **113** within said upper regenerator section **102** for separating catalyst from a spent regeneration gas;

j. vent means in communication with said catalyst-gas separation means **113** for removing spent regeneration gas from said catalyst regeneration apparatus; and

k. a line **114** for transferring separated catalyst from said catalyst-gas separation means **113** to the bottom portion of said lower regenerator section **101**.

4,038,039
PRODUCTION OF ALUMINA

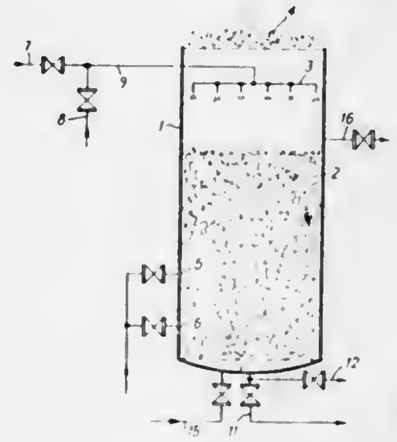
Andrew Nicolson Carruthers, Dollard des Ormaux; John Edward Deutschman, and Michael George Willis, both of Arvida, all of Canada, assignors to Alcan Research and Development Limited, Montreal, Canada

Filed July 6, 1976, Ser. No. 703,005

Claims priority, application United Kingdom, July 7, 1975, 28603/75

Int. Cl.² C01F *7/06;* **B01D** *9/02*

U.S. Cl. 23—293 R **11 Claims**



1. A procedure for controlling the sodium oxalate level in the liquor employed in the Bayer process for the production of alumina from bauxite ore which comprises concentrating by evaporation a part of the spent liquor recovered from the precipitation stage to render to supersaturated with respect to sodium oxalate, spraying such concentrated liquor onto a packing in an enclosed space to impinge on such packing in the form of rapidly moving droplets, the evaporation of the liquor being continued in the evaporation stage until the sodium oxalate exceeds a critical supersaturation with reference to temperature of droplets at impact on the packing, recovering the sprayed liquor from the enclosed space and recycling said liquor to the process circuit.

4,038,040
FLEXIBLE LATTICE-LIKE GRID STRUCTURE ETCHED FROM A METALLIC FOIL

Werner Nagl, Munich, Germany, assignor to Messerschmitt-Bolkow-Blohm GmbH, Munich, Germany

Filed Oct. 2, 1975, Ser. No. 618,933

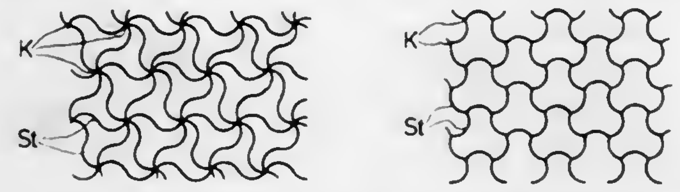
Claims priority, application Germany, Oct. 5, 1974, 2447565

Int. Cl.² C23F *1/02*

U.S. Cl. 428—596 **6 Claims**

1. In a flexible metallic fine grid structure for antenna reflectors with a double curved surface with the grid structure comprising a plurality of web sections interconnected at junction points, said web sections being curved in the plane of the grid and the junction points of said web sections forming the corners of equilateral triangles, wherein the improvement comprises that said web sections being etched from a metal foil, said web sections connecting the junction points having a sinusoidal configuration for the extent of the web sections between junction points, and the ends of at least five web sections forming a junction point.

2. In a flexible metallic fine grid structure for antenna reflectors with a double curved surface with the grid structure comprising a plurality of web sections interconnected at junction points, said web sections being curved in the plane of the grid and the junction points of said web sections forming the corners of equisided, multi-sided closed sections, wherein the improvement comprises that said web sections being etched from a metal foil, said web sections connecting the junction points have a sinusoidal configuration over the extent of the web sections between the junction points.



4,038,041
COMPOSITE INTERLAYER FOR DIFFUSION BONDING

David Scott Duvall, Cobalt, and Daniel Francis Paulonis, Moodus, both of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Dec. 19, 1975, Ser. No. 642,627

Int. Cl.² B32B *15/00*

U.S. Cl. 428—576 **6 Claims**

1. In an interlayer for bonding metallic articles which are based on a metal chosen from the group consisting of nickel, cobalt, and iron, said interlayer having a composition similar to that of the articles being joined, except for the addition of a quantity of at least one melting point depressant, said interlayer having a brittle characteristic because of the formation of brittle phases, the improvement which comprises:

providing the interlayer in the form of a plurality of lamellae, each of said lamellae being free from those combinations of elements which form brittle phases;

whereby the lamellar interlayer is ductile even though its overall composition is one which would be brittle if produced in a homogeneous form.

4,038,042
ELECTROPLATING OF POLYPROPYLENE COMPOSITIONS

Robert L. Adelman, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 641,949, Dec. 18, 1975, Pat. No. 4,002,595, which is a continuation-in-part of Ser. No. 428,725, Dec. 27, 1973, abandoned. This application July 22, 1976, Ser. No. 707,634

Int. Cl.² B23P *3/00;* **C25D** *5/34*

U.S. Cl. 428—625 **13 Claims**

1. A process for electroplating a metal coating onto an article composed of a polyolefin blend comprising

a. 20 to 60 weight percent of propylene homopolymer or copolymer with an α-olefin having less than 10 carbon atoms, having a crystallinity of at least about 25 percent, the propylene content of said copolymer being at least 92 molar percent,

b. 4 to 20 weight percent of an ethylene homopolymer or copolymer with an α-olefin having less than 10 carbon atoms, having a crystallinity of at least about 25 percent, the ethylene content of said copolymer being at least 88 molar percent,

c. 1 to 15 L **weight percent of a low polarity rubber having a low enough polarity to result in the electrical volume resistivity of the blend being less than about** 25 ohm-cm in the injection-molded condition,

d. 12 to 45 weight percent carbon black, having an average particle size less than about 40 mμ, and a volatile content of less than about 3 weight percent, at least 15% of the total of said carbon black being a high conductivity black having a dibutyl phthalate oil absorbtion value of at least about 1.00 cc/gm, an iodine adsorption number greater than about 160 mg/g, and

e. optionally up to 45 weight percent silicate mineral additive dispsersed in said blend, substantially all of said additive being of a size that wil' pass through a screen having 44 micron openings, and at least 60% of the particles being smaller than 10 microns in cross sectional dimension, provided that when said mineral additive is used, the combined amounts of mineral additive and carbon black are between 35 and 60% by weight of the blend,

the process comprising

a. molding the composition into articles of desired shape,

b. surface treating the article with a strongly oxidizing solution comprising CrO_3, H_2SO_4 and H_2O,

c. rinsing the surface, and

d. electroplating the treated object.

10. An electroplated made by the process of claim **1.**

11. An electroplated article of claim **10** which has a multiplicity of electroplated layers, one on another.

4,038,043

GASOLINE ADDITIVE COMPOSITIONS COMPRISING A COMBINATION OF MONOAMINE AND POLYAMINE MANNICH BASES

Bruce Hollis Garth, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1975, Ser. No. 612,728

Int. Cl.² C10L *1/22*

U.S. Cl. 44—75 **19 Claims**

1. A gasoline additive composition comprising a combination of

i. from 20 to 80 weight percent of a monoamine of the formula, Z_nNR_{3-n}, and

ii. from 20 to 80 weight percent of a polyamine of the formula $ZNH(C_xH_{2x}N(R'))_yC_xH_{2x}NHZ$ wherein Z is an alkyl- and hydroxy-substituted benzyl group, the alkyl having 50 to 1000 carbon atoms; R is hydrogen or alkyl of 1 to 18 carbon atoms; and *n* is 1 or 2; R' is hydrogen or Z with the proviso that at least one R' is hydrogen; *x* is 2 or 3; and *y* is 1 to 5.

4,038,044

GASOLINE ADDITIVE COMPOSITIONS COMPRISING A COMBINATION OF DIAMINE AND POLYAMINE MANNICH BASES

Bruce Hollis Garth, Newark, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Sept. 12, 1975, Ser. No. 612,727

Int. Cl.² C10L *1/22*

U.S. Cl. 44—75 **10 Claims**

1. A gasoline additive composition comprising a combination of

i. from 60 to 75 weight percent of a diamine of the formula $ZNHC_nH_{2n}NHZ$, and

ii. from 25 to 40 weight percent of a polyamine of the formula $Z—NH(C_xH_{2x}N(R'))_y—C_xH_{2x}NH—Z$ wherein Z is an alkyl- and hydroxy-substituted benzyl, the alkyl having 50 to 1000 carbon atoms; R' is hydrogen or Z with the proviso that at least one R' is hydrogen; *n* is 2 to 6; *x* is 2 or 3; and *y* is 1 to 5.

4,038,045

PROCESS FOR DEGASIFYING FINE-GRAINED FUELS

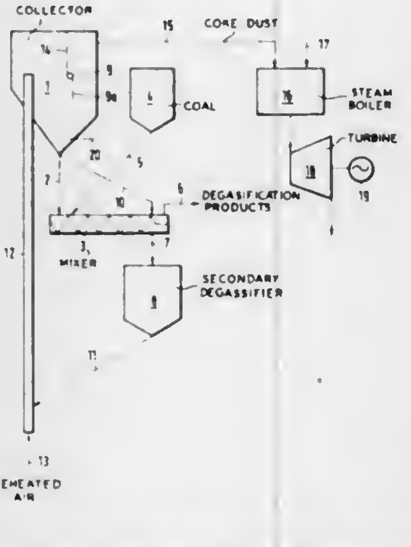
Roland Rammler, Konigstein; Johann Grosse-Heitmeyer, Frankfurt am Main; Hans Sommers, and Heinz Bathke, both of Essen, all of Germany, assignors to Metallgesellschaft Aktiengesellschaft, Frankfurt am Main and Ruhrgas Aktiengesellschaft, Essen, both of Germany

Filed Apr. 8, 1976, Ser. No. 675,011

Claims priority, application Germany, June 23, 1975, 2527852

Int. Cl.² C10J *3/12;* C10B *49/16*

U.S. Cl. 48—197 R **26 Claims**



1. In a process for continuously degasifying finegrained coal, wherein a fine-grained degasified residue is recirculated as a heat-carrying medium and is heated in a pneumatic conveyor line and then fed to a collecting vessel, the improvement which comprises feeding a first partial stream of the heat-carrying medium from said collecting vessel to a mixing zone together with said fine-grained coal for a dry distillation of said coal, feeding a second partial stream of the heat-carrying medium from said collecting vessel and the mixture of solids from said mixing zone to a separate degasification zone downstream from said mixing zone, withdrawing volatile products from the mixtures in the mixing zone and the degasification zone and feeding them to dust-collecting and condensing means, recirculating degasified residue from said degasification zone to the pneumatic conveyor line, maintaining the ratio of the rate of the second partial stream to the rate of the first partial stream of the heat-carrying medium between 0.2:1 and 15:1, and discharging degasified residue dust in a particle size of more than 75% below 0.3 mm from said collecting vessel.

4,038,046

COATED ABRASIVE BONDED WITH UREA-FORMALDEHYDE, PHENOLIC RESIN BLENDS

Stanley J. Supkis, Averill Park, N.Y., assignor to Norton Company, Worcester, Mass.

Filed Dec. 31, 1975, Ser. No. 645,522

Int. Cl.² C08J *5/14*

U.S. Cl. 51—295 **7 Claims**

3. An abrasive product comprising abrasive grits bonded to a fibrous backing by a condensation product of a urea formaldehyde prepolymer and a phenolic prepolymer resin, the ratio of phenolic prepolymer solids to urea formaldehyde prepolymer solids being from 9/1 to 1/9, said condensation product includes a particulate calcium carbonate filler.

4,038,047

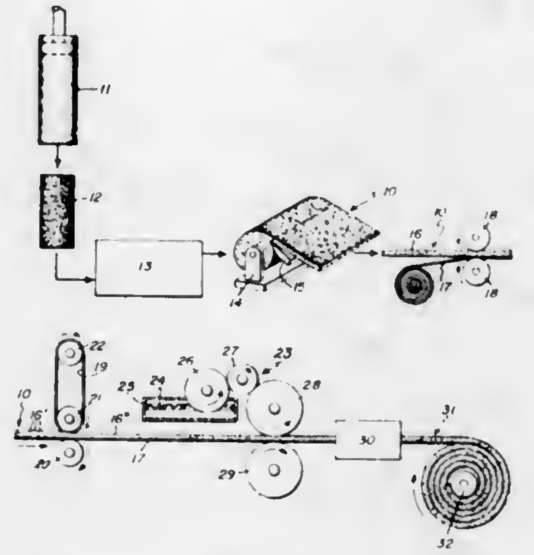
METHOD OF MAKING A FLEXIBLE RESILIENT ABRASIVE

George L. Haywood, Latham, N.Y., assignor to Norton Company, Worcester, Mass.

Continuation-in-part of Ser. No. 815,942, April 14, 1969, abandoned, and Ser. No. 638,042, May 12, 1967, Pat. No. 3,607,159. This application Aug. 13, 1971, Ser. No. 171,449

Int. Cl.² B24D *3/32*

U.S. Cl. 51—295 **5 Claims**



1. In a method of manufacturing a resilient, controlled-density, porous, abrasive material comprising a foam backing member, said method comprising applying to a surface of the foam backing member a composition comprising abrasive grain and binder therefor, the improvement comprising:

a. forming a self-sustaining cylinder of closely-packed small, resilient foam particles bound one to the other by an adhesive binder;

b. peeling a thin continuous sheet from the cylinder by a compressive shearing action; and

c. before application of the abrasive grain-bonding adhesive, subjecting the surface of the foam backing member to a non-compressive shearing action whereby to produce a smooth, porous, surface.

4,038,048

LAPPING COMPOSITION CONTAINING A CARBOXY VINYL POLYMER

Herbert T. Thrower, Jr., 2612C Park Road, Charlotte, N.C. 28209

Continuation-in-part of Ser. No. 549,816, Feb. 14, 1975, abandoned. This application Jan. 14, 1976, Ser. No. 649,014

Int. Cl.² C09K *3/14*

U.S. Cl. 51—298 R **23 Claims**

1. An aqueous lapping composition consisting essentially of:

a. a lapping gel, said gel comprising from about 0.3 to about 1.25 weight percent of a carboxy vinyl polymer thickener; sufficient base to neutralize said polymer thickener and provide a pH in the range of from about 7 to about 9; at least 0.13 weight percent of a surfactant and water; and

b. an inorganic grinding grit.

4,038,049

ELECTROFLUIDIZED BEDS FOR COLLECTION OF PARTICULATE

James R. Melcher, Lexington, Mass.; Kenneth S. Sachar, White Plains, N.Y., and Karim Zahedi, Brookline, Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

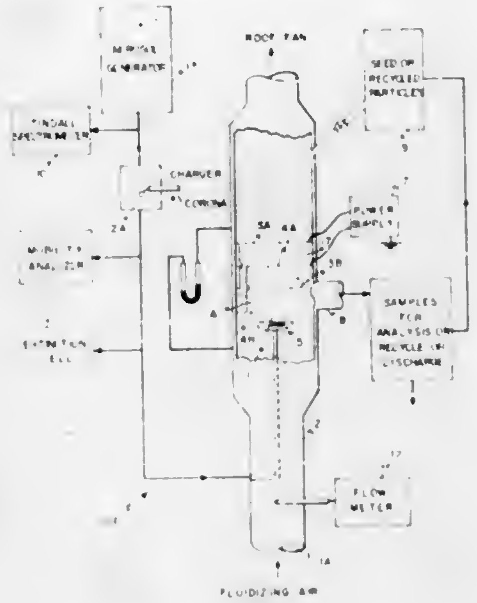
Filed Oct. 18, 1974, Ser. No. 516,057

Int. Cl.² B03C *3/00*

U.S. Cl. 55—2 **22 Claims**

1. Apparatus for electrostatically removing particulate from a gas, said apparatus comprising means for electrically charging the particulate; a housing containing a bed of particles, means for moving a stream of gas, including gas containing said particulate, into and through said bed with a substantial vertical velocity component for substantially totally fluidizing said bed and maintaining said bed substantially totally fluidized; and

means for imposing an electric field upon the particles of the bed to create an electrofluidized bed, said means being operable to maintain the electric field intensity sufficiently high to induce substantial positive and negative surface charges at respective ends of said particles but sufficiently low that there is no substantial electrical discharge in the bed region, said charged particulate being electrically attracted by the charged surfaces of the particles of the electrofluidized bed and collected upon the particles of the electrofluidized bed and thereby being removed from the stream.



4,038,050

ELECTRICAL SENSING AND REGENERATING SYSTEM FOR MOLECULAR SIEVE DRIERS

Frank Eugene Lowther, Buffalo, N.Y., assignor to W. R. Grace & Co., New York, N.Y.

Continuation-in-part of Ser. No. 535,282, Dec. 23, 1974, abandoned, and Ser. No. 625,237, Oct. 23, 1975, which is a continuation-in-part of Ser. No. 527,832, Nov. 27, 1974, abandoned. This application June 7, 1976, Ser. No. 694,017

Int. Cl.² B01D *53/04*

U.S. Cl. 55—18 **13 Claims**

1. A gas drying system comprising:

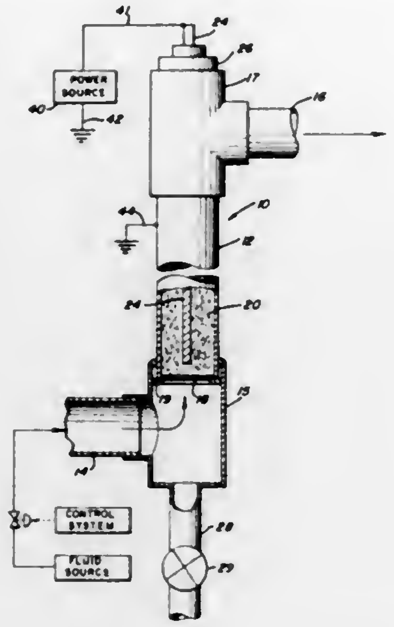
a. an absorbent bed of zeolite particles;

b. a plurality of spaced apart electrodes in contact with the bed;

c. means for measuring electrical current flow through the bed between the spaced electrodes and generating a signal representative of adsorbed water content;

d. means responsive to signal for interrupting gas flow through the bed at a predetermined bed water content; and;

e. means for applying electrical energy to the bed between the spaced electrodes to regenerate the bed, said electrical energy being provided by said means at a voltage gradient of about 0.05 to 500 Kv/cm, a current density of about 0.001 microamps to 1 amp/cm² and a frequency of 0 to 10³Hz.



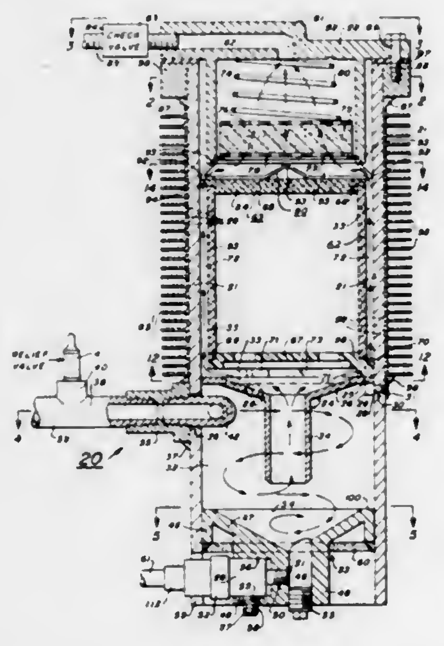
4,038,051
AIR CLEANER AND DRYER

Thomas N. Ide, Drexel Hill, Pa., assignor to Stratoflex, Inc., Fort Worth, Tex.

Division of Ser. No. 235,767, March 17, 1972, Pat. No. 3,934,990. This application Nov. 5, 1975, Ser. No. 629,113

Int. Cl.² B01D *45/16*

U.S. Cl. 55—218 **5 Claims**



1. Apparatus for cleaning and removing moisture and contaminants from a compressed gaseous fluid, said fluid being received from a compressor and being relatively hot, comprising housing means forming a swirl chamber, a fluid intake formed in said housing means and adapted to receive compressed fluid from the compressor and communicating with said swirl chamber, means directing incoming fluid tangentially in a swirl pattern in said swirl chamber, a tubular member having a fluid flow passage therethrough and positioned generally centrally in said housing, said passage having an inlet end located in said swirl chamber and an exit end and forming a flow passage for said fluid from the upper side of said chamber, a contaminant drain opening formed in said housing means at a low side of said swirl chamber and said housing means being pitched toward said drain opening, normally closed valve means in said drain opening for normally closing said drain opening and causing contaminants and moisture to collect in said drain opening, said valve means being adapted to be periodically opened in order to flush the contaminants and moisture from the drain opening, said inlet end of said passage being located intermediate said fluid intake and said drain opening and at a substantial distance from said fluid intake and relatively close to said drain opening, whereby fluid entering said swirl chamber through said fluid intake is directed in a swirl pattern around said tubular member and is required to flow a substantial distance and flow past said drain opening before entering said inlet end and flowing out of said swirl chamber through said exit end, the relatively hot fluid preventing moisture from freezing in the drain opening.

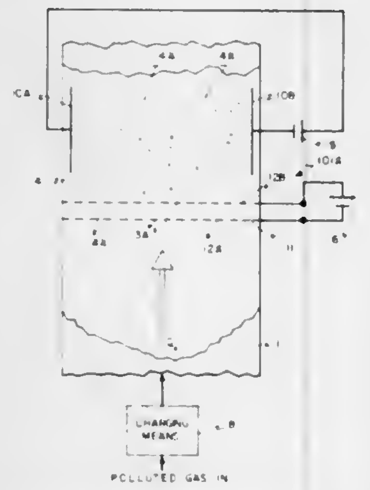
4,038,052
APPARATUS FOR ELECTRICAL SUPPORT AND STABILIZATION OF STATIC, PACKED, AND FLUIDIZED BEDS

James R. Melcher, Lexington, Mass., and Thomas W. Johnson, Yellow Springs, Ohio, assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Filed Oct. 18, 1974, Ser. No. 516,056

Int. Cl.² B03C *3/01, 3/45;* F15C *1/04*

U.S. Cl. 55—138 **20 Claims**



13. Apparatus for electrostatically inducing agglomeration to enhance particulate removal from a gas, that comprises: a duct through which the particulate-carrying gas can flow; means for charging the particulate in the duct; a fluidized bed in the duct comprising semi-insulating particles through which the gas flows; a distributor plate to provide electromechanical support for the bed particles, said distributor plate comprising a grid having a plurality of apertures therethrough, the grid having cross dimensions essentially the same as the cross dimensions of the duct and being disposed in the duct such that the gas must flow through the apertures, said apertures being much larger than the bed particles so that, in the absence of measures to prevent such, the bed particles would drop through the apertures and deplete the bed; means to create an electric field in the apertures of the grid so that the particles making up the bed, though smaller than the apertures in physical size, do not pass through the apertures by virtue at least in part of the influence of the field upon the particles; and means associated with the bed for imposing an electric field upon the particles of the bed to create an electrofluidized bed, said charged particulate being electrically attracted by the charged surfaces of the particles of the electrofluidized bed and collected upon the particles of the electrofluidized bed.

15. Apparatus that comprises, in combination, a bed comprising many semi-insulating particles; and an electromechanical valve to effect valving of the particles, said electromechanical valve including, in combination, a member having an aperture therethrough that is much larger in cross dimensions than the cross dimensions of an individual particle, and means to create an electric field in the aperture, the electric field acting to prevent passage of particles through the aperture and being of sufficient intensity to effect prevention of such passage.

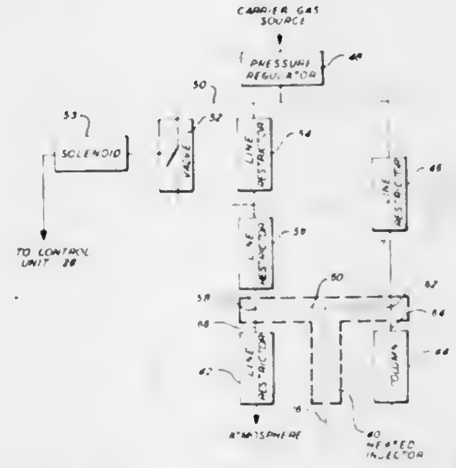
4,038,053
METHOD AND APPARATUS FOR INTRODUCING LIQUID SAMPLES INTO A GAS CHROMATOGRAPHIC COLUMN

Marcel J. E. Golay, Clair-Azur, Switzerland, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.

Filed June 10, 1976, Ser. No. 694,809

Int. Cl.² B01D *15/08*

U.S. Cl. 55—160 **6 Claims**



1. Apparatus for introducing liquid samples into a gas chromatographic column comprising, in combination,
- means for supplying a liquid sample to a heated injector in a continuous, uniform and relatively slow-moving flow,
- means for vaporizing said sample in the heated injector,
- means for passing said vapor through a supply line in said injector to a by-passing restrictor until stationary conditions have been established, and
- means for then passing said vapor to the gas chromatographic column for sampling by reversing the flow in said supply line;
- said means for supplying a liquid sample to a heated injector in a continuous, uniform and relatively slow-moving flow comprising:
- a cylinder having a dispensing outlet coupled to said supply line and an inlet coupled to a liquid sample source,
- a plunger mounted in said cylinder,
- means for rapidly reciprocating said plunger in said cylinder to aspirate in and then vent said by-passing sample through said restrictor to the atmosphere,
- thereby removing substantially all traces of the preceding sample, and
- means for slowly advancing said plunger in said cylinder to push said sample into said heated injector and thence for a relatively brief instant into said gas chromatographic column for sampling.

4,038,054
ADSORPTION APPARATUS

Roderich W. Gräff, Kollwitzweg 19, 61 Darmstadt-Arheilgen, Germany

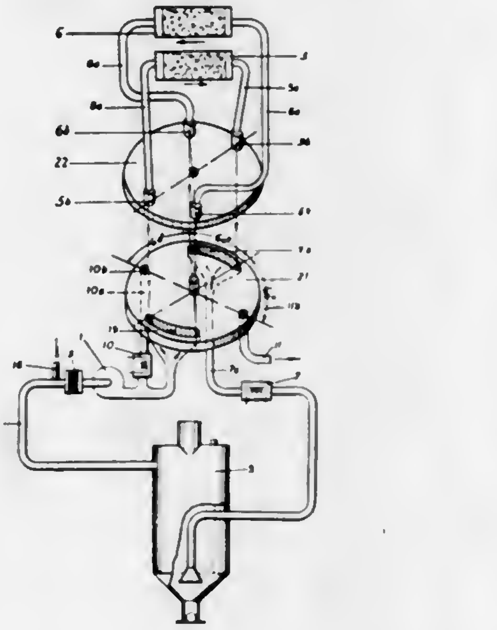
Continuation of Ser. No. 343,915, March 22, 1973, abandoned. This application Oct. 24, 1974, Ser. No. 517,808

Claims priority, application Germany, Mar. 25, 1972, 2214662

Int. Cl.² B01D *53/00, 53/26*

U.S. Cl. 55—179 **7 Claims**

1. An apparatus for drying synthetic plastic particles to be supplied to a plastics processing machine, comprising hopper means for accommodating the particles to be dried; a two-chamber adsorption arrangement for removing moisture from a humid working fluid passing therethrough; duct means communicating with said hopper means and said adsorption arrangement; valve means interposed into said duct means and operative for including at least one of said chambers into a closed adsorption circuit with said hopper means and for selectively including either of said chambers into a regeneration circuit, said valve means including two discs having contact surfaces in sealing contact with one another and being mounted on one another for limited relative angular displacement about a common axis normal to said contact surfaces, said discs being formed with openings which communicate with said surfaces and are distributed along a circle having a center located on said axis, said openings alternatingly communicating with the duct associated with the respective chambers and with the respective circuits; blower means in said duct means for passing said humid working fluid from said hopper means through said adsorption circuit to dehumidify said working fluid and for passing a regeneration fluid through said regeneration circuit; and heating means in said duct means and including a first heating arrangement for heating the dehumidified working fluid downstream of the respective chamber that is included in the adsorption circuit so as to convert said dehumidified fluid into fresh working fluid for drying the particles in said hopper means, and a second heating arrangement for heating the fluid upstream of the respective chamber included in the regeneration circuit so as to convert said fluid into a regeneration fluid.



4,038,055
GAS CHROMATOGRAPH FOR CONTINUOUS OPERATION WITH INFRARED SPECTROMETER

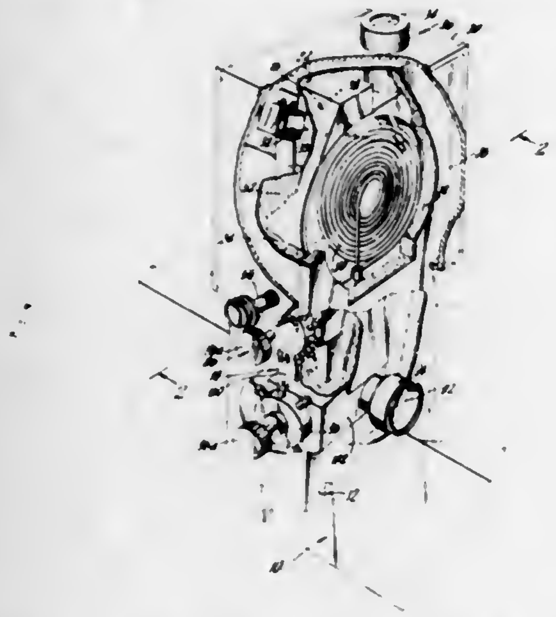
Antonio Varano, Philadelphia, Pa., and Reginald Tobias, Watertown, Mass., assignors to Block Engineering, Inc., Cambridge, Mass.

Filed Oct. 10, 1975, Ser. No. 621,404

Int. Cl.² B01D *15/08*

U.S. Cl. 55—197 **8 Claims**

1. An improved gas chromatograph in combination with an absorption spectrum analyzer, the chromatograph comprising upper and lower cojoined chambers, the lower chamber having measured dimensions, the absorption spectrum analyzer having a measured dimension test sample well, the chromatograph lower chamber being dimensioned to fit within the test sample well; the upper chamber being thermally insulated, provided with heating and thermostat means, the chromatograph further comprising a chromatograph column and an injection port, the column being mounted within the upper chamber and connected at its input to the injection port; a detector, a sample cell and a plurality of valves, the detector cell and at least two multiport valves being mounted juxtaposed to a heated thermostated metal plate means positioned within the lower chamber; the cell, when mounted to the aforesaid plate being positioned transversally of the lower chamber, short tubular connections between, respectively, the column and valves between the detector and valves, and between the cell and valves, whereby, eluted sample materials emitted by the column may be entrained and momentarily retained within the sample cell, the chromatograph lower chamber with the transverse sample cell being positioned within, yet thermally insulated from the analyzer test sample well, while absorption spectrum analysis procedures are completed.

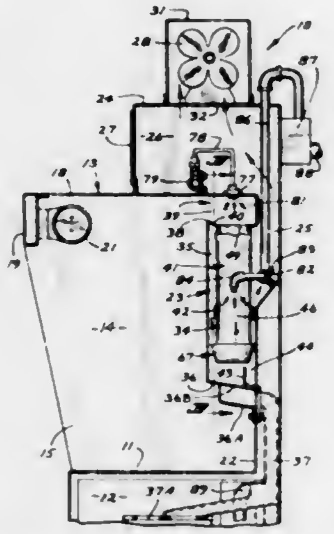


4,038,056
KITCHEN HOOD APPARATUS FOR SEPARATING FOREIGN MATTER FROM FLUID

Wolodymyr Diachuk, Minneapolis, and Reuben N. Palm, Wayzata, both of Minn., assignors to Century 21 Pollution Control, Inc., Minneapolis, Minn.

Filed Mar. 6, 1975, Ser. No. 555,795
Int. Cl.² B01D *47/10*

U.S. Cl. 55—238 **26 Claims**



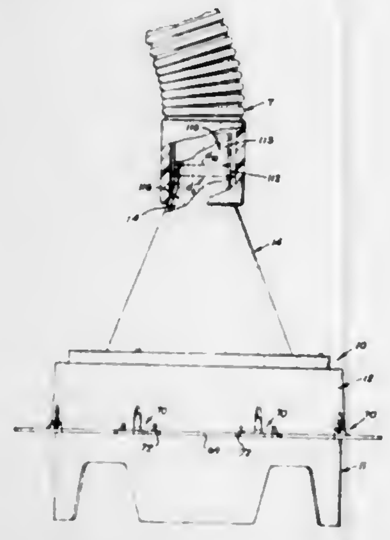
6. An apparatus for separating foreign matter from a fluid carrying the foreign matter comprising: an upright uninterrupted fluid impervious tubular wall defining a passage and an upper fluid inlet end and a lower fluid outlet end open to the passage, helical means for directing the fluid along a helical path through said passage, said helical means comprising a plurality of helical sections being twisted in the same direction and located in end to end relationship and each having terminal edges circumferentially oriented relative to each other to divide the fluid and foreign matter moving through the passage into separate streams whereby when fluid and foreign matter flows through the passage the fluid and foreign matter follows the helical path and is divided in separate streams at each adjacent segment and the foreign matter entrained in the fluid is moved outwardly and in the direction of the flow of fluid through the passage into engagement with said wall, said foreign material being collected on said wall and moved along said wall toward the outlet end, and annular collecting means fixed with respect to the wall located adjacent the outlet end of the wall to collect foreign matter discharged from the walls of said passage at the outlet end of the wall and to permit cleaned fluid to pass centrally thereof, said collecting means having an annular wall surrounding the outlet end of the tubular wall, said annular wall including an inner annular flange surrounding a fluid outlet opening aligned with the outlet end of the passage to permit cleaned fluid to flow through the collecting means, said flange having a diameter smaller than said passage and spaced from the outlet end of said tubular wall whereby foreign matter moves from the tubular wall to the collecting means, and drain means in said annular wall to allow collected foreign matter to drain from the collecting means.

4,038,057
CLOSED CIRCUIT SAMPLER

Thomas P. Roth, Nashville, Tenn., assignor to Andersen 2000, Inc., College Park, Ga.

Continuation-in-part of Ser. No. 469,325, May 13, 1974, Pat. No. 3,922,905. This application Oct. 22, 1975, Ser. No. 624,652
Int. Cl.² B01D *53/30*

U.S. Cl. 55—270 **10 Claims**



1. A sampling device for separating entrained particles from the pressurized gaseous medium output of a positive pressure device, the positive pressure device having an outlet tube with a prescribed diameter discharge opening therein from which the pressurized gaseous medium output is discharged, said sampling device comprising:

an impaction member including a generally circular jet plate and a seamless annular resilient impaction sealing flange integral with said jet plate about the periphery thereof, said jet plate having an impaction centerline, an upstream side, a downstream side and a prescribed plate diameter larger than the diameter of the discharge opening in the outlet tube, said impaction member defining a plurality of jet impaction passages therethrough to direct the gaseous medium along spaced paths generally parallel to said first centerline from the upstream side of said impaction member to the downstream side of said impaction member to divide the flow of the gaseous medium into a plurality of impaction jet streams, said annular impaction sealing flange concentric about said impaction sealing flange and extending away from the upstream side of said jet plate, said impaction sealing flange further defining an inside outwardly flaring impaction sealing surface concentric about said impaction centerline increasing in diameter in a direction away from the upstream side of said jet plate;

a collection member means positioned adjacent the downstream side of said jet plate and defining a collection surface thereon facing the downstream side of said jet plate so that the impaction jet streams will be directed against the collection surface on said collection member means and at least a portion of the particles of a prescribed diameter range entrained in the gaseous medium will be jet impacted onto the collection surface of said collection member means;

a base support member positioning said collection member means with respect to said jet impaction passages so that said collection surface is generally parallel to the downstream surface of said jet plate and operatively associated with said jet impaction passages to cause the particles in the gaseous medium to be jet impacted onto said collection surface as the gaseous medium is forced through said jet impaction passages, said base support member having a support centerline coaxially aligned with said impaction centerline, and defining a base support outlet therethrough through which the gaseous medium passes after impaction against the collection member;

a connector-diffuser member having a diffuser centerline, an inlet end and a discharge end operatively associated with said impaction member for placing said jet impaction passages in said impaction member in communication with the pressurized gaseous medium output of said positive pressure device so that the gaseous medium output is forced through said jet impaction passages by said positive pressure device to cause the entrained particles in said pressurized gaseous medium to be jet impacted onto said collection member whereupon the gaseous medium passes out of said sampling device through said base support outlet, said connector diffuser member including an annular seamless diffuser side wall defining a diversing central diffuser passage therethrough which diverges from the inlet end to the discharge end of said connector-diffuser member, said inlet end defining an inlet opening therein to said central diffuser passage smaller in diameter than the discharge opening in the outlet tube of the positive pressure device so that the outlet tube can be pressed onto the inlet end of said connector-diffuser member to seal the outlet tube to the inlet end of said connector-diffuser member and place the discharge opening in the outlet tube in sealed communication with said diffuser passage in said connector-diffuser member through the inlet opening thereto, said discharge end defining an outlet opening therein from said central diffuser passage, said connector-diffuser member including a resilient, outwardly projecting sealing bead integral with said diffuser side wall at the discharge end thereof, said sealing bead concentric about said diffuser centerline and defining a seamless bead sealing surface thereon outboard of said diffuser side wall, said bead sealing surface having an outside diameter larger than the smallest diameter of said impaction sealing surface but smaller than the largest diameter of said impaction sealing surface so that when the discharge end of said connector-diffuser member is forced toward the upstream side of said jet plate of said impaction member with the diffuser centerline coaxial with the impaction centerline, said bead sealing surface on said connector-diffuser member will sealingly engage said impaction sealing surface of said impaction sealing flange on said impaction member to seal the outlet opening from said connector-diffuser member to the upstream side of said jet plate of said impaction member; and,

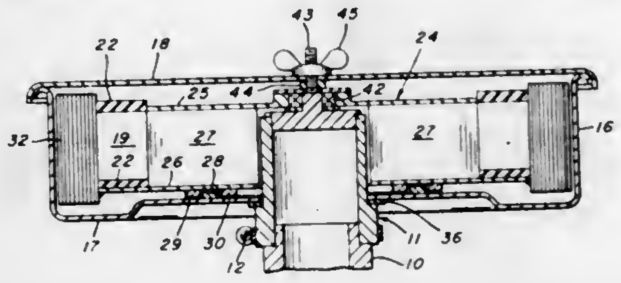
locking means for maintaining said sealing bead on said connector diffuser member in sealing engagement with said impaction sealing flange on said impaction member, said locking means including first resilient catch means carried by the discharge end of said connector-diffuser member and second resilient catch means carried by said impaction member, said first and second resilient catch means constructed and arranged to be resiliently deflected past each other as the discharge end of said connector-diffuser member is forced toward the upstream side of said jet plate and to resiliently snap back into interference with each other when said sealing bead is in sealing relationship with said impaction sealing flange to lock said connector-diffuser member onto said impaction member in a sealed relationship therewith so that when the discharge opening in the outlet tube from the positive pressure device is sealingly pressed onto the inlet end of said connector-diffuser member, the pressurized gaseous medium output from the positive pressure device will be forced through said diffuser passage in said connector-diffuser member, then through the the impaction passages in said impaction member against said collection member means to cause at least a portion of the particles of a prescribed diameter range entrained in the gaseous medium to be jet impacted onto the collection surface of said collection member means and thus separated from the gaseous medium, and then out of the sampling device through said base support outlet.

4,038,058
ROTARY-TYPE AIR FILTER ASSEMBLY

Leonard A. Miskiewicz, 219 Sprucewood St., Pittsburgh, Pa. 15210

Filed Mar. 22, 1976, Ser. No. 668,848
Int. Cl.² B01D *50/00*

U.S. Cl. 55—317 **10 Claims**



1. In an air filter assembly for the carburetor of an internal combustion engine wherein the carburetor is coupled to an air discharge port in the bottom wall of a filter housing having a top wall and an annular side wall which includes an inlet opening for the passage of air into the housing and wherein said housing encloses a renewable filter cartridge having a web of filtered material supported between top and bottom annular walls such that the filtering surface of said web faces toward said side wall, the improvement including the combination of:

a pedestal extending upwardly from the bottom wall of said filter housing and in flow communication with said air discharge port, said pedestal having a tubular shape formed by a side wall with at least one opening therein to conduct filtered air into the carburetor, and

a carrier frame, and means rotatably supporting said frame on said pedestal for rotation of the carrier frame within said filter housing, said carrier frame including an upper cover joined to a bottom cover by spacer members disposed to form at least one passageway to conduct filtered air between the upper and lower covers into said opening in the side wall of said pedestal, said bottom cover having an annular support surface to receive and support said bottom annular wall of said renewable filter cartridge, said upper cover having an annular outer edge received through the opening defined by said top and bottom annular walls of said renewable filter cartridge whereby filtered air passing from said web flows into the passageway between the cover plates of said carrier frame, said spacer members including impeller means for contacting a current of air within said filter housing for rotating said carrier frame together with said renewable filter cartridge.

4,038,059

HUMIDITY AND HEAT EXCHANGER APPARATUS, AND METHOD FOR ITS MANUFACTURE

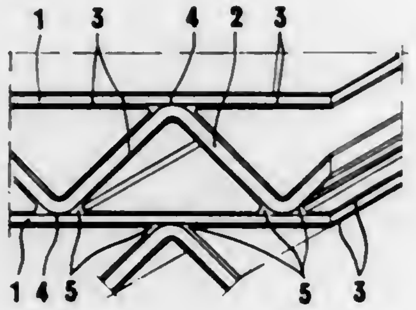
Ove Strindehag, and Erik Wrangel, both of Jonkoping, Sweden, assignors to Aktiebolaget Svenska Flaktfabriken, Nacka, Sweden

Filed Jan. 22, 1976, Ser. No. 651,589

Claims priority, application Sweden, Jan. 30, 1975, 7500987; Nov. 24, 1975, 7513148

Int. Cl.² B01D *53/16*

U.S. Cl. 55—388 **6 Claims**



1. In regenerative humidity and heat exchanger apparatus comprising transfer elements having hygroscopic surfaces movable into heat and humidity exchange alternately with two different zones of fluid, the improvement wherein each of said transfer elements comprises an interior body portion of non-hygroscopic oxidizable metal having an exposed oxidized surface layer formed therefrom to provide an integral hygroscopic metal oxide surface for said transfer element.

4,038,060

APPARATUS FOR TREATING AN EXHAUST GAS FROM NUCLEAR PLANT

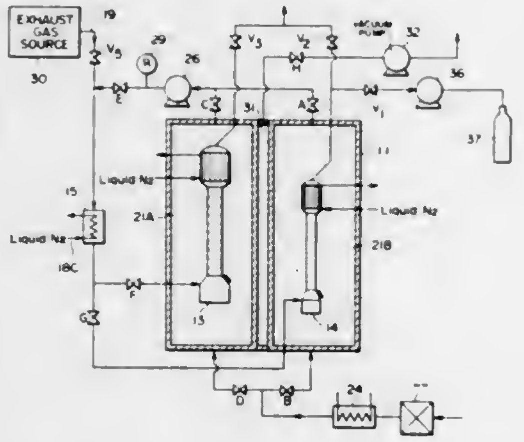
Kunio Kamiya; Hideo Yusa; Fumito Nakajima, and Masato Takeuchi, all of Ibaraki, Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 419,006, Nov. 26, 1973, abandoned. This application Apr. 23, 1975, Ser. No. 570,884

Claims priority, application Japan, Dec. 1, 1972, 47-119903

Int. Cl.² B01D *53/04;* C01B *23/00;* F25J *3/00;* G21C *19/32*

U.S. Cl. 62—36 **3 Claims**



1. In an apparatus for treating exhaust gases which include a radioactive gas, said apparatus comprising cryogenic liquefaction and distillation means for liquefying and distilling the radioactive gas from the exhaust gases, radioactive gas recovering means, conduit means for conveying exhaust gases to be treated to the inlet means of said cryogenic liquefying and distilling means from a source of gases to be treated and for conveying treated gases from an outlet means thereof to the recovery means, the improvement wherein said cryogenic liquefaction and distillation means comprises a plurality of distillation units which are disposed within a casing that is divided into a plurality of chambers which respectively enclose each unit of the cryogenic distillation means and which provide an airtight seal around the cryogenic distillation means, a vacuum compartment disposed between each of said chambers so as to increase the thermal insulation effect between the chambers, and a heat insulating material having adsorbent properties packed into said chambers and surrounding the distillation units, said adsorbent material being a particulate material selected from the group of active carbon, silica gel, synthesized zeolite and activated alumina, said particulate adsorbent having a specific surface area greater than 100 m²/g and being capable of adsorbing the radioactive gas in the event that there is any leakage of the radioactive gas from the cryogenic distillation means during the recovery operation thereby to prevent accidental escape of the radioactive gas upon occurrence of the leakage.

4,038,061

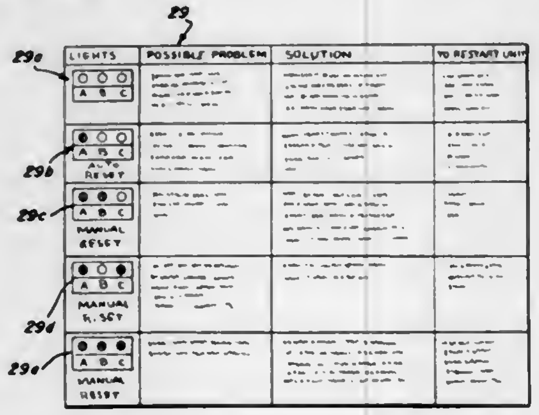
AIR CONDITIONER CONTROL

Richard M. Anderson, Smyrna; Robert S. McGill, III, Murfreesboro, and Robert W. Ramsey, Nashville, all of Tenn., assignors to Heil-Quaker Corporation, Lewisburg, Tenn.

Filed Dec. 29, 1975, Ser. No. 645,281

Int. Cl.² H02K *7/10;* F25B *49/00*

U.S. Cl. 62—126 **17 Claims**



1. In a control system for an air conditioner refrigerant compressor comprising:

- a control means for controlling connection of said compressor to an electrical power source; a sensing means connected to said control means for monitoring the voltage of said source and current flow from said source to said compressor, said sensing means being arranged to prevent said control means from energizing said compressor when said source voltage is below a preselected minimum and said sensing means being arranged to cause said control means to deenergize said compressor when said current flow to said compressor exceeds a preselected maximum;
- a time delay means connected to said control means for delaying operation of said control means to connect said compressor to said power source for a predetermined period of time upon each de-energization of said compressor and upon each occurrence of a voltage below said preselected minimum voltage;
- a temperature sensing means arranged to monitor air conditioner operating temperature conditions, said temperature sensing means being connected to said control means to cause said control means to de-energize said compressor upon the occurrence of temperatures beyond one or more preselected levels until said control means is manually reset; and
- a manual reset means connected between said power source and said control system for permitting said control means to connect said compressor to said power source after said predetermined period of time has elapsed;
- the improvement comprising first indicator means connected to said control means and arranged to provide an indication that said control system is energized but that said control means is prevented from energizing said compressor until said predetermined period of time has elapsed; and second indicator means connected to said temperature sensing means and arranged to provide an indication that said temperature sensing means has determined a temperature beyond one or more of said preselected levels and that said control means must be reset by said manual reset means.

4,038,062

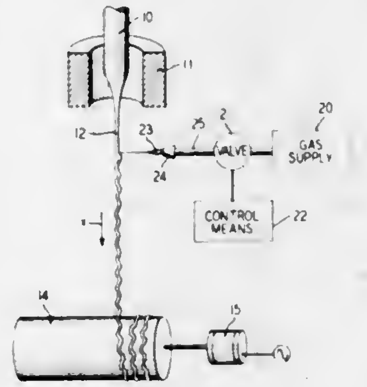
METHOD AND APPARATUS FOR INTRODUCING GEOMETRICAL PERTURBATIONS IN OPTICAL FIBER WAVEGUIDES

Herman Melvin Presby, Highland Park, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Mar. 25, 1976, Ser. No. 670,107

Int. Cl.² C03B *37/02*

U.S. Cl. 65—2 **9 Claims**



1. A method of introducing controlled geometrical perturbations along a conventional optical fiber waveguide comprising the steps of:

- advancing the optical fiber waveguide through the energy emanating from a heat source, while simultaneously
- modulating the intensity of the energy from the heat source in a predetermined sequence and in a relationship to the speed at which said optical fiber is being advanced through said energy to concurrently heat the optical fiber waveguide to at least within its working temperature and deform the fiber waveguide with the energy from the heat source to yield the desired controlled geometrical perturbation pattern along the waveguide.

4,038,063

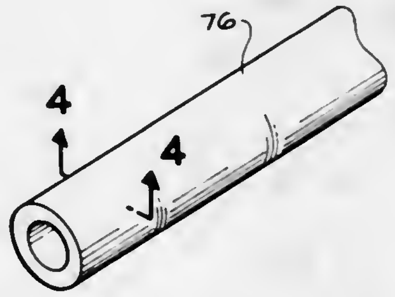
METHOD AND APPARATUS FOR MAKING CONTINUOUS FOAM GLASS PRODUCT

Tudor Williams, Studio City, and John D. Bost, Culver City, both of Calif., assignors to E. C. P., Inc., El Segundo, Calif.

Filed Dec. 17, 1975, Ser. No. 641,810

Int. Cl.² C03B *19/08*

U.S. Cl. 65—22 **12 Claims**



1. A continuous, moldless process for the manufacture of cellular ceramic product in which a foaming agent is added to a ceramic feed, said foaming agent requiring a temperature in excess of 500° C for activation, comprising:

- transporting a first amount of said ceramic feed through a first kiln section and heating said first feed amount in said first kiln section to a first temperature of at least 500° C but which is lower than said activation temperature;
- transporting said heated first feed amount into a second kiln section while transporting a second amount of said ceramic feed through said first kiln section and heating said second feed amount to said first temperature;
- adding foaming agent to said heated first feed amount after passage of said first feed amount through said first kiln section to form a mixture thereof;
- heating said mixture of foaming agent and said heated first feed amount to said activation temperature in said second kiln section for a time sufficient to form a first amount of foamed ceramic;
- transporting said first amount of foamed ceramic while it is at or above its softening point to a drawing kiln section while transporting said heated second feed amount into said second kiln section;
- adding foaming agent to said heated second feed amount after passage of said second feed amount through said first kiln section to form a mixture thereof;
- heating said mixture of foaming agent and said heated second feed amount to said activation temperature in said second kiln section for a time sufficient to form a second amount of foamed ceramic; and
- transporting said second amount of foamed ceramic while it is at or above its softening point to said drawing kiln section and forming said product from said first and second amounts of foamed ceramic.

4,038,064

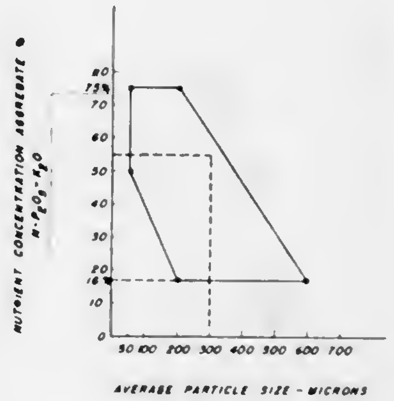
FOLIAR APPLICATIONS OF UREA-POLYPHOSPHATE-POTASSIUM SOLUTIONS TO CROPS

John G. Clapp, Greensboro, N.C.; Donald Lee Johnson, Omaha, Nebr., and James Earl Sansing, Jr., Baton Rouge, La., assignors to Allied Chemical Corporation, Morristown, N.J.

Filed Aug. 7, 1975, Ser. No. 602,714

Int. Cl.² C05B *15/00*

U.S. Cl. 71—29 **21 Claims**



1. A process for improving the yield of soybeans which comprises the step of treating the foliage of such soybeans with a solution consisting essentially of the following nutrient constituents:

- a. H_2O: 25 - 84% (expressed as weight);
- b. Urea: 3 - 25% (expressed as % N by weight);
- c. Predominantly linear polyphosphate having from 55 to 80% of the P_2O_5 present in the form "pyro," "tripoly" or higher linear polyphosphate: 5 - 30% (expressed as P_2O_5 by weight);
- d. Potassium: 5 – 30%, (expressed as K_2O by weight);
- e. Ammoniacal N: Less than 3%;
- f. Cl: Less than 2%;
- g. SO_4: Less than 2%;
- h. Other micronutrients such as sulfur, boron, zinc, iron, manganese and copper: None to nominal amounts as desired; said solution being applied in a fine spray during the period starting shortly before flowering and ending shortly after beginning of pod development; and at a rate

of at least 25 pounds aggregate N—P_2O_5—K_2O per acre in the following proportions:

Component	Rate of Application, Lbs./Acre
Urea (as N)	2 - 60
Phosphorus (as P_2O_5)	2 - 75
Potassium (as K_2O)	2 - 75

4,038,065
1-ALKYLPYRID-2-ONE

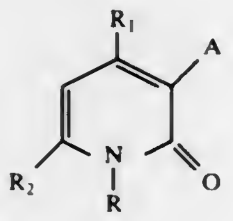
Wayne O. Johnson, Warminster; Michael C. Seidel, Chalfont, and Harlow L. Warner, Hatboro, all of Pa., assignors to Rohm and Haas Company, Philadelphia, Pa.

Filed Oct. 11, 1974, Ser. No. 513,987

Int. Cl.² C07D *213/80;* A01N *9/22*

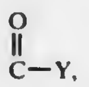
U.S. Cl. 71—76 **7 Claims**

1. A compound of the formula



wherein

A is the group



$$-\overset{O}{\overset{\|}{C}}-Y,$$

wherein Y is halo, NH_2, OH, or (C_1-C_7) alkoxy;

R is (C_1-C_{12}) alkyl, and

R_1 and R_2 are methyl or ethyl and the physiologically acceptable salts thereof.

6. A method for producing preemergence herbicidal activity which comprises applying an effective amount of a compound of claim **1** to the habitat of a plant.

4,038,066
METHOD OF STRIPPING BASE METALS FROM FUSED SALTS

Malcolm Charles Evert Bell, Sudbury; Thijs Eerkes, and Ramamritham Sridhar, both of Mississauga, all of Canada, assignors to The International Nickel Company, Inc., New York, N.Y.

Filed June 24, 1974, Ser. No. 482,249

Claims priority, application Canada, July 13, 1973, 176365

Int. Cl.² C21B *15/00*

U.S. Cl. 75—29 **25 Claims**

1. A process for recovering at least one base metal value selected from the group nickel, cobalt, copper and iron, dissolved as a chloride in a fused chloride solvent consisting of at least one salt selected from the group consisting of alkali and alkaline earth metal halides which comprises contacting the fused chloride solvent containing the base metal chloride with a precipitant comprising hydrogen sulfide to precipitate base metal values in an easy to separate molten phase and to regenerate the fused chloride solvent.

4,038,067
CARBON-FREE CASTING POWDER FOR INGOT CASTING AND CONTINUOUS CASTING

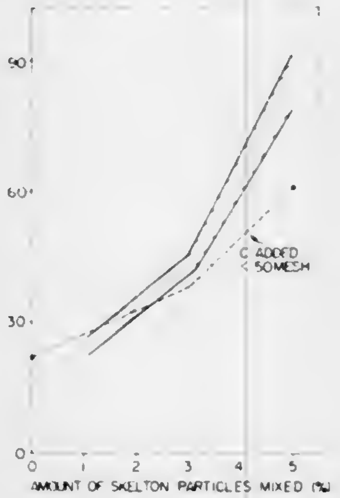
Hidemaro Takeuchi, Hikari, Japan, assignor to Nippon Steel Corporation, Tokyo, Japan

Filed June 8, 1976, Ser. No. 693,901

Claims priority, application Japan, June 13, 1975, 50-71694

Int. Cl.² C21C *7/00;* C22B *9/10*

U.S. Cl. 75—257 **9 Claims**



1. A casting composition for preventing carburization of steel during the casting thereof, said composition comprising a powdery basic material, and particles of a nitride material contained in said basic material as a skeleton therefor, said nitride material being in particle size of 50 mesh or finer, said basic materials containing substantially no carbon particles.

4,038,068
METHOD OF MELTING COPPER ALLOYS WITH A FLUX

Derek E. Tyler, Cheshire, Conn.; David W. Dickinson, Hinckley, Ohio, and James E. Dore, Ballwin, Mo., assignors to Olin Corporation, New Haven, Conn.

Filed Feb. 19, 1976, Ser. No. 659,241

Int. Cl.² C22B *15/00, 9/00;* C22C *9/01*

U.S. Cl. 75—76 **11 Claims**

1. Improved method for making copper base alloys containing from 2 to 12% aluminum which comprises:

a. providing a molten mass of a copper base alloy containing from 2 to 12% aluminum, balance copper;

b. covering the mass with an essentially continuous flux layer of molten salt consisting essentially of from 10 to 90% by weight of potassium chloride and from 10 to 90% by weight sodium chloride, said salt having a melting point of from 660° to 800° C;

c. charging additional amounts of said copper alloy to the melt through said flux layer to melt same in the molten mass; and

d. casting said copper base alloy to ingot,

whereby the amount of dross is reduced, molten metal cleanliness is improved, metal recovery is improved and metal losses reduced.

4,038,069
HEAT-INSULATING AGENT FOR MOLTEN METAL

Masaru Takashima, Tokyo, Japan, assignor to Aikob Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 515,755, Oct. 17, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,017

Claims priority, application Japan, Oct. 17, 1973, 48-115853

Int. Cl.² C22B *9/00*

U.S. Cl. 75—96 **5 Claims**

1. A heat-insulating agent for molten metal which comprises a burned material containing about 5 to 30% by weight carbon which is obtained by light-burning a dehydrate of sludge discharged in pulping or paper-making procedures, said sludge containing pulp fibers, lignin and chemicals conventionally employed in pulping processes, said dehydrate containing about 60 to 90% by weight water and about 10 to 40% by weights solids, said solids including about 40 to 80% by weight organic material and about 20 to 60% by weight ash.

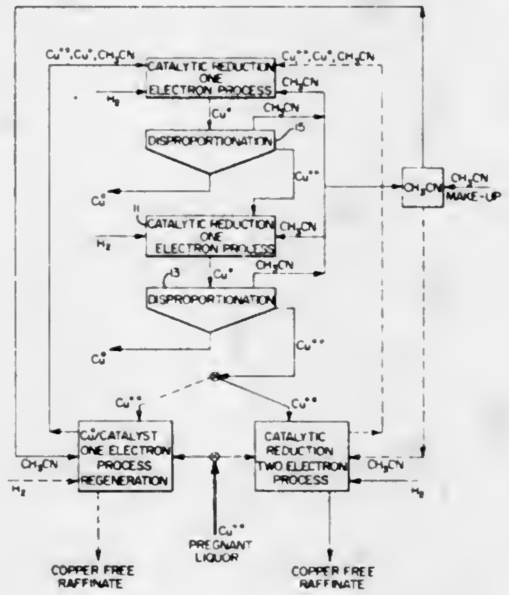
4,038,070
LOW TEMPERATURE AND PRESSURE CONTINUOUS REDUCTION OF COPPER IN ACID SOLUTIONS

Alkis S. Rappas, Arlington, and J. Paul Pemsler, Lexington, both of Mass., assignors to Kennecott Copper Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,390

Int. Cl.² C22B *15/12*

U.S. Cl. 75—108 **65 Claims**



1. A process for recovering copper values from an acidic solution of solubilized cupric ions comprising:

a. reducing the cupric ions with hydrogen in the presence of a solid hydrogenation catalyst and in the presence of a cuprous ion stabilizing ligand to produce a soluble cuprous ion complex;

b. terminating said hydrogenation reaction before copper metal precipitates on the solid catalyst;

c. separating the aqueous acidic solution which contains the soluble ligand stabilized cuprous complex produced during the hydrogenation of step (a) from the solid catalyst; and

d. disproportionating the cuprous ions in said ligand stabilized cuprous complex to produce copper metal and cupric ions.

4,038,071
PROCESS FOR THE REMOVAL OF MERCURY FROM AQUEOUS SOLUTIONS

Eugene P. Di Bella, Piscataway, N.J., assignor to Tenneco Chemicals, Inc., Saddle Brook, N.J.

Filed July 14, 1976, Ser. No. 705,239

Int. Cl.² C22B *43/00*

U.S. Cl. 75—108 **12 Claims**

1. The process for the removal of mercury from an aqueous solution containing mercury in the form of mercuric ions, organo-mercuric ions, or mixtures thereof that comprises the steps of

a. contacting the solution with a reducing agent selected from the group consisting of hypophosphorous acid, phosphorous acid, and the water-soluble salts of hypophosphorous acid and phosphorous acid in an amount sufficient to reduce the ions in the solution to mercury and

b. separating mercury from the aqueous solution.

4,038,072
ALUMINUM-BASE ALLOY

Ivan Filippovich Kolobnev, 1 Spaso-Nalivkovsky perculok, 19, kv. 12, and Georgy Yakovlevich Mishin, 1 Institutsky proezd, 8, kv. 35, both of Moscow, U.S.S.R.

Filed May 5, 1975, Ser. No. 574,459

Int. Cl.² C22C *21/16*

U.S. Cl. 75—142 **5 Claims**

1. An aluminum-base alloy, consisting essentially of the following elements in wt.%: cerium, from 4.0 to 6.0; copper, from 2.0 to 4.0; silicon, from 1.0 to 3.0; manganese, from 0.7 to 2.0; zirconium, from 0.05 to 0.5; and magnesium, from 0.1 to 0.3, aluminum being the balance.

4,038,073
NEAR-ZERO MAGNETOSTRICTIVE GLASSY METAL ALLOYS WITH HIGH SATURATION INDUCTION

Robert Charles O'Handley, Morris Plains; Ethan Allen Nesbitt, Beach Haven, and Lewis Isaac Mendelsohn, Morristown, all of N.J., assignors to Allied Chemical Corporation, Morris Township, N.J.

Filed Mar. 1, 1976, Ser. No. 662,639

Int. Cl.² C22C *19/07*

U.S. Cl. 75—170 **5 Claims**

1. A magnetic alloy that is at least 50% glassy, having the formula $(Co_xFe_{1-x})_aB_bC_c$, where B is boron and C is carbon and where x ranges from about 0.92 to 0.96, a ranges from about 78 to 85 atom percent, b ranges from about 10 to 22 atom percent and c ranges from 0 to about 12 atom percent, with the proviso that the sum of b and c ranges from about 15 to 22 atom percent, said alloy having a value of magnetostriction of essentially zero.

4,038,074
METAL ALLOY COMPOSITION

Daniel M. Davitz, Niles, Ill., assignor to Astro, Niles, Ill.

Filed July 19, 1976, Ser. No. 706,473

Int. Cl.² C22C *19/05*

U.S. Cl. 75—171 **4 Claims**

1. An alloy having a chemical analysis on a weight percent basis consisting essentially of:

Nickel	63.0	-	74.8
Chromium	17.0	-	21.9
Molybdenum	2.5	-	5.0
Cobalt	1.0	-	5.0
Silicon	2.0	-	3.0
Tin	1.0	-	5.0
Indium	0.5	-	2.0
Boron	1.00	-	3.00
Copper	0.00	-	5.00
Iron	0.005	-	1.00

said alloy having a melting point of about 2200° F (1204° C), and a casting temperature of about 2300° F (1260° C), and said alloy being characterized by a lower melting point, a lower casting temperature, a higher fluidity at said casting temperature, greater adhesion for a sintered silicate-containing materials and for a fused silicate glass materials and a softer more workable surface than the alloy would otherwise have without the said tin and indium.

4,038,075

DEVELOPMENT OF PHOTOGRAPHIC SILVER HALIDE MATERIAL

Robert Joseph Pollet, Vremde; Francis Jeanne Sels, Kontich, and Camille Angelina Vandeputte, Mortsel, all of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

Filed Jan. 13, 1976, Ser. No. 648,721

Claims priority, application United Kingdom, Jan. 22, 1975, 2866/75

Int. Cl.² G03C *7/00, 7/16, 5/30*

U.S. Cl. 96—22 **10 Claims**

1. A method of developing a photographic silver halide element containing imagewise developable silver halide by means of a silver halide developing solution wherein the developing solution contains a derivative of a polyethylene glycol or a C_1-C_5 monoalkyl ether thereof corresponding to the formula:

$$R_1O(CH_2CH_2O)_nX—A—Y—R_2$$

wherein

R_1 is hydrogen, C_1-C_5 alkyl or the group $X—A—Y—R_2$

n is an integer of at least 4

X is CO, SO_2, CONH or, when R_1 is $X—A—Y—R_2$ may be a chemical monovalent bond,

A is alkylene or arylene,

Y is a sulphur or selenium atom, and

R_2 is an alkyl group.

4,038,076

PROCESS FOR PRODUCING ELECTROSTATOGRAPHIC PRINTS

Anthony F. Lipani, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Division of Ser. No. 274,394, July 24, 1972, Pat. No. 3,926,824. This application Mar. 25, 1975, Ser. No. 561,959

Int. Cl.² G03G *13/14*

U.S. Cl. 96—1 SD **17 Claims**

1. A process for producing positive and negative prints from both positive and negative originals, comprising:

forming an electrostatic latent image from said original; developing the electrostatic latent image with a developer having only one type of finely divided toner particles and only one type of carrier therefor the carrier particles being larger than the toner particles, at least the surface of said carrier comprising material which is capable of imparting both a negative and a positive charge to said toner whereby said toner electrostatically adhering to said carrier is both negatively and positively charged on said carrier, whereby toner of one polarity is deposited in the image area and toner of the other polarity is deposited in at least the background area immediately adjacent the image area without providing two or more types of toner and/or carrier particles; and transferring toner of one polarity to a receiving surface to produce a positive or negative print.

10. A process for producing positive and negative prints from both positive and negative originals, comprising:

forming an electrostatic latent image from said original; developing said electrostatic latent image with a developer having both negatively and positively charged toner and carrier therefor, the toner being charged positively by the carrier and the toner being charged negatively by the carrier, whereby toner of one polarity is deposited in the image area and toner of the other polarity is deposited in at least the background area immediately adjacent the image area, and transferring toner of one polarity to a receiving surface to produce a positive or negative print.

4,038,077

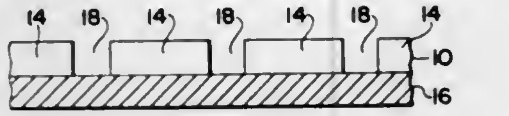
PROCESS COMPRISING DIFFUSION TRANSFER SILVER IMAGE REMOVAL

Edwin H. Land, Cambridge, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Division of Ser. No. 457,854, April 4, 1974, abandoned, which is a continuation-in-part of Ser. No. 676,510, Oct. 19, 1967, abandoned. This application Mar. 10, 1976, Ser. No. 665,562

Int. Cl.² G03C *5/54;* **G03F** *7/02;* **G03C** *5/00;* **B41M** *5/00*

U.S. Cl. 96—29 R **17 Claims**



1. A process comprising

a. developing an exposed silver halide emulsion containing a developable image, with an aqueous alkaline processing composition, and forming, in terms of unexposed areas of said emulsion, as a function of said development, an image-wise distribution of a soluble silver complex;

b. transferring said complex at least in part by imbibition, to a superposed silver-receptive stratum including a hydrophilic, essentially water-insoluble macroscopically continuous siliceous matrix disposed on a layer of hydrophobic material, said silver-receptive stratum and said layer of hydrophobic material comprising an image-receiving element to provide a relatively dense silver transfer image primarily within said stratum, said silver transfer image formation being carried out in the presence of an effective amount of an anti-adhesion reagent which precludes adhesion of said stratum to said hydrophobic layer therebeneath in areas of relatively dense silver deposit so that nonadhering areas of said stratum with the silver deposited therein may be removed by the application of an aqueous medium consisting essentially of water; and

c. contacting said silver-receptive stratum containing said silver transfer image with an aqueous medium consisting essentially of water for a time sufficient to remove those of areas of said stratum containing relatively dense silver deposits.

4,038,078

PROCESS USING SUCTION TO FORM RELIEF IMAGES

Kiyomi Sakurai, Neyagawa, and Yasuyuki Takimoto, Takatsuki, both of Japan, assignors to Nippon Paint Co., Ltd., Osaka, Japan

Filed July 28, 1975, Ser. No. 599,930

Claims priority, application Japan, Apr. 19, 1975, 50-47641

Int. Cl.² G03C *5/00*

U.S. Cl. 96—35.1 **8 Claims**

1. A process for formation of a relief image which comprises exposing a portion of a layer of a photosensitive composition provided on the surface of a support material to light through a negative to cure the exposed portion of the photosensitive composition and thereafter developing the image by eliminating the unexposed uncured photosensitive composition by suction, the photosensitive composition being a liquid composition containing no unsaturated polymeric material and having at least one addition polymerizable unsaturated monomer selected from the group consisting of C_7–C_{20} alkyl acrylates and methacrylates, poly(C_2-C_3) alkylene glycol diacrylates and dimethacrylates having 9 to 14 alkylene glycol units, C_1-C_3 alkoxypoly(C_2-C_3) alkylene glycol acrylates and methacrylates having 9 to 14 alkylene glycol units, hydroxy (C_2-C_3) alkyl acrylates and methacrylates, monoacryloyloxy (C_2-C_3) alkyl and monomethacryloyloxy(C_2-C_3) alkyl phthalates, and hydroxy(C_2-C_3) alkyl acryloyloxy(C_2-C_3) alkyl and methacryloyloxy(C_2-C_3)alkyl phthalates and at least one photopolymerization initiator, the initiator being present in an amount effective to photopolymerize the unsatuated monomer when the photosensitive composition is exposed to light.

4,038,079

PROCESS FOR THE REGENERATION OF PHOTOGRAPHIC BLEACH-FIX BATHS

Heinz Meckl, Schildgen; Helmut Häseler, Leverkusen, and Adolf Seiler, Hitdorf, all of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Continuation of Ser. No. 244,949, April 17, 1972, abandoned. This application Aug. 21, 1975, Ser. No. 606,722

Claims priority, application Germany, July 27, 1971, 2137549

Int. Cl.² G03C *5/26, 5/32*

U.S. Cl. 96—60 BF **2 Claims**

1. The method of desilvering a photographic bleach-fix bath, containing accumulated dissolved silver and also containing an iron (III) complex of aminopolyacetic acid,

by contacting the bath with metallic iron,

the improvement which comprises treating the bath containing the iron (III) complex of aminopolyacetic acids in a preliminary reduction step with a reducing agent, selected from the group consisting of dithionites, phosphites, hypophosphites, boronates, water-soluble hydrazine derivatives, hydroxylamines, ascorbic acid, semicarbazide, carbohydrazide, formamidine sulvinic acid and sulfinic acid before the bath is contacted with the metallic iron,

said preliminary reduction step being carried out by adding the said reducing agent to the bath in order to reduce the iron (III) complex until the iron (III) complex is essentially reduced to the iron (II) complex and before a reduction of the dissolved silver,

and after this preliminary reduction step then desilvering the bath by metallic replacement.

4,038,080

FIX AND BLEACH-FIX BATH DESILVERING

Richard S. Fisch, and Norman Newman, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sept. 21, 1972, Ser. No. 290,972

Int. Cl.² G03C *5/26, 5/32, 5/38*

U.S. Cl. 96—60 BF **4 Claims**

1. A method for desilvering a used photographic fix or bleach-fix bath which comprises adding at least one compound from the group consisting of ascorbic acid, araboascorbic acid, and 4-o-sulfophenyl-2-hydroxytetronimide to a used fix or bleach-fix bath containing complexed silver in an amount sufficient to precipitate the silver in solution and thereby precipitating said silver, wherein at least 12g of the compound are added per liter of used fix bath and wherein at least 15g of the compound are added per liter of used bleach-fix bath.

4,038,081

DEVELOPMENT METHOD

Teiji Habu; Tomio Nakajima, and Eiichi Sakamoto, all of Hino, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Nihonbashi-Muro, Japan

Filed Feb. 24, 1976, Ser. No. 661,046

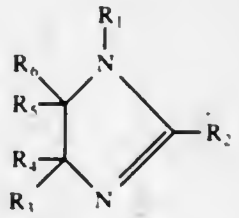
Claims priority, application Japan, Feb. 28, 1975, 50-24689

Int. Cl.² G03C *5/26, 5/30, 1/06, 1/28*

U.S. Cl. 96—66.3 **9 Claims**

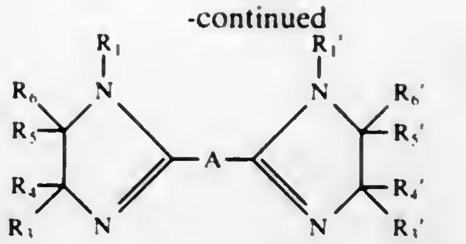
1. A development method for an image-wise exposed light-sensitive silver halide photographic material which comprises developing, by a developing agent, the photographic material in the presence of a compound represented by the following formulas:

(I)

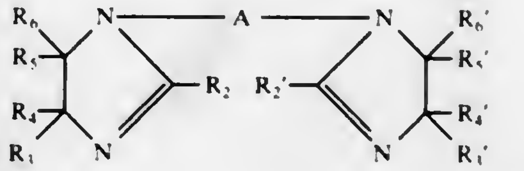


-continued

(II)



(III)



wherein R_1 and R_1' are individually hydrogen, halogen, hydroxyl, or a substituted or unsubstituted alkyl, aralkyl, alkenyl, amino, aryl or acryl group; R_2 and R_2' are individually hydrogen, hydroxyl, or a substituted or unsubstituted alkyl, aralkyl, alkenyl, aryl, hydrazino, heterocyclic, alkylthio or aralkylthio group; R_3, R_3', R_4, R_4', R_5, R_5', R_6 and R_6' are individually hydrogen, alkyl, aryl or a heterocyclic group; and A is a divalent atomic group said compound being present in the material or in a developer bath of the developer composition.

4,038,082

IMAGE-RECEIVING MATERIAL FOR COLOR DIFFUSION TRANSFER COMPRISING PVA AND POLYMETHYLOL COMPOUNDS

Takashi Yoshida, and Nobuo Yamamoto, both of Minami-ashigara, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Aug. 30, 1974, Ser. No. 501,934

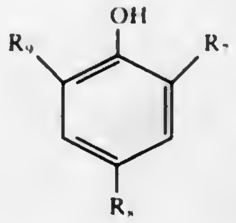
Claims priority, application Japan, Aug. 30, 1973, 48-97633

Int. Cl.² G03C *1/40, 7/00;* **B44D** *1/44, 1/09*

U.S. Cl. 96—77 **8 Claims**

1. An image-receiving element for color diffusion transfer photography for use with a photographic element containing at least one silver halide emulsion layer having incorporated therein a dye image-forming material that is soluble in alkaline solution and becomes diffusible upon development of the silver halide emulsion layer with an alkaline processing solution, and to which the dye image-forming material is imagewise transferred when the alkaline processing solution is spread between the image-receiving element and the photographic element; in which the image-receiving element comprises a support having at least one layer thereon, at least one layer of the image-receiving element being a hydrophilic image-receiving layer consisting essentially of polyvinyl alcohol or a mixture of at least 50 weight percent polyvinyl alcohol and one or more natural or other synthetic polymers and a polymethylol compound selected from the group of polymethylol compounds represented by the general formula (III)

(III)



wherein R_7, R_8 and R_9 each represents a hydrogen atom, a methylol group or an alkyl group and at least two of R_7 to R_9 are methylol groups and wherein said layer containing said polymethylol compound also contains a non-volatile acid as a cross-linking promoter.

4,038,083
PHOTOTHERMOGRAPHIC RECORDING SHEET

Jozef Frans Willems, Wilrijk, and Antoon Leon Vandenberghe, Hove, both of Belgium, assignors to AGFA-GEVAERT N.V., Mortsel, Belgium

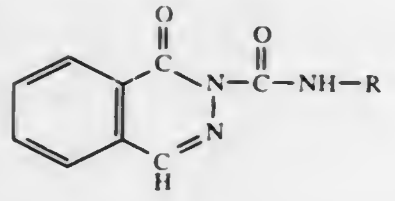
Continuation of Ser. No. 319,773, Dec. 29, 1972, abandoned. This application Dec. 31, 1974, Ser. No. 537,763

Claims priority, application Germany, Apr. 27, 1972, 2220618

Int. Cl.^{2} G03C *1/02*

U.S. Cl. 96—94 R **7 Claims**

1. Image-receiving material for the production of photographic copies in a dry manner with a layer containing a non-light-sensitive silver salt and a phthalazinone compound corresponding to the following general formula:



wherein:

R represents C_{1-18} alkyl group or a cyclopentyl or cyclohexyl group, or a phenyl or naphthyl group.

4,038,084
PHOTO-SETTING COMPOSITION

Tsunetomo Nakano; Kazuaki Nishio; Toshikazu Hayashi, and Hiroshi Andou, all of Ichihara, Japan, assignors to UBE Industries, Ltd., Ube, Japan

Filed Mar. 24, 1976, Ser. No. 669,839

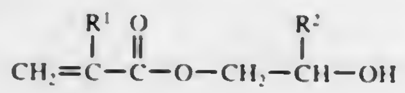
Claims priority, application Japan, Apr. 8, 1975, 50-41790

Int. Cl.^{2} G03G *1/68*

U.S. Cl. 96—115 P **10 Claims**

1. A photo-setting composition comprising:

A. 100 weight parts of a product prepared by esterifying a maleic anhydride adduct of a liquid polybutadiene with a hydroxyl compound (i) having the formula

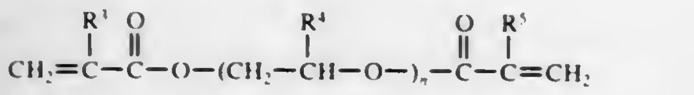


$$CH_2{=}\overset{R^1}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-O-CH_2-\overset{R^2}{\overset{|}{C}H}-OH$$

in which R^1 and R^2 are the same or different and each represents hydrogen or methyl, said adduct having an acid value of from 120 to 250 and a viscosity at 50° C. of from 2,000 to 100,000 centipoises;

B. 10 - 150 weight parts of one or more than one kind of unsaturated compound selected from the group consisting of

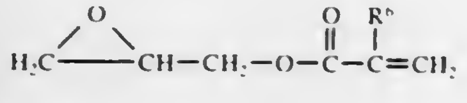
a hydroxyl compound (i), identified above, a di(meth)acrylate compound having the formula



$$CH_2{=}\overset{R^3}{\overset{|}{C}}-\overset{O}{\overset{\|}{C}}-O-(CH_2-\overset{R^4}{\overset{|}{C}H}-O-)_n-\overset{O}{\overset{\|}{C}}-\overset{R^5}{\overset{|}{C}}{=}CH_2$$

in which R^3, R^4 and R^5 are the same or different and each represents hydrogen or methyl, and n is an integer of 1 - 4 and

a glycidyl monoester compound having the formula

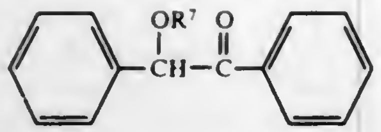


$$H_2C\overset{O}{\frown}CH-CH_2-O-\overset{O}{\overset{\|}{C}}-\overset{R^6}{\overset{|}{C}}{=}CH_2$$

in which R^6 represents hydrogen or methyl;

and

C. 0.5 - 10 weight parts of a benzoinether compound having the formula



in which R^7 represents an alkyl group containing 1 - 3 carbon atoms.

4,038,085
METHOD OF TREATING ELECTROLESS NICKEL PLATING BATH

William G. Scannell, Hinsdale, Ill., assignor to Chromium Industries, Inc., Chicago, Ill.

Filed Mar. 3, 1976, Ser. No. 663,264

Int. Cl.^{2} C23C *3/02*

U.S. Cl. 106—1 **4 Claims**

1. The method of treating a chemical nickel plating solution during the plating process to maintain solution integrity and increase the plating rate, said solution including an aqueous solution of nickel ions in concentrations of about 1.5 ounces per gallon of solution, sodium hypophosphite in concentrations of about 2.7 ounces per gallon of solution, a compound selected from the group consisting of sodium acetate and sodium citrate in concentrations of about 1-1.5 ounces per gallon of solution, and a compound selected from the group consisting of lactic acid and glycolic acid in amounts sufficient to adjust the pH of the solution to about 5, said method comprising: adding to the solution sodium fluoride in quantities of not less than about 0.5 ounces per gallon of solution sufficient to cause the formation of a precipitate; and filtering the precipitate from the solution whereby the control and integrity of the bath are maintained.

4,038,086
AQUEOUS AMMONIACAL ZINC ARSENIC OR ZINC/COPPER ARSENIC WOOD PRESERVATIVE SOLUTIONS

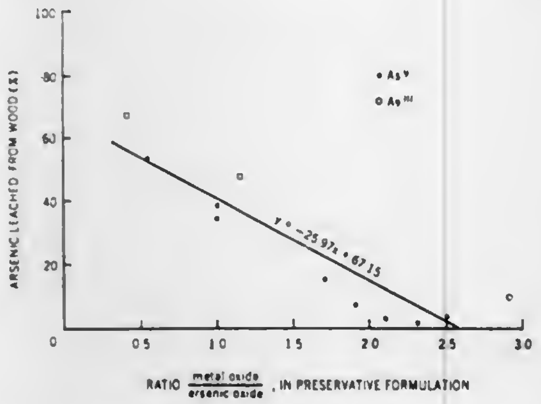
Michael R. Clarke, and Jaromir R. Rak, both of Ottawa, Canada, assignors to Canadian Patents and Development Limited, Ottawa, Canada

Continuation-in-part of Ser. No. 362,104, May 21, 1973, Pat. No. 3,945,835. This application Apr. 16, 1975, Ser. No. 568,789

Claims priority, application Canada, Dec. 12, 1972, 158685

Int. Cl.^{2} C09D *5/14*

U.S. Cl. 106—15 R **13 Claims**



1. A wood treating composition comprising an aqueous solution containing:

a. soluble component adapted to form a normally water-insoluble compound of zinc or zinc and copper with arsenic acid or arsenious acid, the metal being present in an amount of 0.1-4% by weight (as Zn or Zn + Cu metal) of the total aqueous solution, the weight ratio of zinc or zinc and copper (as oxides) to arsenic (as oxides) being 1.5 or more;

b. 0.15-10% by weight of the total aqueous solution of a water repellent component comprising at least one of carbonate and bicarbonate ions, in an amount of up to 150% of the zinc or zinc and copper, the weight ratio of $CO_2/NH_3/Zn/As$ or of $CO_2/NH_3/Zn+ Cu/As$ being 1.7-2.3/5.9-6.7/1.9-2.9/0.9; and

c. ammonia, in an amount of 1-28% by weight of the total aqueous solution; the ammonia being sufficient to solubilize the normally water-insoluble salts of zinc or zinc and copper and the normally water-insoluble water repellent component.

4,038,087
VARNISH FOR PRINTING INKS AND ITS METHOD OF PREPARATION

Hiroyuki Sugisaki, Tokyo; Mitsuo Nozue, Kuwana, and Hiroki Ogawa, Tokyo, all of Japan, assignors to Taniguchi Petroleum Refining Company, Limited and T. S. Chemical, Ltd., Tokyo, both of, Japan

Filed Nov. 10, 1975, Ser. No. 630,683

Claims priority, application Japan, Mar. 3, 1975, 50-25835

Int. Cl.^{2} C07C *139/06;* C09D *11/02, 11/12*

U.S. Cl. 106—32 **17 Claims**

1. A varnish for a printing ink which comprises a mineral oil and a product prepared by adding an anionic surfactant to an acid sludge, neutralizing said acid sludge with an aqueous solution of an alkali metal salt and then, adding an inorganic polyvalent metal salt to the mixture to form polyvalent metal salts of said anionic surfactant and acid components of said acid sludge.

4,038,088
MOLD RELEASE AGENT

John R. White, Wadsworth; Ram M. Krishnan, Monroe Falls, and James D. Wolfe, North Canton, all of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 10, 1975, Ser. No. 557,193

Int. Cl.^{2} B28B *7/36*

U.S. Cl. 106—38.24 **5 Claims**

1. A mold release containing a solution of a sodium or potassium soap of a fatty acid having the structure $C_nH_{2n-1}COOH$ or $C_nH_{2n+1}COOH$ where n is an integer having values of 11 to 22 and 99 to 95 percent by weight of a diluent consisting of alcohol or alcohol and water with the amount of water varying from 0 to 24 percent by weight and the alcohol being selected from the group consisting of methanol and ethanol, isopropanol, and a polyurethane cayatlyst selected from the class consisting of secondary amines, tertiary amines and organo tin compounds.

4,038,089
PROCESS FOR PRODUCING VITREOUS FIBERS CONTAINING CEMENT AS MAJOR CONSTITUENT

Kyosuke Kawai, Fujisawa, Japan, assignor to Japan Inorganic Material Co., Ltd., Japan

Continuation of Ser. No. 384,409, Aug. 1, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 640,777

Claims priority, application Japan, June 19, 1973, 48-68987

Int. Cl.^{2} C03C *13/00, 3/04*

U.S. Cl. 106—50 **3 Claims**

1. A process for producing vitreous fibers containing cement as a major constituent, consisting essentially of mixing the following components in the form of powders:

40 to 50% by weight, Portlant cement; 2.5to 25% by weight, zircon flour; and 40 to 48% by weight, shirasu, having a composition of 65 to 73% SiO_2, 12 to 16% Al_2O_3, 1 to 3% Fe_2O_3, 2 to 4% CaO, 2 to 4% K_2O, and 3 to 4% Na_2O; melting the mixture and making fibers from the molten mixture.

4,038,090
ION EXCHANGEABLE GLASS HAVING LOW THERMAL EXPANSION

Georg Gliemeroth, Finthen, Germany, assignor to Jenaer Glaswerk Schott & Gen., Mainz, Germany

Filed Dec. 2, 1975, Ser. No. 636,843

Claims priority, application Germany, Dec. 2, 1974, 2456894

Int. Cl.^{2} C03C *3/10, 21/00*

U.S. Cl. 106—53 **21 Claims**

1. In organic vitreous material suitable for ion exchange wherein the refractive index of this material can be changed in the zone of the exchange without any significant change in the linear thermal expansion coefficient, said material consisting essentially of (in percent by weight):

SiO_2	47 - 61	CaO	0 - 5
Al_2O_3	13 - 20	Li_2O	3 - 10
La_2O_3	1 - 8	Na_2O	6 - 16
Ta_2O_5	0 - 7.5	K_2O	0 - 6
ZrO_2	0 - 4	PbO	0.5 - 15
WO_3	0 - 3	TiO_2	0 - 4
BaO	0 - 5	P_2O_5	0 - 3
ZnO	0 - 5	B_2O_3	0 - 5
MgO	0 - 5	Fining Agent.	

4,038,091
SEALING GLASS VEHICLE AND COMPOSITION AND METHOD FOR MAKING SAME

Josef Francel; James E. King, both of Toledo, and John M. Woulbroun, Grand Rapids, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 516,900, Oct. 22, 1974, Pat. No. 3,973,975, which is a continuation-in-part of Ser. No. 246,316, April 21, 1972, abandoned, and a continuation-in-part of Ser. No. 511,202, Oct. 1, 1974, Pat. No. 3,967,973, said Ser. No. 511,202, is a continuation of Ser. No. 246,316,. This application Dec. 3, 1975, Ser. No. 637,351

Int. Cl.^{2} C03C *3/10, 3/12*

U.S. Cl. 106—53 **7 Claims**

1. In a PbO containing sealing glass frit for sealing two glass surfaces together, the improvement wherein the PbO in said sealing glass is prevented from being reduced when said sealing glass is being fired in the presence of reducing conditions at a temperature sufficient to seal said glass surfaces together, said improvement comprising incorporating an inorganic nitrate, having a thermal decomposition temperature of about 30°-600° C, a melting point of about 36°-264° C and containing water of hydration, in said sealing glass in a powder form and in an amount sufficient to prevent reduction of the PbO in said sealing glass during sealing in the presence of said reducing condition, without the formation of bubbles in said fired sealing glass and wherein said inorganic nitrate is compatable with the fired sealing glass.

4,038,092
STRENGTHENING REACTION SINTERED SILICON NITRIDE

Hans R. Baumgartner, Worcester, Mass., and Stephen D. Skrovanek, Allentown, Pa., assignors to Norton Company, Worcester, Mass.
Filed Jan. 30, 1976, Ser. No. 653,648
Int. Cl.^{2} C04B *35/58, 35/70;* **F27B** *9/04*
U.S. Cl. 106—73.4 5 Claims

1. In a process for increasing the strength of a previously formed reaction sintered silicon nitride body wherein the surface of the formed body is impregnated with a aluminum oxide (Al_2O_3) and fired in a nitrogen atmosphere at a temperature between about 1200° and about 1500° C, the improvement which comprises maintaining a substantial partial pressure of SiO in the atmosphere during said firing.

4,038,093
CEMENT COMPOSITION FOR HIGH TEMPERATURE WELLS AND METHODS FOR PRODUCING THE SAME

Fred A. Brooks, Jr., Houston, Tex., assignor to Exxon Production Research Company, Houston, Tex.
Filed Oct. 14, 1975, Ser. No. 622,294
Int. Cl.^{2} C04B *7/353*
U.S. Cl. 106—93 5 Claims

1. A composition suitable for cementing high temperature wells comprising a hydraulic cement wherein at least about 20 percent of the surface area of the dry grains of said hydraulic cement are coated with a film of a crosslinked hydroxyalkyl cellulose which has been polymerized on to the surface of said cement grains and which is effective to retard the rate of set of said cement.

3. A method of retarding a hydraulic cement used for high temperature wells which comprises coating at least about 20 percent of the surface area of the dry grains of said hydraulic cement with a film of crosslinked hydroxyalkyl cellulose by polymerizing said hydroxyalkyl cellulose in a nonaqueous medium on to the surface of said cement grains without appreciably admixing said hydroxyalkyl cellulose with said grains, said film being effective to retard the rate of set of said hydraulic cement.

4,038,094
MOLDING COMPOSITION

Herman H. Bondi, 1224 SE. Henry, Portland, Oreg. 97202
Continuation-in-part of Ser. No. 632,669, Nov. 17, 1975, abandoned, which is a division of Ser. No. 492,473, July 29, 1974, abandoned. This application Apr. 5, 1976, Ser. No. 673,667
Int. Cl.^{2} C04B *7/02*
U.S. Cl. 106—99 4 Claims

2. A molding composition in dry form consisting essentially of about one and one-half parts by volume of casting plaster containing at least 80% calcined gypsum with a particle size fine enough that all particles pass a No. 30 sieve and at least 90% pass a No. 100 sieve, about one part by volume of Portland cement, about seven-eights part by volume of sand with a mesh size in the range of 16 to 24 mesh, and about one-half to two parts by volume of fiberglass fibers having discontinuous lengths of about ¾-inch.

4,038,095
MIXTURE FOR PAVEMENT BASES AND THE LIKE

John Patrick Nicholson, Toledo, Ohio, assignor to Nicholson Realty Ltd., Sylvania, Ohio
Filed May 11, 1976, Ser. No. 685,430
Int. Cl.^{2} C04B *1/00*
U.S. Cl. 106—118 8 Claims

1. A mixture consisting essentially of fly ash, lime stack dust and aggregate which through pozzolanic reactions produces hard, strong, durable mass capable of supporting surfacing.

4,038,096
BITUMINOUS EMULSION-MINERAL AGGREGATE COMPOSITIONS CONTAINING SILANES AS ADHESION PROMOTERS

Peter E. Graf, Orinda, and Robert J. Schmidt, El Cerrito, both of Calif., assignors to Chevron Research Company, San Francisco, Calif.
Filed Feb. 12, 1973, Ser. No. 331,425
Int. Cl.^{2} C08L *95/00;* **C09D** *3/24*
U.S. Cl. 106—277 9 Claims

1. A surfacing composition comprising (A) 100 parts by weight of a mineral aggregate, (B) the residuum from 3 to 150 parts by weight of a bituminous emulsion comprising (1) about 50 to 80 percent by weight of a bituminous binder, (2) from about 0.1 to about 5.0 percent by weight of a water soluble emulsifier, and (3) water to make 100 percent by weight of the emulsion, and (C) from 0.0001 to 0.05 parts by weight of a silane of the formula:

$$R^b - R^a - Si - X_3$$

wherein

1. represents halogen or alkoxy,
2. R^a represents alkylene, and
3. R^b represents amino or aminoalkylene amino.

4,038,097
MODIFIED CLAY PAPER COATING

James T. Traxler, Evanston; Emil Patrick Lira, Des Plaines, and John F. Kraemer, Chicago, all of Ill., assignors to International Minerals & Chemical Corporation, Libertyville, Ill.
Filed Mar. 14, 1975, Ser. No. 558,491
Int. Cl.^{2} C09C *1/28, 1/40*
U.S. Cl. 106—288 B 7 Claims

1. A modified clay composition for use in pressure-sensitive duplication systems, said composition comprising montmorillonite clay having aluminum chloride bonded thereto, at least 30% of said aluminum chloride being hydrolyzed, whereby the image formed by reacting said composition with a color-developing substance has increased fade resistance upon exposure to light.

4,038,098
AMORPHOUS PRECIPITATED SILICEOUS PIGMENTS FOR COSMETIC OR DENTRIFICE USE AND METHODS FOR THEIR PRODUCTION

Satish K. Wason, Havre de Grace, Md., assignor to J. M. Huber Corporation, Locust, N.J.
Division of Ser. No. 285,966, Sept. 5, 1972, Pat. No. 3,928,541. This application Dec. 22, 1975, Ser. No. 642,977
The portion of the term of this patent subsequent to June 1, 1993, has been disclaimed.
Int. Cl.^{2} C09C *1/30*
U.S. Cl. 106—288 B 9 Claims

1. A method for producing an amorphous precipitated silicic acid having improved chemical and physical properties including high abrasiveness and low wet cake moisture content prior to the drying thereof, said process comprising the steps of:

1. contacting an aqueous solution of an alkali metal silicate with an alkali or alkaline earth metal salt to prepolymerize said alkali metal silicate and form an aqueous solution of prepolymerized alkali metal silicate solution;
2. combining an acid with an adduct material selected from the group consisting of the water soluble salts of aluminum and alkaline earth metals to form an acidulating solution;
3. acidulating said prepolymerized aqueous alkali metal silicate solution with said acidulating solution by addition of the solution to said prepolymerized silicate solution;
4. continuing the addition of said acidulation solution to said aqueous silicate solution until the precipitation of said silicic acid is complete; and
5. separating and recovering the precipitated silicic acid;

wherein said adduct material combined with said mineral acid is effective to control the refractive index of the precipitated silicic acid and form an alumino or alkaline earth metal silicate.

4,038,099
RUTILE-COATED MICA NACREOUS PIGMENTS AND PROCESS FOR THE PREPARATION THEREOF

Carmine V. DeLuca, Jr., Peekskill; Harold A. Miller, White Plains, and George R. Waitkins, Croton-on-Hudson, all of N.Y., assignors to The Mearl Corporation, Ossining, N.Y.
Filed Aug. 30, 1971, Ser. No. 176,335
Int. Cl.^{2} C09C *1/00*
U.S. Cl. 106—291 10 Claims

9. A process for the preparation of a nacreous pigment which comprises in sequence:

a. treating micaceous particles with an aqueous, acidic solution containing a tin compound;
b. coating said micaceous particles with titanium dioxide by deposition from a titanium compound containing coating bath;
c. calcining said particles at an elevated temperature to produce a translucent coating of rutile form titanium dioxide on the micaceous particles.

4,038,100
CHAR COMPOSITION AND A METHOD FOR MAKING A CHAR COMPOSITION

Charles E. Haberman, Tarzana, Calif., assignor to The Oil Shale Corporation (Tosco), Los Angeles, Calif.
Continuation-in-part of Ser. No. 578,338, May 16, 1975, abandoned. This application Aug. 14, 1975, Ser. No. 604,874
Int. Cl.^{2} C01B *31/08;* **C09C** *1/44*
U.S. Cl. 106—307 11 Claims

1. A char material produced from rubber containing polymeric hydrocarbons and carbon black by simultaneously pyrolyzing and grinding said rubber in the absence of oxygen with heat carrying solids having a sufficient temperature and for a sufficient length of time to volatilize and depolymerize the hydrocarbons and produce a solid char material of very fine particle size, separating said volatilized and depolymerized hydrocarbons from said char particles, and cooling said char particles in the absence of oxygen to a temperature of less than 400° F., said cooled char particles being free of oxidation, substantially free of non-decomposed rubber and coke, having not been contacted with acid or bases, and having a benzene discoloration No. of greater than 70%.

4,038,101
REACTIVE PIGMENTS AND METHODS OF PRODUCING THE SAME

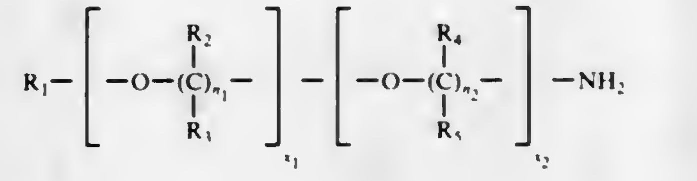
Thomas D. Thompson, Flemington, N.J., assignor to Yara Engineering Corporation, Elizabeth, N.J.
Continuation-in-part of Ser. No. 586,558, June 13, 1975, Pat. No. 3,980,492. This application May 4, 1976, Ser. No. 683,077
The portion of the term of this patent subsequent to Sept. 14, 1993, has been disclaimed.
Int. Cl.^{2} C09C *1/42;* **B41M** *5/22*
U.S. Cl. 106—308 N 15 Claims

1. A reactive pigment for manifold copy systems consisting essentially of a mixture of a member from the group consisting of metal ions and hydrogen ion, a ligand, a member selected from the group consisting of bentonite and montmorillonite and a kaolinite.

4,038,102
ASPHALT COMPOSITIONS HAVING IMPROVED ADHESION TO AGGREGATE

Martin Edvin Hellsten, Odsmal; Anders William Klingberg, and Stig Erick Svennberg, both of Stenungsund, all of Sweden, assignors to Mo Och Domsjo, Ornskoldsvik, Sweden
Division of Ser. No. 353,271, April 23, 1973, Pat. No. 3,928,061. This application June 13, 1975, Ser. No. 586,664
Int. Cl.^{2} C08K *5/06, 5/17*
U.S. Cl. 106—316 3 Claims

1. An additive for improving the adhesion of asphalt to aggregate comprising an ether amine having the general formula:



$$R_1-\left[-O-\overset{R_2}{\underset{R_3}{(C)}}{}_{n_1}-\right]_{x_1}-\left[-O-\overset{R_4}{\underset{R_5}{(C)}}{}_{n_2}-\right]_{x_2}-NH_2$$

wherein:

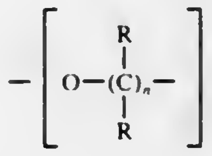
R_1 is a hydrocarbon group having from about six to about sixteen carbon atoms, selected from the group consisting of alkyl and alkenyl;

R_2, R_3, R_4 and R_5 are selected from the group consisting of hydrogen and alkyl radicals having from one to about two carbon atoms;

n_1 and n_2 are numbers within the range from one to about four;

x_1 and x_2 are numbers within the range from zero to about five, the sum of x_1 and x_2 being from one to five;

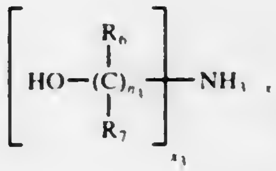
the total number of carbon atoms in each



$$-\left[O-\overset{R}{\underset{R}{(C)}}{}_{n}-\right]$$

unit being from one to about four;

and an alkanolamine having the formula:



$$\left[HO-\overset{R_6}{\underset{R_7}{(C)}}{}_{n_3}-\right]_{x_3}-NH_{3\;x_3}$$

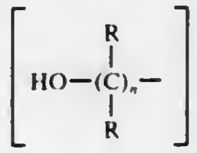
wherein:

R_6 and R_7 are selected from the group consisting of hydrogen and alkyl groups having from one to about two carbon atoms;

n_3 is a number within the range from two to about four;

x_3 is a number within the range from one to about three;

the total number of carbon atoms in each



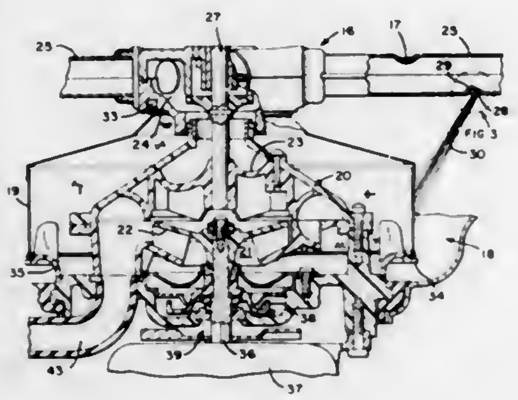
$$\left[HO-\overset{R}{\underset{R}{(C)}}{}_{n}-\right]$$

unit being with the range from two to four.

4,038,103
DISHWASHER FILTER FLUSHING SYSTEM

Ernst Grunewald, Troy, Ohio, assignor to Hobart Corporation, Troy, Ohio

Filed July 27, 1976, Ser. No. 709,169
Int. Cl.^{2} B08B *3/02*
U.S. Cl. 134—10 **10 Claims**

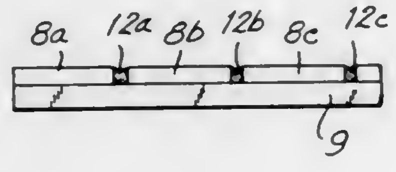


10. In a washing machine including a sump at the bottom of a wash chamber and a drain in the sump, a method of flushing food particles from the wash chamber and its contents while draining, including the steps of:
- introducing washing liquid into the sump,
- converting the washing liquid in the sump into spray form by means of a recirculating pump, having an inlet in the sump for recirculating liquid from the sump into the chamber, and a spraying device to clean the food particles from items contained in the wash chamber,
- filtering food particles from the liquid prior to its reentering the inlet of the recirculating pump by means of a screen having a vertical axis and a substantially vertically extending side wall and thereby trapping food particles on the side wall, and,
- draining the sump after completion of a desired period of liquid recirculation and maintaining recirculation of the liquid during draining, the improvement comprising:
  - orbiting a downwardly-directed jet of the liquid in a circular path coincident with the screen axis and spraying the jet against the exterior of the screen with sufficient velocity and at an angle of incidence with respect thereto to flush trapped food particles downwardly toward the bottom of the sump for draining from the washing machine.

4,038,104
SOLAR BATTERY

Otake Tsutomu, Suwa, Japan, assignor to Kabushiki Kaisha Suwa Seikosha, Tokyo, Japan

Filed June 7, 1976, Ser. No. 693,564
Claims priority, application Japan, June 9, 1975, 50-6995
Int. Cl.^{2} H01L *31/04*
U.S. Cl. 136—89 P **7 Claims**



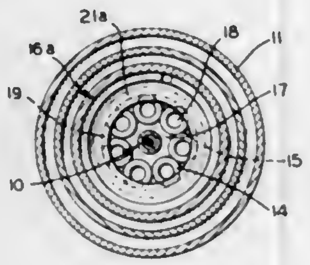
1. A solar battery comprising a plurality of solar cells, and a substrate on which said cells are mounted with channels therebetween, said channels between adjoining cells being up to about 40 μ in width, and being at least equal in depth to the thickness of said solar cells.

2. The solar battery as defind in claim 1, wherein said channels contain an insulating material.

4,038,105
RADIATION SHIELDS FOR ASPIRATING PYROMETERS

Raymond L. Brandeberry, Toledo; Glen J. Lehr, Oregon, and Denzil W. Stacy, Toledo, all of Ohio, assignors to Libbey-Owens-Ford Company, Toledo, Ohio

Filed Oct. 8, 1975, Ser. No. 620,717
Int. Cl.^{2} H01L *35/02*
U.S. Cl. 136—231 **6 Claims**

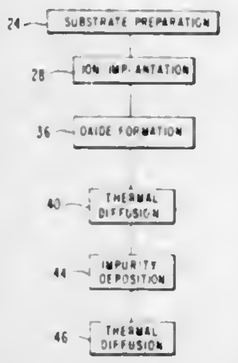


1. A heat shield for shielding a thermocouple of an aspirating pyrometer from radiant heat comprising:
- a. an elongated first refractory tube;
- b. a series of second elongated refractory tubes of smaller diameter circumferentially arranged around and bonded to the inside surface of said first tube forming a central passage and a series of parallel passages surrounding the central passage;
- c. a tubular holder bonded to said first tube for attaching said refractory tubes to the aspirating pyrometer; and
- d. means attached to said holder at the downstream end of said refractory tubes for preventing longitudinal movement of said second tubes in the event of failure of the bond cementing said tubes to each other and to said holder.

4,038,106
FOUR-LAYER TRAPATT DIODE AND METHOD FOR MAKING SAME

Hirohisa Kawamoto, Kendall Park, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 30, 1975, Ser. No. 573,365
Int. Cl.^{2} H01L *21/26*
U.S. Cl. 148—1.5 **10 Claims**



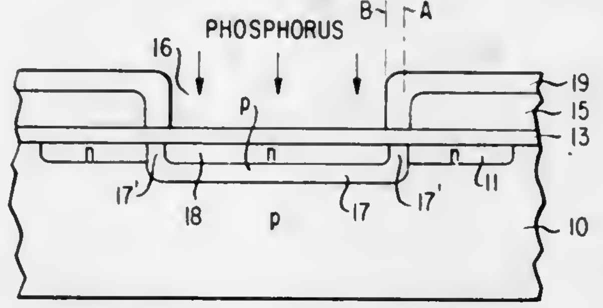
1. A method for making a diode for optimum operation in the TRAPATT mode, the diode having several layers of a semiconductor including two innermost layers, the two innermost layers forming a PN junction close to a surface of the diode, the diode having an impurity profile about the PN junction in the two innermost layers, the profile exhibiting the same slope on each side of the PN junction, said method comprising the steps of:
- a. implanting impurities of a first conductivity type into a lightly doped original layer of a second conductivity type, the original layer being located on a heavily doped semiconductor wafer having impurities of the second conductivity type, up to a density of the order of 5×10^{16} atoms-cm^{-3};

- b. depositing on the original layer a means for preventing out-diffusion of the implanted impurities;
- c. diffusing the implanted impurities into the original layer;
- d. simultaneously diffusing the impurities in the heavily doped wafer into the original layer during the diffusion of the implanted impurities whereby the PN junction is formed in the original layer;
- e. thereafter removing said means for preventing out-diffusion from said original layer; and
- f. diffusing impurities of the first conductivity type into the original layer.

4,038,107
METHOD FOR MAKING TRANSISTOR STRUCTURES

George Marr, Cupertino, Calif., and George Elwood Smith, Murray Hill, N.J., assignors to Burroughs Corporation, Detroit, Mich. and Bell Telephone Laboratories Incorporated, Murray Hill, N.J.

Filed Dec. 3, 1975, Ser. No. 637,177
Int. Cl.^{2} H01L *21/26*
U.S. Cl. 148—1.5 **6 Claims**

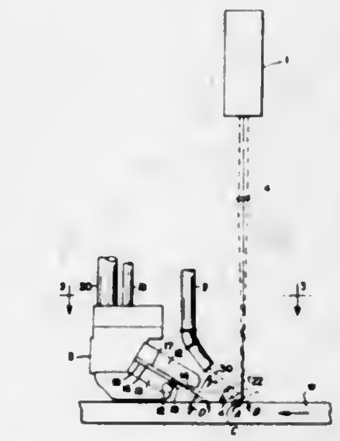


1. In a method for making at least one semiconductor device having a first impurity region removed a short lateral distance from a second impurity region, the improvement CHARACTERIZED BY forming over the semiconductor substrate a mask having an opening having a first vertical edge; controllably decreasing the opening in the mask thereby to define a second vertical edge laterally removed a controlled distance from the location of the first edge; using the first edge to define the location of the first impurity region in the substrate; and using the second edge to define the location of the second impurity region.

4,038,108
METHOD AND APPARATUS FOR MAKING AN INSTANTANEOUS THERMOCHEMICAL START

Stephen August Engel, Shenorock, and Ronald Elmer Fuhrhop, Suffern, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Filed May 10, 1976, Ser. No. 684,833
Int. Cl.^{2} B23K *7/06*
U.S. Cl. 148—9.5 **25 Claims**



1. A method for making an instantaneous thermochemical start on the surface of a metal workpiece to be scarfed comprising the steps of:
- a. contacting a preselected spot on said surface where the scarfing reaction is to begin with a laser beam to bring such spot to its ignition temperature;
- b. impinging a high intensity jet of oxygen gas on said surface at said spot, thereby causing an instantaneous scarfing reaction to begin and a molten puddle to form at said spot; and
- c. continuing the impingement of a high intensity jet of oxygen on said puddle until said puddle has spread to a preselected width.

4,038,109
THREE PHASE HEAT TREATMENT OF STEEL SHEET

Bernard Pflieger, Chamalieres, and André Reiniche, Ceyrat, both of France, assignors to Compagnie Generale des Etablissements Michelin, France

Filed May 20, 1976, Ser. No. 688,112
Claims priority, application France, May 21, 1975, 75.15899
Int. Cl.^{2} C21D *7/14, 1/78;* C23C *11/12, 11/18*
U.S. Cl. 148—12 F **6 Claims**

1. A process for manufacturing a medium-hard to hard thin steel sheet having an increased fatigue strength in which a soft steel sheet having a carbon weight content of less than about 0.25% is cold rolled to a thickness of between about 10 μm and about 500 μm whereupon the resulting soft thin steel sheet is subjected to a carburizing or carbonitriding treatment until a medium-hard to hard thin steel sheet having a carbon weight content of between about 0.5% and about 1.2% is obtained, characterized by the fact that the carburizing or carbo-nitriding treatment is followed by a three-part heat treatment, the first part of which heat treatment consists of a first austenizing operation at an elevated temperature for a sufficient period of time to obtain a very homogeneous austenitic steel, followed by a two-step cooling; the second part of which heat treatment consists of a second austenizing operation of very short duration at a temperature very slightly above the transformation point from the α phase to the γ phase, followed by a two-step cooling identical to that following the first part of the three-part heat treatment, this two-step cooling comprising a first rapid cooling step which terminates in the vicinity of the temperature separating the pearlitic zone from the bainitic zone and a second slow cooling step from the above temperature down to ambient temperature, the rates of cooling being selected in such a manner as to pass around the pearlitic nose in the T T T (temperature, time, texture) diagram corresponding to the chemical composition of the medium-hard to hard thin steel sheet and so as to obtain a martensitic structure free of pearlite and bainite, the two austenizing operations and each of the first cooling steps being carried out in an oxygen-free medium; and the third part of which heat treatment consists of a rapid reheating operation to a temperature above about 300° C. in an oxygen-free medium, followed by a final cooling in ambient air.

4,038,110
PLANARIZATION OF INTEGRATED CIRCUIT SURFACES THROUGH SELECTIVE PHOTORESIST MASKING

Bai-Cwo Feng, Wappingers Falls, N.Y., assignor to IBM Corporation, Armonk, N.Y.

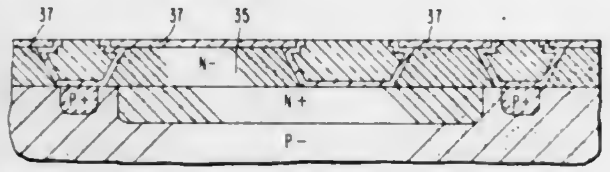
Division of Ser. No. 480,086, June 17, 1974, Pat. No. 3,976,524. This application June 14, 1976, Ser. No. 696,102
Int. Cl.^{2} H01L *21/308*
U.S. Cl. 148—187 **3 Claims**

1. In the method of fabrication of planar semiconductor integrated circuits by the selective introduction of impurities into said integrated circuit, the steps of
- forming a first layer of electrically insulative material over a planar surface of an integrated circuit member,

forming a pattern of apertures through said first layer to expose the underlying surface,

etching through said apertures with an etchant which preferentially etches said surface for a time sufficient so that said first layer is undercut adjacent said apertures,

depositing a second layer of electrically insulative material under the undercut portions of said first layer, said first insulative material more etchable than said second insulative material in selected etchants,



removing selected portions of said first insulative layer from said surface adjacent said undercut portions with an etchant which preferably etches said first layer, said second layer under the undercut portions of the first layer protecting said surface in said undercut portions during the etching, and

introducing conductivity-determining impurities into said surface underlying said removed selected portions, whereby said second layer remaining in said adjacent undercut portions acts as a masking to laterally define the surface areas into which said impurities are introduced.

4,038,111
METHOD FOR DIFFUSION OF ALUMINIUM

Guy Henri Dumas, Paris, France, assignor to Silec-Semi-Conducteurs, Paris, France

Filed July 14, 1975, Ser. No. 595,751
Claims priority, application France, Aug. 1, 1974, 74.26821
Int. Cl.^{2} H01L *21/225*
U.S. Cl. 148—188 9 Claims

1. A method of diffusing aluminium onto a semiconductor substrate comprising the steps of painting onto a semiconductor substrate a diffusable aluminium source comprising an organic aluminium compound:

$$Al\,R_3$$

wherein R_3 is a $C_1 - C_8$ alkoxy group dissolved in a liquid composed of an alkoxyalkanol:

$$R' - R''OH$$

wherein the alkoxy group R′ has from 1 to 5 carbon atoms and the alkylene group R″ has 1 to 5 carbon atoms;
and thereafter heating the painted substrate diffusing the aluminium metal into the substrate.

4,038,112
WELL-FRACTURING EXPLOSIVE COMPOSITION

Leo K. Asaoka, Port Tobacco, Md, assignor to Talley-Frac Corporation, Mesa, Ariz.

Filed May 12, 1975, Ser. No. 576,644
Int. Cl.^{2} C06B *45/00, 33/08, 25/36*
U.S. Cl. 149—2 6 Claims

1. In a liquid explosive composition for geological fracturing having a nitroparaffin or nitrate base, the improvement comprising between 5 and 20 weight percent of a ballistic modifier in the form of finely divided inert non-reactive solids, the particles of which are substantially homogeneous, having a sonic velocity substantially different from that of the remainder of the composition and having a particle size less than about 10 microns.

4,038,113
CATALYST SYSTEM FOR POLYURETHANE PROPELLANTS

Adolf E. Oberth, Fair Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1976, Ser. No. 716,306
Int. Cl.^{2} C06B *45/10*
U.S. Cl. 149—19.4 5 Claims

1. A two-component catalyst system for promoting the cure of polyurethane propellant compositions which comprises zinc oxide as a first component and a second component selected from the group consisting of diketones and organic acids having a pKa of no more than 6.

4,038,114
CATALYST SYSTEM FOR POLYURETHANE PROPELLANT COMPOSITIONS

Adolf E. Oberth, Fair Oaks, Calif., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Aug. 20, 1976, Ser. No. 716,305
Int. Cl.^{2} C06B *45/10*
U.S. Cl. 149—19.4 4 Claims

1. A catalyst system for promoting the iscoyanate-hydroxy curing reaction of polyurethane based propellant compositions which comprises a mixture of (a) ferric acetylacetonate as a catalyst proper; (b) a suppressor component for suppressing the catalytic activity of said catalyst proper; and (c) a scavenger component composed of zinc oxide for increasing the rate of consumption of the said suppressor component.

4,038,115
COMPOSITE MODIFIED DOUBLE-BASE PROPELLANT WITH FILLER BONDING AGENT

Henry C. Dehm, Salt Lake City, Utah, assignor to Hercules Incorporated, Wilmington, Del.

Filed Oct. 7, 1969, Ser. No. 868,666
Int. Cl.^{2} C06B *45/10*
U.S. Cl. 149—19.8 12 Claims

7. In the process of preparing composite modified double-base propellant by slurry casting, the improvement whereby dewetting of filler particles from the binder under conditions of stress is reduced said improvement comprising admixing with the uncured propellant ingredients at least one filler selected from the group consisting of inorganic oxidizer salts, organic oxidizers and metal fluids, said filler having a cross-linked, binder-insoluble coating having reactive surface-NCO groups, and curing the resulting propellant.

4,038,116
METHOD FOR DEGRADING AROMATIC EXPLOSIVE SOLUTIONS

Catherine C. Andrews, Bedford; Robert E. Klausmeier, Bloomington, and Jerald L. Osmon, Bloomfield, all of Ind., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed July 12, 1976, Ser. No. 704,147
Int. Cl.^{2} C06B *25/04*
U.S. Cl. 149—105 5 Claims

1. A method of treating an aqueous solution of aromatic explosives to make said explosives inert comprising,

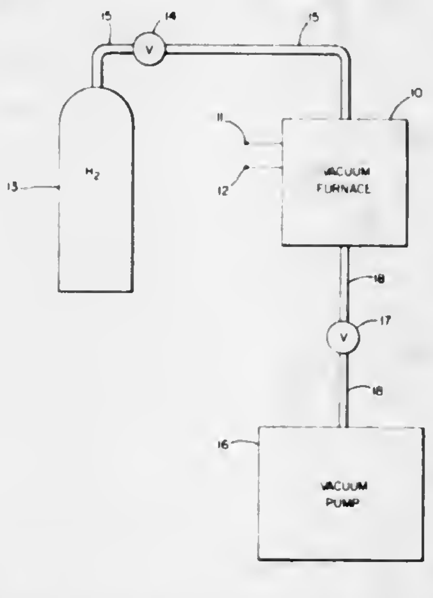
adding to said aqueous solution of aromatic explosives a small amount of an additive selected from the group consisting of acetone and hydrogen peroxide, which said additive when subjected to ultraviolet light produces a free radical which will strip off hydrogen from said aromatic explosive,

then subjecting said selected additive to ultraviolet light for a sufficient period of time for said selected additive to strip off hydrogen from said aromatic explosives and produce an unstable intermediate product and then for said ultraviolet light to reduce said unstable intermediate product to carbon dioxide and ammonia.

4,038,117
PROCESS FOR GAS POLISHING SAPPHIRE AND THE LIKE

Lowell A. Noble, Monte Sereno; Leonard N. Grossman, Aptos, and Mickey O. Marlowe, Livermore, all of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

Filed Sept. 4, 1975, Ser. No. 610,156
Int. Cl.^{2} C09K *13/00*
U.S. Cl. 156—2 6 Claims

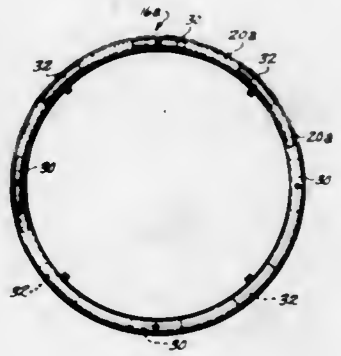


1. The process of surface-polishing bodies of sapphire and the like comprising the steps of heating said body to a temperature of about 1900° C and exposing at least one surface of said body to substantially static hydrogen gas while maintaining said temperature of about 1900^{6} C for a time sufficient that no imperfections in said at least one surface can be detected when subsequently examined by a scanning electron microscope at magnifications of at least 1000×.

4,038,118
THREE DIMENSIONAL COMPOSITE STRUCTURE AND METHOD FOR INCORPORATING FITTINGS

Varnell L. James, Enumclaw, Wash., assignor to The Boeing Company, Seattle, Wash.

Division of Ser. No. 479,397, June 14, 1974, Pat. No. 3,978,256. This application Mar. 4, 1976, Ser. No. 663,876
Int. Cl.^{2} B31C *13/00*
U.S. Cl. 156—143 7 Claims

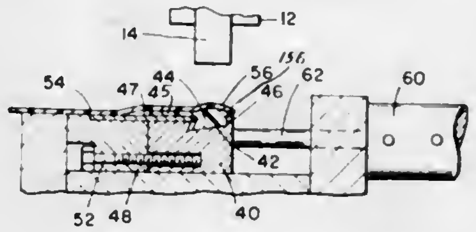


1. A method of preparing an open-ended three-dimensional monocoque structure, the steps comprising: forming reinforced plastic annular rings having a core of a series of spaced apart tubular metal inserts and contiguous light weight reinforcing material filling a remainder of the core, wrapping the annular rings with a continuous wind of composite tape, forming a reinforced plastic annular shell, placing the annular rings over the shell with reinforcing filler between, laying up an outside layer of reinforced plastic to form an assembly, wrapping the assembly in the longitudinal direction with continuous filament composite tape.

4,038,119
BEAD FORMING APPARATUS AND METHOD

Everette M. Lambert, 3380 Edward Ave., Santa Clara, Calif. 95050

Filed Dec. 3, 1975, Ser. No. 637,260
Int. Cl.^{2} B32B *31/00*
U.S. Cl. 156—163 7 Claims



1. A method for fabricating uniform plastic bead along the margin of a sheet of like plastic material to form a swimming pool liner or like article supportable by said bead, said method comprising the steps of:

inserting an elongate strip of plastic bead material into a cavity defined by an elongate die generally conforming to the shape of said bead material;

overlaying said bead material with a margin of a like plastic sheet material to overlap said die cavity with a margin of excess sheet material;

laterally compressing said bead material in said die to create a convex curvature of bead material in abutting relationship to said sheet material;

compressing said sheet material against said bead material transverse of said die compressions; and

fusing said sheet material into said bead material to establish a heat sealed bead of homogeneous plastic material for minimizing the formation of a tear line along the junction of said bead material and said sheet material.

5. An apparatus for forming a uniform plastic bead along a

margin of a like plastic sheet material, said apparatus comprising:

- a working bed for supporting said sheet material;
- means for forming a heat seal, said seal forming means comprising an elongate member and means for moving said elongate member transversely relative to said working bed;
- an elongate die defining an upwardly opening cavity for gripping said bead of said plastic material below and overlaying a plastic sheet disposed upon said working bed, said die comprising a fixed member, and opposing laterally movable member, and means for guiding said movable member for laterally expanding and contracting said head gripping cavity, said fixed member having a lip depressed relative to said opposing movable member, and said movable member having a laterally inwardly extending shoulder for engaging a portion of said bead material opposing said depressed lip;
- said die being compressible upon said bead material to induce an upward curvature; and
- said elongate member being transversely movable along said die for compressing said overlying sheet material against said bead material and for fusing said bead material and said sheet material into a fused bead which conforms to the shape of said die cavity.

4,038,120

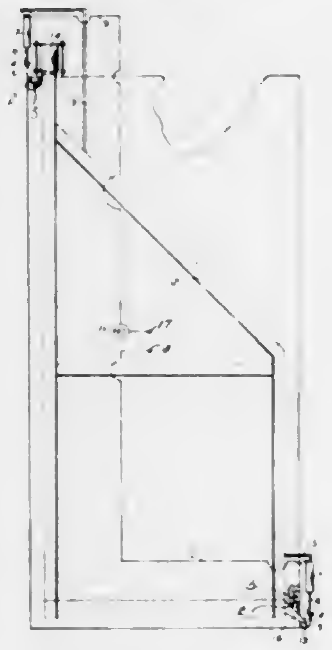
ELECTRIC HEAT BONDING TAPE METHOD FOR CONSTRUCTION PANELS

Carl D. Russell, 1502 S. Boulder St. No. 24-D, Tulsa, Okla. 74119

Filed Nov. 9, 1972, Ser. No. 305,147

Int. Cl.² E04B *2/00*

U.S. Cl. 156—71 **4 Claims**



1. The method of bonding a panel along at least one grooved predetermined edge thereof to existing structure comprising the steps of:

- locating an elongated hot melt glue tape including an elongated electrical heater means in said groove along said edge of the panel to be bonded;
- locating the panel with said edge in said bonding position relative to said structure;
- energizing the heater means to liquefy the glue;
- discontinuing the energization to permit the glue to cool and bond said edge to the structure; and,
- maintaining said elongated heater means under tension to take up expansion during said energization and while the glue cools.

4,038,121

PRODUCTION OF THERMOPLASTIC FILMS

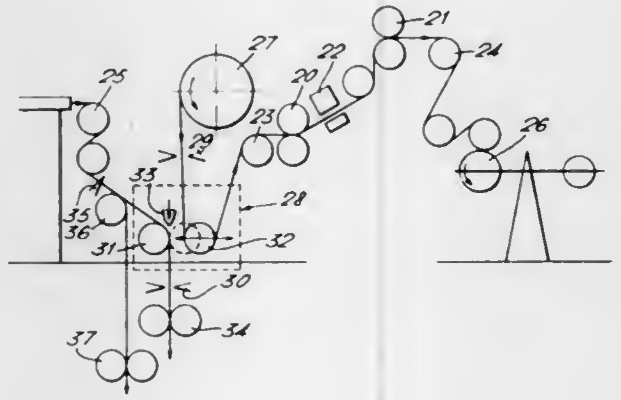
Nigel Colin Benson, and John Dorab Mehta, both of Welwyn Garden City, England, assignors to Imperial Chemical Industries Limited, London, England

Filed Oct. 14, 1975, Ser. No. 622,160

Claims priority, application United Kingdom, Oct. 24, 1974, 46012/74; Jan. 10, 1975, 1112/75

Int. Cl.² B31F *5/00;* **B65H** *69/06*

U.S. Cl. 156—157 **5 Claims**



1. A method of threading a thermoplastic film, issuing from a web-formation section of a production line, through a wind-up section when the production line is re-started after a stoppage or after the wind-up section has become unthreaded due to a malfunction in the web formation section, said method comprising:

- a. running the formation section and feeding the moving production web to waste while simultaneously threading a leader through the wind-up section while the latter is stopped,
- b. starting the wind-up section so as to begin winding up the leader and matching the speed of the wind-up section to that of the formation section, and
- c. then joining the moving leader to the moving production web at a location upstream of the windup section so that the production web is threaded through the wind-up section by the leader.

4,038,122

METHOD AND APPARATUS FOR FABRICATING CORRUGATED BOARD FROM POLY-COATED PAPER

John DeLigt, Covington, Va., assignor to Westvaco Corporation, New York, N.Y.

Filed July 7, 1975, Ser. No. 593,833

Int. Cl.² B31F *1/22*

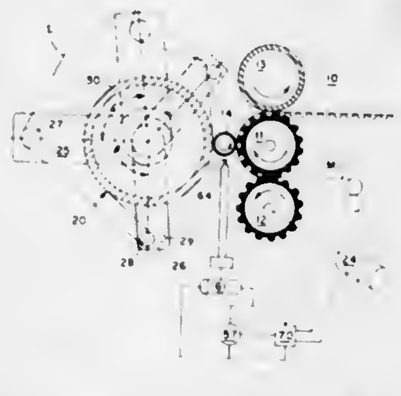
U.S. Cl. 156—210 **17 Claims**

14. A method of fabricating corrugated board comprising a corrguated medium web and a liner web comprising the steps of:

- A. Coating at least one face of said liner web with a thin laminae of polymer plastic material.
- B. Contacting said coated face of said liner web against the surface of a rotating heater drum for a time period sufficient to soften said plastic material to a tacky consistency.
- C. Peeling said liner web from the surface of said heater drum at a first nip of a treated fusion roll with said heater drum;
- D. Fusing the coated surface of said liner web with the crests of corrugation flutes formed in said medium web in a second nip of said fusion roll with a rotating corrugating roll; and
- E. Cooling the fused combination of said liner web and said medium web in a nip between a chilled pressure roll and said corrugating roll.

16. In an apparatus for bonding a liner web to corrugation crests of a medium web, said liner web comprising a lamination of polymer plastic film to at least one surface of a paperboard web, said apparatus comprising:

- A. Rotational drive means for rotating a cooperating pair of medium web corrugating cylinders;
- B. Heating means for transmitting heat to the plastic film laminae of said liner web;



- C. Rotatable heated fusion roll means positioned in nip relationship with one of said corrugating cylinders for guiding said liner web into a fusion nip with the corrugation crests of said medium web;
- D. Temperature sensing means positioned between said heating means and said fusion nip for sensing the temperature of said plastic film laminae and emitting a temperature signal proportional thereto; and
- E. Speed control means responsive to said temperature signal for regulating the rotational speed of said drive means to maintain the temperature of said plastic film laminae within a desired temperature range.

4,038,123

METHOD FOR PRINTING A COLOR DESIGN ON A RELEASE PAPER FOR HEAT TRANSFER TO A FABRIC MATERIAL

George L. Sammis, Mason City, Iowa, assignor to Mach III, Inc., Mason City, Iowa

Filed Feb. 27, 1976, Ser. No. 661,811

Int. Cl.² B44C *1/16;* **B32B** *27/12, 31/20;* **B41M** *3/12*

U.S. Cl. 156—240 **4 Claims**

1. A method for printing a color design on a heat release paper for heat transfer from the paper to a fabric material comprising the steps of:

- a. offset printing a design in color on the release paper,
- b. silk screening on said offset printed design a dark colored plastisol material to outline portions of the design to intensify the color appearance of such portions,
- c. heat drying the design a first time at a temperature of about 350° Fahrenheit for a time period of not more than about ten seconds,
- d. applying to the design an adhesive film having design and fabric material adhering characteristics,
- e. heat drying the design a second time at a temperature of about 350° Fahrenheit for a time period of not more than about 10 seconds.

4,038,124

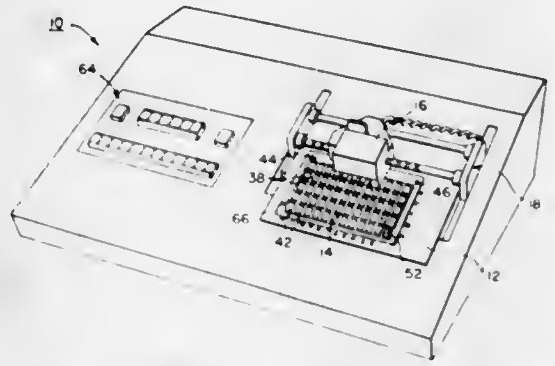
MICROFICHE DELETER METHOD

Augustus W. Griswold, 2 Pine Tree Trail, Rush, N.Y. 14543, and Boris W. Haritonoff, Pole Bridge Road, Geneseo, N.Y. 14454

Division of Ser. No. 327,499, Jan. 29, 1973, Pat. No. 3,927,586. This application Oct. 2, 1975, Ser. No. 618,884

Int. Cl.² B31B *1/25;* **B32B** *31/18*

U.S. Cl. 156—248 **10 Claims**



1. A method for preparing an updated microfiche, wherein said microfiche is of the type including a base and a plurality of microfilm frames removably mounted on the base, comprising:

- a. mounting said microfiche on a deck;
- b. providing a separate light under each frame and energizing only those lights under frames to be deleted;
- c. positioning a movable knife carriage, including a knife blade, over said microfiche;
- d. positioning said carriage and knife blade over a frame to be deleted and cutting, with said knife blade, said frame to be deleted from all adjacent frames connected thereto; and
- e. removing said cut frame to be deleted from said base.

4,038,125

METHOD FOR MOUNTING LASER FUSION TARGETS FOR IRRADIATION

R. Jay Fries; Eugene H. Farnum, and Gene H. McCall, all of Los Alamos, N. Mex., assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

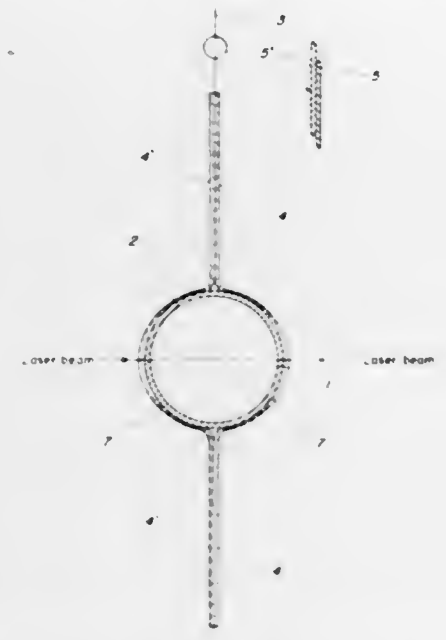
Filed June 18, 1975, Ser. No. 588,119

Int. Cl.² C09J *5/06*

U.S. Cl. 156—280 **6 Claims**

5. A method for forming a ball-and-disk laser fusion target assembly suitable for single-beam laser irradiation which comprises (a) mounting a thin cellulose acetate film across the opening of a target holder, (b) placing a thin polystyrene film in intimate contact with said cellulose acetate film, (c) placing a target microsphere at a desired location on said polystyrene film, (d) heating the assembly to a temperature at which said polystyrene film becomes tacky to bond said target microsphere to said polystyrene layer, (e) cooling the assembly, (f) masking said polystyrene film beyond a desired radius from said target microsphere, and (g) depositing polyethylene to a desired thickness on the unmasked portion of said polystyrene film and on said target microsphere.

6. A method for forming a ball-and-disk laser fusion assembly suitable for double-beam laser irradiation which comprises (a) mounting a first thin cellulose acetate film across the opening of a target holder, (b) placing a target microsphere at a desired location on said first film, (c) placing a second thin planar film of cellulose acetate over said target microsphere and substantially parallel to said first film, (d) exerting downward pressure on said second film sufficient to cause the plane of said second film to come into intimate contact with the plane of said first film and causing the plane of the resultant joined first and second films to pass substantially through the diameter of said target microsphere, (e) heating the assembly to a temperature below the softening temperature of the cellulose acetate but sufficient to bond said first and second films together, (f) masking both sides of said bonded film beyond a desired radius from said target microsphere, and (g) depositing polyethylene to a desired thickness on the unmasked portions of both sides of said bonded film.



4,038,126
METHOD FOR FORMING TABLE AND BENCH CONSTRUCTION

Fritz O. Lester, Kalamazoo, Mich., assignor to Liane E. Lester, Kalamazoo, Mich.
Division of Ser. No. 419,675, Nov. 28, 1973, Pat. No. 3,968,755. This application Feb. 20, 1976, Ser. No. 659,640
Int. Cl.^{2} B32B *7/12, 3/08, 31/26*
U.S. Cl. 156—290 **3 Claims**

1. A method of forming a table top comprising forming a plurality of table top sectors having depending flanges, coating said sectors with a heat-softening adhesive, assembling said sectors into engagement with each other with flanges of each sector abutting a flange of each adjacent sector, and spot heating said sectors at abutting flanges to cause said sectors to adhere to each other.

4,038,127
APPARATUS FOR CONTROLLING THE ANGULAR ORIENTATION OF THE END OF A ROLLED WEB

Richard H. D. Bullock, Jr., Media; George Gallatig, West Chester, both of Pa., and Kurtz A. Franklin, Burlington, N.J., assignors to Scott Paper Company, Philadelphia, Pa.
Filed Oct. 8, 1976, Ser. No. 730,711
Int. Cl.^{2} B26D *5/00*
U.S. Cl. 156—353 **48 Claims**

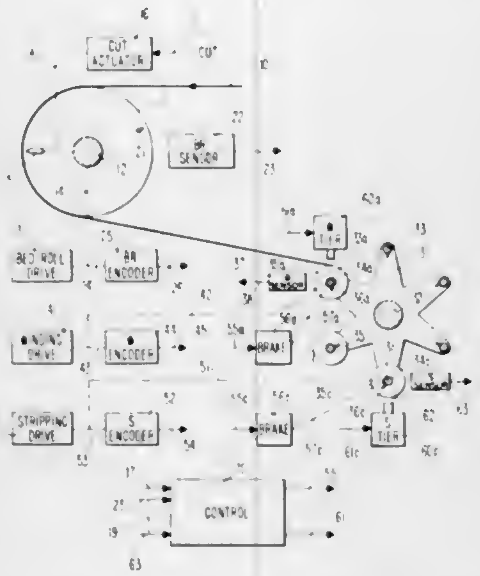
1. In a system for cutting a desired length of a web being wound in a roll, an apparatus for orienting the free end of the roll at a predetermined angle, said orienting occurring in synchronism with the cutting, comprising:

a. first means for generating a signal representative of the cutting of the web;

b. second means for generating a series of pulses, each pulse representing an incremental length of the web being wound on the roll;

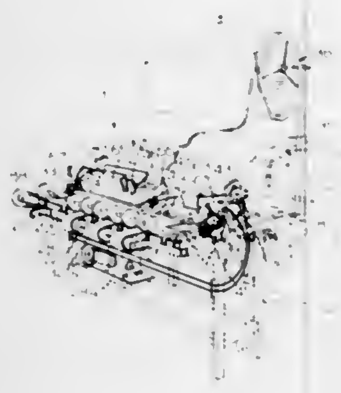
c. third means for generating a number representing a predetermined number of pulses generated by the second means; and

d. circuit means including a counter responsive to the first means signal, the second means pulses and to said predetermined number for generating a signal indicating that said predetermined number of pulses have been generated by the second means since the occurrence of the signal generated by the first means, said circuit means signal indicating that the free end of the roll is at the predetermined angle.



4,038,128
INSULATION BLANKET SHEARING AND APPLYING MACHINE FOR DUCTWORK AND THE LIKE

Thomas L. Mueller, St. Louis, Mo., assignor to Engel Industries, Inc., St. Louis, Mo.
Filed Dec. 17, 1976, Ser. No. 751,392
Int. Cl.^{2} B32B *31/04*
U.S. Cl. 156—355 **9 Claims**



2. A flying cut-off mechanism comprising

a pair of racks arranged linearly along opposite sides of a flow path,

a transverse shaft extending thereover and having secured at its ends spur gears engaging said racks,

a carriage supported by said shaft and bearing a cutting block,

a transverse shear blade extending across said path and having at its ends operating arms mounted for rotation on said carriage,

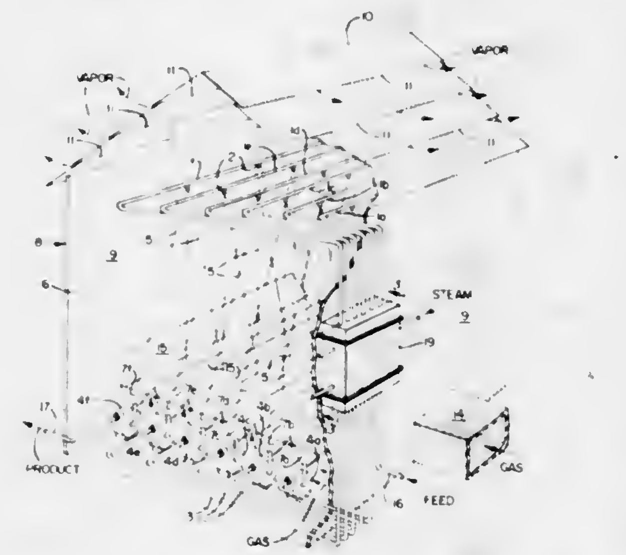
sectors secured to said arms and engaging said racks upstream of said spur gears, and

actuator means to drive the carriage downstream and retract it upstream,

whereby downstream movement of the carriage will so rotate the sectors as to cause the shear blade to rotate toward and engage the cutting block, thereby stopping further downstream movement and utilizing the inertia of the carriage for shearing.

4,038,129
METHOD AND APPARATUS FOR CONCENTRATING LIQUIDS

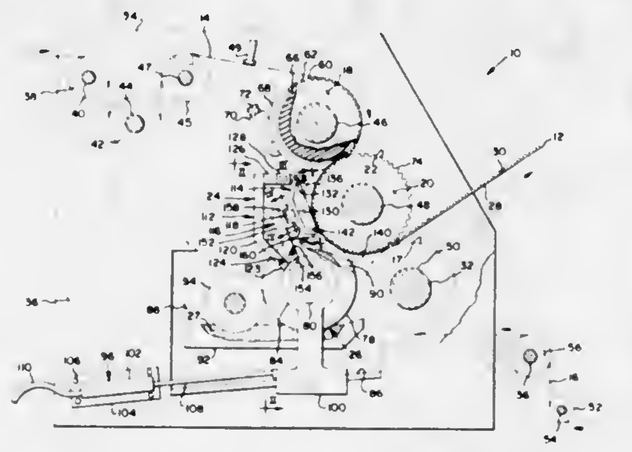
Rolf W. Wreszinski, Caixa Postal, 9549, Sao Paulo, Brazil
Filed July 9, 1975, Ser. No. 594,212
Int. Cl.^{2} B01D *1/16;* **F26B** *3/12*
U.S. Cl. 159—4 CC **13 Claims**



1. A method of continuously concentrating a liquid in a plurality of successive stages, comprising in each stage pumping a concentration of the liquid to a related one of a plurality of spaced overhead nozzle sets, without partitioning between said sets spraying said liquid from each nozzle of said set as a finely dispersed spray separate from the spray from any nozzle of any other set to an underlying one of a like plurality of liquid-separate troughs, and heating said liquid in each stage by heat transfer from a heating medium common to all stages for effecting with said spraying partial evaporation of said liquid during said fall.

4,038,130
CORRUGATING MACHINE HAVING SELF-ADJUSTING WEB GUIDES

James Lynwood Cosby, Parkville, and Gordon Lawrence Morgret, Baltimore, both of Md., assignors to Koppers Company, Inc., Pittsburgh, Pa.
Filed July 16, 1975, Ser. No. 596,407
Int. Cl.^{2} B31F *1/00*
U.S. Cl. 156—473 **29 Claims**



1. An improved corrugating machine for forming a single-face corrugated paper web from a pair of webs passing therethrough of the type comprising:

first corrugating roll means;

second corrugating roll means in meshing engagement with said first corrugating roll means and carrying a web of corrugated paperboard material around a portion of an outer periphery thereof;

guide means urging said corrugated web against said outer periphery of said second corrugating roll means;

adhesive roll means in contact with said corrugated web for applying adhesive to the tips of flutes on said corrugated web extending around said second corrugating roll means; and

pressure roll means carrying a facing web on an outer periphery thereof in contact with said adhesive covered tips of said corrugated web for forming said single face corrugated web,

wherein the improvement comprises an automatically self-adjusting, floating guide means including

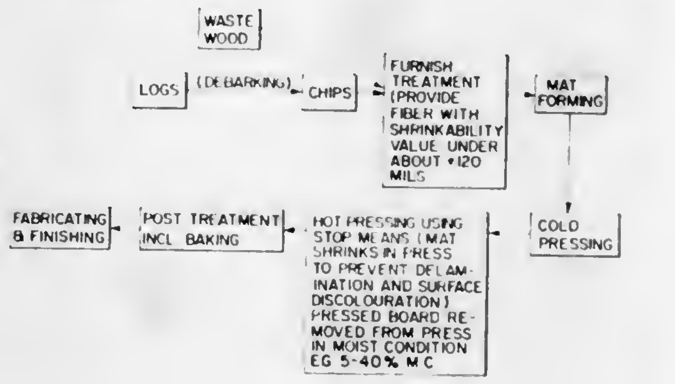
a support means spaced from said second corrugating roll means and extending parallel thereto;

a plurality of spaced finger guide means pivotably mounted along said support means and in contact with said corrugated web extending around said second corrugating roll means; and

a resilient means interposed between said support means and said finger guide means continuously urging each of said finger guide means independently against said corrugated web on said second corrugating roll means and for allowing each of said finger guide means to independently pivot about its pivot point so as to remain in contact with said corrugated web when said finger guide means contacts irregularities in said corrugated web and said second corrugating roll means.

4,038,131
SHORT CYCLE PRESSED FIBERBOARD MANUFACTURING PROCESS

Stanley H. Baldwin, Oakville, and Arnold E. Willoughby, Mississauga, both of Canada, assignors to Abitibi Paper Company Ltd., Canada
Filed Oct. 6, 1975, Ser. No. 620,182
Int. Cl.^{2} D21J *1/04*
U.S. Cl. 162—103 **36 Claims**


WASTE WOOD
LOGS
(DEBARKING)
CHIPS
FURNISH TREATMENT (PROVIDE FIBER WITH SHRINKABILITY VALUE UNDER ABOUT +120 MILS
MAT FORMING
COLD PRESSING
HOT PRESSING USING STOP MEANS (MAT SHRINKS IN PRESS TO PREVENT DELAMINATION AND SURFACE DISCOLOURATION) PRESSED BOARD REMOVED FROM PRESS IN MOIST CONDITION EG 5-40% MC
POST TREATMENT INCL BAKING
FABRICATING & FINISHING

1. The process of producing pressed fiberboard including the steps of providing an aqueous slurry of wood fibre, dewatering said slurry to form a wet mat, hot pressing said mat between a pair of heated upper and lower press members to remove a substantial portion of the water in said mat and to cause binding of the fibres to form a board, and subsequently moving the press members apart and removing the board therefrom, said press having control means therein to limit the degree of advance of the press members toward one another, and wherein said fiber has a Shrinkability Value not higher than about +120 mils such that during said hot pressing the mat of fibres shrinks in thickness while at the same time said press members are prevented from moving toward one another by said control means, with said shrinkage being sufficient to permit gradual dissipation of steam pressures generated within the board being formed thus permitting the press members to be moved apart and the board removed while said board still contains a

substantial quantity of moisture therein without incurring delamination of the board by virtue of unrelieved steam pressures therein.

4,038,132

NUCLEAR REACTORS

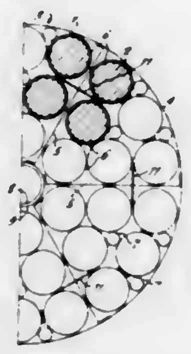
Kenneth George Pearson, Weymouth, England, assignor to United Kingdom Atomic Energy Authority, London, England

Filed Aug. 18, 1975, Ser. No. 605,243

Claims priority, application United Kingdom, Sept. 17, 1974, 40472/74

Int. Cl.^{2} G21C ***15/18***

U.S. Cl. 176—38 **4 Claims**



1. A nuclear fuel element comprising a cluster of nuclear fuel rods supported axes parallel in spaced apart relationship by transverse grids so as to define interspaces for the axial flow of coolant and having at least one of the interspaces occupied by an axially extending auxiliary coolant conduit with lateral holes through which auxiliary coolant is sprayed into the cluster and including deflection means extending from a transverse grid and located in a position in front of the holes for deflecting coolant spray onto parts of the fuel rods inaccessible to auxiliary coolant, and the deflecting means are constituted by a target plate secured to a grid and with a face of the plate positioned in the trajectory of one or more jets of auxiliary coolant from the auxiliary coolant conduit, and the target plate depends vertically from a grid between two rows of nuclear fuel rods, the rods in each row being spaced at a uniform pitch, said face of the target plate being directed towards the auxiliary coolant conduit, said face being bounded by two parallel longitudinal edges which are separated by a width of plate substantially equivalent in distance to half the pitch of the nuclear fuel rods.

4,038,133

NUCLEAR REACTOR WITH SUSPENDED FUEL ASSEMBLIES HAVING SECONDARY EMERGENCY SUSPENSIONS

Dietmar Bittermann, Erlangen, Germany; Kevin Hunt, Macclesfield, England; Klaus Klein, Erlangen, and Peter Rau, Mittelehrenbach, both of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

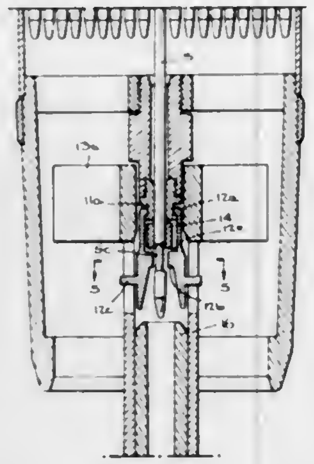
Continuation-in-part of Ser. No. 462,434, April 19, 1974, abandoned. This application Apr. 28, 1976, Ser. No. 681,112

Claims priority, application Germany, Apr. 19, 1973, 2320146

Int. Cl.^{2} G21C ***9/00***

U.S. Cl. 176—38 **7 Claims**

1. A nuclear reactor having a core comprising a plurality of laterally adjacent fuel assemblies, each assembly comprising a vertically elongated casing containing fuel rods and the casing having an upper end and extending downwardly therefrom and having an open lower end extending below said fuel rods, each casing having a vertical tubular suspension rod having an upper end with a supported connection above said casing and a lower end with a connection to the casing's said upper end so that the casing is suspended thereby, at least one of said connections being releasable, each assembly having a rod-like element having an upper end fixed above said casing, said rod-like element suspending from its said upper end downwardly and sliding by through said tubular suspension rod and the casing and having a lower end below the fuel rods and in the casing's said lower end, each fuel assembly independently of its said rod-like element being individually removable downwardly from the core by release of the releasable connection of its said suspension rod, failure of said suspension rod or its said connections in the case of any one of said assemblies causing an accidental release of such assembly so that it can fall from the core while its said rod-like element and any adjacent fuel assembly casing remain suspended so as to form vertically fixed parts relative to the released assembly, each of said casings having latch means for releasably normally latching its casing to one of said relatively fixed parts so that an accidentally released assembly cannot fall substantially relative to that one of the relatively fixed parts, said latch means having a latch release means on the inside of said lower end of the casing for actuation by tool means removably inserted upwardly via said lower end of any of said casings.



4,038,134

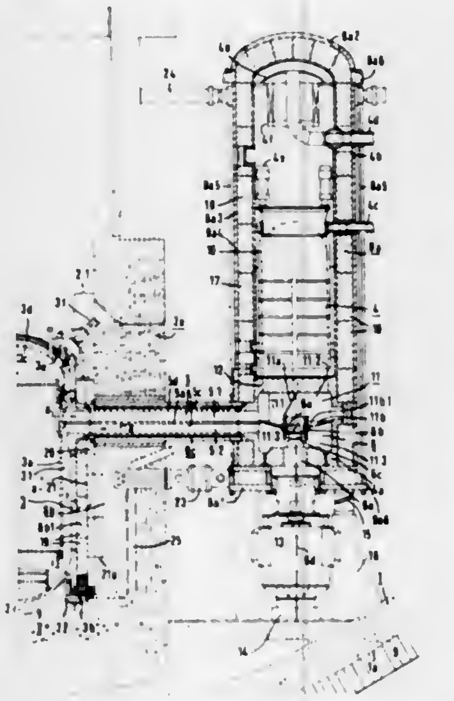
PRESSURIZED WATER-COOLED REACTOR SYSTEM

Heinrich Dorner, Erlangen; Elmar Harand, Hochstadt, and Walter Kleiter, Erlangen, all of Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Continuation-in-part of Ser. No. 393,287, Aug. 31, 1973, abandoned. This application Dec. 29, 1975, Ser. No. 644,914

Int. Cl.^{2} G21C ***19/28***

U.S. Cl. 176—65 **2 Claims**



1. A pressurized-water nuclear reactor installation comprising components including a vertical reactor pressure vessel, at least one vertical steam generator positioned adjacent to said vessel, and a coolant line interconnecting and extending substantially straight between said vessel and said generator, said line comprising coolant return and forwarding pipe portions forming with said generator a pressurized-water coolant circuit for said vessel, said generator containing a horizontal heat exchanger tube plate and forming a space below said plate and said space forming a part of said circuit, said space containing a coolant rotary pump impeller, the drive shaft of which is arranged vertically, all of said components being separately encapsulated by rupture-proof safety housings, a rotary drive motor for said impeller positioned on the outside of all of said housings, said drive shaft of said impeller connecting said motor with said impeller and extending through the one of said housings in which said generator is encapsulated, the one of said housings in which said vessel is encapsulated forming an annular space around said vessel and the others of said housings in each instance tightly encapsulating the component encapsulated thereby, said space below said plate comprising steam generator inlet and outlet chambers and a pressure chamber for the pump, a first substantially vertical, partition wall between said inlet and said outlet chamber, a second substantially horizontal partition wall between said inlet and said pressure chamber and a third substantially horizontal partition wall containing the pump housing with the impeller rotatably positioned within said housing between said outlet and said pressure chamber, said pump housing forming a fluid passage for the coolant from said outlet to said pressure chamber, a coolant forwarding pipe portion communicating at its one end with said pressure chamber and at its other end with a coolant inlet channel of said vessel, a coolant return pipe portion communicating at its one end with said inlet chamber and at its other end with a coolant outlet channel of said vessel, and an U-shaped tube type steam generator with its tube bundle's inlet end communicating with said inlet chamber and its tube bundle's outlet end communicating with said outlet chamber.

4,038,135

PLATE TYPE NUCLEAR FUEL ELEMENT AND A METHOD OF FABRICATION OF SAID ELEMENT

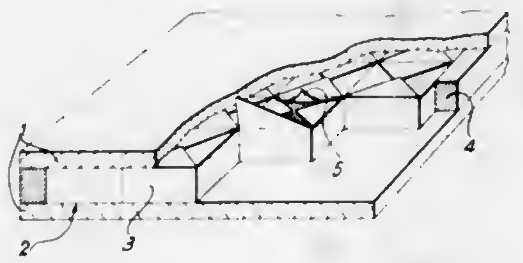
Rene Bergougnoux, Aix-en-Provence, and Jacques Delafosse, Gif-sur-Yvette, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Continuation of Ser. No. 484,743, July 1, 1974, abandoned. This application Sept. 29, 1976, Ser. No. 727,730

Claims priority, application France, July 6, 1973, 73.24992; Apr. 3, 1974, 74.11821

Int. Cl.^{2} G21C ***3/02***

U.S. Cl. 176—68 **14 Claims**



1. A plate-type nuclear fuel element comprising a core having a base of ceramic fuel material enclosed between two metallic cladding plates, wherein the fuel core is constituted by the juxtaposed array of a plurality of thin wafers of a ceramic fuel material, said wafers each having a geometric shape such that their planar juxtaposed assembly serves to form said plate-type nuclear fuel element which does not have any vacant spaces, at least a number of said wafers being provided with an individual metallic protection constituted by covering at least the lateral perimeters of said wafers with a thin metallic covering prior to assembly of said wafers to form said plate-type nuclear fuel element, said thin metallic covering having a contributory function in the assembly of cladding the wafers and dividing said plate-type nuclear fuel element into compartments.

4,038,136

SUPPORT STRUCTURE FOR THE LATERAL NEUTRON SHIELD SYSTEM OF A FAST REACTOR CORE

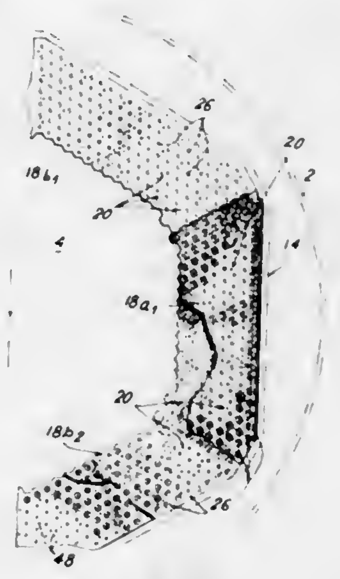
Bernard Gallet, Bruyeres-le-Chatel, and Robert Venot, Fontenay-aux-Roses, both of France, assignors to Commissariat a l'Energie Atomique, Paris, France

Filed June 9, 1975, Ser. No. 584,762

Claims priority, application France, June 11, 1974, 74.20214

Int. Cl.^{2} G21C ***13/00***

U.S. Cl. 176—87 **5 Claims**



1. A support structure for the lateral neutron shield system of a fast reactor core, said core being a vertical axis of symmetry and including a core support structure and a lateral neutron shield wherein said structure is a horizontal ring having an internal contour coinciding exactly with an external contour of the reactor core, a bottom face of said ring being supported by a periphery of said core support structure, said ring comprising a plurality of horizontal layers of metallic plates, clamping members maintaining said layers in relative positional relation, said metallic plates of one layer being angularly displaced around said axis of symmetry and overlappedly engaging said plates of adjacent layers, vertical through-holes in said ring receiving bottom end-connectors of elements of said neutron shield.

4,038,137

LOCKING MEANS FOR FUEL BUNDLES

Ralph A. Pugh, Richland, Wash., assignor to Exxon Nuclear Company, Inc., Bellevue, Wash.

Continuation of Ser. No. 400,734, Sept. 26, 1973, abandoned, which is a continuation of Ser. No. 273,161, July 19, 1972, abandoned. This application Nov. 3, 1975, Ser. No. 628,545

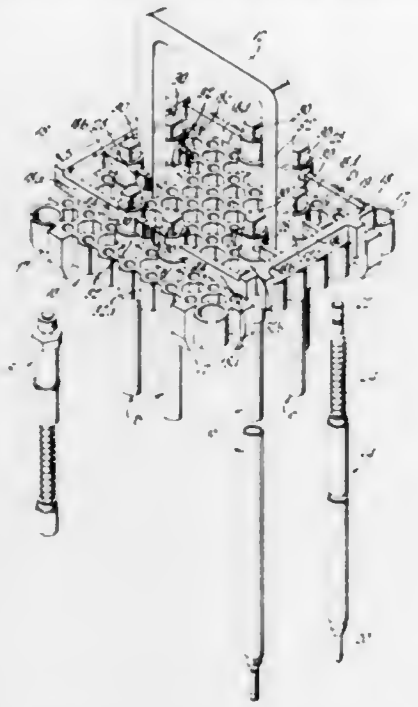
Int. Cl.^{2} G21C ***3/32***

U.S. Cl. 176—78 **6 Claims**

1. In a nuclear power reactor fuel bundle having tie rods for securing a pair for fuel rod mounting end plates in assembled position against the force exerted by compressed springs operably associated with said fuel rods and urging at least one of said end plates away from the other of said end plates, the improvement which comprises:

a. an elongated slot near an end of each of said tie rods, said slot having an upper end spaced from said end of said tie rod, said slot extending at least partially beyond said one of said end plates when said end plates are in assembled position; and

b. a fork-shaped member having a plurality of parallel tines which maintain said end plates in assembled position, each of said tines extending through a corresponding one of said slots in parallel relation, said compressed springs urging said end plate into abutting engagement with said tines of said fork-shaped member so that said tines of said fork-shaped member are forced against said upper end of said slots.



4,038,138

NUCLEAR REACTOR FUEL ELEMENTS

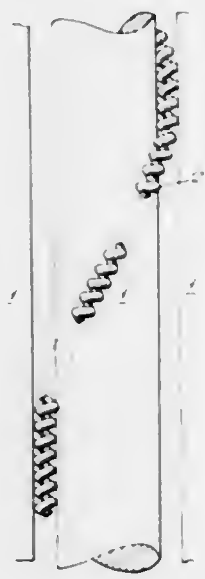
David Lees Linning, and John Alan Dodd, both of Warrington, England, assignors to United Kingdom Atomic Energy Authority, London, England

Filed Feb. 20, 1975, Ser. No. 551,078

Claims priority, application United Kingdom, Mar. 7, 1974, 10243/74

Int. Cl.^{2} G21C *3/12*

U.S. Cl. 176—81 **2 Claims**



1. In a liquid metal cooled fast reactor, a sub-assembly comprising a bundle of spaced fuel elements surrounded by a wrapper, said fuel elements each comprising an elongate cylindrical sheath at least a portion of which is of constant diameter cross section and containing nuclear fuel and having at least one spacing member for spacing the fuel element from neighboring elements in a bundle, said spacing member comprising a wire member helically wrapped around the sheath in the form of a helix over said portion of said fuel element sheath of constant diameter, the improvement wherein all of said wire members are identical and each of said wire members comprises a wire of constant diameter wound about its longitudinal axis in the manner of an open coil spring and wrapped around said fuel element as said helix such that said wire member contacts the fuel element at a series of regularly spaced intermittent points such that, in use, coolant can flow between said wire member and the fuel element and between the points of contact.

4,038,139

CELL CULTURE MEDIUM

John R. Birch, High Wycombe, England, assignor to G. D. Searle & Co., Limited, High Wycombe, England

Filed July 16, 1976, Ser. No. 705,862

Int. Cl.^{2} C12B *3/00*

U.S. Cl. 195—1.8 **5 Claims**

1. A culture medium for lymphoblast cells comprising an aqueous nutrient medium containing 0.5 – 20% swine serum and about 0.1% of a surfactant which inhibits the precipitation of protein.

4,038,140

PROCESS FOR BINDING BIOLOGICALLY ACTIVE PROTEINS

Dieter Jaworek, Weilheim; Joseph Maier, Pocking, and Michael Nelbock-Hochstetter, Tutzing, all of Germany, assignors to Boehringer Mannheim G.m.b.H., Mannheim-Waldhof, Germany

Filed May 30, 1975, Ser. No. 582,495

Claims priority, application Germany, June 4, 1974, 2426988

Int. Cl.^{2} C12K *1/00;* **C07G** *7/02;* **C08L** *5/00*

U.S. Cl. 195—63 **15 Claims**

1. Process for binding a biologically active protein to an insoluble carrier which process comprises reacting at least one such protein in aqueous phase with a carrier comprising an activated polysaccharide with a hydrophilic graft co-polymer grafted thereinto, wherein said polysaccharide is activated by alkylation or acylation monomers, or by radical formation.

12. Process as claimed in claim **1** wherein the biologically active protein is an enzyme.

4,038,141

METHODS FOR EXTRACTING AND PURIFYING KALLIDINOGENASE

Kiyochika Tokuyasu, Higashiyamato; Takeshi Yokobori, Sayama, and Chizuko Nakahara, Hino, all of Japan, assignors to Seikagaku Kogyo Co. Ltd., Tokyo, Japan

Division of Ser. No. 638,042, Dec. 5, 1975, Pat. No. 3,994,782. This application Apr. 7, 1976, Ser. No. 674,645

Int. Cl.^{2} C07G *7/026;* **C12D** *13/10*

U.S. Cl. 195—66 R **11 Claims**

1. In a method for purifying kallidinogenase by subjecting the aqueous phase of a kallidinogenase-containing aqueous extract obtained from the pancreas of a mammal to an adsorption-elution treatment using an anion exchange resin, the improvement comprising (1) bringing said aqueous phase of the kallidinogenase-containing aqueous extract into contact with a gel-type weakly basic anion-exchange resin to cause the kallidinogenase fraction to be adsorbed to said resin, and (2) eluting the kallidinogenase with an aqueous solution of a salt consisting of an ammonium salt of a weak acid, thereby to collect the kallidinogenase.

4,038,142

ISOLATION AND CHARACTERIZATION OF PHENOTYPES OF MYCOBACTERIA

Raymond Turcotte, Montreal, and Marc Quevillon, Ville D'Anjou, both of Canada, assignors to Institut Armand Frappier, Ville de Laval, Canada

Filed May 30, 1975, Ser. No. 582,376

Int. Cl.^{2} C12K *1/04*

U.S. Cl. 195—96 **3 Claims**

1. Process which comprises culturing a mycobacteria under partial anaerobic conditions in culture bottles containing a liquid medium selected from the group consisting of Sauton's medium, Long's medium, Proskauer and Beck's medium and Middlebrook's medium, said liquid medium partially filling said culture bottles, said culture bottles being tightly closed and incubated on their flat side at 37.5° C during 14 to 21 days, the pH of said culture medium being maintained between 4.5 and 8.5, said culturing being carried out during about 14 to 21 days, thereby obtaining surface bacterial pellicles consisting of a mixture of smooth, filamentous and rough bacterial islets, respectively constituting Phenotypes 1, 2 and 3 of said mycobacteria, separately subculturing each of said Phenotypes 1, 2 and 3 in new supply of said liquid medium and isolating each of said Phenotypes 1, 2 and 3 in pure state.

4,038,143

TEST KIT FOR THE GENETIC DETECTION OF MICROORGANISMS

Elliot Juni, Ann Arbor, Mich., assignor to The Regents of the University of Michigan, Ann Arbor, Mich.

Division of Ser. No. 410,533, Oct. 29, 1973, Pat. No. 3,390,956. This application Aug. 15, 1975, Ser. No. 605,059

Int. Cl.^{2} C12K *1/10*

U.S. Cl. 195—100 **21 Claims**

1. A test kit for detecting the presence of a specific microorganism in a biological sample based on the phenomenon of genetic transformation, which test kit comprises (1) a transformable variant of said specific microorganism which is distinguishable therefrom and (2) an aqueous solution separate from said variant containing a surfactant at a concentration of between about 0.01 and 0.1 percent by weight which is sufficient to lyse substantially all of the microorganism cells present in said biological sample while insufficient to destroy a substantial amount of said variant upon contact therewith when said variant is supported on a medium capable of diffusing aqueous solutions.

4,038,144

METHOD OF INCREASING FERMENTATION YIELDS

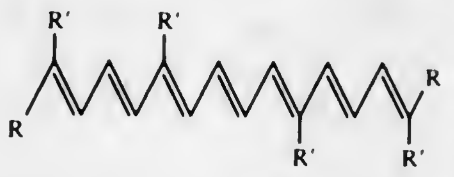
John L. Gainer, Charlottesville, Va., assignor to The University of Virginia, Charlottesville, Va.

Filed Apr. 19, 1976, Ser. No. 678,113

Int. Cl.^{2} C12B *3/12;* **C12D** *1/00;* **C12B** *1/00*

U.S. Cl. 195—100 **9 Claims**

9. A fermentation broth which comprises microorganisms, a nutrient medium for fermentation of said microorganism, and an amount of water soluble carotenoid therein effective for increasing the yield of fermentation by said microorganism; wherein said water-soluble carotenoid has the formula:



wherein each R is a hydrophilic group and wherein each R′ is hydrogen or methyl.

4,038,145

MALIGNANCY DIAGNOSTIC METHOD

Richard G. Devlin, Mount Vernon, Ind., assignor to Mead Johnson & Company, Evansville, Ind.

Filed July 8, 1974, Ser. No. 486,547

Int. Cl.^{2} C12K *9/00*

U.S. Cl. 195—103.5 R **18 Claims**

1. The method for diagnosing lymphoid malignancy in a mammal employing the mixed lymphocyte reaction in tissue culture which comprises securing tissue specimens from at least one pair of tissues selected from the group consisting of lymph node, spleen, and blood of said mammal, individually preparing single cell suspensions of lymphocytes contained in said specimens in an aqueous tissue culture medium in which said lymphocytes can be cultivated, cultivating said lymphocytes of at least one pair of said tissues separately and together as a mixed culture in said medium for a period sufficient for the development of the mixed lymphocyte reaction when lymphocyte reactive cells are present, and determining whether a mixed lymphocyte reaction has occurred.

4,038,146

METHOD OF DETERMINATION OF SERUM TRIGLYCERIDES AND REAGENTS

Urao Nonaka, Tokyo; Hideto Shibata, and Nobuyuki Nakajima, both of Funabashi, all of Japan, assignors to Latron Laboratories, Inc., Tokyo, Japan

Filed Dec. 9, 1974, Ser. No. 531,120

Claims priority, application Japan, June 7, 1974, 49-63893

Int. Cl.^{2} G01N *31/14*

U.S. Cl. 195—103.5 R **2 Claims**

1. A method of determining serum triglycerides by hydrolysis according to an enzymatic reaction, wherein a serum is added to a reaction liquid obtained by adding an aqueous solution of a mixture of a tetrazolium compound and phenazine methosulfate to an enzyme-coenzyme reagent comprising lipoprotein lipase (LPL), glycerol dehydrogenase (GDH) obtained from bacillus megatherium and nicotinamide adenine dinucleotide (NAD), thereby effecting an enzymatic hydrolysis of the triglycerides and dehydrogenation of the resulting glycerol in one step with simultaneous reduction of the tetrazolium compound to formazan and determining colorimetrically at a wavelength in the range of 570–600nm the color developed by said reduction.

4,038,147

METHOD FOR DETECTING ENDOTOXINS

Woodrow James Reno, Baltimore, Md., assignor to Becton, Dickinson and Company, Rutherford, N.J.

Filed June 15, 1976, Ser. No. 696,429

Int. Cl.^{2} G01N *31/00, 33/16*

U.S. Cl. 195—103.5 R **9 Claims**

1. A method of determining the presence or absence of endotoxins in liquids, which comprises:

a. admixing 1 part by volume of mammalian blood plasma, 0.1 to 0.5 parts by volume of mammalian blood platelet factor reagent, 0.1 to 0.4 parts by volume of Limulus polyphemus amebocyte lysate and 0.1 to 0.5 parts by volume of the liquid for determination; said plasma being first diluted in a ratio of from 1:4 to 1:15 (v/v) with an aqueous buffer solution;
b. incubating the mixture obtained in (a) above at 37° C. for 10 minutes;
c. admixing a source of calcium ions with the incubated mixture of (b) above;
d. incubating the mixture of (c) above at 37° C. for from 5 to 20 minutes;
e. disrupting the mixture obtained by incubating in (d) above;
f. separating solids from the disrupted mixture to obtain a supernatant;
g. mixing aliquots of the supernatant, a source of calcium ions and mammalian blood plasma;
h. measuring the elapsed time between completion of mixing in step (g) above and coagulation of the mixture obtained thereby; and
i. comparing the elapsed time measured in step (h) above with the elapsed time measured after following the steps (a) through (h) above but replacing the liquid for determination added in step (a) with an equal proportion of a known endotoxin free solution.

4,038,148

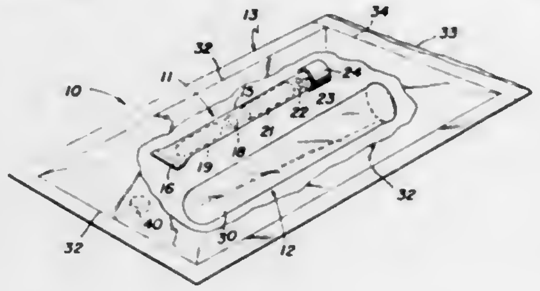
ANAEROBIC ENVIRONMENTAL SYSTEM FOR BACTERIA CULTURE TESTING

Lowell Donald Miller, Kansas City, Mo.; Melvin Wayne Hounsell, Beloit, Wis., and Ernest Elliott Spinner, Grandview, Mo., assignors to Marion Laboratories, Inc., Kansas City, Mo.

Filed Dec. 22, 1975, Ser. No. 643,258

Int. Cl.^{2} C12B *1/00;* **C12K** *1/10*

U.S. Cl. 195—127 **35 Claims**



1. A package for storing and transporting an anaerobic culture comprising:

a bag of flexible sheet material of low gas permeability;

a self-contained gas generating apparatus in the bag for generating at least a reducing gas;

a culture retaining receptacle in the bag; and

a catalyst in the bag which promotes reaction between the reducing gas, when produced by the gas generating apparatus, and oxygen in the bag;

said gas generating apparatus comprising a container having an opening, a reducing gas generating solid material in the container, an ampoule containing a liquid which is reactive with the solid material to produce a reducing gas catalytically reactive with oxygen at room temperature, said ampoule being openable from outside the container to free the liquid to contact the solid material, and means in the container which prevents liquid from flowing from the container after the ampoule is opened but which permits flow of reducing gas generated in the container out of the opening.

4,038,149

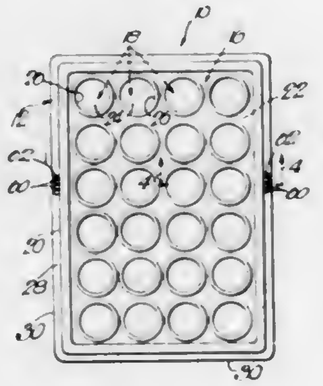
LABORATORY TRAYS WITH LOCKABLE COVERS

John Liner, Woodbridge, and Eric W. Soderberg, Milford, both of Conn., assignors to Linbro Scientific, Inc., Hamden, Conn.

Filed Dec. 31, 1975, Ser. No. 645,550

Int. Cl.^{2} C12B *1/00*

U.S. Cl. 195—127 **5 Claims**



1. A laboratory unit, comprising a tray with a top surface, a bottom, an upright circumferential wall extending from said top surface to said bottom, and a plurality of cup formations extending downwardly from, and being open at, said top surface; and a removable cover having a top wall and a therefrom depending circumferential skirt overlapping said circumferential tray wall in closed cover position in which said top walls rests on said top surface of said tray, with said tray also having pad formations with outer faces on said circumferential wall on opposite sides thereof and extending substantially from said tray bottom heightwise to a level within the confines of said cover skirt in closed cover position, and said cover skirt having notches with which said pad formations register in closed cover position for clearance from said cover skirt and reach of said pad faces in their entirety by an attendant's fingers for secure grasp by the latter of the covered tray.

4,038,150

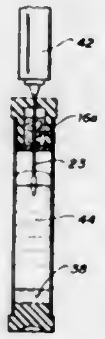
SAMPLE MIXING AND CENTRIFUGATION APPARATUS

Gordon L. Dorn, and Joseph M. Hill, both of Dallas, Tex., assignors to J. K. and Susie L. Wadley Research Institute and Blood Bank, Dallas, Tex.

Filed Mar. 24, 1976, Ser. No. 669,764

Int. Cl.^{2} C12K *1/04*

U.S. Cl. 195—127 **53 Claims**



1. A fluid mixing apparatus comprising:

a. a receptacle having a first end and a second end, said ends being sealably closed so as to define a sample receiving chamber which is maintained at a lower than atmospheric pressure;

b. an injectable closure means sealably communicating with said first end of said receptacle;

c. an enclosed treating fluid chamber contained within said injectable closure means defined by sidewalls enclosed by first and second spaced injectable webs, said chamber being positioned therein such that a stylus may pass through said first and second spaced injectable webs, said treating fluid chamber and into said sample receiving chamber;

d. a sample treating fluid disposed within said treating fluid chamber; and

e. injection stylus means for passing through said injectable closure means and into said sample receiving chamber via said first and second injectable webs and through said treating fluid chamber for injecting a sample fluid into said sample receiving chamber and for admixing said sample treating fluid from said treating fluid chamber with said sample fluid as said sample fluid passes therethrough.

4,038,151

CARD FOR USE IN AN AUTOMATED MICROBIAL DETECTION SYSTEM

Norman L. Fadler, St. Louis; Paul W. Jones, and Jack R. Kirchner, both of St. Charles, all of Mo., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed July 29, 1976, Ser. No. 709,611

Int. Cl.^{2} C12K *1/10*

U.S. Cl. 195—127 **10 Claims**

1. In card for use in detecting the presence of microbes in a specimen wherein the card is comprised of a plate having first and second sides, detection wells for containing microbe supportive media passing from a first side to a second side therethrough, at least one filling port with a septum therein, filler passageways formed in said first side of the plate connecting said filling port to said detection wells and adhesive tape on both sides of the plate to cover said detection wells and filler passageways, the improvement comprising:

at least one discontinuity in one of said filler passageways adjacent a detection well.

4,038,152

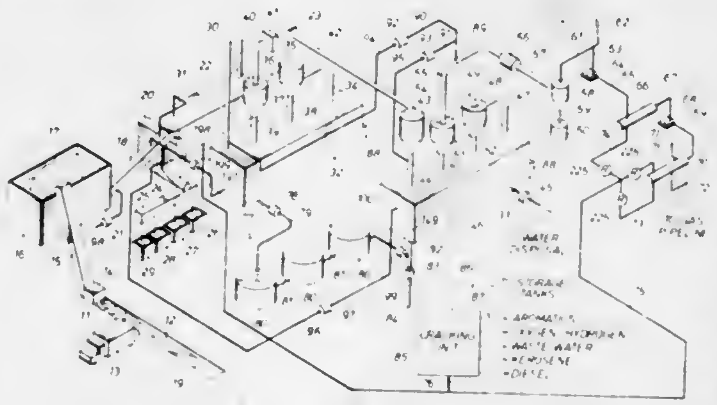
PROCESS AND APPARATUS FOR THE DESTRUCTIVE DISTILLATION OF WASTE MATERIAL

Lyle D. Atkins, Houston, Tex., assignor to Wallace-Atkins Oil Corporation, Houston, Tex.

Filed Apr. 11, 1975, Ser. No. 567,193

Int. Cl.^{2} C10B *57/02, 47/20*

U.S. Cl. 201—2.5 **30 Claims**



1. A process for destructive distillation of waste material containing organic matter, comprising the steps of

shredding the waste material into pieces of predeterminded size,

continuously supplying said shredded materials to a sealed distillator compartment at a predetermined rate,

distributing said shredded material to a uniform predetermined depth for movement through said distillator compartment,

continuously moving said shredded material along a plurality of superposed generally horizontal paths through said sealed distillator compartment at a predetermined rate,

uniformly heating said shredded material along each of said superposed generally horizontal paths to a predetermined range of temperatures during vertical movement of said material through said distillator compartment to pyrolyze said shredded material,

controlling said temperature in said distillator compartment to about 650° F at a highest vertical level and at selectively increasing temperatures to about 1000° F at a lowest vertical level,

pyrolyzing said continuously moving materials for evolving volatile gases and vapors from said organic matter in said waste material,

continuously discharging the solid residue of said pyrolyzed organic waste materials from said sealed distillator compartment,

treating said residue discharged from said distillator compartment to separate said solid residue into charcoal and other carbonaceous products produced by pyrolyzing said organic matter, metals and other non-ferrous aggregates originally contained in said waste material,

continuously removing said evolved gases and vapors from said sealed distillator compartment,

maintaining said distillator and said evolved gases at atmospheric pressure,

cooling said removed gases for condensing a portion of said gases into liquid petroleum products and water,

recovering said condensed water and liquid petroleum products, and recovering the remaining evolved gases.

4,038,153

COKE MANUFACTURING PROCESS

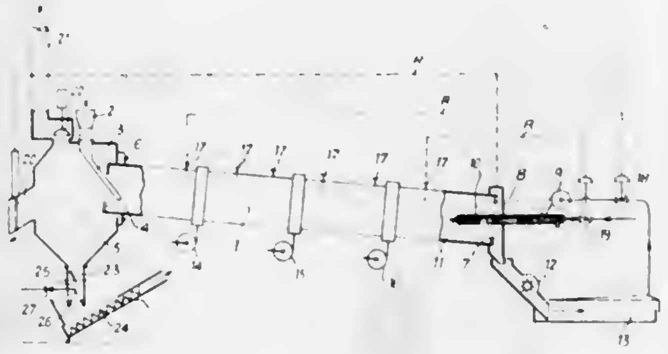
Jean Deruelle, St. Avold, and Olivier Penet, Forbach, both of France, assignors to Houilleres du Bassin de Lorraine, Freyming-Merlebach, France

Filed June 18, 1975, Ser. No. 588,172

Claims priority, application France, June 27, 1974, 74.22402

Int. Cl.^{2} C10B *49/06, 57/12, 57/18*

U.S. Cl. 201—27 **5 Claims**



1. A manufacturing process for producing pulverulent coke and reactive coke in grain form, in which bituminous coal from fins and coal grains containing more than 15% volatile combustible matter with a swelling index ranging between 1 and 8 is carbonized at temperatures between about 600° and 1100° C in which process said bituminous coal is introduced at the higher end of a slightly inclined rotating tubular oven, through which oven the coke during the course of its production moves from the higher end to the lower end; in which process the heat of carbonization is obtained by the substantially simultaneous in situ generation and combustion of a part of the volatile combustible matter, by introducing an amount of air into the oven, which air is combustion air and which amount is in excess of a quantity of said air which would be necessary to bring the coke to the desired coking temperature, the majority of said air being introduced into the oven at a position between the outlet for the coke and the location of the area of maximum temperature reached by the coke; and wherein an endothermic fluid is introduced at the lower end of the oven for selectively establishing the location of said area of maximum temperature in said oven, for cooling the coke between said location and said outlet and for maintaining the temperature of the gases issuing from the higher end of said oven at about 600° C.

4,038,154

PILE FURNACE

Herbert L. Barnebey, Columbus, Ohio, assignor to Barnebey-Cheney Co., Columbus, Ohio

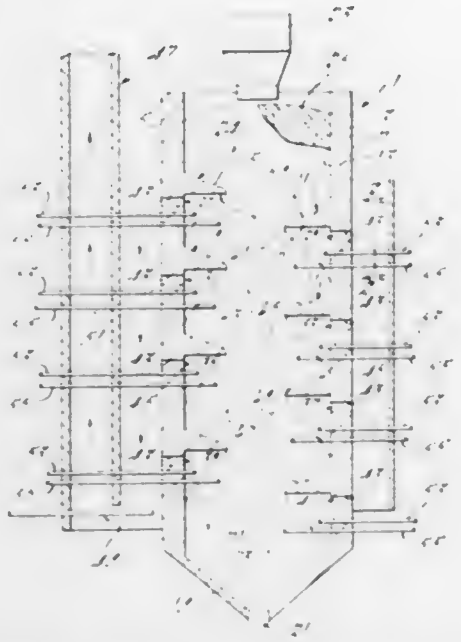
Continuation of Ser. No. 188,213, Oct. 12, 1971, abandoned. This application Oct. 3, 1973, Ser. No. 402,970

Int. Cl.^{2} C10B *51/00*

U.S. Cl. 202—93 **1 Claim**

1. In a furnace for the controlled combustion of a mass of carbonaceous particulate material, a furnace housing having an inlet at one end for material to be treated and an outlet at the other end for treated material, means for supporting said material in a pile in said furnace housing so that said material can flow from the inlet to the outlet, means in said housing providing a series of vent chambers spaced from each other in the direction of flow of material, said furnace including an exhaust stack, outlet means for said vent chambers connecting said chambers to said stack, and means for admitting combustion air

to the pile and to the chambers, said stack including a downflow portion and an upflow portion and means for the admission of air to the stack to provide for the combustion of combustible gases in the stack.



4,038,155

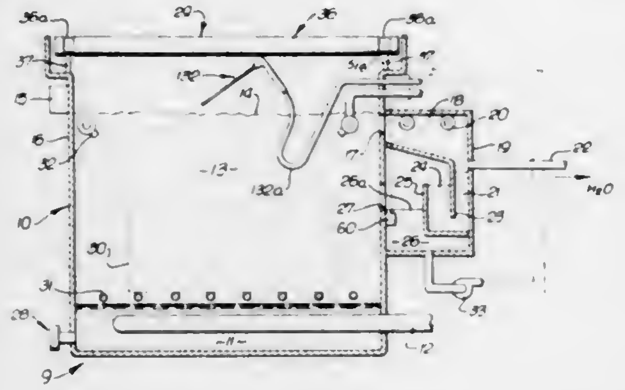
ENERGY SAVING VAPOR DEGREASING APPARATUS

Russell H. Reber, Orange, Calif., assignor to Purex Corporation Ltd., Lakewood, Calif.

Filed Apr. 5, 1976, Ser. No. 673,606

Int. Cl.² B01D *3/00*

U.S. Cl. 202—170 **15 Claims**



1. In combination with work degreasing apparatus including a tank defining an interior sump zone for liquid solvent, and a heater located to transfer heat to the solvent to vaporize same for degreasing contact with work introduced into the tank, the vapor being subject to condensation, there also being a tank cover having open and closed positions, the improvement comprising:

- a. first means operatively connected with the heater and located to be responsive to closing of the cover to control the heater to reduce heat transfer to the liquid solvent, and also responsive to opening of the cover to control the heater to increase heat transfer to the liquid solvent.

4,038,156

BUTADIENE RECOVERY PROCESS

Robert F. Knott, and Arthur E. Handlos, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

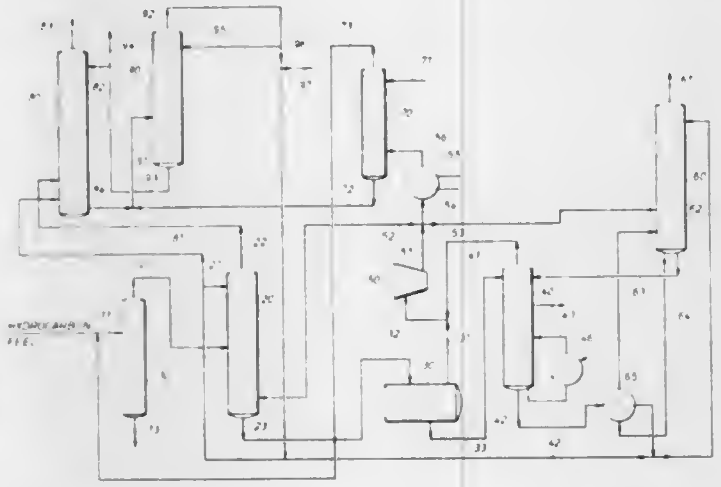
Filed Sept. 21, 1976, Ser. No. 725,065

Int. Cl.² B01D *3/40;* C07C *7/08*

U.S. Cl. 203—45 **8 Claims**

1. In the process for recovery of butadiene from a hydrocarbon mixture made up predominantly of C_4 hydrocarbons and containing a minor amount of C_5 saturated and unsaturated hydrocarbons, said mixture being obtained as overhead product from an initial fractionation step employed to separate larger quantities of C_5 and higher hydrocarbons from the C_4 hydrocarbon fraction, wherein the hydrocarbon mixture is subject to extractive distillation in the presence of a selective polar solvent and butadiene is separated from the fat solvent bottoms of extractive distillation by sequential flashing and stripping of the fat solvent in low pressure flashing and stripping zones operated at pressures lower than that employed in the extractive distillation to afford vapor products containing predominantly butadiene, a relatively high concentration of C_5 hydrocarbons and a minor amount of polar solvent, followed by compression of the combined overhead vapor products of low pressure flashing and stripping and passage of a portion of the compressed vapor product to a second stripping zone operated at a higher pressure for recovery of butadiene as an overhead product with the remainder of the compressed vapor overhead being recycled as reboiled vapor to the extractive distillation step; the improvement which comprises,

- a. condensing a portion of the combined vapor overhead product of compression into a liquid stream,
- b. water washing the condensed liquid stream obtained in step (a) to remove polar solvent therefrom leaving a condensed liquid product containing butadiene and a relatively high concentration of C_5 saturated and unsaturated hydrocarbons which is substantially free of polar solvent,
- c. returning the condensed liquid product from step (b) substantially free of polar solvent to the initial fractionation step employed to separate larger quantities of C_5 and higher hydrocarbons from the C_4 hydrocarbon fraction whereby C_5 saturated and unsaturated hydrocarbons contained in the condensed liquid are substantially removed from the hydrocarbon mixture passed to extractive distillation.



4,038,157

METHOD OF HERMETICALLY SEALING SEMICONDUCTOR DEVICES

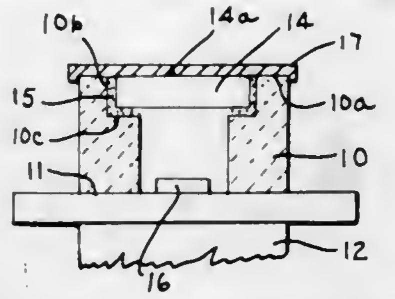
Chung K. Kim, Lexington, Mass., and Yung L. Cho, Hauppauge, N.Y., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 16, 1976, Ser. No. 677,589

Int. Cl.² C25D *5/10, 5/54*

U.S. Cl. 204—16 **2 Claims**

1. An electroplated microwave encapsulation process for a semiconductor being comprised of the step of forming a dielectric sleeve of ceramic for microwave utilization having an inner and outer circumference, a two step structure at one end and a flat surface at the other end, the two step structure having the first step thereof extending partially outwardly from the inner circumference toward the outer circumference of the dielectric sleeve, the first and second step being interconnected to form a rim, the step of metallizing with platinum the surfaces of the two step structure, the flat end of the dielectric sleeve and the outer circumference of the dielectric sleeve, the step of brazing the metallized dielectric flat end onto a metal stud in the form of a brazed joint with said semiconductor being positioned in the center of the brazed joint, painting the surface of the first step and the rim with a viscose conductive material, placing a metal lid having a top surface with said first step and fitting tightly into said rim, said top surface of said metal lid and said second step providing a flush surface, the step of electroforming a metal layer on said flush surface after the hardening of said viscose conductive material, and the step of gold barrel plating for final gold finishing on the entire metal surface exposed to the air.



4,038,158

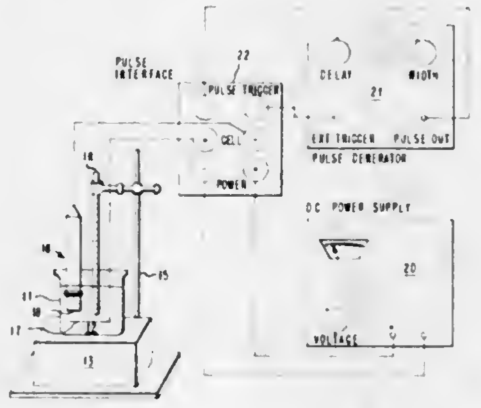
ELECTROCHEMICAL GENERATION OF FIELD DESORPTION EMITTERS

Maurice M. Bursey, Chapel Hill, N.C.; Deborah M. Hinton, Champaign, Ill.; Martin C. Sammons, Cincinnati, Ohio, and R. Mark Wightman, Lawrence, Kans., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed Oct. 22, 1975, Ser. No. 624,102

Int. Cl.² C25D *5/18, 5/00, 7/00*

U.S. Cl. 204—23 **15 Claims**



1. A process for forming a field desorption emitter comprising a metal support and a plurality of metallic dendrites attached to and extending in a generally radially outwardly extending direction from said support, said process comprising the steps of:

- a. forming an electrolytic liquid mixture having an appropriate concentration of a compound of the metal from which the dendrites are to be formed;
- b. immersing said support, as a first electrode, in said mixture;
- c. immersing a second electrode in said mixture in electrode-positing association with said support; and
- d. applying a plurality of short duration pulses of electrical current with substantially zero current between said pulses across said electrodes.

4,038,159

METHOD FOR FABRICATION OF MANGANESE OXIDE SOLID ELECTROLYTE CAPACITOR

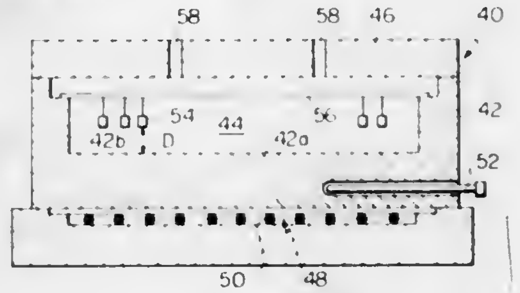
Atsushi Nishino; Hayashi Hayakawa, and Hiroshi Kumano, all of Kadoma, Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Nov. 14, 1975, Ser. No. 632,079

Claims priority, application Japan, Nov. 19, 1974, 49-133999

Int. Cl.² H01G *9/05*

U.S. Cl. 204—38 A **15 Claims**



1. A method of producing a solid electrolyte capacitor having a layer of manganese dioxide as the solid electrolyte, the method comprising the steps of:

- a. preparing a substrate by forming a dielectric oxide coating on a surface of a valve metal member;
- b. immersing said substrate in an aqueous solution consisting of water and manganese nitrate; and
- c. heating the wet substrate to cause pyrolytic decomposition of manganese nitrate to manganese dioxide in a heating chamber of a radiant furnace, said chamber being semi-closed and in communication with the atmosphere exclusively through at least one vent formed in the wall of said chamber, heat for said pyrolytic decomposition being transferred to said substrate exclusively from the wall of said chamber dominantly by radiation, said at least one vent having a predetermined area such that said pyrolytic decomposition proceeds under a positive pressure ranging from 5 to 100 mm H_2O in gage pressure attributable only to a relatively prolonged retention of gaseous decomposition products of said pyrolytic decomposition in said chamber.

4,038,160

METHOD OF REGENERATING A CHROMIUM ELECTROPLATING BATH

John Cooper Crowther, Stourbridge, and Stanley Renton, Penkridge, both of England, assignors to Albright & Wilson Limited, Oldbury, Warley, England

Filed July 2, 1976, Ser. No. 702,374

Claims priority, application United Kingdom, July 3, 1975, 28055/75

Int. Cl.² C25D *3/06;* B01D *9/02*

U.S. Cl. 204—51 **6 Claims**

1. A method for the maintenance of an aqueous trivalent chromium electroplating bath whose performance has deteriorated due to the accumulation of trace metals which consists in adding thereto an amount of a water soluble ferrocyanide effective to restore said performance.

4,038,161

ACID COPPER PLATING AND ADDITIVE COMPOSITION THEREFOR

William Edward Eckles, Cleveland Heights, and Thomas Walter Starinshak, Berea, both of Ohio, assignors to R. O. Hull & Company, Inc., Cleveland, Ohio

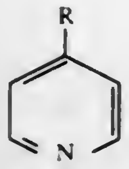
Filed Mar. 5, 1976, Ser. No. 664,278

Int. Cl.² C25D *3/38*

U.S. Cl. 204—52 R **20 Claims**

10. In an acid copper electroplating bath containing one or more copper salts, free acid and chloride ions, the improvement which comprises the presence in said bath of an effective amount of one or more bath-soluble organic leveling compounds obtained by reacting one or more epihalohydrins with one or more nitrogen-containing compounds selected from the group of

a. substituted pyridines having the general formula

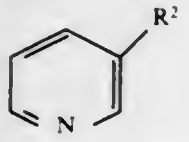


wherein R is a lower alkyl, lower alkenyl, alkylene amine, alkylenol, mercapto, cyano, alkylene-4-pyridyl, $-C(S)NH_2$, or $-CH=NOH$ group, or a group having the formula

$-C(O)R'$

wherein R′ is a lower alkyl or aryl group or $-N(Et)_2$,

b. a substituted pyridine having the general formula



wherein R^2 is an amino, chloro, or β-acrylic acid group,

c. 2-vinyl pyridine,

d. 2-methyl-5-vinyl pyridine,

e. quinoline or 3-amino quinoline,

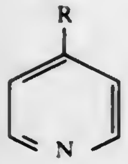
f. isoquinoline, or

g. benzimidazole.

18. An additive composition for acid copper electroplating baths comprising an aqueous mixture of

a. one or more bath-soluble leveling compounds obtained by reacting one or more epihalohydrins with one or more nitrogen-containing compounds selected from the group consisting of

  i. substituted pyridines having the general formula

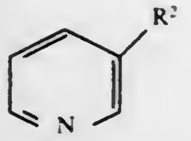


wherein R is a lower alkyl, lower alkenyl, alkylene amine, mercapto, cyano, alkylene-4-pyridyl, $-C(S)NH_2$, or $-CH=NOH$ group, or a group having the formula

$-C(O)R'$

wherein R′ is a lower alkyl or aryl group or $-N(Et)_2$,

  ii. a substituted pyridine having the general formula



where R^2 is an amino, chloro, or β-acrylic acid group,

  iii. 2-vinyl pyridine,

  iv. 2-methyl-5-vinyl pyridine,

  v. quinoline or 3-amino quinoline,

  vi. isoquinoline, or

  vii. benzimidazole,

b. one or more bath-soluble brighteners containing

  i. a carbon-sulfur group in which the carbon atom is attached to at least one other sulfur or nitrogen atom, and

  ii. a hydroxyl group, a carboxylic acid or sulfonic acid group or the water-soluble alkali metal salts of said acids, and

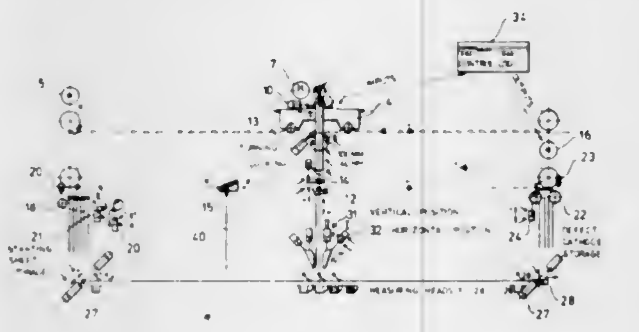
c. a wetting agent.

4,038,162

METHOD AND APPARATUS FOR DETECTING AND ELIMINATING SHORT-CIRCUITS IN AN ELECTROLYTIC TANK

Aarne Albin Kapanen, Espoo, and Pentti Jaakkima Rautimo, Helsinki, both of Finland, assignors to Outokumpu Oy, Helsinki, Finland

Filed Apr. 1, 1976, Ser. No. 672,662
Claims priority, application Finland, Apr. 10, 1975, 751086
Int. Cl.^{2} C25C *1/00, 7/06*
U.S. Cl. 204—105 R **11 Claims**



1. A method for detecting and eliminating short-circuits in an electrolytic tank in which anode plates and cathode sheets have been immersed alternately at predetermined intervals, each cathode sheet being connected to a cathode bar which is in contact with a conductor rail of the tank, said method comprising

determining the total current of a cathode by observing a suitable current-depending quantity, such as the magnetic field, the temperature or similar, of the cathode bar,

recognizing a short-circuit condition when the determined cathode current exceeds a predetermined value,

upon the detection of a short-circuit condition, and responsive thereto, directing an automatic cathode-replacing device, movable along the cathode/anode row, to the position of the detecting short-circuit condition and stopping it above said position,

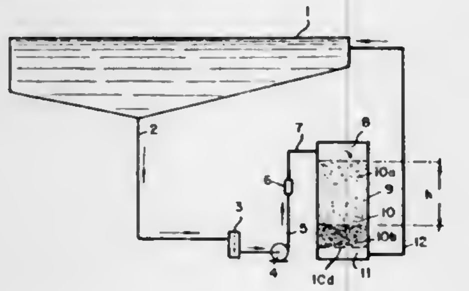
lifting up the short-circuit cathode and moving it away, and lowering a new cathode sheet to replace the one removed.

4,038,163

PROCESS FOR THE TREATMENT BY METALLIC IONS OF AQUEOUS LIQUIDS AND DEVICE FOR MAKING THE SAME

Lorenzo Puig Casanovas, and Jean Leon Justin Vellas, both of Toulouse, France, assignors to Societe d'Etudes et de Diffusion de Procedes et Brevets S.A., Geneva, Switzerland

Continuation of Ser. No. 84,861, Oct. 28, 1970, abandoned. This application June 16, 1975, Ser. No. 586,890
Claims priority, application France, Oct. 28, 1969, 69.369711
Int. Cl.^{2} C02B *1/82;* **C02C** *5/12*
U.S. Cl. 204—152 **4 Claims**



1. A process for purifying an aqueous liquid containing impurities, comprising the steps of:

passing the aqueous liquid in a uniformly distributed manner between electrodes formed of a single metal the ions of which are capable of effecting both the formation of fine flocculates of impurities and sterilization,

continuously subjecting said electrodes to an electric current to effect uniformly scattered emission of monometallic ions through the aqueous liquid thus causing the formation of fine flocculates of the impurities in the aqueous liquid,

retaining the fine flocculates in the form of a porous mass,

continuing to circulate aqueous liquid through said porous mass whereby further flocculated impurities contained therein are deposited and retained in said porous mass to increase the volume thereof;

applying sufficient current to said electrodes to provide said monometallic ions emission at a rate such that a number of free ions sufficient to provide an algicidal or biocidal effect, of the metal of said electrodes, pass through the porous mass with the aqueous liquid, and

washing the porous mass of flocculates upon reaching a determined threshold of pressure drop for the aqueous liquid passing through said porous mass,

whereby said aqueous liquid is epurated by action of flocculates continuously energized by the emission of said monometallic ions, additional ions of said metal of said electrodes going through said porous mass further providing sterilization properties to said epurated aqueous liquid.

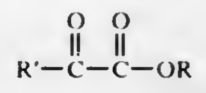
4,038,164

PHOTOPOLYMERIZABLE ARYL AND HETEROCYCLIC GLYOXYLATE COMPOSITIONS AND PROCESS

Francis A. Via, Yorktown Heights, N.Y., assignor to Stauffer Chemical Company, Westport, Conn.

Filed Sept. 18, 1975, Ser. No. 614,469
Int. Cl.^{2} C08F *8/00, 2/46*
U.S. Cl. 204—159.15 **23 Claims**

1. In the polypolymerization of monomeric and polymeric compositions of photopolymerizable substances wherein a photoinitiator is admixed with a photopolymerizable composition and the mixture exposed to actinic radiation, the improvement wherein photopolymerization is effectively initiated by a compound of the formula:



$$R'-\overset{\overset{\displaystyle O}{\|}}{C}-\overset{\overset{\displaystyle O}{\|}}{C}-OR$$

wherein R is straight or branched chain hydrocarbon of from one to ten carbon atoms, aryl, aralkyl, or mono-, di or trialkylsilyl and R′ is a heterocyclic radical, aryl of from 6 to 14 carbon atoms or mono-, di- or polysubstituted phenyl with substituents selected from the group consisting of alkyl, alkoxy, aryloxy, alkylthio, arylthio and halogen, said photoinitiator being present in said composition at a concentration of 0.01 to about 30 weight percent.

4,038,165

CORONA REACTION METHOD

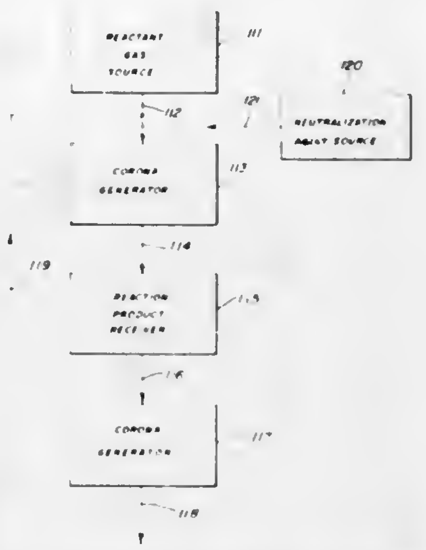
Frank Eugene Lowther, Severna Park, Md., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 558,046, March 13, 1975. This application Nov. 17, 1975, Ser. No. 632,580
Int. Cl.^{2} C01B *13/11*
U.S. Cl. 204—176 **17 Claims**

1. A method for conducting corona discharge reactions between spaced opposing electrodes each having an exposed dielectric surface having a thickness of from about 0.1 to about 10.0 mm and a dielectric constant of from about 2.0 to about 200 relative to vacuum; and a dielectric strength sufficient to withstand applied voltage for forming therebetween a corona discharge gap comprising:

passing a reactant gas through said corona discharge gap:

periodically establishing a corona discharge between said gap by dissipating narrow pulse electrical power of high voltage in said gap with the width of said pulses being relatively small compared to the pulse period as well as being less than the gas ion transit time across said gap and greater than the electron transit time across said gap; and



removing gas ions from said gap before termination of each pulse period.

4,038,166

ELECTRODEPOSITABLE COMPOSITIONS

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 277,931, Aug. 4, 1972, Pat. No. 3,937,679, and a continuation-in-part of Ser. No. 158,063, June 29, 1971, abandoned, and Ser. No. 167,470, July 29, 1971, and Ser. No. 129,267, March 29, 1971, abandoned, and Ser. No. 100,825, Dec. 22, 1970, abandoned, and Ser. No. 100,834, Dec. 22, 1970, abandoned, said Ser. No. 158,063, is a division of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 167,470, is a continuation-in-part of Ser. No. 840,847, July 10, 1969, abandoned, and Ser. No. 840,848, July 10, 1969, abandoned, and a continuation-in-part of said Ser. No. 100,825, and said Ser. No. 100,834, and Ser. No. 210,141, Dec. 20, 1971, abandoned, and Ser. No. 217,278, Jan. 2, 1972, abandoned, and said Ser. No. 100,825, and said Ser. No. 100,834, is a continuation-in-part of Ser. No. 56,730, July 20, 1970, abandoned, which is a continuation-in-part of Ser. No. 772,366, Oct. 31, 1968, abandoned, said Ser. No. 129,267, is a continuation-in-part of said Ser. No. 100,825, which is a continuation-in-part of said Ser. No. 56,730. This application Nov. 13, 1975, Ser. No. 631,779
Int. Cl.^{2} C25D *15/00*
U.S. Cl. 204—181 **15 Claims**

1. A method of electrocoating an electrically conductive surface serving as a cathode in an electrical circuit comprising said cathode, and anode and an aqueous electrodepositable composition wherein the electrodepositable composition comprises an aqueous dispersion of

a. a quaternary onium salt group solubilized synthetic organic resin, wherein the onium group is selected from the group consisting of ammonium, sulfonium, and phosphonium, and

b. 2 to about 30 percent by weight based on total weight of (a) and (b) of an amine/aldehyde condensate.

4,038,167

METHOD OF FORMING A THIN FILM CAPACITOR

Peter L. Young, Horseheads, N.Y., assignor to Corning Glass Works, Corning, N.Y.

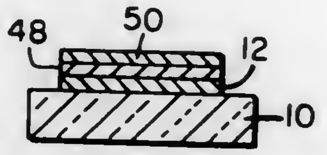
Filed Feb. 9, 1976, Ser. No. 656,527
Int. Cl.^{2} C23C *15/00;* **H01G** *4/10*
U.S. Cl. 204—192 D **10 Claims**

1. A method of forming a capacitor comprising the sequential steps of

providing a dielectric substrate,

applying to said dielectric substrate a first electrically conductive non-tantalum film to form a first capacitor electrode, disposing said substrate and conductive film within a vacuum environment containing an oxygen-nitrogen-inert gas mixture,

r-f sputtering a film of tantalum oxide of desired thickness over said conductive film within said vacuum environment, said tantalum oxide being sputtered from a tantalum oxide target,



cooling said dielectric substrate and conductive film while said film of tantalum oxide is being sputtered thereon, and thereafter

applying a second electrically conductive non-tantalum film over said film of tantalum oxide to form a counter capacitor electrode.

10. A thin film capacitor formed by the method of claim **1.**

4,038,168

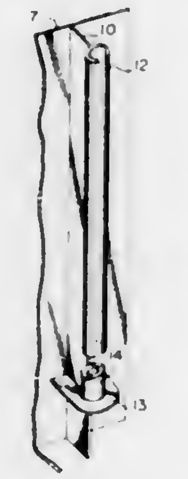
GALVANIC ANODE TYPE CATHODIC PROTECTION APPARATUS

Tadamasa Higuchi, Sayama; Morihiko Kuwa, Ageo, and Hiroshi Saito, Sakado, all of Japan, assignors to Nakagawa Corrosion Protecting Co., Ltd., Tokyo, Japan

Filed Oct. 29, 1975, Ser. No. 626,821

Int. Cl.^{2} C23F *13/00*

U.S. Cl. 204—197 **13 Claims**



1. A galvanic anode type cathodic protection apparatus, wherein a hollow rod having a lengthwise streak of continuous opening is installed as the guide on a part of a structural member, a single sacrificial anode or a continuity of at least 2 sacrificial anodes each having a core and a fitting attached to said core and supported by said guide in a manner as to be free from slipping out of said opening and a stopping plate provided at one end of the guide having a holder holding one end of the core or the fitting in the case of a single anode, or one end of the core or the fitting at one extremity of the continuity of anodes in the case of more than one anode.

4,038,169

INDEXING SYSTEM

Curtis N. Lovejoy, Walpole; Leo N. Kosowsky, Sharon, and Paul C. Holte, Canton, all of Mass., assignors to National Plastics & Plating Supply, Terryville, Conn.

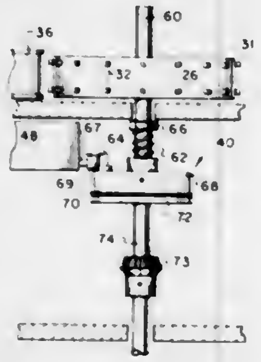
Filed Feb. 18, 1975, Ser. No. 550,348

Int. Cl.^{2} C25D *5/02, 17/00*

U.S. Cl. 204—202 **3 Claims**

1. In apparatus for electroplating pre-selected portions of a continuous metallic strip and of the type comprising means to intermittently advance said strip a precise distance-through an electroplating station between electroplating sequential portions thereof, the improvement wherein said means to achieve said intermittent advance comprise

- A. an indexing wheel carrying a plurality of projections thereon adapted to engage a mating series of holes in said strip to be electroplated, means for intermittently driving said wheel comprising
    - 1. a continuously driven friction clutch means
    - 2. means to engage said driven clutch with said indexing wheel at the end of each electroplating cycle,



    - 3. means to disengage said clutch after a single predetermined distance of travel of said indexing wheel and
- B. a constant tension wheel carrying a plurality of projections also adapted to engage a mating series of holes in said strip, and a constant-tension drag clutch means adapted to maintain a predetermined constant tension on said constant-tension wheel during the advancement thereof,
- C. and wherein said indexing wheel and said tension wheel are positioned on opposite sides of said electroplating station.

4,038,170

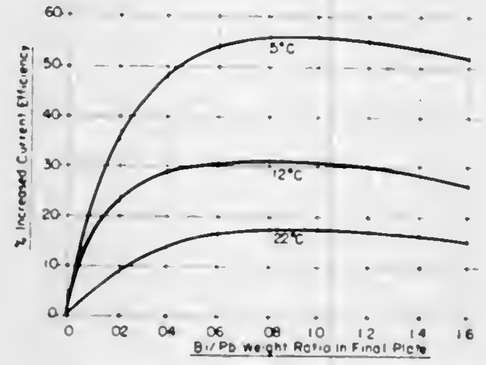
ANODE CONTAINING LEAD DIOXIDE DEPOSIT AND PROCESS OF PRODUCTION

Raymond C. Rhees, 147 Ivy, Henderson, Nev. 89015, and Bruce B. Halker, 657 6th St., Boulder City, Nev. 89005

Filed Mar. 1, 1976, Ser. No. 662,632

Int. Cl.^{2} C25B *1/34, 1/26, 1/30, 11/06*

U.S. Cl. 204—290 R **9 Claims**



1. An anode comprising a substrate having a continuous adherent deposit of lead dioxide containing bismuth in an amount sufficient to provide a ratio of bismuth to lead in the deposit of at least about 1:10^2 and being sufficient to increase the current efficiency of the anode at temperature of use below 25° C, and/or to decrease lead loss from the anode surface.

4,038,171

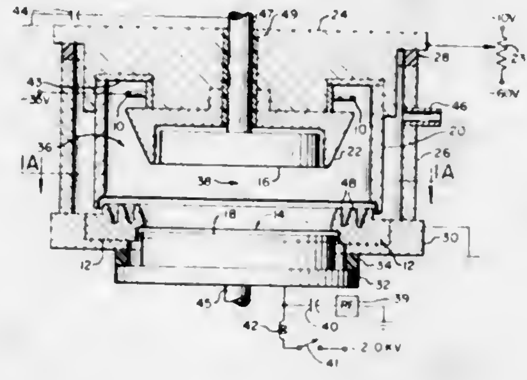
SUPPORTED PLASMA SPUTTERING APPARATUS FOR HIGH DEPOSITION RATE OVER LARGE AREA

Ronald W. Moss; Edwin D. McClanahan, Jr., and Nils Laegreid, all of Richland, Wash., assignors to Battelle Memorial Institute, Columbus, Ohio

Filed Mar. 31, 1976, Ser. No. 672,402

Int. Cl.^{2} C23C *15/00*

U.S. Cl. 204—298 **15 Claims**



1. Sputtering apparatus comprising:

cathode means for emitting electrons;

annular anode means spaced from the cathode means by an electron discharge region through which said electrons pass from said cathode to said anode;

target means for supporting target material to be sputtered, said target means being surrounded by said annular anode and separate therefrom;

substrate support means separate from said anode and spaced from said target means by a sputter region through which sputtered material passes from said target to said substrate;

means for providing sputtering gas in the said electron discharge region and said sputter region which is ionized by said electrons to produce a plasma including positive ions of said sputtering gas which bombard said target to sputter the material thereon from said target onto said substrate;

plasma shaping electrode means surrounding said target and said substrate, said plasma shaping electrode being separate from said anode and electrically insulated therefrom; and

means for applying an electrical potential to said plasma shaping electrode means different than the potential applied to said anode to produce electrical fields in the electron discharge region and the sputter region, said electrical fields repelling electrons from said shaping electrode to said anode and shaping said plasma to cause said positive ions to be distributed more uniformly over a large target area.

15. Sputtering apparatus comprising:

cathode means for emitting electrons;

anode means spaced from said cathode so that said electrons bombard said anode;

substrate means;

main target means for sputtering material from said target means onto said substrate means when said target means is bombarded with positive ions of sputtering gas; and

auxiliary target means separate from said main target and positioned adjacent to said anode, for sputtering electrically conductive material from said auxiliary target onto said anode to compensate for any insulative material sputtered onto said anode from said main target and to maintain a conductive surface on said anode.

4,038,172

METHOD FOR REMOVAL OF OXYGEN FROM OXYGEN-CONTAINING COMPOUNDS

Shigeru Ueda; Shinichi Yokoyama; Yoshinori Nakata; Yoshihisa Hasegawa; Yosuke Maekawa, and Yuji Yoshida, all of Sapporo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan

Filed Oct. 9, 1975, Ser. No. 621,134

Claims priority, application Japan, Oct. 16, 1974, 49-119718

Int. Cl.^{2} C10G *1/08*

U.S. Cl. 208—10 **1 Claim**

1. A method for the treatment of an oxygen-containing compound selected from the group consisting of bituminous coal, sub-bituminous coal, brown coal, lignite, grass peat, wood, paper, lignin substances and petrolic asphalts, which comprises mixing said oxygen-containing compound with 10 to 100% by weight of water and 1 to 10% by weight of a red clay catalyst composition comprised, by weight, of 18 - 25% Al_2O_3, 15 - 20% SiO_2, 30 - 40% Fe_2O_3, 2 -8% TiO_2 and approximately 8 - 12% ignition loss, based on the composition, the percentages of water and catalyst being respectively based on said compound, heating the resultant mixture at a temperature in the range of from 250 to 500°C and simultaneously compressing the mixture with carbon monoxide to 1 to 300 atmospheres for one to 100 minutes and thereby removing the oxygen from said compound and at the same time converting said compound into an organic substance of a lower molecular weight.

4,038,173

HYDROCRACKING PROCESS USING PLATINUM/ALUMINA CATALYST ACTIVATED AND COOLED WITH HCl

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 664,217, March 5, 1976, Pat. No. 4,003,956, Division of Ser. No. 458,700, April 8, 1974, Pat. No. 3,970,589. This application Sept. 29, 1976, Ser. No. 727,921

Int. Cl.^{2} C10G *13/08;* **B01J** *27/06*

U.S. Cl. 208—112 **10 Claims**

1. A hydrocarbon conversion process which comprises contacting a hydrocarbon under hydrocracking conditions with an active alumina supported platinum catalyst prepared by contacting said catalyst at a temperature within the range of 600°-1500° F with a dry activating gas comprising 30 to 100 volume percent anhydrous hydrogen chloride for at least 0.1 hour; and thereafter cooling the thus-activated catalyst for a time of at least 0.5 hour in the presence of a dry carrier gas containing 1 to 20 volume percent anhydrous hydrogen chloride.

4,038,174

HYDROCARBON CONVERSION USING GROUP VIII METAL/ALUMINA CATALYSTS ACTIVATED WITH HALOSILANE

John W. Myers, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation-in-part of Ser. No. 546,819, Feb. 3, 1975, Pat. No. 3,993,594. This application Sept. 7, 1976, Ser. No. 720,522

Int. Cl.^{2} C10G *13/08;* **C07C** *5/24*

U.S. Cl. 208—112 **16 Claims**

1. A hydrocarbon skeletal isomerization process which comprises:

- a. contacting an isomerizable hydrocarbon selected from the group consisting of acyclic paraffin and naphthene under isomerization conditions with a catalyst produced by (1) heating an active alumina-supported Pt, Ir, Os, Ru, Rh, or Pd metal catalyst to a temperature of greater than 1200° F in an atmosphere selected from the group consisting of nitrogen, hydrogen, and mixtures of nitrogen and hydrogen; (2) holding said heated catalyst in said atmosphere at said temperature of greater than 1200° F for at least ; 10

minutes (3) contacting said catalyst at said temperature of greater than 1200° F with a dry activating gas comprising a halosilane selected from the group consisting of chlorosilanes and bromosilanes for a time sufficient to incorporate a halide content to the catalyst and to increase the activity of the catalyst, said contacting step (3) being carried out in the absence of air; (4) cooling said halosilane contacted catalyst of step (3), and

b. recovering an isomerized hydrocarbon from step (a).

13. A hydrocarbon hydrocracking process which comprises:

a. contacting a hydrocarbon under hydrocracking conditions with an active alumina-supported Pt, Ir, Os, Ru, Rh, or Pd metal catalyst activated by (1) heating said catalyst to a temperature of greater than 1200° F in an atmosphere selected from the group consisting of nitrogen, hydrogen, and mixtures of nitrogen and hydrogen; (2) holding said heated catalyst in said atmosphere at said temperature of greater than 1200° F for at least 10 minutes; (3) contacting said heated catalyst of step (2) at said temperature of greater than 1200° F with a dry activating gas comprising a halosilane selected from the group consisting of chlorosilanes and bromosilanes for a time sufficient to incorporate a halide content to the catalyst and to increase the activity of the catalyst, said contacting step (3) being carried out in the absence of air; (4) cooling said halosilane contacted catalyst of step (3), and

b. recovering a hydrocracked product from step (a).

4,038,175

SUPPORTED METAL CATALYST, METHODS OF MAKING SAME, AND PROCESSING USING SAME

Madan Mohan Bhasin, Charleston, W. Va., assignor to Union Carbide Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 508,721, Sept. 23, 1974, abandoned, Ser. No. 508,709, Sept. 23, 1974, abandoned, and Ser. No. 488,497, July 15, 1974, abandoned. This application Dec. 31, 1975, Ser. No. 645,715

Int. Cl.^{2} C10G *23/04*

U.S. Cl. 208—144 **11 Claims**

1. In a process for the hydrogenation of dripolene in which dripolenes are hydrogenated in the presence of a hydrogenation catalyst, the improvement which comprises utilizing as the catalyst a composition consisting essentially of palladium or platinum metal dispersed on the surface of an alpha-alumina support, said support having the following characteristics:

a. a porosity of about 0.1 cubic centimeter to about 0.8 cubic centimeter per gram of support;

b. a surface area of about 0.1 square meter of about 10 square meters per gram of support; and

c. an average pore size of about 0.05 micron to about 100 microns, a major proportion of the pores having a pore size in the range of about 0.05 micron to about 10 microns

wherein the amount of palladium dispersed on the surface of the support is about 0.01 percent to about 1.0 percent by weight of metal based on the weight of the catalyst composition, and the amount of platinum dispersed on the surface of the support is about 0.02 percent to about 2.0 percent by weight of metal based on the weight of the catalyst composition; and

wherein at least about 7.5 percent of the total metal atoms dispersed on the surface of the support are exposed.

4,038,176

OIL SOLUBLE POLYMERIC FLOCCULANTS

Gerry K. Noren, Hoffman Estates, Ill., and Richard C. Diehl, Oakdale, Pa., assignors to Calgon Corporation, Pittsburgh, Pa.

Filed Mar. 22, 1976, Ser. No. 668,894

Int. Cl.^{2} C10M *11/00*

U.S. Cl. 208—180 **6 Claims**

1. A method of reclaiming waste oils which comprises adding at least 0.01 percent, based on the weight of waste oil, of an oil soluble polymer to the waste oil in order to flocculate the colloidal suspensions contained in said oil, said oil soluble polymer having a molecular weight of a 1 least 10,000 and being selected from the group consisting of polymers of fatty diallyl quaternary ammonium salts and fatty acid salts of polymers of tertiary amino substituted acrylamides.

4,038,177

OIL HYDRODESULFURIZATION WITH ALUMINA COMPOSITE CATALYST UTILIZING ALUMINATE AND DICARBOXYLIC ACID IN ITS PREPARATION

Paul E. Eberly, Jr., Baton Rouge, La., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed July 19, 1976, Ser. No. 706,217

Int. Cl.^{2} C07G *23/02*

U.S. Cl. 208—216 **7 Claims**

1. In a process of hydrotreating a sulfurcontaining heavy hydrocarbon oil reduce the sulfur content thereof which comprises contacting said oil as hydrodesulfurization conditions with hydrogen and with a catalyst comprising aluminia and hydrogenation components composited with said alumina, said hydrogenation components are selected from the group consisting of at least one elemental metal, metal oxide and metal sulfide of a Group VI-B element of the Periodic Table of Elements and at least one elemental metal, metal oxide and metal sulfide of a Group VIII element of the Periodic Table of Elements the improvement which comprises said alumina having been prepared by the step which comprises reacting a solution of an aluminate selected from the group consisting of alkali metal aluminates and ammonium aluminate with an aqueous solution of an aliphatic dicarboxylic acid to precipitate a hydrous aluminum oxide.

4,038,178

APPARATUS FOR CONTROLLING DISCHARGE OF CLASSIFIED SAND FROM A HYDRAULIC CLASSIFIER

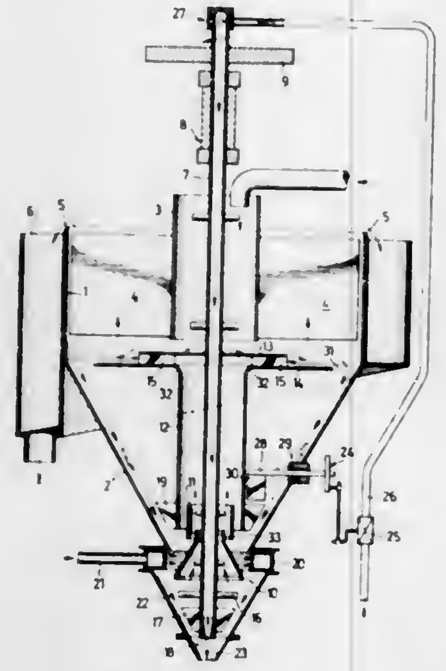
Risto Tapani Otakallio 1A 02150 Otaniemi, Finland

Filed Nov. 5, 1975, Ser. No. 629,067

Claims priority, application Finland, Nov. 19, 1974, 3339/74

Int. Cl.^{2} B03B *5/66*

U.S. Cl. 209—161 **2 Claims**



1. An hydraulic classifier including means for discharging a particulate product comprising:

a. a vessel tapering in a downward direction and having means for discharging fines at the top and a bottom formed with an aperture;

b. a rotor in said vessel including
  1. a shaft having an upright axis,
  2. drive means for rotating said shaft about said axis,

  3. an upwardly tapering, hollow member mounted on said shaft and upwardly spaced from said aperture, said member having an annular lower orifice and an annular upper orifice smaller than said lower orifice,
  4. a flow tube mounted on said shaft for receiving liquid upwardly discharged from said upper orifice for upward flow,
  5. agitating means projecting radially outward beyond said flow tube above said hollow member, and
  6. means on said shaft below said hollow member for forcing cleaned particular product through said aperture;

c. washing means on said vessel for directing a liquid washing medium radially inward against said hollow member intermediate said orifices thereof, whereby said washing medium is deflected into said flow tube and draws additional liquid from said upper orifice,
  1. said flow tube, said hollow member, and the lowermost portion of said shaft bounding an annular path for downward movement of a suspension of particulate material in liquid in a radially inward direction, said path being bounded by said vessel in a radially outward direction,
  2. said agitating means projecting into said path; and

d. feeding means for feeding particulate material to a portion of said vessel above said flow tube.

4,038,179

HYDROCHLORIC ACID FLOTATION PROCESS FOR SEPARATING FELDSPAR FROM SILICEOUS SAND

Akira Katayanagi, No. 11-65, 3-chome, Sainokami, Yahatanishi, Kitakyushu, Japan (806)

Filed June 2, 1975, Ser. No. 582,828

The portion of the term of this patent subsequent to Oct. 29, 1991, has been disclaimed.

Int. Cl.^{2} B03D *1/02*

U.S. Cl. 209—166 **9 Claims**

1. A hydrochloric acid froth flotation process for separating feldspar from an ore containing feldspar and siliceous sand, which comprises finely dividing said ore into fine particles, suspending said particles in an aqueous solution of hydrochloric acid, adding to said suspension a flotation reagent composed of a petroleum sulfonated and an N-higher alkylalkylenediamine salt alone or in mixture with a higher alkyiamine salt, blowing air into said suspension to produce froth, and thereafter recovering fedlspar from said froth.

4,038,180

PROCESS OF DEWATERING SEWAGE SLUDGE

Norwood K. Talbert, Manlius, N.Y., assignor to Agway, Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 526,134, Nov. 22, 1974, abandoned. This application Jan. 9, 1976, Ser. No. 647,739

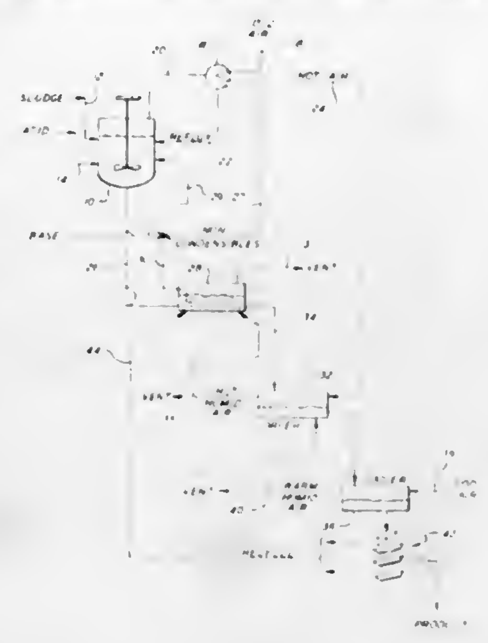
Int. Cl.^{2} C02C *3/00*

U.S. Cl. 210—10 **10 Claims**

1. A process of dewatering noncompressible sewage sludge initially containing a known percentage by weight of water but no gaseous air phase to form an end product containing a predetermined percentage by weight of sludge solids, said process consisting essentially of:

a. physically mixing a quantity of sewage sludge having a water content sufficient to render it non-compressible with a quantity of mineral acid or anhydride thereof sufficient to extract substantially all of the water initially contained in the sludge to form a mixture of sludge solids and water diluted acid; and

b. placing in a reaction vessel said mixture and a base of a type and quantity sufficient to react with the acid or anhydride contained in said mixture to generate a reactive heat sufficient to remove by evaporation all of the water remaining in said mixture required to allow formation, without filtration, of a granular product comprising sludge solids and a salt.



4,038,181

PROCESS FOR DEWATERING SEWAGE SLUDGE

Norwood K. Talbert, Manlius, N.Y., assignor to Agway, Inc., Syracuse, N.Y.

Continuation-in-part of Ser. No. 526,134, Nov. 22, 1974, abandoned. This application Mar. 23, 1976, Ser. No. 669,609

Int. Cl.^{2} C02C *3/00*

U.S. Cl. 210—10 **6 Claims**

1. A process for dewatering previously unprocessed sewage sludge initially containing at least 75% water comprising:

a. contacting a quantity of unprocessed sludge with at least as great a quantity, by weight, of a chemical selected from the group consisting of urea and the common salts of ammonium and potassium;

b. allowing said sludge and chemical to remain in contact for a time sufficient for substantially all of said chemical to dissolve in water extracted thereby from the sludge to produce separation of said sludge and chemical into a liquid phase consisting of said chemical dissolved in water, and a solid or semi-solid phase of sludge solids with any remaining water; and

c. physically separating said phases by decantation of said liquid phase.

4,038,182

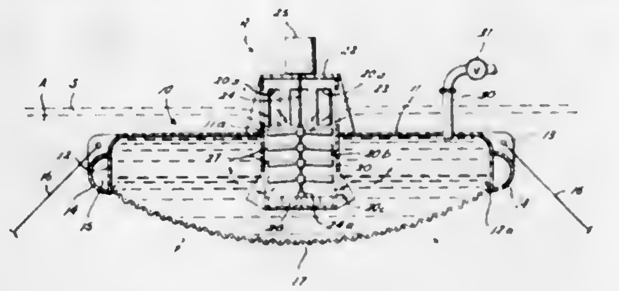
OIL SPILL RECOVERY METHOD AND APPARATUS

Richard Stuart Jenkins, 5821 Dolores, Houston, Tex. 77027

Continuation of Ser. No. 439,219, Feb. 4, 1974, abandoned. This application Jan. 8, 1976, Ser. No. 647,505

Int. Cl.^{2} E02B *15/04*

U.S. Cl. 210—23 R **25 Claims**



1. A method for recovering an immiscible oil substance spread as in oil film over the surface of a water mass, comprising the steps of:

forming a vortex adjacent the surface of the water mass having an oily film substance disposed on the surface of the water mass with a tubular flow conductor means for attracting both the oily film substance and water in the vicinity of the vortex to flow into the tubular flow conductor means;

flowing all the attracted water and oil film substance radially outward from the tubular flow conductor means into a quiescent zone formed by a receiver means located below the surface of the water mass and adjacent the bottom of and surrounding the tubular flow conductor means;

separating the oily film substance and water in the quiescent zone formed by the receiver means by allowing the oily film substance to accumulate in the uppermost portion of the receiver means;

recovering the separated oily film substance from the quiescent zone of the receiver means as desired; and

returning the separated water from the quiescent zone of the receiver means to the water mass as desired.

4,038,183

FLOCCULATION PROCESS

John C. Davidtz, East Amwell Township, Hunterdon County, N.J., assignor to Mobil Oil Corporation, New York, N.Y.

Division of Ser. No. 633,521, Nov. 19, 1975, Pat. No. 3,996,696, which is a division of Ser. No. 443,540, Feb. 19, 1974, Pat. No. 3,956,119. This application Aug. 24, 1976, Ser. No. 717,306

Int. Cl.^{2} B01D *21/01*

U.S. Cl. 210—47 **4 Claims**

1. A method of reducing the amount of above ground storage space needed to store fluid phosphate slimes waste obtained in the hydraulic mining of phosphate mineral, whereby a portion of said fluid waste having a solids content of at least 2 weight percent is treated by:

admixing the fluid waste with fertile topsoil to form about a 30 weight percent slurry of topsoil, said topsoil providing at least 50 parts per million, by weight of the total mixture of extractable organic flocculating agents; transporting and depositing said slurry in a settling area, whereby a sediment, that contains slimes solids, is formed; and separating and recovering water that has less than 2 weight percent solids from said settling area.

4,038,184

METHOD OF PROCESSING WASTE ON SHIPS AND THE LIKE AND ARRANGEMENT FOR CARRYING OUT THE METHOD

Sven Elis Ake Svanteson, Bromma, Sweden, assignor to Aktiebolaget Electrolux, Stockholm, Sweden

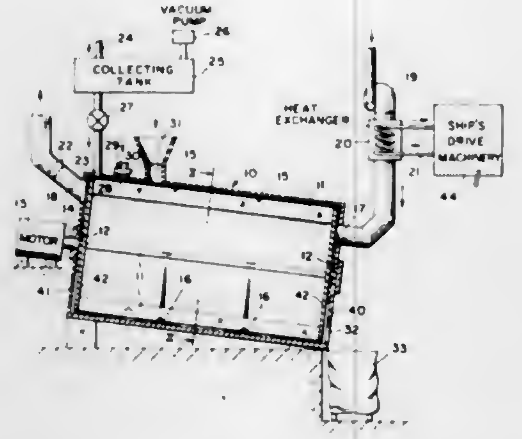
Filed Nov. 13, 1975, Ser. No. 631,538

Claims priority, application Sweden, Nov. 25, 1974, 7414795; Feb. 21, 1975, 7501974

Int. Cl.^{2} B01D *1/14*

U.S. Cl. 210—59 **11 Claims**

7. A method for processing waste having one part in the form of solid waste and another separate part in the form of black water collected in a tank from a reduced-flush toilet; said method comprising introducing said solid waste into a treatment zone, said treatment zone comprising a stationary drum having a substantially horizontal axis and a rotatable agitator, said agitator comprising a plurality of elongated blades having notches, rotatably mounted to move in said drum adjacent to the inner surface thereabout the longitudinal axis of said drum, the bottom of said drum being provided with circumferentially extending ridges directed radially inward, and said notches being axially aligned with said ridges, disintegrating said solid waste and raising said solid waste and dropping said solid waste by gravity in said treatment zone by rotating said blades, heating said solid waste by passing a flow of hot air through said dropping disintegrated waste in said treatment zone said flow being introduced into the upper portion of one end of said stationary drum and being withdrawn from the upper portion of the other end of said stationary drum, mixing said solid disintegrated waste with said black water in said treatment zone whereby said solid disintegrated waste serves as a carrier and an exposure surface for the black water in said hot air flow, continuing to rotate said blades and flow said hot air through said dropping solid disintegrated waste mixed with black water until substantially all waste in said treatment zone is a dry product, and removing said dry product from the bottom of said stationary drum.



4,038,185

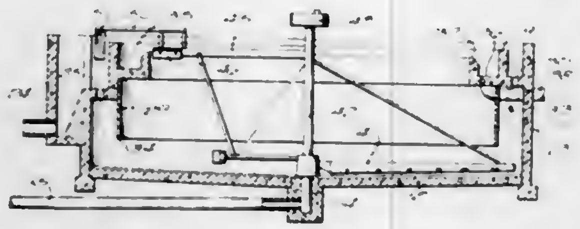
SCUM CONTROL SYSTEM FOR PERIPHERAL FEED CHANNEL OF SEDIMENTATION TANK

Kenneth J. Kline, Pewaukee, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Sept. 8, 1976, Ser. No. 721,258

Int. Cl.^{2} B01D *21/24*

U.S. Cl. 210—83 **8 Claims**



1. In a sedimentation tank of the type having a peripheral feed channel provided within a series of lower ports opening into the tank and an effluent weir which maintains a given level of the liquid in the tank such that the level of the feed in the channel varies with the rate of flow in the channel and through the tank, a riser pipe having support means securing the pipe in the channel for discharge through a selected port in the terminal portion of the feed channel where scum collects following a period of lower flow rates, the upper end of the pipe being vertically adjustable to an elevation which corresponds with that of the scum following such periods whereby such scum is periodically removed on a daily basis.

4,038,186

CARBON DECANTER

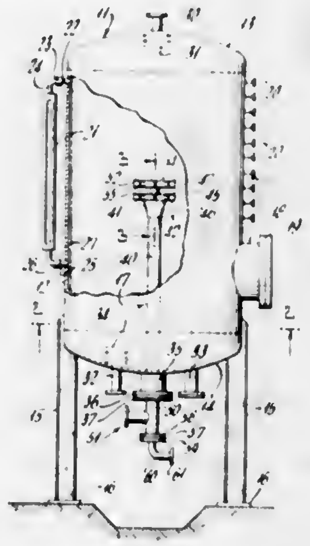
Clyde E. Potter, Bellflower, and George N. Richter, San Marino, both of Calif., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 621,704, Oct. 14, 1975. This application Jan. 19, 1976, Ser. No. 650,385

Int. Cl.^{2} B01D *11/02, 21/24*

U.S. Cl. 210—92 **9 Claims**

1. An apparatus for continuously separating by gravity a liquid feed stream comprising a mixture of particulate carbon, water and liquid organic extractant into a dispersion of particulate carbon-liquid organic extractant and clarified water, which dispersion floats on said clarified water at the interface level comprising: a closed vessel having a substantially circular horizontal cross-section, an exit port in the upper portion of said vessel through which said liquid dispersion of particulate carbon and extractant is discharged, an exit port in the lower portion of said vessel through which said clarified water is simultaneously dicharged, outer conduit means entering said vessel and passing along the vertical axis, inner conduit means connected to a source of liquid organic extractant and concentric with said outer conduit and spaced therefrom to provide an annular passage which is connected to a source of said liquid feed stream and through which said liquid feed stream is introduced into said vessel, a horizontally disposed first radial nozzle in communication with said annular passage and terminating said outer conduit means within said vessel along the vertical axis about ¼ to ¾ of the height of said vessel for distributing said liquid feed stream below said interface level, and a horizontally disposed second radial nozzle in communication with and terminating said inner conduit at a position above that of said first radial nozzle for distributing said stream of liquid organic extractant.



4,038,187

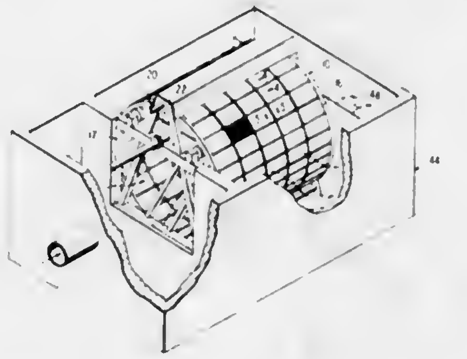
MICROSCREEN DRUM

Edward P. Saffran, Mukwonago, Wis., assignor to Envirex Inc., Waukesha, Wis.

Filed Feb. 3, 1976, Ser. No. 654,811

Int. Cl.^{2} B01D *33/06*

U.S. Cl. 210—108 **8 Claims**



1. In apparatus for screening a water supply or treated waste-water comprising a drum including 1) a cylindrical microscreen, 2) a rigid frame supporting said microscreen, and 3) end means for introduction of the water to be screened into the interior of said drum, a tank surrounding said drum to receive the screened water from said drum and including means for maintaining a selected level of screened water within said tank, bearing means rotatably supporting said drum on a horizontal axis below said water level, drive means rotating said drum at a selected speed of rotation, said microscreen having exposed upward and downward moving sections above said water level and an uppermost backwash section, a backwash water supply system having a discharge means directly over said backwash section and a backwash receiving trough within said drum immediately beneath said backwash section, the improvement wherein said rigid frame includes radially outwardly projecting intersecting walls forming a grid pattern overlaying and integrally connected to said microscreen, the cells of the grid pattern having a surface area of between one and one half and three and one half times the surface area of the microscreen underlying each cell, whereby the cells of said upward moving section entrain a substantial volume of screened water which flows through said microscreen by gravity and provides supplemental backwashing of said microscreen which allows the apparatus to operate at low flows without operation of said backwash water supply system.

4,038,188

METHOD FOR PREVENTING EUTECTIC CAKING OF SODIUM CHLORIDE AT HIGH TEMPERATURES

James A. May, Sr.; Gerard C. Sinke, and Martin A. Langhorst, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 14, 1975, Ser. No. 558,402

Int. Cl.^{2} B01D *57/00*

U.S. Cl. 210—20 **21 Claims**

14. In a process for disposal of aqueous sodium chloride brine streams containing organic matter, of the type wherein the organic matter is oxidized in a fluidized bed reactor having a bed containing granular sodium chloride held in a fluidized state by an upflowing stream of gases from the conbustion of sulfur-containing fuels, the improvement which comprises: maintaining the bed of sodium chloride substantially free from sodium sulfate and sodium carbonate at temperatures within the range of from about 610° C to at least about 700° C by providing in the reactor an effective amount of at least one compound comprising calcium ion to react with sodium sulfate and sodium carbonate present and with additional components in the stream of gases which would otherwise react to form either of sodium sulfate or sodium carbonate.

4,038,189

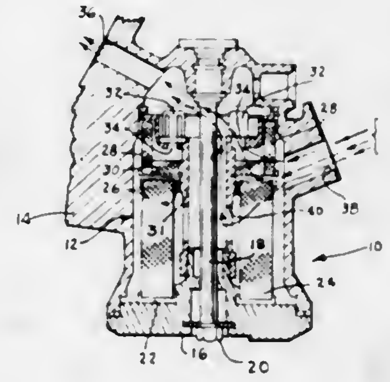
FLUID DUAL FILTER

James R. Dison, and George A. Thomson, both of Indianapolis, Ind., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 16, 1976, Ser. No. 649,764

Int. Cl.^{2} B01D *35/14*

U.S. Cl. 210—90 **1 Claim**



1. A fluid dual filter comprising a housing, said housing comprising a body and a base plate, said body and said base plate being removably secured together by a central tie bolt and nut, said body having a fluid inlet and a fluid outlet, said fluid outlet being positioned vertically above said fluid inlet, a primary filter means in the form of a fine mesh filter element being removably mounted within said body on said base plate, a secondary filter means in the form of a coarse mesh filter element mounted within said body, said secondary filter ele-

ment being mounted vertically above said primary filter element to prevent contamination of said secondary filter element by contaminants trapped on the surface of said primary filter element, said primary and secondary filter means being located between said inlet and said outlet, a plurality of bypass valves being located within said body between said secondary filter means and said outlet, said valves being constructed and arranged to prevent fluid from passing through said coarse mesh filter element until a predetermined pressure differential between the inlet and the outlet is obtained and means for sensing fluid pressure differentials between said inlet and said outlet and activating a first warning indicator at a predetermined pressure differential and activating a second warning indicator at pressure differentials greater than said predetermined pressure differential.

4,038,190

FLUID FRACTIONATION APPARATUS AND METHOD OF MANUFACTURING THE SAME

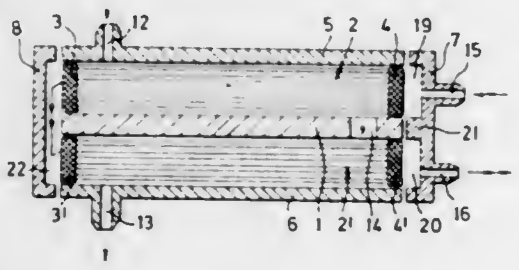
Jacques Baudet, Roussillon; Michel Rochet, Bron; Michel Salmon, Mions, and Bernard Vogt, Caluire, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Filed May 29, 1974, Ser. No. 474,426

Claims priority, application France, May 30, 1973, 73.19732

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 B **12 Claims**



1. A method for the continuous preparation of hollow fiber apparatus in which the fibers rest in a groove in a core, said method comprising the steps of:

a. fixedly positioning a core having a groove formed therein:

b. feeding into the groove of the core at least one bundle of hollow fibers fed from a plurality of bobbins, and maintaining the said bundle at its ends by gripping means, while moving the gripping means parallel to the axis of the groove with the bundle substantially from one end to the other of the core;

c. stopping the movement of the bundle gripping means when they are slightly past one end of the core after having entrained the bundle along the full length of the groove;

d. maintaining by other means the gripping of the bundle adjacent the other end of the groove;

e. forming fluidtight walls by joining the hollow fibers to themselves and to the ends of the core;

f. sectioning the hollow fibers between each end of the core and the means for clamping the bundle close to its ends;

g. loosening the ends of the bundle, by loosening the clamping means towards the end of the core opposite to that where the bundle has been fed to the groove;

h. lifting the core, the groove of which is filled with hollow fibers; and

i. repeating the steps (*a*) to (*h*) successively.

4,038,191

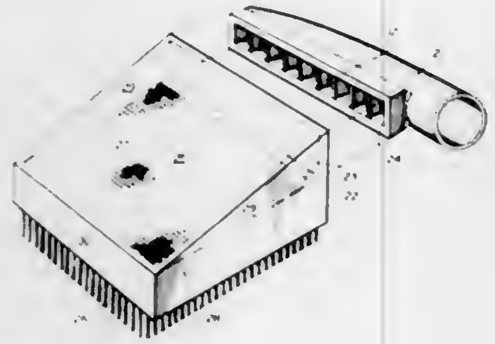
MANIFOLD FOR ULTRA FILTRATION MACHINE

Harold R. Davis; Christopher A. Brockley; Geoffrey V. Parkinson, all c/o Mechanical Engineering Dept., University of British Columbia, and John D. E. Price, c/o Faculty of Medicine, University of British Columbia all of Vancouver, British Columbia, Canada

Filed Oct. 14, 1975, Ser. No. 622,418

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 B **16 Claims**



1. A diffuser providing uniform diversion and diffusion with laminar flow, of liquid from a liquid supply tube having a given cross-section area to a liquid treatment face of a device in which said treatment face is of larger surface area than said supply tube;

said diffuser comprising a first diffuser section of tube continuous with the supply tube, flow turning vanes, and a second diffuser section leading to the liquid treatment face,

said first diffuser section having a cross-section which reduces smoothly and progressively as the liquid flow passage proceeds from an inlet of the first diffuser section to an end thereof, said first diffuser section being open on the side in a direction away from the curvature and supplying liquid in a direction perpendicular to the direction of liquid flow in the supply tube, to an inlet of the second diffuser section,

said second diffuser section comprising a compartment having a liquid flow space, the height of said compartment perpendicular to the treatment face diminishing continuously from an inlet of said diffuser to the distal side of the second diffuser section,

wherein a multiplicity of said flow turning vanes are associated with the interface between the first diffuser section tube and the second diffuser section compartment.

4,038,192

DEVICE FOR EXCHANGE BETWEEN FLUIDS SUITABLE FOR TREATMENT OF BLOOD

Juan Ricardo Serur, Brookline, Mass., assignor to International Biomedical Laboratories, Inc., Boston, Mass.

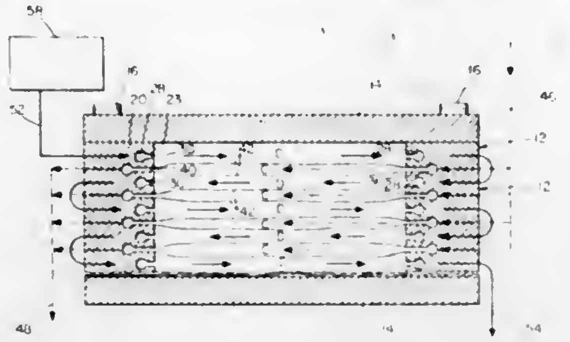
Continuation-in-part of Ser. No. 421,420, Dec. 3, 1973, Pat. No. 3,894,954. This application July 14, 1975, Ser. No. 595,846

The portion of the term of this patent subsequent to July 15, 1992, has been disclaimed.

Int. Cl.² B01D *31/00*

U.S. Cl. 210—321 B **12 Claims**

1. In a device for treating blood comprising blood flow paths defined by semi-permeable membrane walls and treatment fluid paths exposing the blood to the treatment fluid across said membrane walls, the improvement wherein the blood flow paths comprise a three dimensional array of narrow, elongated adjacent channels each defined by a pair of opposed membrane panels supported at channel edges by linear support structure, and said treatment fluid paths extend through the array having opposite sides along their length defined by and exposed to panels of different blood channels of said array.



4,038,193

METHOD AND DEVICE FOR SEPARATING LIQUIDS AND SOLIDS FROM A MIXTURE

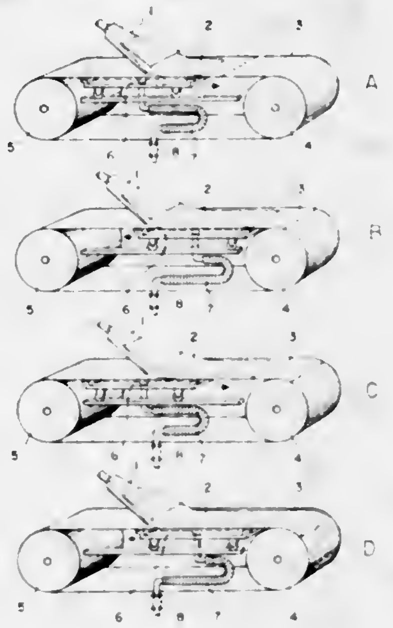
Jacob van Oosten, Maarssen, Netherlands, assignor to De Gooijer's Patent B.V., Rotterdam, Netherlands

Filed Nov. 24, 1972, Ser. No. 309,286

Claims priority, application Netherlands, Aug. 1, 1972, 7210541

Int. Cl.² B01D *33/04*

U.S. Cl. 210—400 **3 Claims**



1. A device for separating liquids and solid substances from a mixture, comprising:

a movable, endless filter belt driven by a driving roller and an adjustable driving gear;

a mixture supply nozzle positioned above the belt;

a suction box subjacent the belt and adapted to move parallel to the belt and communicating through a flexible duct with a vacuum device;

means for connecting the suction box alternately with the vacuum device or with atmosphere;

a pneumatic cylinder for displacing the suction box parallel to the belt, the pneumatic cylinder being coupled to the driving gear to selectively move the suction box and belt toghether and separately return the suction box;

the suction box comprising a plurality of relatively separate elements, each of the separate elements communicating through a separate flexible duct with a separate suction means communicating with the vacuum device, each suction means having a filtrate outlet;

said device further provided with distribution nozzles arranged at intervals above the belt along the direction of movement of the belt, the distribution nozzles being optionally connected by distribution means to at least one of the filtrate outlets and a supply of at least one washing liquor, whereby the filtrate from each element is kept separate and said solid substances on the belt can be washed with filtrate from at least one filtrate outlet and with at least one washing liquor.

4,038,194

BLOOD FILTER UNIT

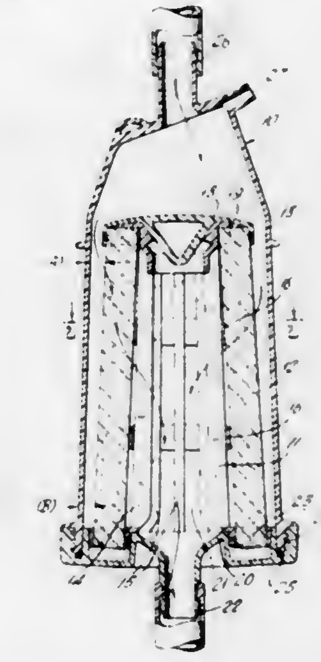
Alfred Robert Luccyk, Santa Paula; Herman Charles Mouwen, Ventura, both of Calif., and Steven Louis Weinberg, East Brunswick, N.J., assignors to Johnson & Johnson, New Brunswick, N.J. and Purolator, Inc., Del.

Continuation of Ser. No. 462,454, April 19, 1974, abandoned.

This application Jan. 6, 1976, Ser. No. 646,775

Int. Cl.² B01D *27/00. 35/00*

U.S. Cl. 210—436 **7 Claims**



1. A unit for filtering blood comprising an assembly for supporting a filter cartridge, a filter cartridge, and a housing for said assembly and cartridge, said housing having a tapered cylindrical form with the smaller diameter end of said housing having an inlet for the blood to be filtered and an air vent, said housing and said assembly being fixedly securable to each other, said assembly for supporting a filter cartridge comprising a permeable cylindrical core, a top cap attached to one end of the core to seal said end, a bottom member attached to the opposite end of the core and extending outwardly from the periphery of the core leaving the center of the core open to act as the filter outlet, a filter cartridge comprising filter media extending between said top cap and said bottom member and about the circumference of said core, said media being sealed to the top cap and the bottom member, said core and said media in contact only at discrete, intermittent areas spaced longitudinally and circumferencially about the core and the distance between the housing and the filter media being uniformly increased from bottom member to the top cap and the area of the internal opening of the filter media being steadily increased from the top cap to the bottom member, whereby the uniformity of filter media utilization is increased.

4,038,195

FIRE FIGHTING COMPOSITIONS

Peter Jordan Chiesa, Jr., Coatesville, Pa., assignor to Philadelphia Suburban Corporation, Bryn Mawr, Pa.

Continuation-in-part of Ser. No. 254,404, May 18, 1972, Pat. No. 3,849,315, Ser. No. 307,479, Nov. 17, 1972, abandoned, Ser. No. 369,584, June 13, 1973, Pat. No. 3,957,657, and Ser. No. 434,544, Jan. 18, 1974, abandoned, said Ser. No. 254,404, Ser. No. 307,479, and Ser. No. 369,584, each is a continuation-in-part of Ser. No. 131,763, April 6, 1971, abandoned. This application Nov. 19, 1974, Ser. No. 525,175

Int. Cl.^{2} A62D *1/00*

U.S. Cl. 252—3 **6 Claims**

1. In an aqueous foam type fire-fighting composition containing a surfactant with a fluorocarbon radical, which surfactant helps form an aqueous film over the surface of a burning hydrocarbon onto which the composition is applied, the improvement according to which (a) said surfactant is by itself unsuited for use with sea water, its hydrophile moiety is an aminocarboxylic acid structure linked to a perfluoroalkyl by a chain of 3 to 6 atoms, and it has a stable essentially linear structure which with the exception of the carboxyl contains not more than two branches each in the form of a substituent no larger than methyl, and (b) the composition is rendered suitable for foaming in sea water by at least one foamability-improving surfactant suitable for such use, at least 40% of the foamability-improving surfactant having a lyophilic hydrocarbyl group with from 6 to 10 carbons.

4,038,196

SOFTENING AGENT FOR WOVEN FABRICS

Yutaka Minegishi, Saitama, and Haruhiko Arai, Narashino, both of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Sept. 25, 1975, Ser. No. 616,621

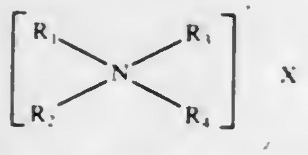
Claims priority, application Japan, Mar. 12, 1975, 50-29768

Int. Cl.^{2} D06M *11/04, 13/36, 13/46*

U.S. Cl. 252—8.8 **3 Claims**

1. A softening agent for woven fabrics consisting essentially of

A. from 3 to 20 weight percent of a quaternary ammonium salt having the formula



wherein R_1 and R_2 each is alkyl having 12 to 20 carbon atoms or β-hydroxyalkyl having 14 to 22 carbon atoms; R_3 and R_4 each is alkyl or hydroxyalkyl having 1 to 3 carbon atoms, benzyl or $—(C_2H_4O)_nH$, wherein n is an integer of from one to 3; and X is halogen or alkyl sulfate in which alkyl has from one to 3 carbon atoms;

B. from 0.2 to 5 weight percent of polyoxyethyleneoleyl ether containing an average of from 8 to 200 moles of ethylene oxide;

C. from 0.5 to 10 weight percent of urea, and

D. from 0.08 to 2 weight percent of a water-soluble ammonium salt selected from the group consisting of the ammonia, monoethanolamine, diethanolamine and triethanolamine salts of mineral acids and carboxylic acids having one to 3 carbon atoms, and

E. and the balance consists essentially of water, with the proviso that the weight ratios of A, B, C and D are as follows:

B/A = 0.06 to 0.7
C/A = 0.1 to 1.3, and
D/A = 0.025 to 0.17.

4,038,197

S-TRIAZINE DERIVATIVES AS MULTI-FUNCTIONAL ADDITIVES FOR LUBRICATING OILS

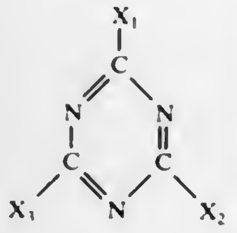
Gunter Caspari, Wheaton, Ill., assignor to Standard Oil Company (Indiana), Chicago, Ill.

Filed Oct. 20, 1975, Ser. No. 625,015

Int. Cl.^{2} C10M *1/48*

U.S. Cl. 252—46.7 **26 Claims**

1. A lubricating oil composition containing from about 0.01 weight percent to about 5 weight percent of one or more oil-soluble multifunctional additives having the general formula



where

X_1 is —S—CS—OR, —S—CS—NR$_2$, —S—PS—(OR)$_2$, or —O—P—(OR)$_2$ and X_2 and X_3 are chlorine, bromine, —S—CS—OR, —S—CS—NR$_2$, —S—PS—(OR)$_2$, —O—P—(OR)$_2$, —HN—R′; or

where R comprises hydrocarbyl, chlorine substituted hydrocarbyl, bromine substituted hydrocarbyl or hydroxyl substituted hydrocarbyl; and R′ comprises hydrocarbyl, hydroxy-substituted hydrocarbyl, amino substituted hydrocarbyl or amido substituted hydrocarbyl.

4,038,198

STORAGE STABLE MULTICOMPONENT MIXTURES USEFUL IN MAKING AMINOPLASTS, PHENOPLASTS, AND POLYURETHANES

Kuno Wagner, Leverkusen-Steinbuechel, and Karlheinz Andres, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Apr. 24, 1975, Ser. No. 571,133

Claims priority, application Germany, May 7, 1974, 2421987

Int. Cl.^{2} C08G *18/30, 18/34, 18/38;* **C09K** *3/00*

U.S. Cl. 252—182 **13 Claims**

1. Low viscosity storable multicomponent mixtures comprising:

a. at least one lactam-type compound,
b. at least one acid group-free material, selected from the group consisting of:
    i. water
    ii. difunctional organic compounds containing functional groups selected from the group consisting of hydroxyl, primary amino, secondary amino and sulfhydryl, and
    iii. mixtures thereof,
c. at least one organic or inorganic acid selected from the group consisting of:
    i. mono or polycarboxylic acid,
    ii. organic and inorganic acids of phosphorus
    iii. inorganic acids of boron, and
    iv. partially hydrolyzed antimonous and antimonic acid esters of polyhydroxyl compounds with molecular weights of from 62 to 600,

wherein from 0.5 to 8 mols of component (*b*) and from 0.5 to 10 mols of component (c) are present per mol of component (a).

4,038,199

LYOTROPIC NEMATIC LIQUID CRYSTALS FOR USE IN ELECTRO-OPTICAL DISPLAY DEVICES

Derick Jones, and Sun Lu, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

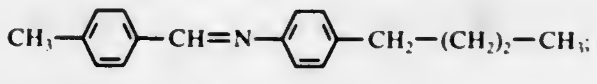
Division of Ser. No. 278,302, Aug. 7, 1972, Pat. No. 3,965,030, which is a division of Ser. No. 16,078, March 3, 1970, Pat. No. 3,690,745. This application June 22, 1976, Ser. No. 698,629

Int. Cl.^{2} C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **6 Claims**

1. A mixed liquid crystal composition consisting essentially of a mixture of

a. a solvent having the formula
b. a solvent selected from the group of compounds consisting of



; and

1. 4,4′-bis(heptyloxy)azoxybenzene,
2. 4,4′-bis(pentyloxy)azoxybenzene,
3. 4,4′-bis(hexyloxy)azoxybenzene,
4. 4,4′-dibutoxyazoxybenzene, and
5. 4,4′-dipropoxyazoxybenzene.

4,038,200

LYOTROPIC NEMATIC LIQUID CRYSTALS FOR USE IN ELECTRO-OPTICAL DISPLAY DEVICES

Derick Jones, and Sun Lu, both of Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

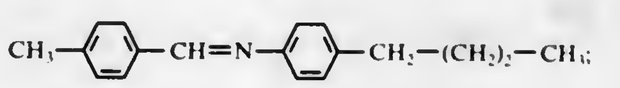
Division of Ser. No. 278,302, Aug. 7, 1972, Pat. No. 3,965,030, which is a division of Ser. No. 16,078, March 3, 1970, Pat. No. 3,690,745. This application June 22, 1976, Ser. No. 698,628

Int. Cl.^{2} C09K *3/34;* **G02F** *1/13*

U.S. Cl. 252—299 **4 Claims**

1. A mixed liquid crystal composition consisting essentially of a mixture of

a. a solvent having the formula



and

b. a solute selected from the group of compounds consisting of
    1. p-ethoxyphenylazo phenyl heptanoate
    2. p-(p-ethoxyphenylazo) phenyl undecylenate, and
    3. p-(p-ethoxyphenylazo) phenyl hexanoate.

4,038,201

POLYCRYSTALLINE BODIES AND MEANS FOR PRODUCING THEM

Walter A. Hargreaves, West Brookfield, Mass., assignor to Optovac, Inc., North Brookfield, Mass.

Filed Mar. 24, 1972, Ser. No. 237,706

Int. Cl.^{2} F21V *9/00;* **G02B** *5/20;* **G02C** *7/10*

U.S. Cl. 252—300 **17 Claims**

1. A method for producing a polycrystalline material of high optical quality having a grain growth size in the range of about 0.10 to about 10.0 millimeters from a batch of crystalline metal halide material which comprises

heating said batch sufficiently to convert said batch to a homogeneous noncrystallized molten mass

thereafter cooling the mass to a temperature which is within the polynucleation temperature range of the mass, the polynucleation temperature range of a substance being defined as the temperature range below the melting point of the substance at which a rapid uniform removal of heat results in the formation of numerous nucleation or independent crystallization centers which form without substantial growth at the expense of other crystals, by removing heat in predetermined directions of outflow therefrom, at a removal rate which is substantially equal in each direction of outflow

thereby to

initiate freezing of said mass as a plurality of individual crystals each of which cohere with others of said crystals in random crystal orientation, and induce substantially uniform contraction of the frozen material in directions in correspondence to the directions of heat outflow,

the heat removal being effected

at a controlled rate to maintain sufficient of said batch of material molten to flow into any voids produced in the frozen portion by contraction of the same, and

through said frozen portion at a rate which is at least substantially equal to the rate of liberation of latent heat of fusion and specific heat from the remaining molten material as the latter freezes, and

continuing heat removal at said rate until said mass is completely frozen into a solid polycrystalline material.

4,038,202

PROCESS FOR ELUTION OF ACTINIDE METAL MICROSPHERES

Otakar Votocek, Arnhem, Netherlands, assignor to Reactor Centrum Nederland (Stichting), The Hague, Netherlands

Continuation-in-part of Ser. No. 284,063 Aug. 28, 1972, abandoned. This application Oct. 17, 1973, Ser. No. 407,225

Claims priority, application Netherlands, Aug. 26, 1971, 7111737

Int. Cl.^{2} G21C *3/62*

U.S. Cl. 252—301.1 S **10 Claims**

1. In a process for the preparation of microspheres of an actinide metal oxide or actinide metal salt including dispersing an aqueous metal oxide or salt phase, or an aqueous metal oxide phase additionally containing carbon, onto an immiscible organic liquid under conditions such that the dispersed droplets are solidified into solid microspheres and separating the thus produced solid microspheres with some organic liquid adhering thereto,

the improvement of removing said organic liquid from said microspheres comprising, in combination

1. providing said organic liquid with a lipophilic surfactant therein having an HLB value from about 7 to less than about 10.0 and
2. washing the thus separated microspheres with an aqueous solution containing a solubilizing amount of a hydrophilic surface active agent having a HLB value of at least 10.0 up to about 14.

4,038,203

CERTAIN ALKALI METAL-RARE EARTH METAPHOSPHATE PHOTOLUMINESCENT GLASSES

Tatsuo Takahashi, Isehara, Japan, assignor to RCA Corporation, New York, N.Y.

Filed May 21, 1976, Ser. No. 688,671

Int. Cl.^{2} C09K *11/46;* **C03C** *3/16*

U.S. Cl. 252—301.4 P **8 Claims**

1. A photoluminescent glass having the composition:

$$[n\{(1-x)M_2O\,2xQ\,P_2O_5\}][(1-y)Y_2O_3\,yR_2O_3\,3P_2O_5]$$

wherein n is from 2 to 6; x is from 0 to 0.2 and y is from 0 to 1; and

M is an alkali metal,

Q is a thallium or silver activator selected from the group consisting of chlorides, oxides and nitrates of thallium and silver,

R is at least one of the group consisting of europium and terbium; and

wherein Q or R are present in said composition in amounts effective to achieve photoluminescence when said glass is subjected to excitation by ultraviolet light.

4,038,204
ALKALINE-EARTH METAL HALOPHOSPHATE LUMINESCENT COMPOSITION ACTIVATED BY DIVALENT EUROPIUM AND METHOD OF PREPARING SAME

Anselm Wachtel, Parlin, N.J., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed May 3, 1968, Ser. No. 726,464

Int. Cl.² C09K *11/46*

U.S. Cl. 252—301.4 P **18 Claims**

1. A luminescent composition consisting essentially of a matrix of halophosphate of alkaline-earth metal, wherein the halogen if of the group consisting of fluorine, chlorine, bromine, and mixtures thereof, and an activating proportion of divalent europium.

4,038,205
METHOD FOR PRODUCING CADMIUM FREE GREEN EMITTING CATHODOLUMINESCENT PHOSPHOR

Henry B. Minnier, Dushore, and H. David Layman, Ulster, both of Pa., assignors to GTE Sylvania Incorporated, Stamford, Conn.

Continuation-in-part of Ser. No. 509,928, Sept. 27, 1974, abandoned. This application July 6, 1976, Ser. No. 702,624

Int. Cl.² C09K *11/30*

U.S. Cl. 252—301.6 S **3 Claims**

1. Process for producing a green emitting cathodoluminescent phosphor consisting essentially of zinc sulfide activated by from 10 to 200 parts per million of copper and coactivated by from 20 to 600 parts per million of aluminum and containing less than 50 parts per million of halogen, the phosphor characterized by a cathodoluminescent emission having *x* and *y* coordinate values within the range of 0.250 to 0.280 and 0.560 to 0.6150, respectively, the process comprising:

a. firing a powder mixture of zinc sulfide, a copper compound and an aluminum compound at a temperature of about 950° to 1010° C for about 1 minute to 2 hours in a non-oxidizing atmosphere,

b. cooling the phosphor from the firing temperature at the rate of about 2° C per minute up to about 30° C per minute down to a temperature within the range of about 760° C to 870° C, in a nonoxidizing atmosphere, and

c. cooling the phosphor from a temperature within the range of about 760° to 870° C at the rate of at least 50° C per minute down to a temperature below about 40° C.

4,038,206
HYDROXYALKYL LOCUST BEAN/XANTHOMONAS HYDROPHILIC COLLOID BLENDS

Curtis Lee Karl, Minneapolis, Minn., assignor to General Mills Chemicals, Inc., Minneapolis, Minn.

Filed Jan. 15, 1976, Ser. No. 649,306

Int. Cl.² B01J *13/00*

U.S. Cl. 252—316 **6 Claims**

1. A thickener blend comprising about 5% to 70% xanthomonas gum by weight of the thickener blend and about 95% to 30% hydroxyethyl ether of locust bean gum having a molar ratio of substitution of about 0.05 to 0.05 moles of ethylene oxide to one mole of locust bean gum.

4. A thickener blend comprising about 5% to 70% xanthomonas gum by weight of the thickener blend and about 95% to 30% hydroxypropyl ether of locust bean gum having a molar ratio of substitution of about 0.05 to 0.50 moles of propylene oxide to one mole of locust bean gum.

4,038,207
STABILIZED HYDROCARBON GELS AND A METHOD FOR THEIR PREPARATION

Erwin Sigmund Poklacki, Arlington Heights, and Reinis Kalnajs, Chicago, both of Ill., assignors to Borg-Warner Corporation, Chicago, Ill.

Filed Nov. 3, 1975, Ser. No. 628,271

Int. Cl.² B01J *13/00;* **F17D** *1/16*

U.S. Cl. 252—316 **3 Claims**

3. A gelled hydrocarbon composition comprising a liquid hydrocarbon, from 0.2 to 10 percent by weight based on hydrocarbon of a gelling agent consisting of the pseudo double salt of an alkyl acid orthophosphate, said alkyl acid orthophosphate consisting of the mixture of monoalkyl diacid orthophosphates and dialkyl monoacid orthophosphates obtained by reacting phosphorus pentoxide with a mixture of alcohols containing at least one alcohol selected from the group consisting of C_1 to C_5 alkanols and C_1 to C_5 alkenols and at least one alcohol selected from the group consisting of C_6 to C_{22} alkanols and C_6 to C_{22} alkenols, with from 20 percent to about 70 percent of a stoichiometric amount of aluminum and a second cation selected from the group consisting of alkali metals, alkaline earth metals and ammonia, and from 5 to 200 percent by weight, based on gelling agent, of a carboxylic anhydride selected from the group consisting of the anhydrides of C_2 to C_{10} carboxylic acids and the anhydrides of C_2 to C_{10} dicarboxylic acids.

4,038,208
PROCESSES FOR REGENERATING DISPERSIONS OF LIGAND-STABILIZED, PALLADIUM(II) HALIDE COMPLEXES USED IN CARBONYLATION CATALYSTS

John F. Knifton, Poughquag, N.Y., assignor to Texaco Inc., New York, N.Y.

Filed Nov. 28, 1975, Ser. No. 635,994

Int. Cl.² B01J *31/40, 27/32;* **C07C** *51/00;* **C11C** *3/02*

U.S. Cl. 252—412 **3 Claims**

1. A process for regenerating spent palladium carbonylation catalysts consisting of dispersions of ligand-stabilized palladium(II) halide catalyst complexes in quaternary ammonium, phosphonium, and arsonium salts of trihalostannate(II) and trihalogermanate(II), the spent catalyst being obtained from the carbonylation of olefins, said ligand-stabilixed catalysts being selected from the group consisting of:

$[(C_2H_5)_4N][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][SnCl_3]\text{-}PdCl_2[P(p\text{-}CH_3.C_6H_4)_3]_2$
$[ClCH_2(_6H_5)_3P][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(n\text{-}C_4H_9)_4N][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$(C_6H_5)_4As][SnCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][GeCl_3]\text{-}PdCl_2[P(C_6H_5)_3]_2$
$[(C_2H_5)_4N][SnCl_3]\text{-}PdCl_2[P(p\text{-}CH_3O.C_6H_4)_3]_2$, and
$[(C_7H_{15})_4N][GeCl_3]\text{-}PdCl_2[As(C_6H_5)_3]_2$,

by the steps of:

a. Contacting said spent catalyst with an aqueous solution of hydrogen peroxide at 20° to 150° C in the mole ratio of $1\text{–}10^4$ mole of peroxide per gram atom of palladium present in said catalyst.

b. Adding additional stabilizing ligand to the solid catalyst in the mole ratio of 1-10 mole of ligand per gram atom of palladium present, said stabilizing ligand being selected from the group consisting of triphenylphosphine, triphenylarsine, tri-p-tolylphosphine and tri-p-methoxyphenylphosphine, until the spent palladium carbonylation catalyst is regenerated.

4,038,209
CATALYST REGENERATION PROCESS

Richard J. Schoofs, Moraga, Calif., assignor to Catco Venture, Moraga, Calif.

Filed May 10, 1976, Ser. No. 684,471

Int. Cl.² B01J *37/12, 37/00*

U.S. Cl. 252—419 **5 Claims**

1. In a process for reactivating catalysts which have become inactive due to deposition of from about 3 to 20% of carbonaceous deposits on their surfaces by contacting the catalyst with a free oxygen-containing gas at elevated temperature to burn off the carbonaceous deposits, the improvement which comprises:

a. covering the catalyst with liquid water and maintaining the liquid water in contact with the catalyst for a least one hour, then

b. contacting the catalyst with a free oxygen-containing gas at a temperature in the range about 300°-600° F. for a time sufficient to evaporate substantially all of the water from the catalyst and concurrently remove a portion of the carbonaceous deposits, and

c. thereafter contacting the dried catalyst with a free oxygen-containing gas at a temperature in the range about 600°-900° F. to burn the remaining carbonaceous deposits.

4,038,210
BETA-AMINO NITRILE CATALYSTS FOR POLYURETHANE PREPARATION

Walter Richard Rosemund, Englewood, N.J.; Michael Ray Sandner, Charleston, and David John Trecker, South Charleston, both of W. Va., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 369,556, June 13, 1973, Pat. No. 3,925,268, which is a continuation-in-part of Ser. No. 353,512, April 23, 1973, abandoned. This application July 17, 1975, Ser. No. 596,628

Int. Cl.² B01J *31/02*

U.S. Cl. 252—426 **4 Claims**

1. A catalyst combination for polyurethane formation which comprises component (1) and component (2) wherein component (1) is 3-(N,N-dimethylamino)propionitrile, and component (2) is at least one of dimethylethanolamine and bis[2-(N,N-dimethylamino)ethyl]ether and wherein:

i. when component (2) is dimethylethanolamine, the said dimethylethanolamine is present in an amount of at least one and not more than 50 weight percent, based on the weight of component (1) and dimethylethanolamine; and

ii. when component (2) is bis[2-(N,N-dimethylamino)ethyl]ether, said bis-ether is present in an amount of at least one and not more than 25 weight percent, based on the combined weight of component (1) and said bis-ether.

4,038,211
OLEFIN HYDRATION CATALYST

Orville D. Frampton, Wyoming, Ohio, assignor to National Distillers and Chemical Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 425,437, Dec. 17, 1973, Pat. No. 3,917,721. This application July 9, 1975, Ser. No. 594,424

Int. Cl.² B01J *27/14*

U.S. Cl. 252—435 **8 Claims**

1. A process for preparing the olefin hydration catalyst which comprises employing an intermediate density silica xerogel characterized by having a particle size passing through 3 mesh and retained on 20 mesh, a bulk density of 0.38-0.48 g/cc, a pore volume of 0.80-2.2 ml/g with most of said volume contributed by micropores, and a BET surface area of 200-500 m^2/g; contacting said xerogel with water vapor or a mixture of water vapor and an inert gas diluent at a total pressure of 20-1500 psig, a relative humidity of about 30%-100%, and a temperature above 100° C. and less than 200° C.; and impregnating said xerogel with H_3PO_4.

4,038,212
ALKYLATION PROCESS FOR PRODUCTION OF MOTOR FUELS

James W. Brockington, and Richard H. Bennett, both of Richmond, Va., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 561,401, March 24, 1975, Pat. No. 3,970,721. This application Mar. 19, 1976, Ser. No. 668,336

Int. Cl.² B01J *27/02*

U.S. Cl. 252—436 **1 Claim**

1. An alkylation catalyst consisting essentially of a mixture of CF_3SO_3H and H_2SO_4, in a weight ratio of about 0.166/1 respectively, and containing 0-3 weight percent weight and about 0-10 weight percent acid oils.

4,038,213
HYDROCARBON CONVERSION PROCESS USING A SUPPORTED PERFLUORINATED POLYMER CATALYST

James D. McClure, and Stanley G. Brandenberger, both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

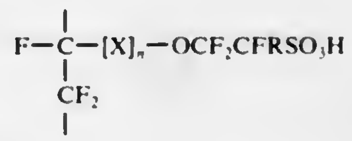
Filed Mar. 4, 1976, Ser. No. 663,956

Int. Cl.² B01J *27/12*

U.S. Cl. 252—430 **8 Claims**

1. A catalyst composition comprising a solid perfluorinated polymer catalyst support on an inert porous carrier having an average pore diameter of between about 50 A and about 600 A in a weight ratio of catalyst to support of between about 0.1:100 and about 20:100 wherein said catalyst contains a repeating structure selected from the group of:

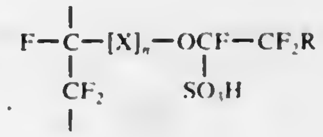
a)



$$-\overset{|}{\underset{\underset{|}{CF_2}}{\overset{}{F-C}}}-[X]_n-OCF_2CFRSO_3H$$

or

b)



$$F-\underset{\underset{|}{CF_2}}{\overset{|}{C}}-[X]_n-O\underset{\underset{SO_3H}{|}}{C}F-CF_2R$$

where *n* is 0, 1 or 2; R is a radical selected from the group consisting of fluorine and perfluoralkyl radicals having from 1 to 10 carbon atoms; and X is selected from the group consisting of:

$[O(CF_2)_m]$, $[OCF_2CFY]$ or $[OCFYCF_2]$

where *m* is an integer from 2 to 10 and Y is a radical selected from the class containing of fluorine and the trifluoromethyl radical.

4,038,214
IMPREGNATED FIBROUS CATALYST FOR TREATING EXHAUST GAS OF AN INTERNAL COMBUSTION ENGINE AND PROCESS FOR MAKING SAME

Sotoji Gotoh, Yokosuka; Jun Nakamura, Tokyo; Yuji Abe, and Tadashige Matsuo, both of Yokohama, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Japan

Continuation-in-part of Ser. No. 546,625, Feb. 3, 1975, abandoned, which is a continuation-in-part of Ser. No. 310,009, Nov. 28, 1972, abandoned, which is a continuation-in-part of Ser. No. 68,004, Aug. 28, 1970, abandoned. This application July 22, 1976, Ser. No. 707,507

Claims priority, application Japan, Aug. 28, 1969, 44-68141

Int. Cl.² B01J *23/86, 23/84, 35/06*

U.S. Cl. 252—458 **5 Claims**

1. A catalyst, for treating the exhaust gas of an internal combustion engine, prepared by the process which comprises:

- a. preparing a carrier in the form of a flexible reticular fabric sheet consisting of spun yarn of 2000 - 10,000 glass filaments, of about 3 - 40 microns diameter, acid leached to remove solubles and to produce filaments of at least 95% purity silica, with the filaments having a heat resistance up to 1200° - 1300° C and the carrier sheet having a mesh in the range of 3.5 - 32 of the Tyler standard sieve;
- b. forming a reaction solution consisting of cobalt chromate, by mixing a water-soluble organic acid salt of cobalt with a material selected from the group consisting of chromium trioxide and chromic acid, and with propylene alcohol by blending and stirring for 0.5 - 1.0 hour, to carry out an esterification reaction;
- c. impregnating said carrier sheet with the obtained reaction solution and thereafter subjecting the impregnated carrier sheet to drying at 200° - 250° C for 0.5 - 1.0 hour;
- d. calcining the impregnated and dried carrier sheet at 700° - 850° C for 0.5 - 1.0 hour; and
- e. thereafter heat treating the catalyst at 800° C for substantially 3 hours in a reducing gas atmosphere containing hydrogen to activate the catalyst.

4,038,215
DEHYDROGENATION CATALYST

Harold E. Manning, Houston, Tex., assignor to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 515,328, Oct. 16, 1974, abandoned. This application July 7, 1975, Ser. No. 593,727

Int. Cl.² B01J *21/04, 21/10, 23/14, 23/26*

U.S. Cl. 252—465 **3 Claims**

1. A dehydrogenation catalyst consisting essentially of (1) magnesium chromite tin oxide, (2) magnesium chromite + tin oxide + aluminum oxide, or (3) $MgAl_xCr_{2-x}O_4$ + tin oxide wherein the ratio of Al:Cr is from 0.0004 to 1.2:1 and x is a number of from more than 0 up to less than 1.

4,038,216
MATERIAL AND METHOD OF MAKING SECONDARY-ELECTRON EMITTERS

Victor E. Henrich, Newton, and John C. C. Fan, Brookline, both of Mass., assignors to Massachusetts Institute of Technology, Cambridge, Mass.

Continuation-in-part of Ser. No. 482,109, June 24, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,390

Int. Cl.² H01B *1/02*

U.S. Cl. 252—514 **7 Claims**

1. A fine-grain layer of material comprising a mixture at least 50 vol % of grains of the high-yield secondary-electron emitting material MgO and grains of an electrically conductive material selected from the group consisting of Au, Ag and Pt,

the composition of said layer having a greater ratio of said emitting material to said conductive material at the surface of the layer than in the bulk of the layer,

the size of the grains of the emitting material is less than 200A and the conducting material of average size of 50–100 A are small enough to allow charge to tunnel from the surface of the grains of emitting material to the surrounding grains of conductive material and the grains of emitting material are large enough so that the emitting material has secondary-electron-emission characteristics close to that of the emitting material in the bulk.

4,038,217
CERAMICS HAVING NON-LINEAR VOLTAGE CHARACTERISTICS AND METHOD OF PRODUCING THE SAME

Masaharu Namba; Ikuo Nagasawa, and Kazuo Mukae, all of Kawasaki, Japan, assignors to Fuji Electric Company Ltd., Kawasaki, Japan

Filed July 24, 1975, Ser. No. 598,956

Claims priority, application Japan, July 25, 1974, 49-85425; July 25, 1974, 49-85426; July 25, 1974, 49-85427

Int. Cl.² H01C *1/06;* **H01B** *1/08*

U.S. Cl. 252—521 **9 Claims**

1. A ceramic having non-linear voltage characteristics consisting essentially of the calcined product obtained on calcining in air a mixture of (a) zinc oxide, as a principal component, and (b) (1) cobalt and (2) one of neodymium, samarium or dysprosium, either in an elemental form or as a compound thereof, each in an amount of 0.1 to 10 atomic % for the cobalt, neodymium, samarium and dysprosium, calculated as cobalt, neodymium, samarium, and dysprosium, respectively, as subcomponents.

4,038,218
PROCESS FOR PREPARATION OF POWDERY DETERGENT COMPOSITIONS

Takashi Fujino, Yokohama; Makoto Yamanaka, Koganei, and Kouichi Yagi, Tokyo, all of Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

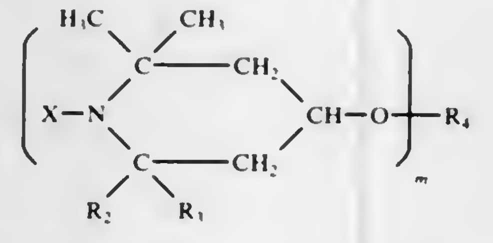
Filed Mar. 31, 1976, Ser. No. 672,472

Claims priority, application Japan, Apr. 14, 1975, 50-45063

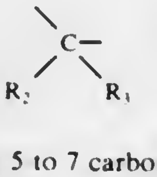
Int. Cl.² C11D *1/14, 1/72, 3/28*

U.S. Cl. 252—542 **9 Claims**

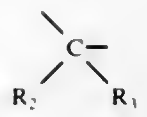
1. In a process which comprises spray drying an aqueous slurry of a detergent composition to obtain a powder detergent, wherein said detergent composition consists essentially of from 2 to 30 percent by weight of surfactant selected from the group consisting of surfactants having the formula $R_1—O—(CH_2CH_2O)_nH$, surfactants having the formula $R_1—O—(CH_2CH_20)_nSO_3M$, and mixtures thereof, wherein R_1 is alkyl having 6 to 24 carbon atoms or alkyl (C_6 to C_{18}) phenyl, n is a number from one to 29, and M is hydrogen, alkali metal or alkaline earth metal, and the balance of the detergent composition is other conventional ingredients for clothes laundering detergent compositions, the improvement which comprises the step of: incorporating in said aqueous slurry during the spray drying step from 0.05 to 10 parts by weight, per 100 parts by weight of said surfactant, of a smoke-preventing agent of the following formula



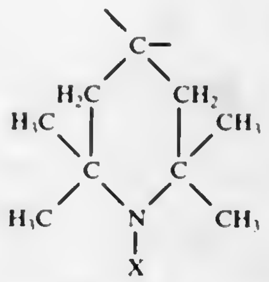
wherein X is hydrogen or oxygen; m is an integer of one to 3; R_2 and R_3, which can be the same or different, are alkyls having one to 12 carbon atoms, or



is cycloalkylidene having 5 to 7 carbon atoms, or



has the formula



wherein X has the same meaning as defined above, in which; when m is one, R_4 is acyl, N-substituted carbamoyl, N-substituted thiocarbamoyl, alkyl, cycloalkyl, aralkyl, aryl, 2,2,6,6-tetramethyl-4-piperidyl and monovalent radical obtained by removal of one OH group from an acid selected from the group consisting of benzenesulfinic acid, benzenesulfonic acid, p-toluenesulfonic acid, p-n-dodecybenzenesulfonic acid, methanesulfonic acid, boric acid and phosphoric acid; when m is 2, R_4 is diacyl, alkylene, p-phenylene, p-xylylene, dicarbamoyl and divalent radical obtained by removing two OH groups from an acid selected from the group consisting of benzene-1,3-disulfonic acid, boric acid and phenylphosphorous acid; and when m is 3, R_4 is triacyl, tricarbamoyl, tristhio carbamoyl, propan-1,3,5-yl, hexan-1,3,6-yl, benzen-1,3,5-yl, benzene-1,3,5-triethylene and trivalent radical obtained by removing 3 OH groups from an acid selected from the group consisting of trisulfonic acid, boric acid, phosphoric acid and phosphorous acid; and when X is hydrogen, a salt thereof with phosphoric acid, carbonic acid, citric acid, stearic acid or benzoic acid.

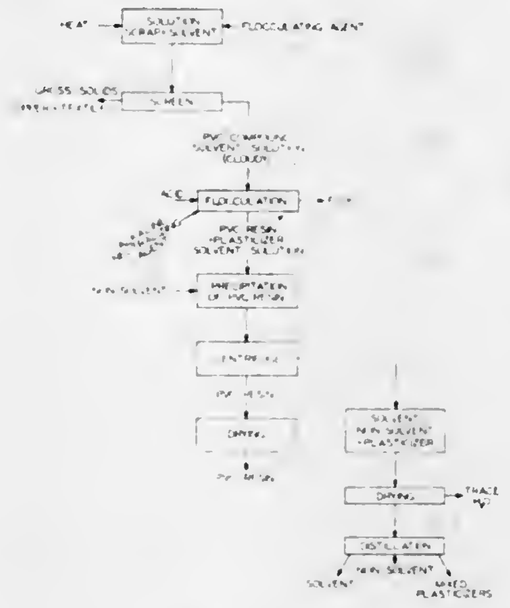
4,038,219
RECLAMATION PROCESSING OF POLYVINYL CHLORIDE-SCRAP MATERIALS AND PRODUCTS PRODUCED THEREBY

Vicky Williams Boehm, Atlanta, and Barret Broyde, Decatur, both of Ga., assignors to Western Electric Company, Inc., New York, N.Y.

Filed Mar. 25, 1976, Ser. No. 670,470

Int. Cl.² C08J *11/02, 11/04*

U.S. Cl. 260—2.3 **11 Claims**



1. A method of recovering a reusable essentially pure vinyl chloride polymer resin from a scrap polymer mixture which comprises plasticized polyvinyl chloride and insoluble additives, which includes the steps of:

contacting a polymer mixture which comprises plasticized polyvinyl chloride and insoluble additives with a solvent for vinyl chloride polymers to form a solvent mixture comprising a solvent solution of dissolved vinyl chloride polymer and plasticizers and other insoluble additives;

treating the solvent mixture with an acid which is selected from the group consisting of an inorganic acid and an inorganic acid solution and which is substantially soluble in the solvent in the presence of a flocculating agent which is selected from the group consisting of liquid monomeric esters, polystyrene, polyethyl methacrylate, poly (vinyl isobutyl ether), polyvinyl acetate and ethylene vinyl acetate to flocculate and remove the suspended additives; and

treating the solvent solution with a non-solvent which is miscible with the solvent in substantially all proportions and which is a solvent for the plasticizer to precipitate an essentially pure vinyl chloride polymer resin therefrom.

4,038,220
METHOD FOR ADHESION OF RUBBER [USING N-(SUBSTITUTED OXYMETHYL)MELAMINES AND BETA NAPHTHOL] TO REINFORCING MATERIALS

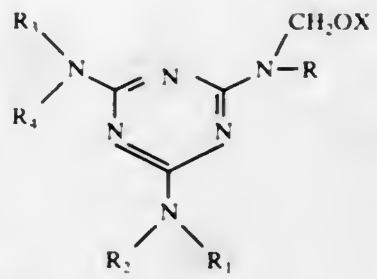
Harold Godfred Thompson, Somerville, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 496,245, Aug. 9, 1974, abandoned. This application Dec. 8, 1975, Ser. No. 638,479

Int. Cl.² C08L *7/00, 9/00;* **C09J** *3/14*

U.S. Cl. 260—3 **8 Claims**

1. A vulcanizable rubber composition comprising rubber, a vulcanizing agent, from about 1 to 10 parts per 100 parts of the rubber of an N-(substituted oxymethyl)melamine having the following general formula



wherein X is hydrogen or lower alkyl having 1 to 8 carbon atoms; R, R_1, R_2, R_3 and R_4 are individually hydrogen, lower alkyl having from 1 to 8 carbon atoms or the group $—CH_2OX$, wherein X is as defined above, and from about 0.5 to 8 parts per 100 parts of rubber of at least one of alpha or beta naphthol, said rubber composition when vulcanized, having good adhesion to textile fiber or metal reinforcing cords embedded therein.

4,038,221
PROCESS FOR THE PRODUCTION OF COLD HARDENING FOAMS CONTAINING URETHANE GROUPS BY IN-MOLD FOAMING

Johan Bernhard Koster, Stuerzelberg; Hans Joachim Meiners, Leverkusen-Schlebusch, and Hans Heinrich Moretto, Leverkusen, all of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

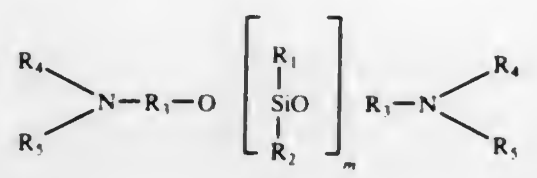
Filed Nov. 17, 1975, Ser. No. 632,422

Claims priority, application Germany, Nov. 20, 1974, 2454054

Int. Cl.² C08J *9/00*

U.S. Cl. 260—2.5 AH **9 Claims**

1. A process for the production of cold-hardening nonshrinking open-pored foams containing urethane groups by foaming in a mold a mixture comprising A) a polyether having at least two hydroxyl groups and a molecular weight in the range from 750 to 100,000, B) a polyisocyanate, C) a blowing agent, D) a catalyst and E) a silicon compound wherein the silicon compound used corresponds to the general formula



$$\genfrac{}{}{0pt}{}{R_4}{R_5}\!>N-R_3-O\left[\begin{matrix}R_1\\ |\\ SiO\\ |\\ R_2\end{matrix}\right]_m R_3-N<\genfrac{}{}{0pt}{}{R_4}{R_5}$$

in which

R_1 and R_2 represents a substituted or unsubstituted monovalent hydrocarbon group,

R_3 represents a C_2–C_{20} alkylene group,

R_4 and R_5 represent a substituted or unsubstituted monovalent hydrocarbon group, in addition to which R_4 and R_5 may together form an alkylene ring which may be interrupted by heteroatoms, and

m is an integer from 1 to 20.

4,038,222

UNTRIAKONTAPEPTIDE WITH OPIATE ACTIVITY

Choh Hao Li, Berkeley, Calif., assignor to Hoffman-La Roche Inc., Nutley, N.J.

Filed Mar. 17, 1976, Ser. No. 667,747

Int. Cl.^{2} C08L *89/00;* **A61K** *37/00;* **C07C** *103/52*

U.S. Cl. 260—8 **7 Claims**

1. A compound of the formula

Boc-Tyr(oBr-Z)-Gly-Gly-Phe-Met-Thr-Ser(Bzl)-Glu(OBzl)-
Lys(oBr-Z)-Ser(Bzl)-Gln-Thr-Pro-Leu-Val-Thr-Leu-Phe-
Lys(oBr-Z)-Asn-Ala-Ile Ile-Lys(oBr-Z)-Asn-Ala-His(Boc)-
Lys(oBr-Z)-Lys(oBr-X)-Gly-Gln-R

wherein oBr-Z is ortho bromobenzyloxycarbonyl; Bzl is benzyl; Boc is toxycarbonyl and R is styrene-divinylbenzene copolymer resin.

4,038,223

NOVEL SEGMENTED COPOLYMERS CONTAINING FREE HYDROXYL GROUPS AND METHOD OF PREPARING THE SAME

Leila Pohjola, Veikkola; Olavi Harva, and Jaakko Karvinen, both of Helsinki, all of Finland, assignors to Neste Oy, Finland

Filed Sept. 30, 1975, Ser. No. 618,038

Int. Cl.^{2} C08L *5/00*

U.S. Cl. 260—9 **13 Claims**

1. A segmented copolymer containing free hydroxyl groups and comprising hard and soft segments, said hard segments comprising a polyhydroxy compound containing two primary hydroxyl groups and at least two secondary hydroxyl groups and being selected from the group consisting of disaccharides and sugar alcohols of the formula

$$HOCH_2(CHOH)_nCH_2OH$$

wherein n is a whole number from 2 to 5, and said soft segments comprising a compound of average molecular weight of from about 250 to about 5000 and being selected from the group consisting of low molecular weight polyesters having terminal isocyanate groups and low molecular weight polyethers having terminal isocyanate groups, and hard segments being linked at the primary hydroxy groups thereof to the isocyanate groups of said soft segments so that said segmented copolymer is substantially free of cross linking and contains free secondary hydroxyl groups.

4,038,224

ORGANICALLY MODIFIED SILICIC ACIDS AND SILICATES FOR DELUSTERING LACQUERS

Edith Eisenmenger, Offenbach (Main); Otto Kühnert, Beuel; Robert Kuhlmann, Keldenich; Peter Nauroth, Wesseling, and Günter Türk, Grossauheim, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt am Main, Germany

Continuation-in-part of Ser. No. 567,203, April 11, 1975, abandoned, which is a continuation of Ser. No. 113,635, Feb. 8, 1971, abandoned, which is a continuation of Ser. No. 765,683, Oct. 7, 1968, Pat. No. 3,607,337. This application Apr. 5, 1976, Ser. No. 673,555

Int. Cl.^{2} C08L *1/12;* **C08K** *3/36;* **C09C** *1/30*

U.S. Cl. 260—15 R **4 Claims**

1. A lacquer composition comprising from about 2 to 5% by weight of wax-impregnated silicic acid or silicate wherein said wax is the only additive for impregnating said silicic acid or silicate and wherein said wax is present in an amount of about 2 to 7% by weight of the wax impregnated 1 microns in size with a particle size distribution such that at least 28.4% by weight are less 2.3 microns at least 68% by weight are less than 3.5 microns and at least 97.7% by weight are less than 7.1 microns, whereby the wax impregnated silicic acid or silicate particles produces a delustered lacquer film smooth surface and of high scratch resistance.

4,038,225

THERMOSETTING HIGH SOLID COATING COMPOSITION

Yasuo Takaya; Tadashi Watanabe, and Naozumi Iwasawa, all of Hiratsuka, Japan, assignors to Kansai Paint Company, Ltd., Japan

Filed June 2, 1975, Ser. No. 582,700

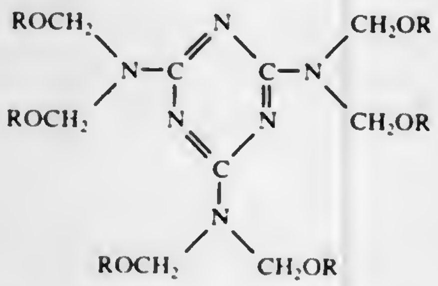
Claims priority, application Japan, June 6, 1974, 49-63416

Int. Cl.^{2} C09D *3/52*

U.S. Cl. 260—21 **10 Claims**

1. A thermosetting high solid coating composition usable for spray coating at a temperature below 70°C which comprises:

A. a mixture of:
  a. 80 to 60 parts by weight of alkyd resin having a fatty acid content of 10 to 20% by weight and a phenyl group content of 10 to 25% by weight, and further the hydroxyl group equivalent and dibasic acid ratio (the molar ratio of dibasic acid/polyhydric alcohol) of said resin existing on or within the four sides of the tetragon as defined by four points of (300, 0.700), (300, 0.775), (500, 0.775) and (500, 0.8500 on a coordinate of said hydroxyl group equivalent as abscissa and said dibasic acid ratio as ordinate; and
  b. 20 to 40 parts by weight of melamine resin comprising hexakisalkoxymethylmelamine of the formula:



in which 2 to 6 of R's are alkyl groups having each 2 to 4 carbon atoms and the remainder are methyl groups, and an amount up to less than one half of said hexakisalkoxymethylmelamine of another melamine resin containing not more than an average of 5.5 moles combined formaldehyde per one mole of melamine resin and being modified with alcohols of 1 to 4 carbon atoms;

B. 0.05 to 1.00 parts by weight of aliphatic or aromatic sulfonic acid or its amine salt per 100 parts of said mixture; and

C. 80 to 20 parts by weight of solvent per 100 parts by weight of said mixture, said solvent being able to dissolve simultaneously the components in said mixture.

4,038,226

METHOD AND COMPOSITION FOR SOLVENTLESS PRINTING

Jack Lewis Towle, and John Herman Vander Ploeg, both of Holland, Mich., assignors to Chemetron Corporation, Chicago, Ill.

Filed May 22, 1975, Ser. No. 579,876

Int. Cl.^{2} C08G *12/12, 12/32;* **C09D** *11/10*

U.S. Cl. 260—22 CQ **41 Claims**

1. A method of polymerizing an amino resin precursor which comprises heating the precursor in the presence of a catalytic amount of at least one latent catalyst selected from the group consisting of ortho-toluenesulfonyl-ortho-tolylhydrazide, benzylsulfonylphenylhydrazide, benzenesulfonylphenylhydrazide, and para-toluenesulfonylphenylhydrazide to a curing temperature of from about the in situ decomposition temperature of the latent catalyst to about the decomposition temperature of the precursor.

4,038,227

PHOTODEGRADABLE POLYOLEFINS CONTAINING AN AROMATIC KETONE, FERRIC STEARATE, AND A PIGMENT

Carl E. Swanholm, and Robert G. Caldwell, both of Boise, Idaho, assignors to Bio-Degradable Plastics, Inc., Sioux Falls, S. Dak.

Continuation of Ser. No. 538,390, Jan. 3, 1975, abandoned, which is a division of Ser. No. 372,046, June 21, 1973, Pat. No. 3,888,804, which is a continuation-in-part of Ser. No. 195,021, Nov. 2, 1971, abandoned. This application Sept. 13, 1976, Ser. No. 722,744

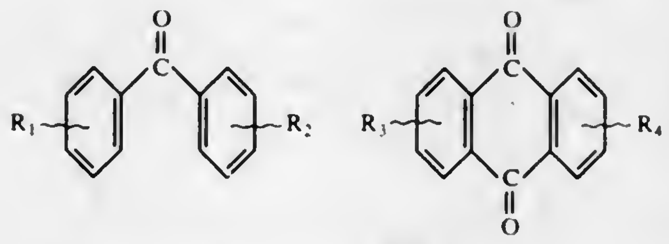
Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—23 H **9 Claims**

1. Microbially consumable packaging materials comprising a predominance of the photodegradation products of

an aliphatic poly-α-olefin polymer;

a photosensitizing agent selected from the group of compounds represented by the general formulas



wherein R_1 and R_3 represent alkyl or alkoxyl groups containing at least four carbon atoms, and R_2 and R_4 represent hydrogen, halogen, alkyl or alkoxyl groups in the concentration range 0.01% to 0.5% by weight of the polymers;

ferric stearate in the concentration range 0.01% to 0.5% by weight of the polymers;

a color pigment that accelerates sensitized photodegradation in a concentration of about five percent by weight of the polymer;

oxygen; and

sunlight.

4,038,228

DEGRADABLE PLASTIC COMPOSITION CONTAINING A TRANSITION METAL SALT OF A HIGHLY UNSATURATED ORGANIC ACID

Lynn J. Taylor, Haslett, Mich., assignor to Owens-Illinois, Inc., Toledo, Ohio

Continuation of Ser. No. 200,593, Nov. 19, 1971, abandoned. This application Sept. 20, 1976, Ser. No. 724,666

Int. Cl.^{2} C08J *3/20*

U.S. Cl. 260—23 AC **14 Claims**

1. As a composition of matter, a plastic composition which is degradable in the absence of electromagnetic radiation and consisting essentially of an organic polymer having dispersed therein at least one transition-metal salt of at least one highly unsaturated organic acid.

4,038,229

PROCESS FOR THE MANUFACTURE OF IMPREGNATING MELAMINE RESINS

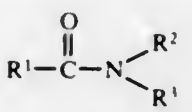
Wolfgang Eisele; Ludwig Lelgemann; Bernhard Magerkurth, all of Ludwigshafen, and Harro Petersen, Frankenthal, all of Germany, assignors to Badische Anilin- & Soda-Fabrik Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Continuation of Ser. No. 353,484, April 23, 1973, abandoned. This application June 12, 1975, Ser. No. 586,424

Int. Cl.^{2} C08L *61/28*

U.S. Cl. 260—29.4 R **6 Claims**

1. In a process for the manufacture of impregnating resins based on precondensates of melamine and formaldehyde, wherein melamine and formaldehyde are condensed at a molar ratio of melamine to formaldehyde of from 1:1.6 to 1:6 in aqueous solution, the improvement comprising the addition of a fatty acid dialkyl amide which is soluble in the aqueous impregnating resin solution and has the formula



$$R^1-\overset{\overset{O}{\|}}{C}-N\genfrac{}{}{0pt}{}{\diagup R^2}{\diagdown R^1}$$

where R^1 is hydrogen or lower alkyl and R^2 and R^3 are alkyl of from 1 to 4 carbon atoms, to the aqueous solution before, during or after condensation in an amount of from 1 to 20% by weight, based on the melamine/formaldehyde precondensate content of the aqueous solution.

4,038,230

AQUEOUS DISPERSION OF PARTICULATE SPHEROIDAL POLYTETRAFLUOROETHYLENE

Max B. Mueller, Morristown; Peter P. Salatiello, Morris Plains, and Dulari L. Sawhney, Highland Park, all of N.J., assignors to Allied Chemical Corporation, Morristown, N.J.

Division of Ser. No. 91,046, Nov. 19, 1970, Pat. No. 3,752,796. This application Jan. 31, 1973, Ser. No. 328,226

Int. Cl.^{2} C08L *27/18*

U.S. Cl. 260—29.6 F **1 Claim**

1. An aqueous dispersion of particulate polytetrafluoroethylene, said particulate polytetrafluoroethylene having a surface area of at least 9 sq.m./g., predominantly comprising spheroidal particles having an average particle diameter of greater than 0.35 micron, a narrow particle size distribution corresponding to a distribution function of less than 0.4, and a number average molecular weight of at least 2.0 × 10^6, said aqueous dispersion comprising more than 75% by weight of said particulate polytetrafluoroethylene.

4,038,231

PROCESS FOR AQUEOUS DISPERSION OF PERFLUOROALKYL- OR PERFLUOROALKOXY TRIFLUOROETHYLENE POLYMERS

John Michael Downer, Harpenden; William George Rodway, Welwyn, and Laurence Stanley John Shipp, Stevenage, all of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Sept. 30, 1974, Ser. No. 510,571

Claims priority, application United Kingdom, May 16, 1974, 21748/74

Int. Cl.^{2} C08L *27/18*

U.S. Cl. 260—29.6 F **12 Claims**

1. An aqueous dispersion of a tetrafluoroethylene polymer comprising colloidal particles containing at least 98% by weight of polymerised tetrafluoroethylene and polymerised therewith at least one copolymerisable monomer selected from perfluoroalkyl trifluoroethylenes and perfluoroalkoxy trifluorethylenes each having from 3 to 10 carbon atoms, said particles having inner core and outer shell portions in which the weight concentration of copolymerised monomer present in the outer shell portion (relative to the weight concentration of tetrafluoroethylene with which it is polymerised) is less than half that of the inner core portion, the weight ratio of the polymer forming the shell to the polymer forming the core being between 1:99 and 99:1.

4,038,232

ELECTRODEPOSITABLE COMPOSITIONS CONTAINING SULFONIUM RESINS AND CAPPED POLYISOCYANATES

Joseph F. Bosso, Lower Burrell, and Marco Wismer, Gibsonia, both of Pa., assignors to PPG Industries, Inc., Pittsburgh, Pa.

Continuation of Ser. No. 316,596, Dec. 19, 1972, abandoned. This application July 8, 1975, Ser. No. 594,152

Int. Cl.^{2} C08F *8/30, 8/34;* **C08J** *3/06;* **C08L** *13/00*

U.S. Cl. 260—29.6 TA **14 Claims**

1. An aqueous based resinous dispersion suitable for use as a coating composition comprising as the resinous phase:

A. a quaternary sulfonium salt group solubilized synthetic organic resin coating free hydroxyl groups, said organic resin produced by reacting:

  1. an epoxy-containing organic material having a 1,2-epoxy equivalency of greater than 1, and
  2. a sulfide-acid mixture, said sulfide-acid mixture being used in an amount to provide sufficient quaternary sulfonium groups to solubilize said resin; said sulfide being selected from the group consisting of aliphatic, mixed aliphatic-aromatic, aralkyl and cyclic sulfides; and

B. a capped, organic polyisocyanate stable at ordinary room temperature in the presence of said resin (A) and reactive with said resin (A) at elevated temperatures.

4,038,233

AQUEOUS RESIN COMPOSITION CONTAINING POLYMERS OR COPOLYMERS OF ETHYLENICALLY UNSATURATED MONOMERS AND A WATER-SOLUBLE CATIONIC POLYELECTROLYTE POLYMER

Jay S. Shultz, Little Rock, Ark., assignor to Johnson & Johnson, New Brunswick, N.J.

Filed July 11, 1975, Ser. No. 595,248

Int. Cl.^{2} C08L *33/08*

U.S. Cl. 260—29.6 RW **7 Claims**

1. An aqueous resin composition capable of being applied to porous materials under conditions of controlled migration thereon or penetration thereinto comprising:

1. 0.1 to 60% by weight on a solids basis of an anionically or non-ionically stabilized aqueous dispersion of synthetic resin solids selected from the group consisting of polymers and copolymers of ethylenically unsaturated monomers; and
2. 0.01 to 8% by weight, based on the weight of the synthetic resin of a water-soluble, cationic polyelectrolyte polymer having a molecular weight of at least 20,000 and having
   a. a backbone consisting essentially of carbon atoms and
   b. side chains containing amine groups, said mixture of synthetic resin solids and cationic polyelectrolyte polymer being stable and having a zeta potential which is slightly cationic, whereby when applied to porous materials having a slightly anionic zeta potential, the zeta potential of said composition approaches or reaches zero thereby destabilizing the composition and coagulating and thickening the same.

4,038,234

AQUEOUS DISPERSION OF FLUOROCARBON POLYMER AND HALOGEN-CONTAINING COMPLEX PHOSPHATE OF ALUMINUM

James Derek Birchall, Norley; John Edward Cassidy, Hartford, and Edward Henry Grice-Hutchinson, London, England, assignors to Imperial Chemical Industries Limited, London, England

Continuation of Ser. No. 593,958, July 8, 1975, abandoned, which is a continuation of Ser. No. 459,699, April 10, 1974, abandoned, which is a continuation of Ser. No. 207,634, Dec. 13, 1971, abandoned. This application Aug. 11, 1976, Ser. No. 713,509

Claims priority, application United Kingdom, Dec. 11, 1970, 59008/70

Int. Cl.^{2} C08L *27/18*

U.S. Cl. 260—29.6 F **15 Claims**

1. A composition which consists essentially of a fluorocarbon polymer resin dispersed in an aqueous medium in which there has been dissolved a halogen-containing complex phosphate of aluminum, said complex being identifiable as containing a chemically-bound hydroxy compound R—OH wherein R is a hydrogen atom or an inert organic group, and wherein the ratio of elements is such as to form the said complex and wherein the ratio of the number of atoms of aluminum to the number of atoms of phosphorus in the complex is $1{:}x$ where x is no greater than 1.8 and the ratio of the number of atoms of aluminum to the number of atoms of halogen in the complex is from 1:0.1 to 1:5, and the weight ratio of aluminum to fluorocarbon polymer resin in the composition is from about 0.02:1 to about 0.25:1.

4,038,235

SOLID, RAPID-SETTING, RIGID POLYURETHANES

Franciszek Olstowski, Freeport, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Continuation of Ser. No. 574,157, May 2, 1975, Pat. No. 3,983,063, which is a division of Ser. No. 405,244, Oct. 10, 1973, Pat. No. 4,001,166, which is a continuation-in-part of Ser. No. 327,630, Jan. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 221,784, Jan. 28, 1972, abandoned. This application May 28, 1976, Ser. No. 691,254

The portion of the term of this patent subsequent to Sept. 28, 1993, has been disclaimed.

Int. Cl.^{2} C08K *5/45*

U.S. Cl. 260—30.2 **11 Claims**

1. A rigid, non-cellular, solid composition having a density of at least 1 g/cc, a percent elongation of less than 100 and which is demoldable within about 5 minutes, without the application of an external source of heat, after admixture of the components of a rapid-setting polyurethane-forming composition, free of catalytic quantities of a catalyst for urethane formation, and comprising

A. an amine initiated polyol having an OH equivalent weight of from about 50 to less than about 250;

B. an organic aromatic polyisocyanate;

C. a liquid modifier compound having a boiling point above about 150° C selected from the group consisting of cyclic sulfones and mixtures thereof; and

wherein components (A) and (B) are present in quantities such that the NCO:OH ratio is from about 0.8:1 to about 1.5:1 and component (C) is employed in quantities of from about 5% to about 60% by weight of the combined weight of components (A), (B) and (C).

4,038,236

RESOL TYPE VARNISHES CONTAINING TAR ACIDS

Joseph Gordon Robinson, Winchcombe, and Edward Aubrey Rogers, Worcester, both of England, assignors to Coal Industry (Patents) Limited, London, England

Filed Dec. 23, 1975, Ser. No. 643,914

Claims priority, application United Kingdom, Jan. 15, 1975, 01708/75

Int. Cl.^{2} C08G *14/06, 14/12, 14/14*

U.S. Cl. 260—32.8 R **14 Claims**

1. A thermosetting resol-type resin prepared by reacting a blend of a tar acid and a resinous reaction product with formaldehyde in the presence of ammonia, wherein the resinous reaction product is prepared by reacting an oxygen-containing naphthalene-formaldehyde resin with a phenol.

4,038,237

FIRE RETARDANT WIRE COATING

John L. Snyder, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed June 17, 1976, Ser. No. 697,181

Int. Cl.^{2} C08K *5/01, 5/02*

U.S. Cl. 260—33.6 AQ **8 Claims**

1. A fire-resistant polymer composition comprising:

a. 100 parts by weight of a block copolymer having at least two polymer end blocks A and at least one polymer mid block B, each block A being a non-elastomeric polyer a monoalkenyl arene having an average molecular weight of between about 2,000 and about 125,000 and having no more than 25% of the aromatic double bonds being reduced by hydrogenation, and each block B being an elastomeric hydrogenated polymer block of a conjugated diene, having an average molecular weight between about 10,000 and about 250,000;

b. 0-200 parts by weight of an extending oil;

c. 10-300 parts by weight of a polymeric alpha-olefin;

d. 5-100 parts by weight of antimony trioxide;

e. 25-200 parts by weight of a chlorinated hydrocarbon; and

f. 50-300 parts by weight of a calcium sulfate filler.

4,038,238

LOW DENSITY RAPID-SETTING POLYURETHANES

Thomas E. Cravens, Lake Jackson, Tex., assignor to The Dow Chemical Company, Midland, Mich.

Filed Aug. 29, 1973, Ser. No. 392,592

Int. Cl.^{2} C08K *7/28*

U.S. Cl. 260—33.6 UB **2 Claims**

1. A solid, polyurethane article having a bulk density of less than about 0.7 g/cm^3 and which is substantially free of large internal air voids and surface imperfections resulting from the admixture of a composition comprising

A. a rapid-setting polyurethane-forming composition which produces a polyurethane which can be demolded, without the application of an external source of heat, within 5 minutes after admixture of the components of the polyurethane-forming composition,

B. as a light weight filler component, hollow spheres or microballoons of a copolymer of vinylidene chloride, acrylonitrile and divinyl benzene in an amount to provide the polyurethane composition with a bulk density of less than about 0.7 g/cm^3, said spheres or microballoons having a density of from about 0.03 to about 0.45 grams/cc and a particle size of from about 10 to about 100 microns, and

C. as a viscosity reducing component, a liquid aromatic or halogenated aromatic compound in a quantity sufficient to provide the mixture of Components (A), (B) and (C) with a viscosity of less than about 2000 centipoises at 25° C.

4,038,239

MOISTURE CURABLE POLYURETHANE SYSTEMS

Robert N. Coyner, Hopkins, and Peter Skujins, Minneapolis, both of Minn., assignors to ConTech Inc., Minneapolis, Minn.

Continuation-in-part of Ser. No. 418,192, Nov. 23, 1973, Pat. No. 3,919,173. This application Aug. 19, 1975, Ser. No. 605,910

The portion of the term of this patent subsequent to Nov. 11, 1992, has been disclaimed.

Int. Cl.^{2} C08G *18/70*

U.S. Cl. 260—33.6 UB **10 Claims**

1. A process for making a one-part, moisture-reactive composition comprising a moisture-reactive isocyanate-terminated polyether-urethane prepolymer, said process comprising the steps of:

a. providing an isocyanate-reactive composition comprising: an alkaline earth metal oxide, wherein the metal has an atomic weight ranging from 40 to 138, a catalyst for isocyanate/active hydrogen reations, and a liquid polyol composition having an average equivalent weight greater than 1000 and an average functionality greater than 2, said polyol containing at least one polyoxyalkylene chain; the amounts of alkaline earth metal oxide being greater than the stoichiometric amount for reacting with all the water in said isocyanate-reactive composition;

b. exothermically reacting an aliphatic polyisocyanate, at least one of the free isocyanate radicals of said aliphatic polyisocyanate being substantially kinetically more reactive with respect to active hydrogen than any other said free isocyanate radicals;

c. after at least 25% of said free isocyanate radicals of said aliphatic polyisocyanate have reacted with said isocyanate-reactive composition, exothermically reacting said isocyanate-reactive composition with an aromatic polyisocyanate, at least one of the free isocyanate radicals of said aromatic polyisocyanate being substantially kinetically more reactive with respect to active hydrogen than any other said free isocyanate radicals of said aromatic polyisocyanate, the amounts of polyisocyanate being controlled such that the ratio of aromatic NCO equivalents to aliphatic NCO equivalents reacted with said isocyanate-reactive composition is at least about 1:1 but less than 7:1 and the NCO/OH ratio for the entire moisture curable composition is greater than about 1.8:1 but no more than about 3:1; **whereby a moisture-reactive isocyanate-terminated polyurethane prepolymer composition having an average NCO functionality greater than** 1.8 but less than 3.0 is obtained as a result of steps (b) and (c), said isocyanate-terminated prepolymer composition, upon the addition of a curing catalyst for the isocyanate/water reaction, being curable under normal ambient conditions to a solid elastomer, which, in the form of a sheet-like article, has a tensile strength at break greater than 25 psi and an elongation at break greater than 200%;

d. applying said moisture-reactive isocyanate-terminated polyurethane prepolymer composition to a substrate and curing said composition.

4,038,240

PROCESS FOR DYEING POLYURETHANE RESINS

Herbert Hugl, and Gerhard Wolfrum, both of Leverkusen, Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed May 22, 1975, Ser. No. 580,036

Claims priority, application Germany, May 29, 1974, 2426180

Int. Cl.^{2} C08K *5/23*

U.S. Cl. 260—37 N **21 Claims**

1. Process for dyeing polyurethane resins with dyes which are suitable for incorporation in the resin with the formation of covalent bonds, characterised in that dyes of formula:

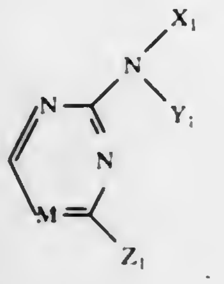
F — B — A

wherein:

F denotes the residue of a dye molecule which is free from reactive groups and from water solubilising groups,

B denotes a direct bond or a bridge member, and

A denotes the group:

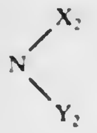


wherein:

M represents N, CH or C—Hal,

Hal represents halogen,

Z_1 represents OZ_2 or



X_1 represents an optionally substituted ω-hydroxyalkyl group or ω-hydroxyalkenyl group,

X_2, Y_1 and Y_2 represent hydrogen or optionally substituted alkyl, alkenyl, aralkyl or aryl groups, or X_1 and Y_1 together with the nitrogen atom form a heterocyclic group, and

Z_2 represents an optionally substituted alkyl group with the proviso that at least one of the groups X_2, Y_1, Y_2 and Z_2 is an ω-hydroxyalkyl or alkenyl group,

are added to the reaction mixture or to one of the components before or during the polyaddition reaction.

4,038,241
POLYMER COMPOSITIONS CONTAINING A BISAZOMETHINE PIGMENT

Eric Richard Inman, Bridge of Weir; James McGeachie McCrae, Stewarton; Christopher Midcalf, Kilbarchan, and Alison Turner, Houston, all of Scotland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

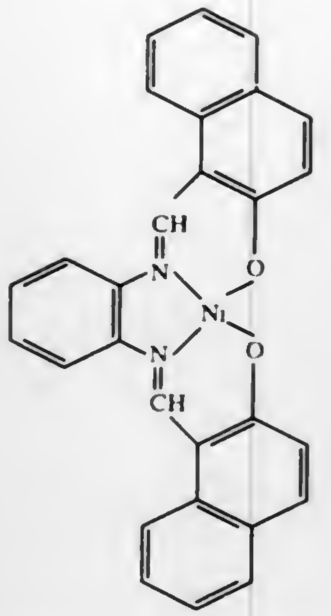
Division of Ser. No. 333,598, Feb. 20, 1973, Pat. No. 3,864,371. This application Nov. 22, 1974, Ser. No. 526,283

Claims priority, application United Kingdom, Feb. 24, 1972, 8517/72

Int. Cl.² C08K *5/35;* **C08L** *23/02, 25/06, 75/04*

U.S. Cl. 260—39 P **9 Claims**

1. A composition comprising a natural or synthetic polymer containing, as pigment, a compound of the formula



in the pigmentary form in which it has an orange-red color and has an X chromaticity co-ordinate of from 0.59 to 0.63 and a Y chromaticity of from 0.33 to 0.36.

4,038,242
SYNTHETIC SLATE

Melvin C. Kuehn, Grand Rapids, Minn., assignor to Ormite, Inc.

Filed May 12, 1975, Ser. No. 576,750

Int. Cl.² C08K *3/22*

U.S. Cl. 260—39 R **15 Claims**

1. A solid dense slate-like composition comprising a unitary product substantially having the physical properties of density and hardness of natural slate which is formed from a substantially uniform mixture of at least about **5** parts by weight of a finely divided taconite material of **35** mesh or less which contains at least about **1** percent magnetite therein, and about **1** part by weight of an amine-formaldehyde resin, said product being formed by heating under pressure the substantially uniform mixture of the taconite material and resin.

4,038,243
GLASS FIBER SIZING COMPOSITIONS FOR THE REINFORCEMENT OF RESIN MATRICES

John Maaghul, Monroeville, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Division of Ser. No. 606,272, Aug. 20, 1975, which is a division of Ser. No. 512,646, Oct. 7, 1974, Pat. No. 3,936,285. This application Mar. 22, 1976, Ser. No. 668,754

Int. Cl.² C08K *3/40*

U.S. Cl. 260—40 R **2 Claims**

1. In the method of forming a molding compound comprising:

coating a nonadhering substrate with thickened polyester resin;

applying chopped glass fiber roving to said coated substrate;

coating a second nonadhering substrate with said polyester resin;

contacting the coatings on said substrates;

mixing the chopped glass fiber roving throughout the resin composition; and

collecting the composite so formed, the improvement comprising:

sizing on said glass fiber roving a composition comprising the dried residue of a sizing composition comprised of a water solubilized first unsaturated polyester resin, said polyester resin being substantially insoluble in aromatic solvents;

a second unsaturated polyester water insoluble resin, said second polyester resin being soluble in said first polyester resin and said second polyester resin preventing the migration of said sizing composition;

a plasticizer;

a first silane coupling agent having amino functionality to promote adhesion between said glass fibers and said resin composite;

a second silane coupling agent which is free radically polymerizable to control the wetting of said glass fibers by said first silane coupling agent;

and a thermoplastic polymer being of sufficiently low molecular weight to impart pressure sensitive adhesive characteristics to said sizing composition.

4,038,244
FLUOROCARBON POLYMER

Keith Ogden, Thornton-Cleveleys, and John Quinby, Northwich, both of England, assignors to Imperial Chemical Industries Limited, London, England

Filed Feb. 27, 1974, Ser. No. 446,505

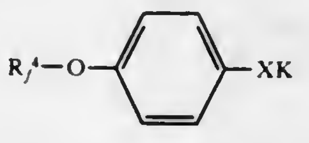
Claims priority, application United Kingdom, Mar. 5, 1973, 48-10537

Int. Cl.² C08K *9/04*

U.S. Cl. 260—42.16 **7 Claims**

1. A method of producing a filled coagulated dispersion form of a fluorocarbon polymer which method comprises

a. treating a filler with a hydrophobising agent which is an anionic surface active agent of the formula:



where R_f^4 is a perfluorocarbon group derived from a TFE oligomer, X is a an anionic group and K is a cationic group,

b. adding the treated filler to an aqueous dispersion of the fluorocarbon polymer, and

c. coagulating the polymer and filler together.

4,038,245
CHAR-FORMING POLYMER COMPOSITIONS

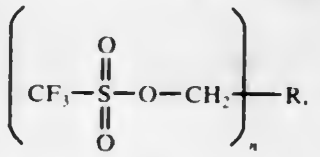
Charles E. Reineke, Midland, Mich., assignor to The Dow Chemical Company, Midland, Mich.

Filed May 21, 1976, Ser. No. 688,862

Int. Cl.² C08K *5/41*

U.S. Cl. 260—45.7 S **10 Claims**

1. A char-forming composition of matter comprising, (A) a polymeric component that comprises (1) polymerized ethylenically unsaturated carboxylic anhydride in an amount sufficient to provide at least about 1 milliequivalent of anhydride moiety per gram of the char-forming composition, and (2) polymerized monovinylidene aromatic monomer in an amount sufficient to provide at least about 1 milliequivalent of reactive aromatic moiety per gram of the char-forming composition, and (B) a char-forming amount of a stable ester of the formula:



$$\left(CF_3-\overset{\overset{\displaystyle O}{\|}}{\underset{\underset{\displaystyle O}{\|}}{S}}-O-CH_2\right)_n R.$$

wherein n is a positive integer and R is an n-valent tertiary hydrocarbyl radical or an inertly substituted n-valent tertiary hydrocarbyl radical.

4,038,246
BUTADIENE RUBBERS STABILIZED WITH THIODIALKANOAMIDOPHENOLS

Martin Knell, Ossining, and Martin Dexter, Briarcliff Manor, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

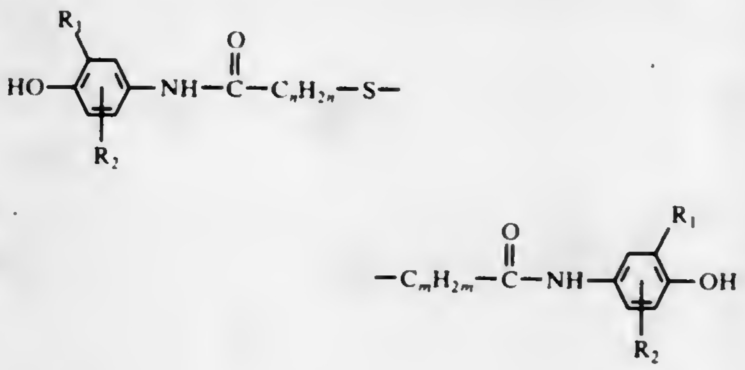
Continuation-in-part of Ser. No. 267,265, June 29, 1972, abandoned, which is a continuation-in-part of Ser. No. 810,352, March 25, 1969, Pat. No. 3,679,744. This application Nov. 27, 1972, Ser. No. 309,847

The portion of the term of this patent subsequent to Sept. 26, 1989, has been disclaimed.

Int. Cl.² C08K *5/36*

U.S. Cl. 260—45.9 NC **7 Claims**

1. A butadiene rubber composition subject to oxidative and/or thermal containing from 0.01 to 5% by weight of the rubber of a thiodialkanoamidophenol having the structure



wherein

R_1 and R_2 are alkyl groups having from 1 to 6 carbon atoms, and

m and *n* are independently integers of from 1 to 10.

4,038,247
STABILIZING POLYOLEFINS WITH DIACYL DIHYDRAZIDES

Helmut Muller, Binningen; Siegfried Rosenberger, Riehen, and Heimo Brunetti, Reinach, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation-in-part of Ser. No. 359,587, May 11, 1973, Pat. No. 3,894,990, which is a continuation of Ser. No. 141,027, May 6, 1971, Pat. No. 3,734,885. This application June 13, 1975, Ser. No. 586,835

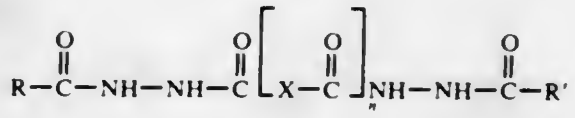
Claims priority, application Switzerland, May 19, 1970, 7371/70

The portion of the term of this patent subsequent to May 22, 1990, has been disclaimed.

Int. Cl.² C08K *5/25*

U.S. Cl. 260—45.9 NC **8 Claims**

1. A process for stabilizing homo- or copolymeric polyolefins, characterised by incorporating into said material from 0.01 to 5 percent by weight, calculated on the material to be stabilized, of a compound of the formula



$$R-\overset{\overset{\displaystyle O}{\|}}{C}-NH-NH-\overset{\overset{\displaystyle O}{\|}}{C}\left[X-\overset{\overset{\displaystyle O}{\|}}{C}\right]_n NH-NH-\overset{\overset{\displaystyle O}{\|}}{C}-R'$$

whherein R and R′ independently of each other represent an aralkyl group which is substituted in its aryl moiety by one or two alkyl groups having each from 1 to 4 carbon atoms and a hydroxyl group or a phenyl group which is substituted by one or two alkyl groups having each from 1 to 4 carbon atoms and a hydroxyl group and X represents the direct bond, an alkylene radical having from 2 to 8 carbon atoms, a phenylene radical or a naphthylene radical, and *n* represents 0 or 1.

4,038,248
PLASTIC COMPOSITIONS

Arnold L. Anderson, Alma, Mich., assignor to Velsicol Chemical Corporation, Chicago, Ill.

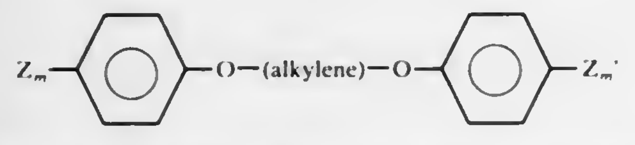
Filed Feb. 8, 1973, Ser. No. 330,782

The portion of the term of this patent subsequent to Apr. 5, 1994, has been disclaimed.

Int. Cl.^{2} C08L *23/06*

U.S. Cl. 260—45.75 R **15 Claims**

1. A plastic composition comprising a polyolefin and a flame retardant, said flame retardant consisting of a compound having the formula



wherein (a) Z is bromine; (b) *m* and *m'* are independent and are integers having a value of from 1 to 5; and (c) alkylene is a straight or branched chain alkylene group having from one to six carbon atoms.

4,038,249
METAL SALTS OF BENZOYLOXYBENZOATES AND COMPOSITIONS STABILIZED THEREWITH

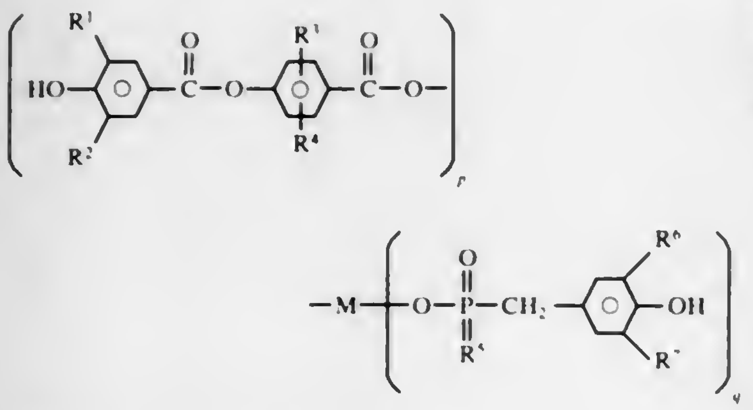
John D. Spivack, Spring Valley, and John J. Luzzi, Carmel, both of N.Y., assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Division of Ser. No. 360,290, May 14, 1973, Pat. No. 3,920,712. This application July 30, 1975, Ser. No. 600,235

Int. Cl.^{2} C08K *5/56, 5/53, 5/09;* **C07F** *15/04, 9/48, 9/46, 15/00*

U.S. Cl. 260—45.75 R **12 Claims**

1. A benzoylyoxybenzoate having the formula



wherein

R^1 and R^2 are (lower)alkyl or (lower)cycloalkyl groups,

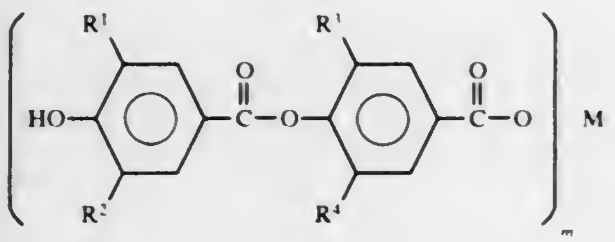
R^3 and R^4 are hydrogen, (lower)alkyl or (lower)cycloalkyl,

R^5 is (lower)alkyl, (lower)alkyloxy or phenyl,

R^6 and R^7 are (lower)alkyl,

M is a metal having a valency of 1 to 4, and *p* and *q* are integers, the sum of which equal the valency of M provided that neither *p* nor *q* is equal to *o*.

3. A composition of matter stabilized against degradation which comprises an organic material subject to oxidative and ultraviolet light degradation and a benzoyloxybenzoate having the formula



wherein

R^1 and R^2 are (lower)alkyl or (lower)cycloalkyl groups,

R^3 and R^4 are hydrogen, (lower)alkyl or (lower)cycloalkyl,

M is metal or an alkyl metal moiety, said metal having a valency of 1 to 4, and

m is an integer from 1 to 4.

4,038,250
LIGHT PROTECTING AGENTS

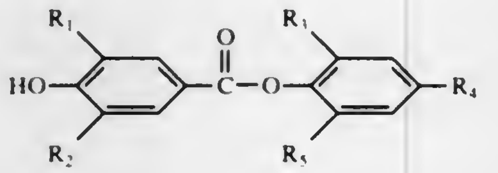
Hanns Lind, Basel, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Continuation of Ser. No. 174,951, Aug. 25, 1971, abandoned. This application Apr. 24, 1975, Ser. No. 571,142

Int. Cl.^{2} C07C *69/76*

U.S. Cl. 260—45.85 B **12 Claims**

1. Compound of the formula I



(I)

in which R_1 denotes alkyl with 1 to 5 carbon atoms, cycloalkyl with 5 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms, R_2 denotes α-branched alkyl with 3 to 8 carbon atoms, cycloalkyl with 5 to 8 carbon atoms or aralkyl with 7 to 9 carbon atoms, R_3 and R_5 independently of one another denote alkyl with 1 to 8 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl or chlorine and R_4 denotes hydrogen, alkyl with 1 to 18 carbon atoms, cycloalkyl with 5 to 8 carbon atoms, aralkyl with 7 to 9 carbon atoms, phenyl or chlorine.

4,038,251
PROCESS FOR THE MANUFACTURE OF POLYADDITION PRODUCTS CONTAINING IMIDE GROUPS BY REACTION OF POLYMALEIMIDES WITH POLYHYDRIC PHENOLS USING AMINE CATALYST

Imre Forgö, Birsfelden; Bruno Schreiber, Basel; Alfred Renner, Munchenstein; Theobald Haug, Frenkendorf, all of Switzerland, and Andre' Schmitter, Hegenheim, France, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

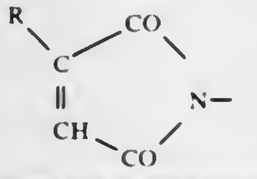
Filed Dec. 18, 1974, Ser. No. 534,105

Claims priority, application Switzerland, Dec. 21, 1973, 18047/73; Dec. 21, 1973, 18048/73

Int. Cl.^{2} C08G *73/10;* **C08F** *222/40*

U.S. Cl. 260—47 NA **50 Claims**

1. Process for the manufacture of polyaddition products containing imide groups, wherein polyamides which contain, per molecule, at least two radicals of the formula



(I)

wherein R is hydrogen or methyl, are reacted with polyhydric phenols in the presence of amines at temperatures between 50° and 280° C.

4,038,252
PHASE BOUNDARY PROCESS FOR THE PREPARATION OF AROMATIC POLYCARBONATES USING A CHLORINATED AROMATIC HYDROCARBON AS THE POLYMER SOLVENT

Hugo Vernaleken, Krefeld, and Uwe Hucks, Duisburg, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Mar. 4, 1975, Ser. No. 555,225

Claims priority, application Germany, Mar. 6, 1974, 2410716

Int. Cl.^{2} C08G *63/62*

U.S. Cl. 260—47 XA **13 Claims**

1. A process for the preparation of a polycarbonate by the phase boundary condensation method, by phosgenation of an aqueous alkali metal salt solution of one or more aromatic dihydroxy compounds, in which the process an aromatic chlorinated hydrocarbon is used as the solvent and the synthesis of the polycarbonate is carried out in two stages, in the first stage of which the reaction of the alkali metal salt solution of the aromatic dihydroxy compoumd(s) with phosgene is carried out at an OH concentration of between 0.01 and 0.1% by weight of OH, relative to the aqueous phase, in the presence of 0.1 to 2.5 mol% of trialkylamine, relative to aromatic dihydroxy compound(s), and at a temperature higher than about 70°C, with a dwell time of less than about 5 minutes, while in a second stage the polycondensation is effected by adjusting the OH concentration to about 0.20 to 0.50% by weight of OH, relative to the aqueous phase, optionally with further addition of trialkylamine, at a temperature higher than about 80°C with a dwell time of more than about 1 minute.

4,038,253
PHOTOCROSS-LINKABLE POLYMERS CONTAINING PENDANT DIAZOESTER GROUPS

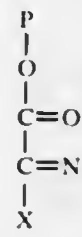
Brian D. Kramer, Wilmington, Del., assignor to Hercules Incorporated, Wilmington, Del.

Continuation of Ser. No. 412,218, Nov. 2, 1973, abandoned. This application June 2, 1976, Ser. No. 692,166

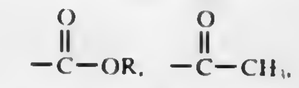
Int. Cl.^{2} C08F *116/02, 218/00;* **C08B** *31/00;* **C07C** *113/00*

U.S. Cl. 260—47 R **5 Claims**

1. A polymer photocross-linkable to actinic radiation containing the following units



where P is derived from a soluble hydroxy containing polymer which has been esterified to give the above pendant groups and X is a radical selected from the group consisting of —H,



$$-\overset{O}{\overset{\|}{C}}-OR,\quad -\overset{O}{\overset{\|}{C}}-CH_3,$$

—CN and —Ar, where Ar is selected from phenyl and phenyl substituted with 1 to 3 —NO_2, Cl, F, Br, $C_{1\text{-}8}$ alkyl or $C_{1\text{-}5}$ alkyloxy groups and R is selected from $C_{1\text{-}18}$ alkyl, $C_{5\text{-}7}$ cycloalkyl, $C_{1\text{-}4}$ alkyl substituted $C_{5\text{-}7}$ cycloalkyl and Ar, where Ar is as defined above.

4,038,254
PROCESS FOR THE MANUFACTURE OF WIRE INSULATION VARNISH RESINS SUITABLE CHIEFLY FOR APPLICATION IN THE MELTED STATE

Gerhard Schade; Peter Uckert, and Manfred Fritz, all of Witten, Germany, assignors to Dynamit Nobel Aktiengesellschaft, Troisdorf, Germany

Continuation of Ser. No. 446,063, Feb. 26, 1974, abandoned. This application Aug. 5, 1975, Ser. No. 602,032

Claims priority, application Germany, Mar. 1, 1973, 2310247

Int. Cl.^{2} C08G *63/20, 63/68*

U.S. Cl. 260—75 N **12 Claims**

1. A process for the manufacture of wire insulation varnish resins suitable for application in the melted state which comprises:

1. contacting a lower alkyl ester of terephthalic acid with tris-(2-hydroxyethyl)-isocyanurate and ethylene glycol in the presence of 0.3 to 1.5%, with reference to the weight of the sum of all resin forming monomers, of an alcoholate of titanium, vanadium or zirconium and effecting transesterification under transesterification conditions until between 90 and 100% of the theoretically possible esterification is effected;
2. contacting the transesterification product of step 1 with trimellitic acid anhydride under esterification conditions to effect further esterification until between 40 and 55% of the theoretically possible esterification is effected;
3. prior to completion of the esterification of step 2 immediately adding to the reaction mixture 4,4'-diaminodiphenylmethane in an amount such that the molar ratio of the trimellitic acid derived from trimellitic acid anhydride to said 4,4'-diaminodiphenylmethane is between 2.1 and 1.9:1; and
4. polycondensing the reaction mixture until a resin is formed having a melt viscosity between 5,000 and 20,000 cP at 140° to 160° C. such that it can be applied to a wire substrate in melted form.

4,038,255
LINEAR POLYESTERS BASED ON N,N-HETEROCYCLIC DICARBOXYLIC ACIDS

Jürgen Habermeier, Pfeffingen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

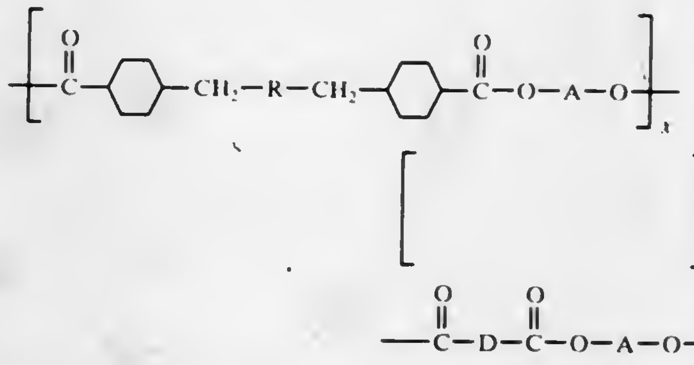
Filed Nov. 20, 1975, Ser. No. 633,771

Claims priority, application Switzerland, Nov. 29, 1974, 15866/74

Int. Cl.^{2} C08G *63/12, 63/16*

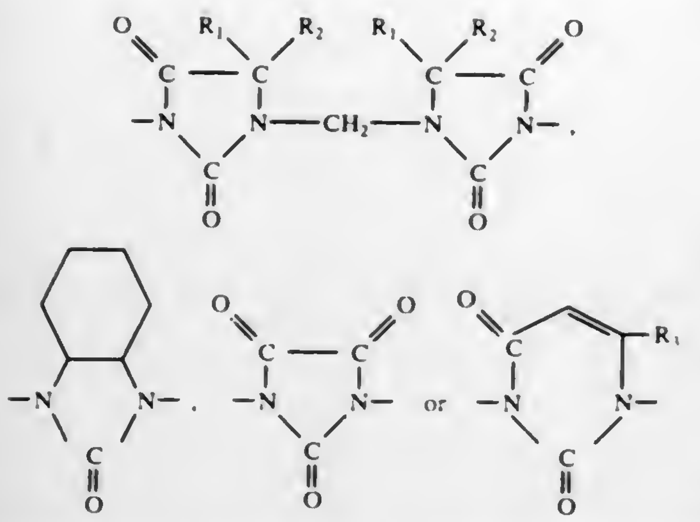
U.S. Cl. 260—75 N **7 Claims**

1. A linear, thermoplastic polyester having a relative viscosity of 1.2 to 3.0, measured at 30° C on a 1% strength solution consisting of equal parts of phenol and tetrachloroethane, which is characterised by the structural elements of the general formula I

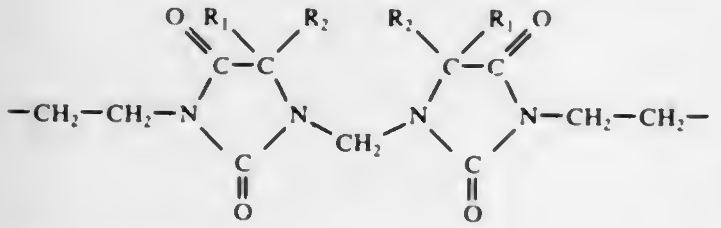


(I)

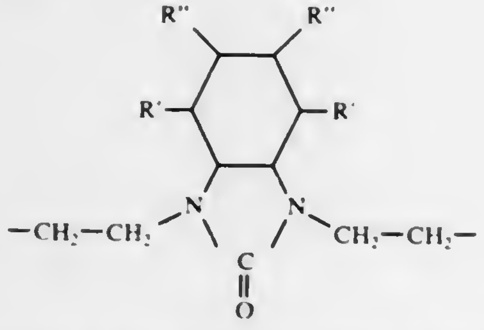
wherein R denotes a N,N-heterocyclic radical of the formula



wherein R_1 and R_2 independently of one another each denote hydrogen or alkyl having 1 to 3 C atoms, R_3 denotes hydrogen or methyl, A denotes an aliphatic radical having 2 to 6 C atoms, a N,N'-heterocyclic-aliphatic radical of the formula



or the formula



wherein R_1 and R_2 have the same meaning as above and R' and R'' represent H, chlorine or bromine atoms or R' represents a H atom and R'' represents a chlorine or bromine atom, D denotes meta- or para-phenylene and *x* and *y* represent integers, and the mol fraction $x/(x + y)$ derived from *x* and *y* can have values from 0.05 to 0.1.

4,038,256

NONSTAINING POLYURETHANE FROM CYCLOALIPHATIC OR ALIPHATIC DIISOCYANATES AND POLYHEXENEDIOL-PHTHALATES

Anthony F. Finelli, and Jeffrey W. Saracsan, both of Akron, Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Nov. 24, 1975, Ser. No. 634,573

Int. Cl.² C08G *18/10*

U.S. Cl. 260—75 NH **4 Claims**

1. In a nondiscoloring polyurethane comprising the reaction product of a mol of a polyester of 1800 to 3500 molecular weight, 1 3 to 3.2 mols of a diisocyanate selected from the group consisting of cycloaliphatic and aliphatic and 0.2 to 2.0 mols of a curative selected from the group consisting of organic diamine having no amino groups attached to a benzenoid carbon atom, and a polyol having a molecular weight less than 500 and mixtures of these the improvement wherein the polyester is polyhexanedoil-ortho-phthalate or a blend of 50 to 80 percent of polyhexanediol-ortho-phthalate and 50 to 20 percent of polyhexanediol isophthalate.

4,038,257

URETHANE MODIFIED ACRYLATE RESIN AND PROCESS FOR THE PRODUCTION THEREOF

Hajime Suzuki, and Hideo Miyake, both of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Osaka, Japan

Filed Sept. 19, 1975, Ser. No. 615,098

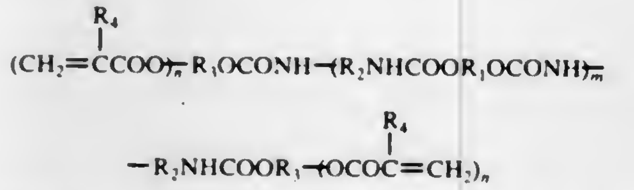
Claims priority, application Japan, Sept. 25, 1974, 49-110753

Int. Cl.² C08G *63/12*

U.S. Cl. 260—75 NK **13 Claims**

1. A urethane modified acrylate which is expressed by the following general formula (I),

(I)



$$(CH_2{=}\overset{\overset{R_4}{|}}{C}COO\!\!+\!\!)_{n}R_3OCONH\!-\!\!(R_2NHCOOR_1OCONH\!\!+\!\!)_{m}$$

$$-R_2NHCOOR_3\!-\!\!(OCO\overset{\overset{R_4}{|}}{C}{=}CH_2)_n$$

(where R_1 is a terephthalic oligoester residue, R_2 is an organic diisocyanate residue, R_3 is a polyhydric alcohol residue, R_4 is a hydrogen atom or methyl group, *m* is a number not more than 5 and *n* is an integer from 1 through 4).

4,038,258

ANTISTATIC COMPOSITION CONTAINING AN ALIPHATIC POLYESTER OR POLYETHER ESTER AND A PHOSPHONIUM SALT

Gurdial Singh, Hockessin, Del., and Richard Edward Von Rutte, Riehen-Basel, Switzerland, assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Division of Ser. No. 614,230, Sept. 17, 1975, Pat. No. 4,005,057, which is a continuation-in-part of Ser. No. 403,334, Oct. 9, 1973, abandoned. This application Oct. 22, 1976, Ser. No. 735,098

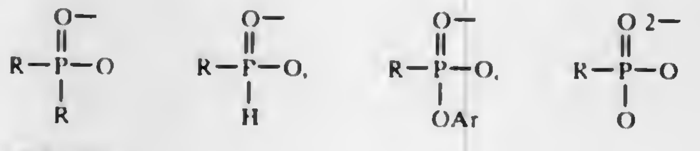
Int. Cl.² C08G *63/70, 63/16*

U.S. Cl. 260—75 T **3 Claims**

1. An antistatic composition having a log R_s of less than 8 and consisting essentially of a polyether-ester or aliphatic polyester having a T_g (NMR) of less than 25° C and from 0.02 to 35 weight percent based on the weight of the composition of a phosphonium salt of the formula

$$[R_1R_2R_3R_4P^+]_n\,X^n$$

where $R_1R_2R_3$ and R_4 each represents a monovalent hydrocarbon group of from 1-18 carbon atoms; X^{n-} is an organic anion selected from the group of



$$R-\overset{\overset{O^-}{\|}}{\underset{\underset{R}{|}}{P}}-O \qquad R-\overset{\overset{O^-}{\|}}{\underset{\underset{H}{|}}{P}}-O, \qquad R-\overset{\overset{O^-}{\|}}{\underset{\underset{OAr}{|}}{P}}-O, \qquad R-\overset{\overset{O\;2-}{\|}}{\underset{\underset{O}{|}}{P}}-O$$

and $R\!\!+\!\!SO_3\!\!+\!\!_m$

wherein *Ar* is an aromatic hydrocarbon radical; *R* is an aliphatic or an aromatic hydrocarbon radical; *m* is 1 or 2; and *n*, the valence of the anion, is 1 or 2.

4,038,259

PRODUCTION OF P-PHENYLENE SULFIDE POLYMERS

Robert W. Campbell, and James T. Edmonds, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,332

Int. Cl.² C08G *75/16*

U.S. Cl. 260—79.1 **12 Claims**

1. A method for producing polymers comprising:

a. forming a composition by contacting at least one p-dihalobenzene, at least one alkali metal sulfide, at least one alkali metal carboxylate, at least one organic amide, and at least one alkali metal carbonate, and

b. maintaining at least a portion of said composition at polymerization conditions to produce a polymer.

4,038,260

PRODUCTION OF p-PHENYLENE SULFIDE POLYMERS

Robert W. Campbell, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,333

Int. Cl.² C08G *75/16*

U.S. Cl. 260—79.1 **12 Claims**

1. A method for producing polymers comprising:

a. forming a composition by contacting at least one p-dihalobenzene, at least one alkali metal sulfide, at least one organic amide, and at one alkali metal sulfonate, and

b. maintaining at least a portion of said composition at polymerization conditions to produce a p-phenylene sulfide polymer.

4,038,261

PRODUCTION OF BRANCHED ARYLENE SULFIDE POLYMERS

Willie W. Crouch, and James T. Edmonds, Jr., both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,334

Int. Cl.² C08G *75/16*

U.S. Cl. 260—79.1 **14 Claims**

1. A method of producing polymers comprising:

a. forming a composition by contacting at least one p-dihalobenzene, at least one polyhalo aromatic compound having more than two halogen substituents per molecule, at least one alkali metal sulfide, at least one lithium salt chosen from lithium carboxylate and lithium chloride, N-methyl-2-pyrrolidone, and at least one alkali metal hydroxide, and

b. maintaining at least a portion of said composition at polymerization conditions to produce a polymer.

4,038,262

PRODUCTION OF ARYLENE SULFIDE POLYMERS

James T. Edmonds, Jr., Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

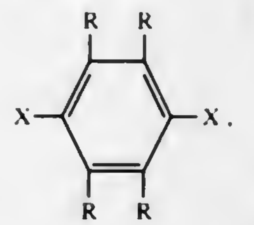
Filed May 27, 1975, Ser. No. 581,338

Int. Cl.² C08G *75/16*

U.S. Cl. 260—79.1 **12 Claims**

1. A method for producing polymers comprising:

a. forming a composition by contacting a p-dihalobenzene represented by the formula



where each X is selected from the group consisting of chlorine, bromine, and iodine, and each R is selected from the group consisting of hydrogen and hydrocarbyl in which the hydrocarbyl is an alkyl, cycloalkyl, or aryl radical or combination thereof, the total number of carbon atoms in each molecule being within the range of 6 to about 24, with the proviso that in at least 50 mole percent of the p-dihalobenzene employed each R must be hydrogen, with an alkali metal sulfide, an alkali metal hydroxide, N-methyl-2-pyrrolidone, carbon dioxide, and a compound chosen from among an alkali metal carboxylate and a lithium halide, and

b. maintaining at least a portion of said composition at polymerization conditions for a time sufficient to produce a polymer.

4,038,263

PRODUCTION OF P-PHENYLENE SULFIDE POLYMERS

James T. Edmonds, Jr., and Robert W. Campbell, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed May 27, 1975, Ser. No. 581,343

Int. Cl.² C08G *75/16*

U.S. Cl. 260—79.1 **15 Claims**

1. A method for producing polymers comprising:

a. forming a composition by contacting at least one p-dihalobenzene, at least one alkali metal sulfide, at least one organic amide, and at least one lithium halide, and

b. maintaining at least a portion of said composition under polymerization conditions for a time sufficient to produce a polymer.

4,038,264

HEMA COPOLYMERS HAVING HIGH OXYGEN PERMEABILITY

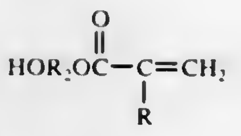
Martin Rostoker, East Windsor, N.J., and Leon Levine, Willow Grove, Pa., assignors to National Patent Development Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 431,555, Jan. 7, 1974, abandoned. This application Nov. 22, 1974, Ser. No. 526,079

Int. Cl.² C08F *220/20*

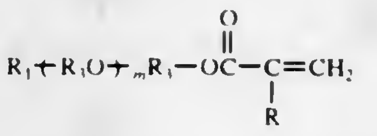
U.S. Cl. 260—79.3 M **55 Claims**

1. A hydrophilic, water insoluble copolymer which is (A) a copolymer of 25 to 97.5% of a compound having the formula (1)



$$HOR_2O\overset{\overset{O}{\|}}{C}-\underset{\underset{R}{|}}{C}{=}CH_2$$

and 75 to 2.5% of a compound having the formula (2)



$$R_1\!\!+\!\!R_3O\!\!+\!\!_mR_3-O\overset{\overset{O}{\|}}{C}-\underset{\underset{R}{|}}{C}{=}CH_2$$

where R is hydrogen or methyl, R_2 is alkylene of 2 to 3 carbon atoms, *m* is an integer of 2 to 6, R_3 is alkylene of 2 to 3 carbon atoms and R_1 is alkoxy of 1 to 6 carbon atoms or (B) a copolymer of at least 50% of (1), up to 40% of (2), and up to 40% of a modifier selected from the group consisting of vinylpyrrolidone, vinylacetate, glycerol methacrylate, trimethylolpropane methacrylate, vinyl propionate sodium salt of 2-acrylamide-2-methylpropane sulfonic acid, polyvinyl pyrrolidone, vinylpyrrolidonevinylacetate copolymer and polyvinyl alcohol.

4,038,265

VINYL BENZYL ETHERS AND NONIONIC WATER SOLUBLE THICKENING AGENTS PREPARED THEREFROM

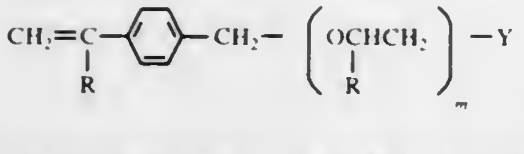
Syamalarao Evani, and Frederick P. Corson, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Division of Ser. No. 489,876, July 18, 1974, Pat. No. 3,963,684, which is a division of Ser. No. 267,571, June 29, 1972. This application Oct. 28, 1975, Ser. No. 626,011

Int. Cl.^{2} C08F *220/56*

U.S. Cl. 260—79.7 2 Claims

1. A nonionic water soluble binary copolymeric thickening agent composed of in polymerized form about 1 to 5 mole percent of a vinyl benzyl ether monomer and the balance to make 100 percent of acrylamide, said ether monomer having the formula



wherein R is hydrogen or methyl, m is about 10 to 100 and Y is where R_1 is an alkyl, aralkyl or alkaryl hydrophobic group of 10 to about 22 carbon atoms.

4,038,266

AZO-BISANHYDRIDE OF TRIMELLITIC ANHYDRIDE

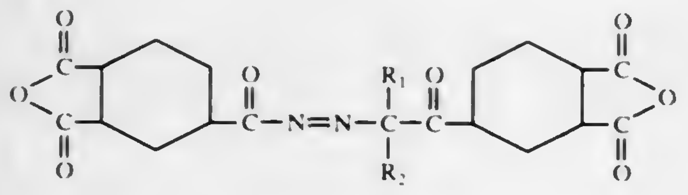
Kerford A. Marchant, Jr., Evanston, and David J. Fenoglio, Carol Stream, both of Ill., assignors to Standard Oil Company (Indiana), Chicago, Ill.

Division of Ser. No. 414,351, Nov. 9, 1973, Pat. No. 3,989,669. This application Dec. 22, 1975, Ser. No. 643,471

Int. Cl.^{2} C07C *107/00;* **C09B** *27/00;* **C08G** *63/12, 69/44*

U.S. Cl. 260—152 3 Claims

1. A compound of the formula:



wherein R_1 and R_2 are selected from the group consisting of alkyl containing from 1 to 6 carbon atoms, halogenated alkyl containing from 1 to 6 carbon atoms and a phenyl.

4,038,267

TRIAZINE REACTIVE DYES

Yoshihisa Sueda, Toyonaka; Suketsugu Koumura, Ibaragi; Kazuyoshi Hirabayashi, Ikeda; Hirohito Kenmochi, Takatsuki; Hisashige Terao, Toyonaka, and Yoshio Mori, Ibaragi, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

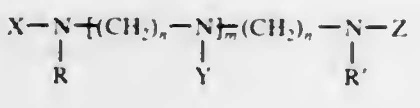
Filed May 21, 1974, Ser. No. 471,986

Claims priority, application Japan, May 24, 1973, 48-58829

Int. Cl.^{2} C09B *43/16, 33/00, 35/00*

U.S. Cl. 260—153 6 Claims

1. A compound of the formula,



$$X-\underset{R}{N}\!\left[(CH_2)_n-\underset{Y}{N}\right]_m(CH_2)_{n'}-\underset{R'}{N}-Z$$

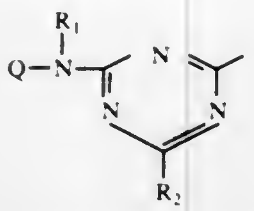
wherein

R and R′ each are hydrogen, C_1-C_4 alkyl or C_1-C_4 hydroxyalkyl,

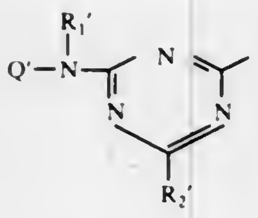
m is an integer of 1 to 5,

n and *n′* each are an integer of 2 or 3,

X is hydrogen or a group of the formula

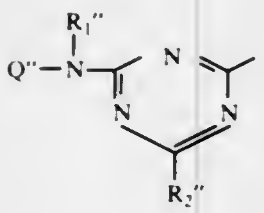


Y is hydrogen or a group of the formula



and

Z is hydrogen or a group of the formula

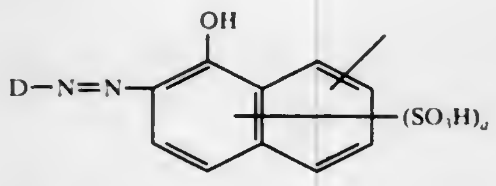


wherein

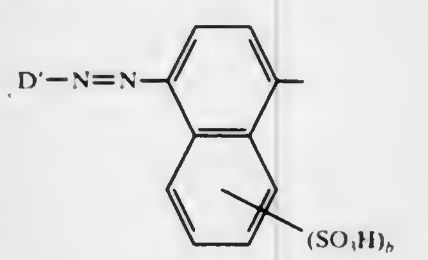
R_1, R_1' and R_1'' each are hydrogen or C_1-C_4 alkyl,

R_2, R_2' and R_2'' each are halogen, and

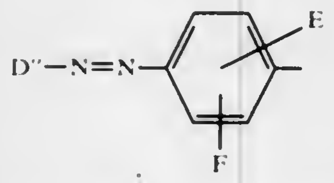
Q, Q′ and Q″ each are independently one member selected from a group consisting of members of the formulae as a free acid form,



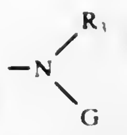
wherein D is a diazo-component of benzene or naphthalene series which may contain an azo group, and *a* is 1 or 2,



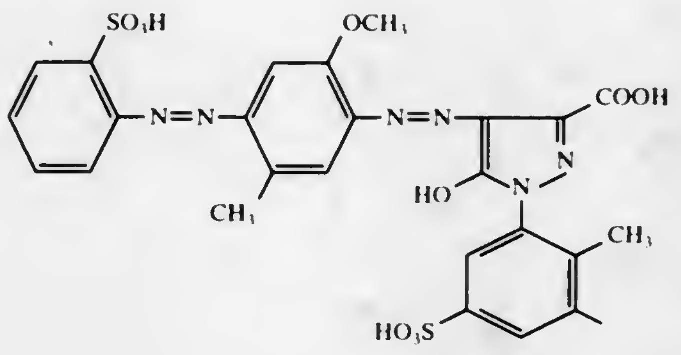
wherein D′ is a diazo-component of benzene or naphthalene series which may contain an azo group, and *b* is 0 or 1,



wherein D″ is a diazo-component of benzene or naphthalene series which may contain an azo group or a coupling component of benzene, naphthalene or pyrazolone series, E is hydrogen, halogen, methyl, methoxy, ethoxy or sulfo and F is hydrogen, methyl, methoxy, ethoxy, sulfo or



wherein R_3 is hydrogen or C_1-C_4 alkyl, and G is C_2-C_5 alkylcarbonyl, C_1-C_4 alkylsulfonyl, or carbamoyl with the proviso that E and F are hydrogen or sulfo when D″ is a coupling component, and



wherein Q, Q′ and Q″ may independently be the same or different, and X, Y and Z are not hydrogen at the same time.

4,038,268

PROCESS FOR PREPARING AZO DYESTUFFS CONTAINING 2,4,6-TRI-AMINO-3-(CYANO ESTER OR CARBONAMIDE)PYRIDINE

Karl Ludwig Moritz, Cologne, and Karl Heinz Schundehutte, Opladen, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Continuation-in-part of Ser. No. 442,621, Feb. 14, 1974, Pat. No. 4,006,128. This application Aug. 12, 1974, Ser. No. 496,715

Claims priority, application Germany, Feb. 14, 1973, 2307168

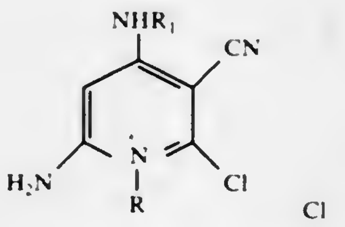
Int. Cl.^{2} C09B *29/36;* **C07D** *213/38*

U.S. Cl. 260—156 11 Claims

1. A process for preparing an azo dyestuff comprising

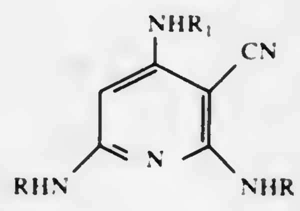
a. reacting

(III)



with at least two equivalents of R_3NH_2 at a temperature of 110° to 130° C to form

IV

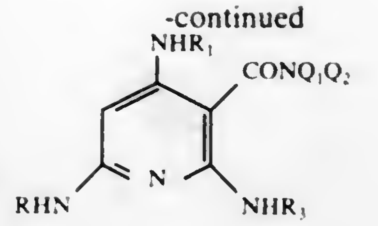


b. and then coupling IV, V or VI with diazotized DNH_2 wherein

V and VI are prepared by converting IV to

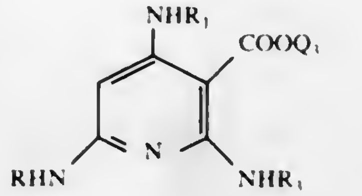
V

-continued



or

VI



by reaction at the cyano group; in which

D is the radical of a diazo component;

R is C_1-C_6-alkyl; C_1-C_6-alkyl substituted by halogen, CN, OH, C_1-C_4-alkoxy or C_2-C_5-alkoxycarbonyl; cyclohexyl; methyl-cyclohexyl; phenyl; phenyl substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, halogen or cyano; benzyl; phenethyl; or benzyl or phenethyl substituted with chlorine, C_1-C_4-alkyl or C_1-C_4-alkoxy;

R_1 and Q_3 are independently C_1-C_6-alkyl; C_1-C_6-alkyl substituted with halogen, cyano, hydroxyl, C_1-C_4-alkoxy or C_2-C_5-alkoxycarbonyl; benzyl; phenethyl; benzyl or phenethyl substituted by chlorine, C_1-C_4-alkyl or C_1-C_4-alkoxy;

Q_1 and Q_2 are independently of one another hydrogen, R or conjointly with the nitrogen atom form a morpholine, piperidine or pyrrolidine ring; and

R_3 is C_1-C_4-alkyl; C_1-C_4-alkyl substituted by hydroxy, methoxy or ethoxy; benzyl; phenethyl; benzyl or phenethyl substituted by chlorine, C_1-C_4-alkyl or C_1-C_4-alkoxy; phenyl; or phenyl substituted by C_1-C_4-alkyl, C_1-C_4-alkoxy, halogen or cyano.

4,038,269

2′-ALKOXYACYLAMINO-4′-ALKYLAMINO-4-NITRO-1,1′-AZOBENZENE DISPERSE DYES

Wolfgang Groebke, Oberwil, Switzerland, assignor to Sandoz Ltd., Basel, Switzerland

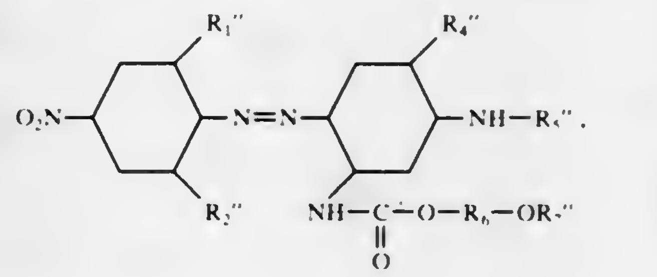
Continuation of Ser. No. 410,479, Oct. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 138,760, April 29, 1971, abandoned. This application Jan. 2, 1976, Ser. No. 646,244

Claims priority, application Switzerland, May 6, 1970, 6808/70; Dec. 29, 1970, 19249/70; May 16, 1973, 6908/73

Int. Cl.^{2} C09B *29/08, 29/26*

U.S. Cl. 260—207 18 Claims

1. A compound of the formula



wherein

R_1- is cyano or nitro,

R_2'' is chloro, bromo or cyano,

R_4'' is hydrogen, methoxy or ethoxy,

R_5'' is alkyl of 2 or 3 carbon atoms monosubstituted by cyano or alkoxycarbonyl wherein the alkoxy radical has 1 to 4 atoms,

R_6 is alkylene of 2 or 3 carbon atoms, and

R_7'' is alkyl of 1 to 4 carbon atoms.

4,038,270

MENTHOL GLYCOSIDE, PROCESS FOR PREPARING THE SAME AND METHOD FOR RELEASING MENTHOL THEREFROM

Tatsuo Higashiyama, and Isao Sakata, both of Kasaoka, Japan, assignors to Toyo Hakka Kobyo Kabushiki Kaisha, Japan

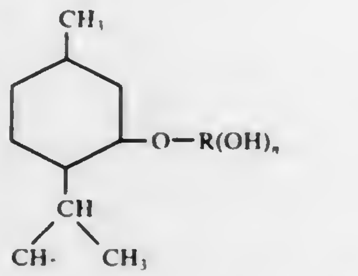
Continuation of Ser. No. 273,455, July 20, 1972, abandoned. This application June 9, 1975, Ser. No. 584,855

Claims priority, application Japan, Aug. 27, 1971, 46-065616; Aug. 27, 1971, 46-065617

Int. Cl.^{2} C07H *15/20*

U.S. Cl. 536—4 **8 Claims**

1. A substantially water-soluble menthol glycoside having the general formula:



where R is the residue of lactose, maltose or raffinose and n is the number of hydroxyl groups on said residue.

4,038,271

[[[(2,4-DIOXO-1-IMIDAZOLIDINYL)AMINO]-CARBONYL]AMINO]ACETYLPENICILLIN DERIVATIVES

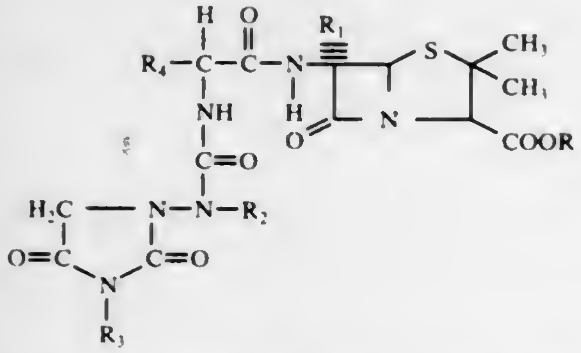
Hermann Breuer, and Uwe D. Treuner, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Filed Nov. 8, 1976, Ser. No. 740,163

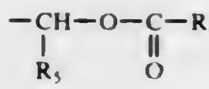
Int. Cl.^{2} C07D *499/64, 499/66, 499/68, 499/70*

U.S. Cl. 260—239.1 **32 Claims**

1. A compound of the formula:



wherein R is hydrogen, lower alkyl, phenyl-lower alkyl, tri(-lower alkyl)silyl, a conventional pharmaceutically acceptable salt forming ion, or


$$-\underset{R_5}{\underset{|}{CH}}-O-\underset{O}{\underset{\|}{C}}-R_6;$$

R_1 is in the α-configuration and is hydrogen or methoxy; R_2, R_3 and R_5 each is hydrogen or lower alkyl; R_4 is hydrogen, lower alkyl, cycloalkyl of 3 to 7 carbons, cycloalkenyl of 3 to 7 carbons, cycloalkadienyl of 6 or 7 carbons, phenyl, phenyl-lower alkyl, substituted phenyl or phenyl-lower alkyl wherein said phenyl substituent is one or two members selected from the group consisting of halogen, lower alkyl, lower alkoxy and hydroxy, or a substituted or unsubstituted heterocyclic selected from the group consisting of 2-thienyl, 3-thienyl, 2-furyl, 3-furyl, 2-pyridyl, 3-pyridyl and 4-pyridyl wherein said heterocyclic substituent is attached at an available carbon atom and is halogen or lower alkyl; and R_6 is lower alkyl.

4,038,272

STEREOSPECIFIC SYNTHESES OF 24R,25- AND 24S,25-DIHYDROXYCHOLESTEROL AND ALKANOYL DERIVATIVES THEREOF

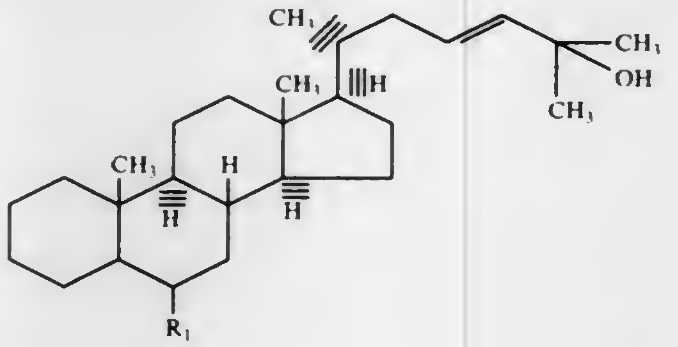
John Joseph Partridge, Jr., and Milan Radoje Uskokovic, both of Upper Montclair, N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Filed Oct. 20, 1975, Ser. No. 623,859

Int. Cl.^{2} C07J *71/00, 53/00*

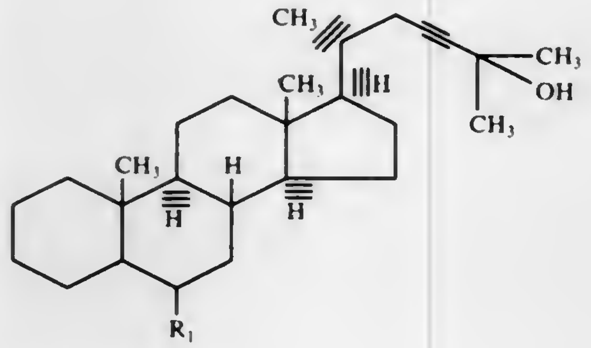
U.S. Cl. 260—239.55 R **63 Claims**

1. A process for the preparation of a compound of the formula



wherein R_1 is hydroxy, lower alkoxy, phenyl lower alkoxy, lower alkanoyloxy or benzoyloxy

and the configuration of the 23, 24-double bond it trans, i.e., where the 23, 24-double bond has the E-configuration, which comprises contacting a compound of the formula



wherein R_1 is as above,

with a complex metal hydride reducing agent in an etheral organic solvent.

4,038,273

PIPERIDONE INTERMEDIATES USEFUL IN THE PREPARATION OF ARYLDECAHYDROPYRROLO [3,4-f]QUINOLINES

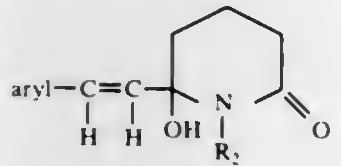
Frederic Peter Hauck, Somerville, and Joseph E. Sundeen, Trenton, both of N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 549,581, Feb. 13, 1975, Pat. No. 3,963,724, which is a division of Ser. No. 374,593, June 28, 1973, Pat. No. 3,891,652. This application Mar. 30, 1976, Ser. No. 671,791

Int. Cl.^{2} C07D *211/40*

U.S. Cl. 260—240 D **5 Claims**

1. A compound of the formula:



wherein R_2 is selected from the group consisting of hydrogen, lower alkyl, lower alkenyl, aryl-lower alkyl, and styryl; and aryl is selected from the group consisting of phenyl, naphthyl, substituted phenyl and substituted naphthyl wherein said substituent is selected from the group consisting of lower alkyl, lower alkoxy, di(lower alkyl)amino, halogen, and trifluoromethyl.

4,038,274

CNS ACTIVE COMPOUNDS

John Krapcho, and Joseph Schwartz, both of Somerset, N.J., assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

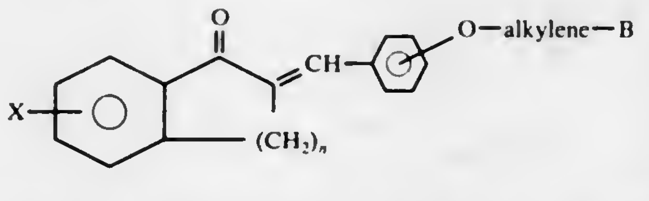
Division of Ser. No. 682,695, May 3, 1976, which is a division of Ser. No. 599,732, July 28, 1975, Pat. No. 3,969,527. This application Dec. 10, 1976, Ser. No. 749,644

Claims priority, application Canada, July 15, 1976, 257036; France, July 27, 1976, 76.22885; Germany, July 28, 1976, 2633931; Japan, July 28, 1976, 51-91264

Int. Cl.^{2} C07D *207/24, 295/02*

U.S. Cl. 260—240 F **6 Claims**

1. A compound of the formula



wherein X is a member selected from the group consisting of H, halogen, alkyl of from 1 to 8 carbons, lower alkoxy or CF_3; *n* is 1, 2 or 3; B is a member selected from the group consisting of piperidino, pyrrolidino, morpholino, N-lower alkylpiperazino, or N-(2-hydroxyethyl)piperazino; and alkylene is a straight or branched saturated hydrocarbon chain group containing from 2 to about 5 carbons; and N-oxides and pharmaceutically acceptable acid-addition salts thereof.

4,038,275

PROCESS FOR PREPARATION OF 3-HYDROXYMETHYLCEPHEMS

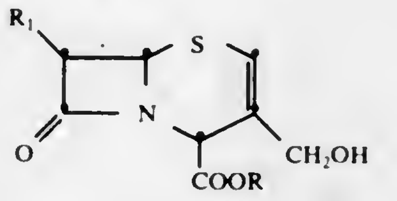
Gary A. Koppel, Indianapolis, Ind., and Laurence J. Nummy, Cambridge, Mass., assignors to Eli Lilly and Company, Indianapolis, Ind.

Filed Apr. 19, 1976, Ser. No. 678,086

Int. Cl.^{2} C07D *501/04*

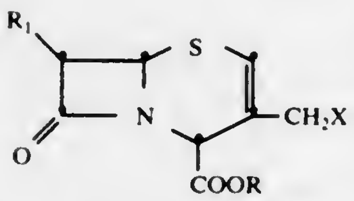
U.S. Cl. 260—243 C **9 Claims**

1. A process for preparing a 3-hydroxymethyl-2-cephem compound of the formula

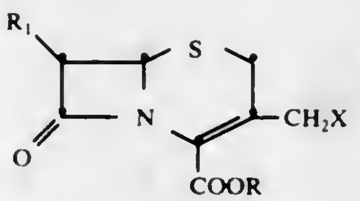


which comprises

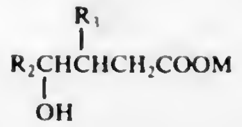
1. reacting a 3-halomethylcephem compound of the formula



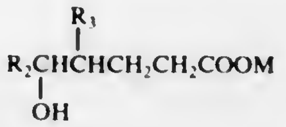
or



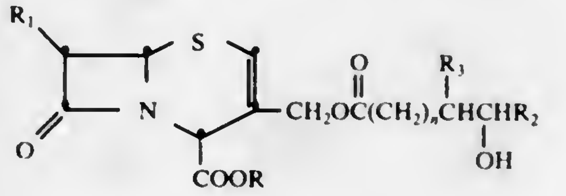
with from about 1 to about 1.3 equivalents of a salt of a γ-hydroxycarboxylic acid of the formula


$$R_2\underset{OH}{\underset{|}{C}}H\overset{R_3}{\overset{|}{C}}HCH_2COOM$$

or a salt of a δ-hydroxycarboxylic acid of the formula


$$R_2\underset{OH}{\underset{|}{C}}H\overset{R_3}{\overset{|}{C}}HCH_2CH_2COOM$$

in hexamethylphosphoramide (HMPA) at a temperature of about −10° to about 25° C. to provide a mixture of the 2-cephem hydroxy ester of the formula



and the corresponding 3-cephem hydroxy ester; and

2. reacting in an inert organic solvent the product 2-cephem hydroxy ester with a protic acid having a pK value of less than about 4.0;

wherein in the above formulae

X is chloro, bromo, or iodo;

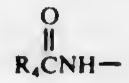
M is an alkali metal cation;

n is 1 or 2;

R is a carboxylic acid protecting group;

R_2 and R_3 are independently hydrogen, ethyl or methyl; and

R_1 is an amido group of the formula


$$R_4\overset{O}{\overset{\|}{C}}NH-$$

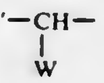
wherein R_4 is

- a. hydrogen, C_1–C_3 alkyl, 3-(2-chlorophenyl)-5-methylisoxazol-4-yl or 4-protected amino-4-protected carboxybutyl;
- b. benzyloxy, 4-nitrobenzyloxy, 2,2,2-trichloroethoxy, tert-butoxy, or 4-methoxybenzyloxy;
- c. the group —R″ wherein R″ is 1,4-cyclohexadienyl, phenyl or phenyl substituted with 1 or 2 substituents independently selected from the group consisting of halo, protected hydroxy, nitro, cyano, trifluoromethyl, C_1–C_3 alkyl, and C_1–C_7 alkoxy;
- d. an arylalkyl group of the formula

$R''-(Q)_m-CH_2-$

wherein R″ is as defined above, Q is O or S, and *m* is O or 1;

- e. a substituted arylalkyl group of the formula


$$R'''-\underset{W}{\underset{|}{C}}H-$$

wherein R‴ is R″ as defined above, 2-thienyl or 3-thienyl, and W is protected hydroxy, protected carboxy or protected amino; or

- f. a heteroarylmethyl group of the formula

$R''''-CH_2-$

wherein R'''' is 2-thienyl, 3-thienyl, 2-furyl, 2-thiazolyl, 5-tetrazolyl, and 1-tetrazolyl.

4,038,276

PROCESS FOR THE PRODUCTION OF FINELY DIVIDED SOLID CYANURIC CHLORIDE

Friedhelm Geiger, Erlensee; Werner Heimberger, Hanau, and Theodor Lussling, Constance, all of Germany, assignors to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler, Frankfurt, Germany

Filed Aug. 20, 1976, Ser. No. 716,353

Claims priority, application Germany, Aug. 23, 1975, 2537673

Int. Cl.^{2} C07D *251/28*

U.S. Cl. 260—248 C **10 Claims**

1. A process of producing finely divided solid cyanuric chloride comprising feeding liquid cyanuric chloride into a separatory container, cooling the liquid cyanuric chloride with recycling inert gas to such an extent that the cyanuric chloride separates in crystalline form, passing and thereby warmed inert gas now containing cyanuric chloride vapor from said separatory container through a conduit into a washing column, washing the cyanuric chloride laden gas in said washing column by countercurrent flow with an inert liquid that is a good solvent for cyanuric chloride, which liquid solvent has a temperature below that of the warmed gas, to remove cyanuric chloride from said gas while simultaneously cooling the gas, subsequently returning the thus cooled and purified gas to the separatory container, cooling to the original temperature the washing liquid containing cyanuric chloride, which liquid had increased in temperature in the washing process and spraying the inside of the conduit connecting the separatory container and washing column constantly with the cooled washing liquid, dividing a partial stream of the cyanuric chloride containing washing liquid in a distillation column into a pure liquid cyanuric chloride fraction, and a pure washing liquid, recycling the pure liquid cyanuric chloride into the separatory column and recycling the pure washing liquid into the washing column.

4,038,277

MONO- AND DIALCOHOLS OF FIVE OR SIX MEMBERED N-HETEROCYCLIC COMPOUNDS, CONTAINING TWO NH GROUPS PER MOLECULE

Juergen Habermeier, Allschwil; Hans Batzer, Arlesheim, and Daniel Porret, Binningen, all of Switzerland, assignors to Ciba-Geigy AG, Basel, Switzerland

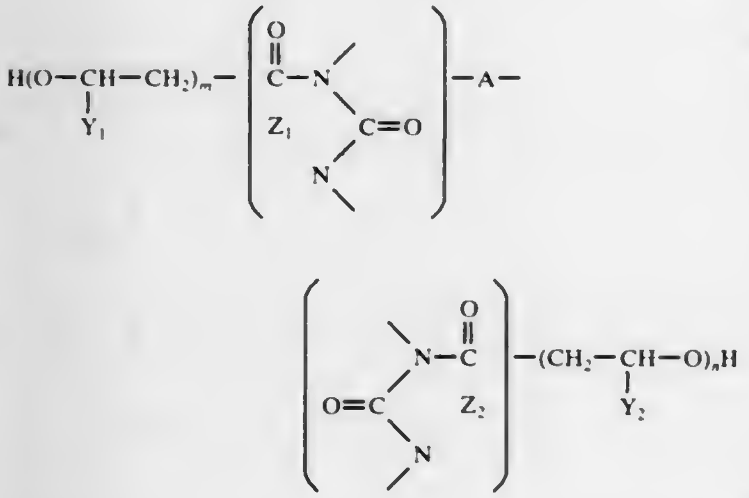
Continuation of Ser. No. 82,072, Oct. 19, 1970, abandoned, which is a continuation-in-part of Ser. No. 1,289, Jan. 7, 1970, Pat. No. 3,679,681. This application May 15, 1975, Ser. No. 577,965

Claims priority, application Switzerland, Jan. 24, 1969, 1104/69

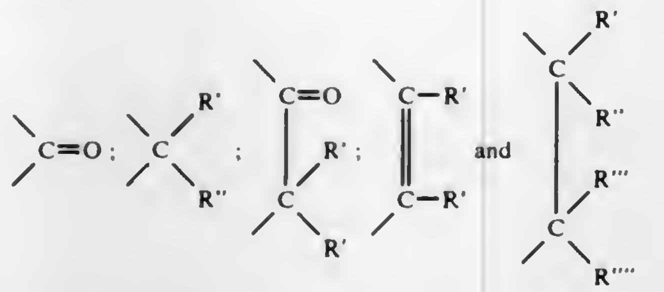
Int. Cl.^{2} C07D *239/54, 233/72*

U.S. Cl. 260—256.4 C **11 Claims**

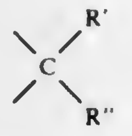
1. A mono-or dialcohol of the formula



wherein Y_1 and Y_2 each represents a member selected from the group consisting of hydrogen and methyl, A represents alkylene containing from 1 to 12 carbon atoms, diethylene ether or tetrachloro-p-xylene and Z_1 and Z_2 each represents a member selected from the group consisting of a divalent residue of the formulae



wherein R', R'', R''' and R'''' each represents a member selected from the group consisting of alkyl with 1 to 5 carbon atoms, alkenyl with up to 5 carbon atoms, cyclohexyl, cyclohexenyl, phenyl, or when the residue Z_1 and Z_2 represents the formula



wherein R' and R'' together can also form a member selected from the group consisting of tetramethylene and pentamethylene, and *m* and *n* each represents an integer having a value of from 0 to 6.7 (average value) with the sum of *m* and *n* having to be at least 1.

4,038,278

4-AMINOPYRIMIDIUM DERIVATIVES AND PREPARATION THEREOF

Sachiyuki Hamano, Tokyo, and Takaharu Nakamura, Shounan, both of Japan, assignors to Eisai Co., Ltd., Tokyo, Japan

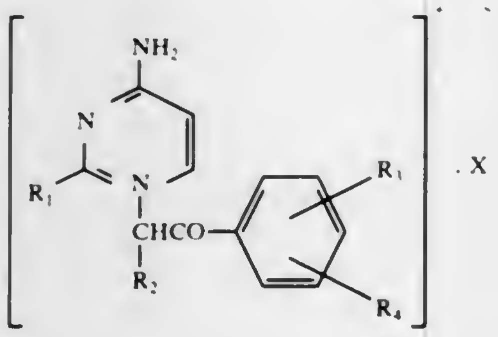
Filed Aug. 8, 1975, Ser. No. 603,235

Claims priority, application Japan, Aug. 9, 1974, 49-90783

Int. Cl.^{2} C07D *239/26*

U.S. Cl. 260—256.4 N **4 Claims**

1. A 4-aminopyrimidium compound represented by the formula:



wherein R_1 and R_2 each represents hydrogen or methyl, R_3 represents a methylsulfonyl, methoxycarbonyl, nitro, methyl, chlorine, fluorine or amino group, R_4 is hydrogen or chlorine and X is bromine.

4,038,279

N-ARYL-N'-(PHENYL-OR PHENOXY-ALKYL)-PIPERAZINES AND SALTS THEREOF

Ernst-Otto Renth; Anton Mentrup; Kurt Schromm, all of Ingelheim am Rhein, and Peter Danneberg, Ockenheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

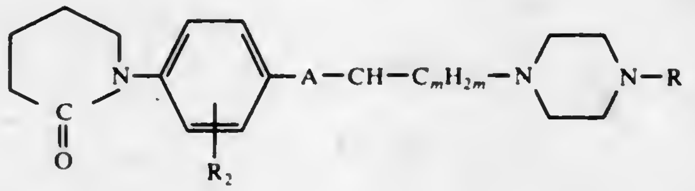
Continuation-in-part of Ser. No. 427,367, Dec. 21, 1973, Pat. No. 3,941,787. This application Dec. 1, 1975, Ser. No. 636,734

Claims priority, application Germany, Dec. 23, 1972, 2263211

Int. Cl.^{2} C07D *401/14*

U.S. Cl. 260—268 BQ **3 Claims**

1. A racemic or optically active compound of the formula



wherein

R is phenyl; phenyl having one or two substituents attached thereto, said substituents being selected from the group consisting of alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms, alkylthio of 1 to 4 carbon atoms, chlorine and trifluoromethyl; naphthyl; tetrahydronaphthyl; indanyl; pyridyl, quinolyl; or thiazolyl;

R_2 is hydrogen, alkyl of 1 to 4 carbon atoms, alkoxy of 1 to 4 carbon atoms or halogen;

A is a single carbon-to-carbon bond or $—OCH_2—$.

R_6 is hydrogen, hydroxyl, alkoxy of 1 to 4 carbon atoms or alkanoyloxy of 1 to 4 carbon atoms; and

m is 0, 1, 2, 3, 4 or 5, but other than 0 when R_6 is hydroxyl; or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,038,280

HYDROXYARYL-TETRAMETHYL-PIPERIDINES

Donald Richard Randell, Stockport, and Malcolm John Smith, Marple, both of England, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

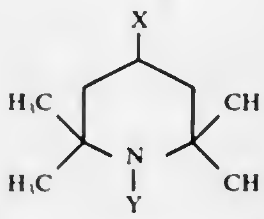
Filed Nov. 28, 1972, Ser. No. 310,060

Claims priority, application United Kingdom, Nov. 30, 1971, 55419/71; July 14, 1972, 32947/72

Int. Cl.^{2} C07D *211/22*

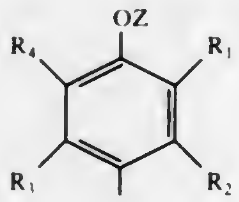
U.S. Cl. 260—293.84 **8 Claims**

1. A compound of the formula I

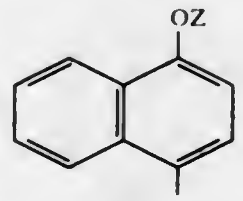


I

or a salt thereof, wherein the substituent X has one of the formulae



II



III

wherein R_1, R_2, R_3 and R_4 are the same or different and each is hydrogen, a straight- or branched-chain alkyl residue having from 1 to 9 carbon atoms, a cycloalkyl residue having from 5 to 14 carbon atoms, an aralkyl residue having from 7 to 14 carbon atoms or an aryl or alkaryl residue having from 6 to 14 carbon atoms,

Y is hydrogen, O, a straight- or branched-chain alkyl residue having from 1 to 12 carbon atoms, an alkenyl or alkynyl residue having from 3 to 12 carbon atoms or an aralkyl residue having from 7 to 12 carbon atoms.

Z is hydrogen, an alkyl residue having from 1 to 20 carbon atoms, an alkenyl or alkynyl residue having from 2 to 20 carbon atoms, a cycloaliphatic residue having from 5 to 12 carbon atoms, an araliphatic residue having from 7 to 12 carbon atoms, an aromatic residue having from 6 to 12 carbon atoms or a β-hydroxyethyl, β-cyonoethyl, furan or thiophene residue or the group $—COZ_1$ wherein Z_1 has the same significance as Z, or Z_1 is a group having the formula $—NR_5R_6$ wherein R_5 is hydrogen or an alkyl residue having from 1 to 4 carbon atoms, and R_6 is hydrogen, an aliphatic residue having from 1 to 20 carbon atoms, a cycloaliphatic residue having from 5 to 12 carbon atoms or an aromatic residue having from 6 to 12 carbon atoms.

4,038,281

CERTAIN 2,7-DIHYDRO-4H-PYRAZOLO[3,4-B]PYRIDINE-5-KETONES

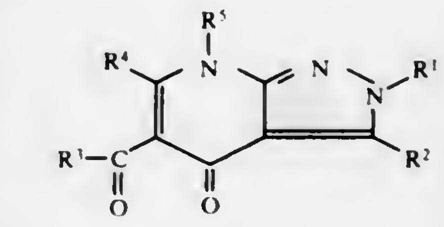
Theodor Denzel, and Hans Hoehn, both of Regensburg, Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Division of Ser. No. 623,150, Oct. 16, 1975, abandoned. This application Oct. 18, 1976, Ser. No. 733,498

Int. Cl.^{2} C07D *471/04*

U.S. Cl. 260—296 H **12 Claims**

1. A compound of the formula



wherein

R^1 is lower alkyl, phenyl or phenyl-lower alkylene;

R^2 and R^4 each is hydrogen or lower alkyl;

R^3 is lower alkyl, phenyl or substituted phenyl wherein the phenyl substituent is lower alkyl, carboxy, halogen or amino;

R^5 is lower alkyl, cyclo-lower alkyl, phenyl-lower alkylene, amino-lower alkylene or di-lower alkylamino-lower alkylene;

and physiologically acceptable acid addition salts thereof.

4,038,282

PYRIDYL-4-METHYL-SUCCINIMIDOCARBONATE AND PROCESS FOR ITS PREPARATION

Ralph F. Hirschmann, Blue Bell, and Daniel F. Veber, Ambler, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 635,465, Nov. 26, 1975, which is a continuation-in-part of Ser. No. 393,351, Sept. 6, 1973, Pat. No. 3,950,348, which is a division of Ser. No. 214,384, Dec. 30, 1971, Pat. No. 3,780,015. This application June 14, 1976, Ser. No. 695,607

Int. Cl.^{2} C07D *401/06*

U.S. Cl. 260—295 D **2 Claims**

1. The process which comprises reacting 4-pyridylcarbinol with succinimido-chloroformate, said reaction being carried out in substantially anhydrous ethyl acetate or halogenated hydrocarbon solvent while maintaining the temperature within the range of about −20° C. to 0° C., adding a tertiary amine to the solution, and maintaining the resulting solution at a temperature of about 0° C. to 5° C. for a period of about 15 minutes, thereby forming pyridyl-4-methyl-succinimidocarbonate.

4,038,283

4-ALKOXY OR HYDROXY DERIVATIVES OF 2H-PYRAZOLO[3,4-B]PYRIDINE-5-CARBOXYLIC ACIDS AND ESTERS

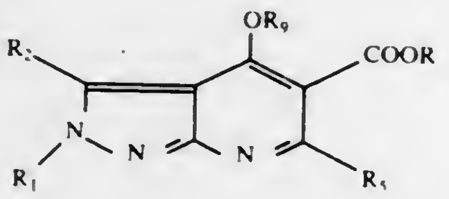
Theodor Denzel, Regensburg, and Hans Hoebn, Tegernheim, both of Germany, assignors to E. R. Squibb & Sons, Inc., Princeton, N.J.

Continuation-in-part of Ser. No. 573,195, April 30, 1975. This application Oct. 14, 1976, Ser. No. 732,241

Int. Cl.^{2} C07D *471/04*

U.S. Cl. 260—295.5 B **12 Claims**

1. A compound of the formula



wherein R is hydrogen or lower alkyl; R_1 is lower alkyl, phenyl, or phenyl-lower alkyl; R_2 is hydrogen or lower alkyl; R_5 is hydrogen, lower alkyl, phenyl or phenyl-lower alkyl; R_9 is hydrogen or lower alkyl, and the pharmaceutically acceptable salt thereof.

4,038,284

N-ACYLATION OF OXAZOLIDINES

Harold M. Pitt, Lafayette, Calif., assignor to Stauffer Chemical Company, Westport, Conn.

Continuation-in-part of Ser. No. 599,793, July 28, 1975, abandoned. This application Jan. 7, 1976, Ser. No. 646,823

Int. Cl.^{2} C07D *263/04*

U.S. Cl. 260—307 FA **14 Claims**

3. A process according to Claim 1 in which the hydrogen chloride acceptor is an alkali metal hydroxide.

4,038,285

1-(2-CARBOXYARYL)-4-ARYLIMIDAZOLES AND 1-(2-CARBOXYARYL)-3-ARYL-1,2,4-TRIAZOLES

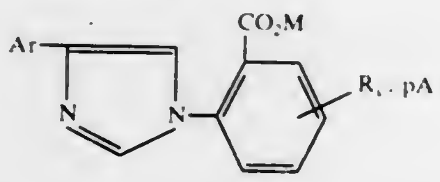
Alexander Lawrence Johnson, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Filed June 25, 1975, Ser. No. 590,372

Int. Cl.^{2} C07D *233/64*

U.S. Cl. 260—309 **7 Claims**

1. A compound of the formula



in which

Ar is phenyl, naphthyl, biphenylyl, furyl, thienyl or phenyl substituted with up to two of fluorine, chlorine, bromine, iodine, alkyl of 1-5 carbons, methoxyl, trifluoromethyl, nitro, methylthio, trifluoromethoxy, dimethylamino, cyano, acetyl, methylsulfony, carbamoyl or sulfamyl;

R is hydrogen, fluorine, chlorine, bromine, iodine, methoxyl, trifluoromethyl, nitro, methylthio, trifluoromethoxyl or alkyl of 1-5 carbon atoms;

p is 0 or 1;

y is 1 or 2;

A is an acid;

M is hydrogen, sodium, potassium, lithium, calcium or magnesium; with the proviso that when M is other than hydrogen, *p* is 0.

4,038,286

RACEMATES AND OPTICAL ISOMERS OF 1-(1-PHENYLETHYL)-1H-IMIDAZOLE-5-CARBOYLIC ACID DERIVATIVES

Leopold Fr. C. Roevens, Rijkevorsel; Jozef J. P. Heykants, Vosselaar, and Walter A. M. Helsen, Wilrijk, all of Belgium, assignors to Janssen Pharmaceutica N.V., Beerse, Belgium

Division of Ser. No. 557,194, March 10, 1975, abandoned. This application Sept. 12, 1975, Ser. No. 612,835

Int. Cl.^{2} C07D *233/90*

U.S. Cl. 260—309 **6 Claims**

1. dl-1-(1-Phenylethyl)-1H-imidazole-5-carboxamide.

4. dl-1-(1-Phenylethyl)-1H-imidazole-5-carbonitrile.

4,038,287

COMPOUNDS OF ALLANTOIN WITH BASIC AMINO ACIDS

Hirohide Takayama, Ogose; Kiyoshi Niino, Hidaka, and Sigeo Fukuda, Kawagoe, all of Japan, assignors to Kawaken Fine Chemicals Co., Ltd., Tokyo, Japan

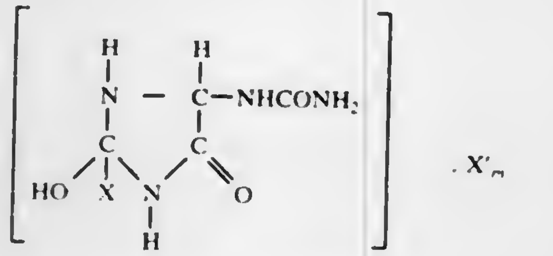
Filed Apr. 12, 1976, Ser. No. 676,134

Claims priority, application Japan, Apr. 21, 1975, 50-48506; Aug. 18, 1975, 50-99466; Aug. 18, 1975, 50-99467

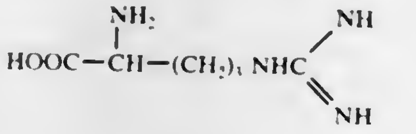
Int. Cl.^{2} C07D *233/48*

U.S. Cl. 260—309.7 **6 Claims**

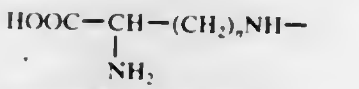
1. A compound of the formula



in which X is a basic amino acid radical having the formula (II) or the formula (III), X' is a basic amino acid radical having the formula (IV), *m* is zero, one or two when X is the formula (II) and *m* is zero when X is the formula (III)

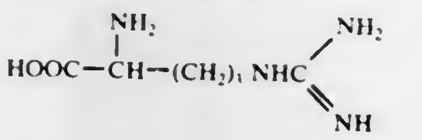


$$HOOC-CH(NH_2)-(CH_2)_3\,NHC(NH)=NH \qquad (II)$$



$$HOOC-CH(NH_2)-(CH_2)_nNH- \qquad (III)$$

wherein n is the number 3 or 4,



$$HOOC-CH(NH_2)-(CH_2)_3\,NHC(NH_2)=NH \qquad (IV)$$

4,038,288

DITHIOCARBAMATE ESTER BACTERICIDES AND FUNGICIDES

Thomas Andrew Lies, Montgomery Township, Mercer County, and James Wellington Clapp, Princeton, both of N.J., assignors to American Cyanamid Company, Stamford, Conn.

Continuation of Ser. No. 323,169, Jan. 12, 1973, abandoned, which is a division of Ser. No. 127,825, March 24, 1971, Pat. No. 3,723,494. This application Apr. 18, 1975, Ser. No. 569,243

Int. Cl.^{2} C07D *333/00*

U.S. Cl. 260—329 S **2 Claims**

1. A compound according to the formula: α-(Nitromethyl)-2-thienyl dimethyldithiocarbamate.

4,038,289

CERTAIN 2-HYDROXY-2,4-DIARYL-3-FURANONES

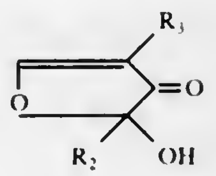
Roy Cleeland, Jr., Short Hills; Emanuel Grunberg, North Caldwell; Willy Leimgruber, Montclair, and Manfred Weigele, North Caldwell, all of N.J., assignors to Hoffmann-La Roche Inc., Nutley, N.J.

Division of Ser. No. 590,655, June 26, 1975, Pat. No. 3,969,373, which is a continuation-in-part of Ser. No. 338,019, March 5, 1973, abandoned. This application Mar. 18, 1976, Ser. No. 668,163

Int. Cl.^{2} C07D *307/58*

U.S. Cl. 260—347.3 **4 Claims**

1. A compound of the formula:



wherein R_2 is phenyl lower-alkoxyphenyl, and di-lower-alkoxyphenyl and R_3 is phenyl, carboxyphenyl, carboxylowerallylphenyl, or nitrophenyl.

4,038,290

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Filed Apr. 4, 1975, Ser. No. 565,004

Int. Cl.^{2} C07D *301/20*

U.S. Cl. 260—348.5 L **2 Claims**

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and aluminum.

4,038,291

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 565,004, April 4, 1975. This application June 25, 1976, Ser. No. 699,836

Int. Cl.^{2} C07D *301/20*

U.S. Cl. 260—348.5 L **2 Claims**

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° C to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and manganese.

4,038,292

BORIDE CATALYST FOR EPOXIDIZING OLEFINIC COMPOUNDS

Robert Malone Gipson, Austin, Tex., assignor to Texaco Development Corporation, New York, N.Y.

Division of Ser. No. 565,004, April 4, 1975. This application June 25, 1976, Ser. No. 699,839

Int. Cl.^{2} C07D *301/20*

U.S. Cl. 260—348.5 L **2 Claims**

1. A method for the liquid phase epoxidation of an olefin having from about 2 to about 60 carbon atoms with an organic hydroperoxide comprising the step of:

intimately contacting said olefin with said organic hydroperoxide at lower temperatures of about 25° to about 200° C and pressures sufficient to maintain the product and reactants substantially in liquid phase in the presence of a catalytically effective amount of a binary boride compound consisting of boron and calcium.

4,038,293

SILICONE-COMPATIBLE TRIS(TRIMETHYLSILILYLOXY)SILYLALKYLAMINO-SUBSTITUTED QUINONOID DYESTUFFS

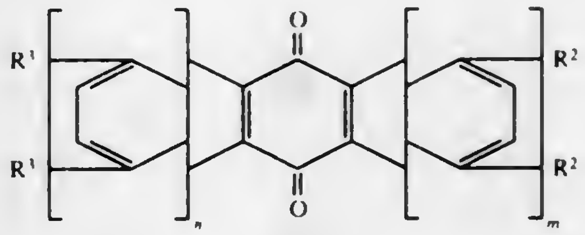
Carl Mayn Smith, Sun City, Ariz., and George V. D. Tiers, St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Continuation-in-part of Ser. No. 501,210, Aug. 28, 1974, abandoned, which is a division of Ser. No. 275,190, July 26, 1972, Pat. No. 3,888,891. This application Dec. 4, 1975, Ser. No. 637,815

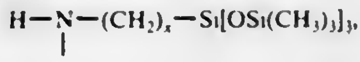
Int. Cl.^{2} C07C *97/20, 97/22, 97/24;* C07F *7/10*

U.S. Cl. 260—378 **4 Claims**

1. A quinonoid dyestuff of the formula:

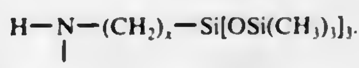


wherein each R^2 and R^3 individually is hydrogen, hydroxyl or



$$H-N(-)-(CH_2)_x-Si[OSi(CH_3)_3]_3,$$

x is 1 to 6, *n* and *m* are independently 0 or 1 and $n \leqq m$ and provided that when $n = 0$ and $m = 1$ R^3 is hydrogen and that when *n* and *m* are both 0 ones each of R^2 and R^3 is hydrogen, and at least one R^3 or R^2 is



$$H-N(-)-(CH_2)_x-Si[OSi(CH_3)_3]_3.$$

4,038,294

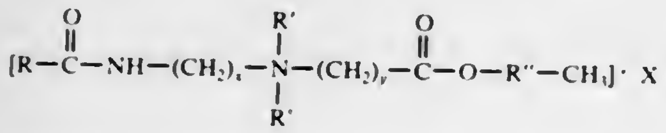
FATTY HALO ALKANOATE QUATERNARIES OF DIALKYLAMINOPROPYLAMIDES

Donald E. Conner, Clifton, and Arnold W. Fogel, Park Ridge, both of N.J., assignors to Van Dyk & Company, Incorporated, Belleville, N.J.

Filed Apr. 13, 1976, Ser. No. 676,416
Int. Cl.² C09F *5/00;* C11C *3/00*

U.S. Cl. 260—404.5 **6 Claims**

1. As a novel emollient, hair conditioning, composition of matter a fatty halo alkanoate quaternary of dialkyl amino propyl amides, corresponding to the formula



$$[R-\overset{O}{\overset{\|}{C}}-NH-(CH_2)_x-\underset{R'}{\overset{R'}{\overset{|}{\underset{|}{N}}}}-(CH_2)_y-\overset{O}{\overset{\|}{C}}-O-R''-CH_3]^{\cdot}\ X$$

wherein the RCO moiety is selected from the group consisting of gluconic acid, and C_7-C_{21} fatty acids; R' is an alkyl group having from 1 to 2 carbon atoms; *x* is an integer of from 2 to 3; *y* is an integer of from 1 to 3; R'' is selected from the group consisting of $(CH_2)_{(7\text{-}21)}$ and sorbate; and X is halogen.

4,038,295

PROCESS FOR THE SELECTIVE HYDROGENATION OF POLYUNSATURATED OILS

Robert Stern, Paris; Eugéne Ucciani, Marseille; André Hirschauer, Montesson, and Georges Cecchi, Marseille, all of France, assignors to Institut Francais du Petrole et Institut des Corps Gras (ITERG), Rueil-Malmaison, France

Filed Jan. 29, 1975, Ser. No. 545,189
Claims priority, application France, Feb. 1, 1974, 74.03365
Int. Cl.² C11C *3/12*

U.S. Cl. 260—409 **24 Claims**

1. In a process for selectively hydrogenating a polyunsaturated glyceridic oil of vegetable or animal origin, wherein hydrogen is reacted with said oil in contact with a catalyst obtained by reacting in a solvent: (a) at least one compound of a metal from groups I B, IV B, V B, VI B, VII B and VIII with (b) at least one reducing organic compound having at least one carbon metal bond or hydride or a metal from groups I A, II A, II B and III A, the molar ratio of the reducing compound to the metal compound being from 0.1 to 1 to 6:1, the improvement wherein said solvent consists essentially of a polyunsaturated glyceridic oil of vegetable or animal origin.

4,038,296

ALKYLENE OXIDE DERIVATIVES BASED ON POLYTETRAHYDROFURAN COPOLYMERS

Norbert Greif, Ludwigshafen; Heinz Bille, Limburgerhof; Rolf Fikentscher, Ludwigshafen, and Toni Simenc, Mannheim, all of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

Filed Jan. 3, 1975, Ser. No. 538,453
Claims priority, application Germany, Jan. 16, 1974, 2401855
Int. Cl.² C07C *43/04, 69/22, 69/58*

U.S. Cl. 260—410.6 **10 Claims**

1. A polyalkylene oxide adduct of the formula

$$R - X$$

wherein R is the radical of a monoalcohol of 8 to 22 carbon atoms, of a monocarboxylic acid of 8 to 22 carbon atoms or of their oxalkylation products with from 1 to 20 moles of an epoxide of 2 to 3 carbon atoms and X is the radical of a copolymer of an epoxide of 2 or 3 carbon atoms and tetrahydrofuran, with the proviso that the total amount of epoxide and tetrahydrofuran units in R—X is from 60 to 95 per cent by weight and that the molar ratio of epoxide units to tetrahydrofuran units is from 1:0.5 to 1:3.

4,038,297

HIGH MOLECULAR WEIGHT MONOCARBOXYLIC ACIDS AND OZONIZATION PROCESS FOR THEIR PREPARATION

Herbert G. Rodenberg, and Charles E. Patton, both of Cincinnati, Ohio, assignors to Emery Industries, Inc., Cincinnati, Ohio

Continuation-in-part of Ser. No. 361,205, May 17, 1973, abandoned. This application Apr. 10, 1975, Ser. No. 566,891
Int. Cl.² G07C *51/32*

U.S. Cl. 260—413 **12 Claims**

1. A process for the preparation of mixed high molecular weight aliphatic straight-chain monocarboxylic acids wherein less than 30% by weight of the acids have fewer than 22 carbon atoms, less than 20% by weight of the acids have greater than 35 carbon atoms, acids in the $C_{22\text{-}35}$ range constitute at least 55% or more of the total acid product and the ratio of odd to even carbon content acids in the $C_{22\text{-}35}$ range is between about 1.5:1 and 10:1 which comprises:

1. reacting ozone and an olefin having from 22 to 60 carbon atoms, of which 60% or more are α-olefins, at a temperature from about 50° C to 100° C in the presence of a participating monocarboxylic acid solvent containing from about 4 to 13 carbon atoms, the weight ratio of said olefin to participating solvent ranging between about 2:1 to 1:10;
2. treating the resulting olefin ozonide of step (1) with oxygen at a temperature from about 75° C to about 145° C to effect scission and oxidation of the ozonide to the acid products; and
3. recovering the mixed acid product by stripping off the participating solvent at an elevated temperature and reduced pressure.

2. A mixed acid composition obtained by the process of claim **1**, consisting essentially of high molecular weight aliphatic straight-chain monocarboxylic acids wherein less than 30% by weight of the acids have fewer than 22 carbon atoms, less than 20% by weight of the acids have greater than 35 carbon atoms, acids in the $C_{22\text{-}35}$ range constitute at least 55% or more of the total acid product and the ratio of odd to even carbon content acids in the $C_{22\text{-}35}$ range is between about 1.5:1 and 10:1.

7. The process of claim **1** wherein the recovered mixed acid product is bleached with ozone and recrystallized to improve the color.

4,038,298

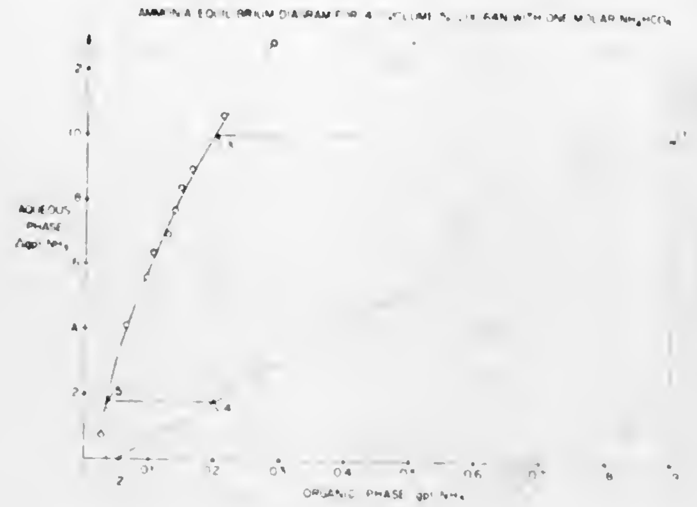
REMOVING AMMONIA FROM SOLUTIONS OF OXIME-METAL CHELATE

Roald R. Skarbo, Lexington; Robert E. Lueders, Needham, both of Mass.; Edmond A. Morin, Aurora, and Hal D. Peterson, Boulder, both of Colo., assignors to Kennecott Copper Corporation, New York, N.Y.

Continuation of Ser. No. 317,003, Dec. 20, 1972, abandoned. This application Sept. 8, 1975, Ser. No. 610,935
Int. Cl.² C07F *1/08, 15/04*

U.S. Cl. 260—429 J **12 Claims**

1. A process for selectively removing ammonia from an organic oxime extractant chelated with a metal and containing ammonia comprising, countercurrently contacting the organic extractant with an aqueous solution containing a bicarbonmate selected from the group consisting of, ammonium bicarbonate, alkali metal bicarbonates and mixtures thereof to effect ammonia transfer from the organic extractant to said aqueous solution and separating the organic extractant from said aqueous solution.



4,038,299

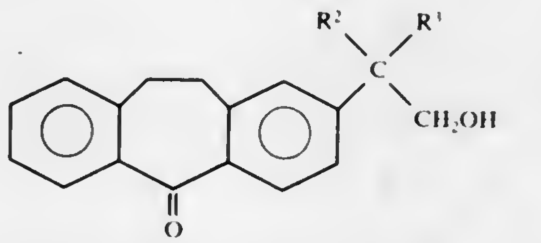
2-SUBSTITUTED-5-OXO-5H-DIBENZO [A,D] -CYCLOHEPTENE ESTERS

Peter H. Nelson, and Karl G. Untch, both of Los Altos, Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Division of Ser. No. 581,501, May 30, 1975, Pat. No. 3,966,820, which is a continuation-in-part of Ser. No. 486,038, July 5, 1974, abandoned. This application Mar. 8, 1976, Ser. No. 664,779
Int. Cl.² C07C *69/02, 69/76*

U.S. Cl. 260—410.5 **25 Claims**

1. The pharmaceutically acceptable esters of a hydrocarbon carboxylic acid of from 1 to 12 carbon atoms and a compound selected from the group of compounds represented by the formula:



(I)

where one of R² and R¹ is hydrogen and the other is hydrogen, methyl, or ethyl, or together R² and R¹ are methylene; the dotted line refers to an optional, additional bond between the carbon atoms at the 10- and 11-positions.

4,038,300

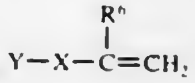
POLYMERIZABLE ETHYLENICALLY UNSATURATED N-SUBSTITUTED 2,2-DIHYDRO CARBYL-2,1,3-BENZOSTANNA-THIAZOLINES

Hector Belmares-Sarabia, Cuernavaca, 745 Colonial La Pastora, Villa de Guadalupe, M. L., Mexico

Filed Aug. 23, 1974, Ser. No. 499,879
Int. Cl.² C07F *7/22*

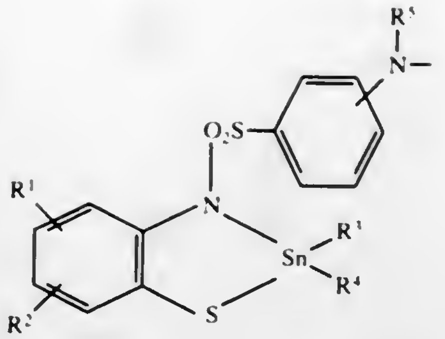
U.S. Cl. 260—429.7 **9 Claims**

1. The ethylenically unsaturated organotin heterocyclic compounds of Formula I shown as follows:



$$Y-X-\overset{R^6}{\overset{|}{C}}=CH_2$$

Formula I, wherein



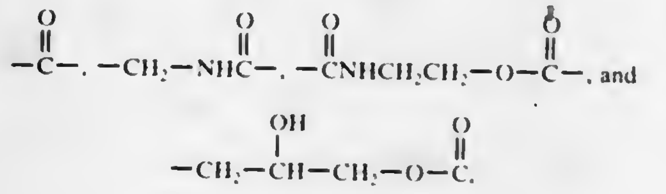
Y is

R¹ and R² are separately selected from the group consisting of hydrogen, halogen, lower carboalkoxy, lower alkoxy, and lower hydrocarbyl, the term "lower" referring to a group containing 1-4 carbon atoms unless otherwise indicated;

R³ and R⁴ are separately selected monovalent hydrocarbyl groups;

R⁵ is a monovalent group selected from the group consisting of hydrogen and hydrocarbyl;

X is a bridging group selected from the group consisting of



$$-\overset{O}{\overset{\|}{C}}-,\ -CH_2-NH\overset{O}{\overset{\|}{C}}-,\ -\overset{O}{\overset{\|}{C}}NHCH_2CH_2-O-\overset{O}{\overset{\|}{C}}-,\ \text{and}$$
$$-CH_2-\overset{OH}{\overset{|}{C}H}-CH_2-O-\overset{O}{\overset{\|}{C}}.$$

R⁶ is a monovalent group selected from the group consisting of hydrogen and methyl.

4,038,301

REMOVAL AND RECOVERY OF ORGANOLEAD COMPOUNDS FROM ACTIVATED CARBON AND RECOVERY OF THE ACTIVATED CARBON

Jack M. Otto, Beaumont, Tex., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Filed Nov. 10, 1975, Ser. No. 630,839
Int. Cl.² C07F *7/24*

U.S. Cl. 260—437 R **7 Claims**

1. In a method of recovering organolead chloride compounds having the formula $PbR_{4-x}Cl_x$, where R is chosen from the group consisting of aryl groups and alkyl groups having from 1 to 8 carbon atoms and *x* is a number from 1 to 3, from an organolead chloride compound bearing aqueous solution containing from about 1 to about 20 parts per million of organolead chloride compounds, which method comprises passing the organolead chloride compound bearing aqueous solution through a bed of solid particle carbonaceous material, said carbonaceous material having a particle size range of 100 percent passing 8 mesh, substantially none passing 40 mesh, a surface area of from about 500 to about 1,600 square meters per gram, and a porosity of from about 0.80 to about 0.85, and withdrawing aqueous solution containing less than one part per million of organolead chloride compound, the improvement comprising passing the organolead chloride compound bearing aqueous solution through the bed of carbonaceous material until the carbonaceous material contains at least one weight percent organolead chloride compound, thereafter contacting the carbonaceous material with an aqueous extracting solution chosen from the group consisting of 0.1 to 5.0 normal solutions of HNO_3, N_2SO_4, $HClO_4$, $HMnO_4$, HCl, HBr, and HI, and recovering an aqueous solution containing in excess of 50 milligrams per liter of organolead chloride compounds.

4,038,302
PROCESS FOR PREPARING 2-(CYCLOHEXENYL-4-)ETHYL-SILICON COMPOUNDS AND NOVEL PRODUCTS MADE THEREBY

Sigrid Reichel, Dresden, and Rudolf Gottfried, Cossebaude near Dresden, both of Germany, assignors to VEB Chemiewerk Nuenchritz, Nuenchritz, Germany

Filed Feb. 23, 1976, Ser. No. 660,344

Int. Cl.² C07F *7/08, 7/18*

U.S. Cl. 260—448.2 E **7 Claims**

1. A process for preparing 2-(cyclohexenyl-4-)ethyl-silicon compounds from Si compounds containing SiH groups, which comprises the steps of reacting the Si compounds in the presence of hexachloroplatinic acid as addition catalyst with vinylcyclohexene-4 at normal pressure and at temperatures between 20° and 200° C.

4,038,303
QUATERNARY AMMONIUM CARBAMIDE COMPOUNDS

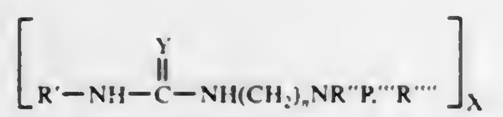
Robert Andrew Bauman, New Brunswick, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Division of Ser. No. 134,827, April 16, 1971, Pat. No. 3,956,479, which is a division of Ser. No. 712,968, March 14, 1968, Pat. No. 3,621,048, which is a continuation-in-part of Ser. No. 578,981, Sept. 13, 1966, abandoned. This application Feb. 20, 1976, Ser. No. 659,623

Int. Cl.² C07C *141/04, 127/15, 157/05;* **A61K** *7/22*

U.S. Cl. 260—459 A **7 Claims**

1. A chemical compound having a composition represented by the formula:



$$\left[R'-NH-\overset{\overset{\displaystyle Y}{\|}}{C}-NH(CH_2)_nNR''R'''R''''\right]_X$$

where

R′ is selected from the group consisting of an alkyl group containing 1 to 22 carbon atoms, an aryl group and an aryl group substituted by halogen;

R″ and R‴ are each independently an alkyl group containing 1 to 2 carbon atoms;

R⁗ is an alkyl group containing 10 to 18 carbon atoms;

Y is selected from the group consisting of oxygen and sulfur;

n is an integer 2 to 6; and

X is a compatible anion selected from the group consisting of chloride, bromide, iodide and methosulfate.

4,038,304
URETHANE PREPOLYMER

Seiji Kazama, Kawanishi; Michio Tanaka, Takatsuki, and Katsuki Nagano, Suita, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan

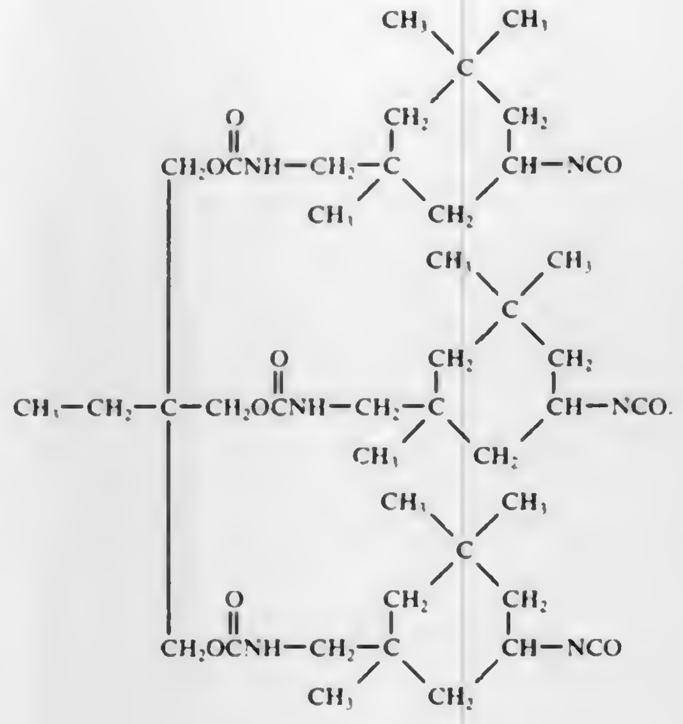
Filed May 9, 1975, Ser. No. 576,136

Claims priority, application Japan, May 20, 1974, 49-56978; Apr. 11, 1975, 50-44473

Int. Cl.² C07C *125/06*

U.S. Cl. 260—468 E **3 Claims**

1. A polyurethane prepolymer composition consisting essentially of (1) not less than a weight ratio of relative to the 0.65 weight of the whole composition of the idealized adduct prepared from reacting trimethylolpropane with 3 moles of 3-isocyanatomethyl-3,5,5-trimethylcyclohexylisocyanate, (2) not more than a weight ratio of 0.05 of 3-isocyanatomethyl-3,5,5-trimethylcyclohexylisocyanate relative to the weight of the whole composition and (3) the remainder being essentially the by-products formed from the reaction producing the idealized adduct (1); and wherein said idealized adduct has the formula:



4,038,305
CYCLOPENTENONE DERIVATIVES

Rune Eliasson, Vallingby, Sweden, and Poul Nedenskov, Birkerod, Denmark, assignors to Aktieselskabet Grindstedvaerket, Arhus, Denmark

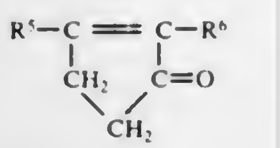
Continuation-in-part of Ser. No. 341,660, March 15, 1973, abandoned. This application Sept. 29, 1975, Ser. No. 617,774

Claims priority, application United Kingdom, Mar. 20, 1972, 12941/72

Int. Cl.² C07C *61/38, 69/74*

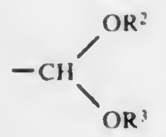
U.S. Cl. 260—468 K **2 Claims**

1. Cyclopentenone derivatives of the formula



(I)

wherein R⁵ is the group



wherein each of R^2 and R^3 is an alkyl group of 1–8 **carbon atoms, when R⁶** is a group of the formula $—(CH_2)_6\text{-}COOR^1$, wherein R^1 is an alkyl group having 1–8 carbon atoms.

4,038,306
N-T-BUTOXYCARBONYL-S-LOWER ALKANOYLAMIDOMETHYL-CYSTEINE AND P-NITROPHENYL ESTERS

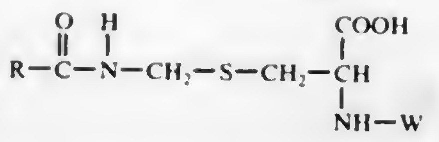
John D. Milkowski, Edison, N.J.; Daniel F. Veber, Ambler, and Ralph F. Hirschmann, Blue Bell, both of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 384,532, Aug. 1, 1973, abandoned, which is a division of Ser. No. 57,883, June 17, 1970, Pat. No. 3,770,822, which is a division of Ser. No. 658,665, Aug. 7, 1967, Pat. No. 3,560,521. This application Sept. 23, 1975, Ser. No. 616,110

Int. Cl.² C07C *149/24, 149/243*

U.S. Cl. 260—479 S **3 Claims**

1. A compound of the formula



$$R-\overset{\overset{O}{\|}}{C}-\overset{\overset{H}{|}}{N}-CH_2-S-CH_2-\underset{\underset{NH-W}{|}}{\overset{\overset{COOH}{|}}{CH}}$$

and p-nitrophenyl esters thereof, wherein R is lower alkyl, and W is t-butoxycarbonyl.

4,038,307
MANUFACTURE OF BUTENEDIOL DIACETATES

Hans-Martin Weitz, Frankenthal, and Juergen Hartig, Ludwigshafen, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

Filed Apr. 28, 1975, Ser. No. 572,133

Claims priority, application Germany, May 3, 1974, 2421408

Int. Cl.² C07C *67/05*

U.S. Cl. 260—497 A **3 Claims**

1. In an improved process for the manufacture of butenediol diacetates by reacting butadiene with oxygen and acetic acid over a solid catalyst which contains palladium and at least one of the elements selected from the group consisting of phosphorus, arsenic, antimony, bismuth, selenium and tellurium, the improvement which comprises carrying out the reaction in the gas phase in the presence of carbon monoxide.

4,038,308
PROSTAGLANDIN DERIVATIVES

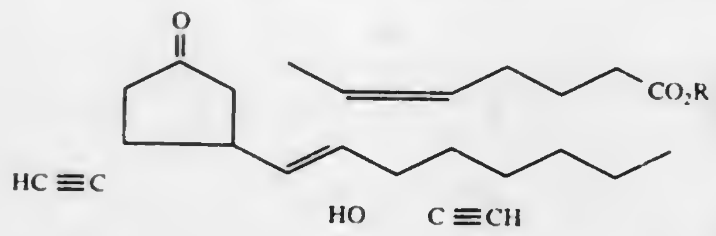
Donald P. Strike, St. Davids, Pa., assignor to American Home Products Corporation, New York, N.Y.

Filed Sept. 13, 1976, Ser. No. 722,458

Int. Cl.² C07C *177/00*

U.S. Cl. 260—514 D **2 Claims**

1. A chemical compound of the structure:



wherein R is hydrogen, alkyl of from 1 to 6 carbon atoms, an alkali metal cation or a pharmacologically acceptable cation derived from ammonia or a basic amine.

4,038,309
PRODUCTION OF 2-HYDROXYNAPHTHALENE-3-CARBOXYLIC ACID

Helmut Hoch, and Hans-Juergen Quadbeck-Seeger, both of Ludwigshafen, Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

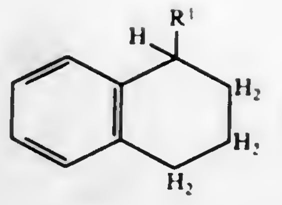
Division of Ser. No. 422,547, Dec. 6, 1973, abandoned. This application Dec. 22, 1975, Ser. No. 643,524

Claims priority, application Germany, Feb. 12, 1972, 2260637

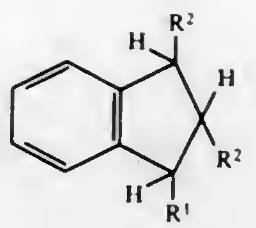
Int. Cl.² C07C *51/15*

U.S. Cl. 260—520 A **18 Claims**

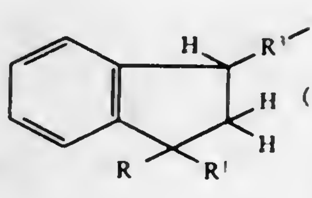
1. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution of suspension in a liquid araliphatic compound having one of the formulae



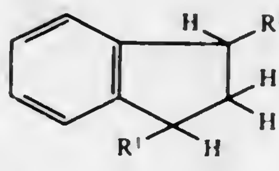
(III),



(IV),

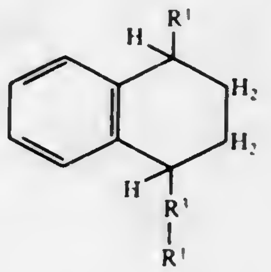


(V),



(VI),

or

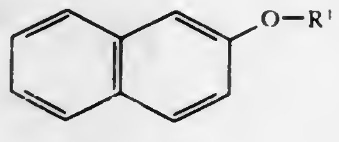


(VII),

in which R^1 is phenyl or naphthyl, R^2 is alkyl of one to four carbon atoms or hydrogen, R^3 is alkylene of one to eight carbon atoms, and the phenylene groups of the compounds of formulae III through VII optionally bearing alkyl of one to three carbon atoms as substituents thereof, then reacting sodium naphtholate after heating thereof in said first stage with carbon dioxide in a second stage at a temperature of at least 180° C to form the sodium salt of 2-hydroxynaphthalene-3-carboxylic acid, and acidifying the latter compound to convert it into 2-hydroxy-naphthalene-3-carboxylic acid.

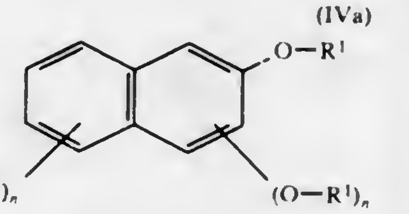
6. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution or suspension in an aromatic ether having one of the formulae

(IIIa)

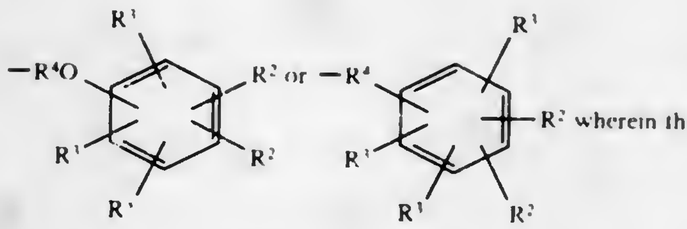


or

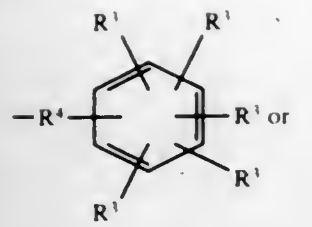
(IVa)



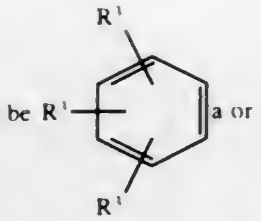
in which R^1 is alkyl of one to four carbon atoms, cyclopentyl, cyclohexyl, $—R^5—(OR^5)_n—CH_3$,

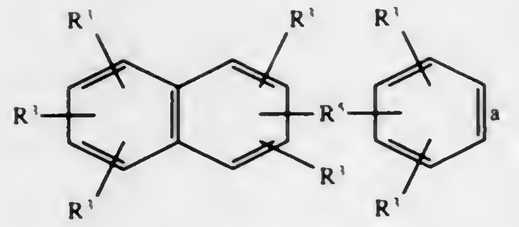


wherein the individual radicals R^2 and R^3 may be identical or different and each is alkyl or alkoxy in each case of one to four carbon atoms, cycloalkyl or cycloalkoxy of five or six carbon atoms, hydrogen or $—(OR^5)_n—CH_3$, one radical R^2 may also be:

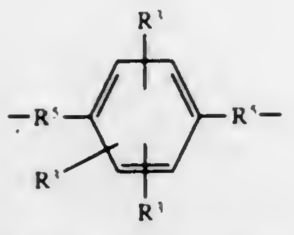


two radicals R² may together be





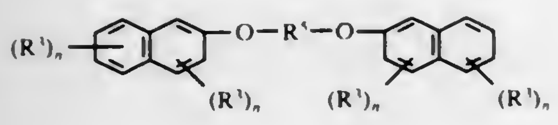
fused with the benzene nucleus at the side a in which R¹ has the above meanings, R⁴ is alkylene of two to four carbon atoms or



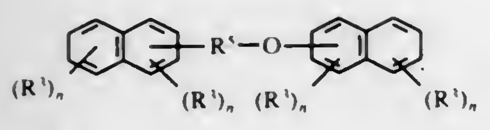
in which R¹ has the above meaning, R⁵ is alkylene of two to four carbon atoms, R⁶ is alkyl of one to four carbon atoms and *n* is zero, 1, 2 or 3 and the said radicals may bear groups which are inert under the reaction conditions for example alkoxy or alkyl of one to three carbon atoms in each case as substituents, reacting the sodium naphtholate from said first stage with carbon dioxide in a second stage at a temperature of at least 180° C, and acidifying the sodium salts of 2-hydroxynaphthalene-3-carboxylic acid to convert it to 2-hydroxynaphthalene-3-carboxylic acid.

10. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution or suspension in an aromatic ether having one of the formulae

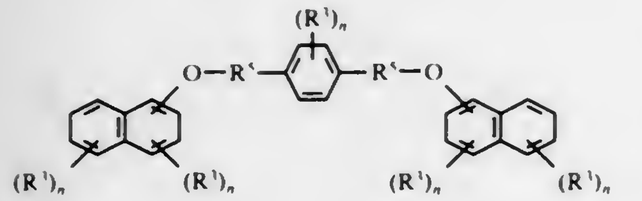
(Va)



(VIa)



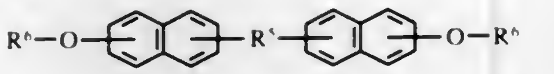
(IX)



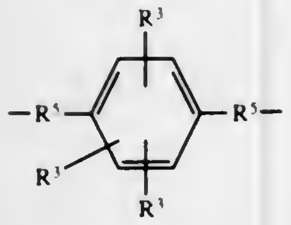
-continued

(XI)

or



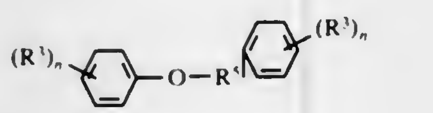
wherein the individual radical R¹ may be identical or different and each is alkyl or alkoxy in each case of one to four carbon atoms cycloalkyl or cycloalkoxy of five or six carbon atoms, hydrogen or —(OR⁵)$_n$—CH₃, R⁴ is alkylene of two to four carbon atoms or



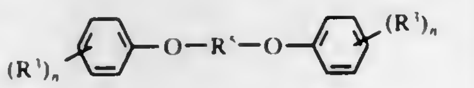
in which R¹ has the above meanings, R⁵ is alkylene of two to four carbon atoms, R⁶ is alkyl of one to four carbon aoms and *n* is zero, 1, 2 or 3 and the said radicals may bear groups which are inert under the reaction conditions for example alkoxy or alkyl of one to three carbon atoms in each case as substituents, reacting the sodium naphtholate from said first stage with carbon dioxide in a second stage at a temperature of at least 180° C, and acidifying the sodium salts of 2-hydroxynaphthalene-3-carboxylic acid to convert it to 2-hydroxynaphthalene-3-carboxylic acid.

14. A process for the production of 2-hydroxynaphthalene-3-carboxylic acid which comprises heating sodium β-naphtholate in a first stage to a temperature of at least 180° C as a solution or suspension in an aromatic ether having one of the formulae

(VIIa)

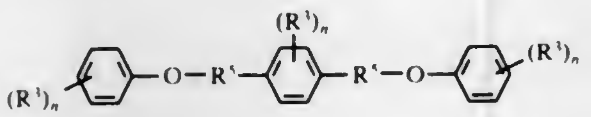


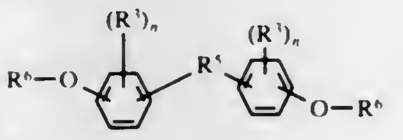
(VIIIa)



(X)

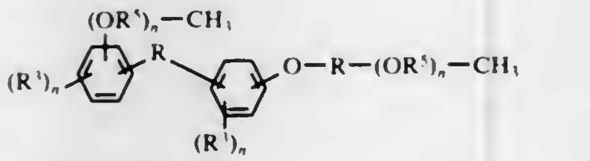
(XII)



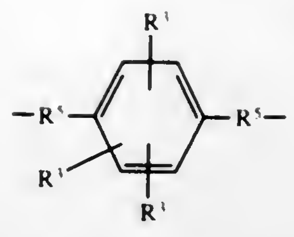


or

(XIII)



wherein the individual radical R¹ may be identical or different and each is alkyl or alkoxy in each case of one to four carbon atoms, cycloalkyl or cycloalkoxy of five or six carbon atoms, hydrogen or —(OR⁵)$_n$—CH₃, R⁴ is alkylene of two to four carbon atoms or



in which R¹ has the above meanings, R⁵ is alkylene of two to four carbon atoms, R⁶ is alkyl of one to four carbon atoms and *n* is zero, 1, 2 or 3 and the said radicals may bear groups which are inert under the reaction conditions for example alkoxy or alkyl of one to three carbon atoms in each case as substituents, reacting the sodium naphtholate from said first stage with carbon dioxide in a second stage at a temperature of at least 180° C, and acidifying the sodium salts of 2-hydroxynaphthalene-3-carboxylic acid to convert it to 2-hydroxynaphthalene-3-carboxylic acid.

4,038,310

ACID ANHYDRIDE TO REACT WITH IMPURITIES IN THE PRODUCTION OF PERFLUOROCARBOXYLIC ACIDS

Geir Björnson, and Harold C. Walters, both of Bartlesville, Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Mar. 11, 1976, Ser. No. 666,092

Int. Cl.² C07C *53/18, 53/34*

U.S. Cl. 260—539 A **9 Claims**

1. In a process comprising contacting under reaction conditions an alkanoic carboxylic acid containing 2 to 10 carbon atoms per molecule, and a perfluorocarboxylic acid fluoride containing 2 to 10 carbon atoms per molecule from an electrochemical fluorination zone to give a perfluorocarboxylic acid and an acyl fluoride, the improvement comprising adding a small amount of an alkanoic acid anhydride to react with impurities, said impurities including at least one of HF, water, and carbonyl fluoride.

4,038,311

PRODUCTION OF N-(1-ALKENYL)-CARBAMYL CHLORIDES

Hans Kiefer, Wachenheim, and Herbert Naarmann, Wattenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen (Rhine), Germany

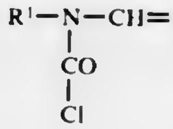
Continuation-in-part of Ser. No. 887,346, Dec. 22, 1969, abandoned. This application Dec. 16, 1974, Ser. No. 533,143

Claims priority, application Germany, Jan. 14, 1969, 1901542

Int. Cl.² C07C *125/03*

U.S. Cl. 260—544 C **7 Claims**

1. A process for the production of a compound of the formula



$$R^1-\underset{\underset{\underset{\underset{Cl}{|}}{CO}}{|}}{N}-CH=CH_2 \qquad (I),$$

wherein R¹ is tert-butyl or tert-pentyl, which process comprises reacting phosgene at a temperature of −30° to +150° C. with a Schiff base of the formula

$$R^1\text{-}N=CH\text{-}CH_3 \qquad (II),$$

wherein r¹ has the same meaning given above, and in the presence of an additional base selected from the class consisting of tertiary amines and alkali metal carbonates.

4,038,312

TRICYCLIC PHOSPHOROUS TRIAMIDES

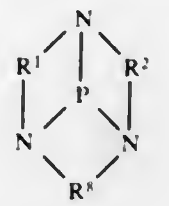
Thomas Joseph Atkins, Wilmington, Del., assignor to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 606,778, Aug. 22, 1975, Pat. No. 3,996,276. This application Oct. 7, 1976, Ser. No. 730,519

Int. Cl.² C07F *9/02, 9/65, 9/22*

U.S. Cl. 260—551 P **11 Claims**

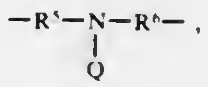
1. Polycyclic phosphorous triamides of the formula



in which

R¹ and R², alike or different, are alkylene of 2 to 6 carbons containing at least 2 carbons in the backbone, and

R⁸ is



$$-R^5-\underset{\underset{Q}{|}}{N}-R^6-\,,$$

—R⁵—O—R⁶—, or

—R⁵—O—R⁶—O—R⁷— where

R⁵, R⁶ and R⁷, alike or different, are alkylene of 2 to 6 carbons containing 2 to 3 carbons in the backbone, and Q is hydrogen or alkyl of 1 to 18 carbons.

4,038,313

CYCLOALKYLUREIDO PHENOXY PROPANOLAMINES

Max Wilhelm, Watchung, N.J., assignor to Ciba-Geigy Corporation, Ardlsey, N.Y.

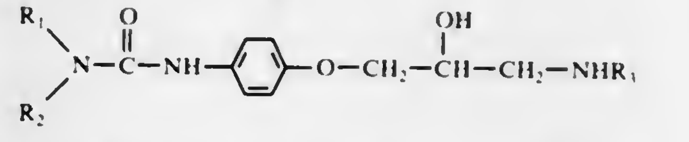
Continuation of Ser. No. 361,373, May 17, 1973, Pat. No. 3,935,259, which is a continuation-in-part of Ser. No. 101,393, Dec. 24, 1970, abandoned. This application Dec. 11, 1975, Ser. No. 639,683

Claims priority, application Switzerland, Jan. 8, 1970, 204/70; Nov. 13, 1970, 16788/70

Int. Cl.² A61K *31/17;* **C07C** *127/19, 127/15*

U.S. Cl. 260—553 A **1 Claim**

1. A compound selected from the group consisting of an amine of the formula



wherein R₁ denotes hydrogen, R₂ denotes cycloalkyl having 4 to 7 ring members and R₃ denotes lower alkyl and of therapeutically acceptable acid addition salts of such compounds.

4,038,314

1-HYDROXY-1-[(4'-HYDROXY-3'AMINOSULFONAMIDO)-PHENYL]-2-AMINO-ETHANES AND SALTS

Anton Mentrup, Ingelheim am Rhein; Kurt Schromm, Ingelheim am Rhein; Ernst-Otto Renth, Ingelheim am Rhein, and Werner Traunecker, Munster-Sarmsheim, all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

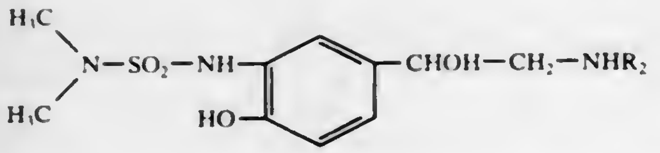
Continuation-in-part of Ser. No. 239,311, March 29, 1971, abandoned. This application Mar. 21, 1974, Ser. No. 453,438

Claims priority, application Germany, Apr. 1, 1971, 2115926

Int. Cl.^{2} C07C *143/80;* **A61K** *31/18*

U.S. Cl. 260—556 N **5 Claims**

1. A racemic mixture of a compound of the formula



wherein R_2 is phenoxy-(alkyl of 3 carbon atoms), phenyl-(alkyl of 5 carbon atoms), or naphthyl-(alkyl of 5 carbon atoms); a diastereoisomeric antipode pair thereof; an optically active isomer thereof; or a non-toxic, pharmacologically acceptable acid addition salt of said racemic mixture, antipode pair or optical isomer.

4,038,315

ISOLATION AND RECOVERY OF CALCIUM CHLORIDE COMPLEX OF 7-DIMETHYLAMINO-6-DIMETHYL L-6-DEOXYTETRACYCLINE HYDROCHLORIDE

Martin Tobkes, Spring Valley, N.Y., assignor to American Cyanamid Company, Stamford, Conn.

Filed May 11, 1972, Ser. No. 252,175

Int. Cl.^{2} C07F *3/04;* **C07C** *103/19*

U.S. Cl. 260—559 AT **1 Claim**

1. A calcium chloride complex of 7-dimethylamino-6-demethyl-6-deoxytetracycline hydrochloride of the formula: $(C_{23}H_{27}N_3O_7\,HCl)_4\ CaCl_2\,nH_2O$, wherein *n* is an integer from 7 to 13, inclusive.

4,038,316

PREPARATION OF ACYLHYDROXIMYL HALIDES

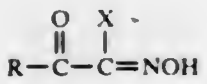
Roger G. Duranleau, Ardonia, and John M. Larkin, Wappingers Falls, both of N.Y., assignors to Texaco Inc., New York, N.Y.

Division of Ser. No. 532,421, Dec. 12, 1974, Pat. No. 3,960,953. This application Dec. 8, 1975, Ser. No. 638,408

Int. Cl.^{2} C07C *131/00*

U.S. Cl. 260—566 A **12 Claims**

1. An acylhydroximyl halide corresponding to the formula:



$$R-\overset{\overset{\displaystyle O}{\|}}{C}-\overset{\overset{\displaystyle X}{|}}{C}=NOH$$

where R is an alkyl group of 3 to 50 carbons and where X is Cl, Br, I or F prepared by contacting a nitroketone with a halogen acid in the presence of a polar protic organic solvent selected from the group consisting of alkanoic acids of up to 16 carbon atoms and alkanols having from 2-16 carbon atoms.

4,038,317

O-AMINOALKYL OXIMES

Camille Georges Wermuth, and Jean Schwartz, both of Strasbourg, France, assignors to Seperic, Morat, Switzerland

Filed Feb. 10, 1976, Ser. No. 656,970

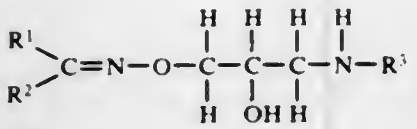
Claims priority, application United Kingdom, Feb. 12, 1975, 5956/75

Int. Cl.^{2} C07C *131/00, 131/02, 131/08*

U.S. Cl. 260—566 AE **3 Claims**

1. A compound selected from the group consisting of compounds of formula :

(I)



in which :

R^1 is selected from the group consisting of phenyl phenyl substituted by a radical selected from C_1-C_4 alkyl, C_1-C_4 alkoxy, halogen, nitro, amino and cyano, and naphthyl,

R^2 is selected from the group consisting of hydrogen, C_1-C_4 alkyl, and phenyl, or together with the carbon atom to which they are attached, R^1 and R^2 form a polycyclic ring, selected from the rings derived from fluorene, xanthene, indane, tetrahydronaphthalene, dihydrodibenzocycloheptene and dibenzocycloheptene,

R^3 is selected from the group consisting of isopropyl and tert.butyl, and a pharmaceutically acceptable acid addition salt thereof.

4,038,318

IONENES

Wun Ten Tai, Palos Hills, Ill., assignor to Nalco Chemical Company, Oak Brook, Ill.

Filed June 27, 1975, Ser. No. 590,882

Int. Cl.^{2} C07C *91/38*

U.S. Cl. 260—567.6 P **7 Claims**

1. A novel ionene polymer prepared by the steps comprising:

A. Adding a lower aliphatic secondary amine containing 2–6 carbon atoms to a lower aliphatic aldehyde from the group consisting of formaldehyde and acetaldehyde in a mole ratio of from 2:1 to 1:2 to produce a secondary amine-aldehyde adduct,

B. Adding the adduct of Step A to a phenol compound selected from the group consisting of phenol, and mono, di and tri alkyl substituted phenols said alkyl groups containing from 1–15 carbon atoms, said phenol compound further characterized as having at least two reactive sites in the ortho and/or para position; in a mole ratio of aldehyde to phenol or substituted phenol of at least 2.0 with agitation at a temperature of from 10°–100° C for a period sufficient to allow a reaction; and then,

C. Adding to the product of Step B a chain extender selected from the group consisting of 1,4-dichlorobutene-2 and epihalohydrins in a mole ratio of said phenol or substituted phenol to chain extender of essentially 1 with agitation at a temperature of from 20°–70° C for a time sufficient to form an ionene polymer,

D. Recovering the ionene polymer.

4,038,319

SUBSTITUTED PHENOXYALKYLAMINES, PROCESS FOR THEIR PREPARATION AND APPLICATIONS THEREOF

Henri Pinhas, Paris, France, assignor to Laboratoires Laroche Navarron, Levallois, France

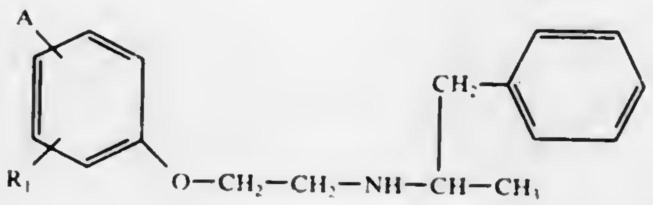
Continuation-in-part of Ser. No. 210,560, Dec. 21, 1971, Pat. No. 3,843,725. This application May 3, 1974, Ser. No. 466,838

Int. Cl.^{2} C07C *93/06*

U.S. Cl. 260—570.7 **4 Claims**

1. A compound selected from the group consisting of phenoxyalkylamines having the formula

(I)



in which R_1 is selected from the group consisting of hydrogen and methyl, and A is a cycloalkyl alkyl.

4,038,320

PHENYLETHYNYL SUBSTITUTED AROMATIC DIAMINES

Fred E. Arnold, Centerville, and Frederick L. Hedberg, Dayton, both of Ohio, assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Apr. 19, 1976, Ser. No. 678,325

Int. Cl.^{2} C07C *87/50*

U.S. Cl. 260—578 **3 Claims**

1. A compound selected from the group consisting of 2,2'-bis(phenylethynyl)-4,4'-diaminobiphenyl and 2,2'-bis(phenylethynyl)-5,5'-diaminobiphenyl.

4,038,321

PROCESS FOR PRODUCTION OF UNSYMMETRICAL DIMETHYLHYDRAZINE BY NITROSATION OF DIMETHYLAMINE AND HYDROGENATION OF THE NITROSO DIMETHYLAMINE TO THE DISTILLATION OF UNSYMMETRICAL DIMETHYLHYDRAZINE

Donald N. Thatcher, Hollister, and Yoshiyuki Arikawa, Gilroy, both of Calif., assignors to Teledyne McCormick Selph, Hollister, Calif.

Filed Jan. 12, 1976, Ser. No. 648,226

Int. Cl.^{2} C07C *109/02, 111/00*

U.S. Cl. 260—583 B **13 Claims**

1. A process for preparing unsymmetrical dimethylhydrazine by the catalytic hydrogenation of N-nitrosodimethylamine and recovering potassium nitrate as a by-product consisting essentially of the steps of:

A. nitrosating an aqueous solution of dimethylamine by reaction with dinitrogen tetraoxide and potassium carbonate at a pressure from atomospheric to 50 psi g and a temperature from −10° C to 40° C to produce an aqueous solution of N-nitrosodimethylamine and potassium nitrate and gaseous carbon dioxide; and,

B. extracting all of said potassium nitrate from said aqueous solution by a liquid extraction at a temperature between 0° C to 30° C wherein methylene chloride is added as an extractive solvent to said aqueous solution, and withdrawing an aqueous solution of said potassium nitrate and a separate potassium nitrate-free stream of N-nitrosodimethylamine in solution with methylene chloride; and,

C. hydrogenating the potassium nitrate-free stream of N-nitrosodimethylamine solution in the presence of a hydrogenation catalyst by reacting said stream with hydrogen at a pressure from 50–1000 psi g and at a temperature from 50°–90° C to produce an aqueous product solution containing unsymmetrical dimethylhydrazine; and

D. distilling said product solution in the presence of an organic distillation base selected from the group consisting of diethanolamine, morpholine, diethylaminoethanol and dimethylamino ethanol, and taking off unsymmetrical dimethylhydrazine as a heart cut substantially free of water, N-nitrosodimethylamine, and said distillation base.

4,038,322

PROCESS FOR THE OXIDATION OF PARAFFINS

Pierre M. J. G. de Radzitzky d'Ostrowick, 101 Avenue Paul Hymans, Woluwe-St-Lambert, Brussels; Jacques D. V. Hanotier, 36 Avenue Docteur Decroly-uccle., Brussels 18, and Joseph M. E. Vaerman, 28 Clos Fernand Tonnet, Jette-Brussels 9, all of Belgium

Division of Ser. No. 239,367, March 29, 1972, abandoned, which is a division of Ser. No. 844,616, , Pat. No. 3,758,557. This application Feb. 6, 1976, Ser. No. 655,997

Int. Cl.^{2} C07C *45/02*

U.S. Cl. 260—597 R **7 Claims**

1. Process for the selective oxidation of straight chain paraffin hydrocarbons having 3 to 60 carbon atoms into oxygenated products having the same number of carbon atoms comprising predominantly saturated ketones wherein the oxygenated function is predominantly located in the 2-position, comprising reacting said hydrocarbon in a liquid phase free of oxidizable solvent in an atmosphere comprising free oxygen with an oxidizing system consisting essentially of oxides and salts of a metal of variable valency of group II though VI and cobalt, the metal in said compound being in its higher valency state and having an oxidation-reduction potential of at least 0.99 volts, and an activator selected from the group consisting of boron trifluoride and strong stable organic and inorganic acids having a dissociation constant greater than 5 10^{-3}, selected from the group consisting of sulfuric, phosphoric, perchloric, dichloracetic, trichloracetic, trifluoracetic, and p-toluenesulfonic and mixtures thereof, at a temperature in the range of −20° C to +80° C.

4,038,323

ALKENYL ARYL SULFONES

Pierre Chabardes, Lyon, and Marc Julia, Paris, both of France, assignors to Rhone-Poulenc S.A., Paris, France

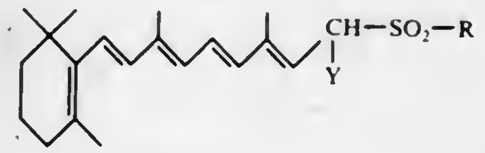
Division of Ser. No. 254,103, May 17, 1972, Pat. No. 3,803,252. This application Sept. 26, 1973, Ser. No. 401,033

Claims priority, application France, May 19, 1971, 71.18168

Int. Cl.^{2} C07C *147/08*

U.S. Cl. 260—607 AR **3 Claims**

1. A retinyl-sulphone of the formula:



in which Y is hydrogen or retinyl, and R is alkyl, aryl, alkylaryl, or aralkyl.

4,038,324

METHOD FOR REACTING ORGANIC HALIDES

Michael F. Farona, Cuyahoga Falls, and James F. White, Akron, both of Ohio, assignors to The University of Akron, Akron, Ohio

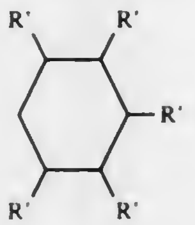
Continuation of Ser. No. 459,484, April 10, 1974, Pat. No. 3,891,713, which is a division of Ser. No. 339,637, March 9, 1973, Pat. No. 3,832,403, which is a continuation-in-part of Ser. No. 119,908, March 1, 1971, abandoned. This application Apr. 21, 1975, Ser. No. 569,780

The portion of the term of this patent subsequent to June 24, 1992, has been disclaimed.

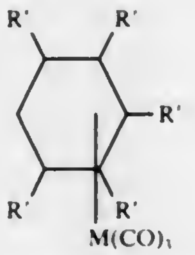
Int. Cl.^{2} C07C *68/02*

U.S. Cl. 260—607 AR 7 Claims

1. The process of reacting an alkyl sulfonyl halide with an aromatic substrate to form an aromatic product comprising the steps of: charging a reaction vessel with a metallic hexacarbonyl compound having the general formula M(CO)$_6$ wherein M is selected from the group consisting of Cr, Mo and W, adding an aromatic substrate having the general formula



wherein R' is selected from the group consisting of hydrogen, alkyl groups having from 1 to about 6 carbon atoms, alkoxide groups having from 1 to about 4 carbon atoms, hydroxide, aryl and aryloxide groups having from 6 to about 12 carbon atoms including alkyl substituents, reacting said metallic hexacarbonyl compound with part of said aromatic substrate to yield in arene metal tricarbonyl catalyst having the general formula



charging the reaction vessel with an alkyl sulfonyl halide having the general formula R—SO$_2$—X wherein R is selected from the group consisting of an alkyl group having from 1 to about 20 carbon atoms, and X is selected from the group consisting of bromine, chlorine and fluorine, heating said reaction vessel from ambient temperatures to a temperature sufficient to cause said catalyst to remove the halide from said alkyl sulfonyl halide with generation of a sulfonium ion from said alkyl sulfonyl halide so that said sulfonium ion will attack the remaining part of said aromatic substrate to yield the aromatic product.

4,038,325

ISOMERIZATION OF CIS-ANETHOLE TO TRANS-ANETHOLE

Michael Martan, Skokie, and Paul H. Reichenbacher, Schaumburg, both of Ill., assignors to UOP Inc., Des Plaines, Ill.

Filed Oct. 23, 1975, Ser. No. 625,290

Int. Cl.^{2} C07C *41/00*

U.S. Cl. 260—612 D 4 Claims

1. A process for the isomerization of cis-anethole to trans-anethole which comprises treating cis-anethole with an inorganic or organic rhodium salt selected from the group consisting of rhodium chloride, rhodium bromide, rhodium iodide, rhodium nitrate, rhodium sulfate, rhodium formate, rhodium acetate, rhodium propionate, rhodium butyrate and rhodium acetylacetonate in an alcoholic medium at a temperature in the range of from about 25° C. to about 200° C. and a pressure in the range of from about atmospheric to about 100 atmospheres, and recovering the resultant isomerized anethole.

4,038,326

UNSATURATED ALICYCLIC CARBINOLS AND DICARBINOLS AND METHOD OF PREPARATION

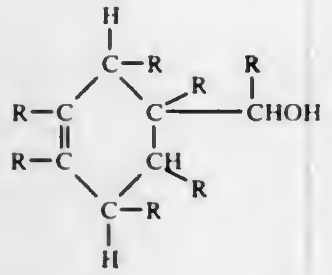
Donald G. Kuper, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Continuation of Ser. No. 344,468, March 23, 1973, abandoned. This application Nov. 6, 1975, Ser. No. 629,431

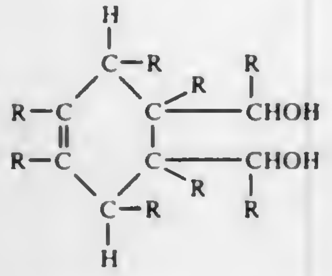
Int. Cl.^{2} C07C *33/05*

U.S. Cl. 260—617 C 43 Claims

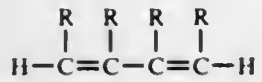
1. A process for preparing an unsaturated alicyclic carbinol having the formula



in which each R can be a hydrogen radical or a methyl radical and no more than 3 R's can be methyl radicals; or an unsaturated alicyclic dicarbinol having the formula



in which each R can be a hydrogen radical or a methyl radical and in which no more than 4 R's can be methyl radicals, or mixtures of said carbinol and said dicarbinol, which process comprises subjecting a polymeric oxidation product having peroxide functionally to an oxo reaction with carbon monoxide, hydrogen, and a metal carbonyl oxo catalyst under reaction conditions sufficient to yield a reaction mixture in which appreciably all of the peroxide functionality has been consumed, and then subjecting said reaction mixture to reducing conditions suitable for reducing carbonylic groups to hydroxyl groups so that no substantial detectable carbonylic groups remain, said reducing conditions further being such that the carbon-carbon double bond in said unsaturated alicyclic carbinol or dicarbinol is preserved, wherein said polymeric oxidation product is produced by the reaction of a conjugated diolefin of the formula



$$\mathrm{H{-}\overset{R}{\overset{|}{C}}{=}\overset{R}{\overset{|}{C}}{-}\overset{R}{\overset{|}{C}}{=}\overset{R}{\overset{|}{C}}{-}H}$$

wherein each R is selected from the group consisting of a hydrogen radical and a methyl radical, and at least two of the R substituents of said conjugated diolefin are hydrogen radicals, with oxygen at a temperature in the range of 50° C. to 150° C. under a partial pressure of oxygen of at least 20 pounds per square inch gauge with the total pressure being sufficient to maintain said conjugated diolefin in the liquid phase for a period of time within the range of 0.1 to 25 hours.

4,038,327

3,5-DISUBSTITUTED-4-HYDROXYBENZYL DERIVATIVE

Gordon D. Brindell, Crystal Lake, and Rudy F. Macander, Cary, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed May 26, 1972, Ser. No. 257,178

Int. Cl.^{2} C07C *37/00*

U.S. Cl. 260—619 R 1 Claim

1. The composition which is 3,5-dibenzyl-4-hydroxybenzyl alochol.

4,038,328

PROCESS FOR PREPARING 2-NITRO-4,6-DICHLORO-5-METHYLPHENOL

Heinrich Pelster, Odenthal-Gloebusch, and Uwe Beck, Cologne, both of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Jan. 2, 1976, Ser. No. 645,983

Claims priority, application Germany, Jan. 18, 1975, 2501899

Int. Cl.^{2} C07C *79/32, 39/26*

U.S. Cl. 260—622 R 4 Claims

1. In a process for preparing 2-nitro-4,6-dichloro-5-methylphenol by sulfonation of 4-chloro-5-methylphenol to form 2-sulfo-4-chloro-5-methylphenol followed by chlorination of the 2-sulfo-4-chloro-5-methylphenol to 2-sulfo-4,6-dichloro-5-methylphenol with subsequent reaction of the 2 -sulfo-4,6dichloro-5-methylphenol with nitric acid, the improvement which comprises carrying out the sulfonation at 40–100° C with concentrated sulfuric acid to form 2-sulfo-4-chloro-5-methylphenol, thereafter diluting the reaction mixture with water to sulfuric acid content of 20 to 30 percent, chlorinating the resulting 2-sulfo-4-chloro-5-methylphenol with chlorine at 45–60° C under a pressure of 1–3 bars gauge pressure to form 2-sulfo-4,6-dichloro-5-methylphenol.

4,038,329

PROCESS FOR PURIFICATION OF NEOPENTYL GLYCOL

Billy W. Palmer, and Howard N. Wright, Jr., both of Longview, Tex., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Nov. 17, 1975, Ser. No. 632,759

Int. Cl.^{2} C07C *29/24*

U.S. Cl. 260—637 P 20 Claims

1. A process for the purification of crude neopentyl glycol produced by the alkali catalyzed condensation of formaldehyde and isobutyraldehyde consisting of the following steps:

A. extraction of crude neopentyl glycol with a hydroxylic organic solvent or mixture of solvents selected from the group consisting of alcohols and aliphatic and aromatic hydrocarbons having boiling points of between about 50° C. and about 150° C. which solvent or mixture of solvents has the property of being a solvent for neopentyl glycol and a nonsolvent for metal salts,

B. separating the neopentyl glycol/organic solvent extract into a solvent stream and a neopentyl glycol stream by distillation under atmospheric conditions,

C. purifying the neopentyl glycol stream under atmospheric conditions.

4,038,330

1-METHYL-2-HALOGEROMETHYL-3-ISOPROPENYL-CYCLOPENT-1-ENES

Werner Hoffmann, Neuhofen, and Karl von Fraunberg, Bobenheim, both of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Germany

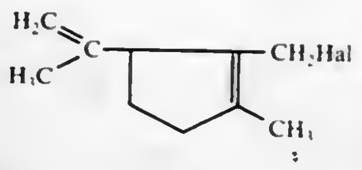
Filed Mar. 8, 1976, Ser. No. 665,064

Claims priority, application Germany, Mar. 29, 1975, 2513995

Int. Cl.^{2} C07C *23/08*

U.S. Cl. 260—648 C 2 Claims

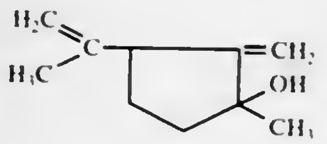
1. Cyclopentene derivatives of the general formula I



I

where Hal is chlorine, bromine or iodine.

2. A process for the manufacture of a cyclopentane derivative as claimed in claim 1, wherein 1-methyl-2-methylene-3-isopropenyl-cyclopentan-1-ol (II)



II

is reacted with a chlorinating, brominating or iodinating agent at from −50° to +100° C, said agent being selected from the group consisting of hydrogen chloride, hydrogen bromide, phosphorus trichloride, phosphorus pentachloride, thionyl chloride, phosphorus tribromide, phosphorus pentabromide, thionyl bromide, phosgene and hydrogen iodide.

4,038,331

CATALYTIC PROCESS FOR PREPARATION OF PERFLUOROALKYL SUBSTITUTED AROMATIC COMPOUNDS

John H. Tobin, Beacon Falls, Conn., assignor to Olin Corporation, New Haven, Conn.

Continuation-in-part of Ser. No. 549,589, Feb. 13, 1975, abandoned. This application Dec. 22, 1975, Ser. No. 643,227

Int. Cl.^{2} C07C *25/14*

U.S. Cl. 260—651 F 9 Claims

1. A process for preparing perfluoroalkyl substituted aromatic compounds which comprises:

A. heating together in the vapor phase under anhydrous conditions at a temperature of 300°–800° C
   1. an aromatic hydrocarbon, said aromatic hydrocarbon being substituted with at least one atom of hydrogen and 0–3 further substituents selected from the group consisting of halogen, perhaloalkyl having 1–4 carbons, nitrile and combinations of such further substituents,
   2. a perfluoroalkyl bromide having 1–16 carbon atoms, and
   3. a catalytic amount of a catalyst selected from the group consisting of iodine and an iodine generating compound selected from the group consisting of perhaloalkyl iodine having 1–4 carbons; and

B. recovering said perfluoroalkyl substituted aromatic compound.

4,038,332

SEPARATION OF ETHYL FLUORIDE

C. O. Carter, Bartlesville, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 9, 1975, Ser. No. 621,097

Int. Cl.^{2} C07C *19/08, 21/18, 21/20, 21/22*

U.S. Cl. 260—653 5 Claims

1. A process for separating ethyl-fluoride from an ethyl fluoride containing propane stream comprising

a. introducing said ethyl fluoride containing propane stream into an ethyl fluoride extraction zone,

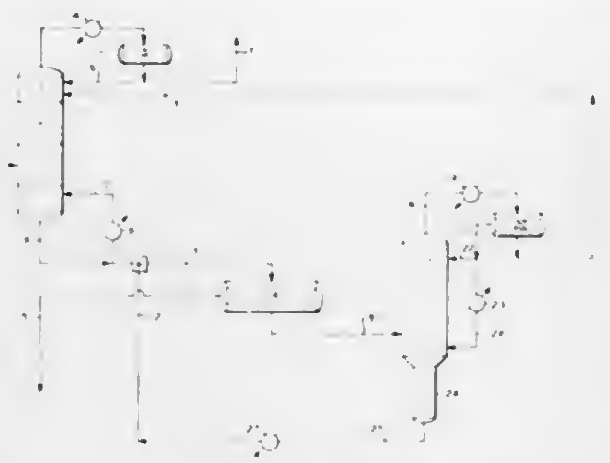
b. introducing a dry liquid HF stream into said ethyl fluoride extraction zone to extract ethyl fluoride from said ethyl fluoride containing propane stream,

c. withdrawing a first stream comprising propane and being essentially free of ethyl fluoride from said ethyl fluoride extraction zone,

- d. withdrawing a second stream comprising ethyl fluoride and HF from said ethyl fluoride extraction zone,
- e. mixing said second stream with an aqueous extractant consisting essentially of to form mixture, and
- f. separating said mixture into a first phase consisting essentially of ethyl fluoride and into a second phase consisting essentially of HF and water.

4. A method for separating ethyl fluoride from a first mixture consisting essentially of ethyl fluoride and HF, which comprises

- a. contacting said first mixture with an aqueous extractant consisting essentially of water to produce a second mixture consisting essentially of ethyl fluoride, HF and said aqueous extractant and,
- b. phase separating said second mixture into a first phase consisting essentially of ethyl fluoride, and into a second phase consisting essentially of HF and water.



4,038,333
TRICYCLI BREDT COMPOUND, TRICYCLO[5.3.1.0^{3,8}]UNDEC-2-ENE

Yoshiaki Inamoto; Yoshiaki Fujikura; Hiroshi Ikeda, and Naotake Takaishi, all of Wakayama, Japan, assignors to Kao Soap Co., Ltd., Tokyo, Japan

Filed Apr. 14, 1976, Ser. No. 676,704

Claims priority, application Japan, Apr. 28, 1975, 50-51700

Int. Cl.^{2} C07C *13/28*

U.S. Cl. 260—666 PY **3 Claims**

1. Tricyclo[5.3.1.0^{3,8}]undec-2-ene

4,038,334
FRACTIONAL DISTILLATION PRESSURE CONTROL FOR SEPARATION OF AROMATIC ALKYLATION PRODUCT

Charles E. Wood, Palatine, Ill., assignor to UOP Inc., Des Plaines, Ill.

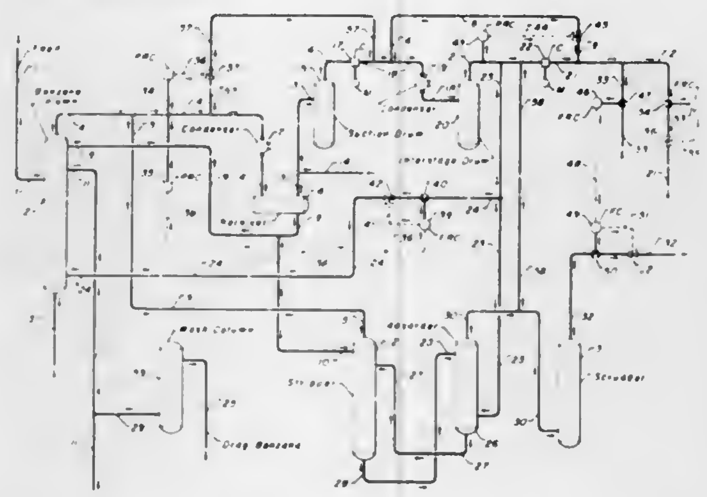
Filed June 24, 1976, Ser. No. 699,747

Int. Cl.^{2} C07C *3/56, 15/09*

U.S. Cl. 260—671 R **11 Claims**

1. In a process for alkylating an aromatic hydrocarbon with a normally gaseous olefinic feed stream containing a normally gaseous paraffinic contaminant, in an alkylation reaction zone and in contact with an alkylation catalyst comprising a boron halide-modified refractory inorganic oxide, to produce an alkylated aromatic hydrocarbon, in which process (1) alkylation reaction product effluent is separated, in a fractional distillation column, to provide a first liquid-phase of an alkylated aromatic concentrate, containing poly-alkylated aromatics, and a first vapor-phase of an unreacted aromatic concentrate, containing boron halide and said paraffinic contaminant; (2) said first vaporous phase is separated, in a separation zone, to provide a second liquid-phase, unreacted aromatic concentrate and a second vapor-phase rich in paraffinic contaminant and boron halide; and, (3) a first portion of said second vapor-phase is returned to said distillation column, a second portion is recycled to said alkylation reaction zone, a third portion is treated, in a treating zone, to remove boron halide and at least a portion of the resulting paraffinic contaminant-rich vapors are withdrawn from the process, the method of controlling the fractional distillation column pressure which comprises the steps of:

- a. sensing the pressure in said distillation column at a locus proximate to the withdrawal of said unreacted aromatic vapor-phase concentrate;
- b. developing a first signal representative of said distillation column pressure;



- c. adjusting the flow rate of the second portion of said second vapor phase being recycled to said alkylation reaction zone responsive to said first signal;
- d. developing a second signal representing the flow rate of the recycled portion of said second vapor phase; and,
- e. regulating the quantity of said paraffinic contaminant-rich vapors withdrawn from said process responsive to said second signal.

4,038,335
METHOD OF PREPARING BENZENE AND METHYLBENZENES

Khabib Minachevich Minachev, Leninsky prospekt, 57, kv. 15; Evgeny Sergeevich Mortikov, Leninsky prospekt, 61/1, kv. 34; Boris Mikhailovich Kozlov, Cherepovetskaya 22, kv. 22, all of Moscow; Alexandr Semenovich Leontiev, ulitsa Gagarina, 13, kv. 13, Bashkirskaya ASSR, Salavat; Nikolai Fedorovich Kononov, ulitsa Garibaldi 13/54, korpus 2, kv. 41, Moscow, and Sergei Markovich Lakiza, ulitsa Kolkhoznaya, 5, kv. 12, Bashkirskaya ASSR, Salavat, all of U.S.S.R.

Filed July 8, 1975, Ser. No. 593,947

Int. Cl.^{2} C07C *3/62*

U.S. Cl. 260—672 T **6 Claims**

1. A method of preparing benzene and methylbenzenes comprising contacting toluene at a temperature within the range of from 350° to 550° C. under a pressure of from 1 to 50 atmosphers with a granulated zeolite catalyst containing cations of metals of Group II of the periodic system with an exchange degree of from 5 to 30% of the theoretical value, hydrogen group with an exchange degree of from 6 to 22% of the theoretical value, and cations of metals of Group III of the periodic system with an exchange degree of from 20 to 80% of the theoretical value to form a reaction mixture I containing benzene and xylenes, separating benzene and xylenes from said reaction mixture I; contacting the separated xylenes with the same catalyst under the same conditions described above to form a reaction mixture II containing toluene and trimethylbenzenes, separating said toluene and trimethyl-benzenes from said reaction mixture II; contacting the separated trimethylbenzenes with the same catalyst under the same conditions described above to form a reaction mixture III containing xylenes and tetramethylbenzenes, and separating said xylenes and tetramethylbenzenes.

4,038,336
PURIFICATION OF UNSATURATED COMPOUNDS

Alfio J. Besozzi, and Alan W. Foster, both of Houston, Tex., assignors to Petro-Tex Chemical Corporation, Houston, Tex.

Division of Ser. No. 420,046, Nov. 29, 1973, abandoned, which is a continuation-in-part of Ser. No. 223,363, Feb. 3, 1972, abandoned. This application Oct. 30, 1975, Ser. No. 627,116

Int. Cl.^{2} C07C *11/12*

U.S. Cl. 260—680 E **1 Claim**

1. In a vapor phase process for the preparation of unsaturated hydrocarbons comprising

catalytic oxidative dehydrogenation of a feed stream of hydrocarbon compounds having 4 to 8 carbon atoms to produce an unsaturated hydrocarbon product stream having a greater degree of ethylenic unsaturation than said feed stream and containing organic carbonyl compounds as an impurity

wherein the improvement comprises contacting said product stream in vapor phase at a temperature in the range of 250° to 800° C and containing less than 5 mol percent free oxygen with a solid catalyst for destroying said carbonyl compounds consisting of mixtures of oxides of Zr and Fe, and removing organic carbonyl compounds.

4,038,337
PROCESS FOR ISOMERIZING ALKENES

Giovanni Manara; Vittorio Fattore, and Bruno Notari, all of San Donato Milanese (Milan), Italy, assignors to Snam Progetti S.p.A., Milan, Italy

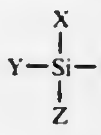
Filed Aug. 1, 1975, Ser. No. 601,208

Claims priority, application Italy, Aug. 2, 1974, 25943/74

Int. Cl.^{2} C07C *5/22*

U.S. Cl. 260—683.2 **21 Claims**

1. A process for the skeleton isomerization of alkenes which comprises contacting an alkene having at least four carbon atoms or a mixture of alkenes having at least four carbon atoms with a catalyst consisting essentially of alumina previously treated with a silicon compound having the formula



$$\begin{array}{c} X \\ | \\ Y-\mathrm{Si}-W \\ | \\ Z \end{array}$$

wherein X, Y, Z and W are selected from the group of —R, —OR, —Cl, —Br, —SiH_3, —COOR, —SiH_nCl_m, R being either hydrogen or an alkyl, cycloalkyl, aromatic, alkyl-aromatic or alkyl-cycloalkyl radical having from 1 to 30 carbon atoms, n and m being whole numbers in the range of from 1 to 3.

4,038,338
NEW POLYEPOXIDE-POLYSILOXANE COMPOUNDS

Dieter Baumann, Birsfelden; Heinz Rembold, Arlesheim; Rolf Schmid, Gelterkinden, and Friedrich Lohse, Oberwil, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

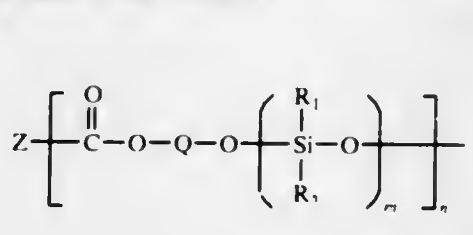
Continuation of Ser. No. 299,537, Oct. 20, 1972, abandoned. This application Mar. 6, 1975, Ser. No. 556,073

Claims priority, application Switzerland, Oct. 25, 1971, 15486/71

Int. Cl.^{2} C08L *83/10*

U.S. Cl. 260—824 EP **10 Claims**

1. Polyepoxide-polysiloxanes characterised in that they contain units of the formula I



$$Z\left[\overset{\displaystyle O}{\overset{\|}{C}}-O-Q-O\left(\begin{array}{c} R_1 \\ | \\ \mathrm{Si}-O \\ | \\ R_2 \end{array}\right)_m\right]_n \qquad (I)$$

in which Z denotes a n-valent radical of a polycarboxylic acid or of an acid polyester, Q denotes an aliphatic, cycloaliphatic, heterocyclic or aromatic epoxide-containing group in which the two oxygen atoms bonded to Q in the formula I are in adjacent positions to one another, R_1 and R_2 independently of one another denote an alkyl, alkenyl, aralkyl, aryl, cycloalkyl, alkoxy or aryloxy group or an epoxide-containing polysiloxane chain, *m* denotes a number greater than 1 and *n* denotes 2 or 3.

4,038,339
EPOXY-VINYL-POLYESTER COLD BLENDED RESIN COMPOSITION

Newton C. Foster, Pittsburgh, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 16, 1975, Ser. No. 613,841

Int. Cl.^{2} C08L *63/00*

U.S. Cl. 260—835 **8 Claims**

1. The method of making a liquid resinous composition from a liquid-solid epoxy resin mixture, liquid Nadic methyl anhydride, a liquid unsaturated reactive vinyl monomer, a polyester, a reaction catalyst, and reaction inhibitor, said liquid composition having a long catalyzed shelf life, said method comprising: forming an unreacted admixture, at a temperature of between about 20° C to 35° C, consisting essentially of: (a) a mixture of 1 part of an epoxy resin combination, consisting of a liquid epoxy resin having an epoxy equivalent weight of between about 150 to 300 and a solid epoxy resin having an epoxy equivalent weight of between about 325 to 2,500, wherein the weight ratio of solid epoxy:liquid epoxy is between about 1:0.3 to 1:9, and about 0.4 to 1.4 parts of a liquid unsaturated reactive vinyl monomer, (b) about 0.3 to 0.7 part of liquid Nadic methyl anhydride, (c) about 0.2 to 1.0 part of a polyester resin for each 1 part of liquid unsaturated monomer, (d) an amount of a free radical reaction catalyst effective to promote a gelling effect to the resinous composition at temperatures over about 85° C and (e) an amount of a reaction inhibitor that is effective to react with the free radicals of the reaction catalyst to prevent reaction catalization of the polyester and the liquid unsaturated monomer at the admixing temperature of between about 20° C to 35° C, wherein the resinous composition has a viscosity of between about 50 cps to 2,500 cps at 25° C and is characterized by having an atmospheric catalyzed shelf life of at least 45 days at 25° C.

4,038,340
UNSATURATED POLYESTER RESINS WHICH HAVE RADICALS OF MONOHYDRIC ALCOHOLS AS TERMINAL GROUPS

Walter Frank; Karl Raichle; Otto Bendszus, and Manfred Patheiger, all of Krefeld, Germany, assignors to Bayer Aktiengesellschaft, Germany

Filed June 18, 1976, Ser. No. 697,418

Claims priority, application Germany, June 21, 1975, 2527675

Int. Cl.^{2} C07C *69/44, 69/74, 69/80*

U.S. Cl. 260—861 **1 Claim**

1. Polyester resins which contain barrier agents and are based on

- A. 60-90% by weight, based on the sum of components (A) and (B), of α, β-ethylenically unsaturated polyesters and
- B. 40-10% by weight, based on the sum of components (A) and (B), of copolymerisable monomers.

characterised in that the polyesters (A) contain, per mol of polycarboxylic acid radical, in addition to 0.65-0.95 mol of radicals of polyhydric alcohols, 0.30-0.70 mol of radicals of monohydric alcohols with 1-16 carbon atoms, 0.25-0.55 mol of which possess an aromatic and/or cycloaliphatic ring with 5-12 carbon atoms, and that the molar ratio of OH groups to COOH groups of the components of the polyesters (A) should be at least 0.9.

4,038,341

LOW PROFILE ADDITIVES IN POLYESTER SYSTEMS

Willis T. Schwartz, Jr., Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,751

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—862 **11 Claims**

1. A polymerizable molding composition comprising:

1. a polymerizable polyester component; comprising an unsaturated polyester and a copolymerizable unsaturated monomer and
2. an additive component comprising the reaction product of a styrene-maleic anhydride copolymer, and a hydroxyl-terminated polydiene.

4,038,342

LOW PROFILE ADDITIVES IN POLYESTER SYSTEMS

Willis T. Schwartz, Jr., Grand Island, N.Y., assignor to Hooker Chemicals & Plastics Corporation, Niagara Falls, N.Y.

Filed Mar. 11, 1976, Ser. No. 665,752

Int. Cl.^{2} C08L *67/06*

U.S. Cl. 260—862 **15 Claims**

1. A polymerizable molding composition comprising

1. a polymerizable polyester compontent comprising an unsaturated polyester and a copolymerizable unsaturated monomer; and
2. an additive component comprising the reaction product of a styrene-maleic anhydride copolymer, and a saturated polyester, said saturated polyester generally being terminated with at least one hydroxyl group.

4,038,343

RESIN COMPOSITION CONTAINING COPOLYPHENYLENE ETHER

Eiichi Yonemitsu, Yokkaichi; Akitoshi Sugio, Ohmiya; Masanobu Masu, Kana; Takao Kawaki, and Yukio Sasaki, both of Tokyo, all of Japan, assignors to Mitsubishi Gas Chemical Company, Inc., Tokyo, Japan

Filed Oct. 17, 1975, Ser. No. 623,328

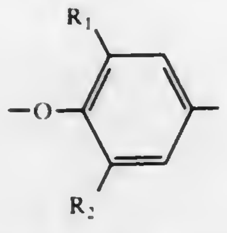
Claims priority, application Japan, Oct. 18, 1974, 49-119748

Int. Cl.^{2} C08L *25/04. 33/04. 51/04. 53/02*

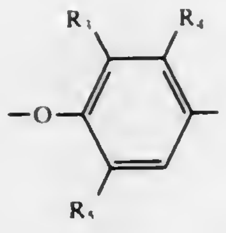
U.S. Cl. 260—874 **4 Claims**

1. A thermoplastic blended resin composition comprising

1. 5 to 95% by weight of a copolyphenylene ether composed of 50 to 98 mole % of a structural unit of the formula



wherein R_1 and R_2 are identical or different and each represents methyl or ethyl, and 2 to 50 mole % of a structural unit of the formula



wherein R_3, R_4 and R_5 are identical or different and each represents methyl or ethyl, the total proportion of the two structural units being 100 mole % based on the copolymer, and

2. 5 to 95% by weight of at least one styrene resin selected from the group consisting of (A) a homopolymer of styrene monomer, α-methyl styrene monomer, vinyl toluene monomer or nucleus-chlorinated styrene monomer, (B) copolymer of at least two of said monomers and (C) a copolymer of one of said monomers with at least one member of olefins, acrylic compounds and conjugated dienes,

the total amount of components (1) and (2) being 100% by weight based on the total weight of the resin composition.

4,038,344

GRAFT COPOLYMERS OF OLEFINIC NITRILES AND OLEFINIC ESTERS ON DIENE RUBBERS

Allan A. Eisenbraun, and Edwin D. Hornbaker, both of Baton Rouge, La., assignors to Ethyl Corporation, Richmond, Va.

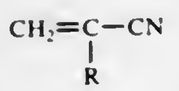
Continuation-in-part of Ser. No. 100,358, Dec. 21, 1970, abandoned. This application Aug. 31, 1971, Ser. No. 176,715

Int. Cl.^{2} C08F *293/00*

U.S. Cl. 260—879 **16 Claims**

1. A process for the production of impact resistant polymers having low permeability to gases and vapors comprising polymerizing at a temperature of from about 0°–100° C in aqueous medium in the presence of an emulsifier and a free radical polymerization initiator in the substantial absence of molecular oxygen, 100 parts by weight of

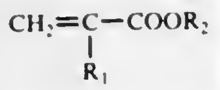
A. at least 50 percent by weight of a compound having the structure



$$CH_2{=}\underset{\substack{|\\ R}}{C}{-}CN$$

wherein R is a member selected from the group consisting of hydrogen and a lower alkyl group having from 1 to 4 carbon atoms, and

B. up to about 50 percent by weight based on the combined weight of (A) and (B) of an ester having the structure



$$CH_2{=}\underset{\substack{|\\ R_1}}{C}{-}COOR_2$$

wherein R_1 is a member selected from the group consisting of hydrogen and an alkyl group having from 1 to 4 carbon atoms and R_2 is an alkyl group having from 1 to 6 carbon atoms,

in the presence of from 8 to 15 parts by weight of

C. a homopolymer of a conjugated diene monomer selected from the group consisting of butadiene and isoprene.

4,038,345

HIGH VISCOSITY CYANOACRYLATE ADHESIVE COMPOSITIONS, AND PROCESS FOR THEIR PREPARATION

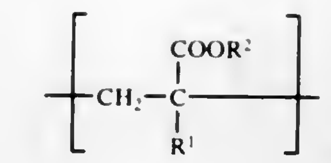
Denis J. O'Sullivan, and Bernard J. Bolger, both of Dublin, Ireland, assignors to Loctite (Ireland), Limited, Dublin, Ireland

Continuation-in-part of Ser. No. 403,375, Oct. 4, 1973, abandoned, which is a continuation-in-part of Ser. No. 212,717, Dec. 27, 1971, abandoned. This application July 2, 1975, Ser. No. 592,695

Int. Cl.^{2} C08L *33/00*

U.S. Cl. 260—881 **10 Claims**

1. The process for preparing an improved cyanoacrylate adhesive composition which comprises heating an acrylate polymer which has a reduced viscosity of substantially less than 5 and a content of free radical polymerization initiator of at least about 1% by weight, at a temperature of about 140° to about 180° centigrade and for about 30 to about 180 minutes and thereby increasing the reduced viscosity to at least about 5 and reducing the content of free radical polymerization initiator to less than about 0.5% by weight, said acrylate polymer having the repeating unit



$$\left[-CH_2-\underset{\substack{|\\ R^1}}{\overset{\substack{COOR^2\\ |}}{C}}-\right]$$

wherein R^1 is hydrogen, ethyl or methyl and R^2 is a C_1 to C_4 alkyl or alkenyl group; and dissolving a quantity of the polymer so treated into a mixture of a monomeric ester of 2-cyanoacrylic acid and about 0.0005% to about 10% by weight of an inhibitor of anionic polymerization, the quantity of polymer being sufficient to produce a cyanocrylate adhesive composition with a viscosity between about 500 and about 20,000 centipoise.

4,038,346

TACKIFIER COMPOSITION AND RUBBER MIXTURE

George W Feeney, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

Filed Mar. 31, 1975, Ser. No. 564,006

Int. Cl.^{2} C08F *4/14;* **C08L** *9/00*

U.S. Cl. 260—887 **9 Claims**

1. A modified tackifying resin composition prepared by mixing (A) about 75 to about 98 weight percent tackifying resin having a softening point in the range of about 80° C. to about 130° C. with, correspondingly, about 25 to about 2 weight percent oily polymer having a boiling point at atmospheric pressure in the range of about 190° C. to about 250° C.; where said tackifying resin is prepared by the step-wise method of (i) polymerizing at a temperature in the range of about 0° C. to about 50° C. in the presence of a catalyst selected from aluminum chloride and ethylaluminum dichloride, a monomer mixture comprised of (a) about 20 to about 80 weight percent piperylene, (b) about 80 to about 20 weight percent of a monoolefin containing 4 to 6 carbon atoms comprised of at least one olefin selected from the group consisting of 2-methyl-2-butene, 2-methyl-1-butene, 2-methyl-2-pentene and 2-methyl-1-pentene and (c) about 0 to about 30 weight percent of a monomer selected from the group consisting of dicyclopentadiene and α-methylstyrene and (ii) recovering the molten tackifying resin as a distilland from a steam distillation at a pot temperature in the range of about 255° C; and where said oily polymer is prepared by the step-wise method which comprises (iii) polymerizing at a temperature in the range of about 0° C. to about 50° C., in the presence of a catalyst selected from aluminum chloride and ethylaluminum dichloride, a monomer mixture comprised of (a) about 20 to about 80 weight percent piperylene, (b) about 80 to about 20 weight percent of a monoolefin containing 4 to 6 carbon atoms comprised of at least one olefin selected from the group consisting of 2-methyl-2-butene, 2-methyl-1-butene, 2-methyl-2-pentene and 2-methyl-1-pentene and (c) about 0 to about 30 weight percent of a monomer selected from the group consisting of dicyclopentadiene and α-methylstyrene and (iv) recovering said oily polymer as a distillation cut at a temperature in the range of about 190° C. to about 250° C. by distilling, optionally steam distilling, the product of (iii) to remove volatiles to a pot temperature in the range of about 235° C.

6. The modified tackifying resin composition of claim **1** in admixture with about 40 to about 60 parts by weight of a rubbery polymer per 50 parts by weight of said tackifying resin/oily polymer mixture, as an adhesive, where said rubbery polymer is selected from cis-1,4-polyisoprene rubber and unvulcanized elastomeric block copolymers having the general configuration A - B - A wherein each A is a nonelastomeric polymer block of styrene having an average molecular weight of about 2000 to about 100,000 and a glass transition temperature above about 25° C., the total block A content being about 10 to about 50 weight percent of said copolymer and B is an elastomeric polymer block of isoprene having an average molecular weight of about 25,000 to about one million and a glass transition temperature below about 10° C., said copolymer having a tensile strength at 25° C. in excess of about 200 pounds per square inch.

4,038,347

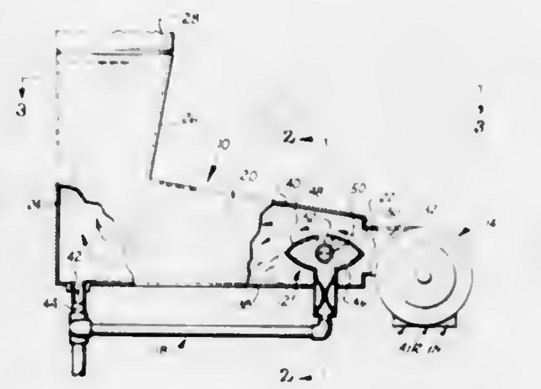
HUMIDIFYING APPARATUS

Thomas B. Mickley, 1810 172nd NE., Bellevue, Wash. 98008

Continuation-in-part of Ser. No. 416,973, Nov. 19, 1973, abandoned. This application June 12, 1975, Ser. No. 586,275

Int. Cl.^{2} B01F *3/04*

U.S. Cl. 261—30 **3 Claims**



1. An air humidifying apparatus comprising:

first means defining a humidification chamber having an air inlet, and air outlet, a water outlet, a bottom wall, a first end wall and an opposite end wall, said end walls attached to and extending upwardly in spaced relationship from said bottom wall, a pair of side walls attached to and extending upwardly in spaced relationship from said bottom wall and being affixed to said end walls, and a top wall spaced from said bottom wall and attached to said side walls and said end walls, said walls defining said chamber, said air outlet and said water outlet being located adjacent to opposite end wall of said chamber, said air inlet being located in said first end wall, said water outlet being associated with said bottom wall, said bottom wall being so constructed and oriented to support and direct water present thereon toward said water outlet,

fan means operatively associated with said first end wall and connected to said air inlet for discharging a stream of air into said chamber, said air inlet and said chamber being so constructed as to cause said stream of air to pass across said bottom wall and exhaust through said air outlet,

second means associated with said first means and defining a holding tank for water, said second means including a top wall having at least one aperture therein, said aperture being positioned in said chamber adjacent said air inlet, said second means having a water inlet and a water outlet, said second means being positioned and oriented within said chamber and being spaced from said bottom wall of said first means so that the stream of air discharged by said fan means is split by said holding tank, thereby causing a portion of the stream of air to pass over said holding tank and causing a portion of the stream of air to pass under said holding tank, said portions of said airstream being recombined at a location downstream from said holding tank,

third means for selectively supplying water to the water inlet of said second means when said fan means is operative, said third means providing a control signal only when supplying water to said second means,

heater means for heating the water in said second means to evaporate water therefrom, and

valve means associated with the water outlet of said second means, said valve means closing said water outlet responsive to said control signal provided by said third means and opening said water outlet in the absence of said signal provided by said third means to rapidly drain water from said holding tank and thereby entrain and remove sediment present in said holding tank after each humidification cycle.

4,038,348

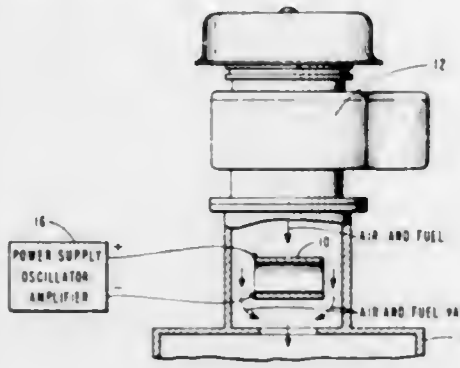
ULTRASONIC SYSTEM FOR IMPROVED COMBUSTION, EMISSION CONTROL AND FUEL ECONOMY ON INTERNAL COMBUSTION ENGINES

Harry W. Kompanek, 153 Rametto Road, Santa Barbara, Calif. 93108

Continuation-in-part of Ser. No. 344,534, March 26, 1973, abandoned. This application May 30, 1975, Ser. No. 582,205

Int. Cl.² F02M *27/08*

U.S. Cl. 261—36 A **17 Claims**



8. A novel system for providing a combustible air-fuel vapor mixture in an internal combustion engine comprising:

a. a cylindrical piezoelectric polycrystalline transducer of a length adapted to vibrate primarily in the hoop or radial mode, said transducer having inside and outside surfaces which are concentric cylinders,

b. electrical means for uniformly vibrating said surfaces of said transducer primarily in the hoop or radial mode at its resonant frequency, and

c. means for impinging a stream of liquid internal combustion engine fuel onto a vibrating cylindrical surface of said transducer at a rate whereby said fuel is immediately atomized or vaporized as it impinges and said transducer remains in an unloaded condition.

4,038,349

DEVICE FOR REDUCING TOXICITY OF I.C. CARBURETTOR ENGINE UNDER FORCED IDLING CONDITIONS

Arkady Solomonovich Ozersky, Festivalnaya ulitsa 31, kv. 139; Vladimir Fedorovich Kamenev, Petrovsko-Razumovsky proezd 15, kv. 85; Boris Alexeevich Kurov, Novo-Konjushenny pereulok, 3, kv. 11, all of, Moscow; Avenir Mikhailovich Gruzdev, ulitsa Michurina, 32, kv. 45, and Erlen Manuilovich Rubin, ulitsa Michurina, 32, kv. 22 both of, Zavolzhie Gorkovskoi oblasti, all of U.S.S.R.

Filed Dec. 22, 1975, Ser. No. 643,384

Int. Cl.² F02M *3/04*

U.S. Cl. 261—41 D **2 Claims**

1. Apparatus for reducing the toxicity of the exhaust from I.C. carburetor-fed engines under forced idling conditions, comprising: a carburetor having an idling system including outlet channels; an economizer adapted to cut off the flow of fuel through said channels during deceleration and installed on the carburetor; an inlet manifold and a pressure regulator installed thereon comprising a body mounting a spring-loaded valve adapted to vent said inlet manifold to the atmosphere, said spring-loaded valve being installed in said regulator body so that it forms, together with its inner surface and seat, an adjacent circular gap communicating with said economizer; two movable partitions mounted in said pressure regulator, each connected with said valve and body and forming, together with the inner surface of said body, three consecutively arranged variable-volume chambers, one of which accommodates said valve spring and communicates with the carburetor space downstream of the throttle in the zone of the lower edge of the closed throttle at the side opposite to said outlet channels of the idling system, the second chamber located between said movable partitions communicating with said circular gap and the third communicating with the atmosphere; and a pressure corrector adapted to put said second chamber in communication with the atmosphere and adapted to adjust pressure in said second chamber in accordance with engine speed.

4,038,350

METHOD OF PRODUCING INTEGRAL NON-FOAMED SKIN LAYER SHAPED ARTICLES

Geoffrey Sanderson Jaques, Runcorn, England, assignor to Imperial Chemical Industries Limited, London, England

Filed Jan. 10, 1975, Ser. No. 540,274

Claims priority, application United Kingdom, Jan. 10, 1974, 1190/74

Int. Cl.² B29D *27/04*

U.S. Cl. 264—22 **20 Claims**

1. A method for the production of a shaped article which comprises forming a foamable mixture of a photopolymerisable ethylenically unsaturated material and a foaming agent in a mould, subjecting at least a part of the surface of the mixture in the mould to radiation of a wavelength such that photopolymerisation of the ethylenically unsaturated material occurs at said part of the surface to form a non-foamed and non-foamable skin layer and subsequently foaming the foamable mixture and polymerising the ethylenicaly unsaturated material in the foam.

4,038,351

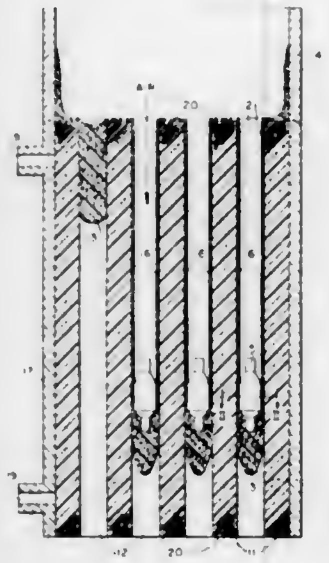
METHOD OF CASTING TUBULAR POLYSULFONE ULTRAFILTRATION MEMBRANES IN SAND MODULES

John W. Koenst, Jr., and Edward Mitchell, both of Pittsburgh, Pa., assignors to Union Carbide Corporation, New York, N.Y.

Filed Sept. 19, 1974, Ser. No. 507,506

Int. Cl.² B29C *23/00;* **B29D** *7/10, 27/04*

U.S. Cl. 264—45.1 **17 Claims**



1. A method of casting unitary, tubular ultrafiltration membranes in place in the feed bores of an open pore module made of filler particles bonded by a thermosetting resin, said method comprising the steps of:

1. placing said module in a stationary vertical position,
2. placing a casting composition into each of the bores within the module; said composition, containing a combination dispersion-solution of 10 parts of polysulfone resin having a moisture content of up to about 0.15 wt.% in about 10–40 parts of a polar organic solvent, formed by mixing polysulfone resin and solvent in a low humidity atmosphere of up to about 50% relative humidity for about 24 to 192 hours to form a substantially homogeneous combination dispersion-solution having a viscosity of between about 2,000–80,000 cp at 25° C and containing about 30–70 wt.% undissolved polysulfone resin,
3. gravity dropping a casting bob having a hydraulically stable geometry and a circular cross-section at its widest point down through the bore containing the casting composition at a speed less than 1 inch/second to form a continuous film of casting composition on the inside of each bore, said bore having an inside diameter between about 0.02 and 0.12 inches greater than the diameter of the bob at its widest point, introducing vapors of an organic solvent other than said polar organic solvent into said bores during the formation of said film on the inside of each of said bores to maintain a low humidity atmosphere of up to about 50% relative humidity in contact with the cast in place film during casting in the bores, and then
4. allowing air to contact the film followed by contacting the film with a leaching liquid selected from the group consisting of water, water organic and water inorganic effective to leach solvent from the film to form a membrane on the inside of each module bore.

4,038,352

METHOD FOR PRODUCING SHEETS OF SMALL UNIFORM THICKNESS

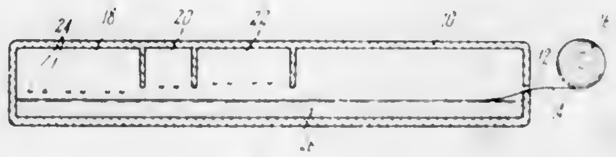
Francois Maurice Hennequin, Kernascleden, 56540 Le Croisty, France

Continuation-in-part of Ser. No. 390,247, Aug. 21, 1973, abandoned. This application Oct. 7, 1974, Ser. No. 512,886

Claims priority, application France, Aug. 21, 1972, 72.29810

Int. Cl.² B29D *7/02*

U.S. Cl. 264—81 **14 Claims**



1. A method of producing solid films of materials capable of being vaporized and transformed directly from the vapor state to the solid state, said method comprising:

emitting the material, selected from the group consisting of metal material, metal oxide material and glass material, of which a film is to be formed or the constituents of such material in the vapor state under a vacuum of from 10^{-3} to 10^{-5} torr;

condensing the vapor to the solid state in the form of a film on the surface of a liquid bath maintained at a temperature appropriate for the controlled condensation of the vapor into solid without uncontrolled condensation at positions other than on the liquid bath, said liquid bath being of a material having a vapor pressure which is low in relation to the pressure of the surrounding atmosphere, said material of said liquid bath being non-reactive with the material of the film or of said surrounding atmosphere, and said material of said bath having a viscosity maintained lower than 1 Poise; and

separating the thus condensed film from said surface of said liquid bath.

4,038,353

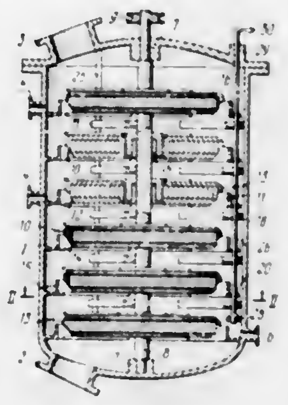
ROTOR FILM COLUMN FOR MAKING CONTACT BETWEEN GAS AND LIQUID

Alexandr Vladimirovich Shafranovsky, Molodezhnaya ulitsa, 4, kv. 7, Moskovskaya oblast, Balashikha; Viktor Markovich Olevsky, Leningradsky prospekt, 75a, kv. 91, Moscow; Vladimir Kazimirovich Chubukov, Komsomolsky prospekt, 41, kv. 97, Moscow, and Jury Alexandrovich Baskov, Shosse Entuziastov, 156, kv. 20, Moscow, all of U.S.S.R.

Filed Aug. 11, 1976, Ser. No. 713,278

Int. Cl.² B01D *47/16*

U.S. Cl. 261—89 **9 Claims**



1. A rotor film column for making contact between a gas and a liquid comprising in combination; a housing; branch pipes for feeding the gas into the bottom part of said housing and for removing the gas from the top part of said housing; branch pipes for feeding the liquid into said housing and for removing the liquid therefrom; a vertical shaft rotatably mounted in said housing; contact stages secured on said shaft at a certain distance one above another; bands forming said contact stages, said bands being bent in the form of spirals diverging from said shaft; edges of said bands flanged towards said shaft; corrugations on said bands arranged substantially across these bands; annular pockets for collecting the liquid thrown down from said contact stages, said pockets being secured on the inner wall of said housing; overflow trays arranged in the space between said contact stages; receiving ends of said overflow trays communicating with said annular pockets for collecting the liquid flowing from the contact stages located above said overflow trays; discharge ends of said overflow trays located above the contact stages underlying these overflow trays.

4,038,354

PROCESS FOR EXTRUDING AND QUENCHING A POLYMERIC FILM

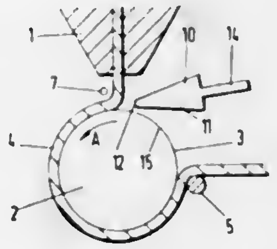
Timothy Alan Remmington, Hertford, England, and William Robinson, Dumfries, Scotland, assignors to Imperial Chemical Industries Limited, London, England

Filed July 28, 1975, Ser. No. 599,349

Claims priority, application United Kingdom, Aug. 7, 1974, 34781/74

Int. Cl.² B29F *3/02*

U.S. Cl. 264—102 **8 Claims**



1. A process for extruding and quenching a polymeric film, which comprises extruding a molten polymeric film on to an electrically earthed moving casting surface, said casting surface moving at a linear speed greater than the speed at which bubbles can be prevented from being entrapped between the molten polymeric film and the casting surface when electrostatic pinning is employed alone, depositing electrostatic charges upon part or the whole of the molten film width by means of an electrostatic pinning electrode supported in spaced relation to the molten film in the proximity of or prior to the region of first contact of the film with the casting surface, and applying suction to the space bounded by the path of the molten film prior to its first contact with the casting surface and that part of the moving casting surface prior to the region of first contact with the molten film, shortening the path of the molten film, the deposited electrostatic charges and the suction operating in combination to adhere the molten film to the casting surface, and to reduce the effect of neck-in.

4,038,355

PRODUCTION METHOD AND MEANS FOR CONCRETE ARTICLES

Robert Lyndon Bratchell, Ottoway, Australia, assignor to Concrete Industries (Monier) Limited, Ottoway, Australia

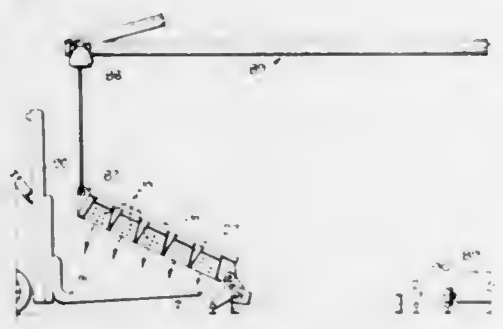
Continuation-in-part of Ser. No. 295,938, Oct. 10, 1972, abandoned. This application Nov. 11, 1974, Ser. No. 522,934

Claims priority, application Australia, Oct. 27, 1971, 6810/71

The portion of the term of this patent subsequent to July 26, 1994, has been disclaimed.

Int. Cl.² B28B *23/04*

U.S. Cl. 264—157 **6 Claims**



1. A method of moulding concrete ties which comprises the steps:

positioning a plurality of mould frames on a longitudinally extending base frame, each mould frame comprising an open ended multicavity mould, the cavities of which are of shape for the forming of the concrete ties, and having thereon engaging members which engage the sides of the base frame and thereby align corresponding cavities of the mould frames,

positioning the lowermost of a first series of transversely extending spacers between adjacent ends of some of the axially adjacent moulds,

positioning a series of reinforcing wires in the aligned cavities in parallel spaced relationship with one another and on said lowermost of the series of spacers,

positioning the remainder of the first series of spacers also between adjacent ends of the said some of the adjacent moulds and in a horizontal direction between the reinforcing wires to separate the wires into horizontal rows, and positioning a second series of spacers between adjacent ends of the remaining adjacent moulds by movement in a vertical direction to engage the wires and separate them into vertical rows,

securing the ends of the reinforcing wires to anchor means at respective ends of said line of cavities, and moving one of said anchor means away from the other to thereby strain said wires,

mixing Portland cement, aggregate, sand and water to form a wet mix of concrete,

transporting the wet mix of concrete over the moulds while simultaneously discharging said concrete into the moulds to thus fill the moulds and surround the reinforcing wires with concrete,

removing the spacers after the concrete has set but before it cures,

allowing the concrete to cure, and then releasing the tension on the wires,

severing the reinforcing wires between adjacent said moulds,

coupling a tilt frame to one side of one of said mould frames and a corresponding side of said base frame while the mould frames remain on the base frame, said tilt frame comprising pivot means having a longitudinal axis,

lifting the other side of said mould frame to thereby pivot the mould frame about said longitudinal axis and then lowering the mould frame to invert it beyond said base frame side, and

discharging said ties from the inverted moulds.

4,038,356

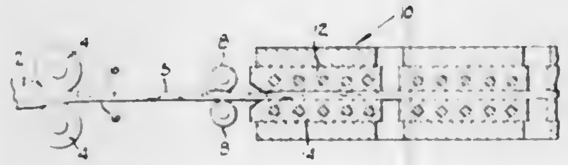
METHOD AND APPARATUS FOR MAKING A FIBROUS BOARD-LIKE PRODUCT HAVING A MALE EDGE AND A FEMALE EDGE

Robert Louis Beranek, Jr., Joshua, and Donny Lee Timms, Cleburne, both of Tex., assignors to Johns-Manville Corporation, Denver, Colo.

Filed Apr. 14, 1976, Ser. No. 676,775

Int. Cl.² B29D *3/02;* **B29G** *5/00*

U.S. Cl. 264—150 **3 Claims**



1. A method of making two or more strips of fibrous duct board, each strip having a female edge and a male edge wherein a blanket of collected fibers having a heat setting binder thereon is passed between a pair of spaced apart heated moving surfaces to partially cure the binder in the top and bottom surface portions of the blanket, said blanket is then passed between opposed heated first and second platens spaced apart less than the thickness of said blanket to shape the blanket and cure the binder in said blanket, a first platen having a shoe spaced between its side edges and running along the length of the platen to form a flat valley depression along the length of said blanket, the portion of the blanket lying below the flat valley having a higher density than the blanket adjacent said valley, the second platen having a male edge forming die running along its length at or near each side edge of the platen to form a male edge along each outer edge portion of said blanket, and separating said blanket longitudinally in said flat valley depression to form said strip; the improvement comprising:

forming the portion of said blanket between the shoe and the opposite platen to essentially its final thickness in the upstream portion of said platens and gradually reducing the thickness of those portions of the blanket adjacent said shoe as said blanket is moved along between said first and second platens, said final thickness of the blanket in said adjacent portions being formed only in the downstream end portion of said platens.

4,038,357

MANUFACTURE OF SYNTHETIC FILAMENTS

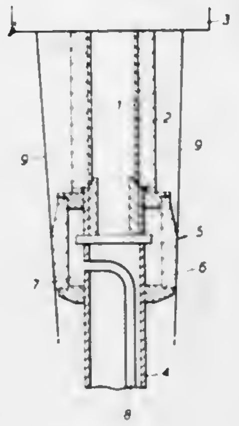
Bryan Boyes, and Alan Jones, both of Harrogate, England, assignors to Imperial Chemical Industries Inc., London, England

Continuation of Ser. No. 373,315, June 25, 1973, abandoned. This application July 10, 1975, Ser. No. 594,933

Claims priority, application United Kingdom, June 28, 1972, 30255/72

Int. Cl.² D01D *5/22*

U.S. Cl. 264—168 **10 Claims**



1. A method for the manufacture of potentially crimpable, synthetic linear polymer filaments which comprises the steps of (A) melt spinning a plurality of filaments, (B) initially partially cooling the hot filaments evenly with a stream of radial outflowing quence gas over a distance commencing from the spinneret and extending 3 to 10 inches below it, and (C) asymmetrically cooling the filaments further by causing them to contact a continuously renewed thin film of liquid less than the thickness of the filaments which liquid is at a temperature effectively below that of the filaments after step (B), the filaments contacting the film of cooler liquid in such manner that one side only of each filament contacts the film of liquid.

4,038,358

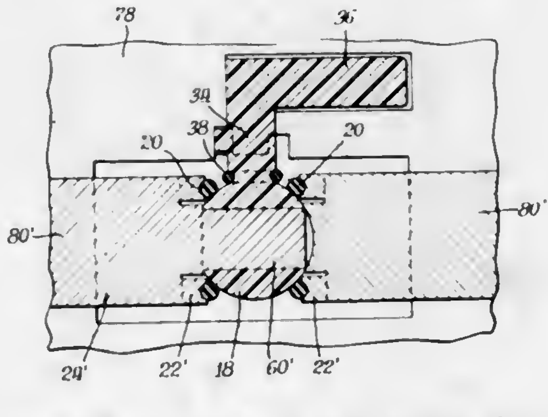
METHOD OF MAKING A VALVE

Thomas J. Wrasman, 12500 Ridge Road, Louisville, Ky. 40223

Filed Nov. 25, 1975, Ser. No. 635,256

Int. Cl.² B29D *3/00*

U.S. Cl. 264—242 **9 Claims**



1. A process for molding an integral housing about a preformed valve component to form a completed valve comprising the steps of;

providing a preformed valve component having a passageway therethrough and a preformed annular elastomeric seal adapted for sealable engagement with said preformed valve component;

securing said seal firmly against said preformed valve component with a seal tool having a plurality of spaced fingers for applying pressure at a plurality of spaced locations around the circumference of said seal;

providing blocking means for substantially blocking said passageway against the entrance of molten plastic during molding;

providing core means for forming inlet and outlet bores on each side of said valve component;

inserting said valve component, seal means, seal tool, blocking means and core means into a mold having relieved surfaces corresponding to the desired exterior shape of the housing;

molding said housing with a suitable plastic material about said valve component, seal means, seal tool, blocking means and core means during which time said fingers firmly hold said sealing means against said component;

removing said seal tool, blocking means and core means after the plastic housing is hardened, and removing the completed valve from said mold, said plastic material between said spaced fingers holding said sealing means intimately against said component after said tool has been removed.

4,038,359

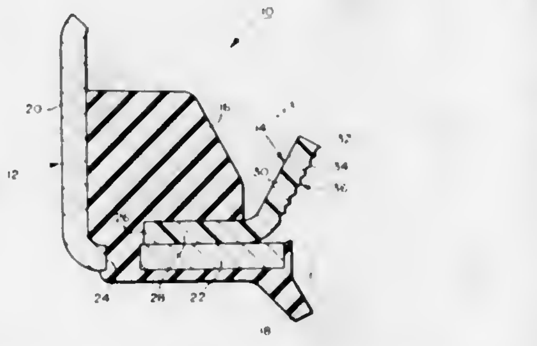
METHOD OF MAKING A SHAFT SEAL WITH DUAL LIP

Darrell D. Pendleton, Gastonia, N.C., assignor to Garlock Inc., Rochester, N.Y.

Filed Jan. 27, 1975, Ser. No. 544,303

Int. Cl.² B29D *3/00;* **B29H** *3/00*

U.S. Cl. 264—263 **9 Claims**



1. A method for making a shaft seal of the type including a single annular metal case having a radial flange and a cylindrical portion, and an annular polytetrafluoroethylene sealing element including a radial portion and a sealing lip, said method comprising the steps of:

a. connecting said sealing element to said case by placing said radial portion of said sealing element against the inside surface of said radial flange of said case and molding an annular synthetic rubber filler ring in the annular space between said radial portion of said sealing element and said cylindrical portion of said metal case, said filler ring being a solid body substantially filling said annular space and being spaced away from and out of contact with said sealing lip, and bonding said filler ring to both said radial portion of said sealing element and to said cylindrical portion of said case; and

b. molding an auxiliary lip from said synthetic rubber simultaneously with said filler ring molding step, said auxiliary lip being located on the opposite side of said radial flange from said sealing lip.

4,038,360

METHOD FOR CONTOURING THE SURFACE OF THERMOPLASTIC SYNTHETIC RESINS

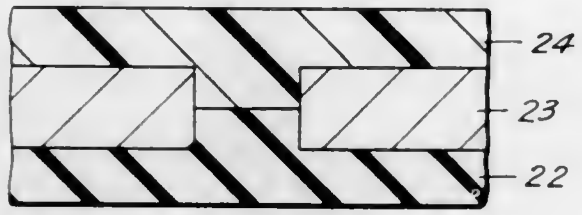
Friedrich Hanstein, Gross-Zimmern, and Theodor Peter Moench, Griessheim near Darmstadt, both of Germany, assignors to Rohm GmbH, Darmstadt, Germany

Filed Oct. 1, 1976, Ser. No. 728,543

Claims priority, application Germany, Nov. 28, 1975, 2553573

Int. Cl.^{2} B29C *17/00;* B29F *5/00*

U.S. Cl. 264—293 **4 Claims**



1. The method for contouring the surface of a thermoplastic synthetic resin sheet, comprising:

disposing said sheet, softened by heat, in contact with an embossing sheet and adjacent at least one perforation between opposite major surfaces of said embossing sheet with a resilient backing sheet on a side of said embossing sheet opposite said thermoplastic sheet, thereby forming an assembly of said sheets, said resilient backing sheet being capable of being deformed so that portions thereof will flow under pressure into said at least one perforation; applying pressure to said assembly, against said thermoplastic and said backing sheets, causing portions of said thermoplastic sheet and said resilient backing sheet to flow into said perforation and make mutual contact therein across substantially the entire area of said at least one perforation; cooling said thermoplastic sheet below the softening temperature thereof and separating said thermoplastic sheet from said embossing sheet and said resilient backing sheet.

4,038,361

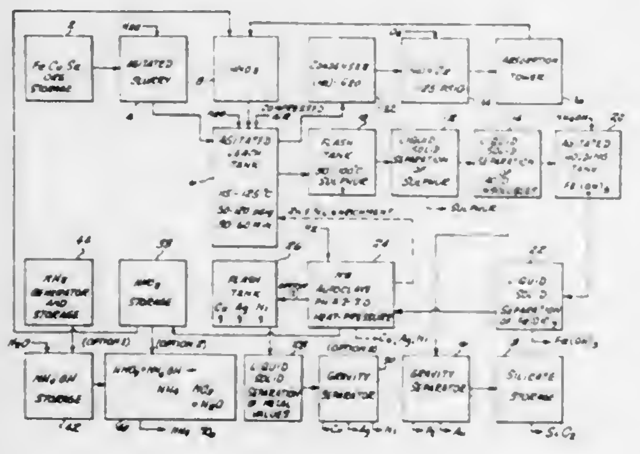
RECOVERY OF NITRIC ACID SOLUBLE TRANSITION METALS FROM SULFUR AND IRON CONTAINING ORES OF THE SAME

John G. Posel, Everett, Wash., assignor to International Ore Technology, Inc., Highland Mills, N.Y.

Division of Ser. No. 569,228, April 18, 1975, Pat. No. 3,965,239. This application Mar. 17, 1976, Ser. No. 667,879

Int. Cl.^{2} C01G *3/00, 5/00, 9/00, 7/00*

U.S. Cl. 423—34 **16 Claims**



1. A method of recovering one or more metal values of the group consisting of copper, silver, nickel, cobalt and zinc from a sulfur and iron containing ore of the metal or metals, comprising intermixing the ore and at least a stoichiometric amount of nitric acid of about 30-50% by volume concentration to form an aqueous acid leach solution of the same, heating the solution to a temperature at or above the melting point of sulfur while the solution is contained under pressure in a relatively inert atmosphere, controlling the temperature of the solution to substantially precipitate the iron values from the solution, relatively separating the iron precipitate from the acid soluble phase of the lution, and recovering the metal value or values from the acid soluble phase.

4,038,362

INCREASING THE RECOVERABILITY OF GOLD FROM CARBONACEOUS GOLD-BEARING ORES

Wilbur J. Guay, Newtown, Conn., assignor to Newmont Explorations Limited, Danbury, Conn.

Filed Nov. 4, 1976, Ser. No. 738,868

Int. Cl.^{2} C01G *7/00*

U.S. Cl. 423—40 **3 Claims**

1. The method for treating sedimentary gold-bearing ore containing indigenous organic carbonaceous material and gold-bearing sulfides so as to increase the recoverability of its gold content by standard cyanidation extraction which comprises: slurrying the ore with water in the absence of extraneous alkaline material; adjusting the temperature of the slurry to about 167° to 212° F, and dispersing air or oxygen throughout the slurry at a rate and for a period of time such as the slurry will continue to absorb oxygen as the oxygen reacts with the organic carbonaceous components and the sulfice content of the ore; adjusting the temperature of the slurry to about 70° to 85° F, and dispersing chlorine gas throughout the slurry at a rate and for a period of time such as the slurry will continue to absorb the chlorine with evolution of carbon dioxide, nitrogen, and oxygen, as the chlorine reacts with the organic carbonaceous components of the ore and only until a significant amount of chlorine gas is liberated from the chlorinated slurry; and maintaining the thus chlorinated slurry at a temperature within the range of about 70° to 85° F for a period of about 6 to 12 hours with the resulting production of a slurry-solids content in which the gold component is amenable to at least 75 weight percent extraction by standard cyanidation practice.

4,038,363

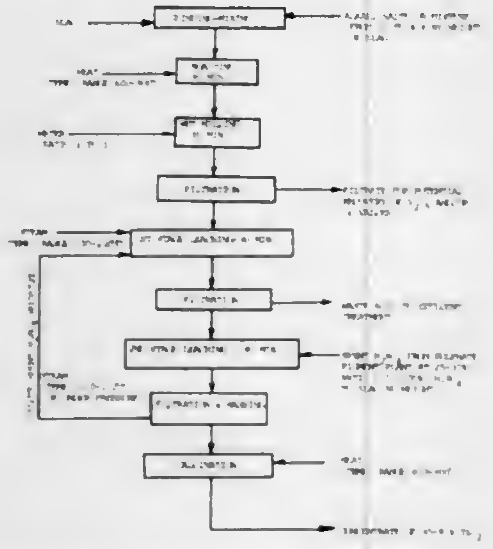
UPGRADING SORELSLAG FOR PRODUCTION OF SYNTHETIC RUTILE

Basil Jarish, St. Lambert, Canada, assignor to Quebec Iron & Titanium Corporation-Fer et Titane due Quebec, Inc., Sorel, Canada

Filed Oct. 21, 1975, Ser. No. 624,458

Int. Cl.^{2} C01G *23/04*

U.S. Cl. 423—82 **6 Claims**



4. A process for recovering titanium, as TiO_2, and other values from Sorelslag the steps comprising:

a. admixing Sorelslag with an alkali metal salt or mixtures thereof in a weight ratio of 0.3:1 to 0.6:1 salt to slag and roasting the same at a temperature from 600° to 950° C for 1 to 4 hours;

b. wet milling said slag and filtering the same including removing from filtrate vanadium and chromium values;

c. leaching countercurrently in a first stage said slag with sulfuric acid leaching liquor, said leaching liquor being introduced from a subsequent leaching stage said leaching liquor being at a concentration of less than about 15% H_2SO_4;

d. separating the spent leaching liquor from said first stage leached slag;

e. leaching in at least one additional stage said slag with a leaching liquor which is a sulphuric acid leaching liquor wherein the concentration of sulphuric acid in said leaching liquor is about 25 to 30%;

f. filtering said leached slag and returning the spent leaching liquor to a preceeding stage for leaching of said slag in said first stage; and

g. calcining said leached slag to obtain a TiO_2 concentrate having at least 94% TiO_2 present.

4,038,364

REDUCTION OF IRON IN TITANIUM ORE

Günter Lailach, Krefeld, Germany, assignor to Bayer Aktiengesellschaft, Leverkusen, Germany

Filed Dec. 30, 1974, Ser. No. 537,622

Claims priority, application Germany, Jan. 25, 1974, 2403458

Int. Cl.^{2} C01G *23/04, 23/08;* B01D *11/02*

U.S. Cl. 423—86 **12 Claims**

1. In the production of synthetic rutile from a titanium and iron-containing ore by reducing most of the iron (III) in said ore into iron (II) with a steam-containing gaseous reducing agent at a temperature of about 850° to 1100° C, followed by leaching to remove the iron (II) and iron (III) and drying of the residue, the improvement which comprises using as said reducing agent hydrogen optionally containing CO, the gas in addition optionally containing CO_2, the molar ratio of the H_2 + any CO present: H_2O + any CO_2 present ranging between 0.36 and 1.8. whereby substantially no metallic iron is produced during reduction and substantially no hydrogen is produced during leaching.

4,038,365

REMOVAL OF LOW LEVEL HARDNESS IMPURITIES FROM BRINE FEED TO CHLORINE CELLS

Arvind S. Patil, Grosse Ile; Shyam D. Argade, Woodhaven, and Stephen M. Collins, Riverview, all of Mich., assignors to BASF Wyandotte Corporation, Wyandotte, Mich.

Filed Dec. 3, 1975, Ser. No. 637,328

Int. Cl.^{2} C01F *11/18, 5/22;* C25B *1/16*

U.S. Cl. 423—161 **9 Claims**

1. A process for the subsequent treatment of conventionally treated brine prior to the electrolysis of the brine, comprising:

a. adjusting the temperature of the conventional brine to a temperature of from about 60° F to about 80° F, the brine having a hardness ion level of about ten parts per million, by weight, based on the weight of the brine, the hardness ion level being based on calcium, the brine having a pH of from about eight to ten,

b. adding sodium carbonate to the brine,

c. stirring the solution,

d. allowing the solution to stand,

e. passing the solution through at least one filter having a nominal pore size of less than five microns, and

f. adjusting the level of the pH of the brine, after filtering, to a level above that of the conventional treated brine,

whereby the ion hardness level of the brine is reduced to less than two parts per million, expressed as calcium, prior to electrolysis of the brine.

4,038,366

METHOD FOR REMOVING HYDROGEN SULFIDE

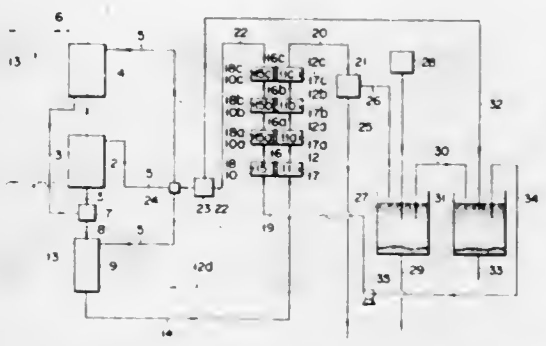
Yutaka Fukuda, Yokohama; Mutsumi Ihida, Tokyo, and Yoshihiko Kawai, Yokohama, all of Japan, assignors to Nippon Kokan Kabushiki Kaisha, Tokyo, Japan

Filed June 25, 1975, Ser. No. 590,090

Claims priority, application Japan, June 29, 1974, 49-74768

Int. Cl.^{2} B01D *53/34;* C25B *1/00*

U.S. Cl. 423—234 **4 Claims**



1. A method for removing hydrogen sulfide from a hydrogen sulfide entrained gas comprising the steps of bringing the hydrogen sulfide entrained gas into contact with a caustic alkaline solution with a pH of 10 to 14 to cause hydrogen sulfide in the hydrogen sulfide entrained gas to be absorbed into said caustic alkaline solution (A); introducing the resultant alkaline solution (B) into a least one diaphragm type electrolytic bath, equipped with a cation exchange membrane as a diaphragm, to subject it to a DC electrolytic treatment whereby a alkaline solution (C) is separated and recovered in a cathode chamber of the electrolytic bath, and sulfur and sulfuric acid are separated into an anode chamber of the electrolytic bath; and circulating as said caustic alkaline solution (A) the recovered alkaline solution (C) separated in the cathode chamber.

4,038,367

PROCESS FOR THE REMOVAL OF SO_x AND NO_x FROM WASTE GASES USING ALKALI METAL OR ALKALINE EARTH METAL IODIDE

Masumi Atsukawa, Hiroshima; Naoyuki Takahashi, Saiki; Naoharu Shinoda, and Naohiko Ukawa, both of Hiroshima, all of Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,055

Claims priority, application Japan, May 31, 1974, 49-60904

Int. Cl.^{2} C01B *21/00*

U.S. Cl. 423—235 **7 Claims**

1. A process for the aqueous absorption treatment of an exhaust gas containing oxides of sulfur and oxides of nitrogen which consist essentially of nitrogen dioxide to simultaneously remove both nitrogen dioxide (NO_2) and oxides of sulfur (SO_x) from the exhaust gas, the process comprising the separate, successive steps of:

1. washing and contacting the exhaust gas with an inorganic calcium compound containing slurry, the calcium compound reacting with (SO_x) thereby removing the sulfur oxides from the exhaust gas; and thereafter, in a separate step,
2. washing and contacting the exhaust gas treated according to step (1) with an aqueous solution of an alkali metal iodide, alkaline earth metal iodide or mixture of alkali metal iodide and alkaline earth metal iodide to remove NO_2 from the exhaust gas; and thereafter
3. contacting the slurry remaining from step (1) with the aqueous solution remaining from step (2) to regenerate the alkali metal iodide or alkaline earth iodide solution and to decompose nitrite formed in step (2) to nitrogen.

4,038,368

PROCESS FOR REMOVING OXIDES OF NITROGEN AND SULFUR FROM EXHAUST GASES

Masumi Atsukawa; Naoharu Shinoda, and Naohiko Ukawa, all of Hiroshima, Japan, assignors to Mitsubishi Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 20, 1975, Ser. No. 579,051

Claims priority, application Japan, June 3, 1974, 49-61860

Int. Cl.^{2} C01B *21/00*

U.S. Cl. 423—235 **9 Claims**

1. A process for wet-treating an exhaust gas to remove an oxide or sulfur and nitrogen dioxide from the exhaust gas, which process comprises the steps of:

1. washing the exhaust gas with a slurry containing one or more magnesium compounds which will react with oxides of sulfur, thereby removing the oxide of sulfur from the exhaust gas;
2. washing the exhaust gas treated in step (1) with an aqueous solution of an alkali metal iodide, an alkaline earth metal iodide or mixtures thereof to remove the oxide of nitrogen from the exhaust gas; and
3. contacting the slurry from step (1) with the aqueous solution from step (2) to regenerate the solution of alkali metal iodide, alkaline earth metal iodide or mixtures thereof and to decompose any nitrite formed in step (2) to nitrogen.

4,038,369

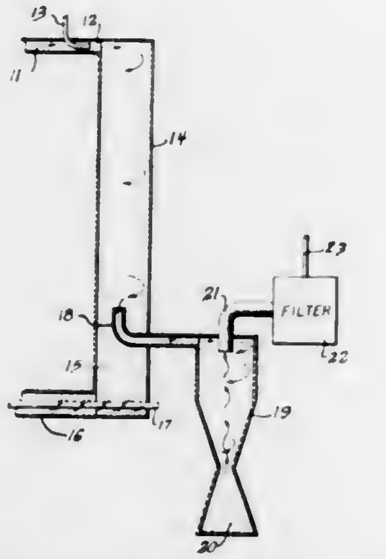
METHOD FOR THE ABATEMENT OF HYDROGEN CHLORIDE

Steven J. Winston, and Thomas R. Thomas, both of Idaho Falls, Ohio, assignors to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Nov. 14, 1975, Ser. No. 632,027

Int. Cl.^{2} B01D *53/34;* **C01C** *1/16*

U.S. Cl. 423—240 **6 Claims**



1. A method for the abatement of hydrogen chloride in a gas stream generated from the incineration of materials which include polyvinyl-chloride plastics comprising:

- a. introducing ammonia gas into said gas stream containing the hydrogen chloride to form a combined gas stream wherein the ammonia and hydrogen chloride react to form ammonium chloride;
- b. passing said combined gas stream into a condensation and collection vessel at a temperature above the sublimation temperature of ammonium chloride;
- c. creating the cyclonic flow in said combined gas stream as it passes through said condensation and collection vessel;
- d. reducing the temperature of said combined gas stream in said condensation and collection vessel to 160° C or less, whereby ammonium chloride crystals condense and grow on the walls of said vessel and turbulence created by said cyclonic flow breaks off larger particles which are driven to the bottom of said vessel; and
- e. removing the solid ammonium chloride particles from the bottom of said vessel.

4,038,370

METHOD OF PRODUCING HIGH-PURITY TRANSPARENT VITREOUS SILICA

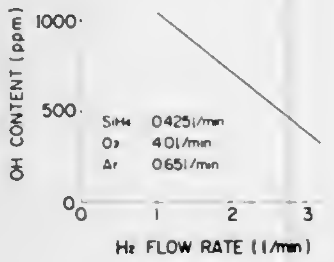
Tadashi Tokimoto, and Yoshinobu Hiraishi, both of Hiratsuka, Japan, assignors to Komatsu Electronic Metals Co., Ltd., Tokyo, Japan

Filed Sept. 23, 1975, Ser. No. 616,077

Claims priority, application Japan, Nov. 1, 1974, 49-125564

Int. Cl.^{2} C01B *33/12*

U.S. Cl. 423—336 **6 Claims**



1. A method of producing high-purity transparent vitreous silica by supplying to a burner a high purity silane type gas, and an inert gas, hydrogen gas and oxygen gas to effect flame hydrolysis, comprising forming a high-purity transparent vitreous silica which contains metastable OH of less than 500 ppm through flame hydrolysis while maintaining the flow rate of said hydrogen gas at least more than six times the flow rate of said high-purity silane type gas and maintaining the rate of said oxygen gas less than 1.5 times a theoretical supply flow rate required to oxidize completely the silicon in said high-purity silane type gas and the hydrogen which exists when effecting said flame hydrolysis, and heat-treating the transparent vitreous silica obtained at a temperature higher than 800° C. in an inert gas atmosphere for more than 20 hours to reduce the OH content of said transparent vitreous silica to the range from 40 to 60 ppm.

4,038,371

DISMUTATION OF TRICHLOROSILANE

Gilbert Marin, Sainte-Foy-les-Lyon, France, assignor to Rhone-Poulenc Industries, Paris, France

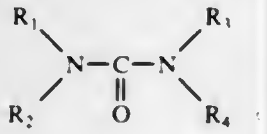
Filed Nov. 4, 1975, Ser. No. 628,666

Claims priority, application France, Nov. 7, 1974, 74.36961

Int. Cl.^{2} C01B *33/08*

U.S. Cl. 423—342 **4 Claims**

1. In a process for the preparation of dichlorosilane and tetrachlorosilane by the disproportionation of trichlorosilane in the presence of a catylyst, the improvement wherein a N,N,N',N'-tetraalkylurea of the formula:



$$(R_1)(R_2)N-C(=O)-N(R_1)(R_4)$$

in which each of R_1, R_2, R_3 nd R_4, which may be identical or different, represents a straight or branched alkyl group having from 1 to 6 carbon atoms is used as the catalyst in an amount from 1 to 50% by weight based on the weight of trichlorosilane, the disproportionation being carried out at a temperature from 30° to 120° C. at a pressure up to 3 bars absolute.

4,038,372

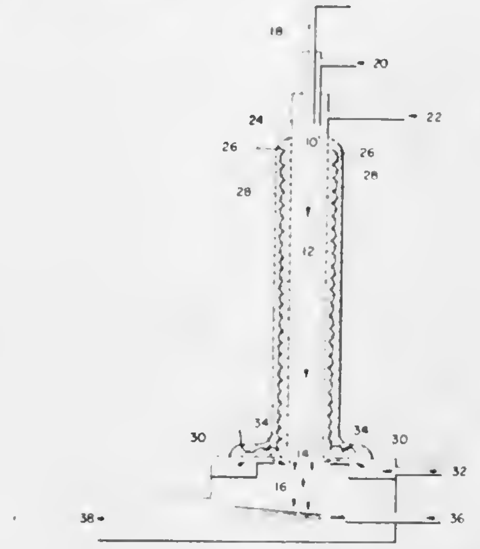
PROCESS FOR MANUFACTURING CHLORAMINE

Albert J. Colli, Oxon Hill, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 5, 1976, Ser. No. 683,451

Int. Cl.^{2} C01B *21/18*

U.S. Cl. 423—413 **20 Claims**



1. A process for the continuous production of chloramine comprising:

introducing chlorine, ammonia, and an inert gas into a reactor tube;

heating the reactor tube;

turbulently flowing said gases through said reactor tube;

reacting the chlorine and the ammonia to form the chloramine product;

introducing a purging gas into the reactor discharge zone;

entraining the product stream in a high velocity jet of a cooling gas; and

recovering the chloramine.

4,038,373

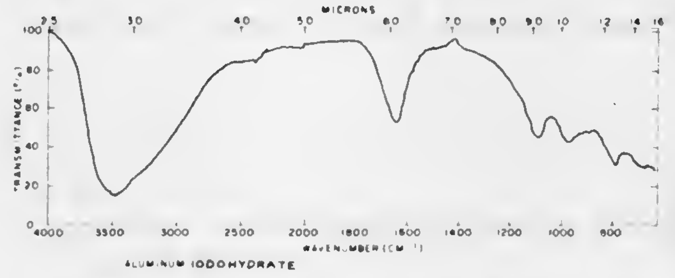
ALUMINUM HALOHYDRATE

George G. Merkl, 46 Sunset Court, Haworth, N.J. 07641

Continuation-in-part of Ser. No. 45,527, June 11, 1970, abandoned, and Ser. No. 127,351, March 23, 1971, abandoned, and a continuation-in-part of Ser. No. 859,703, Sept. 22, 1969, abandoned, said Ser. No. 45,527, is a continuation-in-part of Ser. No. 859,703, , said Ser. No. 127,351, is a continuation-in-part of Ser. No. 859,703, , and Ser. No. 45,527,. This application Feb. 4, 1974, Ser. No. 439,628

Int. Cl.^{2} C01F *7/00, 7/48*

U.S. Cl. 423—462 **6 Claims**



1. A method of preparing a polymeric aluminum halohydrate having a ratio of aluminum to halogen atoms of from 2:1 to 2.7:1 and a stable pH of about 4.2 to about 4.3 which comprises:

reacting an aqueous solution of a halogen acid selected from hydrochloric acid, hydrobromic acid, hydroiodic acid and hydrofluoric acid with mercury permeated aluminum of a purity of at least 99.98% by weight, the mercury content of said mercury permeated aluminum ranging from about 0.1 to about 5.0 percent by weight;

and collecting the formed aluminum halohydrate.

4,038,374

STABLE CHLORINE TRIFLUORIDE DIOXIDE

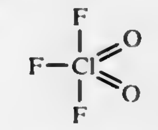
Karl O. Christe, Calabasas, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Continuation-in-part of Ser. No. 529,773, Dec. 5, 1974, abandoned, which is a division of Ser. No. 290,031, Sept. 18, 1972, Pat. No. 3,873,676. This application Aug. 16, 1976, Ser. No. 714,458

Int. Cl.^{2} C01B *7/24*

U.S. Cl. 423—466 **1 Claim**

1. A new composition of matter comprising of chlorine trifuloride dioxide, ClF_3O_2, having structure



$$F-\overset{\displaystyle F}{\underset{\displaystyle F}{Cl}}(=O)_2$$

having the infrared spectrum set forth in the following Table,

Table 1

Infrared Spectrum of ClF_3O_2 and its Tentative Assignment		
Frequency (cm^{-1})	Intensity	Assignment for Point Group C_{2v}
1334	s	$\nu_{10}(B_2)$, $\nu_{as}ClO_2$
1096	s	$\nu_1(A_1)$, $\nu_{sym}ClO_2$
699	vs	$\nu_7(B_1)$, $\nu_{as}ClF_2Ax$
687	vs	$\nu_2(A_1)$, νClF
598	ms	$\nu_{11}(B_2)$, δ_{rock} ClO_2
543) 532)	mw	$\nu_3(A_1)$ and $\nu_8(B_1)$

and being a white solid which melts at about −81° C to a colorless liquid and boils at about −21 C and is stable up to about +25° C.

4,038,375

PROCESS FOR THE RECOVERY OF SELENIUM FROM SELENIUM-CONTAINING URETHANE SOLUTIONS

James H. Vorachek, Drexel Hill, Pa., and Thomas A. Washall, Wilmington, Del., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 15, 1976, Ser. No. 723,359

Int. Cl.^{2} C01B *19/00*

U.S. Cl. 423—510 **17 Claims**

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:

contacting the selenium-containing urethane solution at a suitable temperature with an aqueous solution of a mercuric salt compound selected from the group consisting of mercuric acetate, mercuric bromide, mercuric chloride, mercuric cyanide and mercuric nitrate or mixtures thereof which salt has a solubility in water of at least 0.5 parts by weight of the salt per 100 parts by weight of water at ambient temperature to form an insoluble mercury-selenium compound or complex precipitate in solution;

separating the insoluble precipitated compound or complex from the solution;

subjecting said insoluble mercury-selenium compound or complex to a treatment with nitric acid, heat, air or oxygen to separate selenium and mercury; and

recovering said selenium.

4,038,376

PROCESS FOR THE RECOVERY OF SELENIUM FROM URETHANES CONTAINING SELENIUM OR COMPOUNDS THEREOF

John J. McCoy, Media, and John G. Zajacek, Devon, both of Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 12, 1975, Ser. No. 603,998
Int. Cl.^{2} C01B *19/00, 25/14*
U.S. Cl. 423—510 **9 Claims**

1. A process for the recovery of selenium or compounds thereof from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises treating said urethane solution with a metal oxide at a temperature in the range of from about 25° to 250° C. to retain and remove said selenium or compounds thereof from said urethane solution, said metal oxide being selected from oxides of Group B metals of the Periodic Table of Elements, and recovering said selenium and the treated urethane solution.

4,038,377

REMOVAL OF SELENIUM FROM URETHANE SOLUTIONS

Thomas A. Washall, Wilmington, Del., and Harry Morgan, Upper Darby, Pa., assignors to Atlantic Richfield Company, Los Angeles, Calif.

Filed Sept. 29, 1976, Ser. No. 727,811
Int. Cl.^{2} C01B *19/00*
U.S. Cl. 423—510 **21 Claims**

1. A process for the recovery of selenium from selenium-containing urethane solutions derived from the selenium catalyzed reaction of an organic compound containing at least one hydroxyl group with carbon monoxide and a nitrogenous organic compound at elevated temperatures and pressures in the presence of a base and/or water, which comprises the steps of:

distilling the reaction product selenium-containing urethane solution at a temperature of from about ambient to about 200°, C. to remove unreacted hydroxyl compounds and any contained amine base compounds and/or water;
adding an essentially water insoluble aromatic hydrocarbon or alkyl or halogen substituted aromatic hydrocarbon to said distilled urethane solution forming a hydrocarbon-urethane-selenium-containing solution;
contacting the hydrocarbon-urethane-selenium solution at a temperature of from about ambient to a temperature of up to about 100° C. with an aqueous ammonium hydroxide or alkali metal hydroxide solution to extract selenium compounds from said solution and form a selenium-containing aqueous hydroxide phase and a urethane-containing hydrocarbon phase;
separating the selenium-containing aqueous hydroxide phase from the hydrocarbon phase;
treating the aqueous hydroxide phase to separate selenium compounds therefrom; and
recovering said selenium.

4,038,378

RADIOIMMUNOASSAY FOR HEPATITIS B ANTIGEN

Gyaneshwar Prasad Khare, 311 S. Heatherstone St., Orange, Calif. 92669

Filed Dec. 22, 1975, Ser. No. 643,401
Int. Cl.^{2} A61K *43/00*
U.S. Cl. 424—1 **8 Claims**

1. A process useful for the detection of hepatitis B antigen comprising

a. Reacting an antibody to hepatits B antigen (anti-HB) coated pearl with human plasma or serum sample and allowing sufficient time for the antigen to forma complex with the antibody present on the pearl,
b. Removing the sepcimen and washing the pearl with distilled or deionized water,
c. Carrying on additional reaction following the addition of radioactively labeled antibody to form an additional complex on the pearl.
d. Removing the non-associated radioactive antibody from the pearl and subsequently washing the pearl with distilled or deionized water to remove maximum proportions of unassociated radioactive antibody,
e. Comparing the amount of radioactivity emanating from the sample treated pearls with that of negative control treated pearls.

4,038,379

COMPOSITION FOR ROENTGENOSCOPY OF THE GASTROINTESTINAL TRACT CONTAINING A POLYSACCHARIDE STABILIZER

Nikolai Petrovich Elinov, ulitsa S. Kovalevskoi, 12, korpus 1, kv. 53; Isaak Yakovlevich Gurevich, prospekt Parkhomenko, 35/7, kv. 48; Afrikan Nikolaevich Dranishnikov, ulitsa Tambasova, 8, korpus 4, kv. 13, and Nina Efimovna Goncharova, ulitsa Dobrovoltsev, 46, kv. 76, all of Leningrad, U.S.S.R.

Filed Mar. 24, 1976, Ser. No. 669,991
Int. Cl.^{2} A61K *29/02*
U.S. Cl. 424—4 **3 Claims**

1. A composition for roentgenoscopy of the gastrointestinal tract, comprising 5 to 40 percent by weight of barium sulphate, 0.3 to 0.6 percent by weight of polysaccharide of β-1,3-α-1,4-α-1,6-glucopyranosylglucose, the rest being water.

4,038,380

CALCIUM META SILICATE AS DENTAL POLISHING AGENT

Martin Cordon, Highland Park, N.J., assignor to Colgate-Palmolive Company, New York, N.Y.

Filed May 17, 1976, Ser. No. 686,848
Int. Cl.^{2} A61K *7/16*
U.S. Cl. 424—49 **7 Claims**

1. A dentifrice toothpaste preparation containing as the essential cleaning and polishing agent, about 5 to about 40% of calcium meta silicate in the form of Wollastonite particles having a hardness value of about 4.5 on Moh's scale, and having a mean diameter in the range of about 2 to 15 microns, and composed of about 50.9% SiO_2 and about 46.9% CaO dispersed in a dental cream toothpaste vehicle.

4,038,381

VACCINE FOR THE PREVENTION AND TREATMENT OF VASCULAR CONDITIONS

René Perlant, 32, Avenue de la Republique, 33 Bordeaux-Cauderan, France

Filed Nov. 11, 1974, Ser. No. 522,754
Claims priority, application France, Nov. 22, 1973, 73.41544
Int. Cl.^{2} A61K *39/12, 39/04*
U.S. Cl. 424—89 **9 Claims**

1. Vaccine for the prevention and treatment of vascular insufficiencies, comprising a combination of a methylic tuberculosis antigen, which is a methanol extract of killed tuberculosis bacilli after fats and waxes have been removed, and an inactivated herpes virus culture assaying $10^{7\pm0.5}$ DCP 50 p. 100 prior to inactivation, said antigen containing as antigenic component about 0.20 ml. of tuberculosis bacillar lipoids per ml. of antigen, said antigen being present in said combination in an amount of 0.02-0.20 ml. of antigen per ml. of said culture.

5. A process for the prevention and treatment of vascular insufficiency, comprising administering to a human patient an effective amount of a vaccine as claimed in claim 1.

4,038,382

ALKYL ESTERS OF POLYENE ANTIBIOTICS

Tiberio Bruzzese, and Rodolfo Ferrari, both of Milan, Italy, assignors to SPA-Societe Prodotti Antibiotici S.p.A., Italy

Division of Ser. No. 381,563, July 23, 1973, Pat. No. 3,936,526. This application Nov. 11, 1975, Ser. No. 630,888
Claims priority, application United Kingdom, July 24, 1972, 34497/72
Int. Cl.^{2} H61K *35/00*
U.S. Cl. 424—117 **10 Claims**

3. A process for the preparation of the methyl ester of candicidin which comprises reacting candicidin with diazomethane in the presence of a basic substance selected from the group consisting of ammonia, triethylamine and pyridine in a substantially stoichiometric quantity, the resulting pH being 10 to 10.5 (determined after dilution to 1%), the reaction being carried out at a temperature between 15° and 30° C.

4,038,383

MIXTURE OF ANTIBIOTICS PRODUCED BY A SPECIES OF ACTINOPLANES

Walter D. Celmer, New London; Walter P. Cullen, East Lyme; Charles E. Moppet, Groton; John B. Routien, Lyme, all of Conn.; Riichiro Shibakawa, Handa, and Junsuke Tone, Chita, both of Japan, assignors to Pfizer Inc., New York, N.Y.

Continuation-in-part of Ser. No. 541,800, Jan. 17, 1975, abandoned, which is a continuation-in-part of Ser. No. 461,298, April 16, 1974, abandoned. This application Aug. 13, 1975, Ser. No. 604,260
Int. Cl.^{2} A61K *35/00*
U.S. Cl. 424—119 **5 Claims**

2. Antibiotic substance Compound 37,277 which in crystalline form has an optical rotation of $[\alpha]_D^{25^\circ} = +11^\circ$ **at a concentration of** 1% in ethanol; absorption maxima in ethanol in the ultraviolet light region of the spectrum at 225, 274, 282, 303 and 355 mμ with $F_{1\,cm}^{1\%}$ values of 309.3, 36.67, 45.01, 70 and 20, respectively; having the average composition by weight of 60.91% carbon, 5.98% hydrogen, 10.45% nitrogen and 22.66% oxygen (by difference); and when dissolved in chloroform exhibiting characteristic absorption in the infrared region at the following wavelengths in microns: 3.05, 3.40, 5.70, 5.77, 5.93, 6.07, 6.62, 6.82 and 7.67.

4,038,384

ANTIBIOTIC A-28086 AND PROCESS FOR PRODUCTION THEREOF

David H. Berg, Greenfield; Robert L. Hamill, New Ross, and Marvin M. Hoehn, Indianapolis, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

Continuation-in-part of Ser. No. 477,954, June 10, 1974, abandoned. This application Apr. 21, 1975, Ser. No. 569,740
Int. Cl.^{2} A61K *35/74*
U.S. Cl. 424—122 **11 Claims**

1. Antibiotic A-28086 factor A which is a white crystalline compound when crystallized from acetone-water; which is soluble in lower alcohols, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; but which is only slightly soluble in hexane; and is insoluble in water; which melts at about 98°-100° C., resolidifies, and remelts at about 195°-200° C. and which has:

a. a molecular weight of 764, as determined by mass spectrometry;
b. an approximate elemental composition of 66.69 percent carbon, 9.85 percent hydrogen, and 23.10 percent oxygen;
c. an empirical formula of $C_{43}H_{72}O_{11}$, as determined by mass spectrometry;
d. a specific rotation of −54° (c=0.2, methanol) when determined at 25° C.;
e. an infrared absorption spectrum in chloroform with the following distinguishable absorption maxima: 2.85, 3.34, 5.83, 6.82, 7.22, 7.53 (weak), 7.78 (weak), 8.75 (strong), 8.95 (strong), 9.15, 9.50 (strong), 9.55 (strong), 9.60, 9.85, 10.15, 10.45, and 10.70 (weak) microns;
f. in its ultraviolet spectrum in ethanol only end absorption below 220 mμ;
g. a nuclear magnetic resonance spectrum in deuterochloroform with the following characteristics: δ6.01, 4.21, 4.11, 3.99, 3.89, 3.80, 3.67, 3.65, 3.57, 3.55, 2.83, 2.76, 2.74, 2.68, 2.66, 2.58, 2.56, 2.30, 2.22, 2.17, 2.10, 2.05, 1.96, 1.90, 1.85, 1.70, 1.62, 1.60, 1.47, 1.39, 1.31, 1.25, 1.18, 0.95, 0.93, 0.90, 0.88, 0,85, 0.77, 0.75, 0.73, 0.68, and 0.66 ppm;
h. a titratable group with a pK_a value of 7.9 in 80% aqueous dimethylformamide;
i. a characteristic X-ray powder diffraction pattern (Cu^{++} radiation, 1.5405 λ, nickel filter) having the following interplanar spacings in angstroms (d):

d	Relative Intensity
12.00	100
10.10	50
9.25	90
8.00	40
7.50	15
6.92	90
6.40	40
5.98	05
5.68	15
5.20	40
4.98	40
4.62	40
4.21	20
3.48	10

j. an R_f value of 0.24 on thin-layer chromatography over silica gel in a benzene-ethyl acetate (3:2) solvent system, using *Bacillus subtilis ATCC* 6633 as the detection organism;
k. the following R_f values in the paper-chromatographic systems indicated below, using *Bacillus subtilis* ATCC 6633 as detection organism:

R_f Value	Solvent System
0.11	Water saturated with methyl isobutyl ketone (MIKB)
0.41	Water saturated with MIBK plus 2% p-toluenesulfonic acid and 1% piperidine
0.54	Water:methanol:acetone (12:3:1)-adjusted to pH 10.5 with NH_4OH and then lowered to pH 7.5 with H_3PO_4
0.48	1% MIBK, 0.5% NH_4OH in water
0.15	17.4 g K_2HPO_4, 30 ml ethanol per liter of water
0.24	Benzene saturated with water
0.24	Water
0.75	water:MIBK:ethyl acetate (98:1:1)

l) an acid function capable of forming salts and ester derivatives; and
m) at least one hydroxyl group capable of esterificaion.

l. an acid function capable of forming salts and ester derivatives; and
m. at least one hydroxyl group capable of esterification;

an acyl-ester derivative selected from the group consisting of

1. A-28086 factor A acetyl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone and benzene; is only slightly soluble in hexane; and is insoluble in water; which melts at about 100°-103° C.; and which has:

a'. a molecular weight of about 807;
b'. an elemental composition of 67.67 percent carbon, 8.71 percent hydrogen, and 23.13 percent oxygen;
c'. an empirical formula of $C_{45}H_{74}O_{12}$;
d'. an infrared spectrum in chloroform with the following observable absorption maxima: 2.85, 3.36, 3.38 (strong), 5.80, 6.83, 7.25, 7.52 (strong), 7.60 (weak), 7.80 (strong), 8.45 (strong), 8.80 (strong), 8.95 (strong), 9.10 (strong),

9.20, 9.63, 9.80 (strong), 10.12 (weak), 10.25 (weak), and 10.50 microns;
e'. an ultraviolet spectrum showing only end absorption;
f'. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;
g'. a titratable group with a pK_a value of 8.5 in 80% aqueous dimethylformamide;
h'. an acid function capable of forming salts and ester derivatives;

2. A-**28086** factor A propionyl ester derivative which is a white crystalline compound (from acetone-water); which is solube in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about **96°-98°** C.; and which has:
a''. a molecular weight of about 821;
b''. an elemental composition of 66.06 percent carbon, 9.17 percent hydrogen, and 23.41 percent oxygen;
c''. an empirical formula of $C_{46}H_{76}O_{12}$;
d''. an infrared absorption spectrum in chloroform with the following observable absorption maxima: 2.85, 3.33, 3.38 (strong), 3.45 (strong), 5.75 (strong), 5.82, 6.81, 7.22, 7.30 (strong), 7.50 (weak), 7.60 (weak), 7.80, 8.43, 8.75 (strong), 8.90, 9.05, 9.15 (strong), 9.50 (strong), 9.63, 9.83 (weak), 10.05 (strong), 10.13, 10.20 (strong), 10.45, and 10.68 microns;
e''. an ultraviolet spectrum showing only end absorption;
f''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;
g''. an acid function capable of forming salts and ester derivatives;

3. A-**28086** factor A butyryl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts about **96°-98°** C.; and which has:
a'''. a molecular weight of about 835;
b'''. an approximate elemental composition of 67.60 percent carbon, 9.41 percent hydrogén, and 22.99 percent oxygen;
c'''. an empirical formula of $C_{47}H_{78}O_{12}$;
d'''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.89, 3.40, 3.45, 3.51, 5.85, 5.92 (strong), 5.97 (strong), 6.90, 7.30, 7.84 (weak), 8.55, 8.85 (weak), 9.01 (strong), 9.26, 9.75, 9.95, 10.31, and 10.64 microns;
e'''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;
f'''. an acid function capable of forming salts and ester derivatives;

4. A-**28086** factor A valeryl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about **173°-175°** C.; and which has:
a''''. a molecualr weight of about 849;
b''''. an approximate elemental composition of 67.89 percent carbon; 9.50 percent hydrogen; and 22.61 percent oxygen;
c''''. an empirical formula of $C_{48}H_{80}O_{12}$;
d''''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.90, 3.40, 3.45, 3.51, 5.87, 5.92 (strong), 5.99 (strong), 6.91, 7.30, 7.69 (weak), 7.87 (weak), 8.16, 8.58, 8.85 (weak), 9.26, 9.76, 10.00 (weak), 10.31, and 10.64 microns;
e''''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;
f''''. an acid function capable of forming salts and ester derivatives;

and

5. A-**28086** factor A caproyl ester derivative which is a white crystalline compound (from acetone-water); which is soluble in methanol, ethanol, dimethylformamide, dimethyl sulfoxide, ethyl acetate, chloroform, acetone, and benzene; is slightly soluble in hexane; and is insoluble in water; which melts at about **163°-167°** C.; and which has:
a'''''. a molecular weight of about 863;
b'''''. an approximate elemental composition of 68.18 percent carbon; 9.58 percent hydrogen; and 22.24 percent oxygen;
c'''''. an empirical formula of $C_{49}H_{82}O_{12}$;
d'''''. an infrared spectrum in chloroform with the following observable absorption maxima: 2.90, 3.40, 3.45, 3.51, 5.87, 5.92 (strong), 5.97 (strong), 6.90, 7.30, 7.66 (weak), 7.84 (weak), 8.16, 8.58, 8.85 (weak), 9.05 (strong), 9.17, 9.72, 9.95, 10.29, and 10.62 microns;
e'''''. a nuclear magnetic resonance spectrum in which the carbinyl resonance is shifted downfield to approximately 5.3 ppm;
f'''''. an acid function capable of forming salts and ester derivatives;

or a pharmaceutically-acceptable salt thereof.

3. A method of increasing feed-utilization efficiency in ruminant animals having a rumen flora which method comprises orally administering to said animal an effective propionate-increasing amount of a compound of claim **1.**

4,038,385
PROTECTION OF HORTICULTURAL GROWTH

Alta M. Bowyer, Los Angeles; George B. Hinckley, Montebello, and James E. Davis, Santa Paula, all of Calif., assignors to Leffingwell Chemical Company, Brea, Calif.

Continuation-in-part of Ser. No. 174,228, Aug. 23, 1971, abandoned, which is a continuation of Ser. No. 717,972, April 1, 1968, abandoned. This application Apr. 26, 1973, Ser. No. 354,685

Int. Cl.^{2} A01N *11/00*

U.S. Cl. 424—166 **4 Claims**

1. A method of repelling deers and rabbit predators from horticultural growth which consists in releasing from a coating on said growth a predator repelling volatile agent selected from the group consisting of primary or secondary amines having up to 10 carbon atoms and ammonia, said agent being released from a coating on said growth to be protected, said coating having been applied as an aqueous composition consisting essentially of 70 to 93 percent water, 3 to 10 percent tall oil and 2 to 10 percent of said agent sufficient to provide a pH between 8 and 12 in said composition as applied.

4,038,386
DERIVATIVE OF DESGLUCOHELLEBRIN AND THERAPEUTIC USE

Otto Isaac, Bruchkobel; Klaus Posselt, Wachtberg-Villiprott, and Horst Uthemann, Frankfurt, all of Germany, assignors to Deutsch Gold- und Silber-Scheideanstalt Vormals Roessler, Frankfurt, Germany

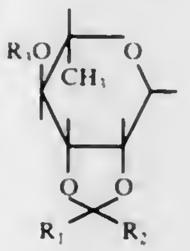
Filed Apr. 3, 1975, Ser. No. 564,832

Claims priority, application Austria, Apr. 3, 1974, 2795/74

Int. Cl.^{2} A61K *31/70*

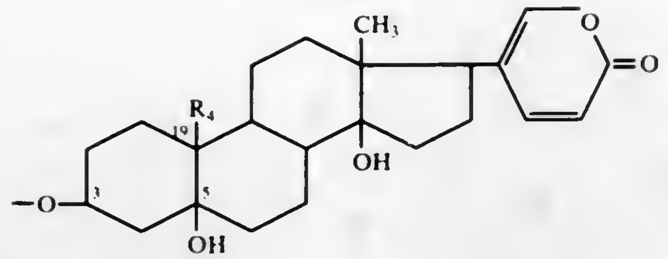
U.S. Cl. 424—182 **5 Claims**

1. A compound having the formula:



I

-continued



wherein one of R_1 and R_2 is benzyl and the other of R_1 and R_2 is ethyl, R_3 is hydrogen and R_4 is formyl and pharmaceutically acceptable salts thereof.

2. A process of administering to a mammal a compound according to claim **1** in an amount sufficient to have a positive inotropic effect.

4,038,387
1-DIMETHYLCARBAMYL-3-BRANCHED ALKYL-1,2,4-TRIAZOL-5-YL-(N-SUBSTITUTED) SULFONAMIDES AND THEIR USE AS INSECTICIDES

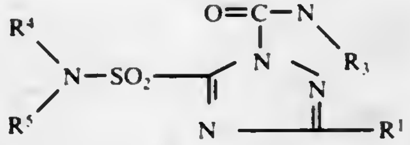
William C. Doyle, Jr., Leawood, and Joel L. Kirkpatrick, Overland Park, both of Kans., assignors to Gulf Oil Corporation, Pittsburgh, Pa.

Division of Ser. No. 513,605, Oct. 10, 1974, Pat. No. 3,973,028, which is a continuation-in-part of Ser. No. 407,678, Oct. 18, 1973, abandoned. This application Jan. 22, 1976, Ser. No. 651,498

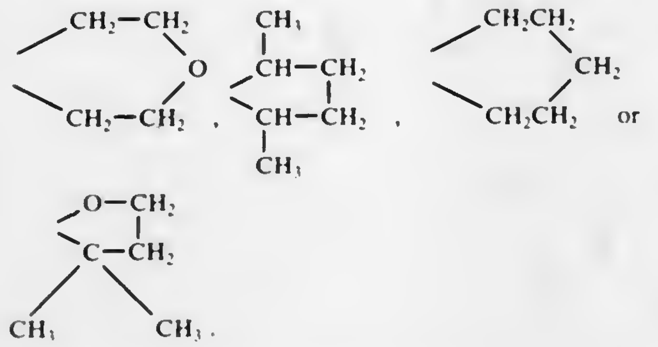
Int. Cl.^{2} A01N *9/20;* **C07D** *413/06*

U.S. Cl. 424—226 **26 Claims**

1. The method of killing aphids on plants comprising applying to the plants a substantially non-phytotoxic but aphicidally effective amount of a compound having the generic structural formula



in which R^1 is C_3 to C_4 secondary or tertiary alkyl or cycloalkyl, R^2 is hydrogen or methyl, R^3 is methyl, and R^4 and R^5 together may be azo, with the added provision that when R^1 is tert.butyl, R^4 and R^5 together may also represent the remainder of a ring structure, selected from one of the following:



8. 1-N,N-dimethylcarbamyl-3-tert.butyl-1,2,4-triazol-5-yl-N,N-dimethylsulfonamide.

4,038,388
ANTIMICROBIAL COMPOSITIONS

David Frederick Cleaver, Hale Barns, England, assignor to Paterson Zochonis & Company Limited, England

Continuation-in-part of Ser. No. 456,199, March 29, 1974, Pat. No. 3,944,668. This application Feb. 20, 1976, Ser. No. 660,062

The portion of the term of this patent subsequent to Mar. 16, 1993, has been disclaimed.

Int. Cl.^{2} A61K *31/65*

U.S. Cl. 424—227 **1 Claim**

1. A stable antimicrobial composition for topical or oral application comprising from 1% to 3% of a tetracycline selected from the group consisting of tetracycline, oxytetracycline and chlorotetracycline, from 0.5 to 3% of 5-chloro-8-hydroxyquinoline or 5,7-dichloro-8-hydroxyquinoline and a pharmaceutically acceptable diluent or carrier.

4,038,389
MEDROXYPROGESTERONE ACETATE COMPOSITIONS

Donald J. Lamb, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Continuation-in-part of Ser. No. 587,747, May 7, 1975, abandoned, which is a continuation of Ser. No. 395,667, Sept. 10, 1973, abandoned, which is a continuation of Ser. No. 296,943, July 17, 1972, abandoned, which is a continuation of Ser. No. 74,163, Sept. 21, 1970, abandoned, which is a continuation-in-part of Ser. No. 714,436, March 20, 1968, abandoned, which is a continuation of Ser. No. 387,230, Aug. 3, 1964, abandoned. This application Mar. 29, 1976, Ser. No. 671,918

Int. Cl.^{2} A61K *31/56*

U.S. Cl. 424—243 **4 Claims**

1. An aqueous suspension for parenteral administration comprising from about 200 to about 600 mg./ml. of suspended medroxyprogesterone acetate; water; from about 0.8% w/v to about 1.5% w/v of sodium sulfate; from about 0.1% w/v to about 1.4% w/v of a parenterally acceptable quaternary ammonium wetting agent; and from about 2% w/v to about 5% w/v of a member selected from the group consisting of glycerin, propylene glycol, polyethylene glycol and polypropylene glycol.

4,038,390
SALTS OF P-DIHYDROXYBENZENE DISULFONIC ACIDS FOR COMBATTING HEMORRHAGES AND FRAGILITY OF THE CAPILLARIES

Antonio Esteve-Subirana, Barcelona, Spain, assignor to Laboratorios del Dr. Esteve, S.A., Barcelona, Spain

Division of Ser. No. 427,679, Dec. 26, 1973, Pat. No. 3,947,448, which is a continuation-in-part of Ser. No. 359,771, May 14, 1973, abandoned. This application Aug. 4, 1975, Ser. No. 601,834

Claims priority, application Switzerland, May 17, 1972, 7326/72; Jan. 26, 1973, 1154/73

Int. Cl.^{2} A61K *31/495, 31/40, 31/185, 31/205*

U.S. Cl. 424—250 **23 Claims**

1. A medicament having hemostatic action, a protective action on capillaries, and antilipemic qualities comprising a pharmaceutically acceptable carrier and a phramaceutically effective amount of bis (piperazine) p-dihydroxybenzene disulfonate.

4,038,391

6-(1,8-NAPHTHYRIDIN-2-YL)-5-PIPERAZINO CARBONYLOXY-7-OXO-6,7-DIHYDRO-5H-PYRROLO-[3,4-B]PYRAZINES AND RELATED PYRIDINES

Claude Cotrel, Paris; Cornel Crisan, Sceaux; Claude Jeanmart, Brunoy, and Mayer Naoum Messer, Bievres, all of France, assignors to Rhone-Poulenc S.A., Paris, France

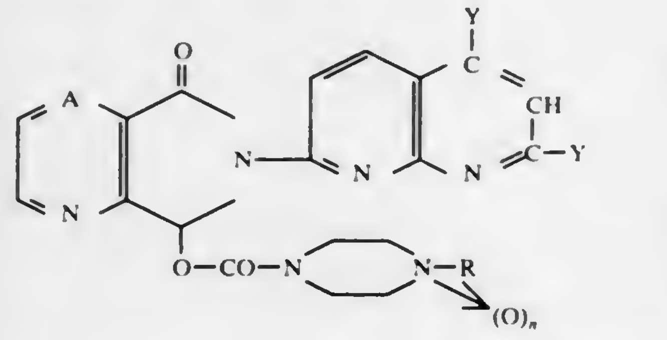
Division of Ser. No. 469,431, May 13, 1974, abandoned. This application Oct. 17, 1975, Ser. No. 623,358

Claims priority, application France, May 15, 1973, 73.17516; Mar. 14, 1974, 74.08728; Mar. 14, 1974, 74.08730

Int. Cl.^{2} A61K *31/495;* C07D *471/04*

U.S. Cl. 424—250 **11 Claims**

1. A naphthyridine compound of the formula:



wherein each Y represents hydrogen, halogen, alkyl of 1 through 4 carbon atoms, or alkoxy of 1 through 4 carbon atoms, =A- represents =CH- or =N-, n is zero and R represents alkyl of 1 through 4 carbon atoms, or n is 1 and R is methyl, or a non-toxic pharmaceutically acceptable acid addition salt thereof.

11. A pharmaceutical composition useful as a tranquilliser and anti-convulsant agent which comprises, as active ingredient, an effective amount of a naphthyridine compound of the formula depicted in claim 1 wherein the various symbols have the meanings specified in claim 1, or a non-toxic pharmaceutically acceptable acid addition salt thereof, in association with a significant amount of a pharmaceutical carrier.

4,038,392

3-(HETEROCYCLICTHIOMETHYL) QUINOXALINE-1,4-DIOXIDES

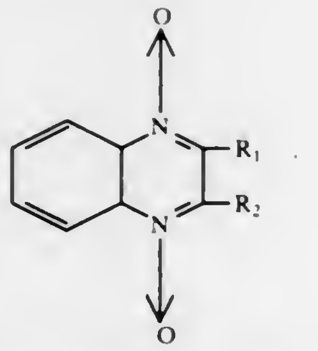
Frank J. Urban, Niantic, Conn., assignor to Pfizer Inc., New York, N.Y.

Filed Oct. 14, 1975, Ser. No. 622,057

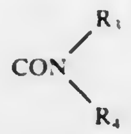
Int. Cl.^{2} C07D *403/12;* A61K *31/495*

U.S. Cl. 424—250 **4 Claims**

1. A compound having the formula



and the pharmaceutically-acceptable acid addition salts thereof, wherein R$_1$ is hydrogen, acetyl, hydroxymethyl, or



$$\mathrm{CON}\begin{matrix} R_1 \\ R_4 \end{matrix}$$

where R$_1$ and R$_4$ are hydrogen, lower alkyl, lower hydroxyalkyl or lower aminoalkyl; and R$_2$ is $CH_2S(O)_m—(CH_2)_n$- heterocycle where m is 0 or 2, n is 0, 1 or 3 and the heterocycle is selected from the group consisting of 2-imidazolyl, N-methyl-2-imidazolyl, pyridyl, 2-benzimidazolyl, 2-pyrimidinyl and 2-benzthiazolyl.

2. A method of controlling pasteurellosis and salmonellosis in animals which comprises administering to said animals a compound of claim 1 at a level of at least 10 mg/kg/day.

4,038,393

1,3-DITHIOLO(4,5-B)PYRAZIN-2-YLIDENE-PROPANEDINITRILE 4-OXIDE

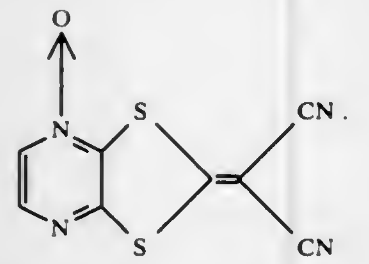
Craig E. Mixan; Christian T. Goralski, and R. Garth Pews, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 15, 1976, Ser. No. 649,175

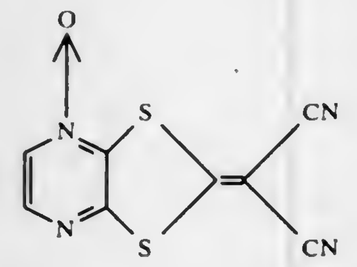
Int. Cl.^{2} A61K *31/495;* C07D *495/04*

U.S. Cl. 424—250 **3 Claims**

1. A compound having the formula



3. A composition useful in preventing the growth of marine organisms on a surface exposed to a marine environment in which marine organisms grow the essential ingredients of which consist of a marine organism cidal amount of the compound having the formula



in combination with a substantially water-insoluble synthetic resinous binder of the group consisting of vinyl resins, epoxy resins and polyurethane resins.

4,038,394

SUBSTITUTED PYRIMIDO-[4,5-D]-PYRIMIDINE COMPOUNDS USEFUL FOR REPELLING INSECTS, RODENTS OR ANIMALS FROM SUBSTRATES

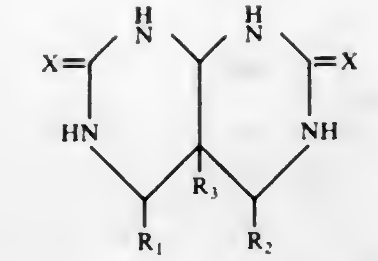
Adin Lee Stautzenberger, and Frank Stevens Wagner, both of Corpus Christi, Tex., assignors to Celanese Corporation, New York, N.Y.

Filed Apr. 28, 1975, Ser. No. 572,532

Int. Cl.^{2} A01N *9/22*

U.S. Cl. 424—251 **3 Claims**

1. A method for repelling insects, rodents or animals from a substrate which comprises applying to said substrate a repellent effective amount of a pyrimidine compound of the formula:



wherein X is S or O; R$_1$ is alkyl, cycloalkylalkyl or aralkyl; R$_2$ is alkyl, cycloalkyl, aryl or aralkyl; and R$_3$ is H, alkyl, cycloalkyl, aryl or aralkyl; each hydrocarbon radical containing up to about 8 carbon atoms.

4,038,395

COMPOSITIONS OF AND METHOD OF TREATING WITH THE ALPHA-ISOMER OF 2-CHLORO-9-[3'-(N'-2-HYDROXYETHYLPIPERAZINO-N)-PROPYLIDENE]-THIAXANTHENE, CARBOXYLIC ACID ESTERS THEREOF AND ACID ADDITION SALTS OF THESE COMPOUNDS

Niels Lassen, Gentofte, Denmark, assignor to Kefalas A/S, Copenhagen-Valby, Denmark

Division of Ser. No. 479,814, June 17, 1974, Pat. No. 3,996,211. This application June 16, 1976, Ser. No. 696,800

Claims priority, application United Kingdom, June 25, 1973, 30152/73

Int. Cl.^{2} A61K *31/495*

U.S. Cl. 424—250 **20 Claims**

13. A method for the treatment of psychotic disorders in mammals comprising the step of administering to the mammal an effective antipsychotic amount of a compound selected from the group consisting of (1) the alpha-isomer of 2-chloro-9-[3'-(N'-2-hydroxyethylpiperazino-N)-propylidene]-thiaxanthene, melting at 84°-85° C., substantially free of the beta-isomer, (2) a carboxylic acid ester thereof with from one to sixteen carbon atoms inclusive, and (3) an acid addition salt thereof with a pharmaceutically acceptable acid.

4,038,396

ANTI-INFLAMMATORY OXAZOLE[4,5-B]PYRIDINES

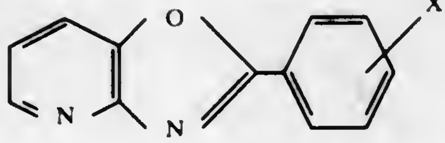
Tsung-Ying Shen, Westfield; Robert L. Clark, Woodbridge; Arsenio A. Pessolano, Colonia; Bruce E. Witzel, Westfield, and Thomas J. Lanza, Edison, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 552,018, Feb. 24, 1975, abandoned, which is a continuation-in-part of Ser. No. 409,504, Oct. 25, 1973, abandoned, which is a continuation-in-part of Ser. No. 262,898, June 14, 1972, abandoned. This application May 2, 1975, Ser. No. 574,173

Int. Cl.^{2} A61K *31/44;* C07D *498/04*

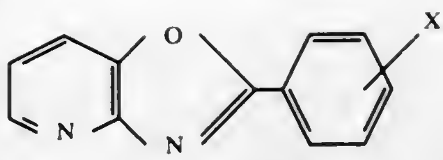
U.S. Cl. 424—256 **36 Claims**

1. A compound of structural formula:



wherein n is an integer from 1 to 2 and X is the same or different and is halo, lower alkyl, trifluoromethyl, lower alkoxy, nitro or cyano.

14. A method of treating inflammation, fever or pain in warm-blooded animals and humans in need of such treatment which comprises administration of an effective amount of a compound of structural formula:



wherein n is an integer from 1 to 2 and X is the same or different and is halo, lower alkyl, trifluoromethyl, lower alkoxy, nitro or cyano.

4,038,397

PHARMACEUTICAL COMPOSITIONS CONTAINING AN N-[(METHOXYMETHYL-FURYL)-METHYL]-6,7-BENZOMORPHAN AND METHOD OF USE

Herbert Merz; Adolf Langbein, both of Ingelheim am Rhein; Gerard Walther, and Klaus Stockhaus, both of Bingen (Rhine), all of Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

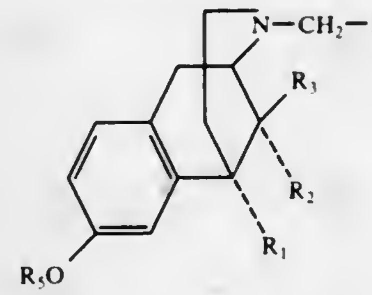
Division of Ser. No. 514,474, Oct. 15, 1974, Pat. No. 3,981,874. This application June 25, 1976, Ser. No. 699,985

Claims priority, application Germany, Oct. 27, 1973, 2354002

Int. Cl.^{2} A61Q *31/485*

U.S. Cl. 424—260 **12 Claims**

1. An analgesic pharmaceutical dosage unit composition consisting essentially of an inert pharmaceutical carrier and an effective analgesic amount of a compound of the formula



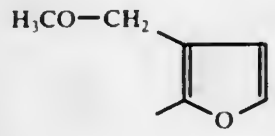
wherein

R$_1$ is methyl, ethyl or propyl,

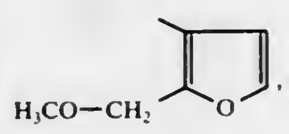
R$_2$ is hydrogen, methyl or ethyl,

R$_3$ is hydrogen or methyl,

R$_4$ is



or



, and

R$_5$ is hydrogen, methyl or acetyl,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4,038,398

COMPOUNDS, COMPOSITIONS AND METHODS OF USE

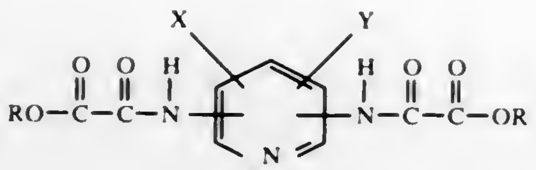
Charles M. Hall, and Herbert G. Johnson, both of Kalamazoo, Mich., assignors to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 563,919, March 31, 1975, Pat. No. 3,963,660, which is a continuation-in-part of Ser. No. 403,677, Oct. 4, 1973, abandoned. This application Mar. 26, 1976, Ser. No. 670,658

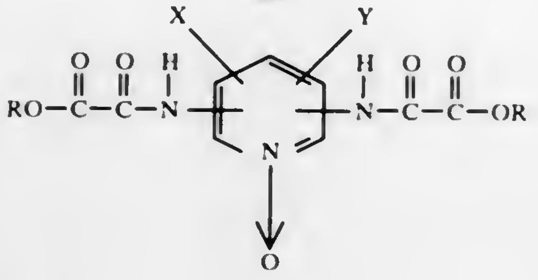
Int. Cl.^{2} A61K *31/44;* C07D *213/57*

U.S. Cl. 424—263 **29 Claims**

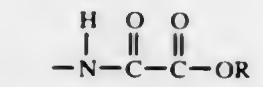
1. A compound of the formula



and



wherein each

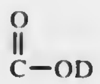


$$-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-OR$$

group is located anywhere on the carbon ring with the proviso that one group cannot be ortho to the other group;

R is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, phenyl, and a pharmaceutically acceptable metal or amine cation;

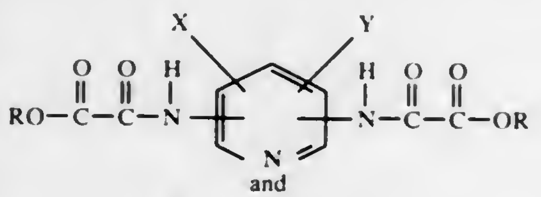
X and Y are the same or different and are selected from the group consisting of hydrogen, alkyl from one through four carbon atoms, phenyl, alkoxy from one through three carbon atoms, nitro, amino, trifluoromethyl, halogen, cyano, and



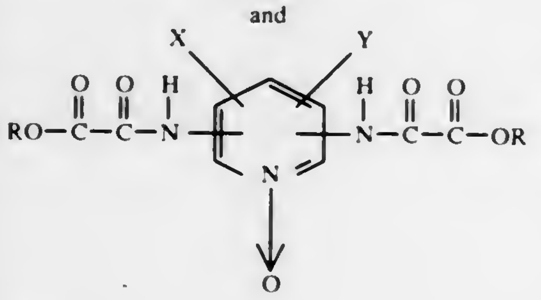
$$\overset{O}{\overset{\|}{C}}-OD\,..$$

wherein D is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, and a pharmaceutically acceptable metal or amine cation with the proviso that when R is hydrogen or a pharmaceutically acceptable metal or amine cation, then D is the same as R and when R is alkyl from one through six carbon atoms or phenyl, then D is alkyl from one through six carbon atoms, phenyl or hydrogen; with the overall proviso that at least one of X and Y is cyano; or a pharmaceutically acceptable acid addition salt thereof.

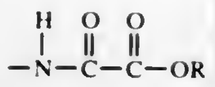
24. A method for prophylactically treating bronchial asthma, allergic rhinitis, food allergy or urticaria in mammals in need of said treatment which comprises administering a compound selected from the group consisting of



and



wherein each

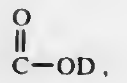


$$-\overset{H}{\overset{|}{N}}-\overset{O}{\overset{\|}{C}}-\overset{O}{\overset{\|}{C}}-OR$$

group is located anywhere on the carbon ring with the proviso that one group cannot be ortho to the other group;

R is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, phenyl, and a pharmaceutically acceptable metal or amine cation;

X and Y are the same or different and are selected from the group consisting of hydrogen, alkyl from one through four carbon atoms, phenyl, alkoxy from one through three carbon atoms, nitro, amino, trifluoromethyl, halogen, cyano, and



$$\overset{O}{\overset{\|}{C}}-OD\,,$$

wherein D is selected from the group consisting of hydrogen, alkyl from one through six carbon atoms, and a pharmaceutically acceptable metal or amine cation with the proviso that when R is hydrogen or a pharmaceutically acceptable metal or amine cation, then D is the same as R; and when R is alkyl or phenyl, then D is selected from the group consisting of alkyl, phenyl, and hydrogen; with the proviso that at least one of X and Y is cyano; or a pharmaceutically acceptable acid addition salt thereof, in an amount effective to prevent the symptoms of said asthma, rhinitis, food allergy or urticaria,

in association with a pharmaceutical carrier.

4,038,399

1,4-DIHYDROPYRIDINE CARBOXYLIC ACID ESTERS USEFUL AS CORONARY VESSEL DILATORS AND ANTI-HYPERTENSIVES

Friedrich Bossert; Horst Meyer, both of Wuppertal, and Wulf Vater, Opladen, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

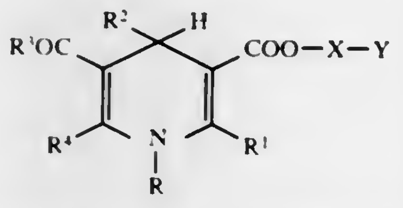
Division of Ser. No. 548,395, Feb. 10, 1975, Pat. No. 3,974,275, which is a division of Ser. No. 350,381, April 12, 1973, Pat. No. 3,905,970. This application Jan. 8, 1976, Ser. No. 647,414

Claims priority, application Germany, Apr. 18, 1972, 2218644

Int. Cl.^{2} A61K *31/455*

U.S. Cl. 424—266 **22 Claims**

1. A pharmaceutical composition useful for effecting coronary vessel dilation in humans and animals and for treating hypertension in humans and animals which comprises a coronary vessel dilating amount or an antihypertensive amount of a compound of the formula:



or a pharmaceutically acceptable nontoxic salt thereof wherein

R is hydrogen, straight- or branched-chain lower alkyl, lower alkenyl or lower alkynyl;

R^1 and R^4 are the same or different and are each hydrogen or straight- or branched-chain lower alkyl;

X is straight- or branched-chain lower alkylene;

Y is the moiety NR′R″ wherein R′ and R″ are the same or different and are each hydrogen or lower alkyl

R^2 is phenyl unsubstituted or substituted by 1, 2 or 3 substituents selected from the group consisting of nitro, cyano, lower alkyl, lower alkoxy, phenyl, trifluoromethyl and halogen; benzyl; phenyl-ethyl; styryl; or naphthyl; and

R^3 is alkoxyalkyl of up to 6 carbon atoms in both moieties; lower alkyl; or lower alkoxy;

in combination with a pharmaceutically acceptable diluent or carrier.

4,038,400

METHOD OF TREATING CONDITIONS OF DELAYED HYPERSENSITIVITY USING BIS-BASIC SUBSTITUTED ACENAPHTHENE DERIVATIVES

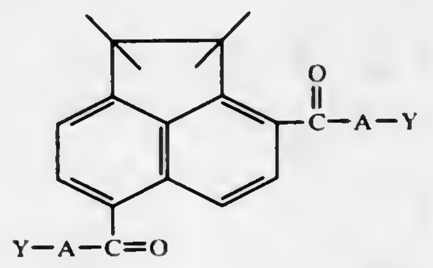
Irving Shemano, Cincinnati, Ohio, assignor to Richardson-Merrell Inc., Wilton, Conn.

Division of Ser. No. 370,289, June 15, 1973, Pat. No. 3,937,842. This application Nov. 3, 1975, Ser. No. 628,530

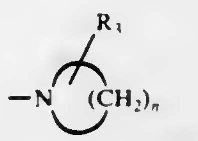
Int. Cl.^{2} A61K *31/445, 31/33, 31/40*

U.S. Cl. 424—267 **3 Claims**

1. A method of treating conditions of delayed hypersensitivity which comprises administering to a patient in need thereof a 3,6-bis-basic ketone of acenaphthene having the formula:



wherein A is a straight or branched alkylene chain having from 1 to 6 carbon atoms; and Y is the group



wherein *n* is an integer of from 4 to 6, and R^3 is selected from the group consisting of hydrogen, lower alkyl having from 1 to 4 carbon atoms, phenyl and benzyl in which said R^3 group is linked to any of the heterocyclic carbon atoms; and pharmaceutically acceptable salts thereof in an amount effective to suppress delayed hypersensitivity.

4,038,401

NOVEL INDOLE DERIVATIVE

John Leheup Archibald, Windsor, and John Lambert Jackson, Royston, both of England, assignors to John Wyeth & Brother Limited, Maidenhead, England

Filed Feb. 11, 1976, Ser. No. 657,121

Int. Cl.^{2} A61K *31/40;* **C07D** *471/04*

U.S. Cl. 424—267 **5 Claims**

1. 4-Benzamido-1-[4-(indol-3-yl)-4-oxobutyl]-piperidine or a pharmaceutically acceptable acid addition salt thereof.

5. A method for producing an anti-hypertensive effect without sedation in a warm-blooded animal which comprises administering an anti-hypertensive amount of the compound 4-benzamido-1-[4-(indol-3-yl)-4-oxobutyl]-piperidine or a pharmaceutically acceptable acid addition salt thereof.

4,038,402

METHOD OF EFFECTING ANTIHISTAMINIC, ANTISEROTONIN AND ANTIALLERGIC ACTIONS

Mikhail Emmanuilovich Kaminka, ulitsa Lobachevskogo, 12, kv. 29; Eva Evseevna Mikhlina, Kutuzovsky prospekt, 5/3, korpus 2, kv. 151; Valentina Yakovlevna Vorobieva, Novo-Alexeevskaya ulitsa, 5a, kv. 13; Anna Dmitrievna Yanina, 2 Karacharovsky proezd, 2, kv. 132; Nadezhda Andreevna Komarova, Shabolovka, 65, korpus, 2, kv. 86; Mikhail Davidovich Mashkovsky, Leningradsky prospekt, 75a, kv. 55, and Leonid Nikolaevich Yakhontov, Nakhimovsky prospekt, 1, korpus 1, kv. 22, all of Moscow, U.S.S.R.

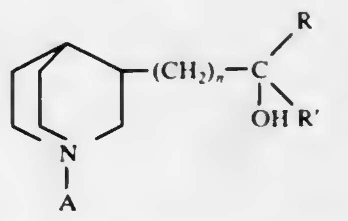
Division of Ser. No. 542,846, Jan. 21, 1975, abandoned. This application July 15, 1976, Ser. No. 705,663

Claims priority, application U.S.S.R., Mar. 5, 1974, 2002003

Int. Cl.^{2} A61K *31/445*

U.S. Cl. 424—267 **2 Claims**

1. Method of effecting at least one of the actions of antihistaminic, antiserotonin and antiallergic action, which comprises administering to a subject requiring such action a corresponding effective dose of a compound of the formula:



where *n* is selected from the group consisting of 0 and 1, wherein R and R_1 are each selected from the group consisting of phenyl loweralkoxy phenyl, loweralkyl phenyl, lower dialkyl phenyl, thienyl, chlorophenyl, benzoyl, cyclohexyl, phenylketone and clorophenyl ketone, and wherein A is absent or is a physiologically compatible acid.

4,038,403

BENZOTRIAZOLE OVICIDES AND LARVICIDES

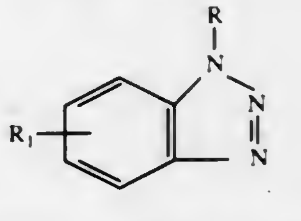
Donald Perry Wright, Jr., Pennington, N.J., assignor to American Cyanamid Company, Stamford, Conn.

Filed Oct. 17, 1975, Ser. No. 623,234

Int. Cl.^{2} A01N *9/00, 9/22*

U.S. Cl. 424—269 **12 Claims**

1. A method for the control of insects and acarina comprising, contacting the eggs of the insects and acarina with an ovicidally effective amount of a compound of the formula:



wherein R represents alkyl C_3–C_8 straight chain or branched, alkoxy C_1–C_8 straight chain or branched, cycloalkyl C_3–C_8, cycloalkenyl C_5–C_6, mono- or di- C_1–C_3 alkylcyclohexyl, cyclohexylmethyl, formyloxycyclohexyl, or $-CONR_2R_3$ wherein R_2 and R_3 represent hydrogen or alkyl C_1–C_4; and R_1 represents $-NO_2$ or $-NCS$.

4,038,404

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Kramer, Wuppertal-Barmen; Karl Heinz Buchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

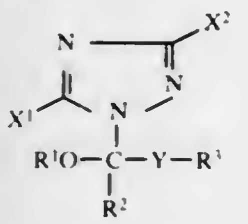
Division of Ser. No. 432,191, Dec. 12, 1974, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Jan. 2, 1976, Ser. No. 646,056

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.^{2} H61K *31/41*

U.S. Cl. 424—269 **28 Claims**

14. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^2 is phenyl unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same or different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^3 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms; and

Y is CO;

in combination with a pharmaceutically acceptable non-toxic, inert carrier.

4,038,405

ACARICIDAL TRIFLUOROMETHYL-1,2,4-TRIAZOLES

John James Alexander Evans, East Brighton, and George Holan, Brighton, both of Australia, assignors to Commonwealth Scientific and Industrial Research Organization, Campbell, Australia

Filed Nov. 11, 1974, Ser. No. 522,626

Claims priority, application Australia, Nov. 13, 1973, 5638/73

Int. Cl.^{2} C07D *249/08;* **A01N** *9/22*

U.S. Cl. 424—269 **4 Claims**

1. A compound of the group consisting of.
4-phenyl-3-trifluoromethyl-1,2,4-triazole;
4-(4-chlorophenyl)-3-trifluoromethyl-1,2,4-triazole;
4-(2-methylphenyl)-3-trifluoromethyl-1,2,4-triazole;
4-(2-t-butylphenyl)-3-trifluoromethyl-1,2,4-triazole;
4-(2-methoxyphenyl)-3-trifluoromethyl-1,2,4-triazole;
4-(4-ethoxyphenyl)-3-trifluoromethyl-1,2,4-triazole;
4-(4-t-butylphenyl)-3-trifluoromethyl-1,2,4-triazole;
4-(2,4-dimethylphenyl)-3-trifluoromethyl-1,2,4-triazole;
4-(4-chloro-2-methylphenyl)-3-trifluoromethyl-1,2,4-triazole;
3-methyl-4-phenyl-5-trifluoromethyl-1,2,4-triazole;
3,4-bis(4-chlorophenyl)-5-trifluoromethyl-1,2,4-triazole;
1-phenyl-3-trifluoromethyl-1,2,4-triazole;
3-trifluoromethyl-1,2,4-triazole;
3(5)-phenyl-5(3)-trifluoromethyl-1,2,4-triazole;
3(5)-(4-chlorophenyl)-5(3)-trifluoromethyl-1,2,4-triazole; and
3(5)-(3,4-dichlorophenyl)-5(3)-trifluoromethyl-1,2,4-triazole.

4. A pest control composition comprising an acaricidally effective amount of a triazole compound as defined in claim 1 in admixture with a solid or liquid carrier material.

4,038,406

1,2,4-TRIAZOLE ANTIMYCOTIC COMPOSITIONS AND USE THEREOF

Werner Meiser, Wuppertal-Elberfeld; Wolfgang Kramer, Wuppertal-Barmen; Karl Heinz Buchel, and Manfred Plempel, both of Wuppertal-Elberfeld, all of Germany, assignors to Bayer Aktiengesellschaft, Germany

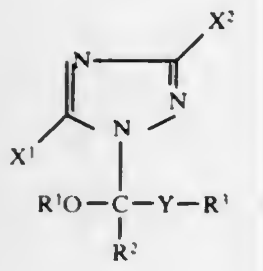
Division of Ser. No. 532,191, Dec. 12, 1974, Pat. No. 4,002,763, which is a division of Ser. No. 396,202, Sept. 11, 1973, Pat. No. 3,890,442. This application Dec. 31, 1975, Ser. No. 645,563

Claims priority, application Germany, Sept. 26, 1972, 2247186

Int. Cl.^{2} A61K *31/41*

U.S. Cl. 424—269 **22 Claims**

11. A method for treating mycotic infections in humans and animals which comprises administering to a human or animal in need thereof an antimycotically effective amount of a 1,2,4-triazole of the formula:



wherein

X^1 is hydrogen or alkyl of 1 to 3 carbon atoms;

X^2 is hydrogen or alkyl of 1 to 3 carbon atoms;

R^1 is aralkyl of 6 to 10 carbon atoms in the aryl moiety and 1 to 2 carbon atoms in the alkyl moiety, unsubstituted or substituted by one to five substituents selected from the group consisting of alkyl of 1 to 4 carbon atoms, the same or different halogen, the same different haloalkyl of 1 or 2 carbon atoms and 2 to 5 halogen atoms, alkoxy of 1 or 2 carbon atoms, the same or different haloalkoxy of 1 or 2 carbon atoms and 2 to 5 halogen atoms, and nitro, or by one substituent selected from the group consisting of phenyl, halophenyl or amino;

R^2 is hydrogen or alkyl of 1 to 6 carbon atoms;

R_3 is alkyl of 1 to 6 carbon atoms or cycloalkyl of 3 to 7 carbon atoms; and

Y is CO.; in combination with a pharmaceutically acceptable non-toxic, inert carrier.

4,038,407

BENZISOTHIAZOLINE-1,1-DIOXIDE DERIVATIVES, COMPOSITIONS AND METHODS

Wolfgang Eberlein; Eberhard Kutter, both of Biberach an der Riss; Joachim Heider, Warthausen; Volkhard Austel, Biberach an der Riss; Rüdolf Kadatz, Biberach an der Riss; Willi Diederen, Biberach an der Riss, all of Germany; Walter Kobinger; Christian Lillie, both of Vienna, Austria, and Jürgen Dammgen, Warthausen, Germany, assignors to Boehringer Ingelheim GmbH, Ingelheim am Rhein, Germany

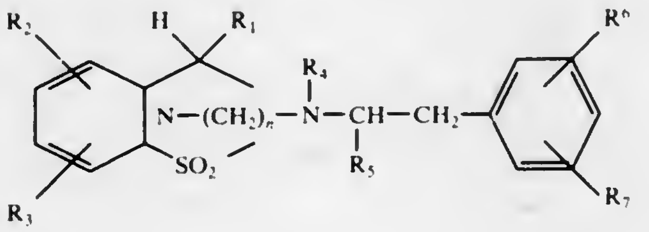
Filed Feb. 24, 1976, Ser. No. 660,841

Claims priority, application Germany, Mar. 6, 1975, 2509797; Dec. 23, 1975, 2558274

Int. Cl.^{2} A61K *31/425;* **C07D** *91/12*

U.S. Cl. 424—270 **4 Claims**

1. A compound of the formula



wherein

R_1 is hydrogen, lower alkyl or phenyl,

R_2 is hydrogen, chlorine or methoxy,

R_3 is hydrogen or methoxy

R_2 and R_3, together with each other, are methylenedioxy or ethylenedioxy,

R_4 and R_5 are each hydrogen or lower alkyl,

R_6 is hydrogen or lower alkoxy,

R_7 is lower alkoxy,

R_6 and R_7, together with each other, are methylenedioxy or ethylenedioxy, and

n is 2 or 3,

or a non-toxic, pharmacologically acceptable acid addition salt thereof.

4. The method of reducing the heart rate in a warm-blooded animal in need of such treatment, which comprises perorally, parenterally or rectally administering to said animal an effective heart rate reducing amount of a compound of claim **1**.

4,038,408

CERTAIN THIAZOLYL AND ISOTHIAZOLYL COMPOUNDS AND COMPOSITIONS AND METHODS WHICH EMPLOY THEM

Graham John Durant; Charon Robin Ganellin, both of Welwyn Garden City, England; Torben Hesselbo, North Berwick, Scotland, and George Raymond White, Harpenden, England, assignors to Smith Kline & French Laboratories Limited, Welwyn Garden City, England

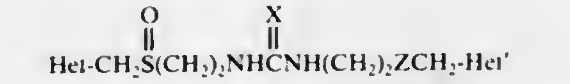
Filed July 13, 1976, Ser. No. 704,871

Claims priority, application United Kingdom, July 31, 1975, 31969/75

Int. Cl.^{2} C07D *417/00, 277/26, 275/02*

U.S. Cl. 424—270 **11 Claims**

1. A compound of the formula:



$$\text{Het-CH}_2\overset{\overset{\text{O}}{\|}}{\text{S}}(\text{CH}_2)_2\text{NH}\overset{\overset{\text{X}}{\|}}{\text{C}}\text{NH}(\text{CH}_2)_2\text{ZCH}_2\text{-Het}'$$

wherein Het and Het' are each selected from imidazole optionally substituted by methyl or bromo, thiazole, and isothiazole, provided that at least one of Het and Het' is thiazole or isothiazole; Z is sulphur, SO or methylene; X is sulphur, $CHNO_2$ or NCN.

11. A method of blocking histamine H_2-receptors which comprises administering to an animal a compound of claim **1**.

4,038,409

1-PHENETHYLIMIDAZOLES

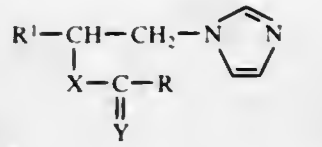
Keith A. M. Walker, Palo Alto, and Michael Marx, Sunnyvale, both of Calif., assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Filed Mar. 1, 1976, Ser. No. 662,786

Int. Cl.^{2} A61K *31/415;* **C07D** *233/60*

U.S. Cl. 424—273 **33 Claims**

1. A compound selected from those represented by the formula



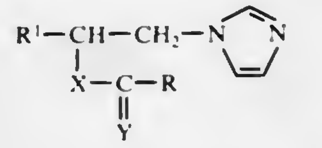
wherein

R is H, alkyl of 1 to 12 carbon atoms, phenylalkenyl of 8 to 9 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, to 9 carbon atoms, phenyl, cycloalkyl of 5 to 8 ring carbon atoms, cycloalkyl lower alkyl of 6 to 9 carbon atoms, said phenylalkenyl, phenylalkyl, and phenyl each being independently optionally substituted with at least one substituent on the phenyl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, and trifluoromethyl;

R^1 is phenyl optionally substituted with at least one substituent selected from the group consisting of halo, lower alkyl, and trifluoromethyl; and

X and Y are independently sulfur or oxygen and the antimicrobial acid addition salts thereof.

33. A method of inhibiting the growth of fungi, protozoa, or bacteria which comprises applying to a host object containing or subject to attack by, fungi, protozoa, or bacteria, a fungicidally, protozoicidally, or bactericidally effective amount of a compound selected from these represented by the formula



wherein

R is H, alkyl of 1 to 12 carbon atoms, phenylalkenyl of 8 to 9 carbon atoms, phenylalkyl of 7 to 9 carbon atoms, phenyl, cycloalkyl of 5 to 8 ring carbon atoms, cycloalkyl lower alkyl of 6 to 9 total carbon atoms, said phenylalkenyl, phenylalkyl, and phenyl each being independently optionally substituted with at least one substituent on the phenyl moiety selected from the group consisting of halo, lower alkyl, lower alkoxy, and trifluoromethyl;

R^1 is phenyl optionally substituted with at least one substituent selected from the group consisting of halo, lower alkyl, and trifluoromethyl, and

X and Y are independently sulfur or oxygen and the antimicrobial acid addition salts thereof or a composition containing same as an active ingredient.

4,038,410

NITROIMIDAZOLE DERIVATIVES AND PROCESS FOR THE PREPARATION THEREOF

Clemens Rufer; Katica Schwarz, and Hans-Joachim Kessler, all of Berlin, Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Germany

Filed Mar. 12, 1975, Ser. No. 557,539

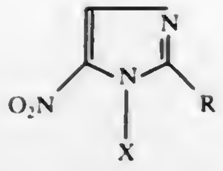
Claims priority, application Germany, Mar. 14, 1974, 2412656; Mar. 14, 1974, 2412657

Int. Cl.^{2} A61K *9/22;* **C07D** *239/22, 403/04*

U.S. Cl. 424—273 **23 Claims**

1. A member of the group consisting of

1. a 5-nitroimidazole of the formula



wherein X is alkyl of 1-4 carbon atoms and R is

- a. 3-dialkylamino-acryloyl of 1-4 carbon atoms in each alkyl group;
- b. 3-, 4-, or 5-pyrazolyl which is unsubstituted or which is (i) mono- or di- substituted by alkyl of 1-4 carbon atoms on 1-2 ring carbon atoms, (ii) substituted at the 1-position by alkyl of 1-4 carbon atoms, hydroxyalkyl of 2-5 carbon atoms or a nitric acid ester thereof or a hydrocarbon-carboxylic acid ester thereof of a total of 4-9 carbon atoms, nitro, phenyl or phenyl substituted by a p-halogen atom, p-alkoxy of 1-4 carbon atoms, or p- or m-nitro, or (iii) substituted both on 1-2 ring carbon atoms and at the 1-position as defined hereinabove;
- 2. a position isomer mixture of pyrazolyl-substituted 5-nitroimidazoles as defined in (1) (b) whose respective pyrazolyl rings are attached at different ring carbon atoms thereof to the 5-nitroimidazole ring; and
- 3. physiologically acceptable acid addition salts of each of the above.

22. A pharmaceutical composition comprising, in unit dosage form, an anti-protozoal effective amount per unit dosage of a compound of claim **1** or a mixture of position isomers as defined therein, in admixture with a pharmaceutically acceptable carrier.

4,038,411
ANTIHYPERTENSIVE AMINO ACID ESTERS

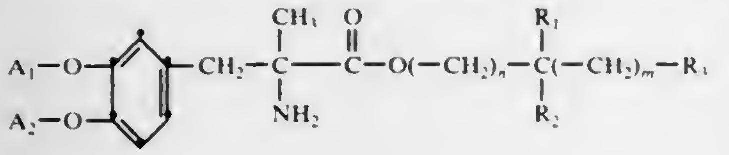
Walfred S. Saari, Lansdale, Pa., assignor to Merck & Co., Inc., Rahway, N.J.

Division of Ser. No. 482,102, June 25, 1974, Pat. No. 3,983,138, which is a continuation-in-part of Ser. No. 400,609, Sept. 25, 1973, abandoned. This application Mar. 21, 1975, Ser. No. 560,908

Int. Cl.^{2} A61K *31/40*

U.S. Cl. 424—274 **24 Claims**

1. A method of treating hypertension in a hypertensive animal which comprises administering to the animal a therapeutically effective amount of a compound of the formula



$$A_1-O-,\ A_2-O-C_6H_3-CH_2-\overset{CH_3}{\underset{NH_2}{C}}-\overset{O}{\overset{\|}{C}}-O(-CH_2)_n-\overset{R_1}{\underset{R_2}{C}}(-CH_2)_m-R_3$$

wherein

- *n* is 0, 1, 2 or 3;
- *m* is 0, 1, 2 or 3;
- A_1 and A_2 are individually H or a lower alkanoyl group;
- R_1 and R_2 are individually H or alkyl of 1 to 3 carbon atoms and;
- R_3 is a monocyclic, heterocyclic radical containing 1 or 2 nuclear N atoms, said heterocyclic radical containing 5 to 6 members

or a pharmaceutically acceptable acid addition salt thereof.

4,038,412
N-(PHENYLETHER-SUBSTITUTED BENZYL)ALKANEDIAMINES

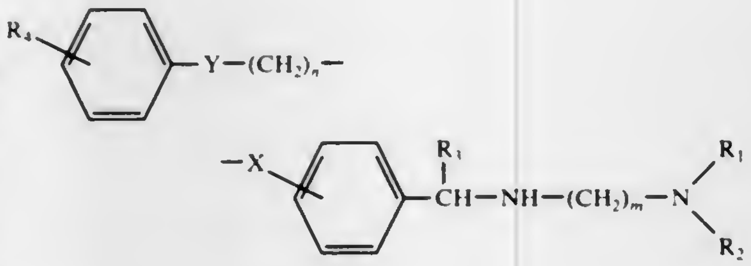
J. Martin Grisar, and George P. Claxton, both of Cincinnati, Ohio, assignors to Richardson-Merrell Inc., Wilton, Conn.

Filed Aug. 25, 1975, Ser. No. 607,333

Int. Cl.^{2} A01N *9/20;* **C07C** *87/28*

U.S. Cl. 424—280 **9 Claims**

1. An N-(substituted benzyl)alkanediamine having the formula:



wherein

- R_1, R_2, R_3 and R_4 are each selected from the group consisting of hydrogen and loweralkyl having 1 to 4 carbon atoms;
- X is selected from the group consisting of oxygen, sulfur and SO_2;
- Y is oxygen or a sigma bond;
- *m* is an integer of from 2 to 4;
- *n* is an integer of from 1 to 4 with the proviso that when Y is oxygen, then *n* cannot be 1; and the pharmaceutically acceptable acid addition salts thereof.

7. A method of treating a host susceptible to invasion by pathogenic viral agents caused by viruses which comprises administering from 0.1 milligram to 500 milligrams per kilogram of body weight per day of an N-(substituted benzyl)alkanediamine of claim **1**.

4,038,413
TREATING IRON DEFICIENCY ANAEMIA

John Louis Suschitzky, and David Rutherford, both of Loughborough, England, assignors to Fisons Limited, London, England

Division of Ser. No. 522,591, Nov. 11, 1974, Pat. No. 3,960,911. This application Mar. 5, 1976, Ser. No. 664,280

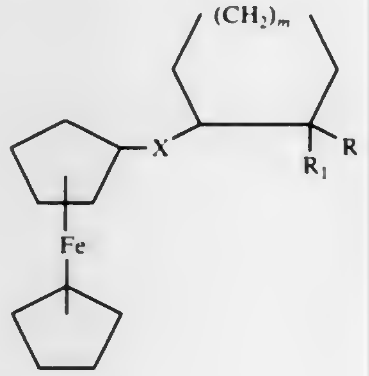
Claims priority, application United Kingdom, Nov. 21, 1973, 54002/73; July 17, 1974, 31609/74

Int. Cl.^{2} A61K *31/295*

U.S. Cl. 424—295 **6 Claims**

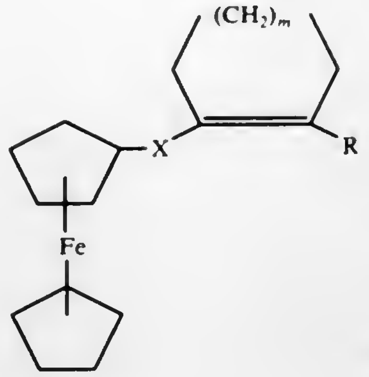
4. A method for treating iron deficiency anaemia in animals, said method comprising administering to an animal having iron deficiency anaemia a therapeutically effective amount of a compound of the formulas

(1)

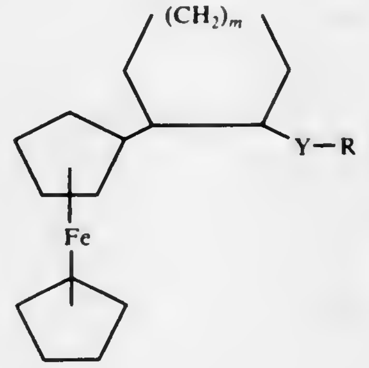


(2)

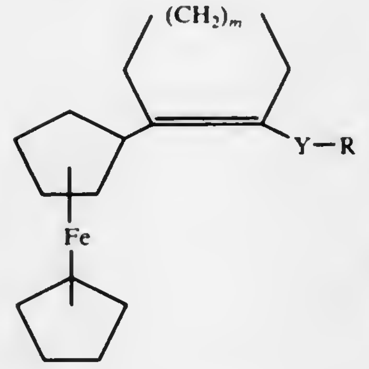
-continued



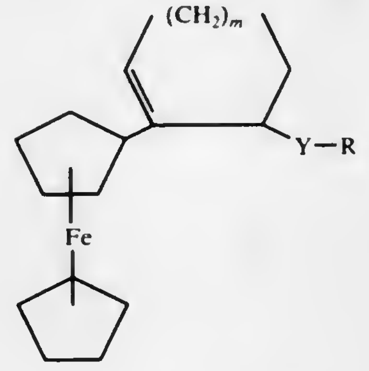
(3)



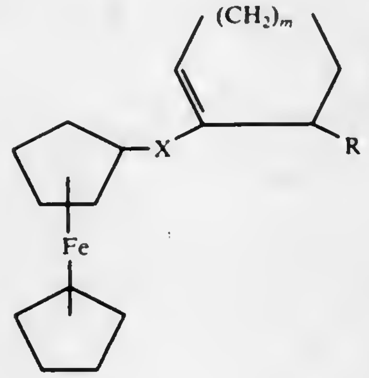
(4)



(5)



(6)



in which

- R is alkyl, chlorine, bormine, phenyl, or phenyl substituted by one or more halogen or alkyl groups.
- X is a group —CO—, —CHOH or —CH_2—,
- Y is a group —CO—, —CHOH or —CH_2—.
- *m* is an integer from 1 to 3, and
- R_1 is hydrogen, or is hydrogen or —OH when X is —CO—.

4,038,414
AMINES AND PROCESSES FOR THEIR MANUFACTURE

Knut Alfred Jaeggi, Basel; Franz Ostermayer, Riehen, and Herbert Schröter, Fullinsdorf, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

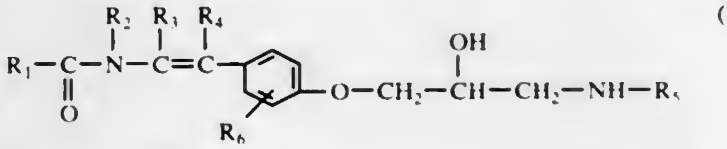
Division of Ser. No. 367,092, June 4, 1973. This application Dec. 19, 1975, Ser. No. 642,628

Claims priörity, application Switzerland, June 8, 1972, 8505/72; Apr. 18, 1973, 5634/73

Int. Cl.^{2} C07C *103/12*

U.S. Cl. 424—304 **7 Claims**

1. An amine of the formula I



$$R_1-\underset{O}{\underset{\|}{C}}-\overset{R_2}{N}-\overset{R_3}{C}=\overset{R_4}{C}-C_6H_3(R_6)-O-CH_2-\overset{OH}{CH}-CH_2-NH-R_5 \quad (I)$$

wherein R_1 is lower alkyl, R_2 is hydrogen or lower alkyl, R_3 is hydrogen or lower alkyl, R_4 is hydrogen or lower alkyl, R_5 is lower alkyl, phenyl-lower alkyl, or phenyl lower alkyl substituted by lower alkyl, lower alkoxy, halogen and/or trifluoromethyl and R_6 denotes halogeno, trifluoromethyl, lower alkyl, lower alkenyl, lower alkoxy, lower alkenyloxy, nitro, lower alkoxymethyl, carbamoyl, N-lower alkylcarbamoyl, cyano, lower alkinyloxy or hydrogen, or a therapeutically acceptable acid addition salt thereof.

4,038,415
PROSTAGLANDIN DEHYDROGENASE INHIBITING AGENTS

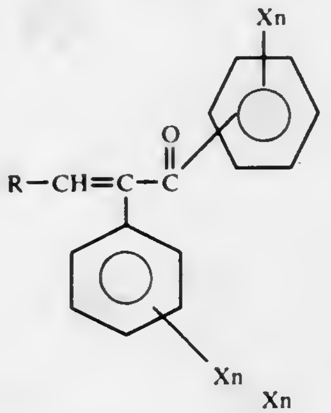
Vithal J. Rajadhyaksha, Mission Viejo, Calif.; Richard A. Schroer, West Nyack, N.Y.; Phillip J. Brock, Mountain View, and Earl R. Krueger, Anaheim, both of Calif., assignors to Nelson Research & Development Company, Irvine, Calif.

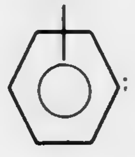
Division of Ser. No. 602,736, Aug. 7, 1975, abandoned. This application Sept. 1, 1976, Ser. No. 719,432

Int. Cl.^{2} A61K *31/19, 31/12, 31/165*

U.S. Cl. 424—317 **12 Claims**

1. A method for inhibiting the activity of 15-OH prostaglandin dehydrogenase in humans or animals comprising administering to a human or animal an effective amount of a compound having the structural formula



wherein R is H or ;

X is selected from the group consisting of OH, lower alkyl, lower alkoxy, aryl, substituted aryl, halogen, nitro, trihaloalkyl, —NR_1R_2 and —$NHCOR_1$ where R_1 and R_2 are selected from the group consisting of H, lower alkyl and NH_2; and *n* is 0-5.

4,038,416

PHARMACEUTICAL COMPOSITION AND METHOD OF THE USE THEREOF

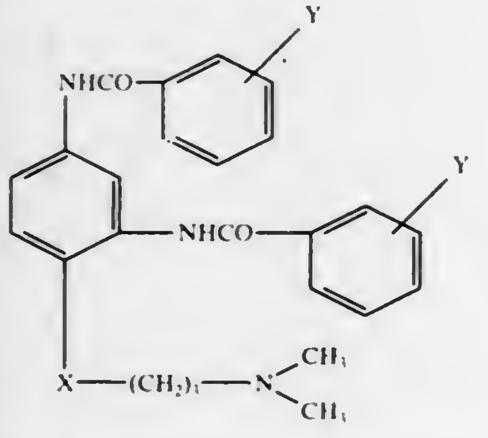
Takashi Mori, Tama; Sakae Takaku, Ageo; Nobuhiro Oi, Hoya; Minoru Shindo, Higashikurume; Takeaki Hirano, Fujimi; Shigeyuki Kataoka, Saitama, and Kouji Furuno, Kokubunji, all of Japan, assignors to Chugai Seiyaku Kabushiki Kaisha, Tokyo, Japan

Filed Sept. 11, 1975, Ser. No. 612,500

Int. Cl.² A61K *31/165*

U.S. Cl. 424—324 **17 Claims**

1. A pharmaceutical composition for prevention and treatment of peptic ulcer and gastritis of a mammal including human being comprising a bis(benzamido)-benzene derivative represented by the formula



wherein X is oxygen and Y is methyl attached to o- or m-position of benzene nucleus or an acid addition salt thereof in an amount sufficient to prevent and treat the gastritis and peptic ulcer and a pharmaceutically acceptable carrier.

4,038,417

METHOD FOR TREATMENT OF PSORIASIS

Eric Loren Nelson, Santa Ana, Calif., assignor to Nelson Research & Development Company, Irvine, Calif.

Filed June 19, 1975, Ser. No. 588,233

Int. Cl.² A61K *31/135*

U.S. Cl. 424—330 **6 Claims**

1. A method for treating psoriasis in humans comprising administering to a human suffering from psoriasis an effective dose for treating psoriasis of a composition comprising isoproterenol or a pharmaceutically acceptable salt thereof, and a pharmaceutical carrier.

4,038,418

PROCESS OF SKIN TREATING WITH COMPOSITIONS CONTAINING POLYHYDROXYALKYLAMINES

Hinrich Möller, Dusseldorf-Benrath; Rainer Osberghaus, Dusseldorf-Urdenbach; Christian Gloxhuber, Haan, and Siegfried Braig, Hilden, all of Germany, assignors to Henkel & Cie G.m.b.H, Dusseldorf-Holthausen, Germany

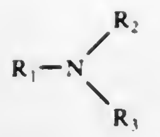
Filed Apr. 28, 1975, Ser. No. 572,270

Claims priority, application Germany, May 4, 1974, 2421618

Int. Cl.² A61K *7/00, 31/13*

U.S. Cl. 424—358 **6 Claims**

1. A process for maintaining or restoring hygroscopicity in the skin for the protection of the skin of warm-blooded animals comprising topically applying to the skin a safe but effective amount as a moisturizing agent of a cosmetic composition consisting essentially of an aqueous medium adjusted to a pH between 5 and 7 containing from 1 to 20% by weight of at least one hydroxyalkylamine selected from the group consisting of (1) compounds having the formula



$$R_1-N(R_2)(R_3)$$

wherein R_1 is a member having from 3 to 6 carbon atoms selected from the group consisting of dihydroxyalkyl and trihydroxyalkyl, and R_2 and R_3 are members selected from the group consisting of hydrogen, alkyl having from 1 to 4 carbon atoms, hydroxyalkyl having from 2 to 4 carbon atoms and dihydroxyalkyl having from 3 to 4 carbon atoms, and (2) topically-inert acid salts thereof; and the remainder to 100% by weight of inert cosmetic excipients.

4,038,419

ENZYMATIC CLARIFICATION OF LIQUIDS

Ricardo Segura Ferns, Madrid, Spain, assignor to Instituto de Farmacologia Espanola, S.L. (Fundacion Marques de Urquijo), Madrid, Spain

Filed May 6, 1975, Ser. No. 574,907

Claims priority, application United Kingdom, May 6, 1974, 19884/74

Int. Cl.² C12H *1/12*

U.S. Cl. 426—12 **3 Claims**

1. A method for the clarification of turbidity, and for the prevention of turbidity in, aqueous liquid beverages comprising the steps of producing a proteolytic enzyme by fermentation of Streptomyces fradiae in a culture medium, separating said proteolytic enzyme from said medium, forming a solution of said proteolytic enzyme in a said aqueous liquid beverage, and maintaining said solution for a predetermined time at a predetermined temperature sufficient to clarify the actual or potential turbidity of the liquid beverage by said proleolytic enzyme hydrolyzing protein materials in said beverage that cause said turbidity; the temperature of the solution being from 0° to 85° C., the pH of the solution being from 3 to 10, and the activity of said proteolytic enzyme in the solution being 200,000 to 20,000,000 UA per hectoliter.

4,038,420

METHOD OF BREWING BEER

James Richard Allan Pollock, 56 New Lane Hill, Tilehurst, and Michael Joseph Weir, 24 Appleby End, both of Reading, Berkshire, England

Continuation of Ser. No. 562,959, March 28, 1975, abandoned, which is a continuation of Ser. No. 367,824, June 7, 1973, abandoned. This application Apr. 5, 1976, Ser. No. 673,703

Claims priority, application United Kingdom, June 27, 1972, 30061/72; Oct. 13, 1972, 47404/72; Mar. 28, 1973, 14916/73

Int. Cl.² C12C *9/00, 11/04*

U.S. Cl. 426—16 **8 Claims**

1. In a method of brewing beer in which a brewer's wort containing malt extract fermentable sugar adjunct is fermented with yeast and, after fermentation is complete, the yeast is filtered off to provide a beer,

the improvement which comprises:

1. separately fermenting with yeast a malt wort containing said malt extract, said malt wort having a minimum total concentration of soluble nitrogenous substances, expressed as total nitrogen present, of 600 mg. per liter, and a minimum concentration of alpha amino acids, expressed as nitrogen present, of 150 Mg. per liter;
2. removing the yeast from the malt wort after fermentation is complete to provide a fermented malt wort;
3. separately fermenting with yeast with stirring, in an amount of at least 5.7 gm. equivalent pressed yeast per liter, an aqueous sugar solution containing said fermentable sugar, said aqueous sugar solution having a maximum total concentration of soluble nitrogenous substances, expressed as total nitrogen present, of 200 mg. per liter, and a maximum concentration of alpha amino acids, expressed as nitrogen present, of 70 mg. per liter;
4. removing the yeast from the sugar solution after fermentation ceases; and
5. blending the fermented malt wort and the fermented aqueous sugar solution to provide a beer product, said beer product being closely similar in flavor to a beer made by fermenting said brewer's wort.

4,038,421

NONALCOHOLIC BEVERAGE

Francois Mendy, Boulogne; Michel Delage, and Jean Teissier, both of Paris, all of France, assignors to Roussel-UCLAF, Paris, France

Filed May 10, 1976, Ser. No. 684,773

Claims priority, application France, May 16, 1975, 75.15383

Int. Cl.² A23L *2/00*

U.S. Cl. 426—72 **9 Claims**

1. A nonalcoholic beverage which comprises 30 to 100 grams/l of galactose, 15 μ grams to 65 μ grams of riboflavine per gram of galactose and 35 μ grams to 50 μ grams nicotinic acid per gram of galactose and mineral elements potassium, sodium, phosporous and magnesium.

4,038,422

COATED BAKED GOODS

William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, both of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Continuation-in-part of Ser. No. 543,435, Jan. 23, 1975, abandoned. This application Oct. 20, 1975, Ser. No. 623,643

Int. Cl.² A23G *3/00*

U.S. Cl. 426—72 **22 Claims**

1. A coating for coating baked products, said coating comprising: from about 30 percent to about 40 percent by weight vegetable fat or oil, from about 10 percent to 40 percent by weight sugar, from about 25 percent to about 50 percent by weight non-fat dry milk solids, and a flavoring agent.

4,038,423

FOOD BAR

James R. Hayward, McHenry; William L. Keyser, East Dundee, and Walter J. Zielinski, Ingleside, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Aug. 2, 1976, Ser. No. 710,453

Int. Cl.² A23J *3/00;* **A23G** *3/00*

U.S. Cl. 426—72 **11 Claims**

1. A food bar comprising:

A. a base; and

B. a coating thereon;

C. said base comprising marshmallow fortified with a high protein ingredient of reduced water binding capability, selected from the goup consisting of heat treated protein, fat coated protein and combinations thereof, said high protein ingredient having a protein content of at least 30 percent by weight;

D. said coating comprising from about 30 to about 40 percent by weight vegetable fat or oil, from about 10 to 40 percent by weight sugar, from about 25 to about 50 percent by weight non-fat dry milk solids, a flavoring agent, and fat coated vitamins.

4,038,424

VEGETABLE SAUCE COMPOSITION

Donald L. Davies, Glen Ellyn, DuPage, Ill., assignor to Swift & Company, Chicago, Ill.

Filed Jan. 22, 1976, Ser. No. 651,408

Int. Cl.² A23L *1/24*

U.S. Cl. 426—94 **12 Claims**

1. An improved aerated food sauce composition, said composition comprising: extended strands of a tomato paste in an amount of about 44-54% of said composition combined with a fat congealable at room temperature in an amount of about 39-44% of said composition.

4,038,425

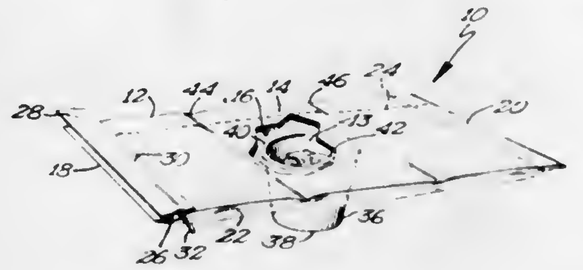
COMBINED POPPING AND SHIPPING PACKAGE FOR POPCORN

Lawrence C. Brandberg, and David W. Andreas, both of Minneapolis, Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Filed Sept. 25, 1974, Ser. No. 508,963

Int. Cl.² B65D *77/14*

U.S. Cl. 426—107 **8 Claims**



1. A double compartmented combined popping and shipping package for popcorn comprising a supporting base including a first semi-rigid compartment having side and bottom walls and a second flexible compartment communicating therewith and having first and second parallel sheets of flexible material defining the upper and lower surfaces thereof, said first and second sheets being connected together at their edges and expansion pleats in the sheets to allow expansion of the second compartment, said second compartment being located outside the walls of the first compartment and supported at the upper end of the first compartment to define the top of the package and being of sufficient size after popping to hold all of said popcorn after it has popped except that which remains in the first compartment, said second compartment being larger than the first compartment.

4,038,426

PROCESS FOR PICKLING MEAT SECTIONS

Knud Jespersen, R.R. No. 1, Terracotta, Ontario, and Theodore Edgar Engman, 429 58th Avenue South East, Calgary, Alberta, both of Canada

Continuation-in-part of Ser. No. 562,474, March 27, 1975, abandoned. This application Jan. 12, 1976, Ser. No. 648,575

Int. Cl.² A23B *4/02*

U.S. Cl. 426—266 **3 Claims**

1. A process for pickling meat sections selected from the group consisting of briskets, hams, or picnics, said meat sections being skinned de-bonded, and de-fatted portions thereof and being intended to absorb a predetermined quantity of a liquid pickling medium, and said process comprising the steps of;

injecting said meat sections with a first quantity of a liquid pickling medium, less than said predetermined quantity;

placing said meat sections in a container together with an additional quantity of said liquid pickling medium said first quantity, and said additional quantity of pickling medium together totalling substantially exactly the quantity of liquid pickling medium desired to be absorbed by said meat sections in the process;

continuously rotating a stirring member at a predetermined torque value sufficient to procure rotation of a speed of between four and eighteen revolutions per minute, within a central part of said container, while leaving other parts remote from the center free of such stirring, thereby subjecting some said meat sections to direct stirring action by contact with said stirring member in said central part of said container while other said meat sections in said other parts of said container are out of contact with said stirring member, and are subjected to movement of other meat sections, whereby to produce a continuous gentle massaging action on said meat sections, and a continual transfer of meat sections from said central portion of said container to said other portions, and back again, said gentle massaging action producing a gradual exudation of soluble protein material from said meat sections, and a gradual absorption of said further quantity of said pickling medium in said container by said meat sections, said exuded protein material rendering the contents of said container more viscous, and hence imposing a greater stirring load on said stirring member, and,

reducing the speed of rotation of said stirring member gradually in response to the increasing viscosity of said contents, while maintaining said torque constant, and continuing stirring at progressively reducing speed until substantially all said further liquid pickling medium is absorbed by said meat sections, and until said protein material is combined with said meat sections into a substantially homogeneous mass.

4,038,427

PROCESS FOR PREPARING A DRIED AGGLOMERATED CEREAL MIXTURE

Thom O. Martin, Battle Creek, Mich., assignor to General Foods Corporation, White Plains, N.Y.

Continuation-in-part of Ser. No. 457,687, April 3, 1974, abandoned. This application Mar. 31, 1975, Ser. No. 563,560

Int. Cl.^{2} A23L *1/18*

U.S. Cl. 426—285 **25 Claims**

1. Process for preparing a dried agglomerated cereal mixture which comprises mixing at least 25% by weight of amylaceous and proteinaceous bumped whole cereal grains, grain by-products of varying particle size and density and a quantity of flaked puffed gelatinized cereal grains having dextrinous surfaces and a lower particle density than the balance of said cereal mixture combined and adapted to receive on the surfaces thereof finer cereal mixture particles upon being wetted; causing a liquified fat to coat and be evenly distributed over the cereal mixture together with a saccharidal syrup having a D.E. of at least 5, continuously tumbling the coated cereal mixture particles until they aggregate to form a heterogeneous cluster of particles adhering around the discrete and separate puffed flakes; and thence drying the aggregates to produce an agglomerated cereal mixture.

4,038,428

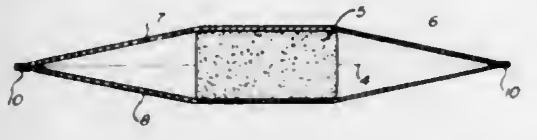
METHOD OF PACKAGING PIECRUST DOUGH

George B. Davis, Jr., 7512 Marbury Road, Bethesda, Md. 20034

Continuation-in-part of Ser. No. 498,575, Aug. 19, 1974, abandoned, which is a continuation-in-part of Ser. No. 404,869, Oct. 10, 1973, abandoned, which is a continuation-in-part of Ser. No. 307,535, Oct. 17, 1972, Pat. No. 3,819,316. This application Dec. 22, 1975, Ser. No. 643,483

Int. Cl.^{2} B65B *55/00*

U.S. Cl. 426—394 **55 Claims**



1. The method of packaging a prepared dough mass that is to be subsequently reshaped by rolling within its packaging receptacle into crust form, including the steps of depositing the prepared dough mass between two thinly formed sheets of flexible material within which at least one of the sheets includes a plurality of air venting ports sufficiently small as to allow the passage of air into and from the receptacle without allowing the viscus dough material extruding excessively from the receptacle through these ports during a normal dough rolling operation and during such time as relatively high pressures are applied to the dough within the receptacle, extending the sheets outwardly from the dough mass to bring the sheets together, securing the sheets together in spaced relation to the dough mass and along a plane extending substantially through the center of the dough mass to form a receptacle about said dough mass, removing substantially all air from within the receptacle to bring the inner surfaces of the receptacle together and closely about the dough mass, inclosing the assembled dough mass and receptacle within a closable container.

4,038,429

ENHANCING CHEESE FLAVOR IN FOODS WITH A DIKETO-PIPERAZINE

Alistair Y. Smith, Geneva; Paul Dietrich, Chene-Bourg, and Wilhelm Pickenhagen, Onex, all of Switzerland, assignors to Firmenich S.A., Geneva, Switzerland

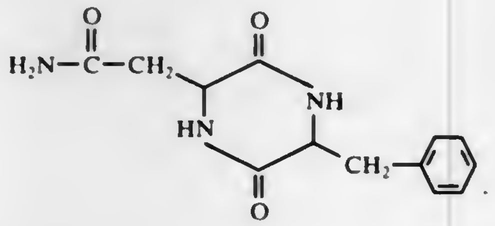
Filed June 28, 1976, Ser. No. 700,168

Claims priority, application Switzerland, July 2, 1975, 8589/75; Oct. 10, 1975, 13499/75

Int. Cl.^{2} A23L *1/226*

U.S. Cl. 426—537 **3 Claims**

1. A cheese, a cheese-imitating or a cheese-containing product having added thereto from about 10 to 200 ppm of a diketopiperazine of the formula



(I)

4,038,430

PROTECTION OF GLASS FROM AQUEOUS ATTACK

Cyril Francis Drake, Harlow, and Robert Walter James Amos, New Barnet, both of England, assignors to ITT Industries, Inc., New York, N.Y.

Filed Mar. 28, 1975, Ser. No. 563,025

Int. Cl.^{2} B05D *3/04*

U.S. Cl. 427—248 E **3 Claims**

1. A method of encapsulating a substrate in glass comprising the steps of:

applying a coating of lead borate glass onto a substrate;
introducing a stream of oxygen containing phosphorus pentoxide to the coated substrate; and
heating the coated substrate in the phosphorus pentoxide-containing oxygen stream to form a layer containing both boron and phosphate oxides on said lead borate glass.

4,038,431

PROTEIN TEXTURIZATION BY STEAM INJECTION

William M. Hildebolt, Mickleton, N.J., assignor to Campbell Soup Company, Camden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,612

Int. Cl.^{2} A23J *1/00*

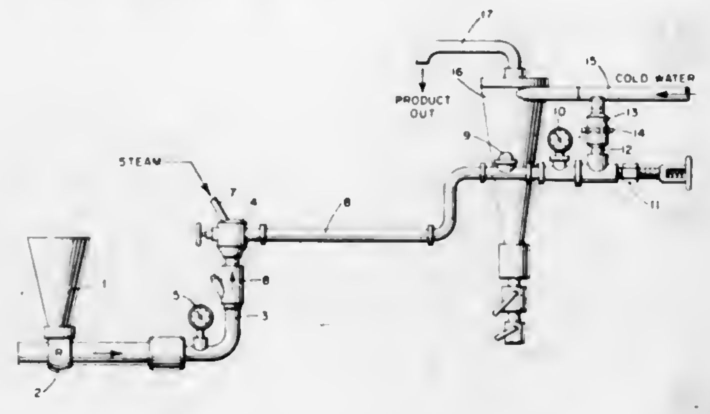
U.S. Cl. 426—511 **9 Claims**

1. A method for producing texturized protein material comprising:

a. mixing untextured protein material and water to form a slurry, said protein material containing at least 70% protein on a dry weight basis, said slurry containing about 40 to 50% solids;

b. injecting a heated gaseous stream into said slurry to propel said protein material into and through a confined treating zone, said heated gaseous stream being at a temperature sufficient to maintain the temperature in said confined zone in the range of about 310° to 350° F., whereby said protein material is rendered to a thermoplastic state and texturized during its passage through said confined zone;

c. transferring said texturized thermoplastic protein material out of the confined treating zone through a means for maintaining back pressure disposed at the discharge end of said confined zone, said means for maintaining back pressure maintaining a pressure of from about 60 to about 80 psi in said confined zone;



d. passing said texturized thermoplastic protein material through means for agglomerating and stretching said protein material, just after its passage through said means for maintaining back pressure; and

e. recovering said texturized protein product in a collection zone.

4,038,432

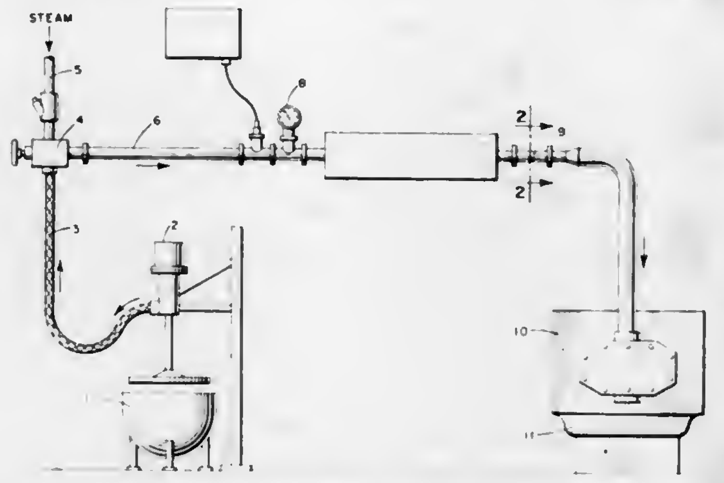
PROTEIN TEXTURIZATION BY STEAM INJECTION

William M. Hildebolt, Mickleton; Murray T. Hundt, Maple Shade, and Robert E. Small, Voorhees, all of N.J., assignors to Campbell Soup Company, Camden, N.J.

Filed Dec. 31, 1975, Ser. No. 645,556

Int. Cl.^{2} A23J *1/00*

U.S. Cl. 426—511 **14 Claims**



1. A method for producing texturized protein in the form of large diceable chunks, said method comprising:

a. mixing untextured protein material and water to form a slurry, said protein material containing at least 70% protein on a dry weight basis, said slurry containing about 40 to 50% solids;

b. injecting a heated gaseous stream into said slurry to propel the protein material into and through a confined treating zone, said heated gaseous stream being at a temperature sufficient to maintain the temperature in said confined zone in the range of about 310° to about 350° F., whereby said protein material is rendered to a thermoplastic state and texturized during its passage through said confined zone;

c. passing said thermoplastic protein material in said confined zone through means for agglomerating and stretching said protein material;

d. transferring said texturized thermoplastic protein material out of the confined treating zone through a means for maintaining back pressure disposed at the discharge end of said confined zone, said transferring effected just after the passage of said protein material through said means for agglomerating and stretching, said means for maintaining back pressure maintaining a pressure of from about 60 to about 80 psi in said confined zone, said means for maintaining back pressure further gently removing large diceable chunks of texturized thermoplastic protein material from said confined zone; and

e. recovering said large diceable chunks of texturized protein in a collection zone.

4,038,433

METHOD FOR PROCESSING SOFT VEGETABLE FOODSTUFFS INTO CRUMBS

Josef Manser, Uzwil, and Friedrich Egger, Niederuzwil, both of Switzerland, assignors to Gebrueder Bühler AG, Uzwil, Switzerland

Division of Ser. No. 600,112, July 29, 1975. This application Mar. 8, 1976, Ser. No. 664,804

Int. Cl.^{2} A23L *1/195, 1/100*

U.S. Cl. 426—615 **22 Claims**

1. A method of continuously processing soft and moist vegetable foodstuffs, particularly vegetables having a high moisture content, comprising the steps of subjecting the moist vegetables to a pronounced compressing, kneading and attendant first homogenizing action to form a mass of fragmentized vegetables; subsequently comminuting said mass including subdividing said mass into a plurality of smaller batches and severing the batches to form a plurality of fragments while homogenizing the fragmentized material by reforming the same into a continuous mass; and subsequently dividing the reformed continuous mass into discrete crumbs.

4,038,434

ANTIOXIDANT STABILIZED EDIBLE COMPOSITIONS

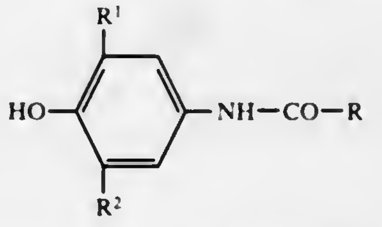
David W. Young, Homewood, Ill., assignor to Howard Hall & Company, Cos Cob, Conn.

Filed Mar. 12, 1976, Ser. No. 666,438

Int. Cl.^{2} A23L *3/34*

U.S. Cl. 426—544 **12 Claims**

1. A composition of matter normally subject to oxidative deterioration comprising an edible organic substance normally subject to oxidative deterioration selected from the group consisting of edible fats, fatty oils, fatty alcohols, fatty acids, and esters of fatty acids, and a minor amount effective as an antioxidant of an N-acyl-2,6-dialkyl-p-aminophenol of the formula



wherein R is hydrogen or an alkyl group having from 1 to about 6 carbon atom and R_1 and R_2 are alkyl groups having from about 4 to 8 carbon atoms and a tertiary α-carbon atom.

4,038,435

FLAVORING AGENT

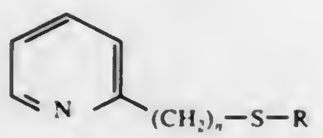
Max Winter, Petit-Lancy; Fritz Gautschi, Commugny; Ivon Flament, and Max Stoll, both of Petit-Lancy, all of Switzerland; Irving M. Goldman, Niantic, Conn., assignors to Firmenich & Cie, Geneva, Switzerland

Division of Ser. No. 243,866, April 13, 1972, abandoned, which is a division of Ser. No. 70,560, Sept. 8, 1970, Pat. No. 3,702,253, which is a continuation of Ser. No. 543,069, April 18, 1966, abandoned, which is a continuation-in-part of Ser. No. 452,342, April 30, 1965, abandoned. This application June 24, 1974, Ser. No. 482,819

Int. Cl.² A23L *1/234*

U.S. Cl. 426—535 67 Claims

1. A composition of matter consisting essentially of a sulfur-containing derivative of pyridine selected from the group of compounds having the general formula:



wherein, when *n* is *o*, R is acetyl; when *n* is 1, r is ethyl or acetyl; and, when *n* is 2, R is furfuryl.

4,038,436

MARGARINE-LIKE PRODUCT HAVING CONTROLLED BROWNING PROPERTIES

Thomas H. Smouse, Plano; James K. Maines, Dallas, and Robert R. Allen, Plano, all of Tex., assignors to Anderson, Clayton & Co., Houston, Tex.

Filed Dec. 21, 1972, Ser. No. 317,420

Int. Cl.² A23D *3/00*

U.S. Cl. 426—603 4 Claims

1. In a margarine-like product, the improvement comprising such product containing:

a. between about 0.20 and 0.63% by weight protein selected from a source which is the class consisting of complete milk protein and milk whey, and

b. less than about 2000 parts per million by weight of reducing sugar.

4,038,437

PROCESS FOR THE PRODUCTION OF A MODIFIED PLANT PROTEIN WITH IMPROVED COLOR AND FLAVOR

Keith L. Chandler, Algonquin; Roy G. Hyldon, Crystal Lake; Surinder Kumar, Buffalo Grove, and John P. O'Mahony, Crystal Lake, all of Ill., assignors to The Quaker Oats Company, Chicago, Ill.

Filed Apr. 26, 1976, Ser. No. 680,098

Int. Cl.² A23J *3/00*

U.S. Cl. 426—656 14 Claims

1. A process for producing a modified plant protein having thermoplastic and forming properties similar to casein and caseinate salts, said process comprising:

a. making an aqueous slurry of a plant protein material, said plant protein material containing steam volatile flavor components and at least about 30 percent by weight protein, said slurry having a solids content of from about 3 to about 18 percent by weight;

b. adjusting the pH of the aqueous slurry to a pH in the range of from about 7.0 to about 10.5 by addition thereto of an alkali metal carbonate;

c. reacting the alkali metal carbonate with the plant protein by heating the aqueous slurry to a temperature in the range of from 280° to 370° F. for from 2.5 to 5 minutes;

d. cooling the reacted protein slurry to a temperature below 130° F.;

e. adding from 0.3 percent to about 1.5 percent by weight peroxide to the slurry, said peroxide being a member selected from the group consisting of hydrogen peroxide, sodium peroxide, potassium peroxide, calcium peroxide, and magnesium peroxide;

f. mixing the peroxide containing slurry;

g. neutralizing the slurry to a pH within the range of from 6.6 to 7.0 by addition thereto of an edible acid;

h. thereafter, removing the steam volatile flavor components from the slurry by heating the slurry; and

i. drying the neutralized slurry until the moisture content is about 15 percent by weight moisture of lower.

4,038,438

METHOD OF COLORING SYNTHETIC FOOD CASINGS

Matiur Rahman, Champaign, and Harold R. Coleman, Danville, both of Ill., assignors to Tee-pak, Inc., Chicago, Ill.

Filed July 19, 1976, Ser. No. 706,854

Int. Cl.² A22C *13/00;* **A23L** *1/27;* **B05D** *3/02*

U.S. Cl. 427—385 R 5 Claims

1. In the process for the manufacture of synthetic food casing wherein a tubular casing is formed in the gel state and subsequently dried, the improvement which comprises impregnating the tubular casing, while in the gel state and prior to drying, with a colorant solution containing about 0.10 to about 3.0% by weight caramel and 0 to 5% by weight of a water dispersible cationic thermosetting resin for reaction with the caramel and then drying the casing to effect cross-linking and insolubilization of the caramel whereby permanent coloration is imparted to the casing.

4,038,439

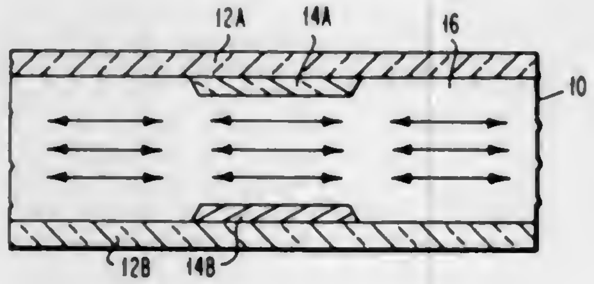
METHOD FOR PRODUCING SELECTED ALIGNMENT IN LIQUID CRYSTAL

Roy Morris Gibson, and Gerard John Sprokel, both of San Jose, Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 20, 1976, Ser. No. 724,439

Int. Cl.² B05D *3/06*

U.S. Cl. 427—38 14 Claims



1. A method for producing a surface suitable for forcing a selected alignment in a liquid crystal display cell comprising the steps of

forming free radicals in an r.f. plasma of one species taken from the group of oxygen free radicals and fluorine free radicals, and

exposing a substrate to said free radicals while said substrate is positioned away from said r.f. plasma to form said surface, said surface forcing a parallel alignment with said surface when only said oxygen free radicals are formed, said surface forcing a perpendicular alignment to said surface when said fluorine free radicals are formed.

4,038,440

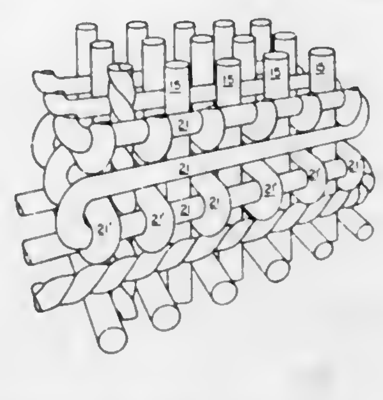
THREE DIMENSIONAL FABRIC MATERIAL

Robert W. King, Lexington, Mass., assignor to Avco Corporation, Wilmington, Mass.

Division of Ser. No. 220,510, Jan. 24, 1972, Pat. No. 4,001,478, which is a continuation of Ser. No. 675,367, Oct. 16, 1967, abandoned. This application July 19, 1976, Ser. No. 706,849

Int. Cl.² D06M *17/00*

U.S. Cl. 428—245 10 Claims



6. A three-dimensional material comprising:

a. a group of filaments oriented parallel to a given axis,

b. a second group of filaments arranged in a planar course, said filaments being woven into said oriented filaments at an angle to said axis,

c. a third group arranged in a plane which overlies and is contiguous with the plane of said second group of filaments, said third group filaments also being woven into said oriented filaments but at an angle to said second group filaments,

d. all of said filaments being sized and spaced relative to each other such that the filaments of each group are in close touching contact with the filaments of each other group, and

e. alternating such second and third groups of filaments in said manner to form a three-dimensional structure.

4,038,441

METHOD OF MANUFACTURING A LIQUID CRYSTAL DEVICE WITH PLANE ALIGNMENT

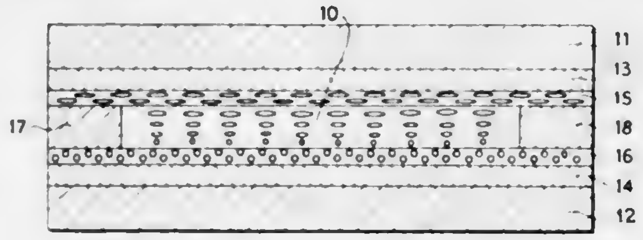
Jean Claude Dubois, Paris, France, assignor to Thomson-CSF, Paris, France

Continuation of Ser. No. 535,975, Dec. 23, 1974, abandoned. This application July 8, 1976, Ser. No. 703,661

Claims priority, application France, Dec. 23, 1973, 73.46955

Int. Cl.² G02F *1/16, 1/13*

U.S. Cl. 427—109 6 Claims



1. A method of manufacturing a liquid crystal device of plane alignment type, comprising the following steps:

A. the deposition upon two transparent substrates which exhibit two large faces, of a first layer of transparent, electrically conductive substance;

B. the treatment of at least one of said substrates in an enclosure made of vitreous silica, the general shape of which is that of a cylinder with a horizontal axis, said enclosure comprising a mounting arrangement along a generatrix of the cylinder, and having a horizontal surface accomodating said substrate, located at half the height of the internal space, said enclosure being surrounded at its central portion by a heater resistor; said treatment comprising the following operations:

a. by means of a tube supplied with a vapor of a liquid monomer selected in the group of methyl acrylate, methyl methacrylate, vinyl monomers, silanes, chlorosilanes and siloxanes, progressively replacing the air of said enclosure by said vapor;

b. adjusting the vapor flow in the enclosure for avoiding turbulence and regulating heating to a predetermined temperature for obtaining a polymer deposit onto said substrate;

c. the insertion of a liquid crystalline substance in the mesomorphous phase, between the two substrates in such a fashion that said polymer deposit is in contact with said crystalline substance.

4,038,442

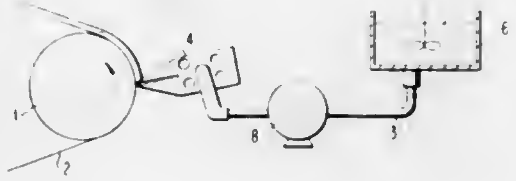
METHOD FOR COATING

Tadae Utumi, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed Sept. 16, 1975, Ser. No. 613,829

Int. Cl.² B05D *5/12, 3/12*

U.S. Cl. 427—128 3 Claims



1. A method for coating a thixotropic high viscosity liquid coating composition on a travelling web at a narrow width through an extrusion type hopper, comprising discharging the coating liquid from the hopper onto the travelling web through at least two coating liquid discharge ports arranged side by side in the direction of the width of the web so that the adjacent edges of the coating liquid discharge meet on the web, and drying the coated liquid within such time that a substantially flat cross sectional area results.

4,038,443

DUST ENTRAPMENT COMPOSITION AND METHOD THEREFOR

Charles H. Jacoby, Dalton, Pa., assignor to Alzona Incorporated, Asheville, N.C.

Division of Ser. No. 337,964, March 5, 1973, Pat. No. 3,896,039. This application May 1, 1975, Ser. No. 573,701

Int. Cl.² B05C *1/16*

U.S. Cl. 427—136 4 Claims

1. The method of entrapping dust particles in a mine working comprising coating the mine working surfaces with a first mixture consisting essentially of sodium chloride, clay and water to form a crust; then coating the formed crust with a second mixture consisting essentially of sodium chloride, water and a water soluble complex iron cyanide selected from the group consisting of alkali metal ferrocyanide salts, alkaline earth metal ferrocyanide salts, alkali metal ferricyanide salts, and alkaline earth metal ferricyanide salts.

4. The method of regenerating an already formed salt crust formed in a mine working comprising the step of spraying the salt crust with a saturated brine solution heated to an above-ambient temperature.

4,038,444

METHOD OF PRODUCING A METALLIC PLATING

Erwin Steinhauser, Heideweg 1, Diekholzen, and Hans Litwin, Bahnhofstrasse 29, Quackenbruck, both of Germany

Continuation-in-part of Ser. No. 345,886, March 29, 1973, abandoned. This application Sept. 30, 1974, Ser. No. 510,645

Claims priority, application Germany, Apr. 15, 1972, 2216275

Int. Cl.^{2} B05D *5/06, 3/12*

U.S. Cl. 427—261 **15 Claims**

1. A method of producing a metallic plating comprising the steps of applying to a substrate a settable pasty intimate mixture consisting of a matrix of an aqueous dispersion of a thermosetting synthetic resin binder and Portland cement, the matrix having a multitude of interstices in the interior thereof and metal particles filling the interstices and bound to the matrix, the binder completely surrounding the metal particles and the amount of the metal particles being sufficient to impart a metallic surface character to the applied layer after subsequently smoothing the surface thereof but insufficient to destroy the continuity of the binder, smoothing the surface of the applied mixture before the setting thereof until the metal particles on the surface of the applied layer are pressed together and practically form the entire surface of the layer and the applied layer is substantially dry to the touch, and subsequently permitting the layer to stand at ambient temperature to permit the resin and cement to set.

4,038,445

COATED PAPER

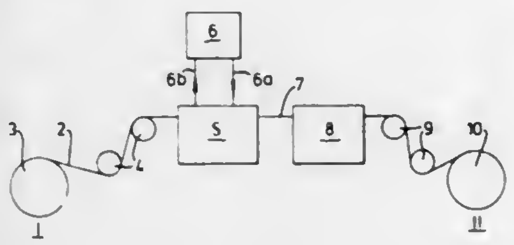
Neil George Douglas Robertson, Marlow Bottom, England, assignor to Wiggins Teape Limited, London, England

Filed June 26, 1975, Ser. No. 590,681

Claims priority, application United Kingdom, July 4, 1974, 29729/74

Int. Cl.^{2} B05D *3/12, 3/02*

U.S. Cl. 427—150 **8 Claims**



1. A method of coating a web of paper with pressure sensitive microcapsules containing a color forming material, for use in pressure sensitive copying systems, which method consists essentially of the following sequential steps:

a. forming in a mixing zone an aqueous coating composition containing dispersed therein said microcapsules, particulate stilt material of a size greater than that of the microcapsules and in an amount sufficient to protect said microcapsules against premature rupture, and a binder in an amount sufficient to enhance the adhesion of the microcapsules and the particulate stilt material to the web;

b. foaming said composition to impart to it a gas content of at least about 25% and a gas bubble size predominantly in the range of 10 to 100 μm;

c. applying said foamed composition to the web at a coating speed of at least about 250 m/min.;

d. metering the foamed composition on the web by means of a mechanical metering member which is in contact with the foamed coating composition on the web and smooths it to a uniform desired coatweight;

e. returning metered off coating composition to said mixing zone, and

f. drying the metered foamed coating composition on the web.

4,038,446

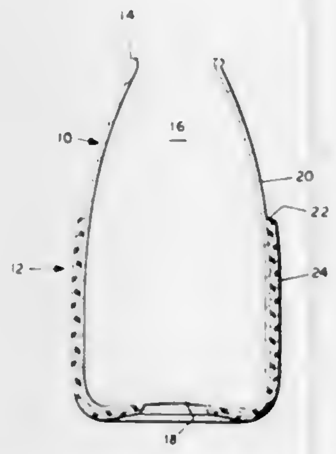
CONTAINER WITH IMPROVED HEAT SHRUNK CELLULAR SLEEVE

Roger R. Rhoads, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio

Filed Sept. 9, 1974, Ser. No. 504,111

Int. Cl.^{2} B65D *1/02*

U.S. Cl. 428—35 **22 Claims**



1. A heat shrinkable two layer sleeve shaped article having a major orientation circumferentially of said sleeve and adapted to be telescopically located about the sidewall of a container, and heat shrunk into snug engagement with said sidewall, said article comprising a composite structure consisting essentially of two layers, one of said layers consisting essentially of a closed cellular polyethylene layer and the other of said layers consisting essentially of a noncellular polyethylene layer in adhering contact with said cellular layer, said composite structure having been formed by blown bubble coextrusion with a blow up ratio of about 2:1 or less and having a machine direction heat shrinkage of at least 50% and a cross direction heat shrinkage of 20% or less, the heat shrinkage of said sleeve in the circumferential direction corresponding to the machine direction heat shrinkage and the heat shrinkage of said sleeve in the axial direction corresponding to the cross direction heat shrinkage, said polyethylene of said cellular and said non-cellular layer being independently selected from the group consisting of high density polyethylene, low density polyethylene, medium density polyethylene and blends thereof.

4,038,447

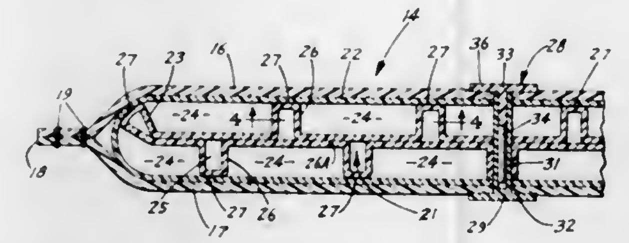
FLAME RESISTANT INSULATION BLANKET

Wayne C. Brock, 4120 Sunnyside Road, Minneapolis, Minn. 55424

Filed Feb. 5, 1976, Ser. No. 655,507

Int. Cl.^{2} B32B *3/00, 3/02*

U.S. Cl. 428—72 **22 Claims**



1. An insulation blanket for covering concrete comprising: an elongated generally flat and flexible core of insulating material, said core having a first sheet member and a second sheet member, said second sheet member having a plurality of cup-shaped portions and being secured to the first sheet member to define separate chambers containing a gas, cover means located around said core to confine the core within the cover means, said cover means including a first flexible sheet member located adjacent one side of the core and a second flexible sheet member located adjacent the other side of the core, said first and second sheet members of the cover means comprising flame resistant sheet material, connecting means attaching spaced portions of the outer peripheral edges of the first and second sheet members of the cover means together to enclose the core within the cover means, said first and second sheet members being unattached at their peripheries between said connecting means thereby allowing moisture and air to flow out from between the sheet members of the cover means between said connecting means, and a plurality of holding assemblies mounted on the first and second sheet members of the cover means and extended through said core for holding the core in a generally flat position between the first and second sheet members of the cover means.

4,038,448

COMPOSITE GLASS ARTICLES, SPONTANEOUS OPAL GLASS AND ENAMEL OF $\mathrm{Li_2\text{-}O\text{-}B_2\text{-}O_3\text{-}TiO_2\text{-}ZrO_2\text{-}PbO\text{-}SiO_2}$

David C. Boyd, Corning; Francis A. Cantaloupe, Horseheads; William H. Dumbaugh, Jr., Painted Post; James E. Flannery, Corning; Louis M. Holleran, Painted Post; Sylvester R. Sandor, and Dale R. Wexell, both of Corning, all of N.Y., assignors to Corning Glass Works, Corning, N.Y.

Filed June 4, 1976, Ser. No. 692,957

Int. Cl.^{2} B32B *7/02;* **C03C** *5/02*

U.S. Cl. 428—212 **11 Claims**

1. A composite article consisting of an opal glass body exhibiting a dense, milky-white appearance and an adherent enamel demonstrating high gloss and exceptional chemical durability, said opal glass consisting essentially, in weight percent on the oxide basis, of about 8–13% Na_2O, 5–9% Al_2O_3, 74–78% SiO_2, and 3.5–4.5% F as analyzed, and said enamel having a flux composition being essentially free from alkali metal oxides other than Li_2O and consisting essentially, in weight percent on the oxide basis, of about 0.5–3% Li_2O, 4–8% B_2O_3, 1–5% TiO_2, 3–8% ZrO_2, 45–55% PbO, and 28–38% SiO_2, wherein opal glass exhibits softening point in excess of 760° C., a strain point in excess of 490° C., and a coefficient of thermal expansion (0°–300° C.) of about $66\text{–}75 \times 10^{-7}$/° C, and wherein said enamel flux exhibits a coefficient of thermal expansion (25°–300° C.) about 3–10 points lower than that of said opal glass, a lead release after chemical attack of less than 2 μg/cm^2, and will fire to a high gloss in less than about ten minutes at temperatures below 720° C.

8. An enamel having a flux composition essentially free from alkali metal oxides other than Li_2O which exhibits a coefficient of thermal expansion (25°–300° C.) of about $57\text{–}70 \times 10^{-7}$/° C., a lead release after chemical attack of less than about 2 μg/cm^2, and will fire to a high gloss in less than about 10 minutes at temperatures below 720° C., said flux consisting essentially, in weight percent on the oxide basis, of about 0.5–3% Li_2O, 4–8% B_2O_3, 1–5% TiO_2, 3–8% ZrO_2, 45–55% PbO, and 28–38% SiO_2.

4,038,449

POLYPROPYLENE OR POLYMETHYLPENTENE FILM COATED WITH GRAFT UNDERCOAT MIXTURE AND VINYLIDENE CHLORIDE COPOLYMER TOP COATING

Koichi Uemura, Toyonaka; Tetsuo Ishihara, and Shigeyuki Takahashi, both of Amagasaki, all of Japan, assignors to Daicel, Ltd., Osaka, Japan

Filed Dec. 22, 1975, Ser. No. 643,371

Claims priority, application Japan, Dec. 27, 1974, 50-3633; Feb. 6, 1975, 50-15698

Int. Cl.^{2} B32B *31/00*

U.S. Cl. 428—220 **5 Claims**

1. A polypropylene or poly-4-methylpentene-1 film coated with

I. an undercoating consisting essentially of a mixture of
   a. a graft polymer of chlorinated polypropylene, as the backbone polymer, having grafted thereto from 2 to 30 percent by weight, based on the weight of the graft polymer, of either a chlorinated vinyl monomer or a styrene monomer,
   wherein said chlorinated polypropylene has a chlorine content of from 15 to 55 percent by weight and has an intrinsic viscosity of from 0.3 to 3.0 dl/g, wherein intrinsic viscosity is determined by measuring the viscosity of a solution of 0.2 to 0.5 percent by weight of said chlorinated polypropylene in decalin at 135° C, wherein said chlorinated vinyl monomer contains from 50 to 100 percent by weight of vinyl chloride, vinylidene chloride, or mixtures thereof, and the balance is a vinyl monomer or a mixture of vinyl monomers copolymerizable with vinyl chloride or vinylidene chloride, wherein said styrene monomer contains 50 to 100 percent by weight of styrene, or nucleus-substituted styrene, or α-hydrogen substituted styrene, or mixtures thereof, and the balance is a vinyl monomer or a mixture of vinyl monomers copolymerizable with said styrene monomer,
   b. acrylonitrile-butadiene rubber; wherein the weight ratio of *a/b* is from 95/5 to 5/95, and
   c. zero to 70 percent by weight of said chlorinated polypropylene, and,

II. a top coating consisting essentially of a vinylidene chloride copolymer containing from 80 to 95 weight percent of vinylidene chloride monomer units.

4,038,450

THIXOTROPIC AQUEOUS POLYIMIDE COMPOSITIONS

Maurice Balme, Sainte-Foy-les-Lyon; Jean Gattus, La Mulatiere, and Bernard Gerard, Lyon, all of France, assignors to Rhone-Poulenc S.A., Paris, France

Continuation of Ser. No. 190,815, Oct. 20, 1971, abandoned. This application Jan. 2, 1974, Ser. No. 429,881

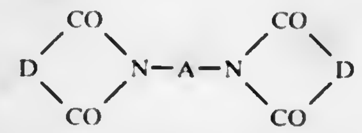
Claims priority, application France, Oct. 23, 1970, 70.38362; June 24, 1971, 71.23066

Int. Cl.^{2} C08G *69/00;* **B32B** *17/02*

U.S. Cl. 428—268 **16 Claims**

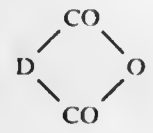
1. A storage-stable composition which consists essentially of a thixotropic solid suspension of:

a. a prepolymer having a particle size of less than 100 microns obtained by reacting, as the sole reactants, a N,N′-bis-imide of an unsaturated dicarboxylic acid of general formula:



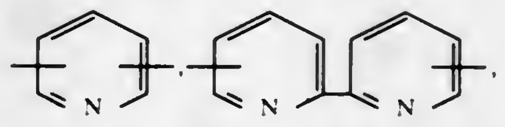
(I)

in which D represents a divalent organic radical containing a carbon-carbon double bond derived from an anhydride of an ethylenic dicarboxylic acid of general formula:



(III)

and A represents a linear or branched alkylene radical having less than 13 carbon atoms, a phenylene or cyclohexylene radical or a radical of formula:



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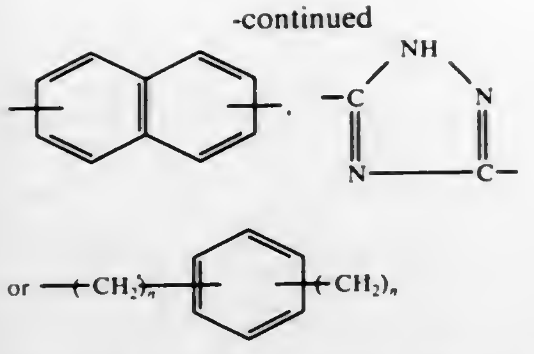


wherein *n* represents an integer of from 1 to 3, or several phenylene or cyclohexylene radicals linked to one another by a valency bond or an inert atom or group, and a polyamine of general formula:

$R(NH_2)_x$

in which *x* represents an integer at least equal to 2 and R represents an organic radical of valency *x* selected from a divalent radical as defined under A, a polyvalent benzene, naphthalene, pyridine or triazine radical or several benzene nuclei linked to one another by a valency bond or an inert atom or group, the bis-imide being used in an amount from 0.55 to 25 mols per mol of $—NH_2$ group introduced by the polyamine, suspended in:

b. water.

4,038,451

COMPOSITIONS COMPRISING POLYALKYLENEPOLYAMINES AND A MIXTURE OF MONO- AND DIAMMONIUM PHOSPHATES AS FIRE RETARDANTS FOR CELLULOSIC SUBSTRATES

Frederick L. Brown, Midland, Mich., and James L. Potter, Lake Jackson, Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed Sept. 29, 1975, Ser. No. 617,359

Int. Cl.^{2} B32B *7/00, 23/00*

U.S. Cl. 428—274 **10 Claims**

1. A composition comprising a polyalkylenepolyamine having a number average molecular weight between about 1,000 and about 100,000 and a mixture of monoammonium phosphate and diammonium phosphate.

7. A cellulosic textile containing the composition described by claim **1.**

4,038,452

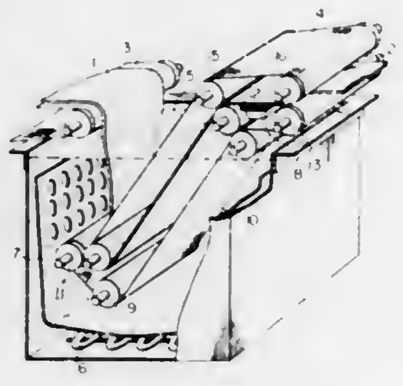
BULKY NON-WOVEN FABRIC

Tadahiro Kobayashi; Eiichi Wakita; Hideo Fukuda, and Yukio Matsubayashi, all of Fuji, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed May 7, 1975, Ser. No. 575,226

Int. Cl.^{2} D04H *13/00*

U.S. Cl. 428—224 **5 Claims**



1. A bulky non-woven fabric comprising (a) 50 to 95% by weight of spontaneously crimped acrylonitrile polymer fibers having lengths of 4mm to 20mm and at least 20 crimps per inch of length, said acrylonitrile polymer fibers consisting essentially of, in polymerized form, 80 to 100% by weight of acrylonitrile and 0 to 20% by weight of at least one copolymerizable monoethylenically unsaturated monomer, and (b) 5 to 50% by weight of fibrillated fibers of at least one acrylonitrile polymer, said acrylonitrile polymer comprising, in polymerized form, 60 to 98% by weight of acrylonitrile and 2 to 40% by weight of at least one copolymerizable monoethylenically unsaturated monomer having a carboxyl group or an amide or N-alkyl substituted amide group, said non-woven fabric being in the form of a web having a structure such that said spontaneously crimped acrylonitrile polymer fibers are entangled with each other and are caught in and adhere to the fibrils of said fibrillated acrylonitrile polymer fibers, and having an apparent density of 0.05 to 0.25 g/cm^3.

4,038,453

LEADER STRIP FOR MOTION PICTURE FILM

Thomas J. Loran, Boulder; Virgil R. Friebel, Longmont, and Robert P. Pardee, Boulder, all of Colo., assignors to Ball Brothers Research Corporation, Boulder, Colo.

Filed Sept. 15, 1975, Ser. No. 613,719

Int. Cl.^{2} B32B *27/14, 5/16*

U.S. Cl. 428—325 **2 Claims**

1. A leader strip for motion picture film capable of removing gum or accumulation of materials deposited upon motion picture equipment, consisting of a flexible strip capable of being passed through an apparatus having a mechanism for moving motion picture film therethrough, said strip being made of a composition selected from the group consisting of cellulose esters and polyesters, said strip having bonded upon at least one surface thereof a gum-removing layer, said layer comprising an organic binder, said organic binder being a member selected from the group consisting of cellulose nitrate, cellulose acetate, cellulose acetate-butyrate, cellulose acetate-propionate, polyurethanes, polyacrylonitriles, copolymers of acrylonitrile and vinylidene chloride, epoxy resins and mixtures thereof, and a gum-shearing agent of finely divided polymeric particles evenly dispersed and anchored to the surface by said binder, said polymeric particles being a member selected from the group consisting of polyesters, polyamides, polyimides, and polyolefins, said particles having a diameter less than about five mils and being substantially spheroidal in shape wherein said gum-shearing agent is about 0.1 to about 10 percent by weight of the total gum removing layer and the thickness of said gum removing layer is in the range of about 1 to 1.5 mils.

4,038,454

PRESSURE SENSITIVE ADHESIVE COATED SHEET MATERIAL

G. W. Horst Lehmann, and H. A. Julius Curts, both of Hamburg, Germany, assignors to Beiersdorf Aktiengesellschaft, Hamburg, Germany

Continuation of Ser. No. 315,990, Dec. 18, 1972, abandoned, which is a continuation of Ser. No. 85,762, Oct. 30, 1970, abandoned, which is a division of Ser. No. 8,033, Feb. 2, 1970, Pat. No. 3,563,953, which is a continuation-in-part of Ser. No. 549,468, May 12, 1966, abandoned. This application Sept. 16, 1974, Ser. No. 505,999

Claims priority, application Germany, May 19, 1966, 82010

Int. Cl.^{2} C09J *7/04;* C08L *33/08*

U.S. Cl. 428—356 **6 Claims**

1. A pressure-sensitive adhesive-coated sheet material cured in the presence of from 0.05 to 5% of zinc chloride at 60°-100° C., which is resistant to the action of solvents, heat and weather and which at the same time possesses good "quick-stick" properties, comprising a flexible backing having bonded thereto a pressure-sensitive adhesive material in the form of a cured coating of a copolymer having a K-value of from 82 to about 100 (determined from a 1% solution of the copolymer in toluene) said copolymer obtained by solution polymerization being a copolymer of monomers consisting essentially of:

a. 100 parts by weight of a mixture composed of approximately equal parts of 2-ethylhexyl acrylate and n-butyl acrylate, and

b. between 0.25 and 4 parts by weight of at least one ethylenically unsaturated monomer selected from the group consisting of glycidyl acrylate and glycidyl methacrylate, said percentage of zinc chloride being based on the weight of the copolymer.

4,038,455

PROCESS FOR IMPROVING THE ADHESION OF POLY-1,3,4-OXADIAZOLE FILAMENTS TO RUBBER

Matthias Johann Wampetich, Chur, Crisons, Switzerland, assignor to Inventa AG fur Forschung und Patentverwertung, Zurich, Switzerland

Filed Apr. 28, 1975, Ser. No. 572,103

Claims priority, application Switzerland, May 13, 1974, 6477/74

Int. Cl.^{2} C08G *33/04;* C09J *3/12*

U.S. Cl. 428—378 **17 Claims**

1. A process for the improvement of adhesion to rubber of aromatic poly-1,3,4-oxadiazole filaments which process comprises applying to said filaments at least one adhesion agent taken from the class consisting of compounds having at least one N-glycidyl group, and fixing said agent on said filaments.

4,038,456

AZIDO-SILANE COMPOSITIONS

James Glenn Marsden, Amawalk, and Peter Joseph Orenski, Ossining, both of N.Y., assignors to Union Carbide Corporation, New York, N.Y.

Division of Ser. No. 483,365, June 26, 1974, Pat. No. 3,944,574. This application Oct. 28, 1975, Ser. No. 626,041

Int. Cl.^{2} B32B *9/00*

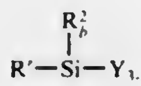
U.S. Cl. 428—391 **15 Claims**

1. An article of manufacture comprising a material selected from the group consisting of siliceous materials, metals, metal oxides and organic polymers coated with a solubilized azido-containing silane composition of matter produced by a process which comprises reacting in the presence of a non-aqueous solvent

a. An azido-containing carboxylic acid halide of the formula

$(N_3X)_a—Ar—(R)_n—COHal$

wherein X is a radical selected from the group consisting of sulfonyl and formyl radicals, a is an integer of from 1 to 2, Ar is an aryl radical, R is a divalent akylene radical having from 1 to 17 atoms, wherein *n* has a value of 0 or 1; and Hal represents a halogen radical, with (b) an amino-containing silane having the formula



$$\begin{array}{c} \quad R^2_b \\ \quad | \\ R'—Si—Y_{3-b} \end{array}$$

wherein R^2 is a monovalent hydrocarbon radical, *b* has a value of 0 to 2, Y is a hydrolyzable group selected from the class consisting of alkoxy and aryloxy radicals and wherein R' is an organic radical directly bonded to the silicon atom of said silane through a carbon to silicon bond, said organic radical further containing at least one nitrogen atom which has a hydrogen atom bonded directly to it, said solvent being present in an amount sufficient to solubilize the azido-containing silane product of (a) and (b).

4,038,457

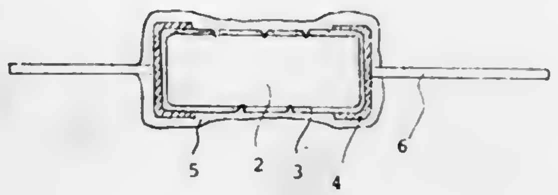
FUSIBLE METAL FILM RESISTOR

Terukazu Kinugasa, Hirakata, and Hyogo Hirohata, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Japan

Filed Feb. 12, 1976, Ser. No. 657,627

Int. Cl.^{2} B32B *9/04*

U.S. Cl. 428—411 **8 Claims**



1. A fusible metal film resistor comprising a substrate of an electrically insulating material and a resistive film formed on said substrate, said resistive film consisting essentially of nickel, 4 to 12 weight % of phosphorus, and 0.05 to 10 weight % of at least one member selected from the group consisting of iron, tin, manganese and bismuth.

8. A fusible metal film resistor according to claim **1** wherein said substrate is ceramic or glass.

4,038,458

ZINC-AIR ELECTROCHEMICAL CELL

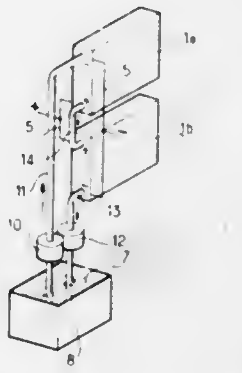
Jean Jacquelin, Marolles en Hurepoix, France, assignor to Compagnie Generale d'Electricite S.A., Paris Cedex, France

Filed Jan. 12, 1976, Ser. No. 648,233

Claims priority, application France, Jan. 14, 1975, 75.00966

Int. Cl.^{2} H01M *8/04*

U.S. Cl. 429—15 **8 Claims**



1. An electrochemical cell of the type comprising several elements fed with an electrolyte solution comprising an active material in suspension and more particularly zinc powder, conveyed by forced flow in the said elements, those elements being grouped together into modules and electrically connected together in series and fed said solution in series within each of the said modules, said electrochemical cell including at least one unitary cell block comprising two substantially identical modules arranged one above the other, electrically interconnected in parallel the module situated at the upper level receiving said electrolytic solution at the input of its upper element, said solution after having passed through the said module situated at the upper level being transferred to the input of the upper element of the second module situated at the lower level and lastly flowing out from that second module after having passed through the latter through the output of its lower element.

4,038,459

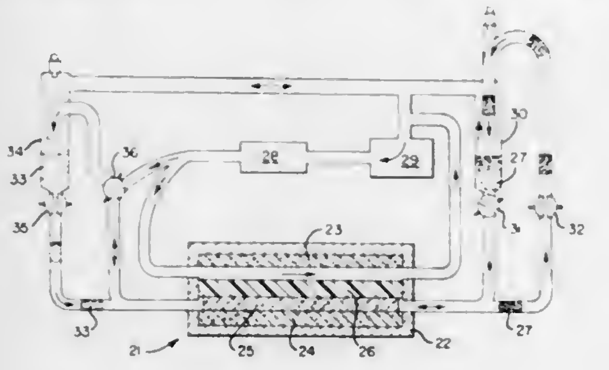
HALOGEN COMPLEXING ALCOHOLS AND NITRILES

Alfred M. Ajami, Boston; Fraser M. Walsh, Arlington, and Dennis N. Crouse, Melrose, all of Mass., assignors to Eco-Control, Inc., Cambridge, Mass.

Filed Mar. 17, 1976, Ser. No. 667,590

Int. Cl.^{2} H01M ***8/08, 4/60***

U.S. Cl. 429—15 **24 Claims**



1. A process for improving the performance of current delivering electrochemical systems of the type which utilize a substance selected from the group consisting of bromine, chlorine, iodine, polyhalogen complexes, and mixtures thereof as its electrochemically active agent, said process comprising adding to the electrolyte of said system an additive comprising an alcohol or nitrile, which exists as a relatively insoluble liquid in aqueous metal halide solutions at 30° C in the presence of one and more than one molar equivalent of halogen for every alcohol or cyano group in the additive, said additive being selected from the group consisting of compounds having the formulae:

$Z(-R-CN)_m$

$Z(-R-OH)_m$

where R is an aliphatic group containing 1 to 8 carbon atoms, *m* is a number from 1 to 6, and Z is any chemical functionality which does not render the additive's halogen complex crystalline at 30° C.

4,038,460

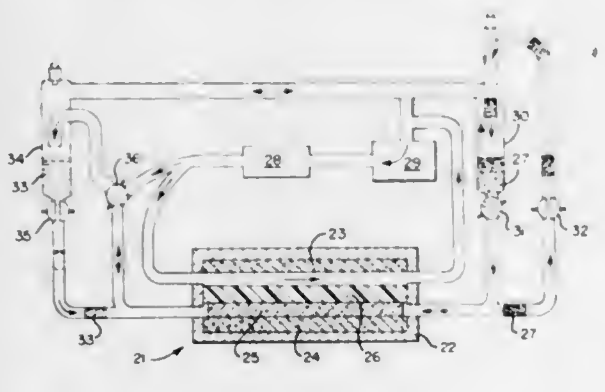
HALOGEN COMPLEXING ETHERS

Fraser M. Walsh, Arlington; Dennis N. Crouse, Melrose, and Alfred M. Ajami, Boston, all of Mass., assignors to Eco-Control, Inc., Cambridge, Mass.

Filed Mar. 17, 1976, Ser. No. 667,685

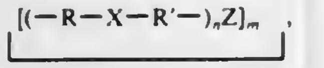
Int. Cl.^{2} H01M ***8/08, 4/60***

U.S. Cl. 429—15 **23 Claims**



1. A process for improving the performance of current delivering electrochemical systems of the type which utilize a substance selected from the group consisting of bromine, chlorine, iodine, polyhalogen complexes, and mixtures thereof as its electrochemically active agent, said process comprising adding to the electrolyte of said system an ether additive which exists as an insoluble liquid in aqueous metal halide solutions at 30° C in the presence of one or more molar equivalents of halogen per ether oxygen in the ether, said additive being selected from the group consisting of compounds aving the formulae:

a. $(R\text{-}X\text{-}R')_m Z$;
b. $Z(\text{-}R\text{-}X\text{-}R'\text{-})_n Z'$;
c. $Z'(\text{-}R\text{-}X\text{-}R'\text{-})_n Z(\text{-}R\text{-}X\text{-}R'\text{-})_{n'} Z(\text{-}R\text{-}X\text{-}R'\text{-})_{n''} Z'$;
d. $Z[(\text{-}R\text{-}X\text{-}R'\text{-})_n Z']_m$; and



$$[(-R-X-R'-)_n Z]_m \quad , \qquad e)$$

where R may equal R', Z may equal Z', R and R' are aliphatic groups containing 1 to 8 carbon atoms, *n*, *n'*, and *n''* are numbers from 1 to 100, *m* is a number from 1 to 6, Z and Z' are chemical groups which do not render the additive's halogen complex crystalline at 30° C and are incpable of substantial irreversible combination with bromine, chlorine, or iodine, and X is selected from the group consisting of an oxygen atom, H-C-OR'', R'''-C-OR'', and combinations thereof, wherein R'' and R''' are aliphatic groups containing 1 to 6 carbon atoms.

4,038,461

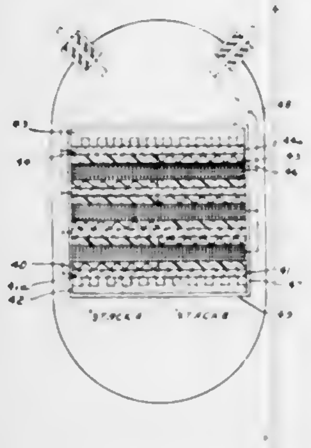
ELECTROCHEMICAL CELL HAVING BALANCED DISTRIBUTION OF OXYGEN AND ELECTROLYTE

Don R. Warnock, Centerville, Ohio, assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Jan. 28, 1976, Ser. No. 652,954

Int. Cl.^{2} H01M ***8/04***

U.S. Cl. 429—21 **4 Claims**



1. An improved electrochemical cell having a plurality of anodes, cathodes, electrolyte reservoirs, separators, gas flow spaces, and an electrolyte, in a sealed gas containing enclosure with the anodes electrically connected to a negative terminal and the cathodes connected to a positive terminal, the said improvement comprising:

a. a plurality of circular disc anodes having opposing faces;
b. a plurality of circular disc cathodes having opposing faces;
c. a plurality of circular disc electrolyte reservoirs;
d. a plurality of semicircular half-disc separators having opposing faces;
e. a plurality of semicircular half-disc gas flow spaces having opposing faces;
f. means for pairing and positioning each of the said plurality of semicircular separators and the said semicircular gas flow spaces in one-to-one relationship to provide a plurality of circular disc separator-flow space elements;
g. means for stacking the said circular elements in the consecutive repetitive order of anode, separator-flow space, cathode, separator-flow space, and repeat, the said stack having an anode at the top and bottom of the stack, and the elements arranged such that approximately one-half of each of the said faces of each cathode is adjacent to a separator face and the other half of each of the said cathode faces is adjacent to a gas flow space such that the area of each cathode face adjacent to the said separator face is opposite (through the cathode) the area of the said cathode face which is adjacent to the said gas flow space face, and approximately one-half of each of the said faces of each anode is positioned adjacent to a said separator face and the other half of each of the said anode faces is adjacent to a said gas flow face, such that each said separator has an adjacent anode face and an adjacent cathode face opposite each other across the separator;
h. means for positioning the said electrolyte reservoirs at the top and bottom ends of the said stack adjacent the said anodes; and
i. an electrolyte entrainment barrier comprising a porous hydrophabic plastic membrane enclosing and contacting said stack.

4,038,462

SOLID-ELECTROLYTE BATTERY, PARTICULARLY FOR THE STORAGE OF ELECTRICAL ENERGY

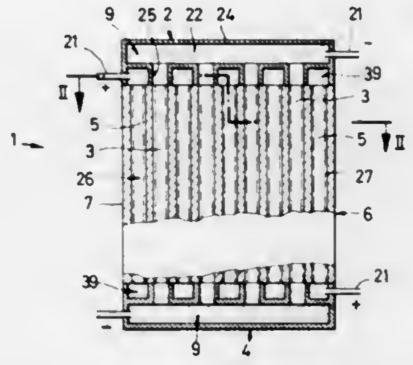
Franz-Josef Rohr, Abtsteinach, Germany, assignor to BBC Brown Boveri & Company Limited, Mannheim, Germany

Filed Mar. 29, 1976, Ser. No. 671,335

Claims priority, application Germany, Mar. 27, 1975, 2513649

Int. Cl.^{2} H01M ***6/18***

U.S. Cl. 429—30 **8 Claims**



1. Solid-electrolyte battery for the storage of electric power with a large number of anode and cathode spaces forming electrode spaces arranged parallelly in straight channels attached to collecting spaces and alternately disposed in an ion conducting body of solid electrolyte so that the electrode spaces have adjacent electrode spaces of opposite polarity wherein the anode spaces comprise a first set of hollow recesses in the body of the solid electrolyte forming anode channels closed at one end and open at the other end to a first collecting space disposed in the body of the solid electrolyte and the cathode spaces comprise a second set of hollow recesses in the body of the solid electrolyte forming cathode channels closed at one end and open at the other end to a second collecting space disposed in the body of the solid electrolyte, the first and second collecting spaces having a locking lid.

4,038,463

ELECTRODE RESERVOIR FOR A FUEL CELL

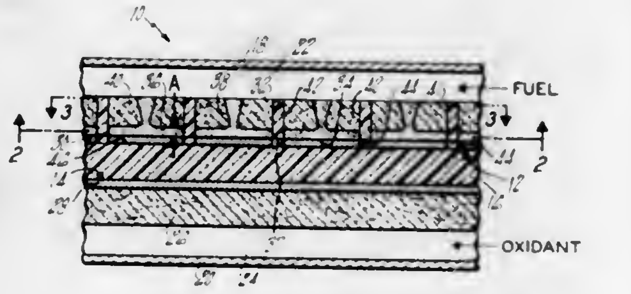
John H. Lamarine, Coventry; Robert C. Stewart, Jr., Granby, and Raymond W. Vine, Bolton, all of Conn., assignors to United Technologies Corporation, Hartford, Conn.

Filed Sept. 1, 1976, Ser. No. 719,875

Int. Cl.^{2} H01M ***8/02***

U.S. Cl. 429—44 **17 Claims**

1. An electrolyte reservoir layer for use adjacent the catalyst layer of a fuel cell, said reservoir layer being porous and including a catalyst facing surface and a noncatalyst facing surface, said catalyst facing surface including first impregnations of hydrophobic material to a shallow depth over a major portion of its area, said catalyst facing surface also including uniformly distributed areas not impregnated with hydrophobic material, said reservoir layer also including uniformly distributed nonelectrolyte retaining portions leading from said noncatalyst facing surface to said impregnations of hydrophobic material at said other surface, said nonelectrolyte retaining portions comprising only a small portion of the volume of said reservoir layer, said reservoir layer being hydrophilic in all portions other than said nonelectrolyte retaining portions and said first impregnations, said reservoir layer also including impregnations of an electrolyte retaining matrix material extending from said areas of said catalyst facing surface not impregnated with hydrophobic material into said hydrophilic portions, said matrix material impregnating less than half of said hydrophilic portions.



4,038,464

SODIUM-SULFUR BATTERY AND PROCESS FOR ITS PRODUCTION

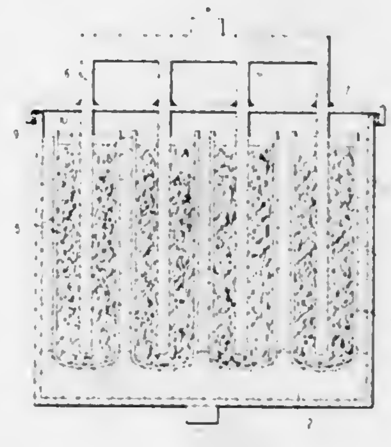
Werner Baukal, Ringstrasse 1, 6242 Kronberg; Reinhard Knodler, Vorstadt 27, 6239 Diedenbergen, and Wolfgang Hermann Kuhn, Oberhochstadter Weg 13, 6 Frankfurt am Main, all of Germany

Filed Nov. 26, 1975, Ser. No. 635,657

Claims priority, application Germany, Nov. 27, 1974, 2456018; Nov. 27, 1974, 2456021

Int. Cl.^{2} H01M ***10/04***

U.S. Cl. 429—104 **7 Claims**



1. A rechargeable galvanic battery which is comprised of liquid sodium, as the negative electro-chemically active material, liquid sulfur, as the positive electro-chemically active material, and a ceramic solid electrolyte, which is capable of conducting sodium ions, said sodium being completely absorbed in a fine-pored metal felt or mat and said sulfur being completely absorbed in a graphite felt or mat, said metal felt having open pores which face toward said solid electrolyte, the pore structure of said metal felt being undisturbed even in the transition area between said metal felt and said solid electrolyte, said metal felt filling the entire anode space of said battery, and, at least at the operating temperature of said battery, an intimate contact over a large surface area existing between said metal felt and said solid electrolyte and the maximum distance between said metal felt and said solid electrolyte being in the order of the magnitude of said pore width of said metal felt.

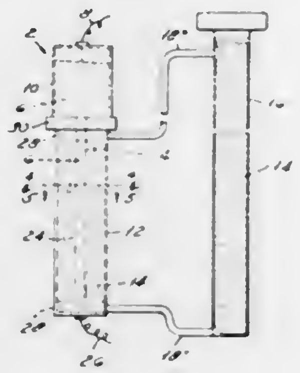
4,038,465
SODIUM SULFUR BATTERY OR CELL WITH EXTERNAL STORAGE

Frank A. Ludwig, Southfield, and Steven A. Weiner, Farmington Hills, both of Mich., assignors to Ford Motor Company, Dearborn, Mich.

Filed Nov. 11, 1975, Ser. No. 630,876

Int. Cl.² H01M *4/36*

U.S. Cl. 429—104 **23 Claims**



1. A secondary battery or cell comprising:

A. One or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;

B. One or more cathodic reaction zones containing (1) a cathodic reactant comprising a liquid electrolyte which is electrochemically reversibly reactive with said anodic reactant and which, when said cell or battery is at least partially discharged, is selected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two-phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant and (2) an electrode in contact with said liquid electrolyte;

C. One or more cation-permeable barriers to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones, said electrode being in electrical contact with both said cation-permeable barrier and said external circuit;

D. One or more storage zones for said liquid electrolyte separate from said one or more cathodic reaction zones but connected thereto; and

E. Means for flowing said liquid electrolyte by free convective flow from at least one of said storage zones, through said one or more cathodic reaction zones, and out of said cathodic reaction zones to at least one of said storage zones.

16. A secondary battery or cell comprising:

A. One or more anodic reaction zones containing a molten alkali metal reactant-anode in electrical contact with an external circuit;

B. One or more cathodic reaction zones containing (1) a cathodic reactant comprising a liquid electrolyte which is electrochemically reversibly reactive with said anodic reactant and which, when said cell or battery is at least partially discharged, is elected from the group consisting of (i) a single phase composition comprising molten polysulfide salts of said anodic reactant and (ii) a two-phase composition comprising molten sulfur and molten sulfur saturated polysulfide salts of said anodic reactant and (2) an electrode in contact with said liquid electrolyte;

C. One or more cation-permeable barriers to mass liquid transfer interposed between and in contact with said anodic and cathodic reaction zones, said electrode being in electrical contact with both said cation-permeable barrier and said external circuit;

D. Two or more storage zones for said liquid electrolyte separate from said one or more cathodic reaction zones but connected thereto; and

E. Means for flowing said liquid electrolyte from at least one of said storage zones through said one or more cathodic reaction zones and out of said cathodic reaction zones to at least one of said storage zones, said means comprising 1) at least two conduits connecting at least two of said storage zones with said one or more cathodic reaction zones and 2) means for adjusting pressure on said liquid electrolyte within such storage zones so as to induce reciprocating flow between said storage zones and through said one or more cathodic reaction zones.

4,038,466
METHOD OF PRODUCING THICKENED ELECTROLYTE FOR PRIMARY CELL

Leonid Lavrentievich Belyshev, ulitsa Akademika Komarova, 19a, kv. 52; Albert Vladimirovich Chuvpilo, ulitsa Novo-Alexeevskaya, 48, korpus 37, kv. 281; Valentina Vladimirovna Trizno, ulitsa Bazhova, 15, korpus 1, kv. 215; Viktor Arsenievich Naumenko, ulitsa Novo-Axexeevskaya, 48, korpus 37, kv. 28; Lidia Fedorovna Penkova, 3 Mytischinskaya ulitsa, 14, kv. 124, all of Moscow; Veniamin Ivanovich Gorokhov, ulitsa 2 Novo-Proletarskaya, 1, kv. 4, Moskovskaya oblast Pushkinsky raion, poselok Pravdinsky; Evgenia Grigorievna Apirina, ulitsa Botanicheskaya, 17, kv. 7, Moscow, and Sarra Abramovna Gantman, ulitsa B. Rupasovskaya, 15, korpus 16, kv. 17, Mytischi Moskovskoi oblasti, all of U.S.S.R.

Filed Aug. 27, 1975, Ser. No. 608,201

Int. Cl.² H01M *6/22*

U.S. Cl. 429—190 **5 Claims**

1. A method of producing a thickened electrolyte for a primary cell, comprising the steps of:

a. mixing, at room temperature, aqueous solutions of calcium chloride, zinc chloride, and ammonium chloride with chromium sulphate and starch;

b. aging the resulting mixture until a thickened electrolyte having a compressive strength of 0.05–0.85 kg/cm² is formed; and

c. pressing said thickened electrolyte through at least one drawhole at a rate of at least 0.05 m/sec, the resulting viscosity of said electrolyte being sufficient for the application of a layer of said thickened electrolyte to the negative electrode of said cell.

4,038,467
GALVANIC CELL

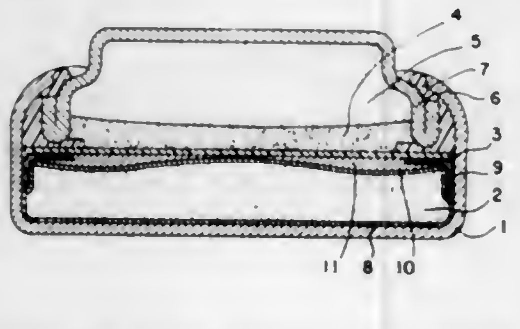
Hans-Martin Lippold, Glashutten, and Dieter Spahrbier, Fischbach, Taunus, both of Germany, assignors to Varta Batterie Aktiengesellschaft, Hannover, Germany

Filed Feb. 5, 1976, Ser. No. 655,485

Claims priority, application Germany, Feb. 15, 1975, 2506399

Int. Cl.² H01M *6/02*

U.S. Cl. 429—219 **13 Claims**



1. A galvanic cell having a negative zinc electrode, a positive electrode of bivalent silver oxide, and alkaline electrolyte, and a positive current take-off connector, said cell being characterized in that:

the positive electrode has a surface reduced from bivalent silver oxide to univalent silver oxide so that the cell has the discharge potential of the Ag_2O/Zn-system;

an electrically non-conducting plastic layer is positioned to insulate the bivalent silver oxide from the positive current take-off connector; and

a porous silver layer is positioned to provide electrical contact between the bivalent silver oxide and the connector,

said porous layer facing the counter electrode and being connected via a porous layer of the univalent silver oxide with the bivalent silver oxide.

4,038,468
PHOTOSENSITIVE POLYMERIC MATERIAL AND ELECTROPHOTOMETRIC MATERIAL AND METHODS OF MANUFACTURING SAME

Ekaterina Egorovna Sirotkina, prospekt Lenina, 87, kv. 6; Vadim Petrovich Lopatinsky, prospekt Lenina, 43, kv. 10a; Viktor Dmitrievich Filimonov, ulitsa Usova, 25b, kv. 9; Rita Moiseevna Kogan, ulitsa Vershinina, 37, kv. 205; Vyacheslav Dmitrievich Pirogov, Studgorodok, 2, kv. 8; Sofya Ivanovna Kudinova, Komsomolsky prospekt, 39/2, kv. 6; Ljubov Sergeevna Sizova, ulitsa Osipenko, 31, kv. 215; Svetlana Stepanovna Reznikova, ulitsa Usova, 11a, kv. 109; Georgy Nikolaevich Ivanov, prospekt Kirova, 1, kv. 3a; Nina Alexandrovna Tsekhanovskaya, poselok Sputnik 8, kv. 316, all of Tomsk; Jonas-Donatos Bronyaus Sidaravichus, ulitsa R. Charno, 1, kv. 48, Vilnjus; Larisa Vasilievna Randina, prospekt Lenina, 30, Tomsk; Svetlana Leonidovna Bocharova, prospekt Lenina, 30, Tomsk; Galina Petrovna Gulyaeva, prospekt Lenina, 30, Tomsk; Raisa Ivanovna Bondarenko, prospekt Lenina, 30, Tomsk; Galina Ivanovna Rybalko, ulitsa Zhirmanu, 20, kv. 82, Vilnjus, and Yanina Antono Adomanite, ulitsa Antokalne, 96, kv. 75, Vilnjus, all of U.S.S.R.

Division of Ser. No. 307,224, Nov. 16, 1972, abandoned. This application Aug. 6, 1975, Ser. No. 602,524

Int. Cl.² C08F *126/06*

U.S. Cl. 526—11.1 **5 Claims**

1. A method for preparing a poly-N-vinyl heterocyclic secondary amine comprising reacting in a medium of an organic solvent a heterocyclic secondary amine selected from the group consisiting of phenothiazine, phenoxazine, indole, carbazole and the chloro, bromo, methyl, nitro and acetyl derivatives of carbazole with a vinyl ether selected from the group consisting of vinyl methyl, vinyl ethyl, vinyl propyl and vinyl butyl ethers in the presence of a strong acid.

4,038,469
AQUEOUS INSOLUBLE POLYMERS CONTAINING A PLURALITY OF DIAZOMETHYLENE GROUPS

Derek Walker, Windermere, and Philip Howard Chapman, Ulverston, both of England, assignors to Glaxo Laboratories Limited, Greenford, England

Filed July 30, 1974, Ser. No. 493,051

Claims priority, application United Kingdom, July 31, 1973, 36384/73

Int. Cl.² C08F *210/00;* **C08C** *19/22, 19/12;* **C08G** *2/00*

U.S. Cl. 526—19 **5 Claims**

1. An aqueous insoluble polymer possessing a plurality of diazomethylene groups wherein each diazomethylene group either forms part of the polymer backbone chain or forms part of a side chain attached to the polymer backbone chain in which case one of the valencies of each diazomethylene group is linked to the polymer backbone chain and the other valency is bonded to an organic substituting group selected from the group consisting of (i) alkyl containing 1–20 carbon atoms, (ii) cycloalkyl containing 5–7 carbon atoms, (iii) aryl, (iv) aralkyl containing 1–6 carbon atoms in the alkyl portion, (v) 5- or 6-membered heterocyclic rings containing one or more hetero atoms selected from O, N and S, (vi) alkyl of 1–6 carbon atoms substituted by a heterocyclic ring as defined in (v), (vii) alkenyl of up to 6 carbon atoms, (viii) cycloalkenyl of 5–7 (ix) alkenyl of up to 6 carbon atoms substituted by aryl or a heterocyclic ring as defined in (v) or any of groups (i)–(ix) substituted by one or more halogen atoms, cyano, nitro, sulphone, oxo, esterified carboxy, C_{1-6} alkyl, or C_{1-6} alkoxy groups.

4,038,470
METHOD FOR PREPARATION OF POLYMERS WHICH CONTAIN N-ACYLLACTAM GROUPS

Jaroslav Stehlicek, and Jan Sebenda, both of Prague, Czechoslovakia, assignors to Ceskoslovenska akademie ved, Prague, Czechoslovakia

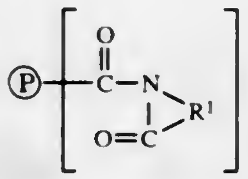
Filed Mar. 18, 1976, Ser. No. 667,943

Claims priority, application Czechoslovakia, Mar. 20, 1975, 1901/75

Int. Cl.² C08F *8/00, 8/18, 8/26, 8/40*

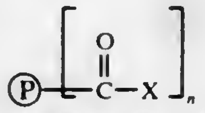
U.S. Cl. 526—29 **4 Claims**

1. Method for preparation of polymers containing N-acyllactam groups of the general formula I



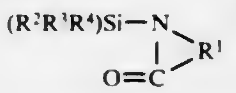
(I)

where R^1 is a bifunctional aliphatic hydrocarbon residue containing 2 to 15 carbon atoms, which may be linear or branched n is an integer and Ⓟ is a n-functional polymeric residue, which may be linear, branched or can form the part of a threedimensional network, wherein the polymers containing acyl halide groups of the general formula II



$$Ⓟ\!-\!\left[\overset{O}{\overset{\|}{C}}-X\right]_n \qquad (II)$$

where n and Ⓟ have the above given meaning and X is Cl or Br, are subjected to the reaction with a trisubstituted N-silylactam of the general formula III



(III)

where R^1 has the above given meaning and R^2, R^3 and R^4 are the same or different alkyl or aryl groups containing 1 to 7 carbon atoms, in an inert solvent at the temperature −15° C to +100° C, preferably at the temperature 0° C to +30° C, while 1 to 5 molar parts of the trisubstituted N-silyllactan is used per one equivalent of acyl halide groups of the polymer.

4,038,471
METHOD FOR PREPARING HIGH-CIS POLYALKENAMERS

Kenneth F. Castner, Akron, Ohio, assignor to The Goodyear Tire & Rubber Company, Akron, Ohio

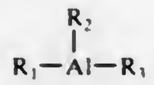
Filed Oct. 29, 1976, Ser. No. 736,810

Int. Cl.² C08F *4/78, 32/04, 32/06*

U.S. Cl. 526—142 **6 Claims**

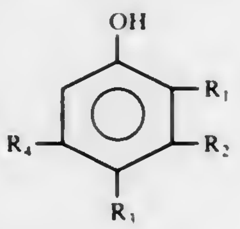
1. The method which comprises polymerizing a cycloolefin selected from the group consisting of cyclooctene and 1,5-cyclooctadiene by subjecting said cycloolefin to a catalyst comprising (A) a tungsten halide salt of the general formula $R_{m-n}WX_n$ wherein X represents chlorine or bromine and R is selected from the group consisting of alkoxy, haloalkoxy, aryloxy, alkaryloxy, and acetyl acetonyl radicals containing up to 20 carbon atoms; m being 6 when X = Cl or 5 when X =

Br; and wherein n may be 3 to 6 inclusive when X = Cl or 3 or 5 inclusive when X = Br and (B) an organoaluminum compound of the formula:



$$R_1-\overset{R_2}{\overset{|}{Al}}-R_3$$

wherein R_1, R_2 and R_3 may independently represent an alkyl or aralkyl radical containing up to 20 carbon atoms or a halogen atom, and (C) a hydroxyl compound which is phenol or o-, m- or p-cresol or which is of the formula ROH wherein R is selected from the group consisting of alkyl, haloalkyl, cycloalkyl, aralkyl and alkoxyalkyl containing up to 20 carbon atoms, and (D) a hindered phenol of the formula



wherein R_1 represents an alkyl group with a tertiary carbon attached to the aromatic ring, and R_2, R_3 and R_4 represent either a hydrogen atom or an alkyl group containing up to 20 carbon atoms, to form polyalkenamers having a cisvinylene content of at least about 85 percent, and wherein the molar ratio of A:B:C:D ranges from 1:2-8:0.5-3:3—24.

4,038,472

NOVEL CURING SYSTEM FOR CONJUGATED DIENE BUTYL ELASTOMERS

James A. Rae, Cranford, N.J., assignor to Exxon Research and Engineering Company, Linden, N.J.

Filed Feb. 25, 1976, Ser. No. 661,286

Int. Cl.^{2} C08F *8/00, 8/42, 8/06*

U.S. Cl. 526—48 **9 Claims**

1. A method of curing a conjugated diene butyl elastomeric copolymer, said copolymer consisting of 85 to 99.5% by weight of a C_4-C_7 isoolefin and 15 to 0.5% by weight of a conjugated C_4-C_{14} diolefin, said copolymer having randomly distributed sites of conjugated diene unsaturation and having a number average molecular weight from about 5000 to 500,000, said method comprising adding to said elastomer about 1 to 6 parts per hundred parts by weight of elastomer of 1,4-dihydroxybenzene and a metal carboxylate oxidation catalyst or oxidizing agent or mixture thereof in amounts effective to promote the oxidation of dihydroxybenzene to 1,4-benzoquinone, said benzoquinone crosslinking copolymer chains whereby a crosslinked cured elastomer product is formed, said oxidizing agent only being present when curing temperatures in excess of 200° F. are employed.

4,038,473

PROCESS FOR CLEANING POLYMERIZATION REACTORS

Louis Cohen, Avon Lake, Ohio, assignor to The B. F. Goodrich Company, Akron, Ohio

Filed Oct. 15, 1975, Ser. No. 622,679

Int. Cl.^{2} C08F *2/20, 14/06*

U.S. Cl. 526—62 **11 Claims**

1. In a process for the aqueous suspension polymerization of a vinylidene halide in reactors containing metal surfaces exposed to said suspension, the improvement comprising conducting said polymerization in reactors wherein said metal surfaces are substantially free of adsorbed organic materials prior to introduction therein of said aqueous suspension into the reactor, whereby the amount of polymer build up on said metal surfaces during polymerization is substantially reduced.

4,038,474

PROCESS FOR PREPARING NOVEL PETROLEUM RESIN EMPLOYING ALRX$_2$ AND ALKYL HALIDE OR HYDROGEN HALIDE

Ken-ichi Kudo; Yoshihiko Kitagawa, and Hideyuki Kuribayashi, all of Niihama, Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Apr. 7, 1975, Ser. No. 565,656

Claims priority, application Japan, Apr. 19, 1974, 49-44690

Int. Cl.^{2} C08F *4/52, 10/00, 120/00, 136/00*

U.S. Cl. 526—185 **15 Claims**

1. A process for manufacturing a petroleum resin, characterized by copolymerizing 20 to 80 parts by weight of a so-called spent C_4- or C_5-fraction obtained by removing most of the dienic constituents from the fraction comprising compounds having mainly four or five carbon atoms produced by petroleum cracking and 80 to 20 parts by weight of styrene and/or a styrene derivative with a catalyst system comprising an organoaluminum compound represented by the general formula $AlRX_2$ (wherein R is an alkyl group having 1 to 4 carbon atoms and X is a halogen atom) as main catalyst and an alkyl halide or a hydrogen halide as co-catalyst, in a hydrocarbon solvent at a temperature of 0° to 60° C.

4,038,475

HIGHLY STABLE ANAEROBIC COMPOSITIONS

Elliott Frauenglass, Newington, and Gerhardt P. Werber, Guilford, both of Conn., assignors to Loctite Corporation, Newington, Conn.

Continuation of Ser. No. 506,132, Sept. 24, 1974, abandoned, which is a continuation of Ser. No. 318,132, Dec. 26, 1972, abandoned, which is a continuation of Ser. No. 112,722, Feb. 14, 1971, abandoned, which is a continuation-in-part of Ser. No. 20,795, March 18, 1970, abandoned. This application Aug. 28, 1975, Ser. No. 608,655

Int. Cl.^{2} C08F *120/20, 120/34*

U.S. Cl. 526—328 **13 Claims**

1. An anaerobic composition comprising a polymerizable acrylate ester monomer, a peroxy polymerization initiator therefor, as accelerators of free radical polymerization an organic amine and an organic sulfimide, an inhibitor of free radical polymerization selected from the class consisting of guinones having an oxidation-reduction potential of about 0.6 volt or less, said anaerobic composition having added thereto from about 1 to about 1000 parts per million by weight of said anaerobic composition of a soluble chelator having ligand atoms other than nitrogen ligand atoms of the $>C=N-$ type.

4,038,476

PROCESS FOR THE PRODUCTION OF POLY-N-VINYLPYRROLIDONE GRANULES CONTAINING IODIDE

Kaya Atasoy, Munchenstein; Karl Franz Weckwarth, Basle, and Walter Reinhardt, Pratteln, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 25, 1975, Ser. No. 635,027

Claims priority, application Switzerland, Dec. 2, 1974, 15956/74

Int. Cl.^{2} C08K *3/16*

U.S. Cl. 528—485 **10 Claims**

1. Process for the production of free-flowing granules consisting essentially of poly-N-vinylpyrrolidone (PVP) and iodide (I), the granules being of practically uniform composition and particle size, which process comprises producing

a. a solution or a colloidal suspension of a substance releasing iodide ions, in a first solvent or solvent mixture, as well as

b. a solution or colloidal solution or suspension of PVP in a second solvent or solvent mixture which possesses a surface tension different from that of the first solvent or solvent mixture, and in which PVP is at least partially soluble or wettable, and in which the substance releasing iodide ions, contained in the first solvent or solvent mixture, is insoluble or only slightly soluble;

combining the solutions or suspensions (a) and (b), with uniform thorough mixing, in small portions to thus form a mixed-phase system; continuing the thorough mixing of the multiphase mixture; and separating and drying the formed agglomerates containing PVP and iodide.

4,038,477

PROCESS FOR THE PRODUCTION OF POLYOLEFIN POWDER

Hiroshi Inoue, Ohi; Makoto Yoda, Kawagoe, and Shozo Wada, Zushi, all of Japan, assignors to Toa Nenryo Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1975, Ser. No. 633,597

Claims priority, application Japan, Nov. 29, 1974, 49-136151

Int. Cl.^{2} C08F *6/12;* **C08C** *2/06*

U.S. Cl. 528—487 **10 Claims**

1. A process for the production of a fine polyolefin powder which comprises precipitating the polyolefin from a solution of the said polyolefin in a mixture of a solvent and non-solvent therefor, said mixture having a ratio of solvent to non-solvent in the range of about 95:5 to about 30:70 parts by weight, in the presence of about 5 to about 500 ppm by weight, of an inorganic compound capable of forming an ion or ion pair in water or the non-solvent and then drying the precipitated polyolefin powder.

4,038,478

O-GLYCOSIDE ORTHO ESTERS OF NEAMINE CONTAINING COMPOUNDS

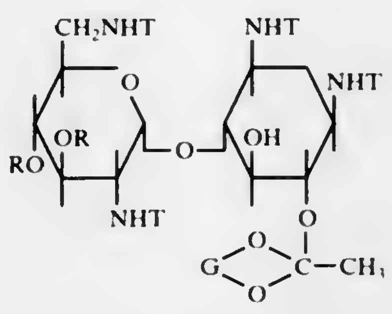
Barney J. Magerlein, Portage, Mich., assignor to The Upjohn Company, Kalamazoo, Mich.

Division of Ser. No. 611,349, Sept. 8, 1975, Pat. No. 3,996,205. This application June 16, 1976, Ser. No. 696,795

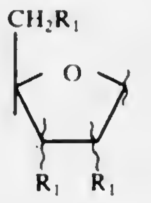
Int. Cl.^{2} C07H *15/22*

U.S. Cl. 536—17 **20 Claims**

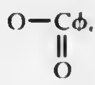
1. A compound of the formula



wherein T is H or an amino blocking group, R is selected from the group consisting of H or a hydrocarbon carboxylic acid acyl radical of from 2 to 18 carbon atoms, inclusive; or a halo-, nitro-, hydroxy-, amino-, cyano-, thiocyano-, and lower alkoxy-substituted hydrocarbon carboxylic acid acyl radical of from 2 to 18 carbon atoms, inclusive; and G is a glycosyl moiety selected from the group consisting of

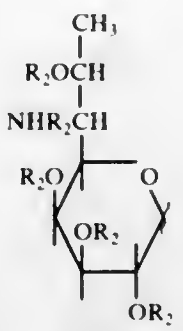


wherein R_1 is selected from the group consisting of OH, OAc,



$$O-\underset{\underset{O}{\|}}{C}\phi,$$

$OCH_2\phi$, NHR′, NR′ alkyl; wherein Ac is acetyl, R′ is H or acyl of from 1 to 8 carbon atoms, inclusive; alkyl is from 1 to 5 carbon atoms, inclusive; and



wherein R_2 is H or acetyl; and nontoxic pharmaceutically acceptable acid addition salts thereof.

4,038,479

AMINO PURINE DERIVATIVES

Gertrude B. Elion, Bronxville, N.Y., and Robert A. Strelitz, Edison, N.J., assignors to Burroughs Wellcome Co., Research Triangle Park, N.C.

Division of Ser. No. 877,443, Nov. 17, 1969, Pat. No. 3,666,856. This application Sept. 7, 1971, Ser. No. 178,406

Int. Cl.^{2} C07H *19/16*

U.S. Cl. 536—24 **2 Claims**

1. 2,6-diamino-9-(β-D-arabinofuramosyl)purine.

4,038,480

6-AMINOCARBONYL PURINE 3′,5′-CYCLIC NUCLEOTIDES

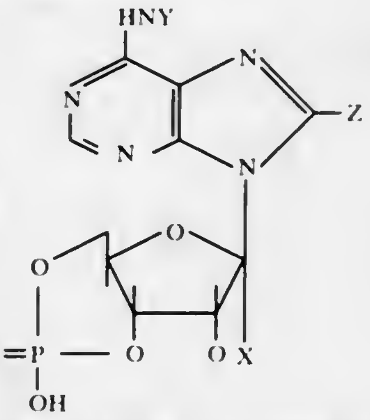
Roland K. Robins, Santa Ana; Dennis A. Shuman, and Kay H. Boswell, both of Mission Viejo, all of Calif., assignors to ICN Pharmaceuticals, Inc., Irvine, Calif.

Filed Sept. 17, 1973, Ser. No. 398,009

Int. Cl.^{2} C07H *19/20*

U.S. Cl. 536—27 **22 Claims**

1. A compound of structure



wherein Y is $COOR_1$, $CONHR_1$, or $CONHC_6H_5$, X is C_1-C_{18} acyl, Y or H, Z is H, bromine, chlorine or SR_2, R_1 is C_1-C_6 alkyl and R_2 is H, phenyl, benzyl or C_1-C_6 alkyl.

4,038,481

METHOD FOR TREATMENT OF CORN HULLS

Richard Lee Antrim, Clinton, and Donald Wayne Harris, Camanche, both of Iowa, assignors to Standard Brands Incorporated, New York, N.Y.

Filed May 24, 1976, Ser. No. 689,232

Int. Cl.^{2} C08B *1/00, 37/14*

U.S. Cl. 536—56 **10 Claims**

1. A method for treating corn hulls to obtain a cellulose fraction, a hemicellulose fraction and a noncarbohydrate fraction comprising treating corn hulls with a sufficient amount of alkali to hydrolyze the corn hulls to affect liberation of the hemicellulose fraction so that it may be solubilized in water and to solubilize the noncarbohydrate fraction, recovering a hemicellulose fraction, an organic solvent extract of the noncarbohydrate fraction and an insoluble residue comprising the cellulose fraction.

4,038,482
RETORT PROCESS STARCH DERIVATIVES

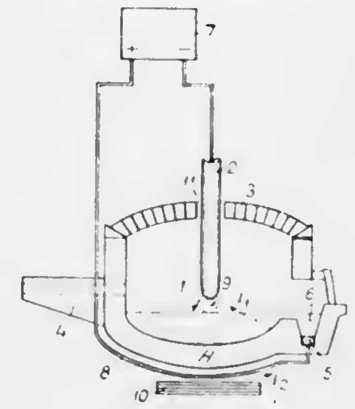
James E. Eastman, Decatur, Ill., assignor to A. E. Staley Manufacturing Company, Decatur, Ill.
Division of Ser. No. 474,300, May 28, 1974, Pat. No. 3,954,514. This application Sept. 29, 1975, Ser. No. 617,770
Int. Cl.^{2} C08B *31/04*
U.S. Cl. 536—110 **7 Claims**

1. A modified starch derivative which exhibits thick viscosity characteristics upon atmospheric heating but which subsequently decreases subtantially in viscosity upon continued heating in a sealed container consisting essentially of a base starch selected from the group consisting of root and root-type starches, said modified starch having 0.05–6% acetyl groups substituted thereon to give a degree of substitution of 0.02 to 0.295 and a 5% dsb sample of said starch being capable of forming a viscous cooked, paste when subjected to heating to 185° F. under atmospheric pressure, said sample having a hot paste viscosity of greater than 2,300 centipoise (20 rpm Brookfield), but further exhibiting substantially complete loss of viscosity to a retorted viscosity of less than 150 centipose (20 rpm Brookfield) after being heated in a sealed container for at least about 20–60 minutes to a temperature of at least about 210°–260° F. in an autoclave, and being allowed to cool overnight at 74°–76° F.

ELECTRICAL

4,038,483
MEANS FOR DIRECT CURRENT ARC FURNACES

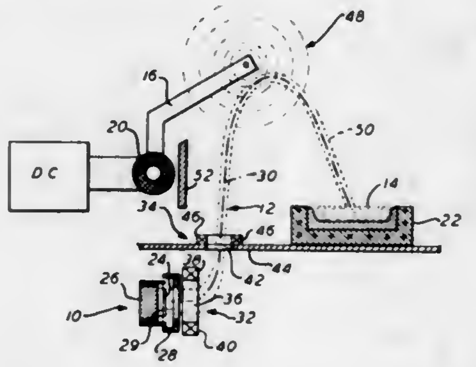
Sven Einar Stenkvist, Vasteras, Sweden, assignor to ASEA Aktiebolag, Vasteras, Sweden
Filed Jan. 7, 1976, Ser. No. 647,215
Claims priority, application Sweden, Jan. 14, 1975, 75003442
Int. Cl.^{2} H05B *7/20*
U.S. Cl. 13—11 **8 Claims**



1. A DC electric arc furnace comprising a furnace enclosure having a hearth for containing a melt, said hearth having a contact electrode for the melt, an arcing electrode positioned above the melt for forming an arc with the melt when placed in circuit therewith via said electrode, said arcing and contact electrodes being relatively offset in a horizontal direction so that the arc is normally angularly deflected with respect to a vertical direction, and means for applying a magnetic field to the arc so as to control its arcing direction, said furnace having a DC power source and means for electrically connecting said electrodes in series with said source to form through said melt, an electric power circuit powered by said source, said means being formed by said power circuit including at least one electric conductor positioned to form said magnetic field and which is in series connection with the balance of said power circuit.

4,038,484
ELECTRON BEAM HEATING SYSTEM

Alan C. Shrader, Redmond, Oreg., assignor to Airco, Inc., Montvale, N.J.
Filed June 21, 1976, Ser. No. 697,904
Int. Cl.^{2} H01J *37/305*
U.S. Cl. 13—31 **9 Claims**



9. An electron beam apparatus for heating a target, comprising:

an electron gun positioned beyond the line-of-sight from the target;

means for directing the bea from the gun in an initial direction generally toward the target;

magnetic means for deflecting the beam through a path of net positive curvature into a final direction in which the beam is incident on the target, and for deflecting the beam through an intermediate path section of comparative negative curvature.

4,038,485
TEST COMPOSITION, DEVICE, AND METHOD

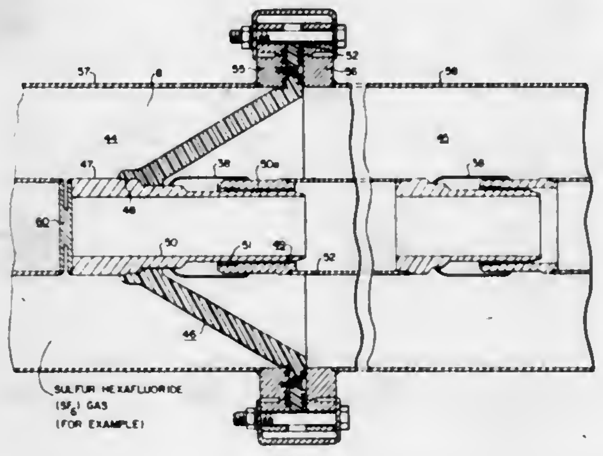
Katharine Gentry Johnston, and Jerome Greyson, both of Elkhart, Ind., assignors to Miles Laboratories, Inc., Elkart, Ind. Continuation-in-part of Ser. No. 667,981, March 18, 1976, abandoned. This application Sept. 17, 1976, Ser. No. 724,365
Int. Cl.^{2} G01N *31/22, 33/16*
U.S. Cl. 23—230 B **38 Claims**

26. A method for detecting the presence of a component in a sample, the method comprising;

a. contacting said sample with a carrier matrix incorporated with (i) a reactant system which, upon contact with said sample, interacts with said component to produce a detectable response, and (ii) an inhibitor system which, upon contact with said sample, prevents the reactant system from interacting with the component after a predetermined time,
b. incubating the matrix, after contact with the said sample, for said predetermined time, and
c. observing said detectable response.

4,038,486
SUPPORTING INSULATOR ASSEMBLY FOR GAS-INSULATED EQUIPMENT

Jeffry R. Meyer, Pittsburgh, and John S. Billings, Jr., Trafford, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed June 10, 1975, Ser. No. 585,729
Int. Cl.^{2} H01B *9/06*
U.S. Cl. 174—28 **2 Claims**



1. A gas-insulated transmission-line including, in combination:

a. means defining an outer-disposed grounded metallic casing;
b. an interiorly-disposed high-voltage metallic transmission-line conductor located generally along the axis within said outer grounded casing;
c. a supporting insulator assembly for fixedly supporting said inner high-voltage, transmission-line conductor and cast to said inner high-voltage transmission-line conductor; and
d. the inner high-voltage, transmissiion-line conductor having an annular protruding metallic attachment surface (**48**) at the casting location and moreover cast therein to reduce high-gradient voltages within the insulating body-portion of said insulator-support assembly and to provide, additionally, secure mechanical bonding of said insulator assembly to said inner high-voltage conductor.

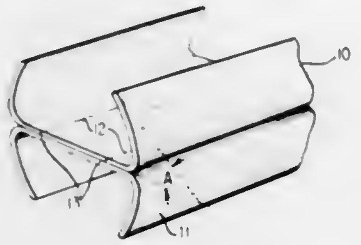
4,038,487
SHIELDED MULTIPAIR CABLE

John Robert Apen, Stone Mountain, and William Homer Bray, Jr., Tucker, both of Ga., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Apr. 5, 1976, Ser. No. 673,411

Int. Cl.² H01B *7/18*

U.S. Cl. 174—36 **7 Claims**



1. A mutipair communications cable comprising:
 a core of insulated conductors;
 a screen partitioning the core, comprising:
  a first and a second metallic sheet, each being C-shaped in cross section and disposed in back-to-back relation; a jacket enveloping said core and screen; and means continuously joining the sheet backs along
two separated paths parallel to the cable axis, creating an enjoined region between said paths.

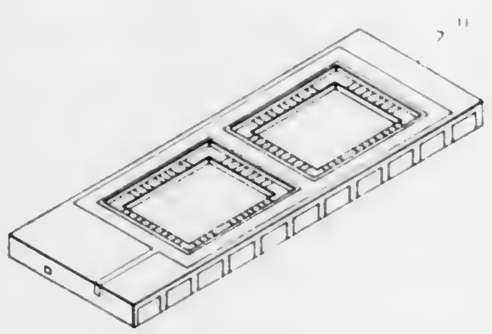
4,038,488
MULTILAYER CERAMIC MULTI-CHIP, DUAL IN-LINE PACKAGING ASSEMBLY

Paul T. Lin, Wappingers Falls, N.Y., assignor to Cambridge Memories, Inc., Poughkeepsie, N.Y.

Filed May 12, 1975, Ser. No. 576,298

Int. Cl.² H05K *5/00*

U.S. Cl. 174—52 FP **11 Claims**



1. A multilayer ceramic, multi-chip packaging assembly comprising:
 a ceramic substrate having at least a pair of semiconductor chip receiving cavities therein;
 a metalization pattern partially embedded within said substrate for providing electrical paths for semiconductor chip devices joined thereto to external circuitry;
 said pattern including a first level having at least a pair of exposed pads for joining semiconductor chips thereto;
 at least a pair of semiconductor chip devices joined to said joining pads within said semiconductor chip receiving cavities;
 said pattern further including a second level above said first level, said second level including
 exposed finger areas spaced from one another and about said semiconductor chip receiving cavities, and
 leads extending between said finger areas and semiconductor chip terminals of said semiconductor chip devices within said semiconductor chip receiving cavities;
 said finger areas on one side of one of said chip receiving cavities being offset with respect to said finger areas on the opposite side of said one of said chip receiving cavities; and,
 said offset finger areas on one side of said one of said chip receiving cavities being aligned with finger areas on one side of another of said chip receiving cavities.

4,038,489
CABLES

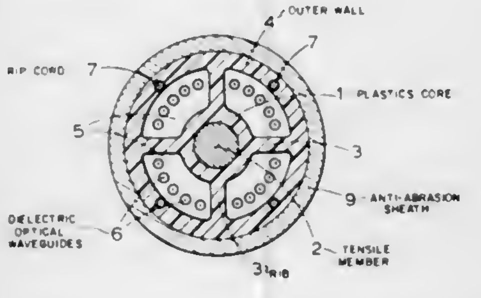
Derek William Stenson, St. Albans, and Dennis Ray Bissel, Chesham, both of England, assignors to The Post Office, London, England

Filed May 29, 1975, Ser. No. 582,415

Claims priority, application United Kingdom, May 31, 1974, 24321/74

Int. Cl.² H01B *7/00*

U.S. Cl. 174—70 R **6 Claims**



1. A telecommunications cable comprising an outer wall separated from a central core by a plurality of rib elements; said outer wall, plurality of rib elements, and central core defining a plurality of compartments, each of said compartments partially filled with two or more coated dielectrical optical waveguides, said central core including a tensile member.

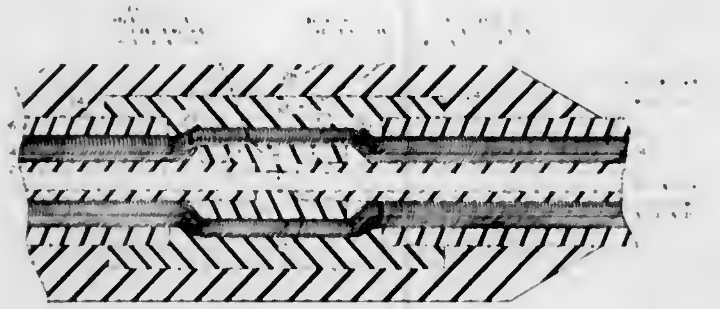
4,038,490
WATER-SEAL SPLICE FOR COAXIAL CABLES AND METHOD OF MAKING SAME

Gerald K. Miller, Saratoga, and Sam Lum, San Jose, both of Calif., assignors to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 30, 1975, Ser. No. 582,561

Int. Cl.² H02G *15/08, 1/14*

U.S. Cl. 174—88 C **7 Claims**



1. A method for forming a three level watertight splice between two coaxial cables, each coaxial cable having an exposed center conductor, an insulating layer around this center conductor, a metallic shield layer encompassing this layer, and an outer jacket, said method comprising the steps of:
 joining the exposed center conductors of the cables to be spliced;
 applying a first potting compound over the exposed sections of the center conductors to form a first watertight cylinder around the center conductors which overlaps the insulating layers of the cables, said potting compound being chosen to be flexible after curing and to have a temperature coefficient substantially matching the temperature coefficient of said insulating layer;
 joining the metallic shield layers of said cables;
 applying a second potting compound over the exposed section of the metallic shielding layer to form a second watertight cylinder which overlaps the outer jackets of cables, said second potting compound being flexible after curing and having a temperature coefficient substantially matching the temperature coefficient of said outer jacket; and
 applying a third potting compound over said second watertight cylinder to form a third watertight cylinder which overlaps the outer jackets of the cables, said third potting compound being chosen for its abrasion resistance and softness to limit chafing and cut-through of said outer jackets of said cables at the point of emergence of of said cables from said third watertight cylinder.

4. A cable-splice assembly for providing an effective three level watertight seal at the splice point of two coaxial, abutting cables, each of said coaxial cables having a center conductor with its end exposed, an insulating layer over this center conductor, a metallic shield layer encompassing the insulating layer, and an outer flexible jacket, said coaxial cables being joined at the abutting, exposed ends of their center conductors, said splice-assembly comprising:
 first potting means formed approximately in the shape of a cylinder, covering the exposed section of the center conductors and overlapping the insulating layers of said coaxial cables to form a watertight seal, said first potting means being flexible after curing and having a thermal-expansion coefficient substantially matching the thermalexpansion coefficient of said insulating layer;
 means electrically joining the shielding layers of said coaxial cables;
 second potting means, formed approximately in the shape of a cylinder, covering said joining means of the shielding layers and overlapping the outer flexible jackets of said coaxial cables to form a second watertight seal, said second potting means being composed of material which is flexible after curing and has a thermalexpansion coefficient substantially matching the thermal-expansion coefficient of said outer flexible jacket; and
 third potting means, formed approximately in the shape of a cylinder, completely covering said second potting means and overlapping the outer jackets of said coaxial cables to form a third watertight seal, said third potting means being composed of material with a soft abrasion resistant physical characteristic to limit chafing and cut-through of said outer jackets of said cables at the point of emergence of said cables from said third watertight seal.

4,038,491
FLUID CASTING COMPOSITION CONTAINING LOW EXPANSION GLASS FILLER

James R. Gamble, Unity Township, Westmoreland County, and James W. Chapman, Penn Hills Township, Allegheny County, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Mar. 30, 1976, Ser. No. 671,853

Int. Cl.² H01B *17/26;* C08L *63/00*

U.S. Cl. 174—153 R **10 Claims**

1. A fluid, filled, resinous casting composition, suitable for use with electrical assembly elements, comprising: (A) 100 parts by weight of a liquid resin, (B) about 250 parts by weight to about 750 parts by weight of a powdered glassy filler comprising: about 50 weight percent to about 60 weight percent of SiO$_2$, about 12 weight percent to about 22 weight percent of Al$_2$O$_3$, about 5 weight percent to about 15 weight percent of B$_2$O$_3$, about 4 weight percent to about 14 weight percent of MgO and about 2.5 weight percent to about 12.5 weight percent of CaO and (C) about 20 parts by weight to about 100 parts by weight of a resin curing agent, said fluid casting composition being characterized by a viscosity of between about 1,500 cp. and 20,000 cp. at 100° C.

4,038,492
CURRENT FEEDING DEVICE FOR ELECTRICAL APPARATUS WITH CONDUCTORS COOLED TO A LOW TEMPERATURE

Dieter Kullmann, Langenzenn, Germany, assignor to Siemens Aktiengesellschaft, Munich, Germany

Filed Feb. 26, 1976, Ser. No. 661,424

Claims priority, application Germany, Apr. 9, 1975, 2515477

Int. Cl.² H01B *12/00*

U.S. Cl. 174—15 S **10 Claims**

1. In a current feeding device for electrical apparatus having conductors cooled to a low temperature, which conductors have their end connected to a normal conductor which is cooled by a cold gas and consists of metal netting, the improvement comprising:
 The metal net having constant conductor cross section over its entire axial length; and a predetermined number of conductor elements of predetermined conductor cross section connected to said metal net in an electrically conducting manner.

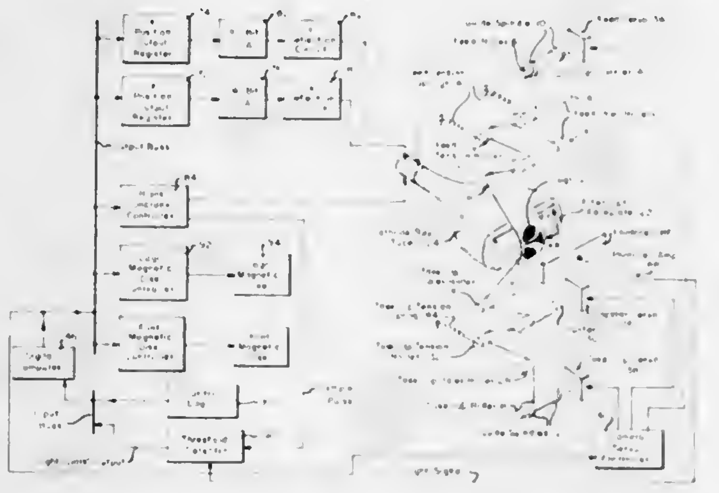
4,038,493
METHOD AND APPARATUS FOR PHOTOTYPESETTING

John S. Richards, Bolingbrook, Ill., assignor to Rockwell International Corporation, Pittsburgh, Pa.

Continuation of Ser. No. 586,830, June 13, 1975, abandoned. This application Dec. 6, 1976, Ser. No. 748,128

Int. Cl.² H04L *15/00*

U.S. Cl. 178—15 **30 Claims**



1. A method of recording and phototypesetting a character having light and non-light transmitting areas in phototypeset-

ting apparatus including light spot scanning means comprising the steps of:

- disposing said character on a logo medium;
- translating said logo medium with respect to a common scanning/photosetting station disposed in a fixed relation with respect to said scanning means, whereby the character is disposed in a position to be scanned thereby;
- scanning a light spot with respect to the character with said scanning means and regularly turning on and off the light spot to sample said character at corresponding, predetermined locations;
- sensing whether the location sampled is within a light or non-light transmitting area of said character;
- recording character data indicating that a transition has been sensed in said character and the location thereof;
- replacing said logo medium with a photosensitive medium;
- transporting said photosensitive medium with respect to the common scanning/photosetting station to be in position to be exposed by the light spot output thereof;
- providing input information indicating that the phototypesetting of said character recorded is desired; and
- controlling the light spot output of said scanning means in response to said input information and said character data so that said character is phototypeset on said photosensitive medium.

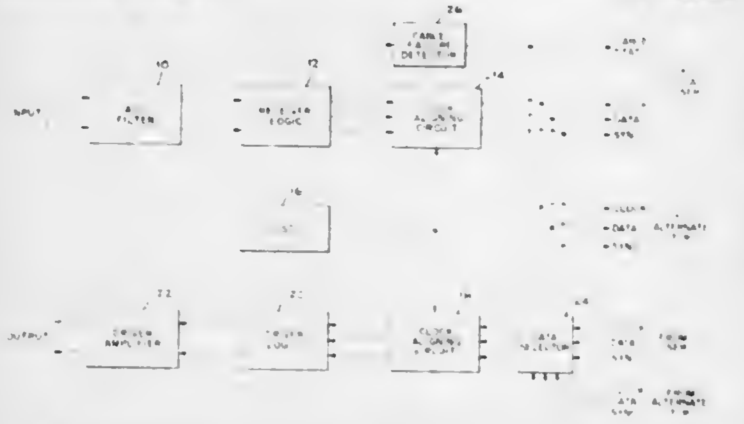
4,038,494
DIGITAL SERIAL TRANSMITTER/RECEIVER MODULE

George W. Miller, Anoka; Mark D. Ryan, Fridley, and Bill H. Niemi, Brooklyn Park, all of Minn., assignors to FMC Corporation, San Jose, Calif.

Filed June 17, 1975, Ser. No. 587,777

Int. Cl.^{2} H04B ***1/16***

U.S. Cl. 178—69.1 **14 Claims**



1. A transmitter/receiver module for handling serial digital data comprising means for receiving said serial digital data on a two-wire input line; means for demodulating said data into a data signal, a clock signal and a synchronizing signal; an oscillator operative at generally the same frequency as the clock signal derived from said data; means for aligning said clock signal with the signal from said oscillator; output lines for each of said data signal, realigned clock signal and synchronizing signal; means for modulating said data signal, realigned clock signal and synchronizing signal or a data signal, clock signal and synchronizing signal which are input directly to said module, said modulation providing a single serial digital data signal; and means for transmitting said modulated signal over a two-wire output line.

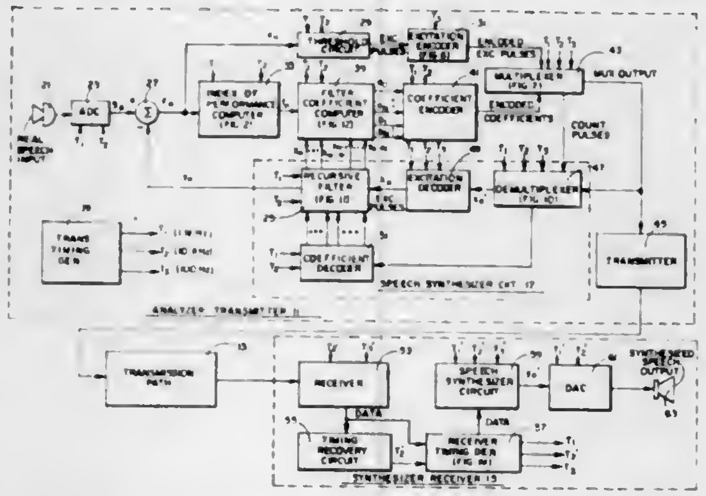
4,038,495
SPEECH ANALYZER/SYNTHESIZER USING RECURSIVE FILTERS

Stanley A. White, Yorba Linda, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Nov. 14, 1975, Ser. No. 632,119

Int. Cl.^{2} G10L ***1/00***

U.S. Cl. 179—1 SA **14 Claims**



1. A system comprising:

- input means responsive to an input speech signal and to a feedback digital speech signal for developing an error signal;
- first means for extracting excitation signals from the error signal;
- second means for developing a performance measure signal as a function of the error signal;
- a first recursive filter responsive to feedforward and feedback filter coefficient value signals and to the excitation signals for developing filter state signals and the feedback digital speech signal to minimize the error signal; and
- third means responsive to the performance measure signal and the filter state signals for developing the feedforward and feedback filter coefficient value signals, the feedforward and feedback filter coefficient value signals, causing said first recursive filter to converge to minimize the error signal.

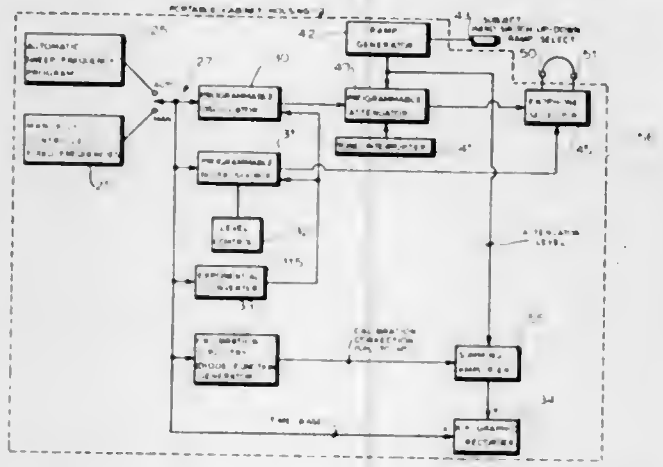
4,038,496
PORTABLE BEKESY TYPE DIAGNOSTIC AUDIOMETER

Michael D. Feezor, Chapel Hill, N.C., assignor to Audiometric Teleprocessing, Inc., Chapel Hill, N.C.

Filed May 15, 1975, Ser. No. 577,626

Int. Cl.^{2} H04R ***29/00***

U.S. Cl. 179—1 N **16 Claims**



1. A diagnostic audiometer for producing an audiogram indicative of a patient's hearing threshold comprising, in combination:

- a. a set of right and left earphones;
- b. a two position patient actuated switch;
- c. programmably controllable oscillator means adapted to provide in response to application of a selected series of voltage levels in predetermined order thereto a corresponding series of continuous tone signals in corresponding order, such tone signal being of a selected audio frequency, amplitude and period of duration;
- d. a programmably controllable continuous ramp voltage source productive of a ramp voltage wave controllable as to ascending and descending direction and representing a control voltage having maximum and minimum values when moved without interruption in either direction, said ramp voltage source being connected to said two position switch and being adapted such that the direction of said ramp voltage wave may be interrupted and reversed in direction by the position of said two position switch and the magnitude of the ramp voltage wave may be regulated in coordination with desired maximum and minimum audio thresholds in said earphones;
- e. programmably controllable circuit attenuator means connected to said oscillator means to receive said tone signals and to said ramp voltages source to receive said ramp voltage wave, said attenuator means being adapted to produce therefrom a series of audio output test signals having precisely controlled gain qualities in linear proportion to said control voltage and at the selected said frequency;
- f. programmed logic controlled voltage source means connected to said oscillator means and having an output for being connected to an X-Y graphic recorder means, and being adapted to automatically provide a series of control voltages to programmably control said oscillator means in a sweep frequency mode of operation whereby upon actuation thereof said oscillator means is caused to produce said tone signals in correspondence with said control voltages and in a sweep frequency mode;
- g. a programmably controllable noise signal source connected to said logic controlled voltage source and adapted when appropriately connected to said earphones and when one ear is being tested with a particular test signal in the series to provide for the opposite ear a masking noise appropriately selected and programmed to mask said particular test signal;
- h. a manually controllable right-left earphone switch connected to both said attenuator source of audio test signals and said noise signal source of masking noise and adapted in one position to receive and direct the particular audio test signal being employed to the right ear and the corresponding masking noise being employed to the left ear and in another position to receive and direct the particular audio test signal to the left ear and the corresponding masking noise to the right ear wherein said patient hears as he manually alternates the positions of said earphone switch first in one said earphone and then in the other a programmed series of said continuous test signals in a predetermined order and repeatable sequence and as such sequence test signals proceed a corresponding sequence of said masking noises are directed to the ear not being tested and such that during the hearing of each such test signal in each respective earphone the patient is enabled to move said two position switch to a first position when said test signal is first heard and to a second position when said test signal is lost to hearing and by so positioning said two position switch said patient being able to control both the direction of said ramp voltage wave and the maximum or minimum level achieved in each direction;
- i. X-Y graphic recording means connected to said programmed logic controlled voltage source output and to said ramp voltage source and adapted to develop and record a printout for said patient in a form directly corresponding to the earphone levels heard as determined by, when and at what amplification levels the patient operates said two position switch in respect to said test signals as an indication of the patient's hearing loss.
- j. voltage responsive compensation circuit means including a diode function generator connected and adapted to provide a calibration correction voltage representing the conversion of sound pressure level to hearing threshold level and providing a compensation voltage therefor and further representing a correction for earphone frequency response deficiencies and providing an earphone deficiency correction voltage therefor; and
- k. summing amplifying circuit means connected to combine said calibration correction signal and the output of said logic controlled voltage source means and produce an output therefrom to control the Y-axis of said recording means.

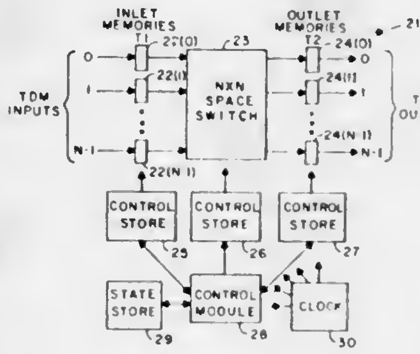
4,038,497
HARDWIRED MARKER FOR TIME FOLDED TST SWITCH WITH DISTRIBUTED CONTROL LOGIC AND AUTOMATIC PATH FINDING, SET UP AND RELEASE

Arthur A. Collins, 13731 Danvers Drive; John C. Bellamy, II, 7605 Chattington, both of Dallas, Tex. 75240, and Richard L. Christensen, 22 Bunker Hill, Richardson, Tex. 75080

Filed May 12, 1975, Ser. No. 576,451

Int. Cl.^{2} H04J ***3/00***

U.S. Cl. 179—15 AT **23 Claims**



1. In a time folded time space time switch for interconnecting digital time division multiplex communication lines: hardwired marker circuit means that includes, switch time stage busy/idle status sensing means interconnecting time stage means of said time space time switch with said marker circuit, switch space stage busy/idle status sensing means interconnecting space stage means of said time space time switch with said marker circuit, clock means connected to supply timing signals to said marker circuit means, path search logic means in an automatic path finding, set up and release circuit means in said switch setting up and releasing transmission paths through the switch, with said path search logic means locating an idle path and path disconnect selection logic means connected to said automatic path finding, set up and release circuit for achieving desired circuit path disconnect as initiated by the time stage disconnect signals.

4,038,498
CENTRAL OFFICE SWITCHING SYSTEM WITH REMOTE LINE SWITCH

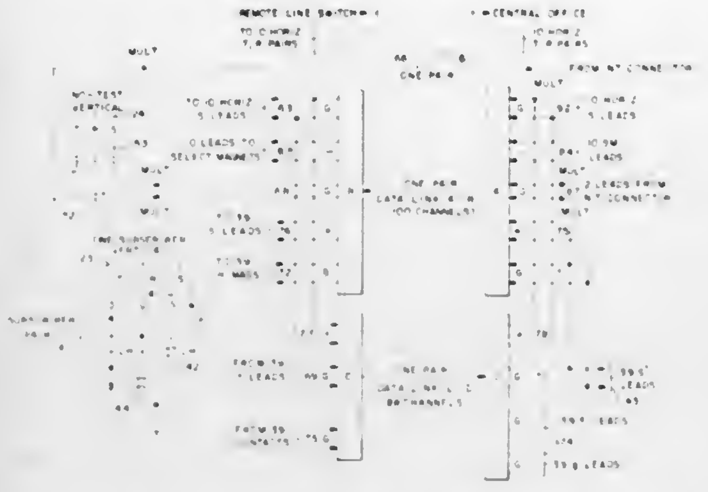
Frank S. Boxall, 380 Eleanor Drive, Woodside, Calif. 94062

Filed Apr. 12, 1976, Ser. No. 676,542

Int. Cl.^{2} H04Q ***3/60***

U.S. Cl. 179—18 FC **8 Claims**

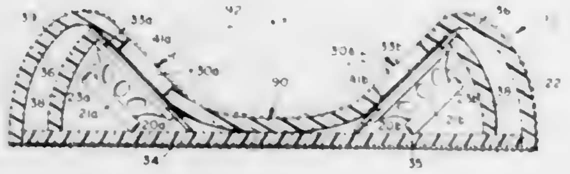
1. A telephone subscriber system including remotely located switch units which provide full-access switching of individual ones of a number of remotely located subscriber lines to a lesser number of line-links, transmission paths providing extended line-links between said remote switch units and a serving central office, switch units at said central office providing switching of line-links to junctors, and a two-way multichannel data transmission means connected between said remote switch units and said serving central office to transmit status and control signals between the remote switch units and the serving central office whereby said serving central office controls switching of remote subscribers lines.



4,038,499
STEREOPHONIC PILLOW SPEAKER SYSTEM

Ronald Norman Yeaple, Fairport, N.Y., assignor to Yeaple Corporation, Rochester, N.Y.

Filed Feb. 2, 1976, Ser. No. 654,576
Int. Cl.² H04M *1/04;* H04R *5/02*
U.S. Cl. 179—146 H **18 Claims**



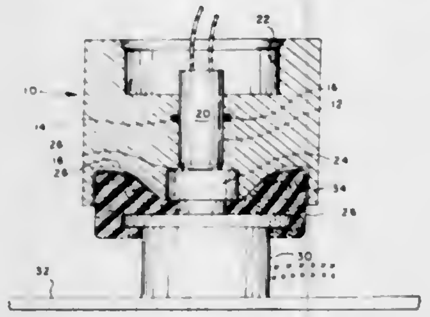
1. A stereophonic pillow speaker system comprising:
a. a first baffle frame;
b. at least one loudspeaker mounted on said baffle frame in cooperative relationship with said baffle frame to derive a first near field effect proximal to said one loudspeaker in response to an electrical signal applied to said one loudspeaker from one channel of an amplifier;
c. a second baffle frame;
d. at least one other loudspeaker mounted on said second baffle frame in cooperative relationship with said second baffle frame to derive a second near field effect proximal to said one other loudspeaker in response to another electrical signal applied to said one other loudspeaker from another channel of said amplifier;
e. pillow means for resiliently isolating said first and second baffle frames in spaced relationship and for positioning said baffle frames at an angle relative to each other so that one ear of a listener is in registry with said first near field effect and the other ear of said listener is in registry with said second near field effect when said listener's head is disposed between said first and second baffle frames; and
f. said pillow means includes resilient means for isolating mechanical vibrations from said first and second baffle frames to said listener's head.

4,038,500
MICROPHONE COUPLER

George J. Frye, 12175 SW. Douglas, Portland, Oreg. 97225

Filed June 20, 1975, Ser. No. 588,885
Int. Cl.² H04R *29/00*
U.S. Cl. 179—175.1 A **3 Claims**

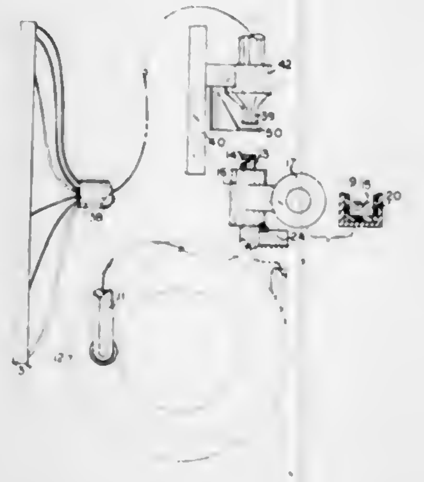
1. An earphone testing system comprising:
a rigid supporting member,
an earphone to be tested positioned on said supporting member with its acoustic output end facing upwardly,
a raltively heavy body member provided with a bore therethrough terminating in a cavity of predeterminded volume at one end and forming an acoustic coupler,
a microphone fitted closely within the bore,
said coupler having an annular lip extending axially from said one end,
a cushioning member within the space provided by said lip having an opening therethrough in communciation with said cavity therein and seated against said one end,
said body member being seated on said one end of the earphone through the interposition of said cushioning member, the acoustic output of the earphone being in direct communication with the cavity in the body member through the opening in the cushion member,
the body member being of sufficient weight to compress the cushioning member against the earphone to provide the necessary coupling pressure to prevent acoustic leakage between the earphone output and the microphone.



4,038,501
APPARATUS AND METHOD FOR AUTOMATICALLY CONNECTING TO THE INDIVIDUAL CONDUCTORS OF A MULTICONDUCTOR CABLE

Victor F. Volk, 646 Snug Harbor Drive, Boynton Beach, Fla. 33435

Filed July 10, 1975, Ser. No. 594,691
Int. Cl.² H04B *3/46*
U.S. Cl. 179—175.3 R **13 Claims**

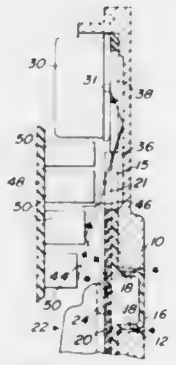


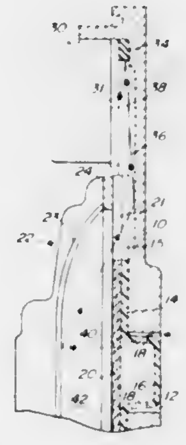
1. Apparatus for making connection to the individual insulated conductors of a multiconductor cable without separating said individual conductors from one another comprising:
A. clamping means for holding an end section of a bundle comprising a large plurality of said insulated conductors in a fixed position relative to elements of said apparatus,
B. a grid comprising a plurality of conductors substantially exceeding in number said plurality of insulated conductors of said bundle, said conductors of said grid being separated from one another, and a substantially planar end section at least equal in size to said section of said bundle, said end section defining a coordinate system,
C. automatic means for determining the coordinates in said system of the end section of each said conductors in said bundle,
D. computer means for storing said coordinates,
E. means controlled by said computer means for selectively removing individual conductors of said grid from said end section of said grid,
F. means for bringing together said end section of said bundle and said planar section of said grid thereby electrically connecting each of the conductors of said bundle with one conductor of said grid.

4,038,502
ACOUSTIC COUPLING STRUCTURE FOR MICROPHONE

Pasquale Ambruoso, Sr., Coral Springs, and Laszlo Szalvay, Fort Lauderdale, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 19, 1975, Ser. No. 560,008
Int. Cl.² H04R *1/02*
U.S. Cl. 179—179 **10 Claims**





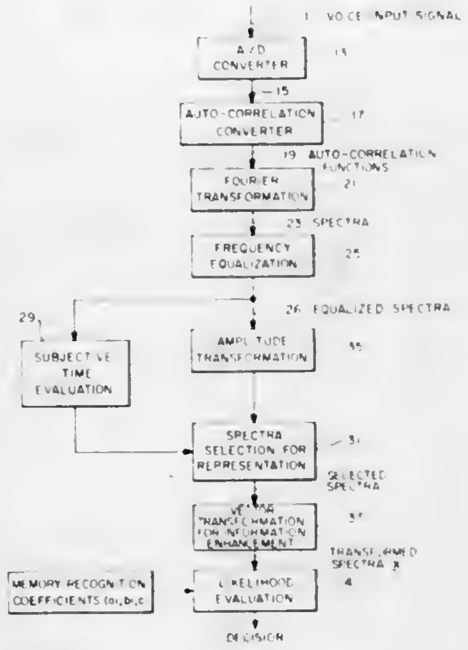
1. In an electronic device having a housing with a sound transmission portion and electronic components within said housing, the combination including:
a microphone within the housing and supported thereby, said microphone having an electro-acoustic element and a sound receiving opening,
a sound reinforcing chamber adjacent said microphone and in communication with said sound receiving opening,
a cavity within the housing for receiving sound through the sound transmission portion, and
means forming an indirect passage connecting the cavity within the housing to said sound chamber to apply sound received from outside the housing through the indirect passage to said microphone, said passage forming means comprising a portion of the surface of at least one of said electronic components.

10. In an electronic device having a housing with a sound transmission portion, the combination including:
a loudspeaker having a cone;
a microphone within the housing and supported thereby, said microphone having a sound receiving opening,
a sound reinforcing chamber adjacent said microphone and in communication with said sound receiving opening,
a cavity within the housing for receiving sound through the sound transmission portion, and
means forming an indirect passage connecting the cavity within the housing to said sound chamber to apply sound received from outside the housing through the passage to said microphone, said passage forming means including a portion of said loudspeaker cone.

4,038,503
SPEECH RECOGNITION APPARATUS

Stephen L. Moshier, Cambridge, Mass., assignor to Dialog Systems, Inc., Cambridge, Mass.

Filed Dec. 29, 1975, Ser. No. 644,722
Int. Cl.² G10L *1/00*
U.S. Cl. 179—1 SA **10 Claims**



1. In a speech analysis system in which an audio signal is spectrum analyzed to determine the behavior of formant resonances over an interval of time, a frequency compensation method comprising:
repeatedly within said interval, evaluating a set of parameters determining the short-term power spectrum of said audio signal in a subinterval within the said interval, thereby to generate a sequence of short-term power spectra;
for each parameter in the set, determining the maximum value of the parameter occurring over the interval, the set of maximum values thereby determined corresponding to a peak spectrum over the interval;
smoothing the peak spectrum by averaging each maximum value with values from said set of maximum values corresponding to adjacent frequencies, the width of the band of frequencies contributing to each averaged value being approximately equal to the typical frequency separation between formant frequencies; and
for each short-term power spectrum in said sequence of spectra, dividing the value for each parameter in the set by the corresponding smoothed maximum value in the smoothed peak spectrum, thereby to generate over said interval a sequence of frequency band equalized spectra corresponding to a compensated audio signal having the same maximum short-term energy content in each of the frequency bands comprising the spectrum.

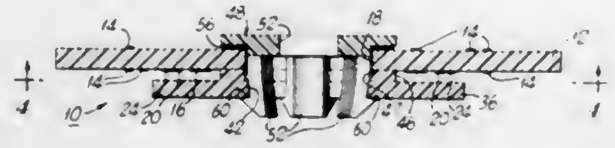
4,038,504
ROTARY, PRINTED CIRCUIT WAFER SWITCH AND METHOD FOR ADJUSTING

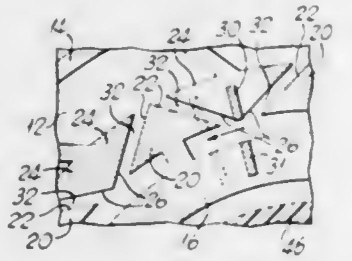
James C. McAnulty, Dunedin, and Edwin B. McCarthy, Clearwater, both of Fla., assignors to A.C. Nielsen Company, Northbrook, Ill.

Filed Nov. 19, 1975, Ser. No. 633,503
Int. Cl.² H01H *9/00, 19/58*
U.S. Cl. 200—11 DA **16 Claims**

1. In combination, a printed circuit board having an aperture and first and second sides, contact array means defined on at least one of said first and second sides, and
a switch comprising
a substantially planar rotor fabricated of nonconductive

material having a central aperture and first and second planar surfaces,
at least one switch blade mounted upon said first planar surface, and
a bushing fabricated of nonconductive material having resilient spring means of a larger cross-sectional area than the cross-sectional area of said aperture in said rotor, whereby upon insertion of said spring means from said first side



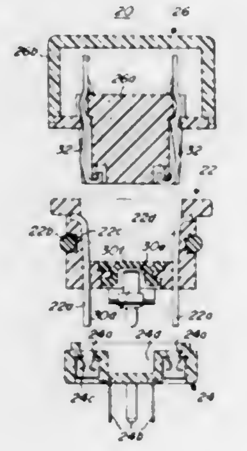


through said apertures of said board and said rotor and to said second side of said board, respectively, such that said blade abuts said board on said second side, said spring means is deformed such that the frictional force resulting from said fit in said aperture in said rotor is greater than the drag force resulting from movement of said blade along said second side upon rotation of said bushing so that said bushing and said rotor act in concert as one element and on opposite sides of said board.

4,038,505

SUBMINIATURE CONNECTOR ARRANGEMENT

Bernard Gasparaitis, Fort Lauderdale; Jay H. Eichler, Boca Raton, and Alfred Y. Terao, Margate, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.
Filed Mar. 3, 1975, Ser. No. 554,829
Int. Cl.² H01R *13/70*
U.S. Cl. 200—51.1 **8 Claims**

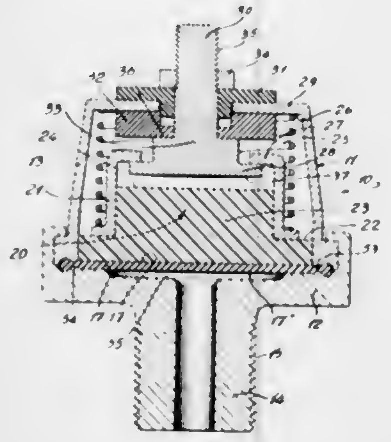


1. An improved subminiature electrical connector arrangement for use with associated electrical apparatus with internally positioned components, said connector arrangement including in combination:
a housing having an opening and a recess spaced therefrom;
a female connector assembly having a first portion thereof for positioning internally of said housing and adapted for interconnection to components of the apparatus, and a second connector portion for making a snap-in, watertight fit within said opening in said housing and mechanically and electrically engaging said first connector portion;
a male connector plug for detachably interfitting with said second connector portion of said female assembly; and
means for securing said male portion in the interfitted relation within said female portion,
said male connector including means for automatic alignment of said plug when interfitting with said female connector portion, said means including a projection extending therefrom for effecting a camming action with respect to said housing recess together with contact elements being positioned about the periphery of said male connector plug and having forward tapered portions,
said male connector further including means for automatic disengagement with and at least partial ejection from said female connector portion upon release of said securing means.

4,038,506

OIL PRESSURE SWITCH HAVING IMPROVED DIAPHRAGM SEAL

Stanislaw F. Filip, Don Mills, Canada, assignor to I.C.S. Ignition Control Systems Ltd., Montreal, Canada
Filed July 17, 1975, Ser. No. 596,845
Int. Cl.² H01H *35/34*
U.S. Cl. 200—83 J **3 Claims**

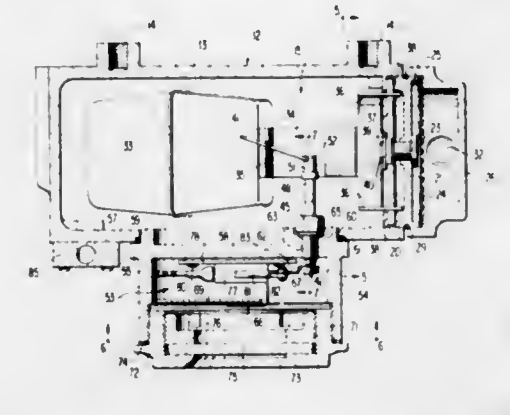


1. An oil pressure switch comprising a housing having an inlet end connectable to an oil pressure line to admit oil from said line within said housing, a flexible membrane secured in said housing and having opposed surfaces, one of said surfaces being in contact with oil admitted to said housing, the other of said surfaces being in engagement with a displaceable member supporting a spring biased electrical contact, said spring biased contact being in abutting engagement with a stationary electrical contact, external connection means for said stationary electrical contact, said membrane being displaced by oil pressure in an oil pressure line connected to said inlet end whereby said spring biased contact is caused to be displaced against its spring biased direction to cause disengagement with said stationary electrical contact, said flexible membrane being a flat member of flexible impervious material having a peripheral ridge of larger thickness than the major portion of said flat member, said ridge being clamped in a continuous cavity which is of larger cross-sectional area than the cross-section of said ridge, said ridge being oval in cross-section with the long central axis of said oval extending transversely of the planar axis of said flat member, said continuous cavity being defined between opposed surfaces of two displaceable wall sections of said housing, said cavity having a substantially circular cross-section clamping portion with a narrow throat opening on an inner side thereof, said narrow throat opening being of smaller width than the thickness of said major portion of said flat member whereby said flat member adjacent said ridge will be maintained in compression along said narrow throat opening, said oval ridge being compressed in said continuous cavity from opposed sides in the direction of said long central axis, said housing being constituted by a base section and a cap section, said inlet end being provided in said base section, said continuous cavity being defined between opposed surfaces of said base and cap sections, said continuous cavity being located in an area of said housing about said inlet end to seal said inlet end from the inner area of said cap section which constitutes a switching chamber, both said electrical contacts being located at least partly in said chamber, a contact support block of non-conductive material being in engagement with said other of said surfaces of said membrane, said support block having an outer stop face, said stationary contact having a flanged end with a flat contact surface spaced from said outer stop face, said spring biased electrical contact being urged in guided engagement with said support block and having a flange wall in abutting engagement with said flanged end to limit said displacement of said spring biased electrical contact, said displacement of said membrane being limited by abutment of said outer stop face with said flat contact surface.

4,038,507

OIL LEVEL REGULATOR AND SHUT-DOWN DEVICE FOR STATIONARY ENGINES AND COMPRESSORS

Frank W. Murphy, Jr.; Buddy G. Sparks, both of Tulsa, and Lewis M. Carlton, Jenks, all of Okla., assignors to Frank W. Murphy Manufacturer, Inc., Tulsa, Okla.
Filed Feb. 20, 1976, Ser. No. 659,846
Int. Cl.² H01H *35/18*
U.S. Cl. 200—84 R **12 Claims**

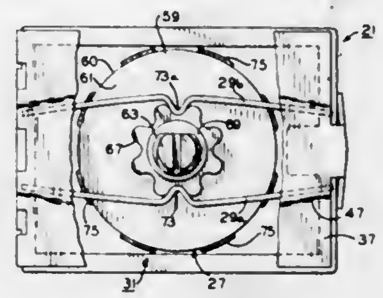


1. An oil level regulating and safety shut-down device for engines and the like comprising a housing means having a float chamber provided with oil inlet and oil outlet passage means and an explosion-proof chamber isolated from the float chamber, float valve means on the housing means in the float chamber for automatically opening and closing said oil inlet passage means to maintain an optimum level of oil in the float chamber, a sealed rotary shaft extending between the float chamber and explosion-proof chamber and operatively engaged with the float valve means whereby rising and falling of the latter causes turning of said rotary shaft, an indicator means on said rotary shaft in the explosion-proof chamber, and an engine shut-down control means in the explosion-proof chamber including a movable actuator in the path of movement of said indicator means, said float valve means comprising a float and float supporting arm pivotally mounted in said float chamber, a valve element bodily carried by said float supporting arm and swingable therwith into opening and closing engagement with said oil inlet passage means, and a crank arm on said sealed rotary shaft in the float chamber and having a lost motion connection with said float supporting arm.

4,038,508

ELECTRICAL SWITCH METHOD OPERATING SUCH AND INDEXING SYSTEM

George C. Mapelsden, Easton, Conn., assignor to General Electric Company, New York, N.Y.
Filed May 22, 1975, Ser. No. 579,949
Int. Cl.² H01H *3/50, 19/00;* G05G *5/00*
U.S. Cl. 200—329 **38 Claims**

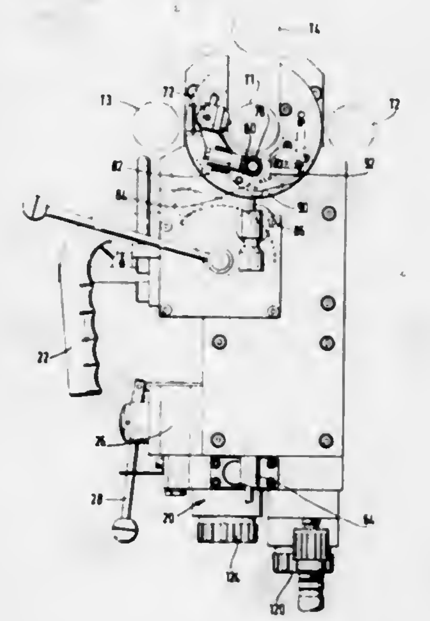


1. An electrical switch comprising a housing, means operable generally for switching power through the switch, means rotatable in the housing between a plurality of indexed positions for actuating the switching means, means for releasably holding the actuating means in each of its indexed positions, and means operable independently of said releasably holding means for retarding the rotation of the actuating means between at least some of its indexed positions.

4,038,509

ORBITAL WELDING APPARATUS

Leslie Henderson, Whitley Bay, England, and Thomas Bentham Hemsley, deceased, late of Monkseaton, England (by Vera Hemsley, executrix), assignors to Clarke Chapman Limited, Gateshead, England
Filed Oct. 2, 1975, Ser. No. 618,979
Int. Cl.² B23K *9/02*
U.S. Cl. 219—60 A **4 Claims**

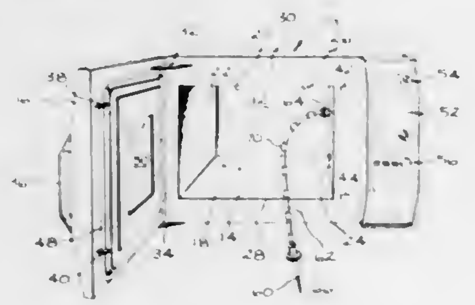


1. Orbital welding apparatus comprising a main assembly including a support structure carrying first and second rotary drive means and having a generally U-shaped portion comprising two fixed parallel limbs between which a tube to be welded can be received; said support structure also having mounted thereon two clamp jaws and means for operating said jaws, said clamp jaws being relatively movable by said jaw operating means to first relative positions in which a tube to be welded and said support structure can be relatively positioned by relative movement transversely to the length of the tube, said tube entering between said parallel limbs, said clamp jaws being movable by said jaw operating means to second relative positions to grip said tube in position for welding between said

parallel limbs; a rotatable assembly carried by said support structure and comprising first and second relatively rotatable gear members rotatable about a common axis, said gear members each being generally of U-shape, said gear members being rotatable into like positions with said U-shape of said support structure in which to receive said tube therein, said first and second gear members being rotationally coupled to said first and second drive means, respectively, said rotatable assembly also comprising arc welding means including wire feed mechanism mounted for rotation with said first gear member, said feed mechanism being operable by relative rotation of said first and second gear members; conductive means for supplying welding current to said arc welding means; and gas duct means for supplying gas to said arc welding means.

4,038,510
FOOD TEMPERATURE CONTROL CABLE FOR MICROWAVE OVEN

James A. White, Louisville, Ky., assignor to General Electric Company, Louisville, Ky.
Filed Mar. 3, 1976, Ser. No. 663,236
Int. Cl.^{2} H05B *9/06;* **G01K** *1/08*
U.S. Cl. 219—10.55 E **7 Claims**

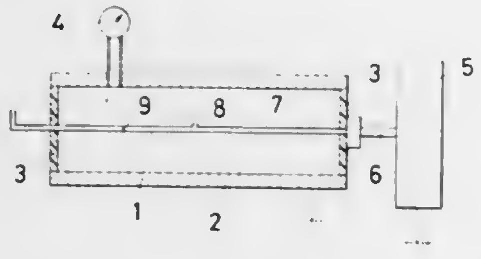


1. Apparatus for monitoring the internal temperature of food being heated in the cooking cavity of a microwave oven, said cooking cavity being formed by a box-like oven liner and an access door, said apparatus comprising:

a. a temperature-sensing probe adapted for insertion into the food to be heated;
b. an elongated flexible electric cable joined to the probe and adapted to connect the probe to one wall of the oven liner for joining the cable in a temperature control circuit;
c. said cable supporting a plurality of diameter-increasing protrusions.

4,038,511
METHOD FOR ELECTROPNEUMATIC CONVERSION

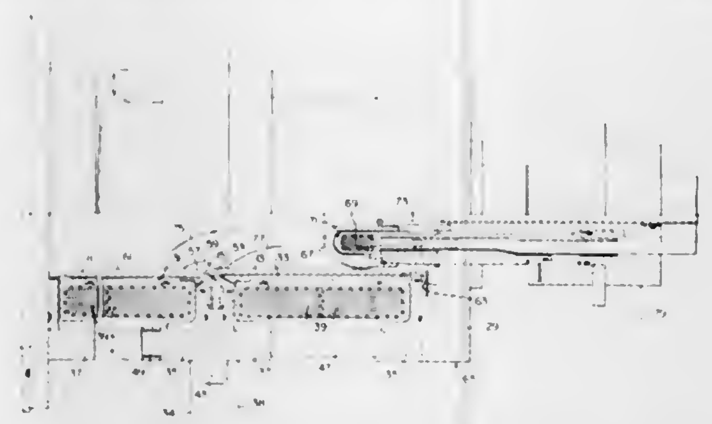
Joji Yamaga, and Morio Jido, both of Tokyo, Japan, assignors to Agency of Industrial Science & Technology, Tokyo, Japan
Filed Mar. 19, 1975, Ser. No. 559,814
Claims priority, application Japan, May 21, 1974, 49-56956
Int. Cl.^{2} B23K *9/00*
U.S. Cl. 219—121 P **4 Claims**



1. An apparatus for electropneumatic conversion which comprises in combination, a discharge electrode supported by an electric insulating material, an opposite electrode disposed to confront said discharge electrode, said electric insulating material and opposite electrodes forming a discharge chamber, a gas disposed in said chamber, means for applying a high electric potential between said discharge electrode and said opposite electrode, pin hole means disposed for communicating said gas in the discharge chamber and the ambient air.

4,038,512
SELF-STABILIZING ARC HEATER

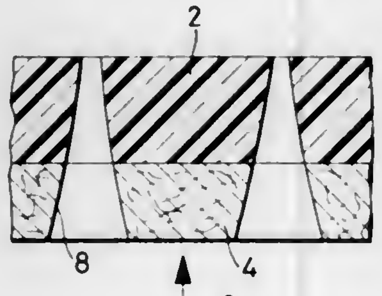
Charles B. Wolf, Irwin; Maurice G. Fey, Plum Borough, and Frederick A. Azinger, Jr., Churchill Borough, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Aug. 11, 1975, Ser. No. 603,575
Int. Cl.^{2} B23K *9/00*
U.S. Cl. 219—121 P **7 Claims**



1. An arc heater for processing particulate material comprising at least two axially spaced, substantially cylindrical electrodes forming a narrow gap therebetween and adapted to be connected to a source of potential to produce an arc in the gap, means spacing and electrically insulating the electrodes from each other and comprising means for channeling gas to be heated at a high velocity to the gap, the cylindrical electrodes forming the gap also defining an arc chamber extending in opposite directions from the gap and having an inlet end and an outlet end, the cylindrical electrodes comprising spaced wall surfaces forming the gap and being inclined at an angle to the longitudinal axis of the chamber and extending downwardly toward the outlet end thereof, whereby solid particles moving through the chamber toward the outlet end do not collect in the gap.

4,038,513
PROCESS FOR ENERGY BEAM PERFORATION, ESPECIALLY ELECTRON BEAM PERFORATION, OF MULTI-LAYERED ARTIFICIAL LEATHER

Karl Heinz Steigerwald, Starnberg, Germany, assignor to Steigerwald Strahltechnik GmbH, Munich, Germany
Filed Oct. 1, 1975, Ser. No. 618,520
Claims priority, application Germany, Oct. 16, 1974, 2449264
Int. Cl.^{2} B23K *15/00*
U.S. Cl. 214—121 EM **13 Claims**

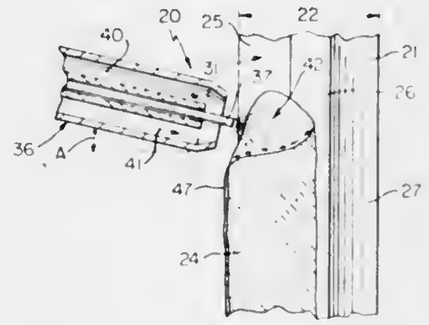


1. A process for perforating a multilayered artificial leather product by the energy beam emitted from a beam source, said leather product having a top layer formed of an essentially impervious material joined to a pervious support layer, said process comprising the steps of:

orienting the leather product so that the support layer is toward the beam source; and
applying the energy beam to the support layer to completely perforate the support layer and to perforate the impervious layer.

4,038,514
VERTICAL WELDING OF THICK ALUMINUM MEMBERS

Richard F. Ashton, Richmond, Va., assignor to Reynolds Metals Company, Richmond, Va.
Filed Feb. 3, 1975, Ser. No. 546,217
Int. Cl.^{2} B23K *9/12*
U.S. Cl. 219—126 **1 Claim**



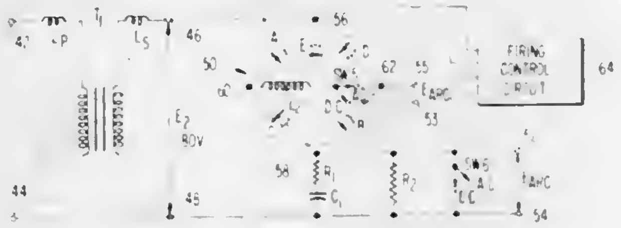
1. A method of welding a substantially vertically oriented pair of aluminum members, each of said members having a thickness of at least about 0.5 inches, and each of said members having a land defining surface and a groove defining surface, the land defining surface of one said member being positioned against the land defining surface of the other said member, whereby the groove defining surface of one said member cooperates with the groove defining surface of the other said member to define a substantially vertically oriented groove, the groove defining surface of each said member being characterized such that said groove has a depth of about ⅛ to about ½ the thickness of each of said members and an included angle in the range of about 45° to about 75° , which method comprises: placing a gas-metal arc torch having a consumable aluminum electrode and means for supplying a shielding gas therearound with said consumable electrode in said groove, generating a welding arc characterized by a weld current ranging between 200 and 400 amperes and an arc voltage ranging between 20 and 40 volts, and moving said torch substantially vertically along said groove while holding said torch at a backhand torch angle ranging between 1° and 25° and feeding said consumable electrode and said shielding gas at rates effective to produce weld metal in said groove having an outside oxide support skin which acts as a sole support for said weld metal during its solidification, said torch being moved at a rate which ranges between 3 and 10 inches per minute and is effective to substantially fill and groove with said weld metal in a single pass.

4,038,515
ASYMMETRICAL A.C. WELDER

Robet L. Risberg, Brookfield, Wis., assignor to Miller Electric Manufacturing Company, Appleton, Wis.
Filed May 8, 1975, Ser. No. 575,685
Int. Cl.^{2} B23K *9/10*
U.S. Cl. 219—131 R **2 Claims**

1. A controllable power supply for supplying substantially square waves of current to a welding arc, and comprising:

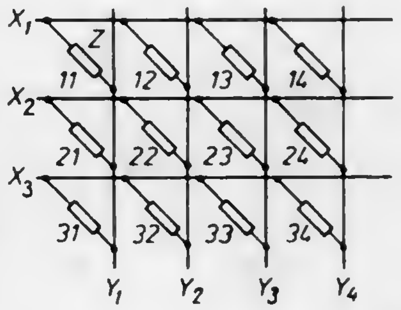
a single phase, A.C. power source;
a circuit connected in series between said source and said arc, and including first and second controllable, alternately conducting, current paths for supplying current in respectively opposite and mutually exclusive polarities to said arc;
inductor means connected in said current paths, such that the arc current supplied from said source flows in the same direction in seies through said inductor means irrespective of the polarity of the arc current;
control means for rendering said first current path conducting at a selected non-zero value of a positive polarity half-cycle of the source voltage while said arc current is of negative polarity and is being supplied through the conducting second current path by inductive current from said inductor, whereby a free-wheeling path is formed through said current for said inductive current and whereby the positive source voltage causes said arc current to reverse to a positive polarity, said second current path being rendered non-conducting when the positive arc current exceeds the free-wheeling inductive current;



said inductor self-inducing a positive polarity voltage to maintain the positive arc current when the source voltage falls below the arc voltage and reverses polarity at the next negative half-cycle thereof;
control means for rendering said second current path conducting at a selected non-zero value of said next negative half-cycle of the source voltage, again to form said free-wheeling path, so that said source voltage causes said arc voltage and arc current to reverse to a negative polarity; and
means for independently selecting said non-zero values of said positive and negative source voltage half-cycles such that said values have different phases relative to their respective source voltage half-cycles, whereby the corresponding positive and negative half-cycles of arc current have different durations to provide an unbalanced power supply.

4,038,516
THERMAL PRINTING HEAD

Bengt Allan Bergvall, Vasteras, Sweden, assignor to Facit Aktiebolag, Atvidaberg, Sweden
Filed Feb. 20, 1975, Ser. No. 551,267
Int. Cl.^{2} H05B *1/00*
U.S. Cl. 219—216 **9 Claims**

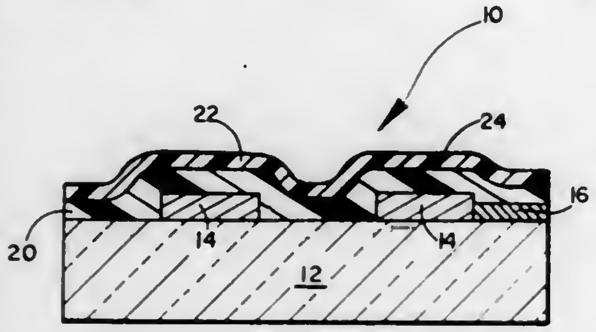


1. A thermal printing head comprising a plurality of electric heating elements for recording information on a recording medium, a support member mounting said heating elements, said heating elements being varistor elements, said varistor elements each comprising a series combination of an element having non-linear current-voltage characteristics and a resistor having linear current-voltage characteristics, and means for

the selective supply of the electric current to at least one of said varistor elements.

4,038,517
ENVIRONMENTALLY AND WEAR PROTECTED GLASS SUBSTRATE THIN FILM THERMAL PRINTHEADS

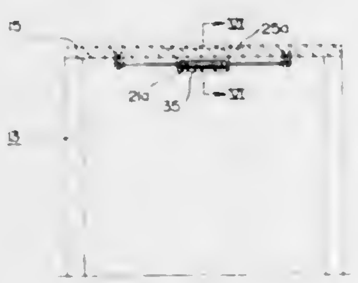
Laurence G. Nelson, Villa Park, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Apr. 2, 1976, Ser. No. 673,249
Int. Cl.² H05B *1/00*
U.S. Cl. 219—216 **5 Claims**



1. A thermal printhead comprising:
a glass substrate;
thin film thermal printing elements disposed on said substrate;
thin film conductors disposed on said substrate and electrically connected to said printing elements; and
a protective overcoat consisting of a first layer of silicon monoxide disposed on said substrate, said printing elements and said conductors, and a second layer of a material selected from the group consisting of aluminum oxide, zirconium oxide, and chromium oxide.

4,038,518
DINING TABLE COMBINED WITH FOOD WARMING APPARATUS

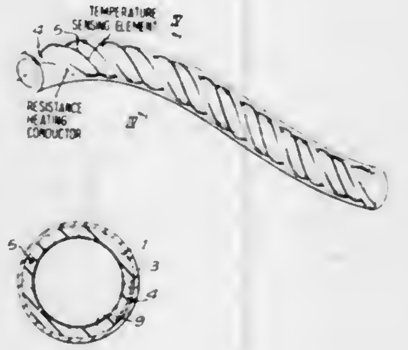
Richard F. Morton, 200 Buzzard Roost Road, and David F. Hale, 508 E. First St., both of Mountain Home, Ark. 72653
Filed May 24, 1976, Ser. No. 689,650
Int. Cl.² H05B *1/00*
U.S. Cl. 219—218 **5 Claims**



1. The combination with a dining table having a horizontally disposed table top constructed from a substance which readily permits flux linkage therethrough; of heat producing means for constantly maintaining food, which may selectively be placed in at least one prescribed location on said table top, at an optimum temperature during the complete course of a meal; said heat producing means including electric means disposed beneath said table top for generating at least one electromagnetic field each having a field of influence extending upwardly through said table top, and at least one peculiar food vessel means responsive to the field of influence when placed in said prescribed location; said food vessel means including conductor winding means inductively coupled to said electric means via the field of influence for generating an electromotive force therein, and heating element means electrically connected to said conductor winding means and being powered by said electromotive force for developing a nominal amount of heat whereby the food contained within said food vessel means may be maintained at the optimum temperature during the complete course of the meal; said food vessel means being in the form of a serving platter with said conductor winding means and said heater element means being embedded therein, and said food vessel means including cladding means for establishing an impervious exterior for said serving platter whereby said conductor winding means and said heater element means are sealably enveloped by said cladding means.

4,038,519
ELECTRICALLY HEATED FLEXIBLE TUBE HAVING TEMPERATURE MEASURING PROBE

Jacques Foucras, Bron, France, assignor to Rhone-Poulenc S.A., Paris, France
Filed Nov. 15, 1974, Ser. No. 524,210
Claims priority, application France, Nov. 15, 1973, 73.40688; Oct. 7, 1974, 74.33694
Int. Cl.² H05B *3/58;* **A61M** *5/14;* **F16L** *11/12;* **F24H** *1/10*
U.S. Cl. 219—301 **12 Claims**



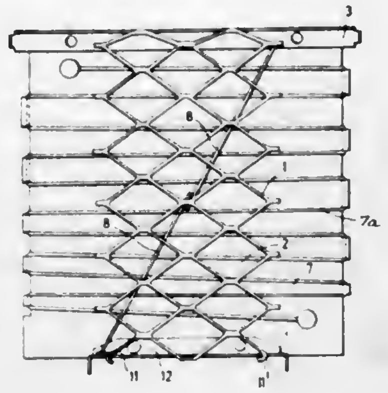
1. A flexible heating tube, especially for medical use, comprising a flexible pipe of transparent plastics material, at least one electrical helical resistance heating conductor and at least one helical filiform temperature measuring resistance probe being wound on the same axis and being embedded in the wall of the said pipe, and in surrounding relation to the bore in the pipe, the helical turns of the at least one electrical resistance conductor and of the at least one temperature measuring probe being of the same pitch, and being coextensive along the length of the pipe and electrical connection terminals at at least one end of said pipe connected to said at least one heating conductor and said at least one temperature measuring probe.

4,038,520
ELEMENT GUARDS FOR ELECTRIC TOASTERS

Gerd Boller, Karben; Karl Knott, Neu-Isenburg; Heinz Marburger, Frankfurt am Main; Norbert Voss, Offenbach (Main), and Manfred Wolf, Altheim, all of Germany, assignors to Rowenta-Werke GmbH, Germany
Filed June 2, 1975, Ser. No. 583,061
Claims priority, application Germany, June 6, 1974, 2427247; May 7, 1975, 2520354
Int. Cl.² H05B *3/06*
U.S. Cl. 219—521 **14 Claims**

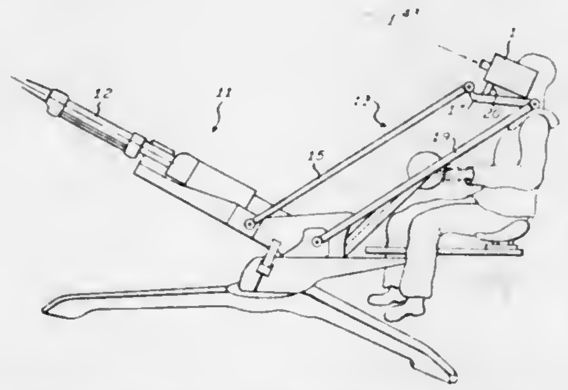
1. In an electric toaster, the combination comprising a toaster heating element, an element guard, said guard including a grid and being formed from a sheet metal blank, the blank

having a slotted area which is expanded to form the grid, the area of the slotted area of the blank being substantially smaller than the area of said grid, said guard being positioned with said grid in parallel spaced relation to said element.



4,038,521
AIMING DEVICE FOR FIRING ON MOVABLE TARGETS

Martin Baumann, Muri near Bern, Switzerland, assignor to Sperry Rand Corporation, New York, N.Y.
Filed Dec. 3, 1975, Ser. No. 636,903
Claims priority, application Switzerland, Dec. 11, 1974, 16345/74; Nov. 20, 1975, 15083/75
Int. Cl.² F41G *5/08;* **G06F** *15/58;* **G06G** *7/80*
U.S. Cl. 235—61.5 S **3 Claims**



1. An aiming device for aiming a weapon at a moving target comprising in combination:
- A. a gun sight device including
  1. means for measuring azimuth and sight angle of instantaneous positions of said moving target to establish an apparent path thereof;
  2. means to visualize a target mark positioned relative to a lead point such that the distance between said target mark and said lead point is representative of a lead angle; and
  3. signal controlled sight means to visualize said apparent path of said moving target and to set said target mark on said apparent path in accordance with said lead angle; and
- B. a data processing device connected to said gun sight device for receiving digital signals indicative of said measurements and capable of furnishing signals necessary for the control of said signal controlled sight means including
  1. means to store data of azimuth and sight angle of at least one instantaneous sighting of said moving target;
  2. means to store data concerning ballistic characteristics of the ammunition for said weapon;
  3. data input means adapted to receive digital signals representing target distance;
  4. data input means adapted to receive digital signals representing target velocity; and
  5. computing means to obtain from said angle data, said ballistic characteristics and said digital signals, control signals required to set said apparent path and said target mark in said signal controlled sight means.

4,038,522
INTEGRATED CARD READER SYSTEM

Vernon T. Kleimeyer, and Thomas J. Schianer, both of Cincinnati, Ohio, assignors to General Signal Corporation, New York, N.Y.
Division of Ser. No. 563,655, March 31, 1975. This application Feb. 11, 1976, Ser. No. 657,052
Int. Cl.² G06K *5/00, 7/04*
U.S. Cl. 235—61.7 B **6 Claims**

1. An integrated card reader system adapted to read a card, said card having compatibility indicia and identifying indicia encoded thereon, said system comprising
  an input line connectable to a central station, said input line being adapted to receive and interrogate signal,
  an interrogate signal output line,
  a card compatibility network connected in series with said input line and said output line, said compatibility network comprising at least one selectively preset switch arranged to define a prearranged circuit through a first section of said network, and at least one other selectively movable switch adapted for movement to establish different circuit paths between a series of compatibility terminals and a common terminal, said common terminal and at least one of said compatibility terminals being connected in series with said interrogate signal output line and said input line, said compatibility indicia of a card compatible with said reader system being operable to move said selectively movable switch into proper position to complete a circuit between said input line and said output line to activate said compatibility network upon insertion of a properly encoded card into said system,
  a home position switch interposed in series with said output line, said home position switch being responsive to complete insertion of said card into said system so as to preliminarily activate said system,
  at least one digit readout network connected in series with said compatibility network, said digit readout network having a series of digit readout lines each interconnected with a digit readout terminal, said readout network further including a first movable readout contact adapted to selectively move into cooperative engagement with each of said readout terminals yet remain connected in series with said interrogate signal output line,
  said identifying indicia on said card being operable to position said movable readout contact from a rest position to an operative position where said movable readout contact

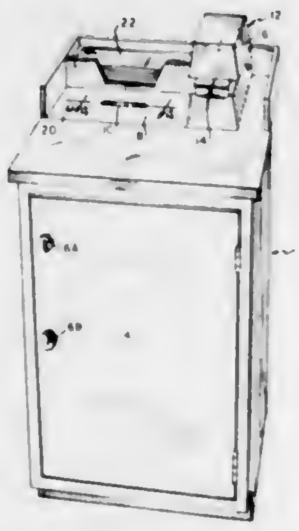
connects to the readout terminal with respect to which said identifying indicia is encoded,

whereby the interrogate signal is gated through said home position switch, said compatibility network, and said digit readout network to provide a readout signal at the readout terminal if the card is coded such that same is compatible with the compatibility network.

4,038,523
RECEIPT VALIDATING BANK DEPOSITORY

John Robert Widmer, Hillsdale, and Arthur John Gloeckler, Cresskill, both of N.J., assignors to Widmer Time Recorder Co., Inc., New York, N.Y.

Filed June 4, 1976, Ser. No. 692,881
Int. Cl.² G06K *15/02;* B41K *45/00*
U.S. Cl. 235—61.9 R **9 Claims**



1. A receipt validating depository wherein a receipt ticket inserted by a depositor is validated only when a deposit is made and wherein no deposit may be made unless the depositor first inserts a deposit ticket for validation comprising:

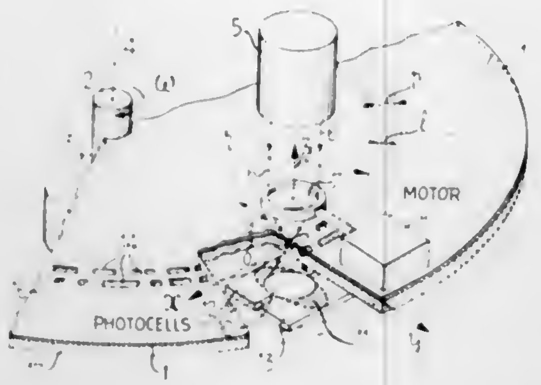
- means for validating a receipt ticket placed therein,
- first sensing means for sensing the placment of said receipt ticket in said validating means,
- a housing having a chamber in which said deposit is to be stored, said housing having an access way leading to said chamber through which the deposit can be made,
- second sensing means for sensing the passage of the deposit through the access way to the chamber,
- said validating means being responsive to said second sensing means for validating said deposit ticket only when a deposit is made,
- means normally obstructing said access way, said obstructing means being responsive to said first sensing means for permitting communication between said access way and said chamber only after said receipt ticket is inserted in said validating means, and
- switching means operatively connected to said obstructing means, said obstructing means being returned to its normal position obstructing said access way to prevent communication with said chamber in response to actuation of said switching means.

4,038,524
DATA CARRIER OPTICALLY READABLE BY TRANSMISSION AND METHOD OF MANUFACTURING SUCH A DATA CARRIER

Claude Puech; Claude Bricot; Bernard Carre; Jean Claude Dubois; Francois Le Carvennec, and Jean Claude Lehureau, all of Paris, France, assignors to Thomson-Brandt, Paris, France

Filed June 17, 1975, Ser. No. 588,158
Claims priority, application France, June 21, 1974, 74.21662
Int. Cl.² G11B *19/02;* B32B *31/00;* G11B *7/14;* G11C *11/44*
U.S. Cl. 235—61.12 N **21 Claims**

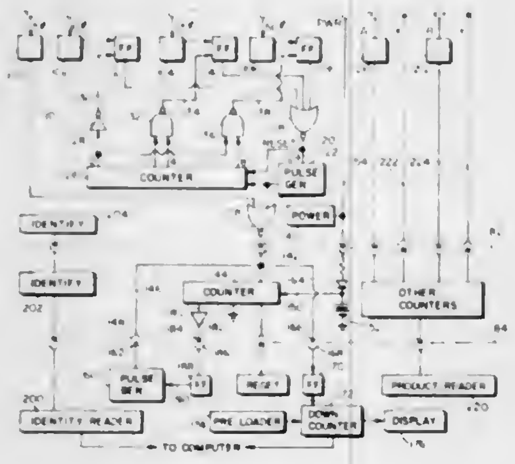
1. A data carrier optically readable by transmission using an optical radiation, said data carrier comprising: a sheet of material transmitting said radiation; said sheet having at least one face carrying a permanent relief impression; said relief impression being in the form of a track; said track being made up of a succession of diffractive elements formed by alternating peaks and troughs constituting the transcription of a carrier wave angularly modulated by said data; said data carrier further comprising at least one protective layer transmitting said radiation; said protective layer having smooth faces and adhering by one of said smooth faces to said peaks without filling up said troughs; the bottom of said troughs being in contact with a space having a refractive index substantially equal to unity.



4,038,525
TALLYING METHOD AND MEANS

Arthur G. Freeman, 6133 Faust, Lakewood, Calif. 90713

Filed Apr. 28, 1975, Ser. No. 572,281
Int. Cl.² G07D *9/00;* H03K *21/36*
U.S. Cl. 235—92 CN **2 Claims**



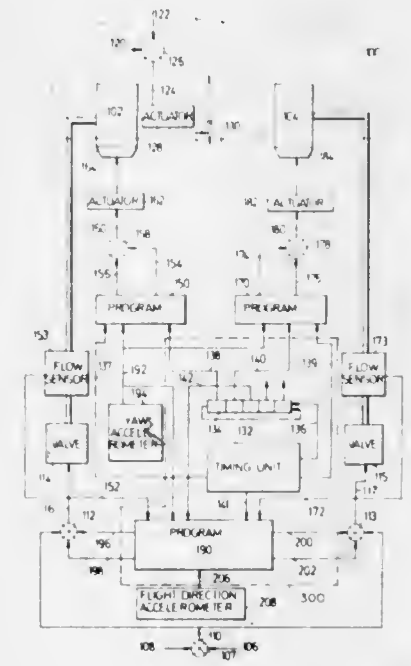
1. In an apparatus for tallying:

- first signal generating means responsive to an event for generating signals upon the occurrence of said event;
- second signal generating means for generating such signals independently of the occurrence of said event;
- counting means in the form of a counter having a maximum capacity for counting signals from said first and second signal generating means until its capacity is reached;
- read-out means for counting the number of signals furnished to said counting means by said second signal generating means and for finding the difference between the maximum capacity of said counting means and the number of signals from first signal generating means which are counted by said counting means; and
- means for preloading, to the maximum capacity of said counting means, one of said counting means or said read-out means.

4,038,526
OPTIMIZING CONTROL SYSTEM FOR AIRCRAFT

Edward Stuart Eccles, Cheltenham, and David James Moore, Bristol, both of England, assignors to The Secretary of State for Defence in Her Britanic Majesty's governmentof the United Kingdom of Great Britain and Northern Ireland, London, England

Continuation of Ser. No. 419,654, Nov. 28, 1973, abandoned. This application Dec. 15, 1975, Ser. No. 640,862
Claims priority, application United Kingdom, Dec. 29, 1967, 59029/67
Int. Cl.² G06F *15/46, 15/06*
U.S. Cl. 235—150.1 **4 Claims**



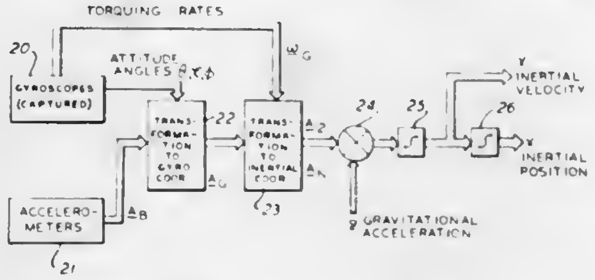
1. In an aircraft including: a power plant having at least two engines having respective gross thrust versus fuel flow characteristics and positioned on opposite sides of the longitudinal axis of the aircraft, a speed control loop for maintaining the speed of the aircraft substantially constant, and a direction control loop for maintaining the direction of the aircraft substantially constant, a method for optimizing the operating efficiency of the power plant to account for differences in the efficiencies of the engines by adjustably proportioning fuel flow to the engines, said method comprising the steps of:

a. simultaneously perturbing the fuel flow to each of said two engines a small amount, the respective perturbations being opposite in sign;
b. sensing acceleration in the aircraft flight direction produced in response to the perturbation of step (a);
c. comparing the sign of the perturbation in fuel flow to one of said engines with the sign of acceleration sensed as a result of the perturbations in fuel flow to the engines to determine if said signs are the same or opposite;
d. if said compared signs are the same, increasing fuel flow to said one engine and decreasing fuel flow by a like amount to the other of said engines;
e. if said compared signs are opposite, decreasing fuel flow to said one engine and increasing fuel flow by a like amount to said other engine; and
f. repeating steps (a) through (e) until no net acceleration is sensed in response to perturbations of the fuel flow to said engines.

4,038,527
SIMPLIFIED STRAPPED DOWN INERTIAL NAVIGATION UTILIZING BANG-BANG GYRO TORQUING

Peter Michael Brodie, Oakland, and Edwin George Solov, Wayne, both of N.J., assignors to The Singer Company, Little Falls, N.J.

Filed Oct. 21, 1975, Ser. No. 624,343
The portion of the term of this patent subsequent to Dec. 9, 1992, has been disclaimed.
Int. Cl.² G01C *21/16;* G06F *15/50*
U.S. Cl. 235—150.25 **8 Claims**



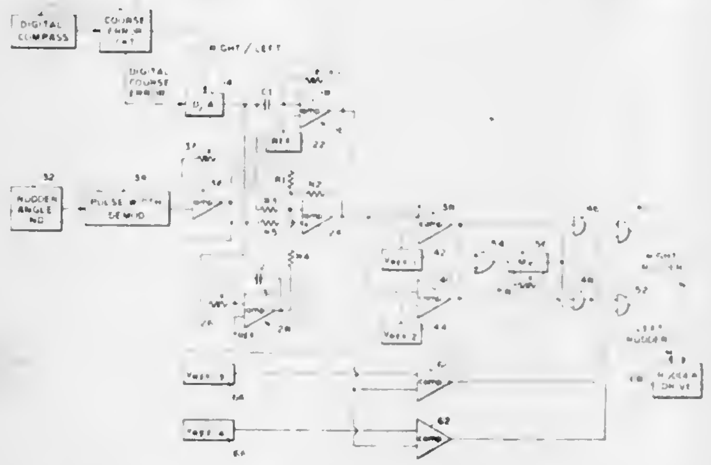
1. A self contained strapped down inertial guidance system combining all axis, all attitude navigation comprising:

- a vehicle in which said inertial system is mounted,
- two wide angle, two-degree-of-freedom gyros having their cases rigidly mounted to said vehicle said gyros oriented so that their momentum vectors are non-parallel and having a predetermined span of angular freedom between said null and spin axes,
- means for torquing said gyros at constant rates in a bang-bang torque fashion so that the long term torquing rates of said gyros equal the rotational rate of said vehicle whereby all vehicle restrictions are removed, and
- means for computing corrections for said angular deviation between the null and spin axes by use of the electrical outputs of said gyro pickoffs.

4,038,528
AUTOMATIC PILOTING SYSTEM

John T. Fowler, Winthrop, Mass., assignor to The Laitram Corporation, Harahan, La.

Filed Nov. 10, 1975, Ser. No. 630,539
Int. Cl.² B63H *25/24;* G06G *7/70*
U.S. Cl. 235—150.26 **6 Claims**



1. An automatic piloting system comprising:

- a digital magnetic compass providing a digital output signal representative of magnetic compass heading;
- digital means operative in response to said compass output signal to produce a course error signal representative of the difference between said compass heading and a desired course heading;
- means operative in response to said course error signal to provide first and second signals representative of the integral and the derivative of course error, respectively;
- rudder angle means operative to provide a signal representative of the present angular position of the rudder;

means for combining said first signal, said second signal, and said course error signal and for providing a control signal representative of the difference between the combined signal and said signal from said rudder angle means;

means defining a range of output signals within which no rudder control is provided; and

output gate means operative in response to said control signal and said range defining means for providing rudder control signals representing course errors outside of said range.

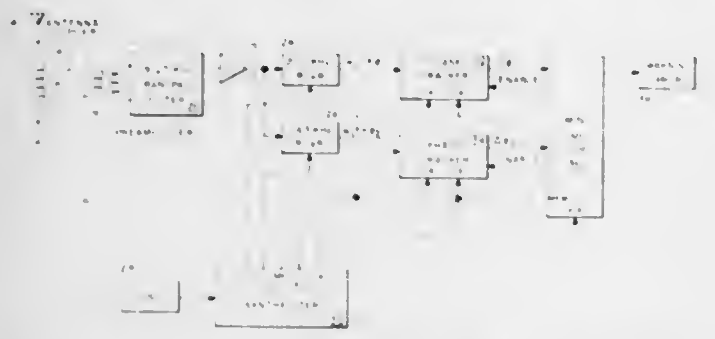
4,038,529
SELF LEARNING MONITOR FOR VLF WAVE PROPAGATION

Eric R. Swanson, San Diego, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 14, 1976, Ser. No. 695,614

Int. Cl.^{2} G01S *7/44;* **G06F** *15/50*

U.S. Cl. 235—150.27 **11 Claims**



1. An apparatus for providing notice whenever a condition of VLF wave propagation becomes abnormal, wherein said condition is normal only when a detectable nunerical quantity has a value within an unspecified range of values, said apparatus comprising:

a. sensing means for sensing the value of said detectable quantity at successive points in time and for generating an updating quantity wherein a unique value of said updating quantity is generated for each different sensed value of said detectable quantity, said detectable quantity comprising the change in phase angle of a VLF wave sensed at each of said successive points in time;

b. data processing means receiving each generated value of said updating quantity for computing an average value of said updating quantity and for providing an abnormal condition notification signal whenever the absolute difference between a given received value of said updating quantity and the average value computed from selected previously received values of the updating quantity exceeds a preselected criterion.

4,038,530
HYBRID COMPUTER FOR DISPLAYING SOUND RAYS OF A SONAR SYSTEM

Masahiro Miyahara, and Hideo Suzuki, both of Tokyo, Japan, assignors to Oki Electric Industry Company, Ltd., Tokyo, Japan

Filed July 24, 1975, Ser. No. 598,567

Int. Cl.^{2} G01S *9/66;* **G06F** *15/20*

U.S. Cl. 235—150.53 **3 Claims**

1. An apparatus for analyzing and displaying sound ray paths comprising:

a. a pair of switching means for setting sea depth (Z_i) and the temperature of sea water (T_i);

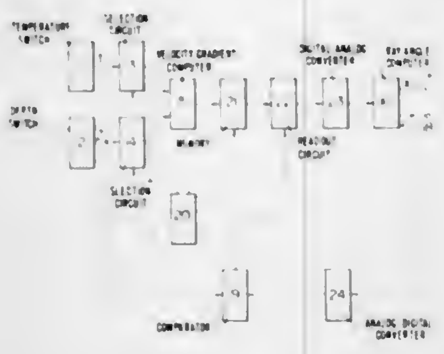
b. a velocity gradient computer connected to said switching means through a pair of selection circuits for computing a velocity gradient (g_i) with the equation

$$g_i = \frac{C_{i+1} - C_i}{Z_{i+1} - Z_i}$$

where Z, Z_{i+1}, are i-th and (i , 1)-th sea depth set by switches, and C_i and Ci , 1 are i-th and (i , 1)th sound velocity in the sea water at the depth Z_i and Z_{i+1}, respectively;

c. memory means connected to said velocity gradient computer for storing a plurality of sets of (g, Z_i) in a digital form;

d. a digital-analog converter connected to said memory means through a read out circuit for converting a set (g, Z_i) from a digital form to an analog form;



e. a ray angle computer connected to said digital analog converter for computing and displaying the coordinates (x, z) of the ray path with the equations;

$$\theta = -\int g_i \cos \theta dt$$
$$dx = C \cos \theta \, dt$$
$$dz = C \sin \theta \, dt$$

where C is a sound velocity in the sea water at the depth z, and

f. a comparator for comparing Z_i with z and controlling the operation of said read out circuit according to the result of the comparison.

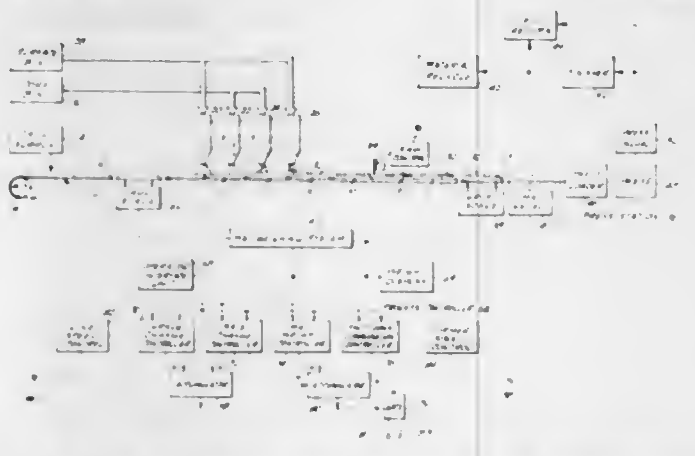
4,038,531
PROCESS CONTROL APPARATUS FOR CONTROLLING A PARTICLEBOARD MANUFACTURING SYSTEM

Alton L. Loe, Jr., Tacoma, Wash., assignor to Weyerhaeuser Company, Tacoma, Wash.

Filed May 18, 1976, Ser. No. 687,452

Int. Cl.^{2} B29J *5/00;* **G05B** *17/02, 13/02*

U.S. Cl. 235—151.1 **21 Claims**



1. In a particleboard manufacturing system wherein mats having a predetermined length and width dimension are formed on a moving conveyor by a plurality of formers arranged to deposite a volume of resin coated wood particles for forming a web of loosely bonded wood particles, said web being trimmed to form said mats, the speed of said conveyor and the volume of said wood particles deposited by each of said formers being controllable by electrical signals to thereby establish the weight of each of said mats, the improvement comprising:

weight control means for automatically controlling the weight of each mat produced by said manufacturing system, said weight control means including means for detecting the weight of each of said mats; means for detecting the weight error between the weight of each of said mats and a predetermined target weight, prediction means for determining a predicted weight error for each of said mats being produced by said system, said prediction means responsive to the difference between said weight error and said predicted error for each of said mats supplied by said manufacturing system; means for determining said difference between said weight error and said predicted error; signal conditioning means responsive to said difference between said weight error and said predicted weight error of each of said mats, said signal conditioning means supplying a control signal having a predetermined mathematical relationship with said difference between said weight error and said predicted weight error of each of said mats; and

means responsive to said control signal for supplying said electrical signals to at least one of said formers to control the weight of said mats.

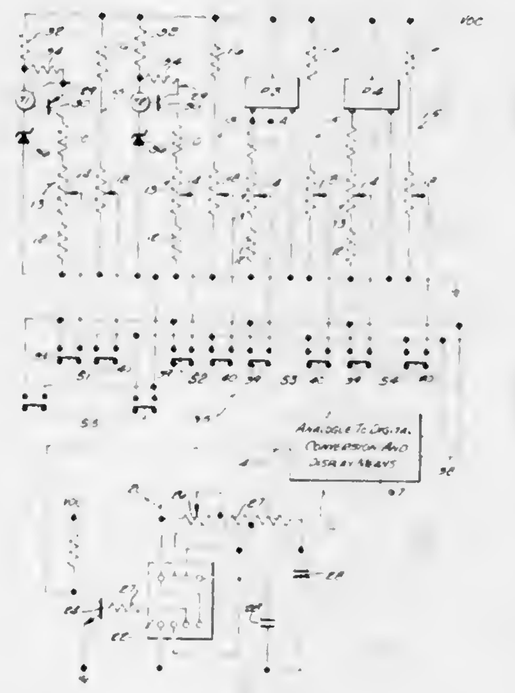
4,038,532
ELECTRONIC DIGITAL GAUGE

Robert E. Burris, New Berlin, and Lester E. Adams, Oak Creek, both of Wis., assignors to Prime Manufacturing Corporation, Oak Creek, Wis.

Filed Dec. 8, 1975, Ser. No. 638,366

Int. Cl.^{2} G01K *7/10;* **G01L** *1/18*

U.S. Cl. 235—151.3 **10 Claims**



1. An electronic digital gauge for measuring the magnitude of a physical characteristic, said gauge comprising:

a. a transducer having a signal voltage which changes substantially linearly in response to a change in the physical characteristic to be measured, said signal voltage including a generally constant stand off voltage,

b. adjustable compensating scaling means for providing matching calibrated outputs, said calibrated outputs including a scaled output proportional to said signal voltage and a compensating output generally equal to a portion of said scaled output attributable to said stand off voltage,

c. analog to digital conversion and display means having an input adapted for receiving said matching calibrated outputs, and

d. switching means for affording selectively connecting said matching calibrated outputs to said input, said compensating scaling means being adjustable to afford calibrating said scaled output and said compensating output of said matching calibrated outputs so that when said switching means connects said matching calibrated outputs to said input of said analog to digital conversion and display means, said analog to digital conversion and display means processes said matching calibrated output and provides a digital read out generally equal to the magnitude of the physical characteristic.

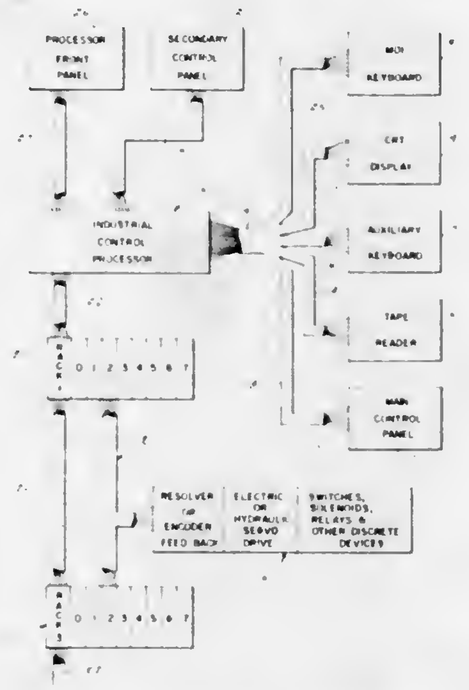
4,038,533
INDUSTRIAL CONTROL PROCESSOR SYSTEM

Ernst Dummermuth, Chesterland; William A. Donze, Mentor, and Timothy Bielawski, Maple Heights, all of Ohio, assignors to Allen-Bradley Company, Milwaukee, Wis.

Filed Sept. 29, 1976, Ser. No. 728,000

Int. Cl.^{2} G06F *15/46*

U.S. Cl. 235—151.11 **22 Claims**



1. An industrial control processor which comprises:

a read/write memory for storing multi-bit words which include an I/O image table and program instructions;

a multi-lead data processor bus coupled to said read/write memory to convey words which are written into or read out of said read/write memory;

an instruction register connected to said processor data bus and operable to receive and store program instructions read out of said read/write memory;

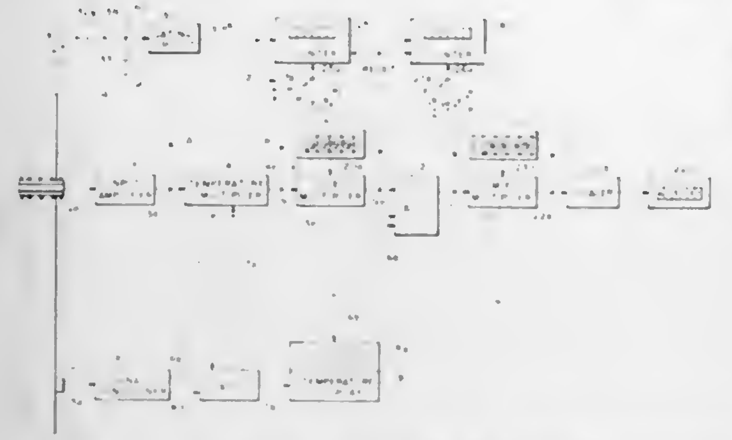
an arithmetic and logic unit having a first set of inputs connected to the leads in said data processor bus;

an L register having a set of inputs connected to the leads in said data processor bus and a corresponding set of output terminals connected to a second set of input terminals on said arithmetic and logic unit;

a bit pointer circuit having a set of inputs coupled to the instruction register to receive a bit pointer code contained in selected program instructions and having a set of output terminals connected to the respective leads in said processor data bus, said bit pointer circuit being responsive to received bit pointer codes to generate a mask on said processor data bus which is coupled to and stored in said L register;

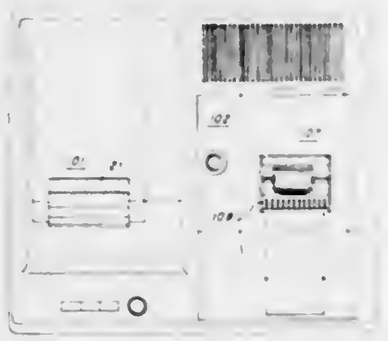
wherein said mask is logically combined in said arithmetic and logic unit with a word read out of the I/O image table in said read/write memory to perform a logic operation on a selected single bit in said word.

4,038,534
METHODS AND SYSTEMS FOR USE WITH PULSE TRAIN CIRCUITRY
Mohammad Kian Mirdadian, 7015 Atwell, Houston, Tex. 77036
Filed Feb. 27, 1975, Ser. No. 553,834
Int. Cl.² G01F *1/08, 15/02*
U.S. Cl. 235—151.34 **34 Claims**



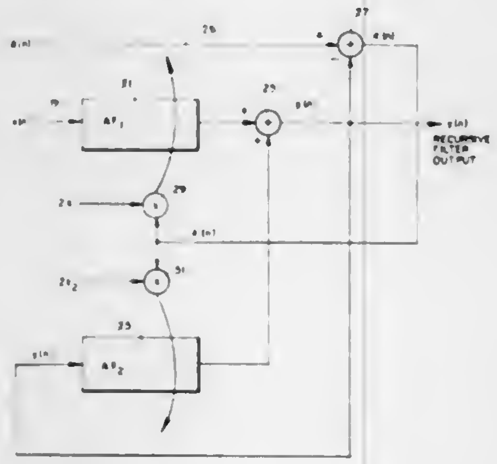
1. A system for testing operation of a digital computing circuit of the type in which input data in the form of an input pulse train is supplied to the circuit input and pulses are added to or removed from the input pulse train according to a relationship characteristic of said digital computing circuit so that the resulting output pulse train supplied to the circuit output is representative of the application of said characteristic relationship to the input data comprising:
- a. first and second counters;
- b. electrical circuit means for providing the input pulse train to said first counter and the output pulse train to said second counter so that the count accumulated by the first counter represents the number of pulses in the input pulse train during the counting interval for the first counter and the count accumulated by the second counter represents the number of pulses in the output pulse train during the counting interval for the second counter;
- c. grating means actuatable for simultaneously starting the counting operation of said first and second counters; and
- d. display means for displaying the accumulated counts in said first and second counters.

4,038,535
CALCULATOR-PRINT CRADLE SYSTEM
Bruce E. Aldridge, Dallas; Michael J. Cochran, Richardson; Lee G. Kitchens, Richardson; Robert R. Kressler, Richardson, and Stephen P. Hamilton, Garland, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Jan. 5, 1976, Ser. No. 646,463
Int. Cl.² G06F *15/02*
U.S. Cl. 235—152 **10 Claims**



1. A printing calculator system which comprises:
- a. a portable electric calculator implemented on at least one integrated circuit semiconductor chip with entry means therein for entering both data and functions and for outputting data and instructions,
- b. a cradle including a printer for receiving said calculator in a nest therein with a set of contacts in said nest for connecting the calculator to the cradle when in said nest, and
- c. means including at least one integrated circuit semiconductor chip in said cradle to receive data for actuating said printer in response to the entering of data and functions at said entry means.

4,038,536
ADAPTIVE RECURSIVE LEAST MEAN SQUARE ERROR FILTER
Paul L. Feintuch, Covina, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.
Filed Mar. 29, 1976, Ser. No. 671,889
Int. Cl.² G06F *15/34;* H04B *3/04*
U.S. Cl. 235—152 **17 Claims**

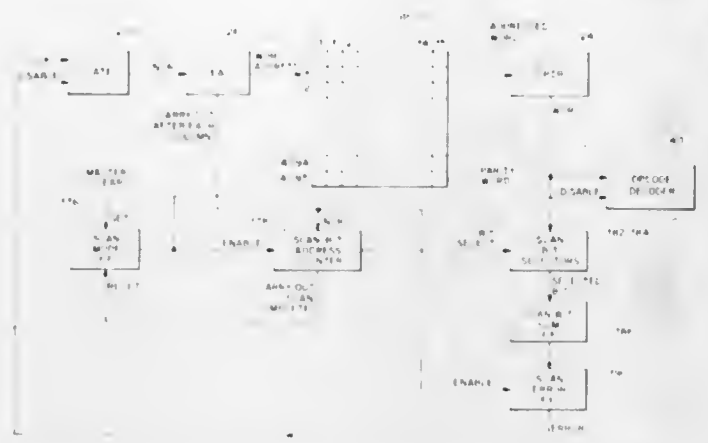


1. An adaptive filter comprising:
first means for receiving a first input signal;
a first adaptive transversal filter, coupled to said first means, being responsive to the first input signal for developing a first filter signal;
a second adaptive transversal filter responsive to an output signal of the adaptive recursive filter for developing a second filter signal;
second means for combining the first and second filter signals to form said output signal;
third means for receiving the second input signal;
fourth means coupled to said second and third means for combining the second input signal with the output signal to generate an error signal; and
fifth means responsive to the error signal for causing said first and second transversal filters to adaptively modify the first and second filter signals to minimize the mean square error in the output signal.

4,038,537
APPARATUS FOR VERIFYING THE INTEGRITY OF INFORMATION STORED IN A DATA PROCESSING SYSTEM MEMORY
Frank V. Cassarino, Jr., Weston; Thomas O. Holtey, Newton Lower Falls, and Douglas L. Riikonen, Westford, all of Mass., assignors to Honeywell Information Systems, Inc., Waltham, Mass.
Filed Dec. 22, 1975, Ser. No. 643,453
Int. Cl.² G06F *11/10*
U.S. Cl. 235—153 AM **13 Claims**

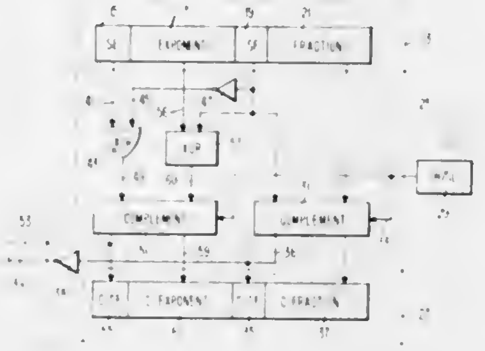
1. Apparatus comprising:
- A. means for storing information, said means for storing including a plurality of word locations, each for storing a word, each of said word locations including a plurality of bit locations, each for storing a bit, said bit locations in the same position in each of said word locations forming a column of bit locations, one of said word locations including a parity bit in each said bit location in order to indicate the integrity of said information on a said column basis;

- B. means for sequentially accessing said words in each of said word locations in said means for storing;
- C. column selector means for accessing one bit in the same bit location for each of said words accessed from said word locations, thereby selecting one of said columns for the purpose of indicating the integrity of the contents thereof;



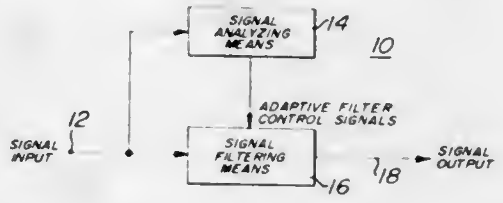
- D. means for adding the value of the accessed bits for the same bit location in each of said accessed words until all of said bits in one said column identified by said same bit location are added together thereby generating a final value; and
- E. means for detecting whether said final value indicates an error condition.

4,038,538
INTEGER AND FLOATING POINT TO BINARY CONVERTER
Carl Frederick Semmelhaack, West Chester, and Mark Camillo DiVecchio, Phoenixville, both of Pa., assignors to Burroughs Corporation, Detroit, Mich.
Division of Ser. No. 605,251, Aug. 18, 1975, Pat. No. 4,007,439. This application May 12, 1976, Ser. No. 685,615
Int. Cl.² G06F *5/00*
U.S. Cl. 235—154 **3 Claims**



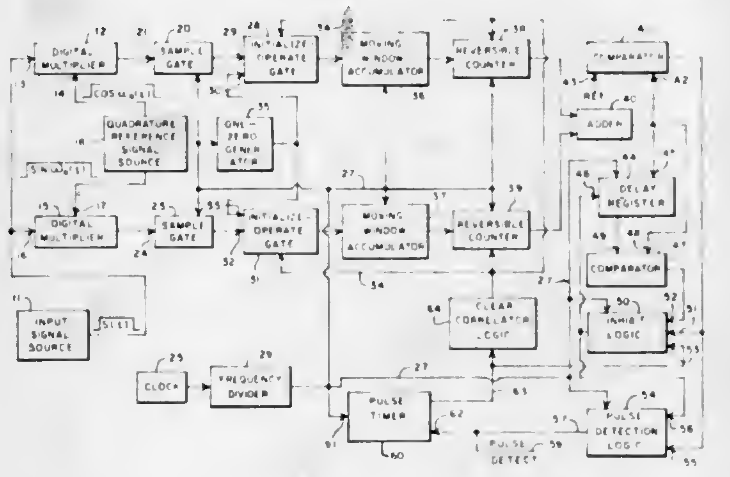
1. A converter for use in a logic element storing a numerical digital value having an exponent sign bit, an exponent field, an integer/fraction sign bit, and an integer/fraction field, said converter comprising:
controller means having a first and a second logical state for controlling conversion of said numerical digital value;
means for complementing said exponent sign bit when both said integer/fraction sign bit equals a logical zero and said controller means is in said first logical state and when both said integer/fraction sign bit equals a logical one and said controller means is in said second logical state;
means for complementing said exponent field when both said integer/fraction sign bit equals a logical one and said controller means is in said first logical state and when both said integer/fraction sign bit equals a logical zero and said controller means is in said second logical state;
means for complementing said integer/fraction field when said controller means is in said second logical state; and
means for complementing said integer/fraction bit when said controller means is in said first logical state.

4,038,539
ADAPTIVE PULSE PROCESSING MEANS AND METHOD
James R. Van Cleave, Furlong, Pa., assignor to American Electronic Laboratories, Inc., Colmar, Pa.
Filed Feb. 23, 1976, Ser. No. 660,230
Int. Cl.² G06F *15/34;* H04B *3/04*
U.S. Cl. 235—156 **106 Claims**



1. A signal processing means for pulse signals which are received with noise signals comprising terminal means for receiving input signals including pulse and noise signals with the pulse signals occurring at unknown times and having unknown durations; signal filtering means having a first input receiving signals derived from said terminal means, a second input and an output; said signal filtering means having a controllable filter characteristic for passing signals from its first input to its output responsive to signals received at its second input; and a signal analyzing means having an input receiving signals derived from said terminal means and an output delivering signals which are responsive to signals currently received at its input without using previous signals, to the second input of said signal filtering means for controlling its filter characteristic; whereby the output of said signal filtering means delivers signals corresponding to the pulse signals of the input signals of said terminal means while minimizing the delivery of noise signals received at said terminal means.

4,038,540
QUADRATURE CORRELATION PULSE DETECTOR
James L. Roberts, Seattle, Wash., assignor to Honeywell Inc., Minneapolis, Minn.
Filed Apr. 19, 1976, Ser. No. 678,016
Int. Cl.² G06F *15/34;* G01S *9/23*
U.S. Cl. 235—181 **12 Claims**



1. Pulse detection apparatus for detecting tone pulses of a known duration and carrier frequency in a signal in which random noise is present, comprising in combination:
input means for supplying an input signal in which tone pulses are to be detected;

clipping means for hard limiting the input signal to produce a clipped signal having either of two instantaneous amplitudes;

a reference signal source for generating first and second square wave signals comprising quadrature components of a square wave reference signal having a repetition rate equal to said carrier frequency and either of two instantaneous amplitudes substantially equal to those of the clipped signal;

first and second digital multiplication means for multiplying the clipped signal and each of the first and second square wave signals to produce first and second product signals respectively, each having a first value when the instantaneous amplitudes of its multiplicand signals are substantially equal and a second value when the instantaneous amplitudes of its multiplicand signals are different;

sampling means for sampling the first and second product signals at a sampling rate adequate to retain the desired information in the input signal to provide first and second sample trains respectively;

a first shift register having an input terminal connected to receive the first sample train, an output terminal for subsequently supplying the first sample train, and a predetermined number of storage locations through which samples are shifted seriatim at said sampling rate between the input and output terminals;

a first reversible counter having a data input terminal connected to receive the first sample train from said first shift register, and an enabling terminal for receiving a signal to permit counting in response to samples received at the data input terminal, said first reversible counter being operable to count in one sense in response to samples having said first value, and operable to count in the opposite sense in response to samples having said second value, so as to produce a first count indicative of the difference between the numbers of samples in said first shift register having first and second values;

first enabling means operable to supply a signal to the enabling terminal of said first reversible counter only when the values of the samples at the input and output terminals of said first shift register means are different;

a second shift register having an input terminal connected to receive the second sample train, an output terminal for subsequently supplying the second sample train, and a predetermined number of storage locations through which samples are shifted seriatim at said sampling rate between the input and output terminals;

second reversible counted means having a data input terminal connected to receive the second sample train from said second shift register, and an enabling terminal for receiving a signal to permit counting in response to signals received at the data input terminal, said second reversible counter being operable to count in one sense in response to samples having said first value, and operable to count in the opposite sense in response to samples having said second value, so as to produce a second count indicative of the difference between the numbers of samples in said second shift register having first and second values;

second enabling means operable to supply a signal to the enabling terminal of said second reversible counter only when the values of the samples at the input and output terminals of said second shift register are different;

an adder for adding the first and second counts to produce a moving correlation signal indicative of degree of correlation between the input signal and the square wave reference signal; and

a first comparator for comparing the moving correlation signal with a threshold reference signal indicative of a correlation threshold, and producing a pulse indication signal when the moving correlation signal indicates correlation greater than the correlation threshold.

4,038,541

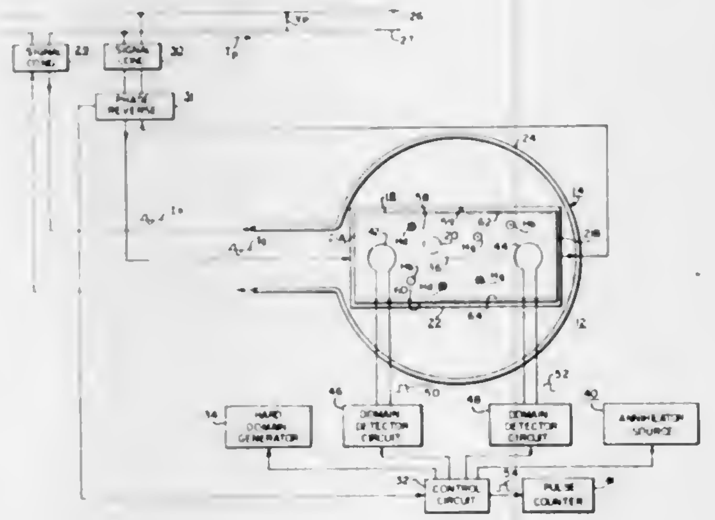
HARD MAGNETIC BUBBLE DOMAIN ANALOG MULTIPLIER

Aleksander I. Braginski, Plum Borough, and Terence W. O'-Keeffe, Pittsburgh, both of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Apr. 7, 1976, Ser. No. 674,512

Int. Cl.^{2} G06G *7/16;* G11C *11/14*

U.S. Cl. 235—194 **13 Claims**



1. A hard magnetic bubble domain analog multiplier comprising:

a strip layer of hard bubble domain magnetic material capable of sustaining a hard bubble domain, said strip layer having an elongated area therein defining a bubble domain propagating channel, said channel having an axis of net displacement of bubble domain motion extending substantially parallel to opposite side boundaries of said propagating channel;

means including a bias magnetic field for maintaining at least one hard magnetic bubble domain in said propagating channel;

means producing a domain diameter control magnetic field into said strip layer so as to have an instantaneously uniform intensity throughout said domain propagating channel;

a first input current signal means responsive to a first quantity to be computed upon for cyclically varying said domain diameter control field in response to cyclic variations of the first quantity;

means producing a driving field gradient into said strip layer so as to have a gradient direction of maximum increasing intensity across said domain propagating channel so that the direction of the driving field gradient is substantially perpendicular to the net displacement axis;

a second input signal means for cyclically varying said driving field gradient in response to the cyclic variations of a second quantity to be computed upon by being multiplied by said first quantity whereby the combined cyclic variations of said domain diameter control field and said driving field gradient produce orbital domain movements having average movement along the net displacement axis of said domain propagating channel at an average velocity directly proportional to the product of said domain diameter control field and said driving field gradient thereby producing a domain net displacement proportional to the time integral of the product of said first and second quantities.

4,038,542

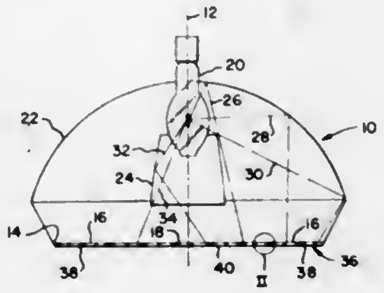
LUMINAIRE FOR CONTROLLING LOCALLY UNIDIRECTIONAL LIGHT

Thomas W. Dey, Rochester, N.Y., assignor to Bausch & Lomb Incorporated, Rochester, N.Y.

Filed July 21, 1975, Ser. No. 597,846

Int. Cl.^{2} F21V *13/00*

U.S. Cl. 240—92 **5 Claims**



1. A luminaire having an aperture for providing locally unidirectional light across a zone of the aperture, comprising:

a light source for emitting visible light;

reflector means for reflecting a portion of light emitted from said light source through a first zone of the aperture to provide a first zonal illumination area and for providing light of substantially uniform flux across the first zone;

deviator means disposed within said reflector means for preventing the direct passage of light from said light source to the first zone and for directing a second portion of light emitted from said light source through a second zone of the aperture to provide a second zonal illumination area, the deviator and reflector means being constructed to provide substantially equal zonal illumination of the first and second areas; and

light modifying means disposed across the aperture for controlling the locally unidirectional light passing through at least the first zone by critically reflecting and then refracting such light into a control range.

4,038,543

SCANNING TRANSMISSION ELECTRON MICROSCOPE INCLUDING AN IMPROVED IMAGE DETECTOR

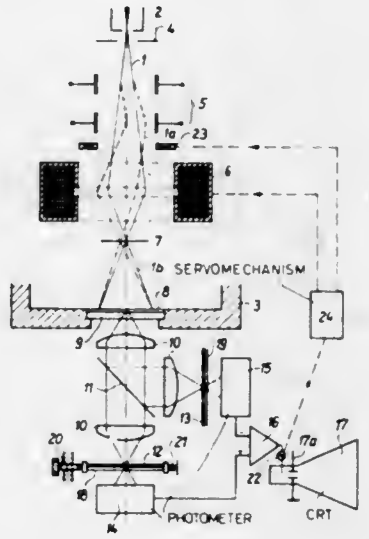
Burkhard Krisch; Lee H. Veneklasen, and Dieter Willasch, all of Berlin, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany

Filed June 15, 1976, Ser. No. 696,475

Claims priority, application Germany, July 8, 1975, 2530844

Int. Cl.^{2} H01J *37/26;* G01N *23/04*

U.S. Cl. 250—307 **15 Claims**



1. In a scanning transmission electron microscope including an evacuated housing and a phase contrast device, and in which the imaging ray cone of the microscope generates a hologram having zones of positive or negative interference, said microscope also including means for separately detecting and measuring the intensities of said zones of positive or negative interference and display means coupled to and controlled by said detecting means for monitoring said intensities, the improvement comprising said means for detecting comprising

image conversion means, disposed in the electron beam path of said microscope, on which said hologram is projected for converting said hologram into an optical image;

planar mask means, disposed outside of said microscope housing, having transparent and opaque areas which correspond to said zones of positive and negative interference of said hologram;

means, disposed adjacent said image conversion means, for transmitting said optical image with unchanged relative intensity distribution to said mask means; and

means, disposed adjacent said mask means and coupled to said display means, for measuring the light intensity transmitted through said transparent areas of said mask means and generating an output signal corresponding to the measured light intensity for display on said display means.

4,038,544

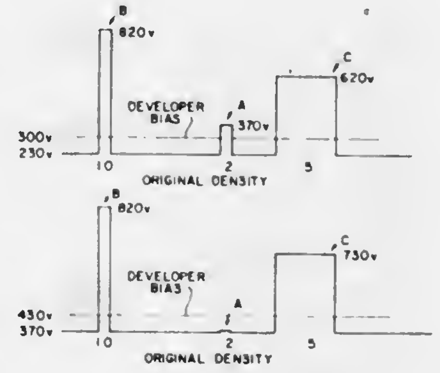
APPARATUS AND METHOD FOR DEVELOPING AN ELECTROSTATIC LATENT IMAGE

Vittal U. Shenoy, Rochester, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,238

Int. Cl.^{2} G03G *15/00*

U.S. Cl. 250—315 R **4 Claims**



1. The method of treating an electrostatic latent image having a background area charged to a first level, a first area charged to a second level which is higher than the first level, and a second area charged to a third level which is higher than the second level comprising:

depositing a charge onto the latent image of the same polarity as the polarity of the background and of a magnitude sufficient to substantially eliminate the contrast in charge levels between the background and the first area.

4,038,545

ELECTROSTATIC RECORDING PROCESS AND IONIZING RADIATION IMAGE RECORDING METHOD EMPLOYING THE SAME

Takao Komaki; Kazuo Horikawa; Satoru Honjo, and Seiji Matsumoto, all of Asaka, Japan, assignors to Fuji Photo Film Co., Ltd., Minami-ashigara, Japan

Filed June 7, 1976, Ser. No. 693,641

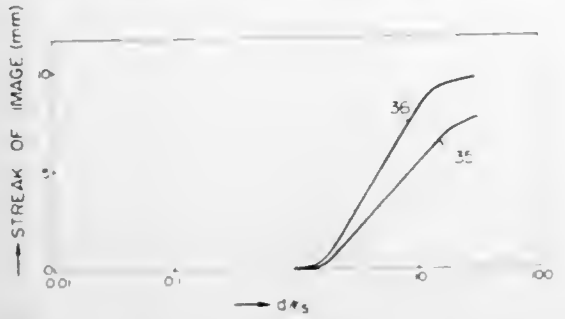
Claims priority, application Japan, June 6, 1975, 50-68369; June 9, 1975, 50-69387

Int. Cl.^{2} G03G *13/00, 15/00*

U.S. Cl. 250—315 A **2 Claims**

1. An electrostatic recording method comprising the steps of forming an electrostatic latent image on the surface of a dielectric electrostatic recording layer provided on a support at least the surface of which is conductive, the ratio of the thickness of said electrostatic recording layer $d[\mu m]$ to the specific dielec-

tric constant thereof ϵ_s being not larger than 1.65[μm] when a reflection type image is formed on said layer, and being not



larger than 1.5[μm] when a transmission type image is formed thereon, and developing said electrostatic latent image by use of an electrophotographic liquid developer.

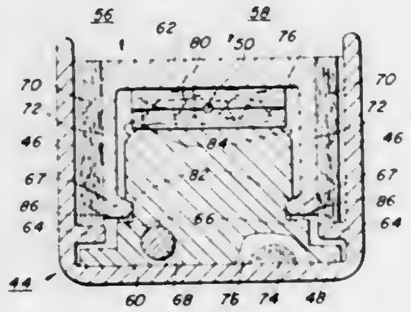
4,038,546
CLEANING APPARATUS FOR A CORONA GENERATING DEVICE

Stefan A. Jasinski, Webster, N.Y., assignor to Xerox Corporation, Stamford, Conn.

Filed May 3, 1976, Ser. No. 682,828

Int. Cl.² H01J *37/26*

U.S. Cl. 250—324 **6 Claims**



1. An improved cleaning apparatus for a corona generating device of the type having an elongated generally U-shaped shield defining a discharge opening through which ions are emitted, and a corona wire mounted within and extending along the shield, wherein the improvement comprises:

a. a block, and means for slidably mounting and retaining the block within the shield so that the block can be moved back and forth along the shield;

b. a cap having shield cleaning means thereon for cleaning at least a portion of the interior surface of the shield; and

c. means for locking the cap into an operative position as the cap is being pushed over the corona wire and block.

4,038,547
TRACKING AND SIGHTING INSTRUMENT

Howard F. Hoesterey, Santa Ana, Calif., assignor to Philco Corporation, Dearborn, Mich.

Filed May 31, 1966, Ser. No. 553,790

Int. Cl.² F41G *11/00*

U.S. Cl. 250—338 **7 Claims**

1. Missile tracking and target sighting apparatus of the type which receives conjoint, generally parallel beams of incident visible and infrared light, coming respectively from a target and a missile, said apparatus comprising means for initially splitting the incident conjoint light beams into separate beams of infrared and visible light respectively; a first objective, disposed in the path of the visible light beam and focusing the light thereof into target-sighting ocular means; and a second and separate objective, disposed in the path of the infrared light beam and focusing the light of the latter beam into missile-tracking receiver means, said first and second objectives being highly transmissive, respectively, to visible light and to infrared light.

4,038,548
LEVEL AND INTERFACE DETECTION

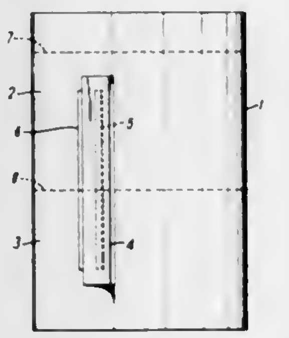
John Stuart Charlton, Billingham, England, assignor to Imperial Chemical Industries Limited, London, England

Filed June 19, 1975, Ser. No. 588,647

Claims priority, application United Kingdom, June 21, 1974, 27644/74

Int. Cl.² G01F *23/00;* **G01T** *3/00*

U.S. Cl. 250—357 **12 Claims**



1. Equipment for determing the position of the interface between two liquids in a vessel, both liquids having a moderating effect on fast neutrons and being selected from the group consisting of liquids having differing abilities to moderate fast neutrons, liquids having differing abilities to absorb slow neutrons and liquids having different abilities to moderate fast neutrons and to absorb slow neutrons comprising an emitter of fast neutrons, which in use is positioned adjacent the vessel and an associated detector of slow neutrons, which in use is placed adjacent the vessel to receive at least some of the slow neutrons emerging from the vessel.

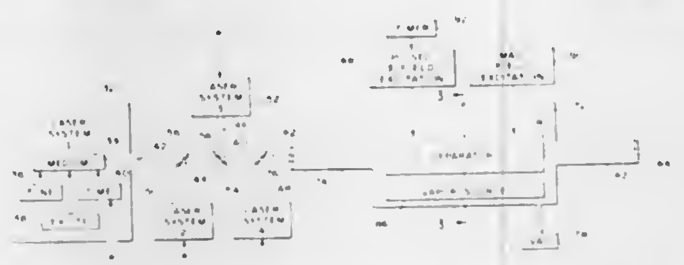
4,038,549
ISOTOPICALLY SELECTIVE EXCITATION FROM PLURAL EXCITED STATES

George Sargent Janes, Lincoln, Mass., and Richard H. Levy, Seattle, Wash., assignors to Jersey Nuclear-Avco Isotopes, Inc., Bellevue, Wash.

Filed June 8, 1973, Ser. No. 368,298

Int. Cl.² H01J *37/08, 39/34*

U.S. Cl. 250—423 P **29 Claims**



28. In a system for isotope separation, apparatus for selectively exciting particles of one isotope type in an environment of plural isotope types in which the plural isotope type particles populate the ground and one or more other low-lying energy states to a substantial degree, said apparatus including:

means for applying first radiant energy to said environment to produce selective excitation of said particles of said one isotope type from the ground energy state to a substantially excited energy state; and

means for applying a second radiant energy to said environment to produce selective excitation of further particles of said one isotope type from the one or more other populated low-lying excited energy states to a substantially excited energy state.

4,038,550
METHOD AND AN APPARATUS FOR THE MEASURING OF THE WALL THICKNESS OF A TUBE

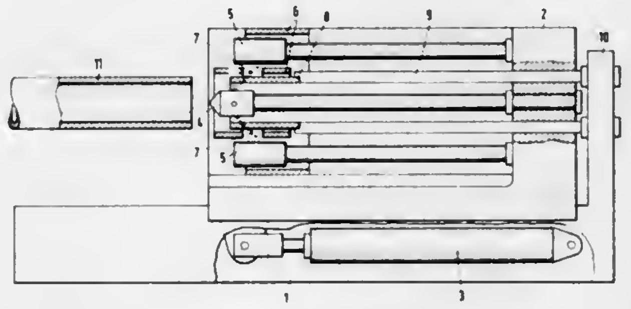
Johann Wassen, Brackwede; Gunter Schulz, Dusseldorf, and Gunter Ivens, Julich, all of Germany, assignors to Mannesmannrohren-Werke AG, Dusseldorf, Germany

Filed June 30, 1975, Ser. No. 591,532

Claims priority, application Germany, Aug. 20, 1974, 2440274

Int. Cl.² G01N *23/00*

U.S. Cl. 250—358 P **2 Claims**



1. Apparatus for measuring the wall thickness of a tube comprising:

a bed adapted to mount said tube;

a reciprocal carriage mounted on said bed for movements longitudinally of the tube axis;

reciprocal means on said bed connected to said carriage;

said carriage having an advanced testing position and a retracted position;

a stationary calibration tube of predetermined wall thickness axially aligned with the tube to be tested, and mounted on and overlying said bed;

a holding bar coaxial of and within said tubes anchored to said carriage and at one end mounting a radiation source;

said source in the retracted position of said carriage being nested within said calibration tube, and in the testing position of said carriage, nested within the tube whose wall thickness is to be measured;

a pair of concentric inner and outer tubular radiation protection sleeves mounted on said carriage enclosing the radiation element and adapted to alternately receive and enclose the corresponding portion of the tube to be tested when the carriage is in testing position and to receive and enclose the corresponding portion of the calibration tube when the carriage is retracted;

and a plurality of parallel equiangularly arranged scintillation counters parallel to said rod secured to said carriage and positioned around said radiation element, and disposed between said protection sleeves;

the inner protection sleeve having a series of window-like apertures through which radiation from the radiation source passes in the testing position of the carriage after passing through the wall of the tube to be tested and respectively, in the retracted position of the carriage after passing through the wall of the calibration tube;

said scintillating counters adapted for connection to apparatus including means for indicating and detecting values received from said scintillation counters.

4,038,551
CIRCUIT FOR PROCESSING SIGNAL DATA OBTAINED FROM AN AXIAL TOMOGRAPHIC SCANNING APPARATUS

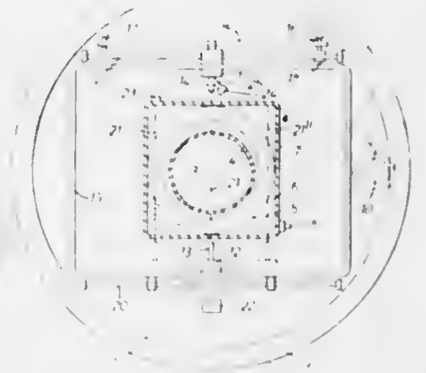
Christopher Archibald Gordon LeMay, Osterley, England, assignor to E M I Limited, Haynes, England

Division of Ser. No. 462,104, April 18, 1974, Pat. No. 3,924,129. This application Sept. 2, 1975, Ser. No. 609,718

Claims priority, application United Kingdom, Apr. 25, 1973, 19528/73; Aug. 21, 1973, 39420/73; Oct. 11, 1973, 47507/73

Int. Cl.² G01N *21/34*

U.S. Cl. 250—445 T **8 Claims**



1. Apparatus for examining a substantially planar section of a body by means of penetrating radiation, especially X-or γ-radiation, comprising a source of the radiation, a detecting arrangement for detecting radiation emergency from the section along at least one beam, scanning means arranged to cause said detecting arrangement to provide data signals representing the transmission or absorption of radiation passing through the section along sets of beams orientated at different angles in said section, and circuit means for constructing a representation of the transmission or absorption of said radiation at different locations in said section, the circuit means including storage elements corresponding to said locations and means for accumulating, in each storage element, signals derived from the data signals and relating to beams passing through or adjacent the corresponding locations, the improvement comprising; a signal modifying device having input and output connections and a recirculatory signal path linking said input and output connections, means for applying the data signals relating to a set of beams, in regular time sequence, to said input connection, a multiplying circuit for multiplying, by a factor less than unity, signals traversing said signal path and for applying the product to said input connection and means for combining said product with the next signal in said sequence so that, as the data signals relating to a set of beams are applied sequentially to said input connection, output signals appear in succession at said output connection, each corresponding to a respective one of said data signals and some at least of said output signals including contributions from other data signals of the same set each said contribution comprising a data signal multiplied by a respective one of a series of progressively diminishing factors, related to the spacing between the beam to which said respective one of said data signals relates and the beams to which said other data signals relate, means being provided for distributing the output signals so derived to the storage elements corresponding to the locations in said section intersected by the beam to which said respective one of said data signals relates.

4,038,552
LUMINOUS SAFETY DEVICE

Anne Louise Ciofalo, 310 Lakeshore Drive, Haworth, N.J. 07641

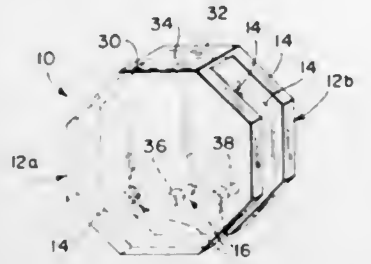
Filed June 16, 1976, Ser. No. 696,781

Int. Cl.² F21K *2/00*

U.S. Cl. 250—462 **3 Claims**

1. A safety device comprising a pair of octagonal plates and

a living hinge secured therebetween along adjacently disposed edges thereof to thereby integrally and hingedly connect said plates, said plates and said hinge element being formed in a single step by a molding procedure, a luminous material being provided on at least the opposed outer faces of said plates, and separable cooperable connecting means for detachably securing said plates to a selected object.



4,038,553

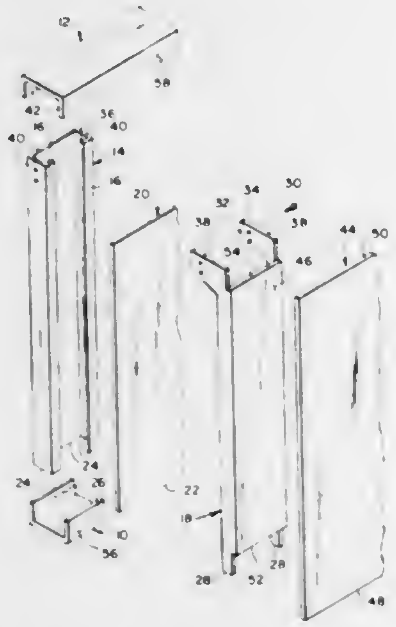
RADIATION SHIELDING APPARATUS

Ralph J. McCullagh, 11221 NW. 43rd St., Coral Springs, Fla. 33065

Filed Aug. 24, 1976, Ser. No. 717,111

Int. Cl.^{2} G21F *3/04*

U.S. Cl. 250—517 **6 Claims**



1. A radiation shielding apparatus comprising a pair of U-shaped tracks, a first element having a U-shaped cross-section and a pair of inwardly turned flanges fixedly secured to the free longitudinal edges thereof, a second element having a U-shaped cross-section and a pair of arms extending the length of the legs of said U-shaped cross-section, said pair of arms fixedly secured to said legs adjacent one end of said second element, means to removably fasten said pair of arms to portions of said first element adjacent one end thereof, means to clampingly secure lead sheeting between said first element and said second element, means to confine said one end of said first element and said one end of said second element within one of said pair of U-shaped tracks, means to confine the other end of said first element and the other end of said second element within the other of said pair of U-shaped tracks.

4,038,554

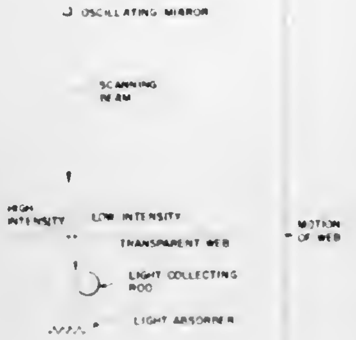
DETECTION OF FLAWS IN A MOVING WEB OF TRANSPARENT MATERIAL

Dwin R. Craig, Gaithersburg, Md., assignor to Columbia Research Corporation, Gaithersburg, Md.

Filed Mar. 9, 1976, Ser. No. 665,354

Int. Cl.^{2} G01N *21/32*

U.S. Cl. 250—572 **14 Claims**



1. A method for detection of flaws in a substantially planar web of transparent material, said method being characterized by being able to distinguish between the presence of a light absorbing flaw, and a light refracting flaw, in said material, comprising the steps of:

A. directing a light beam upon one surface of said web of transparent material with a beam direction that is within a plane that is perpendicular to the plane of said web; wherein,

B. said light beam has a light distribution further comprising a high intensity central cores, symmetrical about an axis colinear with said beam direction, and surrounded by an annular disk of significantly lower intensity; and

C. passively absorbing all of said high intensity light distribution which remains directed in the plane of said beam direction after passing through said transparent web material; while

D. impinging at least a portion of that low intensity disk, which remains directed in the plane of said beam direction after passing through said web, onto a photoelectric signal generating means; and

E. generating a constant intermediate signal in said photoelectric signal generating means in response to the said impingement of said low intensity disk, whereby a light refracting flaw is operable to deviate said high intensity core to produce a signal of a first polarity, and a light absorbing flaw is operable to generate a signal of the opposite polarity.

4,038,555

PHOTOMETRIC MEASURING SYSTEM

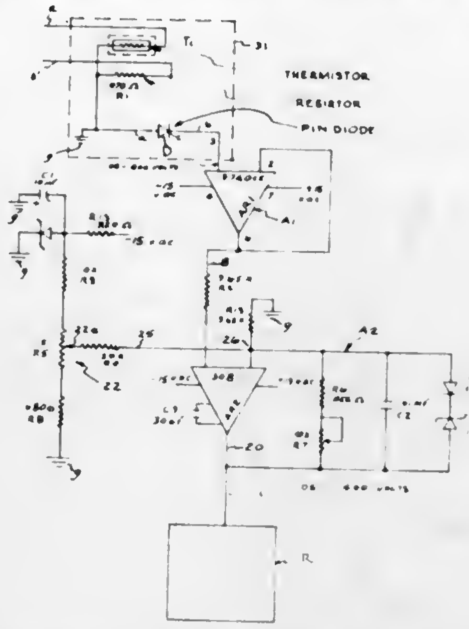
Gary M. Freeman, Houston, Tex., assignor to Gilford Instrument Laboratories, Inc., Oberlin, Ohio

Filed Aug. 28, 1974, Ser. No. 501,272

Int. Cl.^{2} G01N *21/24*

U.S. Cl. 250—573 **3 Claims**

1. An asborption photometric measurement system comprising, a light source for projecting light onto a liquid sample under test, a photodiode disposed in light interrrupting position with respect to the light passing through said sample, signal amplifier means having a high impedance input and an input bias current less than ten pico amperes, said photodiode having its anode-cathode circuit connected in series circuit relation between the input of said amplifier means and the system ground, said photodiode being operable to provide an open circuit voltage signal across its anode-cathode junction whose magnitude is linearly proportioned to the absorbance of the sample under test, and second circuit means operably connected to the amplifier means and including means adjustable to preset said second circuit means at a preselected operational level whereby said amplifier means is responsive to the output signal of said photodiode to provide a signal that is directly representative of the absorbance of light by said sample under test.



4,038,556

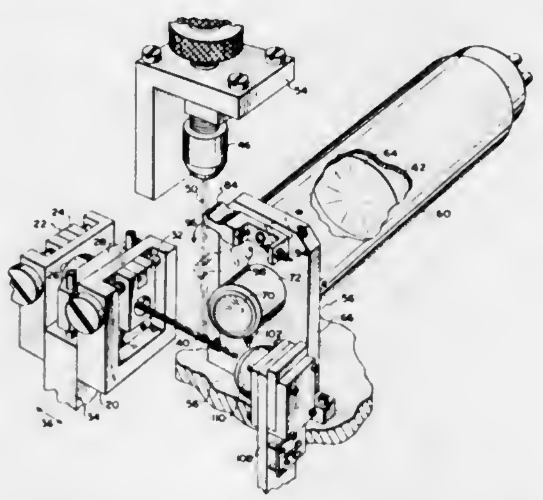
METHOD AND APPARATUS FOR SIMULTANEOUS OPTICAL MEASUREMENT OF PARTICLE CHARACTERISTICS

Robert Edward Auer, Miami, Fla., and Howard E. Tucker, Los Alamos, N. Mex., assignors to Coulter Electronics, Inc., Hialeah, Fla.

Filed June 14, 1976, Ser. No. 695,475

Int. Cl.^{2} G01N *21/26*

U.S. Cl. 250—575 **54 Claims**



1. An apparatus for simultaneous optical measurement of several characteristics of each particle of a group of small particles while the particles are suspended in a liquid including in combination:

a sample passage means through which the particles pass,

a first optical detector for receiving light from said sample passage means and for developing first detection signals in response to said received light,

means for moving one of said sample passage means and said optical detector with respect to the other for aligning one with respect to the other,

a source of light,

means for directing light from said light source to said sample passage means and for aligning said light and sample passage means,

a second optical detector for receiving light from said sample passage means and for developing second detection signals in response to said received light, said second detector including a converging lens for receiving said light from said sample passage means and photodetector means positioned a predetermined distance from said focusing lens for receiving said light from said lens, said predetermined distance selected such that the light pattern received by said photodetector due to the passage of a particle through the sample passage means will maintain a substantially constant intensity with movement of any of said sample passage means, particle and light whereby said detector means is insensitive to the movement of any of said sample passage means, first optical detector, light source and particle.

4,038,557

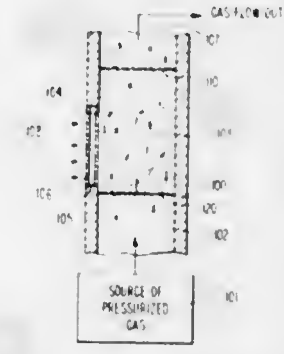
PARTICULATE ENERGY ABSORBER

Oliver DeP. Gildersleeve, Jr., 109 Deepdale Road, Strafford, Pa. 19087, and George A. Hunger, Jr., 410 W. Palmer St., Morrisville, Pa. 19067

Filed Feb. 12, 1975, Ser. No. 549,152

Int. Cl.^{2} H02P *9/04;* G02B *5/10*

U.S. Cl. 290—1 R **24 Claims**



1. Apparatus for converting radiant energy from a specified source to thermal energy comprising:

a. a housing defining a chamber therein;

b. a predetermined quantity of solid particulate material in said chamber, capable of absorbing radiant energy;

c. means for supplying gas to said particulate material at a pressure and rate which suspends said particulate material in a fluidized bed condition within said chamber; and

d. means for coupling radiant energy to said particulate material while simultaneously maintaining said fluidized bed condition, for absorption of radiant energy by said particulate matter and thermal transfer from said particulate matter to said gas.

4,038,558

ELECTRIC POWER GENERATING DEVICE FED WITH ENERGY RECOVERED FROM THE EXHAUST GASES OF AN INTERNAL COMBUSTION ENGINE

Jacques Gallois, Paris, France, assignor to Societe d'Etudes de Machines Thermiques, Saint Denis, France

Filed Oct. 10, 1975, Ser. No. 621,501

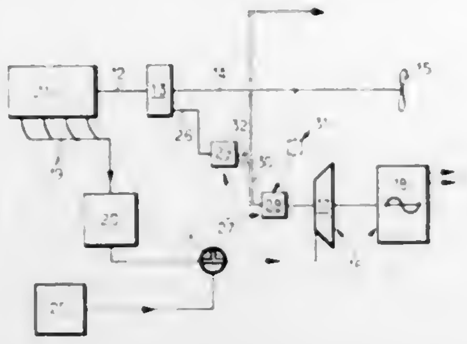
Claims priority, application France, Dec. 23, 1974, 74.42533

Int. Cl.^{2} F02G *3/02*

U.S. Cl. 290—52 **5 Claims**

1. An electric power generating device operated by recovering the energy from the exhaust gases of an internal combustion engine, comprising speed-reducing means mounted between said engine and a transmission shaft and a turbo-alternator set driven by said energy taken from said exhaust gases, the turbine of said turbo-alternator set being operatively coupled to said speed-reducing means, wherein the improvement con-

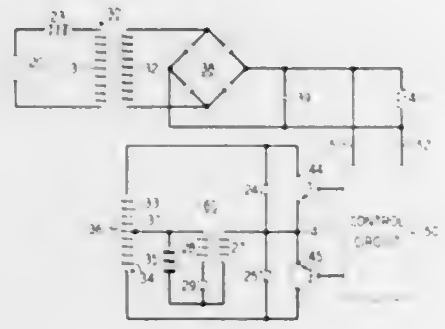
sists in that said turbine is operatively coupled to said speed-reducing means through the agency of a (variable-speed reversible transmission member) keyed in follow-up relationship to the actual speed variations of said transmission shaft.



4,038,559
REGULATED UNINTERRUPTIBLE POWER SUPPLY

Ping Sun Chun, Morristown; Patrick William Clarke, Murray Hill, and Kenneth William Gardner, Hopatcong, all of N.J., assignors to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.

Filed Jan. 23, 1976, Ser. No. 651,644
Int. Cl.² H02J *9/00*
U.S. Cl. 307—64 24 Claims



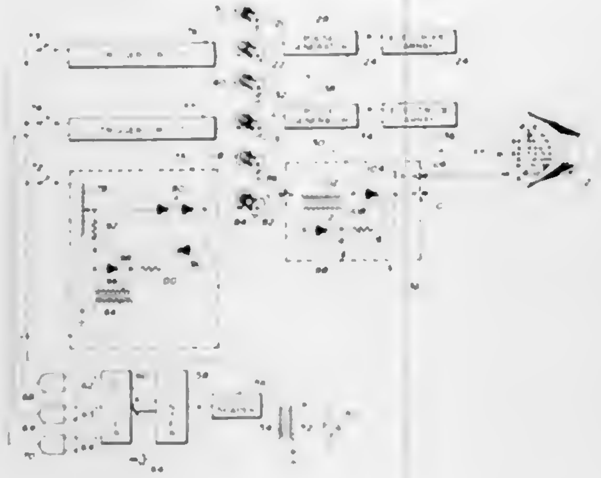
1. An uninterruptible power supply comprising
- a power transformer including a first, second, and third access winding,
- means for accepting an AC source coupled to said first winding,
- means for accepting a load coupled to said second winding,
- power flow control means including gating means coupled to said third winding, means for accepting a reserve source of energy coupled to said gating means, first means for controlling said gating means in order to short-circuit said third winding for controlled intervals of time, and second means for controlling said gating means to enable power flow from said reserve source of energy to said second winding.

4,038,560
PULSE SHAPING CIRCUIT FOR SHRIMP FISHING APPARATUS LOAD

James L. Newman, 1321 Glen Cove, Richardson, Tex. 75080, and M. Marion Hawthorne, 4824 Overton, Fort Worth, Tex. 76133

Continuation of Ser. No. 303,412, Nov. 3, 1972, abandoned, which is a division of Ser. No. 883,187, Dec. 8, 1969, abandoned. This application Aug. 23, 1974, Ser. No. 500,146
Int. Cl.² H03K *3/00*
U.S. Cl. 307—106 14 Claims

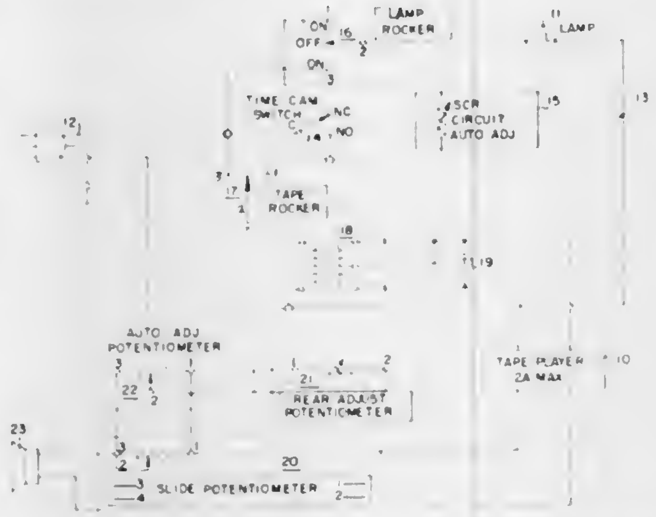
1. A pulse circuit comprisng:
- first, second and third terminals, said first and second terminals comprising input terminals and said second and third terminals comprising output terminals for the pulse circuit;
- a capacitor having first and second plates connected between said input terminals for charging by a charging current applied by a voltage across said input terminals;
- a gate controlled rectifier connecting said first plate to the third terminal;
- means connected to said input terminals for initiating a discharging current between the capacitor and the first terminal said discharging current having a polarity opposite to the charging current; and
- gate circuit means connected to said gate controlled rectifier and responsive to said discharging current for turning the gate controlled rectifier on to discharge the capacitor through a load connected between the terminals.



4,038,561
CHILDREN'S LAMP

Michael Lorenz, 421 55th St., Downers Grove, Ill. 60515

Filed June 30, 1975, Ser. No. 591,456
Int. Cl.² H01H *43/00*
U.S. Cl. 307—141 1 Claim

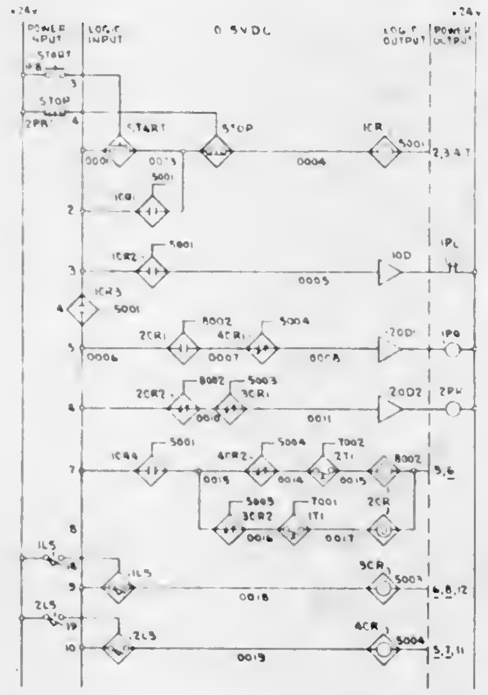


1. A combination audio, light and timing mechanism adapted to provide light and sound under control of said timing mechanism including an electrical circuit for the light and an audio device and a source of power energizing the circuit, an automatic adjusting SCR circuit device in said electrical circuit, a pair of rocker switches disposed in circuit with said timing mechanism and SCR circuit device each comprising a single pole double throw switch, potentiometer means in the electrical circuit including an automatic adjusting potentiometer and an adjustable potentiometer operating in circuit with a variable slide potentiometer with the automatic adjusting potentiometer and the adjustable potentiometer disposed in series parallel to provide a dual potentiometer circuit, a step-down transformer in the electrical circuit, and speaker means projecting said sound, said potentiometer means being disposed in the electrical circuit between said audio device and said speaker means.

4,038,562
LADDER STATIC LOGIC CONTROL SYSTEM AND METHOD OF MAKING

Paul M. Kintner, Bayside, Wis., assignor to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed June 16, 1972, Ser. No. 263,712
Int. Cl.² H03K *19/08*
U.S. Cl. 307—203 34 Claims



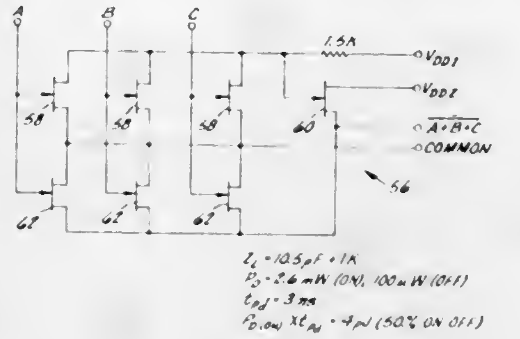
1. In a static logic control system, a logic system that is the static logic functional equivalent of a relay comprising:
- a coil equivalent static logic circuit having a signal input terminal and a single electrical signal, output terminal;
- means in said circuit operable upon application to said signal input terminal of an input logic signal simulating a coil energizing signal for causing said coil equivalent static logic circuit to provide at said single, electrical signal, output terminal a time delayed electrical output logic signal simulating the operating time of a relay for contact equivalent static logic circuit operation;
- a contact equivalent static logic circuit having a signal input terminal, a signal output terminal and a control input terminal;
- and means responsive to application of said coil equivalent static logic circuit electrical output logic signal to said control input terminal for conditioning said contact equivalent static logic circuit to control logic signal transmission between its signal input and signal output terminals;
- and said equivalent static logic circuits connectable on a one-to-one basis in a, for example, contact-contact-coil circuit.

4,038,563
SYMMETRICAL INPUT NOR/NAND GATE CIRCUIT

Rainer Zuleeg, Huntington Beach, and Johannes K. Notthoff, Lomita, both of Calif., assignors to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Oct. 3, 1975, Ser. No. 619,308
Int. Cl.² H03K *19/08, 19/34, 19/36;* H01L *29/80*
U.S. Cl. 307—205 5 Claims

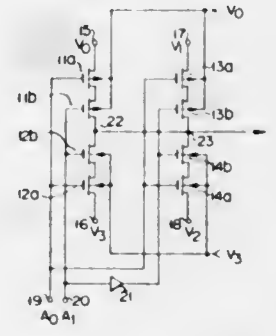
1. A nor/nand gate circuit comprising:
- a plurality of first normally-off type of junction field effect transistors, each of said first transistors including a drain, gate and source;
- a like plurality of second normally-off type of junction field effect transistors, each of said second transistors including a drain, gate and source;
- a like plurality of individual input terminals;
- a third normally-off type of junction field effect transistor, said third transistor including a drain, gate and source;
- a common impedance means connecting said drains of said first transistors and said gate of said third transistor to a first supply voltage, said drain of said third transistor being connected to a second supply voltage, said drains of said second transistors and said source of said third transistor being connected to a first output terminal, said sources of said first and second transistors being connected directly to a second output terminal; and
- means connecting said gates of said first transistors and said gates of said second transistors directly to each other by pairs and each such pair directly to a corresponding one of said input terminals in an arrangement of said first and said second transistors which is symmetrical relative to said second output terminal.



4,038,564
MULTI-LEVEL VOLTAGE SELECTION CIRCUIT

Masayuki Hakata, Oume, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Feb. 17, 1976, Ser. No. 658,172
Claims priority, application Japan, Feb. 20, 1975, 50-21306
Int. Cl.² H03K *19/08;* G02F *1/13;* G08B *5/36*
U.S. Cl. 307—205 5 Claims



1. A multi-level voltage selection circuit comprising:
- two CMOS circuits, each including a pair of P-channel MOS transistors serially connected in source-to-drain fashion, and a pair of N-channel MOS transistors serially connected in source-to-drain fashion and having their gate electrodes connected to those of said P-channel MOS transistors, respectively, thereby forming two pairs of P- and N-channel MOS transistors, and the open drain electrode of said pair of N-channel MOS transistors being connected to that of said pair of P-channel MOS transistors;
- an output terminal connected to the junctions between the P-channel MOS transistors and N-channel MOS transistors of said two CMOS circuits;
- two gate control terminals, one of said gate control terminals being connected to the gate electrodes of one pair of P-

and N-channel MOS transistors of one of said CMOS circuits and to those of one pair of P- and N-channel MOS transistors of the other CMOS circuit, and the other of said gate control terminals being connected to the gate electrodes of the other pair of P- and N-channel MOS transistors of one of said CMOS circuits and to those of the other pair of P- and N-channel MOS transistors of the other CMOS circuit, said gate control terminals receiving 1-bit binary coded signals;

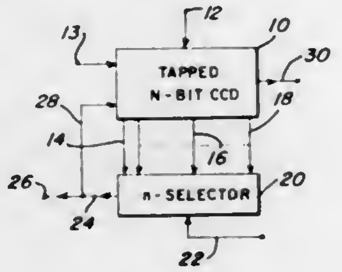
a logic circuit including one inverter and connected between said gate control terminals and the gate electrodes of said P- and N-channel MOS transistors so as to supply said 1-bit binary coded signals to the gate electrodes of both pairs of P- and N-channel MOS transistors of one of said CMOS circuits and the gate electrodes of one pair of P- and N-channel MOS transistors of the other CMOS circuit and said 1-bit binary coded signals inverted by said inverter to the gate electrodes of the other pair of P- and N-channel transistors of the other CMOS circuit; and

four selection voltage supplying terminals connected to the open source electrodes of said CMOS circuits, respectively.

4,038,565

FREQUENCY DIVIDER USING A CHARGED COUPLED DEVICE

Ramasesha Bharat, 2905 Echo Hill Way, Orange, Calif. 92667
Filed Oct. 3, 1974, Ser. No. 511,861
Int. Cl.² H03K ***21/36***
U.S. Cl. 307—225 C **8 Claims**



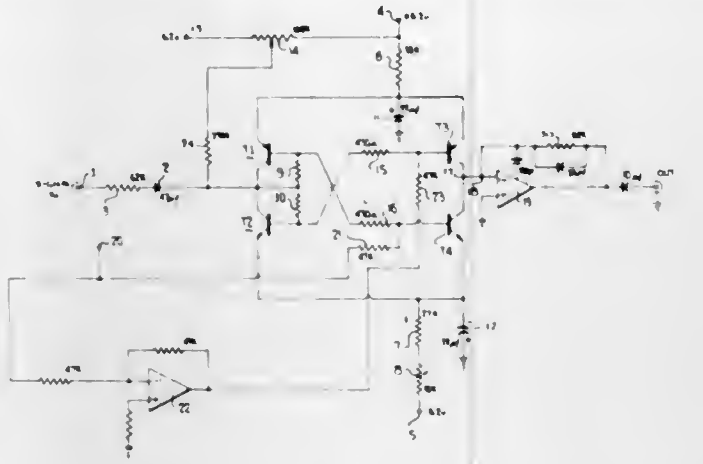
1. A frequency divider comprising:
- a tapped N-bit charge coupled device;
- means connected to a clock input of the charge coupled device for introducing clock pulses thereto;
- means connected to a trigger input of the charge coupled device for introducing an initial propagating trigger pulse thereto to initiate charge injection;
- means connected to a plurality of outputs of the charge coupled device, corresponding to the N bits of the charge coupled device, for selecting transmission of preselected tapped signals from the charge coupled device to an output terminal of the selecting means at which a frequency divided signal appears; and
- feedback means connected between an output terminal of the selecting means and a feedback input terminal of the charge coupled device to provide trigger pulses subsequent to the initial trigger pulse to trigger subsequent charge injection.

4,038,566

MULTIPLIER CIRCUIT

Ronald C. Evans, Binghamton, N.Y., assignor to McIntosh Laboratory, Inc., Binghamton, N.Y.
Filed Mar. 22, 1976, Ser. No. 669,053
Int. Cl.² H03K ***17/00***
U.S. Cl. 307—229 **10 Claims**

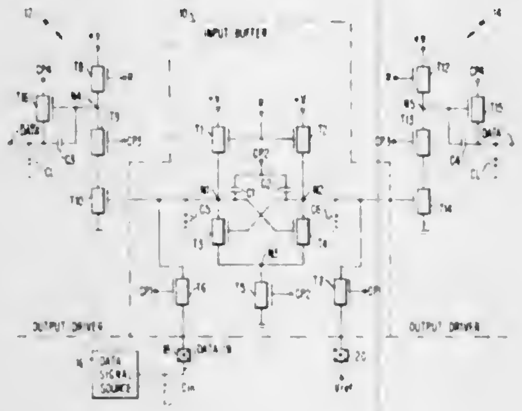
1. An electrical gain control system providing linear response over a wide range of gains including first bipolar diode circuit means for providing first output signals which are logarithmically related to an applied input signal, second bipolar circuit means connected in cascade with said first circuit means for providing a second output signal which is an antilogarithmic function of input signals applied to said second bipolar circuit means, and means for applying dc gain control voltage to said second bipolar circuit means, said second bipolar circuit means comprising a pair of series connected variable gain transistors of opposite conductivity types having an output terminal at the junction of said pair of series connected transistors.



4,038,567

MEMORY INPUT SIGNAL BUFFER CIRCUIT

Scott Clarence Lewis, Essex Junction; Theodore Milton Redman, Williston; James Edward Rock, Milton, and Donald Lawrence Wilder, Colchester, all of Vt., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Mar. 22, 1976, Ser. No. 669,012
Int. Cl.² H03K ***5/20, 5/18, 3/286, 3/353***
U.S. Cl. 307—362 **19 Claims**

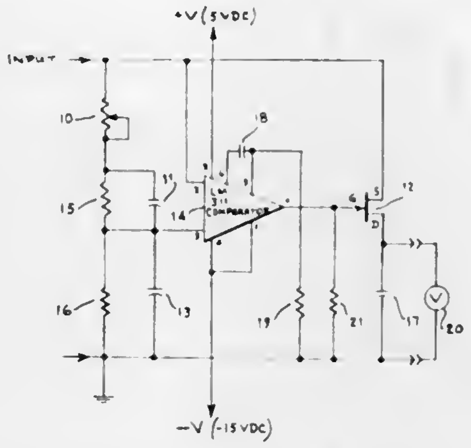


1. An input signal buffering circuit comprising:
- first and second input/output voltage nodes;
- regenerative latch means coupled to said input/output voltage nodes for providing logical output signals on said input/output voltage nodes in response to the application of differential potentials to said nodes only on the condition that the potential of at least one of said voltage nodes exceeds a predetermined potential;
- input signal source means for applying first and second input signal potentials to said first and second voltage nodes during a first clock period, the maximum magnitude of said first and second input signal potentials being insufficient to render said regenerative latch responsive; and
- capacitive coupling means coupled to said voltage nodes for independently increasing the magnitude of the potentials applied to said first and second voltage nodes after the application of said signal potentials and during a second time period to cause said regenerative latch means to provide logical output signals.

4,038,568

PULSE PEAK SAMPLE AND HOLD CIRCUIT

Klaus D. May, and Anthony T. Nasuta, Jr., both of Baltimore, Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Feb. 23, 1976, Ser. No. 660,573
Int. Cl.² H03K ***5/20***
U.S. Cl. 307—351 **1 Claim**



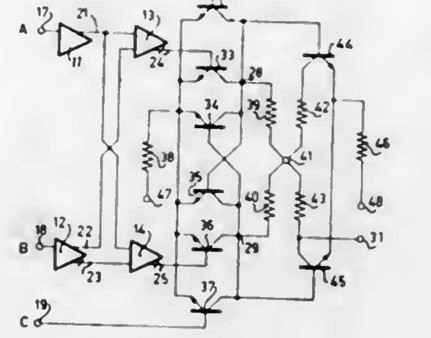
1. A pulse peak sample and hold circuit being comprised of an input integrator having a preselected time constant, said integrator including a variable resistor and capacitor, a switch field effect transistor normally off, a comparator having a preselected sensitivity, input pulses whose amplitude are to be determined being fed simultaneously and directly to said input integrator, said switch field effect transistor, and said comparator, said comparator also simultaneously receiving the output signal from said input integrator, the voltage across said comparator and across said resistor starting from a voltage peak and decaying to zero as said variable capacitor charges turning on said comparator until the voltage across said variable resistor becomes less than a preselected minimum voltage being said sensitivity of said comparator thus operating to provide an output gate pulse therefrom, a storage capacitor connected across the output of said switch field effect transistor, said output gate pulse being fed to said normally off switch field effect transistor turning it on allowing said storage capacitor to charge to the input pulse amplitude and pinching the field effect transistor off at the conclusion of the sample time as determined by said variable resistor, and a sensitive DC divider consisting of said variable resistor, first and second fixed resistors in series between a DC input and ground thus setting up a sensitive division between said variable, and said first and second fixed resistors always turning on said comparator.

4,038,569

BISTABLE CIRCUIT

Ferdinand Pool, Beekbergen, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.
Filed Aug. 26, 1975, Ser. No. 607,772
Claims priority, application Netherlands, Sept. 2, 1974, 7411604
Int. Cl.² H03K ***3/286***
U.S. Cl. 307—289 **9 Claims**

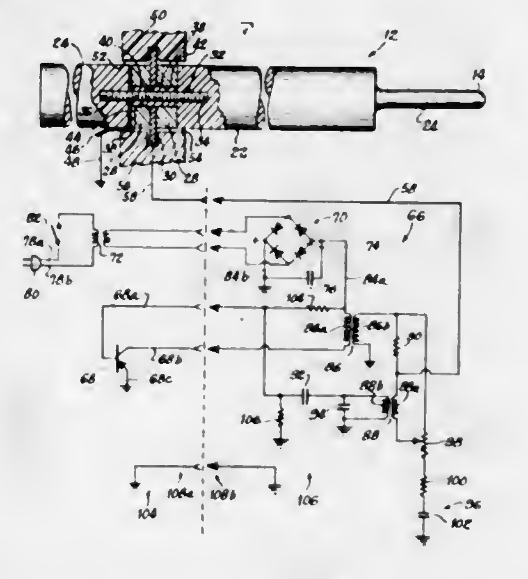
1. In combination, a bistable circuit and a logic circuit, the bistable circuit comprising, a first set of transistors having their emitter electrodes interconnected and their collector electrodes interconnected, a second set of transistors having their emitter electrodes interconnected and their collector electrodes interconnected, means connecting first corresponding interconnected electrodes of said first and second sets of transistors to a first supply terminal via respective separate first and second resistors, means connecting second corresponding interconnected electrodes of said first and second sets of transistors to a second supply terminal via a common third resistor in a current source circuit which is common to both sets of transistors, said third resistor having a higher resistance value than said first and second resistors, one control electrode of each set of transistors being cross-wise coupled to said first corresponding interconnected electrodes of the other set, said logic circuit comprising at least two input terminals and two output terminals and internal logic means for generating a redundant logic signal, means connecting at least one further control electrode of each set of transistors to a respective output of said logic circuit, the redundancy of the logic circuit being testable under the control of co-existent signals applied to said further control electrodes whereby at least one transistor of each set of transistors can be made to conduct together so that said first and second resistors carry substantially equal currents in parallel.



4,038,570

ULTRASONIC PIEZOELECTRIC TRANSDUCER DRIVE CIRCUIT

Benton A. Durley, III, Rte. 45, Druce Lake, P.O. Box 304, Grayslake, Ill. 60030
Division of Ser. No. 525,487, Nov. 20, 1974, abandoned. This application Jan. 26, 1976, Ser. No. 652,228
Int. Cl.² H01L ***41/04***
U.S. Cl. 310—8.1 **7 Claims**



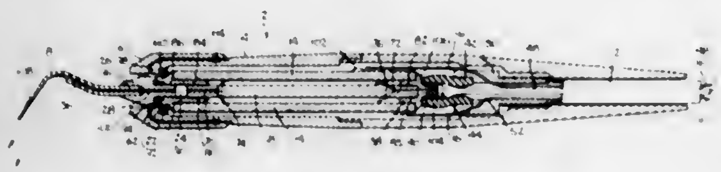
1. A device for generating ultrasonic energy,
- comprising a piezoelectric transducer including at least one piezoelectric element having a pair of electrodes on opposite sides of said element,
- a solid-state amplifier having input and output connections,
- a driver transformer having a primary winding connected to said output connections of said solid-state amplifier,
- said driver transformer having a secondary winding connected to said electrodes of said piezoelectric transducer,
- a feedback transformer having a secondary winding connected to said input connections of said solid-state amplifier,
- said feedback transformer having a primary winding,
- a phase shifting circuit connected between said electrodes and said primary winding of said feedback transformer,

and a resonating capacitor connected across said secondary winding of said feedback transformer,
said resonating capacitor and said secondary winding of said feedback transformer forming a parallel resonant bandpass filter.

4,038,571

PIEZOELECTRIC DENTAL CLEANING DEVICE

Johann F. Hellenkamp, Miami, Fla., assignor to Litton Industrial Products, Inc., Beverly Hills, Calif.
Filed Jan. 3, 1974, Ser. No. 430,504
Int. Cl.^{2} H01L *41/04*
U.S. Cl. 310—8.2 **10 Claims**

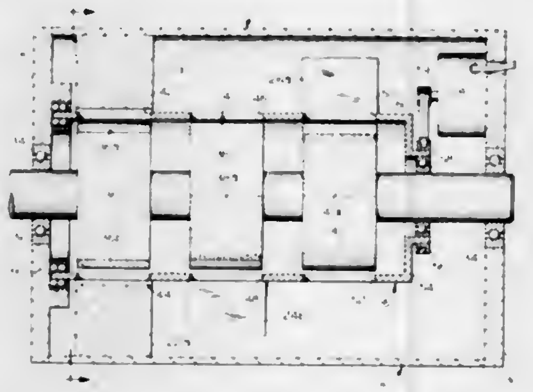


1. A piezoelectric dental cleaning device comprising:
a. a hollow, tubular, piezoelectric crystal for converting electrical energy into mechanical vibrations, said crystal having a front portion and a rear portion;
b. electric wires electrically connected to said crystal to provide electrical energy to said crystal;
c. a tie rod axially disposed within said tubular crystal, said tie rod having a front portion and a rear portion, said tie rod having means to allow the passage of fluid from the rear portion of said tie rod to the front portion of said tie rod;
d. a acoustical transformer having a front portion and a rear portion, said rear portion of said acoustical transformer being attached to the front portion of said tie rod and to the front portion of said crystal, said acoustical transformer having an axial bore;
e. a tip base having a front portion and a rear portion, said rear portion of the tip base being connected to the front portion of said acoustical transformer, said tip base having an axial bore to allow the passage of fluid and flats on a portion of the outer circumference of said tip base;
f. a dental workpiece, having a front portion and a rear portion, said rear portion of the dental workpiece being mounted in the front portion of said tip base, said workpiece having an axial bore to allow the passage of fluid;
g. a fluid connector having a front portion and a rear portion, the front portion of said fluid connector being attached to the rear portion of said tie rod and to the rear portion of said crystal, said fluid connector having an axial bore to permit the passage of fluid;
h. a bumper having a front portion and a rear portion, said front portion of the bumper being connected to the rear portion of said fluid connector, said bumper having an axial bore;
i. a fluid tube having a front portion and a rear portion, said front portion of the fluid tube being connected to the rear portion of said bumper, said fluid tube having an axial bore to permit the passage of fluid;
j. a wire holder having a front portion and a rear portion, the front portion of said wire holder being attached to the rear portion of said bumper, said wire holder having an axial bore within which the fluid tube is disposed;
k. an outer case which houses th crystal, tie rod, acoustical transformer, tip base, fluid connector, bumper, wire holder, fluid tube and electric wires; and
l. a front cap having a front portion and a rear portion and a substantially cylindrical configuration, the interior circumference of said cap being slightly larger than the outer circumference of the front portion of said outer case, said cap being rotatably positioned around the front portion of said outer case, said cap having interior flats at the front end of said cap, said flats being dimensioned to engage the flats on the exterior of said tip base to tighten or loosen or facilitate the removal of tip base and workpiece.

4,038,572

MAGNETIC CLUTCH DEVICE

Michael W. Hanagan, Somers, Conn., assignor to Corbin Gentry Inc., Somersville, Conn.
Continuation-in-part of Ser. No. 565,747, April 7, 1975, abandoned. This application Apr. 5, 1976, Ser. No. 673,933
Int. Cl.^{2} H02K *37/00*
U.S. Cl. 310—46 **8 Claims**



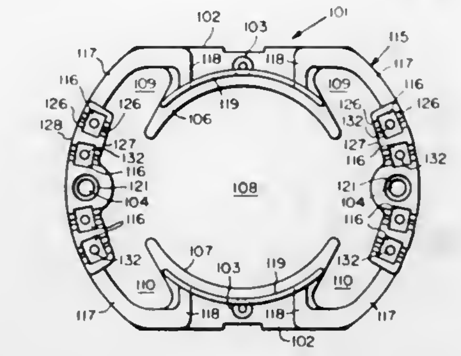
1. A magnetic motor comprising:
a. a stationary housing having a generally cylindrical inner configuration including a pair of end bells supported within said housing;
b. stationary field means supported within said housing;
c. an output shaft supported by said pair of end bells for rotation relative thereto and in response to the application thereto of magnetic forces;
d. rotatable field means supported on said output shaft for rotation therewith, said rotatable field means being secured to said output shaft at a position along the length of said output shaft so that said rotatable field means and said stationary field means are in axial alignment;
e. control means supported within said housing for rotation relative thereto, said control means being rotatable independent of the rotation of said output shaft, said control means being being interposed between said stationary field means and said rotatable field means and having port means formed therein alignable with said stationary field means and said rotatable field means, said control means being rotatable between a first position wherein said port means is aligned with said stationary field means and said rotatable field means so as to enable maximum magnetic attraction to exist therebetween operable for imparting rotation to said output shaft and a second position wherein said port means is nonaligned with said stationary field means and said rotatable field means; and
f. drive means supported within said housing and operatively connected to said control means for rotating said control means between said first and second positions thereof.

4,038,573

COIL TERMINATING MEANS

Michael J. Hillyer, Mechanicsburg, and Victor J. Madison, Carlisle, both of Pa., assignors to General Signal Corporation, Rochester, N.Y.
Filed Apr. 21, 1975, Ser. No. 569,918
Int. Cl.^{2} H02K *11/00*
U.S. Cl. 310—71 **14 Claims**

1. An assembly comprising in combination:
a. a magnetizable stator assembly for a fractional horsepower motor made of a plurality of laminated elements having congruent outlines, stacked together and configured to include a central opening to accommodate a rotor;
b. a preformed and separable terminal board configured to lie within the outline of said congruent elements without infringing on the area of said central opening and overlaying the outermost of said stack of laminated elements;
c. said terminal board including a first retaining means, a wing section and a facility for accommodating a plurality of terminals;

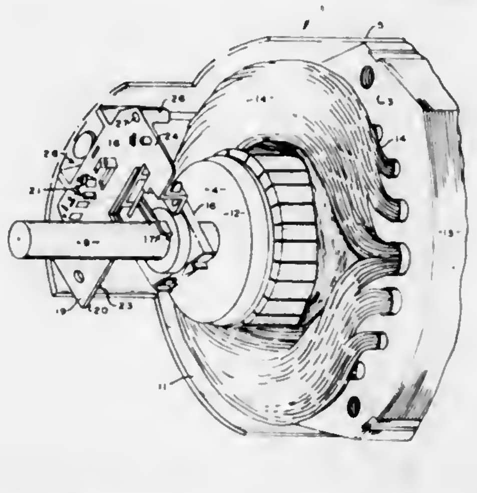


d. said stator assembly having at least one hole in the body thereof; and wherein
e. said first retaining means includes a boss on said terminal board for mating with said hole in said stator assembly with a press fit to retain said terminal board on said stator assembly in said overlaying relationship.

4,038,574

MOTOR LEAD GUIDE AND LEAD WIRE ATTACHING MEANS

William D. Crow, and Thomas V. Ottersbach, both of St. Louis, Mo., assignors to Emerson Electric Co., St. Louis, Mo.
Filed June 18, 1975, Ser. No. 587,971
Int. Cl.^{2} H02K *11/00*
U.S. Cl. 310—71 **9 Claims**

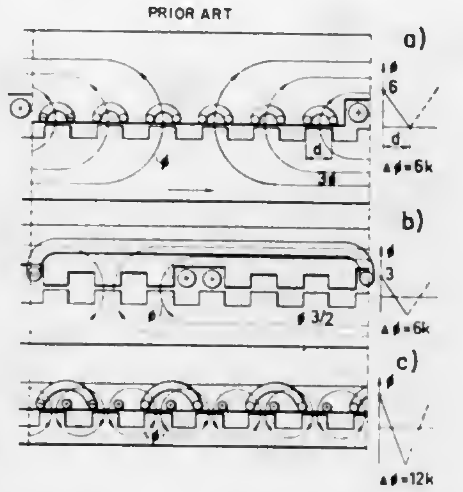


1. In an electric motor having a shell, end shields at opposite ends of said shell, said shell and end shields defining a chamber, said shell having an opening in it communicating with said chamber, said opening adapted to receive external lead wires for connecting said motor to a source of electrical energy, a stator assembly mounted in said chamber, said stator assembly including a winding having motor lead wires attached thereto, a shaft, said shaft being rotatably supported along said end shields, a rotor assembly mounted to said shaft and rotatable therewith, and a terminal board mounted to said motor, said terminal board being adapted to interconnect the external lead wires to various ones of said motor lead wires, the improvement which comprises means for guiding the external lead wires inserted through said opening in said shell from said opening to said terminal board, said guide means including a first wall defining ramp means extending between an area near said opening and said terminal board for directing said external lead wires to a connection area of said terminal board, said first wall having a rectangular shape in plan, said first wall further being offset with respect to a horizontal axis, and three side walls positioned along the perimetrical edges of said first wall.

4,038,575

MULTI-PHASE GENERATOR

Knut Assar Nordebo, 28 Ringvagen, Haparanda, Sweden (S-953 00)
Filed Mar. 18, 1974, Ser. No. 452,448
Claims priority, application Sweden, Mar. 19, 1973, 7303768
Int. Cl.^{2} H02K *3/00*
U.S. Cl. 310—179 **1 Claim**

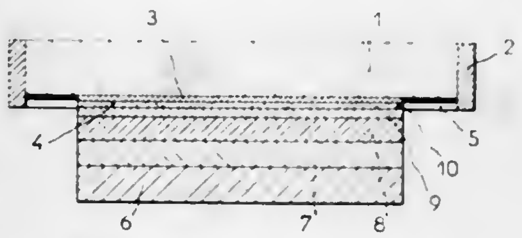


1. A multi-phase induction generator including in combination, a rotor having a plurality of equally spaced poles but no windings thereon, a stator having a different number of equally spaced poles each provided with a single centrally disposed slot, said rotor and stator being mounted concentrically for relative rotation and with an air gap therebetween, a direct current energizable exciting winding mounted on said stator and encompassing each said stator pole for producing magnetic flux of the opposite sense in adjacent stator poles, and a multi-phase alternating current output winding mounted on said stator with the phase windings located respectively in the centrally disposed slots of adjacent stator poles thereby to achieve a mutual displacement of half a pole pitch between said exciting winding and said multi-phase output winding, said multi-phase output winding producing a multi-phase output voltage between beginning and end terminals of each stator phase winding, the number of stator poles being equal to $m \cdot p$, the number of rotor poles being equal to $m(p \pm 1)$, m being an integer factor 1, 2, 3...., and p being an even integer 2, 4, 6 ... .

4,038,576

PHOTOCATHODE SUPPORT OF CORUNDUM WITH LAYER OF BARIUM BOROALUMINATE OR CALCIUM BOROALUMINATE GLASS

Jean Philippe Hallais, Ablon; Michel Jean-Claude Monnier, and Jean-Claude Richard, both of Montgeron, all of France, assignors to U.S. Philips Corporation, New York, N.Y.
Filed Jan. 26, 1976, Ser. No. 652,547
Claims priority, application France, Feb. 4, 1975, 75.03429
Int. Cl.^{2} H01J *39/02, 31/38*
U.S. Cl. 313—101 **3 Claims**



1. In an electron tube having a photocathode for the near infra-red of the III–V type of the p-conductivity type, a window consisting of an oxidic monocrystalline body of corundum on which the photocathode is secured by a glass which is pervious in the relevant wavelength range and is chemically

resistnat, said glass being selected from barium boroaluminate and calcium boroaluminate having the composition 15-35% CaO, or BaO, 45-70% B_2O_3 and 10-20% Al_2O_3.

4,038,577

GAS DISCHARGE DISPLAY DEVICE HAVING OFFSET ELECTRODES

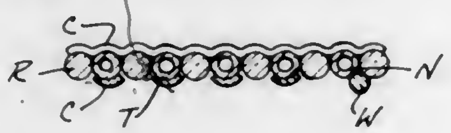
Wolfgang W. Bode, Sylvania; Glenn H. Dunlap, Maumee; Anthony M. Kobylak, Rossford; Raymond S. Richards, and Lawrence V. Pfaender, both of Toledo, all of Ohio, assignors to Owens-Illinois, Inc., Toledo, Ohio

Division of Ser. No. 86,094, Nov. 2, 1970, Pat. No. 3,927,342, which is a division of Ser. No. 819,641, April 28, 1969, Pat. No. 3,602,754. This application Apr. 12, 1973, Ser. No. 350,425

The portion of the term of this patent subsequent to Aug. 31, 1988, has been disclaimed.

Int. Cl.² H01J *61/04, 61/30*

U.S. Cl. 313—188 **2 Claims**



1. In a gaseous discharge information display/memory panel in which an ionizable gaseous medium associated with a pair of transversely related conductor arrays is excited at least at one selected site thereof by applied electrical potentials between at least one conductor in one of said arrays and at least one conductor in the other of said arrays, the gas adjacent the crossing point of each pair of said conductors locating a selected site in the gaseous medium, respectively, and said arrays and conductors being electrically insulated from one another and the gaseous medium, the improvement

wherein each conductor in the conductor array on the viewer's side of said panel is a single conductor physically offset to one side of the respective gas sites in the gaseous medium located thereby so as to not block light emission from the sites so located in the direction of a viewer of information displayed in said panel,

and wherein said gaseous medium is confined in an elongated capillary tube and said at least one conductor is parallel to the longitudinal axis of said capillary tube.

4,038,578

SHORT-ARC DISCHARGE LAMP WITH ELECTRODE SUPPORT STRUCTURE

Petrus Johannes Mathijssen, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

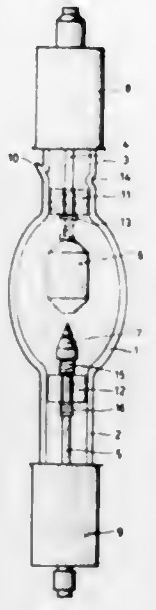
Filed June 2, 1976, Ser. No. 692,058

Claims priority, application Netherlands, June 5, 1975, 7506655

Int. Cl.² H01J *61/06, 61/16, 61/30*

U.S. Cl. 313—217 **7 Claims**

1. A short-arc discharge lamp comprising: an envelope, two opposed electrodes, a rigid electrode pin supporting each electrode and a rare gas filling, said envelope having a portion enclosing the discharge space and two neck-shaped portions via which said electrode pins to said electrodes extends to support said electrodes, said electrode pins extending through the wall of the lamp envelope in a vacuum-tight manner said lamp further including a cylindrical supporting member disposed about each of said electrode pins within one of said neck-shaped portions said cylindrical supporting member having an inside diameter greater then said electrode pin and an outside diameter less than the inside diameter of said neck-shaped portions in which said supporting member is disposed when said lamp is not operating and means to fix the supporting member against axial displacement with respect to the electrode pin about which said supporting member is disposed, the difference in the inside diameter of said supporting member and said neck-shaped portion allowing for differential expansion with changes in temperature.



4,038,579

SOLDER JOINT CONNECTION BETWEEN LEAD-IN CONDUCTOR AND ELECTRODE

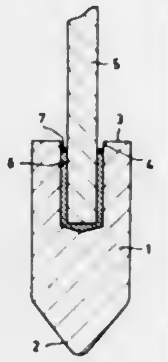
Tjepke Hendrik Ekkelboom, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Dec. 6, 1973, Ser. No. 422,587

Claims priority, application Netherlands, Jan. 11, 1973, 7300381

Int. Cl.² H01J *5/50*

U.S. Cl. 313—331 **4 Claims**



1. An electrode intended for a high-pressure gas discharge lamp which primarily consists of at least one of the metals selected from the group consisting of tungsten and tantalum and which is secured by means of a soldered joint to a current supply conductor mainly consisting of at least one of the metals selected from the group which consists of tungsten, molybdenum and tantalum, said metals having a melting point greater than 2000° C, said joint containing zirconium, and at least the external surface layer of the soldered joint consisting of zirconium nitride.

4,038,580

ELECTRO-LUMINESCENT DIODE

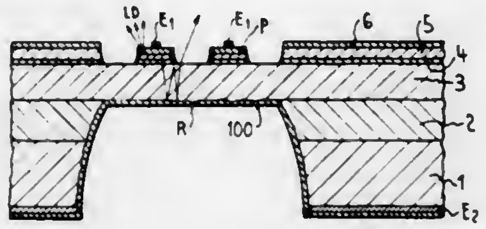
Francis Porret, Hauterive, Switzerland, assignor to Centre Electronique Horloger S.A., Neuchatel, Switzerland

Filed Aug. 26, 1975, Ser. No. 607,922

Claims priority, application Switzerland, Sept. 5, 1974, 12082/74

Int. Cl.² H01J *1/02*

U.S. Cl. 313—498 **8 Claims**



1. An electro-luminescent diode, comprising a body having a luminous surface which is defined by a thinned portion of said body, said surface including zones with light emitting junctions, said zones occupying only a portion of said thinned portion, the composition of said thinned portion being varied such that a lower absorption of the emitted light is exhibited outside said zones than within said zones, and said thinned portion including reflector means on the back surface of said thinned portion to enable recovery, by multiple reflection, of the light emitted within the diode to improve the luminous efficiency thereof.

4,038,581

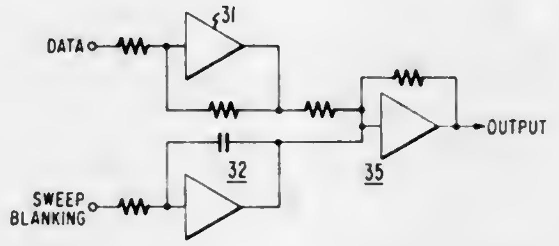
CIRCUIT FOR ELIMINATION OF SURFACE CHARGE INTEGRATION

Denis Peter Dorsey, Levittown, Pa., and William E. Rodda, Trenton, N.J., assignors to RCA Corporation, New York, N.Y.

Filed Nov. 12, 1975, Ser. No. 631,326

Int. Cl.² H01J *29/52, 29/78*

U.S. Cl. 315—13 ST **1 Claim**



1. The combination comprising:

surface charge storage means for recording data by charging a surface;

charge deposit means for charging said surface in response to signals to be stored;

sweep means for radially positioning said charge deposit means from the center of the surface in response to a sweep signal; and

control means for varying charge intensity as a function of the distance of the charge deposit means from the center of the surface,

said control means comprising integrator means responsive to a blanking signal preceding each sweep signal for producing an output signal and adder means responsive to data signals and to said output signal.

4,038,582

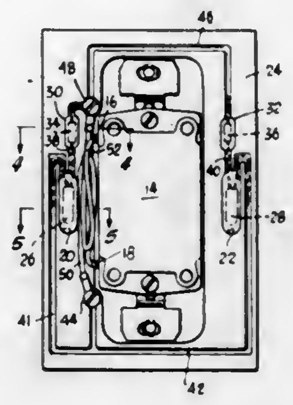
INTERNALLY ILLUMINATED SWITCH PLATE

Elwood R. Horwinski, Cheshire, Conn., assignor to Product Concepts, Inc., Middlebury, Conn.

Filed Aug. 28, 1975, Ser. No. 608,742

Int. Cl.² F21V *33/00;* **H05B** *37/00*

U.S. Cl. 315—129 **1 Claim**



1. An illuminated switch plate for wall fixtures and the like, comprising in combination:

a. a flat slab adapted to overlie and be secured to the fixture so as to constitute a wall plate thereof,
b. said slab having a shallow recess disposed behind the front surface thereof, and being constituted of a material which conducts light,
c. a neon glow lamp disposed in said recess,
d. resistive circuit means carried by the slab, disposed behind its front surface and connected with said glow lamp, and
e. electrical leads connected with said resistive circuit means and adapted for attachment to the terminals of a switch over which the slab is disposed, whereby the lamp will become illuminated by the voltage appearing across the switch terminals when the switch is open, thus providing a visual indication of the condition of the switch,
f. said slab having an additional recess,
g. said resistive circuit means comprising a resistor disposed in said additional recess and connected in series with said lamp,
h. means physically securing said resistor in said additional recess,
i. said slab having grooves on its rear surface,
j. said electrical leads comprising conductive strips of conductive paint disposed in said grooves, connected with said resistor and said lamp,
k. a pair of electrical contacts carried by said slab, and being electrically connected with said conductive strips,
l. said electrical leads further comprising a pair of flexible wires connected respectively to said contacts and adapted to be connected to the terminals of the switch,
m. said lamp, said resistor and said conductive paint all lying substantially entirely within the confines of the slab whereby the likelihood of damage to the lamp and resistor due to inadvertent jarring, and the likelihood of breakage or shortcircuiting of their leads are substantially reduced.

4,038,583

APPARATUS FOR THE GENERATION OF NEGATIVE OR POSITIVE ATMOSPHERIC IONS

Jacques Leon Georges Breton, 9, avenue de Gradignan, Pessac, France

Filed Oct. 28, 1975, Ser. No. 625,901

Claims priority, application France, May 9, 1974, 74.16732

Int. Cl.² H05F *3/06*

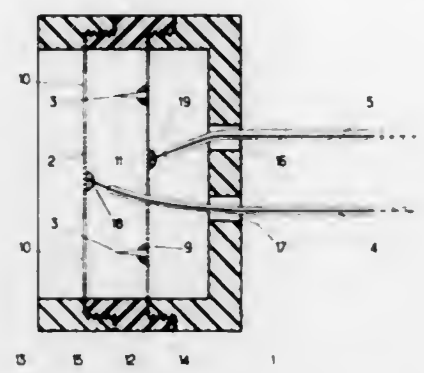
U.S. Cl. 361—230 **9 Claims**

1. Apparatus for generating negative or positive atmospheric ions, within a confined or free atmospheric space, with a high and adjustable yield and a large distance penetration and no appreciable ozone production, comprising:

an ionizing electrode comprising at least one ionizing point;

an acceleration electrode comprising a conductive plate spaced outwardly from the tip of the ionizing electrode point and having an acceleration and focussing aperture with a diameter substantially larger than the maximum diameter of the ionizing point and aligned with the axis of the ionizing point;

and high voltage supply means, connected to the two electrodes, for maintaining the ionizing electrode at a high



voltage of given polarity and for maintaining the acceleration electrode at a substantially lower voltage of the same polarity, so that the configurations of the equipotential surfaces between the two electrodes and externally of the acceleration electrode are only a function of the ratio of the voltage of the two electrodes and afford an electronic lens having an axis coincident with the axis of the ionizing point.

4,038,584

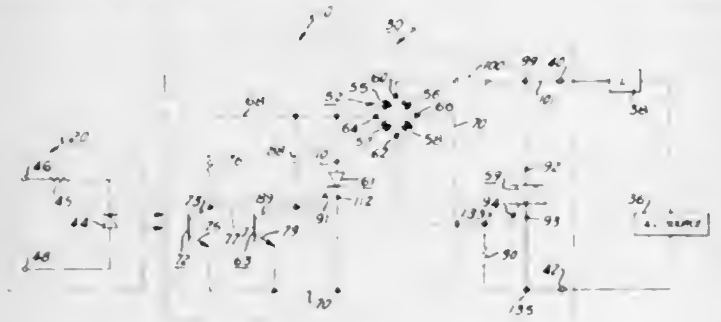
PROTECTIVE ARRANGEMENT FOR DEPENDENT SWITCHING CIRCUITS

Edward Tarchalski, Lawrenceville, and John C. Wilkinson, Hightstown, both of N.J., assignors to Heinemann Electric Company, Trenton, N.J.

Filed June 15, 1976, Ser. No. 696,211

Int. Cl.^{2} H02H ***7/20***

U.S. Cl. 361—104 **12 Claims**



1. An alternating current solid state relay circuit comprising

a pair of load terminals connectable in series with a load and in series with an alternating current power source,

a triac having first and second main terminals and a gate terminal,

means for connecting said triac main terminals to said load terminals and thereby to the alternating current to be controlled,

a full wave rectifier having alternating current input terminals and direct current output terminals,

said full wave rectifier input terminals being connected between said first main terminal of said triac and said gate terminal of said triac,

a fusible resistor connected between said first main terminal of said triac and one of the input terminals of said full wave rectifier,

a silicon controlled rectifier connected between said direct current terminals of said full wave rectifier, and

an optically controlled means responsive to a control signal for rendering said silicon controlled rectifier conductive and thereby also triggering said triac into conduction,

whereby said fusible resistor limits the current to said triac and also opens the circuit when it fuses should said triac fail open.

4,038,585

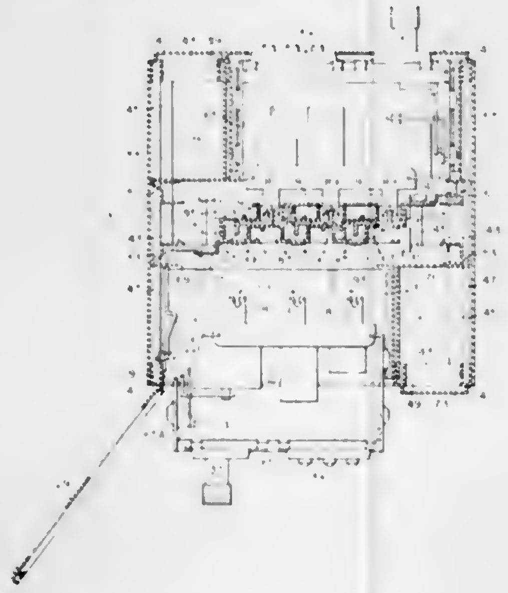
INSULATING SHUTTER MECHANISM FOR BUS BARS

Jerome C. Wolski, Downers Grove, and Neal E. Rowe, Oak Forest, both of Ill., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Sept. 11, 1975, Ser. No. 612,524

Int. Cl.^{2} H02B ***1/14***

U.S. Cl. 361—334 **3 Claims**



1. A control center for distributing electric power from a power supply source to power-consuming devices, comprising a cabinet having a frame providing a compartment on the front side of the cabinet, a plurality of vertical, horizontally spaced, bus bars in said cabinet, a barrier of electrically insulative material covering the bus bars, the barrier having spaced contact-receiving openings for each bus bar so that terminal contacts of a circuit interrupter may be inserted into the openings when a circuit interrupter is placed in the cabinet, shutter means for closing the openings when the circuit interrupter is withdrawn from the bus bars, said means including a planar shutter extending across the spaced openings and having spaced apertures; the planar shutter being slidable between aligned and unaligned positions of the openings and apertures which positions correspond to installed and removed positions of the circuit interrupter, shutter-opening means comprising an elongated rod rotatable about its axis and having an outturned portion operatively connected to said shutter, and the shutter-opening means also comprising an outwardly inclined cam segment extending into the path of travel of the circuit interrupter so that the rod is rotated to move the shutter to the aligned position when the circuit interrupter is installed.

4,038,586

COULOMB MEMORY ELEMENT

Satoshi Sekido, Kyoto, and Tomohiko Arita, Neyagawa, both of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

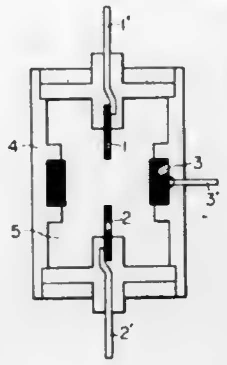
Continuation of Ser. No. 397,330, Sept. 17, 1973, abandoned. This application May 20, 1975, Ser. No. 579,240

Claims priority, application Japan, Sept. 20, 1972, 47-94766; Sept. 20, 1972, 47-94767; Mar. 1, 1973, 48-24889

Int. Cl.^{2} H01G ***9/18***

U.S. Cl. 361—435 **2 Claims**

1. A coulomb memory element comprising an electrolyte consisting of an aqueous solution selected from the group consisting of lead silicofluoride ($PbSiF_6$), lead borofluoride ($Pb(BF_4)_2$) and mixtures thereof, having added thereto a member selected from the group consisting of lithium silicofluoride and lithium borofluoride; at least one inactive electrode consisting essentially of tungsten plated with gold; and at least one



active electrode consisting essentially of lead, said electrolyte being charged between said inactive and active electrodes and said active electrode being dissolved or deposited according to Faraday's law.

4,038,587

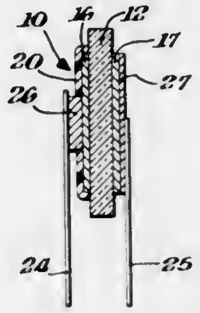
CERAMIC DISC CAPACITOR AND METHOD OF MAKING THE SAME

Kenneth J. Kaliebe, Cedarburg, Wis., assignor to Sprague Electric Company, North Adams, Mass.

Filed Aug. 21, 1975, Ser. No. 606,699

Int. Cl.^{2} H01G ***4/06***

U.S. Cl. 361—321 **8 Claims**



1. A capacitor comprising a dielectric body having opposed surfaces, a first electrode on one of said surfaces, a second electrode on the other of said surfaces in substantial capacitive overlap with said first electrode, a coating of abradable hard insulative solder-resistant material overlying a first portion of said first electrode, a second portion of said first electrode being uncoated by said coating, terminal members attached to said second portion and to said second electrode by solder layers which physically contact and adhere to said second portion and said second electrode, a part of said one surface of the dielectric body overlying said second electrode being free of said coating and said first electrode, said first portion and said part being free of solder.

4,038,588

PRECISION AMPLITUDE CONTROL SYSTEM FOR A HIGH Q TORSION PENDULUM

Martin G. Woolfson, Baltimore, and Robert H. Plath, Linthicum Heights, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Feb. 3, 1976, Ser. No. 655,031

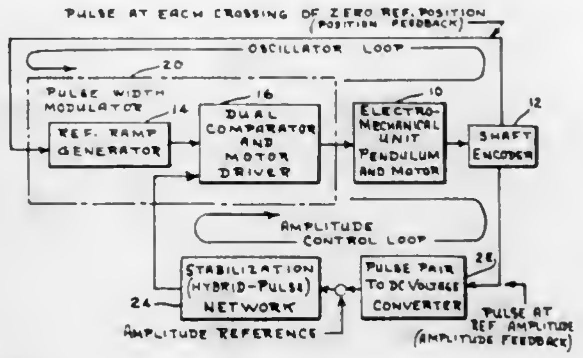
Int. Cl.^{2} B64C ***17/02***

U.S. Cl. 318—648 **6 Claims**

1. An amplitude control apparatus for a high Q torsion pendulum comprising in combination:

an oscillating means providing a pendulum amplitude, said oscillating means utilizing position feedback signals to maintain pendulum amplitude, said position feedback signals occuring each time said oscillating means passes though the zero reference position, and

an amplitude control means connected to said oscillating means to derive an amplitude signal for each swing of said oscillating means, said amplitude control means comprising said amplitude signal with an amplitude reference voltage, said amplitude signals occurring in pulse pairs,


PULSE AT EACH CROSSING OF ZERO REF. POSITION (POSITION FEEDBACK)
OSCILLATOR LOOP
20
PULSE WIDTH MODULATOR
14
REF. RAMP GENERATOR
16
DUAL COMPARATOR AND MOTOR DRIVER
10
ELECTRO-MECHANICAL UNIT PENDULUM AND MOTOR
12
SHAFT ENCODER
AMPLITUDE CONTROL LOOP
STABILIZATION (HYBRID-PULSE) NETWORK
24
28
PULSE PAIR TO DC VOLTAGE CONVERTER
AMPLITUDE REFERENCE
PULSE AT REF AMPLITUDE (AMPLITUDE FEEDBACK)

said pulse pairs being transformed to a DC level which is compared with said amplitude reference voltage to provide an amplitude error signal, said amplitude error signal being integrated and transformed into an error pulse having a pulse width representative of said amplitude error signal, said error pulse being applied to said oscillating means to maintain a constant preset pendulum amplitude.

4,038,589

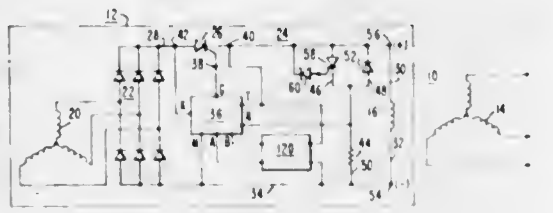
CONTROLLED POST-SYNCHRONIZING ON BRUSHLESS SYNCHRONOUS MOTORS

Carl J. Heyne, Allison Park; Richard Cooper, Jr., Monroeville, and Gurney L. Godwin, ittsburgh, all of Pa., assignors to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed Nov. 20, 1975, Ser. No. 634,002

Int. Cl.^{2} H02P ***1/50***

U.S. Cl. 318—174 **3 Claims**



1. A synchronous dynamoelectric machine comprising: a rotary field winding, an alternating current exciter armature rotatable with said field winding, rectifier means connected to said exciter armature to supply direct current excitation to said field winding, a discharge circuit including a resistor and field discharge switching means connected across said field winding for discharging current induced in said field winding during subsynchronous operation, an exciter switch connected in an excitation circuit between said rectifier means and said field winding for applying direct current excitation from said rectifier means to said field winding, and an excitation control system operably connected to control the actuation of said exciter switch,

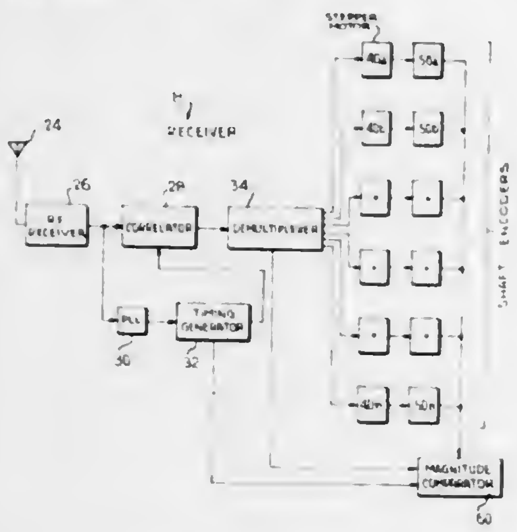
said excitation control system comprising a pre-synchronizing circuit responsive to the slip frequency of voltage induced in said field winding for actuating said exciter switch to conduct synchronizing excitation current to said field winding substantially at a predetermined slip voltage frequency, a post-synchronizing firing circuit responsive to a voltage of predetermined magnitude and polarity impressed across said exciter switch for actuating said exciter switch upon the condition that said field winding is synchronized before said exciter switch is actuated by said pre-synchronizing circuit, and circuit means for inhibiting the operation of said post-synchronizing circuit during subsynchronous operation,

said inhibiting circuit means being responsive to a voltage of predetermined magnitude and polarity developed across said field winding for preventing actuation of said exciter switch by said post-synchronizing firing circuit during subsynchronous operation, and

said post-synchronizing circuit including a timing circuit having a resistor and a capacitor connected to be energized by the voltage appearing across the anode-cathode terminals of said exciter switch, means responsive to said timing circuit for providing a firing signal when the voltage of said post-synchronizing timing circuit capacitor exceeds a predetermined value of predetermined polarity, and means operably connected thereto for applying said firing signal to a gate terminal of said exciter switch, said inhibiting circuit including means responsive to said voltage appearing across said field winding being connected to provide an inhibiting signal when said field winding voltage exceeds a predetermined value, and discharge means responsive to said inhibiting signal connected to discharge said post-synchronizing timing capacitor during each slip cycle of subsynchronous operation.

4,038,590
PULSE CODE MODULATION RADIO CONTROL SYSTEM

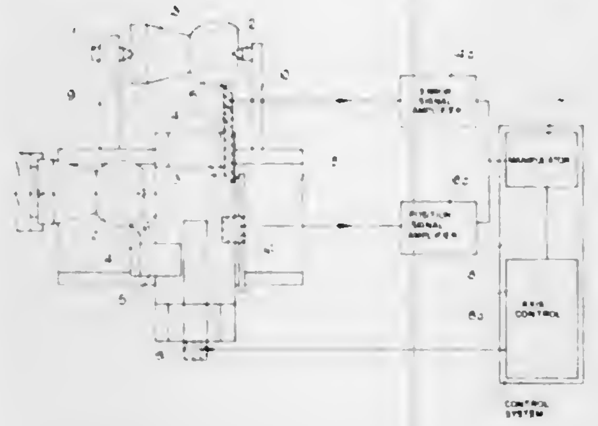
Dennis J. Knowlton, 1915 Park, Laramie, Wyo. 82070
Filed Jan. 3, 1975, Ser. No. 538,338
Int. Cl.² G05B *11/32*
U.S. Cl. 318—562 **7 Claims**



1. A pulse code modulation radio control system particularly suited for the remote control of model aircraft which comprises:
   - shaft encoder means for producing digital output signals indicative of the position of a plurality of control members;
   - means responsive to said digital output signal for modulating the phase of a subcarrier signal to shift the phase of said subcarrier signal in response to digital signals of one type by 180°;
   - means for transmitting an r-f carrier signal modulated by said phase-modulated subcarrier signal;
   - receiver means for detecting said phase-modulated subcarrier signal from said r-f carrier signal;
   - a phase-locked loop circuit connected to receive the output from said receiver means; and
   - correlation detection means for receiving the output from said receiver means and the output from said phase-locked loop circuit and for producing an output digital pulse train corresponding to said digital output signals.

4,038,591
AUTOMATIC MACHINE TOOL AND METHOD OF OPERATION

Julius Harman, Baginton, England, assignor to Alfred Herbert Limited, Coventry, England
Filed July 21, 1975, Ser. No. 597,558
Claims priority, application United Kingdom, July 26, 1974, 33026/74
Int. Cl.² G05B *17/36*
U.S. Cl. 318—578 **14 Claims**



1. An automatic machining process for the production of a component according to a predetermined programme, comprising moving a member automatically through a machining cycle acording to said programme and simultaneously causing a monitoring device to be correspondingly traversed in a path determined by the programme over a component previously machined according to the programme, so as to sense deviations from the expected component shape appearing in the previously machined component, and using said deviations to effect corresponding corrective tool off-sets in one of the aforesaid and a subsequent machining cycle.

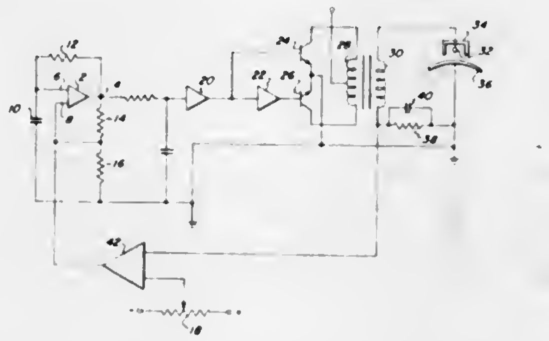
4,038,592
VOLTAGE AND FREQUENCY CONTROL CIRCUIT

Franz Stummer, Noham, Germany, assignor to Alberto Kling, Germany
Filed Sept. 17, 1975, Ser. No. 614,235
Claims priority, application Germany, July 30, 1975, 2534090
Int. Cl.² H02M *5/257*
U.S. Cl. 363—165 **15 Claims**

1. A voltage and frequency control circuit for converting an input ac signal with inconstant frequency and amplitude into an output ac signal with constant amplitude and a constant nominal frequency which is lower than the lowest occurring frequency of the input ac signal, said control circuit including serially connected switching units comprising:
   - amplitude control circuit means for converting an ac signal with inconstant amplitude to an ac signal with constant amplitude, said amplitude control circuit means including a variable transformer and automatic control means for sensing the amplitude of the output signal of said transformer and varying the transformer to maintain said amplitude constant;
   - rectifier circuit means in communication with said amplitude control circuit means for converting an ac signal with inconstant frequency to alternate positive and negative sets of half-waves of said inconstant frequency signal, including an ac voltage source connected to said rectifier circuit means to provide an ac control signal having a constant nominal frequency such that a positive set of said half-waves is generated by said rectifier means during positive polarity of said control signal and a negative set of said half-waves is generated by said rectifier means during negative polarity of said control means; and
   - filter circuit means in communication with the output of said rectifier circuit means for smoothing and shaping the positive and negative sets of half-waves into a sinusoidal signal having the frequency of said ac voltage source to form said output ac signal.

4,038,593
REGULATED HIGH VOLTAGE AC POWER SUPPLY WITH REGULATED D.C. BIAS CURRENT

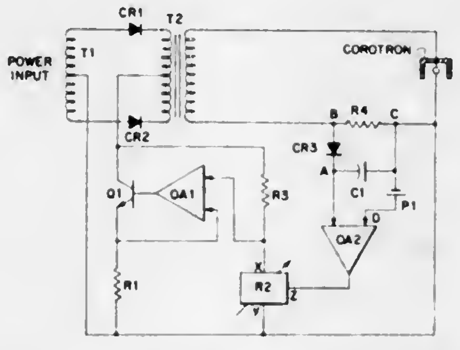
Halsey P. Quinn, Los Angeles, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Sept. 26, 1975, Ser. No. 617,112
Int. Cl.² H01T *19/00;* **H02M** *7/515*
U.S. Cl. 323—4 **8 Claims**



1. An a.c. and d.c. power supply for driving a non-linear load in which current over the operating voltage range increases faster or slower than applied voltages comprising:
   - generating means for generating non-symmetrical a.c. voltage waveshape,
   - a transformer for coupling said a.c. waveshape from said generating means to said load such that the sum of all instantaneous positive and negative a.c. voltages at said load will be approximately zero,
   - d.c. feedback means for sensing the d.c. current at said load produced by the application of said non-symmetrical a.c. voltage to said non-linear load, and for producing and coupling to said generating means a correction signal to vary the symmetry of said a.c. waveshape to regulate said load d.c. current to a pre-determined level.

4,038,594
DISTORTIONLESS SINE WAVE AMPLIFICATION

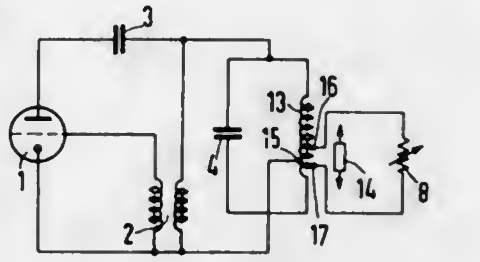
Halsey P. Quinn, Rancho Palos Verdes, and Donald B. Levinson, Beverly Hills, both of Calif., assignors to Xerox Corporation, Stamford, Conn.
Filed Sept. 26, 1975, Ser. No. 617,111
Int. Cl.² G05F *1/44*
U.S. Cl. 323—4 **8 Claims**



1. A power supply for generating true sine wave signals comprising:
   - means for supplying AC current to a load,
   - means coupled to said supplying means for monitoring the amount of current flowing through said load,
   - feedback circuit means coupled to said monitoring means and said supplying means to allow an adjustment of said AC current to said load, said feedback circuit means including variable resistance means for effecting a linear current change in said load to effect said generation of true sine wave signals,
   - said feedback circuit means also including first circuit means coupled between said variable resistance means and said supplying means for adjusting the input supply current to said supplying means, said first circuit means and said variable resistance means comprising a resistance dividing network so that when said variable resistance means is varied the current supplied to said supplying means is varied accordingly,
   - said first circuit means also including an operational amplifier,
     - a pass transistor whose base element is connected to the output of said operational amplifier and whose emitter and collector elements are in series with the supply current to said supplying means,
     - a first resistor connected to said emitter element to complete said series connection to said supplying means, said first resistor-transistor emitter element junction also connected to one input of said operational amplifier,
     - a second resistor connected to the collector of said transistor and the other input of said operational amplifier, this input junction also connected to said variable resistance means, and
     - said operational amplifier, upon change of resistance of said variable resistance means, will cause the ratio of the voltage across said first resistor and said variable resistance means to be constant, and
   - said feedback circuit means also including second circuit means coupled between said monitoring means and said variable resistance means for adjusting the signal applied to said variable resistance means in response to the change in current through said monitoring means.

4,038,595
SELF-EXITED HIGH-FREQUENCY GENERATOR

Herbert Wächter, and Hans-Joachim Gronemann, both of Erlangen, Germany, assignors to Siemens Aktiengesellschaft, Munich, Germany
Filed Feb. 26, 1975, Ser. No. 553,111
Claims priority, application Germany, Mar. 20, 1974, 2413508
Int. Cl.² H02P *13/10;* **G05F** *7/00*
U.S. Cl. 323—45 **1 Claim**



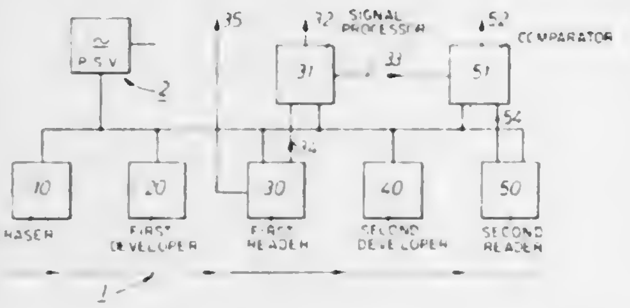
1. In a self excited high frequency generator of the type including an oscillator tube and a parallel resonant circuit and including a high frequency current transformer consisting of a single transformer winding and a axially movable core of highly permeable material of a size which is considerably shorter than the length of the winding and which is arranged wholly inside of the transformer winding, with an inductor coupled to the transformer winding as a load, the improvement comprising:
   - a. the load being connected directly between at least one turn of the transformer winding with terminals attached thereto near the end of said winding;
   - b. the oscillator tube being coupled to the transformer winding in the area of said load terminals using a rigidly connected intermediate tap; and
   - c. said core being disposed for axial movement only in the vicinity of the intermediate tap of said oscillator tube whereby movement of said core is restricted within the

confines of the transformer winding and permits matching the oscillator tube to the load without changing the overall inductance of the transformer coil and thus without changing frequency.

4,038,596

METHOD AND APPARATUS FOR AUTHENTICATING A RECORD MEDIUM CONSISTING OF APPLYING TWO DIFFERENT STRENGTH MAGNETIZING FIELDS AND MONITORING THE REMANENT FIELDS

Cyril Arthur Lee, Maidenhead, England, assignor to E M I Limited, Hayes, England
Filed July 2, 1975, Ser. No. 592,669
Claims priority, application United Kingdom, July 4, 1974, 29663/74
Int. Cl.² G01R ***33/12***
U.S. Cl. 324—34 R **11 Claims**



1. A system for examining a record medium expected to include a magnetic material storage layer exhibiting an inherent pattern of magnetic remanence difference between a part of the layer and another part of the layer when both parts are subjected to a uniform magnetising field including

means for applying to the layer in turn at least two different strength magnetising fields along the same direction,

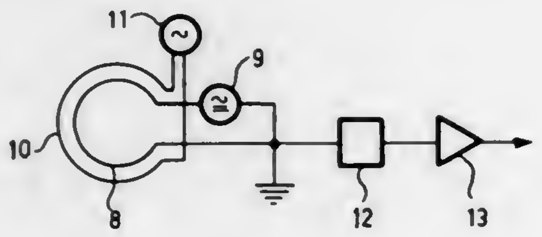
means for measuring the relative remanent magnetisation in said part and said another part for each said magnetising field, and

means responsive to the measurements to assess the authenticity status of the medium, the relative remanent magnetisations differing for said different strength magnetising fields for an authentic medium.

4,038,597

MAGNETORESISTANCE DETECTION DEVICE HAVING NOISE SUPPRESSION

Frederik Willem Gorter, and Henricus Petrus Johannes Wijn, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.
Continuation of Ser. No. 505,243, Sept. 12, 1974, abandoned. This application Jan. 15, 1976, Ser. No. 649,560
Claims priority, application Netherlands, Sept. 22, 1973, 7313096
Int. Cl.² G01R ***33/02***
U.S. Cl. 324—46 **3 Claims**

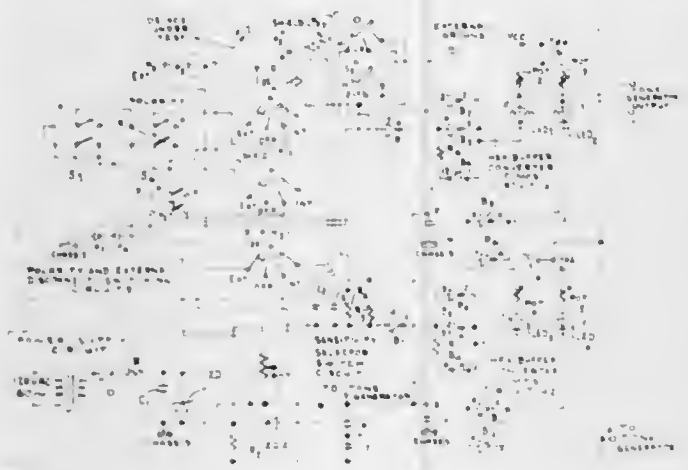


1. A magneto-resistive detection device for determining the presence or absence of a single-wall magnetic domain at a position in a sheet of magnetic material in which stable single-wall magnetic domains can be moved, comprising which stable single-wall magnetic domains can be moved, comprising a loop-shaped element of magneto-resistive material on said sheet of magnetic material disposed so that the resistance thereof varies when a single-wall domain is present at said position, means to energize said sensing element with an a-c current signal, and means to detect a signal produced by said loop-shaped sensing element when a single-wall magnetic domain is present at said position, said detection means including a selective amplifier tuned to one of the second, third, and fifth harmonics of said signal, said harmonics being interference free.

4,038,598

PROBE CONTACT AND JUNCTION DETECTOR

Vincent C. Kapfer, Chadwicks, N.Y., assignor to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.
Filed Mar. 16, 1976, Ser. No. 667,820
Int. Cl.² G01R ***31/02, 19/16***
U.S. Cl. 324—72.5 **7 Claims**



1. A probe contact and junction detector for microcircuit analysis comprising

a probe means,

first and second complementary MOS hex buffer converter logic circuits connected to receive the output of said probe means,

each said hex buffer converter logic circuit comprising first, second, third, fourth, fifth and sixth buffer stages, each stage having an input and an output, said first buffer stage having its input connected to said probe means and its output connected to the inputs of said second and third buffer stages and through resistance means to the output of said fourth buffer stage, the outputs of said second and third buffer stages being connected to the inputs of said fourth, fifth and sixth buffer stages, and, each said light emitting diode means comprises first and second light emitting diodes, said first light emitting diode being connected between the outputs of said second and third buffer stages and the power supply means, and said second light emitting diode being connected between the outputs of said fifth and sixth buffer stages and the power supply means;

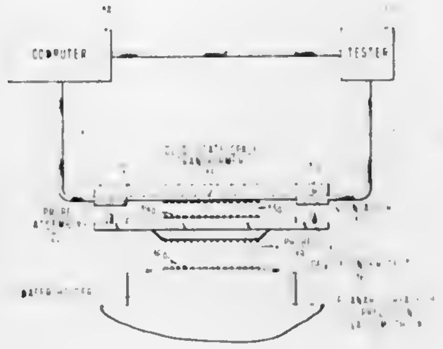
a light emitting diode means connected to receive and respond to 0 and 1 level logic signals generated by each hex buffer converter logic circuit, and

power supply means connected to provide a voltage source for said light emitting diode means and for said hex buffer converter logic circuits.

4,038,599

HIGH DENSITY WAFER CONTACTING AND TEST SYSTEM

Ronald Bove, and Eric M. Hubacher, both of Wappingers Falls, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 30, 1974, Ser. No. 537,514
Int. Cl.² G01R ***31/02, 31/26***
U.S. Cl. 324—158 F **5 Claims**



1. A space transformer for use in an electronic test system for testing micro-miniature electronic devices, said space transformer comprising:

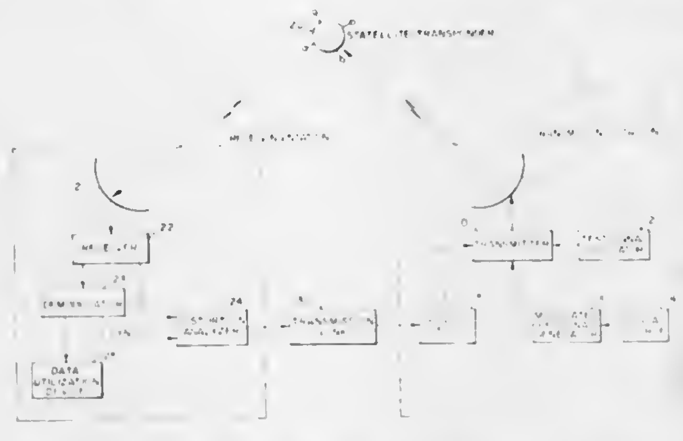
a monolithic silicon structure;

said silicon structure containing, a first binary decoder circuit adapted to receive a first set of *m* binary inputs and provide a first set of 2^m binary outputs, a second binary decoder circuit adapted to receive a second set of *m* binary inputs and provide a second set of 2^m binary outputs, a third binary decoder circuit adapted to receive a third set of *m* binary inputs and provide a third set of 2^m binary outputs, a fourth binary decoder circuit adapted to receive a fourth set of *m* binary inputs and provide a fourth set of 2^m binary outputs, where *m* may be any integer number, a plurality of logic circuits selectively connected to said outputs of said first, second, third and fourth binary decoders, an array of exposed conductive pads connected to said plurality of logic circuits.

4,038,600

POWER CONTROL ON SATELLITE UPLINKS

Leslie D. Thomas, Baltimore, Md., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.
Filed Feb. 17, 1976, Ser. No. 658,932
Int. Cl.² H04B ***7/00***
U.S. Cl. 325—4 **9 Claims**



1. A system for controlling the power level of the output signal of a transmitter which communicates with a receiver via a transponder such that the power level of the signal arriving at the input of said transponder has the desired level, comprising in combination:

transmitter means for generating and transmitting a signal comprising first and second carriers;

transponder means for receiving said signal and for retransmitting selected intermodulation products produced by said transponder;

receiving means for receiving said selected intermodulation products;

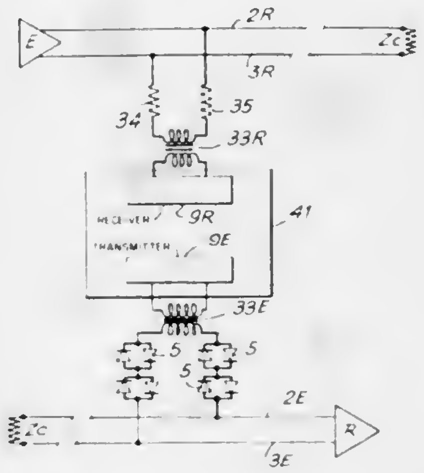
distortion analyzer means coupled to said receiving means for analyzing said selected intermodulation products to produce a control signal related to the magnitude of said signal at the input of said transponder; and

power control means responsive to said control signal for adjusting said transmitter so that said signal has the desired level as measured at the input of said transponder.

4,038,601

DEVICE FOR CONNECTING PERIPHERAL UNITS TO A LINE FOR TRANSMITTING DATA BY PULSE CODE MODULATION

Jean-Pierre Laborie, Blagnac, and Michel Pevrol, Toulouse, both of France, assignors to Societe Nationale Industrielle Aerospatiale, Paris, France
Filed Jan. 29, 1975, Ser. No. 545,018
Claims priority, application France, Feb. 18, 1974, 74.05343
Int. Cl.² H04B ***1/48***
U.S. Cl. 325—23 **7 Claims**



1. A device for connecting a peripheral transmitting-receiving unit having an emitter portion for transmitting and a receiving portion for receiving signals to and from a two-conductor transmission line, having a characteristic impedance, said device transmitting and receiving data modulated by coded pulses, comprising in combination:

a. a first linking circuit connecting said transmission line to said peripheral unit, for the transmission of signals therefrom to said transmission line, said first linking circuit including a low impedance circuit, to establish transmission from said peripheral unit,

b. a second linking circuit separate and independent from said first linking circuit connecting said transmission line to said peripheral unit for receiving signals from said transmission line, said second linking circuit including a high impedance circuit,

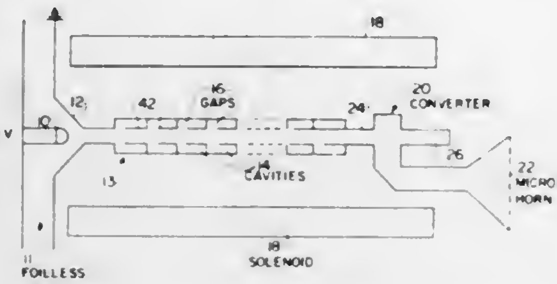
c. a third linking circuit connected with said first and said second linking circuits and with said peripheral transmitting receiving unit including a transformer electrically connected to the emitter and receiver portions of said peripheral unit, and

d. said first linking circuit including at least one group of semi-conducting diodes connected in series and electrically connecting one of the conductors of said two conductor transmission line and with said third linking circuit.

4,038,602
AUTOMODULATED REALTIVISTIC ELECTRON BEAM MICROWAVE SOURCE

Moshe Friedman, Washington, D.C., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 25, 1976, Ser. No. 661,208
Int. Cl.² H01J *25/02*
U.S. Cl. 325—125 15 Claims



1. A microwave rf radiation generator comprising, in combination:

pulsed electron-beam producing mean for producing an intense relativistic electron beam;

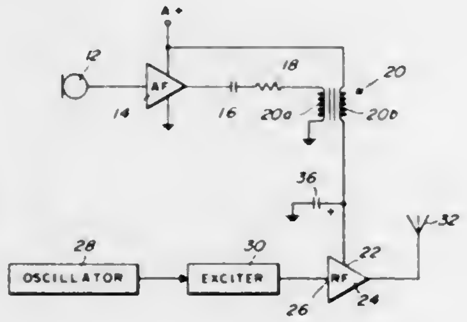
drift chamber means for energy-modulating said electron beam; and

converter means, through which said beams propagates, for converting said energy-modulated, relativistic electron beam into a density-modulated, relativistic electron beam and for extracting rf microwave energy from said density-modulated beam.

4,038,603
TRANSMITTER MODULATION LIMITER

Charles William Bethards, Schaumburg, Ill., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Mar. 25, 1976, Ser. No. 670,502
Int. Cl.² H04B *1/04*
U.S. Cl. 325—182 11 Claims



1. In an amplitude modulated transmitter wherein an information signal amplitude modulates a radio frequency (RF) carrier, the improvement comprising:

a modulation transformer having primary and secondary windings;

means for modulating the RF carrier with the signal appearing at the secondary winding of the modulation transformer, the index of modulation of the RF carrier dependent on the amplitude of said transformer secondary signal;

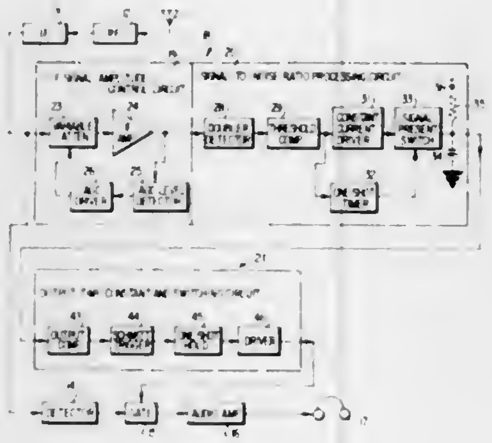
resistor limiting means adapted for coupling the information signal to the primary winding of the modulation transformer, the limiting means having a predetermined resistance such that the amplitude of the information signal appearing at the secondary of the modulation transformer modulates the RF carrier to, but not in excess of, a predetermined index of modulation; and

immpedance means coupled to the secondary of the modulation transformer for forming a filter network, having a predetermined characteristic, with the resistance of the resistor limiting means as transformed through the modulation transformer.

4,038,604
SIGNAL TO NOISE RATIO INDICATING CIRCUIT

Clement J. Koerber, Cincinnati, Ohio, assignor to Cincinnati Electronics Corporation, Cincinnati, Ohio

Filed Dec. 15, 1975, Ser. No. 640,876
Int. Cl.² H04B *1/10*
U.S. Cl. 325—363 15 Claims

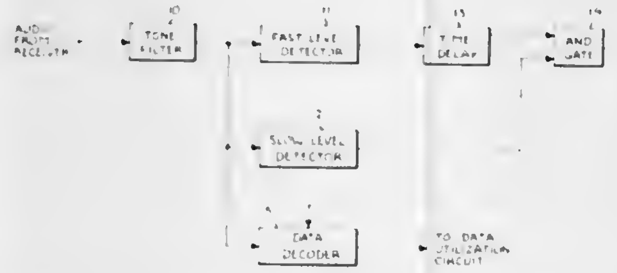


1. Apparatus for deriving a signal indicative of the signal to noise ratio of a carrier susceptible to being modulated by any of AM voice, AM pulse, CW, interrupted CW or angle modulated signals comprising means for deriving a waveform that is a replica of the amplitude variations of the envelope of the modulated carrier, a capacitor, and means responsive to the waveform for applying: (a) a constant current of one polarity to the capacitor while the waveform amplitude is above a threshold level indicative of a noise threshold, (b) a constant current of an other polarity to the capacitor for an initial predetermined time while the waveform is below the threshold level, and (c) a much smaller current of the other polarity to the capacitor during the time while the waveform is below the threshold level after the initial time, whereby the capacitor voltage level is indicative of the signal to noise ratio.

4,038,605
MESSAGE PREAMBLE DETECTOR

James H. Elder, Brookneal, and Hubert A. Patterson, Lynchburg, both of Va., assignors to General Electric Company, Lynchburg, Va.

Filed Mar. 5, 1976, Ser. No. 664,085
Int. Cl.² H03K *5/153, 5/18*
U.S. Cl. 328—119 6 Claims



1. An improved arrangement for detecting signals representing a binary sequence and having a predetermined time duration, said arrangement comprising:

a. an input terminal for said signals;

b. a fast level detector connected to said input terminal for producing a fast detection signal after a predetermined first time period following receipt of said signals;

c. a time delay circuit connected to said fast level detector for producing a delayed signal after a predetermined second time period following receipt of said fast detection signal;

d. a slow level detector connected to said input terminal for producing a slow detection signal after a predetermined third time period following receipt of said signals;

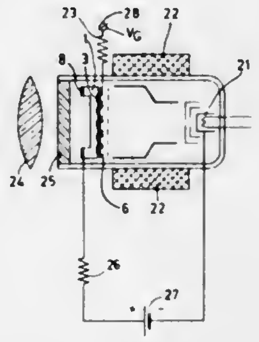
e. said third time period being substantially equal to the sum of said first and second time periods;

f. and means connected to said time delay circuit and to said slow level detector for producing an output signal in response to the simultaneous presence of said delayed signal and said slow detection signal.

4,038,606
SEMICONDUCTOR DEVICE FOR STORING AND NON-DESTRUCTIVELY READING IMAGE INFORMATION AND MEMORY SYSTEM COMPRISING SUCH A DEVICE

Arthur Marie Eugene Hoeberechts, and Marino Giuseppe Carasso, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 541,444, Jan. 16, 1975, abandoned. This application Dec. 13, 1976, Ser. No. 749,742
Claims priority, application Netherlands, Feb. 14, 1974, 7402013
Int. Cl.² G11C *11/34*
U.S. Cl. 328—124 10 Claims



1. A semiconductor device having an electric and an optical input and an electric output for nondestructively reading information written in via the input and comprising a semiconductor target having a substrate of a first conductivity type, a regular pattern of island-shaped zones of a second conductivity type on one surface of said target, said zones forming p-n junctions with the adjoining part of the target, an electrically insulating layer covering at said surface at least said island-shaped zones, a conductive layer having apertures therein covering said electrically insulating layer and forming a read-out grating, said insulating layer having sufficient thickness to substantially prevent transfer of electrical charges and constitutes a dielectric in which information is stored, an aperture being present in the read-out grating above each island and leaving exposed at least a part of the insulating layer present on the island to permit information stored in said insulating layer to be read out.

4,038,607
COMPLEMENTARY FIELD EFFECT TRANSISTOR AMPLIFIER

Otto Heinrich Schade, Jr., North Caldwell, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Aug. 23, 1976, Ser. No. 716,536
Int. Cl.² H03F *3/185*
U.S. Cl. 330—13 5 Claims

1. An amplifier, comprising:

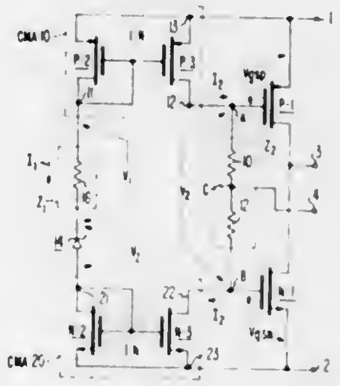
first and second supply terminals for receiving a supply voltage, V_s, thereacross which may vary over a voltage range;

an output terminal;

a pair of complementary field effect transistors, one transistor being connected at the source and drain electrodes thereof, respectively, to said first supply terminal and said output terminal, the other transistor being connected at the source and drain electrodes thereof, respectively, to said second supply terminal and said output terminal, each transistor having a gate electrode;

a direct current conductive impedance connected between said gate electrodes;

input means for applying an input signal to be amplified to at least one point on said impedance;



a first current mirror amplifier having a common terminal coupled to said first supply terminal, an output terminal coupled to said gate electrode of said one transistor and having also an input terminal;

a second current mirror amplifier having a common terminal coupled to said second supply terminal, an output terminal coupled to said gate electrdoe of said other transistor, and having also an input terminal; and

a current path coupled between said input terminals of said first and second current mirror amplifiers for conducting a first current therebetween when V_s is greater than a minimum value, said current path including a series connection of a further impedance and a threshold conduction device.

4,038,608
REDUNDANT OSCILLATOR FOR CLOCKING SIGNAL SOURCE

Howard B. Bard, Chula Vista, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed May 7, 1976, Ser. No. 684,506
Int. Cl.² H03B *5/12*
U.S. Cl. 331—56 3 Claims

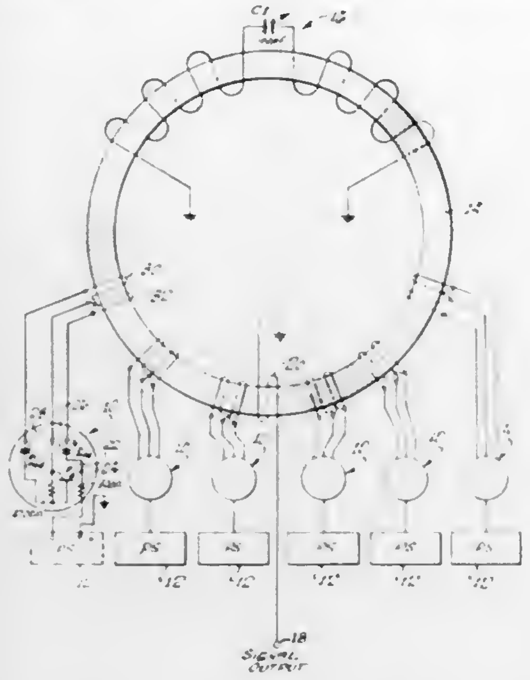
1. A redundant clocking signal source comprising:

a. a plurality of energy generators, each having a separate power source,

b. a High Q tank circuit,

c. a torroid core of magnetic material mutually coupling said energy generators to said resonant tank circuit,

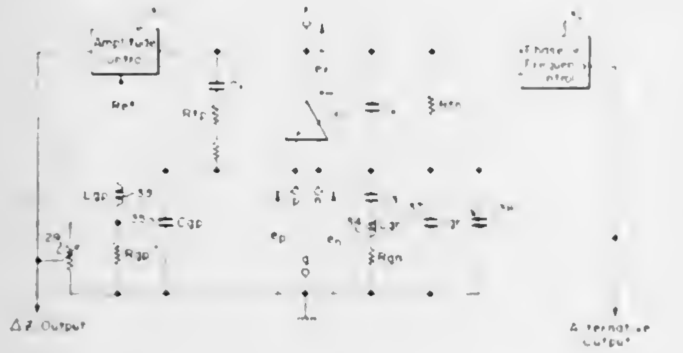
d. an output circuit means mutually coupled by means of said torroid core to said plurality of energy generators and providing and maintaining an output signal of a predeter-



mined frequency when there is failure of at least one of said energy generators.

4,038,609
REPLICA BRIDGE SENSING CIRCUIT

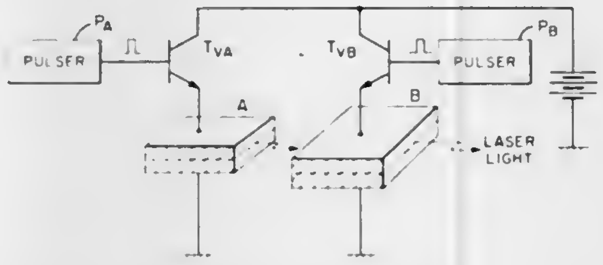
Edwin Langberg, 33 Manning Lane, Cherry Hill, N.J. 08003
Filed July 19, 1976, Ser. No. 706,605
Int. Cl.² G01D *21/04;* G01R *33/00;* G01V *3/10*
U.S. Cl. 331—65 **14 Claims**



1. A sensing circuit comprising:
- a. amplifier means having at least two inputs, and at least one output;
- b. a bridge network having replica elements in corresponding branches;
- c. said bridge network connected symmetrically between a source of alternating current and at least two of the inputs of said amplifier; and
- d. means responsive to a change in attenuation of said bridge network for producing a signal connected to said amplifier.

4,038,610
LUMINOSITY CONTROL SYSTEM EMPLOYING SEMICONDUCTOR LASERS

Jun-ichi Nishizawa; Ichiemon Sasaki, and Kaoru Takahashi, all of Sendai, Japan, assignors to Semiconductor Research Foundation, Japan
Continuation-in-part of Ser. No. 286,882, Sept. 7, 1972, abandoned, which is a continuation-in-part of Ser. No. 56,582, July 20, 1970, abandoned, and a continuation-in-part of Ser. No. 684,395, Nov. 20, 1967, abandoned. This application Oct. 11, 1974, Ser. No. 514,286
Claims priority, application Japan, Nov. 21, 1966, 41-76486; May 10, 1967, 42-29675
Int. Cl.² H01S *3/10*
U.S. Cl. 331—94.5 H **12 Claims**



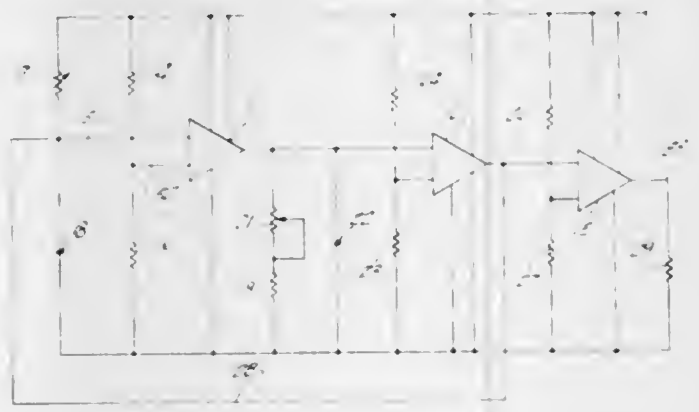
1. A luminosity control device comprising:
- a. a semiconductor laser operable in one mode to emit noncoherent light when a bias current below a threshold value I_Ath is applied thereto and in an inherent laser mode to emit coherent light having a wavelength λ_A when a bias current greater than I_Ath is applied thereto;
- b. means for applying a substantially constant bias current having a value equal to or greater than about eight tenths of I_Ath to said semiconductor laser;
- c. means for developing coherent light having a wavelength λ_B where λ_B satisfies the following relationship:

$$60\text{A} \geq \lambda_A - \lambda_B \geq 0; \text{ and}$$

- d. means positioning said means for developing coherent light having a wavelength λ_B relative to said semiconductor laser to direct the coherent light having a wavelength λ_B to strike said semiconductor laser to bias said semiconductor laser to develop a coherent light output having a wavelength λ_B.

4,038,611
VARIABLE ON-AND OFF-TIME RELAXATION OSCILLATOR

Douglas J. Greig, 30053 Del Lane, Warren, Mich. 48091
Filed Feb. 27, 1976, Ser. No. 661,849
Int. Cl.² H03K *3/02*
U.S. Cl. 331—108 D **7 Claims**

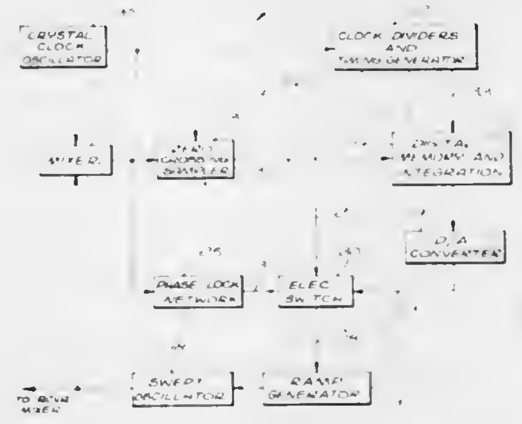


1. A variable on-and off-time relaxation oscillator comprising:

- a plurality of dual input terminal electron control means connected in cascade for generating outputs of predetermined polarities in response to inputs;
- variable impedance means connected to one input terminal of a first of said electron control means;
- first fixed impedance means connected to the other input terminal of said first electron control means;
- the output terminal of said first electron control means being connected to one input terminal of a second of said electron control means, a resistance-capacitance network connected to said one input terminal of said second electron control means;
- second fixed impedance means connected to the other input terminal of said second electron control means;
- the output terminal of said second electron control means being connected to an input terminal of a third electron control means, the polarity of the output of said second electron control means being the opposite of the polarity of said first and third electron control means;
- third fixed impedance means connected to the other input terminal of said third electron control means;
- the output terminal of said second electron control means being coupled to said one input terminal of said first electron control means so that an output signal on the output terminal of said second electron control means causes said first and third electron control means to be turned off and said resistance-capacitance network controls the off-time of said variable on-and off time relaxation oscillator.

4,038,612
SWEPT OSCILLATOR AUTOMATIC LINEARIZER

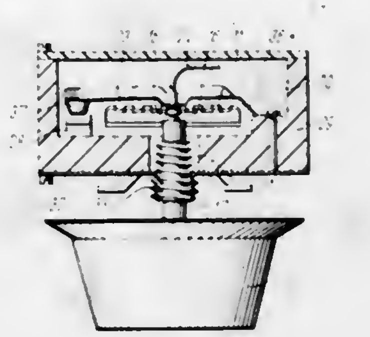
Robert P. Borofka, Granada Hills, and Lynn R. Barton, Glendale, both of Calif., assignors to International Telephone and Telegraph Corporation, New York, N.Y.
Filed May 21, 1976, Ser. No. 688,750
Int. Cl.² H03B *23/00*
U.S. Cl. 331—178 **5 Claims**



1. A device for producing a repetitive, linear, frequency ramp, comprising:
- a signal-controlled oscillator and a ramp generator for generating and applying a repetitive oscillator control signal as a frequency controlling function to said oscillator to produce said frequency ramp;
- a zero-crossing sampler responsive to said frequency ramp;
- synchronizing means for controlling the initiation of each cycle of said repetitive oscillator control signal and for generating a series of sampling signals for said zero-crossing sampler at predetermined points in times at which the waves of said frequency ramp should be passing through zero if df/dt is constant, where f is ramp frequency and t is time;
- means for integrating the output of said sampler over at least a single cycle of said frequency ramp to generate a corresponding repetitive error signal, and for applying said error signal as a correction signal to said ramp generator to provide said oscillator control signal in whatever modified form is required to linearize said frequency ramp.

4,038,613
TEMPERATURE RESPONSIVE DEVICES

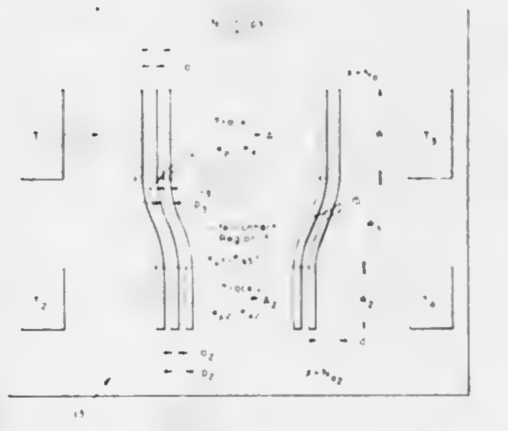
Karl Fischer, Am Gaensberg, 7519 Oberderdingen, Germany
Filed Mar. 21, 1975, Ser. No. 560,926
Claims priority, application Germany, Mar. 27, 1974, 2414812
Int. Cl.² H01H *37/34, 37/40*
U.S. Cl. 337—321 **25 Claims**



1. A temperature-responsive device comprising an expansible box comprising two sheet metal members which are interconnected in a sealed manner; a temperature sensor; a capillary tube connected to the latter; means connecting said capillary tube to said expansible box; an expansible fluid filling said temperature sensor, said capillary tube and said box; a movable transmission lever which is rigidly connected with said expansible box at the side of one of said sheet metal members, said lever having an opening through which said capillary tube passes;
- said one sheet metal member having a central region with an opening therein and said connecting means comprising a connection piece secured to said one sheet metal member and having an inner flange which is located inside said expansible box and a tubular portion which extends outwardly through said opening, said capillary tube being inserted into said tubular portion.

4,038,614
FRACTIONAL EFFICIENCY COUPLER

Charles Weldon Chapman, and Thomas W. Bristol, both of Orange, Calif., assignors to Hughes Aircraft Company, Culver City, Calif.
Filed June 16, 1975, Ser. No. 587,485
Int. Cl.² H03H *9/26, 9/30, 9/32;* H01L *41/04*
U.S. Cl. 333—30 R **5 Claims**



1. A Fractional efficiency surface acoustic wave coupling device, comprising:
- a substrate of piezoelectric material having a surface capable of supporting propagating surface acoustic wave energy;

input means including an input transducer disposed on said surface for launching surface acoustic wave energy along a first track on said surface in response to an electrical input signal;

output means including an output transducer disposed on said surface for detecting surface acoustic wave energy propagating along a second track on said surface and producing a corresponding electrical output signal; and

coupler means including a multistrip coupling array of a predetermined number N of conductive strips disposed on said surface, said coupling array having a tapping portion in said first track and an approximately equal length launching portion in said second track for launching along said second track only a portion of said surface acoustic wave energy incident on said tapping portion, the strip period p_1 of said strips in said tapping portion being different than the strip period p_2 of said strips in said launching portion, the strip period difference being defined by a predetermined strip period ratio p_1/p_2 which in conjunction with said predetermined strip number N provides a broadband device having a desired transfer efficiency less than unity at a desired center frequency, the downstream end of said launching portion of said multistrip coupling array being offset by a distance *d* in an upstream direction relative to the downstream end of said tapping portion to provide a desired phase shift characteristic.

4,038,615

ELASTIC SURFACE WAVE DEVICE

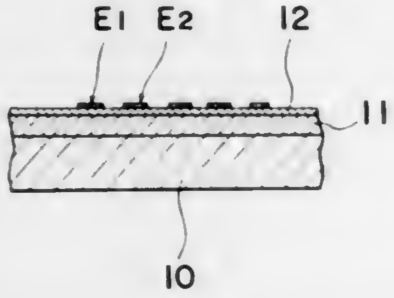
Hideki Ishiyama; Atushi Inoue, and Hideharu Ieki, all of Nagaokakyo, Japan, assignors to Murata Manufacturing Co., Ltd., Nagaokakyo, Japan

Filed Mar. 4, 1976, Ser. No. 663,764

Claims priority, application Japan, Mar. 4, 1975, 50-26858; Mar. 4, 1975, 50-26859; Sept. 4, 1975, 50-107658; Nov. 7, 1975, 50-152144

Int. Cl.² H03H *9/04, 9/26, 9/32;* **H01L** *41/18*

U.S. Cl. 333—72 **4 Claims**



1. An elastic surface wave device which comprises;

a substrate made of dielectric material;

a thin layer made of piezoelectric material formed on said substrate; and

at least one pair of electrodes formed between said substrate and thin layer;

the ratio between the velocity of propagation of the elastic surface waves transmitted through said substrate to the velocity of propagation of the elastic surface waves transmitted through said thin layer being within the range of more than 0.85 to less than 1.15.

4,038,616

VACUUM TUBE GAS TEST APPARATUS

Ervin Matthew Ball, Zionsville, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Apr. 29, 1976, Ser. No. 681,694

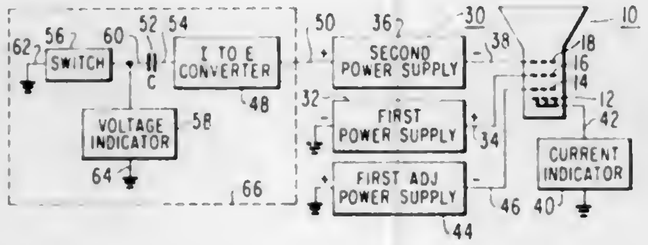
Int. Cl.² G01R *31/024*

U.S. Cl. 324—20 CR **16 Claims**

1. An apparatus for measuring gas current (I_g) in the presence of leakage current (I_l) in a vacuum tube, said apparatus comprising:

a. means for energizing said tube to produce a current (I_k) from a cathode to a first electrode and said I_g and said I_l to a second electrode of said tube;

b. means for energizing said tube to prevent said I_k and I_g but to produce said I_l;



c. means for generating a first voltage proportional to the sum of said I_g and said I_l and a second voltage proportional to said I_l; and

d. means for applying said first and second voltages sequentially to a voltage differentiation means to produce a third voltage which is equal to the difference between said first and second voltages and which is representative of said I_g.

4,038,617

APPARATUS FOR INDICATING THE OUTPUT OF A MACHINE

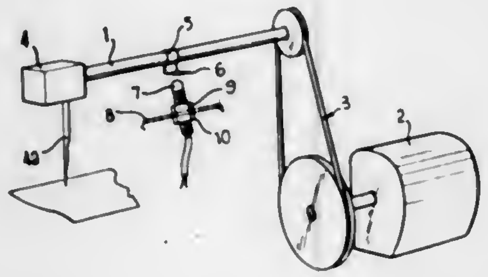
Joseph Milom, 8 Anson Road, Victoria Park, Manchester 14, England

Filed May 14, 1975, Ser. No. 577,232

Claims priority, application United Kingdom, Sept. 27, 1974, 42178/74

Int. Cl.² G01P *3/66*

U.S. Cl. 324—179 **8 Claims**



1. In combination with a machine having a part undergoing cyclic movement during operation, means for registering operation of the machine comprising a detector device having a magnetic coil and a pole piece spaced by an air gap from said part, means connected to the coil for establishing a magnetic field in said air gap periodically traversed by said part during said cyclic movement thereof, a counter device connected to the coil for receiving pulse signals generated in the coil by said part traversing the magnetic field, and indicator means connected to the counter device for visually registering the number of operational cycles of the machine, the counter device including a Schmitt Trigger pulse circuit and a pair of series connected decade counters, one of the counters being driven by the pulse circuit and the second of the counters being connected to a drive transistor, the drive transistor being connected to the second decade counter through a capacitor.

4,038,618

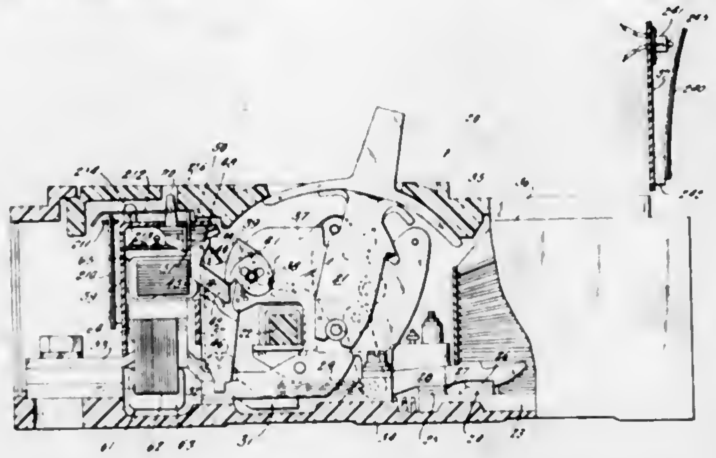
CIRCUIT BREAKER HAVING THERMAL AND SOLID STATE TRIP MEANS

Carl E. Gryctko, Bellefontaine, Ohio, assignor to I-T-E Imperial Corporation, Spring House, Pa.

Filed Apr. 12, 1976, Ser. No. 675,968

Int. Cl.² H01H *73/00, 73/48*

U.S. Cl. 335—23 **6 Claims**



1. A circuit breaker including cooperating contact means; an operating mechanism operatively connected to said contact means: a latch means normally maintaining and said mechanism latched in position for opening and closing said contact means; solid state trip means having a first portion for monitoring currents flowing in said breaker, a second portion for processing signals generated by said first portion, and a third portion for releasing said latch means to automatically trip said mechanism thereby opening said contact means responsive to a trip signal generated by said portion when predetermined overload currents flow in said breaker; a housing wherein said contact means, said operating mechanism, said latch means and said trip means are disposed; a thermally responsive first means disposed within said housing and insulated from electrical and thermal conduction with current carrying elements in said housing whereby temperature of said first means is essentially a function of air temperature within said housing; and second means operatively connecting said first means with said latch means whereby the latter will release said latch means when said first means is subjected to predetermined conditions of temperature.

4,038,619

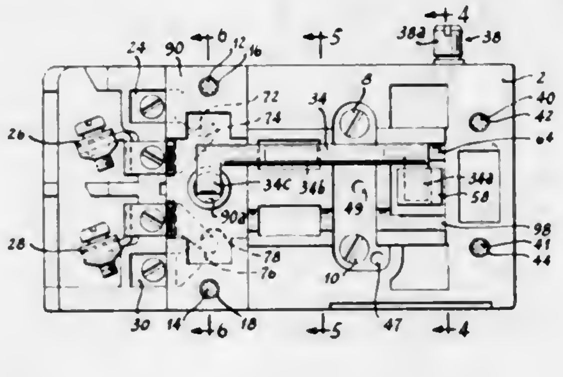
PNEUMATIC TIMER

Frederic Oakland, Hales Corners, and Edward A. Mallonen, New Berlin, both of Wis., assignors to Cutler-Hammer, Inc., Milwaukee, Wis.

Filed Oct. 1, 1975, Ser. No. 618,579

Int. Cl.² H01H *7/03*

U.S. Cl. 335—61 **5 Claims**



1. A timing device comprising:

a housing:

a lever mounted in said housing for rotational movement about its longitudinal axis and having a plurality of cams extending transversely therefrom;

an actuator mounted in said housing for reciprocal movement and having a portion engaging a first of said cams;

biasing mans biasing said lever in one direction of rotation thereof;

an operator movably mounted in said housing and having a camming tip engageable with a second of said cams such that in one direction of movement of said operator, said camming tip disengages said second cam to allow said lever to rotate under the bias of said biasing means and such that in the opposite direction of movement of said operator, said camming tip engages said second cam to rotate said lever against the bias of said biasing means;

pneumatic time delay means mounted in said housing and having a movable timing head in engagement with a third of said cams to adjustably retard the rate of rotation of said lever under the bias of said biasing means; and

switch means mounted in said housing for effecting switching operations in response to a predetermined amount of movement of said actuator corresponding to a predetermined amount of rotation of said lever.

4,038,620

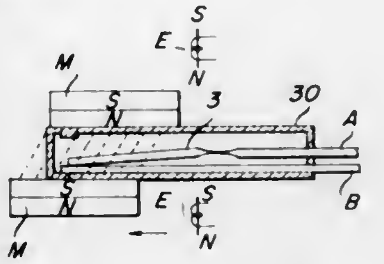
MAGNETIC REED SWITCH

B. Edward Shlesinger, Jr., 9411 Macklin Court, Alexandria, Va. 22309, and Charlie Dwain Mariner, 2846 Greenway Blvd., Falls Church, Va. 22042

Continuation-in-part of Ser. No. 533,223, Dec. 16, 1974, Pat. No. 3,943,474, which is a division of Ser. No. 404,612, Oct. 9, 1973, Pat. No. 3,866,007. This application Sept. 8, 1975, Ser. No. 611,156

Int. Cl.² H01H *1/66*

U.S. Cl. 335—153 **67 Claims**



1. A reed switch comprising:

a. a first reed of conductive magnetic material

b. a second reed of conductive non-magnetic material mounted in cooperating spaced relation to said first reed.

c. said first reed comprising a body of conductive material having a contact section, an intermediate spring section and a support section

d. said intermediate section being foil-thin

e. said contact section being substantially rigid and non-flexible

f. said contact section being substantially thicker than said intermediate section

g. said intermediate section comprising a leaf spring having a flexibility permitting one end of said leaf spring to flex a substantial distance through an arc with respect to the other end of said leaf spring without exceeding the elastic limits of said spring.

h. said intermediate section being substantially harder, less ductile and more dense than said contact section and having a substantially higher tensile strength than said contact section

i. a magnetic operator mounted in cooperating spaced relation to said first and second reeds

j. whereby cooperative operation of said magnetic operator with said magnetic causes said magnetic reed to move into or out of contact with said non-magnetic reed.

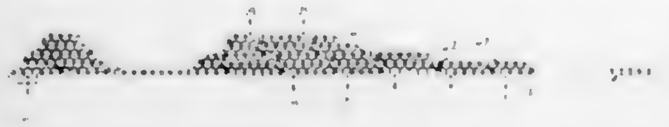
4,038,621
PRECISION VERTICAL DEFLECTION COIL FOR A HYBRID TELEVISION YOKE

Wayne R. Chiodi, Northbrook, and Bryan R. Grummon, Oak Park, both of Ill., assignors to Zenith Radio Corporation, Glenview, Ill.

Filed Mar. 16, 1976, Ser. No. 667,918

Int. Cl.^{2} H01F *1/00*

U.S. Cl. 335—213 **6 Claims**



1. An electromagnetic deflection yoke comprising:
a liner;
saddle wound horizontal deflection coils mounted on one side of said liner;
a magnetically permeable substantially smooth core adjacent the opposite side of said liner; and
a pair of vertical deflection coils toroidally wound in a wave sequence on said core, each having a repeatable multilayer precision stack of wire turns with only said wire turns providing support for maintaining said multilayer precision stack.

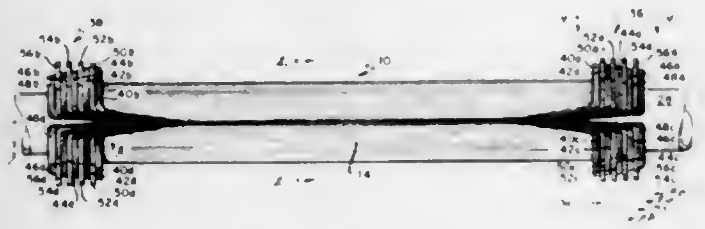
4,038,622
SUPERCONDUCTING DIPOLE ELECTROMAGNET

John R. Purcell, San Diego, Calif., assignor to The United States of America as represented by the United States Energy Research and Development Administration, Washington, D.C.

Filed Apr. 13, 1976, Ser. No. 676,585

Int. Cl.^{2} H01F *7/22*

U.S. Cl. 335—216 **5 Claims**



1. A superconducting dipole electromagnet wound of wires formed by a filament of superconducting material embedded in a normal conductor that is enclosed in an electrically insulating material, the electromagnet exhibiting cylindrical symmetry about an axis, the electromagnet comprising:

a. a central portion of said wires disposed substantially parallel to each other and to the axis of cylindrical symmetry, the wires in said central portion disposed in two crescent-shaped cross-sections defined by non-intersecting portions of two equal circles having centers on a line through the axis and perpendicular to the axis, the centers equidistant from the axis, the wires in one of said two crescent-shaped cross-sections disposed to carry electric current in a first direction parallel to the axis and the wires in the other of said two crescent-shaped cross-sections carrying electric current in an opposite direction;

b. a first terminating portion of said wires connected electrically to the central portion at a first end to form a plurality of looping portions, each of said looping portions connecting wires from one of said crescent-shaped cross-sections to wires in the other of said crescent-shaped portions and continuing an electric circuit therethrough, the fractional number of wires in each of said looping portions equalling the reciprocal of the number of said plurality, further unlooped portions of said wires disposed in cross-sections bounded by arcs of two bounding circles equal in size to said two equal circles, the centers of the bounding circles moving into coincidence upon approaching an end of the magnet; and

c. a second terminating portion of said wires connected to the central portion at a second end opposite to said first end and exhibiting mirrored symmetry to said first terminating portion, the second terminating portion carrying electric current connected to continue an electric circuit from wires in one of said crescent-shaped cross-sections to wires in the other, whereby the second terminating portion forms with the first terminating portion and the central portion a continuous current-carrying dipole electromagnet.

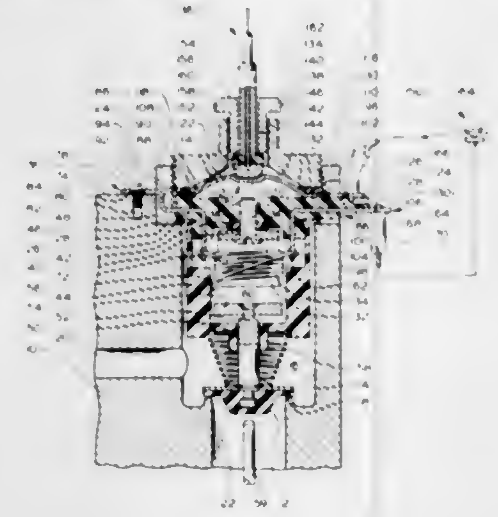
4,038,623
ELECTROMAGNET WITH TERMINALS

Eugene L. Kamp, and Charles D. Visos, both of St. Louis County, Mo., assignors to Emerson Electric Co., St. Louis, Mo.

Filed May 6, 1976, Ser. No. 683,644

Int. Cl.^{2} H01F *7/08*

U.S. Cl. 335—219 **10 Claims**



1. In a control device adapted to be energized by a thermocouple and to be connected in circuit with controlling circuit means,
a housing having an opening therein comprising a lower portion and a threaded upper portion;
thermocouple connector means threadedly engaged to said upper portion of said opening having an internally threaded bore for receiving coaxial terminal means of said thermocouple;
a first electric terminal spaced from said connector means and said housing having one end in said opening in alignment with said bore for connection to one terminal of said thermocouple terminal means and having another end extending externally of said opening for connection to said controlling circuit means;
an insulative base disposed in said opening having an upper portion providing means for retaining said first electric terminal;
a cover member having an open end and a closed end and having its open end connected to a bottom portion of said base and defining a cavity therewith;
a magnetic core member fixed to said base;
a winding on said core member;
said core member and said winding extending into said cavity;
a second electric terminal extending through said base and having one end extending externally of said opening for connection to said controlling circuit means and having another end extending into said cavity and connected to one end of said winding; and
a third electric terminal extending through said base and having one end extending externally of said opening and attached to said housing and having another end extending into said cavity and connected to the other end of said winding.

4,038,624
ROTARY TRANSFORMER

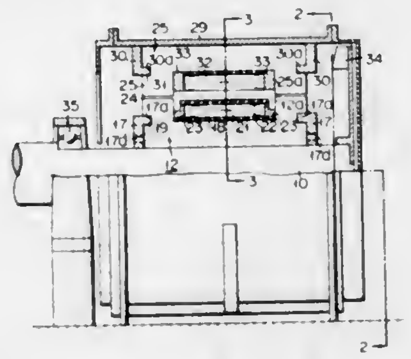
Masanao Namba; Masateru Kuniyoshi, and Akira Kobayashi, all of Yokohama, Japan, assignors to Tokyo Shibaura Electric Co., Ltd., Kawasaki, Japan

Continuation-in-part of Ser. No. 480,385, June 18, 1974, abandoned. This application Sept. 26, 1975, Ser. No. 617,245

Claims priority, application Japan, June 26, 1973, 48-75958[U]

Int. Cl.^{2} H01F *27/08. 27/24*

U.S. Cl. 336—60 **9 Claims**



1. A rotary transformer comprising:
a cylindrical housing;
a stator core including a plurality of iron blocks and an annular recess therein, each block being made of U-shaped, laminated iron plates each having the same and uniform thickness and arranged on the inner wall of said housing, and any two adjacent blocks being spaced from each other for a distance at the outer edges and contacted with each other at the inner edges;
a rotary shaft;
a rotor core including a plurality of iron blocks and an annular recess therein, each block being made of U-shaped, laminated iron plates each having the same and uniform thickness, arranged on the periphery of said rotary shaft, and having the outer end spaced from the inner surface of said stator core;
a stator coil disposed in the recess of said stator core;
a rotor coil disposed in the recess of said rotor core;
first fastening means engaging the end face of every stator iron block to thereby fix the stator iron blocks and secure the stator core to the housing; and
second fastening means engaging the end face of every rotor iron block to thereby fix the rotor iron blocks and secure the rotor core to the rotary shaft.

4,038,625
MAGNETIC INDUCTIVELY-COUPLED CONNECTOR

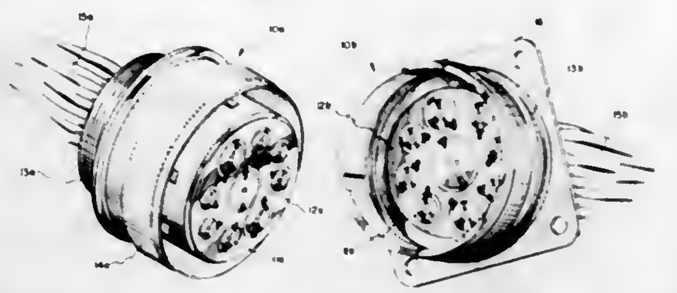
Russell E. Tompkins, Scotia, N.Y.; Franklin A. Fisher, Pittsfield, Mass., and Robert P. Wanger, Fairfield, Ohio, assignors to General Electric Company, Schenectady, N.Y.

Filed June 7, 1976, Ser. No. 693,298

Int. Cl.^{2} H01F *15/02*

U.S. Cl. 336—83 **2 Claims**

1. An inductive connector comprising
a pair of mating metallic housing units within each of which is mounted a metallic support plate respectively having a plurality of closely spaced recesses arranged in the same pattern,
a plurality of transformer couplings each made in two separable sections which are received in opposing recesses in said support plates,
each two-section transformer coupling comprising a ferrite magnetic core composed of two substantially identical, one-piece, opposing cup-type core halves each including a center member about which one transformer winding is disposed and also an outer member, said core halves when assembled having a magnetic gap therebetween with the transformer windings and center members collinear and magnetically coupled and further substantially enclosed by said outer members.



a protective coating over at least exposed areas of said core halves and transformer windings, and
means for releasably clamping together said housing units with the two sections of each transformer coupling in alignment.

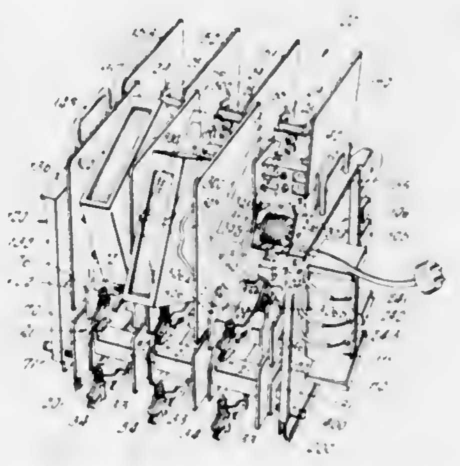
4,038,626
HIGH VOLTAGE CONTACTOR

John L. Haydu, Towson; Michel M. Fenneteau, Gaithersburg, and Byron C. Mann, Kingsville, all of Md., assignors to I-T-E Imperial Corporation, Spring House, Pa.

Filed June 11, 1975, Ser. No. 585,774

Int. Cl.^{2} H01H *83/00*

U.S. Cl. 337—4 **32 Claims**

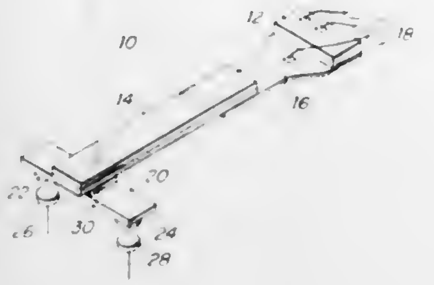


1. A contactor comprising a stationary contact and a movable contact; the movable contact being operable into engagement with said stationary contact and out of engagement therewith to open a circuit through said contacts;
a. control circuit for said contactor comprising an electromagnet and an armature;
means for energizing said electromagnet to move said armature toward said electromagnet;
a mechanical connection between said armature and said movable contact;
said movable contact being driven into engagement with said stationary contact when said armature is drawn to said electromagnet;
additional electromagnetic means for retaining said armature in a position in which said movable contact is engaged with said stationary contact;
biasing means driving said movable contact away from said stationary contact;
and means for opening the circuit to said additional electromagnetic means thereby releasing said armature and permitting said biasing means to move said movable contact away from said stationary contact.

4,038,627
ELECTRO-THERMAL ISOLATING SWITCH

Brant T. Johnson, 123 Carlisle Pines Drive, Carlisle, Mass. 01741

Filed Apr. 14, 1975, Ser. No. 567,992
Int. Cl.² H01H *61/02, 63/013*
U.S. Cl. 337—107 **4 Claims**

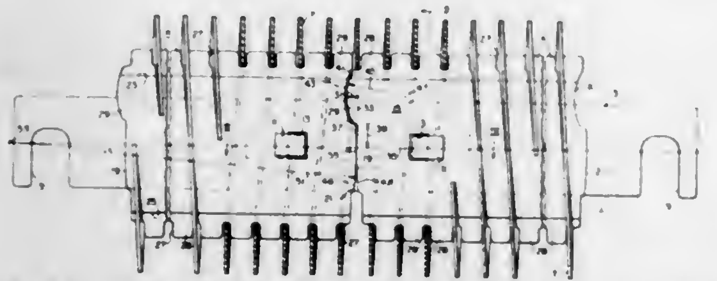


1. The switch of claim 1 including a low thermal conductivity support member for supporting and for reducing heat loss from said semiconductor device.

4,038,628
ELECTRIC RESISTOR

Nicholas A. Salemi, Plum Borough, Pa., assignor to Westinghouse Electric Corporation, Pittsburgh, Pa.

Filed June 21, 1976, Ser. No. 698,226
Int. Cl.² H01C *10/14*
U.S. Cl. 338—318 **9 Claims**



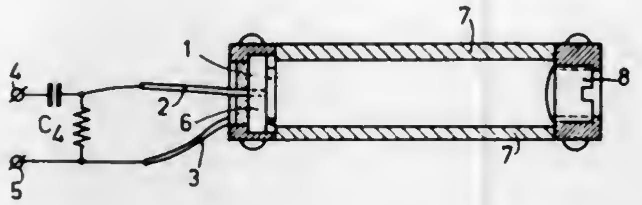
1. An electric resistor assembly comprising an elongated mounting strap having terminals at both ends respectively for panel mounting, the mounting strap having a flexing direction, a plurality of insulating refractory bodies disposed on the strap in end-to-end abutment, the bodies having opposite vertical side walls, opposite end walls, and upper and lower edges, one end wall of each body having a bulged portion protruding from the end wall, the other end wall having a concavity corresponding to and receptive of the bulged portion of adjacent body, to enable angular motion of the adjacent bodies in the flexing direction, and a helical resistance conductor mounted on and surrounding the bodies.

4,038,629
PROPAGATION DELAY METER

Cornelis Martinus van der Burgt, and Gerardus Andreas van Maanen, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed May 5, 1975, Ser. No. 574,349
Claims priority, application Netherlands, May 6, 1974, 7406033
Int. Cl.² G01S *9/66*
U.S. Cl. 340—3 E **10 Claims**

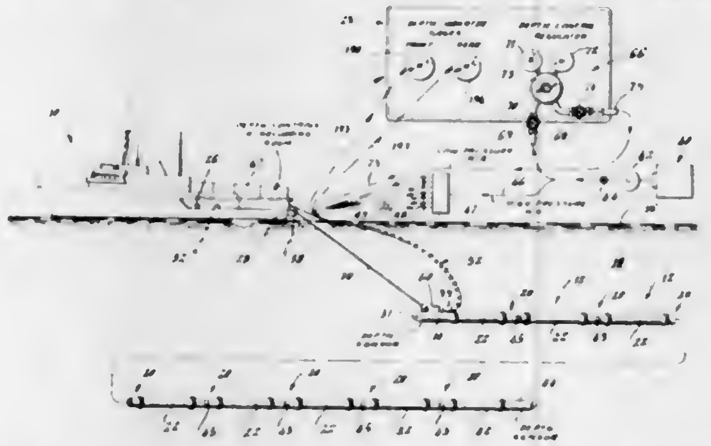
1. Apparatus for measuring the propagation delay of an acoustic wave in a fluid medium comprising, a transducer for launching an acoustic wave along a given path in the fluid medium, a reflector of acoustic energy positioned in the fluid medium in the path of said acoustic wave at a distance from the transducer which is less than ½ times the length of the Fresnel region of the acoustic wave launched by the transducer and greater than one half times said Fresnel region, said reflector having a convex surface facing the transducer for reflecting the launched acoustic wave back towards the transducer, and means coupled to the transducer and responsive to an acoustic wave reflected back from the reflector for deriving an electric control signal.



4,038,630
AIRGUN MARINE SEISMIC SURVEY STREAMER METHOD AND APPARATUS

Stephen V. Chelminski, West Redding, Conn., assignor to Bolt Associates, Inc., Norwalk, Conn.

Filed Oct. 28, 1975, Ser. No. 625,886
Int. Cl.² G01V *1/38, 1/02*
U.S. Cl. 340—7 R **28 Claims**



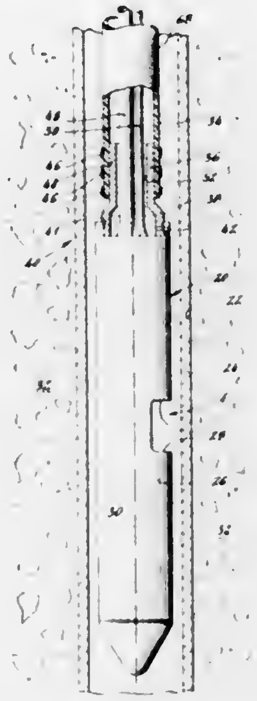
1. The method of employing airguns each having a plurality of neighboring discharge ports for generating marine seismic impulses comprising the steps of:

- positioning a plurality of such airguns of generally elongated cylindrical configuration in axial alignment along a line at spaced positions,
- interconnecting each axially aligned airgun in the line to the next successive airgun by a flexible sleeve axially aligned with the respective airguns to which it is connected for forming chambers within the sleeves between successive airguns while leaving all of the neighboring discharge ports of each airgun exposed to the ambient between the successive flexible sleeves, thereby forming a flexible steamer in which said airguns are axially aligned and having the discharge ports of all of the airguns therein exposed to the ambient,
- towing the airgun streamer from one end through the water, and
- feeding the high pressure compressed air along the streamer by-passing preceding airguns for supplying high pressure compressed air to each of the air guns in the streamer and suddenly discharging high pressure air through the exposed ports of the streamer for generating seismic impulses in the water.

4,038,631
METHOD FOR GENERATING AND DETECTING SEISMIC SHEAR WAVE ENERGY IN THE EARTH

Vincent J. Murphy, 89 Traincroft, Medford, Mass. 02155

Filed Nov. 7, 1975, Ser. No. 629,810
Int. Cl.² G01V *1/00*
U.S. Cl. 340—15.5 BH **7 Claims**



3. The method of making determinations of seismic shear wave velocities in the earth at sites where large civil engineering structures are proposed to be built comprising the steps of:

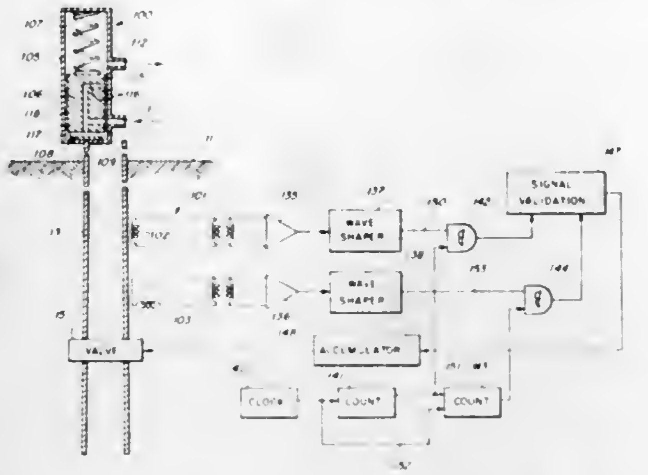
- providing at least two boreholes in the earth,
- providing an airgun capable of being lowered into one of said boreholes and having only one discharge port directed radially outwardly from one side of the airgun,
- lowering said airgun into said one borehole,
- aiming the airgun therein to a sequence of predetermined azimuths relative to the other borehole,
- firing the airgun while it is being aimed at each of the azimuths in the predetermined sequence, and
- sensing the resulting seismic waves appearing in the earth at said other borehole.

4,038,632
OIL AND GAS WELL DISASTER VALVE CONTROL SYSTEM

William H. Parker, Hurst, Tex., assignor to Del Norte Technology, Inc., Euless, Tex.

Continuation-in-part of Ser. No. 294,289, Oct. 2, 1972, Pat. No. 3,961,308. This application Nov. 6, 1975, Ser. No. 629,515
Int. Cl.² E21B *35/00*
U.S. Cl. 340—18 NC **11 Claims**

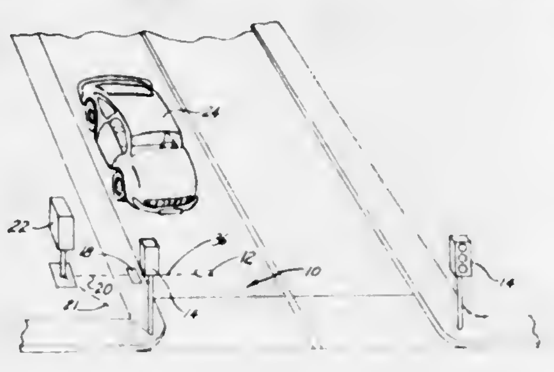
1. A system for communicating into an oil or gas well comprising a gas or oil tubing extending down into said well to a disaster valve near the bottom of the tubing, means near the top of said tubing for selectively transmitting cyclically recurring sonic energy signals through the walls of said tubing when a control function is desired, said signals resolving themselves into vertical and time displaced horizontal sonic energy signals, means near the bottom end of said tubing for detecting and comparing the recurring vertical signals with the time displaced horizontal signals transmitted through said walls, and means responsive to said detection and comparison of said signals for selectively performing said control function upon said disaster valve.



4,038,633
DETECTION SYSTEM FOR AUTOMOBILES AND OTHER MOTOR-DRIVEN OBJECTS

Frederick N. King, 5068 Franklin Ave., Los Angeles, Calif. 90027

Continuation of Ser. No. 390,364, Aug. 22, 1973. This application Apr. 21, 1975, Ser. No. 569,708
Int. Cl.² G08G *1/00*
U.S. Cl. 340—38 L **12 Claims**



1. Apparatus for indicating the nonmoving presence of motor-driven objects and the like comprising:

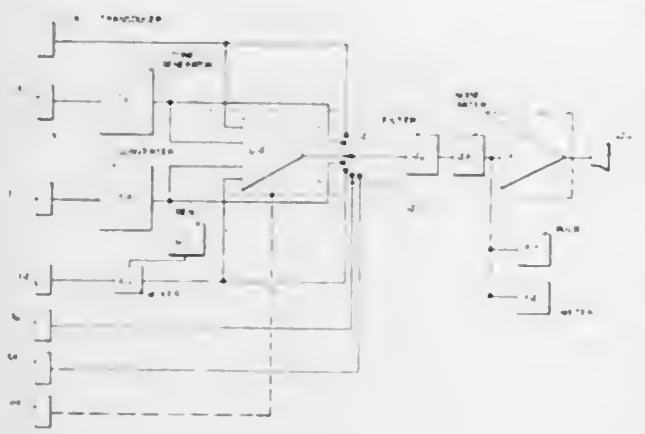
- means for coupling to the changing magnetic field radiated by the flow of pulsating D.C. or A.C. ripple current supplied to the electrical system of a motor-driven object by a rotational electrical generating device contained in the electrical system of and driven by the motor of the motor-driven object;
- said coupling means comprising a coil of small diameter copper wire wound on a laminated, ferrite iron core connected through an electrical connection to the input of a signal developing means to continuously detect the presence of motor-driven objects in close proximity to said coupling means independently of whether the motor-driven object being sensed is in motion;
- said signal developing means comprising a system of midraange filter means, operational amplifier means, a rectifier means and an indicating means all coupled in sequence; whereby
- A.C. current of a frequency the same as the frequency of the changing magnetic field radiated by the ripple current is induced in the windings of said coupling means and fed through said signal developing means which removes electrical energy of undesirable frequencies induced in said coupling means and passes only those in the range of frequencies of ripple current generated in the electrical

systems of motor-driven objects to actuate said indicating means to continuously indicate the presence of a motor-driven object in close proximity to the sensing means so long as the motor is running and the electrical generating device is operational.

4,038,634

AUTOMOBILE WARNING SYSTEM

Frank Caliri, 2 Royal Crest Drive, Marlboro, Mass. 01752
Continuation of Ser. No. 544,242, Feb. 6, 1975, abandoned. This application Aug. 2, 1976, Ser. No. 710,722
Int. Cl.² G08B *19/00*
U.S. Cl. 340—52 F **1 Claim**



1. A warning system for installation in a vehicle to report the condition of various critical running gear comprising
  a. a plurality of transducers, each transducer being located at a different position adjacent a critical running gear in the vehicle to receive impulses from such gear and to generate a signal containing raw information, the transducers being attached to their positions by magnets, the vehicle having front wheel supporting members and the transducers being located on the members.
  b. a master unit to which each transducer is connected, the unit including filtering means to remove extraneous information from the raw information in the signal, the filtering means including a variable high-pass frequency filter, the filtering means including frequency suppressing elements, the filtering means also including a variable lowpass frequency filter, and
  c. an indicator connected to the master unit to receive the remaining signal.

4,038,635

VEHICLE INTRUSION ALARM CIRCUIT

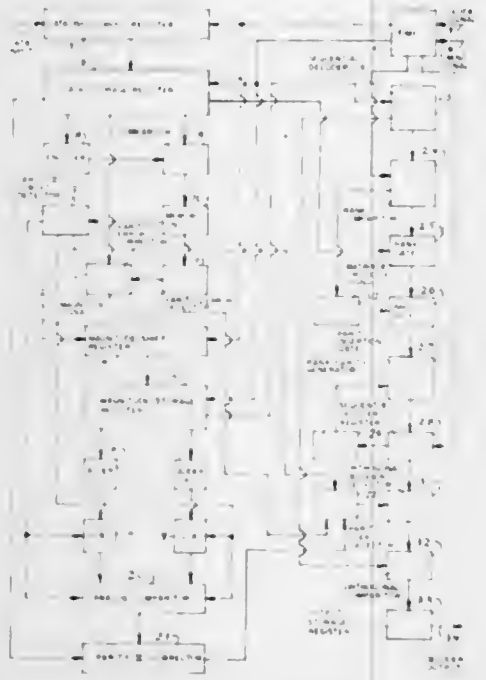
Larry A. Schotz, 6220 N. Sunny Point Road, Glendale, Wis. 53217
Filed Jan. 2, 1976, Ser. No. 646,095
Int. Cl.² B60R *25/10*
U.S. Cl. 340—63 **16 Claims**

1. A vehicle intrusion alarm circuit for use in combination with a vehicle having at least one compartment, an openable compartment closure therefore, at least one electrical load element for coupling to a battery, and switch means for energizing said load element when said compartment closure is opened, said intrusion alarm circuit comprising an operational amplifier having two inputs and an output, said operational amplifier being operable to produce an output signal which is proportional to the difference between its two input signals, means coupling both of said operational amplifier inputs to the ungrounded terminal of said battery, a capacitor coupled between one operational amplifier input and ground, the voltage on said capacitor and said one input being substantially equal to the voltage on said other input when the load element is deenergized and the voltage on said other input changing incidental to energization of said load element and coincidental change in said battery voltage to thereby produce a voltage difference between said inputs for operating said amplifier, alarm means coupled to the operational amplifier output, said alarm means being operable to produce an audible alarm in response to an output signal of said operational amplifier caused by the opening of said compartment closure, and alarm disabling means accessible from outside said vehicle for disabling said alarm circuit to permit opening of said compartment closure without activating said alarm.

4,038,636

MULTIPLE DECODING SYSTEM

George D. Doland, 1602 Redway Lane, Houston, Tex. 77062
Filed June 18, 1975, Ser. No. 588,028
Int. Cl.² G06F *11/12*
U.S. Cl. 340—146.1 AV **3 Claims**



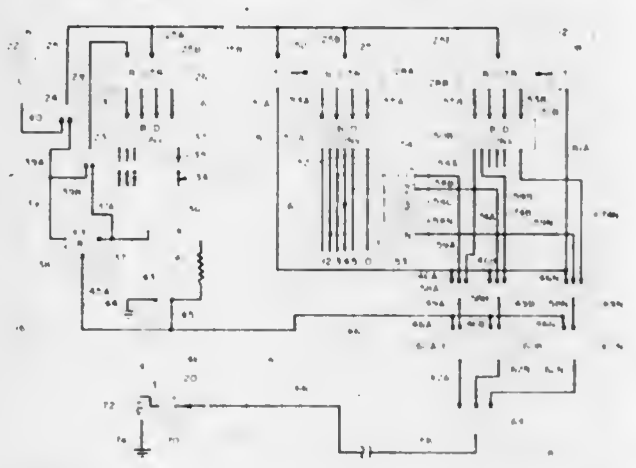
1. A Parity decoder for decoding coded digital data consisting of the data and parity check bits, the decoder comprising, a serial data input shift register means for accepting the coded data, a timer means for synchronizing the operation of said decoder by using a clock input and timing signal input, a magnitude shift register means for accepting magnitude data related to the coded digital data, said timer is connected to said data input shift register and said magnitude shift register, said clock signal via said timer causes the transfer to data in said data input shift register from the input end toward the output end of said data input shift register, similarly said clock signal causes the transfer of the magnitude signal data from the input of said magnitude shift register toward the output of said magnitude shift register, said data input shift register is connected to a data storage register means which stores the digital data, said magnitude shift register is connected to a magnitude storage register means which stores the magnitude data, a signal from said timer which is connected to said data storage register and said magnitude storage register transfers the data from said data input shift register to the data storage register and transfers the magnitude data from said magnitude shift register to said magnitude storage register, said data storage register is connected to an encoder means which encodes the uncoded portion of the data stored in said data storage register, said encoder is connected to a comparitor means and said comparitor is also connected to said data storage register, said comparitor compares the check bits from said encoder with check bits from the data storage register and generates error signals, said comparitor is connected to a memory unit means, said memory unit is connected to a Parity II subset detector means and to a Parity I error detector means, said memory unit recognizes the error signal pattern and provides control signals to said Parity I error detector and said Parity II subset detector, said Parity I error detector is connected to Parity I error corrector means, said data storage register is also connected to said Parity I error corrector, said Parity I error corrector corrects one bit error in the digital data from said data storage register using a corrector signal from said Parity I error detector, said Parity I error corrector is connected to a Parity code selector means, said magnitude storage register is connected to a plurality of added means, said adders add the magnitude data for pairs of bits, said adders are connected to a plurality of digital data to a set of analog voltages, said Sequential decoder analog to digital converter is connected to a rank comparitor means which orders the signals based upon absolute magnitude, said timer is connected to said rank comparitor, said timer signal allows passage of the signals in sequence starting with the signal with greatest magnitude, said rank comparitor is connected to a rank gate means, said data storage register is connected to said rank gate, said rank comparitor output signals allows passage of the data from said data storage register through said rank gate, said rank gate is connected to an inhibit gate means, said inhibit gate inhibits passage of data bits when sufficient data bits have been processed to determine the data bits inhibited using data previously processed, said inhibit gate is connected to a parity insertion gate means, said parity insertion is connected to a Sequential decoder register means, said Sequential decoder register stores data from said parity insertion gate, said Sequential decoder register is connected to a rank parity generator means, said rank parity generator encodes data stored in said Sequential decoder register, said rank parity generator is connected to said parity insertion gate, said rank comparitor is connected to a matrix of processed signal means, said matrix of processed signals determines when a sufficient number of data bits have been processed to determine other data bits which have not been processed, said matrix of processed signals is connected to said inhibit gate and said parity insertion gate, control signals from said matrix of processed signals inhibit processing of signals in said inhibit gate and insert data generated by said rank parity generator in said parity insertion gate, the output signal from said Sequential decoder register is the Sequential decoder output, said timer is connected to said Sequential decoder register, said timer signal resets said Sequential decoder register to zero after processing each word.

4,038,637

ACCESS CONTROL SYSTEM

Sherman M. Peters, 5209 S. Vadalia, No. 5, Tulsa, Okla. 74135
Filed Nov. 24, 1975, Ser. No. 634,347
Int. Cl.² E05B *49/00*
U.S. Cl. 340—147 MD **3 Claims**

1. A system for access control comprising;
  a. storage means at a control location, and means for entering into said storage means signals representative of a first selected series of decimal digits, said storage means being decimal switch means;
  b. means at an access location for generating a plurality of sequential signals, which comprises clock means, means to start said clock means; means to count the pulses produced by said clock means, comprising binary counter means; binary to decimal converter means; decimal switch means; and means responsive to said switch means to stop said clock means when said number of pulses corresponds to a selected decimal digit;
  each signal comprising a plurality of sequential electrical pulses, the number of pulses in each signal corresponding to the sequential digits in second selected series of decimal digits;

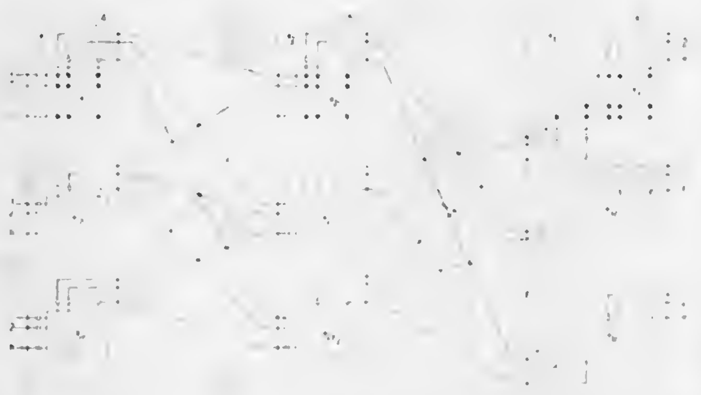


  c. means to transmit said sequential pulses of each of said sequential signals from said access location to said control location over a signal conductor;
  d. means including binary counter means and binary to decimal converter means for converting said sequential pulses of said sequential signals to sequential decimal digits corresponding to said second selected series of decimal digits; and
  e. means to compare said sequential decimal digits corresponding to said second selected series of decimal digits to said first selected series to decimal digits;
  f. means responsive to said means to compare, to set each of a plurality of latches, one for each of said sequential digits; and
  g. means responsive to said plurality of latches, set in the proper order, for granting access.

4,038,638

EFFICIENT REARRANGEABLE MULTISTAGE SWITCHING NETWORKS

Frank Kwangming Hwang, Piscataway Township, Middlesex County, N.J., assignor to Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed June 1, 1976, Ser. No. 691,898
Int. Cl.² H04Q *3/52*
U.S. Cl. 340—166 R **8 Claims**



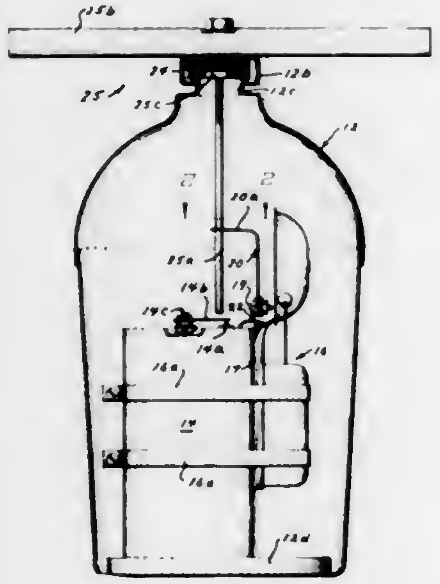
1. A multistage switching network subdivided into a first stage, a second stage, and a third stage characterized in that:

said first stage comprises an *n* plurality of switches;
said second stage comprises no more than an $n+1$ plurality of switches;
said third stage comprises an *n* plurality of switches; and
exactly two of said stages comprise two-sided rearrangeable switches.

4,038,639
BIRD PERCH ALARM

Glenn M. Kuebler, Rte. 3, Box 128, Bell Road, Newburgh, Ind. 47630

Filed Jan. 16, 1976, Ser. No. 649,643
Int. Cl.² G08B *21/00*
U.S. Cl. 340—272 **2 Claims**



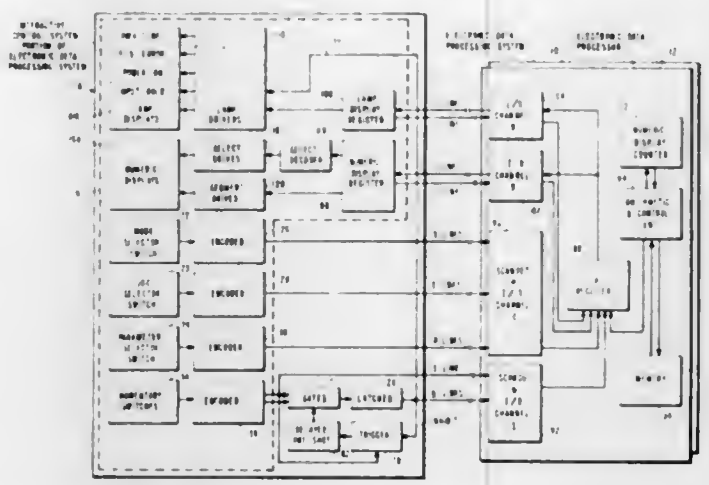
1. A bird perch alarm comprising a movable bird perch assembly mounted on a housing and responsive to the weight of an alighting bird, said bird perch assembly including a cap mounted on a neck of said housing and a plunger extending into said housing through said neck, resilient material disposed within said cap compressing upon movement of said cap on said neck by an alighting bird, audible means responsive to movement of said plunger, and an electrical circuit to said audible means completed upon movement of said plunger.

4,038,640
INTERACTIVE CONTROL SYSTEM

Barry T. Lee, Woodland Hills; Ralph V. Cole, Simi; Irving Hirsch, Beverly Hills; Gilbert P. Hyatt, Northridge, and Gunther W. Wimmer, Saugus, all of Calif., assignors to said Micro Computer Inc. by said Barry T. Lee, Ralph V. Cole, Gunther W. Wimmer

Continuation of Ser. No. 101,449, Dec. 28, 1970. This application Apr. 24, 1973, Ser. No. 354,590
Int. Cl.² G06F *9/06*
U.S. Cl. 364—200 **15 Claims**

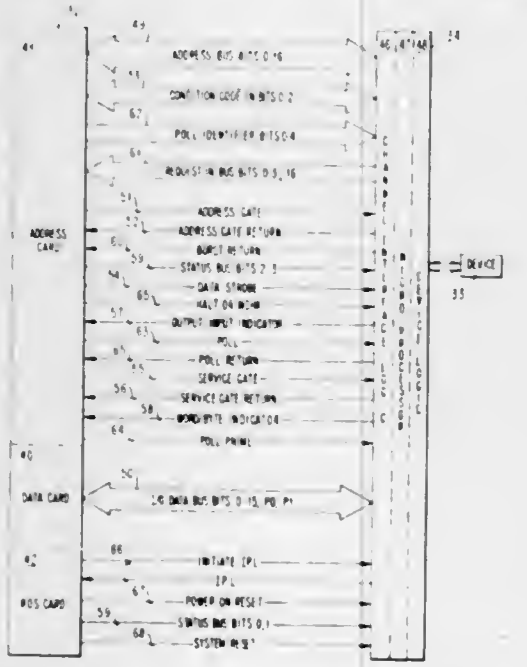
1. An interactive control system comprising an operator panel for communicating with an operator; said operator panel including panel input means for generating at least one input signal in response to an operator input action, display register means for storing at least one display signal from a data processor, and display output means for providing an operator display in response to the display signal stored in said display register means; said interactive control system further comprising a stored program data processor processing digital data including memory means for storing a plurality of instructions, execution means for deriving the significance of the received input signal and for generating at least one display signal in response to execution of at least one of the stored instructions, processor register means for providing temporary storage of signals involved in the execution of instructions, processor input means for periodically sampling and for receiving the input signal in response to execution of at least one instruction, and processor output means for outputting the display signal to said display register means in response to execution of at least one instruction.



4,038,641
COMMON POLLING LOGIC FOR INPUT/OUTPUT INTERRUPT OR CYCLE STEAL DATA TRANSFER REQUESTS

Max Abbott Bouknecht; Donall Garraid Bourke, both of Boca Raton, and Louis Peter Vergari, Palm Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 681,983
Int. Cl.² G06F *3/04, 13/00*
U.S. Cl. 364—900 **5 Claims**



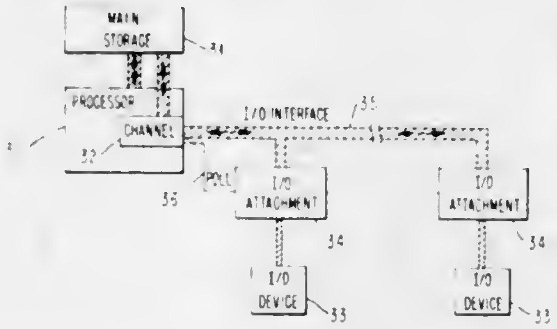
1. A peripheral device control unit for use in a data processing system including a central processor unit, storage unit, I/O control logic unit, and an interface (I/F) bus with a plurality of I/F lines for interconnecting and transferring between said storage unit and a peripheral device, under control of instructions executed by said central processor unit, information, command, control, address, and status signals in parallel between the I/O control logic unit and one or more of said peripheral device control units, and a further I/F line for transferring a poll signal from the I/O control logic unit and one or more of said peripheral device control units in series, certain of the I/F lines transferring to the peripheral device control unit for storage therein, signals indicating an interrupt priority level and poll identifier signals associated with said interrupt priority levels, and certain of the I/F lines including a plurality of interrupt request signal lines for signalling to the I/O control logic unit an interrupt request on a particular one of said interrupt request signal lines associated with the priority interrupt level, said peripheral device control unit comprising:

- indicating means for storing and indicating an interrupt request status received from an attached peripheral device;
- means responsive to said indicating means for energizing one of the interrupt request lines associated with the priority level stored;
- further indicating means for storing a data transfer request status received from an attached peripheral device;
- means responsive to said further indicating means for energizing a further I/F line on the interface bus for signalling a cycle/steal (CS) request to the I/O control logic unit;
- poll signal receiving means connected to said further I/F line and poll identifier signal receiving means connected to said I/F lines transmitting said poll identifier signals;
- means connected and responsive to the stored interrupt priority level and said poll identifier signal receiving means for providing an equal signal;
- decode means connected to said poll identifier signal receiving means for providing a CS poll signal; and
- means, connected and responsive to, either said equal signal or said CS poll signal, and said poll signal receiving means for providing a request granted indication to said attached peripheral device.

4,038,642
INPUT/OUTPUT INTERFACE LOGIC FOR CONCURRENT OPERATIONS

Max Abbott Bouknecht; Michael Ian Davis, both of Boca Raton, and Louis Peter Vergari, Palm Springs, all of Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,229
Int. Cl.² G06F *3/04, 13/00*
U.S. Cl. 364—900 **11 Claims**



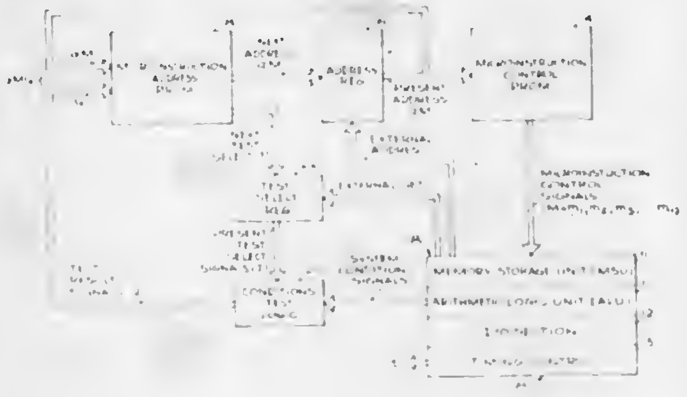
1. A peripheral device control unit for use in a data processing system including a central processor unit (CPU), storage unit, I/O control logic, and an interface (I/F) bus having a plurality of I/F lines for interconnecting the I/O control logic and one or more of said peripheral device control units in parallel, the I/F lines including I/F data lines and I/F address lines for transfer of data and addresses between one or more of said peripheral device control units and the storage unit through the I/O control logic and under control of instructions executed by the CPU, I/F lines from said peripheral device control units to the I/O control logic including a plurality of I/F interrupt request lines, and I/F lines from the I/O control logic to one or more of said periheral device control units including I/F poll identifier lines and a poll signal line connecting said peripheral device control units in series, the storage unit having at addressable locations therein, operate I/O instructions to be fetched and executed by the CPU, peripheral device command information to be transferred through the I/O control logic to said peripheral device control units, and addressable locations for data, each of said peripheral device control units including:

- a data register for storing data being transferred between the storage unit and an attached peripheral device;
- a command register for storing command information transferred from the storage unit to an attached peripheral device,
- device select means for enabling an attached peripheral device; and
- device control means for controlling an attached peripheral device including,
- first gate means interconnecting said data register and the I/F data lines,
- second gate means interconnecting said command register and a first plurality of the I/F address lines,
- means interconnecting said device select means and a second plurality of the I/F address lines, said device select means including device address identifying means and responsive to device address signals on the second plurality of I/F address lines to generate, when equal to said device address identifying means, a device select signal, and
- means connected and responsive to said device select signal, for rendering said first and said second gate means effective to transfer data between said data register and said I/F data lines, and to store said command information transferred on said first plurality of the I/F address lines in said command register.

4,038,643
MICROPROGRAMMING CONTROL SYSTEM

Dongsung Robert Kim, Fountain Valley, Calif., assignor to Burroughs Corporation, Detroit, Mich.

Filed Nov. 4, 1975, Ser. No. 628,745
Int. Cl.² G06F *9/16*
U.S. Cl. 364—200 **17 Claims**



1. In a data processing system, microprogramming control means comprising:

- a control memory for storing microinstructions at selectively addressable locations thereof;
- an address memory for storing microinstruction addresses at selectively addressable locations thereof;
- a first addressing means responsive to a microinstruction read out from said address memory for applying first address data to both said control memory and said address memory;
- said control memory being responsive to said first address data for reading out a selected microinstruction for performance by said system; and
- additional addressing means responsive to predetermined operations of said system for applying additional address data to said address memory;

said address memory being jointly responsive to said first address data and said additional address data for reading out a microinstruction address from a selected location to said first addressing means for use as a next microinstruction address;

said address memory having microinstruction addresses mapped in the storage locations thereof such that said first address data applied thereto designates a predetermined plurality of storage locations each storing a possible next microinstruction address, while said additional address data determines which one of said predetermined plurality of storage locations is to have its possible next microinstruction address read out therefrom for application to said first addressing means.

4,038,644

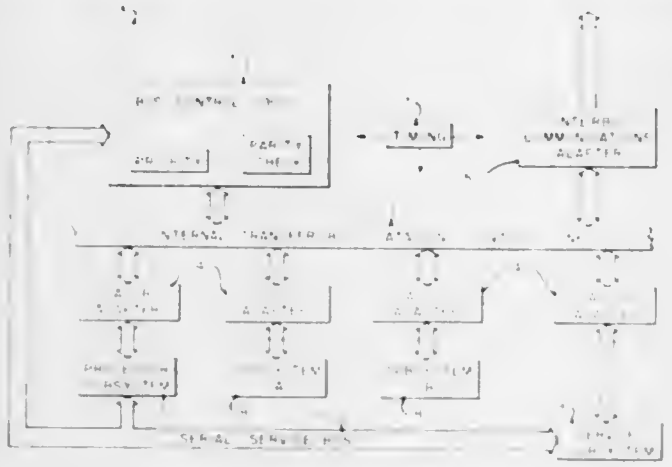
DESTINATION SELECTION APPARATUS FOR A BUS ORIENTED COMPUTER SYSTEM

Jack R. Duke, Escondido; Philip W. Brooks, Lakeside, and Robert R. Elzer, Escondido, all of Calif., assignors to NCR Corporation, Dayton, Ohio

Filed Nov. 19, 1975, Ser. No. 633,345

Int. Cl.^{2} G06F *3/04, 9/18*

U.S. Cl. 364—900 **8 Claims**



1. In a data processing system which includes a plurality of data processors adapted to communicate with one another, each such data processing including means for issuing a request signal, a destination signal, and data to be transferred to another data processor, apparatus for establishing a data transmission path between an originating data processor and a destination data processor comprising:

a. a common bus;

b. a plurality of local bus adapters corresponding in number to said plurality of data processors, each local bus adapter operatively connected between a respective one of the data processors and the said common bus, each of said local bus adapters including:

1. busy indicator means having first and second states, said first state providing an indication that a data processor coupled to the local bus adapter is busy;
2. means for individually setting its own said busy indicator means and any one of the other of said local bus adapters coupled to said common bus to said first state; and
3. means responsive to said first state of the indicator means included therewith for accepting data from said common bus.

4,038,645

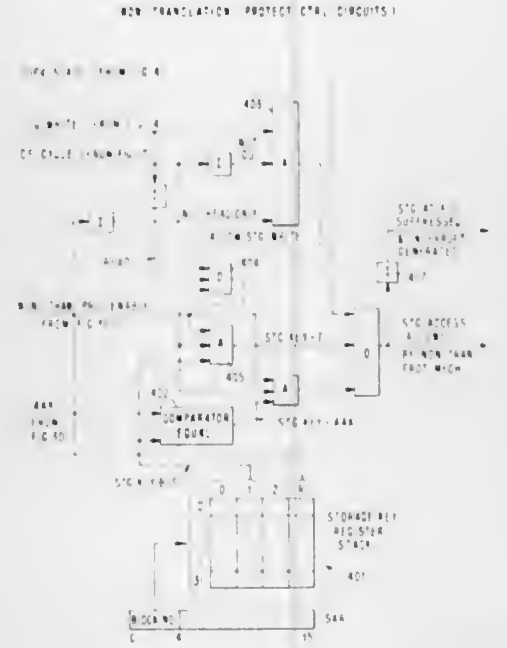
NON-TRANSLATABLE STORAGE PROTECTION CONTROL SYSTEM

Richard Eugene Birney, and Michael Ian Davis, both of Boca Raton, Fla., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 30, 1976, Ser. No. 682,224

Int. Cl.^{2} G06F *13/00*

U.S. Cl. 364—200 **6 Claims**



1. A protectable storage system for a main memory comprised of physical blocks, the blocks having respective address sub-ranges within the overall physical address range of the main memory, comprising

key register means having at least in instruction access key register section and an operand access key register section,

storage access request means in a processor for sensing and signalling each type of storage access request made by the processor, the detectable types of request signals including an instruction fetch signal and at least one type of operand access signal, each request signal being for accessing a specified physical address in the main memory, storage request selection means for granting an instruction fetch or operand access request signal to have access to storage,

active key selection means being actuated by a granted instruction fetch request signal or a granted operand access request signal to outgate the content of a corresponding key register section as an active accesss key, the active access key being associated with the specified physical address corresponding to the active access key,

a storage key stack comprised of a plurality of storage key registers respectively assigned to the blocks in the main memory, each register having a key field for containing a storage key assigned to the respective block,

means for outputting a storage key in a selected storage key register in the stack, the register being selected by means of a high-order field in a specified physical address which is the address providing the request signal actuating the active key selection means to outgate the active access key,

a comparator means comparing the outputted storage key from the selected storage key register with the active access key outputted by the active key selection means to provide a compare-equal signal when the compared keys are equal, and a non-compare signal when they are not equal,

whereby the access at the specified address within a key protected sub-range may be followed if a compare-equal signal is outputted by the comparator means.

4,038,646

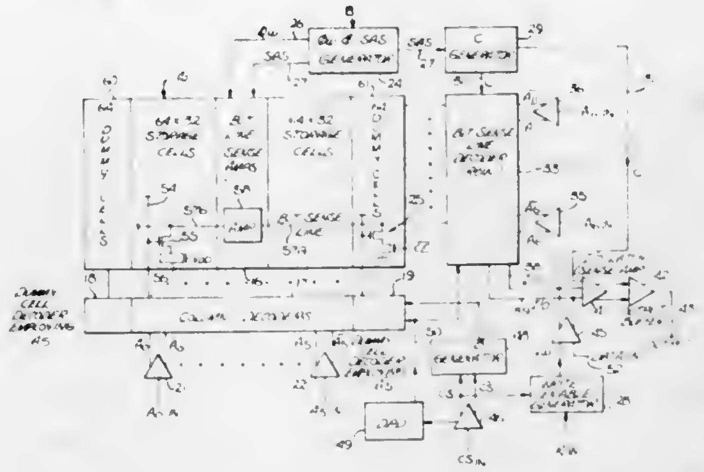
DYNAMIC MOS RAM

Rustam Mehta, Sunnyvale, and Stephen F. Dreyer, San Jose, both of Calif., assignors to Intel Corporation, Santa Clara, Calif.

Filed Mar. 12, 1976, Ser. No. 666,338

Int. Cl.^{2} G11C *11/04*

U.S. Cl. 340—173 R **24 Claims**



1. A dynamic, metal-oxide-semiconductor (MOS), random-access memory (RAM) comprising:

a plurality of storage cells disposed along a plurality of bit-sense lines;

a plurality of bit-sense amplifiers, each of said amplifiers being coupled to one of said bit-sense lines, each bit-sense amplifier including a bistable circuit having a pair of load devices;

a generator means coupled to said plurality of bit-sense amplifiers for activating said bit-sense amplifiers, said generator means generating an output signal having a first slope for a predetermined period, followed by a second slope at the end of said period, said second slope being greater than said first slope;

whereby said bit-sense amplifiers ae activated in a manner which provides high noise rejection.

4,038,647

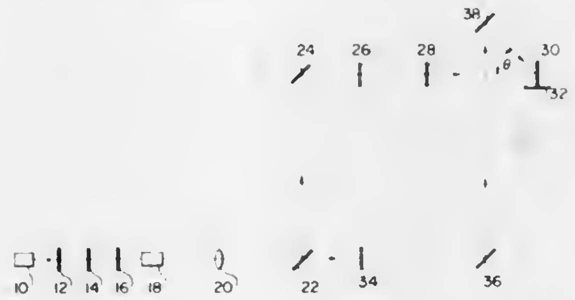
METHOD FOR HOLOGRAPHIC STORAGE

Irwin Schneider, Alexandria, Va., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Feb. 18, 1976, Ser. No. 659,058

Int. Cl.^{2} G11C *11/32, 13/04*

U.S. Cl. 340—173 CC **4 Claims**



1. A method for improving holographic storage which comprises:

recording an interferogram of a reference wave and an object wave on the ionic crystal with a random distribution of anisotropic centers:

beaming only said reference wave in the erase mode on the crystal; and

beaming only said object wave in the erase mode on the crystal.

4,038,648

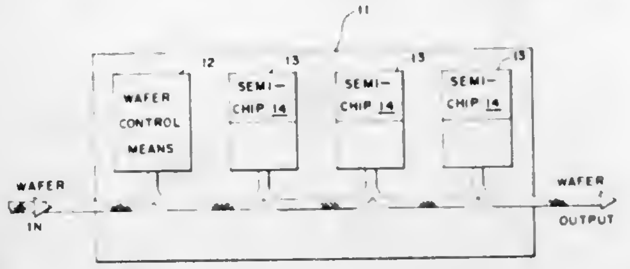
SELF-CONFIGURABLE CIRCUIT STRUCTURE FOR ACHIEVING WAFER SCALE INTEGRATION

Gilman D. Chesley, 22431 Starling Drive, Los Altos, Calif. 94022

Filed June 3, 1974, Ser. No. 475,748

Int. Cl.^{2} G11C *11/40*

U.S. Cl. 340—173 R **13 Claims**



1. In an integrated circuit structure: a semiconductor wafer, a plurality of unit circuits formed on the wafer, input and output lines on the wafer for carrying signals to and from the unit circuits during normal operation of the same, means for applying test signals to the unit circuits via the input lines, and means for sensing the response of each of the unit circuits to test signals and interconnecting the unit circuits with the input and output lines to form a device consisting solely of unit circuits which respond to the test signals in a predetermined manner.

4,038,649

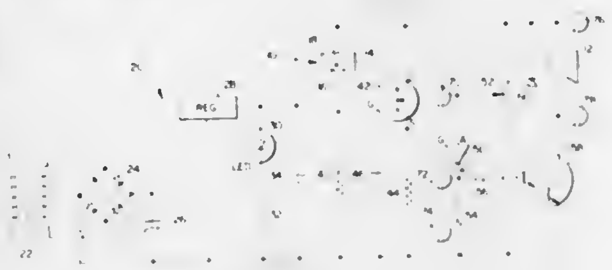
SMOKE DETECTION ALARM DEVICE

John Dobrzanski, New Britain, Conn., assignor to Emhart Industries, Inc., Farmington, Conn.

Filed Sept. 16, 1975, Ser. No. 613,856

Int. Cl.^{2} G08B *17/10*

U.S. Cl. 340—237 S **10 Claims**



1. A smoke detection alarm device having a stable transition into and out of an alarm condition comprising:

an ionization chamber having a radiation source and two electrodes separated by an open space through which ambient air, ions and smoke may pass, the chamber having an electrical resistance variable in relationship to the smoke within the open space;

a resistive member connected in series with one electrode of the ionization chamber to form with the ionization chamber a first voltage divider having an output at the junction of the resistive member and the one electrode;

a dc power supply connected across the voltage divider formed by the resistive member and the ionization chamber for energizing the chamber whereby smoke entering the chamber varies the chamber resistance and causes a corresponding variation in the output of the voltage divider;

annunciating means responsive to a smoke condition signal for providing an alarm signal; and

threshold circuit means connected between the output of the first voltage divider and the annunciating means for unambiguously detecting transition into and out of an unsafe smoke condition in the chamber and providing to the annunciating means signals corresponding to the smoke condition existing in the chamber, the threshold circuit means including a programmable unijunction transistor and a second voltage divider connected across the dc power supply, the gate of the programmable unijunction transistor being connected with the output of one of the voltage dividers and the anode being connected with the output of the other of the voltage dividers to permit the transistor to respond to variations in the resistance of the chamber and determine the threshold condition at which the transistor switches between the non-conductive and conductive states, the transistor and the anode-cathode circuit of the transistor providing an anode current greater than the characteristic valley current of the transistor when the transistor switches into the conductive state at the threshold condition.

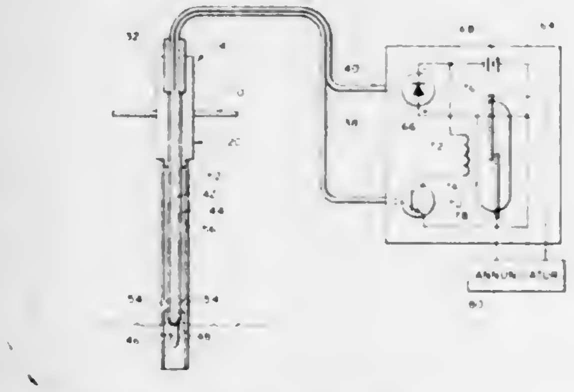
4,038,650
FLUID LEVEL DETECTOR AND PROBE ASSEMBLY

Martin Evans, 22216 Victory Blvd., Apt. C-309, Woodland Hills, Calif. 91364, and James H. Kirkendall, 9509 Casaba, Chatsworth, Calif. 91311

Filed Oct. 14, 1975, Ser. No. 621,865

Int. Cl.^{2} G08B *21/00;* G02B *5/16*

U.S. Cl. 340—244 R 15 Claims



1. A fluid level detector comprising:
a fiber optic assembly comprising an elongated fibrous member having an inner end and an outer end, said member to transmit light from said inner end to said outer end with a portion of the light being reflectable by reflection means from said outer end back to said inner end;
light transmitting means located adjacent said inner end capable of supplying light to said fibrous member;
light detection means located adjacent said inner end capable of detecting the reflected light beam from said inner end;
activation means connected to said light detection means, said activation means being capable of assuming an activating position and a deactivating position, upon said light detection means receiving said reflected light said activation means being located in said activating position;
annunciator means connected to said activation means, said annunciator means being actuated with said activation means in said activating position and
a probe to be located within a container and is positioned to be located adjacent the upper surface of a liquid which has previously been established as a known volumetric amount of the liquid, said probe connected to said outer end of said elongated fibrous member, said probe comprising a housing, said fiber optic assembly passing through an opening within said housing and extending exteriorly of said housing, a splash sleeve attached to said housing and located about said fiber optic assembly, said splash sleeve extending beyond the free end of said fiber optic assembly.

9. A fluid level detection probe comprising:
a housing;
a fibrous optic assembly including a fibrous optic member attached to said housing with the free end of said fibrous optic member extending exteriorly of said housing;
a splash guard surrounding the free end of said fibrous optic member, said splash guard being attached to said housing, said splash guard extending past the free end of said fibrous optic member, the interior wall of said splash guard being spaced from said fibrous optic member.

4,038,651
MINIATURE DIGITAL COMMUNICATOR CAPABLE OF DISPLAYING A SERIES OF ALPHA-NUMERIC CHARACTERS

Thomas F. McGraw, 7538 Axton St., Springfield, Va. 22151

Filed July 9, 1975, Ser. No. 594,425

Int. Cl.^{2} G06F *3/14*

U.S. Cl. 340—336 17 Claims

1. A miniature digital communicator capable or receiving digital information in the form of a binary format and displaying said information in the form of alpha-numeric characters rippling across a display comprising means for receiving said digital, binary information, said receiving means emitting a series of information pulses which describe an alpha-numeric character, means operably connected to said receiving means for accepting said information pulses and producing an enabling signal for said communicator, means operably connected to said enabling means for producing a series of timed pulses, means operably connected to said enabling means for producing a reset pulse, means operably connected to said receiving means, said enabling means and said timing means for accepting said information pulses and correlating said timed pulses with the arrival of said information pulses, said correlating means producing a sequential series of pulses, a memory means operatively connected to said correlating means for accumulating said sequential series of pulses, means operatively connected to said memory means for conventing said binary, digital information to alpha-numeric information upon said memory means receiving said reset pulse, means for displaying said alpha-numeric information operatively connected to said converting means and means operatively associated with said communicator for supplying power to said communicator.

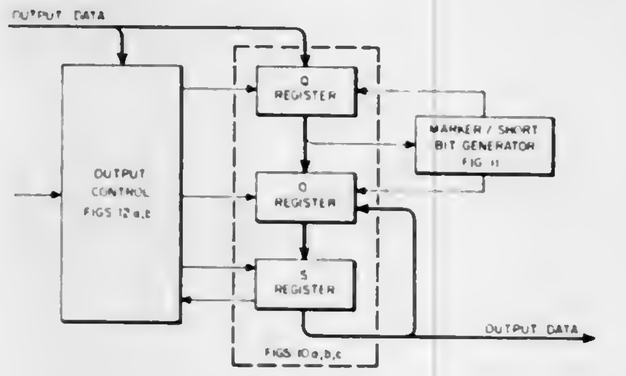
4,038,652
DIGITAL COMMUNICATIONS LINE TERMINAL COMPACTER/EXPANDER

Steven J. Schippers, Bellevue, Nebr., assignor to Sperry Rand Corporation, New York, N.Y.

Filed May 13, 1974, Ser. No. 469,265

Int. Cl.^{2} G06F *3/00*

U.S. Cl. 340—347 DD 12 Claims



2. A data compacter/expander communications system, comprising:
a communications system;
data compacter means adapted to receive a fixed number of the lower-ordered bits of fixed-level characters and to convert each of said fixed-level characters to corresponding multi-level characters that include said fixed number of the lower-ordered bits of said fixed-level character, and that are then coupled to said communications system, said data compacter means
a. sampling said fixed number of the lower-ordered bits of said fixed-level characters for the presence of an even or odd number of 1 bits, and
b. sampling the bits of said fixed-level character that are higher-ordered than said fixed number of the lower-ordered bits of said fixed-level characters for the presence of all 0 bits
for adding a Short bit 2^S preceding the lowest-ordered bit of said fixed-level characters and deleting only certain of the 0 bits of said bits of said fixed-level character that are higher-ordered than said fixed number of the lower-ordered bits of said fixed-level characters and thereby converting said fixed-level characters to said multi-level characters in response to said sampling procedure;
data expander means coupled to said communications system and adapted to receive said multi-level characters and to convert each of said multi-level characters back to its corresponding fixed-level character, each of which fixed-level characters is then transmitted from said data expander means, said data expander means
a. sampling certain of the lower-ordered bits of said multi-level characters for the presence of an even or an odd number of 1 bits and
b. sampling the Short bit 2^S of said multi-level characters
for forcing the bits above the highest-ordered bit of such multi-level characters to 0 bits to form the like-ordered bits of said fixed-level character and deleting said Short bit 2^S and thereby converting each of said multi-level characters back to its corresponding fixed-level character in response to said sampling procedure.

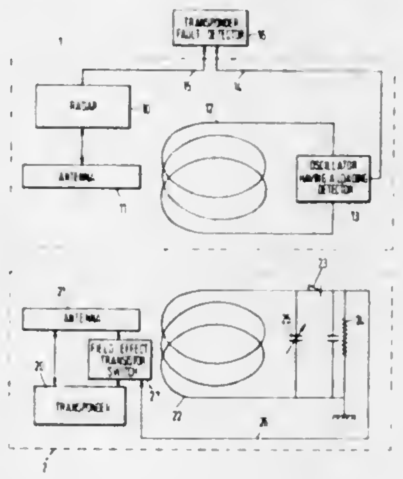
4,038,653
TRAIN POSITION INDICATOR

Arthur Edward Brewster, Thaxted, England, assignor to International Standard Electric Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,327

Int. Cl.^{2} B61L *25/00;* G01S *9/56*

U.S. Cl. 343—6.8 R 6 Claims



1. A train position indicating system comprising:
a radar disposed in said train;
a first inductive coupling means disposed adjacent said radar in said train;
a plurality of transponders disposed in spaced relation along a track upon which said train runs;
a plurality of second inductive coupling means each disposed adjacent a different one of said plurality of transponders;
first means coupled to said first inductive coupling means to energize said first inductive coupling means; and
a plurality of second means each coupled to a different one of said plurality of second inductive coupling means responsive to an inductively coupled signal from said first inductive coupling means to enable an associated one of said plurality of transponders to respond to a radar interrogation signal, the others of said plurality of transponders being inhibited from responding to said radar interrogation signal due to the absence of said inductively coupled signal.

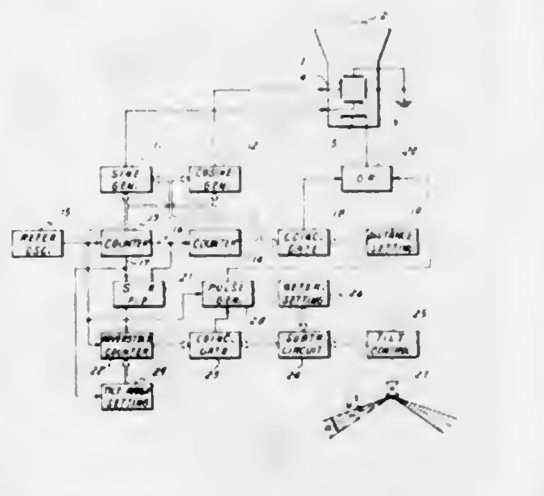
4,038,654
INDICATION DEVICE IN PLAN POSITION INDICATION SYSTEM

Masajiro Iida; Hideharu Morimatsu, both of Takarazuka; Itsuo Fukuoka, and Yoshinari Yoshida, both of Nishinomiya, all of Japan, assignors to Furuno Electric Company, Japan

Filed Sept. 12, 1975, Ser. No. 612,906

Int. Cl.^{2} G01S *7/22, 9/68*

U.S. Cl. 343—5 EM 3 Claims



1. An indication device in a plan position indication system including means for transmitting and receiving a spatial wave signal with directivity to and from a specific direction having a preselected tilt angle with respect to a horizontal plane; said device comprising a cathode ray tube including a circular display screen having a fixed reference diameter, scanning means for scanning said screen with a number of concentric circular scan lines, first indicating means for indicating a specific scan line as a bright circle to indicate the straight line distance to the object, second indicating means for indicating a specific radius of said display screen as a bright line, said radius having an angle corresponding to said tilt angle with respect to said reference diameter.

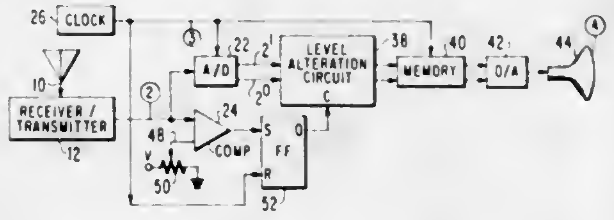
4,038,655
RADAR CONTOUR EDGE RESTORE CIRCUIT

Charles Albert Clark, Jr., Chatsworth, and Roy Atsushi Ito, Woodland Hills, both of Calif., assignors to RCA Corporation, New York, N.Y.

Filed June 14, 1976, Ser. No. 695,984

Int. Cl.^{2} G01S *9/60*

U.S. Cl. 343—5 W 4 Claims



1. In a weather radar of the type providing an iso-contour feature in which only the outline of certain forms are displayed in response to radar returns by sampling said radar returns at a given period to integrate said radar returns into *n* different light levels for display and where for some sampled radar returnes below some given value a unique one of said *n* light levels is displayed, the improvement comprising:
means responsive to said radar returns exceeding said given

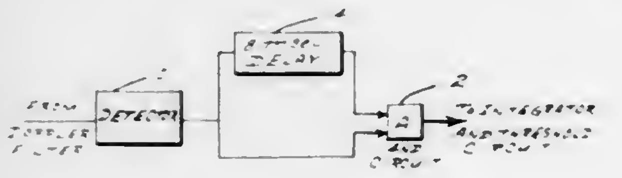
value for a time less than said period for producing a signal pulse; and

means responsive to said signal pulse altering the display to one of the *n* levels other than said unique level.

4,038,656
HELICOPTER DISCRIMINATION APPARATUS FOR THE MURINE RADAR

John G. Webb, Jr., Sandia Park, N. Mex., and Roger M. Gray, Dallas, Tex., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Mar. 27, 1974, Ser. No. 456,574
Int. Cl.² G01S *7/02*
U.S. Cl. 343—5 SA **7 Claims**



1. A helicopter discrimination apparatus for the Murine radar comprising in combination:

detecting means receiving a doppler signal, said detecting means detecting said doppler signal, said detecting means providing output doppler signal in response to said doppler signals:

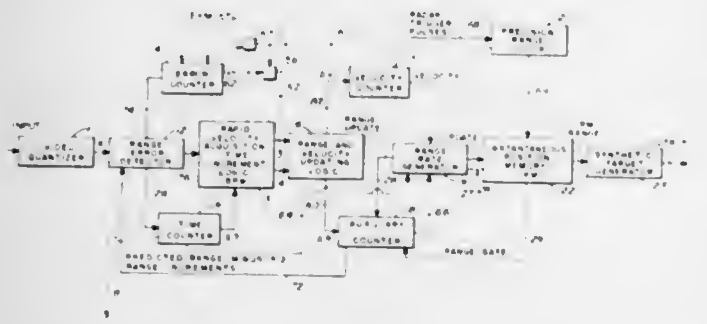
delay means connected to said detecting means to receive said output doppler signal, said delay means having a predetermined time delay, said delay means delaying said output doppler signal by said predetermined time to provide a delayed doppler signal, said predetermined time delay is 8 milliseconds, and,

logic control means connected to both said detecting means and said delay means to receive said output doppler signal and said delay doppler signal, said logic control means providing an output signal when said output doppler signal has a time period greater than said delayed doppler signal.

4,038,657
INTERMITTENT RANGE TRACKER

Leslie M. Orloff, Huntington, N.Y., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed June 9, 1969, Ser. No. 833,242
Int. Cl.² G01S *9/14*
U.S. Cl. 343—7.3 **7 Claims**



1. An intermittent data tracking system comprising:

input means for producing a standard width pulse from any length target input pulse;

error detecting means for measuring the distance between said target input pulse and a predicted target range;

an error counter means connected to a first output of said error detecting means;

a time counter means connected to a second output of said error detecting means;

a first binary rate multiplier for performing range acquisition and time increment logic having three inputs, said first input connected to said error counter, said second input connected to said time counter and said third input connected to a third output of said error detecting means;

range and velocity updating logic means connected to said first binary rate multiplier having a first output connected to a velocity counter and a second output connected to an auxiliary counter;

a second binary rate multiplier connected between the outputs of said velocity and auxiliary counters, a first output of said second binary rate multiplier being connected to the input of said auxiliary counter;

a digital storage and readout means connected to a second output of said second binary rate multiplier;

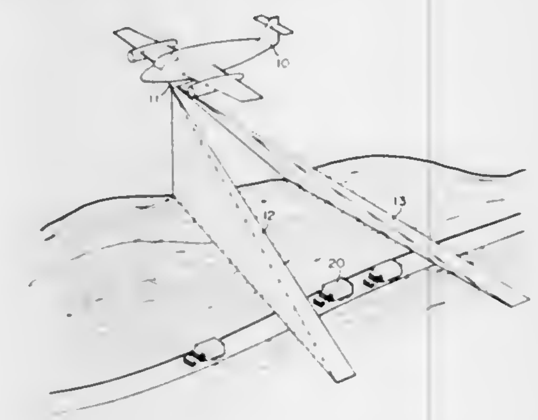
means for supplying synchronizing signals to said digital storage means; and

a target generating means connected to said storage and read-out means to produce a synthetic radar pulse representative of the target input signal.

4,038,658
MOVING TARGET SPEED AND DIRECTION DETERMINING RADAR SYSTEM

John L. Nelson, and Douglas G. Trego, both of Phoenix, Ariz., assignors to Motorola, Inc., Franklin Park, Ill.

Filed Dec. 13, 1972, Ser. No. 314,881
Int. Cl.² G01S *9/42*
U.S. Cl. 343—7.7 **6 Claims**



1. An aircraft mounted moving target speed and direction determining radar system comprising:

a. a moving target radar transmitter-receiver means;

b. antenna means connected to said transmitter-receiver means for providing two radar beams at an angle to each other;

c. mounting means for affixing said antenna means to such aircraft with the two radar beams directed outwardly to the side of the vehicle relative to the normal direction of movement of the vehicle;

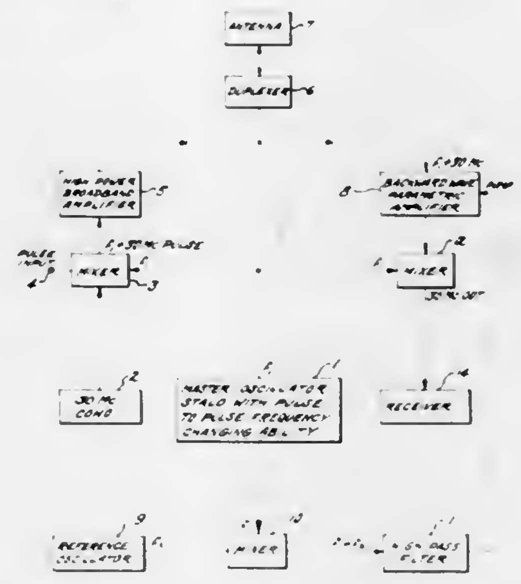
d. one of said radar beams being directed angularly ahead of a line perpendicular to said normal direction and the second of said two radar beams being directed angularly behind said perpendicular line; and

e. means for providing individually identifiable visual indications of a target relative to its surrounding interrupting each of said beams to indicate the distance and direction the target has moved between interruptions of the two beams, said visual indications means being connected to said transmitter-receiver means for receiving signals therefrom.

4,038,659
FREQUENCY AGILITY RADAR

Edward G. Hamer, Baltimore, and Calvert F. Phillips, Jr., Annapolis, both of Md., assignors to The United States of America as represented by the Secretary of the Air Force, Washington, D.C.

Filed Sept. 9, 1966, Ser. No. 578,935
Int. Cl.² G01S *7/28*
U.S. Cl. 343—17.1 R **2 Claims**


ANTENNA
DUPLEXER
HIGH POWER BROADBAND AMPLIFIER
BACKWARD WAVE PARAMETRIC AMPLIFIER
MIXER
MIXER
MASTER OSCILLATOR STALO WITH PULSE TO PULSE FREQUENCY CHANGING ABILITY
RECEIVER
MIXER

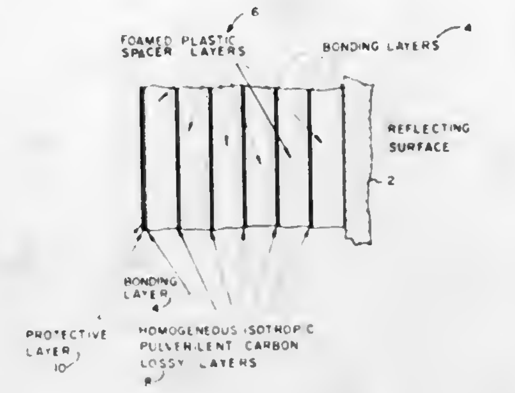
1. A frequency agility radar system comprising a first oscillator having a predetermined frequency range, said first oscillator generating a first output signal with the frequency thereof selected in a random manner, a second oscillator generating a second signal having a preselected frequency, first pulsed mixer means receiving said first and second signals and providing an upper sideband pulsed output signal, means to transmit said upper sideband pulsed output signal toward preselected targets to provide return echo signals therefrom, a backward wave parametric amplifier, means to feed said backward wave parametric amplifier said return echo signals, means for tuning said backward wave parametric amplifier automatically to follow the transmitted signal frequency, said automatic tuning means including a third oscillator generating a third signal of preselected frequency, second mixer means receiving said first signal and said second signals, means to filter the output signal from said second mixer means to provide only the upper sideband signal pump frequency to said backward wave parametric amplifier for tuning thereof, third means to mix the output signal from said backward wave parametric amplifier and said first signal to provide an output signal, and receiver means being fed the output signal from said third mixer means.

4,038,660
MICROWAVE ABSORBERS

Thomas M. Connolly, Canton, and Eino J. Luoma, Norwood, both of Mass., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Aug. 5, 1975, Ser. No. 602,168
Int. Cl.² H01Q *17/00*
U.S. Cl. 343—18 A **2 Claims**

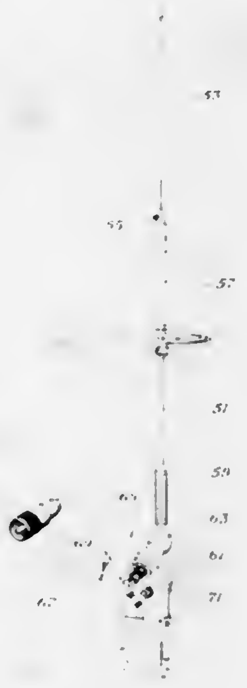
1. In a microwave absorber of the type including a plurality of partially conductive lossy layers, whose conductivity increases from front layer to back layer, separated by intermediate dielectric spacing layers all bonded together to form a Jaumann microwave absorber, the combination of spacing layers having a thickness not greater than one-fourth of the wavelength at the higher frequency, such that the total thickness of the absorber is at least one-half of the wavelength at the lowest frequency of the range to be absorbed, with lossy layers having a homogeneity and isotropy such that average admittance values determined at a plurality of points in one degree of orientation do not differ from average values determined in another degree of orientation by more than ±0.02.


6
FOAMED PLASTIC SPACER LAYERS
BONDING LAYERS
4
REFLECTING SURFACE
2
BONDING LAYER
4
PROTECTIVE LAYER
10
HOMOGENEOUS ISOTROPIC PULVERULENT CARBON LOSSY LAYERS
8

4,038,661
TUNING LOOP FOR ATTACHMENT TO A CITIZENS BAND RADIO ANTENNA

Charles P. Nolte, Rte. 1, Box 129, Aledo, Tex. 76008

Filed Jan. 2, 1976, Ser. No. 646,385
Int. Cl.² H01Q *1/32*
U.S. Cl. 343—715 **11 Claims**



1. A device adapted to be attached to an omni-directional mobile antenna for a radio having an elongated conductive element, comprising:

adjustable metallic clamp means adapted to be coupled to the elongated conductive element, and

a bendable metallic member having a generally planer loop-shaped portion generally surrounding said clamp means with at least one end portion extending inward from the loop and fixedly connected to said clamp means,

said portion of said metallic member which forms said loop-shaped portion being coiled such that it defines an angle greater than 360°,

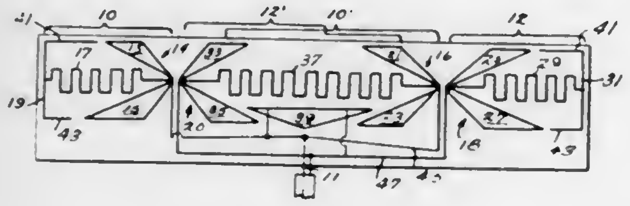
said one end portion being connected to said clamp means such that when said clamp means is coupled to the elongated conductive element of the antenna, said loop-shaped portion surrounds the elongated conductive element of the antenna and is located in a plane generally perpendicular to the elongated axis of the eleongated conductive element of the antenna.

said inward extending end portion between said loop-shaped

portion and said clamp means being generally in the same plane as that of said loop-shaped portion,
the dimension of said device in a plane perpendicular to the pane of said loop-shaped portion being less than the diameter of said loop-shaped portion,
said clamp means comprising:
  a metallic loop member having two ends adapted to be opened to be fitted around the elongated conductive element of the antenna from a position transverse to the axis thereof and to be closed and tightened around the elongated conductive element of the antenna, and
  means for tightening said metallic loop member of said clamp means around the elongated conductive element of the antenna.

4,038,662
DIELECTRIC SHEET MOUNTED DIPOLE ANTENNA WITH REACTIVE LOADING

Edwin M. Turner, Dayton, Ohio, assignor to Ball Brothers Research Corporation, Boulder, Colo.
Filed Oct. 7, 1975, Ser. No. 620,501
Int. Cl.² H01Q ***9/16***
U.S. Cl. 343—752 **12 Claims**

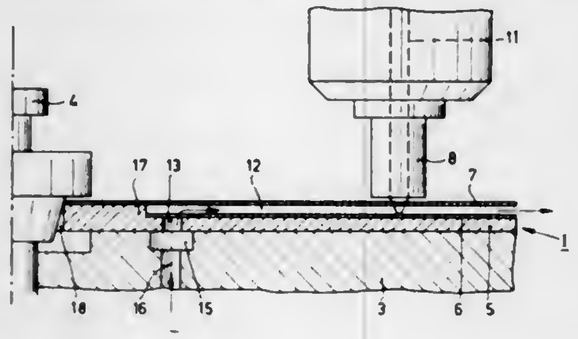


1. A broadband television antenna comprising a substrate formed of a thin, elongated strip of dielectric material, said substrate having a width which is many orders of magnitude smaller than the length thereof, and a thin, elongated electrically small conducting means mounted on said substrate, said conducting means being in the form of an interlaced dipole array, each dipole having a first tapered conductive radiator for receiving electromagnetic signals over a broad frequency band, an inductive loading undulating conductor connected at one end thereof to each of said first tapered conductors, a capacitive loading conductor connected to the other end of each of said undulating conductors, said inductive and capacitive loading conductors increasing the effective electrical length of said dipole array for receiving relatively low frequency electromagnetic signals, each dipole having a second tapered conductive radiator for receiving electromagnetic signals over a broad frequency band, a second inductive loading undulating conductor connected at one end of one of said second tapered conductors and at the other end to the other of said second tapered conductors of another dipole of said dipole array, said second undulating conductor increasing the effective electrical length of each of said first and second tapered dipoles, and means for connecting said dipoles to an output terminal.

4,038,663
METHOD OF WRITING INFORMATION WITH A MODULATED RADIATION BEAM ONTO AN INFORMATION STORAGE MEDIUM AND INFORMATION STORAGE MEDIUM PARTICULARLY ADAPTED TO THE METHOD

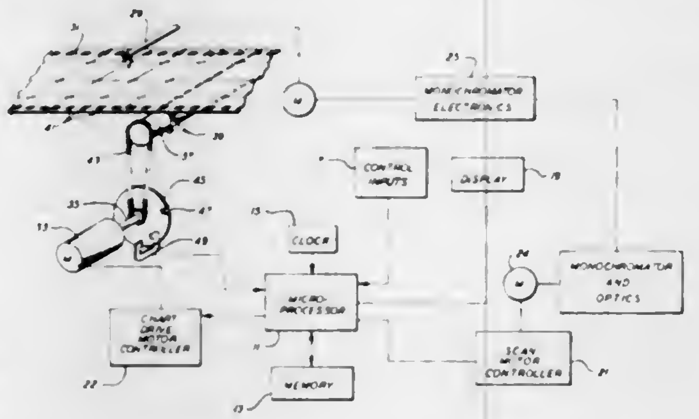
Paul Edwin Day, Eindhoven, Netherlands, and George Churchill Kenney, Stamford, Conn., assignors to U.S. Philips Corporation and North American Philips Corporation, both of New York, N.Y.
Filed Sept. 23, 1975, Ser. No. 615,881
Int. Cl.² G01D ***15/32***
U.S. Cl. 346—1 **6 Claims**

1. A method for writing information with an information modulated radiation write beam onto a radiation sensitive information layer provided on at least one face of an information storage medium, the information being stored in the information layer by local changes in the physical properties of the information layer, the method comprising the steps of:
  a. providing a write-beam-transparent flexible foil attached to at least part of said information storage medium and in clinging relationship to said information layer prior to recording,
  b. immediately prior to writing said information providing a gas layer between said foil and said information layer, thereby separating said transparent foil from said information layer,
  c. modulating the read beam with the information to be stored in the storage medium,
  d. focussing the modulated write beam through the protective foil and through said gas layer onto said information layer,
  e. moving the write beam in relation to the storage medium and the protective foil in order to write information tracks in said information layer,
  f. maintaining said gas layer between said transparent foil and said information layer throughout said writing process, and
  g. exhausting said gas from between said foil and said information layer subsequent to said writing process to reestablish said clinging relationship between said foil and said information layer, thereby protecting said information layer from dust contamination both prior and subsequent to writing, while providing a gas-filled space abutting said information layer during the writing process to permit byproducts of the writing process to pass freely from said information layer.



4,038,664
RECORDING CHART LOCK

Andrew Redvers Muir, High Wycombe, England, assignor to The Perkin-Elmer Corporation, Norwalk, Conn.
Filed July 1, 1976, Ser. No. 701,719
Int. Cl.² G01D ***9/00, 15/24;*** **B65H** ***17/26***
U.S. Cl. 346—1 **12 Claims**

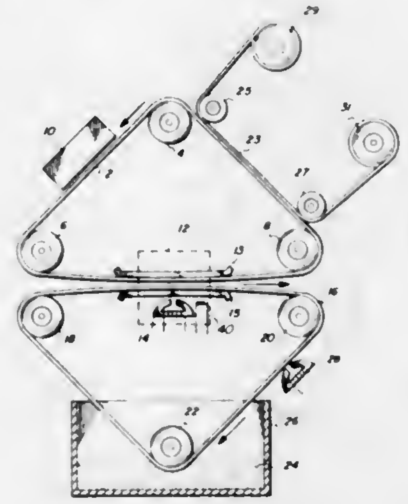


1. In an analytical instrument in which a sample under test is analyzed over a continuous range of at least one input variable, with the response of said sample plotted as the ordinate value and the change of variable as the abscissa value on an associated chart recorded having a sprocket drive, said instrument having associated therewith a microcomputer including a microprocessor, a read only memory, a random access memory, and input/output facilities, the microcomputer at all times having stored therein the instantaneous value of the independent variable, the chart paper having graduated grid lines thereon corresponding to various independent variable values, a method of synchronizing said instrument and said chart recorded to obtain correspondence between said independent variable and said chart lines comprising:

  a. maintaining in the random access memory of the microcomputer a record of the instantaneous position of the chart drive, representing the current position of the drive sprockets;
  b. positioning the chart paper on which recording is to be carried out on at a position approximating the grid position corresponding to the independent variable value;
  c. calculating from the independent variable value a desired chart position;
  d. differencing the desired chart position and actual chart position; and
  e. moving said chart until said difference is zero.

4,038,665
RECORDING WITH DONOR TRANSFER OF MAGNETIC TONER

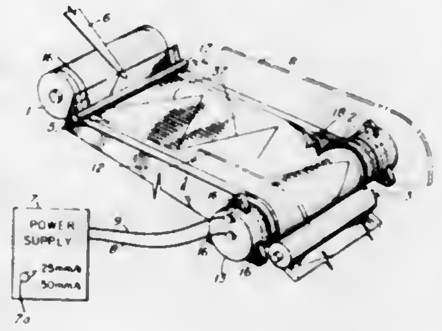
Armand P. Neukermans, Palo Alto, Calif., assignor to Xerox Corporation, Stamford, Conn.
Filed Sept. 26, 1975, Ser. No. 616,969
Int. Cl.² G03G ***19/00***
U.S. Cl. 346—74.1 **26 Claims**



1. A method for developing a latent magnetic image on a magnetizable copy surface comprising the steps of:
  forming a magnetic latent image on said magnetizable copy surface by alterating patterns of magnetizable of a first spatial wavelength;
  providing a magnetizable donor surface;
  uniformly magnetizing said donor surface in alternating patterns of magnetization of a second spatial wavelength, whereby said first magnetization pattern produces a magnetic field stronger than said second magnetization pattern;
  attracting magnetic toner to the alterating magnetization pattern of said donor surface;
  transporting said donor surface substantially uniformly laden with said magnetic tonor into non-cnducting proximity with said copy surface, whereby said toner is transferred from said donor surface to said image area of the copy surface under the influence of the stronger magnetic field of the image area.

4,038,666
PORTABLE MEDICAL DATA RECORDER

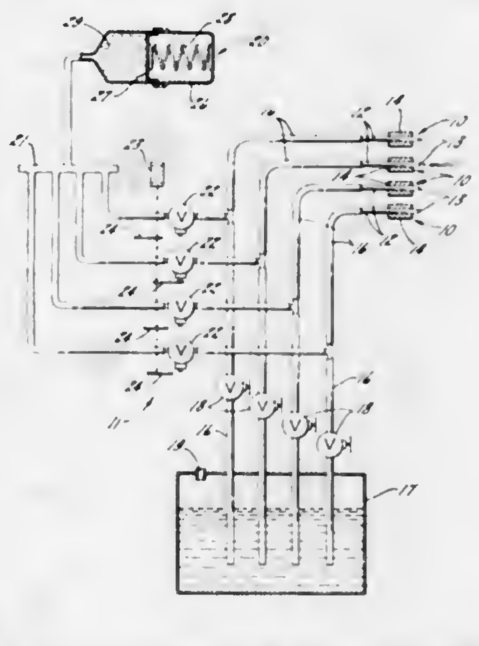
Henry Edward Fuller, Jr., Stow, Mass., assignor to American Optical Corporation, Southbridge, Mass.
Filed Nov. 28, 1975, Ser. No. 636,005
Int. Cl.² G01D ***15/24, 9/00;*** **H02K** ***7/00***
U.S. Cl. 346—136 **5 Claims**



1. A portable medical data strip chart recorder comprising:
a supply roller on which the strip chart is stored;
a platen across which the strip is drawn at a predetermined linear velocity and tension; and
drive roller means for drawing the strip across the platen including integral motive means for rotating the roller means at a selected angular velocity, the drive roller means including a hollow shaft about which is affixed a concentric cylinder pad member of selected durometer, DC motor means mounted internally and concentrically of the shaft and affixed thereto having a DC motor axially aligned with a gearbox of selected ratio for providing the selected angular velocity and wherein the DC motor stator is affixed to the drive shaft and the rotor held stationary thereby causing the shaft and stator to rotate about the rotor at the selected angular velocity, the recorder includes a frame member to which the rotor is affixed and bearing members mounted to the frame in which marginal ends of the shaft are mounted, and a DC power source energizes the DC motor through brush means contacting means on one of the bearing members.

4,038,667
INK JET INK SUPPLY SYSTEM

Shou L. Hou, and Robert D. Carnahan, both of Barrington, Ill., assignors to Gould Inc., Rolling Meadows, Ill.
Filed Apr. 28, 1976, Ser. No. 681,338
Int. Cl.² G01D ***15/18***
U.S. Cl. 346—140 R **2 Claims**



1. In an ink jet writing device including a droplet forming

nozzle, a transducer for ejecting ink droplets from said nozzle and a capillary conduit for conveying ink from a reservoir to said nozzle, the combination comprising, an on-off valve interposed in said conduit for selectively blocking said nozzle from said reservoir thereby allowing the nozzle to be vacuum primed and, once primed, to trap ink in the nozzle during shipping and storage, a second source of ink under pressure connected through a normally closed valve to said conduit between said on-off valve and said nozzle, and means for intermittently opening said normally closed valve so as, when said on-off valve is closed, to pressure charge said nozzle with ink and drive a squirt of ink from said nozzle so as to clear any dirt or bubbles from the nozzle and reprime the jet.

4,038,668

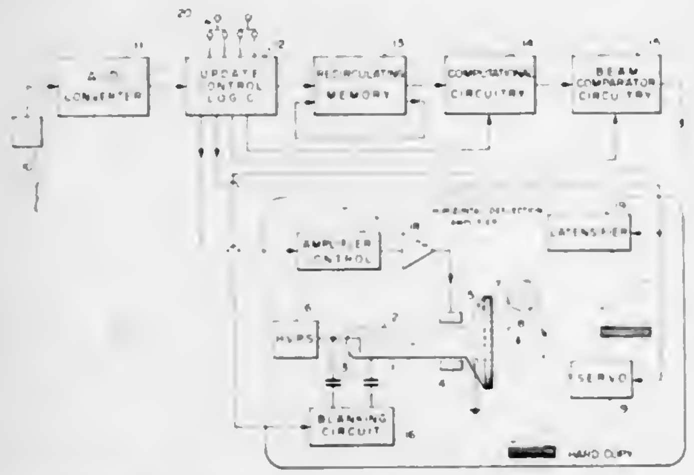
APPARATUS FOR PRODUCING SMOOTH AND CONTINUOUS GRAPHIC DISPLAYS FROM INTERMITTENTLY SAMPLED DATA

William T. Quarton, Englewood, Colo., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Oct. 31, 1975, Ser. No. 627,794

Int. Cl.^{2} G06G *7/30*

U.S. Cl. 235—151 **2 Claims**



1. Apparatus for producing a display of the condition of a signal comprising,

a display means having a display medium,

first means connected to the source of the signal for producing a succession of digital value representations,

each of which represents a successive condition of the signal, and

second means connected to said first means to derive from consecutively derived ones of said digital values other digital values intermediate of said consecutively derived ones said second means including a recirculating memory in which said succession of digital value representations are stored and which is arranged to output digital value representations of adjacent stored values of the condition of the signal, a computational circuit that is connected to the output of said memory and is responsive to the digital value representations produced at said output to produce digital representations of values of the condition of the signal intermediate said adjacent stored values, said computational circuit including first and second latch means connected to the output of said recirculating memory, the digital representations of the first occurring of said adjacent values being stored in the first one of said latch means, and the digital representation of the second occurring of said adjacent values being stored in a second one of said latch means, first and second adders, each of said adders having first and second sets of input terminals and a set of summation output terminals, the output of said second latch means being applied to said first set of input terminals of said first adder, inverting means, the output of said first latch means being connected through said inverting means to said second set of input terminals of said first adder, the summation output terminals of said first adder being connected to said first set of input terminals of said second adder, a data selector having first and second sets of input terminals and a set of output terminals, connections from the output of said first latch means to said first set of input terminals of said data selector, a connection from the summation output terminals of said second adder to said second set of input terminals of said data selector, an accumulator having input terminals and output terminals, a connection from the output terminals of said data selector to the input terminals of said accumulator, and a connection from the output of said accumulator to said second set of input terminals of said second adder and

third means includes a digital comparator connected to the output of said data selector of said computational circuit, said digital comparator being operative to respond to the digital representations produced by said computational circuit to provide a succession of control signals, and display means controlled by said control signals to produce substantially parallel lines on said display medium,

each of said lines being individually representative of a related one of said consecutively derived ones and said other values, all of said lines being substantially continuous and extending in their aggregate length between two points, the positions of which represent, respectively, a corresponding two, consecutively derived ones, of said values.

4,038,669

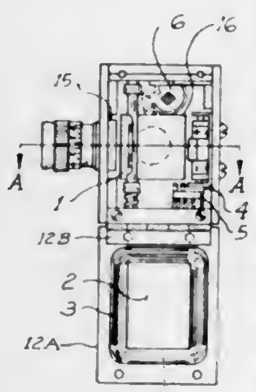
CRYOGENIC CAMERAS

John Michael Guerra, 186 Waltham St., W. Newton, Mass. 02165

Filed Mar. 27, 1975, Ser. No. 562,948

Int. Cl.^{2} G03B *29/00*

U.S. Cl. 354—76 **1 Claim**



1. A self-contained cryogenic camera comprising a hollow Plexiglas rectangular parallelopiped body having a central aperture on a frontplate of said body, a tube and collar assembly attached to said frontplate over said aperture, an entrance slot in the side of said body into which a filmholder is inserted, a hinged Plexiglas back to which is attached an aluminum insulated refrigeration chamber with fittings for the refrigerant entrance and proper ventilation, said back assembly being attached by hinge to the back of said camera body, a sealed film chamber formed by said filmholder and a portion of said body when said hinged back is closed and secured thereby keeping out moisture, a silica gel absorption packet and holder within the said film chamber for absorbing moisture within the sealed film chamber and thereby preventing frosting of the film surface and optical window, a reflex-type off-axis optical guide system contained within said film chamber for directing the image being photographed, an illuminated optical Plexiglas reticle comprising a piece of optical Plexiglas having etched cross-hairs on the surface of the optical Plexiglas and having an LED imbedded in the optical Plexiglas, said Plexiglas rectangular parallel body having an eyepiece aperture on top of the body, said optical Plexiglas reticule being cemented to the inside top of the said body so as to cover the eyepiece aperture, an eyepiece cemented into the said eyepiece aperature so as to

protrude from the top of the said body, a penlight-cell power supply and potentiometer switch contained within the said film chambr for powering the said LED, said refrigeration chamber being able to accept any refrigerant material, the refrigeration of the film occurring through thermal conduction by pressure of the aluminum refrigeration chamber against the back of the filmholder, said reflex-type optical guide system including a spring-action rod, collar and bearing assemble the said rod being supported by a plexiglas bearing that is cemented to the inside of the hinge wall of the said body, said bearing having a round head tack inserted into the face of said bearing, a shaft collar with notches drilled into the face of said shaft collar at an angle of 45° apart to accept said round head tack, said rod protruding through the wall opposite to the said hinge wall of the said body, a helical spring on said rod compressed between the said opposite wall and another shaft collar on said rod, said compressed spring causing the rod and notched shaft collar assembly to lock on the said round head tack in two positions 45° apart, a first surface mirror cemented midway along the said rod, said mirror so positioned to lock at a 45° and 0° angle from the top of the said body, said mirror intercepts a portion of the light entering the aperature on the frontplate when said mirror is in the 45° position.

4,038,670

PANORAMIC PICKUP CAMERA

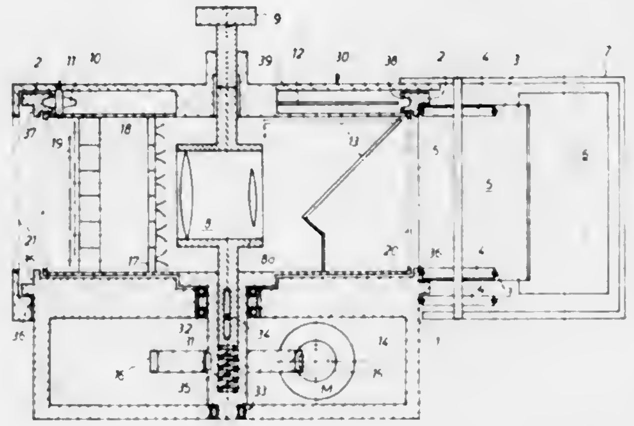
Hermann Seitz, Niederwangen, Switzerland, assignor to Infra-Vision Ltd. Zug, Schaffhausen, Switzerland

Filed Mar. 3, 1975, Ser. No. 554,448

Claims priority, application Germany, Mar. 11, 1974, 2411537

Int. Cl.^{2} G03B *37/00, 37/02*

U.S. Cl. 354—96 **8 Claims**



1. In a panoramic pickup camera for producing pictures with randomly large viewing angles which may exceed 360°, wherein at the moment of light exposure the film is stationary, having a support, a camera structure containing the objective and rotatable relative to the support, and a film container and a film guide having a substantially cylindrical arched portion, the radius of which is equal to the focal length of the objective, the improvement comprising: the camera structure containing spaced from the objective the film container, said camera structure incorporating a housing enclosing the objective, the film guide including a ring positioned on the side of the housing which is situated opposite the support, said ring being freely rotatable respective to the camera structure, said support possessing a substantially cylindrical configuration, a first substantially cylindrical circumferential surface provided on said cylindrical support, said ring possessing a second substantially cylindrical circumferential surface, the film being held under contact at its one edge against the first cylindrical circumferential surface of the support and at its other edge against the second cylindrical circumferential surface of the ring.

4,038,671

PHOTOGRAPHIC APPARATUS WITH TWO PICTURE TAKING LENSES

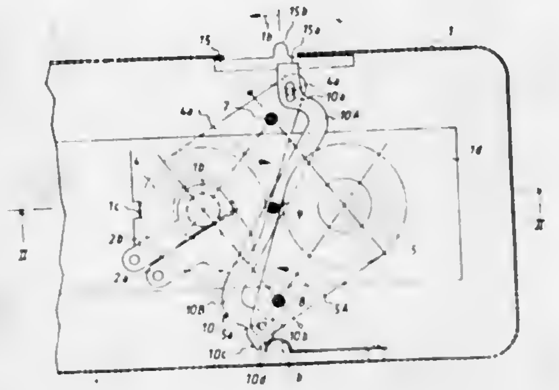
Rolf Schroder, Baldham, and Reinhard Nicko, Munich, both of Germany, assignors to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany

Filed Aug. 20, 1976, Ser. No. 716,297

Claims priority, application Germany, Aug. 29, 1975, 2538426

Int. Cl.^{2} G03B *3/00, 13/02*

U.S. Cl. 354—197 **10 Claims**



1. In a photographic apparatus, a combination comprising a housing; means defining a light-admitting aperture in said housing; first and second picture taking lenses; first and second pivots mounted in said housing in parallelism with the optical axes of said lenses, said first and second lenses respectively having first and second mounts movable about the axes of said first and second pivots between first and second positions in which said first and second lenses respectively register with said aperture; and means for moving said mounts, including a displacing member, pivot means for said displacing member, said pivot means being mounted in said housing intermediate said first and second pivots, and first and second motion transmitting means respectively coupling said displacing member with said first and second lens mounts.

4,038,672

INTERLOCKING DEVICE FOR A CAMERA

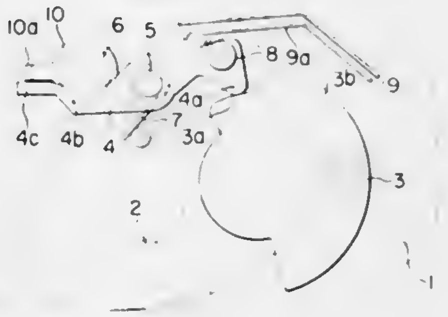
Hidenobu Kondo, Yokohama, and Yoshiyuki Nakano, Tokyo, both of Japan, assignors to Nippon Kogaku K.K., Tokyo, Japan

Filed Aug. 12, 1975, Ser. No. 604,032

Claims priority, application Japan, Aug. 23, 1974, 49-100233[U]

Int. Cl.^{2} G03B *17/38*

U.S. Cl. 354—212 **4 Claims**



1. In a device for a camera wherein the operation of a shutter release mechanism is blocked and a power switch is opened when a film advance lever is in a position housed in a camera body, and the blocking of said shutter release mechanism is released and the power switch is closed when said film advance lever is in a preparatory position extending out of the camera body a predetermined distance without having advanced the film; the improvement which comprises:

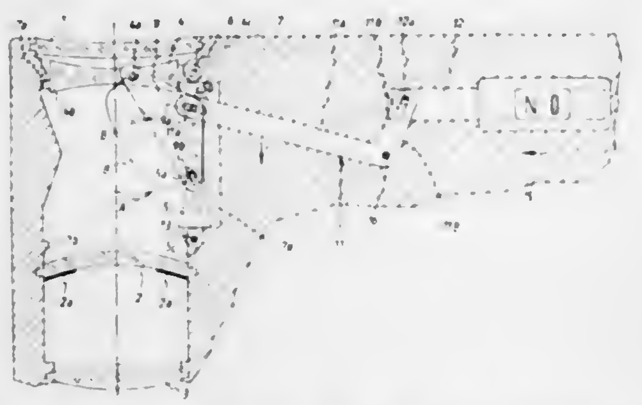
a. a working member engageable with both said shutter release mechanism and the power switch, and movable between a first position in which the working member blocks the operation of said shutter release mechanism and opens the power switch and a second position in which the working member releases said blocking and closes the power switch;

b. means for actuating said working member in coordination with said film advance lever to the first position when the film advance lever is in the housed position and to the second position when the film advance lever is in the preparatory position; and

c. an operating member operable from the exterior of said camera to interrupt the cooperation between said actuating means and said working member when said film advance lever in in the housed position and to move said working member to the second position, whereby the cooperation between said film advance lever, the shutter release mechanism and the power switch can be interrupted when said film advance lever is in the housed position.

4,038,673
VIEW FINDER FOR PHOTOGRAPHIC APPARATUS UTILIZING OBJECTIVES HAVING DIFFERENT FOCAL LENGTHS

Rolf Schroder, Baldham, Germany, assignor to AGFA-Gevaert Aktiengesellschaft, Leverkusen, Germany
Filed Aug. 20, 1976, Ser. No. 716,182
Claims priority, application Germany, Aug. 30, 1975, 7527515[U]
Int. Cl.^{2} G03B *13/02, 13/10*
U.S. Cl. 354—222 **10 Claims**



1. In a photographic apparatus for use with objectives of different focal length, a view finder comprising a field lens for admission of scene light; first and second intermediate lenses disposed behind said field lens; fixed first and second pivots for said first and second intermediate lenses; a link; first and second articulate connections between said link and said first and second intermediate lenses, one of said connections constituting a pin-and-slot connection; and means for pivoting said intermediate lenses through the medium of said link about the axes of said first and second pivots between first and second positions in which said first and second lenses respectively extend across the path of scene light behind said field lens.

4,038,674
SHOCK INHIBITING ARRANGEMENT FOR LATCHED SHUTTER BLADE MECHANISM

George D. Whiteside, Lexington, and Bruce K. Johnson, Andover, both of Mass., assignors to Polaroid Corporation, Cambridge, Mass.
Filed June 25, 1976, Ser. No. 699,677
Int. Cl.^{2} G03B *9/08*
U.S. Cl. 354—230 **11 Claims**

1. A photographic camera having means for mounting photographic film material at a given focal plane, said camera comprising:

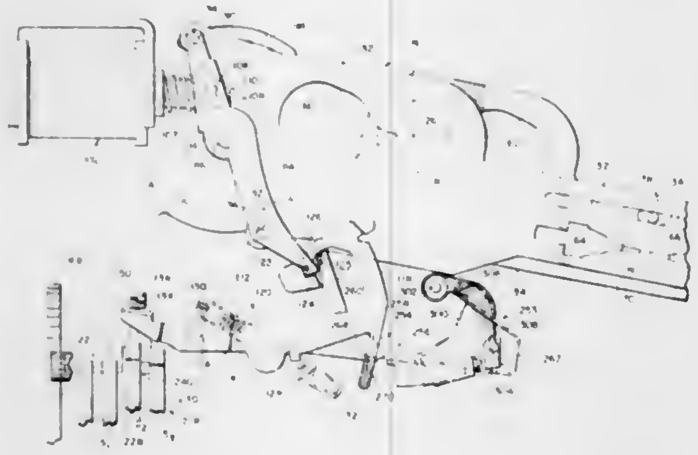
a blade mechanism;

means for mounting said blade mechanism for displacement between at least one blocking arrangement precluding transmission of scene light to the focal plant and an unblocking arrangement defining at least one aperture value structured for transmission of scene light to the focal plane;

drive means actuable for displacing said blade mechanism between its said arrangements;

latch means for initially retaining said blade mechanism in one of its said arrangements;

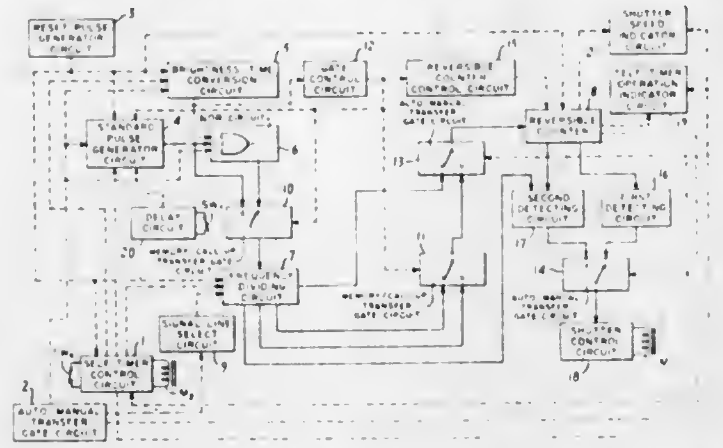
means at least in part electrically energizable for actuating said drive means to effect the displacement of said blade mechanism from its said arrangement wherein it is retainable by said latch means to another of its said arrangements and then back to its said arrangement wherein it is retainable by said latch means to define an exposure cycle of said blade mechanism, said latch means being structured for displacement responsive to said actuation of said drive means to effect its normal release of said blade mechanism facilitating the movement of said blade mechanism under the influence of said drive means to define said exposure cycle and said blade mechanism also being structured to be responsive to a sudden shocking thereof for movement from its said arrangement wherein it is retainable by said latch means into a position wherein it becomes released from said latch means; and



means for inhibiting movement of said blade mechanism from its said arrangement wherein it is retainable by said latch means into said position wherein it becomes released from said latch means in response to the sudden shocking thereof, said inhibiting means including a first moveable element disposed for displacement between a first arrangement wherein it is engageable by said blade mechanism when said blade mechanism is retained by said latch means serving to preclude the displacement of said blade mechanism from its operative association with said latch means and a second arrangement wherein it will not preclude the unlatching of said blade mechanism from said latch means thereby facilitating normal film exposure operations of said camera, and means for precluding said first moveable element from being displaced from its said first arrangement into its said second arrangement under the influence of a sudden shocking of said camera, said inhibiting means including a shock sensitive mechanism structured and arranged to respond to a sudden shocking of said camera to move from an initial position outside of the path of displacement of said first moveable element into said path of displacement of said first moveable element before said first moveable element has responded to the sudden shocking of said camera to move into its said second arrangement.

4,038,675
SYSTEM FOR INDICATING THE OPERATION OF A SELF-TIMER IN AN ELECTRIC SHUTTER FOR CAMERA

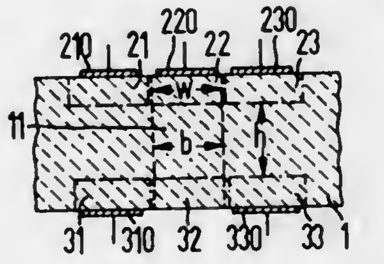
Kiyoshi Kitai, Tokyo; Takeo Saito, Yotsukaido, and Youichi Seki, Chiba, all of Japan, assignors to Seiko Koki Kabushiki Kaisha, Japan
Filed Mar. 14, 1975, Ser. No. 558,356
Claims priority, application Japan, Mar. 14, 1974, 49-28546
Int. Cl.^{2} G03B *9/64*
U.S. Cl. 354—238 **3 Claims**


RESET PULSE GENERATION CIRCUIT
BRIGHTNESS-TIME CONVERSION CIRCUIT
GATE CONTROL CIRCUIT
REVERSIBLE COUNTER CONTROL CIRCUIT
SHUTTER SPEED INDICATOR CIRCUIT
SELF-TIMER OPERATION INDICATOR CIRCUIT
STANDARD PULSE GENERATOR CIRCUIT
REVERSIBLE COUNTER
DELAY CIRCUIT
SECOND DETECTING CIRCUIT
AUTO MANUAL TRANSFER GATE CIRCUIT
SHUTTER CONTROL CIRCUIT

1. A system for indicating the operation of a self-timer in an electric camera shutter of the type having a digital recording and reproducing system operable in a self-timer mode for counting and memorizing in a counter circuit a number of pulses produced from a pulse generator circuit, said number of pulses corresponding to the brightness of a subject to be photographed: means for controlling the exposure time in response to the triggering of a camera shutter release member according to the memorized content of said counter circuit and for controlling, in the case of using a self-timer, the operative period of the self-timer by frequency dividing the pulse output of said pulse generator through said counter circuit; and a self-timer operation indicator circuit controlled at the time of using the self-timer by the frequency division pulse output of said counter circuit for indicating operation in the self-timer mode.

4,038,676
PAIR OF BIPOLAR TRANSISTORS HAVING BASE ZONES WHICH ARE ELECTRICALLY CONDUCTIVELY CONNECTED TO ONE ANOTHER, AND A PROCESS FOR PRODUCING THE PAIR OF TRANSISTORS

Karl Goser, Munich, Germany, assignor to Siemens Aktiengesellschaft, Berlin & Munich, Germany
Filed Nov. 21, 1975, Ser. No. 634,038
Claims priority, application Germany, Dec. 19, 1974, 2460269
Int. Cl.^{2} H01L *29/72, 29/48, 29/56, 29/64*
U.S. Cl. 357—34 **9 Claims**



1. A transistor arrangement comprising:

a semiconductor substrate,

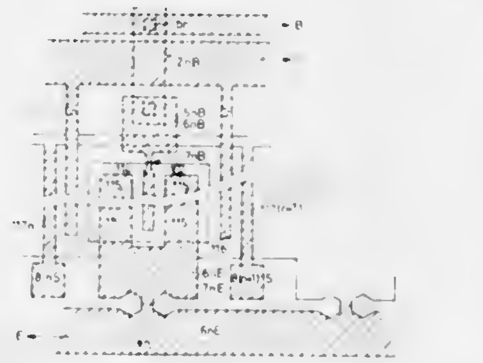
a pair of lateral bipolar transistors superposed and spaced apart in said substrate,

each of said transistors including a base zone, an emitter zone and a collector zone superposed with the like zones of the other transistor, at least said base zone of each transistor being a doped zone in said substrate and each of said base zones electrically conductively connected together, each of said base zones having a free boundary face line opposite the like face of the other base, and

a doped connection zone in said substrate of the same type of doping as said base zones extending between and connecting said base zones.

4,038,677
COMPOSITE SEMICONDUCTOR UNIT AND METHOD

Karl Nagel, Gomaringen; Gerhard Conzelmann, Leinfelden, and Horst Gschwendtner, Esslingen, all of Germany, assignors to Robert Bosch G.m.b.H., Stuttgart, Germany
Filed Feb. 7, 1975, Ser. No. 548,068
Claims priority, application Germany, Feb. 22, 1974, 2408540
Int. Cl.^{2} H01L *27/02, 29/06*
U.S. Cl. 357—51 **24 Claims**



1. Composite semiconductor unit comprising on a common substrate:

a plurality of substantially similar semiconductor elements each containing at least one p-n junction and having a plurality of electrodes, and

circuit means in said unit for connecting the similar electrodes of all said elements, except those found to be defective as hereinafter stated, effectively in parallel through branches leading to said respective electrodes, all of said branches related to each set of similar electrodes being connected together by a common lead conductor path, said circuit means including, in each of said branches respectively related to the electrodes of at least one set of similar electrodes, means for facilitating detection of whether the semiconductor element connected to the branch in question is defective and means for facilitating severing of the branch, at least one branch so equiped related to each defective semiconductor element, if any, being severed at said severance facilitation means thereby to disconnect said defective element from the others.

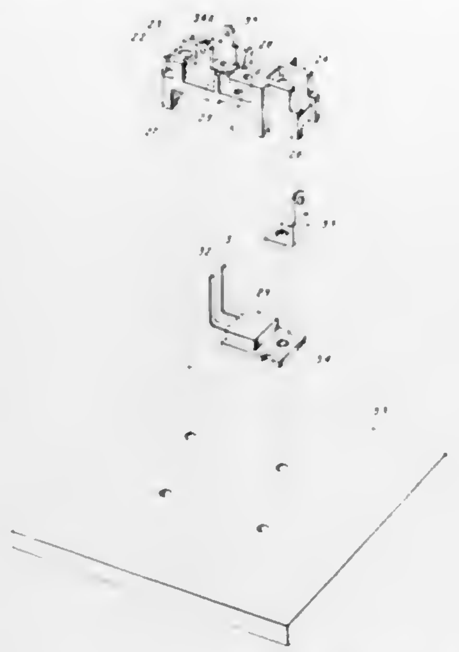
4,038,678
POWER TRANSISTOR AND THYRISTOR ADAPTER

Thomas Leon Gottbreht, Plano; James William Tolson, Garland, and Joe Wade Crawford, Dallas, all of Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.
Filed Oct. 4, 1976, Ser. No. 729,235
Int. Cl.^{2} H01L *23/02, 39/02;* H02B *1/04, 1/00*
U.S. Cl. 357—81 **9 Claims**

1. A universal adapter, for mounting on a planar surface, to which one of various types of power transistors and thyristors may be attached, comprising:

a. a body having at least one mounting pedestal connected to its lower surface to provide a power transistor or thyristor accepting cavity, a plurality of lead apertures to accommodate the various types of power transistors and thyristors communicating between the lower and upper surfaces; and

b. a plurality of electrical contacts for connection to exterior electrical circuits, mounted on the upper surface of the body member, each positioned at a selected one of the lead apertures and attached to a respective lead of the power transistor or thyristor.



4,038,679

APPARATUS FOR READING AN OPTICALLY RECORDED RECORD CARRIER PROVIDED WITH PERIODIC SURFACE UNDULATIONS AND FOR DERIVING A FOCUSSING CONTROL SIGNAL FROM SUCH SURFACE UNDULATIONS

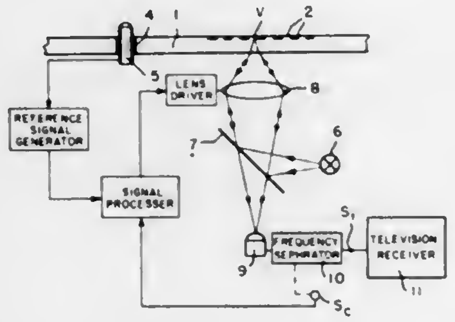
Gijsbertus Bouwhuis, and Christiaan Hendriks Frans Velzel, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Division of Ser. No. 464,841, April 29, 1974. This application Oct. 29, 1975, Ser. No. 626,618

Claims priority, application Netherlands, Feb. 14, 1974, 7402012

Int. Cl.² H04N *5/76*

U.S. Cl. 358—127 **1 Claim**



1. An apparatus for reading a record carrier, said record carrier having periodic surface excursions in the thickness directions of said carrier, the spatial frequency of the excursions along the direction in which the tracks are read being lower than the spatial frequency of said areas and intermediate areas, said apparatus comprising a radiation source supplying a read beam nominally focussed on said tracks, a radiation-sensitive detector for converting the read beam, modulated by the sequence of areas and intermediate areas of a track and by said excursions into an electrical signal, signal frequency separator means connected to said detector for deriving from the detector signal a high-frequency and a low-frequency signal component, means for processing the high-frequency signal component to an information signal, means for converting the low-frequency component into a control signal, and means responsive to said control signal for correcting the read beam focussing.

4,038,680

SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

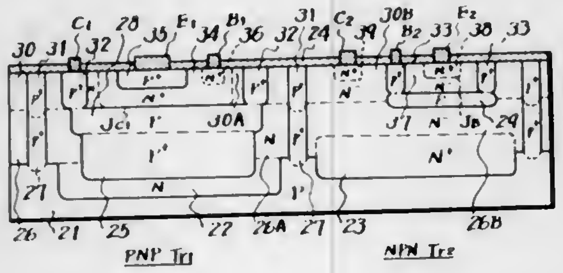
Hajime Yagi, Tokyo, and Tadaharu Tsuyuki, Isehara, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Continuation-in-part of Ser. No. 561,914, March 25, 1975, which is a continuation-in-part of Ser. No. 427,648, Dec. 26, 1973, abandoned, and a continuation-in-part of Ser. No. 620,293, Oct. 7, 1975, which is a continuation-in-part of Ser. No. 427,647, Dec. 26, 1973, abandoned. This application Feb. 3, 1976, Ser. No. 654,758

Claims priority, application Japan, Dec. 29, 1972, 47-550; Mar. 28, 1974, 49-35307; Oct. 31, 1974, 49-125869; Dec. 29, 1972, 47-551; Oct. 31, 1974, 49-125868; Feb. 8, 1975, 50-16561

Int. Cl.² H01L *27/02, 29/72, 27/04*

U.S. Cl. 357—44 **5 Claims**



1. A semiconductor integrated circuit having first and second transistors of opposite conductivity type, comprising:

a. a semiconductor substrate of a first conductivity type;

b. an epitaxial layer formation of a second conductivity type and relatively low impurity concentration formed on said substrate and having a major face opposite the substrate;

c. said first transistor comprising:

   i. a first region of first conductivity type in said epitaxial layer of formation spaced below said major face, and a conductive path region of first conductivity type and higher impurity concentration than said first region extending from the first region up to the major face;

   ii. a second region of second conductivity type being formed of said epitaxial layer formation and partially surrounded by said first region and conductive path region; and

   iii. a third region of first conductivity type formed in said second region spaced from said first region by said second region;

d. an isolating PN junction between said first transistor and said second transistor, said second transistor comprising:

   i. a fourth region of second conductivity type formed of a portion of said epitaxial layer formation isolated from the first transistor by the isolating PN junction;

   ii. a fifth region of first conductivity type spaced below said major face; and a conductive path region of first conductivity type and higher impurity concentration than said fifth region from the fifth region up to the major face;

   iii. a sixth region of second conductivity type being formed of said relatively low concentration epitaxial layer formation and partially surrounded by said fifth region and conductive path region, said sixth region being spaced from said fourth region by said fifth region; and

   iv. a seventh region of second conductivity type and concentration relatively higher than said sixth region formed in said sixth region and forming a low-high concentration barrier junction therewith, said junction being spaced from said fifth region by a distance less than the diffusion length of minority carriers in said sixth region injected from said fifth region when a forward bias is applied between said fifth and sixth regions;

whereby a first transistor is formed in an integrated circuit with a second transistor of low emitter concentration.

4,038,681

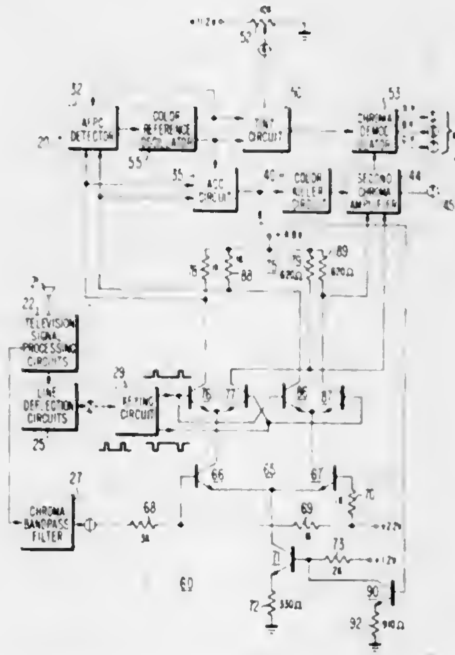
CHROMA-BURST SEPARATOR AND AMPLIFIER

Leopold Albert Harwood, Somerville, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Jan. 29, 1976, Ser. No. 653,289

Int. Cl.² H04N *9/46*

U.S. Cl. 358—20 **11 Claims**



1. Electronic signal processing apparatus for separating and amplifying burst and chroma signal components of a periodic color television composite chrominance signal including a color reference burst signal component and a chroma information signal component respectively occuring during first and second predetermined intervals of the period of said composite signal, comprising:

differential amplifier means having at least one input terminal and first and second antiphase output terminals, said amplifier means being responsive to composite signals applied to said input terminal for producing amplified antiphase composite signals at said output terminals;

first gating means comprising first and second current conducting devices each having a gating input terminal, a signal input terminal and an output terminal, said signal input terminals being coupled in common to said first output terminal of said amplifier means;

second gating means comprising first and second current conducting devices each having a gating terminal, a signal input terminal and an output terminal, said signal input terminals being coupled in common to said second output terminal of said amplifier means; and

means for providing periodic gating signals with a period comprising first and second gating intervals respectively coincident with said first and second predetermined intervals of said composite signal, said gating signal means being coupled to said gating inputs of said first and second gating means for rendering said first and second current conducting devices of each of said gating means respectively conductive and non-conductive during said first gating interval to produce antiphase separated burst components at said output terminals of said first devices and for rendering said first and second current conducting devices respectively non-conductive and conductive during said second gating interval to produce antiphase separated chroma components at said output terminals of said second devices, said output terminals of said first devices and said output terminals of said second devices each having associated therewith a differential direct output voltage which remains substantially constant during said first and second gating intervals.

4,038,682

VIDEO DISC PLAYER APPARATUS FOR ESTABLISHING ELECTRICAL CONNECTION BETWEEN A STYLUS ELECTRODE AND A SIGNAL PROCESSING CIRCUIT

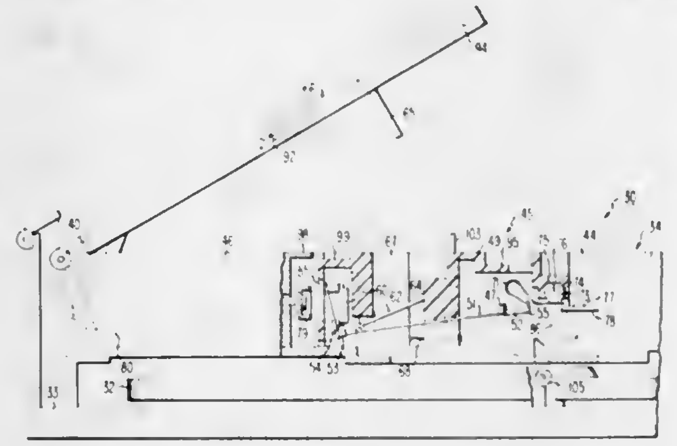
James Austin Allen, Monrovia, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 16, 1976, Ser. No. 667,310

Claims priority, application United Kingdom, Sept. 18, 1975, 38458/75; Nov. 28, 1975, 49108/75

Int. Cl.² G11B *25/04*

U.S. Cl. 358—128 **6 Claims**



2. In a system for playing back prerecorded signals from a spirally grooved record; said system including a turntable for rotatably supporting said record and a carriage mounted for lateral motion relative to a base plate of said system in correlation with lateral motion of a groove-riding stylus during playback; said carriage having a compartment which has an aperture for permitting said stylus to protrude for engagement with said record during playback; said groove-riding stylus including an electrode; said system further including a support member located within said carriage; said system also including a signal processing circuit having an input terminal located with said carriage; an apparatus comprising:

A. a stylus arm unit including:

   a. a stylus arm carrying said stylus at one end thereof;

   b. a connector plate; and

   c. a compliant member securing said connector plate to the end of said stylus arm remote from said one end;

B. a cartridge body having walls defining a protective enclosure for said stylus arm unit; said cartridge body being dimensioned for reception in said carriage compartment;

C. means for flexibly suspending said connector plate within said cartridge body; said suspending means establishing a location of said connector plate permitting a rigid engagement thereof with said support member when said cartridge body is received in said carriage compartment;

D. a spring for urging said stylus into said record groove during playback; said spring being conductive; said spring having a first end and a second end; said first end of said spring being secured to said stylus so as to effect an electrical connection between said first and said stylus electrode;

E. means for securing said second end of said spring within said cartridge body above said stylus; said securing means establishing a location for said second end of said spring permitting lateral alignment thereof with said input terminal when said cartridge body is received in said carriage compartment;

F. means for providing displacement of said cartridge body toward said input terminal subsequent to cartridge reception in said carraige compartment;

G. means for spatially separating said second end of said spring from said input terminal during said displacement of said cartridge body in a direction perpendicular to said displacement; and

H. means for causing engagement of said second end of said spring with said input terminal when said second end of said spring is aligned with said input terminal during said displacement of said cartridge body to effect an electrical connection between said second end of said spring and said input terminal.

4,038,683

TELEVISION SYNCHRONIZING GENERATOR

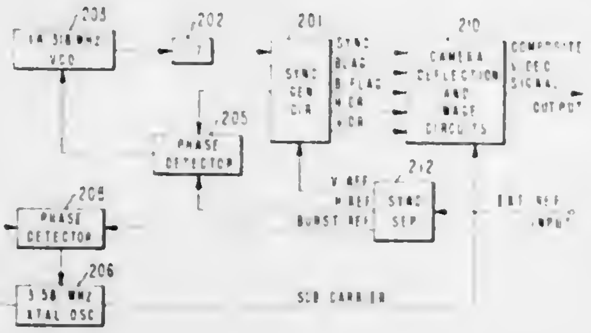
Laurence Joseph Thorpe, Marlton, and Burnard Eugene Nicholson, Haddonfield, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Dec. 22, 1975, Ser. No. 642,731

Claims priority, application United Kingdom, Apr. 4, 1975, 13948/75; Apr. 4, 1975, 13949/75

Int. Cl.² H04N *9/46*

U.S. Cl. 358—19 **3 Claims**



1. A synchronizing generator for synchronizing the composite video signal output of a television camera to an external television system reference represented by a source of reference signal having at least line and color reference signal components, wherein said line and color reference signal components are subject to variations in relative time and phase, said generator comprising:

a first phase-lock loop including a sync generating circuit for producing a plurality of synchronizing signals other than color subcarrier, a first source of clock signals coupled to an input of said sync generating circuit, a first phase detector coupled to a line rate output of said sync generating circuit and said external line reference signal component for producing a first control voltage, said first control voltage being coupled to said first clock signal source for synchronizing said plurality of synchronizing signals to the line signal component of said external reference, said synchronized plurality of signals being coupled to utilization means in said camera; and

a second phase-lock loop including a second source of clock signals for producing said color subcarrier, a second phase detector coupled to said second clock source and to said external color reference signal component for producing a second control voltage, said second control voltage being coupled to said second clock source for synchronizing said color subcarrier to the color reference signal component of said external reference, said synchronized color subcarrier being coupled to utilization means in said camera;

said first and second phase-lock loops providing independent synchronism of the line and color signal components of said composite video output signal to said line and color signal components of said source of reference signal.

4,038,684

SIGNAL DETECTION CIRCUIT

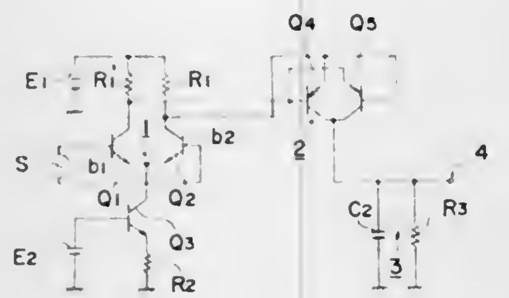
Seiji Miyamoto, Yao, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan

Filed Feb. 18, 1976, Ser. No. 658,921

Claims priority, application United Kingdom, Feb. 18, 1975, 50-20554

Int. Cl.² H04N *9/00*

U.S. Cl. 358—27 **9 Claims**



1. A signal detection circuit which comprises a differential amplifier circuit connected to an A.C. signal source and having a pair of first and second output electrodes and a constant current circuit for amplification of the signal from said A.C. signal source, a detector circuit coupled to said differential amplifier circuit said detector circuit including a first transistor and a second transistor for detecting the amplified A.C. signal from said differential amplifier circuit, and a time constant circuit coupled to said detector circuit for producing a rectified D.C. output therefrom, said first output electrode of said differential amplifier circuit being connected to the base of said first transistor and the emitter of said second transistor, with said second output electrode of the differential amplifier circuit being connected to the emitter of said first transistor and the base of said second transistor, and wherein the collectors of said first and second transistors are connected to each other and coupled to said time constant circuit.

4,038,685

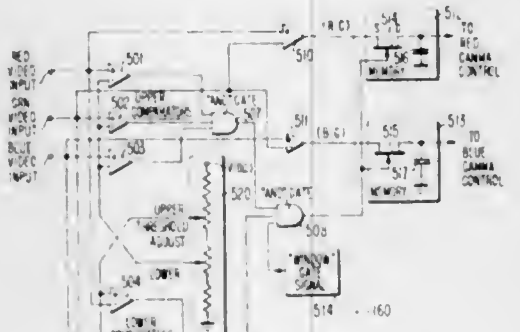
APPARATUS FOR AUTOMATIC GAMMA CONTROL OF TELEVISION COLOR SIGNALS

Lucas John Bazin, Stratford, N.J., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 31, 1975, Ser. No. 563,684

Int. Cl.² H04N *9/53*

U.S. Cl. 358—32 **9 Claims**



1. Automatic gamma correction apparatus for continuously correcting the gamma characteristic of one or more video signals generated by a television camera during the telecasting of an actual program source, said video signals being representative of said program source and occurring within predetermined maximum and minimum amplitude levels during transmission of said signals, comprising:

means providing a pair of signal translating channels for a pair of related video signals;

gamma correction circuitry included in one of said pair of signal translating channels, said gamma correction circuitry responsive to a control signal to alter the gamma correction characteristic of said channel;

means for continuously comparing the amplitude levels of said pair of signals in a relatively narrow range of amplitude levels between the maximum and minimum levels of said signals;

means coupled to said comparing means and to said signal translating channels for developing a control signal of a value related to the differential amplitude between said pair of signals when both of said signals have an amplitude within said narrow range of amplitude levels; and

means for applying said control signal to said gamma correction circuitry for altering the gamma characteristic of said one signal translating channel in a direction so as to make the amplitude of said pair of signals equal.

4,038,686

DEFECT DETECTION AND COMPENSATION

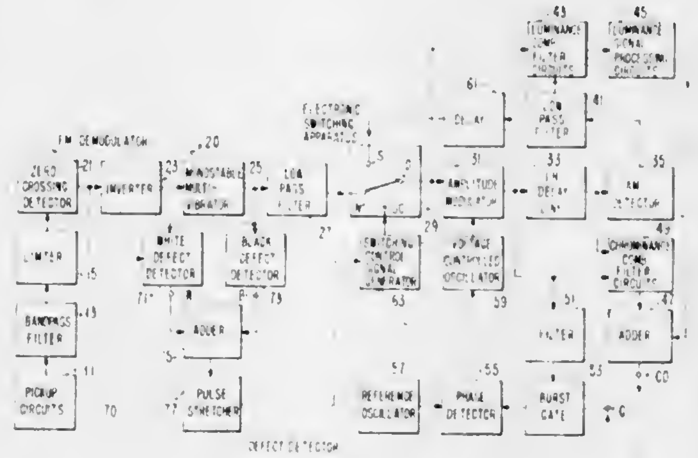
Alfred Lynn Baker, Indianapolis, Ind., assignor to RCA Corporation, New York, N.Y.

Filed Mar. 8, 1976, Ser. No. 664,674

Claims priority, application United Kingdom, Mar. 10, 1975, 9951/75; Feb. 26, 1976, 9951/75

Int. Cl.² H04N *5/76*

U.S. Cl. 358—127 **10 Claims**



1. In a video disc player including pickup circuits for developing during playback of a video disc record an FM signal having an instantaneous frequency subject to variation over a given deviation range in accordance with the amplitude of recorded video signals, the combination comprising:

a zero-crossing detector for developing output pulses indicative of the zero crossings of the signal developed by said pickup circuits;

a monostable multivibrator responsive to the output pulses of said zero-crossing detector;

a low pass filter coupled to receive an output of said multivibrator;

means for utilizing the output of said low pass filter to control the display of images;

means for developing a delayed version of an output pulse of said multivibrator; and

means responsive to coincidence between a portion of an output pulse of said zero-crossing detector and a portion of said delayed version of an output pulse of said multivibrator for altering the mode of operation of said output utilizing means.

4,038,687

VIDEO BLANKING CIRCUIT

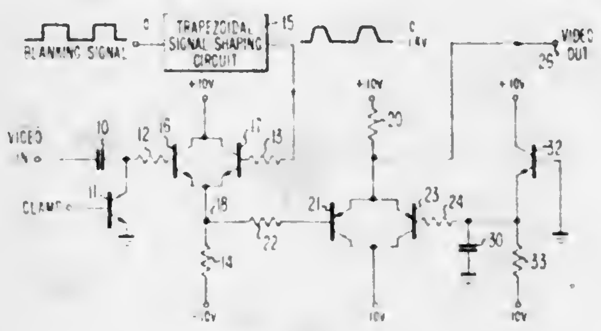
Dennis Michael Schneider, Sewell, and Lucas John Bazin, Vincentown, both of N.J., assignors to RCA Corporation, New York, N.Y.

Filed Aug. 18, 1976, Ser. No. 715,301

Claims priority, application United Kingdom, Mar. 19, 1976, 11120/76

Int. Cl.² H04N *5/14*

U.S. Cl. 358—165 **6 Claims**



1. A circuit for inserting a system reference signal into a video signal having active and retrace periods, comprising:

signal clamping means for clamping said video signal to a reference potential during said retrace period;

means for generating a reference signal occurring during said retrace period; and

a non-additive signal mixer responsive to said clamped video signal and said reference signal for developing an output signal wherein said reference signal is inserted into said video signal retrace period.

4,038,688

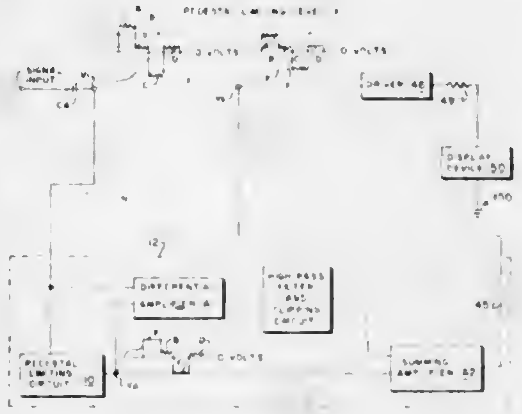
AUTOMATIC LOW FREQUENCY GAIN LIMITING BY ADDITION METHOD IN VIDEO PROCESSING SYSTEM

Sen-Te Chow, Alexandria, and Earl M. Thomas, Arlington, both of Va., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jan. 19, 1976, Ser. No. 650,483

Int. Cl.² H04N *5/14*

U.S. Cl. 358—174 **8 Claims**



1. An automatic low frequency pedestal gain limiting circuit for composite video signals in an AC coupled video processing system, said gain limiting circuit comprising:

a pedestal limiting circuit for clipping the low frequency pedestal voltages of said composite video signals into smoothly clipped pedestal voltages when said low frequency pedestal voltages exceed a pedestal limiting voltage level;

a differential amplifier having first and second inputs and an output in which said composite video signals are applied at said first input to said differential amplifier and said smoothly clipped pedestal voltages are applied at said second input to said differential amplifier wherein said video signals and said smoothly clipped pedestal voltages are differentially compared by said differential amplifier to provide short pedestal voltages having the high frequency detail of said composite video signals remaining thereon at said output of said differential amplifier;

a summing amplifier having first and second inputs and an output;

means for removing said short pedestal voltages and passing said high frequency detail to said first input of said summing amplifier wherein said smoothly clipped pedestal voltages are also applied to said first input to said summing amplifier for summing said high frequency detail on said smoothly clipped pedestal voltages; and

means for providing a reference voltage at said second input to said summing amplifier to sum with said high frequency detail on said smoothly clipped pedestal voltages to provide an output video signal therefrom that retains said high frequency detail thereon but limits the gain of the low frequency pedestals to maintain operation of said video processing system within its dynamic range.

4,038,689

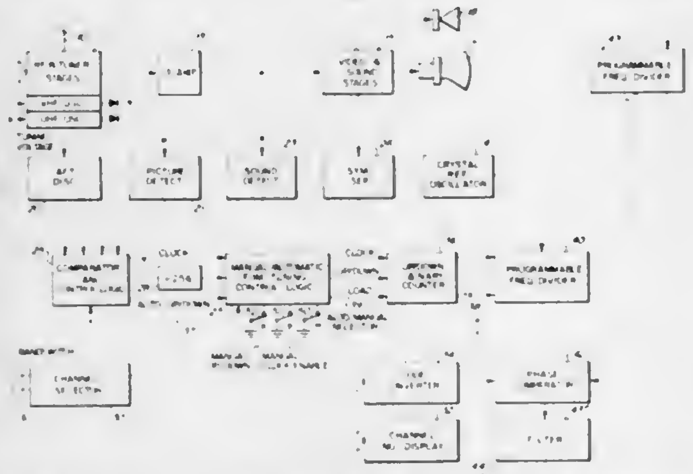
FREQUENCY SYNTHESIZER TUNING SYSTEM WITH MANUAL FINE TUNING CONTROL

Theodore S. Rzeszewski, Lombard; Paul D. Frantzis, Chicago, both of Ill., and Sotirios Sideris, Sunnyvale, Calif., assignors to Matsushita Electric Corporation of America, Franklin Park, Ill.

Filed June 14, 1976, Ser. No. 695,855

Int. Cl.² H04N *5/44*

U.S. Cl. 358—191 **12 Claims**



1. A frequency synthesizer tuning system for a tuner of a television receiver capable of receiving a composite television signal, said system including in combination:

reference oscillator means providing a reference signal at a predetermined frequency;

local oscillator means in the tuner providing a variable output frequency in response to the application of a control signal thereto;

a first programmable frequency divider having an input coupled to the output of said reference oscillator means for producing an output signal having a frequency which is a programmable fraction of the frequency of the signal applied to the input thereto from said reference oscillator means;

a second programmable frequency divider having an input coupled to the output of said local oscillator means and producing an output signal having a frequency which is a programmable fraction of the frequency of the signal applied to the input thereto from said local oscillator means;

channel selection means coupled to said second programmable frequency divider for controlling said second programmable frequency divider to establish the programmable fraction thereof;

means coupled to the outputs of said first and second frequency dividers for developing a control signal and applying such control signal to said local oscillator means for controlling the frequency of operation thereof; and

manual fine tuning control means coupled to said first programmable frequency divider for controlling said first frequency divider to establish the programmable fraction of division thereof as desired by an operator of said manual fine tuning control means.

4,038,690

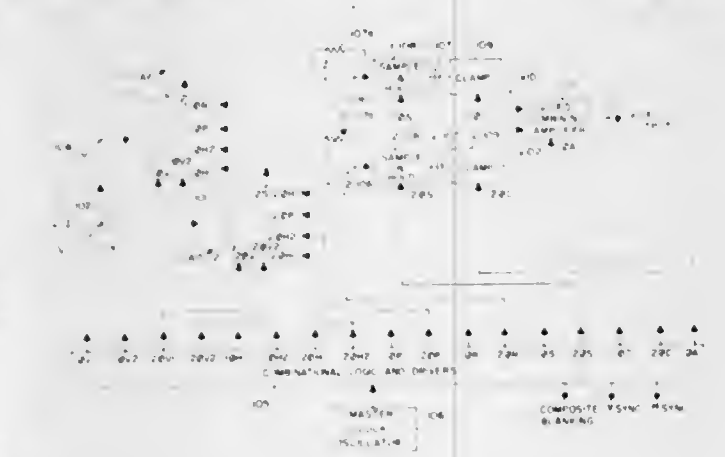
CHARGE-COUPLED DEVICE VIDEO-SIGNAL-GENERATING SYSTEM

Kenneth A. Hoagland, Smithtown, N.Y., assignor to Fairchild Camera and Instrument Corporation, Syosset, N.Y.

Filed Jan. 21, 1976, Ser. No. 651,117

Int. Cl.² H04N *3/14*

U.S. Cl. 358—213 **10 Claims**



1. A video-signal-generating system comprising:

a plurality of similar area-image-sensing devices, each comprising a two-dimensional array of photosensor sites arranged in rows and columns, each site being effective to produce a charge packet in response to illumination incident thereon, a charge-detection output circuit capable of producing an output signal varying with the magnitudes of successive charge packets in sequence, and means for effecting the orderly transfer of charge-packet-signal information from the photosensor sites in sequence to said charge-detection circuit;

an optical system for simultaneously imaging a scene to be reproduced on each of said area-image-sensing devices but with the photosensor sites of at least one device offset within the image plane from corresponding photosensor sites of the others of said devices to such an extent and in such a direction that the photosensor sites of said one device sense or provide access to image point information which cannot be sensed or accessed by the others of said devices during the same field readout interval;

control circuitry for periodically and sequentially causing the transfer of the charge-packet-signal information developed at each of the photosensor sites to the charge-detection output circuit of its respective device;

and means for combining the output signals of said output circuits to provide a video signal for reproduction.

4,038,691

STILL IMAGE SLIDE COMBINATION WITH SEQUENTIALLY ACTIVATED AUDIO CHANNELS PER SLIDE

Martin E. Gerry, 13452 Winthrope St., Santa Ana, Calif. 92705

Filed Mar. 26, 1976, Ser. No. 671,013

Int. Cl.² G11B *5/008, 23/44*

U.S. Cl. 360—2 **16 Claims**

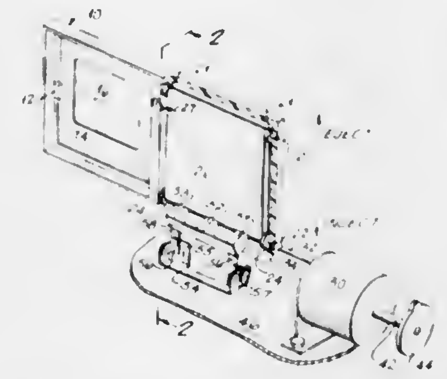
1. Means for providing stationary images and sound related to said images, comprising the combination:

a plurality of non-translatable magnetic transducer heads;

an endless magnetic medium in cooperation with said heads;

control means connected to said heads for providing a plurality of sound tracks for each of the images, one said head per sound track, said control means including

means for disconnecting a first of said heads at end of its corresponding sound track and connecting a second of said heads at the beginning of its corresponding sound track, substantially only one of said heads being activated during any one transducing time period;



means for transducing an analog intelligence message between said heads and sound tracks, said means for disconnecting and connecting enabling the message to be continued from one of said sound tracks to another; and

means, coupled to the control means, for initiating translation of the magnetic medium and for translating said magnetic medium a whole number of complete revolutions, one said transducer head activated for each of said revolutions, and for terminating translation of said magnetic medium at the end of a last of said complete revolutions.

4,038,692

TAPE SENSING DEVICE FOR MAGNETIC TAPE RECORDING AND/OR REPRODUCING APPARATUS

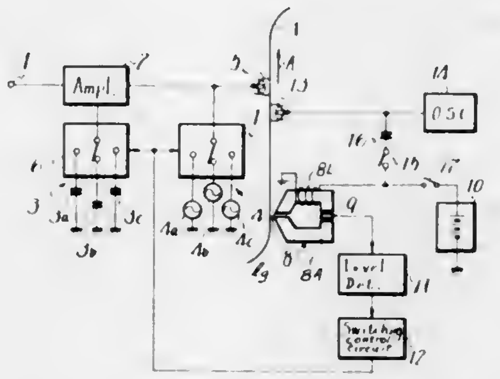
Kenkichi Umeda, Tokyo, and Hiroyuki Yamauchi, Urawa, both of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Mar. 6, 1975, Ser. No. 556,120

Claims priority, application Japan, Mar. 12, 1974, 49-28813

Int. Cl.² G11B *5/45*

U.S. Cl. 360—25 **16 Claims**



1. A device for sensing the type of magnetic coating on a magnetic tape, comprising a DC magnetic recording head adapted to engage the magnetic tape, means for applying a predetermined DC voltage to said head so that the latter applies a DC magnetic flux to the tape while said tape is at rest, means for discontinuing the application of said DC magnetic flux, means for sensing the remanance of the magnetic tape while the latter remains at rest following the discontinuance of said DC magnetic flux to the tape, the level detecting means for detecting the level of the sensed remanence of the tape as an indication of the type of magnetic coating thereon.

4,038,693

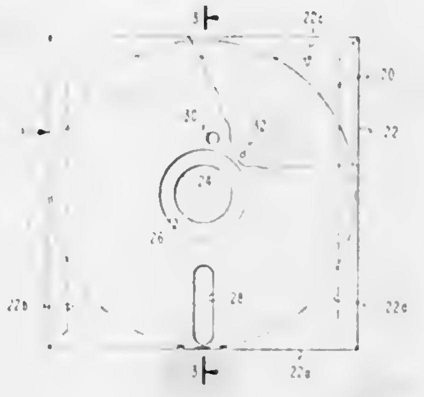
ANTI-STATIC MAGNETIC RECORD DISK ASSEMBLY

Coy Lee Huffine, Rochester; Larry Frederick Mattson, Pine Island; Karl Allen Shidler, Rochester, and Norman Edward Slindee, Austin, all of Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sept. 23, 1975, Ser. No. 615,943

Int. Cl.² G11B *5/016, 23/02;* H05F *3/00*

U.S. Cl. 360—99 **4 Claims**



1. A magnetic record assembly including:

a magnetic disk of highly electrically insulating, flat, uniform thickness sheet material,

a jacket of highly electrically insulating material enclosing said disk and having a central opening through it by means of which the disk may be rotatably driven within the jacket and having a slot therein for receiving a magnetic transducer to have a data transferring relationship with the disk and having flat internal faces adjacent to and extending along the faces of said disk,

a layer of a porous low friction dusting fabric within said jacket and in wiping contact with the faces of said disk as the disk rotates within the jacket, and

a uniform thickness flat thin layer of electrically conducting non-porous material within said jacket and in contact with and between said flat internal jacket faces and said layer of dusting fabric for draining static electricity from the jacket.

4,038,694

PLAYER FOR TAPE CARTRIDGES AND CASSETTES

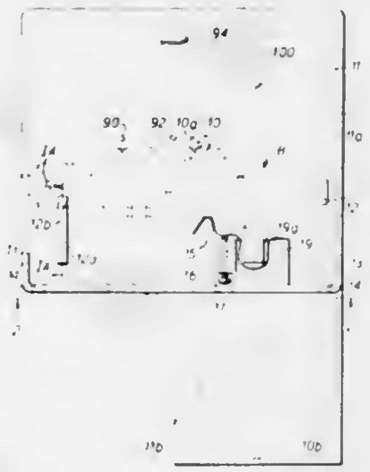
Edward Alexander Leshik, London, England, assignor to Hellermann Cassettes Limited, Crawley, England

Filed Sept. 30, 1975, Ser. No. 618,225

Claims priority, application United Kingdom, Oct. 1, 1974, 42549/74

Int. Cl.² G11B *21/22, 21/24, 5/56*

U.S. Cl. 360—105 **14 Claims**



1. Tape transport apparatus, comprising:

a. a tape deck (11) including means for receiving a tape module containing a length of tape;
b. a unitary elongate bridge member (B) formed of synthetic plastic material, said bridge member comprising a main body portion, and a first extension portion hingedly connected with one end of said main body portion by a first resilient hinge portion (21), said bridge member being disposed on the tape deck with said extension rigidly connected with the tape deck, said first resilient hinge having a pivot axis normal to said tape deck so that the main body of the bridge member is movable in an arc across the tape deck; and
c. a magnetic sensing head (28) carried by said main body portion of the bridge member.

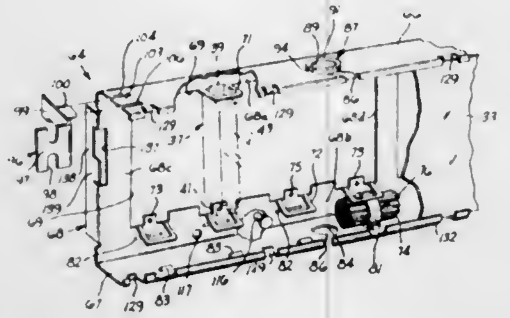
4,038,695
STATIC TRIP UNIT FOR CIRCUIT PROTECTIVE DEVICES

Robert P. DePuy, Cherry Hill, N.J., assignor to General Electric Company, New York, N.Y.
Filed Apr. 19, 1976, Ser. No. 678,251
Int. Cl.^{2} H02H *3/08*
U.S. Cl. 361—96 **23 Claims**

1. A static trip unit for application in an electric circuit breaker to initiate its interruption of a protected electrical distribution circuit automatically in response to an abnormal circuit condition, said trip unit comprising, in combination:
A. a signal translator coupled to the distribution circuit for developing an analog signal proportional to the magnitude of current flowing in the circuit;
B. an analog to digital converter electrically connected to said signal translator for generating a digital signal having a pulse frequency proportional to the square of said analog signal;
C. a binary counter connected to said converter and operable to accumulate a count of said digital signal pulses;
D. a threshold detector having an input connected to receive said analog and operating to develop an output signal when said analog signal exceeds a preselected level, said output signal applied to condition said counter to accumulate said digital signal pulses; and
E. a decoder connected to monitor the pulse count accumulating in said counter and operating to generate a trip initiating signal when said pulse count reaches a preselected total.

4,038,696
STRUCTURE FOR PROVIDING SUPPORT FOR CIRCUIT PLUG-IN UNITS, CONNECTORS AND RELATED WIRING

John Orrell Etchison, Jr., Clemmons; Garland Ralph Jobe, and Robert Henry Wellons Jones, Jr., both of Greensboro, all of N.C., assignors to Western Electric Company, Inc., New York, N.Y. and Bell Telephone Laboratories, Incorporated, Murray Hill, N.J.
Filed Feb. 9, 1976, Ser. No. 656,213
Int. Cl.^{2} H02B *1/02*
U.S. Cl. 361—415 **18 Claims**



1. A structure for providing support for a plurality of circuit plug-in units, a corresponding plurality of connectors and associated wires, which comprises:
means for supporting in a prescribed array a plurality of the circuit plug-in units of a prescribed depth dimension and a prescribed thickness dimension;
means, independent of the circuit plug-in unit supporting means, for receiving a plurality of the connectors in a prescribed array corresponding to the prescribed array of the supporting of the circuit plug-in units;
bendable means, formed integrally with the connector receiving means, for enclosing portions of each of the plurality of connectors to secure the connectors with the connector receiving means in the prescribed array;
means for fastening the circuit plug-in unit supporting means with the connector receiving means;
frame means for supporting the circuit plug-in unit supporting means with the connector receiving means in the prescribed array;
means, formed integrally with the circuit plug-in unit supporting means, for securing the circuit plug-in unit supporting means to the frame means;
at least one wire passageway opening formed in the connector receiving means to permit the routing of the associated wires from the connector receiving means to areas external thereof; and
means, in movable assembly with the connector receiving means at the wire passageway opening, for providing a lateral opening to the passageway opening to permit the placing of the associated wires therein and for selectively closing the lateral opening to retain the associated wires in the passageway opening.

DESIGN PATENTS

GRANTED JULY 26, 1977

ERRATA

For CLASS	See PATENT NO.
013-024	245,185
013-040	244,186
048-033	245,187
014-073	245,198
014-070	245,199
024-067	245,202
024-021	245,203
002-378.1	245,204

DESIGNS

JULY 26, 1977

245,126
SHOE

Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima Tokushima, Japan

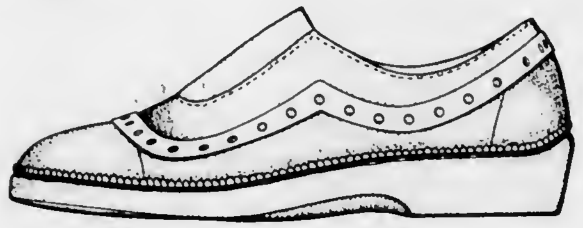
Filed Aug. 4, 1975, Ser. No. 601,840

Claims priority, application Japan, May 28, 1975, 50-21540

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—308



245,127
SHOE

Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan

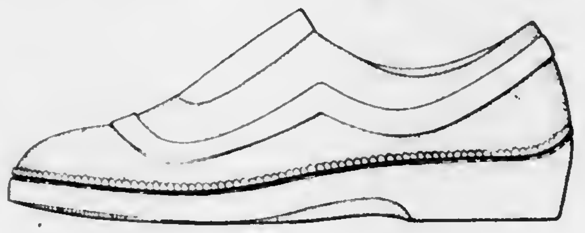
Filed Aug. 4, 1975, Ser. No. 601,842

Claims priority, application Japan, May 28, 1975, 50-21537

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—308



245,128
SHOE

Tatsuo Fukuoka, No. 3, 3-Ban, 2-chome, Shin-Minami-Fukushima, Tokushima, Japan

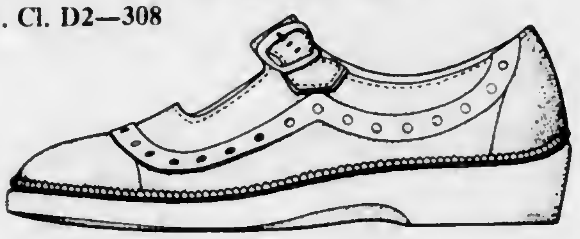
Filed Aug. 4, 1975, Ser. No. 601,841

Claims priority, application Japan, May 28, 1975, 50-21539

Term of patent 14 years

Int. Cl. D2—*04*

U.S. Cl. D2—308



245,129
BELT BUCKLE

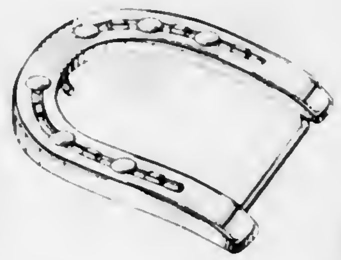
Ronal L. Adams, and Forest E. Brown, both of Phoenix, Ariz., assignors to Drummond, Nelson & Ptak

Filed Aug. 11, 1975, Ser. No. 603,325

Term of patent 14 years

Int. Cl. D2—*07*

U.S. Cl. D2—431



245,130
BUCKLE FOR LUGGAGE STRAP OR THE LIKE

Alain D. Perrin, Boulogne, France, assignor to Les Must de Cartier-France, Paris, France

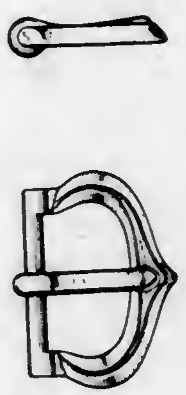
Filed May 2, 1975, Ser. No. 573,943

Claims priority, application France, Nov. 4, 1974, 74.30658

Term of patent 14 years

Int. Cl. D2—*07*

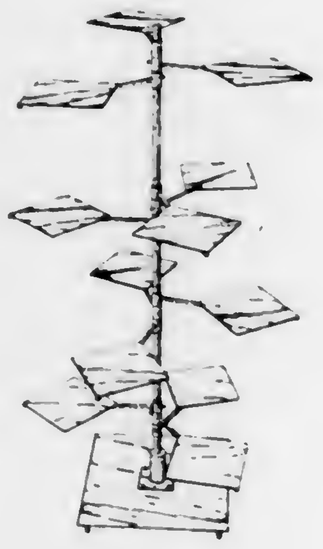
U.S. Cl. D2—444



245,131

DISPLAY STAND

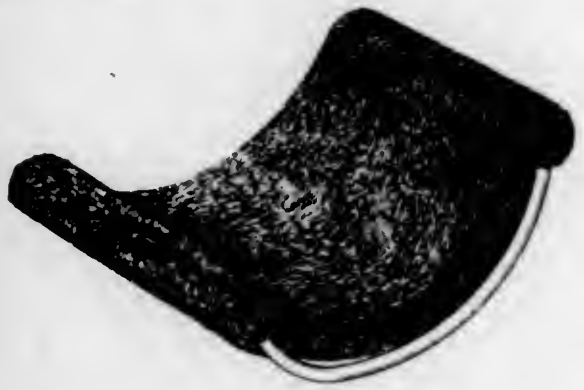
Berndt Johnsson, Linkoping, Sweden, assignor to Moderna Butiksinredningar AB, Sweden
Filed Feb. 4, 1976, Ser. No. 655,115
Term of patent 3½ years
Int. Cl. D20—*02*; D6—*04*
U.S. Cl. D6—24



245,132

CHAIR

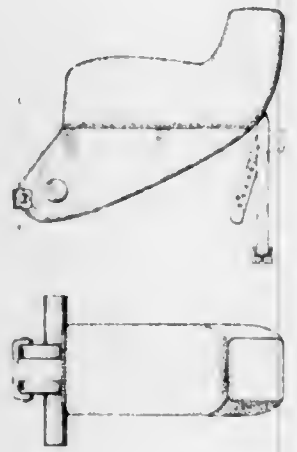
Floyd C. Gale, Jr., 32658 Nantasket Drive, Rancho Palos Verdes, Calif. 90274
Continuation-in-part of Ser. No. 404,351, Oct. 9, 1973, which is a continuation-in-part of Ser. No. 346,002, March 29, 1973. This application June 24, 1975, Ser. No. 589,670
Term of patent 14 years
Int. Cl. D6—*01*
U.S. Cl. D6—38



245,133

AUXILIARY BICYCLE SEAT

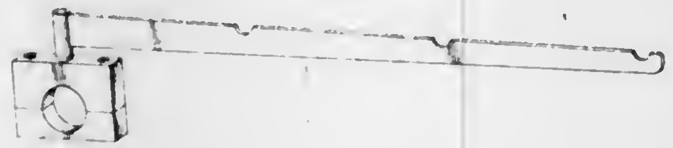
Bruce W. Kerley, 6311 Yucca St., No. 1084, Hollywood, Calif. 90028
Filed June 11, 1976, Ser. No. 692,573
Term of patent 14 years
Int. Cl. D12—*11*
U.S. Cl. D6—48.1



245,134

COMBINED GARMENT DISPLAY ARM AND MOUNTING BRACKET

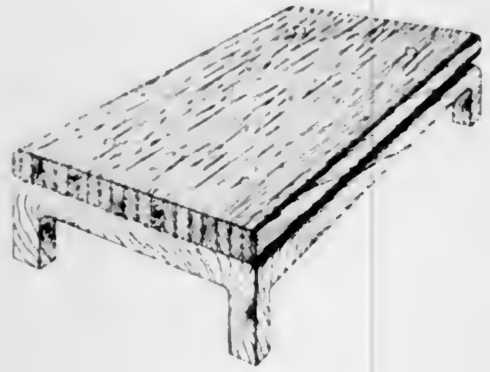
Stanley A. Friedberg, 8001 Paso Robles, Van Nuys, Calif. 91406
Filed Sept. 5, 1975, Ser. No. 610,533
Term of patent 14 years
Int. Cl. D6—*04*; D8—*08*
U.S. Cl. D6—116



245,135

TABLE

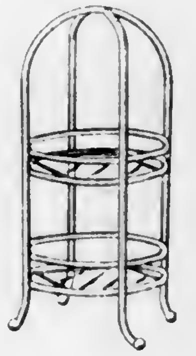
Richard B. Saltz, 16941 Edgewater Lane, Huntington Harbor, Calif. 92649
Filed Jan. 21, 1976, Ser. No. 651,054
Term of patent 14 years
Int. Cl. D6—*03, 04*
U.S. Cl. D6—177



245,136

STAND FOR POTTED PLANTS

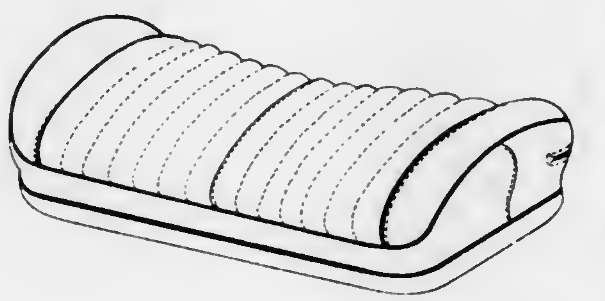
Thomas J. Hughes, Jr., 2050 Valencia Drive, Northbrook, Ill., 60062
Filed Dec. 19, 1975, Ser. No. 642,661
Term of patent 14 years
Int. Cl. D6—*04*
U.S. Cl. D6—183



245,137

CUSHION

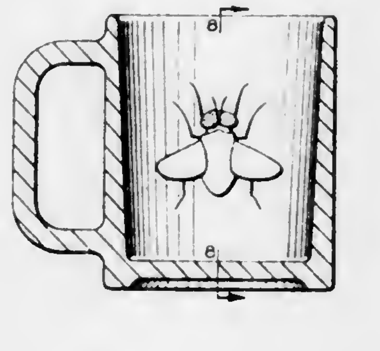
Meyer Benn, 2903 NW. 60th Ave., Sunrise, Fla. 33313
Filed Oct. 20, 1975, Ser. No. 623,893
Term of patent 14 years
Int. Cl. D6—*09*
U.S. Cl. D6—201



245,138

NOVELTY CUP

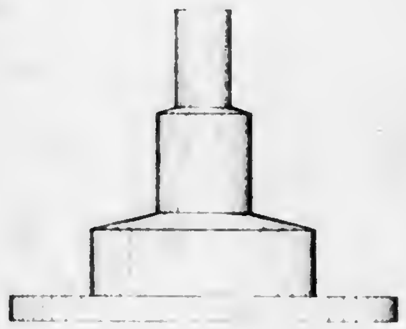
Makoto M. Iwashita, 1222 Glenmorie Drive, Lake Oswego, Oreg. 97034
Filed July 23, 1975, Ser. No. 598,677
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D7—8



245,139

CAKE PAN STAND

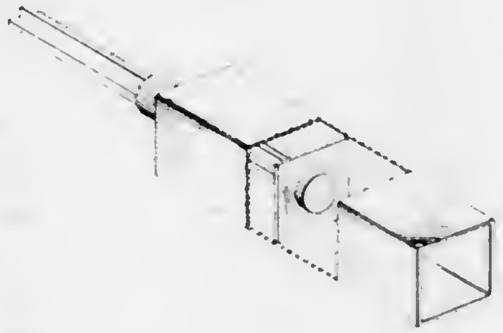
Jack D. Graham, 75 McMeekin St., Sault Ste. Marie, Ontario, Canada
Filed July 17, 1975, Ser. No. 596,902
Claims priority, application Canada, Jan. 30, 1975, 300175
Term of patent 14 years
Int. Cl. D7—*06*
U.S. Cl. D7—83



245,140

BUTTER BASTER

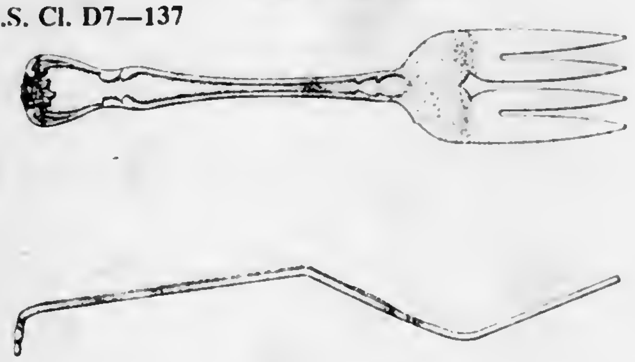
William E. Benson, 17351 Lakeview Drive, Morgan Hill, Calif. 95037
Filed July 14, 1975, Ser. No. 595,695
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D7—99



245,141

FORK OR OTHER SIMILAR ARTICLE OF FLATWARE

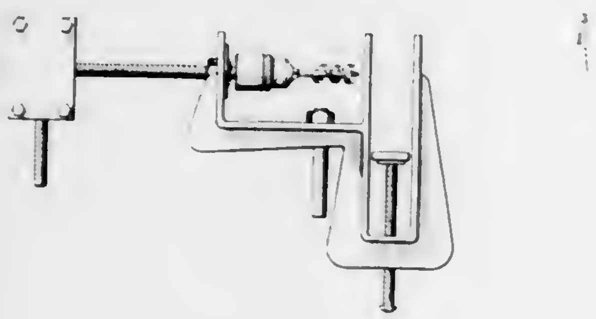
Thomas S. Eldridge, 2521 Hilltop Road, Schenectady, N.Y. 12309, and Robert A. Sovik, 13 Meadow Valley, Elnora, N.Y. 12065
Filed Oct. 18, 1974, Ser. No. 516,101
Term of patent 14 years
Int. Cl. D7—*03*
U.S. Cl. D7—137



245,142

RIGHT ANGLE DRILLING APPARATUS FOR DRILLING WIRING HOLES AND THE LIKE THROUGH BUILDING STUDS, JOISTS, RAFTERS AND THE LIKE

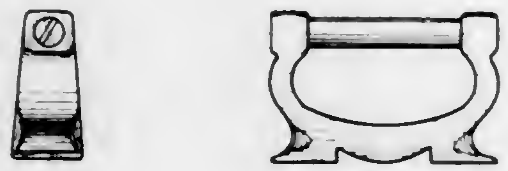
Karman H. Simms, Rte. 39, Box 100, Canvas, W. Va. 26662, and Nathan O. Sanders, Box 65, Summersville, W. Va. 26651
Filed May 13, 1976, Ser. No. 686,991
Term of patent 14 years
Int. Cl. D8—*05*
U.S. Cl. D8—70



245,143

FIXING RING FOR LUGGAGE HANDLE OR THE LIKE

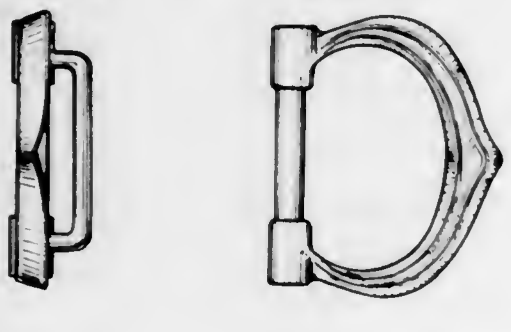
Alain D. Perrin, Boulogne, France, assignor to Les Must de Cartier-France, Paris, France
Filed May 2, 1975, Ser. No. 573,942
Claims priority, application France, Nov. 4, 1974, 74.30658
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—321



245,144

FIXING RING FOR LUGGAGE HANDLE OR THE LIKE

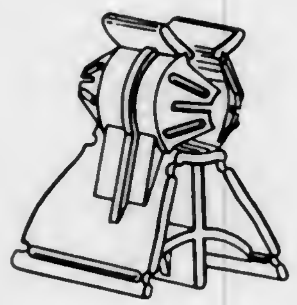
Alain D. Perrin, Boulogne, France, assignor to Les Must De Cartier-France, Paris, France
Filed May 2, 1975, Ser. No. 573,944
Claims priority, application France, Nov. 4, 1974, 74.30658
Term of patent 14 years
Int. Cl. D3—*99*
U.S. Cl. D8—321



245,145

SPACER FOR REINFORCED CONCRETE

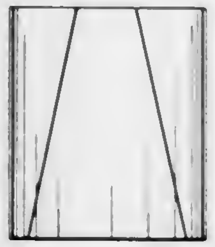
Ferdinand William Berry, "Latchetts" 108 Woodland Drive, Hove, 4, Sussex, England
Filed Sept. 16, 1975, Ser. No. 613,915
Claims priority, application United Kingdom, Mar. 19, 1975, 970365/75
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—356



245,146

CYLINDRICAL ANCHOR FOR SECURING OBJECTS SUCH AS MOBILE HOMES AND THE LIKE TO THE EARTH

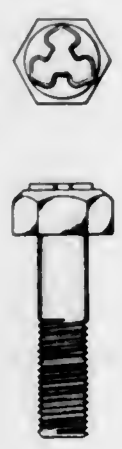
Earnest R. Mullenax, P.O. Box 32349 Warr Acres Branch, Oklahoma City, Okla. 73132
Filed Jan. 14, 1974, Ser. No. 432,882
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—349



245,147

HEXAGONAL HEADED BOLT

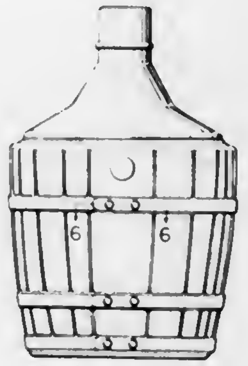
Toru Ono, Izumi, Japan, assignor to Kabushiki Kaisha Izumi Seisakusho, Osaka, Japan
Filed Oct. 7, 1975, Ser. No. 620,339
Term of patent 14 years
Int. Cl. D8—*08*
U.S. Cl. D8—387



245,148

BOTTLE

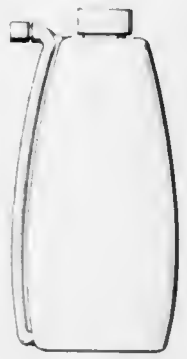
Gordon A. Strand, Toledo, Ohio, assignor to Owens-Illinois, Inc., Toledo, Ohio
Filed Mar. 23, 1976, Ser. No. 669,787
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—28



245,149

BOTTLE

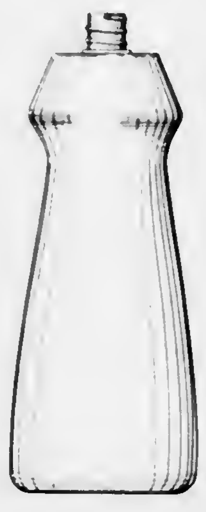
Philip F. Hartung, 655 Main St., East Greenwich, R.I. 02818
Filed Dec. 10, 1975, Ser. No. 639,492
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—60



245,150

BOTTLE

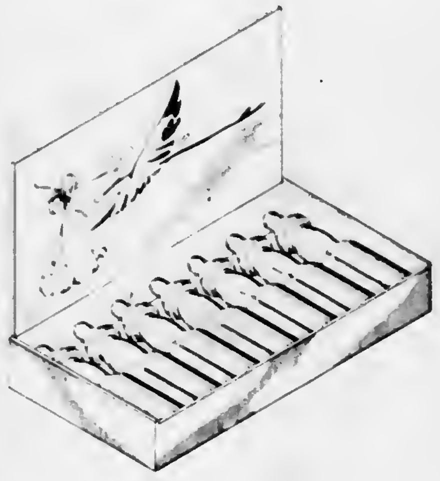
Victor Koenigsberg, Franklin Square, N.Y., assignor to Colgate-Palmolive Company, New York, N.Y.
Filed Mar. 19, 1975, Ser. No. 559,972
Term of patent 14 years
Int. Cl. D9—*01*
U.S. Cl. D9—89



245,151

PACKAGE OF MINIATURE BOTTLES

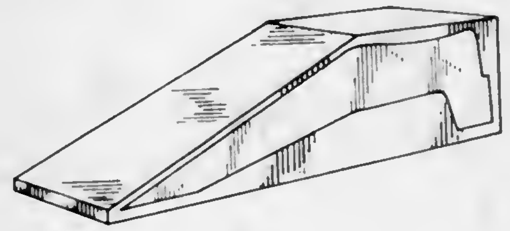
William C. Sturm, 3017 NE. Third Ave., Fort Lauderdale, Fla. 33334
Filed Jan. 19, 1976, Ser. No. 650,121
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—193



245,152

CONTAINER FOR AUTO REPAIR RAMP OR THE LIKE

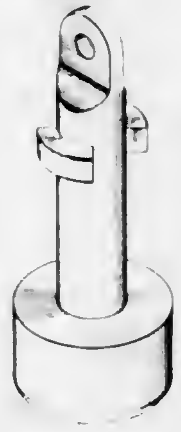
Jack V. Miller, Sierra Madre, Calif., assignor to Acroform Corporation
Filed July 28, 1975, Ser. No. 599,463
Term of patent 14 years
Int. Cl. D9—*03*
U.S. Cl. D9—229



245,153

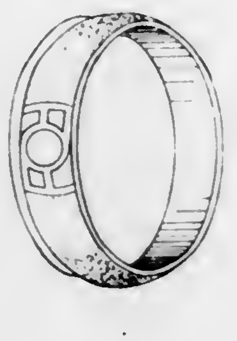
BUOY

Albert W. Flor, 13534 Bali Way, Marina Del Rey, Calif. 93913
Filed June 23, 1975, Ser. No. 589,142
Term of patent 14 years
Int. Cl. D10—*06*
U.S. Cl. D10—107



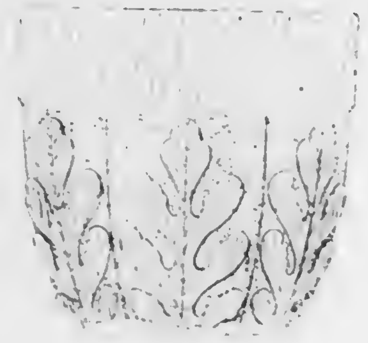
245,154
FINGER RING

John R. Unertl, 1573 Duncan Drive, Pittsburgh, Pa. 15237
Filed Aug. 28, 1975, Ser. No. 608,665
Term of patent 3½ years
Int. Cl. D11—*01*
U.S. Cl. D11—37



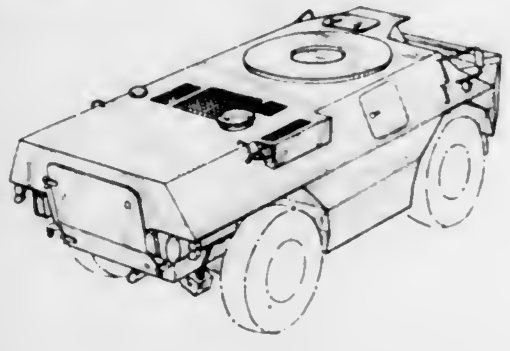
245,155
FLOWER POT

Arthur L. Harshman, Dunkirk, Ind., and James I. Messmer, Detroit, Mich., assignors to Florists' Transworld Delivery Association, Southfield, Mich.
Filed May 17, 1976, Ser. No. 687,188
Term of patent 14 years
Int. Cl. D11—*02*
U.S. Cl. D11—153



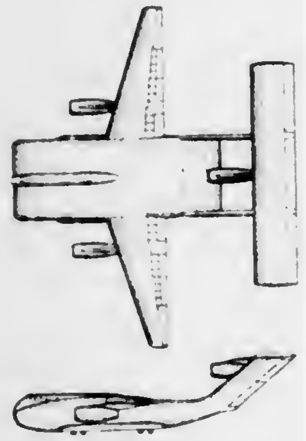
245,156
ARMOURED VEHICLE BODY

Jacques Longeau, Suresnes, France, assignor to Societe Anonyme de Vehicules Industriels et d'Eqipements Mecaniques Saviem, Suresnes, France
Filed Oct. 8, 1975, Ser. No. 620,779
Claims priority, application France, Apr. 10, 1975, 73.780
Term of patent 14 years
Int. Cl. D12—*13*
U.S. Cl. D12—12



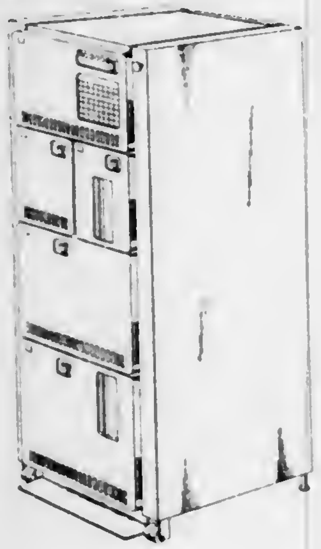
245,157
AIRPLANE

Gerhard Ernst Seidel, Renton, Wash., assignor to The Boeing Company, Seattle, Wash.
Continuation-in-part of Ser. No. 591,973, June 30, 1975, abandoned. This application Feb. 17, 1976, Ser. No. 658,317
Term of patent 14 years
Int. Cl. D12—*07*
U.S. Cl. D12—76



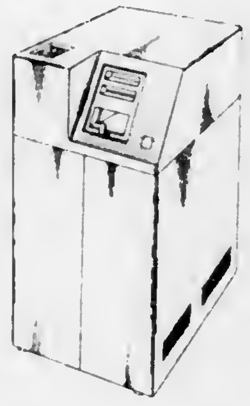
245,158
DATA PROCESSING SYSTEM CONSOLE

Myron Fulenwider Davis, Jr., Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed Apr. 19, 1976, Ser. No. 678,013
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



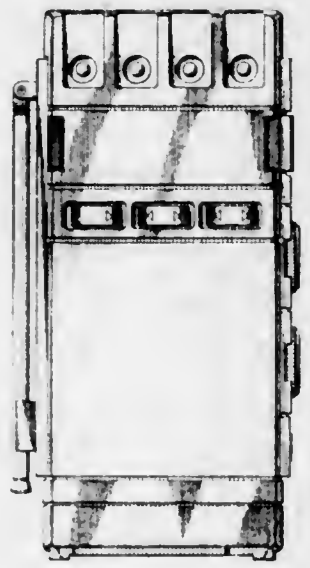
245,159
TEXT PROCESSING CONSOLE

Tommy Ray Hardy, Boca Raton, Fla., assignor to International Business Machines Corporation, Armonk, N.Y.
Filed June 3, 1976, Ser. No. 692,409
Term of patent 14 years
Int. Cl. D14—*02*
U.S. Cl. D14—42



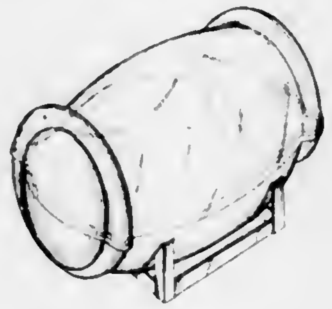
245,160
PORTABLE RADIO

John T. Houlian, Fayetteville, N.Y., assignor to General Electric Company
Filed Dec. 22, 1975, Ser. No. 642,950
Term of patent 14 years
Int. Cl. D14—*03*
U.S. Cl. D14—70



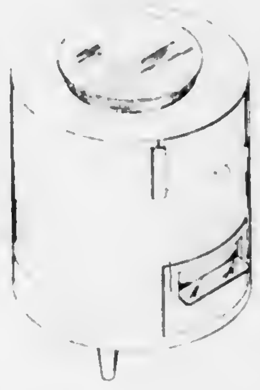
245,161
BEER MUG CHILLER

Timothy Perkins, 17 Greene Ave., Brooklyn, N.Y. 11238
Filed June 20, 1975, Ser. No. 588,676
Term of patent 14 years
Int. Cl. D7—*01*
U.S. Cl. D15—79



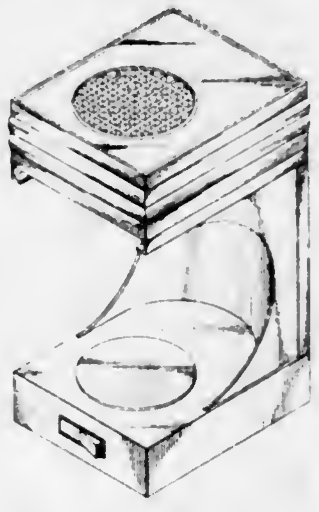
245,162
FOOD OVEN OR SIMILAR ARTICLE

Elvis Simon Zimmer, Andover, Minn., assignor to Jeno F. Paulucci, Duluth, Minn.
Filed Apr. 2, 1976, Ser. No. 673,041
Term of patent 14 years
Int. Cl. D15—*08*
U.S. Cl. D15—108



245,163
COFFEE-MAKER

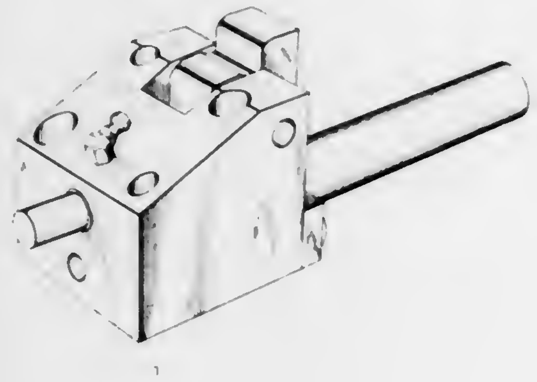
Richard H. George, 7903 Aleta, Spring, Tex. 77373
Filed June 5, 1975, Ser. No. 584,016
Term of patent 14 years
Int. Cl. D7—*04*
U.S. Cl. D15—113



245,164
CAM PUNCH UNIT

James E. Persik, and Gerald E. Persik, both of Menomonee Falls, Wis., assignors to J. J. & M.
Filed May 10, 1976, Ser. No. 684,883
Term of patent 14 years
Int. Cl. D15—*09*

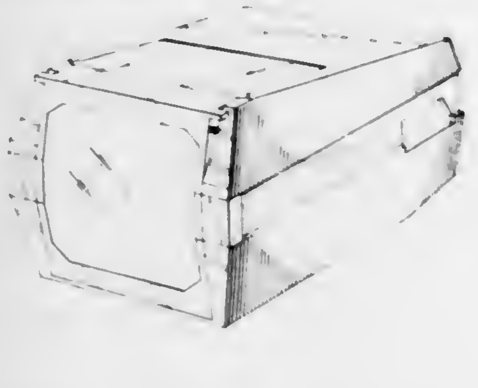
U.S. Cl. D15—128



245,165
HEAD FOR AN OVERHEAD PROJECTOR

Gerald E. Drake, Lucas Township, Dunn County, Minn., assignor to Minnesota Mining and Manufacturing Company
Filed Dec. 19, 1975, Ser. No. 642,479
Term of patent 14 years
Int. Cl. D16—*05*

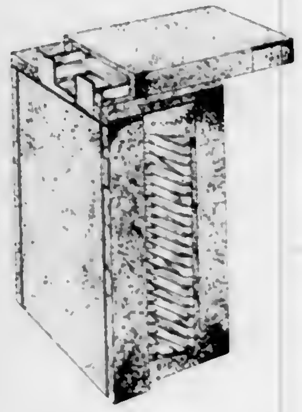
U.S. Cl. D16—26

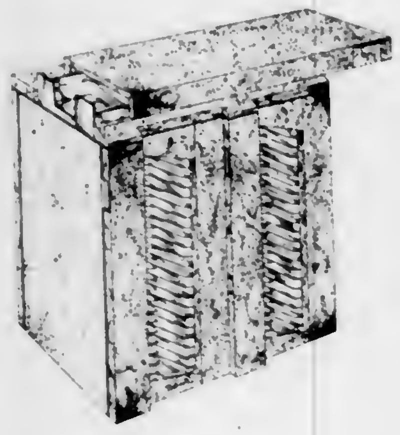


245,166
COLLATOR FOR AN ELECTROPHOTOGRAPHIC APPARATUS

Ernest Michael Bevilacqua, Wilton; Allen Dana Hawthorne, and Eliot Fette Noyes, both of New Canaan, all of Conn., assignors to International Business Machines Corporation, Armonk, N.Y.
Filed Dec. 3, 1975, Ser. No. 637,487
Term of patent 14 years
Int. Cl. D16—*3*

U.S. Cl. D16—32

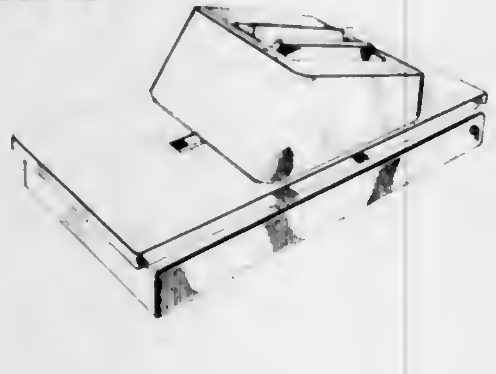




245,167
SPLICER FOR MAGNETIC TAPE

Mario F. Fernandez, and Mervin B. Kronfeld, both of Minneapolis, Minn., assignors to Nortronics Company, Inc., Minneapolis, Minn.
Filed Feb. 17, 1976, Ser. No. 658,539
Term of patent 14 years
Int. Cl. D16—*05*

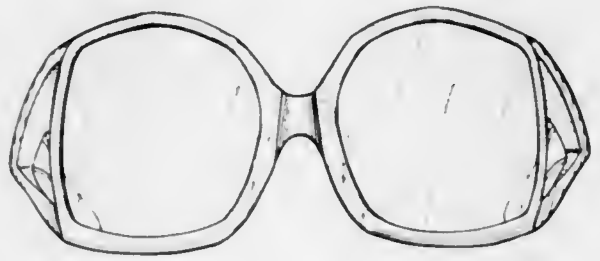
U.S. Cl. D16—41

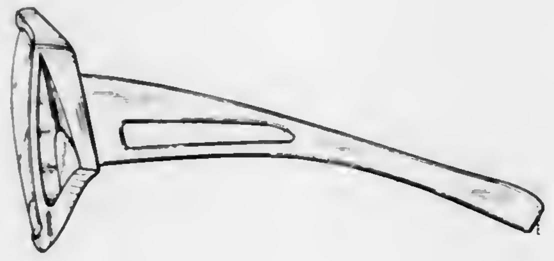


245,168
EYEGLASS FRAME

Hilde Zimmermann, Vienna, Austria, assignor to Christian Dior, S.A.R.L., Paris, France
Filed Oct. 14, 1975, Ser. No. 621,820
Term of patent 14 years
Int. Cl. D16—*06*

U.S. Cl. D16—65

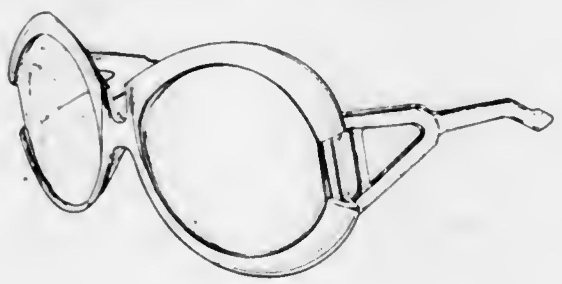




245,169
EYEGLASS FRAME

Elfriede Teufelhart, Vienna, Austria, assignor to Optyl Corporation, Norwood, N.J.
Filed Oct. 21, 1975, Ser. No. 624,331
Term of patent 14 years
Int. Cl. D16—*06*

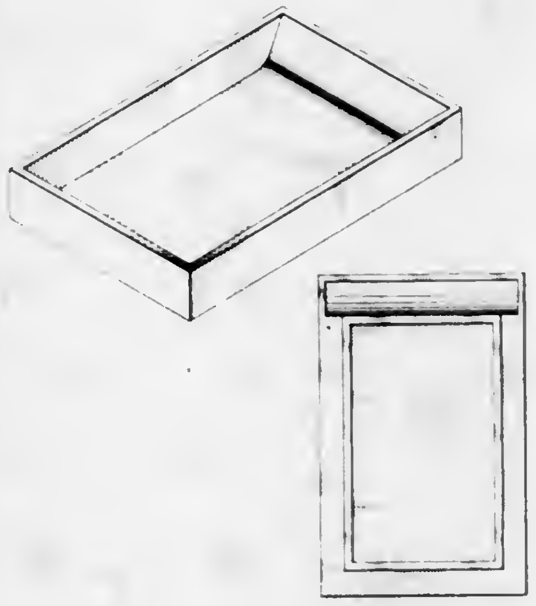
U.S. Cl. D16—65



245,170
NOTE PAPER TRAY

Mel Evenson, Santa Monica, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Filed May 19, 1975, Ser. No. 578,492
Term of patent 14 years
Int. Cl. D19—*02*

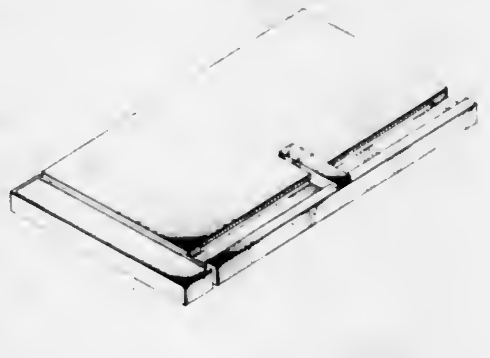
U.S. Cl. D19—92



245,171
LIST FINDER

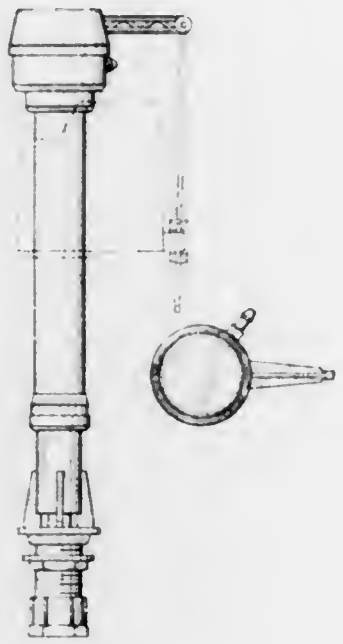
Mel Evenson, Santa Monica, Calif., assignor to Eldon Industries, Inc., Hawthorne, Calif.
Division of Ser. No. 541,425, Jan. 16, 1975, Pat. No. Des. 243,604.
This application July 26, 1976, Ser. No. 708,417
Term of patent 14 years
Int. Cl. D19—*02*

U.S. Cl. D19—76



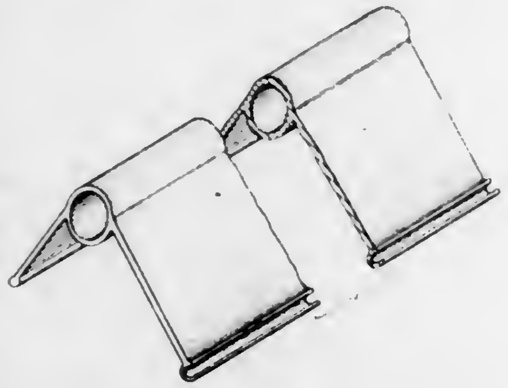
245,172
VERTICALLY ADJUSTABLE BALL COCK

Adolf Schoepe, 1620 N. Raymond Ave., Fullerton, Calif. 92631
Filed July 19, 1976, Ser. No. 706,524
Term of patent 14 years
Int. Cl. D23—*01*
U.S. Cl. D23—40



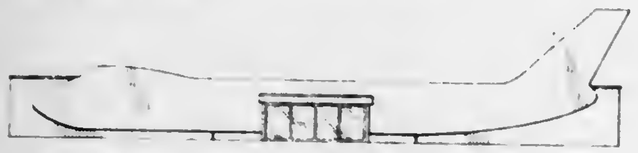
245,173
SOLAR HEAT EXCHANGE ELEMENT

Egon Van Leeuwen, 35 Richmond St., Blackburn, Victoria, Australia (3130)
Filed Oct. 30, 1975, Ser. No. 627,453
Term of patent 14 years
Int. Cl. D23—*03*
U.S. Cl. D23—136



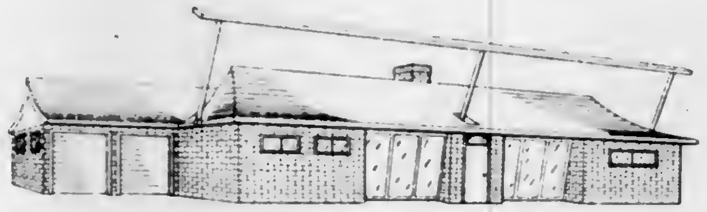
245,174
DISCOTHEQUE BUILDING

James A. Cosentino, Cheektowaga, N.Y., assignor to The Executive, A Motor Hotel of Buffalo, Inc., Buffalo, N.Y.
Filed Dec. 5, 1975, Ser. No. 637,873
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—11



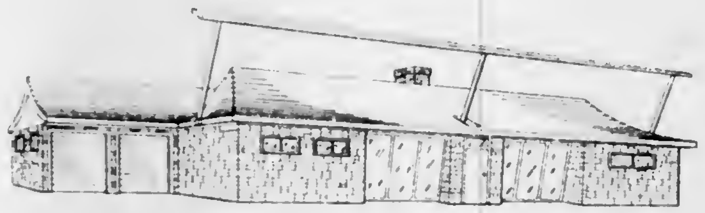
245,175
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,706
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



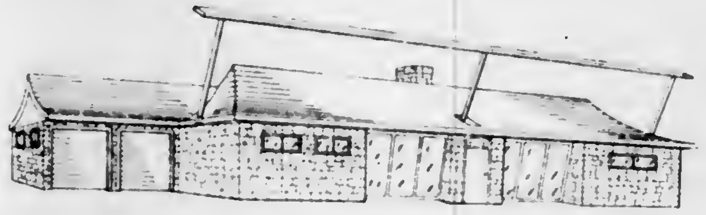
245,176
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,707
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



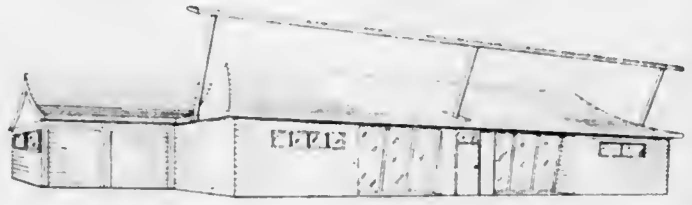
245,177
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,708
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



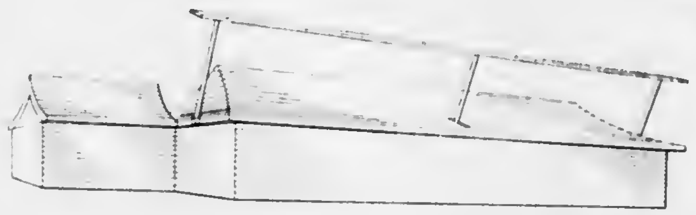
245,178
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 700,709
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



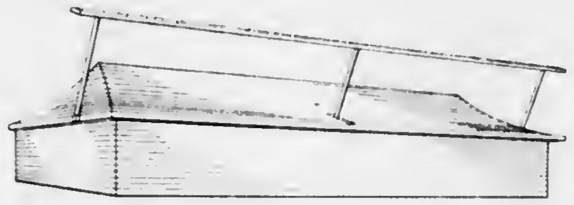
245,179
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 701,010
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



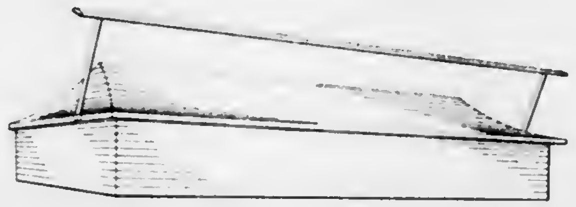
245,180
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 701,043
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



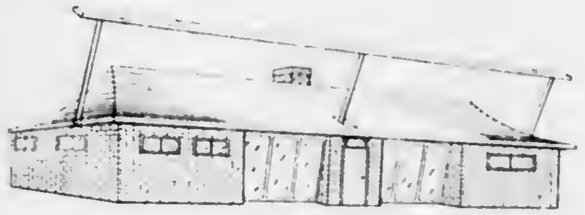
245,181
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed June 29, 1976, Ser. No. 701,044
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



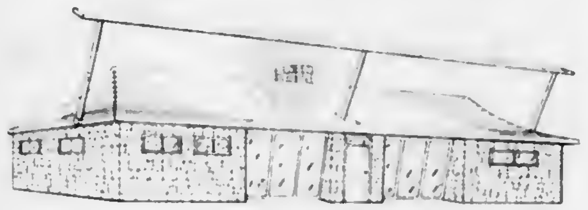
245,182
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Oct. 6, 1976, Ser. No. 729,747
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



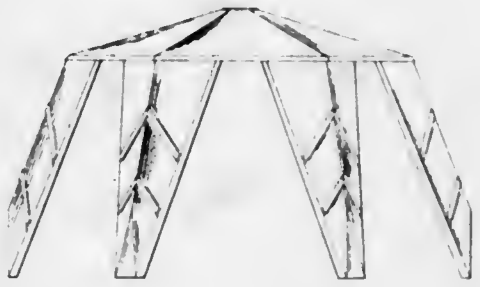
245,183
SOLAR BUILDING

Irwin R. Barr, Lutherville, Md., assignor to AAI Corporation, Cockeysville, Md.
Filed Oct. 6, 1976, Ser. No. 729,748
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—21



245,184
SHELTER

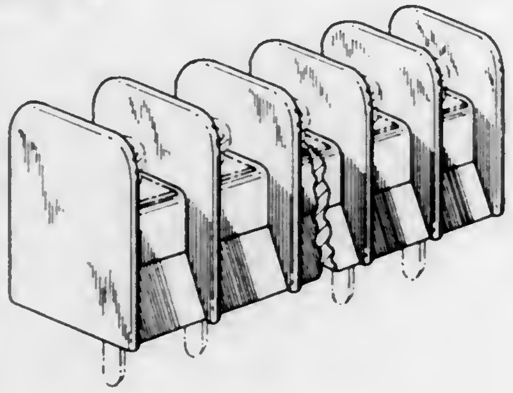
Donald E. Lowman; Ronald L. Hovick, and Virgil E. Sellers, all of Box 633, Cedar Falls, Iowa 50613
Filed Jan. 19, 1976, Ser. No. 650,054
Term of patent 14 years
Int. Cl. D25—*03*
U.S. Cl. D25—56



245,185

TERMINAL BLOCK

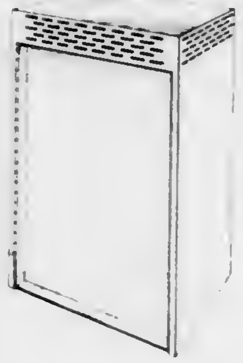
Edward A. Obuch, Linden, N.J., assignor to Amerace Corporation, New York, N.Y.
Filed Feb. 24, 1976, Ser. No. 661,380
Term of patent 14 years
Int. Cl. D13—*03*
U.S. Cl. D13—24



245,186

ELECTRICAL EQUIPMENT CABINET

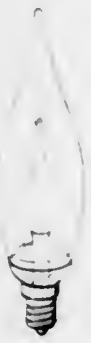
Alfred M. Hase, 6 Manorwood Road, Scarborough, Ontario, Canada
Filed Oct. 24, 1975, Ser. No. 625,390
Term of patent 14 years
Int. Cl. D13—*99*
U.S. Cl. D13—40



245,187

LAMP OR THE LIKE

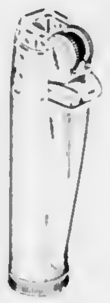
Hideo Moriyama, c/o Moriyama Sangyo Kabushiki Kaisha, 5-10, Nakanobu, 2-chome, Shinagawa, Tokyo, Japan
Filed May 20, 1976, Ser. No. 688,244
Claims priority, application Japan, Dec. 3, 1975, 50-47581
Term of patent 14 years
Int. Cl. D26—*04*
U.S. Cl. D48—33



245,188

GAS LIGHTER

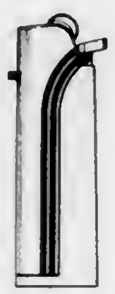
Alfred Racek, Seitenberggasse 50, Vienna 16, Austria
Filed Oct. 17, 1975, Ser. No. 623,247
Claims priority, application Austria, Apr. 23, 1975, 503482/75
Term of patent 7 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



245,189

LIGHTER

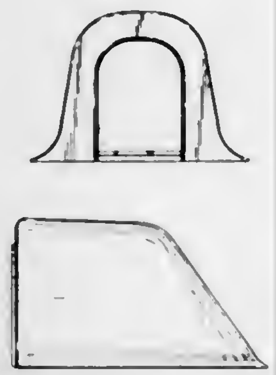
Katsuhisa Terasaki, 43, Okimiya, Edogawa, Tokyo, Japan
Filed Oct. 30, 1975, Ser. No. 627,266
Claims priority, application Japan, July 23, 1975, 50-30617
Term of patent 14 years
Int. Cl. D27—*05*
U.S. Cl. D27—42



245,190

DOGHOUSE

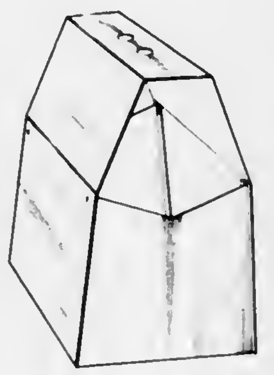
Hiromi Higo, 1320 Princess St., Richmond, Canada (V7E 3S2)
Filed Apr. 7, 1976, Ser. No. 674,640
Term of patent 14 years
Int. Cl. D30—*02*
U.S. Cl. D30—1



245,191

HOUSING FOR CAT LITTER BOX

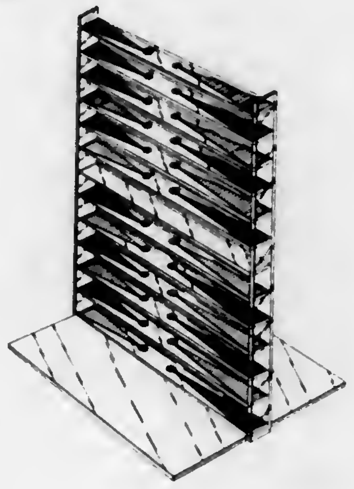
Fred M. Gore, 2808 Oak Lawn, Dallas, Tex. 75219
Filed Mar. 31, 1976, Ser. No. 672,508
Term of patent 7 years
Int. Cl. D30—*99*
U.S. Cl. D30—99



245,192

VERTICAL BACKGAMMON BOARD

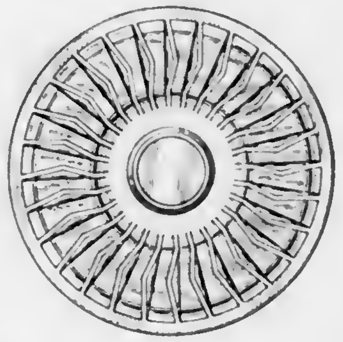
Joseph W. Davis, III, 119 Bidwell Parkway, Buffalo, N.Y. 14222
Filed Feb. 19, 1976, Ser. No. 659,530
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—5 SS



245,193

ROTATABLE CARD HOLDING CARROUSEL

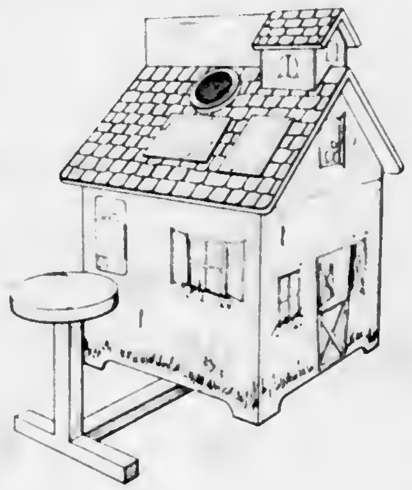
William B. Cooke, Marlboro, and Arthur P. Venditti, Peabody, both of Mass., assignors to General Mills Fun Group, Inc., Minneapolis, Minn.
Filed Dec. 29, 1975, Ser. No. 644,481
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—13 A



245,194

PLAYHOUSE FOR DISPLAYING MOTION PICTURES

George N. Bell, 938 Nature Drive, Duncanville, Tex. 75116
Filed Oct. 20, 1975, Ser. No. 624,101
Term of patent 14 years
Int. Cl. D21—*01*
U.S. Cl. D34—15 LL



245,195
CURTAIN MATERIAL

Peter E. Schroeder, Gardisette International AG, Pilatusstrasse 38,6003 Lucerne, Switzerland

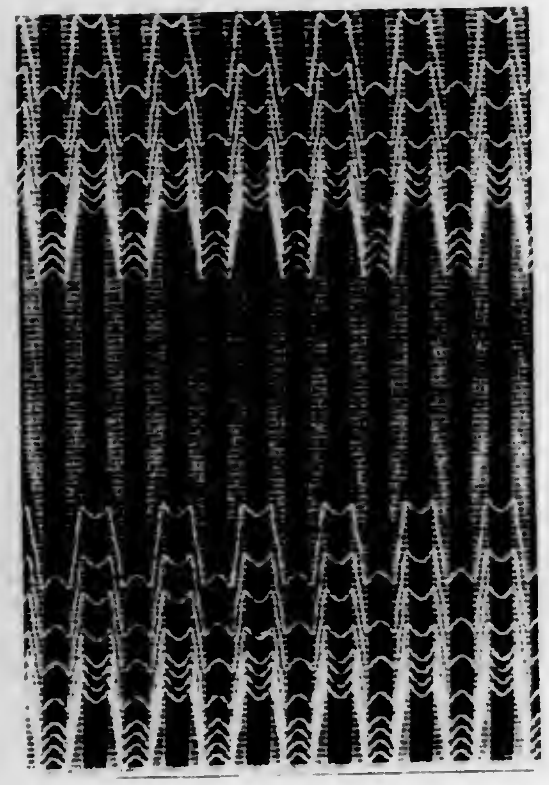
Filed Aug. 25, 1975, Ser. No. 607,840

Claims priority, application Germany, May 26, 1975, URA 360/75

Term of patent 14 years

Int. Cl. D5—*05*

U.S. Cl. D47—6 D



245,196
CURTAIN MATERIAL

Peter E. Schroeder, Gardisette International AG, Pilatusstrasse 38, 6003 Lucerne, Switzerland

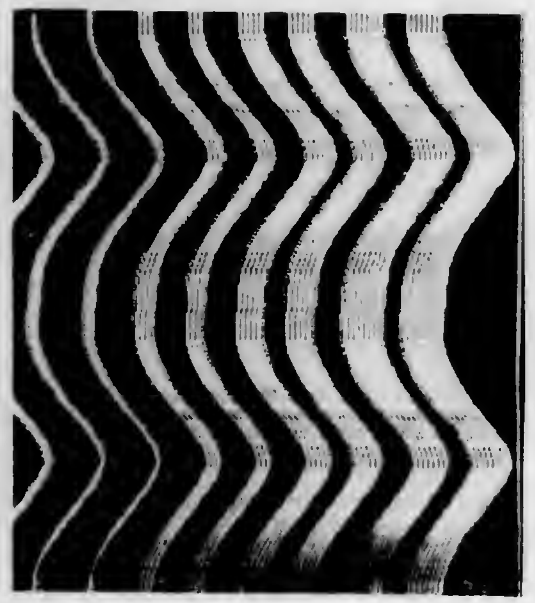
Filed Aug. 25, 1975, Ser. No. 607,603

Claims priority, application Germany, May 26, 1975, URA 360/75

Term of patent 14 years

Int. Cl. D5—*05*

U.S. Cl. D47—6 R



245,197
PORTABLE, ELECTRONIC, REMOTE-CONTROL, WIRELESS KEYBOARD MUSICAL INSTRUMENT

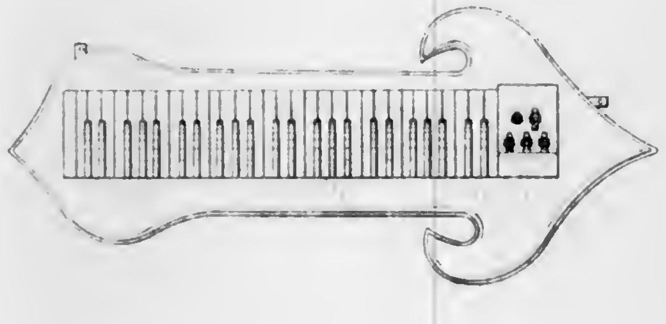
Jerry Lewis Noury, Jr., 522 W. 29th St., New York, N.Y. 10001

Filed July 30, 1975, Ser. No. 600,471

Term of patent 14 years

Int. Cl. D17—*01*

U.S. Cl. D56—1 R



245,198
CLOCK RADIO

Koji Terada, Kawasaki, and Kunio Kitagawa, Tokyo, both of Japan, assignors to Tamura Electric Works, Ltd., Tokyo, Japan

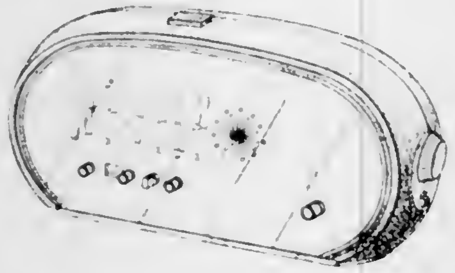
Filed Dec. 5, 1974, Ser. No. 529,606

Claims priority, application Japan, June 8, 1974, 49-19212

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—73



245,199
PORTABLE RADIO

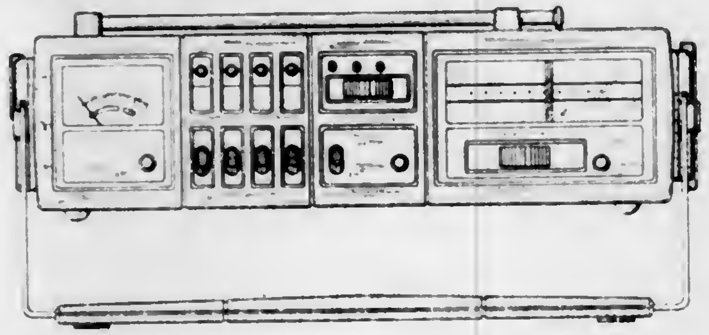
John T. Houlihan, Fayetteville, N.Y., assignor to General Electric Company

Filed May 13, 1975, Ser. No. 577,108

Term of patent 14 years

Int. Cl. D14—*03*

U.S. Cl. D14—70



245,200
PRINTER CONSOLE HOUSING FOR A HAND-HELD CALCULATOR

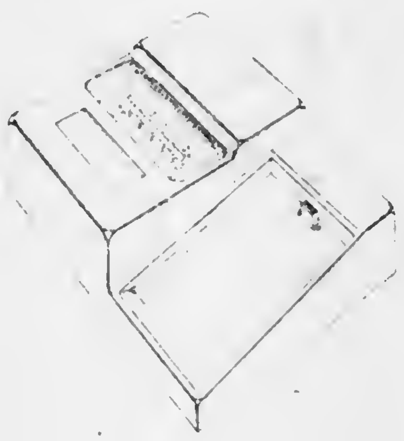
Newton R. Packard, 3994 Toland Circle, Los Alamitos, Calif. 90720

Filed Jan. 20, 1975, Ser. No. 542,264

Term of patent 14 years

Int. Cl. D18—*01*

U.S. Cl. D64—11 B



245,201
TYPE FONT

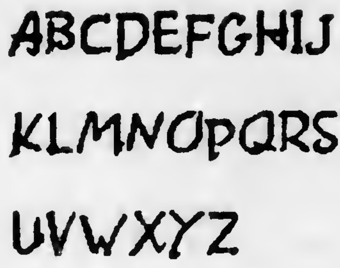
William R. Bitticker, Centerville, Ohio, assignor to The Mead Corporation

Filed Feb. 13, 1976, Ser. No. 657,851

Term of patent 14 years

Int. Cl. D18—*03*

U.S. Cl. D64—12 B



245,202
EAR PROTECTION PLUG SET

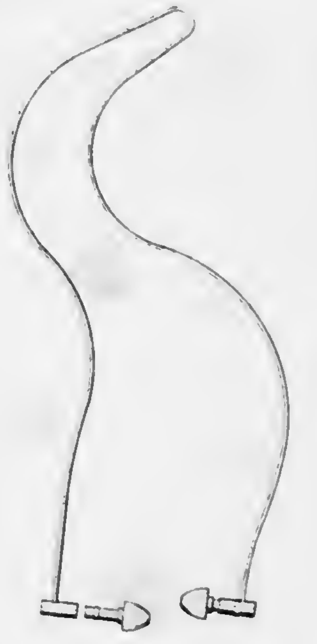
Lambert Carl Curt Asker, Talltitevagen 17, 230 50 Bjarred, Sweden

Filed Sept. 3, 1975, Ser. No. 610,032

Term of patent 14 years

Int. Cl. D24—*04*

U.S. Cl. D24—67



245,203
SPHYGMOMANOMETER

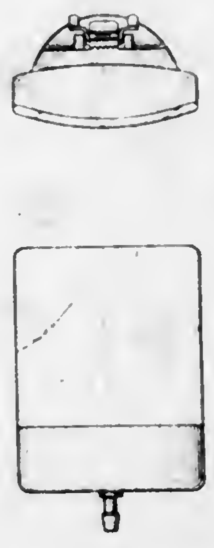
John Cuccio, Westport, Conn., assignor to Sybron Corporation, Rochester, N.Y.

Filed Aug. 27, 1975, Ser. No. 608,144

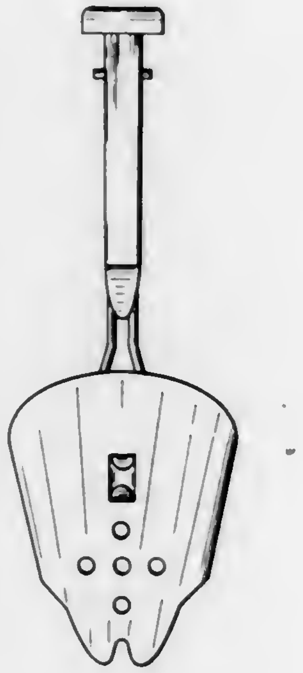
Term of patent 14 years

Int. Cl. D24—*02*

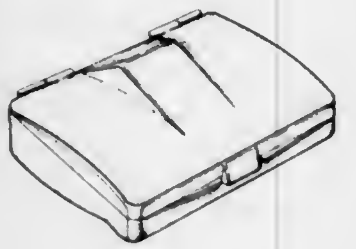
U.S. Cl. D24—21

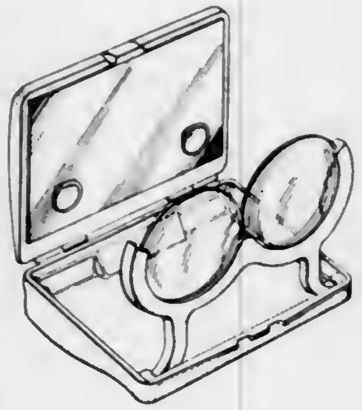


245,204
COMBINED SHOE TREE AND SHOE HORN
Philip J. Walter, 4109 Victoria St., Minnetonka, Minn. 55343
Filed Apr. 28, 1975, Ser. No. 572,520
Term of patent 14 years
Int. Cl. D7—*99*
U.S. Cl. D2—378.1



245,205
EYE MAKE-UP KIT
E. Vincent Santurbane, Centerville, Ohio, assignor to Fashion Optics, Inc.
Filed Nov. 10, 1975, Ser. No. 630,525
Term of patent 14 years
Int. Cl. D28—*03*
U.S. Cl. D28—76





LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JULY, 1977

NOTE—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

- A.C. Nielsen Company: *See—*
  - McAnulty, James C.; and McCarthy, Edwin B., 4,038,504, Cl. 200-11.0DA.
- A. E. Staley Manufacturing Company: *See—*
  - Eastman, James E., 4,038,482, Cl. 536-110.000.
- AB Nike Hydraulik: *See—*
  - Barcella, Giovanni, 4,037,822, Cl. 254-124.000.
- AB Tellusond: *See—*
  - Hill, Jan, 4,037,966, Cl. 356-102.000.
- Abe, Yuji: *See—*
  - Gotoh, Sotoji; Nakamura, Jun; Abe, Yuji; and Matsuo, Tadashige, 4,038,214, Cl. 252-458.000.
- Abitibi Paper Company Ltd.: *See—*
  - Baldwin, Stanley H.; and Willoughby, Arnold E., 4,038,131, Cl. 162-103.000.
- Acme Visible Records, Inc.: *See—*
  - Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., 4,037,780, Cl. 232-31.000.
- Acton, Daniel D.; and Boerstler, John W., to Anchor Hocking Corporation. Safety closure cap with torque control. 4,037,747, Cl 215-219.000.
- Adams, John F. Portable luggage carrier. 4,037,858, Cl. 280-652.000.
- Adams, Lester E.: *See—*
  - Burris, Robert E.; and Adams, Lester E., 4,038,532, Cl. 235-151.300.
- ADCO Buckets, Inc.: *See—*
  - Hemphill, Charles Wayne, 4,037,337, Cl. 37-141.00R.
- Adelman, Robert L., to Du Pont de Nemours, E. I., and Company. Electroplating of polypropylene compositions. 4,038,042, Cl. 428-625.000.
- Adomanite, Yanina Antono: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
- Advanced Instrumentation Inc.: *See—*
  - Gates, Wendall C., 4,037,472, Cl. 73-421.00B.
- Aetna-Standard Engineering Company: *See—*
  - Remner, Robert A.; and Rowland, Leroy V., 4,037,453, Cl. 72-252.000.
  - Schuetz, James W., 4,037,449, Cl. 72-209.000.
  - Schuetz, James W., 4,037,451, Cl. 72-238.000.
- Agency of Industrial Science & Technology: *See—*
  - Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, 4,038,172, Cl. 208-10.000.
  - Yamaga, Joji; and Jido, Morio, 4,038,511, Cl. 219-121.00P.
- AGFA-Gevaert Aktiengesellschaft: *See—*
  - Escales, Eberhard, 4,037,768, Cl. 226-43.000.
  - Meckl, Heinz; Haseler, Helmut; and Seiler, Adolf, 4,038,079, Cl. 96-60.0BF.
  - Schroder, Rolf; and Nicko, Reinhard, 4,038,671, Cl. 354-197.000.
  - Schroder, Rolf, 4,038,673, Cl. 354-222.000.
- AGFA-GEVAERT N.V.: *See—*
  - Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, 4,038,075, Cl. 96-22.000.
  - Willems, Jozef Frans; and Vandenberghe, Antoon Leon, 4,038,083, Cl. 96-94.00R.
- Aglitsky, Vladimir Efimovich: *See—*
  - Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.
- Agosta, Frank L. Appliance and method for facilitating hairpiece attachment. 4,037,274, Cl. 3-1.000.
- Agway, Inc.: *See—*
  - Talbert, Norwood K., 4,038,180, Cl. 210-10.000.
  - Talbert, Norwood K., 4,038,181, Cl. 210-10.000. .
- Ahlen, Karl Gustav, to S.R.M. Hydromekanik Aktiebolag. Resilient driving connection. 4,037,432, Cl. 64-27.00L.
- Ahlschwede, Brian Alvin; and Whisler, Edwin Lee, to Deere & Company. Service brake lock mechanism. 4,037,487, Cl. 74-529.000.
- Aikoh Co., Ltd.: *See—*
  - Takashima, Masaru, 4,038,069, Cl. 75-96.000.
- Airco, Inc.: *See—*
  - Shrader, Alan C., 4,038,484, Cl. 13-31.000.
- Airwick Industries, Inc.: *See—*
  - Hennart, Claude; and Blanc, Rene, 4,037,352, Cl. 43-129.000.
  - Hennart, Claude; Dulat, Marcel; and Blanc, Rene, 4,037,353, Cl. 43-129.000.
- Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., to Eco-Control, Inc. Halogen complexing alcohols and nitriles. 4,038,459, Cl. 429-15.000.
- Ajami, Alfred M.: *See—*
  - Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,038,460, Cl. 429-15.000.
- Akebono Brake Industry Company, Ltd.: *See—*
  - Maehara, Toshifumi, 4,037,689, Cl. 188-1.00A.
- Aktiebolaget Electrolux: *See—*
  - Svanteson, Sven Elis Ake, 4,038,184, Cl. 210-59.000.
- Aktiebolaget Svenska Flaktfabriken: *See—*
  - Strindehag, Ove; and Wrangel, Erik, 4,038,059, Cl. 55-388.000.
- Aktieselskabet Grindstedvaerket: *See—*
  - Eliasson, Rune; and Nedenskov, Poul, 4,038,305, Cl. 260-468.00K.
- Akzona Incorporated: *See—*
  - Jacoby, Charles H., 4,038,443, Cl. 427-136.000.
- Alan White Company, The: *See—*
  - White, Douglas M.; and White, Alga L., 4,037,296, Cl. 24-90.00B.
- Albers, Teunis. Cattle locking apparatus. 4,037,566, Cl. 119-147.000.
- Albert, Jack, to American Lottery Equipment, Inc. Coin operated dispensing machine. 4,037,702, Cl. 194-93.000.
- Albright, Bill E.; D'Aquino, Michael; and Heller, Zindel H., to American Hospital Supply Corporation. Profile analysis pack and method. 4,038,030, Cl. 23-230.00B.
- Albright & Wilson Limited: *See—*
  - Crowther, John Cooper; and Renton, Stanley, 4,038,160, Cl. 204-51.000.
- Alburger, James R. Method of regenerating a glycol-ether type inspection penetrant remover by, solvent extraction. 4,037,466, Cl. 73-104.000.
- Alcan Research and Development Limited: *See—*
  - Carruthers, Andrew Nicolson; Deutschman, John Edward; and Willis, Michael George, 4,038,039, Cl. 23-293.00R.
- Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., to Texas Instruments Incorporated. Calculator-print cradle system. 4,038,535, Cl. 235-152.000.
- Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich. Assembling and repair station of a plant for pneumatic transportation of goods in containers through a pipeline. 4,037,805, Cl. 243-38.000.
- Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; by Zolotarevskaya, Alla Meerovna, administrator; and by Zolotarevskaya, Maiya Vladimirovna, administrator. Ignition system for internal-combustion engines negative bias trigger. 4,037,576, Cl. 123-148.00R.
- Alfred Gutmann Gesellschaft fur Maschinenbau: *See—*
  - Maitra, Sisir Kumar, 4,037,648, Cl. 165-13.000.
- Alfred Herbert Limited: *See—*
  - Harman, Julius, 4,038,591, Cl. 318-578.000.
- Allen-Bradley Company: *See—*
  - Dummermuth, Ernst; Donze, William A.; and Bielawski, Timothy, 4,038,533, Cl. 235-151.110.
- Allen, James Austin, to RCA Corporation. Video disc player apparatus for establishing electrical connection between a stylus electrode and a signal processing circuit. 4,038,682, Cl. 358-128.000.
- Allen, Robert R.: *See—*
  - Smouse, Thomas H.; Maines, James K.; and Allen, Robert R., 4,038,436, Cl. 426-603.000.
- Allied Chemical Corporation: *See—*
  - Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., 4,038,064, Cl. 71-29.000.
  - Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,038,230, Cl. 260-29.60F.
  - O'Handley, Robert Charles; Nesbitt, Ethan Allen; and Mendelsohn, Lewis Isaac, 4,038,073, Cl. 75-170.000.
- Allis-Chalmers Corporation: *See—*
  - Coxhill, Major, 4,037,800, Cl. 241-213.000.
- Allmanna Svenska Elektriska Aktiebolaget: *See—*
  - Larsson, Hans Gunnar, 4,037,305, Cl. 29-421.00R.

- Almosnino, Emanuel, and Almosnino, Susan Draisin. Child carrier. 4,037,764, Cl. 224-6.000.
- Almosnino, Susan Draisin: *See—*
  - Almosnino, Emanuel; and Almosnino, Susan Draisin, 4,037,764, Cl. 224-6.000.
- Alpura Koreco A.G.: *See—*
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  - Lewis, Paul R., 4,037,551, Cl. 113-121.00C.
- Amano, Takashi *See—*
  - Hanyu, Susumu; and Amano, Takashi, 4,037,549, Cl. 112-258.000.
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  - Grosse-Scharmann, Franz; Gattermann, Bernd; and Steenken, Bernhard, 4,037,759, Cl. 222-142.000.
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  - Fleming, Robert S., 4,037,925, Cl. 350-97.000.
- American Can Company: *See—*
  - Meyers, George Leroy; and Pawlowski, Thomas Dominic, 4,037,776, Cl. 229-43.000.
  - Wallace, Sydney Johnstone, 4,037,329, Cl. 34-4.000.
  - Zofko, David Edward, 4,037,550, Cl. 113-120.00Y.
- American Chain & Cable Company, Inc.: *See—*
  - Johnson, Richard B., 4,037,738, Cl. 214-38.0CC.
- American Cyanamid Company: *See—*
  - Lies, Thomas Andrew; and Clapp, James Wellington, 4,038,288, Cl. 260-329.00S.
  - Thompson, Harold Godfred, 4,038,220, Cl. 260-3.000.
  - Tobkes, Martin, 4,038,315, Cl. 260-559.0AT.
  - Wright, Donald Perry, Jr., 4,038,403, Cl. 424-269.000.
- American Electronic Laboratories, Inc.: *See—*
  - Van Cleave, James R., 4,038,539, Cl. 235-156.000.
- American Home Products Corporation: *See—*
  - Strike, Donald P., 4,038,308, Cl. 260-514.00D.
- American Hospital Supply Corporation: *See—*
  - Albright, Bill E.; D'Aquino, Michael; and Heller, Zindel H., 4,038,030, Cl. 23-230.00B.
  - Huempfner, David F.; and Tringali, Richard C., 4,037,291, Cl. 16-35.00R.
- American Lottery Equipment, Inc.: *See—*
  - Albert, Jack, 4,037,702, Cl. 194-93.000.
- American Optical Corporation: *See—*
  - Dusza, Robert J.; and Kantorski, Joseph W., 4,038,014, Cl. 425-388.000.
  - Fuller, Henry Edward, Jr., 4,038,666, Cl. 346-136.000.
- Amos, Robert Walter James: *See—*
  - Drake, Cyril Francis; and Amos, Robert Walter James, 4,038,430, Cl. 427-248.00E.
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  - Acton, Daniel D.; and Boerstler, John W., 4,037,747, Cl. 215-219.000.
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  - Roth, Thomas P., 4,038,057, Cl. 55-270.000.
- Anderson, Arnold L., to Velsicol Chemical Corporation. Plastic compositions. 4,038,248, Cl. 260-45.75R.
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- Anderson, Donald J., to Chevron Research Company. Method of recovering viscous petroleum from an underground formation. 4,037,658, Cl. 166-272.000.
- Anderson, Leslie T.; Thompson, Arthur D.; and Kairbara, Iamo, to Emco Ltd. Pipe coupling. 4,037,864, Cl. 285-342.000.
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- Andreasen, George F., to University of Iowa Research Foundation, The. Method and system for orthodontic moving of teeth. 4,037,324, Cl. 32-14.00A.
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  - Wagner, Kuno; and Andres, Karlheinz, 4,038,198, Cl. 252-182.000.
- Andrews, Catherine C.; Klausmeier, Robert E.; and Osmon, Jerald L., to United States of America, Navy. Method for degrading aromatic explosive solutions. 4,038,116, Cl. 149-105.000.
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- Anhalt, John W.; and Curley, James H., to International Telephone and Telegraph Corporation. Electrical connector. 4,037,911, Cl. 339-217.00S.
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- Aoki, Teiji Audio-visual cartridge and player. 4,037,951, Cl. 353-19.000.
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  - Arakawa, Yoshiaki; Aoyanagi, Isamu, and Matsumoto, Saburo, 4,037,463, Cl. 73-341.000.
- Apen, John Robert; and Bray, William Homer, Jr., to Bell Telephone Laboratories, Incorporated. Shielded multipair cable. 4,038,487, Cl. 174-36.000.
- Apirina, Evgenia Grigorievna: *See—*
  - Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.
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- Arena, Thomas. Nail holding device. 4,037,632, Cl. 145-46.000.
- Arevalo, Luis Jorge Velandia. Hand-driven water craft. 4,037,557, Cl. 115-24.000.
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  - Patil, Arvind S.; Argade, Shyam D.; and Collins, Stephen M., 4,038,365, Cl. 423-161.000.
- Arikawa, Yoshiyuki: *See—*
  - Thatcher, Donald N.; and Arikawa, Yoshiyuki, 4,038,321, Cl. 260-583.00B.
- Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, to Bridgestone Tire Company Limited. Pneumatic radial tires. 4,037,637, Cl. 152-352.00R.
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- Armstrong, Donald E.: *See—*
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- Arnold, Bruce K.; and Yamamoto, Stephen K., to International Telephone and Telegraph Corporation. Electrical connector. 4,037,904, Cl. 339-64.00R.
- Arnold, Fred E.; and Hedberg, Frederick L., to United States of America, Air Force. Phenylethynyl substituted aromatic diamines. 4,038,320, Cl. 260-578.000.
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  - Kobayashi, Tadahiro; Wakita, Eiichi; Fukuda, Hideo; and Matsubayashi, Yukio, 4,038,452, Cl. 428-224.000.
- Asaoka, Leo K., to Talley-Frac Corporation. Well-fracturing explosive composition. 4,038,112, Cl. 149-2.000.
- ASEA Aktiebolag: *See—*
  - Stenkvist, Sven Einar, 4,038,483, Cl. 13-11.000.
- Ashauer, Karl; and Mihatsch, Hansjorg, to Volkswagenwerk Aktiengesellschaft. Bearing arrangement for axle or shafts provided with rotating gears in a differential gear box. 4,037,492, Cl. 74-710.000.
- Ashton, Richard F., to Reynolds Metals Company. Vertical welding of thick aluminum members. 4,038,514, Cl. 219-126.000.
- Asplundh Tree Expert Company: *See—*
  - Moyer, Richard A.; and Patton, Joseph D., 4,037,684, Cl. 182-2.000
- Assaraf, Simon: *See—*
  - Shabtai, Joseph; and Assaraf, Simon, 4,037,440, Cl. 70-108.000.
- Astro: *See—*
  - Davitz, Daniel M., 4,038,074, Cl. 75-171.000.
- Atasoy, Kaya; Weckwarth, Karl Franz; and Reinhardt, Walter, to Ciba-Geigy Corporation. Process for the production of poly-N-vinylpyrrolidone granules containing iodide. 4,038,476, Cl. 528-485.000.
- Atherton, Robert Allan; and Cole, Carroll Richard, to Caterpillar Tractor Co. Motor grader with blade clamping mechanism. 4,037,670, Cl. 172-795.000.
- Atkins, Lyle D., to Wallace-Atkins Oil Corporation. Process and apparatus for the destructive distillation of waste material. 4,038,152, Cl. 201-2.500.
- Atkins, Thomas Joseph, to Du Pont de Nemours, E. I., and Company. Tricyclic phosphorous triamides. 4,038,312, Cl. 260-551.00P.
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  - Vorachek, James H.; and Washall, Thomas A., 4,038,375, Cl. 423-510.000.
  - Washall, Thomas A.; and Morgan, Harry, 4,038,377, Cl. 423-510.000.
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  - Kimber, Erich Voldemar; and Ronne, Per-Axel Carsten, 4,037,671, Cl. 173-2.000.
- Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, to Mitsubishi Jukogyo Kabushiki Kaisha. Process for the removal of SO_x and NO_x from waste gases using alkali metal or alkaline earth metal iodide. 4,038,367, Cl. 423-235.000.
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  - Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.
  - Ruf, Max, 4,037,455, Cl. 72-324.000.
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  - Feezor, Michael D., 4,038,496, Cl. 179-1.00N.
- Auer, Robert Edward; and Tucker, Howard E., to Coulter Electronics, Inc. Method and apparatus for simultaneous optical measurement of particle characteristics. 4,038,556, Cl. 250-575.000.
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  - King, Robert W., 4,038,440, Cl. 428-245.000.
- Azelton, Claud: *See—*
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- Azinger, Frederick A., Jr.: *See—*
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- B.C. Investments Ltd.: *See—*
  - Connelly, Brian W., 4,037,978, Cl. 403-164.000.
- B. F. Goodrich Company, The: *See—*
  - Cohen, Louis, 4,038,473, Cl. 526-62.000.
- Baal-Taxa, Baruch. Building structure. 4,037,376, Cl. 52-280.000.
- Bachinger, Peter, to International Standard Electric Corporation. Toggle or the like. 4,037,884, Cl. 308-2.00R.
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  - Bailey, Henry E.; Bailey, Dennis H.; and Bailey, Richard E., 4,037,570, Cl. 123-47.00A.
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  - Lien, Neil C., 4,037,654, Cl. 166-88.000.
- Baker, Robert M. Pick up apparatus. 4,037,868, Cl. 294-19.00R.
- Bakun, Paul; and Porter, Clifford. Solar heating system and panels. 4,037,583, Cl. 126-271.000.
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  - Balzer, Claude P.; Reiff, Almer A.; and Corman, Edward M., 4,037,374, Cl. 52-179.000.
- Baldwin, Stanley H.; and Willoughby, Arnold E., to Abitibi Paper Company Ltd. Short cycle pressed fiberboard manufacturing process. 4,038,131, Cl. 162-103.000.
- Baldwin, William I.: *See—*
  - Buchele, Wesley F.; and Baldwin, William I., 4,037,396, Cl. 56-255.000.
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  - Loran, Thomas J.; Friebel, Virgil R.; and Pardee, Robert P., 4,038,453, Cl. 428-325.000.
  - Turner, Edwin M., 4,038,662, Cl. 343-752.000.
- Ball, Ervin Matthew, to RCA Corporation. Vacuum tube gas test apparatus. 4,038,616, Cl. 324-20.0CR.
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  - Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., 4,037,325, Cl. 33-125.00C.
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  - Hooker, Donald E., 4,037,845, Cl. 273-138.00A.
- Balme, Maurice; Gattus, Jean; and Gerard, Bernard, to Rhone-Poulenc S.A. Thixotropic aqueous polyimide compositions. 4,038,450, Cl. 428-268.000.
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- Barbour, William P. Imprinter. 4,037,534, Cl. 101-269.000.
- Barcella, Giovanni, to AB Nike Hydraulik. Scissors jack. 4,037,822, Cl. 254-124.000.
- Bard, Howard B., to United States of America, Navy. Redundant óscillator for clocking signal source. 4,038,608, Cl. 331-56.000.
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  - Barnebey, Herbert L., 4,038,154, Cl 202-93.000.
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  - Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, 4,038,296, Cl. 260-410.600.
  - Hoch, Helmut; and Quadbeck-Seeger, Hans-Juergen, 4,038,309, Cl. 260-520.00A.
  - Hoffmann, Werner; and von Fraunberg, Karl, 4,038,330, Cl. 260-648.00C.
  - Kiefer, Hans; and Naarmann, Herbert, 4,038,311, Cl. 260-544.00C.
  - Weitz, Hans-Martin; and Hartig, Juergen, 4,038,307, Cl. 260-497.00A.
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  - Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.
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- Battenfeld Maschinenfabriken GmbH: *See—*
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- Bauer, Werner R.; and Sepso, Roger P., to Robertshaw Controls Company. Method of making fluid operated electrical switch construction. 4,037,317, Cl. 29-622.000.
- Bauer, William. Method of playing baseball. 4,037,837, Cl. 273-25.000.
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- Baumgartner, Hans R.; and Skrovanek, Stephen D., to Norton Company. Strengthening reaction sintered silicon nitride. 4,038,092, Cl. 106-73.400.
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  - Macemon, James H., 4,037,960, Cl. 356-73.000.
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  - Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 4,038,399, Cl. 424-266.000.
  - Frank, Walter; Raichle, Karl; Bendszus, Otto; and Patheiger, Manfred, 4,038,340, Cl. 260-861.000.
  - Hugl, Herbert; and Wolfrum, Gerhard, 4,038,240, Cl. 260-37.00N.
  - Ippen, Jakob; and Stuttgen, Friedel, 4,037,635, Cl. 152-301.000.
  - Koster, Johan Bernhard; Meiners, Hans Joachim; and Moretto, Hans Heinrich, 4,038,221, Cl. 260-2.5AH.
  - Lailach, Gunter, 4,038,364, Cl. 423-86.000.

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Hwang, Frank Kwangming, 4,038,638, Cl. 340-166.00R.
Marr, George; and Smith, George Elwood, 4,038,107, Cl. 148-1.500.
Presby, Herman Melvin, 4,038,062, Cl. 65-2.000.
Reznicek, Kurt, 4,037,749, Cl. 220-2.30R.
Smith, George Elwood, 4,037,307, Cl. 29-571.000.
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Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., 4,038,497, Cl. 179-15.0AT.
Belleson, James Garman; and Clark, Kendall, to International Business Machines Corporation. Inspection tool. 4,037,941, Cl. 350-285.000.
Belleson, James Garman; and Clark, Kendall, to International Business Machines Corporation. Inspection tool. 4,037,971, Cl. 356-199.000.
Belmares-Sarabia, Hector. Polymerizable ethylenically unsaturated N-substituted 2,2-dihydro carbyl-2,1,3-benzostanna-thiazolines. 4,038,300, Cl. 260-429.700.
Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna. Method of producing thickened electrolyte for primary cell. 4,038,466, Cl. 429-190.000.
Bendszus, Otto: *See—*
Frank, Walter; Raichle, Karl; Bendszus, Otto; and Patheiger, Manfred, 4,038,340, Cl. 260-861.000.
Benkoe, Erwin: *See—*
Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.
Bennett, Richard H.: *See—*
Brockington, James W.; and Bennett, Richard H., 4,038,212, Cl. 252-436.000.
Bennett, Robert R.; and Byerley, Wilbur M., to Westinghouse Electric Corporation. Flow distribution arrangement for a steam generator. 4,037,569, Cl. 122-32.000.
Benson, John O. Continuous grain drier and method. 4,038,021, Cl. 432-112.000.
Benson, Nigel Colin; and Mehta, John Dorab, to Imperial Chemical Industries Limited. Production of thermoplastic films. 4,038,121, Cl. 156-157.000.
Benson, Robert D. Scraper device having receptacle walls heated by engine exhaust. 4,037,336, Cl. 37-124.000.
Beranek, Robert Louis, Jr.; and Timms, Donny Lee, to Johns-Manville Corporation. Method and apparatus for making a fibrous board-like product having a male edge and a female edge. 4,038,356, Cl. 264-160.000.
Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., to Eli Lilly and Company. Antibiotic A-28086 and process for production thereof. 4,038,384, Cl. 424-122.000.
Berg, Harry, to H. B. Contracting Ltd. Buoyancy apparatus. 4,037,425, Cl. 61-112.000.
Bergougnoux, Rene; and Delafosse, Jacques, to Commissariat a l'Energie Atomique. Plate type nuclear fuel element and a method of fabrication of said element. 4,038,135, Cl. 176-68.000.
Bergvall, Bengt Allan, to Facit Aktiebolag. Thermal printing head. 4,038,516, Cl. 219-216.000.
Berline, Sylvain Dominique Daniel Leonce. Vacuum belt filters. 4,037,338, Cl. 210-77.000.
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Berry, Peter John: *See—*
Runciman, Herbert Morrison; and Berry, Peter John, 4,037,920, Cl. 350-7.000.
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Grisar, Ulrich; and Berstermann, Wilhelm, 4,037,962, Cl. 356-86.000.
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Besozzi, Alfio J.; and Foster, Alan W., to Petro-Tex Chemical Corporation. Purification of unsaturated compounds. 4,038,336, Cl. 260-680.00E.
Besser, Helmut Siegfried; Kieven, Gunter; and Wettlauffer, Jurgen, to International Business Machines Corporation. Terminal assembly. 4,037,912, Cl. 339-198.00R.
Beswick, Paul R. Variable O-ring control valve. 4,037,623, Cl. 137-599.000.
Bethards, Charles William, to Motorola, Inc. Transmitter modulation limiter. 4,038,603, Cl. 325-182.000.
Bharat, Ramasesha. Frequency divider using a charged coupled device. 4,038,565, Cl. 307-225.00C.
Bhasin, Madan Mohan, to Union Carbide Corporation. Supported metal catalyst, methods of making same, and processing using same. 4,038,175, Cl. 208-144.000.
Bibb Company, The: *See—*
Kearney, John A., 4,038,027, Cl. 8-120.000.
BICC Limited: *See—*
Beal, Richard Ernest, 4,037,923, Cl. 350-96.00B.
Bielawski, Timothy: *See—*
Dummermuth, Ernst; Donze, William A.; and Bielawski, Timothy, 4,038,533, Cl. 235-151.110.
Bigbee, Marvin Lee: *See—*
Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, 4,037,740, Cl. 214-83.140.
Bille, Heinz: *See—*
Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, 4,038,296, Cl. 260-410.600.
Billings, John S., Jr.: *See—*
Meyer, Jeffry R.; and Billings, John S., Jr., 4,038,486, Cl. 174-28.000.
Bio-Degradable Plastics, Inc.: *See—*
Swanholm, Carl E.; and Caldwell, Robert G., 4,038,227, Cl. 260-23.00H.
Bio-Medicus, Inc.: *See—*
Rafferty, Edson Howard; and Kletschka, Harold D., 4,037,984, Cl. 415-60.000.
Birch, John R., to G. D. Searle & Co., Limited. Cell culture medium. 4,038,139, Cl. 195-1.800.
Birch, Terrell C.: *See—*
Peng, Ting-fu; and Peng, Eng-Chin, 4,037,359, Cl. 47-14.000.
Birchall, James Derek; Cassidy, John Edward; and Grice-Hutchinson, Edward Henry, to Imperial Chemical Industries Limited. Aqueous dispersion of fluorocarbon polymer and halogen-containing complex phosphate of aluminum. 4,038,234, Cl. 260-29.60F.
Bird, Forrest M. Pressure unloading valve device for compressor. 4,037,994, Cl. 417-316.000.
Birney, Richard Eugene; and Davis, Michael Ian, to International Business Machines Corporation. Non-translatable storage protection control system. 4,038,645, Cl. 364-200.000.
Bissel, Dennis Ray: *See—*
Stenson, Derek William; and Bissel, Dennis Ray, 4,038,489, Cl. 174-70.00R.
Bittermann, Dietmar; Hunt, Kevin; Klein, Klaus; and Rau, Peter, to Siemens Aktiengesellschaft. Nuclear reactor with suspended fuel assemblies having secondary emergency suspensions. 4,038,133, Cl. 176-38.000.
Bjornson, Geir; and Walters, Harold C., to Phillips Petroleum Company. Acid anhydride to react with impurities in the production of perfluorocarboxylic acids. 4,038,310, Cl. 260-539.00A.
Blackman, Calvin C. In-furnace recuperator. 4,038,022, Cl. 431-166.000.
Blackman, Morris V.; and Jenner, Michael D., to U.S. Philips Corporation. Methods of manufacturing infra-red detector elements. 4,037,311, Cl. 29-593.000.
Blair, Stephen A.: *See—*
Medlin, Eric G.; Blair, Stephen A.; and Dennis, Richard H., 4,037,856, Cl. 280-446.00B.

Blanc, Rene: *See—*
Hennart, Claude; and Blanc, Rene, 4,037,352, Cl. 43-129.000.
Hennart, Claude; Dulat, Marcel; and Blanc, Rene, 4,037,353, Cl. 43-129.000.
Block Engineering, Inc.: *See—*
Hirschfeld, Tomas, 4,037,760, Cl. 222-145.000.
Varano, Antonio; and Tobias, Reginald, 4,038,055, Cl. 55-197.000.
Blumenthal, Oreste, to S.p.A. Giuseppe Ratti Industria Ottica. Flexible bar for spectacle-frames. 4,037,946, Cl. 351-114.000.
Bocharova, Svetlana Leonidovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., to Owens-Illinois, Inc. Gas discharge display device having offset electrodes. 4,038,577, Cl. 313-188.000.
Boden, Karl; and Geweke, Werner, to Padana AG. Bearings. 4,037,886, Cl. 308-10.000.
Boehm, Vicky Williams; and Broyde, Barret, to Western Electric Company, Inc. Reclamation processing of polyvinyl chloride-scrap materials and products produced thereby. 4,038,219, Cl. 260-2.300.
Boehringer Ingelheim GmbH: *See—*
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,038,314, Cl. 260-556.00N.
Merz, Herbert; Langbein, Adolf; Walther, Gerard; and Stockhaus, Klaus, 4,038,397, Cl. 424-260.000.
Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,038,279, Cl. 260-268.0BQ.
Boehringer Mannheim G.m.b.H.: *See—*
Jaworek, Dieter; Maier, Joseph; and Nelbock-Hochstetter, Michael, 4,038,140, Cl. 195-63.000.
Boeing Company, The: *See—*
James, Varnell L., 4,038,118, Cl. 156-143.000.
Laird, George William, 4,037,988, Cl. 416-141.000.
Boerstler, John W.: *See—*
Acton, Daniel D.; and Boerstler, John W., 4,037,747, Cl. 215-219.000.
Bogert, David L.: *See—*
Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., 4,037,706, Cl. 197-54.000.
Bolger, Bernard J.: *See—*
O'Sullivan, Denis J.; and Bolger, Bernard J., 4,038,345, Cl. 260-881.000.
Boll, Dietmar: *See—*
Reis, Walter; and Boll, Dietmar, 4,037,731, Cl. 214-1.0BB.
Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, to Rowenta-Werke GmbH. Element guards for electric toasters. 4,038,520, Cl. 219-521.000.
Bolt Associates, Inc.: *See—*
Chelminski, Stephen V., 4,038,630, Cl. 340-7.00R.
Bom, Cornelis Johannes Gerardus: *See—*
van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,037,669, Cl. 172-59.000.
Bondarenko, Raisa Ivanovna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Bondi, Herman H. Molding composition. 4,038,094, Cl. 106-99.000.
Booth, William M.; and Rieth, James E., to Reith, James E. Trolling apparatus. 4,037,326, Cl. 33-139.000.
Borg-Warner Corporation: *See—*
Ivey, John Saxon, 4,037,691, Cl. 192-3.310.
Poklacki, Erwin Sigmund; and Kalnajs, Reinis, 4,038,207, Cl. 252-316.000.
Roberts, Richard W., 4,037,993, Cl. 417-222.000.
Borofka, Robert P.; and Barton, Lynn R., to International Telephone and Telegraph Corporation. Swept oscillator automatic linearizer. 4,038,612, Cl. 331-178.000.
Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, to Bayer Aktiengesellschaft. 1,4-Dihydropyridine carboxylic acid esters useful as coronary vessel dilators and anti-hypertensives. 4,038,399, Cl. 424-266.000.
Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodepositable compositions. 4,038,166, Cl. 204-181.000.
Bosso, Joseph F.; and Wismer, Marco, to PPG Industries, Inc. Electrodepositable compositions containing sulfonium resins and capped polyisocyanates. 4,038,232, Cl. 260-29.6TA.

Bost, John D.: *See—*
Williams, Tudor; and Bost, John D., 4,038,063, Cl. 65-22.000.
Boswell, Kay H.: *See—*
Robins, Roland K.; Shuman, Dennis A.; and Boswell, Kay H., 4,038,480, Cl. 536-27.000.
Bott, John A. License plate holder. 4,037,342, Cl. 40-209.000.
Bottos, Bela. Brush for cleaning whitewall tires. 4,037,285, Cl. 15-160.000.
Bougain, Georges, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Coupling device for gas turbine engine. 4,037,404, Cl. 60-223.000.
Bouknecht, Max Abbott; Bourke, Donall Garraid; and Vergari, Louis Peter, to International Business Machines Corporation. Common polling logic for input/output interrupt or cycle steal data transfer requests. 4,038,641, Cl. 364-900.000.
Bouknecht, Max Abbott; Davis, Michael Ian; and Vergari, Louis Peter, to International Business Machines Corporation. Input/output interface logic for concurrent operations. 4,038,642, Cl. 364-900.000.
Bourgraf, Elroy E.; and Self, Kenneth R., to Ferno-Washington, Inc. Multiple purpose ambulance cot with removable stretcher top. 4,037,871, Cl. 296-20.000.
Bourke, Donall Garraid: *See—*
Bouknecht, Max Abbott; Bourke, Donall Garraid; and Vergari, Louis Peter, 4,038,641, Cl. 364-900.000.
Bourque, Rene, to Garcia Corporation. Mold filling system. 4,037,758, Cl. 222-134.000.
Bouwhuis, Gijsbertus; and Velzel, Christiaan Hendriks Frans, to U.S. Philips Corporation. Apparatus for reading an optically recorded record carrier provided with periodic surface undulations and for deriving a focussing control signal from such surface undulations. 4,038,679, Cl. 358-127.000.
Bove, Ronald; and Hubacher, Eric M., to International Business Machines Corporation. High density wafer contacting and test system. 4,038,599, Cl. 324-158.00F.
Bowling, Leslie. Automated bailing apparatus in flexible combination for bailing shallow wells. 4,037,662, Cl. 166-311.000.
Bowyer, Alta M.; Hinckley, George B.; and Davis, James E., to Leffingwell Chemical Company. Protection of horticultural growth. 4,038,385, Cl. 424-166.000.
Box, Theodor M. Transport-display case. 4,037,750, Cl. 220-4.00E.
Boxall, Frank S. Central office switching system with remote line switch. 4,038,498, Cl. 179-18.0FC.
Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., to Corning Glass Works. Composite glass articles spontaneous opal glass and enamel of Li_2-O-B_2-O_3-TiO_2-ZrO_2-PbO-SiO_2. 4,038,448, Cl. 428-212.000.
Boyes, Bryan; and Jones, Alan, to Imperial Chemical Industries Inc. Manufacture of synthetic filaments. 4,038,357, Cl. 264-168.000.
Boyle, Kenneth E. Universal bag support. 4,037,778, Cl. 229-55.000.
Bradford, George J., to International Telephone and Telegraph Corporation. Reduced outside air capability for unit ventilators. 4,037,783, Cl. 236-49.000.
Braginski, Aleksander I.; and O'Keeffe, Terence W., to Westinghouse Electric Corporation. Hard magnetic bubble domain analog multiplier. 4,038,541, Cl. 235-194.000.
Braig, Siegfried: *See—*
Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,038,418, Cl. 424-358.000.
Braitinger, Helmut: *See—*
Fetzer, Helmut; Schneider, Franz; and Braitinger, Helmut, 4,037,730, Cl. 214-1.0BB.
Brandau, Justus, to Thyssen Industrie Aktiengesellschaft. Container closure, especially for mixing containers. 4,037,753, Cl. 220-211.000.
Brandberg, Lawrence C.; and Andreas, David W., to Pillsbury Company, The. Combined popping and shipping package for popcorn. 4,038,425, Cl. 426-107.000.
Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., to Libbey-Owens-Ford Company. Radiation shields for aspirating pyrometers. 4,038,105, Cl. 136-231.000.
Brandenberger, Stanley G.: *See—*
McClure, James D.; and Brandenberger, Stanley G., 4,038,213, Cl. 252-430.000.
Bratchell, Robert Lyndon, to Concrete Industries (Monier) Limited. Production method and means for concrete articles. 4,038,355, Cl. 264-157.000.
Braune, Rudi Helmut. Vehicle chassis structure. 4,037,678, Cl. 180-11.000.
Bray, William Homer, Jr.: *See—*
Apen, John Robert; and Bray, William Homer, Jr., 4,038,487, Cl. 174-36.000.
Bremer, Donald. Protective packaging for bottles. 4,037,722, Cl. 206-523.000.
Bremer, Horst, to Gunther Papenmeier KG Maschinen-und Apparatebau. Apparatus for production of granulated and pulverized particles from pasty or similar material. 4,038,010, Cl. 425-314.000.
Bresler, Albert E. Razor adapted for surgical preparation. 4,037,322, Cl. 30-53.000.
Breslow, Jeffrey D., to Marvin Glass & Associates. Target device for pinball games. 4,037,842, Cl. 273-127.00R.
Bresnahan, Alfred E.: *See—*
Di Maio, Anthony E.; Bresnahan, Alfred E.; and Todisco, Joseph G., 4,037,448, Cl. 72-114.000.
Breton, Jacques Leon Georges. Apparatus for the generation of negative or positive atmospheric ions. 4,038,583, Cl. 361-230.000.
Breuer, Hermann; and Treuner, Uwe D., to E. R. Squibb & Sons, Inc.

[[[(2,4-Dioxo-1-imidazolidinyl)amino]-carbonyl]amino]acetylpenicillin derivatives. 4,038,271, Cl. 260-239.100.

Brewer, Gerald L.; and Olsen, Steven D., to UOP Inc. Method and means for controlling the incineration of waste. 4,038,032, Cl. 23-230.00A.

Brewster, Arthur Edward, to International Standard Electric Corporation. Train position indicator. 4,038,653, Cl. 343-6.80R.

Bricot, Claude; Hareng, Michel; and Spitz, Erich, to Thomson-Brandt. Optical projection device and an optical reader incorporating this device. 4,037,929, Cl. 350-160.0LC.

Bricot, Claude: *See—*

Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.

Bridgestone Tire Company Limited: *See—*

Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, 4,037,637, Cl. 152-352.00R.

Bridigum, Robert J., to Westinghouse Air Brake Company. Emergency brake valve device for propogating an emergency brake application. 4,037,880, Cl. 303-82.000.

Briggs, George S.; and Snider, Hugh H., Jr., to United States of America, Navy. Fuze activation device. 4,037,517, Cl. 89-1.50D.

Briggs & Stratton Corporation: *See—*

Harkness, Joseph R., 4,037,389, Cl. 56-11.300.

Brilloit, Jacques, to L'Air Liquide, Societe Anonyme pour l'Etude et l'Exploitation des Procedes Georges Claude. Freeze-drying apparatus. 4,037,331, Cl. 34-92.000.

Brindell, Gordon D.; and Macander, Rudy F., to Quaker Oats Company, The. 3,5-Disubstituted-4-hydroxybenzyl derivative. 4,038,327, Cl. 260-619.00R.

Brinker, Reiner G. Multifunctional tool for rescue work. 4,037,276, Cl. 7-6.000.

Bristol Products, Inc.: *See—*

Turner, Larry G.; and Crawford, Dennis W., 4,037,624, Cl. 137-615.000.

Bristol, Thomas W.: *See—*

Chapman, Charles Weldon; and Bristol, Thomas W., 4,038,614, Cl. 333-30.00R.

Bristoline Inc.: *See—*

Kaneda, Nobuo; Tokisono, Takenosuke; and Uchida, Teizo, 4,037,587, Cl. 128-2.05G.

British Petroleum Company Limited, The: *See—*

Topham, William Henry, 4,037,475, Cl. 73-422.00R

British Syphon Industries Limited: *See—*

Green, David William, 4,037,757, Cl. 222-129.200.

Britzius, George Edward. Adapter unit for converting a two-wheel drive vehicle to a four-wheel drive vehicle. 4,037,429, Cl. 64-4.000.

Brock, Alan James: *See—*

Mullett, Leslie Fred; and Brock, Alan James, 4,037,791, Cl. 239-542.000.

Brock, Phillip J.: *See—*

Rajadhyaksha, Vithal J.; Schroer, Richard A.; Brock, Phillip J.; and Krueger, Earl R., 4,038,415, Cl. 424-317.000.

Brock, Wayne C. Flame resistant insulation blanket. 4,038,447, Cl. 428-72.000.

Brockington, James W.; and Bennett, Richard H., to Texaco Inc. Alkylation process for production of motor fuels. 4,038,212, Cl. 252-436.000.

Brockley, Christopher A.: *See—*

Davis, Harold R.; Brockley, Christopher A.; Parkinson, Geoffrey V.; and Price, John D. E., 4,038,191, Cl. 210-321.00B.

Brodie, Peter Michael; and Solov, Edwin George, to Singer Company, The. Simplified strapped down inertial navigation utilizing bang-bang gyro torquing. 4,038,527, Cl. 235-150.250.

Broehl, Anton: *See—*

Thaeter, Hans; and Broehl, Anton, 4,037,823, Cl. 254-172.000.

Broken Hill Proprietary Company Limited, The: *See—*

Kemlo, Kenneth Garry; and Gregory, Clive Allen, 4,037,761, Cl. 222-590.000.

Brooks, Fred A., Jr., to Exxon Production Research Company. Cement composition for high temperature wells and methods for producing the same. 4,038,093, Cl. 106-93.000.

Brooks, Philip W.: *See—*

Duke, Jack R.; Brooks, Philip W.; and Elzer, Robert R., 4,038,644, Cl. 364-900.000.

Brooks, Robert J.: *See—*

Roberts, Harold G.; and Brooks, Robert J., 4,037,725, Cl. 209-122.000.

Brown, Frederick L.; and Potter, James L., to Dow Chemical Company, The. Compositions comprising polyalkylenepolyamines and a mixture of mono- and diammonium phosphates as fire retardants for cellulosic substrates. 4,038,451, Cl. 428-274.000.

Brown & Williamson Tobacco Corporation: *See—*

Newton, Richard P.; Geiss, Vernon L.; Jewell, John N.; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.

Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., to Acme Visible Records, Inc. Locking letter tray. 4,037,780, Cl. 232-31.000.

Broyde, Barret: *See—*

Boehm, Vicky Williams; and Broyde, Barret, 4,038,219, Cl. 260-2.300.

Brugger, Hans. Solar heat storage system. 4,037,652, Cl. 165-45.000.

Brunetti, Heimo: *See—*

Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, 4,038,247, Cl. 260-45.9NC.

Brutcher, Donald W., to Lipe-Rollway Corporation. Accumulator for object feeder. 4,037,710, Cl. 198-443.000.

Bruzzese, Tiberio; and Ferrari, Rodolfo, to SPA-Societe Prodotti Antibiotici S.p.A. Alkyl esters of polyene antibiotics. 4,038,382, Cl. 424-117.000.

Buchel, Karl Heinz: *See—*

Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,404, Cl. 424-269.000.

Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz; and Plempel, Manfred, 4,038,406, Cl. 424-269.000.

Buchele, Wesley F.; and Baldwin, William I., to Iowa State University Research Foundation, Inc. Blade guard for rotary lawn mowers. 4,037,396, Cl. 56-255.000.

Bucher-Guyer AG Maschinenfabrik: *See—*

Hartmann, Eduard, 4,038,004, Cl. 425-150.000.

Buchman, Smil. Method for well exploitation. 4,037,663, Cl. 166-314.000.

Budzich, Tadeusz. Load responsive control valve with constant leakage device. 4,037,621, Cl. 137-596.130.

Building Components Research, Inc.: *See—*

Wahlquist, Carl D., 4,037,385, Cl. 52-745.000.

Bullock, Richard H. D., Jr.; Gallatig, George; and Franklin, Kurtz A., to Scott Paper Company. Apparatus for controlling the angular orientation of the end of a rolled web. 4,038,127, Cl. 156-353.000.

Bumgardner, Jon H., to United States of America, Navy. Means for real-time laser source characterization. 4,037,959, Cl. 356-73.000.

Bunn, Dorrance P., Jr.; Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., to Texaco Inc. Fluidized cracking catalyst regeneration apparatus. 4,038,038, Cl. 23-288.00B.

Burgert, Herwig. Loop reactor for chemical processes. 4,037,825, Cl. 259-4.00R.

Burke, George K.: *See—*

LeFevre, Robert J.; Burke, George K.; and Raines, Kenneth, 4,037,596, Cl. 128-214.00C.

Burkley, Harold W.; and Geno, Wayne H., to United States of America, Navy. Method of making fuses. 4,037,318, Cl. 29-623.000.

Burris, Robert E.; and Adams, Lester E., to Prime Manufacturing Corporation. Electronic digital gauge. 4,038,532, Cl. 235-151.300.

Burron Medical Products, Inc.: *See—*

LeFevre, Robert J.; Burke, George K.; and Raines, Kenneth, 4,037,596, Cl. 128-214.00C.

Burroughs Corporation: *See—*

Kim, Dongsung Robert, 4,038,643, Cl. 364-200.000.

Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., 4,037,535, Cl. 101-287.000.

Marr, George; and Smith, George Elwood, 4,038,107, Cl. 148-1.500.

Semmelhaack, Carl Frederick; and DiVecchio, Mark Camillo, 4,038,538, Cl. 235-154.000.

Burroughs Wellcome Co.: *See—*

Elion, Gertrude B.; and Strelitz, Robert A., 4,038,479, Cl. 536-24.000.

Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, to Du Pont de Nemours, E. I., and Company. Electrochemical generation of field desorption emitters. 4,038,158, Cl. 204-23.000.

Bycroft, George William: *See—*

Thorp, Peter; and Bycroft, George William, 4,037,862, Cl. 285-260.000.

Byerley, Wilbur M.: *See—*

Bennett, Robert R.; and Byerley, Wilbur M., 4,037,569, Cl. 122-32.000.

C L Industries, Inc.: *See—*

Kloster, William R.; and Stewart, Patrick H., 4,037,645, Cl. 164-161.000.

C. van der Lely N. V.: *See—*

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, 4,037,669, Cl. 172-59.000.

Cabaud, Aime, to COMATEL - Comptoir Europeen de Materiel Electronique. Electrical connector strips. 4,037,915, Cl. 339-258.00P.

Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno. Apparatus for storing and feeding yarn to yarn using machines. 4,037,802, Cl. 242-47.050.

Caldwell, Robert G.: *See—*

Swanholm, Carl E.; and Caldwell, Robert G., 4,038,227, Cl. 260-23.00H.

Calgon Corporation: *See—*

Noren, Gerry K.; and Diehl, Richard C., 4,038,176, Cl. 208-180.000.

Calin, Valentin: *See—*

Barozzi, Dan Alexandru; Calin, Valentin; and Peter, Zsigmond, 4,037,774, Cl. 228-183.000.

Caliri, Frank. Automobile warning system. 4,038,634, Cl. 340-52.00F.

Callahan, George Edgar, to Naumann, Helmut. Device for measuring the density of liquids. 4,037,481, Cl. 73-454.000.

Cambridge Memories, Inc.: *See—*

Lin, Paul T., 4,038,488, Cl. 174-52.0FP.

Cameron, Anson W. Clamp for garment racks. 4,037,728, Cl. 211-124.000.

Campbell, Murray Robert. Floor maintenance brush. 4,037,369, Cl. 51-400.000.

Campbell, Robert W.; and Edmonds, James T., Jr., to Phillips Petroleum Company. Production of p-phenylene sulfide polymers. 4,038,259, Cl. 260-79.100.

Campbell, Robert W., to Phillips Petroleum Company. Production of p-phenylene sulfide polymers. 4,038,260, Cl. 260-79.100.

Campbell, Robert W.: *See—*

Edmonds, James T., Jr.; and Campbell, Robert W., 4,038,263, Cl 260-79.100.

Campbell Soup Company: *See—*

Hildebolt, William M., 4,038,431, Cl. 426-511.000.

Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,038,432, Cl. 426-511.000.

Canada, Her Majesty the Queen in Right of: *See—*

Kuehn, Lorne; and Seigel, Harold O., 4,037,328, Cl. 33-349.000.

Canadian Patents and Development Limited: *See—*

Clarke, Michael R.; and Rak, Jaromir R., 4,038,086, Cl. 106-15.00R.

Canon Kabushiki Kaisha: *See—*

Minoura, Kazuo, 4,037,937, Cl. 350-184.000.

Momiyama, Kikuo, 4,037,935, Cl. 350-176.000.

Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,037,948, Cl. 352-29.000.

Sone, Yoshiaki; and Shirai, Masanari, 4,037,953, Cl. 355-45.000.

Cantaloupe, Francis A.: *See—*

Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.

Cantone, Natale. Agricultural machine. 4,037,544, Cl. 111-6.000.

Carasso, Marino Giuseppe: *See—*

Hoeberechts, Arthur Marie Eugene; and Carasso, Marino Giuseppe, 4,038,606, Cl. 328-124.000.

Cargill Detroit Corporation: *See—*

Sampson, Sheldon E.; and Cargill, Don A., 4,037,447, Cl. 72-92.000.

Cargill, Don A.: *See—*

Sampson, Sheldon E.; and Cargill, Don A., 4,037,447, Cl. 72-92.000.

Carlton, Lewis M.: *See—*

Murphy, Frank W., Jr.; Sparks, Buddy G.; and Carlton, Lewis M., 4,038,507, Cl. 200-84.00R.

Carnahan, James R.: *See—*

Newsom, William D., and Carnahan, James R., 4,037,660, Cl. 166-302.000.

Carnahan, Robert D.: *See—*

Hou, Shou L.; and Carnahan, Robert D., 4,038,667, Cl. 346-140.00R.

Carpenter, Neil L., to Electroflood Company. Method for secondary recovery of oil. 4,037,655, Cl. 166-248.000.

Carr, Larry R., to Optronix Inc. Light sensitive device for measuring particles in a liquid. 4,037,973, Cl. 356-206.000.

Carre, Bernard: *See—*

Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.

Carruthers, Andrew Nicolson; Deutschman, John Edward; and Willis, Michael George, to Alcan Research and Development Limited. Production of alumina. 4,038,039, Cl. 23-293.00R.

Carter, C. O., to Phillips Petroleum Company. Separation of ethyl fluoride. 4,038,332, Cl. 260-653.000.

Carver, Harold E.: *See—*

Pownall, John R.; and Carver, Harold E., 4,037,736, Cl. 214-23.000.

Casanovas, Lorenzo Puig; and Vellas, Jean Leon Justin, to Societe d'Etudes et de Diffusion de Procedes et Brevets S.A. Process for the treatment by metallic ions of aqueous liquids and device for making the same. 4,038,163, Cl. 204-152.000.

Casio Computer Co., Ltd.: *See—*

Hakata, Masayuki, 4,038,564, Cl. 307-205.000.

Caspari, Gunter, to Standard Oil Company (Indiana). s-Triazine derivatives as multi-functional additives for lubricating oils. 4,038,197, Cl. 252-46.700.

Cassarino, Frank V., Jr.; Holtey, Thomas O.; and Riikonen, Douglas L., to Honeywell Information Systems, Inc. Apparatus for verifying the integrity of information stored in a data processing system memory. 4,038,537, Cl. 235-153.0AM.

Cassidy, John Edward: *See—*

Birchall, James Derek; Cassidy, John Edward; and Grice-Hutchinson, Edward Henry, 4,038,234, Cl. 260-29.60F.

Castner, Kenneth F., to Goodyear Tire & Rubber Company, The. Method for preparing high-cis polyalkenamers. 4,038,471, Cl. 526-142.000.

Catco Venture: *See—*

Schoofs, Richard J., 4,038,209, Cl. 252-419.000.

Caterpillar Tractor Co.: *See—*

Atherton, Robert Allan; and Cole, Carroll Richard, 4,037,670, Cl. 172-795.000.

Cole, Carroll Richard, 4,037,365, Cl. 51-97.00R.

Goloff, Alexander, 4,037,998, Cl. 418-83.000.

Morge, Michael P., 4,037,293, Cl. 16-171.000.

Sommars, Mark F., 4,037,575, Cl. 123-140.0MC.

Cecchi, Georges: *See—*

Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, 4,038,295, Cl. 260-409.000.

Celanese Corporation: *See—*

Stautzenberger, Adin Lee; and Wagner, Frank Stevens, 4,038,394, Cl. 424-251.000.

Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, to Pfizer Inc. Mixture of antibiotics produced by a species of actinoplanes. 4,038,383, Cl. 424-119.000.

Centre Electronique Horloger S.A.: *See—*

Porret, Francis, 4,038,580, Cl. 313-498.000.

Centri-Spray Corporation: *See—*

Koepke, Frederick W., 4,037,714, Cl. 198-750.000.

Century 21 Pollution Control, Inc.: *See—*

Diachuk, Wolodymyr; and Palm, Reuben N., 4,038,056, Cl. 55-238.000.

Ceskoslovenska akademie ved: *See—*

Stehlicek, Jaroslav; and Sebenda, Jan, 4,038,470, Cl. 526-29.000.

Cessna Aircraft Company, The: *See—*

Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D., 4,037,410, Cl. 60-445.000.

ChaBakKuk. Educational and topological toys, packaging, key, jewel, floating gear, architecture and geodesics, space mechanics and visual eye therapy devices. 4,037,354, Cl. 46-1.00L.

Chabardes, Pierre; and Julia, Marc, to Rhone-Poulenc S.A. Alkenyl aryl sulfones. 4,038,323, Cl. 260-607.0AR.

Chalus, Bernard: *See—*

Michaud, Andre; and Chalus, Bernard, 4,037,703, Cl. 194-97.00R.

Champ, Robert Bruce; and Shattuck, Meredith David, to International Business Machines Corporation. Visual image display device. 4,037,928, Cl. 350-160.00R.

Champion International Corporation: *See—*

Schillinger, Joseph F., 4,037,721, Cl. 206-434.000.

Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'Mahony, John P., to Quaker Oats Company, The. Process for the production of a modified plant protein with improved color and flavor. 4,038,437, Cl. 426-656.000.

Chantland, Gilbert S. Spinning hoop. 4,037,356, Cl. 46-47.000.

Chapman, Charles Weldon; and Bristol, Thomas W., to Hughes Aircraft Company. Fractional efficiency coupler. 4,038,614, Cl. 333-30.00R.

Chapman, James W.: *See—*

Gamble, James R.; and Chapman, James W., 4,038,491, Cl. 174-153.00R.

Chapman, Philip Howard: *See—*

Walker, Derek; and Chapman, Philip Howard, 4,038,469, Cl. 526-19.000.

Charles, Fred J. Building panel. 4,037,381, Cl. 52-627.000.

Charles, Herbert N.; and Lie, George K., to Fram Corporation. Flexible bladed fan with increased natural frequency. 4,037,987, Cl. 416-132.00A.

Charlton, John Stuart, to Imperial Chemical Industries Limited. Level and interface detection. 4,038,548, Cl. 250-357.000.

Chelminski, Stephen V., to Bolt Associates, Inc. Airgun marine seismic survey streamer method and apparatus. 4,038,630, Cl. 340-7.00R.

Chemetron Corporation: *See—*

Kuntz, William H.; and Moore, Donald G., 4,037,479, Cl. 73-432.00R.

Towle, Jack Lewis; and Vander Ploeg, John Herman, 4,038,226, Cl. 260-22.0CQ.

Cheplanov, Vyacheslav Ivanovich: *See—*

Alexeev, Alexandr Nikolaevich; Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich; Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.

Chernak, John A., to Tomlinson Industries, Inc. Pinch tube valve. 4,037,817, Cl. 251-7.000.

Chesley, Gilman D. Self-configurable circuit structure for achieving wafer scale integration. 4,038,648, Cl. 340-173.00R.

Chesley, Ronald F.: *See—*

Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.

Chevron Research Company: *See—*

Anderson, Donald J., 4,037,658, Cl. 166-272.000.

Graf, Peter E.; and Schmidt, Robert J., 4,038,096, Cl. 106-277.000.

Chiesa, Peter Jordan, Jr., to Philadelphia Suburban Corporation. Fire fighting compositions. 4,038,195, Cl. 252-3.000.

Chihara, Hiroyuki, to Kabushiki Kaisha Suwa Seikosha. Electronic timepiece battery potential detecting circuitry. 4,037,399, Cl. 58-23.0BA.

Chilman, John Alfred, to Dowty Rotol Limited. Bladed rotors having control means for effecting blade pitch adjustment. 4,037,986, Cl. 416-46.000.

Chiodi, Wayne R.; and Grummon, Bryan R., to Zenith Radio Corporation. Precision vertical deflection coil for a hybrid television yoke. 4,038,621, Cl. 335-213.000.

Chloride Group Limited: *See—*

Foulkes, Stanley Charles, 4,037,630, Cl. 141-1.100.

Cho, Yung L.: *See—*

Kim, Chung K.; and Cho, Yung L., 4,038,157, Cl. 204-16.000.

Chow, Sen-Te; and Thomas, Earl M., to United States of America, Army. Automatic low frequency gain limiting by addition method in video processing system. 4,038,688, Cl. 358-174.000.

Christe, Karl O., to Rockwell International Corporation. Stable chlorine trifluoride dioxide. 4,038,374, Cl. 423-466.000.

Christensen, Richard L.: *See—*

Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L., 4,038,497, Cl. 179-15.0AT.

Christopher, Albert S.; and Tufts, Robert J. Implosion rotary engine. 4,037,415, Cl. 60-673.000.

Chromium Industries, Inc.: *See—*

Scannell, William G., 4,038,085, Cl. 106-1.000.

Chubb, Talbot A. Energy storage-boiler tank using salt fusion and heat piping. 4,037,579, Cl. 126-400.000.

- Chubukov, Vladimir Kazimirovich: *See—*
  - Shafranovsky, Alexandr Vladimirovich; Olevsky, Viktor Markovich; Chubukov, Vladimir Kazimirovich; and Baskov, Jury Alexandrovich, 4,038,353, Cl. 261-89.000.
- Chugai Seiyaku Kabushiki Kaisha: *See—*
  - Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.
- Chun, Ping Sun; Clarke, Patrick William; and Gardner, Kenneth William, to Bell Telephone Laboratories, Incorporated. Regulated uninterruptible power supply. 4,038,559, Cl. 307-64.000.
- Chuvpilo, Albert Vladimirovich: *See—*
  - Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.
- Ciba-Geigy AG: *See—*
  - Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, 4,038,277, Cl. 260-256.40C.
- Ciba-Geigy Corporation: *See—*
  - Atasoy, Kaya; Weckwarth, Karl Franz; and Reinhardt, Walter, 4,038,476, Cl. 528-485.000.
  - Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, 4,038,338, Cl. 260-824.0EP.
  - Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.
  - Habermeier, Jurgen, 4,038,255, Cl. 260-75.00N.
  - Inman, Eric Richard; McCrae, James McGeachie; Midcalf, Christopher; and Turner, Alison, 4,038,241, Cl. 260-39.00P.
  - Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, 4,038,414, Cl. 424-304.000.
  - Knell, Martin; and Dexter, Martin, 4,038,246, Cl. 260-45.9NC.
  - Lind, Hanns, 4,038,250, Cl. 260-45.85B.
  - Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, 4,038,247, Cl. 260-45.9NC.
  - Randell, Donald Richard; and Smith, Malcolm John, 4,038,280, Cl. 260-293.840.
  - Spivack, John D.; and Luzzi, John J., 4,038,249, Cl. 260-45.75R.
  - Wilhelm, Max, 4,038,313, Cl. 260-553.00A.
- Cincinnati Electronics Corporation: *See—*
  - Koerber, Clement J., 4,038,604, Cl. 325-363.000.
- Cincinnati Milacron, Inc.: *See—*
  - Dawson, James Earl, 4,038,015, Cl. 425-451.700.
- Ciofalo, Anne Louise. Luminous safety device. 4,038,552, Cl. 250-462.000.
- Clapp, James Wellington: *See—*
  - Lies, Thomas Andrew; and Clapp, James Wellington, 4,038,288, Cl. 260-329.00S.
- Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., to Allied Chemical Corporation. Foliar applications of urea-polyphosphate-potassium solutions to crops. 4,038,064, Cl. 71-29.000.
- Clark, Charles Albert, Jr.; and Ito, Roy Atsushi, to RCA Corporation. Radar contour edge restore circuit. 4,038,655, Cl. 343-5.00W.
- Clark Equipment Company: *See—*
  - Shealy, Noah Alvin, 4,037,696, Cl. 192-48.500.
- Clark, Kendall: *See—*
  - Belleson, James Garman; and Clark, Kendall, 4,037,941, Cl. 350-285.000.
  - Belleson, James Garman; and Clark, Kendall, 4,037,971, Cl. 356-199.000.
- Clark, Robert L.: *See—*
  - Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,038,396, Cl. 424-256.000.
- Clarke Chapman Limited: *See—*
  - Henderson, Leslie; and Hemsley, Thomas Bentham, deceased, 4,038,509, Cl. 219-60.00A.
- Clarke, Michael R.; and Rak, Jaromir R., to Canadian Patents and Development Limited. Aqueous ammoniacal zinc arsenic or zinc-/copper arsenic wood preservative solutions. 4,038,086, Cl. 106-15.00R.
- Clarke, Patrick William: *See—*
  - Chun, Ping Sun; Clarke, Patrick William; and Gardner, Kenneth William, 4,038,559, Cl. 307-64.000.
- Clausen, Anthony Robin. Container support and holder. 4,037,814, Cl. 248-311.100.
- Claxton, George P.: *See—*
  - Grisar, J. Martin; and Claxton, George P., 4,038,412, Cl. 424-280.000.
- Claypoole, Stewart A., to Corning Glass Works. Optical waveguide cable. 4,037,922, Cl. 350-96.00B.
- Cleaver, David Frederick, to Paterson Zochonis & Company Limited. Antimicrobial compositions. 4,038,388, Cl. 424-227.000.
- Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, to Hoffmann-La Roche Inc. Certain 2-hydroxy-2,4-diaryl-3-furanones. 4,038,289, Cl. 260-347.300.
- Clegg, Giles C., Jr.: *See—*
  - Tate, George W., Jr., 4,037,593, Cl. 128-146.200.
- Clement, Gilbert-Louis, to Infranor S.A. Machine tools. 4,037,982, Cl. 408-61.000.
- Clement, Ralph C., to I-T-E Imperial Corporation. Field installed fuse rejection means with spring between clip jaws. 4,037,917, Cl. 339-259.00F.
- Clements, Lloyd W. Irrigation pipe joint lock. 4,037,859, Cl. 285-5.000.
- Coal Industry (Patents) Limited: *See—*
  - Robinson, Joseph Gordon; and Rogers, Edward Aubrey, 4,038,236, Cl. 260-32.80R.
  - Thorp, Peter; and Bycroft, George William, 4,037,862, Cl. 285-260.000.
- Coaltex, Inc.: *See—*
  - Justice, James Conley, 4,037,875, Cl. 299-31.000.
- Cochran, Michael J.: *See—*
  - Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.
- Cohen, Louis, to B. F. Goodrich Company, The. Process for cleaning polymerization reactors. 4,038,473, Cl. 526-62.000.
- Cole, Carroll Richard, to Caterpillar Tractor Co. Apparatus for cutting arcuately-shaped worms. 4,037,365, Cl. 51-97.00R.
- Cole, Carroll Richard: *See—*
  - Atherton, Robert Allan; and Cole, Carroll Richard, 4,037,670, Cl. 172-795.000.
- Cole, Ralph V.: *See—*
  - Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., 4,038,640, Cl. 364-200.000.
- Coleman, Harold R.: *See—*
  - Rahman, Matiur; and Coleman, Harold R., 4,038,438, Cl. 427-385.00R.
- Colgate-Palmolive Company: *See—*
  - Bauman, Robert Andrew, 4,038,303, Cl. 260-459.00A.
  - Cordon, Martin, 4,038,380, Cl. 424-49.000.
- Colli, Albert J., to United States of America, Navy. Process for manufacturing chloramine. 4,038,372, Cl. 423-413.000.
- Collins, Arthur A.; Bellamy, John C., II; and Christensen, Richard L. Hardwired marker for time folded TST switch with distributed control logic and automatic path finding, set up and release. 4,038,497, Cl. 179-15.0AT.
- Collins, David R.; and Katz, Sheldon N., to Replacement Products Industries Corporation. Window frame. 4,037,378, Cl. 52-397.000.
- Collins, Stephen M.: *See—*
  - Patil, Arvind S.; Argade, Shyam D.; and Collins, Stephen M., 4,038,365, Cl. 423-161.000.
- Columbia Research Corporation: *See—*
  - Craig, Dwin R., 4,038,554, Cl. 250-572.000.
- Colwell, Richard Rial: *See—*
  - Necker, Carl George; and Colwell, Richard Rial, 4,037,462, Cl. 73-32.00R.
- COMATEL - Comptoir Europeen de Materiel Electronique: *See—*
  - Cabaud, Aime, 4,037,915, Cl. 339-258.00P.
- Combette, Marc: *See—*
  - Dorgnon, Roger; Combette, Marc; Luthringer, Jean; and Ollivier, Jean, 4,037,770, Cl. 227-9.000.
- Combustion Unlimited Incorporated: *See—*
  - Straitz, John F., III, 4,038,024, Cl. 431-202.000.
- Commissariat a l'Energie Atomique: *See—*
  - Bergougnoux, Rene; and Delafosse, Jacques, 4,038,135, Cl. 176-68.000.
  - Gallet, Bernard; and Venot, Robert, 4,038,136, Cl. 176-87.000.
- Commonwealth Scientific and Industrial Research Organization: *See—*
  - Evans, John James Alexander; and Holan, George, 4,038,405, Cl. 424-269.000.
- Compagnie Generale d'Electricite S.A.: *See—*
  - Jacquelin, Jean, 4,038,458, Cl. 429-15.000.
- Compagnie Generale des Etablissements Michelin: *See—*
  - Pflieger, Bernard; and Reiniche, Andre, 4,038,109, Cl. 148-12.00F.
- Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., to International Harvester Company. Radiation pyrometers with purging fluid. 4,037,473, Cl. 73-346.000.
- Compur-Werk Gesellschaft mit beschrankter Haftung & Co.: *See—*
  - Pross, Wilhelm, 4,037,972, Cl. 356-206.000.
- Concrete Industries (Monier) Limited: *See—*
  - Bratchell, Robert Lyndon, 4,038,355, Cl. 264-157.000.
- Connelly, Brian W., to B.C. Investments Ltd. Resilient swivel connector. 4,037,978, Cl. 403-164.000.
- Conner, Donald E.; and Fogel, Arnold W., to Van Dyk & Company, Incorporated. Fatty halo alkanoate quaternaries of dialkylaminopropylamides. 4,038,294, Cl. 260-404.500.
- Conners, Richard C.: *See—*
  - Flanagan, Robert J.; Conners, Richard C.; and Merrill, Richard C., 4,037,298, Cl. 29-25.420.
- Connolly, Thomas M.; and Luoma, Eino J., to United States of America, Army. Microwave absorbers. 4,038,660, Cl. 343-18.00A.
- ConTech Inc.: *See—*
  - Coyner, Robert N.; and Skujins, Peter, 4,038,239, Cl. 260-33.6UB.
- Conwed Corporation: *See—*
  - Hillman, Theodore E., 4,037,499, Cl. 83-1.000.
  - Larsen, Ronald Leslie, 4,038,008, Cl. 425-290.000.
- Conzelmann, Gerhard: *See—*
  - Nagel, Karl; Conzelmann, Gerhard; and Gschwendtner, Horst, 4,038,677, Cl. 357-51.000.
- Cook, K. Von; Koerner, Dan W.; Cunningham, Robert A., Jr.; and Murrin, Horace T., Jr., to United States of America, Energy Research and Development Administration. Ultrasonic probe system for the bore-side inspection of tubes and welds therein. 4,037,465, Cl. 73-67.80S.
- Cooper, James E., to Mobil Oil Corporation. Oil recovery method employing acids extracted from crudes using a ion-exchange process. 4,037,656, Cl. 166-270.000.

- Cooper, Richard, Jr.: *See—*
  - Heyne, Carl J.; Cooper, Richard, Jr.; and Godwin, Gurney L., 4,038,589, Cl. 318-174.000.
- Coors Container Company: *See—*
  - Dulmaine, Joseph Francis; and Bagrosky, Michael Edward, 4,037,752, Cl. 220-70.000.
  - Sirvet, Enn, 4,037,530, Cl. 101-40.000.
- Coratomic Inc.: *See—*
  - Shipko, Frederick J., 4,037,277, Cl. 7-1.00G.
- Corbin Gentry Inc.: *See—*
  - Hanagan, Michael W., 4,038,572, Cl. 310-46.000.
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  - Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.
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  - Meyers, Wheeler W., 4,037,769, Cl. 226-190.000.
  - Young, Peter L., 4,038,167, Cl. 204-192.00D.
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  - Auer, Robert Edward; and Tucker, Howard E., 4,038,556, Cl. 250-575.000.
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- Coxhill, Major, to Allis-Chalmers Corporation. Gyratory crusher having antispin device for head. 4,037,800, Cl. 241-213.000.
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- Craig, Dwin R., to Columbia Research Corporation. Detection of flaws in a moving web of transparent material. 4,038,554, Cl. 250-572.000.
- Cravens, Thomas E., to Dow Chemical Company, The. Low density rapid-setting polyurethanes. 4,038,238, Cl. 260-33.6UB.
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- Crawford, Joe Wade: *See—*
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- Cronen, Peter J., Jr. Safety apparatus for a punch press. 4,037,699, Cl. 192-134.000.
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- Crowell, Kenneth E., to Motorola, Inc. Miniature socket assembly. 4,037,899, Cl. 339-17.00C.
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- Curtiss-Wright Corporation: *See—*
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- Curts, H. A. Julius: *See—*
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  - Oakland, Frederic; and Mallonen, Edward A., 4,038,619, Cl. 335-61.000.
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  - DeLano, Arthur D., 4,037,815, Cl. 248-285.000.
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- Daimler-Benz Aktiengesellschaft: *See—*
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  - Becking, Paul E., 4,037,803, Cl. 242-55.180.
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- Davidtz, John C., to Mobil Oil Corporation. Flocculation process. 4,038,183, Cl. 210-47.000.
- Davies, Donald L., to Swift & Company. Vegetable sauce composition. 4,038,424, Cl. 426-94.000.
- Davis, George B., Jr. Method of packaging piecrust dough. 4,038,428, Cl. 426-394.000.
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- Davis, Michael Ian: *See—*
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  - Oosten, Jacob van, 4,038,193, Cl. 210-400.000.
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  - Anderson, Sidney Elmer, 4,037,393, Cl. 56-119.000.
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  - Miller, Wayne Russell; Seipp, Jan Vilas; and Penfold, Garn Farley, 4,037,519, Cl. 91-1.000.
  - Plemitscher, Robert Antone, 4,037,334, Cl. 37-8.000.
  - Welck, Arnold Emil, 4,037,695, Cl. 192-13.00R.
  - Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, 4,037,740, Cl. 214-83.140.
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- Deitch, James C.; and Leistiko, Lawrence F., to Magnetic Controls Company. Printed circuit jack. 4,037,913, Cl. 339-221.00M.
- Del Norte Technology, Inc.: *See—*
  - Parker, William H., 4,038,632, Cl. 340-18.0NC.
- Delafosse, Jacques: *See—*
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- Delage, Michel: *See—*
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- DeLano, Arthur D., to D & J Products. Musical instrument support. 4,037,815, Cl. 248-285.000.
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- Delligatti, Patrick. Bottom coders. 4,037,529, Cl. 101-35.000.
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  - Grimpe, Karl; and Reth, Erich, 4,037,452, Cl. 72-249.000.
- Denkinger, Marian C. Process for preparing sterilized feminine hygiene articles of non-woven and woven textures. 4,037,601, Cl. 128-285.000.
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- DePuy, Robert P., to General Electric Company. Static trip unit for circuit protective devices. 4,038,695, Cl. 361-96.000.
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- DeSisto, Frank Alfred, to J. C. Penney Company. Display apparatus 4,037,729, Cl. 211-208.000.
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  - Geiger, Friedhelm; Heimberger, Werner; and Lussling, Theodor, 4,038,276, Cl. 260-248.00C.
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- Devlin, Richard G., to Mead Johnson & Company. Malignancy diagnostic method. 4,038,145, Cl. 195-103.50R.
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  - Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.
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- Di Bella, Eugene P., to Tenneco Chemicals, Inc. Process for the removal of mercury from aqueous solutions. 4,038,071, Cl. 75-108.000
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- Didde-Glaser, Inc.: *See—*
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- Diebold, William H.; and Russo, Adolph D., to Russo Architectural Metals, Inc. Metal grating. 4,037,383, Cl. 52-664.000.
- Diederen, Willi: *See—*
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- Diehl, Richard C.: *See—*
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- Diemolding Corporation: *See—*
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- Dierks & Sohne: *See—*
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  - Smith, Alistair Y.; Dietrich, Paul; and Pickenhagen, Wilhelm, 4,038,429, Cl. 426-537.000.
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- Doe, Ewart H.; and Linforth, William J., to Hagenuk Vormals Neufeldt and Kuhnke G.m.b.H. Bar holder arrangement for bar stock material to be fed to a machine tool. 4,037,733, Cl. 214-1.500.
- Dohring, Albert A.; and Dohring, Grace H. Point pressure therapy device. 4,037,590, Cl. 128-24.400.
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- Dojan, Harold D., to Tennant Company. Scrubber squeegee apparatus. 4,037,289, Cl. 15-320.000.
- Doland, George D. Multiple decoding system. 4,038,636, Cl. 340-146.1AV.
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- Dorman, Evans D.; and Getty, William P., to United States Steel Corporation. Movable sizing gauge. 4,037,498, Cl. 82-86.000.
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- Dorner, Heinrich; Harand, Elmar; and Kleiter, Walter, to Siemens Aktiengesellschaft. Pressurized water-cooled reactor system. 4,038,134, Cl. 176-65.000.
- Dorsey, Denis Peter; and Rodda, William E., to RCA Corporation. Circuit for elimination of surface charge integration. 4,038,581, Cl. 315-13.0ST
- Dotti, Giuseppe, to Snam Progetti S.p.A. Device for coupling a cardan half-joint with a fixed structure. 4,037,278, Cl. 9-8.00R.
- Doutrelepont, Jean-Marie. Installation for conveying living fish particularly anaesthetized fish, in aqueous medium. 4,037,562, Cl. 119-5.000.
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  - Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,038,393, Cl. 424-250.000.
  - Olstowski, Franciszek, 4,038,235, Cl. 260-30.200.
  - Reineke, Charles E., 4,038,245, Cl. 260-45.70S.
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- Dowty Mining Equipment Limited: *See—*
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- Drake, Cyril Francis; and Amos, Robert Walter James, to ITT Industries, Inc. Protection of glass from aqueous attack. 4,038,430, Cl. 427-248.00E.
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  - Elinov, Nikolai Petrovich; Gurevich, Isaak Yakovlevich; Dranishnikov, Afrikan Nikolaevich; and Goncharova, Nina Efimovna, 4,038,379, Cl. 424-4.000.
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- Duffy, Thomas E.: *See—*
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- Dunlap, Glenn H.: *See—*
  - Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 4,038,577, Cl. 313-188.000.
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  - Adelman, Robert L., 4,038,042, Cl. 428-625.000.
  - Atkins, Thomas Joseph, 4,038,312, Cl. 260-551.00P.
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  - Garth, Bruce Hollis, 4,038,043, Cl. 44-75.000.
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  - Johnson, Alexander Lawrence, 4,038,285, Cl. 260-309.000.
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- Duranleau, Roger G.; and Larkin, John M., to Texaco Inc. Preparation of acylhydroximyl halides. 4,038,316, Cl. 260-566.00A.
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- Durley, Benton A., III. Ultrasonic piezoelectric transducer drive circuit. 4,038,570, Cl. 310-8.100.
- Durville, Gerard; and Wunner, Charles Hamilton, to Singer Company, The. Closed cam track for a circular knitting machine. 4,037,434, Cl. 66-57.000.
- Dusza, Robert J.; and Kantorski, Joseph W., to American Optical Corporation. Lens mold. 4,038,014, Cl. 425-388.000.
- Duvall, David Scott; and Paulonis, Daniel Francis, to United Technologies Corporation. Composite interlayer for diffusion bonding. 4,038,041, Cl. 428-576.000.
- Dworak, Wilhelm, to Robert Bosch G.m.b.H. Gear machine with bearing cooling and lubrication. 4,038,000, Cl. 418-102.000.
- Dynamic Industries, Inc.: *See—*
  - Gorby, Oliver L., 4,037,681, Cl. 180-44.00R
- Dynamit Nobel Aktiengesellschaft: *See—*
  - Schade, Gerhard; Uckert, Peter; and Fritz, Manfred, 4,038,254, Cl. 260-75.00N.
- E. C. P., Inc.: *See—*
  - Williams, Tudor; and Bost, John D., 4,038,063, Cl. 65-22.000.
- E M I Limited: *See—*
  - Lee, Cyril Arthur, 4,038,596, Cl. 324-34.00R.
  - LeMay, Christopher Archibald Gordon, 4,038,551, Cl. 250-445.00T.
  - Toull, William Herbert, 4,038,009, Cl. 425-308.000.
- E. R. Squibb & Sons, Inc.: *See—*
  - Breuer, Hermann; and Treuner, Uwe D., 4,038,271, Cl. 260-239.100.
  - Denzel, Theodor; and Hoehn, Hans, 4,038,281, Cl. 260-296.00H.
  - Denzel, Theodor; and Hoehn, Hans, 4,038,283, Cl. 260-295.50B.
  - Hauck, Frederic Peter; and Sundeen, Joseph E., 4,038,273, Cl. 260-240.00D.
  - Krapcho, John; and Schwartz, Joseph, 4,038,274, Cl. 260-240.00F.
- Eagle Picher Industries, Inc.: *See—*
  - Romero, Victor R., 4,037,851, Cl. 280-79.300.
- Eastman, James E., to A. E. Staley Manufacturing Company. Retort process starch derivatives. 4,038,482, Cl. 536-110.000.
- Eastman Kodak Company: *See—*
  - Palmer, Billy W.; and Wright, Howard N., Jr., 4,038,329, Cl. 260-637.00P.
- Eaton Corporation: *See—*
  - Johnson, Oliver Wendell, 4,037,620, Cl. 137-596.000.
- Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, to Boehringer Ingelheim GmbH. Benzisothiazoline-1,1-dioxide derivatives, compositions and methods. 4,038,407, Cl. 424-270.000.
- Eberly, Paul E., Jr., to Exxon Research and Engineering Company. Oil hydrodesulfurization with alumina composite catalyst utilizing aluminate and dicarboxylic acid in its preparation. 4,038,177, Cl. 208-216.000.
- Eccles, Edward Stuart; and Moore, David James, to United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britanic Majesty's government of the. Optimizing control system for aircraft. 4,038,526, Cl. 235-150.100.
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  - Klimek, Boleslaw M.; and Mastis, Victor, 4,037,907, Cl. 339-126.00R.
- Echtler, Sigmund. Earth anchor. 4,037,373, Cl. 52-127.000.
- Eckles, William Edward; and Starinshak, Thomas Walter, to R. O. Hull & Company, Inc. Acid copper plating and additive composition therefor. 4,038,161, Cl. 204-52.00R.
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  - Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., 4,038,459, Cl. 429-15.000.
  - Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., 4,038,460, Cl. 429-15.000.
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  - Fastenau, Werner, 4,037,979, Cl. 403-284.000.
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  - Campbell, Robert W.; and Edmonds, James T., Jr., 4,038,259, Cl. 260-79.100.
  - Crouch, Willie W.; and Edmonds, James T., Jr., 4,038,261, Cl. 260-79.100.
- EDS, Inc.: *See—*
  - Sjogren, Christer A.; and Backman, Ralph H., 4,037,525, Cl. 93-93.00C.
- Edward P. Siggia Inc.: *See—*
  - Siggia, Edward P., 4,037,897, Cl. 312-343.000.
- Eerkes, Thijs: *See—*
  - Bell, Malcolm Charles Evert; Eerkes, Thijs; and Sridhar, Ramamritham, 4,038,066, Cl. 75-29.000.
- Egger, Friedrich: *See—*
  - Manser, Josef; and Egger, Friedrich, 4,038,433, Cl. 426-615.000.
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- Eickmann, Karl. Application of an entering or deep-diving piston shoe with a central radial support member and means for securing the same in fluid handling radial piston devices. 4,037,523, Cl. 92-72.000.
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  - Hamano, Sachiyuki; and Nakamura, Takaharu, 4,038,278, Cl. 260-256.40N.
- Eisele, Wolfgang; Lelgemann, Ludwig; Magerkurth, Bernhard; and Petersen, Harro, to Badische Anilin- & Soda-Fabrik Aktiengesellschaft. Process for the manufacture of impregnating melamine resins. 4,038,229, Cl. 260-29.40R.
- Eisenbraun, Allan A.; and Hornbaker, Edwin D., to Ethyl Corporation. Graft copolymers of olefinic nitriles and olefinic esters on diene rubbers. 4,038,344, Cl. 260-879.000.
- Eisenmenger, Edith; Kuhnert, Otto; Kuhlmann, Robert; Nauroth, Peter; and Turk, Gunter, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Organically modified silicic acids and silicates for delustering lacquers. 4,038,224, Cl. 260-15.00R.
- Ekkelboom, Tjepke Hendrik, to U.S. Philips Corporation. Solder joint connection between lead-in conductor and electrode. 4,038,579, Cl. 313-331.000.
- Elam, James O. Breathing equipment such as resuscitators. 4,037,595, Cl. 128-145.700
- Elder, James H.; and Patterson, Hubert A., to General Electric Company. Message preamble detector. 4,038,605, Cl. 328-119.000.
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  - Jimenez, James A., 4,037,801, Cl. 241-247.000.
- Electro-Nite Co.: *See—*
  - Cure, Omer P., 4,037,478, Cl. 73-425.40R.

- Electroflood Company: *See—*
  - Carpenter, Neil L., 4,037,655, Cl. 166-248.000.
- Elex A.G.: *See—*
  - Kunzle, Othello, 4,037,863, Cl. 285-320.000.
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  - Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,038,384, Cl. 424-122.000.
  - Koppel, Gary A.; and Nummy, Laurence J., 4,038,275, Cl. 260-243.00C.
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- Elion, Gertrude B.; and Strelitz, Robert A., to Burroughs Wellcome Co. Amino purine derivatives. 4,038,479, Cl. 536-24.000.
- Elliott, Jack P., to J. P. Elliott Associates, Inc. Washer for bearing races. 4,037,613, Cl. 134-83.000.
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  - Duke, Jack R.; Brooks, Philip W.; and Elzer, Robert R., 4,038,644, Cl. 364-900.000.
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  - Anderson, Leslie T.; Thompson, Arthur D.; and Kairbara, Iamo, 4,037,864, Cl. 285-342.000.
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  - Crow, William D.; and Ottersbach, Thomas V., 4,038,574, Cl. 310-71.000.
  - Kamp, Eugene L.; and Visos, Charles D., 4,038,623, Cl. 335-219.000.
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  - Rodenberg, Herbert G.; and Patton, Charles E., 4,038,297, Cl. 260-413.000.
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  - Dobrzanski, John, 4,038,649, Cl. 340-237.00S.
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  - Heller, Laszlo; Forgo, Laszlo; and Szabo, Zoltan, 4,037,413, Cl. 60-655.000.
- Enfield Industrial Engines Limited: *See—*
  - Nossiter, Clarence Frank, 4,037,558, Cl. 115-41.0HT.
- Engel Industries, Inc.: *See—*
  - Mueller, Thomas L., 4,038,128, Cl. 156-355.000.
- Engel, Stephen August; and Fuhrhop, Ronald Elmer, to Union Carbide Corporation. Method and apparatus for making an instantaneous thermochemical start. 4,038,108, Cl. 148-9.500.
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  - Jespersen, Knud; and Engman, Theodore Edgar, 4,038,426, Cl. 426-266.000.
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  - Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.
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  - Kline, Kenneth J., 4,038,185, Cl. 210-83.000.
  - Saffran, Edward P., 4,038,187, Cl. 210-108.000.
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  - Rose, James J.; and Horton, Edward L., 4,037,290, Cl. 15-345.000.
- Erdman, Frank H., to Tropicana Products, Inc. Method and apparatus for depalletizing. 4,037,734, Cl. 214-8.50A.
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  - Puderbaugh, George; and Erman, Stanley, 4,037,836, Cl. 272-99.000.
- Ernest Scragg & Sons Limited: *See—*
  - Tomlinson, Ian, 4,038,013, Cl. 425-378.00S.
- Ernst Leitz Wetzlar GmbH: *See—*
  - Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, 4,037,958, Cl. 356-4.000.
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- Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., to Western Electric Company, Inc.; and Bell Telephone Laboratories, Incorporated. Structure for providing support for circuit plug-in units, connectors and related wiring. 4,038,696, Cl. 361-415.000.
- Ethyl Corporation: *See—*
  - Eisenbraun, Allan A.; and Hornbaker, Edwin D., 4,038,344, Cl. 260-879.000.
- Eulit Werk Staude & Co. KG: *See—*
  - Staude, Heinz; and Goesswald, Fritz, 4,037,442, Cl. 70-456.00R.
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- Evans, Ronald C., to McIntosh Laboratory, Inc. Multiplier circuit. 4,038,566, Cl. 307-229.000.
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  - Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.
- Extel Corporation: *See—*
  - Martin, Donald P.; and Ryan, Richard G., 4,037,705, Cl. 197-1.00R.
- Exxon Nuclear Company, Inc.: *See—*
  - Pugh, Ralph A., 4,038,137, Cl. 176-78.000.
- Exxon Production Research Company: *See—*
  - Brooks, Fred A., Jr., 4,038,093, Cl. 106-93.000.
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  - Eberly, Paul E., Jr., 4,038,177, Cl. 208-216.000.
  - Rae, James A., 4,038,472, Cl. 526-48.000.
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  - Davison, Alan L., 4,037,827, Cl. 259-37.000.
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  - Bergvall, Bengt Allan, 4,038,516, Cl. 219-216.000.
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  - Hoagland, Kenneth A., 4,038,690, Cl. 358-213.000.
- Fan, John C. C.: *See—*
  - Henrich, Victor E.; and Fan, John C. C., 4,038,216, Cl. 252-514.000.
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- Farnsworth, Robert S. Raft apparatus for growing plants by means of water culture. 4,037,360, Cl. 47-63.000.
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  - Fries, R. Jay; Farnum, Eugene H.; and McCall, Gene H., 4,038,125, Cl. 156-280.000.
- Farona, Michael F.; and White, James F., to University of Akron, The. Method for reacting organic halides. 4,038,324, Cl. 260-607.0AR.
- Farrell, John J., to Farrell Patent Company. Apparatus for making a blow molded container with hollow handle and method of making. 4,038,006, Cl. 425-525.000.
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  - Farrell, John J., 4,038,006, Cl. 425-525.000.
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  - Manara, Giovanni; Fattore, Vittorio; and Notari, Bruno, 4,038,337, Cl. 260-683.200.
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  - Urban, Guy K., deceased, 4,037,799, Cl. 241-186.00A.
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- Feintuch, Paul L., to Rockwell International Corporation. Adaptive recursive least mean square error filter. 4,038,536, Cl. 235-152.000.
- Feldman, Mark Abramovich: *See—*
  - Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.
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- Feng, Bai-Cwo, to International Business Machines Corporation. Planarization of integrated circuit surfaces through selective photoresist masking. 4,038,110, Cl. 148-187.000.
- Fenneteau, Michel M.: *See—*
  - Haydu, John L.; Fenneteau, Michel M.; and Mann, Byron C., 4,038,626, Cl. 337-4.000.
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  - Marchant, Kerford A., Jr.; and Fenoglio, David J., 4,038,266, Cl. 260-152.000.
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  - Bourgraf, Elroy E.; and Self, Kenneth R., 4,037,871, Cl. 296-20.000.
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- Ferrier, Vernon Dale. Wave rod system. 4,037,612, Cl. 132-31.00R.
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- Fetzer, Martin, to Robert Bosch G.m.b.H. Electrical connector and connector cable. 4,037,914, Cl. 339-253.00R.
- Fey, Maurice G.: *See—*
  - Wolf, Charles B.; Fey, Maurice G.; and Azinger, Frederick A., Jr., 4,038,512, Cl. 219-121.00P.
- Fiat-Allis Construction Machinery, Inc.: *See—*
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  - Sandrock, Don G.; and Hoag, Peter J., 4,037,682, Cl. 180-69.00R.

- Fikentscher, Rolf: *See—*
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- Filimonov, Viktor Dmitrievich: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
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  - Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.
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  - Smith, Alistair Y.; Dietrich, Paul; and Pickenhagen, Wilhelm, 4,038,429, Cl. 426-537.000.
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- Fisher, Franklin A.: *See—*
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- Fisons Limited: *See—*
  - Suschitzky, John Louis; and Rutherford, David, 4,038,413, Cl. 424-295.000.
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  - Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.
- Flanagan, Robert J.; Conners, Richard C.; and Merrill, Richard C., to General Electric Company. Method of making a partially impregnated capacitor. 4,037,298, Cl. 29-25.420.
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  - Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.
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- Fleming, Robert S., to Amerace Corporation. Reflector assembly. 4,037,925, Cl. 350-97.000.
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  - Quakenbush, Howard M., 4,037,872, Cl. 297-65.000.
- Flinth, Rune Nils Allan: *See—*
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- Floyd, Roger M.: *See—*
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  - Miller, George W.; Ryan, Mark D.; and Niemi, Bill H., 4,038,494, Cl. 178-69.100.
  - Pepmeier, Carl R., 4,038,018, Cl. 425-505.000.
- Fogel, Arnold W.: *See—*
  - Conner, Donald E.; and Fogel, Arnold W., 4,038,294, Cl. 260-404.500.
- Forberg, Hans-Jurgen, to Transcodan Sven Husted-Anderson, Firma. Drip chamber for infusion and transfusion apparatus formed of several parts. 4,037,597, Cl. 128-214.00C.
- Ford, George Alan, to Walker-Neer Manufacturing Co., Inc. Method and apparatus for cleaning a screened well. 4,037,661, Cl. 166-311.000.
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  - Ludwig, Frank A.; and Weiner, Steven A., 4,038,465, Cl. 429-104.000.
  - Mohla, Prem P.; Hetke, Adolf; and Warrick, Robert J., 4,037,643, Cl. 164-58.000.
- Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, to Ciba-Geigy Corporation. Process for the manufacture of polyaddition products containing imide groups by reaction of polymaleimides with polyhydric phenols using amine catalyst. 4,038,251, Cl. 260-47.0UA
- Forgo, Laszlo: *See—*
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- Form-Scaff (Proprietary)Limited: *See—*
  - Jacobs, Daniel, 4,037,382, Cl. 52-638.000.
- Forsyth, Roland W. Stabilizing means for trampoline. 4,037,835, Cl. 272-65.000.
- Foscolo, Peter F. Combination gaff and boat hook. 4,037,554, Cl. 114-221.00R.
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- Foster, Allen. Down-loading device. 4,037,877, Cl. 302-53.000.
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- Foulkes, Stanley Charles, to Chloride Group Limited. Manufacture of battery plates. 4,037,630, Cl. 141-1.100.
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  - Charles, Herbert N.; and Lie, George K., 4,037,987, Cl. 416-132.00A.
- Frampton, Orville D., to National Distillers and Chemical Corporation. Olefin hydration catalyst. 4,038,211, Cl. 252-435.000.
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  - Odle, Herbert Arnold; Sullivan, Daryl Dean; and Franck, Kurt, 4,037,341, Cl. 40-130.00B.
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  - Murphy, Frank W., Jr.; Sparks, Buddy G.; and Carlton, Lewis M., 4,038,507, Cl. 200-84.00R.
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  - Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, 4,038,689, Cl. 358-191.000.
- Franz, Dennis LaVerne. Paired piston engine with rotary valves. 4,037,572, Cl. 123-64.000.
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- Freeman, Ardee H.; Schulte, Harold F.; and Davidson, Hubert, to Wheelabrator-Frye, Inc. Method and means for continuous surface treatment. 4,037,364, Cl. 51-415.000.
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- Freer, Edgar P. Positioning and indexing apparatus. 4,037,493, Cl. 74-820.000.
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  - Althoff, Heinz, 4,037,735, Cl. 214-10.000.
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  - Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., 4,037,840, Cl. 273-85.00A.
- Fries, R. Jay; Farnum, Eugene H.; and McCall, Gene H., to United States of America, Energy Research and Development Administration. Method for mounting laser fusion targets for irradiation. 4,038,125, Cl. 156-280.000.
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  - Trifiletti, Thomas, 4,037,581, Cl. 126-39.00M.
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- Frye, George J. Microphone coupler. 4,038,500, Cl. 179-175.10A.
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  - Rix, Albert; Fuchs, Hans; and Onuscheit, Jens, 4,037,698, Cl. 192-105.0CE.
- Fuchs, Werner Karl Heinz. Anti-locking brake system. 4,037,883, Cl. 303-116.000.

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  - Engel, Stephen August; and Fuhrhop, Ronald Elmer, 4,038,108, Cl. 148-9.500.
- Fuji Electric Company Ltd.: *See—*
  - Namba, Masaharu; Nagasawa, Ikuo; and Mukae, Kazuo, 4,038,217, Cl. 252-521.000.
- Fuji Jukogyo Kabushiki Kaisha: *See—*
  - Mizuno, Yukio; and Hiramoto, Midori, 4,037,407, Cl. 60-277.000.
  - Ozawa, Masahiro, 4,037,408, Cl. 60-282.000.
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  - Komaki, Takao; Horikawa, Kazuo; Honjo, Satoru; and Matsumoto, Seiji, 4,038,545, Cl. 250-315.00A.
  - Utumi, Tadae, 4,038,442, Cl. 427-128.000.
  - Yoshida, Takashi; and Yamamoto, Nobuo, 4,038,082, Cl. 96-77.000.
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  - Terada, Yoshimi; and Fujii, Akira, 4,037,869, Cl. 294-104.000.
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- Fujino, Takashi; Yamanaka, Makoto; and Yagi, Kouichi, to Kao Soap Co., Ltd. Process for preparation of powdery detergent compositions. 4,038,218, Cl. 252-542.000.
- Fujita, Kenichi: *See—*
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  - Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.
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- Fukuda, Hideo: *See—*
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- Fukuda, Sigeo: *See—*
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  - Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.
- Fukuda, Yutaka; Ihida, Mutsumi; and Kawai, Yoshihiko, to Nippon Kokan Kabushiki Kaisha. Method for removing hydrogen sulfide. 4,038,366, Cl. 423-234.000.
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  - Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,038,654, Cl. 343-5.0EM.
- Fuller, Henry Edward, Jr., to American Optical Corporation. Portable medical data recorder. 4,038,666, Cl. 346-136.000.
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  - Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.
- Fyfe, Donald R. Waste disposal systems. 4,037,795, Cl. 241-58.000.
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  - Birch, John R., 4,038,139, Cl. 195-1.800.
- Gainer, John L., to University of Virginia, The. Method of increasing fermentation yields. 4,038,144, Cl. 195-100.000.
- Gainsborough Hardware Industries, Pty., Ltd.: *See—*
  - Hook, John Laurence, 4,037,865, Cl. 292-357.000.
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  - Bullock, Richard H. D., Jr.; Gallatig, George; and Franklin, Kurtz A., 4,038,127, Cl. 156-353.000.
- Gallet, Bernard; and Venot, Robert, to Commissariat a l'Energie Atomique. Support structure for the lateral neutron shield system of a fast reactor core. 4,038,136, Cl. 176-87.000.
- Gallo, Michael R. Auto ignition system. 4,037,577, Cl. 123-148.00E.
- Gallois, Jacques, to Societe d'Etudes de Machines Thermiques. Electric power generating device fed with energy recovered from the exhaust gases of an internal combustion engine. 4,038,558, Cl. 290-52.000.
- Gallone, Cesare. Strip of light-signal unit shells. 4,037,908, Cl. 339-147.00R.
- Gamble, James R.; and Chapman, James W., to Westinghouse Electric Corporation. Fluid casting composition containing low expansion glass filler. 4,038,491, Cl. 174-153.00R.
- Ganellin, Charon Robin: *See—*
  - Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,038,408, Cl. 424-270.000.
- Ganssle, Eugene R.: *See—*
  - Webster, Donald R.; and Ganssle, Eugene R., 4,037,970, Cl. 356-188.000
- Ganter, Wolfgang; and Scholz, Gunter, to Gebruder Junghans GmbH, Firma. Apparatus for adjusting a date ring of a watch. 4,037,401, Cl. 58-58 000.
- Gantman, Sarra Abramovna: *See—*
  - Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.
- Garcia Corporation: *See—*
  - Bourque, Rene, 4,037,758, Cl. 222-134.000.
- Garcia Lorenzen, Felix Hector. Musical chord and note calculator. 4,037,518, Cl. 84-474.000.
- Gardner, Kenneth William: *See—*
  - Chun, Ping Sun; Clarke, Patrick William; and Gardner, Kenneth William, 4,038,559, Cl. 307-64.000.
- Garlock Inc.: *See—*
  - Pendleton, Darrell D., 4,038,359, Cl. 264-263.000.
- Garner, Lloyd L., to Smith International, Inc. Drilling bit bearing structure. 4,037,300, Cl. 29-148.40R.
- Garrison, Harold Keith: *See—*
  - White, Allen Andrew; Yatcilla, George; and Garrison, Harold Keith, 4,037,528, Cl. 100-191.000.
- Garth, Bruce Hollis, to Du Pont de Nemours, E. I., and Company. Gasoline additive compositions comprising a combination of monoamine and polyamine Mannich bases. 4,038,043, Cl. 44-75.000.
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- Gasparaitis, Bernard; Eichler, Jay H.; and Terao, Alfred Y., to Motorola, Inc. Subminiature connector arrangement. 4,038,505, Cl. 200-51.100.
- Gates, Wendall C., to Advanced Instrumentation Inc. Explosion-proof flow sampling apparatus. 4,037,472, Cl. 73-421.00B.
- Gattermann, Bernd: *See—*
  - Grosse-Scharmann, Franz; Gattermann, Bernd; and Steenken, Bernhard, 4,037,759, Cl. 222-142.000.
- Gattus, Jean: *See—*
  - Balme, Maurice; Gattus, Jean; and Gerard, Bernard, 4,038,450, Cl. 428-268.000.
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  - Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.
- Gebruder Junghans GmbH, Firma: *See—*
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  - Maggos, Theodore; Geiger, David H.; Steiner, Sheldon M.; and Gregorio, Henry D., 4,037,375, Cl. 52-220.000.
- Geiger, Friedhelm; Heimberger, Werner; and Lussling, Theodor, to Deutsche Gold- und Silber-Scheideanstalt vormals Roessler. Process for the production of finely divided solid cyanuric chloride. 4,038,276, Cl. 260-248.00C.
- Geiss, Vernon L.: *See—*
  - Newton, Richard P.; Geiss, Vernon L.; Jewell, John N ; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.
- General Dynamics Corporation: *See—*
  - Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., 4,037,806, Cl. 244-3.160.
- General Electric Company: *See—*
  - DePuy, Robert P., 4,038,695, Cl. 361-96.000.
  - Elder, James H.; and Patterson, Hubert A., 4,038,605, Cl. 328-119.000.
  - Flanagan, Robert J.; Conners, Richard C.; and Merrill, Richard C., 4,037,298, Cl. 29-25.420.
  - Graham, Alfred Rapp, 4,037,995, Cl. 417-349.000.
  - Harris, David J., 4,037,990, Cl. 416-220.00R.
  - Mapelsden, George C., 4,038,508, Cl. 200-329.000.
  - Stoll, Donald H., 4,037,316, Cl. 29-622.000.
  - Tompkins, Russell E.; Fisher, Franklin A.; and Wanger, Robert P., 4,038,625, Cl. 336-83.000.
  - White, James A., 4,038,510, Cl. 219-10.55E.
  - Wilson, Arthur C., 4,037,490, Cl. 74-553.000.
- General Foods Corporation: *See—*
  - Martin, Thom O., 4,038,427, Cl. 426-285.000.
- General Mills Chemicals, Inc.: *See—*
  - Karl, Curtis Lee, 4,038,206, Cl. 252-316.000.
- General Mills, Inc.: *See—*
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- General Motors Corporation: *See—*
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- General Signal Corporation: *See—*
  - Hillyer, Michael J.; and Madison, Victor J., 4,038,573, Cl. 310-71.000.
  - Kleimeyer, Vernon T.; and Schinner, Thomas J., 4,038,522, Cl. 235-61.70B.
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  - Burkley, Harold W.; and Geno, Wayne H., 4,037,318, Cl. 29-623.000.
- Georg, Werner; Heberling, Walter; and Langenberg, Werner, to Gewerkschaft Eisenhutte Westfalia. Tightening arrangement for longwall mining machine cable and conveyor. 4,037,876, Cl. 299-43.000.
- George Kent Limited: *See—*
  - Record, Robert George Hamilton, 4,037,773, Cl. 228-122.000.
- George, Philip F. Smoking system. 4,037,610, Cl. 131-184.00A.
- Georgi, Heinz W., to Ivac Corporation. Method and apparatus for fluid flow control. 4,037,598, Cl. 128-214.00E.
- Gerard, Bernard: *See—*
  - Balme, Maurice; Gattus, Jean; and Gerard, Bernard, 4,038,450, Cl. 428-268.000.
- Germain, Roger Louis Elysee, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Universal-joint assemblies and self-aligning thrust bearings, especially for the shafts of rotating machines. 4,037,887, Cl. 308-72.000.
- Gerry, Martin E. Still image slide combination with sequentially activated audio channels per slide. 4,038,691, Cl. 360-2.000.
- Gerth, Howard L., to United States of America, Energy Research and Development Administration. Combination spindle-drive system for high precision machining. 4,037,496, Cl. 82-28.00R.

- Getty, William P.: *See—*
  - Dorman, Evans D.; and Getty, William P., 4,037,498, Cl. 82-86 000.
- Geweke, Werner: *See—*
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  - Georg, Werner; Heberling, Walter; and Langenberg, Werner, 4,037,876, Cl. 299-43.000.
  - Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.
- Giannotti, Albert J. Beverage cooler assembly. 4,037,428, Cl 62-371.000.
- Gibson, John C., to Gibson Motor and Machine Service, Inc. Fire fighting-foam producing module. 4,037,664, Cl. 169-15.000.
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  - Gibson, John C., 4,037,664, Cl. 169-15.000.
- Gibson, Roy Morris; and Sprokel, Gerard John, to International Business Machines Corporation. Method for producing selected alignment in liquid crystal. 4,038,439, Cl. 427-38.000.
- Giessler, Horst; and Luckerath, Klaus. Track for a combined monorail and overhead monorail. 4,037,541, Cl. 104-109.000.
- Gilchrist, Edgar S.: *See—*
  - Karsh, Herbert; and Gilchrist, Edgar S., 4,037,767, Cl. 226-7.000.
- Gildenberg, Philip L. Method of measuring blood flow by radiation. 4,037,585, Cl. 128-2.00A.
- Gildersleeve, Oliver DeP., Jr.; and Hunger, George A., Jr. Particulate energy absorber. 4,038,557, Cl. 290-1.00R.
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  - Freeman, Gary M., 4,038,555, Cl. 250-573.000.
- Gilvar, Martin, to Morgan Construction Company. Apparatus for supporting bearing chocks in a rolling mill. 4,037,450, Cl. 72-237.000.
- Ginex, Michael F.; and Thomas, Donald E. Fret refinishing apparatus and method. 4,037,510, Cl. 84-453.000.
- Gipson, Robert Malone, to Texaco Development Corporation. Boride catalyst for epoxidizing olefinic compounds. 4,038,290, Cl. 260-348.50L.
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- GKN Transmissions Limited: *See—*
  - Hewitt, Roger John Arthur; and Cross, Nigel Terence, 4,037,693, Cl. 192-3.560.
- Gladow, Dean E., to Didde-Glaser, Inc. Through-the-cylinder slug out device. 4,037,501, Cl. 83-100.000.
- Glasrock Products, Inc.: *See—*
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- Glaxo Laboratories Limited: *See—*
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- Gliemeroth, Georg, to Jenaer Glaswerk Schott & Gen. Ion exchangeable glass having low thermal expansion. 4,038,090, Cl. 106-53.000.
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  - Widmer, John Robert; and Gloeckler, Arthur John, 4,038,523, Cl. 235-61.90R.
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  - Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,038,418, Cl. 424-358.000.
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  - Heyne, Carl J.; Cooper, Richard, Jr.; and Godwin, Gurney L., 4,038,589, Cl. 318-174.000.
- Goesswald, Fritz: *See—*
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- Golay, Marcel J. E., to Perkin-Elmer Corporation, The. Method and apparatus for introducing liquid samples into a gas chromatographic column. 4,038,053, Cl. 55-160.000.
- Goldfarb, Adolph E.; Benkoe, Erwin; Everitt, Delmar K.; Chesley, Ronald F.; and Frierdich, Richard D., to Goldfarb, Adolph E.; and Benkoe, Erwin. Toy game device and method. 4,037,840, Cl. 273-85.00A.
- Golobay, Gary L.; and Schrag, Robert L., to NCR Corporation. Actuator for a wire matrix printer and method of making. 4,037,704, Cl. 197-1.00R.
- Goloff, Alexander, to Caterpillar Tractor Co. Rotary engine cooling. 4,037,998, Cl. 418-83.000.
- Goncharova, Nina Efimovna: *See—*
  - Elinov, Nikolai Petrovich; Gurevich, Isaak Yakovlevich; Dranishnikov, Afrikan Nikolaevich; and Goncharova, Nina Efimovna, 4,038,379, Cl. 424-4.000.
- Gongwer, Calvin A., to Innerspace Corporation. Fluid control,valve. 4,037,615, Cl. 137-1.000.
- Gonsalves, Michael; and Sarmiento, Constante C. Blower for edger. 4,037,667, Cl. 172-14.000.
- Goodyear Tire & Rubber Company, The: *See—*
  - Castner, Kenneth F., 4,038,471, Cl. 526-142.000.
  - Feeney, George W, 4,038,346, Cl. 260-887.000.
  - Finelli, Anthony F.; and Saracsan, Jeffrey W., 4,038,256, Cl. 260-75.0NH.
  - Hoback, Ronald D., 4,037,485, Cl. 74-229.000.
  - White, John R.; Krishnan, Ram M.; and Wolfe, James D., 4,038,088, Cl. 106-38.240.
- Goralski, Christian T.: *See—*
  - Mixan, Craig E.; Goralski, Christian T.; and Pews, R. Garth, 4,038,393, Cl. 424-250.000.
- Gorby, Oliver L., to Dynamic Industries, Inc. Towable front end loader. 4,037,681, Cl. 180-44.00R.
- Gordon, Michael, to Koret, Inc. Hinged handbag handle apparatus. 4,037,633, Cl. 150-33.000.
- Gorokhov, Veniamin Ivanovich: *See—*
  - Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich, Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.
- Gorter, Frederik Willem; and Wijn, Henricus Petrus Johannes, to U.S. Philips Corporation. Magnetoresistance detection device having noise suppression. 4,038,597, Cl. 324-46.000.
- Goser, Karl, to Siemens Aktiengesellschaft. Pair of bipolar transistors having base zones which are electrically conductively connected to one another, and a process for producing the pair of transistors. 4,038,676, Cl. 357-34.000.
- Gotoh, Sotoji; Nakamura, Jun; Abe, Yuji; and Matsuo, Tadashige, to Mitsubishi Jukogyo Kabushiki Kaisha Impregnated fibrous catalyst for treating exhaust gas of an internal combustion engine and process for making same. 4,038,214, Cl. 252-458.000.
- Gottbreht, Thomas Leon; Tolson, James William; and Crawford, Joe Wade, to Texas Instruments Incorporated. Power transistor and thyristor adapter. 4,038,678, Cl. 357-81.000.
- Gottfried, Rudolf: *See—*
  - Reichel, Sigrid; and Gottfried, Rudolf, 4,038,302, Cl. 260-448.20E.
- Gottlieb, Wilmers: *See—*
  - Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.
- Gould Inc.: *See—*
  - Hou, Shou L.; and Carnahan, Robert D., 4,038,667, Cl. 346-140.00R.
- Graber, Homer R.: *See—*
  - Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D , 4,037,410, Cl. 60-445.000.
- Graf, Peter E.; and Schmidt, Robert J., to Chevron Research Company. Bituminous emulsion-mineral aggregate compositions containing silanes as adhesion promoters. 4,038,096, Cl. 106-277.000.
- Graff, Roderich W. Adsorption apparatus. 4,038,054, Cl. 55-179.000.
- Graham, Alfred Rapp, to General Electric Company. Liquid propellant gun (damper). 4,037,995, Cl. 417-349.000.
- Grantham, Geoffrey John: *See—*
  - Cowie, William Pirie; Donaldson, Fraser; and Grantham, Geoffrey John, 4,037,294, Cl. 17-56.000.
- Gravely, Lawrence E.: *See—*
  - Newton, Richard P.; Geiss, Vernon L.; Jewell, John N.; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.
- Gray, Roger M.: *See—*
  - Webb, John G., Jr.; and Gray, Roger M., 4,038,656, Cl. 343-5.0SA.
- Green, David William, to British Syphon Industries Limited. Preparation of beverages. 4,037,757, Cl. 222-129.200.
- Greene, Frank E., to United States of America, Army. Telescoping retractor. 4,037,821, Cl. 254-93.00R.
- Gregorio, Henry D.: *See—*
  - Maggos, Theodore; Geiger, David H.; Steiner, Sheldon M., and Gregorio, Henry D., 4,037,375, Cl. 52-220.000.
- Gregory, Clive Allen: *See—*
  - Kemlo, Kenneth Garry; and Gregory, Clive Allen, 4,037,761, Cl 222-590.000.
- Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, to BASF Aktiengesellschaft. Alkylene oxide derivatives based on polytetrahydrofuran copolymers. 4,038,296, Cl. 260-410.600.
- Greig, Douglas J. Variable on-and off-time relaxation oscillator. 4,038,611, Cl. 331-108.00D.
- Greyson, Jerome: *See—*
  - Johnston, Katharine Gentry; and Greyson, Jerome, 4,038,485, Cl. 23-230.00B.
- Grice-Hutchinson, Edward Henry: *See—*
  - Birchall, James Derek; Cassidy, John Edward; and Grice-Hutchinson, Edward Henry, 4,038,234, Cl. 260-29.60F.
- Grichnik, James A. Electroencephalograph display. 4,037,586, Cl. 128-2.10B.
- Griffith, George L., to IMC Chemical Group, Inc. Enclosure for explosive material. 4,037,536, Cl. 102-20.000.
- Grimpe, Karl; and Reth, Erich, to Demag Aktiengesellschaft. Group gearing arrangement in a continuous rolling mill. 4,037,452, Cl. 72-249.000.
- Griner, Arthur J.; and Koppa, Daniel Anthony, to Nabisco, Inc. Apparatus for making hollow molded products. 4,038,007, Cl. 425-259.000.
- Griner, Arthur J.; and Koppa, Daniel Anthony, to Nabisco, Inc. Apparatus for making hollow molded products. 4,038,016, Cl. 425-451.900.
- Grisar, J. Martin; and Claxton, George P., to Richardson-Merrell Inc. N-(phenylether-substituted benzyl)alkanediamines. 4,038,412, Cl. 424-280.000.
- Grisar, Ulrich; and Berstermann, Wilhelm, to Klockner-Werke AG. Apparatus for the spectral analysis of materials. 4,037,962, Cl. 356-86.000.
- Grisar, Ulrich; and Berstermann, Wilhelm, to Klockner-Werke AG. Spark-discharge apparatus with ground detection safety circuit. 4,037,963, Cl. 356-86.000.
- Griswold, Augustus W.; and Haritonoff, Boris W. Microfiche deleter method. 4,038,124, Cl. 156-248.000.
- Groebke, Wolfgang, to Sandoz Ltd. 2'-Alkoxyacylamino-4'-

alkylamino-4-nitro-1,1 -azobenzene disperse dyes. 4,038,269, Cl. 260-207.000.

Gronemann, Hans-Joachim: *See—*

Wachter, Herbert; and Gronemann, Hans-Joachim, 4,038,595, Cl. 323-45.000.

Grosse-Heitmeyer, Johann: *See—*

Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.

Grosse-Scharmann, Franz; Gattermann, Bernd; and Steenken, Bernhard, to Amazonen-Werke H. Dreyer. Seed planting machine 4,037,759, Cl. 222-142.000.

Grossman, Harold, to Montclair Research Corporation. Cigarette and filter for tobacco smoke. 4,037,607, Cl. 131-10.00R.

Grossman, Leonard N.: *See—*

Noble, Lowell A.; Grossman, Leonard N.; and Marlowe, Mickey O., 4,038,117, Cl. 156-2.000.

Grove, Clinton E. Apparatus for adjusting camber. 4,037,680, Cl 180-43.00R.

Grubb, Fred H.: *See—*

Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., 4,037,780, Cl. 232-31.000.

Grummon, Bryan R.: *See—*

Chiodi, Wayne R.; and Grummon, Bryan R., 4,038,621, Cl. 335-213.000.

Grunberg, Emanuel: *See—*

Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,038,289, Cl. 260-347.300.

Grunewald, Ernst, to Hobart Corporation. Dishwasher filter flushing system. 4,038,103, Cl. 134-10.000.

Gruzdev, Avenir Mikhailovich: *See—*

Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl. 261-41.00D.

Gryctko, Carl E., to I-T-E Imperial Corporation. Circuit breaker having thermal and solid state trip means. 4,038,618, Cl. 335-23.000

Gschwendtner, Horst: *See—*

Nagel, Karl; Conzelmann, Gerhard; and Gschwendtner, Horst, 4,038,677, Cl. 357-51.000.

GSF Corporation: *See—*

Ver Hage, Richard P., 4,037,746, Cl. 215-31.000.

GTE Sylvania Incorporated: *See—*

Audesse, Emery G.; and Armstrong, Donald E., 4,038,020, Cl. 431-93.000.

Jayne, Max Leroy, 4,037,906, Cl. 339-107.000.

Minnier, Henry B.; and Layman, H. David, 4,038,205, Cl. 252-301.60S.

Guay, Wilbur J., to Newmont Explorations Limited. Increasing the recoverability of gold from carbonaceous gold-bearing ores. 4,038,362, Cl. 423-40.000.

Guerra, John Michael. Cryogenic cameras. 4,038,669, Cl. 354-76.000.

Gulf Oil Corporation: *See—*

Doyle, William C., Jr.; and Kirkpatrick, Joel L., 4,038,387, Cl. 424-226.000.

Gulyaeva, Galina Petrovna: *See—*

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Gun, Dmitry Rudolfovich: *See—*

Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.

Gunnergaard, Marius, to Dansk Industri Syndikat A/S. Method in the operation of an apparatus for producing castings. 4,037,642, Cl. 164-18.000.

Gunther Papenmeier KG Maschinen-und Apparatebau: *See—*

Bremer, Horst, 4,038,010, Cl. 425-314.000.

Gurevich, Isaak Yakovlevich: *See—*

Elinov, Nikolai Petrovich; Gurevich, Isaak Yakovlevich; Dranishnikov, Afrikan Nikolaevich; and Goncharova, Nina Efimovna, 4,038,379, Cl. 424-4.000.

Gustafsson, Hans Eric Karl, to Hiab-Foco Aktiebolag. Programme controlled hydraulic loading crane. 4,037,742, Cl. 214-138.00R.

Gutteridge, Ronald J.; and Stickney, George A., to Motorola, Inc. Integrated circuit and method. 4,037,306, Cl. 29-577.000.

Guyer, Robert Charles, to RCA Corporation. Optical adjustment device. 4,037,942, Cl. 350-285.000.

Guyette, Edward L., to Beckman Instruments, Inc. Snap-in electrical terminals. 4,037,898, Cl. 339-17.00C.

H. B. Contracting Ltd.: *See—*

Berg, Harry, 4,037,425, Cl. 61-112.000.

H. H. Robertson Company: *See—*

Howell, Norbert C.; Tischuk, Walter; and Welsh, Thomas M., 4,037,377, Cl. 52-309.900.

Haas, Werner E. L.; and Dir, Gary A., to Xerox Corporation. Electrooptic-photoconductor sandwich using actinic readout light. 4,037,932, Cl. 350-160.0LC.

Haberlin, Paul. Ski pole handle or the like. 4,037,850, Cl. 280-11.37H.

Haberman, Charles E., to Oil Shale Corporation (Tosco), The. Char composition and a method for making a char composition. 4,038,100, Cl. 106-307.000.

Habermeier, Juergen; Batzer, Hans; and Porret, Daniel, to Ciba-Geigy AG. Mono- and dialcohols of five or six membered N-heterocyclic compounds, containing two NH groups per molecule. 4,038,277, Cl. 260-256.40C.

Habermeier, Jurgen, to Ciba-Geigy Corporation. Linear polyesters based on N,N-heterocyclic dicarboxylic acids. 4,038,255, Cl. 260-75.00N.

Habu, Teiji; Nakajima, Tomio; and Sakamoto, Eiichi, to Konishiroku Photo Industry Co., Ltd. Development method. 4,038,081, Cl. 96-66.300.

Hackman, Emory E., to United States of America, Navy. Spiral channel blast-fragment warhead. 4,037,539, Cl. 102-67.000.

Haentjens, Walter D. Pump coupling. 4,037,980, Cl. 403-336.000.

Hagenbohmer, Bodo; and Schaefer, Philipp, to Michelin Recherche et Technique. Safety pneumatic tire. 4,037,636, Cl. 152-347.000.

Hagenuk Vormals Neufeldt and Kuhnke G.m.b.H.: *See—*

Doe, Ewart H.; and Linforth, William J., 4,037,733, Cl. 214-1.500.

Hajdu, Paul A.: *See—*

Yates, Howard D.; Smyth, James A.; and Hajdu, Paul A., 4,037,940, Cl. 350-242.000.

Hakata, Masayuki, to Casio Computer Co., Ltd. Multi-level voltage selection circuit. 4,038,564, Cl. 307-205.000.

Hale, David F.: *See—*

Morton, Richard F.; and Hale, David F., 4,038,518, Cl. 219-218.000.

Halker, Bruce B.: *See—*

Rhees, Raymond C.; and Halker, Bruce B., 4,038,170, Cl. 204-290.00R.

Hall, Charles M.; and Johnson, Herbert G., to Upjohn Company, The. Compounds, compositions and methods of use. 4,038,398, Cl. 424-263.000.

Hall, Floyd Vanmeda, to Liggett Group Inc. Apparatus for combining a tube with a cigarette filter. 4,037,524, Cl. 93-77.0FT.

Hallais, Jean Philippe; Monnier, Michel Jean-Claude; and Richard, Jean-Claude, to U.S. Philips Corporation. Photocathode support of corundum with layer of barium boroaluminate or calcium boroaluminate glass. 4,038,576, Cl. 313-101.000.

Hamano, Sachiyuki; and Nakamura, Takaharu, to Eisai Co., Ltd. 4-Aminopyrimidium derivatives and preparation thereof. 4,038,278, Cl. 260-256.40N.

Hamer, Edward G.; and Phillips, Calvert F., Jr., to United States of America, Air Force. Frequency agility radar. 4,038,659, Cl. 343-17.10R.

Hamill, Robert L.: *See—*

Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,038,384, Cl. 424-122.000.

Hamilton, Stephen P.: *See—*

Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.

Hanagan, Michael W., to Corbin Gentry Inc. Magnetic clutch device. 4,038,572, Cl. 310-46.000.

Handlos, Arthur E.: *See—*

Knott, Robert F.; and Handlos, Arthur E., 4,038,156, Cl. 203-45.000.

Handy Button Machine Company: *See—*

Loui, Phillip J.; and Schmidt, James A., Jr., 4,037,813, Cl. 248-250.000.

Hannan, John I., to Phillips Stamping Co., Inc. Load supporting bearing plate. 4,037,418, Cl. 61-45.00B.

Hanotier, Jacques D. V.: *See—*

de Radzitzky d'Ostrowick, Pierre M. J. G.; Hanotier, Jacques D. V.; and Vaerman, Joseph M. E., 4,038,322, Cl. 260-597.00R.

Hanson, Richard A., to Systron Donner Corporation. Low stress optical mounting structure and method. 4,037,944, Cl. 350-310.000.

Hanssen, Albert J.: *See—*

Soderberg, Roy E.; and Hanssen, Albert J., 4,037,818, Cl. 251-121.000.

Hansson, Jan Erik Enefrid, to Sund-Akesson Aktiebolag. Injection molding machine. 4,038,003, Cl. 425-137.000.

Hanstein, Friedrich; and Moench, Theodor Peter, to Rohm GmbH. Method for contouring the surface of thermoplastic synthetic resins. 4,038,360, Cl. 264-293.000.

Hanyu, Susumu; and Amano, Takashi, to Janome Sewing Machine Co. Case for portable sewing machines. 4,037,549, Cl. 112-258.000.

Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, to Sumitomo Metal Industries, Ltd.; and Satosen Company Limited. Molds for continuously casting steel. 4,037,646, Cl. 164-273.00R.

Harand, Elmar: *See—*

Dorner, Heinrich; Harand, Elmar; and Kleiter, Walter, 4,038,134, Cl. 176-65.000.

Hareng, Michel: *See—*

Bricot, Claude; Hareng, Michel; and Spitz, Erich, 4,037,929, Cl. 350-160.0LC.

Hargreaves, Walter A., to Optovac, Inc. Polycrystalline bodies and means for producing them. 4,038,201, Cl. 252-300.000.

Haritonoff, Boris W.: *See—*

Griswold, Augustus W.; and Haritonoff, Boris W., 4,038,124, Cl. 156-248.000.

Harkness, Joseph R., to Briggs & Stratton Corporation. Brake safety system for a power driven rotary mower. 4,037,389, Cl. 56-11.300.

Harman, Julius, to Alfred Herbert Limited. Automatic machine tool and method of operation. 4,038,591, Cl. 318-578.000.

Harrington Manufacturing Company: *See—*

Mitchell, John D.; and Jordan, Bertram L., 4,037,391, Cl. 56-27.500.

Harris, David J., to General Electric Company. Composite turbomachinery rotor. 4,037,990, Cl. 416-220.00R.

Harris, David L.: *See—*

Hulslander, Gary L.; Mills, Gary E.; and Harris, David L., 4,037,826, Cl. 259-8.000.

Harris, Donald Wayne: *See—*

Antrim, Richard Lee; and Harris, Donald Wayne, 4,038,481, Cl. 536-56.000.

Harris, Garrett H.; and Harris, Louis M. Boat steering mechanism for outboard motor. 4,037,556, Cl. 115-18.00R.

Harris, Louis M.: *See—*

Harris, Garrett H.; and Harris, Louis M., 4,037,556, Cl. 115-18.00R.

Harris, Vernon B.: *See—*

Flumm, Paul T.; and Harris, Vernon B., 4,037,398, Cl. 58-22.900.

Hart, Mark M. Safety device and method. 4,037,516, Cl. 85-62.000.

Hartel, Gunter. Apparatus for the predetermined addition of secondary air for the optimum combustion of exhaust gases of internal combustion engines. 4,037,406, Cl. 60-276.000.

Hartig, Juergen: *See—*

Weitz, Hans-Martin; and Hartig, Juergen, 4,038,307, Cl. 260-497.00A.

Hartka, Dale R. Heating and refrigeration system. 4,037,649, Cl. 165-16.000.

Hartmann, Eduard, to Bucher-Guyer AG Maschinenfabrik. Measurement apparatus for determining the degree of filling of a casting mold. 4,038,004, Cl. 425-150.000.

Harva, Olavi: *See—*

Pohjola, Leila; Harva, Olavi; and Karvinen, Jaakko, 4,038,223, Cl. 260-9.000.

Harwood, Leopold Albert, to RCA Corporation. Chroma-burst separator and amplifier. 4,038,681, Cl. 358-20.000.

Hasegawa, Yoshihisa: *See—*

Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, 4,038,172, Cl. 208-10.000.

Haseler, Helmut: *See—*

Meckl, Heinz; Haseler, Helmut; and Seiler, Adolf, 4,038,079, Cl. 96-60.0BF.

Hauck, Frederic Peter; and Sundeen, Joseph E., to E. R. Squibb & Sons, Inc. Piperidone intermediates useful in the preparation of aryldecahydropyrrolo [3,4-f]quinolines. 4,038,273, Cl. 260-240.00D.

Haug, Theobald: *See—*

Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.

Hauni-Werke Korber & Co., KG: *See—*

Wahle, Gunter, 4,037,608, Cl. 131-21.00B.

Wochnowski, Waldemar, 4,037,712, Cl. 198-524.000.

Hauser, Raimund: *See—*

Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,037,947, Cl. 352-27.000.

Hawthorne, Janet R. Adaptable diaper. 4,037,602, Cl. 128-287.000.

Hawthorne, M. Marion: *See—*

Newman, James L.; and Hawthorne, M. Marion, 4,038,560, Cl. 307-106.000.

Hayakawa, Hayashi: *See—*

Nishino, Atsushi; Hayakawa, Hayashi; and Kumano, Hiroshi, 4,038,159, Cl. 204-38.00A.

Hayashi, Toshikazu: *See—*

Nakano, Tsunetomo; Nishio, Kazuaki; Hayashi, Toshikazu; and Andou, Hiroshi, 4,038,084, Cl. 96-115.00P.

Haydu, John L.; Fenneteau, Michel M.; and Mann, Byron C., to I-T-E Imperial Corporation. High voltage contactor. 4,038,626, Cl. 337-4.000.

Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. Food bar. 4,038,423, Cl. 426-72.000.

Haywood, George L., to Norton Company. Method of making a flexible resilient abrasive. 4,038,047, Cl. 51-295.000.

Heberling, Walter: *See—*

Georg, Werner; Heberling, Walter; and Langenberg, Werner, 4,037,876, Cl. 299-43.000.

Heckele, Helmut, to Richard Wolf GmbH. Laryngoscopes. 4,037,588, Cl. 128-11.000.

Hedberg, Frederick L.: *See—*

Arnold, Fred E.; and Hedberg, Frederick L., 4,038,320, Cl. 260-578.000.

Hedstrom, Norman; Wright, David; and O'Toole, Jerome, to Wright Line Inc. Document storage system. 4,037,895, Cl. 312-233.000.

Heider, Joachim: *See—*

Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.

Heil-Quaker Corporation: *See—*

Anderson, Richard M.; McGill, Robert S., III; and Ramsey, Robert W., 4,038,061, Cl. 62-126.000.

Heimberger, Werner: *See—*

Geiger, Friedhelm; Heimberger, Werner; and Lussling, Theodor, 4,038,276, Cl. 260-248.00C.

Heinemann Electric Company: *See—*

Tarchalski, Edward; and Wilkinson, John C., 4,038,584, Cl. 361-104.000.

Heisler, Raymond A. Anti-jam converging apparatus for bailed containers from plural conveyors. 4,037,711, Cl. 198-452.000.

Heitmann, Knut: *See—*

Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, 4,037,958, Cl. 356-4.000.

Hellenkamp, Johann F., to Litton Industrial Products, Inc. Piezoelectric dental cleaning device. 4,038,571, Cl. 310-8.200.

Heller, Laszlo; Forgo, Laszlo; and Szabo, Zoltan, to Energiagazdalkodasi Intezet. Power plant with a closed cycle comprising a gas turbine and a work gas cooling heat exchanger. 4,037,413, Cl. 60-655.000.

Heller, Zindel H.: *See—*

Albright, Bill E.; D'Aquino, Michael; and Heller, Zindel H., 4,038,030, Cl. 23-230.00B.

Hellermann Cassettes Limited: *See—*

Leshik, Edward Alexander, 4,038,694, Cl. 360-105.000.

Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erick, to Mo Och Domsjo. Asphalt compositions having improved adhesion to aggregate. 4,038,102, Cl. 106-316.000.

Helsen, Walter A. M.: *See—*

Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., 4,038,286, Cl. 260-309.000.

Hemphill, Charles Wayne, to ADCO Buckets, Inc. Excavating bucket and teeth for a backhoe. 4,037,337, Cl. 37-141.00R.

Hemsley, Thomas Bentham, deceased: *See—*

Henderson, Leslie; and Hemsley, Thomas Bentham, deceased, 4,038,509, Cl. 219-60.00A.

Hemsley, Vera, executrix: *See—*

Henderson, Leslie; and Hemsley, Thomas Bentham, deceased, 4,038,509, Cl. 219-60.00A.

Hencye, Ronald E.: *See—*

Lanz, Donald D.; and Hencye, Ronald E., 4,037,403, Cl. 59-8.000.

Henderson, John E. Support table for pipe bender. 4,037,457, Cl. 72-389.000.

Henderson, Leslie; and Hemsley, Thomas Bentham, deceased (by Hemsley, Vera, executrix), to Clarke Chapman Limited. Orbital welding apparatus. 4,038,509, Cl. 219-60.00A.

Hengen, Edward John; and Hutchinson, Eugene Byron, to Deere & Company. Combine grain tank unloading mechanism. 4,037,745, Cl. 214-521.000.

Henkel & Cie G.m.b.H: *See—*

Moller, Hinrich; Osberghaus, Rainer; Gloxhuber, Christian; and Braig, Siegfried, 4,038,418, Cl. 424-358.000.

Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., to Owatonna Manufacturing Company, Inc. Tractor pulled crop harvester. 4,037,395, Cl. 56-218.000.

Hennart, Claude; and Blanc, Rene, to Airwick Industries, Inc. Electrical device which emits insecticidal vapors. 4,037,352, Cl. 43-129.000.

Hennart, Claude; Dulat, Marcel; and Blanc, Rene, to Airwick Industries, Inc. Device for emitting vapors of active substance. 4,037,353, Cl. 43-129.000.

Hennequin, Francois Maurice. Method for producing sheets of small uniform thickness. 4,038,352, Cl. 264-81.000.

Henrich, Victor E.; and Fan, John C. C., to Massachusetts Institute of Technology. Material and method of making secondary-electron emitters. 4,038,216, Cl. 252-514.000.

Heraty, Patrick T. Coin vault. 4,037,700, Cl. 194-1.00B.

Herberg, Klaus: *See—*

Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.

Hercules Incorporated: *See—*

Dehm, Henry C., 4,038,115, Cl. 149-19.800.

Kramer, Brian D., 4,038,253, Cl. 260-47.00R.

Hermann Berstorff Maschinenbau GmbH: *See—*

Sander, Gottfried, 4,038,012, Cl. 425-363.000.

Hess, Charles W., to Speco, Inc. Method of producing a radial arm-type meat grinder cutter blade. 4,037,494, Cl. 76-101.00A.

Hesselbo, Torben: *See—*

Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,038,408, Cl. 424-270.000.

Hesston Corporation: *See—*

White, Allen Andrew; Yatcilla, George; and Garrison, Harold Keith, 4,037,528, Cl. 100-191.000.

Hetke, Adolf: *See—*

Mohla, Prem P.; Hetke, Adolf; and Warrick, Robert J., 4,037,643, Cl. 164-58.000.

Hewitt, Roger John Arthur; and Cross, Nigel Terence, to GKN Transmissions Limited. Motor vehicle drive system. 4,037,693, Cl. 192-3.560.

Heykants, Jozef J. P.: *See—*

Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., 4,038,286, Cl. 260-309.000.

Heyne, Carl J.; Cooper, Richard, Jr.; and Godwin, Gurney L., to Westinghouse Electric Corporation. Controlled post-synchronizing on brushless synchronous motors. 4,038,589, Cl. 318-174.000.

Hiab-Foco Aktiebolag: *See—*

Gustafsson, Hans Eric Karl, 4,037,742, Cl. 214-138.00R.

Higashiyama, Tatsuo; and Sakata, Isao, to Toyo Hakka Kobyo Kabushiki Kaisha. Menthol glycoside, process for preparing the same and method for releasing menthol therefrom. 4,038,270, Cl. 536-4.000.

High, Robert Edward, to Pennwalt Corporation. Decanter centrifuge apparatus. 4,037,781, Cl. 233-7.000.

Higuchi, Tadamasa; Kuwa, Morihiko; and Saito, Hiroshi, to Nakagawa Corrosion Protecting Co., Ltd. Galvanic anode type cathodic protection apparatus. 4,038,168, Cl. 204-197.000.

- Hildebolt, William M., to Campbell Soup Company. Protein texturization by steam injection. 4,038,431, Cl. 426-511.000.
- Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., to Campbell Soup Company. Protein texturization by steam injection. 4,038,432, Cl. 426-511.000.
- Hildebrand, George. Dog height measuring wicket. 4,037,327, Cl. 33-169.00R.
- Hill, Jan, to AB Tellusond. Method and device for examining pulp for the presence of shives. 4,037,966, Cl. 356-102.000.
- Hill, Joseph M.: *See—*
  - Dorn, Gordon L.; and Hill, Joseph M., 4,038,150, Cl. 195-127.000.
- Hill, Nigel; and Sutton, James Anthony, to Dowty Mining Equipment Limited. Mine roof support. 4,037,419, Cl. 61-45.00D.
- Hillman, Theodore E., to Conwed Corporation. Method and apparatus for perforating fibrous board surfaces in non-repetitive patterns. 4,037,499, Cl. 83-1.000.
- Hillyer, Michael J.; and Madison, Victor J., to General Signal Corporation. Coil terminating means. 4,038,573, Cl. 310-71.000.
- Hinckley, George B.: *See—*
  - Bowyer, Alta M.; Hinckley, George B.; and Davis, James E., 4,038,385, Cl. 424-166.000.
- Hines, Charles E.; and Williams, Dwight E., to Outboard Marine Corporation. Vehicle canopy. 4,037,614, Cl. 135-5.00A.
- Hinson, Virgil: *See—*
  - Jarman, Davis R., 4,037,456, Cl. 72-325.000.
- Hinton, Deborah M.: *See—*
  - Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,038,158, Cl. 204-23.000.
- Hirabayashi, Kazuyoshi: *See—*
  - Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.
- Hiraishi, Yoshinobu: *See—*
  - Tokimoto, Tadashi; and Hiraishi, Yoshinobu, 4,038,370, Cl. 423-336.000.
- Hiramoto, Midori: *See—*
  - Mizuno, Yukio; and Hiramoto, Midori, 4,037,407, Cl. 60-277.000.
- Hirano, Hironori: *See—*
  - Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, 4,037,637, Cl. 152-352.00R.
- Hirano, Takeaki: *See—*
  - Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.
- Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, to Juki Co., Ltd. Knife operating device for sewing machines. 4,037,548, Cl. 112-123.00R.
- Hirohata, Hyogo: *See—*
  - Kinugasa, Terukazu; and Hirohata, Hyogo, 4,038,457, Cl. 428-411.000.
- Hirsch, Irving: *See—*
  - Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., 4,038,640, Cl. 364-200.000.
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- Hirschauer, Andre: *See—*
  - Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, 4,038,295, Cl. 260-409.000.
- Hirschfeld, Tomas, to Block Engineering, Inc. Proportional diluter. 4,037,760, Cl. 222-145.000.
- Hirschmann, Ralph F.; and Veber, Daniel F., to Merck & Co., Inc. Pyridyl-4-methyl-succinimidocarbonate and process for its preparation. 4,038,282, Cl. 260-295.00D.
- Hirschmann, Ralph F.: *See—*
  - Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., 4,038,306, Cl. 260-479.00S.
- Hisagi, Takashi: *See—*
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- Hitachi, Ltd.: *See—*
  - Ito, Tosikatu; and Takahashi, Reijiro, 4,037,651, Cl. 165-30.000.
  - Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, 4,038,060, Cl. 62-36.000.
  - Kurita, Seiichi; Nakayama, Toru; Okano, Kinpei; and Watahiki, Seishi, 4,037,890, Cl. 308-187.000.
  - Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi; Tsuzurahara, Mamoru, and Sunahara, Kazuo, 4,037,930, Cl. 350-160.0LC.
  - Takeda, Yasutsugu; and Tsunoda, Yoshito, 4,037,919, Cl. 350-3.500.
  - Uchida, Kenji; and Fujita, Kenichi, 4,037,992, Cl. 417-102.000.
- Hively, Vern J. Portable crimping device. 4,037,629, Cl. 140-106.000.
- Hoag, Peter J.: *See—*
  - Sandrock, Don G.; and Hoag, Peter J., 4,037,682, Cl. 180-69.00R.
- Hoagland, Kenneth A., to Fairchild Camera and Instrument Corporation. Charge-coupled device video-signal-generating system. 4,038,690, Cl. 358-213.000.
- Hoback, Ronald D., to Goodyear Tire & Rubber Company, The. Belt drive and belts and pulleys therefor. 4,037,485, Cl. 74-229.000.
- Hobart Corporation: *See—*
  - Grunewald, Ernst, 4,038,103, Cl. 134-10.000.
- Hobson, Stephan C., to Portec, Inc. Cotter pin. 4,037,513, Cl. 85-8.300.
- Hoch, Helmut; and Quadbeck-Seeger, Hans-Juergen, to BASF Aktiengesellschaft. Production of 2-hydroxynaphthalene-3-carboxylic acid. 4,038,309, Cl. 260-520.00A.
- Hochstein, Peter A. Thermal energy converting assembly. 4,037,411, Cl. 60-527.000.
- Hodge, Lee Roy, to Hughes Tool Company. Shaft drill break-out system. 4,037,672, Cl. 173-157.000.
- Hoeberechts, Arthur Marie Eugene; and Carasso, Marino Giuseppe, to U.S. Philips Corporation. Semiconductor device for storing and non-destructively reading image information and memory system comprising such a device. 4,038,606, Cl. 328-124.000.
- Hoehn, Hans: *See—*
  - Denzel, Theodor; and Hoehn, Hans, 4,038,281, Cl. 260-296.00H.
  - Denzel, Theodor; and Hoehn, Hans, 4,038,283, Cl. 260-295.50B.
- Hoehn, Marvin M.: *See—*
  - Berg, David H.; Hamill, Robert L.; and Hoehn, Marvin M., 4,038,384, Cl. 424-122.000.
- Hoerner Waldorf Division - Champion Int. Corporation: *See—*
  - Roccaforte, Harry I., 4,037,717, Cl. 206-45.140.
- Hoesterey, Howard F., to Philco Corporation. Tracking and sighting instrument. 4,038,547, Cl. 250-338.000.
- Hoffa, Jack L.: *See—*
  - Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., 4,037,806, Cl. 244-3.160.
- Hoffman, Alfred J. Board game apparatus. 4,037,843, Cl. 273-131.0AB.
- Hoffman-La Roche Inc.: *See—*
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- Hoffmann-La Roche Inc.: *See—*
  - Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,038,289, Cl. 260-347.300.
  - Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, 4,038,272, Cl. 260-239.55R.
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- Holan, George: *See—*
  - Evans, John James Alexander; and Holan, George, 4,038,405, Cl. 424-269.000.
- Holland, Andrew P. Automatic cigarette snuffer and disposal device. 4,037,611, Cl. 131-237.000.
- Hollander, John M. Used vehicle parts disassembly system and method. 4,037,302, Cl. 29-403.000.
- Holleran, Louis M.: *See—*
  - Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.
- Holm, LeRoy W., to Union Oil Company of California. Micellar flooding process for recovering oil from petroleum reservoirs. 4,037,659, Cl. 166-273.000.
- Holmes, Arthur: *See—*
  - Hopkins, John Leslie; and Holmes, Arthur, 4,037,559, Cl. 116-133.000.
- Holst, Johan Wilhelm Isaachsen. Tube fly, and method for its production. 4,037,346, Cl. 43-42.140.
- Holte, Paul C.: *See—*
  - Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., 4,038,169, Cl. 204-202.000.
- Holtey, Thomas O.: *See—*
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- Honda Giken Kogyo Kabushiki Kaisha: *See—*
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- Honeywell Inc.: *See—*
  - Mott, Richard C., 4,037,625, Cl. 138-46.000.
  - Quarton, William T., 4,038,668, Cl. 235-151.000.
  - Roberts, James L., 4,038,540, Cl. 235-181.000.
- Honeywell Information Systems, Inc.: *See—*
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- Honjo, Satoru: *See—*
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- Hook, John Laurence, to Gainsborough Hardware Industries, Pty., Ltd. Door furniture mounting. 4,037,865, Cl. 292-357.000.
- Hooker Chemicals & Plastics Corporation: *See—*
  - Schwartz, Willis T., Jr., 4,038,341, Cl. 260-862.000.
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- Hooker, Donald E., to Bally Manufacturing Corporation. Amusement apparatus. 4,037,845, Cl. 273-138.00A.
- Hopf, Walter: *See—*
  - Tarmann, Rainer; and Hopf, Walter, 4,037,644, Cl. 164-61.000.
- Hopkins, John Leslie; and Holmes, Arthur. Milk requirement indicator. 4,037,559, Cl. 116-133.000.
- Hopper, Larry R., to Petrolite Corporation. Fire extinguisher containing a high internal phase ratio emulsion as fire extinguishing agent. 4,037,665, Cl. 169-49.000.
- Horikawa, Kazuo: *See—*
  - Komaki, Takao; Horikawa, Kazuo; Honjo, Satoru; and Matsumoto, Seiji, 4,038,545, Cl. 250-315.00A.
- Hornbaker, Edwin D.: *See—*
  - Eisenbraun, Allan A.; and Hornbaker, Edwin D., 4,038,344, Cl. 260-879.000.
- Horner, Raymond L.: *See—*
  - Prescott, David B.; Thumm, Herbert H.; and Horner, Raymond L., 4,037,848, Cl. 277-37.000.
- Horowitz, Charles, to Sloan Valve Company. Empty and load sensing valve. 4,037,879, Cl. 303-23.00R.
- Horton, Edward L.: *See—*
  - Rose, James J.; and Horton, Edward L., 4,037,290, Cl. 15-345.000.

- Horwinski, Elwood R., to Product Concepts, Inc. Internally illuminated switch plate. 4,038,582, Cl. 315-129.000.
- Hosoe, Kazuya: *See—*
  - Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, 4,037,948, Cl. 352-29.000.
- Hou, Shou L.; and Carnahan, Robert D., to Gould Inc. Ink jet ink supply system. 4,038,667, Cl. 346-140.00R.
- Houilleres du Bassin de Lorraine: *See—*
  - Deruelle, Jean; and Penet, Olivier, 4,038,153, Cl. 201-27.000.
- Hounsell, Melvin Wayne: *See—*
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- How, James Charles, to James How Industries Limited. Strings for musical instruments. 4,037,506, Cl. 84-297.00S.
- Howard Hall & Company: *See—*
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- Howell, Norbert C.; Tischuk, Walter; and Welsh, Thomas M., to H. H. Robertson Company. Foamed-in-place double-skin building panel. 4,037,377, Cl. 52-309.900.
- Hubacher, Eric M.: *See—*
  - Bove, Ronald; and Hubacher, Eric M., 4,038,599, Cl. 324-158.00F.
- Hubbard, Michael James. Tapestry holder. 4,037,640, Cl. 160-398.000.
- Hucks, Uwe: *See—*
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- Huempfner, David F.; and Tringali, Richard C., to American Hospital Supply Corporation. Caster and swivel lock assembly. 4,037,291, Cl. 16-35.00R.
- Huenniger, Edward A.; and Spurrell, Robert M., to United Technologies Corporation. Two dimensional nozzle with rotating plug. 4,037,405, Cl. 60-229.000.
- Huffine, Coy Lee; Mattson, Larry Frederick; Shidler, Karl Allen; and Slindee, Norman Edward, to International Business Machines Corporation. Anti-static magnetic record disk assembly. 4,038,693, Cl. 360-99.000.
- Huffman, Fred A. Writing instrument. 4,037,975, Cl. 401-6.000.
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- Hughes Tool Company: *See—*
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- Hugl, Herbert; and Wolfrum, Gerhard, to Bayer Aktiengesellschaft. Process for dyeing polyurethane resins. 4,038,240, Cl. 260-37.00N.
- Hukki, Risto Tapani. Apparatus for controlling discharge of classified sand from a hydraulic classifier. 4,038,178, Cl. 209-161.000.
- Hulslander, Gary L.; Mills, Gary E.; and Harris, David L., to Dependable-Fordath, Inc. Mixing apparatus having plurality of different blades with multiple functions. 4,037,826, Cl. 259-8.000.
- Hundt, Murray T.: *See—*
  - Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,038,432, Cl. 426-511.000.
- Hunger, George A., Jr.: *See—*
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- Hunt, Kevin: *See—*
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- Hunter, Tracy A.: *See—*
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- Hurst, John, to W. R. Grace Limited. Separator for concrete wrapping to submarine pipelines. 4,037,627, Cl. 138-175.000.
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- Hutchinson, Eugene Byron: *See—*
  - Hengen, Edward John; and Hutchinson, Eugene Byron, 4,037,745, Cl. 214-521.000.
- Huther, Jerome W. Vertical axis wind turbine rotor. 4,037,989, Cl. 416-197.00A.
- Hwa, Fu: *See—*
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- Hwang, Frank Kwangming, to Bell Telephone Laboratories, Incorporated. Efficient rearrangeable multistage switching networks. 4,038,638, Cl. 340-166.00R.
- Hyatt, Gilbert P.: *See—*
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- Hyldon, Roy G.: *See—*
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- I.C.S. Ignition Control Systems Ltd.: *See—*
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- I-T-E Imperial Corporation: *See—*
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  - Gryctko, Carl E., 4,038,618, Cl. 335-23.000.
  - Haydu, John L.; Fenneteau, Michel M.; and Mann, Byron C., 4,038,626, Cl. 337-4.000.
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- ICN Pharmaceuticals, Inc.: *See—*
  - Robins, Roland K.; Shuman, Dennis A.; and Boswell, Kay H., 4,038,480, Cl. 536-27.000.
- Ide, Thomas N., to Stratoflex, Inc. Air cleaner and dryer. 4,038,051, Cl. 55-218.000.
- Ideal Industries, Inc.: *See—*
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- Ido, Kazuo; and Saito, Shizuo, to Kabushiki Kaisha Suwa Seikosha; and Shinshu Seiki Kabushiki Kaisha. Liquid crystal display cell driving circuit. 4,037,931, Cl. 350-160.0LC.
- Ieki, Hideharu: *See—*
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- Ihida, Mutsumi: *See—*
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- Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, to Furuno Electric Company. Indication device in plan position indication system. 4,038,654, Cl. 343-5.0EM.
- Ikeda, Hiroshi: *See—*
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- ILC Technology, Inc.: *See—*
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- IMC Chemical Group, Inc.: *See—*
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- Imperial Chemical Industries Inc.: *See—*
  - Boyes, Bryan; and Jones, Alan, 4,038,357, Cl. 264-168.000.
- Imperial Chemical Industries Limited: *See—*
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  - Downer, John Michael; Rodway, William George; and Shipp, Laurence Stanley John, 4,038,231, Cl. 260-29.60F.
  - Jaques, Geoffrey Sanderson, 4,038,350, Cl. 264-22.000.
  - Ogden, Keith; and Quinby, John, 4,038,244, Cl. 260-42.160.
  - Remmington, Timothy Alan; and Robinson, William, 4,038,354, Cl. 264-102.000.
- Inaba, Yoshio; and Hisagi, Takashi, to Toyobo Co., Ltd. Pelletizer. 4,038,002, Cl. 425-136.000.
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- Indian Head Inc.: *See—*
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- Industrial & Marine Services (Scotland) Limited: *See—*
  - Moody, Isaac N., 4,037,582, Cl. 126-116.00R.
- Industrial Mining Machinery Company. *See—*
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- Industriewerk Schaeffler OHG: *See—*
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- Infra-Vision Ltd. Zug: *See—*
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  - Sandberg, Nils Arne, 4,037,335, Cl. 37-58.000.
- Inman, Eric Richard; McCrae, James McGeachie; Midcalf, Christopher; and Turner, Alison, to Ciba-Geigy Corporation. Polymer compositions containing a bisazomethine pigment. 4,038,241, Cl. 260-39.00P.
- Innerspace Corporation: *See—*
  - Gongwer, Calvin A., 4,037,615, Cl. 137-1.000.
- Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, to Taihou Kogyo Kabushiki Kaisha; and Kabushiki Kaisha Toyoda Jidoshokki Seisakusho. Vehicle air conditioning compressor. 4,037,522, Cl. 92-71.000.
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  - Ishiyama, Hideki; Inoue, Atushi; and Ieki, Hideharu, 4,038,615, Cl. 333-72.000.
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  - Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, 4,038,295, Cl. 260-409.000.
- Institute of Gas Technology: *See—*
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  - Ferns, Ricardo Segura, 4,038,419, Cl. 426-12.000.
- Intel Corporation: *See—*
  - Mehta, Rustam; and Dreyer, Stephen F., 4,038,646, Cl. 340-173.00R.
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Terada, Yoshimi; and Fujii, Akira, 4,037,869, Cl. 294-104.000.
Ishiyama, Hideki; Inoue, Atushi; and Ieki, Hideharu, to Murata Manufacturing Co., Ltd. Elastic surface wave device. 4,038,615, Cl. 333-72.000.
Iten, Clemens A.; and Sykes, Malcolm B., to Philip Morris Incorporated. Double edge blade razor. 4,037,321, Cl. 30-47.000.
Ithaca Textiles, Inc.: *See—*
Wehrmann, Nicholas, 4,037,436, Cl. 66-186.000.
Ito, Roy Atsushi: *See—*
Clark, Charles Albert, Jr.; and Ito, Roy Atsushi, 4,038,655, Cl. 343-5.00W.
Ito, Tosikatu; and Takahashi, Reijiro, to Hitachi, Ltd. Temperature control apparatus of air conditioner for automobiles. 4,037,651, Cl. 165-30.000.
ITT Industries, Inc.: *See—*
Drake, Cyril Francis; and Amos, Robert Walter James, 4,038,430, Cl. 427-248.00E.
ITW de France, S.A.: *See—*
Morel, Henri, 4,037,489, Cl. 74-548.000.
Ivac Corporation: *See—*
Georgi, Heinz W., 4,037,598, Cl. 128-214.00E.
Ivanov, Georgy Nikolaevich: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Ivens, Gunter: *See—*
Wassen, Johann; Schulz, Gunter; and Ivens, Gunter, 4,038,550, Cl. 250-358.00P.
Ivey, John Saxon, to Borg-Warner Corporation. Centrifugal lock up clutch for fluid couplings. 4,037,691, Cl. 192-3.310.
Iwasawa, Naozumi: *See—*
Takaya, Yasuo; Watanabe, Tadashi; and Iwasawa, Naozumi, 4,038,225, Cl. 260-21.000.
J. C. Penney Company: *See—*
DeSisto, Frank Alfred, 4,037,729, Cl. 211-208.000.
J. I. Case Company: *See—*
McDonald, Raymond F., 4,037,284, Cl. 15-83.000.
Pedersen, Carl Oluf, 4,037,743, Cl. 214-140.000.
Zyduck, Ronald L., 4,037,878, Cl. 303-13.000.
J. K. and Susie L. Wadley Research Institute and Blood Bank: *See—*
Dorn, Gordon L.; and Hill, Joseph M., 4,038,150, Cl. 195-127.000.
J. M. Huber Corporation: *See—*
Wason, Satish K., 4,038,098, Cl. 106-288.00B.
J. P. Elliott Associates, Inc.: *See—*
Elliott, Jack P., 4,037,613, Cl. 134-83.000.
J. Ray McDermott & Co. Inc.: *See—*
deBoer, Nico; and Olsen, Robert L., 4,037,422, Cl. 61-72.400.
Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D., to Cessna Aircraft Company, The. Hydraulic control valve. 4,037,410, Cl. 60-445.000.
Jackson, John Lambert: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,038,401, Cl. 424-267.000.
Jackson, William Nelson, to United States of America, Army. Engine condition calculating device. 4,037,782, Cl. 235-84.000.
Jacobs, Daniel, to Form-Scaff (Proprietary)Limited. Scaffolding. 4,037,382, Cl. 52-638.000.
Jacobson, Evan C.; and Becker, Stephen R. Power operated guitar device. 4,037,503, Cl. 84-9.000.
Jacoby, Charles H., to Akzona Incorporated. Dust entrapment composition and method therefor. 4,038,443, Cl. 427-136.000.
Jacquelin, Jean, to Compagnie Generale d'Electricite S.A. Zinc-air electrochemical cell. 4,038,458, Cl. 429-15.000.
Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, to Ciba-Geigy Corporation. Amines and processes for their manufacture. 4,038,414, Cl. 424-304.000.
Jaekle, William M., to Southern Pacific Transportation Company. Train tunnel ventilation method and apparatus. 4,037,526, Cl. 98-49.000.
Jahn, Rudolf; and Toth, Arpad, to Industriewerk Schaeffler OHG. Radial roller bearing for two parallel shafts. 4,037,892, Cl. 308-194.000.
Jakob, Herbert Edward. Fluid motor apparatus. 4,037,520, Cl. 91-224.000.
James How Industries Limited: *See—*
How, James Charles, 4,037,506, Cl. 84-297.00S.
James, Varnell L., to Boeing Company, The. Three dimensional composite structure and method for incorporating fittings. 4,038,118, Cl. 156-143.000.
Jamieson, John; and Price, Henry F., to Bell & Howell Company. Microfilm camera and photographic film handling apparatus. 4,037,955, Cl. 355-54.000.
Janes, George Sargent; and Levy, Richard H., to Jersey Nuclear-Avco Isotopes, Inc. Isotopically selective excitation from plural excited states. 4,038,549, Cl. 250-423.00P.
Janome Sewing Machine Co.: *See—*
Hanyu, Susumu; and Amano, Takashi, 4,037,549, Cl. 112-258.000.
Janssen Pharmaceutica N.V.: *See—*
Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., 4,038,286, Cl. 260-309.000.
Japan Inorganic Material Co., Ltd.: *See—*
Kawai, Kyosuke, 4,038,089, Cl. 106-50.000.
Jaques, Geoffrey Sanderson, to Imperial Chemical Industries Limited. Method of producing integral non-foamed skin layer shaped articles. 4,038,350, Cl. 264-22.000.
Jaquish, John, to Trans World Display Corporation. Display-dispenser rack. 4,037,756, Cl. 221-242.000.
Jarish, Basil, to Quebec Iron & Titanium Corporation-Fer et Titane due Quebec, Inc. Upgrading sorelslag for production of synthetic rutile. 4,038,363, Cl. 423-82.000.
Jarman, Davis R., to Hinson, Virgil, a part interest. Auto body clamp. 4,037,456, Cl. 72-325.000.

Jasinski, Stefan A., to Xerox Corporation. Cleaning apparatus for a corona generating device. 4,038,546, Cl. 250-324.000.
Jaworek, Dieter; Maier, Joseph; and Nelbock-Hochstetter, Michael, to Boehringer Mannheim G.m.b.H. Process for binding biologically active proteins. 4,038,140, Cl. 195-63.000.
Jayne, Max Leroy, to GTE Sylvania Incorporated. Electrical connector and contact. 4,037,906, Cl. 339-107.000.
Jeanmart, Claude: *See—*
Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Messer, Mayer Naoum, 4,038,391, Cl. 424-250.000.
Jenaer Glaswerk Schott & Gen.: *See—*
Gliemeroth, Georg, 4,038,090, Cl. 106-53.000.
Jenkins, Richard Stuart. Oil spill recovery method and apparatus. 4,038,182, Cl. 210-23.00R.
Jenner, Michael D.: *See—*
Blackman, Morris V.; and Jenner, Michael D., 4,037,311, Cl. 29-593.000.
Jersey Nuclear-Avco Isotopes, Inc.: *See—*
Janes, George Sargent; and Levy, Richard H., 4,038,549, Cl. 250-423.00P.
Jeschke, Norbert, to Samson Apparatebau AG. Three-point regulator with feedback. 4,037,619, Cl. 137-492.500.
Jespersen, Knud; and Engman, Theodore Edgar. Process for pickling meat sections. 4,038,426, Cl. 426-266.000.
Jewell, John N.: *See—*
Newton, Richard P.; Geiss, Vernon L.; Jewell, John N.; and Gravely, Lawrence E., 4,037,609, Cl. 131-141.000.
Jido, Morio: *See—*
Yamaga, Joji; and Jido, Morio, 4,038,511, Cl. 219-121.00P.
Jimenez, James A., to Electra Food Machinery, Inc. Grinding apparatus. 4,037,801, Cl. 241-247.000.
Jobe, Garland Ralph: *See—*
Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., 4,038,696, Cl. 361-415.000.
Johannes, Steinwart: *See—*
Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.
John Wyeth & Brother Limited: *See—*
Archibald, John Leheup; and Jackson, John Lambert, 4,038,401, Cl. 424-267.000.
Johns-Manville Corporation: *See—*
Beranek, Robert Louis, Jr.; and Timms, Donny Lee, 4,038,356, Cl. 264-160.000.
Necker, Carl George; and Colwell, Richard Rial, 4,037,462, Cl. 73-32.00R.
Odle, Herbert Arnold; Sullivan, Daryl Dean; and Franck, Kurt, 4,037,341, Cl. 40-130.00B.
Patry, Francis Joseph, 4,037,372, Cl. 52-96.000.
Johnson, Alexander Lawrence, to Du Pont de Nemours, E. I., and Company. 1-(2-Carboxyaryl)-4-arylimidazoles and 1-(2-carboxyaryl)-3-aryl-1,2,4-triazoles. 4,038,285, Cl. 260-309.000.
Johnson, Brant T. Electro-thermal isolating switch. 4,038,627, Cl. 337-107.000.
Johnson, Bruce K.: *See—*
Whiteside, George D.; and Johnson, Bruce K., 4,038,674, Cl. 354-230.000.
Johnson Controls, Inc.: *See—*
Matthews, Russell Byron, 4,038,019, Cl. 431-51.000.
Johnson, Donald Lee: *See—*
Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., 4,038,064, Cl. 71-29.000.
Johnson, Harold O. Cutter hold down apparatus. 4,037,831, Cl. 269-306.000.
Johnson, Herbert G.: *See—*
Hall, Charles M.; and Johnson, Herbert G., 4,038,398, Cl. 424-263.000.
Johnson & Johnson: *See—*
Luceyk, Alfred Robert; Mouwen, Herman Charles; and Weinberg, Steven Louis, 4,038,194, Cl. 210-436.000.
Shultz, Jay S., 4,038,233, Cl. 260-29.6RW.
Johnson, Oliver Wendell, to Eaton Corporation. Controller for fluid pressure operated devices. 4,037,620, Cl. 137-596.000.
Johnson, Richard B., to American Chain & Cable Company, Inc. Transfer apparatus. 4,037,738, Cl. 214-38.0CC.
Johnson, Thomas W.: *See—*
Melcher, James R.; and Johnson, Thomas W., 4,038,052, Cl. 55-138.000.
Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., to Rohm and Haas Company. 1-Alkylpyrid-2-one. 4,038,065, Cl. 71-76.000.
Johnston, Katharine Gentry; and Greyson, Jerome, to Miles Laboratories, Inc. Test composition, device, and method. 4,038,485, Cl. 23-230.00B.
Johnston, Thomas; and Youens, Frederick Peter, to Short Brothers and Harland Limited. Flight vehicle. 4,037,807, Cl. 244-7.00B.
Jones, Alan: *See—*
Boyes, Bryan; and Jones, Alan, 4,038,357, Cl. 264-168.000.
Jones, Charles, to Curtiss-Wright Corporation. Compound spark-ignition and diesel engine. 4,037,412, Cl. 60-605.000.
Jones, Derick; and Lu, Sun, to Texas Instruments Incorporated. Lyotropic nematic liquid crystals for use in electro-optical display devices. 4,038,199, Cl. 252-299.000.
Jones, Derick; and Lu, Sun, to Texas Instruments Incorporated. Lyotropic nematic liquid crystals for use in electro-optical display devices. 4,038,200, Cl. 252-299.000.
Jones, J. Paul. Thermal barrier. 4,037,639, Cl. 160-133.000.
Jones, Paul W.: *See—*
Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., 4,038,151, Cl. 195-127.000.
Jones, Robert Henry Wellons, Jr.: *See—*
Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., 4,038,696, Cl. 361-415.000.
Jordan, Bertram L.: *See—*
Mitchell, John D.; and Jordan, Bertram L., 4,037,391, Cl. 56-27.500.
Jovick, Raymond John: *See—*
Fisher, Frank H.; and Jovick, Raymond John, 4,037,690, Cl. 188-181.00R.
Juki Co., Ltd.: *See—*
Hirayama, Tetsuro; Yuyama, Kousuke; and Matsuura, Yoshihiko, 4,037,548, Cl. 112-123.00R.
Julia, Marc: *See—*
Chabardes, Pierre; and Julia, Marc, 4,038,323, Cl. 260-607.0AR.
Juni, Elliot, to University of Michigan, The Regents of the. Test kit for the genetic detection of microorganisms. 4,038,143, Cl. 195-100.000.
Justice, James Conley, to Coaltex, Inc. Full face miner. 4,037,875, Cl. 299-31.000.
Justman, Daniel B., to Reed Tool Company. Roller cutter drill bit 4,037,673, Cl. 175-371.000.
K. R. Evans & Associates: *See—*
Newsom, William D.; and Carnahan, James R., 4,037,660, Cl 166-302.000.
Kabushiki Kaisha Suwa Seikosha: *See—*
Chihara, Hiroyuki, 4,037,399, Cl. 58-23.0BA.
Ido, Kazuo; and Saito, Shizuo, 4,037,931, Cl. 350-160.0LC.
Tsutomu, Otake, 4,038,104, Cl. 136-89.00P.
Kabushiki Kaisha Toyoda Jidoshokki Seisakusho: *See—*
Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.
Kadatz, Rudolf: *See—*
Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
Kairbara, Iamo: *See—*
Anderson, Leslie T.; Thompson, Arthur D.; and Kairbara, Iamo, 4,037,864, Cl. 285-342.000.
Kaliebe, Kenneth J., to Sprague Electric Company. Ceramic disc capacitor and method of making the same. 4,038,587, Cl. 361-321.000.
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Poklacki, Erwin Sigmund; and Kalnajs, Reinis, 4,038,207, Cl. 252-316.000.
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Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich, Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl 261-41.00D.
Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna, Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich. Method of effecting antihistaminic, antiserotonin and antiallergic actions. 4,038,402, Cl. 424-267.000.
Kamiya, Kunio; Yusa, Hideo; Nakajima, Fumito; and Takeuchi, Masato, to Hitachi, Ltd. Apparatus for treating an exhaust gas from nuclear plant. 4,038,060, Cl. 62-36.000.
Kamp, Eugene L.; and Visos, Charles D., to Emerson Electric Co. Electromagnet with terminals. 4,038,623, Cl 335-219.000.
Kamyr Valves Inc.: *See—*
Kindersley, Peter G., 4,037,819, Cl 251-306.000.
Kaneda, Nobuo; Tokisono, Takenosuke; and Uchida, Teizo, to Bristoline Inc. Valve assembly for a sphygmomanometer. 4,037,587, Cl 128-2.05G.
Kanengieter, Glenn G.: *See—*
Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., 4,037,395, Cl. 56-218.000.
Kaniut, Herbert. Travelling tail-unit with circular arc motion. 4,037,808, Cl. 244-53.00B.
Kansai Paint Company, Ltd.: *See—*
Takaya, Yasuo; Watanabe, Tadashi; and Iwasawa, Naozumi, 4,038,225, Cl. 260-21.000.
Kantner, Otto: *See—*
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Kantor, Ilya Solomonovich: *See—*
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Kantorski, Joseph W.: *See—*
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Kao Soap Co., Ltd.: *See—*
Fujino, Takashi; Yamanaka, Makoto; and Yagi, Kouichi, 4,038,218, Cl. 252-542.000.
Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,038,333, Cl. 260-666.0PY.
Minegishi, Yutaka; and Arai, Haruhiko, 4,038,196, Cl. 252-8.800.
Kapanen, Aarne Albin; and Rautimo, Pentti Jaakkima, to Outokumpu Oy. Method and apparatus for detecting and eliminating short-circuits in an electrolytic tank. 4,038,162, Cl. 204-105.00R.

- Kapfer, Vincent C., to United States of America, Air Force. Probe contact and junction detector. 4,038,598, Cl. 324-72.500.
- Karassik, Igor J.; and Thaw, Charles H., to Worthington Pump, Inc. Flushing liquid system for the wearing ring in centrifugal pumps and the wearing ring assembly and wearing ring for use therein. 4,037,985, Cl 415-175.000.
- Karl, Curtis Lee, to General Mills Chemicals, Inc. Hydroxyalkyl locust bean/xanthomonas hydrophilic colloid blends. 4,038,206, Cl. 252-316.000.
- Karsh, Herbert; and Gilchrist, Edgar S., to Bell & Howell Company. Tape transporting apparatus. 4,037,767, Cl. 226-7.000.
- Karvinen, Jaakko: *See*—
  - Pohjola, Leila; Harva, Olavi; and Karvinen, Jaakko, 4,038,223, Cl. 260-9.000.
- Kasai, Masayoshi: *See*—
  - Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi; Tsuzurahara, Mamoru; and Sunahara, Kazuo, 4,037,930, Cl. 350-160.0LC.
- Kaszuba, Edward H. Electrical safety socket. 4,037,901, Cl. 339-41.000.
- Kataoka, Shigeyuki: *See*—
  - Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.
- Katayanagi, Akira. Hydrochloric acid flotation process for separating feldspar from siliceous sand. 4,038,179, Cl. 209-166.000.
- Kato, Makoto, to Matsushita Electric Industrial Co., Ltd. Fourier-transform holography by pseudo-random phase shifting. 4,037,918, Cl. 350-3.500.
- Katz, Sheldon N.: *See*—
  - Collins, David R.; and Katz, Sheldon N., 4,037,378, Cl. 52-397.000.
- Kawabata, Hidetoshi: *See*—
  - Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.
- Kawai, Kyosuke, to Japan Inorganic Material Co., Ltd. Process for producing vitreous fibers containing cement as major constituent. 4,038,089, Cl. 106-50.000.
- Kawai, Yoshihiko: *See*—
  - Fukuda, Yutaka; Ihida, Mutsumi; and Kawai, Yoshihiko, 4,038,366, Cl. 423-234.000
- Kawaken Fine Chemicals Co., Ltd.: *See*—
  - Takayama, Hirohide; Niino, Kiyoshi; and Fukuda, Sigeo, 4,038,287, Cl. 260-309.700.
- Kawaki, Takao: *See*—
  - Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.
- Kawamoto, Hirohisa, to RCA Corporation. Four-layer trapatt diode and method for making same. 4,038,106, Cl. 148-1.500.
- Kawasaki Jukogyo Kabushiki Kaisha: *See*—
  - Sugimoto, Takao, 4,037,431, Cl. 64-14.000.
- Kazama, Seiji; Tanaka, Michio; and Nagano, Katsuki, to Takeda Chemical Industries, Ltd. Urethane prepolymer. 4,038,304, Cl. 260-468.00E.
- Kearney, John A., to Bibb Company, The. Cellulosic textile materials having improved soil release and stain resistance properties. 4,038,027, Cl. 8-120.000.
- Keating, James L.: *See*—
  - Wahl, Harold F.; and Keating, James L., 4,037,723, Cl. 209-104.000.
- Keese, Beverly W., to Rockwell International Corporation. Drive axle outer end with brake and gearing. 4,037,694, Cl. 192-4.00A.
- Kefalas A/S: *See*—
  - Lassen, Niels, 4,038,395, Cl. 424-250.000.
- Kelly, Kristine M.: *See*—
  - Teller, Joseph D.; and Kelly, Kristine M., 4,038,029, Cl. 23-230.00B.
- Kemlo, Kenneth Garry; and Gregory, Clive Allen, to Broken Hill Proprietary Company Limited, The. Indication of levels in receptacles. 4,037,761, Cl. 222-590.000.
- Kemmetmuller, Roland, to Waagner-Biro Aktiengesellschaft. Method and means for dry cooling bulk materials. 4,037,330, Cl. 34-20.000.
- Kenmochi, Hirohito: *See*—
  - Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.
- Kennecott Copper Corporation: *See*—
  - Rappas, Alkis S.; and Pemsler, J. Paul, 4,038,070, Cl. 75-108.000
  - Skarbo, Roald R.; Lueders, Robert E.; Morin, Edmond A.; and Peterson, Hal D., 4,038,298, Cl. 260-429.00J.
- Kennedy, Robert J., Jr.; and Smith, Kendall S., II, to Lincoln Manufacturing Company, Inc. Tray slide and support therefor. 4,037,896, Cl. 312-281.000.
- Kenney, George Churchill: *See*—
  - Day, Paul Edwin; and Kenney, George Churchill, 4,038,663, Cl 346-1.000.
- Kerstein, Melvin T.: *See*—
  - Pasturczak, Vincent S.; and Kerstein, Melvin T., 4,037,949, Cl 352-158.000.
- Kerwin, William S.; Nelson, John Rodney; and Toll, Hans Robert, to Toll Cryogenics, Inc. Method for deflashing small parts. 4,037,368, Cl. 51-314.000.
- Kesselman, David A. Tamper resistant fastener. 4,037,515, Cl 85-61.000.
- Kessler, Hans-Joachim: *See*—
  - Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, 4,038,410, Cl. 424-273.000.
- Key, James A. Minnow bucket with water aerating means. 4,037,349, Cl. 43-57.000.
- Keydel, Wolfgang, to Licentia Patent-Verwaltungs-G.m.b.H. Directional antenna for a projectile or rocket detonator. 4,037,540, Cl. 102-70.20P.
- Keyser, William L.; and Zielinski, Walter J., to Quaker Oats Company, The. Coated baked goods. 4,038,422, Cl. 426-72.000.
- Keyser, William L.: *See*—
  - Hayward, James R.; Keyser, William L.; and Zielinski, Walter J., 4,038,423, Cl. 426-72 000.
- Khare, Gyaneshwar Prasad. Radioimmunoassay for hepatitis B antigen. 4,038,378, Cl. 424-1.000.
- Kiefer, Hans; and Naarmann, Herbert, to BASF Aktiengesellschaft. Production of N-(1-alkenyl)-carbamyl chlorides. 4,038,311, Cl. 260-544 00C.
- Kieven, Gunter: *See*—
  - Besser, Helmut Siegfried; Kieven, Gunter; and Wettlauffer, Jurgen, 4,037,912, Cl. 339-198.00R.
- Kim, Chung K.; and Cho, Yung L., to United States of America, Air Force. Method of hermetically sealing semiconductor devices. 4,038,157, Cl. 204-16.000.
- Kim, Dongsung Robert, to Burroughs Corporation. Microprogramming control system. 4,038,643, Cl. 364-200.000.
- Kimber, Erich Voldemar; and Ronne, Per-Axel Carsten, to Atlas Copco Aktiebolag. Drill boom with hydraulic parallel motion means. 4,037,671, Cl. 173-2.000.
- Kimura, Tomohiko: *See*—
  - Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.
- Kindersley, Peter G., to Kamyr Valves Inc. Butterfly valve having metal-to-metal sealing with conical angle-transported vane. 4,037,819, Cl. 251-306.000.
- King, David P.; and Barker, Robert I., to Monsanto Company. Method and apparatus for measuring a dimension of an object in a defined space by scanning with a light beam. 4,037,968, Cl. 356-160.000.
- King, Frederick N. Detection system for automobiles and other motor-driven objects. 4,038,633, Cl. 340-38.00L.
- King, Harry A. Method of supplemental irrigation for farming. 4,037,787, Cl. 239-2.00R.
- King, James E.: *See*—
  - Francel, Josef; King, James E.; and Woulbroun, John M., 4,038,091, Cl. 106-53.000.
- King, Robert W., to Avco Corporation. Three dimensional fabric material. 4,038,440, Cl. 428-245.000.
- Kintner, Paul M., to Cutler-Hammer, Inc. Ladder static logic control system and method of making. 4,038,562, Cl. 307-203.000.
- Kinugasa, Terukazu; and Hirohata, Hyogo, to Matsushita Electric Industrial Co., Ltd. Fusible metal film resistor. 4,038,457, Cl. 428-411.000.
- Kirchner, Jack R.: *See*—
  - Fadler, Norman L.; Jones, Paul W.; and Kirchner, Jack R., 4,038,151, Cl. 195-127.000.
- Kirkendall, James H.: *See*—
  - Evans, Martin; and Kirkendall, James H., 4,038,650, Cl. 340-244.00R.
- Kirkpatrick, Joel L.: *See*—
  - Doyle, William C., Jr.; and Kirkpatrick, Joel L., 4,038,387, Cl. 424-226.000.
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  - Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,038,474, Cl. 526-185.000.
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  - Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G.; Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.
- Klausmeier, Robert E.: *See*—
  - Andrews, Catherine C.; Klausmeier, Robert E.; and Osmon, Jerald L., 4,038,116, Cl. 149-105.000.
- Kleinmeyer, Vernon T.; and Schinner, Thomas J., to General Signal Corporation. Integrated card reader system. 4,038,522, Cl. 235-61.70B
- Klein, Klaus: *See*—
  - Bittermann, Dietmar; Hunt, Kevin; Klein, Klaus; and Rau, Peter, 4,038,133, Cl. 176-38.000.
- Kleinschmidt, Johann Otto, to Union Special G.m.b.H. Sewing machine apparatus for aligning and sewing pieces of textile fabric or the like. 4,037,546, Cl. 112-121.260.
- Kleiter, Walter: *See*—
  - Dorner, Heinrich; Harand, Elmar; and Kleiter, Walter, 4,038,134, Cl. 176-65.000.
- Klepsch, Christian. Apparatus for walking on water or land. 4,037,280, Cl. 9-310.00D.
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  - Rafferty, Edson Howard; and Kletschka, Harold D., 4,037,984, Cl. 415-60.000.
- Klimek, Boleslaw M.; and Mastis, Victor, to Echlin Manufac[illegible]ring Company, The. Tractor-trailer electrical receptacle. 4,037,907, Cl. 339-126.00R.
- Kline, Kenneth J., to Envirex Inc. Scum control system for peripheral feed channel of sedimentation tank. 4,038,185, Cl. 210-83.000.

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  - Stummer, Franz, 4,038,592, Cl. 363-165.000.
- Klingberg, Anders William: *See*—
  - Hellsten, Martin Edvin, Klingberg, Anders William; and Svennberg, Stig Erick, 4,038,102, Cl. 106-316.000.
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  - Grisar, Ulrich; and Berstermann, Wilhelm, 4,037,962, Cl. 356-86.000.
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- Knell, Martin; and Dexter, Martin, to Ciba-Geigy Corporation. Butadiene rubbers stabilized with thiodialkanoamidophenols. 4,038,246, Cl. 260-45.9NC.
- Knickerbocker, Karl. Price setter for totalizer coin mechanism. 4,037,701, Cl. 194-1.00L.
- Knifton, John F., to Texaco Inc. Processes for regenerating dispersions of ligand-stabilized, palladium(II) halide complexes used in carbonylation catalysts. 4,038,208, Cl. 252-412.000.
- Knodler, Reinhard: *See*—
  - Baukal, Werner; Knodler, Reinhard; and Kuhn, Wolfgang Hermann, 4,038,464, Cl. 429-104.000.
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  - Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, 4,038,520, Cl. 219-521.000.
- Knott, Robert F.; and Handlos, Arthur E., to Shell Oil Company. Butadiene recovery process. 4,038,156, Cl. 203-45.000.
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- Knutsen, Einar. Process for producing a connecting construction unit, such as a quay, container or platform. 4,037,423, Cl. 61-87.000.
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  - Namba, Masanao; Kuniyoshi, Masateru; and Kobayashi, Akira, 4,038,624, Cl. 336-60.000.
- Kobayashi, Tadahiro; Wakita, Eiichi; Fukuda, Hideo; and Matsubayashi, Yukio, to Asahi Kasei Kogyo Kabushiki Kaisha. Bulky non-woven fabric. 4,038,452, Cl. 428-224.000.
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  - Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
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  - Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 4,038,577, Cl. 313-188.000.
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- Koenst, John W., Jr.; and Mitchell, Edward, to Union Carbide Corporation. Method of casting tubular polysulfone ultrafiltration membranes in sand modules. 4,038,351, Cl. 264-45.100.
- Koepke, Frederick W., to Centri-Spray Corporation. Reciprocating conveyor. 4,037,714, Cl. 198-750.000.
- Koerber, Clement J., to Cincinnati Electronics Corporation. Signal to noise ratio indicating circuit. 4,038,604, Cl. 325-363.000.
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  - Cook, K Von; Koerner, Dan W.; Cunningham, Robert A., Jr.; and Murrin, Horace T., Jr., 4,037,465, Cl. 73-67.80S.
- Kogan, Rita Moiseevna: *See*—
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
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  - Tokimoto, Tadashi; and Hiraishi, Yoshinobu, 4,038,370, Cl. 423-336.000.
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  - Habu, Teiji; Nakajima, Tomio; and Sakamoto, Eiichi, 4,038,081, Cl. 96-66.300.
- Kononov, Nikolai Fedorovich: *See*—
  - Minachev, Khabib Minachevich, Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich, Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.
- Kopachkov, Slavco A., to Rothmans of Pall Mall Canada Limited. Locking mechanism. 4,037,804, Cl 242-68.300.
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  - Griner, Arthur J.; and Koppa, Daniel Anthony, 4,038,007, Cl. 425-259.000.
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- Koppel, Gary A; and Nummy, Laurence J., to Eli Lilly and Company. Process for preparation of 3-hydroxymethylcephems. 4,038,275, Cl. 260-243.00C.
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  - Cosby, James Lynwood; and Morgret, Gordon Lawrence, 4,038,130, Cl. 156-473.000.
  - Wright, John, 4,037,430, Cl. 64-9.00R.
- Koret, Inc.: *See*—
  - Gordon, Michael, 4,037,633, Cl. 150-33.000.
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  - Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., 4,038,169, Cl. 204-202.000.
- Kost, Walter Robert, to General Mills, Inc Representative sampling device. 4,037,474, Cl. 73-421.00R
- Koster, Johan Bernhard, Meiners, Hans Joachim, and Moretto, Hans Heinrich, to Bayer Aktiengesellschaft Process for the production of cold hardening foams containing urethane groups by in-mold foaming 4,038,221, Cl. 260-2.5AH.
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  - Matsuyama, Shigeru; Koyama, Masaharu; Kasai, Masayoshi, Tsuzurahara, Mamoru; and Sunahara, Kazuo, 4,037,930, Cl 350-160.0LC.
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  - Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich, Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.
- Kraemer, John F.: *See*—
  - Traxler, James T.; Lira, Emil Patrick; and Kraemer, John F., 4,038,097, Cl. 106-288.00B.
- Kramer, Brian D., to Hercules Incorporated. Photocross-linkable polymers containing pendant diazoester groups. 4,038,253, Cl. 260-47.00R.
- Kramer, Doris S. Refrigeration evaporators with ice detectors. 4,037,427, Cl. 62-128.000.
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  - Meiser, Werner; Kramer, Wolfgang; Buchel, Karl Heinz, and Plempel, Manfred, 4,038,404, Cl. 424-269.000.
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- Kratochvil, Miroslav, to R.M.C. Transport (New South Wales) Pty. Limited Kilns. 4,038,025, Cl. 432-13.000.
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  - Trifiletti, Thomas, 4,037,581, Cl. 126-39.00M.
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  - Jackson, Alan D.; Graber, Homer R.; and Krehbiel, Robert D., 4,037,410, Cl. 60-445.000.
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- Kronner, Richard F. Guide pin locating tool and method. 4,037,592, Cl. 128-92.0EB.
- Kropiwka, Thomas. Auxiliary shelf apparatus. 4,037,542, Cl. 108-32.000.
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- Krueger, Hans, to Siemens Aktiengesellschaft. Liquid crystal display screen with multiple electrode arrangement. 4,037,927, Cl. 350-160.0LC.
- Kruger, Joachim. Fish lure. 4,037,348, Cl. 43-42.230.
- Kruse, James A. Grinding tool. 4,037,367, Cl. 51-209.00S.
- Krutz, Wolfgang; and Steinberg, Hans, to Lohmann & Stolterfoht A.G. Lubricating means for the transmission gear of a ship. 4,037,687, Cl. 184-6.400.
- Ku, Ta Cheng; and Stiles, Donald Joseph, to International Business Machines Corporation. Cup shaped printer. 4,037,707, Cl. 197-53.000.
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  - Terada, Takashi; Amemiya, Isamu; Kubota, Shinsaku; and Asada, Koji, 4,037,828, Cl. 266-271.000.
- Kudinova, Sofya Ivanovna: *See—*
  - Sirotkina, Ekaterina Egorovna, Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
- Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, to Sumitomo Chemical Company, Limited. Process for preparing novel petroleum resin employing $AlRX_2$ and alkyl halide or hydrogen halide. 4,038,474, Cl. 526-185.000.
- Kuebler, Glenn M. Bird perch alarm. 4,038,639, Cl. 340-272.000.
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- Kuehn, Melvin C., to Ormite, Inc. Synthetic slate. 4,038,242, Cl. 260-39.00R.
- Kuhlmann, Robert: *See—*
  - Eisenmenger, Edith; Kuhnert, Otto; Kuhlmann, Robert; Nauroth, Peter; and Turk, Gunter, 4,038,224, Cl. 260-15.00R.
- Kuhn, Wolfgang Hermann: *See—*
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  - Nishino, Atsushi; Hayakawa, Hayashi; and Kumano, Hiroshi, 4,038,159, Cl. 204-38.00A.
- Kumar, Surinder: *See—*
  - Chandler, Keith L.; Hyldon, Roy G.; Kumar, Surinder; and O'-Mahony, John P., 4,038,437, Cl. 426-656.000.
- Kuniyoshi, Masateru: *See—*
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- Kunkle, Kenneth W., to Pierce America, Inc. Adjustable painting or plating rack. 4,037,727, Cl. 211-117.000.
- Kuntz, William H.; and Moore, Donald G., to Chemetron Corporation. Method and apparatus for sensor assembly inspection. 4,037,479, Cl. 73-432.00R.
- Kunzle, Othello, to Elex A.G. Quick coupling device. 4,037,863, Cl. 285-320.000.
- Kuper, Donald G., to Phillips Petroleum Company. Unsaturated alicyclic carbinols and dicarbinols and method of preparation. 4,038,326, Cl. 260-617.00C.
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  - Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,038,474, Cl. 526-185.000.
- Kurita, Seiichi; Nakayama, Toru; Okano, Kinpei; and Watahiki, Seishi, to Hitachi, Ltd. Vertical type antifriction bearing device. 4,037,890, Cl. 308-187.000.
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  - Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.
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  - Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl. 261-41.00D.
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  - Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
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- Kuzmich, Valery Konstantinovich; and Dashevsky, Yakov Tevelevich. Balance for determining the weight percentage of an extracted component with respect to the total weight of a test material. 4,037,674, Cl. 177-200.000.
- L. Schuler GmbH: *See—*
  - Fetzer, Helmut; Schneider, Franz; and Braitinger, Helmut, 4,037,730, Cl. 214-1.0BB.
- La Technique Integrale: *See—*
  - Perrin, Herve, 4,037,893, Cl. 308-205.000.
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  - Pinhas, Henri, 4,038,319, Cl. 260-570.700.
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  - Esteve-Subirana, Antonio, 4,038,390, Cl. 424-250.000.
- Laborie, Jean-Pierre; and Pevrol, Michel, to Societe Nationale Industrielle Aerospatiale. Device for connecting peripheral units to a line for transmitting data by pulse code modulation. 4,038,601, Cl. 325-23.000.
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  - Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., 4,037,325, Cl. 33-125.00C.
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  - Hirsch, Joseph G.; Hoffa, Jack L.; Lacy, Garry T.; and Mowell, Jerry M., 4,037,806, Cl. 244-3.160.
- Ladd, Floyd R.: *See—*
  - Schulze, Robert R.; and Ladd, Floyd R., 4,037,631, Cl. 141-2.000.
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  - Moss, Ronald W.; McClanahan, Edwin D., Jr.; and Laegreid, Nils, 4,038,171, Cl. 204-298.000.
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  - Brilloit, Jacques, 4,037,331, Cl. 34-92.000.
- Laird, George William, to Boeing Company, The. Flexure having pitch flap coupling. 4,037,988, Cl. 416-141.000.
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  - Fowler, John T., 4,038,528, Cl. 235-150.260.
- Lakiza, Sergei Markovich: *See—*
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- Lallement, Bernard, to Vitos Etablissements Vitoux. Method and machine for the production of a serigraphic screen by the photochemical method. 4,037,957, Cl. 355-91.000.
- Lam, Charles T. W., to Miles Laboratories, Inc. Test composition, device and method for detecting bilirubin. 4,038,031, Cl. 23-230.00B.
- Lamarine, John H.; Stewart, Robert C., Jr.; and Vine, Raymond W., to United Technologies Corporation. Electrode reservoir for a fuel cell. 4,038,463, Cl. 429-44.000.
- Lamb, Donald J., to Upjohn Company, The. Medroxyprogesterone acetate compositions. 4,038,389, Cl. 424-243.000.
- Lambert, Everette M. Bead forming apparatus and method. 4,038,119, Cl. 156-163.000.
- LaMonica, Diana: *See—*
  - LaMonica, Jeanette; and LaMonica, Diana, 4,037,844, Cl. 273-136.00K.
- LaMonica, Jeanette; and LaMonica, Diana. Child's toy tent chess board. 4,037,844, Cl. 273-136.00K.
- Land, Edwin H., to Polaroid Corporation. Process comprising diffusion transfer silver image removal. 4,038,077, Cl. 96-29.00R.
- Laney, Thomas D., Sr. Handle mechanism for machine tools. 4,037,488, Cl. 74-548.000.
- Langbein, Adolf: *See—*
  - Merz, Herbert; Langbein, Adolf; Walther, Gerard; and Stockhaus, Klaus, 4,038,397, Cl. 424-260.000.
- Langberg, Edwin. Replica bridge sensing circuit. 4,038,609, Cl. 331-65.000.
- Langecker, Erhard, to Battenfeld Maschinenfabriken GmbH. Extrusion head. 4,038,017, Cl. 425-466.000.
- Langenberg, Werner: *See—*
  - Georg, Werner; Heberling, Walter; and Langenberg, Werner, 4,037,876, Cl. 299-43.000.
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  - May, James A., Sr.; Sinke, Gerard C.; and Langhorst, Martin A., 4,038,188, Cl. 210-20.000.
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- Lanza, Thomas J.: *See—*
  - Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., 4,038,396, Cl. 424-256.000.
- Lapham, Sidney D. Universal stem for a carpet caster. 4,037,292, Cl. 16-38.000.
- Large, Eugene. Flywheel aided bicycle. 4,037,854, Cl. 280-217.000.
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  - Duranleau, Roger G.; and Larkin, John M., 4,038,316, Cl. 260-566.00A.
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- Larsen, Ronald Leslie, to Conwed Corporation. Production of net or net-like products. 4,038,008, Cl. 425-290.000.
- Larsson, Hans Gunnar, to Allmanna Svenska Elektriska Aktiebolaget. Method for hydrostatic extrusion. 4,037,305, Cl. 29-421.00R.
- Lassen, Niels, to Kefalas A/S. Compositions of and method of treating with the alpha-isomer of 2-chloro-9-[3'-(N'-2-hydroxyethylpiperazino-N)-propylidene]-thiaxanthene, carboxylic acid esters thereof and acid addition salts of these compounds. 4,038,395, Cl. 424-250.000.
- Latady, William R. Variable field of view, variable magnification lens assembly for miniature image viewer. 4,037,939, Cl. 350-241.000.

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  - Nonaka, Urao; Shibata, Hideto; and Nakajima, Nobuyuki, 4,038,146, Cl. 195-103.50R.
- Lawrence Peska Associates, Inc.: *See—*
  - Schweers, William Edwin, 4,037,726, Cl. 211-105.500.
- Layman, H. David: *See—*
  - Minnier, Henry B.; and Layman, H. David, 4,038,205, Cl. 252-301.60S.
- LeBell, Gene. Motorvehicle safety cut-out switch. 4,037,683, Cl. 180-99.000.
- Le Carvennec, Francois: *See—*
  - Puech, Claude; Bricot, Claude; Carre, Bernard; Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.
- Ledebur, Harry Calhoon; and Diehl, Floyd William, Jr., to Wean United, Inc. Shell feed system for a cold pilger mill. 4,037,444, Cl. 72-21.000.
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- Lee, Barry T.; Cole, Ralph V.; Hirsch, Irving; Hyatt, Gilbert P.; and Wimmer, Gunther W., to said Micro Computer Inc. by said Barry T. Lee, Ralph V. Cole, Gunther W. Wimmer. Interactive control system. 4,038,640, Cl. 364-200.000.
- Lee, Cyril Arthur, to E M I Limited. Method and apparatus for authenticating a record medium consisting of applying two different strength magnetizing fields and monitoring the remanent fields. 4,038,596, Cl. 324-34.00R.
- Lee Inventions, Inc.: *See—*
  - Lee, William S., 4,037,739, Cl. 214-38.0CC.
- Lee, William S., to Lee Inventions, Inc. Moving system with integral casters. 4,037,739, Cl. 214-38.0CC.
- Leeds & Northrup Company: *See—*
  - Weiss, Edward Leonhardt, 4,037,965, Cl. 356-102.000.
  - Wertheimer, Alan Lee; and Williams, Frederick Lee, 4,037,964, Cl. 356-102.000.
- LeFevre, Robert J.; Burke, George K.; and Raines, Kenneth, to Burron Medical Products, Inc. Parenteral administration set with internal valve and flow restrictor. 4,037,596, Cl. 128-214.00C.
- Leffingwell Chemical Company: *See—*
  - Bowyer, Alta M.; Hinckley, George B.; and Davis, James E., 4,038,385, Cl. 424-166.000.
- Legrand, Paul Joseph, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation. Device for mounting a turboreactor on an aeroplane. 4,037,809, Cl. 244-54.000.
- Lehmann, G. W. Horst; and Curts, H. A. Julius, to Beiersdorf Aktiengesellschaft. Pressure sensitive adhesive coated sheet material. 4,038,454, Cl. 428-356.000.
- Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., to Burroughs Corporation. High speed printing apparatus. 4,037,535, Cl. 101-287.000.
- Lehr, Glen J.: *See—*
  - Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 4,038,105, Cl. 136-231.000.
- Lehureau, Jean Claude: *See—*
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- Leibach, Heinrich, to Motoren- und Turbinen-Union Munchen GmbH. Gas turbine engine for vehicles. 4,037,409, Cl. 60-413.000.
- Leimgruber, Willy: *See—*
  - Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,038,289, Cl. 260-347.300.
- Leistiko, Lawrence F.: *See—*
  - Deitch, James C.; and Leistiko, Lawrence F., 4,037,913, Cl. 339-221.00M.
- Lekas, Mitchell A. Process for recovery of carbonaceous materials from subterranean deposits by in situ processing. 4,037,657, Cl. 166-271.000.
- Lelgemann, Ludwig: *See—*
  - Eisele, Wolfgang; Lelgemann, Ludwig; Magerkurth, Bernhard; and Petersen, Harro, 4,038,229, Cl. 260-29.40R.
- LeMay, Christopher Archibald Gordon, to E M I Limited. Circuit for signal data obtained from an axial tomographic scanning apparatus. 4,038,551, Cl. 250-445.00T.
- Lemelson, Jerome H. Apparatus for forming ribbed tubing. 4,038,011, Cl. 425-325.000.
- Lemont, Harold E.: *See—*
  - Miller, Robert C.; and Lemont, Harold E., 4,037,751, Cl. 220-9.00R.
- Lenk, Erich, to Barmag Barmer Maschinenfabrik. Nozzle plate holder. 4,038,005, Cl. 425-190.000.
- Leontiev, Alexandr Semenovich: *See—*
  - Minachev, Khabib Minachevich; Mortikov, Evgeny Sergeevich; Kozlov, Boris Mikhailovich; Leontiev, Alexandr Semenovich; Kononov, Nikolai Fedorovich; and Lakiza, Sergei Markovich, 4,038,335, Cl. 260-672.00T.
- Leshik, Edward Alexander, to Hellermann Cassettes Limited. Player for tape cartridges and cassettes. 4,038,694, Cl. 360-105.000.
- Leslie Hartridge Limited: *See—*
  - Emerson, Reginald Stanley, 4,037,467, Cl. 73-119.00A.
  - Emerson, Reginald Stanley, 4,037,468, Cl. 73-119.00A.
- Lester, Fritz O., to Lester, Liane E. Method for forming table and bench construction. 4,038,126, Cl. 156-290.000.
- Lester, Liane E.: *See—*
  - Lester, Fritz O., 4,038,126, Cl. 156-290.000.
- Lever Brothers Company: *See—*
  - Cowie, William Pirie; Donaldson, Fraser; and Grantham, Geoffrey John, 4,037,294, Cl. 17-56.000.
- Levine, Leon: *See—*
  - Rostoker, Martin; and Levine, Leon, 4,038,264, Cl. 260-79.30M.
- Levinson, Donald B.: *See—*
  - Quinn, Halsey P.; and Levinson, Donald B., 4,038,594, Cl. 323-4.000.
- Levy, Richard H.: *See—*
  - Janes, George Sargent; and Levy, Richard H., 4,038,549, Cl. 250-423.00P.
- Lewis, Fielding H., Jr., to W. T. Burnett & Co. Lacrosse stick having tubular metallic handle. 4,037,841, Cl. 273-96.00D.
- Lewis, Paul R., to Aluminum Company of America. Tear-off closure and method of forming the same. 4,037,551, Cl. 113-121.00C.
- Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, to International Business Machines Corporation. Memory input signal buffer circuit. 4,038,567, Cl. 307-362.000.
- Li, Choh Hao, to Hoffman-La Roche Inc. Untriakontapeptide with opiate activity. 4,038,222, Cl. 260-8.000.
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  - Brandeberry, Raymond L.; Lehr, Glen J.; and Stacy, Denzil W., 4,038,105, Cl. 136-231.000.
- Licentia Patent-Verwaltungs-G.m.b.H.: *See—*
  - Keydel, Wolfgang, 4,037,540, Cl. 102-70.20P.
  - Kresser, Anton; and Bastein, Jens, 4,037,618, Cl. 137-266.000.
  - Sieber, Paul, 4,037,402, Cl. 58-85.500.
- Lichtenberg, Jose: *See—*
  - Rojahn, Fred H.; and Lichtenberg, Jose, 4,037,295, Cl. 24-205.13D.
- Lie, George K.: *See—*
  - Charles, Herbert N.; and Lie, George K., 4,037,987, Cl. 416-132.00A.
- Lien, Neil C., to Baker Manufacturing Company. Pitless well adapter apparatus. 4,037,654, Cl. 166-88.000.
- Lies, Thomas Andrew; and Clapp, James Wellington, to American Cyanamid Company. Dithiocarbamate ester bactericides and fungicides. 4,038,288, Cl. 260-329.00S.
- Liggett Group Inc.: *See—*
  - Hall, Floyd Vanmeda, 4,037,524, Cl. 93-77.0FT.
- Lillie, Christian: *See—*
  - Eberlein, Wolfgang; Kutter, Eberhard; Heider, Joachim; Austel, Volkhard; Kadatz, Rudolf; Diederen, Willi; Kobinger, Walter; Lillie, Christian; and Dammgen, Jurgen, 4,038,407, Cl. 424-270.000.
- Lin, Paul T., to Cambridge Memories, Inc. Multilayer ceramic multichip, dual in-line packaging assembly. 4,038,488, Cl. 174-52.0FP.
- Linbro Scientific, Inc.: *See—*
  - Liner, John; and Soderberg, Eric W., 4,038,149, Cl. 195-127.000.
- Lincoln Manufacturing Company, Inc.: *See—*
  - Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,037,896, Cl. 312-281.000.
- Lind, Hanns, to Ciba-Geigy Corporation. Light protecting agents. 4,038,250, Cl. 260-45.85B.
- Lindblad, Sture, to Stiga AB. Grass ejection system for motor-driven lawn mowers. 4,037,394, Cl. 56-202.000.
- Linden-Alimak AB. *See—*
  - Thorsell, Torgny; and Svensson, Torbjorn, 4,037,537, Cl. 102-22.00R.
- Liner, John, and Soderberg, Eric W., to Linbro Scientific, Inc. Laboratory trays with lockable covers. 4,038,149, Cl. 195-127.000.
- Linforth, William J.: *See—*
  - Doe, Ewart H.; and Linforth, William J., 4,037,733, Cl. 214-1.500.
- Linning, David Lees; and Dodd, John Alan, to United Kingdom Atomic Energy Authority. Nuclear reactor fuel elements. 4,038,138, Cl. 176-81.000.
- Lipani, Anthony F., to Xerox Corporation. Process for producing electrostatographic prints. 4,038,076, Cl. 96-1.0SD.
- Lipe-Rollway Corporation: *See—*
  - Brutcher, Donald W., 4,037,710, Cl. 198-443.000.
- Lippold, Hans-Martin; and Spahrbier, Dieter, to Varta Batterie Aktiengesellschaft. Galvanic cell. 4,038,467, Cl. 429-219.000.
- Lira, Emil Patrick: *See—*
  - Traxler, James T.; Lira, Emil Patrick, and Kraemer, John F., 4,038,097, Cl. 106-288.00B.
- Litton Industrial Products, Inc.: *See—*
  - Hellenkamp, Johann F., 4,038,571, Cl. 310-8.200.
- Litton Systems, Inc.: *See—*
  - Reynolds, Richard L., 4,037,281, Cl. 10-10.00R.
- Litwin, Hans: *See—*
  - Steinhauser, Erwin; and Litwin, Hans, 4,038,444, Cl. 427-261.000.
- Lliteras, Juan Andres. High torque fastener head. 4,037,514, Cl. 85-45.000.
- Lo, Allen Kwok Wah; and Nims, Jerry Curtis, to Dimensional Development Corporation. Camera for taking stereoscopic pictures. 4,037,950, Cl. 352-58.000.
- Loctite Corporation: *See—*
  - Frauenglass, Elliott; and Werber, Gerhardt P., 4,038,475, Cl. 526-328.000.
- Loctite (Ireland), Limited: *See—*
  - O'Sullivan, Denis J.; and Bolger, Bernard J., 4,038,345, Cl. 260-881.000.
- Loe, Alton L., Jr., to Weyerhaeuser Company. Process control apparatus for controlling a particleboard manufacturing system. 4,038,531, Cl. 235-151.100.

Lohmann & Stolterfoht A.G.: *See—*
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Lohse, Friedrich: *See—*
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Loliger, Willi, to Alpura Koreco A.G. Volumetric pump. 4,037,996, Cl. 417-518.000.
Lonsmin, Victor. Novelty writing instrument having an appearing and disappearing personal name. 4,037,343, Cl. 40-334.000.
Looney, John Howard, to Xerox Corporation. Sorter apparatus. 4,037,832, Cl. 271-173.000.
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Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich, Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Loran, Thomas J.; Friebel, Virgil R.; and Pardee, Robert P., to Ball Brothers Research Corporation. Leader strip for motion picture film. 4,038,453, Cl. 428-325.000.
Lorang, Walter R. Golf swing training apparatus. 4,037,847, Cl. 273-187.00B.
Lorenz, Michael. Children's lamp. 4,038,561, Cl. 307-141.000.
Loui, Phillip J.; and Schmidt, James A., Jr., to Handy Button Machine Company. Shelf support. 4,037,813, Cl. 248-250.000.
Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., to National Plastics & Plating Supply. Indexing system. 4,038,169, Cl. 204-202.000.
Lovgren, Anders, to UTEC AB. Method of manufacturing doors and arrangement therefor. 4,037,301, Cl. 29-429.000.
Lowe, Richard L. Seatless valve. 4,037,820, Cl. 251-310.000.
Lowther, Frank Eugene, to W. R. Grace & Co. Electrical sensing and regenerating system for molecular sieve driers. 4,038,050, Cl. 55-18.000.
Lowther, Frank Eugene, to Union Carbide Corporation. Corona reaction method. 4,038,165, Cl. 204-176.000.
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Jones, Derick; and Lu, Sun, 4,038,200, Cl. 252-299.000.
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Luckerath, Klaus: *See—*
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Lutz, Kurt; and Ulmer, Eugen. Apparatus for discontinuously applying fluid to a strand-like material. 4,037,560, Cl. 118-314.000.
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Maaghul, John, to PPG Industries, Inc. Glass fiber sizing compositions for the reinforcement of resin matrices. 4,038,243, Cl. 260-40.00R.
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Macemon, James H., to Baxter Travenol Laboratories, Inc. Digitally settable selective control for speed of wavelength scan or for time base scan. 4,037,960, Cl. 356-73.000.
Macemon, James H., to Baxter Travenol Laboratories, Inc. System and apparatus for contour plotting the total luminescence spectrum of a sample. 4,037,961, Cl. 356-85.000.
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Maekawa, Yosuke: *See—*
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Magerlein, Barney J., to Upjohn Company, The. O-Glycoside ortho esters of neamine containing compounds. 4,038,478, Cl. 536-17.000.
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Maggos, Theodore; Geiger, David H.; Steiner, Sheldon M.; and Gregorio, Henry D. Multi-story floor-ceiling system and method. 4,037,375, Cl. 52-220.000.
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Maloof, Robert E., to Victor Electric Wire & Cable Corporation. Method of manufacture of male electrical plug assembly. 4,037,319, Cl. 29-629.000.
Manara, Giovanni; Fattore, Vittorio; and Notari, Bruno, to Snam Progetti S.p.A. Process for isomerizing alkenes. 4,038,337, Cl. 260-683.200.
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Manning, Harold E., to Petro-Tex Chemical Corporation. Dehydrogenation catalyst. 4,038,215, Cl. 252-465.000.
Manser, Josef; and Egger, Friedrich, to Gebrueder Buehler AG. Method for processing soft vegetable foodstuffs into crumbs. 4,038,433, Cl. 426-615.000.
Mapelsden, George C., to General Electric Company. Electrical switch method operating such and indexing system. 4,038,508, Cl. 200-329.000.
Maples, Lea. Adjustable end pin for string bass or cello. 4,037,505, Cl. 84-280.000.
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Marchant, Kerford A., Jr.; and Fenoglio, David J., to Standard Oil Company (Indiana). Azo-bisanhydride of trimellitic anhydride. 4,038,266, Cl. 260-152.000.
Marforio, Nerino, to Rockwell-Rimoldi S.p.A. Clamshell guide to apply annular elastic bands on clothes. 4,037,547, Cl. 112-121.270.
Marin, Gilbert, to Rhone-Poulenc Industries. Dismutation of trichlorosilane. 4,038,371, Cl. 423-342.000.
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Marker, Hannes. Apparatus for connecting a sailing mast to a sailing board. 4,037,553, Cl. 114-91.000.
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Marr, George; and Smith, George Elwood, to Burroughs Corporation; and Bell Telephone Laboratories Incorporated. Method for making transistor structures. 4,038,107, Cl. 148-1.500.
Marsden, James Glenn; and Orenski, Peter Joseph, to Union Carbide Corporation. Azido-silane compositions. 4,038,456, Cl. 428-391.000.
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Martan, Michael; and Reichenbacher, Paul H., to UOP Inc. Isomerization of cis-anethole to trans-anethole. 4,038,325, Cl. 260-612.00D.
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  - Benson, Nigel Colin; and Mehta, John Dorab, 4,038,121, Cl. 156-157.000.
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  - O'Handley, Robert Charles; Nesbitt, Ethan Allen, and Mendelsohn, Lewis Isaac, 4,038,073, Cl. 75-170.000.
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- Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, to Boehringer Ingelheim GmbH. 1-Hydroxy-1-[(4'-hydroxy-3'aminosulfonamido)-phenyl]-2-amino-ethanes and salts. 4,038,314, Cl. 260-556.00N.
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- Merchant Inventors International Limited: *See—*
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  - Hirschmann, Ralph F.; and Veber, Daniel F., 4,038,282, Cl. 260-295.00D.
  - Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., 4,038,306, Cl. 260-479.00S.
  - Saari, Walfred S., 4,038,411, Cl. 424-274.000.
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  - Nagl, Werner, 4,038,040, Cl. 428-596.000.
- Metacon AG: *See—*
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  - Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.
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- Meyer, Jeffry R.; and Billings, John S., Jr., to Westinghouse Electric Corporation. Supporting insulator assembly for gas-insulated equipment. 4,038,486, Cl. 174-28.000.
- Meyer, Richard D., to Phillips Petroleum Company. Filament liquid quenching apparatus. 4,037,288, Cl. 15-302.000.
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  - Hagenbohmer, Bodo; and Schaefer, Philipp, 4,037,636, Cl. 152-347.000.
- Mickley, Thomas B. Humidifying apparatus. 4,038,347, Cl. 261-30.000.
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- Mihatsch, Hansjorg: *See—*
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- Mikhlina, Eva Evseevna: *See—*
  - Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich, 4,038,402, Cl. 424-267.000.
- Miles Laboratories, Inc.: *See—*
  - Johnston, Katharine Gentry; and Greyson, Jerome, 4,038,485, Cl. 23-230.00B.
  - Lam, Charles T. W., 4,038,031, Cl. 23-230.00B.
- Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., to Merck & Co., Inc. N-t-butoxycarbonyl-S-lower alkanoylamidomethyl-cysteine and p-nitrophenyl esters. 4,038,306, Cl. 260-479.00S.
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  - Stevens, Harold E., deceased, 4,037,797, Cl. 241-100.000.
- Miller, Charles Eveleigh, to International Telephone and Telegraph Corporation. Probe and method of making the same. 4,037,461, Cl. 73-32.00A.
- Miller Electric Manufacturing Company: *See—*
  - Risberg, Robet L., 4,038,515, Cl. 219-131.00R.
- Miller, George W.; Ryan, Mark D.; and Niemi, Bill H., to FMC Corporation. Digital serial transmitter/receiver module. 4,038,494, Cl. 178-69.100.
- Miller, Gerald K.; and Lum, Sam, to United States of America, Navy. Water-seal splice for coaxial cables and method of making same. 4,038,490, Cl. 174-88.00C.
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- Milom, Joseph. Apparatus for indicating the output of a machine. 4,038,617, Cl. 324-179.000.
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  - Fisch, Richard S.; and Newman, Norman, 4,038,080, Cl. 96-60.0BF.
  - Smith, Carl Mayn; and Tiers, George V. D., 4,038,293, Cl. 260-378.000.
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  - Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.
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- Miskiewicz, Leonard A. Rotary-type air filter assembly. 4,038,058, Cl. 55-317.000.
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  - Rapoport, Sidney L.; and Mitchell, Douglas F., 4,037,533, Cl. 101-211.000.
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  - Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.
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  - Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,367, Cl. 423-235.000.
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  - Suzuki, Hajime; and Miyake, Hideo, 4,038,257, Cl. 260-75.0NK.
- Miyamoto, Seiji, to Sanyo Electric Co., Ltd. Signal detection circuit. 4,038,684, Cl. 358-27.000.
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  - Hellsten, Martin Edvin; Klingberg, Anders William; and Svennberg, Stig Erick, 4,038,102, Cl. 106-316.000.
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  - Cooper, James E., 4,037,656, Cl. 166-270.000.
  - Davidtz, John C., 4,038,183, Cl. 210-47.000.
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- Monroe, Henry T.; and Peebles, William H., Jr. Jumping toy. 4,037,357, Cl. 46-129.000.
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  - King, David P.; and Barker, Robert I., 4,037,968, Cl. 356-160.000.
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  - Grossman, Harold, 4,037,607, Cl. 131-10.00R.
- Moody, Isaac N., to Industrial & Marine Services (Scotland) Limited. Oil stove. 4,037,582, Cl. 126-116.00R.
- Moore, David James: *See—*
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- Moore, Donald G.: *See—*
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- Morgan Construction Company: *See—*
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- Morgan, Harry: *See—*
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- Morge, Michael P., to Caterpillar Tractor Co. Hinge and panel mounting means. 4,037,293, Cl. 16-171.000.
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  - Cosby, James Lynwood; and Morgret, Gordon Lawrence, 4,038,130, Cl. 156-473.000.
- Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, to Chugai Seiyaku Kabushiki Kaisha. Pharmaceutical composition and method of the use thereof. 4,038,416, Cl. 424-324.000.
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- Morimatsu, Hideharu: *See—*
  - Iida, Masajiro; Morimatsu, Hideharu; Fukuoka, Itsuo; and Yoshida, Yoshinari, 4,038,654, Cl. 343-5.0EM.
- Morin, Edmond A.: *See—*
  - Skarbo, Roald R.; Lueders, Robert E.; Morin, Edmond A.; and Peterson, Hal D., 4,038,298, Cl. 260-429.00J.
- Moritz, Karl Ludwig; and Schundehutte, Karl Heinz, to Bayer Aktiengesellschaft. Process for preparing azo dyestuffs containing 2,4,6-triamino-3-(cyano ester or carbonamide)pyridine. 4,038,268, Cl. 260-156.000.
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- Morrell, T. Herbert: *See—*
  - Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., 4,037,395, Cl. 56-218.000.
- Morris, Harold B.: *See—*
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- Morse, Milton. Derailleur construction having fixed increment means. 4,037,484, Cl. 74-217.00B.
- Mortikov, Evgeny Sergeevich: *See—*
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- Moshier, Stephen L., to Dialog Systems, Inc. Speech recognition apparatus. 4,038,503, Cl. 179-1.0SA.
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  - Leibach, Heinrich, 4,037,409, Cl. 60-413.000.
- Motorola, Inc.: *See—*
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  - Bethards, Charles William, 4,038,603, Cl. 325-182.000.
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  - Ishiyama, Hideki; Inoue, Atushi; and Ieki, Hideharu, 4,038,615, Cl. 333-72.000.
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  Frampton, Orville D., 4,038,211, Cl. 252-435.000.

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  Rostoker, Martin; and Levine, Leon, 4,038,264, Cl. 260-79.30M.

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  Lovejoy, Curtis N.; Kosowsky, Leo N.; and Holte, Paul C., 4,038,169, Cl. 204-202.000.

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  Randall, John Edward, 4,037,650, Cl. 165-29.000.

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  Dersch, James E.; and Maciey, James L., 4,037,578, Cl. 123-179.0BG.

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  Duke, Jack R.; Brooks, Philip W.; and Elzer, Robert R., 4,038,644, Cl. 364-900.000.
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  Webster, Donald R.; and Ganssle, Eugene R., 4,037,970, Cl. 356-188.000.

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  O'Handley, Robert Charles; Nesbitt, Ethan Allen; and Mendelsohn, Lewis Isaac, 4,038,073, Cl. 75-170.000.

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  Kondo, Hidenobu; and Nakano, Yoshiyuki, 4,038,672, Cl. 354-212.000.

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  Sakurai, Kiyomi; and Takimoto, Yasuyuki, 4,038,078, Cl. 96-35.100.

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  Day, Paul Edwin; and Kenney, George Churchill, 4,038,663, Cl. 346-1.000.

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  Dupuis, Jean Marcel, 4,037,772, Cl. 228-1.00R.

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  Baumgartner, Hans R.; and Skrovanek, Stephen D., 4,038,092, Cl. 106-73 400.
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  Koppel, Gary A.; and Nummy, Laurence J., 4,038,275, Cl. 260-243.00C.

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  Haberman, Charles E., 4,038,100, Cl. 106-307.000.

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  Cummings, Thomas L., 4,037,304, Cl. 29-427 000.
  Dorgnon, Roger; Combette, Marc; Luthringer, Jean; and Ollivier, Jean, 4,037,770, Cl. 227-9.000.
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  Hargreaves, Walter A., 4,038,201, Cl. 252-300.000.

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  - Rhoads, Roger R., 4,038,446, Cl. 428-35.000.
  - Taylor, Lynn J., 4,038,228, Cl. 260-23.0AC.
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- Palmer, Billy W.; and Wright, Howard N., Jr., to Eastman Kodak Company. Process for purification of neopentyl glycol. 4,038,329, Cl. 260-637.00P.
- Paluch, Edward S., to Reliable Electric Company. Telephone distribution frame connector assembly. 4,037,910, Cl. 339-198.00R.
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- Pasturczak, Vincent S.; and Kerstein, Melvin T., to Bell & Howell Company. Slot load projector. 4,037,949, Cl. 352-158.000.
- Pate, Harold T., to Indian Head Inc. Pipe bracket and clamp. 4,037,810, Cl. 248-68.0CB.
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- Perlmutter, Alan. Cigarette counting case. 4,037,719, Cl. 206-266.000.
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  - Urban, Frank J., 4,038,392, Cl. 424-250.000.
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- Pflueger, John M.; and Hutcheson, William A., to Pflueger, John M. Aquarium viewing window. 4,037,563, Cl. 119-5.000.
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- Poeta, Rolando. Wind motor. 4,037,983, Cl. 415-2.000.
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  - Whiteside, George D.; and Johnson, Bruce K., 4,038,674, Cl. 354-230.000.
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Kratochvil, Miroslav, 4,038,025, Cl. 432-13.000.

R. O. Hull & Company, Inc.: *See—*

Eckles, William Edward; and Starinshak, Thomas Walter, 4,038,161, Cl. 204-52.00R.

Rader Companies, Inc.: *See—*

Wahl, Harold F.; and Keating, James L., 4,037,723, Cl. 209-104.000.

Radiochemical Centre, Limited, The: *See—*

Monks, Reginald; and Thomas, Idris Lewis, 4,038,033, Cl. 23-230.300.

Rae, James A., to Exxon Research and Engineering Company. Novel curing system for conjugated diene butyl elastomers. 4,038,472, Cl. 526-48.000.

Rafferty, Edson Howard; and Kletschka, Harold D., to Bio-Medicus, Inc. Pumping apparatus and process characterized by gentle operation. 4,037,984, Cl. 415-60.000.

Rahman, Matiur; and Coleman, Harold R., to Tee-pak, Inc. Method of coloring synthetic food casings. 4,038,438, Cl. 427-385.00R.

Raichle, Karl: *See—*

Frank, Walter; Raichle, Karl; Bendszus, Otto; and Patheiger, Manfred, 4,038,340, Cl. 260-861.000.

Raines, Kenneth: *See—*

LeFevre, Robert J.; Burke, George K.; and Raines, Kenneth, 4,037,596, Cl. 128-214.00C.

Rajadhyaksha, Vithal J.; Schroer, Richard A.; Brock, Phillip J.; and Krueger, Earl R., to Nelson Research & Development Company. Prostaglandin dehydrogenase inhibiting agents. 4,038,415, Cl. 424-317.000.

Rak, Jaromir R.: *See—*

Clarke, Michael R.; and Rak, Jaromir R., 4,038,086, Cl. 106-15.00R.

Ralph M. Parsons Company, The: *See—*

Beavon, David K., 4,038,036, Cl. 23-262.000.

Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, to Metallgesellschaft Aktiengesellschaft; and Ruhrgas Aktiengesellschaft. Process for degasifying fine-grained fuels. 4,038,045, Cl. 48-197.00R.

Ramsey, Robert W.: *See—*

Anderson, Richard M.; McGill, Robert S., III; and Ramsey, Robert W., 4,038,061, Cl. 62-126.000.

Randall, John Edward, to National Research Development Corporation. Thermal storage apparatus. 4,037,650, Cl. 165-29.000.

Randell, Donald Richard; and Smith, Malcolm John, to Ciba-Geigy Corporation. Hydroxyaryl-tetramethyl-piperidines. 4,038,280, Cl. 260-293.840.

Randina, Larisa Vasilievna: *See—*

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Rank Xerox Ltd.: *See—*

Matsumoto, Seiji, 4,037,952, Cl. 355-3.00P.

Ransburg Corporation: *See—*

LaFave, Richard L.; and Probst, Richard O., 4,037,561, Cl. 118-629.000.

Rapoport Printing Corporation: *See—*

Rapoport, Sidney L.; and Mitchell, Douglas F., 4,037,533, Cl. 101-211.000.

Rapoport, Sidney L.; and Mitchell, Douglas F., to Rapoport Printing Corporation. Color lithography using a random pattern screen. 4,037,533, Cl. 101-211.000.

Rappas, Alkis S.; and Pemsler, J. Paul, to Kennecott Copper Corporation. Low temperature and pressure continuous reduction of copper in acid solutions. 4,038,070, Cl. 75-108.000.

Rath, Karl Friedrich. Apparatus for harvesting and bundling plants. 4,037,666, Cl. 171-61.000.

Rau, Peter: *See—*

Bittermann, Dietmar; Hunt, Kevin; Klein, Klaus; and Rau, Peter, 4,038,133, Cl. 176-38.000.

Raulerson, James D. Continuous flow catheter device. 4,037,599, Cl. 128-214.400.

Rautimo, Pentti Jaakkima: *See—*

Kapanen, Aarne Albin; and Rautimo, Pentti Jaakkima, 4,038,162, Cl. 204-105.00R.

Ray, Robert D. Bicycle lock. 4,037,441, Cl. 70-233.000.

RCA Corporation: *See—*

Allen, James Austin, 4,038,682, Cl. 358-128.000.

Baker, Alfred Lynn, 4,038,686, Cl. 358-127.000.

Ball, Ervin Matthew, 4,038,616, Cl. 324-20.0CR.

Bazin, Lucas John, 4,038,685, Cl. 358-32.000.

Clark, Charles Albert, Jr.; and Ito, Roy Atsushi, 4,038,655, Cl. 343-5.00W.

Dorsey, Denis Peter; and Rodda, William E., 4,038,581, Cl. 315-13.0ST.

Guyer, Robert Charles, 4,037,942, Cl. 350-285.000.

Harwood, Leopold Albert, 4,038,681, Cl. 358-20.000.

Kawamoto, Hirohisa, 4,038,106, Cl. 148-1.500.

Morrell, Albert Maxwell; and Irlbeck, Dennis Henry, 4,037,936, Cl. 350-189.000.

Schade, Otto Heinrich, Jr., 4,038,607, Cl. 330-13.000.

Schneider, Dennis Michael; and Bazin, Lucas John, 4,038,687, Cl. 358-165.000.

Takahashi, Tatsuo, 4,038,203, Cl. 252-301.40P.

Thorpe, Laurence Joseph; and Nicholson, Burnard Eugene, 4,038,683, Cl. 358-19.000.

Reactor Centrum Nederland (Stichting): *See—*

Votocek, Otakar, 4,038,202, Cl. 252-301.10S.

Reber, Russell H., to Purex Corporation Ltd. Energy saving vapor degreasing apparatus. 4,038,155, Cl. 202-170.000.

Record, Robert George Hamilton, to George Kent Limited. Bonding of metals to solid electrolytes. 4,037,773, Cl. 228-122.000.

Redman, Theodore Milton: *See—*

Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, 4,038,567, Cl. 307-362.000.

Reed, Frederick P., to United States of America, Army. Magnetic cartridge chambering and bolt holding system. 4,037,344, Cl. 42-16.000.

Reed Tool Company: *See—*

Justman, Daniel B., 4,037,673, Cl. 175-371.000.

Reichel, Sigrid; and Gottfried, Rudolf, to VEB Chemiewerk Nuenchritz. Process for preparing 2-(cyclohexenyl-4-)ethyl-silicon compounds and novel products made thereby. 4,038,302, Cl. 260-448.20E.

Reichenbacher, Paul H.: *See—*

Martan, Michael; and Reichenbacher, Paul H., 4,038,325, Cl. 260-612.00D.

Reiff, Almer A.: *See—*

Balzer, Claude P.; Reiff, Almer A.; and Corman, Edward M., 4,037,374, Cl. 52-179.000.

Reineke, Charles E., to Dow Chemical Company, The. Char-forming polymer compositions. 4,038,245, Cl. 260-45.70S.

Reinhardt, Walter: *See—*

Atasoy, Kaya; Weckwarth, Karl Franz; and Reinhardt, Walter, 4,038,476, Cl. 528-485.000.

Reiniche, Andre: *See—*

Pflieger, Bernard; and Reiniche, Andre, 4,038,109, Cl. 148-12.00F.

Reis, Walter; and Boll, Dietmar, to Reis, Walter. Workpiece transport apparatus. 4,037,731, Cl. 214-1.0BB.

Reiser, Roger W.; and Summers, Gary K. Water glove. 4,037,790, Cl. 239-529.000.

Reissland, Martin-Ulrich: *See—*

Schweizer, Walter; and Reissland, Martin-Ulrich, 4,037,967, Cl. 356-135.000.

Reith, James E.: *See—*

Booth, William M.; and Rieth, James E., 4,037,326, Cl. 33-139.000.

Reliable Electric Company: *See—*

Paluch, Edward S., 4,037,910, Cl. 339-198.00R.

Rembold, Heinz: *See—*

Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, 4,038,338, Cl. 260-824.0EP.

Remmington, Timothy Alan; and Robinson, William, to Imperial Chemical Industries Limited. Process for extruding and quenching a polymeric film. 4,038,354, Cl. 264-102.000.

Remner, Robert A.; and Rowland, Leroy V., to Aetna-Standard Engineering Company. Shellpusher for plug mill or the like. 4,037,453, Cl 72-252.000.

Renner, Alfred: *See—*

Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.

Reno, Woodrow James, to Becton, Dickinson and Company. Method for detecting endotoxins. 4,038,147, Cl. 195-103.50R.

Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, to Boehringer Ingelheim GmbH. N-aryl-N'-(phenyl-or phenoxy-alkyl)-piperazines and salts thereof. 4,038,279, Cl. 260-268.0BQ.

Renth, Ernst-Otto: *See—*

Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,038,314, Cl. 260-556.00N.

Renton, Stanley: *See—*

Crowther, John Cooper; and Renton, Stanley, 4,038,160, Cl. 204-51.000.

Replacement Products Industries Corporation: *See—*

Collins, David R.; and Katz, Sheldon N., 4,037,378, Cl. 52-397.000.

Reth, Erich. *See—*

Grimpe, Karl; and Reth, Erich, 4,037,452, Cl. 72-249.000.

Reuter, Floyd W., to Massey-Ferguson Inc. Pneumatic seed dispensing apparatus. 4,037,755, Cl. 221-211.000.

Revy von Belvard, Peter: *See—*

Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,037,947, Cl. 352-27.000.

Reynolds Metals Company: *See—*

Ashton, Richard F., 4,038,514, Cl. 219-126.000.

Reynolds, Richard L., to Litton Systems, Inc. Fastener manufacturing method. 4,037,281, Cl. 10-10.00R.

Reznicek, Kurt, to Bell Telephone Laboratories, Incorporated. Hermetically sealed envelope and method of making the same. 4,037,749, Cl. 220-2.30R.

Reznikova, Svetlana Stepanovna: *See—*

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.

Rhees, Raymond C.; and Halker, Bruce B. Anode containing lead dioxide deposit and process of production. 4,038,170, Cl. 204-290.00R.

Rhoads, Roger R., to Owens-Illinois, Inc. Container with improved heat shrunk cellular sleeve. 4,038,446, Cl. 428-35.000.

Rhone-Poulenc Industries: *See—*

Marin, Gilbert, 4,038,371, Cl. 423-342.000.

Rhone-Poulenc S.A.: *See—*

Balme, Maurice; Gattus, Jean; and Gerard, Bernard, 4,038,450, Cl. 428-268.000.

Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, 4,038,190, Cl. 210-321.00B.

Chabardes, Pierre; and Julia, Marc, 4,038,323, Cl. 260-607.0AR.

Cotrel, Claude; Crisan, Cornel; Jeanmart, Claude; and Messer, Mayer Naoum, 4,038,391, Cl. 424-250.000.

Foucras, Jacques, 4,038,519, Cl. 219-301.000.

Ricciardi, Franc M., to Richton International Corporation. Wallet construction. 4,037,634, Cl. 150-36.000.

Richard, Jean-Claude: *See—*

Hallais, Jean Philippe; Monnier, Michel Jean-Claude; and Richard, Jean-Claude, 4,038,576, Cl. 313-101.000.

Richard Wolf GmbH: *See—*

Heckele, Helmut, 4,037,588, Cl. 128-11.000.

Richards, John S., to Rockwell International Corporation. Method and apparatus for phototypesetting. 4,038,493, Cl. 178-15.000.

Richards, Raymond S.: *See—*

Bode, Wolfgang W.; Dunlap, Glenn H.; Kobylak, Anthony M.; Richards, Raymond S.; and Pfaender, Lawrence V., 4,038,577, Cl. 313-188.000.

Richardson-Merrell Inc.: *See—*

Grisar, J. Martin; and Claxton, George P., 4,038,412, Cl. 424-280.000.

Shemano, Irving, 4,038,400, Cl. 424-267.000.

Richter, George N.: *See—*

Potter, Clyde E.; and Richter, George N., 4,038,186, Cl. 210-92.000.

Richter, Gerhard; and Poppel, Peter, to USM Corporation. Machine for the processing of hides and skins. 4,037,437, Cl. 69-42.000.

Richton International Corporation: *See—*

Ricciardi, Franc M., 4,037,634, Cl. 150-36.000.

Riegel, Peter S.; Magill, Stephen E.; and Schroeder, Dwain R., to United States of America, Navy. Exhaust regulator valve for push-pull diving system. 4,037,594, Cl. 128-142.300.

Rieschel, Hartmut, to Maschinenfabrik Koppern GmbH & Co., KG. Method for the briquetting of metal swarf, pellets, and powders with roller presses. 4,037,303, Cl 29-420.500.

Rieth, James E.: *See—*

Booth, William M.; and Rieth, James E., 4,037,326, Cl. 33-139.000.

Rigid-Pak Corporation: *See—*

Stubbs, Edgar S., Jr., 4,037,748, Cl. 215-256.000.

Riikonen, Douglas L.: *See—*

Cassarino, Frank V., Jr.; Holtey, Thomas O.; and Riikonen, Douglas L., 4,038,537, Cl. 235-153.0AM.

Riley, Harry D. Fence construction. 4,037,788, Cl. 239-207.000.

Risberg, Robet L., to Miller Electric Manufacturing Company. Asymmetrical A.C. welder. 4,038,515, Cl. 219-131.00R.

Ritzerfeld, Gerhard. Rotary printing machine. 4,037,531, Cl. 101-91.000.

Rix, Albert; Fuchs, Hans; and Onuscheit, Jens, to Olympia Werke AG. Centrifugal coupling. 4,037,698, Cl. 192-105.0CE.

Robert Bosch G.m.b.H.: *See—*

Dworak, Wilhelm, 4,038,000, Cl. 418-102.000.

Fetzer, Martin, 4,037,914, Cl. 339-253.00R.

Nagel, Karl; Conzelmann, Gerhard; and Gschwendtner, Horst, 4,038,677, Cl. 357-51.000.

Roberti, Anthony M.: *See—*

Poluzzi, Henry Benjamin; Roberti, Anthony M.; and Romich, Wilfried Robert, 4,037,830, Cl. 269-21.000.

Roberts, Harold G.; and Brooks, Robert J. Laundry sorting machine. 4,037,725, Cl. 209-122.000.

Roberts, James E., Jr., to Standard Oil Company (Indiana). High strength composite pipe structure having leakproof joints. 4,037,626, Cl. 138-109.000.

Roberts, James L., to Honeywell Inc. Quadrature correlation pulse detector. 4,038,540, Cl. 235-181.000.

Roberts, Richard W., to Borg-Warner Corporation. Control system for variable displacement compressor. 4,037,993, Cl. 417-222.000.

Robertshaw Controls Company: *See—*

Bauer, Werner R.; and Sepso, Roger P., 4,037,317, Cl. 29-622.000.

Flumm, Paul T.; and Harris, Vernon B., 4,037,398, Cl. 58-22.900.

Robertson, Neil George Douglas, to Wiggins Teape Limited. Coated paper. 4,038,445, Cl. 427-150.000.

Robins, Roland K.; Shuman, Dennis A.; and Boswell, Kay H., to ICN Pharmaceuticals, Inc. 6-Aminocarbonyl purine 3',5'-cyclic nucleotides 4,038,480, Cl. 536-27.000.

Robinson, Bruce R.: *See—*

Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., 4,037,325, Cl. 33-125.00C.

Robinson, Joseph Gordon; and Rogers, Edward Aubrey, to Coal Industry (Patents) Limited. Resol type varnishes containing tar acids. 4,038,236, Cl. 260-32.80R.

Robinson, William: *See—*

Remmington, Timothy Alan, and Robinson, William, 4,038,354, Cl. 264-102.000.

Roccaforte, Harry I., to Hoerner Waldorf Division - Champion Int. Corporation. Display carton. 4,037,717, Cl. 206-45.140.

Rochet, Michel: *See—*

Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, 4,038,190, Cl. 210-321.00B.

Rock, Erich; and Mages, Bernhard. Withdrawal guide for drawers or the like. 4,037,885, Cl. 308-3.800.

Rock, James Edward: *See—*

Lewis, Scott Clarence; Redman, Theodore Milton; Rock, James Edward; and Wilder, Donald Lawrence, 4,038,567, Cl. 307-362.000.

Rockwell International Corporation: *See—*

Christe, Karl O., 4,038,374, Cl. 423-466.000.

Feintuch, Paul L., 4,038,536, Cl. 235-152.000.

Fisher, Frank H.; and Jovick, Raymond John, 4,037,690, Cl. 188-181.00R.

Keese, Beverly W., 4,037,694, Cl. 192-4.00A.

Nelson, Laurence G., 4,038,517, Cl. 219-216.000.

Richards, John S., 4,038,493, Cl. 178-15.000.

White, Stanley A., 4,038,495, Cl. 179-1.0SA.

Rockwell-Rimoldi S.p.A.: *See—*

Marforio, Nerino, 4,037,547, Cl. 112-121.270.

Rodda, William E.: *See—*

Dorsey, Denis Peter; and Rodda, William E., 4,038,581, Cl. 315-13.0ST.

Rodenberg, Herbert G.; and Patton, Charles E., to Emery Industries, Inc. High molecular weight monocarboxylic acids and ozonization process for their preparation. 4,038,297, Cl. 260-413.000.

Rodway, William George: *See—*

Downer, John Michael; Rodway, William George; and Shipp, Laurence Stanley John, 4,038,231, Cl. 260-29.60F.

Roevens, Leopold Fr. C.; Heykants, Jozef J. P.; and Helsen, Walter A. M., to Janssen Pharmaceutica N.V. Racemates and optical isomers of 1-(1-phenylethyl)-1H-imidazole-5-carboylic acid derivatives. 4,038,286, Cl. 260-309.000.

Rogers, Edward Aubrey: *See—*

Robinson, Joseph Gordon; and Rogers, Edward Aubrey, 4,038,236, Cl. 260-32.80R.

Rohm GmbH: *See—*

Hanstein, Friedrich; and Moench, Theodor Peter, 4,038,360, Cl 264-293.000.

Rohm and Haas Company: *See—*

Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,038,065, Cl. 71-76.000.

Rohr, Franz-Josef, to BBC Brown Boveri & Company Limited. Solid-electrolyte battery, particularly for the storage of electrical energy. 4,038,462, Cl. 429-30.000.

Rojahn, Fred H.; and Lichtenberg, Jose. Slide fastener stringer. 4,037,295, Cl. 24-205.13D.

Rojey, Alexandre, to Institut Francais du Petrole. Cold producing process. 4,037,426, Cl. 62-117.000.

- Rolf, Lechler: *See—*
  - Armin, Bauder; Rolf, Lechler; Johannes, Steinwart; and Gottlieb, Wilmers, 4,037,999, Cl. 418-84.000.
- Romero, Victor R., to Eagle Picher Industries, Inc. Store merchandising apparatus. 4,037,851, Cl. 280-79.300.
- Romich, Wilfried Robert: *See—*
  - Poluzzi, Henry Benjamin; Roberti, Anthony M.; and Romich, Wilfried Robert, 4,037,830, Cl. 269-21.000.
- Romick, Jerome M. Visible file-card system. 4,037,339, Cl. 40-104.120.
- Ronai, Anne A. Massage and dispensing apparatus. 4,037,977, Cl. 401-209.000.
- Ronne, Per-Axel Carsten: *See—*
  - Kimber, Erich Voldemar; and Ronne, Per-Axel Carsten, 4,037,671, Cl. 173-2.000.
- Rose, James J.; and Horton, Edward L., to Enviro-Blast International. Vacuum cleaning device. 4,037,290, Cl. 15-345.000.
- Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, to Union Carbide Corporation. Beta-amino nitrile catalysts for polyurethane preparation. 4,038,210, Cl. 252-426.000.
- Rosenbaum, Phillip. Model airplane drive and control system. 4,037,358, Cl. 46-253.000.
- Rosenberger, Siegfried: *See—*
  - Muller, Helmut; Rosenberger, Siegfried; and Brunetti, Heimo, 4,038,247, Cl. 260-45.9NC.
- Rosler, Wulff: *See—*
  - Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.
- Rostoker, Martin; and Levine, Leon, to National Patent Development Corporation. Hema copolymers having high oxygen permeability. 4,038,264, Cl. 260-79.30M.
- Roth, Thomas P., to Andersen 2000, Inc. Closed circuit sampler. 4,038,057, Cl. 55-270.000.
- Rothmans of Pall Mall Canada Limited: *See—*
  - Kopachkov, Slavco A., 4,037,804, Cl. 242-68.300.
- Roussel-UCLAF: *See—*
  - Mendy, Francois; Delage, Michel; and Teissier, Jean, 4,038,421, Cl. 426-72.000.
- Routien, John B.: *See—*
  - Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,038,383, Cl. 424-119.000.
- Rowe, Neal E.: *See—*
  - Wolski, Jerome C.; and Rowe, Neal E., 4,038,585, Cl. 361-334.000.
- Rowenta-Werke GmbH: *See—*
  - Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, 4,038,520, Cl. 219-521.000.
- Rowland, Leroy V.: *See—*
  - Remner, Robert A.; and Rowland, Leroy V., 4,037,453, Cl. 72-252.000.
- Roy, Joseph Jean; and Roy, Lorenzo. Heating system having high-low temperature limit controlled auxiliary boiler. 4,037,779, Cl. 237-8.00R.
- Roy, Lorenzo: *See—*
  - Roy, Joseph Jean; and Roy, Lorenzo, 4,037,779, Cl. 237-8.00R.
- Rubin, Erlen Manuilovich: *See—*
  - Ozersky, Arkady Solomonovich; Kamenev, Vladimir Fedorovich; Kurov, Boris Alexeevich; Gruzdev, Avenir Mikhailovich; and Rubin, Erlen Manuilovich, 4,038,349, Cl. 261-41.00D.
- Ruckstuhl, Franz, to Metacon AG. Protective nozzle for the outlet of a casting ladle. 4,037,762, Cl. 222-591.000.
- Ruf, Max, to Audi NSU Auto Union Aktiengesellschaft. Process for producing metal rings. 4,037,455, Cl. 72-324.000.
- Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, to Schering Aktiengesellschaft. Nitroimidazole derivatives and process for the preparation thereof. 4,038,410, Cl. 424-273.000.
- Ruhrgas Aktiengesellschaft: *See—*
  - Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl. 48-197.00R.
- Runciman, Herbert Morrison; and Berry, Peter John, to Barr and Stroud Limited. Radiation scanning system with two relatively movable reflectors. 4,037,920, Cl. 350-7.000.
- Ruse, Edward Thipthorp. Powered invalid-chairs. 4,037,676, Cl. 180-6.500.
- Russell, Carl D. Electric heat bonding tape method for construction panels. 4,038,120, Cl. 156-71.000.
- Russo, Adolph D.: *See—*
  - Diebold, William H.; and Russo, Adolph D., 4,037,383, Cl. 52-664.000.
- Russo Architectural Metals, Inc.: *See—*
  - Diebold, William H.; and Russo, Adolph D., 4,037,383, Cl. 52-664.000.
- Rutherford, David: *See—*
  - Suschitzky, John Louis; and Rutherford, David, 4,038,413, Cl. 424-295.000.
- Ryan, Edward Clyde: *See—*
  - Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, 4,037,740, Cl. 214-83.140.
- Ryan, Mark D.: *See—*
  - Miller, George W.; Ryan, Mark D.; and Niemi, Bill H., 4,038,494, Cl. 178-69.100.
- Ryan, Richard G.: *See—*
  - Martin, Donald P.; and Ryan, Richard G., 4,037,705, Cl. 197-1.00R.
- Rybalko, Galina Ivanovna: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
- Rzeszewski, Theodore S.; Frantzis, Paul D.; and Sideris, Sotirios, to Matsushita Electric Corporation of America. Frequency synthesizer tuning system with manual fine tuning control. 4,038,689, Cl. 358-191.000.
- S.R.M. Hydromekanik Aktiebolag: *See—*
  - Ahlen, Karl Gustav, 4,037,432, Cl. 64-27.00L.
- Saari, Walfred S., to Merck & Co., Inc. Antihypertensive amino acid esters. 4,038,411, Cl. 424-274.000.
- Sabarly, Louis J., to Societe Industrielle des Charmilles. Steam trap. 4,037,784, Cl. 236-56.000.
- Sachar, Kenneth S.: *See—*
  - Melcher, James R.; Sachar, Kenneth S.; and Zahedi, Karim, 4,038,049, Cl. 55-2.000.
- Saffran, Edward P., to Envirex Inc. Microscreen drum. 4,038,187, Cl. 210-108.000.
- Saint-Gobain Industries: *See—*
  - Vatin, Raymond, 4,037,500, Cl. 83-7.000.
- Saito, Hiroshi: *See—*
  - Higuchi, Tadamasa; Kuwa, Morihiko; and Saito, Hiroshi, 4,038,168, Cl. 204-197.000.
- Saito, Koetsu: *See—*
  - Yano, Tsutomu; Saito, Koetsu; Fukaya, Kuniaki; and Watanabe, Akinori, 4,037,933, Cl. 350-161.00W.
- Saito, Shizuo: *See—*
  - Ido, Kazuo; and Saito, Shizuo, 4,037,931, Cl. 350-160.0LC.
- Saito, Takeo: *See—*
  - Kitai, Kiyoshi; Saito, Takeo; and Seki, Youichi, 4,038,675, Cl. 354-238.000.
- Sakaguchi, Keiichi; Komine, Yoshio; Ichiyanagi, Toshikazu; Shimazaki, Mamoru; and Hosoe, Kazuya, to Canon Kabushiki Kaisha. Photographic camera which can use a film cartridge housing a film containing sound recording belt. 4,037,948, Cl. 352-29.000.
- Sakamoto, Eiichi: *See—*
  - Habu, Teiji; Nakajima, Tomio; and Sakamoto, Eiichi, 4,038,081, Cl. 96-66.300.
- Sakata, Isao: *See—*
  - Higashiyama, Tatsuo; and Sakata, Isao, 4,038,270, Cl. 536-4.000.
- Sakurai, Kiyomi; and Takimoto, Yasuyuki, to Nippon Paint Co., Ltd. Process using suction to form relief images. 4,038,078, Cl. 96-35.100.
- Salatiello, Peter P.: *See—*
  - Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,038,230, Cl. 260-29.60F.
- Salemi, Nicholas A., to Westinghouse Electric Corporation. Electric resistor. 4,038,628, Cl. 338-318.000.
- Salmon, Michel: *See—*
  - Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, 4,038,190, Cl. 210-321.00B.
- Sammis, George L., to Mach III, Inc. Method for printing a color design on a release paper for heat transfer to a fabric material. 4,038,123, Cl. 156-240.000.
- Sammons, Martin C.: *See—*
  - Bursey, Maurice M.; Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,038,158, Cl. 204-23.000.
- Sampson, Sheldon E.; and Cargill, Don A., to Cargill Detroit Corporation. Planetary straightening machine. 4,037,447, Cl. 72-92.000.
- Samson Apparatebau AG: *See—*
  - Jeschke, Norbert, 4,037,619, Cl. 137-492.500.
- Sandberg, Nils Arne, to Ingenjorsfirman N.A. Sandbergs Industrikonstruktioner AB. Method of controlling a mobile suction device for sucking suspendible material from the bottom of a liquid body, and an apparatus for carrying out the method. 4,037,335, Cl. 37-58.000.
- Sander, Gottfried, to Hermann Berstorff Maschinenbau GmbH. Multiple-roll calendars for producing thermoplastics film. 4,038,012, Cl. 425-363.000.
- Sandner, Michael Ray: *See—*
  - Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, 4,038,210, Cl. 252-426.000.
- Sandor, Sylvester R.: *See—*
  - Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.
- Sandoz Ltd.: *See—*
  - Groebke, Wolfgang, 4,038,269, Cl. 260-207.000.
- Sandrock, Don G.; and Hoag, Peter J., to Fiat-Allis Construction Machinery, Inc. Engine compartment enclosure. 4,037,682, Cl. 180-69.00R.
- Saner, Kaspar, to Wirth, Gallo and Company. Casing. 4,037,903, Cl. 339-75.00R.
- Sankey, Edwin W., to Marion Power Shovel Company, Inc. Frame construction for power shovels and the like. 4,037,894, Cl. 308-227.000.
- Sansing, James Earl, Jr.: *See—*
  - Clapp, John G.; Johnson, Donald Lee; and Sansing, James Earl, Jr., 4,038,064, Cl. 71-29.000.
- Sanyo Electric Co., Ltd.: *See—*
  - Miyamoto, Seiji, 4,038,684, Cl. 358-27.000.
- Saracsan, Jeffrey W.: *See—*
  - Finelli, Anthony F.; and Saracsan, Jeffrey W., 4,038,256, Cl. 260-75.0NH.

- Sarich, Tony Ralph. Orbital engine with stabilizing plate. 4,037,997, Cl. 418-61.00R.
- Sarkes Tarzian, Inc.: *See—*
  - Valdettaro, Alarico A., 4,037,482, Cl. 74-10.410.
- Sarmiento, Constante C.: *See—*
  - Gonsalves, Michael; and Sarmiento, Constante C., 4,037,667, Cl. 172-14.000.
- Sarno, Jay J. Bath tub therapeutic pad. 4,037,591, Cl. 128-33.000.
- Sasaki, Ichiemon: *See—*
  - Nishizawa, Jun-ichi; Sasaki, Ichiemon; and Takahashi, Kaoru, 4,038,610, Cl. 331-94.50H.
- Sasaki, Yukio: *See—*
  - Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.
- Sate-lite Mfg. Co.: *See—*
  - May, Louis, 4,037,924, Cl. 350-97.000.
- Sato, Akio: *See—*
  - Arimura, Iwao; Sato, Akio; Hirano, Hironori; and Makino, Shigeo, 4,037,637, Cl. 152-352.00R.
- Sato, Fumio. Silencing method and silencer device in crank press machine. 4,037,458, Cl. 72-429.000.
- Sato, Kozo: *See—*
  - Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo; Seki, Yoichi; and Takazawa, Yuzuru, 4,037,400, Cl. 58-23.00D.
- Sato, Takayuki: *See—*
  - Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.
- Satosen Company Limited: *See—*
  - Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.
- Savio, Ermanno: *See—*
  - Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno, 4,037,802, Cl. 242-47.050.
- Sawhney, Dulari L.: *See—*
  - Mueller, Max B.; Salatiello, Peter P.; and Sawhney, Dulari L., 4,038,230, Cl. 260-29.60F.
- SCA Development Aktiebolag: *See—*
  - Peterson, Viking Per, 4,037,792, Cl. 241-18.000.
- Scannell, William G., to Chromium Industries, Inc. Method of treating electroless nickel plating bath. 4,038,085, Cl. 106-1.000.
- Schade, Gerhard; Uckert, Peter; and Fritz, Manfred, to Dynamit Nobel Aktiengesellschaft. Process for the manufacture of wire insulation varnish resins suitable chiefly for application in the melted state. 4,038,254, Cl. 260-75.00N.
- Schade, Otto Heinrich, Jr., to RCA Corporation. Complementary field effect transistor amplifier. 4,038,607, Cl. 330-13.000.
- Schaefer, Philipp: *See—*
  - Hagenbohmer, Bodo; and Schaefer, Philipp, 4,037,636, Cl. 152-347.000.
- Scheib, Harold A., to Bell & Howell Company. Film registering advancing mechanism. 4,037,954, Cl. 355-50.000.
- Schering Aktiengesellschaft: *See—*
  - Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, 4,038,410, Cl. 424-273.000.
- Schillinger, Joseph F., to Champion International Corporation. Glassware carrier. 4,037,721, Cl. 206-434.000.
- Schinner, Thomas J.: *See—*
  - Kleimeyer, Vernon T.; and Schinner, Thomas J., 4,038,522, Cl. 235-61.70B.
- Schippers, Steven J., to Sperry Rand Corporation. Digital communications line terminal compacter/expander. 4,038,652, Cl. 340-347.0DD.
- Schlatter, Gerald L., to International Telephone and Telegraph Corporation. Densitometer. 4,037,459, Cl. 73-32.00A.
- Schloemann-Siemag Aktiengesellschaft: *See—*
  - Streubel, Hans, 4,037,647, Cl. 164-282.000.
- Schmid, Rolf: *See—*
  - Baumann, Dieter; Rembold, Heinz; Schmid, Rolf; and Lohse, Friedrich, 4,038,338, Cl. 260-824.0EP.
- Schmidger, Fritz. Baseboard for electrical installations. 4,037,900, Cl. 339-23.000.
- Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, to Ernst Leitz Wetzlar GmbH. Apparatus for determining photoelectrically the position of at least one focusing plane of an image. 4,037,958, Cl. 356-4.000.
- Schmidt, James A., Jr.: *See—*
  - Loui, Phillip J.; and Schmidt, James A., Jr., 4,037,813, Cl. 248-250.000.
- Schmidt, Robert J.: *See—*
  - Graf, Peter E.; and Schmidt, Robert J., 4,038,096, Cl. 106-277.000.
- Schmitter, Andre: *See—*
  - Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.
- Schneider, Dennis Michael; and Bazin, Lucas John, to RCA Corporation. Video blanking circuit. 4,038,687, Cl. 358-165.000.
- Schneider, Eckart: *See—*
  - Schmidt, Horst; Heitmann, Knut; Schneider, Eckart; and Mandler, Walter, 4,037,958, Cl. 356-4.000.
- Schneider, Franz: *See—*
  - Fetzer, Helmut; Schneider, Franz; and Brattinger, Helmut, 4,037,730, Cl. 214-1.0BB.
- Schneider, Irwin, to United States of America, Navy. Method for holographic storage. 4,038,647, Cl. 340-173.0CC.
- Schnitzer, Johann Georg. Cereal mill. 4,037,798, Cl. 241-101.200.
- Scholz, Gunter: *See—*
  - Ganter, Wolfgang; and Scholz, Gunter, 4,037,401, Cl. 58-58.000.
- Schoofs, Richard J., to Catco Venture. Catalyst regeneration process. 4,038,209, Cl. 252-419.000.
- Schor, Fred O. Sportsman's screwdriver and wrench. 4,037,275, Cl. 7-1.00G.
- Schora, Frank C.: *See—*
  - Meissner, Herman P.; and Schora, Frank C., 4,037,653, Cl. 165-1.000.
- Schotz, Larry A. Vehicle intrusion alarm circuit. 4,038,635, Cl. 340-63.000.
- Schrag, Robert L.: *See—*
  - Golobay, Gary L.; and Schrag, Robert L., 4,037,704, Cl. 197-1.00R.
- Schreiber, Bruno: *See—*
  - Forgo, Imre; Schreiber, Bruno; Renner, Alfred; Haug, Theobald; and Schmitter, Andre, 4,038,251, Cl. 260-47.0UA.
- Schreiber, Edward T. Exhaust heated hydrogen and oxygen producing catalytic converter for combustion engine. 4,037,568, Cl. 123-3.000.
- Schroek, Andrew A. Collapsible livestock ramp. 4,037,564, Cl. 296-61.000.
- Schroder, Rolf; and Nicko, Reinhard, to AGFA-Gevaert Aktiengesellschaft. Photographic apparatus with two picture taking lenses. 4,038,671, Cl. 354-197.000.
- Schroder, Rolf, to AGFA-Gevaert Aktiengesellschaft. View finder for photographic apparatus utilizing objectives having different focal lengths. 4,038,673, Cl. 354-222.000.
- Schroeder, Dwain R.: *See—*
  - Riegel, Peter S.; Magill, Stephen E.; and Schroeder, Dwain R., 4,037,594, Cl. 128-142.300.
- Schroer, Richard A.: *See—*
  - Rajadhyaksha, Vithal J.; Schroer, Richard A.; Brock, Phillip J.; and Krueger, Earl R., 4,038,415, Cl. 424-317.000.
- Schromm, Kurt: *See—*
  - Mentrup, Anton; Schromm, Kurt; Renth, Ernst-Otto; and Traunecker, Werner, 4,038,314, Cl. 260-556.00N.
  - Renth, Ernst-Otto; Mentrup, Anton; Schromm, Kurt; and Danneberg, Peter, 4,038,279, Cl. 260-268.0BQ.
- Schroter, Herbert: *See—*
  - Jaeggi, Knut Alfred; Ostermayer, Franz; and Schroter, Herbert, 4,038,414, Cl. 424-304.000.
- Schuetz, James W., to Aetna-Standard Engineering Company. Continuous flow plug mill system. 4,037,449, Cl. 72-209.000.
- Schuetz, James W., to Aetna-Standard Engineering Company. Piercing and reeling mill construction with removable cap. 4,037,451, Cl. 72-238.000.
- Schulte, Harold F.: *See—*
  - Freeman, Ardee H.; Schulte, Harold F.; and Davidson, Hubert, 4,037,364, Cl. 51-415.000.
- Schultz, Edward H., Jr., to Nagel-Chase Manufacturing Company. Pulley. 4,037,486, Cl. 74-230.800.
- Schultz, Frederick Arthur: *See—*
  - Orlando, Anthony William; and Schultz, Frederick Arthur, 4,037,732, Cl. 214-1.0BB.
- Schultz, Peter; and Martinen, Hinrich, to Up Geratebau-und Vertriebs GmbH, Firma. Method of and apparatus for measuring defects in sealings. 4,037,724, Cl. 209-111.70R.
- Schulz, Gunter: *See—*
  - Wassen, Johann; Schulz, Gunter; and Ivens, Gunter, 4,038,550, Cl. 250-358.00P.
- Schulze, Robert R.; and Ladd, Floyd R., to said Robert B. Schulze; by said Floyd R. Ladd. Method of charging a cryogenic probe. 4,037,631, Cl. 141-2.000.
- Schundehutte, Karl Heinz: *See—*
  - Moritz, Karl Ludwig; and Schundehutte, Karl Heinz, 4,038,268, Cl. 260-156.000.
- Schwartz, Jean: *See—*
  - Wermuth, Camille Georges; and Schwartz, Jean, 4,038,317, Cl. 260-566.0AE.
- Schwartz, Joseph: *See—*
  - Krapcho, John; and Schwartz, Joseph, 4,038,274, Cl. 260-240.00F.
- Schwartz, Willis T., Jr., to Hooker Chemicals & Plastics Corporation. Low profile additives in polyester systems. 4,038,341, Cl. 260-862.000.
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- Schwarz, Katica: *See—*
  - Rufer, Clemens; Schwarz, Katica; and Kessler, Hans-Joachim, 4,038,410, Cl. 424-273.000.
- Schwarzer, Henry: *See—*
  - Bayer, Arthur J.; and Schwarzer, Henry, 4,037,852, Cl. 280-87.04A.
- Schweers, William Edwin, to Lawrence Peska Associates, Inc., a part interest. Multiple section curtain rod. 4,037,726, Cl. 211-105.500.
- Schweizer, Walter; and Reissland, Martin-Ulrich, to VDO Adolf Schindling AG. Apparatus for measuring the density of a liquid, utilizing the law of refraction. 4,037,967, Cl. 356-135.000.
- Scott Paper Company: *See—*
  - Bullock, Richard H. D., Jr.; Gallatig, George; and Franklin, Kurtz A., 4,038,127, Cl. 156-353.000.
- Scott, Samuel C. Apparatus for forming a liner on a planar form means. 4,037,816, Cl. 249-83.000.
- Sebenda, Jan: *See—*
  - Stehlicek, Jaroslav; and Sebenda, Jan, 4,038,470, Cl. 526-29.000.
- Seegall, Manfred I.: *See—*
  - Compton, William A.; Duffy, Thomas E.; and Seegall, Manfred I., 4,037,473, Cl. 73-346.000.
- Seibold, Paul F. Grass trimming device. 4,037,323, Cl. 30-206.000.

Seidel, Michael C.: *See—*
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Seikagaku Kogyo Co. Ltd.: *See—*
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Semiconductor Research Foundation: *See—*
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Semmelhaack, Carl Frederick; and DiVecchio, Mark Camillo, to Burroughs Corporation. Integer and floating point to binary converter. 4,038,538, Cl. 235-154.000.
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Shafranovsky, Alexandr Vladimirovich; Olevsky, Viktor Markovich; Chubukov, Vladimir Kazimirovich; and Baskov, Jury Alexandrovich. Rotor film column for making contact between gas and liquid. 4,038,353, Cl. 261-89.000.
Shani, Esther G. Recipe apron. 4,037,272, Cl. 2-48.000.
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Shealy, Noah Alvin, to Clark Equipment Company. Dynamic tooth clutch. 4,037,696, Cl. 192-48.500.
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Snyder, John L., 4,038,237, Cl. 260-33.6AQ
Shemano, Irving, to Richardson-Merrell Inc. Method of treating conditions of delayed hypersensitivity using bis-basic substituted acenaphthene derivatives. 4,038,400, Cl. 424-267.000.
Shen, Tsung-Ying; Clark, Robert L.; Pessolano, Arsenio A.; Witzel, Bruce E.; and Lanza, Thomas J., to Merck & Co., Inc. Anti-inflammatory oxazole[4,5-b]pyridines. 4,038,396, Cl. 424-256.000.
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Showa Seitai Co. Ltd.: *See—*
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Shrader, Alan C., to Airco, Inc. Electron beam heating system. 4,038,484, Cl. 13-31.000.
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Shull, Harold H. Escape ladder. 4,037,686, Cl. 182-96.000.
Shultz, Jay S., to Johnson & Johnson. Aqueous resin composition containing polymers or copolymers of ethylenically unsaturated monomers and a water-soluble cationic polyelectrolyte polymer. 4,038,233, Cl. 260-29.6RW.
Shuman, Dennis A.: *See—*
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Kullmann, Dieter, 4,038,492, Cl. 174-15.00S.
Wachter, Herbert; and Gronemann, Hans-Joachim, 4,038,595, Cl. 323-45.000.
Wilhelm, Manfred, 4,037,313, Cl. 29-599.000.
Siggia, Edward P., to Edward P. Siggia Inc. Vertically indexed drawer guide support strip. 4,037,897, Cl. 312-343.000.
Silec-Semi-Conducteurs: *See—*
Dumas, Guy Henri, 4,038,111, Cl. 148-188.000.
Simenc, Toni: *See—*
Greif, Norbert; Bille, Heinz; Fikentscher, Rolf; and Simenc, Toni, 4,038,296, Cl. 260-410.600.
Singer Company, The: *See—*
Brodie, Peter Michael; and Solov, Edwin George, 4,038,527, Cl. 235-150.250.
Durville, Gerard; and Wunner, Charles Hamilton, 4,037,434, Cl. 66-57.000.
Zocher, Josef, 4,037,641, Cl. 163-5.000.
Singh, Gurdial; and Von Rutte, Richard Edward, to Du Pont de Nemours, E. I., and Company. Antistatic composition containing an aliphatic polyester or polyether ester and a phosphonium salt. 4,038,258, Cl. 260-75.00T.
Sinke, Gerard C.: *See—*
May, James A., Sr.; Sinke, Gerard C.; and Langhorst, Martin A., 4,038,188, Cl. 210-20.000.

Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono. Photosensitive polymeric material and electrophotometric material and methods of manufacturing same. 4,038,468, Cl. 526-11.100.
Sirvet, Enn, to Coors Container Company. Mandrel trip mechanism for can printers. 4,037,530, Cl. 101-40.000.
Sitole, Aniel G.: *See—*
Lehmann, Jerry Hans; Mills, Richard L.; Mowry, William H., Jr.; Peglow, James D.; Preston, Norman H.; and Sitole, Aniel G., 4,037,535, Cl. 101-287.000.
Sizova, Ljubov Sergeevna: *See—*
Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
Sjogren, Christer A.; and Backman, Ralph H., to EDS, Inc. Signature stacker employing swingable intercept means driven in a non-linear fashion. 4,037,525, Cl. 93-93.00C.
Sjoman, Carl F., to Team Industries. Method of folding and rolling briefs. 4,037,386, Cl. 53-21.0FW.
Sjostrand, Gunnar. Device in a piano mechanism. 4,037,504, Cl. 84-255.000.
Skarbo, Roald R.; Lueders, Robert E.; Morin, Edmond A.; and Peterson, Hal D., to Kennecott Copper Corporation. Removing ammonia from solutions of oxime-metal chelate. 4,038,298, Cl. 260-429.00J
Skrovanek, Stephen D.: *See—*
Baumgartner, Hans R.; and Skrovanek, Stephen D., 4,038,092, Cl. 106-73.400.
Skujins, Peter: *See—*
Coyner, Robert N.; and Skujins, Peter, 4,038,239, Cl 260-33.6UB.
Slayman, Mitchell. Golf club carrier. 4,037,765, Cl. 224-25.00R
Slindee, Norman Edward: *See—*
Huffine, Coy Lee; Mattson, Larry Frederick; Shidler, Karl Allen; and Slindee, Norman Edward, 4,038,693, Cl. 360-99.000.
Sloan Valve Company: *See—*
Horowitz, Charles, 4,037,879, Cl. 303-23.00R.
Slomovits, Ralph. Practice cymbal cover. 4,037,509, Cl. 84-422.00R.
Small, Robert E.: *See—*
Hildebolt, William M.; Hundt, Murray T.; and Small, Robert E., 4,038,432, Cl. 426-511.000.
Smith, Alistair Y.; Dietrich, Paul; and Pickenhagen, Wilhelm, to Firmenich S.A. Enhancing cheese flavor in foods with a diketo-piperazine. 4,038,429, Cl. 426-537.000.
Smith, Carl Mayn; and Tiers, George V. D., to Minnesota Mining and Manufacturing Company. Silicone-compatible tris(trimethylsilylox-y)silylalkylamino-substituted quinonoid dyestuffs. 4,038,293, Cl. 260-378.000.
Smith, Donald E. Bale transporting and feeding apparatus 4,037,741, Cl. 214-130.00C.
Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Methods for making transistor structures. 4,037,307, Cl. 29-571.000.
Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Methods for making transistor structures. 4,037,308, Cl. 29-571.000.
Smith, George Elwood, to Bell Telephone Laboratories, Incorporated. Methods for making transistor structures. 4,037,309, Cl. 29-571.000.
Smith, George Elwood: *See—*
Marr, George; and Smith, George Elwood, 4,038,107, Cl 148-1.500.
Smith International, Inc.: *See—*
Garner, Lloyd L., 4,037,300, Cl. 29-148.40R.
Smith, Kendall S., II: *See—*
Kennedy, Robert J., Jr.; and Smith, Kendall S., II, 4,037,896, Cl. 312-281.000.
Smith, Kenneth C., to Dayco Corporation. Textile cot assembly 4,037,299, Cl. 29-130.000.
Smith Kline & French Laboratories Limited: *See—*
Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben, and White, George Raymond, 4,038,408, Cl. 424-270.000.
Smith, Malcolm John: *See—*
Randell, Donald Richard; and Smith, Malcolm John, 4,038,280, Cl 260-293.840
Smith, Melvin. Bicycle with shock absorbing front end. 4,037,855, Cl. 280-276.000.
Smith, Richard C.: *See—*
Brownlee, Sherwood S.; Grubb, Fred H.; and Smith, Richard C., 4,037,780, Cl. 232-31.000.
Smith, Warren F.: *See—*
Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., 4,037,445, Cl. 72-60.000.
Smouse, Thomas H.; Maines, James K.; and Allen, Robert R., to Anderson, Clayton & Co. Margarine-like product having controlled browning properties. 4,038,436, Cl. 426-603.000.
Smyth, James A.: *See—*
Yates, Howard D.; Smyth, James A.; and Hajdu, Paul A., 4,037,940, Cl. 350-242.000.
Snam Progetti S.p.A.: *See—*
Dotti, Giuseppe, 4,037,278, Cl. 9-8.00R.
Manara, Giovanni; Fattore, Vittorio; and Notari, Bruno, 4,038,337, Cl. 260-683.200
Snider, Hugh H., Jr.: *See—*
Briggs, George S., and Snider, Hugh H., Jr., 4,037,517, Cl. 89-1.50D.
Snyder, John L., to Shell Oil Company. Fire retardant wire coating. 4,038,237, Cl. 260-33.6AQ.
S.p.A. Giuseppe Ratti Industria Ottica: *See—*
Blumenthal, Oreste, 4,037,946, Cl. 351-114.000.
Societe d'Etudes de Machines Thermiques: *See—*
Gallois, Jacques, 4,038,558, Cl 290-52.000.
Societe d'Etudes et de Diffusion de Procedes et Brevets S.A.: *See—*
Casanovas, Lorenzo Puig; and Vellas, Jean Leon Justin, 4,038,163, Cl. 204-152.000.
Societe Industrielle des Charmilles: *See—*
Sabarly, Louis J., 4,037,784, Cl. 236-56.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation: *See—*
Bougain, Georges, 4,037,404, Cl. 60-223.000.
Germain, Roger Louis Elysee, 4,037,887, Cl. 308-72.000.
Legrand, Paul Joseph, 4,037,809, Cl. 244-54.000.
Societe Nationale Industrielle Aerospatiale: *See—*
Laborie, Jean-Pierre; and Pevrol, Michel, 4,038,601, Cl. 325-23.000.
Soderberg, Eric W.: *See—*
Liner, John; and Soderberg, Eric W., 4,038,149, Cl. 195-127.000.
Soderberg, Roy E.; and Hanssen, Albert J., to International Telephone and Telegraph Corporation. Control valve 4,037,818, Cl. 251-121.000.
Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., to Xerox Corporation. Composite print wheel. 4,037,706, Cl. 197-54.000.
Sokolin, Leonid Shlemovich: *See—*
Alexeev, Alexandr Nikolaevich, Zhmurin, Igor Ivanovich; Moskovsky, Alexandr Antonovich; Oparin, Igor Minovich; Cheplanov, Vyacheslav Ivanovich, Sokolin, Leonid Shlemovich; Zolotarevsky, Vladimir Semenovich, deceased; Zolotarevskaya, Alla Meerovna, administrator; and Zolotarevskaya, Maiya Vladimirovna, administrator, 4,037,576, Cl. 123-148.00R.
Soliman, Mustafa; Rosler, Wulff; Spies, Jacob, and Herberg, Klaus, to Gewerkschaft Eisenhutte Westfalia. Scraper-chain conveyors. 4,037,713, Cl. 198-725.000.
Solov, Edwin George: *See—*
Brodie, Peter Michael; and Solov, Edwin George, 4,038,527, Cl. 235-150.250.
Somers, Roger E.: *See—*
Wilhelmi, Julius B.; and Somers, Roger E., 4,037,754, Cl 220-254.000.
Sommars, Mark F., to Caterpillar Tractor Co. Altitude compensated fuel control system. 4,037,575, Cl. 123-140.0MC.
Sommers, Hans: *See—*
Rammler, Roland; Grosse-Heitmeyer, Johann; Sommers, Hans; and Bathke, Heinz, 4,038,045, Cl 48-197.00R.
Sone, Yoshiaki; and Shirai, Masanari, to Canon Kabushiki Kaisha Cassette loading apparatus. 4,037,953, Cl 355-45.000
Sony Corporation: *See—*
Umeda, Kenkichi; and Yamauchi, Hiroyuki, 4,038,692, Cl 360-25.000.
Yagi, Hajime; and Tsuyuki, Tadaharu, 4,038,680, Cl 357-44.000
Southern Pacific Transportation Company: *See—*
Jaekle, William M., 4,037,526, Cl. 98-49.000.
Souza, Anthony J., to Woodstream Corporation. Safety release for animal trap. 4,037,350, Cl. 43-90.000.
SPA-Societe Prodotti Antibiotici S.p.A.: *See—*
Bruzzese, Tiberio; and Ferrari, Rodolfo, 4,038,382, Cl. 424-117.000.
Spahrbier, Dieter: *See—*
Lippold, Hans-Martin; and Spahrbier, Dieter, 4,038,467, Cl. 429-219.000.
Sparks, Buddy G.: *See—*
Murphy, Frank W., Jr.; Sparks, Buddy G.; and Carlton, Lewis M., 4,038,507, Cl. 200-84.00R.
Sparks, Carl K. Delivery bicycle-trailer. 4,037,853, Cl. 280-204.000.
Speco, Inc.: *See—*
Hess, Charles W., 4,037,494, Cl. 76-!01.00A.
Speizman Industries, Inc.: *See—*
Tapia, Everardo, 4,037,435, Cl. 66-142.000.
Spence-Bate, Harry Arthur Hele. Photographic film reading instrument. 4,037,926, Cl. 350-135.000.
Sperry Rand Corporation: *See—*
Baumann, Martin, 4,038,521, Cl. 235-61.50S.
Schippers, Steven J., 4,038,652, Cl. 340-347.0DD.
Spies, Jacob: *See—*
Soliman, Mustafa; Rosler, Wulff; Spies, Jacob; and Herberg, Klaus, 4,037,713, Cl. 198-725.000.
Spinner, Ernest Elliott: *See—*
Miller, Lowell Donald; Hounsell, Melvin Wayne; and Spinner, Ernest Elliott, 4,038,148, Cl. 195-127.000.
Spitz, Erich: *See—*
Bricot, Claude; Hareng, Michel; and Spitz, Erich, 4,037,929, Cl. 350-160.0LC.
Spivack, John D.; and Luzzi, John J., to Ciba-Geigy Corporation.

Metal salts of benzoyloxybenzoates and compositions stabilized therewith. 4,038,249, Cl. 260-45.75R.

Sprague Electric Company: *See—*

Kaliebe, Kenneth J., 4,038,587, Cl. 361-321.000.

Springer, Charles H. Apparatus for attracting and electrocuting flies. 4,037,351, Cl. 43-112.000.

Sprokel, Gerard John: *See—*

Gibson, Roy Morris; and Sprokel, Gerard John, 4,038,439, Cl 427-38.000.

Spurrell, Robert M.: *See—*

Huenniger, Edward A., and Spurrell, Robert M., 4,037,405, Cl 60-229.000.

Sridhar, Ramamritham: *See—*

Bell, Malcolm Charles Evert, Eerkes, Thijs; and Sridhar, Ramamritham, 4,038,066, Cl. 75-29.000

Stacy, Denzil W: *See—*

Brandeberry, Raymond L.; Lehr, Glen J., and Stacy, Denzil W., 4,038,105, Cl. 136-231.000

Stanadyne, Inc.: *See—*

Swift, Joseph Edward, 4,037,573, Cl. 123-139.0AQ.

Swift, Joseph Edward, 4,037,574, Cl. 123-139.0AQ.

Standard Brands Incorporated: *See—*

Antrim, Richard Lee, and Harris, Donald Wayne, 4,038,481, Cl 536-56.000

Standard Oil Company (Indiana): *See—*

Caspari, Gunter, 4,038,197, Cl. 252-46.700.

Marchant, Kerford A., Jr.; and Fenoglio, David J., 4,038,266, Cl 260-152.000.

Roberts, James E., Jr., 4,037,626, Cl. 138-109.000.

Stapleton, Earl Wesley; McLaughlin, Patricia Ann; and Turnbaugh, Jerry Edwin, to Tektronix, Inc. Thermal printing head. 4,037,315, Cl. 29-612.000.

Starinshak, Thomas Walter: *See—*

Eckles, William Edward, and Starinshak, Thomas Walter, 4,038,161, Cl. 204-52.00R

Staude, Heinz, and Goesswald, Fritz, to Eulit Werk Staude & Co. KG Cloakroom bracelet for bathing establishments and the like 4,037,442, Cl 70-456.00R.

Stauffer Chemical Company: *See—*

Pitt, Harold M., 4,038,284, Cl 260-307.0FA.

Via, Francis A., 4,038,164, Cl 204-159.150

Stautzenberger, Adin Lee; and Wagner, Frank Stevens, to Celanese Corporation. Substituted pyrimido-[4,5-d]-pyrimidine compounds useful for repelling insects, rodents or animals from substrates 4,038,394, Cl. 424-251.000)

Steenken, Bernhard: *See—*

Grosse-Scharmann, Franz, Gattermann, Bernd, and Steenken, Bernhard, 4,037,759, Cl. 222-142.000

Steffen, Vincent B. Grain drying apparatus. 4,037,527, Cl. 98-55.000

Stehlicek, Jaroslav; and Sebenda, Jan, to Ceskoslovenska akademie ved Method for preparation of polymers which contain N-acyllactam groups. 4,038,470, Cl 526-29.000

Steigerwald, Karl Heinz, to Steigerwald Strahltechnik GmbH. Process for energy beam perforation, especially electron beam perforation, of multi-layered artificial leather 4,038,513, Cl 219-121.0EM

Steigerwald Strahltechnik GmbH. *See—*

Steigerwald, Karl Heinz, 4,038,513, Cl. 219-121.0EM.

Steinberg, Hans: *See—*

Krutz, Wolfgang, and Steinberg, Hans, 4,037,687, Cl 184-6.400.

Steiner, Sheldon M: *See—*

Maggos, Theodore, Geiger, David H., Steiner, Sheldon M., and Gregorio, Henry D., 4,037,375, Cl. 52-220.000.

Steinhauser, Erwin; and Litwin, Hans. Method of producing a metallic plating. 4,038,444, Cl. 427-261.000

Stenkvist, Sven Einar, to ASEA Aktiebolag. Means for direct current arc furnaces. 4,038,483, Cl. 13-11.000

Stenson, Derek William; and Bissel, Dennis Ray, to Post Office, The Cables 4,038,489, Cl 174-70.00R.

Stern, Robert, Ucciani, Eugene, Hirschauer, Andre; and Cecchi, Georges, to Institut Francais du Petrole et Institut des Corps Gras (ITERG). Process for the selective hydrogenation of polyunsaturated oils 4,038,295, Cl. 260-409.000

Stevens, Harold E., deceased (by Stevens, Joan, heiress), to Mill & Mix Company, Inc. Grinding mill. 4,037,797, Cl 241-100.000.

Stevens, James E.; and Martin, Randel C. Rack structure for supporting articles. 4,037,737, Cl. 211-106.000.

Stevens, Joan, heiress: *See—*

Stevens, Harold E., deceased, 4,037,797, Cl 241-100.000.

Stewart, Patrick H.: *See—*

Kloster, William R.; and Stewart, Patrick H., 4,037,645, Cl 164-161.000.

Stewart, Robert C., Jr.: *See—*

Lamarine, John H., Stewart, Robert C., Jr., and Vine, Raymond W., 4,038,463, Cl. 429-44.000

Stickney, George A.: *See—*

Gutteridge, Ronald J; and Stickney, George A., 4,037,306, Cl 29-577.000.

Stiga AB: *See—*

Lindblad, Sture, 4,037,394, Cl 56-202.000

Stiles, Donald Joseph: *See—*

Ku, Ta Cheng; and Stiles, Donald Joseph, 4,037,707, Cl 197-53.000

Stiller, Paul Franklin. Film retention device. 4,037,718, Cl 206-53.000

Stinnes, Wolf Walter. Centrifugal moulding. 4,038,001, Cl. 425-110.000

Stockhaus, Klaus: *See—*

Merz, Herbert; Langbein, Adolf, Walther, Gerard; and Stockhaus, Klaus, 4,038,397, Cl. 424-260.000.

Stoll, Donald H., to General Electric Company. Method of assembling temperature responsive resistance member. 4,037,316, Cl. 29-622.000.

Stoll, Max: *See—*

Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, 4,038,435, Cl. 426-535.000.

Storace, Anthony; and Sette, Paul R., to Pitney-Bowes, Inc. Leaf spring weighing scale. 4,037,675, Cl. 177-229.000.

Storm, Thomas N.: *See—*

Henkensiefken, Larry L.; Kanengieter, Glenn G.; Morrell, T. Herbert; and Storm, Thomas N., 4,037,395, Cl. 56-218.000.

Straitz, John F., III, to Combustion Unlimited Incorporated. Flare stack gas burner 4,038,024, Cl. 431-202.000.

Stratoflex, Inc.: *See—*

Ide, Thomas N., 4,038,051, Cl. 55-218.000.

Street, Bonnie A. Marble track toy. 4,037,355, Cl. 46-43.000.

Strelitz, Robert A.: *See—*

Elion, Gertrude B.; and Strelitz, Robert A., 4,038,479, Cl. 536-24.000.

Streubel, Hans, to Schloemann-Siemag Aktiengesellschaft. Strand guide framework for supporting a partially solidified strand in a continuous casting installation. 4,037,647, Cl. 164-282.000.

Strickland, John C.: *See—*

Bunn, Dorrance P., Jr.; Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., 4,038,038, Cl. 23-288.00B.

Strike, Donald P., to American Home Products Corporation. Prostaglandin derivatives. 4,038,308, Cl. 260-514.00D.

Strindehag, Ove; and Wrangel, Erik, to Aktiebolaget Svenska Flaktfabriken. Humidity and heat exchanger apparatus, and method for its manufacture. 4,038,059, Cl. 55-388.000.

Stubbs, Edgar S., Jr., to Rigid-Pak Corporation. Container and closure. 4,037,748, Cl. 215-256.000.

Stummer, Franz, to Kling, Alberto. Voltage and frequency control circuit 4,038,592, Cl. 363-165.000.

Stuttgen, Friedel: *See—*

Ippen, Jakob; and Stuttgen, Friedel, 4,037,635, Cl. 152-301.000.

Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, to Sumitomo Chemical Company, Limited. Triazine reactive dyes. 4,038,267, Cl. 260-153.000.

Sugimoto, Takao, to Kawasaki Jukogyo Kabushiki Kaisha. Coupling device used in one-way rotating drive. 4,037,431, Cl. 64-14.000.

Sugio, Akitoshi: *See—*

Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, 4,038,343, Cl. 260-874.000.

Sugisaki, Hiroyuki; Nozue, Mitsuo; and Ogawa, Hiroki, to Taniguchi Petroleum Refining Company, Limited; and T. S. Chemical, Ltd. Varnish for printing inks and its method of preparation. 4,038,087, Cl. 106-32.000.

Sullivan, Daryl Dean: *See—*

Odle, Herbert Arnold; Sullivan, Daryl Dean; and Franck, Kurt, 4,037,341, Cl. 40-130.00B.

Sulzer Brothers Limited: *See—*

Ergenc, Mehmet Sahabettin; and Mandrin, Charles, 4,038,035, Cl. 23-260.000

Sumitomo Chemical Company, Limited: *See—*

Kudo, Ken-ichi; Kitagawa, Yoshihiko; and Kuribayashi, Hideyuki, 4,038,474, Cl. 526-185.000

Sueda, Yoshihisa; Koumura, Suketsugu; Hirabayashi, Kazuyoshi; Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.

Sumitomo Metal Industries, Ltd.: *See—*

Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.

Summa Corporation: *See—*

Miller, Robert C.; and Lemont, Harold E., 4,037,751, Cl. 220-9.00R.

Summers, Gary K.: *See—*

Reiser, Roger W.; and Summers, Gary K., 4,037,790, Cl 239-529.000.

Sunahara, Kazuo: *See—*

Matsuyama, Shigeru; Koyama, Masaharu, Kasai, Masayoshi; Tsuzurahara, Mamoru, and Sunahara, Kazuo, 4,037,930, Cl. 350-160.0LC

Sund-Akesson Aktiebolag: *See—*

Hansson, Jan Erik Enefrid, 4,038,003, Cl 425-137.000.

Sundberg, B. E. Ingvar, to Nordisk Kartro Aktiebolag. Wire nail 4,037,512, Cl 85-79.000.

Sundeen, Joseph E.: *See—*

Hauck, Frederic Peter, and Sundeen, Joseph E., 4,038,273, Cl 260-240.00D

Supkis, Stanley J., to Norton Company. Coated abrasive bonded with urea-formaldehyde, phenolic resin blends. 4,038,046, Cl. 51-295.000.

Suschitzky, John Louis, and Rutherford, David, to Fisons Limited. Treating iron deficiency anaemia. 4,038,413, Cl 424-295.000

Susekos, Sergei Mikhailovich: *See—*

Alexandrov, Adolf Moritsovich, Aglitsky, Vladimir Efimovich, Kantor, Ilya Solomonovich, Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekos, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich, Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.

Sutton, James Anthony: *See—*

Hill, Nigel, and Sutton, James Anthony, 4,037,419, Cl 61-45.00D

Suzuki, Hajime; and Miyake, Hideo, to Toyo Boseki Kabushiki Kaisha Urethane modified acrylate resin and process for the production thereof 4,038,257, Cl 260-75.0NK.

Suzuki, Hideo: *See—*

Miyahara, Masahiro; and Suzuki, Hideo, 4,038,530, Cl. 235-150.530.

Svanteson, Sven Elis Ake, to Aktiebolaget Electrolux. Method of processing waste on ships and the like and arrangement for carrying out the method. 4,038,184, Cl. 210-59.000.

Svejda, Terry M. Gardening implement with offcenter balancing weight. 4,037,668, Cl. 172-371.000.

Svennberg, Stig Erick: *See—*

Hellsten, Martin Edvin; Klingberg, An[illegible] William; and Svennberg, Stig Erick, 4,038,102, Cl 106-316.[illegible].

Svensson, Torbjorn: *See—*

Thorsell, Torgny; and Svensson, Torbjorn, 4,037,537, Cl. 102-22.00R.

Swanholm, Carl E.; and Caldwell, Robert G., to Bio-Degradable Plastics, Inc. Photodegradable polyolefins containing an aromatic ketone, ferric stearate, and a pigment. 4,038,227, Cl. 260-23.00H.

Swanson, Eric R., to United States of America, Navy. Self learning monitor for VLF wave propagation. 4,038,529, Cl. 235-150.270.

Swift & Company: *See—*

Davies, Donald L., 4,038,424, Cl. 426-94.000.

Swift, Joseph Edward, to Stanadyne, Inc. Timing control for fuel injection pump. 4,037,573, Cl. 123-139.0AQ.

Swift, Joseph Edward, to Stanadyne, Inc. Timing control for fuel injection pump. 4,037,574, Cl. 123-139.0AQ.

Sykes, Malcolm B.: *See—*

Iten, Clemens A.; and Sykes, Malcolm B., 4,037,321, Cl. 30-47.000.

Syntex (U.S.A.) Inc.: *See—*

Nelson, Peter H.; and Untch, Karl G., 4,038,299, Cl. 260-410.500.

Walker, Keith A. M.; and Marx, Michael, 4,038,409, Cl. 424-273.000.

Systron Donner Corporation: *See—*

Hanson, Richard A., 4,037,944, Cl. 350-310.000.

Szabo, Zoltan: *See—*

Heller, Laszlo; Forgo, Laszlo; and Szabo, Zoltan, 4,037,413, Cl. 60-655.000.

Szalvay, Laszlo: *See—*

Ambruoso, Pasquale, Sr.; and Szalvay, Laszlo, 4,038,502, Cl. 179-179.000.

T. S. Chemical, Ltd.: *See—*

Sugisaki, Hiroyuki; Nozue, Mitsuo; and Ogawa, Hiroki, 4,038,087, Cl. 106-32.000.

Tai, Wen Ten, to Nalco Chemical Company. Ionenes. 4,038,318, Cl. 260-567.60P.

Taihou Kogyo Kabushiki Kaisha: *See—*

Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.

Takahashi, Kaoru: *See—*

Nishizawa, Jun-ichi; Sasaki, Ichiemon; and Takahashi, Kaoru, 4,038,610, Cl. 331-94.50H.

Takahashi, Naoyuki: *See—*

Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,367, Cl. 423-235.000.

Takahashi, Reijiro: *See—*

Ito, Tosikatu; and Takahashi, Reijiro, 4,037,651, Cl. 165-30.000.

Takahashi, Shigeyuki: *See—*

Uemura, Koichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, 4,038,449, Cl. 428-220.000.

Takahashi, Tatsuo, to RCA Corporation. Certain alkali metal-rare earth metaphosphate photoluminescent glasses. 4,038,203, Cl. 252-301.40P.

Takaishi, Naotake: *See—*

Inamoto, Yoshiaki; Fujikura, Yoshiaki; Ikeda, Hiroshi; and Takaishi, Naotake, 4,038,333, Cl. 260-666.0PY

Takaku, Sakae: *See—*

Mori, Takashi; Takaku, Sakae; Oi, Nobuhiro; Shindo, Minoru; Hirano, Takeaki; Kataoka, Shigeyuki; and Furuno, Kouji, 4,038,416, Cl. 424-324.000.

Takaoka, Hikaru: *See—*

Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.

Takashima, Masaru, to Aikoh Co., Ltd. Heat-insulating agent for molten metal. 4,038,069, Cl. 75-96.000.

Takaya, Yasuo; Watanabe, Tadashi; and Iwasawa, Naozumi, to Kansai Paint Company, Ltd. Thermosetting high solid coating composition. 4,038,225, Cl. 260-21.000.

Takayama, Hirohide; Niino, Kiyoshi; and Fukuda, Sigeo, to Kawaken Fine Chemicals Co., Ltd. Compounds of allantoin with basic amino acids. 4,038,287, Cl. 260-309.700

Takazawa, Yuzuru: *See—*

Kitai, Kiyoshi; Ogihara, Masuo; Sato, Kozo; Shinozaki, Nobuo, Seki, Yoichi; and Takazawa, Yuzuru, 4,037,400, Cl. 58-23.00D.

Takeda Chemical Industries, Ltd.: *See—*

Kazama, Seiji; Tanaka, Michio; and Nagano, Katsuki, 4,038,304, Cl 260-468.00E.

Takeda, Yasutsugu, and Tsunoda, Yoshito, to Hitachi, Ltd. Holographic device with divided object beams, a multicolor light source and direction-selective screen. 4,037,919, Cl. 350-3.500.

Takeuchi, Hidemaro, to Nippon Steel Corporation. Carbon-free casting powder for ingot casting and continuous casting. 4,038,067, Cl 75-257.000

Takeuchi, Masato: *See—*

Kamiya, Kunio; Yusa, Hideo, Nakajima, Fumito, and Takeuchi, Masato, 4,038,060, Cl 62-36.000

Takimoto, Yasuyuki: *See—*

Sakurai, Kiyomi, and Takimoto, Yasuyuki, 4,038,078, Cl 96-35.100.

Talbert, Norwood K., to Agway, Inc. Process of dewatering sewage sludge 4,038,180, Cl 210-10.000.

Talbert, Norwood K., to Agway, Inc. Process for dewatering sewage sludge. 4,038,181, Cl. 210-10.000.

Talley-Frac Corporation: *See—*

Asaoka, Leo K., 4,038,112, Cl. 149-2.000.

Talucci, Anthony. Building evacuation system. 4,037,685, Cl. 182-18.000.

Tanaka, Michio: *See—*

Kazama, Seiji; Tanaka, Michio; and Nagano, Katsuki, 4,038,304, Cl. 260-468.00E.

Tanaka, Susumu: *See—*

Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, 4,038,026, Cl. 432-60.000.

Taniguchi Petroleum Refining Company, Limited: *See—*

Sugisaki, Hiroyuki; Nozue, Mitsuo; and Ogawa, Hiroki, 4,038,087, Cl. 106-32.000

Tapia, Everardo, to Speizman Industries, Inc. Auxiliary feed attachment for a circular knitting machine. 4,037,435, Cl. 66-142.000.

Tarchalski, Edward; and Wilkinson, John C., to Heinemann Electric Company. Protective arrangement for dependent switching circuits 4,038,584, Cl. 361-104.000.

Tarmann, Rainer; and Hopf, Walter, to Vereinigte Edelstahlwerke Aktiengesellschaft (VEW). Process for casting steel ingots under a vacuum. 4,037,644, Cl. 164-61.000.

Tate, George W., Jr., to Clegg, Giles C., Jr.; and Lynn, John R. Surgical mask with vapor barrier. 4,037,593, Cl. 128-146.200.

Taylor, David W., to General Motors Corporation. Anti-lock brake control circuit. 4,037,882, Cl 303-107.000

Taylor, George R: *See—*

Taylor, Miller; Taylor, Jimmy N., Taylor, Oren M., and Taylor, George R., 4,037,392, Cl. 56-27.500

Taylor, Jimmy N.: *See—*

Taylor, Miller; Taylor, Jimmy N.; Taylor, Oren M., and Taylor, George R., 4,037,392, Cl. 56-27.500

Taylor, Lynn J., to Owens-Illinois, Inc. Degradable plastic composition containing a transition metal salt of a highly unsaturated organic acid 4,038,228, Cl. 260-23.0AC

Taylor, Miller; Taylor, Jimmy N., Taylor, Oren M., and Taylor, George R. Tobacco harvester. 4,037,392, Cl 56-27.500.

Taylor, Oren M.: *See—*

Taylor, Miller; Taylor, Jimmy N., Taylor, Oren M., and Taylor, George R., 4,037,392, Cl 56-27.500.

Taylor, Peter John, to Plessey Company Limited, The. Fluid-flow assisting devices. 4,037,991, Cl. 417-80.000

Team Industries: *See—*

Sjoman, Carl F., 4,037,386, Cl. 53-21.0FW

Tee-pak, Inc.: *See—*

Rahman, Matiur; and Coleman, Harold R., 4,038,438, Cl 427-385.00R.

Teissier, Jean: *See—*

Mendy, Francois; Delage, Michel; and Teissier, Jean, 4,038,421, Cl 426-72.000.

Tektronix, Inc.: *See—*

Stapleton, Earl Wesley; McLaughlin, Patricia Ann; and Turnbaugh, Jerry Edwin, 4,037,315, Cl. 29-612.000

Teledyne McCormick Selph: *See—*

Thatcher, Donald N.; and Arikawa, Yoshiyuki, 4,038,321, Cl 260-583.00B.

Teller, Joseph D., and Kelly, Kristine M., to Worthington Biochemical Corporation. Limulus lysate turbidity test for pyrogens. 4,038,029, Cl 23-230.00B

Tennant Company: *See—*

Dojan, Harold D., 4,037,289, Cl. 15-320.000.

Tenneco Chemicals, Inc.: *See—*

Di Bella, Eugene P., 4,038,071, Cl. 75-108.000.

Terada, Takashi; Amemiya, Isamu; Kubota, Shinsaku, and Asada, Koji, to Nippon Carbide Kogyo Kabushiki Kaisha. Automatic tapping machine. 4,037,828, Cl 266-271.000

Terada, Yoshimi; and Fujii, Akira, to Ishikawajima-Harima Jukogyo Kubushiki Kaisha. Clamping device for use in lifting ship's hull blocks or the like 4,037,869, Cl. 294-104.000.

Terao, Alfred Y.: *See—*

Gasparaitis, Bernard; Eichler, Jay H.; and Terao, Alfred Y., 4,038,505, Cl 200-51.100

Terao, Hisashige: *See—*

Sueda, Yoshihisa; Koumura, Suketsugu, Hirabayashi, Kazuyoshi, Kenmochi, Hirohito; Terao, Hisashige; and Mori, Yoshio, 4,038,267, Cl. 260-153.000.

Tesco Engineering Company: *See—*

Miller, Sheldon M., 4,037,902, Cl 339-49.00R

Texaco Development Corporation: *See—*

Gipson, Robert Malone, 4,038,290, Cl. 260-348.50L.

Gipson, Robert Malone, 4,038,291, Cl 260-348.50L.

Gipson, Robert Malone, 4,038,292, Cl. 260-348.50L.

Texaco Inc.: *See—*

Brockington, James W.; and Bennett, Richard H., 4,038,212, Cl 252-436.000.

Bunn, Dorrance P., Jr., Strickland, John C.; MacLean, John P.; and May, Douglas H., Jr., 4,038,038, Cl. 23-288.00B.

Duranleau, Roger G.; and Larkin, John M., 4,038,316, Cl. 260-566.00A.

Knifton, John F., 4,038,208, Cl. 252-412.000.

Potter, Clyde E.; and Richter, George N., 4,038,186, Cl. 210-92.000.

- Texas Instruments Incorporated: *See—*
  - Aldridge, Bruce E.; Cochran, Michael J.; Kitchens, Lee G., Kressler, Robert R.; and Hamilton, Stephen P., 4,038,535, Cl. 235-152.000.
  - Gottbreht, Thomas Leon; Tolson, James William; and Crawford, Joe Wade, 4,038,678, Cl. 357-81.000.
  - Jones, Derick; and Lu, Sun, 4,038,199, Cl. 252-299.000.
  - Jones, Derick; and Lu, Sun, 4,038,200, Cl. 252-299.000.
- Textron, Inc.: *See—*
  - Peterson, William J., 4,037,771, Cl. 227-130.000.
- Th.Kieserlin & Albrecht: *See—*
  - Fangmeier, Ralf, 4,037,446, Cl. 72-68.000.
- Thaeter, Hans; and Broehl, Anton. Steam-driven tow line winch. 4,037,823, Cl. 254-172.000.
- Thatcher, Donald N.; and Arikawa, Yoshiyuki, to Teledyne McCormick Selph. Process for production of unsymmetrical dimethylhydrazine by nitrosation of dimethylamine and hydrogenation of the nitroso dimethylamine to the distillation of unsymmetrical dimethylhydrazine. 4,038,321, Cl. 260-583.00B.
- Thaw, Charles H.: *See—*
  - Karassik, Igor J.; and Thaw, Charles H., 4,037,985, Cl. 415-175.000.
- Thiele, Horst. Suspension arrangement. 4,037,860, Cl. 280-709.000.
- Thomas, Donald E.: *See—*
  - Ginex, Michael F.; and Thomas, Donald E., 4,037,510, Cl 84-453.000.
- Thomas, Earl M.: *See—*
  - Chow, Sen-Te; and Thomas, Earl M., 4,038,688, Cl. 358-174.000
- Thomas, Idris Lewis: *See—*
  - Monks, Reginald; and Thomas, Idris Lewis, 4,038,033, Cl. 23-230.300.
- Thomas, Leslie D., to Westinghouse Electric Corporation. Power control on satellite uplinks. 4,038,600, Cl. 325-4.000.
- Thomas, Thomas R.: *See—*
  - Winston, Steven J.; and Thomas, Thomas R., 4,038,369, Cl 423-240.000.
- Thompson, Arthur D.: *See—*
  - Anderson, Leslie T.; Thompson, Arthur D; and Kairbara, Iamo, 4,037,864, Cl. 285-342.000.
- Thompson, Harold Godfred, to American Cyanamid Company. Method for adhesion of rubber [using N-(substituted oxymethyl)-melamines and beta naphthol] to reinforcing materials. 4,038,220, Cl. 260-3.000.
- Thompson, Lloyd E., Jr High current density electrical contact 4,037,916, Cl. 339-258.00R.
- Thompson, Thomas D, to Yara Engineering Corporation Reactive pigments and methods of producing the same 4,038,101, Cl. 106-308.00N.
- Thomson-Brandt: *See—*
  - Bricot, Claude; Hareng, Michel; and Spitz, Erich, 4,037,929, Cl 350-160.0LC
  - Puech, Claude; Bricot, Claude, Carre, Bernard, Dubois, Jean Claude; Le Carvennec, Francois; and Lehureau, Jean Claude, 4,038,524, Cl. 235-61.12N.
- Thomson-CSF: *See—*
  - Dubois, Jean Claude, 4,038,441, Cl 427-109.000.
- Thomson, George A.: *See—*
  - Dison, James R.; and Thomson, George A., 4,038,189, Cl. 210-90.000.
- Thorp, Peter; and Bycroft, George William, to Coal Industry (Patents) Limited. Flexible ducting joints. 4,037,862, Cl. 285-260.000
- Thorpe, Laurence Joseph; and Nicholson, Burnard Eugene, to RCA Corporation. Television synchronizing generator 4,038,683, Cl 358-19.000.
- Thorsell, Torgny; and Svensson, Torbjorn, to Linden-Alimak AB Method and a device for blasting 4,037,537, Cl 102-22.00R.
- Thrower, Herbert T., Jr. Lapping composition containing a carboxy vinyl polymer. 4,038,048, Cl 51-298.00R
- Thumm, Herbert H., to Mechanex Corporation. The Lubricant seal 4,037,849, Cl. 277-37.000.
- Thumm, Herbert H: *See—*
  - Prescott, David B., Thumm, Herbert H; and Horner, Raymond L., 4,037,848, Cl. 277-37.000.
- Thyssen Industrie Aktiengesellschaft: *See—*
  - Brandau, Justus, 4,037,753, Cl. 220-211.000.
- Tibay, Eulogio Camacho. Ribbon spool with built-in bifacial re-inker 4,037,709, Cl. 197-171.000.
- Tiers, George V. D: *See—*
  - Smith, Carl Mayn; and Tiers, George V. D, 4,038,293, Cl 260-378.000.
- Timms, Donny Lee: *See—*
  - Beranek, Robert Louis, Jr, and Timms, Donny Lee, 4,038,356, Cl. 264-160.000
- Tischuk, Walter: *See—*
  - Howell, Norbert C.; Tischuk, Walter; and Welsh, Thomas M., 4,037,377, Cl. 52-309.900
- Titov, Dmitry Vladimirovich: *See—*
  - Komarov, Jury Ivanovich; Titov, Dmitry Vladimirovich; Kovalev, Gennady Ivanovich; and Mshvenieradze, Alexei Pimenovich, 4,037,628, Cl 139-436.000.
- Toa Nenryo Kogyo Kabushiki Kaisha: *See—*
  - Inoue, Hiroshi; Yoda, Makoto; and Wada, Shozo, 4,038,477, Cl. 528-487.000.
- Tobias, Reginald: *See—*
  - Varano, Antonio; and Tobias, Reginald, 4,038,055, Cl. 55-197.000
- Tobin, John H., to Olin Corporation. Catalytic process for preparation of perfluoroalkyl substituted aromatic compounds. 4,038,331, Cl. 260-651.00F.
- Tobkes, Martin, to American Cyanamid Company. Isolation and recovery of calcium chloride complex of 7-dimethylamino-6-dimethyl 1-6-deoxytetracycline hydrochloride. 4,038,315, Cl 260-559.0AT.
- Todisco, Joseph G: *See—*
  - Di Maio, Anthony E.; Bresnahan, Alfred E.; and Todisco, Joseph G., 4,037,448, Cl 72-114.000.
- Toga, Hitoshi: *See—*
  - Inoshita, Teruaki; Fukuda, Takashi; Toga, Hitoshi; and Takaoka, Hikaru, 4,037,522, Cl. 92-71.000.
- Tokimoto, Tadashi; and Hiraishi, Yoshinobu, to Komatsu Electronic Metals Co., Ltd. Method of producing high-purity transparent vitreous silica. 4,038,370, Cl. 423-336.000
- Tokisono, Takenosuke: *See—*
  - Kaneda, Nobuo; Tokisono, Takenosuke; and Uchida, Teizo, 4,037,587, Cl. 128-2.05G.
- Tokuyasu, Kiyochika; Yokobori, Takeshi; and Nakahara, Chizuko, to Seikagaku Kogyo Co. Ltd. Methods for extracting and purifying kallidinogenase 4,038,141, Cl. 195-66.00R.
- Tokyo Shibaura Electric Co., Ltd.: *See—*
  - Namba, Masanao; Kuniyoshi, Masateru; and Kobayashi, Akira, 4,038,624, Cl. 336-60.000.
- Toll Cryogenics, Inc.: *See—*
  - Kerwin, William S; Nelson, John Rodney; and Toll, Hans Robert, 4,037,368, Cl. 51-314.000.
- Toll, Hans Robert: *See—*
  - Kerwin, William S.; Nelson, John Rodney; and Toll, Hans Robert, 4,037,368, Cl. 51-314.000.
- Tolson, James William: *See—*
  - Gottbreht, Thomas Leon; Tolson, James William; and Crawford, Joe Wade, 4,038,678, Cl. 357-81.000.
- Tomlinson, Ian, to Ernest Scragg & Sons Limited. Spinneret apparatus with particulate material conveying means. 4,038,013, Cl. 425-378.00S.
- Tomlinson Industries, Inc.: *See—*
  - Chernak, John A., 4,037,817, Cl. 251-7.000.
- Tomono, Hiroshi: *See—*
  - Hara, Senri; Kimura, Tomohiko; Tomono, Hiroshi; and Sato, Takayuki, 4,037,646, Cl. 164-273.00R.
- Tompkins, Russell E.; Fisher, Franklin A.; and Wanger, Robert P., to General Electric Company. Magnetic inductively-coupled connector 4,038,625, Cl 336-83.000.
- Tone, Junsuke: *See—*
  - Celmer, Walter D.; Cullen, Walter P.; Moppet, Charles E.; Routien, John B.; Shibakawa, Riichiro; and Tone, Junsuke, 4,038,383, Cl. 424-119.000.
- Topham, William Henry, to British Petroleum Company Limited, The. Sampling device 4,037,475, Cl. 73-422.00R.
- Topolyansky, Jury Arnoldovich: *See—*
  - Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.
- Torres, Peter L. Water heating system including recycle loop. 4,037,567, Cl. 122-20.00B.
- Torroja, Jaime, to Sener, Tecnica Industrial Y Naval S.A. Process for reducing the stresses caused by the vertical bending of a boat on independent tanks installed therein. 4,037,552, Cl 114-74.00R.
- Toth, Arpad: *See—*
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- Toull, William Herbert, to E M I Limited. Apparatus for the manufacture of disc records. 4,038,009, Cl. 425-308.000.
- Towle, Jack Lewis; and Vander Ploeg, John Herman, to Chemetron Corporation. Method and composition for solventless printing. 4,038,226, Cl 260-22.0CQ
- Toyo Boseki Kabushiki Kaisha: *See—*
  - Suzuki, Hajime; and Miyake, Hideo, 4,038,257, Cl. 260-75.0NK.
- Toyo Hakka Kobyo Kabushiki Kaisha: *See—*
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- Toyobo Co., Ltd: *See—*
  - Inaba, Yoshio; and Hisagi, Takashi, 4,038,002, Cl. 425-136.000.
- Toyota Jidosha Kogyo Kabushiki Kaisha: *See—*
  - Ishida, Yasuhiko, 4,037,571, Cl. 123-52.00R.
- Trans World Display Corporation: *See—*
  - Jaquish, John, 4,037,756, Cl. 221-242.000.
- Transac - Compagnie Pour le Developpment des Transactions Automatiques: *See—*
  - Michaud, Andre; and Chalus, Bernard, 4,037,703, Cl. 194-97.00R
- Transcodan Sven Husted-Anderson, Firma: *See—*
  - Forberg, Hans-Jurgen, 4,037,597, Cl. 128-214.00C.
- Transrail AB: *See—*
  - Nordstrom, Kjell Helge, and Flinth, Rune Nils Allan, 4,037,469, Cl. 73-141.00A.
- Traunecker, Werner: *See—*
  - Mentrup, Anton, Schromm, Kurt, Renth, Ernst-Otto; and Traunecker, Werner, 4,038,314, Cl. 260-556.00N.
- Traxler, James T.; Lira, Emil Patrick, and Kraemer, John F, to International Minerals & Chemical Corporation. Modified clay paper coating 4,038,097, Cl 106-288.00B
- Trecker, David John: *See—*
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- Trego, Douglas G.: *See—*
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- Treuner, Uwe D.: *See—*
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- Trifiletti, Lewis: *See—*
  - Trifiletti, Thomas, 4,037,581, Cl. 126-39.00M.
- Trifiletti, Thomas, to Friese, Lucia F.; Krauss, Mary A.; and Trifiletti, Lewis, part interest to each. Screen device for stove ovens. 4,037,581, Cl. 126-39.00M.
- Tringali, Richard C.: *See—*
  - Huempfner, David F.; and Tringali, Richard C., 4,037,291, Cl. 16-35.00R.
- Trizno, Valentina Vladimirovna: *See—*
  - Belyshev, Leonid Lavrentievich; Chuvpilo, Albert Vladimirovich; Trizno, Valentina Vladimirovna; Naumenko, Viktor Arsenievich; Penkova, Lidia Fedorovna; Gorokhov, Veniamin Ivanovich; Apirina, Evgenia Grigorievna; and Gantman, Sarra Abramovna, 4,038,466, Cl. 429-190.000.
- Trompeter Electronics, Inc.: *See—*
  - Trompeter, Emanuel; Hunter, Tracy A.; and Azelton, Claud, 4,037,909, Cl. 339-177.00R.
- Trompeter, Emanuel; Hunter, Tracy A.; and Azelton, Claud, to Trompeter Electronics, Inc. Coaxial cable connector with energy loss prevention. 4,037,909, Cl. 339-177.00R.
- Tropicana Products, Inc.: *See—*
  - Erdman, Frank H., 4,037,734, Cl. 214-8.50A.
- TRW Inc.: *See—*
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- Tsekhanovskaya, Nina Alexandrovna: *See—*
  - Sirotkina, Ekaterina Egorovna; Lopatinsky, Vadim Petrovich; Filimonov, Viktor Dmitrievich; Kogan, Rita Moiseevna; Pirogov, Vyacheslav Dmitrievich; Kudinova, Sofya Ivanovna; Sizova, Ljubov Sergeevna; Reznikova, Svetlana Stepanovna; Ivanov, Georgy Nikolaevich; Tsekhanovskaya, Nina Alexandrovna; Sidaravichus, Jonas-Donatos Bronyaus; Randina, Larisa Vasilievna; Bocharova, Svetlana Leonidovna; Gulyaeva, Galina Petrovna; Bondarenko, Raisa Ivanovna; Rybalko, Galina Ivanovna; and Adomanite, Yanina Antono, 4,038,468, Cl. 526-11.100.
- Tsimbler, Jury Abramovich: *See—*
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- Tsutomu, Otake, to Kabushiki Kaisha Suwa Seikosha. Solar battery. 4,038,104, Cl. 136-89.00P.
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- Tufts, Robert J.: *See—*
  - Christopher, Albert S.; and Tufts, Robert J., 4,037,415, Cl. 60-673.000.
- Turbo, S.A.: *See—*
  - Masso Remiro, Jose Maria, 4,037,606, Cl. 128-547.000.
- Turchen, Dick, to Video Components, Inc. Instrument support. 4,037,763, Cl. 224-5.00V.
- Turcotte, Raymond; and Quevillon, Marc, to Institut Armand Frappier. Isolation and characterization of phenotypes of mycobacteria. 4,038,142, Cl. 195-96.000.
- Turk, Gunter: *See—*
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- Turner, Edwin M., to Ball Brothers Research Corporation. Dielectric sheet mounted dipole antenna with reactive loading. 4,038,662, Cl. 343-752.000.
- Turner, Larry G.; and Crawford, Dennis W., to Bristol Products, Inc. Spout assembly. 4,037,624, Cl. 137-615.000.
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  - Calamani, Sergio; Turri, Eugenio; and Savio, Ermanno, 4,037,802, Cl. 242-47.050.
- Tyler, Derek E.; Dickinson, David W.; and Dore, James E., to Olin Corporation. Method of melting copper alloys with a flux. 4,038,068, Cl. 75-76.000.
- U-Haul International, Inc.: *See—*
  - Medlin, Eric G.; Blair, Stephen A.; and Dennis, Richard H., 4,037,856, Cl. 280-446.00B.
- UBE Industries, Ltd.: *See—*
  - Nakano, Tsunetomo; Nishio, Kazuaki; Hayashi, Toshikazu; and Andou, Hiroshi, 4,038,084, Cl. 96-115.00P.
- Ucciani, Eugene: *See—*
  - Stern, Robert; Ucciani, Eugene; Hirschauer, Andre; and Cecchi, Georges, 4,038,295, Cl. 260-409.000.
- Uchida, Kenji; and Fujita, Kenichi, to Hitachi, Ltd. Slurry continuous pressure-feeding apparatus. 4,037,992, Cl. 417-102.000.
- Uchida, Teizo: *See—*
  - Kaneda, Nobuo; Tokisono, Takenosuke; and Uchida, Teizo, 4,037,587, Cl. 128-2.05G.
- Uckert, Peter: *See—*
  - Schade, Gerhard; Uckert, Peter; and Fritz, Manfred, 4,038,254, Cl. 260-75.00N.
- Ueda, Shigeru; Yokoyama, Shinichi; Nakata, Yoshinori; Hasegawa, Yoshihisa; Maekawa, Yosuke; and Yoshida, Yuji, to Agency of Industrial Science & Technology. Method for removal of oxygen from oxygen-containing compounds. 4,038,172, Cl. 208-10.000.
- Uemura, Koichi; Ishihara, Tetsuo; and Takahashi, Shigeyuki, to Daicel, Ltd. Polypropylene or polymethylpentene film coated with graft undercoat mixture and vinylidene chloride copolymer top coating. 4,038,449, Cl. 428-220.000.
- Ukawa, Naohiko: *See—*
  - Atsukawa, Masumi; Takahashi, Naoyuki; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,367, Cl. 423-235.000.
  - Atsukawa, Masumi; Shinoda, Naoharu; and Ukawa, Naohiko, 4,038,368, Cl. 423-235.000.
- Ulmer, Eugen: *See—*
  - Lutz, Kurt; and Ulmer, Eugen, 4,037,560, Cl. 118-314.000.
- Umeda, Kenkichi; and Yamauchi, Hiroyuki, to Sony Corporation. Tape sensing device for magnetic tape recording and/or reproducing apparatus. 4,038,692, Cl. 360-25.000.
- Union Carbide Corporation: *See—*
  - Bhasin, Madan Mohan, 4,038,175, Cl. 208-144.000.
  - Engel, Stephen August; and Fuhrhop, Ronald Elmer, 4,038,108, Cl. 148-9.500.
  - Koenst, John W., Jr.; and Mitchell, Edward, 4,038,351, Cl. 264-45.100.
  - Lowther, Frank Eugene, 4,038,165, Cl. 204-176.000.
  - Marsden, James Glenn; and Orenski, Peter Joseph, 4,038,456, Cl. 428-391.000.
  - Rosemund, Walter Richard; Sandner, Michael Ray; and Trecker, David John, 4,038,210, Cl. 252-426.000.
- Union Oil Company of California: *See—*
  - Holm, LeRoy W., 4,037,659, Cl 166-273.000.
  - Pownall, John R.; and Carver, Harold E., 4,037,736, Cl 214-23.000.
- Union Special G.m.b.H.: *See—*
  - Kleinschmidt, Johann Otto, 4,037,546, Cl. 112-121.260.
- United Bakery Equipment Company, Inc.: *See—*
  - Bastasch, Frank J., 4,037,388, Cl. 53-64.000.
- United Kingdom Atomic Energy Authority: *See—*
  - Linning, David Lees; and Dodd, John Alan, 4,038,138, Cl. 176-81.000.
  - Pearson, Kenneth George, 4,038,132, Cl. 176-38.000.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britanic Majesty's government of the: *See—*
  - Eccles, Edward Stuart; and Moore, David James, 4,038,526, Cl. 235-150.100.
- United Kingdom of Great Britain and Northern Ireland, The Secretary of State for Defence in Her Britannic Majesty's Government of the: *See—*
  - Cox, Alan Frederick John, 4,037,921, Cl. 350-36.000.
- United States of America
  - Air Force: *See—*
    - Arnold, Fred E.; and Hedberg, Frederick L., 4,038,320, Cl 260-578.000.
    - Dison, James R.; and Thomson, George A., 4,038,189, Cl. 210-90.000.
    - Hamer, Edward G.; and Phillips, Calvert F., Jr., 4,038,659, Cl 343-17.10R.
    - Kapfer, Vincent C., 4,038,598, Cl. 324-72.500.
    - Kim, Chung K.; and Cho, Yung L., 4,038,157, Cl. 204-16.000.
    - May, Klaus D.; and Nasuta, Anthony T., Jr., 4,038,568, Cl 307-351.000.
    - Oberth, Adolf E., 4,038,113, Cl. 149-19.400.
    - Oberth, Adolf E., 4,038,114, Cl. 149-19.400.
    - Warnock, Don R., 4,038,461, Cl 429-21.000.
    - Webb, John G., Jr.; and Gray, Roger M., 4,038,656, Cl. 343-5.0SA.
    - Woolfson, Martin G.; and Plath, Robert H., 4,038,588, Cl. 318-648.000.
  - Army: *See—*
    - Chow, Sen-Te; and Thomas, Earl M., 4,038,688, Cl. 358-174.000.
    - Connolly, Thomas M.; and Luoma, Eino J., 4,038,660, Cl. 343-18.00A.
    - Greene, Frank E., 4,037,821, Cl. 254-93.00R.
    - Jackson, William Nelson, 4,037,782, Cl. 235-84.000.
    - Reed, Frederick P., 4,037,344, Cl. 42-16.000.
  - Energy Research and Development Administration: *See—*
    - Cook, K. Von; Koerner, Dan W.; Cunningham, Robert A., Jr.; and Murrin, Horace T., Jr., 4,037,465, Cl. 73-67.80S.

- Fries, R. Jay; Farnum, Eugene H.; and McCall, Gene H., 4,038,125, Cl. 156-280.000.
- Gerth, Howard L., 4,037,496, Cl. 82-28.00R.
- Purcell, John R., 4,038,622, Cl. 335-216.000.
- Winston, Steven J.; and Thomas, Thomas R., 4,038,369, Cl 423-240.000.

Navy: *See—*
- Andrews, Catherine C.; Klausmeier, Robert E.; and Osmon, Jerald L., 4,038,116, Cl. 149-105.000.
- Bard, Howard B., 4,038,608, Cl. 331-56.000.
- Briggs, George S.; and Snider, Hugh H., Jr., 4,037,517, Cl. 89-1.50D.
- Bumgardner, Jon H., 4,037,959, Cl. 356-73.000.
- Burkley, Harold W.; and Geno, Wayne H., 4,037,318, Cl. 29-623.000.
- Colli, Albert J., 4,038,372, Cl. 423-413.000.
- Friedman, Moshe, 4,038,602, Cl. 325-125.000.
- Hackman, Emory E., 4,037,539, Cl. 102-67.000.
- Miller, Gerald K.; and Lum, Sam, 4,038,490, Cl. 174-88.00C.
- Mock, Kenneth John; and Mozic, Joseph Daniel, 4,037,470, Cl. 73-190.0EW.
- Orloff, Leslie M., 4,038,657, Cl. 343-7.300.
- Riegel, Peter S.; Magill, Stephen E.; and Schroeder, Dwain R., 4,037,594, Cl. 128-142.300.
- Schneider, Irwin, 4,038,647, Cl. 340-173.0CC.
- Swanson, Eric R., 4,038,529, Cl. 235-150.270.

U.S Philips Corporation: *See—*
- Blackman, Morris V.; and Jenner, Michael D., 4,037,311, Cl 29-593.000.
- Bouwhuis, Gijsbertus; and Velzel, Christiaan Hendriks Frans, 4,038,679, Cl. 358-127.000.
- Day, Paul Edwin; and Kenney, George Churchill, 4,038,663, Cl. 346-1.000.
- Ekkelboom, Tjepke Hendrik, 4,038,579, Cl. 313-331.000.
- Gorter, Frederik Willem; and Wijn, Henricus Petrus Johannes, 4,038,597, Cl. 324-46.000.
- Hallais, Jean Philippe; Monnier, Michel Jean-Claude; and Richard, Jean-Claude, 4,038,576, Cl. 313-101.000.
- Hoeberechts, Arthur Marie Eugene; and Carasso, Marino Giuseppe, 4,038,606, Cl. 328-124.000.
- Mathijssen, Petrus Johannes, 4,038,578, Cl. 313-217.000.
- Pool, Ferdinand, 4,038,569, Cl. 307-289.000.
- van der Burgt, Cornelis Martinus; and van Maanen, Gerardus Andreas, 4,038,629, Cl. 340-3.00E.
- van Turnhout, Jan, 4,037,310, Cl. 29-592.000.

United States Steel Corporation: *See—*
- Dorman, Evans D.; and Getty, William P., 4,037,498, Cl. 82-86.000

United Technologies Corporation: *See—*
- Duvall, David Scott; and Paulonis, Daniel Francis, 4,038,041, Cl. 428-576.000.
- Huenniger, Edward A.; and Spurrell, Robert M., 4,037,405, Cl. 60-229.000.
- Lamarine, John H.; Stewart, Robert C., Jr.; and Vine, Raymond W., 4,038,463, Cl. 429-44.000.

University of Akron, The: *See—*
- Farona, Michael F.; and White, James F, 4,038,324, Cl. 260-607.0AR.

University of Iowa Research Foundation, The: *See—*
- Andreasen, George F., 4,037,324, Cl. 32-14.00A.

University of Michigan, The Regents of the: *See—*
- Juni, Elliot, 4,038,143, Cl. 195-100.000.

University of Virginia, The: *See—*
- Gainer, John L., 4,038,144, Cl. 195-100.000.

Untch, Karl G.: *See—*
- Nelson, Peter H.; and Untch, Karl G., 4,038,299, Cl. 260-410.500.

UOP Inc.: *See—*
- Brewer, Gerald L.; and Olsen, Steven D., 4,038,032, Cl. 23-230.00A.
- Martan, Michael; and Reichenbacher, Paul H., 4,038,325, Cl. 260-612.00D.
- Wood, Charles E., 4,038,334, Cl. 260-671.00R.

Up Geratebau-und Vertriebs GmbH, Firma: *See—*
- Schultz, Peter; and Martinen, Hinrich, 4,037,724, Cl. 209-111.70R

Upjohn Company, The: *See—*
- Hall, Charles M.; and Johnson, Herbert G., 4,038,398, Cl 424-263.000.
- Lamb, Donald J., 4,038,389, Cl 424-243.000.
- Magerlein, Barney J., 4,038,478, Cl. 536-17.000.

Urban, Frank J., to Pfizer Inc. 3-(Heterocyclicthiomethyl) quinoxaline-1,4-dioxides. 4,038,392, Cl. 424-250.000.

Urban, Guy K., deceased (by Urban, Mary, administratrix/executrix), to Feedmobile, Inc Portable hammermill and attached inclined augered feed table. 4,037,799, Cl. 241-186.00A.

Urban, Mary, administratrix/executrix: *See—*
- Urban, Guy K., deceased, 4,037,799, Cl 241-186 00A.

Uskokovic, Milan Radoje: *See—*
- Partridge, John Joseph, Jr.; and Uskokovic, Milan Radoje, 4,038,272, Cl. 260-239.55R.

USM Corporation: *See—*
- Richter, Gerhard; and Poppel, Peter, 4,037,437, Cl 69-42.000

UTEC AB: *See—*
- Lovgren, Anders, 4,037,301, Cl. 29-429.000.

Uthemann, Horst: *See—*
- Isaac, Otto; Posselt, Klaus, and Uthemann, Horst, 4,038,386, Cl 424-182.000.

Utumi, Tadae, to Fuji Photo Film Co., Ltd. Method for coating 4,038,442, Cl 427-128.000

Vaerman, Joseph M. E.: *See—*
- de Radzitzky d'Ostrowick, Pierre M. J. G.; Hanotier, Jacques D. V.; and Vaerman, Joseph M E., 4,038,322, Cl. 260-597.00R

Valdettaro, Alarico A., to Sarkes Tarzian, Inc. Accurate UHF television tuning system and method of fabricating same. 4,037,482, Cl. 74-10.410.

Van Dyk & Company, Incorporated: *See—*
- Conner, Donald E., and Fogel, Arnold W., 4,038,294, Cl. 260-404.500

Van Cleave, James R., to American Electronic Laboratories, Inc. Adaptive pulse processing means and method 4,038,539, Cl 235-156.000.

Vandenberghe, Antoon Leon: *See—*
- Willems, Jozef Frans; and Vandenberghe, Antoon Leon, 4,038,083, Cl. 96-94.00R.

Vandeputte, Camille Angelina: *See—*
- Pollet, Robert Joseph; Sels, Francis Jeanne; and Vandeputte, Camille Angelina, 4,038,075, Cl. 96-22.000.

van der Burgt, Cornelis Martinus; and van Maanen, Gerardus Andreas, to U.S. Philips Corporation. Propagation delay meter. 4,038,629, Cl. 340-3.00E.

van der Lely, Ary; and Bom, Cornelis Johannes Gerardus, to C. van der Lely N. V. Tine cultivator. 4,037,669, Cl. 172-59.000.

Vander Ploeg, John Herman: *See—*
- Towle, Jack Lewis; and Vander Ploeg, John Herman, 4,038,226, Cl. 260-22.0CQ.

van Maanen, Gerardus Andreas: *See—*
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van Turnhout, Jan, to U.S. Philips Corporation. Method of manufacturing a homopolar electret from a foil. 4,037,310, Cl. 29-592.000.

Varano, Antonio; and Tobias, Reginald, to Block Engineering, Inc. Gas chromatograph for continuous operation with infrared spectrometer. 4,038,055, Cl. 55-197.000.

Varta Batterie Aktiengesellschaft: *See—*
- Lippold, Hans-Martin; and Spahrbier, Dieter, 4,038,467, Cl. 429-219.000.

Vater, Wulf: *See—*
- Bossert, Friedrich; Meyer, Horst; and Vater, Wulf, 4,038,399, Cl. 424-266.000.

Vatin, Raymond, to Saint-Gobain Industries. Process and apparatus for continually cutting stacked glass sheets. 4,037,500, Cl. 83-7.000.

VDO Adolf Schindling AG: *See—*
- Schweizer, Walter; and Reissland, Martin-Ulrich, 4,037,967, Cl. 356-135.000.

VEB Chemiewerk Nuenchritz: *See—*
- Reichel, Sigrid; and Gottfried, Rudolf, 4,038,302, Cl. 260-448.20E.

Veber, Daniel F.: *See—*
- Hirschmann, Ralph F.; and Veber, Daniel F., 4,038,282, Cl. 260-295.00D.
- Milkowski, John D.; Veber, Daniel F.; and Hirschmann, Ralph F., 4,038,306, Cl. 260-479.00S.

Vellas, Jean Leon Justin: *See—*
- Casanovas, Lorenzo Puig; and Vellas, Jean Leon Justin, 4,038,163, Cl. 204-152.000.

Velsicol Chemical Corporation: *See—*
- Anderson, Arnold L., 4,038,248, Cl. 260-45.75R.

Velzel, Christiaan Hendriks Frans: *See—*
- Bouwhuis, Gijsbertus; and Velzel, Christiaan Hendriks Frans, 4,038,679, Cl. 358-127.000.

Veneklasen, Lee H.: *See—*
- Krisch, Burkhard; Veneklasen, Lee H.; and Willasch, Dieter, 4,038,543, Cl. 250-307.000.

Venot, Robert: *See—*
- Gallet, Bernard; and Venot, Robert, 4,038,136, Cl. 176-87.000.

Vereinigte Edelstahlwerke Aktiengesellschaft (VEW): *See—*
- Tarmann, Rainer; and Hopf, Walter, 4,037,644, Cl. 164-61.000.

Vergari, Louis Peter: *See—*
- Bouknecht, Max Abbott; Bourke, Donall Garraid; and Vergari, Louis Peter, 4,038,641, Cl. 364-900.000.
- Bouknecht, Max Abbott; Davis, Michael Ian; and Vergari, Louis Peter, 4,038,642, Cl. 364-900.000.

Ver Hage, Richard P., to GSF Corporation. Plastic cap and bottle neck. 4,037,746, Cl. 215-31.000.

Vernaleken, Hugo; and Hucks, Uwe, to Bayer Aktiengesellschaft. Phase boundary process for the preparation of aromatic polycarbonates using a chlorinated aromatic hydrocarbon as the polymer solvent. 4,038,252, Cl. 260-47.0XA.

Via, Francis A., to Stauffer Chemical Company. Photopolymerizable aryl and heterocyclic glyoxylate compositions and process. 4,038,164, Cl. 204-159.150.

Victor Electric Wire & Cable Corporation: *See—*
- Maloof, Robert E., 4,037,319, Cl 29-629.000.

Video Components, Inc.: *See—*
- Turchen, Dick, 4,037,763, Cl 224-5.00V

Vilas Industries Limited: *See—*
- Shuffler, Earlyn Elridge, 4,037,366, Cl 51-140.000

Vine, Raymond W.: *See—*
- Lamarine, John H.; Stewart, Robert C., Jr.; and Vine, Raymond W., 4,038,463, Cl. 429-44 000

Visos, Charles D.: *See—*
- Kamp, Eugene L.; and Visos, Charles D., 4,038,623, Cl. 335-219.000.

Vitos Etablissements Vitoux: *See—*
- Lallement, Bernard, 4,037,957, Cl. 355-91.000.

Vockenhuber, Karl: *See—*
- Freudenschuss, Otto; Kantner, Otto; and Revy von Belvard, Peter, 4,037,947, Cl. 352-27.000.

Vogelenzang, Alexander Jan. Device for side delivery of crop, grass or grain. 4,037,390, Cl. 56-14.500.

Vogt, Bernard: *See—*
- Baudet, Jacques; Rochet, Michel; Salmon, Michel; and Vogt, Bernard, 4,038,190, Cl. 210-321.00B.

Volk, Victor F. Apparatus and method for automatically connecting to the individual conductors of a multiconductor cable. 4,038,501, Cl. 179-175.30R.

Volkswagenwerk Aktiengesellschaft: *See—*
- Ashauer, Karl; and Mihatsch, Hansjorg, 4,037,492, Cl. 74-710.000.

Volyansky, Igor Igorievich: *See—*
- Alexandrov, Adolf Moritsovich; Aglitsky, Vladimir Efimovich; Kantor, Ilya Solomonovich; Tsimbler, Jury Abramovich; Topolyansky, Jury Arnoldovich; Susekov, Sergei Mikhailovich; Gun, Dmitry Rudolfovich; Volyansky, Igor Igorievich; Pertsev, Gennady Alexeevich; Devyatkina, Zoya Timofeevna; and Feldman, Mark Abramovich, 4,037,805, Cl. 243-38.000.

von Fraunberg, Karl: *See—*
- Hoffmann, Werner; and von Fraunberg, Karl, 4,038,330, Cl. 260-648.00C.

Von Rutte, Richard Edward: *See—*
- Singh, Gurdial; and Von Rutte, Richard Edward, 4,038,258, Cl. 260-75.00T.

Vorachek, James H.; and Washall, Thomas A., to Atlantic Richfield Company. Process for the recovery of selenium from selenium-containing urethane solutions. 4,038,375, Cl. 423-510.000.

Vorobieva, Valentina Yakovlevna: *See—*
- Kaminka, Mikhail Emmanuilovich; Mikhlina, Eva Evseevna; Vorobieva, Valentina Yakovlevna; Yanina, Anna Dmitrievna; Komarova, Nadezhda Andreevna; Mashkovsky, Mikhail Davidovich; and Yakhontov, Leonid Nikolaevich, 4,038,402, Cl. 424-267.000.

Voss, Norbert: *See—*
- Boller, Gerd; Knott, Karl; Marburger, Heinz; Voss, Norbert; and Wolf, Manfred, 4,038,520, Cl. 219-521.000.

Votocek, Otakar, to Reactor Centrum Nederland (Stichting). Process for elution of actinide metal microspheres. 4,038,202, Cl. 252-301.10S.

W. E. Bassett Company, The: *See—*
- Motzer, Alfred E., 4,037,443, Cl. 70-459.000.

W. R. Grace & Co.: *See—*
- Lowther, Frank Eugene, 4,038,050, Cl. 55-18.000.

W. R. Grace Limited: *See—*
- Hurst, John, 4,037,627, Cl. 138-175.000.

W. T. Burnett & Co.: *See—*
- Lewis, Fielding H., Jr., 4,037,841, Cl. 273-96.00D.

Waagner-Biro Aktiengesellschaft: *See—*
- Kemmetmuller, Roland, 4,037,330, Cl. 34-20.000.

Wachtel, Anselm, to Westinghouse Electric Corporation. Alkaline-earth metal halophosphate luminescent composition activated by divalent europium and method of preparing same. 4,038,204, Cl. 252-301.40P.

Wachter, Herbert; and Gronemann, Hans-Joachim, to Siemens Aktiengesellschaft. Self-exited high-frequency generator. 4,038,595, Cl. 323-45.000.

Wada, Kenichi; Enoguchi, Yuji; Ogawa, Masaya; Kawabata, Hidetoshi; Kurita, Takaji; Tanaka, Susumu; Fujiwara, Takao; and Murasaki, Hiroshi, to Minolta Camera Kabushiki Kaisha. Electrophotographic fusing apparatus. 4,038,026, Cl. 432-60.000.

Wada, Shozo: *See—*
- Inoue, Hiroshi; Yoda, Makoto; and Wada, Shozo, 4,038,477, Cl. 528-487.000.

Wagner, Christoph, to Max-Planck-Gesellschaft zur Forderung der Wissenschaften e.v. Manual dexterity aptitude testing. 4,037,480, Cl. 73-432.00R.

Wagner Electric Corporation: *See—*
- Fleagle, Joseph E., 4,037,881, Cl. 303-106.000.

Wagner, Frank Stevens: *See—*
- Stautzenberger, Adin Lee; and Wagner, Frank Stevens, 4,038,394, Cl. 424-251.000.

Wagner, Kuno; and Andres, Karlheinz, to Bayer Aktiengesellschaft. Storage stable multicomponent mixtures useful in making aminoplasts, phenoplasts, and polyurethanes. 4,038,198, Cl. 252-182.000.

Wahl, Harold F.; and Keating, James L., to Rader Companies, Inc. Disk separator. 4,037,723, Cl. 209-104.000.

Wahle, Gunter, to Hauni-Werke Korber & Co., KG. Method and apparatus for producing cigarettes with dense ends. 4,037,608, Cl. 131-21.00B.

Wahlquist, Carl D., to Building Components Research, Inc. Portable room construction and method. 4,037,385, Cl. 52-745.000.

Waitkins, George R.: *See—*
- DeLuca, Carmine V., Jr.; Miller, Harold A.; and Waitkins, George R., 4,038,099, Cl. 106-291.000.

Wakita, Eiichi: *See—*
- Kobayashi, Tadahiro; Wakita, Eiichi; Fukuda, Hideo; and Matsubayashi, Yukio, 4,038,452, Cl. 428-224 000.

Walker-Arnott, David A., to Xerox Corporation. Multicolor ink ribbon control for a typewriter. 4,037,708, Cl. 197-151.000.

Walker, Derek; and Chapman, Philip Howard, to Glaxo Laboratories Limited. Aqueous insoluble polymers containing a plurality of diazomethylene groups. 4,038,469, Cl. 526-19.000.

Walker, Keith A. M.; and Marx, Michael, to Syntex (U.S.A.) Inc. 1-Phenethylimidazoles. 4,038,409, Cl. 424-273.000.

Walker-Neer Manufacturing Co., Inc.: *See—*
- Ford, George Alan, 4,037,661, Cl. 166-311.000.

Wallace-Atkins Oil Corporation: *See—*
- Atkins, Lyle D., 4,038,152, Cl. 201-2.500.

Wallace, Sydney Johnstone, to American Can Company. Shutter and system employing same. 4,037,329, Cl. 34-4.000.

Walsh, Fraser M.; Crouse, Dennis N.; and Ajami, Alfred M., to Eco-Control, Inc. Halogen complexing ethers. 4,038,460, Cl. 429-15.000.

Walsh, Fraser M.: *See—*
- Ajami, Alfred M.; Walsh, Fraser M.; and Crouse, Dennis N., 4,038,459, Cl. 429-15.000.

Walters, Harold C.: *See—*
- Bjornson, Geir; and Walters, Harold C., 4,038,310, Cl. 260-539.00A.

Walters, Tom. Gland seal compression. 4,037,891, Cl. 308-187.100.

Walther, Gerard: *See—*
- Merz, Herbert; Langbein, Adolf, Walther, Gerard; and Stockhaus, Klaus, 4,038,397, Cl. 424-260.000.

Wampetich, Matthias Johann, to Inventa AG fur Forschung und Patentverwertung. Process for improving the adhesion of poly-1,3,4-oxadiazole filaments to rubber. 4,038,455, Cl. 428-378.000.

Wanger, Robert P.: *See—*
- Tompkins, Russell E.; Fisher, Franklin A.; and Wanger, Robert P., 4,038,625, Cl. 336-83.000.

Warner, Harlow L.: *See—*
- Johnson, Wayne O.; Seidel, Michael C.; and Warner, Harlow L., 4,038,065, Cl. 71-76.000.

Warnock, Don R., to United States of America, Air Force. Electrochemical cell having balanced distribution of oxygen and electrolyte. 4,038,461, Cl. 429-21.000.

Warrick, Robert J.: *See—*
- Mohla, Prem P.; Hetke, Adolf; and Warrick, Robert J., 4,037,643, Cl. 164-58.000.

Washall, Thomas A.; and Morgan, Harry, to Atlantic Richfield Company. Removal of selenium from urethane solutions. 4,038,377, Cl. 423-510.000.

Washall, Thomas A.: *See—*
- Vorachek, James H.; and Washall, Thomas A., 4,038,375, Cl 423-510.000.

Wason, Satish K., to J. M. Huber Corporation. Amorphous precipitated siliceous pigments for cosmetic or dentrifice use and methods for their production. 4,038,098, Cl. 106-288.00B

Wassen, Johann; Schulz, Gunter; and Ivens, Gunter, to Mannesmannrohren-Werke AG. Method and an apparatus for the measuring of the wall thickness of a tube. 4,038,550, Cl. 250-358.00P.

Watahiki, Seishi: *See—*
- Kurita, Seiichi; Nakayama, Toru; Okano, Kinpei; and Watahiki, Seishi, 4,037,890, Cl. 308-187.000.

Watanabe, Akinori: *See—*
- Yano, Tsutomu; Saito, Koetsu; Fukaya, Kuniaki; and Watanabe, Akinori, 4,037,933, Cl. 350-161.00W.

Watanabe, Tadashi: *See—*
- Takaya, Yasuo; Watanabe, Tadashi; and Iwasawa, Naozumi, 4,038,225, Cl. 260-21.000.

Wean United, Inc.: *See—*
- Ledebur, Harry Calhoon; and Diehl, Floyd William, Jr., 4,037,444, Cl. 72-21.000.

Webb, John G., Jr.; and Gray, Roger M., to United States of America, Air Force. Helicopter discrimination apparatus for the murine radar. 4,038,656, Cl. 343-5.0SA.

Weber, Blanche V. Hand knitting aid. 4,037,433, Cl. 66-1.00A

Weber, Ernest G.; Balliett, John W.; Lacagnina, John M.; and Robinson, Bruce R., to Quality Measurement Systems, Inc. Linear glass scale height gage. 4,037,325, Cl. 33-125.00C.

Webster, Donald R.; and Ganssle, Eugene R., to Neotec Corporation. Optical analyzer for agricultural products. 4,037,970, Cl. 356-188.000.

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- Atasoy, Kaya; Weckwarth, Karl Franz; and Reinhardt, Walter, 4,038,476, Cl. 528-485.000.

Wehrmann, Nicholas, to Ithaca Textiles, Inc. Toe construction and method for seamless hosiery products. 4,037,436, Cl. 66-186.000.

Weigele, Manfred: *See—*
- Cleeland, Roy, Jr.; Grunberg, Emanuel; Leimgruber, Willy; and Weigele, Manfred, 4,038,289, Cl. 260-347.300.

Weinberg, Steven Louis: *See—*
- Luceyk, Alfred Robert; Mouwen, Herman Charles; and Weinberg, Steven Louis, 4,038,194, Cl. 210-436.000.

Weiner, Steven A.: *See—*
- Ludwig, Frank A.; and Weiner, Steven A., 4,038,465, Cl. 429-104.000.

Weir, Michael Joseph: *See—*
- Pollock, James Richard Allan; and Weir, Michael Joseph, 4,038,420, Cl. 426-16.000.

Weisberg, Michael C.: *See—*
- Plaza, Mario G.; and Weisberg, Michael C., 4,037,532, Cl. 101-93.480.
- Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., 4,037,706, Cl. 197-54.000.

Weiss, Edward Leonhardt, to Leeds & Northrup Company. Method and optical means for determining dimensional characteristics of the particle distribution in a collection of particles. 4,037,965, Cl. 356-102.000.

Weitz, Hans-Martin; and Hartig, Juergen, to BASF Aktiengesellschaft. Manufacture of butenediol diacetates. 4,038,307, Cl. 260-497.00A.

- Welck, Arnold Emil, to Deere & Company. Interlock for a vehicle brake and clutch control. 4,037,695, Cl. 192-13.00R.
- Welsh, Thomas M.: *See—*
  - Howell, Norbert C.; Tischuk, Walter; and Welsh, Thomas M., 4,037,377, Cl. 52-309.900.
- Weman, Per Olof, to N.V. Klippan S.A. Car seat with slack roll-up mechanism. 4,037,873, Cl. 297-388.000.
- Wenander, Bjorn, to Mediplast AB. Device for transferring blood or a similar fluid to a pipette. 4,037,464, Cl. 73-61.400.
- Wendorff, Erwin R. Metallic surgical suture. 4,037,603, Cl. 128-335.500.
- Werber, Gerhardt P.: *See—*
  - Frauenglass, Elliott; and Werber, Gerhardt P., 4,038,475, Cl. 526-328.000.
- Wermuth, Camille Georges; and Schwartz, Jean, to Seperic. O-aminoalkyl oximes. 4,038,317, Cl. 260-566.0AE.
- Wertheimer, Alan Lee; and Williams, Frederick Lee, to Leeds & Northrup Company. Method and apparatus for measuring the sum of the radii of particles in a collection. 4,037,964, Cl. 356-102.000.
- Western Electric Company, Inc.: *See—*
  - Boehm, Vicky Williams; and Broyde, Barret, 4,038,219, Cl. 260-2.300.
  - Etchison, John Orrell, Jr.; Jobe, Garland Ralph; and Jones, Robert Henry Wellons, Jr., 4,038,696, Cl. 361-415.000.
  - Fuchs, Francis Joseph, Jr., 4,037,454, Cl. 72-264.000.
- Westfall, Paul J. Log positioners. 4,037,502, Cl. 83-726.000.
- Westinghouse Air Brake Company: *See—*
  - Bridigum, Robert J., 4,037,880, Cl. 303-82.000.
- Westinghouse Electric Corporation: *See—*
  - Bennett, Robert R.; and Byerley, Wilbur M., 4,037,569, Cl. 122-32.000.
  - Braginski, Aleksander I.; and O'Keeffe, Terence W., 4,038,541, Cl. 235-194.000.
  - Deis, Daniel W., 4,037,312, Cl. 29-598.000.
  - Foster, Newton C., 4,038,339, Cl. 260-835.000.
  - Gamble, James R.; and Chapman, James W., 4,038,491, Cl. 174-153.00R.
  - Heyne, Carl J.; Cooper, Richard, Jr.; and Godwin, Gurney L., 4,038,589, Cl. 318-174.000.
  - Meyer, Jeffry R.; and Billings, John S., Jr., 4,038,486, Cl. 174-28.000.
  - Salemi, Nicholas A., 4,038,628, Cl. 338-318.000.
  - Thomas, Leslie D., 4,038,600, Cl. 325-4.000.
  - Wachtel, Anselm, 4,038,204, Cl. 252-301.40P.
  - Winkler, Charles L., 4,037,688, Cl. 187-29.00R.
  - Wolf, Charles B.; Fey, Maurice G.; and Azinger, Frederick A., Jr., 4,038,512, Cl. 219-121.00P.
  - Wolski, Jerome C.; and Rowe, Neal E., 4,038,585, Cl. 361-334.000.
- Westvaco Corporation: *See—*
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  - Maughan, William G., 4,037,777, Cl. 229-52.00B.
- Wettlauffer, Jurgen: *See—*
  - Besser, Helmut Siegfried; Kieven, Gunter; and Wettlauffer, Jurgen, 4,037,912, Cl. 339-198.00R.
- Wexell, Dale R.: *See—*
  - Boyd, David C.; Cantaloupe, Francis A.; Dumbaugh, William H., Jr.; Flannery, James E.; Holleran, Louis M.; Sandor, Sylvester R.; and Wexell, Dale R., 4,038,448, Cl. 428-212.000.
- Weyerhaeuser Company: *See—*
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- Wheelabrator-Frye, Inc.: *See—*
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- White, Alan David: *See—*
  - Feldman, Martin; and White, Alan David, 4,037,969, Cl. 356-172.000.
- White, Alga L.: *See—*
  - White, Douglas M.; and White, Alga L., 4,037,296, Cl. 24-90.00B.
- White, Allen Andrew; Yatcilla, George; and Garrison, Harold Keith, to Hesston Corporation. Density control mechanism for crop baler. 4,037,528, Cl. 100-191.000.
- White, Douglas M.; and White, Alga L., to Alan White Company, The. Method and article for tufting upholstery and the like, and the resulting article of manufacture. 4,037,296, Cl. 24-90.00B.
- White, George Raymond: *See—*
  - Durant, Graham John; Ganellin, Charon Robin; Hesselbo, Torben; and White, George Raymond, 4,038,408, Cl. 424-270.000.
- White, James A., to General Electric Company. Food temperature control cable for microwave oven. 4,038,510, Cl. 219-10.55E.
- White, James F.: *See—*
  - Farona, Michael F.; and White, James F., 4,038,324, Cl. 260-607.0AR.
- White, John R.; Krishnan, Ram M.; and Wolfe, James D., to Goodyear Tire & Rubber Company, The. Mold release agent. 4,038,088, Cl. 106-38.240.
- White, Stanley A., to Rockwell International Corporation. Speech analyzer/synthesizer using recursive filters. 4,038,495, Cl. 179-1.0SA.
- Whiteside, George D.; and Johnson, Bruce K., to Polaroid Corporation. Shock inhibiting arrangement for latched shutter blade mechanism. 4,038,674, Cl. 354-230.000.
- Whitley, William P., Jr. Float-on boat docking and lifting assembly 4,037,421, Cl. 61-65.000.
- Whitmer, Gerald T. Safety post. 4,037,824, Cl. 256-53.000.
- Whittaker, Richard E. Buffing machine pad cleaning device 4,037,287, Cl 15-257.00R.
- Wicks, Jack W Mechanism for installation and removal of a dock in the water. 4,037,420, Cl. 61-48.000.
- Widmer, John Robert; and Gloeckler, Arthur John, to Widmer Time Recorder Co., Inc. Receipt validating bank depository 4,038,523, Cl. 235-61.90R.
- Widmer Time Recorder Co., Inc.: *See—*
  - Widmer, John Robert, and Gloeckler, Arthur John, 4,038,523, Cl. 235-61.90R.
- Wiggins Teape Limited: *See—*
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  - Bursey, Maurice M., Hinton, Deborah M.; Sammons, Martin C.; and Wightman, R. Mark, 4,038,158, Cl. 204-23.000.
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- Wilder, Donald Lawrence: *See—*
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- Wilding, Gerard Edward. Apparatus for forming armature windings for commutator type dynamo/electric machines. 4,037,320, Cl. 29-733.000.
- Wilhelm, Manfred, to Siemens Aktiengesellschaft. Method for the manufacture of a superconductor. 4,037,313, Cl. 29-599.000.
- Wilhelm, Max, to Ciba-Geigy Corporation. Cycloalkylureido phenoxy propanolamines. 4,038,313, Cl. 260-553.00A.
- Wilhelmi, Julius B.; and Somers, Roger E., to TRW Inc. Closure plug. 4,037,754, Cl. 220-254.000.
- Wilkinson, Bruce L.: *See—*
  - Fletcher, Taylor C.; and Wilkinson, Bruce L., 4,037,974, Cl. 356-246.000.
- Wilkinson, John C.: *See—*
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- Willasch, Dieter: *See—*
  - Krisch, Burkhard; Veneklasen, Lee H.; and Willasch, Dieter, 4,038,543, Cl. 250-307.000.
- Willems, Jozef Frans; and Vandenberghe, Antoon Leon, to AGFA-GEVAERT N.V. Photothermographic recording sheet. 4,038,083, Cl. 96-94.00R.
- Williams, Dwight E.: *See—*
  - Hines, Charles E.; and Williams, Dwight E., 4,037,614, Cl. 135-5.00A.
- Williams, E. Alan, to Nolex Corporation. Carton closing and sealing apparatus. 4,037,370, Cl. 53-375.000.
- Williams, Frederick Lee: *See—*
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  - Medearis, G. P.; Williams, Sam F., Jr.; and Medearis, Morris O., 4,037,286, Cl. 15-250.050.
- Williams, Tudor; and Bost, John D., to E. C. P., Inc. Method and apparatus for making continuous foam glass product. 4,038,063, Cl. 65-22.000.
- Willis, Michael George: *See—*
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- Willums, Jan-Olaf, to Nor-Am Resources Technology Incorporated. Apparatus for underwater retrieval, selection and concentration of material for ocean mining. 4,037,874, Cl. 299-8.000.
- Wilmsen, Hans, deceased (by Wilmsen, Joerg, heir). Apparatus for the manufacture of homogeneous, fine-pored synthetic resin foams. 4,038,037, Cl. 23-288.00R.
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- Wilson, Arthur C., to General Electric Company. Two-step control knob operation. 4,037,490, Cl. 74-553.000.
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- Winkler, Charles L., to Westinghouse Electric Corporation. Elevator system. 4,037,688, Cl. 187-29.00R.
- Winston, Steven J.; and Thomas, Thomas R., to United States of America, Energy Research and Development Administration. Method for the abatement of hydrogen chloride. 4,038,369, Cl. 423-240.000.
- Winter, Joseph; Shapiro, Eugene; and Smith, Warren F., to Olin Corporation. Method and apparatus for production of multiple gauge strip. 4,037,445, Cl. 72-60.000.
- Winter, Max; Gautschi, Fritz; Flament, Ivon; and Stoll, Max, to Firmenich & Cie. Flavoring agent. 4,038,435, Cl. 426-535.000.
- Wirtgen, Reinhard. Machine for cutting away or peeling off road surfaces. 4,037,981, Cl. 404-91.000.
- Wirth, Gallo and Company: *See—*
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- Witzel, Bruce E.: *See—*
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- Wochnowski, Waldemar, to Hauni-Werke Korber & Co., KG. Method and apparatus for supplying tobacco to tobacco cutting machines. 4,037,712, Cl. 198-524.000.
- Wolf, Charles B.; Fey, Maurice G.; and Azinger, Frederick A., Jr., to Westinghouse Electric Corporation. Self-stabilizing arc heater. 4,038,512, Cl. 219-121.00P.
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- Wolfe, James D.: *See—*
  - White, John R.; Krishnan, Ram M.; and Wolfe, James D., 4,038,088, Cl. 106-38.240.
- Wolford, John W. Snare drum. 4,037,508, Cl 84-415.000.
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- Wolski, Jerome C.; and Rowe, Neal E., to Westinghouse Electric Corporation. Insulating shutter mechanism for bus bars. 4,038,585, Cl. 361-334.000.
- Wood, Charles E., to UOP Inc. Fractional distillation pressure control for separation of aromatic alkylation product. 4,038,334, Cl. 260-671.00R.
- Wood, William Robert; Ryan, Edward Clyde; and Bigbee, Marvin Lee, to Deere & Company. Stack feeding apparatus. 4,037,740, Cl 214-83.140.
- Woodstream Corporation: *See—*
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- Woolfson, Martin G.; and Plath, Robert H., to United States of America, Air Force. Precision amplitude control system for a high Q torsion pendulum. 4,038,588, Cl. 318-648.000.
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- Wrasman, Thomas J. Method of making a valve. 4,038,358, Cl. 264-242.000.
- Wreszinski, Rolf W. Method and apparatus for concentrating liquids. 4,038,129, Cl. 159-4.0CC.
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- Wright, Howard N., Jr.: *See—*
  - Palmer, Billy W.; and Wright, Howard N., Jr., 4,038,329, Cl. 260-637.00P.
- Wright, John, to Koppers Company, Inc. Roll-end spindle coupling. 4,037,430, Cl. 64-9.00R.
- Wright Line Inc.: *See—*
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  - Quinn, Halsey P.; and Levinson, Donald B., 4,038,594, Cl. 323-4.000.
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  - Sohl, Gordon; Bogert, David L.; Crystal, Richard G.; and Weisberg, Michael C., 4,037,706, Cl. 197-54.000.
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- Yagi, Hajime; and Tsuyuki, Tadaharu, to Sony Corporation. Semiconductor integrated circuit device. 4,038,680, Cl. 357-44.000.
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- Yano, Tsutomu; Saito, Koetsu; Fukaya, Kuniaki; and Watanabe, Akinori, to Matsushita Electric Industrial Co., Ltd. Light deflector of acousto-optic interaction type. 4,037,933, Cl. 350-161.00W.
- Yara Engineering Corporation: *See—*
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- Yeaple, Ronald Norman, to Yeaple Corporation. Stereophonic pillow speaker system. 4,038,499, Cl. 179-146.00H.
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- Yonemitsu, Eiichi; Sugio, Akitoshi; Masu, Masanobu; Kawaki, Takao; and Sasaki, Yukio, to Mitsubishi Gas Chemical Company, Inc. Resin composition containing copolyphenylene ether. 4,038,343, Cl. 260-874.000.
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- Young, David W., to Howard Hall & Company. Antioxidant stabilized edible compositions. 4,038,434, Cl. 426-544.000.
- Young, Peter L., to Corning Glass Works. Method of forming a thin film capacitor. 4,038,167, Cl. 204-192.00D.
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- Zahedi, Karim: *See—*
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- Zenith Radio Corporation: *See—*
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- Ziebart, Herbert F. Water ski. 4,037,279, Cl. 9-310.00A.
- Zielinski, Walter J.: *See—*
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Zuleeg, Rainer; and Notthoff, Johannes K., to McDonnell Douglas Corporation. Symmetrical input NOR/NAND gate circuit. 4,038,563, Cl. 307-205.000.
Zyduck, Ronald L., to J. I. Case Company. Vehicle with dual braking systems. 4,037,878, Cl. 303-13.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 26TH DAY OF JULY, 1977

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Ariga, Masao: *See—*
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, Re. 29,323, Cl. 355-3.00R.
Barkalow, Clare E.: *See—*
Mosley, Kenneth C.; and Barkalow, Clare E., Re. 29,317, Cl. 35-17.000.
Canon Kabushiki Kaisha: *See—*
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, Re. 29,323, Cl. 355-3.00R.
Commissariat a l'Energie Atomique: *See—*
Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, Re. 29,326, Cl. 360-123.000.
Fujii, Motoharu: *See—*
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, Re. 29,323, Cl. 355-3.00R.
G. D. Searle & Co.: *See—*
Jones, David A.; and Mazur, Robert H., Re. 29,324, Cl. 260-112.50R.
Hargis, Billy M., to Minnesota Mining and Manufacturing Company. Hermetic power package. Re. 29,325, Cl. 174-52.00S.
Holbrook, LeGrand K., to Medical Development Corporation. Fluid collection bottle and improvements therein. Re. 29,321, Cl. 215-309.000.
Hollister Incorporated: *See—*
Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., Re. 29,319, Cl. 128-275.000.
Huston, Henry H.: *See—*
Kalata, Daniel R.; and Huston, Henry H., Re. 29,320, Cl. 206-519.000.
Johnson, Bremen I.: *See—*
Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., Re. 29,319, Cl. 128-275.000.
Jones, David A.; and Mazur, Robert H., to G. D. Searle & Co. N-Substituted aspartyl peptide amides. Re. 29,324, Cl. 260-112.50R.
Kalata, Daniel R.; and Huston, Henry H., to Owens-Illinois, Inc. Nestable containers. Re. 29,320, Cl. 206-519.000.
Kawakubo, Kazuo; Fujii, Motoharu; and Ariga, Masao, to Canon Kabushiki Kaisha. Electrophotographic copying apparatus. Re. 29,323, Cl. 355-3.00R.
Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, to Commissariat a l'Energie Atomique. Integrated magnetic head having alternate conducting and insulating layers within an open loop of two magnetic films. Re. 29,326, Cl. 360-123.000.
Lebocey Industrie: *See—*
Palencher, Jacques, Re. 29,318, Cl. 66-161.000.
Mazur, Robert H.: *See—*
Jones, David A.; and Mazur, Robert H., Re. 29,324, Cl. 260-112.50R.
Medical Development Corporation: *See—*
Holbrook, LeGrand K., Re. 29,321, Cl. 215-309.000.
Melnick, Igor: *See—*
Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, Re. 29,326, Cl. 360-123.000.
Michigan Instruments, Inc.: *See—*
Mosley, Kenneth C.; and Barkalow, Clare E., Re. 29,317, Cl. 35-17.000.
Minnesota Mining and Manufacturing Company: *See—*
Hargis, Billy M., Re. 29,325, Cl. 174-52.00S.
Mosley, Kenneth C.; and Barkalow, Clare E., to Michigan Instruments, Inc. Pneumatic lung analog. Re. 29,317, Cl. 35-17.000.
Nelson, Norman A., to Teledyne Merla, div. of Teledyne, Inc. Valve and actuator assembly. Re. 29,322, Cl. 251-14.000.
Nolan, John L.: *See—*
Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., Re. 29,319, Cl. 128-275.000.
Nordby, Harvey M.; Nolan, John L.; and Johnson, Bremen I., to Hollister Incorporated. Drainage system for incisions or wounds in the body of an animal. Re. 29,319, Cl. 128-275.000.
Owens-Illinois, Inc.: *See—*
Kalata, Daniel R.; and Huston, Henry H., Re. 29,320, Cl. 206-519.000.
Palencher, Jacques, to Lebocey Industrie. Device for the detection of excessive thread tension and thread breakage. Re. 29,318, Cl. 66-161.000.
Teledyne Merla, div. of Teledyne, Inc.: *See—*
Nelson, Norman A., Re. 29,322, Cl. 251-14.000.
Valet, Jean-Yves: *See—*
Lazzari, Jean Pierre; Melnick, Igor; and Valet, Jean-Yves, Re. 29,326, Cl. 360-123.000.

LIST OF PLANT PATENTEES

Carlton Rose Nurseries: *See—*
McDaniel, Gayle Kent, 4,082, Cl. 18.000.
De Witte, Willem. Rose plant—Jofitali variety. 4,083, 7-26-77, Cl. 19.000.
Kirsch, Ted T. Lily plant named Star Gazer. 4,085, 7-26-77, Cl. 68.000.
McDaniel, Gayle Kent, to Carlton Rose Nurseries. Rose plant-Melissa variety. 4,082, 7-26-77, Cl. 18.000.
Parnagian, Sam. Nectarine tree 4,084, 7-26-77, Cl. 41.000.

LIST OF DESIGN PATENTEES

AAI Corporation: *See—*
Barr, Irwin R., 245,175, Cl. D25-21.000.
Barr, Irwin R., 245,176, Cl. D25-21.000.
Barr, Irwin R., 245,177, Cl. D25-21.000.
Barr, Irwin R., 245,178, Cl. D25-21.000.
Barr, Irwin R., 245,179, Cl. D25-21.000.
Barr, Irwin R., 245,180, Cl. D25-21.000.
Barr, Irwin R., 245,181, Cl. D25-21.000.
Barr, Irwin R., 245,182, Cl. D25-21.000.
Barr, Irwin R., 245,183, Cl. D25-21.000.
Acroform Corporation: *See—*
Miller, Jack V., 245,152, Cl. D9-229.000.
Adams, Ronal L.; and Brown, Forest E., to Drummond, Nelson & Ptak. Belt buckle. 245,129, 7-26-77, Cl. D2-431.000.
Amerace Corporation: *See—*
Obuch, Edward A., 245,185, Cl. D13-24.000.
Asker, Lambert Carl Curt. Ear protection plug set. 245,202, 7-26-77, Cl. D24-67.000
Barr, Irwin R., to AAI Corporation. Solar building. 245,175, 7-26-77, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Solar building. 245,176, 7-26-77, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Solar building. 245,177, 7-26-77, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Solar building. 245,178, 7-26-77, Cl. D25-21.000.
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Barr, Irwin R., to AAI Corporation. Solar building. 245,181, 7-26-77, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Solar building. 245,182, 7-26-77, Cl. D25-21.000.
Barr, Irwin R., to AAI Corporation. Solar building. 245,183, 7-26-77, Cl. D25-21.000.

Bell, George N. Playhouse for displaying motion pictures. 245,194, 7-26-77, Cl. D34-15.0LL.
Benn, Meyer. Cushion. 245,137, 7-26-77, Cl. D6-201.000.
Benson, William E. Butter baster. 245,140, 7-26-77, Cl. D7-99.000.
Berry, Ferdinand William. Spacer for reinforced concrete. 245,145, 7-26-77, Cl. D8-356.000.
Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, to International Business Machines Corporation. Collator for an electrophotographic apparatus. 245,166, 7-26-77, Cl. D16-32.000.
Bitticker, William R., to Mead Corporation, The. Type font. 245,201, 7-26-77, Cl. D64-12.00B.
Boeing Company, The: *See—*
  Seidel, Gerhard Ernst, 245,157, Cl. D12-76.000.
Brown, Forest E.: *See—*
  Adams, Ronal L.; and Brown, Forest E., 245,129, Cl. D2-431.000.
Christian Dior, S.A.R.L.: *See—*
  Zimmermann, Hilde, 245,168, Cl. D16-65.000.
Colgate-Palmolive Company: *See—*
  Koenigsberg, Victor, 245,150, Cl. D9-89.000.
Cooke, William B.; and Venditti, Arthur P., to General Mills Fun Group, Inc. Rotatable card holding carrousel. 245,193, 7-26-77, Cl. D34-13.00A.
Cosentino, James A., to Executive, A Motor Hotel of Buffalo, Inc., The. Discotheque building. 245,174, 7-26-77, Cl. D25-11.000.
Cuccio, John, to Sybron Corporation. Sphygmomanometer. 245,203, 7-26-77, Cl. D24-21.000.
Davis, Joseph W., III. Vertical backgammon board. 245,192, 7-26-77, Cl. D34-5.0SS.
Davis, Myron Fulenwider, Jr., to International Business Machines Corporation. Data processing system console. 245,158, 7-26-77, Cl. D14-42.000.
Drake, Gerald E., to Minnesota Mining and Manufacturing Company. Head for an overhead projector. 245,165, 7-26-77, Cl. D16-26.000.
Drummond, Nelson & Ptak: *See—*
  Adams, Ronal L.; and Brown, Forest E., 245,129, Cl. D2-431.000.
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  Evenson, Mel, 245,171, Cl. D19-76.000.
Eldridge, Thomas S.; and Sovik, Robert A. Fork or other similar article of flatware. 245,141, 7-26-77, Cl. D7-137.000.
Evenson, Mel, to Eldon Industries, Inc. Note paper tray. 245,170, 7-26-77, Cl. D19-92.000.
Evenson, Mel, to Eldon Industries, Inc. List finder. 245,171, 7-26-77, Cl. D19-76.000.
Executive, A Motor Hotel of Buffalo, Inc., The: *See—*
  Cosentino, James A., 245,174, Cl. D25-11.000.
Fashion Optics, Inc.: *See—*
  Santurbane, E. Vincent, 245,205, Cl. D28-76.000.
Fernandez, Mario F.; and Kronfeld, Mervin B., to Nortronics Company, Inc. Splicer for magnetic tape. 245,167, 7-26-77, Cl D16-41.000.
Flor, Albert W. Buoy. 245,153, 7-26-77, Cl. D10-107.000
Florists' Transworld Delivery Association: *See—*
  Harshman, Arthur L.; and Messmer, James I., 245,155, Cl. D11-153.000.
Friedberg, Stanley A. Combined garment display arm and mounting bracket. 245,134, 7-26-77, Cl. D6-116.000.
Fukuoka, Tatsuo. Shoe. 245,126, 7-26-77, Cl. D2-308.000.
Fukuoka, Tatsuo. Shoe. 245,127, 7-26-77, Cl. D2-308.000.
Fukuoka, Tatsuo. Shoe. 245,128, 7-26-77, Cl. D2-308.000
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  Houlihan, John T., 245,199, Cl. D14-70.000.
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  Cooke, William B.; and Venditti, Arthur P., 245,193, Cl. D34-13.00A.
George, Richard H. Coffee-maker. 245,163, 7-26-77, Cl. D15-113.000.
Gore, Fred M. Housing for cat litter box. 245,191, 7-26-77, Cl. D30-99.000.
Graham, Jack D. Cake pan stand. 245,139, 7-26-77, Cl. D7-83.000.
Hardy, Tommy Ray, to International Business Machines Corporation. Text processing console. 245,159, 7-26-77, Cl. D14-42.000.
Harshman, Arthur L.; and Messmer, James I., to Florists' Transworld Delivery Association. Flower pot. 245,155, 7-26-77, Cl. D11-153.000.
Hartung, Philip F. Bottle. 245,149, 7-26-77, Cl. D9-60.000.
Hase, Alfred M. Electrical equipment cabinet. 245,186, 7-26-77, Cl. D13-40.000.
Hawthorne, Allen Dana: *See—*
  Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,166, Cl. D16-32.000.
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Houlihan, John T., to General Electric Company. Portable radio. 245,199, 7-26-77, Cl. D14-70.000.
Hovick, Ronald L.: *See—*
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  Hardy, Tommy Ray, 245,159, Cl. D14-42.000.
Iwashita, Makoto M. Novelty cup. 245,138, 7-26-77, Cl. D7-8.000.
J. J. & M.: *See—*
  Persik, James E.; and Persik, Gerald E., 245,164, Cl. D15-128.000.
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Kabushiki Kaisha Izumi Seisakusho: *See—*
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Kerley, Bruce W. Auxiliary bicycle seat. 245,133, 7-26-77, Cl. D6-48.100.
Kitagawa, Kunio: *See—*
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Koenigsberg, Victor, to Colgate-Palmolive Company. Bottle. 245,150, 7-26-77, Cl. D9-89.000.
Kronfeld, Mervin B.: *See—*
  Fernandez, Mario F.; and Kronfeld, Mervin B., 245,167, Cl. D16-41.000.
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  Perrin, Alain D., 245,130, Cl. D2-444.000.
  Perrin, Alain D., 245,143, Cl. D8-321.000.
  Perrin, Alain D., 245,144, Cl. D8-321.000.
Longeau, Jacques, to Societe Anonyme de Vehicules Industriels et d'Eqipements Mecaniques Saviem. Armoured vehicle body. 245,156, 7-26-77, Cl. D12-12.000.
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Mead Corporation, The: *See—*
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  Harshman, Arthur L.; and Messmer, James I., 245,155, Cl. D11-153.000.
Miller, Jack V., to Acroform Corporation. Container for auto repair ramp or the like. 245,152, 7-26-77, Cl. D9-229.000.
Minnesota Mining and Manufacturing Company: *See—*
  Drake, Gerald E., 245,165, Cl. D16-26.000.
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  Johnsson, Berndt, 245,131, Cl. D6-24.000.
Moriyama, Hideo. Lamp or the like. 245,187, 7-26-77, Cl. D48-33.000.
Mullenax, Earnest R. Cylindrical anchor for securing objects such as mobile homes and the like to the earth. 245,146, 7-26-77, Cl. D8-349.000.
Nortronics Company, Inc.: *See—*
  Fernandez, Mario F.; and Kronfeld, Mervin B., 245,167, Cl. D16 41.000.
Noury, Jerry Lewis, Jr. Portable, electronic, remote-control, wireless keyboard musical instrument. 245,197, 7-26-77, Cl. D56-1.00R.
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  Bevilacqua, Ernest Michael; Hawthorne, Allen Dana; and Noyes, Eliot Fette, 245,166, Cl. D16-32.000.
Obuch, Edward A., to Amerace Corporation. Terminal block. 245,185, 7-26-77, Cl. D13-24.000.
Ono, Toru, to Kabushiki Kaisha Izumi Seisakusho. Hexagonal headed bolt. 245,147, 7-26-77, Cl. D8-387.000.
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Packard, Newton R. Printer console housing for a hand-held calculator. 245,200, 7-26-77, Cl. D64-11.00B.
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Perkins, Timothy. Beer mug chiller. 245,161, 7-26-77, Cl. D15-79.000.
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Perrin, Alain D., to Les Must De Cartier-France. Fixing ring for luggage handle or the like. 245,144, 7-26-77, Cl. D8-321.000.
Persik, Gerald E.: *See—*
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Sanders, Nathan O.: *See—*
  Simms, Karman H.; and Sanders, Nathan O., 245,142, Cl. D8-70.000.
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Schroeder, Peter E. Curtain material. 245,195, 7-26-77, Cl. D47-6.00D.
Schroeder, Peter E. Curtain material. 245,196, 7-26-77, Cl. D47-6.00R.
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  Lowman, Donald E.; Hovick, Ronald L.; and Sellers, Virgil E., 245,184, Cl. D25-56.000.
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  Eldridge, Thomas S.; and Sovik, Robert A., 245,141, Cl. D7-137.000.

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282 4,037,408
413 4,037,409
445 4,037,410
527 4,037,411
605 4,037,412
655 4,037,413
670 4,037,414
673 4,037,415

CLASS 61
1 F 4,037,416
45 B 4,037,418
45 D 4,037,419
45 R 4,037,417
48 4,037,420
65 4,037,421
72.4 4,037,422
87 4,037,423
98 4,037,424
112 4,037,425

CLASS 62
36 4,038,060
117 4,037,426
126 4,038,061
128 4,037,427
371 4,037,428

CLASS 64
4 4,037,429
9 R 4,037,430
14 4,037,431
27 L 4,037,432

CLASS 65
2 4,038,062
22 4,038,063

CLASS 66
1 A 4,037,433
57 4,037,434
142 4,037,435
161 Re.29,318
186 4,037,436

CLASS 69
42 4,037,437

CLASS 70
18 4,037,438
108 4,037,440
233 4,037,441
456 R 4,037,439
4,037,442
459 4,037,443

CLASS 71
29 4,038,064
76 4,038,065

CLASS 72
21 4,037,444
60 4,037,445
68 4,037,446
92 4,037,447
114 4,037,448
209 4,037,449
237 4,037,450
238 4,037,451
249 4,037,452
252 4,037,453
264 4,037,454
324 4,037,455
325 4,037,456
389 4,037,457
429 4,037,458

CLASS 73
32 A 4,037,459
4,037,460
4,037,461
32 R 4,037,462
61.4 4,037,464
67.8 S 4,037,465
104 4,037,466
119 A 4,037,467
4,037,468
141 A 4,037,469
190 EW 4,037,470
324 4,037,471
341 4,037,463
346 4,037,473
421 B 4,037,472
421 R 4,037,474
422 R 4,037,475
423 R 4,037,476
425.4 R 4,037,477
4,037,478
432 R 4,037,479
4,037,480
454 4,037,481

CLASS 74
10.41 4,037,482
32 4,037,483
217 B 4,037,484
229 4,037,485
230.8 4,037,486
529 4,037,487
548 4,037,488
4,037,489
553 4,037,490
561 4,037,491
710 4,037,492
820 4,037,493

CLASS 75
29 4,038,066
76 4,038,068
96 4,038,069
108 4,038,070
4,038,071
142 4,038,072
170 4,038,073
171 4,038,074
257 4,038,067

CLASS 76
101 A 4,037,494

CLASS 81
64 4,037,495

CLASS 82
28 R 4,037,496
36 R 4,037,497
86 4,037,498

CLASS 83
1 4,037,499
7 4,037,500
100 4,037,501
726 4,037,502

CLASS 84
9 4,037,503
255 4,037,504
280 4,037,505
297 S 4,037,506
318 4,037,507
415 4,037,508
422 R 4,037,509
453 4,037,510
474 4,037,518
478 4,037,511

CLASS 85
8.3 4,037,513
45 4,037,514
61 4,037,515
62 4,037,516
79 4,037,512

CLASS 89
1.5 D 4,037,517

CLASS 91
1 4,037,519
224 4,037,520
499 4,037,521

CLASS 92
71 4,037,522
72 4,037,523

CLASS 93
77 FT 4,037,524
93 C 4,037,525

CLASS 96
1 SD 4,038,076
22 4,038,075
29 R 4,038,077
35.1 4,038,078
60 BF 4,038,079
4,038,080
66.3 4,038,081
77 4,038,082
94 R 4,038,083
115 P 4,038,084

CLASS 98
49 4,037,526
55 4,037,527

CLASS 100
191 4,037,528

CLASS 101
35 4,037,529
40 4,037,530
91 4,037,531
93.48 4,037,532
211 4,037,533
269 4,037,534
287 4,037,535

CLASS 102
20 4,037,536
22 R 4,037,537
23 4,037,538
67 4,037,539
70.2 P 4,037,540

CLASS 104
109 4,037,541

CLASS 106
1 4,038,085
15 R 4,038,086
32 4,038,087
38.24 4,038,088
50 4,038,089
53 4,038,090
4,038,091
73.4 4,038,092
93 4,038,093
99 4,038,094
118 4,038,095
277 4,038,096
288 B 4,038,097
4,038,098
291 4,038,099
307 4,038,100
308 N 4,038,101
316 4,038,102

CLASS 108
32 4,037,542

CLASS 110
14 4,037,543

CLASS 111
6 4,037,544
85 4,037,545

CLASS 112
121.26 4,037,546
121.27 4,037,547
123 R 4,037,548
258 4,037,549

CLASS 113
120 Y 4,037,550
121 C 4,037,551

CLASS 114
74 R 4,037,552
91 4,037,553
221 R 4,037,554
245 4,037,555

CLASS 115
18 R 4,037,556
24 4,037,557
41 HT 4,037,558

CLASS 116
133 4,037,559

CLASS 118
314 4,037,560
629 4,037,561

CLASS 119
5 4,037,562
4,037,563
82 4,037,565
147 4,037,566

CLASS 122
20 B 4,037,567
32 4,037,569

CLASS 123
3 4,037,568
47 A 4,037,570
52 R 4,037,571
64 4,037,572
139 AQ 4,037,573
4,037,574
140 MC 4,037,575
148 E 4,037,577
148 R 4,037,576
179 BG 4,037,578

CLASS 126
25 R 4,037,580
39 M 4,037,581
116 R 4,037,582
271 4,037,583
290 4,037,584
400 4,037,579

CLASS 128
2 A 4,037,585
2.05 G 4,037,587
2.1 B 4,037,586
11 4,037,588
20 4,037,589
24.4 4,037,590
33 4,037,591
92 EB 4,037,592
142 3 4,037,594
145.7 4,037,595
146 2 4,037,593
214 C 4,037,596
4,037,597
214 E 4,037,598
214.4 4,037,599
4,037,600
275 Re.29,319
285 4,037,601
287 4,037,602
335.5 4,037,603

350 V	4,037,604
351	4,037,605
547	4,037,606

CLASS 131

10 R	4,037,607
21 B	4,037,608
141	4,037,609
184 A	4,037,610
237	4,037,611

CLASS 132

31 R	4,037,612

CLASS 134

10	4,038,103
83	4,037,613

CLASS 135

5 A	4,037,614

CLASS 136

89 P	4,038,104
231	4,038,105

CLASS 137

1	4,037,615
99	4,037,616
118	4,037,617
266	4,037,618
492 5	4,037,619
596	4,037,620
596 13	4,037,621
597	4,037,622
599	4,037,623
615	4,037,624

CLASS 138

46	4,037,625
109	4,037,626
175	4,037,627

CLASS 139

436	4,037,628

CLASS 140

106	4,037,629

CLASS 141

1.1	4,037,630
2	4,037,631

CLASS 145

46	4,037,632

CLASS 148

1 5	4,038,106
	4,038,107
9 5	4,038,108
12 F	4,038,109
187	4,038,110
188	4,038,111

CLASS 149

2	4,038,112
19.4	4,038,113
	4,038,114
19.8	4,038,115
105	4,038,116

CLASS 150

33	4,037,633
36	4,037,634

CLASS 152

301	4,037,635
347	4,037,636
352 R	4,037,637
415	4,037,638

CLASS 156

2	4,038,117
71	4,038,120
143	4,038,118
157	4,038,121
163	4,038,119
210	4,038,122
240	4,038,123
248	4,038,124
280	4,038,125
290	4,038,126
353	4,038,127
355	4,038,128
473	4,038,130

CLASS 159

4 CC	4,038,129

CLASS 160

133	4,037,639
398	4,037,640

CLASS 162

103	4,038,131

CLASS 163

5	4,037,641

CLASS 164

18	4,037,642
58	4,037,643
61	4,037,644
161	4,037,645
273 R	4,037,646
282	4,037,647

CLASS 165

1	4,037,653
13	4,037,648
16	4,037,649
29	4,037,650
30	4,037,651
45	4,037,652

CLASS 166

88	4,037,654
248	4,037,655
270	4,037,656
271	4,037,657
272	4,037,658
273	4,037,659
302	4,037,660
311	4,037,661
	4,037,662
314	4,037,663

CLASS 169

15	4,037,664
49	4,037,665

CLASS 171

61	4,037,666

CLASS 172

14	4,037,667
59	4,037,669
371	4,037,668
795	4,037,670

CLASS 173

2	4,037,671
157	4,037,672

CLASS 174

15 S	4,038,492
28	4,038,486
36	4,038,487
52 FP	4,038,488
52 S	Re.29,325
70 R	4,038,489
88 C	4,038,490
153 R	4,038,491

CLASS 175

371	4,037,673

CLASS 176

38	4,038,132
	4,038,133
65	4,038,134
68	4,038,135
78	4,038,137
81	4,038,138
87	4,038,136

CLASS 177

200	4,037,674
229	4,037,675

CLASS 178

15	4,038,493
69.1	4,038,494

CLASS 179

1 N	4,038,496
1 SA	4,038,495
	4,038,503
15 AT	4,038,497
18 FC	4,038,498
146 H	4,038,499
175.1 A	4,038,500
175.3 R	4,038,501
179	4,038,502

CLASS 180

6 5	4,037,676
6 7	4,037,677
11	4,037,678
24 12	4,037,679
43 R	4,037,680
44 R	4,037,681
69 R	4,037,682
99	4,037,683

CLASS 182

2	4,037,684
18	4,037,685
96	4,037,686

CLASS 184

6.4	4,037,687

CLASS 187

29 R	4,037,688

CLASS 188

1 A	4,037,689
181 R	4,037,690

CLASS 192

3.31	4,037,691
	4,037,692
3.56	4,037,693
4 A	4,037,694
13 R	4,037,695
48.5	4,037,696
91 R	4,037,697
105 CE	4,037,698
134	4,037,699

CLASS 194

1 B	4,037,700
1 L	4,037,701
93	4,037,702
97 R	4,037,703

CLASS 195

1.8	4,038,139
63	4,038,140
66 R	4,038,141
96	4,038,142
100	4,038,143
	4,038,144
103.5 R	4,038,145
	4,038,146
	4,038,147
127	4,038,148
	4,038,149
	4,038,150
	4,038,151

CLASS 197

1 R	4,037,704
	4,037,705
53	4,037,707
54	4,037,706
151	4,037,708
171	4,037,709

CLASS 198

443	4,037,710
452	4,037,711
524	4,037,712
725	4,037,713
750	4,037,714
800	4,037,715

CLASS 200

11 DA	4,038,504
51.1	4,038,505
83 J	4,038,506
84 R	4,038,507
329	4,038,508

CLASS 201

2.5	4,038,152
27	4,038,153

CLASS 202

93	4,038,154
170	4,038,155

CLASS 203

45	4,038,156

CLASS 204

16	4,038,157
23	4,038,158
38 A	4,038,159
51	4,038,160
52 R	4,038,161
105 R	4,038,162
152	4,038,163
159.15	4,038,164
176	4,038,165
181	4,038,166
192 D	4,038,167
197	4,038,168
202	4,038,169
290 R	4,038,170
298	4,038,171

CLASS 206

38	4,037,716
45.14	4,037,717
53	4,037,718
266	4,037,719
328	4,037,720
434	4,037,721
519	Re 29,320
523	4,037,722

CLASS 208

10	4,038,172
112	4,038,173
	4,038,174
144	4,038,175
180	4,038,176
216	4,038,177

CLASS 209

104	4,037,723
111 7 R	4,037,724
122	4,037,725
161	4,038,178
166	4,038,179

CLASS 210

10	4,038,180
	4,038,181
20	4,038,188
23 R	4,038,182
47	4,038,183
59	4,038,184
77	4,037,338
83	4,038,185
90	4,038,189
92	4,038,186
108	4,038,187
321 B	4,038,190
	4,038,191
	4,038,192
400	4,038,193
436	4,038,194

CLASS 211

105.5	4,037,726
106	4,037,737
117	4,037,727
124	4,037,728
208	4,037,729

CLASS 214

1 BB	4,037,730
	4,037,731
	4,037,732
.1.5	4,037,733
8.5 A	4,037,734
10	4,037,735
23	4,037,736
38 CC	4,037,738
	4,037,739
83.14	4,037,740
130 C	4,037,741
138 R	4,037,742
140	4,037,743
514	4,037,744
521	4,037,745

CLASS 215

31	4,037,746
219	4,037,747
256	4,037,748
309	Re.29,321

CLASS 219

10.55 E	4,038,510
60 A	4,038,509
121 EM	4,038,513
121 P	4,038,511
	4,038,512
126	4,038,514
131 R	4,038,515
216	4,038,516
	4,038,517
218	4,038,518
301	4,038,519
521	4,038,520

CLASS 220

2.3 R	4,037,749
4 E	4,037,750
9 R	4,037,751
70	4,037,752
211	4,037,753
254	4,037,754

CLASS 221

211	4,037,755
242	4,037,756

CLASS 222

129.2	4,037,757
134	4,037,758
142	4,037,759
145	4,037,760
590	4,037,761
591	4,037,762

CLASS 224

5 V	4,037,763
6	4,037,764
25 R	4,037,765
45 AA	4,037,766

CLASS 226

7	4,037,767
43	4,037,768
190	4,037,769

CLASS 227

9	4,037,770
130	4,037,771

CLASS 228

1 R	4,037,772
122	4,037,773
183	4,037,774

CLASS 229

15	4,037,775
43	4,037,776
52 B	4,037,777
55	4,037,778

CLASS 232

31	4,037,780

CLASS 233

7	4,037,781

CLASS 235

61.12 N	4,038,524
61.5 S	4,038,521
61.7 B	4,038,522
61.9 R	4,038,523
84	4,037,782
92 CN	4,038,525
150.1	4,038,526
150.25	4,038,527
150.26	4,038,528
150.27	4,038,529
150 53	4,038,530
151	4,038,668
151.1	4,038,531
151.11	4,038,533
151.3	4,038,532
151.34	4,038,534
152	4,038,535
	4,038,536
153 AM	4,038,537
154	4,038,538
156	4,038,539
181	4,038,540
194	4,038,541

CLASS 236

49	4,037,783
56	4,037,784

CLASS 237

1 A	4,037,785
8 R	4,037,779
19	4,037,786

CLASS 239

2 R	4,037,787
207	4,037,788
214.17	4,037,789
529	4,037,790
542	4,037,791

CLASS 240

92	4,038,542

CLASS 241

18	4,037,792
30	4,037,793
46.17	4,037,794
58	4,037,795
59	4,037,796
100	4,037,797
101.2	4,037,798
186 A	4,037,799
213	4,037,800
247	4,037,801

CLASS 242

47.05	4,037,802
55.18	4,037,803
68.3	4,037,804

CLASS 243

38	4,037,805

CLASS 244

3.16	4,037,806
7 B	4,037,807
53 B	4,037,808
54	4,037,809

CLASS 248

68 CB	4,037,810
162	4,037,811
218.4	4,037,812
250	4,037,813
285	4,037,815
311.1	4,037,814

CLASS 249

83	4,037,816

CLASS 250

307	4,038,543
315 A	4,038,545
315 R	4,038,544
324	4,038,546
338	4,038,547
357	4,038,548
358 P	4,038,550
423 P	4,038,549
445 T	4,038,551
462	4,038,552
517	4,038,553
572	4,038,554
573	4,038,555
575	4,038,556

CLASS 251

7	4,037,817
14	Re 29,322
121	4,037,818
306	4,037,819
310	4,037,820

CLASS 252

3	4,038,195
8.8	4,038,196
46.7	4,038,197
182	4,038,198
299	4,038,199
	4,038,200
300	4,038,201
301 1 S	4,038,202
301.4 P	4,038,203
	4,038,204
301.6 S	4,038,205
316	4,038,206
	4,038,207
412	4,038,208
419	4,038,209
426	4,038,210
430	4,038,213
435	4,038,211
436	4,038,212
458	4,038,214
465	4,038,215
514	4,038,216
521	4,038,217
542	4,038,218

CLASS 254

93 R	4,037,821
124	4,037,822
172	4,037,823

CLASS 256

53	4,037,824

CLASS 259

4 R	4,037,825
8	4,037,826
37	4,037,827

CLASS 260

2.3	4,038,219
2.5 AH	4,038,221
3	4,038,220
8	4,038,222
9	4,038,223
15 R	4,038,224
21	4,038,225
22 CQ	4,038,226
23 AC	4,038,228
23 H	4,038,227
29.4 R	4,038,229
29.6 F	4,038,230
	4,038,231
	4,038,234
29.6 RW	4,038,233
29.6 TA	4,038,232
30.2	4,038,235
32.8 R	4,038,236
33.6 AQ	4,038,237
33.6 UB	4,038,238
	4,038,239
37 N	4,038,240
39 P	4,038,241
39 R	4,038,242
40 R	4,038,243
42.16	4,038,244
45.7 S	4,038,245
45.75 R	4,038,248
	4,038,249
45.85 B	4,038,250
45.9 NC	4,038,246
	4,038,247
47 R	4,038,253
47 UA	4,038,251
47 XA	4,038,252
75 N	4,038,254
	4,038,255
75 NH	4,038,256
75 NK	4,038,257
75 T	4,038,258
79.1	4,038,259
	4,038,260
	4,038,261
	4,038,262
	4,038,263
79.3 M	4,038,264
79.7	4,038,265
112.5 R	Re.29,324
152	4,038,266
153	4,038,267
156	4,038,268
207	4,038,269
239.1	4,038,271
239.55 R	4,038,272
240 D	4,038,273
240 F	4,038,274
243 C	4,038,275
248 C	4,038,276
256.4 C	4,038,277
256 4 N	4,038,278
268 BQ	4,038,279
293.84	4,038,280
295 D	4,038,282
295 5 B	4,038,283

296 H	4,038,281
307 FA	4,038,284
309	4,038,285
	4,038,286
309.7	4,038,287
329 S	4,038,288
347.3	4,038,289
348.5 L	4,038,290
	4,038,291
	4,038,292
378	4,038,293
404.5	4,038,294
409	4,038,295
410.5	4,038,299
410.6	4,038,296
413	4,038,297
429 J	4,038,298
429.7	4,038,300
437 R	4,038,301
448.2 E	4,038,302
459 A	4,038,303
468 E	4,038,304
468 K	4,038,305
479 S	4,038,306
497 A	4,038,307
514 D	4,038,308
520 A	4,038,309
539 A	4,038,310
544 C	4,038,311
551 P	4,038,312
553 A	4,038,313
556 N	4,038,314
559 AT	4,038,315
566 A	4,038,316
566 AE	4,038,317
567.6 P	4,038,318
570.7	4,038,319
578	4,038,320
583 B	4,038,321
597 R	4,038,322
607 AR	4,038,323
	4,038,324
612 D	4,038,325
617 C	4,038,326
619 R	4,038,327
622 R	4,038,328
637 P	4,038,329
648 C	4,038,330
651 F	4,038,331
653	4,038,332
666 PY	4,038,333
671 R	4,038,334
672 T	4,038,335
680 E	4,038,336
683.2	4,038,337
824 EP	4,038,338
835	4,038,339
861	4,038,340
862	4,038,341
	4,038,342
874	4,038,343
879	4,038,344
881	4,038,345
887	4,038,346

CLASS 261

30	4,038,347
36 A	4,038,348
41 D	4,038,349
89	4,038,353

CLASS 264

22	4,038,350
45.1	4,038,351
81	4,038,352
102	4,038,354
157	4,038,355
160	4,038,356
168	4,038,357
242	4,038,358
263	4,038,359
293	4,038,360

CLASS 266

271	4,037,828

CLASS 267

110	4,037,829

CLASS 269

21	4,037,830
306	4,037,831

CLASS 271

173	4,037,832

CLASS 272

52	4,037,833
65	4,037,834
	4,037,835
99	4,037,836

CLASS 273

25	4,037,837
30	4,037,838
84	4,037,839
85 A	4,037,840
96 D	4,037,841
127 R	4,037,842
131 AB	4,037,843
136 K	4,037,844
138 A	4,037,845
157 R	4,037,846
187 B	4,037,847

CLASS 277

37	4,037,848
	4,037,849

CLASS 280

11 37 H	4,037,850
79.3	4,037,851
87.04 A	4,037,852
204	4,037,853
217	4,037,854
276	4,037,855
446 B	4,037,856
478 B	4,037,857
652	4,037,858
709	4,037,860

CLASS 285

5	4,037,859
168	4,037,861
260	4,037,862
320	4,037,863
342	4,037,864

CLASS 290

1 R	4,038,557
52	4,038,558

CLASS 292

357	4,037,865

CLASS 294

1 CA	4,037,866
19 R	4,037,867
	4,037,868
104	4,037,869

CLASS 296

3	4,037,870
20	4,037,871
61	4,037,564

CLASS 297

65	4,037,872
388	4,037,873

CLASS 299

8	4,037,874
31	4,037,875
43	4,037,876

CLASS 302

53	4,037,877

CLASS 303

13	4,037,878
23 R	4,037,879
82	4,037,880
106	4,037,881
107	4,037,882
116	4,037,883

CLASS 307

64	4,038,559
106	4,038,560
141	4,038,561
203	4,038,562
205	4,038,563
	4,038,564
225 C	4,038,565
229	4,038,566
289	4,038,569
351	4,038,568
362	4,038,567

CLASS 308

2 R	4,037,884
3.8	4,037,885
10	4,037,886
72	4,037,887
74	4,037,888
121	4,037,889
187	4,037,890
187.1	4,037,891
194	4,037,892
205	4,037,893
227	4,037,894

CLASS 310

8 1	4,038,570
8 2	4,038,571
46	4,038,572
71	4,038,573
	4,038,574
179	4,038,575

CLASS 312

233	4,037,895
281	4,037,896
343	4,037,897

CLASS 313

101	4,038,576
188	4,038,577
217	4,038,578
331	4,038,579
498	4,038,580

CLASS 315

13 ST	4,038,581
129	4,038,582

CLASS 318

174	4,038,589
562	4,038,590
578	4,038,591
648	4,038,588

CLASS 323

4	4,038,593
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45	4,038,595

CLASS 324

20 CR	4,038,616
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46	4,038,597
72.5	4,038,598
158 F	4,038,599
179	4,038,617

CLASS 325

4	4,038,600
23	4,038,601
125	4,038,602
182	4,038,603
363	4,038,604

CLASS 328

119	4,038,605
124	4,038,606

CLASS 330

13	4,038,607

CLASS 331

56	4,038,608
65	4,038,609
94.5 H	4,038,610
108 D	4,038,611
178	4,038,612

CLASS 333

30 R	4,038,614
72	4,038,615

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23	4,038,618
61	4,038,619
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219	4,038,623

CLASS 336

60	4,038,624
83	4,038,625

CLASS 337

4	4,038,626
107	4,038,627
321	4,038,613

CLASS 338

318	4,038,628

CLASS 339

17 C	4,037,898
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23	4,037,900
41	4,037,901
49 R	4,037,902
64 R	4,037,904
75 R	4,037,903
98	4,037,905
107	4,037,906
126 R	4,037,907
147 R	4,037,908
177 R	4,037,909
198 R	4,037,910
	4,037,912
217 S	4,037,911
221 M	4,037,913
253 R	4,037,914
258 P	4,037,915
258 R	4,037,916
259 F	4,037,917

CLASS 340

3 E	4,038,629
7 R	4,038,630
15 5 BH	4,038,631
18 NC	4,038,632
38 L	4,038,633
52 F	4,038,634
63	4,038,635
146 1 AV	4,038,636
147 MD	4,038,637
166 R	4,038,638
173 CC	4,038,647
173 R	4,038,646
	4,038,648
237 S	4,038,649
244 R	4,038,650
272	4,038,639
336	4,038,651
347 DD	4,038,652

CLASS 343

5 EM	4,038,654
5 SA	4,038,656
5 W	4,038,655
6.8 R	4,038,653
7.3	4,038,657
7.7	4,038,658
17.1 R	4,038,659
18 A	4,038,660
715	4,038,661
752	4,038,662

CLASS 346

1	4,038,663
	4,038,664
74.1	4,038,665
136	4,038,666
140 R	4,038,667

CLASS 350

3.5	4,037,918
	4,037,919
7	4,037,920
36	4,037,921
96 B	4,037,922
	4,037,923
97	4,037,924
	4,037,925
135	4,037,926
160 LC	4,037,927
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	4,037,930
	4,037,931
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160 R	4,037,928
161 W	4,037,933
175 ML	4,037,934
176	4,037,935
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189	4,037,936
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294	4,037,943
310	4,037,944
319	4,037,945

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114	4,037,946

CLASS 352

27	4,037,947
29	4,037,948
58	4,037,950
158	4,037,949

CLASS 353

19	4,037,951

CLASS 354

76	4,038,669
96	4,038,670
197	4,038,671
212	4,038,672
222	4,038,673
230	4,038,674
238	4,038,675

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50	4,037,954
54	4,037,955
77	4,037,956
91	4,037,957

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4	4,037,958
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85	4,037,961
86	4,037,962
	4,037,963
102	4,037,964
	4,037,965
	4,037,966
135	4,037,967
160	4,037,968
172	4,037,969
188	4,037,970
199	4,037,971
206	4,037,972
	4,037,973
246	4,037,974

CLASS 357

34	4,038,676
44	4,038,680
51	4,038,677
81	4,038,678

CLASS 358

19	4,038,683
20	4,038,681
27	4,038,684
32	4,038,685
127	4,038,679
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128	4,038,682
165	4,038,687
174	4,038,688
191	4,038,689
213	4,038,690

CLASS 360

2	4,038,691
25	4,038,692
99	4,038,693
105	4,038,694
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CLASS 361

96	4,038,695
104	4,038,584
230	4,038,583
321	4,038,587
334	4,038,585
415	4,038,696
435	4,038,586

CLASS 363

165	4,038,592

CLASS 364

200	4,038,640
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900	4,038,641
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198	4,037,976
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CLASS 403

164	4,037,978
284	4,037,979
336	4,037,980

CLASS 404

91	4,037,981

CLASS 408

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CLASS 415

2	4,037,983
60	4,037,984
175	4,037,985

CLASS 416

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141	4,037,988
197 A	4,037,989
220 R	4,037,990

CLASS 417

80	4,037,991
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222	4,037,993
316	4,037,994
349	4,037,995
518	4,037,996

CLASS 418

61 R	4,037,997
83	4,037,998
84	4,037,999
102	4,038,000

CLASS 423

34	4,038,361
40	4,038,362
82	4,038,363
86	4,038,364
161	4,038,365
234	4,038,366
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1	4,038,378
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49	4,038,380
89	4,038,381
117	4,038,382
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122	4,038,384
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267	4,038,400
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295	4,038,413
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150	4,038,004
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451 9	4,038,016
466	4,038,017
505	4,038,018
525	4,038,006

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12	4,038,419
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72	4,038,421
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38	4,038,439
109	4,038,441
128	4,038,442
136	4,038,443
150	4,038,445
248 E	4,038,430
261	4,038,444
385 R	4,038,438

CLASS 428

35	4,038,446
72	4,038,447
212	4,038,448
220	4,038,449
224	4,038,452
245	4,038,440
268	4,038,450
274	4,038,451
325	4,038,453
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